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Vol. 935 Number 1

OFFICIAL GAZETTE
of the
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

June 3, 1975

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DEPARTMENT
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June 3, 1975 Volume 935 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,807,213, S. Rosen, FILLING MACHINES; **2,907,614,** same, PRECISION PUMP; **3,237,661,** same CONTAINER FILLING SYSTEM, filed Nov. 10, 1971, D.C.N.J. (Newark), Doc. C–1663–71, *Sidney Rosen and National Instrument Co., Inc.* v. *Harry G. Kalish and H. G. Kalish Co., Ltd.* Stipulation and order of dismissal of action, Nov. 19, 1974.

2,864,990, A. D. Hill, AUTOMATIC PILOT; **2,973,418,** same, COMPASS SUSPENSION FOR AUTOMATIC PILOT; **3,018,750,** same, MERCURY SWITCH CONTROL FOR ELECTRICALLY GOVERNED RUBBER, filed Apr. 2, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV–74–869–JWC, *Ann M. Hill* v. *Robert Baltierra.* Filed plaintiff's request for dismissal of complaint with prejudice to plaintiff and the consent of defendant and order thereon, entered Nov. 26, 1974.

2,907,614. (See 2,807,213.)

2,909,384, M. F. Saxton, MAGNETIC DOOR CATCH, filed Jan. 10, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c99, *Engineered Products Company* v. *Richard K. Sweet and Assoc.*

2,916,546, Ginsburg and Dolby, VISUAL IMAGE RECORDING AND REPRODUCING SYSTEM AND METHOD; **2,916,547,** Ginsburg and Henderson, Jr., RECORDING AND REPRODUCING SYSTEM; **2,968,692,** Ginsburg and Dolby, ELECTRONIC SWITCHING SYSTEM FOR MAGNETIC RECORDER AND/OR REPRODUCER; **2,996,576,** R. M. Dolby, VIDEO SYSTEM WITH TRANSIENT AND DROPOUT COMPENSATION; **3,003,025,** Ginsburg, Henderson, Jr., Dolby and Anderson, VIDEO RECORDER TAPE AND HEAD SPEED CONTROL SYSTEM; **3,017,462,** Clark and MacLeod, TAPE APPARATUS SYNCHRONIZING SYSTEM; **3,100,816,** Coleman, Jr. and Jensen, TIMING CONTROL FOR SIGNAL REPRODUCING SYSTEM; **3,340,367,** Coleman, Jr., Felix, Jensen, PLAYBACK EQUALIZATION SCHEME FOR A REPRODUCED FREQUENCY MODULATED SIGNAL; **3,345,457,** D. B. MacLeod, TENSION CONTROL FOR WIDEBAND RECORDING SYSTEM; **3,519,761,** A. J. Trost, RECORD EXCITATION OPTIMIZATION METHOD AND APPARATUS FOR ROTARY HEAD MAGNETIC TAPE RECORDERS, filed Jan. 7, 1975, D.C., N.D. Calif. (San Francisco), Doc. C–75–35–ACW, *Ampex Corp.* v. *International Video Corporation.*

3,047,040, T. A. O. Gross, PNEUMATIC LOAD BEARING DEVICES, filed Apr. 3, 1969, D.C. Mass. (Boston), Doc. C.A. 69–334–J, *Thomas A. O. Gross* v. *General Motors Corporation.* Judgment for the defendant declaring (*a*) that Claims 1, 2 and 4 are not infringed, (*b*) that Claims 1, 2 and 4 are invalid. Plaintiff is permanently enjoined from asserting any further claim of infringement and from bringing any further suit based uuon Claims 1, 2 and 4 against the defendant, Jan. 14, 1975.

2,916,547. (See 2,916,546.)

2,968,692. (See 2,916,546.)

2,973,413. (See 2,864,990.)

2,996,576. (See 2,916,546.)

3,003,025. (See 2,916,546.)

3,017,462. (See 2,916,546.)

3,018,750. (See 2,864,990.)

3,100,816. (See 2,916,546).

3,213,192. (See 2,916,546.)

3,237,661. (See 2,807,213.)

3,244,359, C. A. Holland, CRATE SUPPORTING AND DOOR OPERATING STRUCTURE, filed Dec. 4, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV 74–3556–RF, *Clarence A. Holland* v. *Jack DeWolf.*

3,340,367. (See 2,916,546.)

3,345,457. (See 2,916,546.)

3,375,679, W. F. Helsel, REFRIGERATOR-FREEZER CONSTRUCTION, filed Dec. 26, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c3742, *Fedders Corporation* v. *Amana Refrigeration, Inc.* Same, filed Nov. 8, 1974, D.C. Iowa (Cedar Rapids), Doc. C–74–58, *Amana Refrigeration, Inc.* v. *Fedders Corporation.*

3,428,333, V. E. Nelson, TOW-TYPE SECTIONAL AUTOMATICALLY FOLDABLE HARROW CART, filed Jan. 21, 1975, D.C. Minn. (St. Paul), Doc. C–6–75–21, *Gladys Nelson Howen* v. *Clark Equipment Co.*

3,432,867, G. R. Whitten, Jr., GUTTER AND WATER SUPPLY SYSTEM FOR SWIMMING POOLS; **3,537,111,** same, SYSTEM FOR CONTROLLING WATER LEVEL AND RECIRCULATION IN SWIMMING POOLS WITH GUTTERS, filed Oct. 7, 1974, D.C.N.J. (Newark), Doc. 74–1546, *George R. Whitten, Jr.* v. *KDI Sylvan Pools, Inc. et al.*

3,458,783, M. A. Rosenberg, HERMETICALLY SEALED CAPACITOR, filed Jan. 16, 1975, D.C., C.D. Calif. (Los Angeles), Doc. 75–154 WPG, *San Fernando Electric Mfg. Co.* v. *Varadyne Industries, Inc.*

3,469,686, Gutsche, Harris and Walsh, RETAINING TRAYS FOR SEMICONDUCTOR WAFERS AND THE LIKE; **3,482,682,** P. W. CRONKHITE, same, filed Sept. 25,1974, D.C., N.D. Calif. (San Francisco), Doc. C–74–2043–SW, *Semicon Systems Inc.* v. *Galamar Industries, Inc.*

3,482,682. (See 3,469,686.)

3,519,761. (See 2,916,546.)

3,537,111. (See 3,432,867.)

3,547,057, S. R. Wilson, UNDERGROUND INCINERATOR, filed Nov. 25, 1974, D.C., N.D. Tex. (Lubbock), Doc. CA–5–74–126, *Stanley R. Wilson* v. *D. L. Roberson, doing business as Roberson Bros. Cesspool Drilling Co.*

3,558,381, W. D. Collanni, METHOD OF MAKING BUTTONHOLES, filed Oct. 9, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c2906, *William D. Collanni* v. *The Rrece Corporation.*

3,739,653, D. Bogosh, SPEEDOMETER DRIVES, filed May 29, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c1467, *Donald Bogosh* v. *Stewart-Warner Corporation.*

3,742,571, R. C. Brehm, APPARATUS FOR TRIMMING AND INSERTING WIRES; **3,766,622,** Brehm, Long and Over, AUTOMATIC APPARATUS FOR ATTACHING WIRES TO TERMINALS, filed Oct. 31, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c3147, *AMP Incorporated* v. *TRW INC.*

3,758,051, D. D. Williams, VELOCITY CONTROL AND ORIENTATION OF SPIN-STABILIZED BODY; **Re. 26,887,** W. B. McLean, PROPORTIONAL NAVIGATION SYSTEM FOR A SPINNING BODY IN FREE SPACE, filed Dec. 5, 1974, D.C., M.D. Fla. (Orlando), Doc. 74–366–Orl–C–R, *Hughes Aircraft Company and William B. McLean and Walter G. Finch* v. *Messerschmitt-Boelkow-Blohm, GmbH.*

3,766,622. (See 3,742,571.)

3,837,124, Johnson and O'Rourke, METHOD FOR MAKING REPLICA CONTOUR BLOCK MASTERS FOR PRODUCING SCHMIDT CORRECTOR PLATES; **3,837,125,** T. J. Johnson, METHOD AND SYSTEM FOR MAKING SCHMIDT CORRECTOR LENSES, filed Nov. 19, 1974, D.C. Conn. (New Haven), Doc. N–74–276, *Celestron Pacific* v. *The Criterion Manufacturing Co., Inc.*

3,837,125. (See 3,837,124.)

3,861,989, Ashenfarb, Weinblatt and Glowzenski, METHOD OF MAKING MIRRORS HAVING RANDOMLY REFLECTIVE DECORATION, filed Jan. 23, 1975, D.C.N.J. (Newark), Doc. 75–118, *Hoyne Industries, Inc.* v. *New Age Mirror and Tile Industries, Inc.*

Re. 26,887. (See 3,758,051.)

D. 230,099, E. R. Orr, WATER PIPE, filed Nov. 21, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV–74–3432–Rf, *Cabin Crafts, Inc.* v. *Berney Karp.*

Interference Practice

Listing of Attorneys or Agents in Final Decisions

A recent inquiry was made at the Board of Patent Interferences relating to the listing of attorneys' names in the heading of the final decisions of the Board of Patent Interferences.

Since this is a matter that may be of interest to those who prosecute interferences in the United States Patent and Trademark Office, the present practice of the Board of Patent Interferences is set forth below.

The heading of final decisions of the Board of Patent Interferences separately lists the names of all attorneys, agents or firms recognized as representing a party in the interference. Since firms have not been recognized by the Office since July 2, 1971, the listing of firm names is limited to firms of record in applications filed prior to July 2, 1971, and in unexecuted continuations or divisions thereof (Rule 60).

The names of the attorneys, agents or firms are taken from the interference file wrapper. The noted file wrapper lists the attorney or agent or firm of record in the applications or patent involved in the interference. Additionally, the name of any attorney presenting a party's oral argument at the final hearing is separately listed.

If a party desires to correct a firm name or exclude an attorney or agent previously of record from the above-noted decision, steps should be taken *promptly* to correct the files involved in the interference. This should be done by proceeding pursuant to the provisions of Rule 36, or by taking such other action as the party deems appropriate.

WALTER A. MODANCE,
May 6, 1975. *Chairman, Board of Patent Interferences.*

An "Open Letter" to Subscribers to the Official Gazette of the United States Patent and Trademark Office

Dear Subscriber:

The Patent and Trademark Office views the increase in the annual subscription rate for the Official Gazette (Patents) from $211 to $342.20 and for the Official Gazette (Trademarks) from $60.25 to $88.40, announced this past November, with the same deep concern as the many subscribers who have written to us about it.

In attempting to understand the basis for this substantial price increase, dramatic even for a period marked by inflationary spiral, we have conferred with the Public Printer of the United States and the Superintendent of Documents. Finding that publications are priced according to requirement of law that the cost of printing sales copies be recovered in the sale or subscription price, and that future price increases due to production costs and postal rate increases are in the offing, our mutual attention has been directed to steps which might be taken to reduce publication and distribution costs, or to bring the Official Gazette to the public in new forms, but with the same information, at lower cost.

We have looked into possible economies in publication that might be realized through the following measures: change in size of the publication, so as to achieve a greater amount of printing for the press time involved; using a lower grade of paper, such as newsprint; changing the format of the Gazette, such as a three-column layout, instead of two columns; separating textual matter from drawing reproductions, placing the latter in a separate portion of the publication devoted exclusively to that matter; printing drawings in a separate companion volume to the volume containing textual matter; offering the Gazette in separate portions along broad subject lines based on its present subdivisions (General and Mechanical, Chemical, and Electrical), so that subscribers could obtain only that subject matter which might be of a particular interest, instead of having to purchase the entire issue; reverting to the publication of abstracts in view of the fact that the printing of claims increased the size of the Gazette by nearly 27% and, correspondingly, the cost of postage; together, these cost elements added to the subscription price increase. As a replacement for the Gazette for those desiring only the Official Notice Section, a pamphlet containing the pages, "Contents," "Official Notices" and "Patent Examining Filing Date of Oldest New Case" could be provided.

We have, also, explored the alternative publication form of microfiche and find that the entire Gazette, in its present format and content. could be offered for an annual subscription rate of $140. This new but widely used form of publication would reduce the annual cost of the Official Gazette to an amount less than the former subscription rate; would offer space-saving convenience in storing copies for later reference; would reach you by first class mail, a fact that cannot be assured for the conventional publication in view of prospective further increases in postal rates, unless subscribers are willing to accept this element of greater cost. Microfiche distribution would not introduce any delay in availability of the Official Gazette, as the film would be released for mailing simultaneously, on issue day, with printed copies; quite possibly the mailing time would be reduced because, being handled as first-class letter mail, the microfiche could be dispatched as air mail to more distant points. Subscribers whose organizations are already equipped with microfilm facilities could reproduce the microfiche for low cost additional dissemination within their organizations; subscribers who are not now so equipped, could find it profitable to explore the cost-saving aspects and other benefits offered by such equipment.

A number of the alternatives considered jointly by the Patent and Trademark Office and the U.S. Government Printing Office were found not to be feasible for one reason or another. For example, format and paper changes would entail major revisions in production methods and equipment which, for the expense and disruptions involved, afforded little basis of certain long-run benefit in lower subscription rates. Offering the Official Gazette in separate sections (General and Mechanical, Chemical and Electrical), while reducing subscription costs to those who need only one or two sections, would raise Patent and Trademark Office costs an excessive amount. Some of the alternatives seem to be viable, but they need to be tested from the subscriber's point of view. Accordingly, there is presented, elsewhere in this issue of the Official Gazette a survey form (PTO Temp. 218) which puts before the subscriber various choices to be made as measures for reducing the cost of obtaining information contained in weekly issues of the Official Gazette.

The survey form, when completed by the subscriber to show his preferences, will be helpful to the Patent and Trademark Office in planning the actions it may take to serve its clientele and to assure that the Official Gazettes remain effective publications in disseminating information concerning newly issued patents and registered trademarks. Your cooperation and assistance in careful consideration of the alternatives offered, thoughtful election of choices, and expression of those choices on the survey form, will be helpful to the Patent and Trademark Office, as well as to your ultimate benefit.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Certificates of Correction for the Week of June 3, 1975

Re. 28,213
3,643,513
3,706,122
3,723,306
3,756,004
3,762,140
3,762,934
3,764,350
3,765,153
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3,771,960
3,780,160
3,785,662
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3,863,909
3,863,994
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3,866,433
3,866,736
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3,875,568
3,876,057

As of July 1, 1975, reissue patents will be printed under the data base system and in the same general style and format presently in effect for invention patents. (See the Notice of July 16, 1970 published at 877 O.G. 1 for details of patent front page format.) However, for reissue patents the following modifications are necessary:

A. *Front Page*

- Use of the uppercase alpha code "E" with the INID Code [11] (for document number): This ICIREPAT alpha code, identifying the document as a reissue patent, is one of the "Standard Codes for Identification of Different Kinds of Patent Documents," which indicate levels of publication.
- Use of "REISSUED" preceding the date the patent was reissued.
- Addition of a new data element titled "Related U.S. Patent Documents" which is comprised of two categories of information:

    1) "Reissue of:"—presenting data identifying the original patent being reissued. INID Code [64] is assigned thereto. (See Section 901.04 of the Manual of Patent Examining Procedure for a list with definitions of INID Codes (ICIREPAT numbers for identification of data).)

    This information will appear on each reissue patent.

    2) "U.S. Applications:"—presenting continuing application data which appears for invention patents under the data element "Related U.S. Application Data."

    This information will appear when applicable.

B. *Drawings*

- Use of "REISSUED" instead of "PATENTED" at the top left of sheets of drawings.

C. *Specification*

- Presence of same preface paragraph formerly used for reissue patents to explain indicators (brackets and italics) of changes made by reissue.

The specimen which appears on opposite page illustrates the front page for reissue patents under the revised format.

Approved: May 6, 1975.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

United States Patent [19]
Shook

[11] B **Re. 12,345**
[45] **Reissued Nov. 30, 1972**

SPECIMEN

[54] **REAR SUSPENSION MECHANISM**

[75] Inventor: **Howard E. Shook**, Xenia, Ohio

[73] Assignee: **Fox Equipment Company,**
Xenia, Ohio

[22] Filed: **Dec. 24, 1971**

[21] Appl. No.: 999,999

Related U.S. Patent Documents

Reissue of:

[64] Patent No.: **3,999,999**
Issued: **Nov. 30, 1970**
Appl. No.: **999,999**
Filed: **Oct. 31, 1969**

[52] **U.S. Cl.** .... **180/5 R**; 280/25
[51] **Int. Cl.^{2}** **B62E 27/02; B62M** 17/04
[58] **Field of Search** .... 180/5 R, 3, 4, 6; 280/25,12; 244/108, 105

[56] **References Cited**

UNITED STATES PATENTS

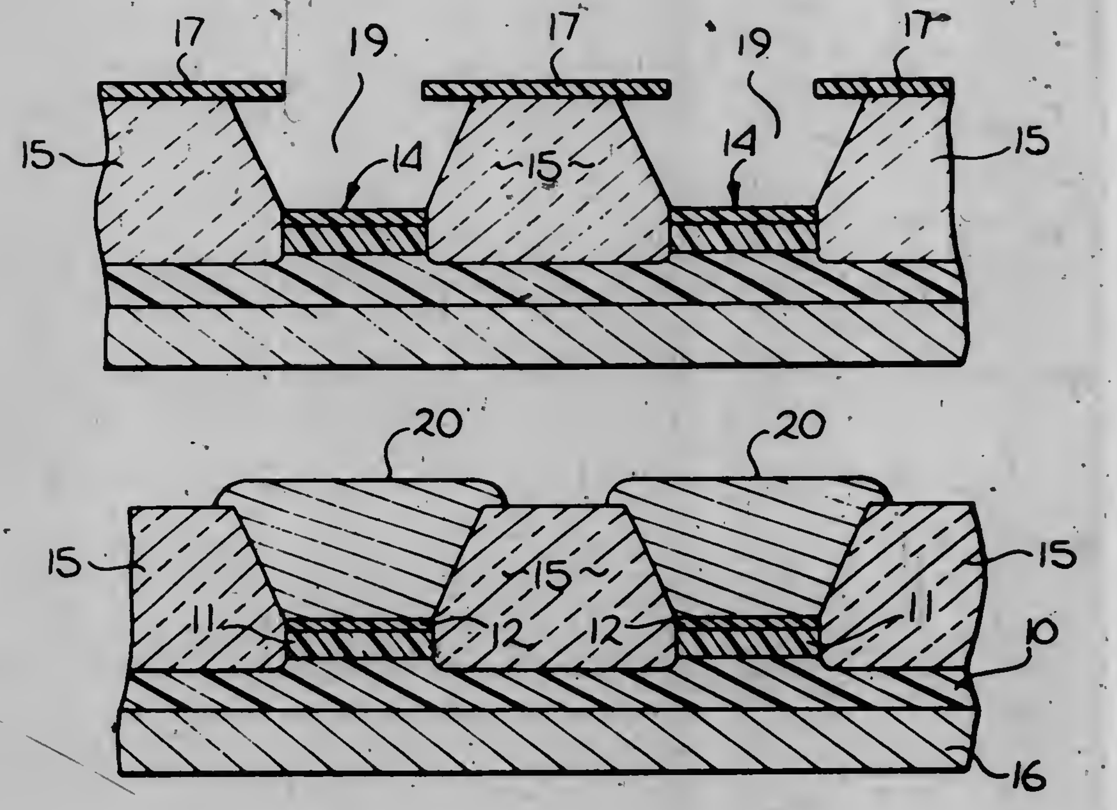
3,999,999	12/1932	Stalb	244/108
3,999,999	12/1932	Markey	244/108
3,999,999	1/1941	Smith	280/12 R X
3,999,999	2/1960	Laporte	180/5 R

Primary Examiner—Richard J. Johnson
Attorney, Agent, or Firm—Jones & Jones

[57] **ABSTRACT**

A single shot firing mechanism adapted to be concealed in an elongated rod normally utilized for an entirely different purpose comprising, a tubular housing forming a section of the rod, a barrel portion removably secured to the forward end of said housing for holding a cartridge in position to be fired, a forwardly biased striker longitudinally disposed in said housing for firing contact with the cartridge, a cylindrical sear secured to the rear end of said striker, a cocking rod disposed in said housing in simultaneous contact with the breech face of said barrel portion and the front face of said sear for retaining said striker in a cocked position, a firing ring surrounding the junction of said housing and said rod for rotatable and slidable movement thereon, and means for transferring the rotation of said firing ring to said sear to release said striker for movement into firing contact with the cartridge.

21 Claims, 4 Drawing Figures



PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 10, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-24-74
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-22-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-21-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-3-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	6-7-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	11-6-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-8-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-5-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-15-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-8-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	2-4-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-12-74
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-3-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-30-74
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	8-9-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-4-74

Expiration of patents: The patents within the range of numbers indicated below expire during May 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,832,959, to 2,836,825 inclusive
Plant Patents	Numbers 1,698, to 1,713 inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED JUNE 3, 1975

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T935,001

SOFT ADHESIVE FOR TWO-ADHESIVE POLYESTER BAGS

Aurelius Franklin Chapman, 2417 Brookshire Drive,
Wilmington, Del. 19803

Continuation of application Ser. No. 207,636, Dec 13, 1971. This application Jan. 2, 1974, Ser. No. 430,051

Int. Cl. B65d *33/20, 33/22;* **B32b** *7/14*
U.S. Cl. 229—53

No Drawing. 6 Pages Specification

A thermoplastic adhesive suitable for use as the inner shock-absorbing band in a double adhesive band bag closure comprising

(a) a polymer selected from the group consisting of plasticized polyvinyl acetate and plasticized polyacrylate wherein the plasticizer is present in an amount preferably ranging from 30 to 150 parts per 100 parts of polymer; and

(b) about 2 to 30 parts, preferably 5 to 15 parts, of a vinylidene chloride copolymer, per 100 parts of plasticized polymer, containing from about 40 to 85 weight percent vinylidene chloride.

T935,002

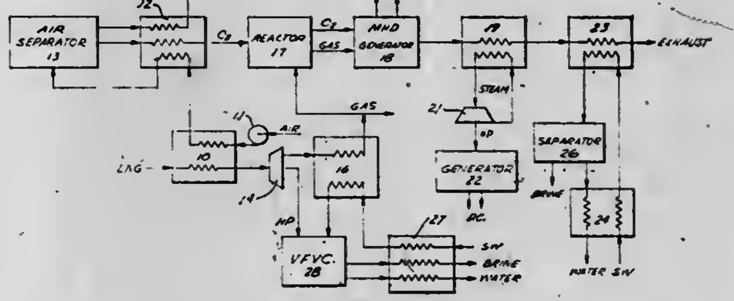
LIQUEFIED NATURAL GAS OXYGEN SEPARATION WATER DESALINATION AND ELECTRICAL GENERATION SYSTEM

Joseph Seliber, 313 Hibbard Road,
Wilmette, Ill. 60091

Continuation of abandoned application Ser. No. 154,015, June 17, 1971. This application Jan. 31, 1974, Ser. No. 438,300

Int. Cl. B01d *3/10*
U.S. Cl. 203—11

1 Sheet Drawing. 8 Pages Specification



A combined system and method using liquefied natural gas for generating electricity and recovering potable water from saline water is provided. The liquefied natural gas cools air that is separated to produce oxygen that is combined with a portion of the vaporized natural gas for producing electricity preferably with a magnetohydrodynamic (MHD) generator. Additional refrigeration and kinetic energy gained from gas expansion are employed for vacuum freezing vapor compression desalination. Heat from the MHD generator may generate steam for producing additional electricity, and also heat water for vaporization desalination. Preferably a nuclear reactor is used for preheating oxygen and natural gas before reaction in the MHD generator.

T935,003

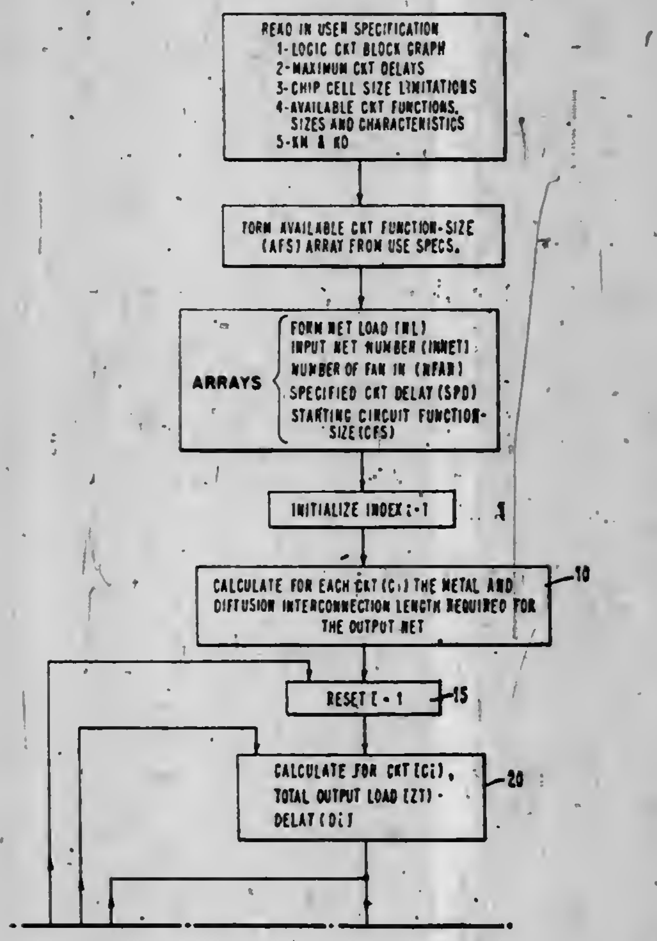
PROCESS FOR SELECTING CIRCUITS WITH OPTIMUM POWER AND AREA REQUIREMENTS

Thomas P. Linville, 2264 Brookside Ave., Yorktown Heights, N.Y. 10598, and Erwin Schischa, Peekskill, Gerhard R. Thompson, Mahopac, N.Y.

Continuation of abandoned application Ser. No. 214,143, Dec. 30, 1971. This application Feb. 19, 1974, Ser. No. 443,268

Int. Cl. G06f *15/06, 15/56*
U.S. Cl. 444—1

7 Sheets Drawing. 27 Pages Specification


READ IN USER SPECIFICATION
1-LOGIC CKT BLOCK GRAPH
2-MAXIMUM CKT DELAYS
3-CHIP CELL SIZE LIMITATIONS
4-AVAILABLE CKT FUNCTIONS, SIZES AND CHARACTERISTICS
5-KN & KO
FORM AVAILABLE CKT FUNCTION-SIZE (AFS) ARRAY FROM USE SPECS.
ARRAYS
FORM NET LOAD (NL)
INPUT NET NUMBER (INNET)
NUMBER OF FAN IN (NFAN)
SPECIFIED CKT DELAY (SPD)
STARTING CIRCUIT FUNCTION-SIZE (CFS)
INITIALIZE INDEX i=1
5
CALCULATE FOR EACH CKT (Ci) THE METAL AND DIFFUSION INTERCONNECTION LENGTH REQUIRED FOR THE OUTPUT NET
10
RESET i=1
15
CALCULATE FOR CKT (Ci), TOTAL OUTPUT LOAD (ZT) · DELAY (Di)
20

This is an automatic process for selecting circuits to be placed on a large scale integrated (LSI) circuit chip. The process selects a minimum circuit size which satisfies the power and timing requirements of the individual circuits on the chip. Minimization is achieved by selecting from user specification lists, that circuit which satisfies the requirements. The large scale integrated circuit chip resulting from the design process contains field effect transistor circuits of different physical size. By matching the required power and timing with a satisfactory circuit, the LSI chip is more highly compacted in the number of circuits and performance available within the chip structure.

T935,004

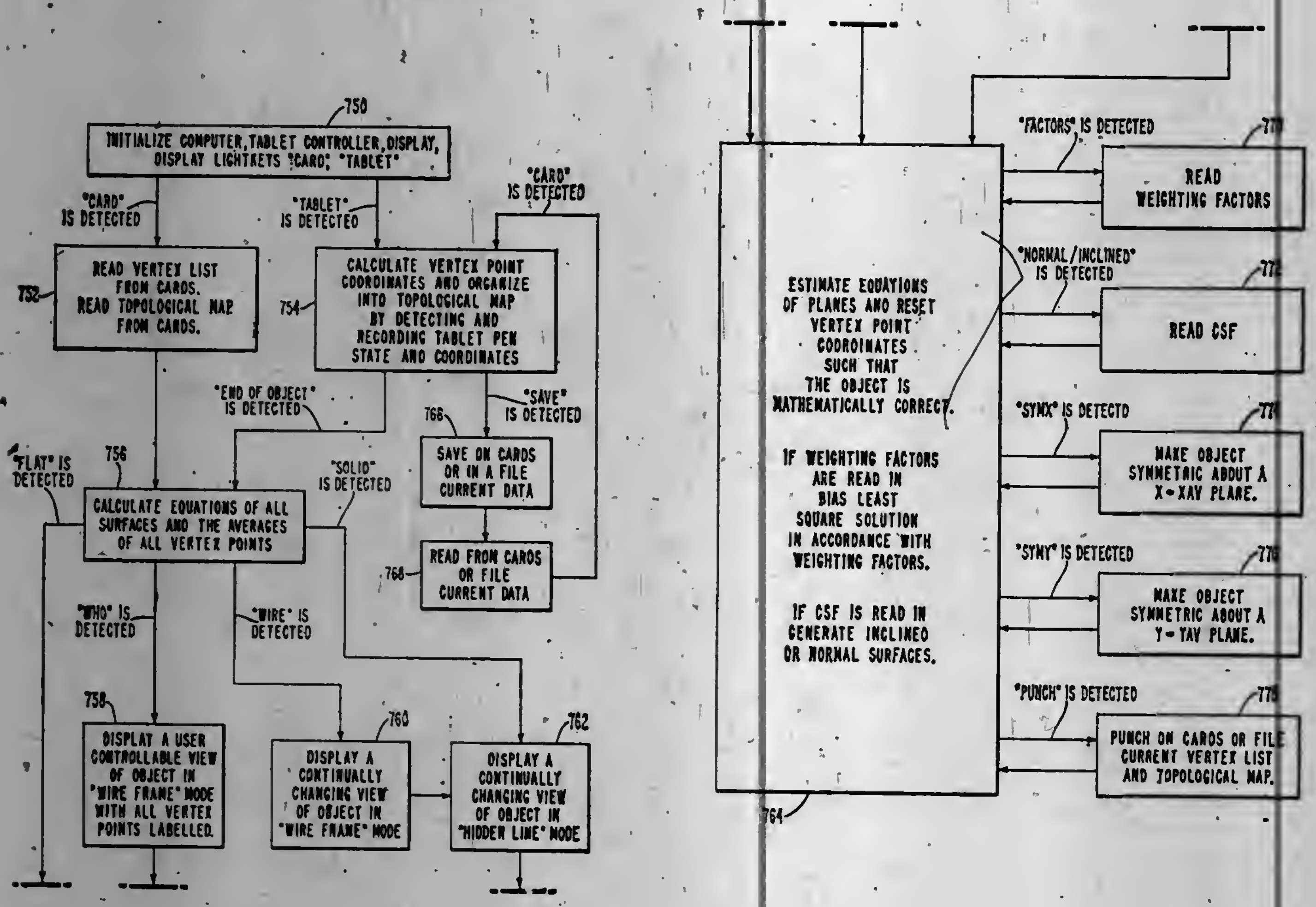
PROCESS FOR THE INTERACTIVE DESIGN OF POLYHEDRA

Arthur Appel, 1512 Indiana Ave., Yorktown Heights, N.Y. 10598, Arthur J. Stein, 35 Wheeler Drive, Peekskill, N.Y. 10566

Continuation of abandoned application Ser. No. 318,452, Dec. 26, 1972. This application May 17, 1974, Ser. No. 471,090

Int. Cl. G06f *15/20*
U.S. Cl. 444—1

38 Sheets Drawing. 82 Pages Specification


750
INITIALIZE COMPUTER,TABLET CONTROLLER,DISPLAY, DISPLAY LIGHTKEYS "CARD", "TABLET"
"CARD" IS DETECTED
"TABLET" IS DETECTED
"CARD" IS DETECTED
752
READ VERTEX LIST FROM CARDS. READ TOPOLOGICAL MAP FROM CARDS.
754
CALCULATE VERTEX POINT COORDINATES AND ORGANIZE INTO TOPOLOGICAL MAP BY DETECTING AND RECORDING TABLET PEN STATE AND COORDINATES
"END OF OBJECT" IS DETECTED
"SAVE" IS DETECTED
766
SAVE ON CARDS OR IN A FILE CURRENT DATA
768
READ FROM CARDS OR FILE CURRENT DATA
"FLAT" IS DETECTED
756
CALCULATE EQUATIONS OF ALL SURFACES AND THE AVERAGES OF ALL VERTEX POINTS
"SOLID" IS DETECTED
"WHO" IS DETECTED
"WIRE" IS DETECTED
758
DISPLAY A USER CONTROLLABLE VIEW OF OBJECT IN "WIRE FRAME" MODE WITH ALL VERTEX POINTS LABELLED.
760
DISPLAY A CONTINUALLY CHANGING VIEW OF OBJECT IN "WIRE FRAME" MODE
762
DISPLAY A CONTINUALLY CHANGING VIEW OF OBJECT IN "HIDDEN LINE" MODE
ESTIMATE EQUATIONS OF PLANES AND RESET VERTEX POINT COORDINATES SUCH THAT THE OBJECT IS MATHEMATICALLY CORRECT.
IF WEIGHTING FACTORS ARE READ IN BIAS LEAST SQUARE SOLUTION IN ACCORDANCE WITH WEIGHTING FACTORS.
IF CSF IS READ IN GENERATE INCLINED OR NORMAL SURFACES.
764
"FACTORS" IS DETECTED
770
READ WEIGHTING FACTORS
"NORMAL/INCLINED" IS DETECTED
772
READ CSF
"SYMX" IS DETECTD
774
MAKE OBJECT SYMMETRIC ABOUT A X=XAV PLANE.
"SYMY" IS DETECTED
776
MAKE OBJECT SYMMETRIC ABOUT A Y=YAV PLANE.
"PUNCH" IS DETECTED
778
PUNCH ON CARDS OR FILE CURRENT VERTEX LIST AND TOPOLOGICAL MAP.

In the process described herein, there is sketched on the screen of an interactive graphics display device a front view and a side view of a three-dimensional object such as a polyhedron, a capacitance tablet being a suitable input sketching device. Thereafter, there is described in the front view of the device, a particular surface boundary. The tracking spot on the screen is placed over successive vertex points in the front view and the interactive graphics device lightpen switch is closed at every vertex point. Thereby, there is recorded from the tracking spot position, the Y and Z coordinates of the vertex point in the order in which these points are entered. Next, the same surface is described in the right side view by selecting the vertex points in the same order. A computer determines the X coordinate in this view and since the order of entering data is the same in both views, X values can be assigned to the correct vertex point. The order in which points are entered is the topological map for the surface and the coordinates of all vertex points are known. If the tracking spot is detected in the right-half of the screen, encoded points are treated as being in the right side view. When the number of points entered for a particular surface on the right side view equal the number of points entered for a particular surface on the front view, the topological description of that surface is completed and an isometric drawing of that surface is projected. Thereafter, another surface is encoded. In the computer, there are compared encoded vertex points to all previously entered points to determine if a new point is within a small error distance of any other point. If it is, then the new vertex point is to be replaced with the previously entered point in the topological map. After an object is completely encoded, in accordance with the process, the orthographic view of the solid object can be rotated for inspection. To determine whether the solid is perfectly encoded, a hidden line test can be made. In this connection, if hidden lines can be eliminated, the vertex list and the topological map are usually correct and complete. The use of the order in which points are entered to construct the topological map and to associate coordinates of points between the front and side views enables complete freedom in the type of polyhedra which can be encoded and the type of graphic material being traced. The process can, therefore, be employed to calculate coordinates and the tedious work of writing down the vertex list and the topological map is eliminated. The process is particularly applicable in numerical control techniques.

T935,005

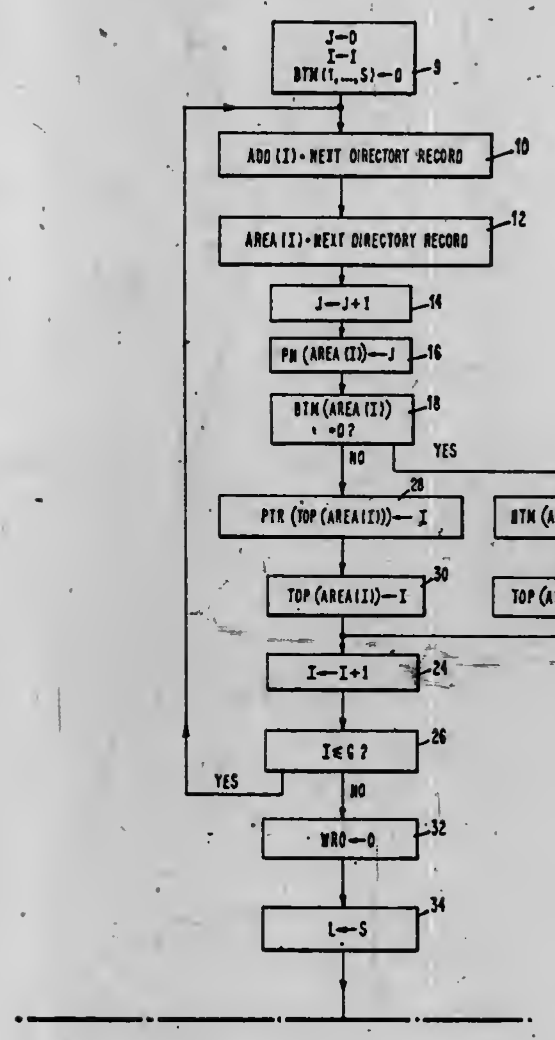
PROCESS FOR THE SEQUENTIAL RECOVERY OF THE RECORDS OF A FILE

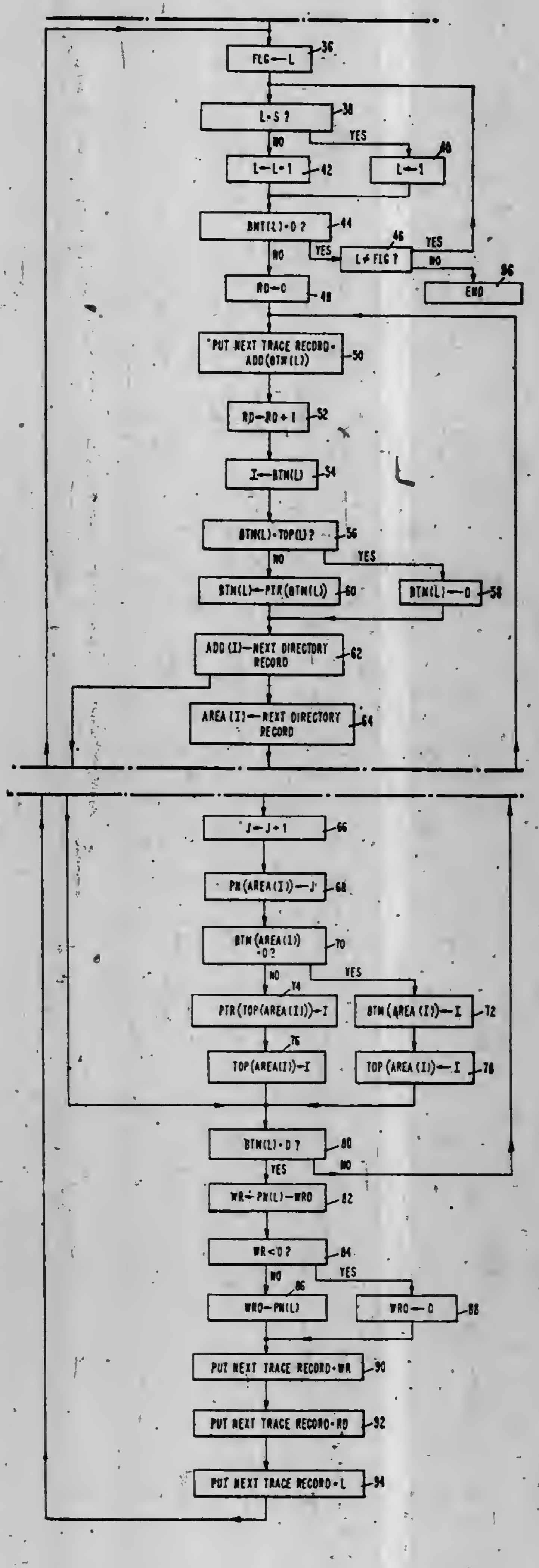
Brian T. Bennett, Wenonah Trail, Mohegan Lake, N.Y. 10547, and Archie C. McKellar, 100 Diplomat Drive, Apt. 3C, Mount Kisco, N.Y. 10549

Continuation of application Ser. No. 208,547, Dec. 16, 1971. This application June 7, 1974, Ser. No. 477,373.

Int. Cl. G06f *7/06*
U.S. Cl. 340—172.5

41 Sheets Drawing. 6 Pages Specification



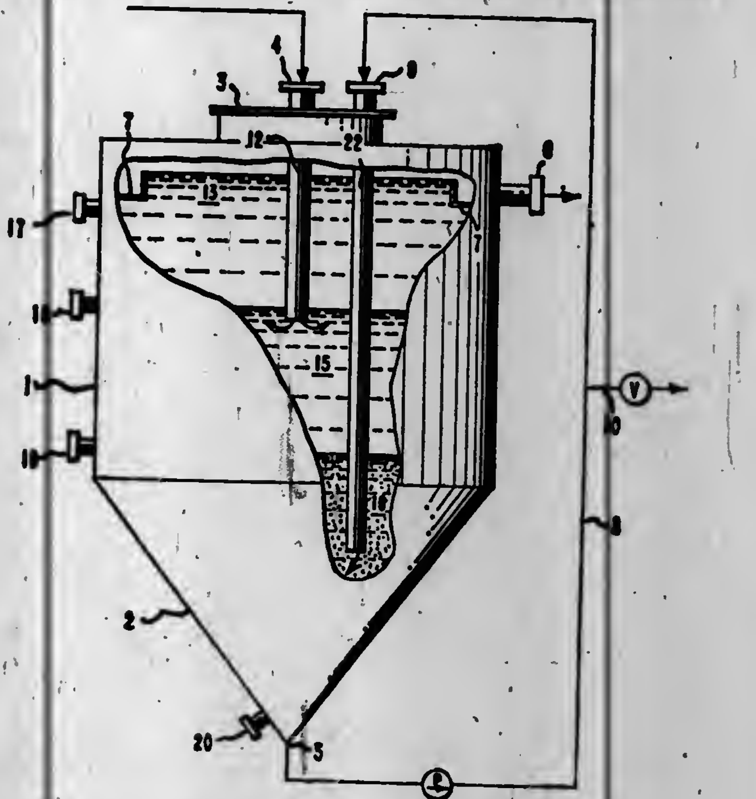


A process is disclosed for the sequential recovery of the records of a file wherein the records are randomly located on a storage device which comprises a plurality of areas. The process is based upon the principle that the recovery of the records in sequence order is isomorphic to the distribution of the sequence of records into the specific locations on the storage device. In the process, a directory is employed which contains the tags of the records in sequential order of key value, the tag comprising the records key value, and its address in the storage device. Utilizing the directory, a simulation of the distribution of the tags therein is performed and the result of the simulated distribution is written out in the form of a string of items which includes portions of the tags grouped therein according to areas and information as to which records and how many are to be written out at respective visits to the storage device. The items in the string are then employed in the reverse order of their writing out to determine the recovery or retrieval of the records in sequential order of key value. In one aspect of the invention, the record recovery may be performed by scanning the areas of the storage device in a cyclic fashion. In another aspect, the record recovery may be achieved by selectively visiting chosen areas of the storage device, the determination of the selection of the area which may be visited at a particular juncture depending upon predetermined criteria such as quantity of records that can be written out at a visit, etc. The process can be accomplished either by a single or multi-pass operation. The process is a substantial improvement over other sequential record recovery processes which employ a tag sort and utilize the sorted tags to perform an ordered record retrieval by conventional methods. In another aspect of the invention, order substrings of the file are formed and these substrings then function as the areas in the execution of the process. Concurrently, with the formation of these strings, corresponding directories are created which can subsequently be merged.

T935,006
METHOD FOR TREATING POLYGLYCOL-WATER EMULSIONS TO REMOVE SOLIDS

Melvin C. Baker, 377 Howard Drive, Youngstown, N.Y. 14174
Filed June 14, 1974, Ser. No. 479,513
Int. Cl. C02b *1/20*
U.S. Cl. 210—45
1 Sheet Drawing. 9 Pages Specification

Decantation is used to separate from a polytetramethylene ether glycol-water emulsion a large portion of salts which have been formed by precipitating fluosulfonic acid polymerization catalysts with calcium hydroxide. The emulsion is allowed to settle in a vessel and separate into layers with the glycol concentrated in a top layer above an intermediate layer of relatively clear water and with the salts concentrated in a bottom layer. The bottom layer is removed continuously with part of it being recirculated back into the bottom layer at a rate which avoids clogging. The glycol is removed above, and fresh feed is added at a rate which maintains the levels in the vessel.



REISSUES

JUNE 3, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

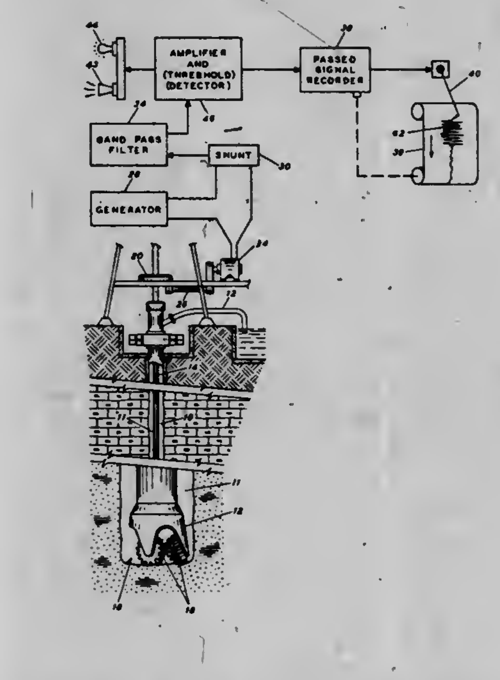
28,435
APPLE TREE

Daniel F. Dayton, Urbana, and James B. Mowry, Carbondale, Ill., L. Fredrick Hough, Bloomsbury, and Catherine Bailey, Englishtown, N.J., Edwin B. Williams, Lafayette, and Jules Janick, West Lafayette, Ind., James Ralph Shay, Corvallis, Oreg. and Frank H. Emerson, Lafayette, Ind. assignors to Purdue Research Foundation, Lafayette, Ind.
Original No. Plant Pat. 3,134, dated Apr. 25, 1972, Ser. No. 54,090, June 17, 1970. Application for reissue July 28, 1972, Ser. No. 276,165
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—34 1 Claim

1. A new and distinct variety of apple tree substantially as described and illustrated and particularly characterized by resistance to apple scab, excellent fresh fruit quality as regards rich flavor and crisp texture, and maturing approximately 4 weeks earlier than "Delicious."

28,436
METHOD OF DETERMINING DOWNHOLE OCCURRENCES IN WELL DRILLING USING ROTARY TORQUE OSCILLATION MEASUREMENTS

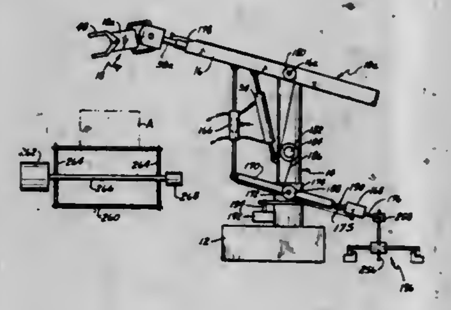
Albert L. Vitter, Jr., New Orleans, and Hugh G. McDonald, Monroe, La., assignors to Chevron Research Company, San Francisco, Calif.
Original No. 3,703,096, dated Nov. 21, 1972, Ser. No. 101,739, Dec. 28, 1970. Application for reissue July 23, 1973, Ser. No. 381,956
Int. Cl. E21b *47/00*
U.S. Cl. 73—151 18 Claims



1. The method of determining bit damage in rotary drilling comprising rotating a drill string having a bit attached thereto in a hole and monitoring the rotary torque for characteristic oscillations, said characteristic oscillations having a frequency not more than twice and not less than half the expected frequency of torsional oscillation of the drill string, and said characteristic oscillations having an amplitude substantially in excess of the oscillations produced while rotating an undamaged bit.

28,437
WORK-HEAD WITH AUTOMATIC MOTIONS CONTROLS

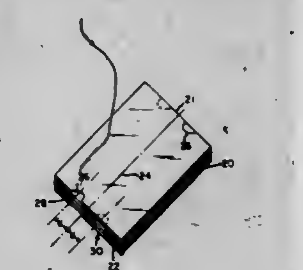
George C. Devol, 990 Ridgefield Road, Wilton, Conn. 06897, and Paul S. Martin, 189—54 43 Road, Flushing, N.Y. 11358
Original No. 3,543,910, dated Dec. 1, 1970, Ser. No. 748,703, July 30, 1968. Application for reissue Nov. 30, 1972, Ser. No. 310,769
Int. Cl. B65g *47/08*
U.S. Cl. 198—34 68 Claims



56. Automatically controlled apparatus, including a work device, means for transporting said work device through three-dimensional ranges of positions, and control means for said work device and said transporting means, said control means including a first source of control information for determining a prescribed program of motions of said work device in three-dimensonal space, a further source of control information independent of said transporting means for generating, during operation of said first source, offset information that varies in the course of the program provided by said first source of control information, and means combining and responsive jointly to said first and further sources of control information for controlling said transporting means to execute said prescribed program of motions modified by the generated offset information.

28,438
X-RAY FILM PACKAGE

Gunter Schmidt, Malibu, Calif., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.
Original No. 3,741,386, dated June 26, 1973, Ser. No. 136,530, Apr. 22, 1971, which is a continuation-in-part of Ser. No. 52,980, July 7, 1970. Application for reissue May 2, 1974 Ser. No. 466,402
Int. Cl. B65d *85/00, 85/30, 85/62*
U.S. Cl. 206—455 7 Claims



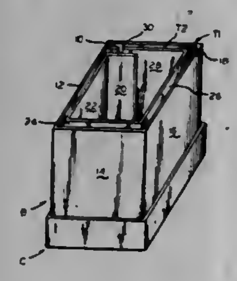
1. A film package for use in a daylight handling system, said package comprising

a. a plurality of substantially identical photographically sensitive film sheets, each sheet having a *single* cut-away portion of small area along an edge thereof, said sheets being stacked in alternating superposition whereby the cut-away portions of alternate sheets form discontinuous, [spaced apart,] parallel rows *which are spaced equidistant from opposite sides of a center line perpendicular to a common edge of said stack;* and

b. cover means opaque to actinic radiation surrounding said stack.

28,439
HEAVY DUTY CONTAINER

Charles J. Shepherd, Pasadena, Tex., assignor to Container Corporation of America, Chicago, Ill.
Original No. 3,726,467, dated Apr. 10, 1973, Ser. No. 217,090, Jan. 12, 1972. Application for reissue Aug. 23, 1974, Ser. No. 499,831
Int. Cl. B865d *5/00, 13/00*
U.S. Cl. 229—23 R **9 Claims**



1. An improved corner construction for a heavy duty shipping container having a tubular body and end closure means for closing the ends of said body wherein said body comprises:

a. a pair of first and second tubes, formed from paperboard and adhesively secured to each other in telescoping relation, each of said tubes including five panels hingedly attached along parallel fold lines, wherein:
   i. each of the three center panels has a width corresponding substantially to the width of one of three walls of said body;
   ii. the two end panels have a combined width substantially equal to at least the width of the fourth wall of said body with one of said end panels being relatively wide and the other panel being relatively narrow;

b. said tubes being disposed one within the other, with the three center panels of each tube positioned in face-to-face relation to provide double-ply thickness for said three walls of said body;

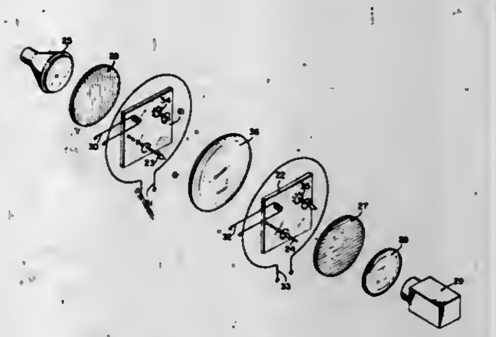
c. said fourth wall of said body being double-ply in thickness throughout the majority of its width and having a joint section at one side thereof, adjacent one corner of said body which is triple-ply in thickness;

d. said fourth wall having:
   i. one ply formed entirely from one of the wide end panels;
   ii. another ply formed from the other of the wide end panels and one of the narrow end panels having adjacent end edges forming a butt-joint;
   iii. a securing flap formed from the other narrow panel and extending from said corner beyond said butt-joint;

e. said securing flap being located outwardly of said one ply and said other ply.

28,440
MAGNETO-OPTICAL CYLINDRICAL MAGNETIC DOMAIN MEMORY

Jon H. Myer, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Original No. 3,806,903, dated Apr. 23, 1974, Ser. No. 205,095, Dec. 6, 1971. Application for reissue May 23, 1974, Ser. No. 472,766
Int. Cl. G11c *11/14, 11/42*
U.S. Cl. 340—174 YC **23 Claims**



1. A magneto-optical signal translating device for binary digital signals comprising:

a. first and second optically translucent uniaxially anisotropic ferromagnetic crystal platelets of equal thickness, one of the major plane surfaces of each of said platelets being juxtaposed in light transmitting relationship to a major plane surface of the other of said platelets, and each of said platelets having an easy axis of magnetization perpendicular to the plane of said major surface of said platelet;

b. means to magnetically bias said first and second platelets respectively in opposing polarities along said easy axes of magnetization so that their respective Faraday rotations will normally compensate each other;

c. means to transilluminate and optically superimpose in registration said pair of platelets with a beam of polarized light;

d. means to establish at least one movable cylindrical magnetic domain in said first platelet having a magnetic polarity antiparallel to the direction of said magnetic bias for said first platelet and means to establish at least one cylindrical magnetic domain in said second platelet having a magnetic polarity antiparallel to the direction of said magnetic bias for said second platelet, said magnetic domains respectively representing the binary value of one bit of a digital signal and of one bit of a digital reference to which said digital signal is subtractively compared;

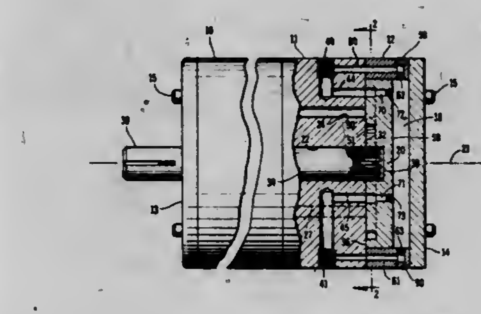
e. polarization analyzer means positioned to receive light transmitted through said pair of platelets to detect any uncompensated change in the state of polarization of said light produced by its transmission through said platelets; and

f. light transducing means, positioned to receive light transmitted through said polarization analyzer to produce an output indicative of said detected uncompensated change in the state of polarization.

28,441
HIGH PRESSURE EXPANSIBLE CHAMBER DEVICE

Wayne B. Easton, 3007 W. 96th St. Circle, Bloomington, Minn. 55431
Original No. 3,687,581, dated Aug. 29, 1972, Ser. No. 106,047, Jan. 13 1971. Application for reissue July 18, 1974, Ser. No. 489,525
Int. Cl. F01c *21/00;* **F03c** *3/00;* **F04c** *15/00*
U.S. Cl. 418—270 **5 Claims**

2. A fluid pressure operated device of the expansible chamber type comprising a casing, a valve block having a fluid transfer surface, said valve block having a plurality of expansible chamber feeding and exhausting passages having openings in said transfer surface, a valve having a first surface engaging said transfer surface, said valve first surface being recessed to form *a* [reversible] feeding [and exhausting sections] *section,* [reversible] *an* inlet [and outlet passages] *passage* in said valve block having [openings] *an opening* in said transfer surface and [respective] constant fluid communication with said feeding [and exhausting sections] *section* of said valve, said valve block inlet passage and said valve feeding section forming fluid inlet path means, [said valve block outlet passage and said valve exhausting section forming fluid outlet path means,] said valve being cyclically movable relative to said transfer surface with said feeding [and exhausting sections] *section* thereof sequentially feeding [and exhausting] said expansible chamber passages, *means for sequentially exhausting said expansible chamber passages,* said valve having a second surface on the opposite side thereof from said first surface, a valve biasing pressure chamber formed by an internal surface of said casing and said second valve surface, passage means between [each of] said fluid inlet [and outlet] path means and said pressure chamber [, check valve means] for [said passage means] allowing fluid therein to flow [in only one direction] to said pressure chamber for biasing said valve towards said valve block transfer surface, [said valve biasing pressure chamber having no openings other than openings for said check valve means,] *said valve being the only cyclically movable member with which pressurized fluid in said chamber has contact,* and drive means attached to said valve and extending in a direction away from said valve biasing pressure chamber, said second valve surface being between said drive means and said valve biasing pressure chamber.



28,442
RADIOIMMUNOASSAY OF ANGIOTENSIN AND RENIN ACTIVITY

Robert L. Wolf, New York, N.Y., assignor to Mount Sinai School of Medicine of the City University of New York, New York, N.Y.
Original No. 3,592,888, dated July 13, 1971, Ser. No. 699,098, Jan. 19, 1968. Application for reissue Sept. 7, 1972, Ser. No. 286,983
Int. Cl. A61k *27/04;* **G01n** *23/00*
U.S. Cl. 424—1 **10 Claims**

1. A process for assaying angiotensin activity comprising the following steps: (1) preparing an amount of antibody to angiotensin coupled to poly-L-lysine; (2) labeling an amount of angiotensin with radioactivity; (3) preparing solutions containing varying known amounts of unlabeling angiotensin, a [quatity] *quantity* of the antibody and a quantity of labeled angiotensin in order to form mixtures having a pH of about 7.0 to 9.5 containing radioactive antibody-bound angiotensin complexes and antibody-bound unlabeled angiotensin complexes; (*4*) subjecting said mixtures to paper radioelectrophoresis to separate the antibody-bound angiotensin complexes from the free angiotensin on paper strips; (*5*) counting the radioactivity in both bound and free angiotensin groups on the paper strips to determine the ratios of the radioactive antibody-bound angiotensin complexes to the radioactive free angiotensin; (*6*) [plotting on a graph] *referencing* the ratios of bound to free radioactive angiotensin [as a function of] *to* the known amounts of angiotensin in [each of the] *said* mixtures to establish a [line graph showing the] relationship between the ratio of bound to free angiotensin and the concentration of angiotensin; (*7*) repeating [the process recited] *steps* (*1*) *to* (*5*), *inclusive,* above using an unknown amount of unlabeled angiotensin in [said] *a* mixture to determine the ratio of bound labeled angiotensin to free labeled angiotensin *in said mixture;* and (*8*) [locating the ratio on the line graph] *using the relationship previously established according to step* (*6*) to determine the concentration of the unknown amount of angiotensin.

PLANT PATENTS

GRANTED JUNE 3, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,724
ROSE PLANT

Reimer Kordes, Sparrieshoop, Germany, assignor to Jackson & Perkins Company, Medford, Oreg.
Filed Feb. 11, 1974, Ser. No. 441,381
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—28 **1 Claim**

1. A new and distinct cultivar of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a bushy, compact plant, high production of cut flowers in the greenhouse, large oval leaflets, and a clear, bright flower color of Yellowish-Red 7.5 R 5/12.

3,725
ROSE PLANT

Hideharu Henry Kuramoto, Salinas, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.
Filed Feb. 25, 1974, Ser. No. 445,573
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—22 **1 Claim**

1. A new and distinct cultivar of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by being substantially identical with its parent cultivar, Woburn Abbey, U.S. Plant Pat. 2,319, but being distinguished therefrom by its flower color of between Grenadine Red and Mars Orange on both sides of the petals.

3,726
ROSE PLANT

Reimer Kordes, Sparrieshoop, Germany, assignor to Jackson & Perkins Company, Medford, Oreg.
Filed Mar. 7, 1974, Ser. No. 449,070
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—15 **1 Claim**

1. A new and distinct cultivar of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its pointed, broad based bud of bright Lemon Yellow; an abundance of large, leathery, non-glossy foliage; well branched habit of growth; medium stem length of its cut flowers; high centered imbricated form of blooms; a petal count of 30 to 35; and very little fragrance.

PATENTS

GRANTED JUNE 3, 1975

ERRATA

For CLASS	See PATENT NO.
017–011	3,886,635
228–182	3,886,646
228–175	3,886,647
228–112	3,886,649
228–136	3,886,650
228–103	3,886,651
173–159	3,886,999
223–028	3,887,118
239–676	3,887,153
251–339	3,887,165
260–209.6	3,887,175
432–152	3,887,266
250–458	3,887,271
416–145	3,887,296
416–220	3,887,298
148–031.57	3,887,395
250–338	3,887,471
250–345	3,887,473
260–340.7	3,887,472
264–066	3,887,524
264–316	3,887,579
252–319	3,887,580
252–531	3,887,614
425–260	3,887,685
191–001 A	3,887,776
339–014 R	3,887,895
340–003 R	3,887,896
340–007 R	3,887,897
260–008	3,887,940

PATENTS

GRANTED JUNE 3, 1975

GENERAL AND MECHANICAL

3,886,596

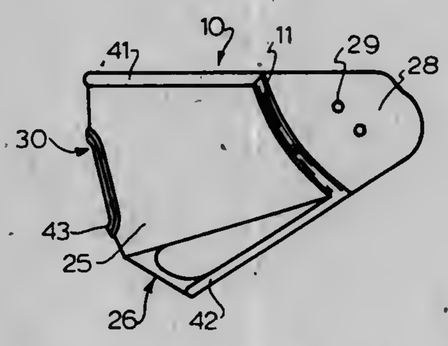
FACE GUARD FOR A BASEBALL HELMET OR THE LIKE

Charlotte S. Franklin, and Burton P. Franklin, both of Danville, Va., assignors to Cav, Inc., Bent Mountain, Va.

Filed Jan. 8, 1973, Ser. No. 321,745

Int. Cl. A41d *13/00*

U.S. Cl. 2—9 **3 Claims**



1. In a protective face guard for a game using a ball or like struck play piece in combination with an integral helmet having a protective dome, a bill and a pair of ear pieces, each having a forward outwardly curved edge and a plurality of apertures behind such edge, comprising:

- a. a relatively thin lightweight sheet of molded transparent thermoplastic material having:
  - 1. an upper section protective of the mouth, nose and cheeks of the wearer providing an unbroken exterior surface of predetermined generally outward curvature and including a centrally disposed breathing aperture and
  - 2. a lower section protective of the jaw and lower pallet areas of the wearer providing an unbroken exterior surface of predetermined generally outward curvature depending beneath and angled rearwardly from said first section and formed integral therewith;
- b. end pieces located at respective opposite ends of and molded integral with said first and second curved sections and each having plural mounting apertures, said end pieces being formed with inwardly curved force transmitting and distributing ledge surfaces mating with said forwardly outwardly curved helmet ear piece edges with said end pieces plural mounting apertures being located behind said ledge surfaces and mating with said helmet ear piece apertures; and
- c. connector means mounted in said apertures and securing said face guard end pieces adjacent said helmet ear pieces, each said inwardly curved face guard end piece force transmitting ledge surface mating with and engaging a respective one of said outwardly curved helmet ear piece edges and being plurally secured at points behind said ledge surfaces and in such engagement wherein the force of impact of the play piece on either of said sections is transmitted through said engaged curved end piece and helmet ear piece surfaces.

3,886,597

FACE MASK AND PROCESS FOR MAKING FACE MASKS

Jacques-Philippe Dupre, 8, Rue de Levis, Paris 17 eme, France

Filed Apr. 30, 1973, Ser. No. 355,435

Claims priority, application France, May 4, 1972, 72.15892

Int. Cl. A61b *19/00;* **A42b** *1/18*

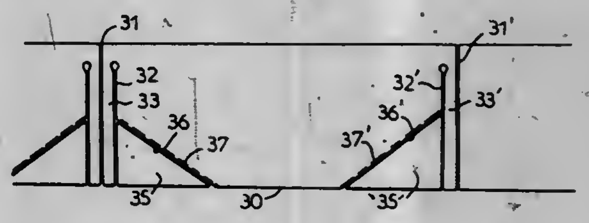
U.S. Cl. 2—206 **10 Claims**

1. A method of making face masks for surgical, medical or other protective use comprising the steps of:

folding a rectangular blank of porous thermoplastic material about a line parallel to a pair of the opposite margins of said blank to form a double thickness of the material;

severing by die cutting said two thicknesses of folded material adjacent the respective end margins transverse to said first mentioned margins along respective pairs of lines of severance;

one of each of said respective pairs of lines of severance being parallel with and spaced from a respective transverse margin to define a pair of handles to engage the ears of a wearer when the blank is unfolded;



the other of each of said respective pairs of lines of severance intersecting said line of folding at a point spaced inwardly from the first line of severance and also intersecting the first line of severance at a point spaced from the line of folding to define an area of material to be removed;

joining said two thicknesses of material together along at least a portion of the second line of severance by thermal welding.

3,886,598

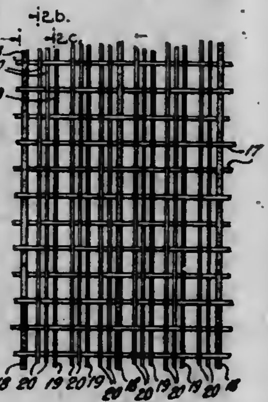
NARROW ELASTIC FABRIC FOR APPAREL WAISTBANDS

Roger G. Campbell; Richard E. Goff, Jr., both of Barrington, and Normand D. Guay, Woonsocket, all of R.I., assignors to Johnson & Johnson, New Brunswick, N.J.

Division of Ser. No. 370,103, June 14, 1973. This application July 31, 1974, Ser. No. 493,441

Int. Cl. A41f *9/00*

U.S. Cl. 2—237 **2 Claims**

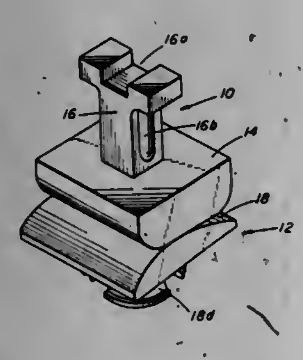


1. In a pair of trousers made from stretchable material, said trousers having an inwardly folded edge portion about the waist thereof, a waistband attached to said folded edge comprising a thin lightweight narrow elastic fabric having a face surface and a back surface, said fabric comprising a set of monofilament filling yarns running in the transverse direction of the fabric and a set of warp yarns running in the longitudinal direction of the fabric said set of warp yarns comprising elastic yarns, stretch synthetic yarns and nonelastic yarns, there being twice as many stretch synthetic yarns as there are elastic yarns in the warp set and three times as many nonelas-

tic yarns as there are stretch yarns in the warp set, said nonelastic yarns being woven with said filling yarns in a twill weave to form the face surface of said fabric, said face surface being primarily composed of said nonelastic yarns to form a twill pattern on the face surface, said stretch synthetic yarns and said elastic yarns being woven with said filling yarns in a plain weave with at least two stretch synthetic yarns being disposed between adjacent elastic yarns to form the back surface of said fabric, said elastic yarns forming a complimentary diamond pattern on the face surface of said fabric whereby the filling yarns are covered and stabilized in the fabric and rollover of the waist encircling portion of the trousers is prevented.

3,886,599
SURGICALLY IMPLANTABLE TOTAL ANKLE PROSTHESIS

Allen P. Schlein, Stratford, Conn., assignor to Louis Charles Schlein, Union, N.J.
Filed July 25, 1974, Ser. No. 491,754
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **6 Claims**

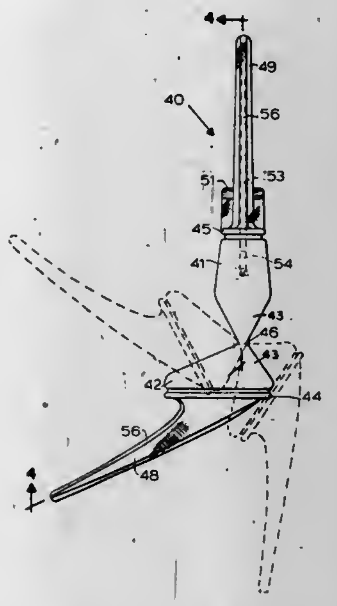


1. Prosthesis for total replacement of the ankle joint of humans comprising,
 first and second bearing members each having a convex surface and adapted to engage each other along a line contact, said first bearing member being formed of a metal alloy which is essentially non-reactive with body tissue and having a stem adapted to be received in a cavity formed in the tibia, and
 said second bearing member being formed of high density plastic material and including an integral shank adapted to be received in a cavity formed in the surface of the head of the talus.

3,886,600
JOINT PROSTHESIS

Paul Kahn, San Francisco, and James A. Stubstad, Lafayette, both of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.
Continuation-in-part of Ser. No. 162,936, July 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 60,804, Aug. 4, 1970, abandoned. This application Sept. 26, 1973, Ser. No. 401,021
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **38 Claims**

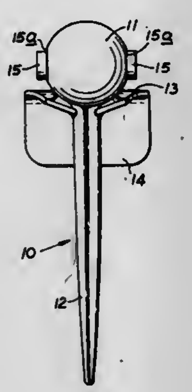
1. A prosthesis for replacement of a skeletal hinged joint, comprising:
 first and second stems each adapted to be inserted into a medullary canal of a bone of said joint, and
 a flexing web integral with said stems, joining said stems and acting as a hinge to enable the first and second stems to swing relatively to each other,
 said stems lying in a common plane and inclined to each other to make an included angle, with said web at the vertix, which in its at-rest non-flexed position is between 90° and 160°,
 each said stem and said web having a reinforcing core and a cushioning coating of elastomer,
 each said stem but not said web also having an outer layer with an open-pore three-dimensional reticular structure adapted to receive host tissue ingrowth,



 said core being continuous through said stems and web and comprising a series of longitudinally extending cords which at said web are coplanar to increase lateral stability.

3,886,601
PROSTHETIC KNEE JOINT ASSEMBLY

Eric George Findlay, 66 Barley Ln., Kingsthorpe, England
Continuation of Ser. No. 347,461, April 3, 1973, abandoned. This application Sept. 9, 1974, Ser. No. 504,123
Claims priority, application United Kingdom, Mar. 4, 1972, 10207/72
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **7 Claims**

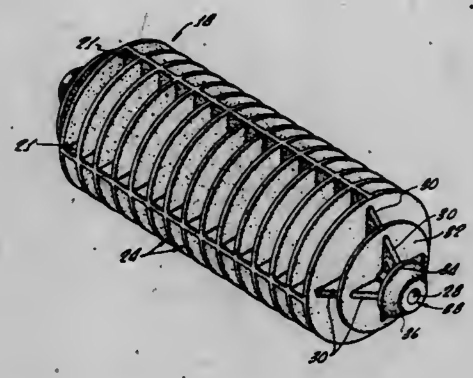


1. A prosthetic knee joint assembly comprising first and second joint members respectively formed to be rigidly attached to the femur and tibia to be interconnected by the joint, wherein a ball on the first member is adapted to fit for rocking movement within a socket of the second member which socket extends over more than 180° of arc with respect to the axis of rocking so as to support the suspended weight of the lower leg and resist dislocation of the joint following snap-engagement of the ball in the socket for bearing compressive forces acting on the joint and there being a pair of diametrally extending cylindrical trunnions projecting on opposite sides of the ball on a common lateral axis thereof to be received in corresponding recesses in a rim of the socket for limiting relative angular movement between the members in two opposite directions, said recesses consisting of cut-outs in said rim breaking the continuity of said socket so as to permit escape of fluid from the socket as said snap-engagement takes place.

4

3,886,602
WAVE QUENCHING DEVICE

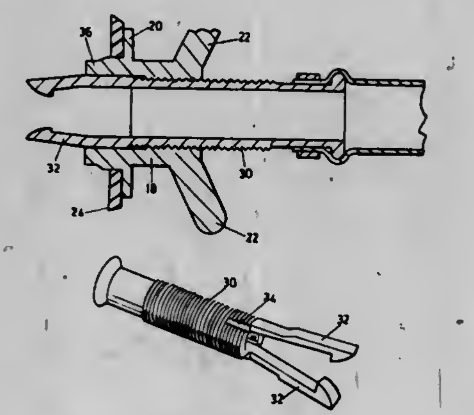
David A. Stanwood, West Covina, Calif., assignor to Baker Hydro, Inc., Irvine, Calif.
Filed Mar. 28, 1974, Ser. No. 455,630
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172 **23 Claims**



1. A wave quelling device comprising:
 a plurality of spaced wafers having axial apertures to accommodate an axis member on which they rotate; and
 means for dividing the space between adjacent wafers into pockets comprising a plurality of barrier elements extending transversely between confronting surfaces of adjacent wafers, at least one of said barrier elements being above the surface of the water so that turbulence in the water such as waves impinges on the barrier elements exposed above the surface of the water which extend substantially entirely across the space between adjacent wafers and imparts to the device rotation about the axis, which rotation is resisted by submerged barrier elements to dampen the wave action.

3,886,603
DEVICE TO FACILITATE THE CLEARANCE OF A BLOCKED DRAIN

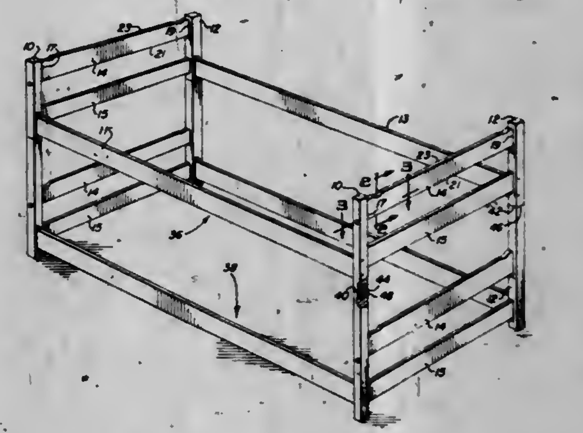
Roberto Carlo Onesta, 97 Corlett Dr., Birnam, Johannesburg, Transvaal, South Africa
Filed Mar. 13, 1973, Ser. No. 340,752
Claims priority, application South Africa, Mar. 14, 1972, 72/1758; Aug. 14, 1972, 72/5562
Int. Cl. E03d *11/00*
U.S. Cl. 4—255 **4 Claims**



1. Apparatus for clearing a blocked drain consisting of a plug having a body adapted to close and opening into the drain, a core, including two opposed resilient hooked formations which are integrally formed with the core and which project from its one end, passing through and movable relatively to the body towards and away from each other, the formations being adapted to be moved towards and away from each other by the body to engage and release respectively fixed structure in the drain when the body is moved longitudinally relatively to the core and means on the body to move the body relatively to the core.

3,886,604
BUNK BED CONSTRUCTION

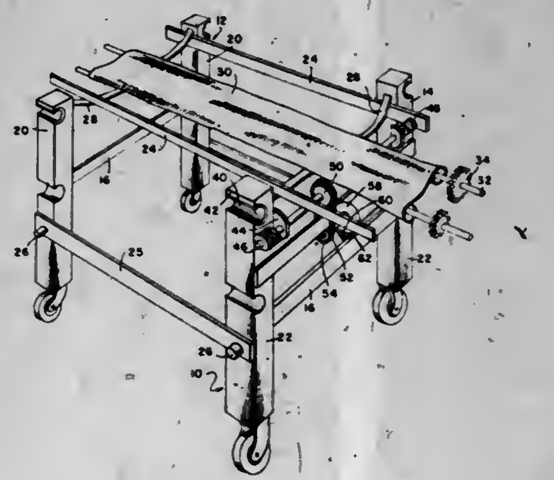
Tom Ewing, 1950 W. Broadway, Phoenix, Ariz. 85041
Filed Sept. 17, 1973, Ser. No. 398,217
Int. Cl.^{2} A47C *13/38*
U.S. Cl. 5—8 **6 Claims**



1. In a bunk bed construction wherein there is a headboard assembly; a footboard assembly and a pair of longitudinal frame members interconnecting the headboard and footboard assemblies the combination of a pair of substantially vertical posts in each of said assemblies; at least one cross-board between each pair of posts; each cross-board having a lower edge and opposite ends said opposite ends abutted to respective ones of said posts; said cross-board having a groove in said lower edge; a high tensil strength rod in said groove; said rod having opposite ends extending into respective ones of said pair of posts and secured thereto, said rod having a nut screw threadably engaged with at least one of said ends of said rod, said nut abutted to a respective one of said posts and adapted to place said rod in tension and said cross-board in compression between said pair of posts; said posts are provided with inner and outer sides; said inner sides abutted against ends of said cross-boards; said outer sides of said posts having recesses about the ends of the respective rods; said recesses each adapted to contain one of said nuts; and a bore in each post through which said rod extends said bore being of smaller diameter than the respective one of said recesses; and a shoulder area at the juncture between said bore and respective recess; said nut being supported by said shoulder area.

3,886,605
BED DEVICE FOR MOVING PATIENT

Joe F. Harris, Albion, Ill., assignor to J. David Harris, Albion, Ill.
Filed Sept. 10, 1973, Ser. No. 395,762
Int. Cl.^{2} A61G *1/02*
U.S. Cl. 5—81 R **6 Claims**



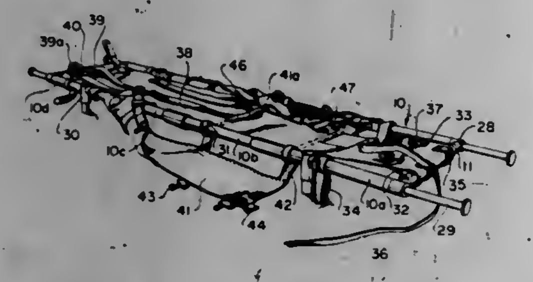
1. A portable and separate self contained unit for a hospital bed for setting up by a bed and out of contact therewith,

comprising a frame with a head section and a foot section both sections comprising spaced apart vertical posts joined together by transverse members, slot means in said posts to receive separate side members therein to connect the head and foot section thereto, said separate side members comprising a pair of elongated rotatable shaft members, a pair of short and a pair of long side members, for attachment to said post below said slot means, and a flexible patient carrying sheet member connected to said elongated rotatable members, said sheet carrying means being provided with driving means, and said rotatable shaft members being provided with driven means for uncoiling the sheet from one shaft member and coiling it up on the other shaft member.

3,886,606
FOLDABLE CASUALTY CARRIER

John Guythar Bradford, 47 Mansfield Dr., Ancaster, Ontario, Canada

Filed May 29, 1973, Ser. No. 364,320
Int. Cl. A61g *1/02;* A45f *1/00*
U.S. Cl. 5—82 **1 Claim**



1. A collapsible and portable casualty carrier comprising a rectangular frame having two end frame members and two side frame members engageable with the end frame members and a bed portion in the form of a flexible sheet supported by the frame with longitudinal spaces between the side edges of the bed portion and the two side frame members, the bed portion being fixed to the side frame members by means of straps extending across between the side frame members, each of said side frame members comprising three rigid tubular sections, the end of one tubular section being foldably connected to the end of the next adjacent tubular section by means of a hinge joint, each hinge joint comprises a pair of solid cylindrical members fitted within adjacent ends of said tubular side frame members, each cylindrical member having a pair of projecting opposed ears forming a slot therebetween, with the pair of cylindrical members being pivotally joined by means of a plate mounted within the slots and pivotally connected to each pair of opposed ears, a rigid tubular locking sleeve slidably mounted on one of said tubular sections adjacent said hinge joint, said sleeve being slidable between a folding position entirely on said one tubular section and a locking position surrounding the hinge joint whereby the two tubular sections are locked in rigid end to end relationship and a resilient O-ring mounted in an annular recess adjacent said hinge joint, said O-ring being positioned to frictionally engage the sleeve while it is being moved between folding and locking positions and to just clear an end of the sleeve in folding or locking position thereby positively retaining the sleeve in either folding or locking position.

3,886,607
PLAY CRIB

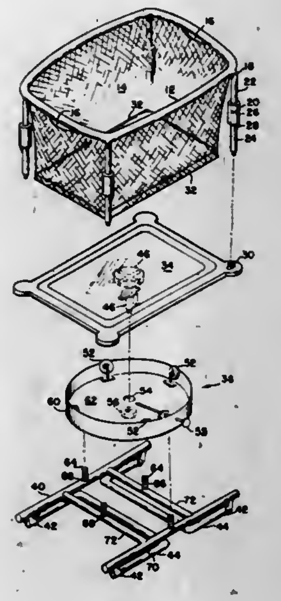
Troy Dunn, 3445 Ocean View Blvd., San Diego, Calif. 92113
Continuation-in-part of Ser. No. 351,234, April 16, 1973, abandoned. This application Oct. 9, 1973, Ser. No. 404,210
Int. Cl. A47d *9/00*
U.S. Cl. 5—104 **5 Claims**

1. A baby crib assembly comprising:

a body portion having a generally planar base with a continuous enclosure means upstanding from the outer margins thereof;

a stand assembly;

a rotatable means upon which the body portion is mounted, said body portion being vertically axled on said rotatable means and said rotatable means includes bearing means supporting said base;

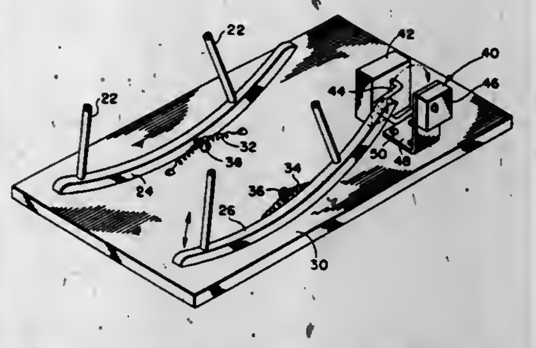


spring means positioned between the rotatable means and the stand assembly whereby manual force may cause the body portion to both rotate horizontally and simultaneously oscillate vertically; and

means mounted on said crib assembly to lock said body portion against rotation relative to said rotatable means.

3,886,608
ROCKING CHAIR OR CRADLE WITH ROCKING MECHANISM

Michael D. Casella, 248 E. 151 St., Cleveland, Ohio 44110
Division of Ser. No. 302,278, Oct. 30, 1972, Pat. No. 3,818,517. This application Jan. 30, 1974, Ser. No. 437,898
Int. Cl. A47d *9/02*
U.S. Cl. 5—109 **5 Claims**

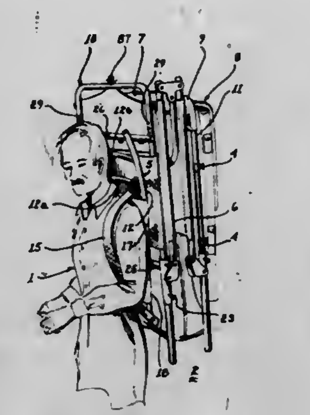


1. A rocker comprising a support member, rocker bars rigidly secured to and spaced from said support member for providing rocking motion, a base, means operatively connecting said rocker bars to said base to permit controlled rocking movement of said rocker on said base, and automatic rocking means operatively associated with at least one of said rocker bars for rocking the same, said automatic rocking means comprising an electric motor, and a crank rotatably driven by said motor, said crank being engageable with the adjacently disposed rocker bar for lifting the same for a relatively limited period in the rotational cycle of said crank, the relative positions of said crank and said adjacently disposed rocker bar and the path of rotational movement of said crank being such that said crank is out of the plane of said one rocker bar for the major portion of its rotational cycle, said one rocker bar being free to rock by itself when out of contact with said crank.

3,886,609
LIGHTWEIGHT TRANSPORTABLE TENT COT

Albert H. MacKenzie, 1632 E. Claremont, Phoenix, Ariz. 85016

Filed May 16, 1974, Ser. No. 470,347
Int. Cl. E03d *13/00*
U.S. Cl. 5—110 **10 Claims**



1. A self contained transportable shelter unit for hikers, said unit comprising in combination:

A. a foldable cot for providing off-the-ground support for the hiker, said cot having a first folded position and a second extended position and including:
   1. a first and second head frame disposed at opposite ends of said cot, said first head frame including at least one transverse rod extending horizontally across said first head frame and means for vertically repositioning said transverse rod with respect to said first head frame;
   2. a pair of articulated spaced apart rails extending intermediate said first and second head frames, said rails in combination with said first and second head frames defining the perimeter of said cot;
   3. each said rail including joined pairs of telescoping members, for reducing the length of said rails when said cot is in said first position, said pairs of telescoping members being positionalbe adjacent one another when said cot is in said first position and positionable in axial alignment with one another when said cot is in said second position;
   4. pivot means disposed at each junction of each of said rails and the corresponding one of said first and second head frames to permit said rails to pivot with respect to said first and second head frames;
   5. further pivot means disposed at the junction of said pairs of telescoping members of each said rail to accommodate the articulation of said pairs of telescoping members;
   6. a center support secured to said further pivot means for supporting said pair of rails; and
   7. a foldable canvas support disposed intermediate to and supported by said first and second head frames and said pair of rails;

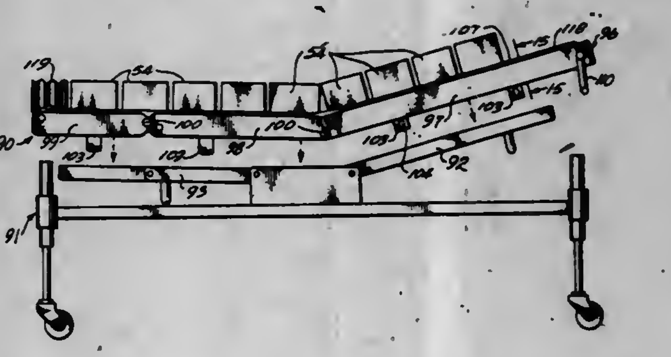
B. a foldable tent for sheltering the hiker, said tent being disposed upon said canvas support and extending intermediate said first and second head frames, said tent including resilient means interconnecting said tent with each of said first and second head frames for maintaining said tent upon said cot;

C. a form fitting backpack frame for mounting said cot upon the hiker's back, said form fitting backpack frame including a pair of vertical supports, releasable connection means engaging said vertical supports and said transverse rod for securing said form fitting backpack frame to said first head frame, whereby said form fitting backpack frame may be repositioned in the vertical axis with respect to said first head frame; and

D. a knapsack for carrying the provisions of the hiker, attachment means extending from said knapsack for supporting said knapsack on said second head frame; whereby, said cot is foldable to said first position by articulating said rails to draw said first and second head frames and said attached knapsack toward said first head frame while foldably storing said canvas support and said tent intermediate said drawn together first and second frames to compress said unit and permit the hiker to carry said unit, and, whereby, said cot is extended to said second position by positioning said first and second head frames in a spaced apart relationship to axially extend and align said pairs of telescoping members to form said cot and extend said tent while retaining said knapsack off the ground by said second head frame.

3,886,610
HOSPITAL BED

Charles Hunter Shelden, San Marino, Calif., assignor to Huntington Institute of Applied Medical Research, Pasadena, Calif.
Continuation-in-part of Ser. No. 171,702, Aug. 13, 1971, abandoned. This application July 11, 1973, Ser. No. 383,298
Int. Cl. A61g *7/02, 7/10*
U.S. Cl. 5—81 R **16 Claims**



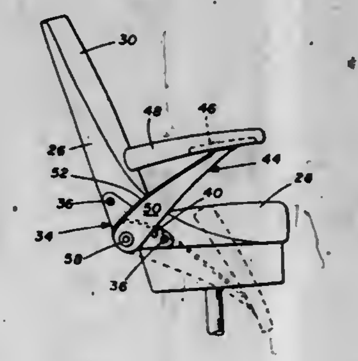
1. A bed, comprising:

a bed frame having a foot end and a head end, the frame being hinged so the head end can be raised to elevate a patient's upper body;

mattress means for supporting a patient on the bed frame; drive means on the frame and engaged with the mattress means for moving the mattress means longitudinally toward the head end of the bed and along an upwardly sloping portion of the frame adjacent the head end when the head end is elevated, whereby a patient who has slipped downwardly toward the foot end can be moved back toward the head end and along the upwardly sloping frame portion by moving the mattress means.

3,886,611
PIVOTABLE ARM REST FOR BOAT SEAT

James E. Lammy, Napoleon; Thomas Francis, Russia, and Lawrence E. Canter, Bryan, all of Ohio, assignors to Scott Port-A-Fold, Inc., Archbold, Ohio
Filed Aug. 2, 1973, Ser. No. 385,047
Int. Cl. B63b *29/00*
U.S. Cl. 9—7 **3 Claims**



1. In combination:

a fishing boat including:

a relatively long, relatively narrow hull;

drive means for propelling the hull at relatively high speeds; and

an operating compartment including means facilitating steering of the boat and controlling the operation of the drive means;

a fishing seat supported on the hull of the fishing boat and including:

a substantially rigid seat shell;

a generally horizontally disposed bottom cushion mounted on the shell; and

a generally vertically disposed back cushion mounted on the shell;

a pivotable arm rest for the boat seat including:

a bracket secured to the boat shell and having at least one projection extending horizontally therefrom;

an arm pivotally supported on the projection of the bracket and extending therefrom to an arm rest portion; and

cooperating means on the arm and the bracket for selectively securing the arm either in an operative position wherein the arm rest portion of the arm extends outwardly from the back cushion and substantially above the bottom cushion of the boat seat and a stowed position wherein the arm rest portion of the arm is positioned adjacent to and substantially below the bottom cushion of the boat seat and for releasing the arm for pivotal movement about the projection of the bracket downwardly from the operative position to the stowed position and upwardly from the stowed position to the operative position the cooperating means further comprising:

a second projection extending from the bracket at a point spaced from the first projection;

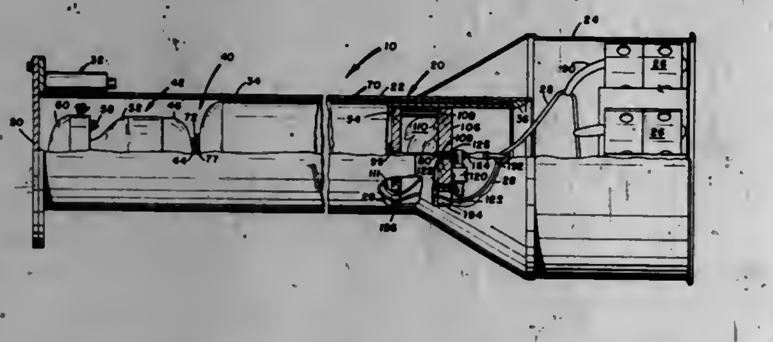
a first surface on the arm for cooperation with the second projection to support the arm in the operative position; a second surface on the arm for cooperation with the second projection to support the arm in the stowed position; and

a knob threadedly engaging the first projection for cooperation therewith to alternately secure the arm either in the operative position or in the stowed position, and to release the arm for pivotal movement between the two positions.

3,886,612
MAN OVERBOARD PACKAGE

David R. Schnirel, Oxon Hill; William T. Zimmerman, White Plains; Birger E. Barsell, Indian Head, and Charles M. Christensen, Camp Springs, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 29, 1974, Ser. No. 501,530
Int. Cl. B63c *9/26*
U.S. Cl. 9—14 **18 Claims**



1. Apparatus for carrying life-saving equipment from a launcher to a selected target comprising:

a rocket motor;

a container open at one end and closed at another end;

said container connected to said rocket motor at said another end;

life-saving equipment housed within said container;

anchoring means between said life saving equipment and said open end, said anchoring means being attached to said lifesaving equipment;

means for urging said life-saving equipment out of said container;

releasable means for holding said life-saving means in said container;

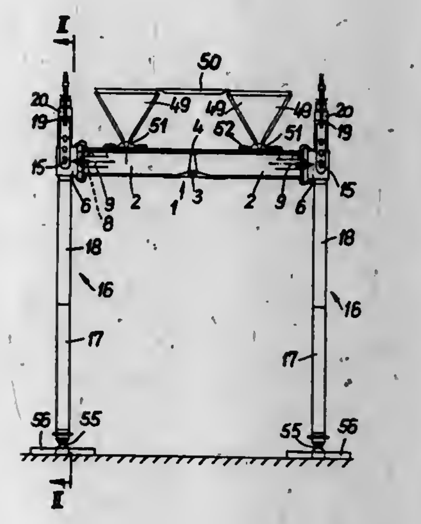
a length of buoyant line free at one end stored in said launcher and connected to said life-saving equipment at the other end thereof; and

life saving rings connected to said buoyant line at intervals therealong.

3,886,613
HINGE SUPPORT, ESPECIALLY FOR A BRIDGE

Johannes Busch; Herbert Roser, and Hugo Sedlacek, all of Rheinhausen, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Dec. 27, 1973, Ser. No. 428,870
Claims priority, application Germany, Jan. 8, 1973, 2300673
Int. Cl. E01d *19/00*
U.S. Cl. 14—14 **15 Claims**



1. A support for a bridge which has a roadway framework, said support comprising:

two columns at each side of said framework;

a tie beam extending between said columns in the lateral direction of said framework, said tie beam being supported by said columns and supporting said framework which is fixed to said tie beam;

two head members engaging the ends of said tie beam in load transmitting relation in such a manner that independently of one another they can freely rotate relative to said tie beam about an axis extending in the lateral direction of said framework, and means for arresting said head members in angular positions relative to said tie beam;

guide members guided along said columns;

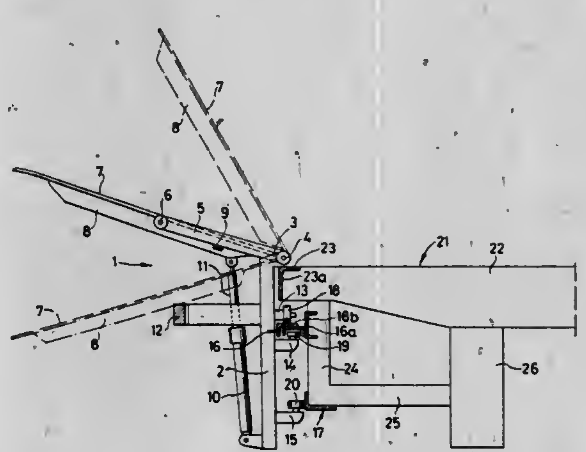
adjusting means on each said column engaging the respective guide member for adjusting it upwards and downwards along the respective column;

each said guide member being pivoted to one of said head members so that it can freely swivel relative to the head member about an axis which extends transversely to the longitudinal axis of said tie beam.

3,886,614
LOADING YARD WITH WHARVES

Knut Tage Lennart Rosengren, Eriksfaltsgatan 16, S-214 32 Malmo, Sweden

Filed Jan. 10, 1974, Ser. No. 432,201
Int. Cl. B65g *11/00*
U.S. Cl. 14—71 **6 Claims**

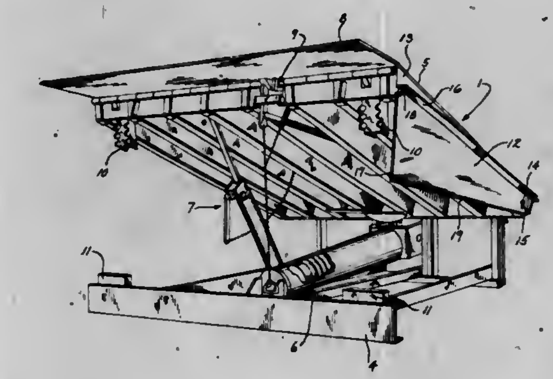


1. A loading yard provided with wharves wherein the front side of the loading yard has supporting and guiding rails extending horizontally along said front side to define journals and said wharf has rollers contacting said journals so that said wharf is suspended for movement along said loading yard, the improvement consisting in that a longitudinal member is mounted at said front side of said loading yard above said rails substantially along the length thereof, said longitudinal member extending from said front side forwardly at least approximately up to a vertical plane passing through the outermost edge of said rails and constituting a stop edge to prevent vehicles driven to the loading yard from ramming and deforming said rails.

3,886,615
TOE GUARD FOR A DOCKBOARD

Robert D. Metro, Brookfield, Wis., assignor to Kelley Company, Inc., Milwaukee, Wis.

Filed July 8, 1974, Ser. No. 486,413
Int. Cl. B65g *11/00*
U.S. Cl. 14—71 **15 Claims**

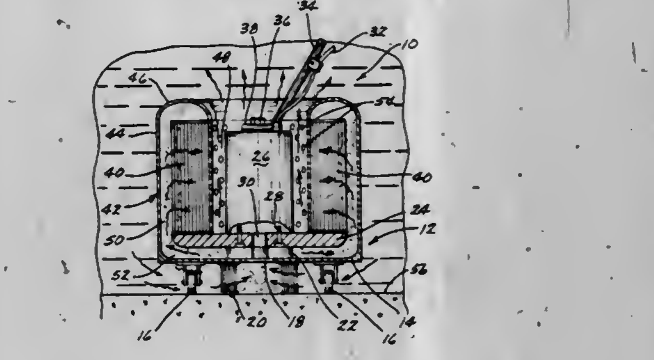


11. In combination, a loading dock having an upper loading surface and a forward vertical surface, said dock having a pit located at the junction of the upper surface and vertical surface, a dockboard mounted in the pit and including a supporting structure and a ramp structure hinged at its rear edge to the supporting structure and movable from a generally horizontal dock level position to an upwardly inclined position and to a downwardly inclined below dock level position, said ramp structure having a generally vertical side surface, a toe guard plate disposed generally flatwise to said side surface, pivotal means for pivotally mounting the rear end portion of the toe guard to one of said structures, first abutment means on said ramp structure, sedond abutment means on said plate disposed to be engaged by said first abutment means on upward elevation of said ramp structure, said first abutment means being spaced a substantial distance below the second abutment means when the ramp structure is at the horizontal dock level position, said first and second abutment means being arranged so that on initial upward movement of the ramp structure, the plate will not be moved upwardly with the ramp structure, and on continued upward movement of the ramp structure the first abutment means will engage the second abutment means to thereby pivot the plate upwardly with upward movement of the ramp structure, third abutment means on said plate, and stop means disposed to be engaged by said third abutment means as the ramp structure is lowered toward a dock level position, engagement of said third abutment means with said stop means preventing further downward movement of the plate and enabling the ramp structure to move to a below dock level position relative to said plate.

3,886,616
HAND PROPELLED SWIMMING POOL CLEANER

Fay A. Hayes, 144 N.W. 7th St., Boca Raton, Fla. 33432

Filed Dec. 6, 1972, Ser. No. 312,569
Int. Cl. E04h *3/20*
U.S. Cl. 15—1.7 **4 Claims**



1. A submergible swimming pool cleaner comprising,

a wheeled frame means,

a motor driven pump means on said frame means having a water intake means,

a filter means on said frame means in fluid communication with said water intake means for trapping water-borne particles in the water passing therethrough,

an elongated handle means operatively connected to said frame means extending upwardly therefrom to permit a person at poolside to manually move the cleaner along the bottom of the pool,

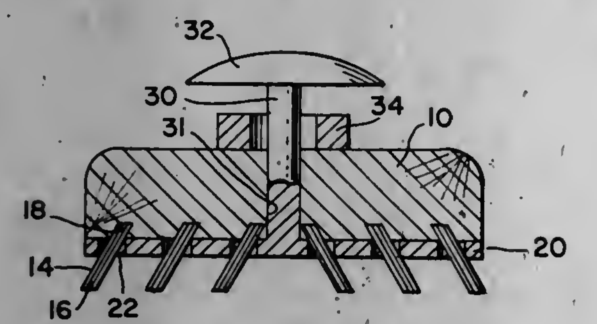
said frame means comprising a bottom portion spaced above the floor of the pool, a cylindrical housing extending upwardly from said bottom portion and having upstanding spaced apart outer and inner wall portions, said housing having a top portion extending over the upper ends of its said inner and outer wall portions, said filter means being cylindrical in shape and positioned in said housing between said inner and outer wall portions thereof, said filter means having an outer wall portion, said filter means having a diameter less than said housing so that the outer wall portion of said filter means is spaced inwardly of said outer wall portion of said housing to define an enclosed compartment area therebetween, said filter means having an inner wall portion positioned adjacent the inner wall portion of said housing, said inner wall portion of said housing having a plurality of discharge openings formed therein in communication with said filter means in said compartment area, said water intake means being an intake port formed in said bottom portion, said water intake means being in fluid communication with said compartment area so that the water will be drawn inwardly through said intake port by said pump means into said compartment area thence through said filter means and outwardly through said discharge openings.

3,886,617
SELF CLEANABLE HAIR BRUSH

Garrie Labran, 1535 Pensacola St., Apt. 81, Honolulu, Hawaii 96822, and Thomas A. Chabrak, 185 Greenbrook Rd., Greenbrook, N.J. 08812

Filed May 28, 1974, Ser. No. 473,752
Int. Cl. A46b *17/06*

U.S. Cl. 15—169 **3 Claims**



1. In a hair brush with means to remove entwined hair comprising a brush body having a plurality of tufts of bristles, a moveable plate having a principal plane parallel to the brush body, the plate having orifices through which the tufts pass, and means for moving the plate along the tufts to disengage hair entwined about the tufts, the improvement wherein:

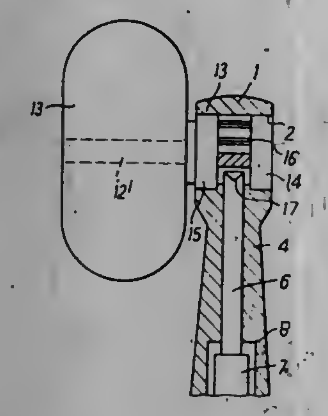
Said tufts of bristles are rooted at an angle relative to the plane of the moveable plate, said plate having orifices through which the tufts pass whereby when the plate is moved away from the brush body the tufts are bent to a position substantially perpendicular to the plane of said moveable plate.

3,886,618
SWIVELLING TOOTHBRUSH

Xavier Paoletti, Le Pigonnet, Rue Roumanille, Aixen Provence, France

Filed Jan. 8, 1973, Ser. No. 322,004
Int. Cl. A46b *9/10*

U.S. Cl. 15—172 **2 Claims**



1. A swivel tooth brush comprising:

an elongated handle provided with a transverse bore forming a smooth bearing surface adjacent one end and a longitudinal bore terminating in said transverse bore,

shaft means within the bearing including a pair of axially spaced readially enlarged shaft portions and an intermediate gear-like member of smaller diameter than the shaft portions, said shaft portion being closely fitted to the smooth bearing to protect the member against dirt or external effects,

a spring biased locking-pin within the longitudinal bore having a wedge-shaped end normally located between a pair of teeth on the gear-like member for locking said shaft means in selected positions,

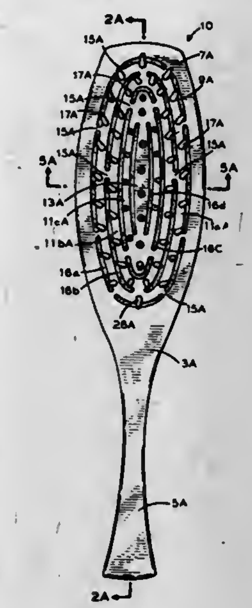
and a brush mounted on one end of the shaft means extending from the transverse bore, said brush being oblique relative to the axis of said shaft means.

3,886,619
DEFLECTING HAIRBRUSH

Solomon Natman, Brooklyn, and Robert A. Cohen, Kew Gardens, both of N.Y., assignors to Stance Industries Inc., Brooklyn, N.Y.

Continuation-in-part of Ser. No. 95,477, Dec. 7, 1970, Pat. No. 3,739,419. This application Mar. 26, 1973, Ser. No. 344,612. The portion of the term of this patent subsequent to June 19, 1990, has been disclaimed.
Int. Cl. A46b *1/00, 5/00*

U.S. Cl. 15—187 **16 Claims**



1. A hairbrush comprising:

a plurality of flexible concentric rings separated by annular openings;

stiff teeth mounted on said concentric rings; and

flexible hinges bridging said openings flexibly connecting adjacent concentric rings;

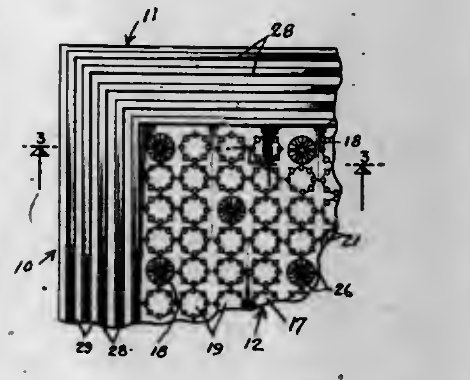
said flexible concentric rings and flexible hinges causing said concentric rings to deflect away from the direction of brushing when said stiff teeth engage snags in the hair.

3,886,620
DOOR OR SHOE MAT

Harold Miller; Jack Miller, and Michael Miller, all of c/o Milco Plastics Corp., 100 8th St., Passaic, N.J. 07055

Filed Sept. 17, 1971, Ser. No. 181,436
Int. Cl. A47i *23/26*

U.S. Cl. 15—217 **7 Claims**



1. A door mat comprising a molded one-composite material having a bottom base portion with top and bottom surfaces, flexible projections being integrally formed with the top surface of the base and extending upwardly therefrom with which wiping action can be effected upon the bottom of a shoe sole,

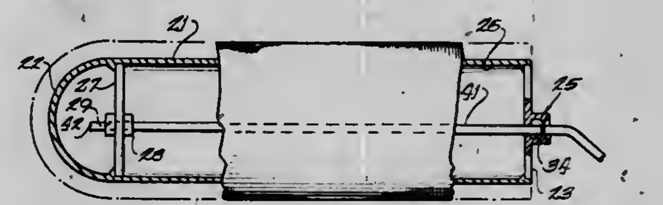
annularly inter-connecting base ridges extending upwardly from and integral with each of adjacent flexible projections providable of upright reinforcement support such that said projections are substantially rigidly self-supporting but adapted to be flexed under the weight of a foot-worn shoe; upstanding non-flexible scraper-projections with an upper top surface having a plurality of upwardly directed separate scraper sharp edges integrally fused laterally to one another such that hard or fastened debris on a shoe sole is readily scraped by the non-flexible projections being dispersed through the flexible projections and rising upwardly to less than the height of the free and extended flexible projections and adapted for full weight of a foot-worn shoe being placed opon the mat to support the weight of the foot-worn shoe and at the same time providing means upon which heavier and concentrated wiping action can be effected upon the more adhered debris upon the shoe sole and while the flexible projections still lie in contact with the shoe sole for light wiping action thereupon, said flexible projections being formed in clusters with the individual projections being circularly arranged thereabout and circumferentially spaced from one another, each of the projections extending upwardly from a common base and being of tapering section and having its ends overlying a plane extending between the surface of the upper ends of the non-flexible projections, the diameter of the clusters being generally the same diameter as the non-flexible projections, the clusters and the non-flexible projections being spaced from one another to support a foot sole under its full weight without depressing the flexible projections below the plane extending across the top surface of the non-flexible projections, and in which the plurality of scraper sharp edges of the non-flexible projections are formed as ridges with notches alternately angularly spaced between adjacent ridges of said non-flexible projections upper top surfaces and the plurality of notches and ridges extending radially outwardly from the center of the top surface of the rigid projections and being formed as part of the rigid projections providing thereby sharp rigid scraping edges.

3,886,621
PAINT ROLLER AND HANDLE THEREFOR

Homer Ernest Welsh, Rt. 1, Box 186, Talbott, Tenn. 37877

Filed Jan. 22, 1974, Ser. No. 435,444
Int. Cl. B44d *3/28*

U.S. Cl. 15—230.11 **1 Claim**



1. A device intended for the applying of paint simultaneously to a face surface of one siding member and an adjacent bottom overlapping edge of an adjacent top siding member, said device comprising:

a roller of an elongated cylindrical shape having cylindrical side wall surfaces, a curved closed outer end, and a closed inner end, said side wall surfaces and end surfaces defining a bore interiorly thereof, said cylindrical side wall surfaces and said curved end surface provided with a nap of material adapted to hold paint for applying the same to a surface to be painted;

a handle member including an elongated cylindrically shaped rod like axle adapted to be received axially in said bore of said roller for said roller to rotate thereabout;

a support member disposed in said roller bore intermediate the interior surfaces of said cylindrical wall surfaces and adjacent said curved end, said support member provided with a bushing centrally thereof;

said bushing having an axial bore extending therethrough and disposed concentric with the axis of said roller;

said closed end of said roller having an opening disposed centrally thereof and extending axially therethrough in alignment with said bushing bore;

a collar member disposed concentric with said closed end opening and projecting axially outwardly from said closed end, said collar member having a bore extending therethrough disposed in substantial alignment with said closed end opening such that said axle is adapted to be rotatably supported in said aligned closed end opening and said bushing bore with said collar member detachably retaining said axle to said roller to permit rotation of said roller about said axle in opposite directions; and

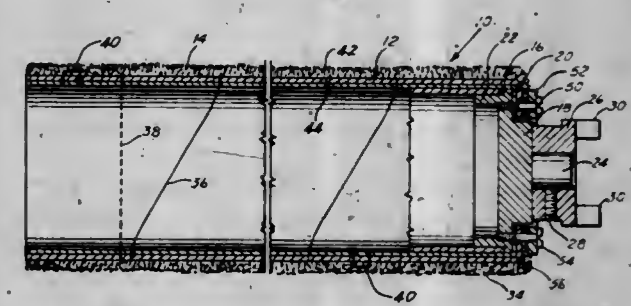
said collar member comprises an elongated cylindrical open ended body member having cylindrical side walls, a back end affixed to said roller closed end, and a front end projecting outwardly therefrom, a plurality of circumferally spaced slots disposed in said side walls opening out of said front end and extending longitudinally through said side walls to a position short of said back end thereof, said collar member being manufactured of a resilient material, said slots dividing said collar member side-wall surfaces into a plurality of sections, each of said sections provided on the interior surface thereof with a radially inwardly directed projection, each projection terminating in an apex portion spaced apart from the other apex portions of the other projections, the apex portions defining a circle having a diameter less than the diameter of said collar member bore and also less than the diameter of said axle, and said axle provided with an annular groove therein adapted to be engaged by said apex portions when said axle is in supported position in said roller bore with said axle terminal end rotatably supported in said bushing bore whereby the roller is detachably attached to the axle in a rotatable manner relative thereto.

3,886,622
TUBULAR BUFFER ELEMENT

Thomas A. Horst, Lafayette, Colo., assignor to Western Sales and Supply Co., Denver, Colo.

Filed Jan. 26, 1973, Ser. No. 326,762
Int. Cl. A47l *11/40*

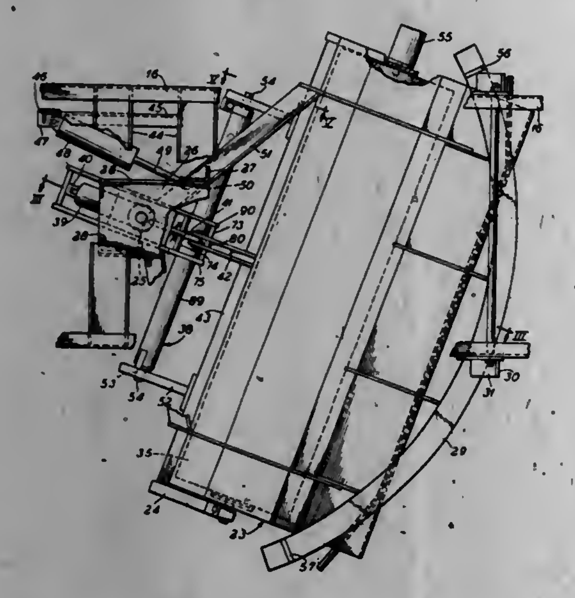
U.S. Cl. 15—230.13 **1 Claim**



1. The replaceable buffer element for rotating drum-type buffers which comprises: an elongate rigid tubular core sized to fit over the drum; a strip of carpeting wound in spiral fashion onto the core so as to define a helical butt joint between adjacent convolutions; means for attaching the carpeting strip to the core comprising circumferentially stitched seams adjacent each end, said seams each being essentially coplanar and the planes defined thereby lying in substantially normal relation to the core axis, and a sawtooth edge formed in at least one end, said sawtooth edge defining a ring of bendable teeth foldable inwardly into essentially coplanar relation.

3,886,623
VACUUM TYPE SWEEPER

Eric Landesman, Aurora, and Donald R. Palmiter, Elgin, both of Ill., assignors to Elgin Sweeper Company, Elgin, Ill.
Filed July 14, 1972, Ser. No. 271,684
Int. Cl. A47l *5/00*
U.S. Cl. 15—319 **12 Claims**

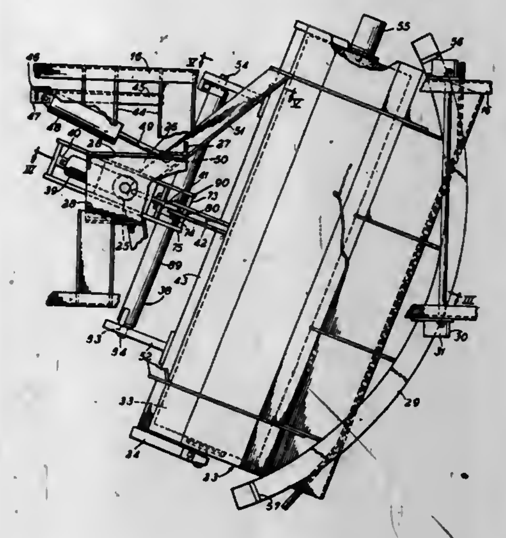


3. A vacuum type sweeper comprising: a truck having a frame and a transmission shiftable between forward and reverse; a pair of side brooms mounted on opposite sides of said truck; side broom control means operable to move said side brooms between sweeping and transport positions; a rotatable cylindrical extension broom; mounting means mounting said extension broom beneath said truck, said mounting means including means for pivoting said extension broom between selected positions where it is cooperable in sweeping toward said side brooms; a pair of suction nozzles mounted on opposite sides of said truck adjacent said side brooms; means for moving said suction nozzles between sweeping and transport positions; a debris container carried by said truck in communication with said suction nozzles; a pair of gate valves disposed between respective ones of said nozzles and said debris container and means for selectively operating said gate valves to interrupt the communication thereof; additional devices in corresponding pairs mounted on opposite sides of said truck and means for operating said devices to perform other street cleaning functions; means operable to store a selection of street cleaning functions connected to said side broom control means, to said extension broom pivoting means, to said means for moving said suction nozzles, to said means for selectively operating said gate valves, and to said means for operating said additional operating devices, and a single switch for causing said devices corresponding to said selection of functions to be placed in operation on one side of the truck; and means connected between said transmission and said means for moving said suction nozzles being operable to cause said nozzles to be raised automatically upon shifting of said transmission into reverse.

3,886,624
VACUUM TYPE SWEEPER

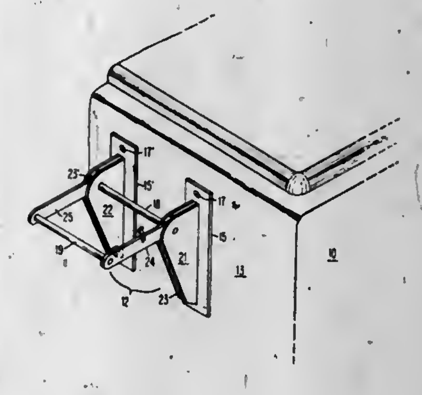
Eric Landesman, Aurora, and Donald R. Palmiter, Elgin, both of Ill., assignors to Elgin Sweeper Company, Elgin, Ill.
Division of Ser. No. 271,684, July 14, 1972. This application July 31, 1973, Ser. No. 384,236
Int. Cl. A47l *9/00*
U.S. Cl. 15—340 **12 Claims**

1. A vacuum type sweeper of the type having dual side brooms mounted on opposite sides of a sweeper truck, a cylindrical rotating extension broom mounted beneath the sweeper truck and pivotable between positions wherein it is effective to sweep toward the side brooms, two transversely spaced vacuum sweepings pickups mounted on said frame immediately rearward of said extension broom, said extension broom when pivoted in one position, being operable to sweep into one of said vacuum sweepings pickups and when its other position being operable to sweep into the other of said vacuum sweepings pickups, means for selectively moving either vacuum sweepings pickup from a road travel position to a sweepings pickup position, and means for preventing uneven wear of said extension broom including means for maintaining the axis of rotation of said extension parallel to the surface being swept.



3,886,625
DUAL HANDLE CONSTRUCTION FOR CASKETS

Ernest J. Rollband, 3415 Slaterville R.D. No. 1, Brooktondale, N.Y. 14817
Filed July 5, 1974, Ser. No. 485,838
Int. Cl. A47b *95/02*
U.S. Cl. 16—112 **3 Claims**



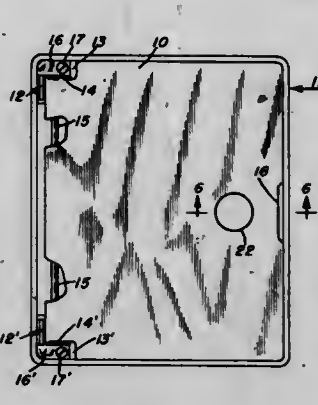
1. A dual handle construction for attachment to the wall of a casket comprising a first, fixed bar member extending at a given distance from the wall of the casket and parallel thereto, support means for said member attached to the wall of the casket, a second bar member adapted to extend from said wall at a greater distance than said first bar member and parallel thereto, a pair of arms attached to said second bar member, said arms being pivotally mounted for swinging said second bar member into active position when in use and into inactive position against the casket wall when not in use.

3,886,626
HINGE MECHANISM

Stephen G. Fogle, Mountain Lakes, N.J., assignor to Q.V.S., Inc., East Orange, N.J.
Filed Nov. 28, 1973, Ser. No. 419,681
Int. Cl. E05f *1/12*
U.S. Cl. 16—184 **5 Claims**

1. A hinge mechanism securing a panel to a case and comprising,

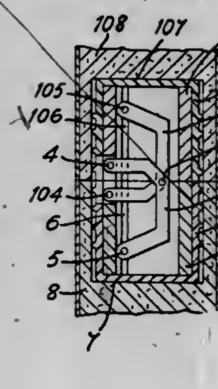
a. a pair of fixed supports positioned at two internal, adjacent corners of the case, said supports having flat surfaces lying in a plane spaced from and substantially parallel to the plane of the base of the case,
b. a shaft rotatably carried by the panel along one edge thereof, said shaft having end portions supported on the said flat surfaces and said shaft having a diameter less than the length of the flat surfaces taken in a direction normal to the shaft axis,



c. means limiting lateral displacement of the shaft in a direction away from the said flat surface,
d. spring means disposed between an inner wall of the case and the said one edge of the panel, said spring means normally applying pressure to the panel in a direction away from the said inner wall of the case, and
e. latching means disposed at the opposite inner wall of the case for securing the panel in a plane substantially parallel to that of the base of the case.

3,886,627
LINK HINGE

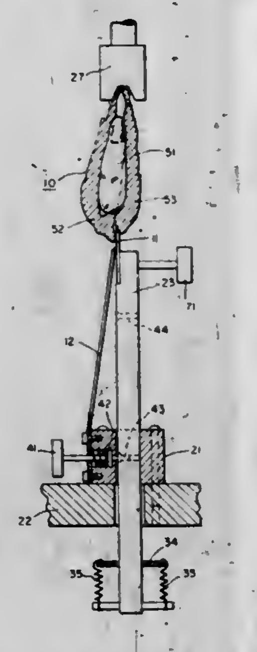
Eraclio Bassan, 91 e, Viale Porta Adige, Rovigo, Italy (45100)
Filed May 22, 1973, Ser. No. 362,670
Claims priority, application Italy, May 30, 1972, 12693/72
Int. Cl. E05d *3/06*
U.S. Cl. 16—163 **4 Claims**



1. In a link hinge for connecting two elements, the link hinge including a pair of hollow, substantially tubular shells hingedly interconnected at one end of each shell by link means normally housed inside said tubular shells, the improvement comprising a pair of thin walled cylindrical boxes into which said tubular shells are inserted, with each said box and its corresponding shell being substantially longitudinally coextensive, and with means in the form of at least one flattened surface formed at one side of each shell cooperating with a corresponding profile formed in each box for coupling the shells to the boxes in a non-rotatable manner, said boxes being received within respective ones of the elements to be connected.

3,886,628
OYSTER SHUCKER AND METHOD

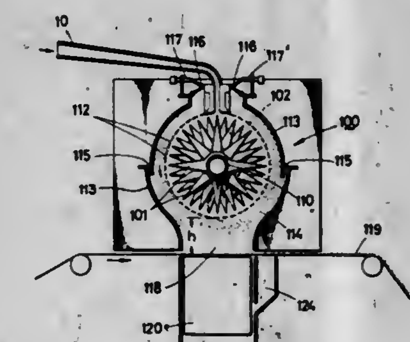
Robert J. Berry, Lake Hiawatha, N.J., assignor to Lawrence J. Maher, Lake Hiawatha, N.J., a part interest
Filed Jan. 11, 1974, Ser. No. 432,747
Int. Cl. A22c *29/00*
U.S. Cl. 17—76 **24 Claims**



1. An oyster shucker, comprising: a pair of knife blades, a first blade of said pair being adapted to sever the hinge of an intact oyster shell, the second blade of said pair being adapted to scrape an oyster away from one inner wall of a severed-hinge oyster shell; and movable compressive force means for compressively forcing an oyster shell upon said pair of knife blades; said movable compressive force means being positioned with respect to said pair of blades and said oyster shell so as to force both of said blades to engage and enter said oyster shell and cause said first blade to sever the hinge of said shell and said second blade to scrape said oyster away from said inner wall, upon movement of said compressive force means toward said pair of blades.

3,886,629
APPARATUS FOR PRODUCING FIBROUS MATS

Susumu Nakai, Tokyo, and Hisashi Matsumura, Fujinomiya, both of Japan, assignors to Honshu Paper Company, Ltd., Tokyo, Japan
Filed Apr. 7, 1972, Ser. No. 242,060
Claims priority, application Japan, Sept. 10, 1971, 46-69672
Int. Cl. D01g *25/00*
U.S. Cl. 19—156.3 **9 Claims**

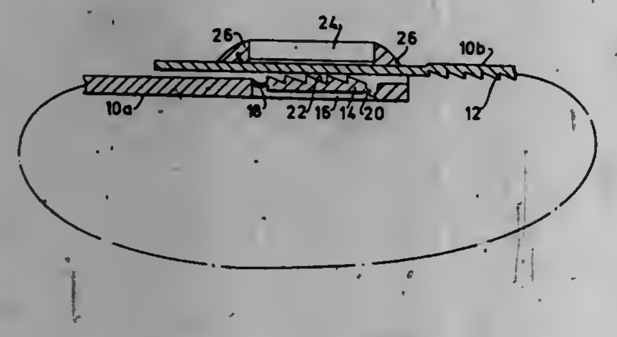


1. Apparatus for producing fibrous mats which comprises: an elongate cylindrical separating wall having sifting openings uniformly distributed over substantially its entire circumferential areas except a full width inlet portion through which untreated fibers are fed; a rotary shaft; a dispersing means mounted on said shaft for rotation therewith and operatively associated with said separating wall for dispersing fiber flocks

info elementary fibers; a casing disposed in surrounding relation to said separating wall and defining therewith an annular dispersing chamber having a downwardly directed fiber outlet for dispersed fibers, said casing being provided with full width air intake openings at the upper end thereof and, said casing being further provided in opposite sides thereof with an elongate aperture communicating with the atmosphere for introducing a controlled volume of air into said chamber, said chamber between the casing and the separating wall widening progressively towards said fiber outlet so as to maintain a constant velocity of air throughout all regions of said chamber; a damper provided at the upper end of said dispersing chamber in operative association with said air intake openings for regulating the volumertic ratio of air to fibers within said chamber; and a moving endless wire conveyor and suction means underlying said fiber outlet for the deposition thereon of dispersed fibers.

3,886,630
CABLE TIE CLIPS

Edgar Frank Emery, Isle of Man, England, assignor to Manx Mail Order Limited, Isle of Man, England
Filed July 15, 1974, Ser. No. 488,420
Int. Cl. B65d *63/00*
U.S. Cl. 24—16 PB **3 Claims**



1. A tie device comprising an elongate strip which is transversely serrated on one surface over at least part of the length of the strip towards one end thereof and has a pawl disposed within an opening at the other end thereof and joined, at opposite ends, to the main body of the strip by flexible webs integral with such body and with said pawl, said pawl being transversely serrated on the surface therof corresponding to said one surface at the other end of the strip, said strip further being formed with a quideway extending over said opening and pawl to receive the serrated end of the strip, said webs permitting yielding movement of said pawl to allow the serrated end of the strip to pass into the guideway and the serrations thereon to engage with the serrations on said pawl, and said serrations being so shaped that movement of the serrated end of the strip in a direction to withdraw such end from said quideway results in a jamming together of the pawl and serrated strip end within the confines of said quideway thereby resisting withdrawal of said end from the guideway.

3,886,631
SELF-CLAMPING GRIP FOR A FREE CABLE WINCH

Patrice Caradot, Saint-Etienne, France, assignor to Milbras, France
Filed Dec. 14, 1972, Ser. No. 315,110
Claims priority, application France, Dec. 15, 1971, 71.46247
Int. Cl. F16g *11/00;* **B66f** *3/00*
U.S. Cl. 24—134 N **10 Claims**

1. A gripping apparatus for a free cable winch, comprising, in combination:

a first jaw member;

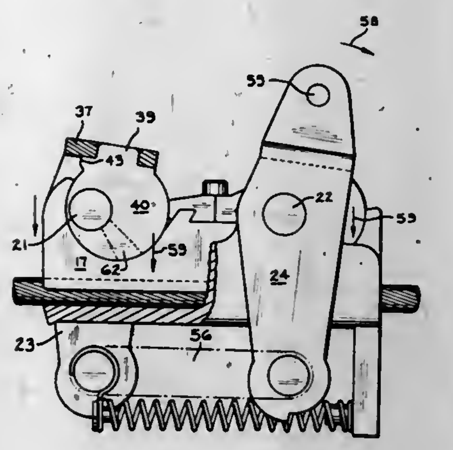
a second jaw member disposed adjacent said first jaw member to form with said first jaw member a passageway through which a cable may selectively be pulled and clamped;

substantially round eccentric push means bearing directly against and mating with said first jaw member;

first strap means embracing one end of said first and second jaw members;

second strap means embracing the other end of said first and second jaw members;

first pivot means disposed on one side of said cable passageway, said first pivot means extending through apertures having completely closed peripheries provided in said strap means, in said second jaw member, and in said eccentric push means to pivotally interconnect said first and second strap means, respectively, and said eccentric push means with said second jaw member;



link means;

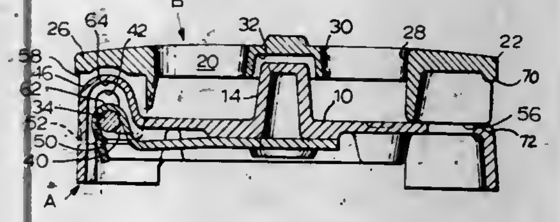
second pivot means disposed on the other side of said cable pivotally interconnecting said link means and said first and second strap means; and

resilient means connected between said second jaw member and said first strap means urging said jaw members to clamp together against said cable under the action of said eccentric push means, and

wherein each of said strap means has a transverse bottom, the inner surface of which is provided with an aperture adapted to receive one of said eccentric push means.

3,886,632
BUCKLE

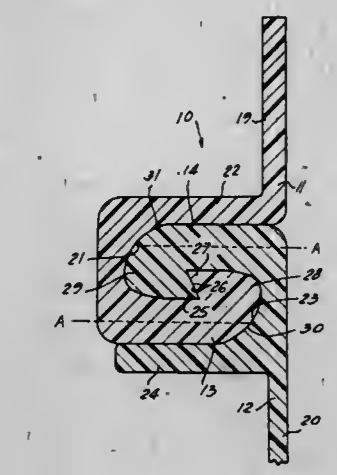
Lazlo Bako, Woodcliff Lake, N.J., assignor to Presto Lock Company, Division of Walter Kidde & Company, Inc., Elmwood Park, N.J.
Filed Jan. 30, 1974, Ser. No. 437,932
Int. Cl. A44b *11/22*
U.S. Cl. 24—167 **10 Claims**



1. A buckle for use with a perforated strap comprising a base plate having a stud projecting therefrom for receiving a selected perforation of the strap, a loop member pivotally attached to the base plate and movable to lowered and raised positions relative to the base plate, and tang means formed integrally with the loop member and extending into the opening defined by the loop member, the tang means covering the end of the stud when the loop member is in the lowered position for maintaining the selected perforation of the strap in receiving engagement with the stud.

3,886,633
INTERLOCKING FASTENER WITH INCREASED RESISTANCE TO SEPARATION

Steven Ausnit, Rt. 303, Orangeburg, N.Y. 10962
Filed Aug. 30, 1973, Ser. No. 392,882
Int. Cl. A44b *17/00*
U.S. Cl. 24—201 C **4 Claims**



1. In a separably releasable fastener formed from resiliently yieldable material and comprising at least one inner head on a first fastener strip and a complementary outer head on a second fastener strip, each head having a back side and a hook tooth side at respectively opposite sides of a generally central axis extending through a crown area of the head, each head having on its hook tooth side a hook tooth portion provided with a hook surface extending generally laterally relative to the central axis of the head, the hook surfaces of the hook tooth portions being interlockingly engaged with one another, and the hook tooth portions under conditions of stress separating through distortion of said hook tooth portions until they release from one another, the improvement comprising:

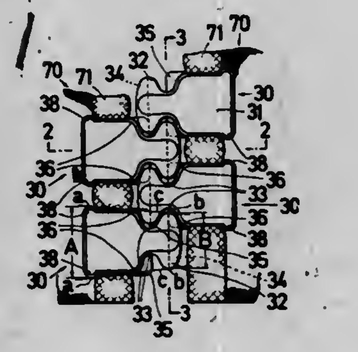
a greater crown mass of material on the respective crown areas at the tooth portion side of the axis of each of the heads and generally aligned with the hook tooth portion at that side of the axis;

and the crown area of each head at the back side of the axis being of substantially less mass than the greater crown mass of material at the hook tooth side of the axis;

whereby resistance to separating distortion of the hook tooth portions of said heads is increased because of said greater crown mass of material, as compared with fastener heads having a generally uniform mass semicylindrical crown profile from the hook tooth sides to the back sides of the heads.

3,886,634
ZIP-FASTENER

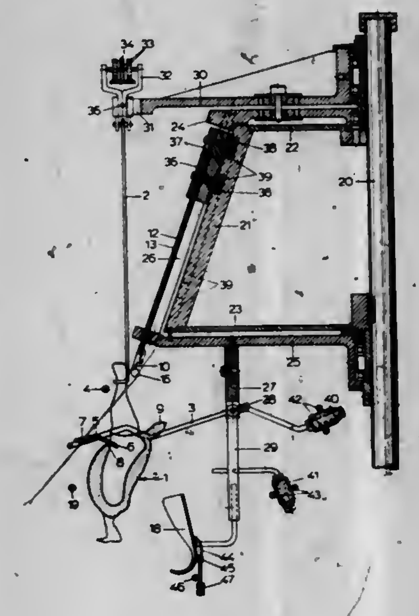
Kiyoo Murata, Kyoto, Japan, assignor to New Japan Slide Fastener Mfg. Co., Ltd., Japan
Filed Nov. 27, 1973, Ser. No. 419,188
Int. Cl. A44f *19/04*
U.S. Cl. 24—205.13 R **3 Claims**



1. A zip-fastener comprising a pair of cloth tapes in an opposed relation, a pair of cloth stringers fixed along the two opposed edges of said cloth tapes, a plurality of interlocking members anchored on said stringers at regular intervals, and a slide piece to be pulled between said interlocking members to open and close the fastener; said interlocking members consisting of a head, a neck adjacent said head and a stem adjacent said neck, said head having two generally semicircular portions on opposed sides of the plane of the tape, said head and said neck having engaging means for interlocking with the necks and heads of adjacent opposed interlocking members when the fastener is closed, the terminal portion of the anchoring end of said stem being wider than the remaining portion of said stem and wider than said head, said remaining portion of said stem falling within imaginary lines drawn between the terminal portion of said anchoring end and the widest portion of said head, said intervals between two adjacent interlocking members being such that the adjacent terminal ends of their stems touch each other before their necks touch an adjacent head of an opposed interlocking member when the fastener is closed and flexed.

3,886,635
APPARATUS FOR DRAWING A FOWL

Pieter Meyn, Noordeinde 72, Oostzann, Netherlands
Filed Nov. 13, 1973, Ser. No. 415,379
Claims priority, application Netherlands, Nov. 22, 1972, 7215768
Int. Cl. A22c *21/00*
U.S. Cl. 17—11 **13 Claims**



1. Apparatus for drawing a fowl, comprising at least one movable supporting element, a hook in said supporting element for suspending a fowl by its ankle joints;

a drawing member formed as a linearly reciprocable bar having a pivotable extension provided with a wedge shaped slot for catching the fowl's gullet, and with a blunt outer end;

means for inserting said drawing member in a fowl through an opening made between its breatbone and its tail until the free end of the drawing member abuts on the fowl's ribs on both sides of its spine;

means for keeping said extension aligned with said bar during the insertion of said drawing member;

means for pivoting said extension towards the fowl's spine when said drawing member reaches its lowermost position, in such manner that said blunt outer end of said extension is pressed against the fowl's ribs;

a pressure member;

means for withdrawing said drawing member from the fowl along its ribs while pressing the fowl's back against said pressure member and carrying along the fowl's entrails connected to its gullet;

means adapted to grip between the fowl's legs and hold the same during the insertion and the withdrawal of said drawing member; and

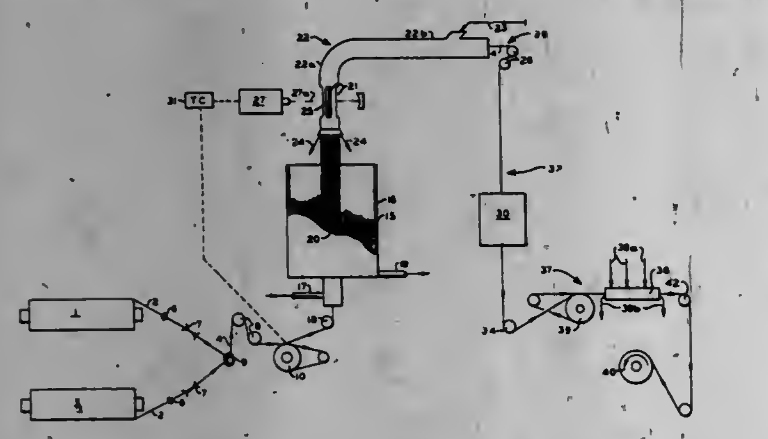
positioning means cooperating with said drawing member to bring the fowl's breatbone into the desired position relative to said drawing member during the insertion of said drawing member, and including a flap pivotably connected to said holding means, a counterweight normally holding said flap spaced from and over the tip of the fowl's breastbone, said flap being pressable down onto the said breastbone by said drawing member during its insertion against the action of said counterweight to bring the breastbone into the correct position, after which said flap serves to guide said drawing member into the fowl.

3,886,636

YARN PROCESSING

David E. Borenstein, and Richard C. Newton, both of Greenville, S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 24, 1973, Ser. No. 363,480
Int. Cl. D02g *1/20*
U.S. Cl. 28—72.11 **7 Claims**



1. A method for processing yarn in one continuous operation without allowing the yarn to cool to ambient temperature comprising:

crimping a heated yarn;

entangling the crimped yarn while under low tension; and

heating the entangled yarn under a higher tension and thereafter packaging the entangled yarn while still warm and under tension thereby producing a straightened yarn which after cooling in the straightened form will assume a crimped form upon subsequent heating in a relaxed state.

3,886,637

METHOD OF PRODUCING HEAT TREATABLE TITANIUM CARBIDE TOOL STEEL COATINGS ON CYLINDERS OF INTERNAL COMBUSTION ENGINES

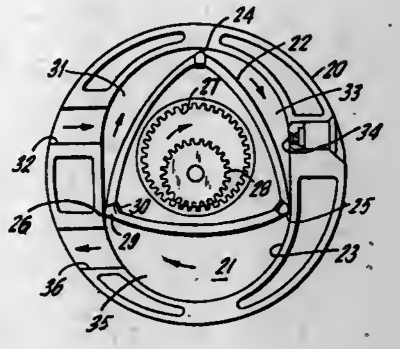
John L. Ellis, White Plains; M. Kumar Mal, Spring Valley, and Stuart E. Tarkan, Monsey, all of N.Y., assignors to Chromalloy American Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 199,497, Nov. 17, 1971, Pat. No. 3,779,720. This application Aug. 17, 1973, Ser. No. 389,212
Int. Cl. B21k *3/00*
U.S. Cl. 29—156.4 WL **5 Claims**

1. In a method of producing a hard, wear resistant metal coating on the wall of a piston-receiving chamber of a housing of an internal combustion engine cast from aluminum, wherein said coating metal is first deposited by a plasma flame upon a smooth surface of a core corresponding in configuration to the wall of said aluminum housing, the core being then inserted in a mold for casting said engine housing by causing molten aluminum to flow into said mold under pressure and surround said core in contact with said coating and solidify therein and wherein said core is thereafter removed from said cast housing with the coating transferred to the wall of said cast housing, the improvement which comprises,

selecting a powder composition containing about 10% to 80% by weight of primary grains of titanium carbide and the balance essentially about 90% to 20% by weight of steel-forming ingredients which when melted to form a steel and quenched from an austenitizing temperature tends to form martensite,

and quench-depositing said composition upon the smooth surface of said core by means of a plasma flame to form a coherent coating therein,



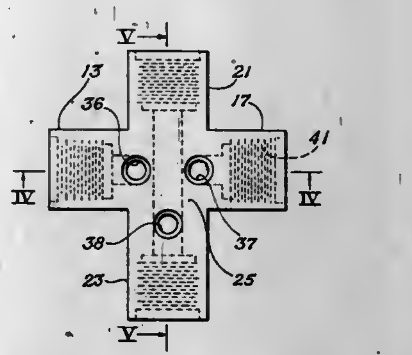
such that when said coherent coating of said titanium carbide tool steel composition is transferred to the wall of said housing by casting aluminum about said core and the core thereafter removed, the transferred coating is characterized by primary grains of titanium carbide uniformly dispered through a matrix containing an austenitic decomposition product selected from the group consisting of martensite, bainite and mixtures thereof and further characterized in that said coating is capable of being heat treated at a temperature below the melting point of said aluminum housing.

3,886,638

MULTI-WAY VALVE PORTING BLOCK

Dennis J. Hayman, Abilene, and Robert George Stultz, McKinney, both of Tex., assignors to Hydrometals, Inc., Dallas, Tex.

Filed June 15, 1973, Ser. No. 370,228
Int. Cl. B23p *15/00, 13/00*
U.S. Cl. 29—157.1 R **3 Claims**



1. A method of forming a four-way valve porting block for a mixing valve having a control head and respective conduits for, respectively, hot and cold water from a source and controlled water to one of a tub and shower comprising the steps of:

a. cutting off a predetermined thickness of a four-way metallic bar stock having a cross sectional shape in the form of a cross with two laterally extending arms and two aligned perpendicular arms extending normal to said laterally extending arms to form a solid cross shaped block with four respective arms;

b. forming by machining a first large bore in each of said four arms for conformingly and sealingly receiving respective large conduits carrying the respective waters;

c. forming by machining a first smaller bore extending longitudinally of said two perpendicular arms and communicating with the respective first large bores formed therewithin; one arm being adapted for connection with conduit leading to a shower and the other arm being adapted for connection with conduit leading to a tub;

d. forming by machining two smaller apertures extending laterally through one side wall of said cross shaped block and communicating, respectively, with each of said first large bores in said laterally extending arms; said smaller apertures being adapted for being connected with smaller conduits to the control head; and

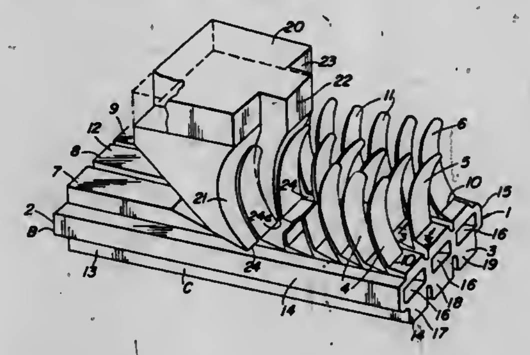
e. forming an aspirating passageway extending through said side wall and in communication with said first large bore in said other arm, of said two perpendicular arms, for being installed pointing downwardly and connected with said conduit leading to said tub; said aspirating passageway being adapted for being connected with a smaller conduit from the control head and terminating in an aspirating aperture near the center of said first large bore of said other arm, said aspirating passageway being formed by drilling two intersecting third and fourth bores.

3,886,639

METHOD OF MAKING A FINNED HEAT EXCHANGER

Stephen F. Pasternak, Park Ridge, Ill., assignor to Peerless of America, Incorporated, Chicago, Ill.

Filed Feb. 1, 1975, Ser. No. 438,682. The portion of the term of this patent subsequent to July 17, 1990, has been disclaimed.
Int. Cl. B21d *53/02;* **B23p** *15/26*
U.S. Cl. 29—157.3 A **3 Claims**



1. The method of making heat transfer element, comprising

a. forming an elongated tubular member having a wall portion with spaced elongated external ribs extending longitudinally of said tubular member, and

b. successively, from one end portion of said tubular member toward the other end portion thereof,

1. cutting fins from a plurality of said ribs simultaneously, and by means of a cutting tool having cutting surfaces aligned with respective ones of said ribs and having alternate ones of said cutting surfaces being offset longitudinally of said ribs from the immediately transversely adjacent cutting surfaces, and

c. to thereby

1. afford

a'. elongated base portions

1'. extending across said ribs transversely to the length thereof and

2'. directly attached to said ribs, and

b'. free end portions projecting outwardly therefrom, and

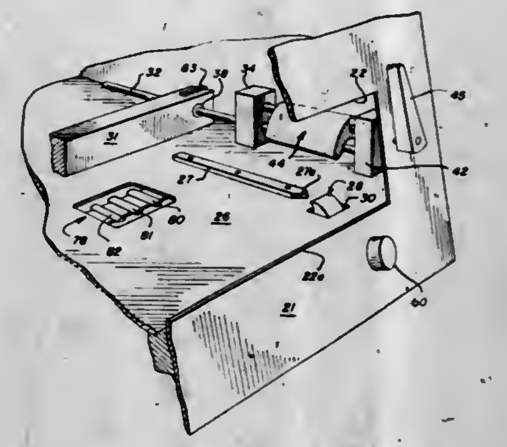
2. dispose said free end portions of said fins in position wherein said free end portions of said fins on alternate ones of said rows are disposed a different distance from one end of said tubular member than the free end portions on immediately transversely adjacent fins in the other said rows.

3,886,640

HOUSING FOR THE CONTROLLED EXPOSURE OF FILM CASSETTE

Jay S. Waxman, and Burton L. Siegal, both of Skokie, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Nov. 23, 1973, Ser. No. 418,230
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 P **15 Claims**



1. A housing for controlled exposure of a film cassette wherein the latter has a tray section, a cover section hingedly connected thereto, a releasable lock for retaining the cover section in a closed relation with respect to the tray section, and an elongated guideway formed in the underside of the tray section, said housing comprising a light-tight chamber having a wall provided with an opening through which a closed cassette is adapted to pass; a door mounted on said chamber wall for movement between either an open or closed position with respect to the chamber wall opening; a cassette-supporting base forming a surface of the chamber and provided with an elongated protruding guide means for being slidably disposed within the cassette guideway when the cassette is inserted into or removed from the chamber through the chamber wall opening, said guide means effecting release of the cassette lock when the cassette assumes a predetermined station within the housing chamber; means adjustably mounted within said chamber and adapted when actuated in one direction to effect opening of the cassette cover section to permit exposure of the film when the cassette has assumed said predetermined station, and when actuated in a second direction to effect closing of the cassette cover section; releasable means within said chamber for retaining a cassette at said predetermined station; and locking means movably mounted on said housing for retaining said door in a closed position when the cassette cover section is in an open position.

3,886,641

APPARATUS FOR INSERTING WIRES INTO TERMINALS IN AN ELECTRICAL CONNECTOR

John Douglas Davis, Lexington, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

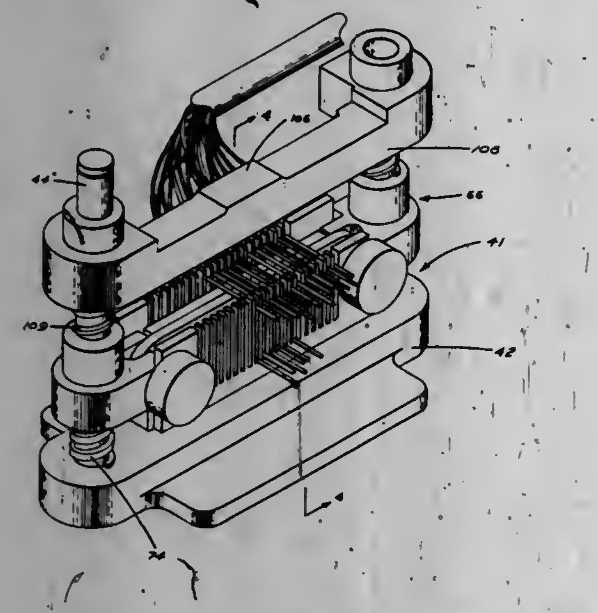
Filed June 14, 1974, Ser. No. 479,380
Int. Cl. H01r *43/04*
U.S. Cl. 29—203 MW **10 Claims**

1. Apparatus for moving conductors laterally of their axes in opposite directions towards each other and into the conductor-receiving portions of electrical contact terminals which are contained in a multi-contact electrical connector, said conductor-receiving portions being arranged in two side-by-side parallel rows which are on oppositely facing surfaces of said connector, said apparatus comprising:

fixed and movable insertion tool means, each of said tool means having conductor insertion means for inserting said conductors into said conductor-receiving portions, said insertion tool means being normally spaced apart with said conductor insertion means opposed to each other,

connector holding means normally disposed between said tool means, said holding means being adapted to hold said connector in an orientation with said conductor-receiving portions opposed to said insertion tool means,

guide means extending rectilinearly from said fixed insertion tool means to said movable insertion tool means, said movable insertion tool means and said connector holding means being in guiding engagement with said guide means, and



resilient means interposed between said fixed insertion tool means and said connector holding means and between said connector holding means and said movable insertion tool means whereby,

upon locating said conductors between said fixed insertion tool means and said connector holding means and between said connector holding means and said movable insertion tool means, and upon moving said movable insertion tool means towards said fixed insertion tool means, said movable insertion tool means moves said connector holding means towards said fixed insertion tool means and said conductor insertion means inserts said conductors into said conductor-receiving portions of said terminals.

3,886,642

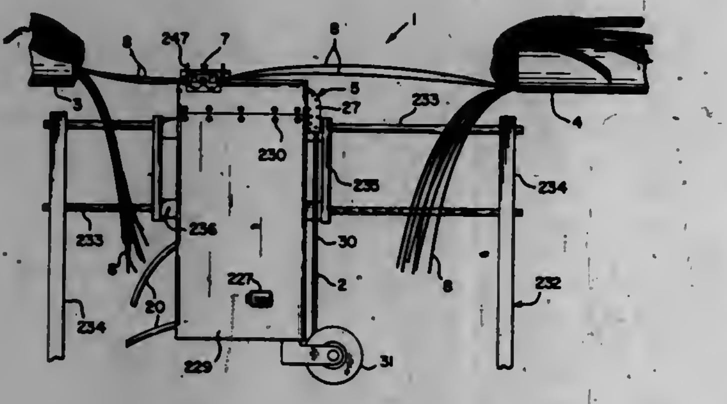
METHOD AND APPARATUS FOR CONNECTING WIRES

Dory J. Neale, Sr., Saint Petersburg, Fla., assignor to The National Telephone Supply Co., Cleveland, Ohio

Filed July 24, 1974, Ser. No. 491,288

Int. Cl. H01r *43/04*

U.S. Cl. 29—203 DT **21 Claims**



1. Apparatus for trimming the end portions of wires and crimping an open sided electrical connecting device onto the trimmed wire ends to splice same, said apparatus comprising:

a. a support member;

b. wire receiving members movably mounted relative to said support member and each adapted to grip a wire of a matched pair adjacent free ends of said wires;

c. cutting means on the support adjacent the wire receiving member when in a wire receiving position and operable to trim each wire free end to a predetermined point relative the respective wire receiving member;

d. means on the support defining a connector sleeve receiving position;

e. connector sleeve moving means moving and indexing an open sided connector sleeve to said connector sleeve receiving position;

f. crimping members mounted on the support and having portions relatively movable toward and away from each other at said connector sleeve receiving position for crimping a connector sleeve about wires therein to splice same;

g. actuator means on said support and operative to in sequence move the cutting means to trim the wires, move the wire receiving members to deposit the trimmed wire end portions in the connector sleeve and move the crimping member portions to crimp the wire end portions in the connector sleeve and electrically connect same, retract the crimping member portions to release the sleeve and connected wires.

3,886,643

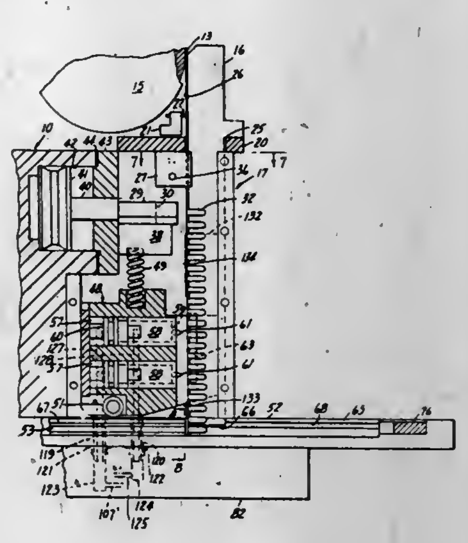
CLIPPING APPARATUS AND CLIPS THEREFOR

Karl A. Klenz, Oakland, and Clyde R. Velarde, Hayward, both of Calif., assignors to Rheem Manufacturing Company, New York, N.Y.

Division of Ser. No. 175,085, Aug. 26, 1971, Pat. No. 3,777,400. This application Apr. 26, 1973, Ser. No. 354,737

Int. Cl. B23p *11/00;* **B65b** *51/04*

U.S. Cl. 29—243.57 **2 Claims**



1. Clipping apparatus comprising:

an elongated planar strip of clip material formed with a plurality of equally spaced apart apertures along its length,

means for feeding said strip along a path of travel parallel to the longitudinal axis of said strip,

means alongside said path for forming said strip to a generally U-shape during said feeding to provide a central body portion and a pair of legs bent at substantially right angles thereto,

means for shearing an end portion of said strip to separate a clip, and

means for deforming said clip around a product,

said feeding means being interposed between said forming means and said shearing means,

said feeding means comprising a slide supported for movement parallel to said path, a pin carried by said slide, means carried by said slide for urging said pin in a direction perpendicular to said path and into one of said apertures, and means carried by said slide for withdrawing said pin from such aperture.

3,886,644

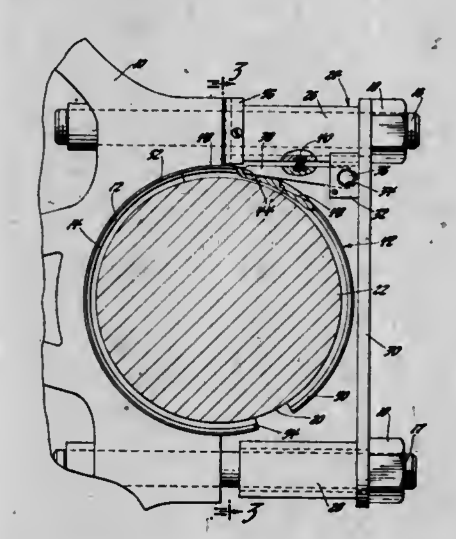
UPPER MAIN BEARING REMOVAL TOOL

Julius F. Koch, Jr., River Forest, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed June 19, 1974, Ser. No. 480,935

Int. Cl. B25b *27/14*

U.S. Cl. 29—270 **2 Claims**



1. A main bearing removal device for use with an engine having a block with one or more arcuate bearing seats, a crankshaft having journal surfaces adjacent the bearing seats, an arcuate bearing shell in each bearing seat between the bearing seat and the crankshaft journal surface, a pair of stud bolts flanking each bearing seat and projecting from the block and a nut on each stud bolt, the device comprising in combination:

a reciprocable member mountable on one of the stud bolts between the nut and the engine block, the reciprocable member having a pawl pivotably mounted thereon, the pawl extending toward the main bearing seat when the reciprocable member is mounted on the one stud bolt, and being biased away from the one stud bolt;

an arcuate member substantially similar to the main bearing shell, the arcuate member having ratchet teeth cut in its outer surface, the arcuate member being effective when placed against the crankshaft bearing surface with one end abutting the end of the main bearing shell nearest the pawl to engage the pawl with its ratchet teeth and push the main bearing shell out of the main bearing seat as the nut on the one stud bolt is screwed alternately down and back.

3,886,645

METHOD OF MOLDING AND ASSEMBLING A HINGED PLASTIC CONTAINER

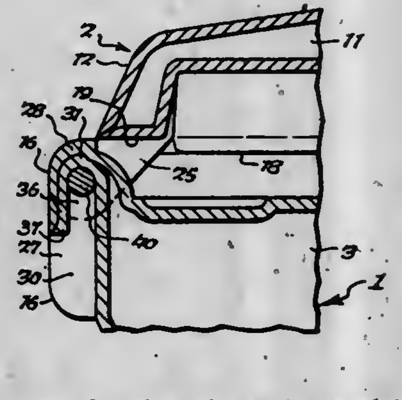
Peter T. Schurman, Woodbridge, Conn., assignor to The Plastic Forming Company, Inc., Woodbridge, Conn.

Division of Ser. No. 186,357, Oct. 4, 1971, Pat. No. 3,796,780, which is a division of Ser. No. 9,529, Feb. 9, 1970, Pat. No. 3,659,999. This application June 13, 1973, Ser. No. 369,514

Int. Cl. B23p *11/00;* **B29c** *17/07, 27/30*

U.S. Cl. 29—434 **4 Claims**

1. The method of making a container having molded cover and body parts joined by a pinned hinge which comprises molding each of said parts by moving cavity-defining mold sections into engagement about a length of tubing of thermoplastic material, moving opposed portions of said tubing against each other and shaping said portions to form a hinge pin bearing wall portion having a wall thickness substantially twice that of said tubing and a hinge pin receiving wall portion adjacent the bearing wall portion, and expanding another portion of said tubing within the cavity to form the container part integral with said hinge portions, said parts being molded separately and thereafter assembled and the hinge portions of the body part being arranged to interfit the hinge portions of the cover part when said parts are assembled, assembling said cover and body parts, forming hinge pin receiving openings through said hinge pin receiving wall portions adjacent said bearing wall portions, and inserting a hinge pin through said openings in bearing relation to said bearing wall portions to join said parts in assembled hinged relation.



3,886,646

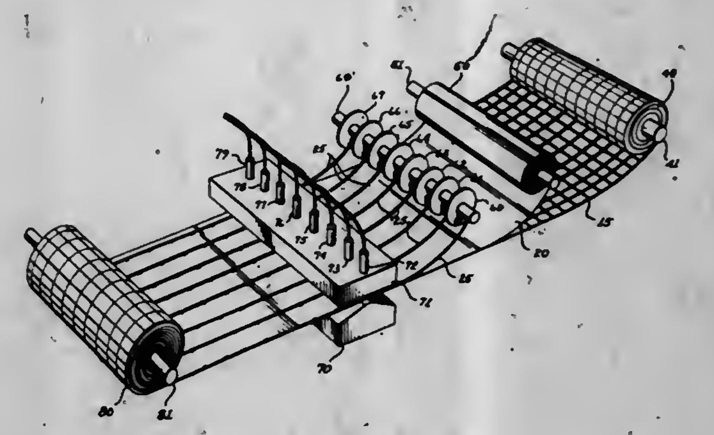
METHOD FOR CONSTRUCTING AN AWNING

John C. Broderson, 3017 W. Almeria, Phoenix, Ariz. 85009

Filed May 30, 1974, Ser. No. 474,815

Int. Cl. B23k *31/02*

U.S. Cl. 228—182 **3 Claims**



1. A method for forming an awning of any given width and length, said method comprising the steps of:

a. transporting a length of wire mesh having laterally and longitudinally oriented wires through a welding machine;

b. laying a length of sheet material of the wire mesh for transportation with the wire mesh;

c. positioning a plurality of retaining wires on the sheet of material in alignment with the longitudinally oriented wires of the wire mesh;

d. forming holes within the sheet of material at selected intersections of the retaining wires and the laterally oriented wires of the mesh; and

e. attaching the retaining wires to the laterally oriented wires of the wire mesh through the holes within the sheet of material.

3,886,647

METHOD OF MAKING EROSION RESISTANT ARTICLES

John A. Alexander, Painesville, Ohio, assignor to TRW Inc., Cleveland, Ohio

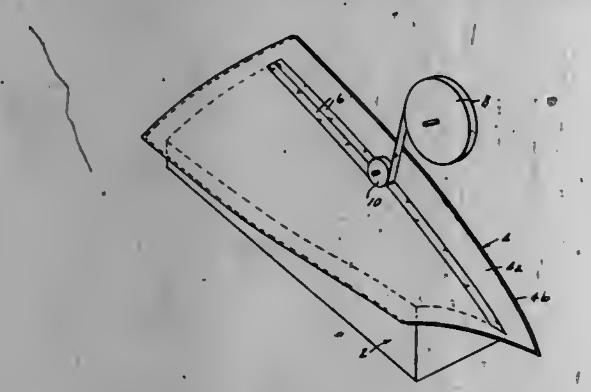
Division of Ser. No. 160,342, July 7, 1971, abandoned. This application Apr. 25, 1974, Ser. No. 464,138

Int. Cl. B23k *31/02*

U.S. Cl. 228—175 **10 Claims**

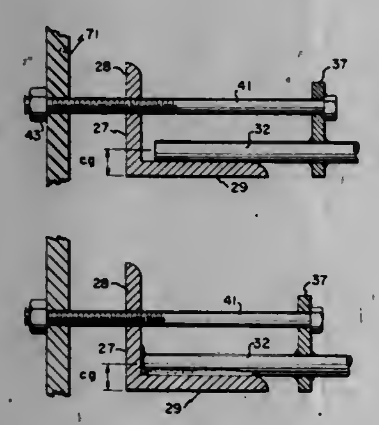
1. The method of making a shaped article which comprises positioning a first bi-metal sheet in a shaping means having a contour corresponding to the desired shape, the inner layer of

said shape being made of metal less erosion resistant than the outer layer, forming a metal matrix core assembly over that first bi-metal sheet, covering the assembly with a covering sheet of the same type as said first bi-metal sheet, the inner layer of said bi-metal sheets corresponding to said matrix metal, welding together the edges of the first sheet and the covering sheet to encase the core assembly, and diffusion bonding said metal sheets and core under heat and pressure.



3,886,648
METHOD OF MANUFACTURING REINFORCED CONCRETE PANELS

Burton M. Kahn, 51 Gillett St., West Hartford, Conn. 06105
Division of Ser. No. 124,322, March 15, 1971, Pat. No. 3,774,359. This application Aug. 10, 1973, Ser. No. 387,353
Int. Cl. B21d *39/00*
U.S. Cl. 29—452 **7 Claims**

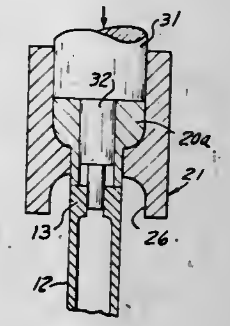


1. A method for manufacturing reinforced panels, comprising the steps of:
- A. forming a peripheral closed framework of interconnected members of relatively high tensile strength;
- B. securing a reinforcing network to said framework members at a plurality of centers of gravity of the framework member;
- C. casting material to substantially fill the framework and surroundingly support said reinforcing network;
- D. cleaning said framework members prior to casting; and
- E. applying a casting material and framework member bonding agent to said framework prior to casting.

3,886,649
PROCESS FOR COLD FORMING A METAL TUBE WITH AN INWARDLY THICKENED END

Joseph A. Simon, 8620 Mt. Elliott, Grosse Pointe Farms, Mich. 48211
Division of Ser. No. 384,441, Aug. 1, 1973, Pat. No. 3,837,205. This application July 1, 1974, Ser. No. 484,423
Int. Cl. B23k *27/00*
U.S. Cl. 29—470.3 **2 Claims**

1. A method for forming an elongated tubular metal axle-like part having one end formed with reduced outer diameter portions and the opposite end formed with an inwardly thickened portion and a central barrel portion of uniform diameter and thickness, comprising:
- separately forming the part in two separate pieces, namely, one piece having the formed reduced outer diameter portions with that piece terminating at the barrel portion, and a second piece consisting of the barrel portion and the inwardly thickened portion, comprising extruding said second piece by:
- positioning a relatively short tubular blank within a die mounted upon the base of a press having an aligned ram, with the die having an open inlet end with a blank receiving portion and an outlet end having an inwardly extending annular extrusion shoulder whose inner cross-sectional diameter is smaller than that of the blank receiving portion for extruding the blank therethrough;
- ram pushing the blank partway through the die shoulder for thereby extruding the barrel portion on the blank, leaving the remaining portion of the blank still within the die blank receiving portion;
- next, inserting a second, identical blank into the die blank receiving portion in end to end contact with the first mentioned blank;
- then ram pushing the second blank through the die shoulder to form a barrel portion thereon, thereby simultaneously forcing the first blank completely through the die shoulder to cause the portion previously remaining within the die blank receiving portion to flow inwardly to form the inwardly thickened portion of the piece, and then repeating the cycle of inserting a new blank, etc.;
- and thereafter welding said extruded second piece to a preformed first piece end to end, to form the completed axle-like part.

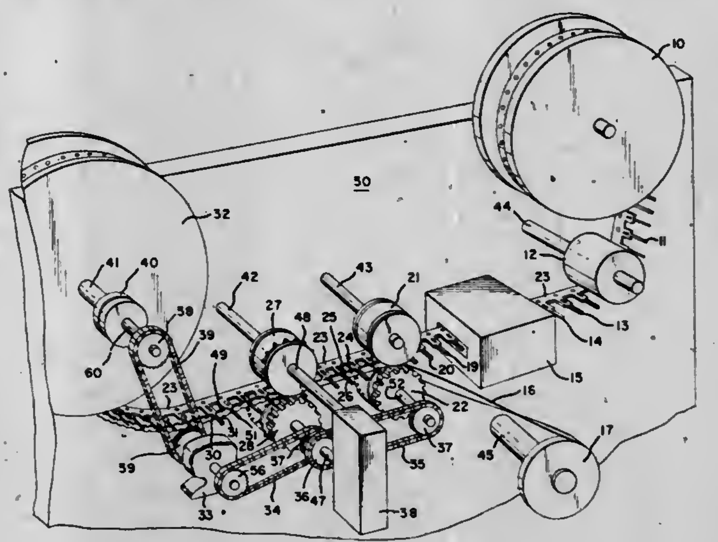


3,886,650
METHOD AND APPARATUS FOR PRECRIMPING SOLDER RINGS ON ELECTRICAL TERMINAL POSTS

Robert Franklin Cobaugh, Elizabethtown, and James Ray Coller, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Continuation-in-part of Ser. No. 455,765, March 28, 1974, abandoned. This application May 2, 1974, Ser. No. 466,322
Int. Cl. B23k *31/02*
U.S. Cl. 228—136 **27 Claims**

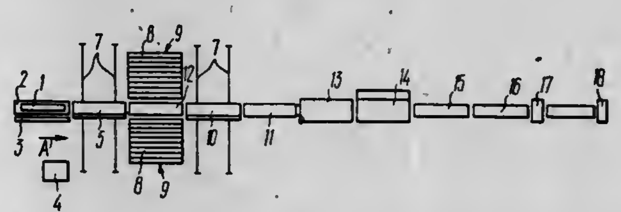
12. A method for placing solder rings on terminal posts secured to a common carrier comprising the steps of:
- heating the terminal posts to a temperature adequate to melt solder; and
- pressing the heated terminal posts into the edge of, but not through, a ribbon of solder which is positioned vertically with respect to said heated terminal posts.

21. A method for placing solder rings on terminal posts secured to a common carrier comprising the steps of:
- forming notches in a ribbon of solder;
- positioning the individual terminal posts of a carrier held strip of terminal posts in said notches in said notched solder ribbon and with the plane of the solder ribbon substantially normal to the direction of the terminal posts; and
- passing the assembly comprising the carrier held terminal posts positioned in the notches in the solder ribbon through a pair of rollers having a perimetric profile constructed to crimp the solder ribbon between the terminal posts to force sections of the solder ribbon around said terminal posts to ensure an equal distribution of solder around each terminal post when the terminal posts are gang inserted in a circuit board and heated.



3,886,651
METHOD OF PRODUCING TUBES FROM SHEET METAL BLANKS ON MILL

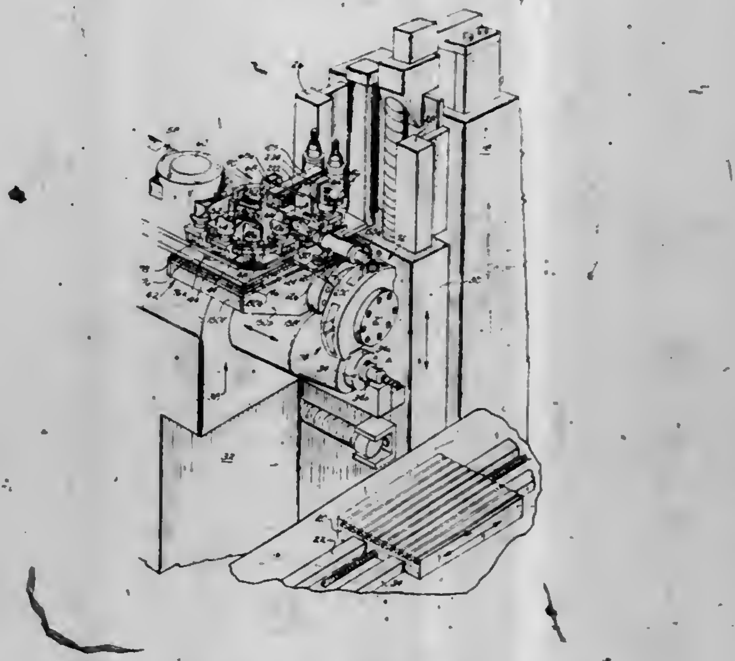
Alexandr Borisovich Vernik, prospekt Lenina, 30/13, kv. 54; Viktor Fedorovich Listkov, ulitsa Pobedy, 20, korpus 2, kv. 20; Boris Pavlovich Skorupsky, prospekt Lenina, 20, kv. 20; Mark Izrailevich Grinshpun, ulitsa Pushkina, 4, kv. 21; Petr Iosifovich Tetelbaum, prospekt Lenina, 20A, kv. 45, all of Elektrostal, Moskovskoi oblasti; Anatoly Sergeevich Tyrtov, Noginsky raion, derevnya babeevo, 14, Moskovskaya oblasti; Vladimir Petrovich Konyaev, ulitsa Pushkina, 31, kv. 39, Elektrostal, Moskovskoi oblasti; Ivan Petrovich Afanasiev, ulitsa Sovetskaya, 2/102, kv. 62, Elektrostal, Moskovskoi oblasti; Igor Illarionovich Kazakevich, prospekt Lenina, 28, kv. 44, Elektrostal, Moskovskoi oblasti; Pavel Nikitovich Kalinushkin, ulitsa Kirova, 8, kv. 17, Dnepropetrovsk; Ivan Ivanovich Andreev, ulitsa Mechnikova, 3, kv. 2, Khartsyzsk, Donetskoi oblasti, and Alexandr Alexandrovich Sukhanov, prospekt Lenina, 10A, kv. 67, Elektrostal, Moskovskoi oblasti, all of U.S.S.R.
Filed Oct. 11, 1973, Ser. No. 405,644
Int. Cl. B23k *31/02*
U.S. Cl. 228—103 **3 Claims**



1. A method of producing pipes from sheet metal blanks on a mill, comprising the steps of: feeding successively sheet metal blanks having elongated edges in a progression following each other; measuring the length of each said blank; leaving in the progression pairs of successively fed blanks whose difference in length is less than a preset value; removing from said progression the blanks having no pair blanks in the progression with the difference in lengths less than the preset value; selecting from said progression of successively fed blanks a pair of blanks to each successively fed blank with a difference in lengths less than the preset value and returning said blanks into the progression of blanks; treating the edges for welding of each blank; forming a half-cylinder from each fed blank; assembling a pipe from a pair of the formed half-cylinder blanks with subsequent welding of edges in the half-cylinder blanks assembled into a pipe; and trimming the edges of the resultant pipes.

3,886,652
TOOL CHANGER MECHANISM

Alexander D. Roubloff, deceased, late of West Hartford, Conn., and Adolf E. Peiser, Windsor Locks, Conn., assignors to Colt Industries Operating Corp., West Hartford, Conn.
Filed Oct. 24, 1971, Ser. No. 299,781
Int. Cl. B23q *3/157*
U.S. Cl. 29—568 **24 Claims**



1. In a machine tool, the combination comprising:
- a frame;
- a vertical slide secured to the frame for vertical movement thereupon;
- a spindle housing, having a spindle, mounted upon the vertical slide for horizontal movement, the spindle being adapted to receive and lock a tool therein;
- a tool changer supporting structure vertically spaced above the spindle housing and directly connected to and supported by the vertical slide so as to extend laterally from the face thereof in cantilever fashion such that the load carried thereby is not transmitted to the spindle housing; a tool storage magazine secured to the supporting structure for carrying a plurality of tools and presenting a selected tool to a tool transfer position;
- a tool transfer arm mounted upon the supporting structure intermediate the magazine and the spindle for rotation about an axis;
- first and second angularly spaced clamping devices operatively connected to the transfer arm for selective extension and retraction relative to the axis of rotation in mutually transverse directions to respectively grasp and release a tool;
- first and second actuators respectively operatively connected to the first and second clamping devices for the extension and retraction thereof; and
- an indexing device operatively connected to the transfer arm for rotating the transfer arm between first, second, third and fourth index positions such that the first clamping device may extend and grasp the selected tool in the transfer position in the first index position, the second clamping device may extend and grasp a used tool in the spindle in the second index position, the selected tool held by the first clamping device is aligned with the spindle in the third index position so as to be insertable therein, and the used tool held by the second clamping device is aligned with the magazine in the fourth index position so as to be insertable therein.

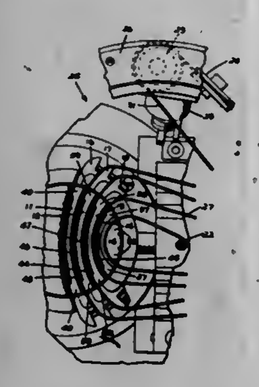
3,886,653
METHOD AND APPARATUS FOR DEVELOPING AND PLACING ELECTRICAL COILS

Richard B. Arnold, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Continuation of Ser. No. 237,829, March 24, 1972, Pat. No. 3,797,105. This application Feb. 8, 1974, Ser. No. 440,857The portion of the term of this patent subsequent to Mar. 19, 1991, has been disclaimed.

Int. Cl. H02k *15/00*

U.S. Cl. 29—596 **5 Claims**



1. A method for developing at least one electrical coil formed of at least two independent strands of conductive wire material, and placing side turn portions of the at least one electrical coil in slots of a magnetic core, the coil having side turn portions adapted to be accommodated in selected magnetic core slots and having predetermined portions for moving adjacent the entrances of magnetic core slots; the method comprising the steps of: disposing at least two independent strands of conductive wire material substantially simultaneously about winding turn size determining means by moving winding turn developing means about the winding turn size determining means, constraining the at least two independent strands of substantially simultaneously disposed conductive wire material from crossing one over another in either of at least two predetermined portions of the at least one coil; and moving the at least two predetermined portions of the at least one electrical coil along the entrances of preselected slots of the magnetic core.

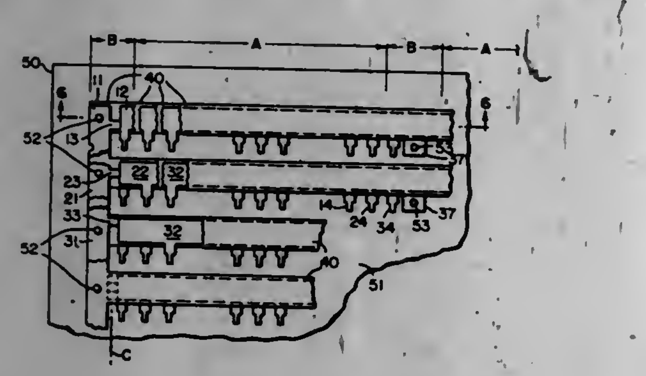
3,886,654
METHOD OF MANUFACTURING LAMINATED BUS BARS

Harvey B. Erdle, Rochester, N.Y., assignor to Eldre Components, Inc., Rochester, N.Y.

Filed Jan. 22, 1974, Ser. No. 435,598

Int. Cl. H01b *13/00*

U.S. Cl. 29—624 **10 Claims**



1. A method of producing laminated bus bars from flat, electrically conductive blanks of the type having at least a pair of spaced side sections connected by a plurality of transverse strip sections, comprising

stacking a plurality of said electrically conductive blanks and a plurality of flat, dielectric insulator blanks in alternating relation, with the spaced side sections and the transverse strip sections on each electrically conductive blank registering vertically with similarly shaped side and strip sections, respectively, on the remaining blanks in the stack, and with the insulator blanks having overlapping marginal edges projecting slightly beyond the edges of the electrically conductive blanks.

laminating part of the stacked blanks to bond together registering portions thereof other than in the areas of said side sections,

removing said side sections of the electrically conductive blanks from the strip sections thereof after the first-named laminating operation,

laminating the remainder of the stacked blanks to bond together overlapping portions of the insulator blanks in the areas previously occupied by the side sections of the electrically conductive blanks, and

severing the laminated portions of the insulator blanks in the areas previously occupied by said side sections of said electrically conductive blanks to separate the spaced stacks of laminated strip sections from each other.

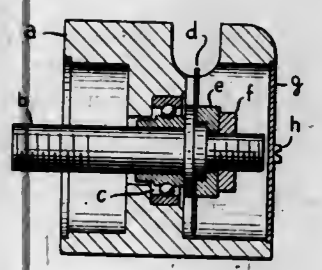
3,886,655
CUTTING DEVICE FOR FLEXIBLE SPIRAL TUBES AND CABLES

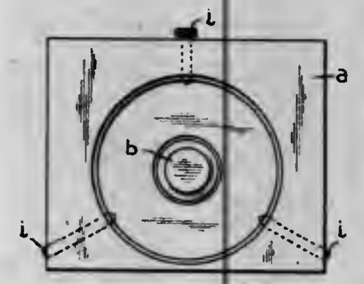
Sandor Molnar, 5630 Riverdale Ave., Bronx, N.Y. 10471

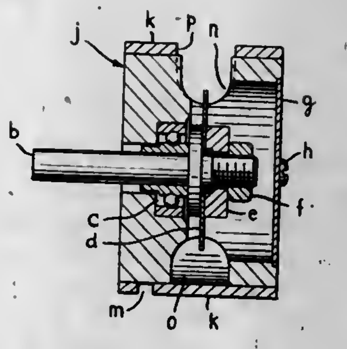
Continuation-in-part of Ser. Nos. 300,497, Oct. 25, 1972, and Ser. No. 206,970, April 17, 1972. This application Nov. 19, 1973, Ser. No. 416,857

Int. Cl. B21f *13/00*

U.S. Cl. 30—90.3 **9 Claims**







1. Apparatus for cutting flexible spiral tubes and the like comprising a housing, said housing having at least one groove positioned on an exterior surface thereof for accepting said tubes, chamber means in said housing, said groove having an opening into said chamber, an axle rotatably mounted in said chamber and extending from a surface of said housing, said axle being positionally fixed with respect to said groove, the axis of said axle being substantially perpendicular to the plane of said groove, a hacksaw blade within the chamber and fixedly mounted on said axle, said hacksaw blade having a portion thereof extending into said groove through the said opening, said hacksaw blade being otherwise contained entirely within said housing, said axle having means for accepting a drill motor to rotate said axle and said hacksaw blade, and an additional groove in said housing, said additional groove being of a different size than the first-mentioned groove.

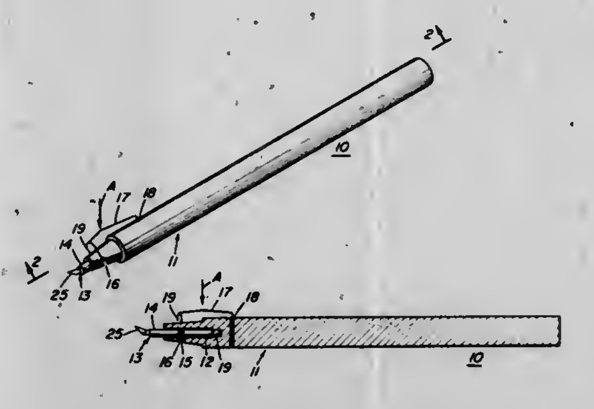
3,886,656
SWIVEL KNIFE

Avram Meshulam, Edison, N.J., and Jerome Rebold, Baltimore, Md., assignors to CBS Inc., New York, N.Y.

Filed Apr. 11, 1974, Ser. No. 460,129

Int. Cl. B26b *1/02; 5/00*

U.S. Cl. 30—164.9 **2 Claims**



1. A swivel knife comprising:

a blade unit comprising an elongated cylindrical body having a blade element at one end thereof, said body having an annular retaining groove therein;

a housing having an elongated passage extending longitudinally in one end thereof, said passage having a length proportioned to receive at least a portion of the length of said body so that said blade element protrudes from said housing, said housing having a slot at a position corresponding to the groove in said body; and

manually actuable retaining means comprising a single length of spring-bias wire mounted at one end in said housing and having a loop at its other end which communicates with said groove through said slot, said wire being manually actuable by bending against the bias thereof to disengage said groove to render said body removable from said housing.

3,886,657
WINDSHIELD WIPER SHARPENER

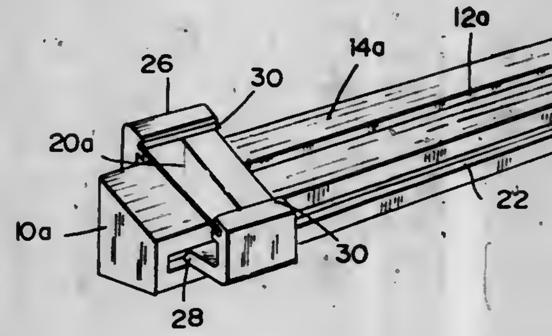
Ralf Fabian, 634 Cedar St., Mamaroneck, N.Y. 10543

Filed Feb. 28, 1974, Ser. No. 446,943

Int. Cl. B26b *13/22;* **B26d** *3/02*

U.S. Cl. 30—294 **1 Claim**

1. A sharpener for windshield wipers and the like comprising a guide body, said body having a slot extending therethrough with an opening on a first side and a second opening on an opposing, second side thereof, one of said sides having an inclined surface, a blade holder slidably mounted on said sharpener and adapted to retain a blade in close association with said, inclined surface, said body having opposing grooves formed in sides of the sharpener other than said first and second sides, said holder having interiorly directed bottom members engaging said grooves, whereby the blades of said holders are maintained in accurate disposition relative to said inclined surface.



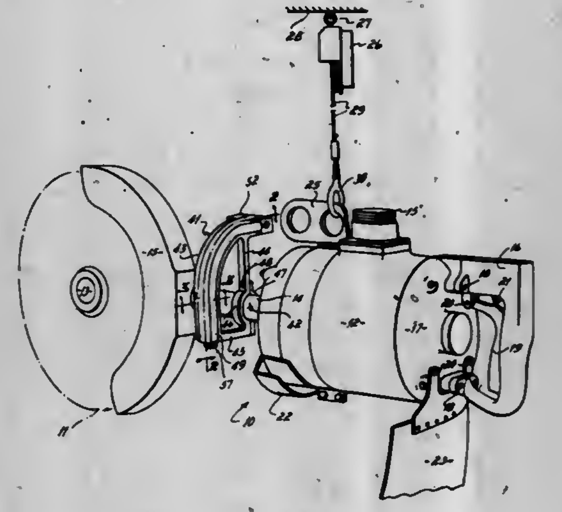
3,886,658
HAND-HELD POWER SAW

Mark W. Wikoff, Mason, Ohio, assignor to The Wolf Machine Company, Cincinnati, Ohio

Filed May 13, 1974, Ser. No. 469,123

Int. Cl. B23d *45/16*

U.S. Cl. 30—388 **3 Claims**



1. A hand-held power saw comprising

a saw blade,

a motor drivingly connected with said saw blade, said motor being located beyond the periphery of said saw blade,

a main handle fixed to said motor at the end thereof opposite said saw blade, said main handle incorporating an off/on switch for said motor adapted to be activated by a trigger member, said main handle being located in the plane of said saw blade, and

a dual grip safety handle connected to said saw and interposed between said motor and said saw blade, said safety handle lying in a plane substantially transverse to the plane of said saw blade, said dual grip safety handle including

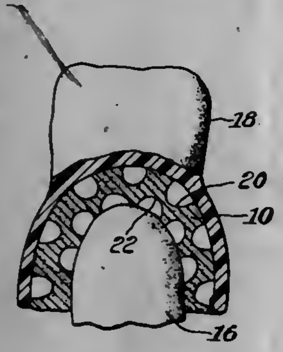
- a first handgrip section of generally arcuate configuration that defines an arc of at least about 90°, said first section being fixed to said saw,
- a second handgrip section that extends along said first section's length from one end thereof to the other, said second section being movably connected to said first section, thereby permitting said second section to be squeezed toward first section regardless of where said safety handle is held along its length,

spring means interposed between said first and second handgrip sections, said spring means continuously biasing said second section away from said first section,

restraint means interconnecting said first and second handgrip sections, said restraint means defining the

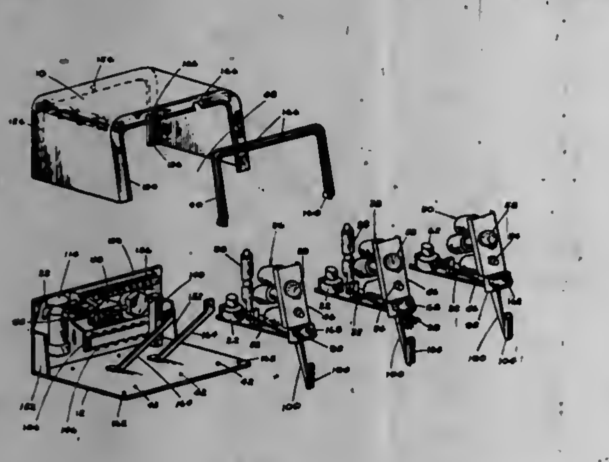
outer limit permitted of said second section from said first section as biased by said spring means, and
a safety switch fixed to said first section and adapted to be activated by said second section, said switch being electrically connected with said off/on switch such that said trigger member must be activated and said second handgrip section must be squeezed toward said first handgrip section to energize said motor.

3,886,659
PAD FOR ARTIFICIAL TEETH
Milton F. Reifke, 9890 Monroe Ave. Ext., Aptos, Calif. 95003
Filed June 20, 1974, Ser. No. 481,342
Int. Cl. A66c *13/00*
U.S. Cl. 32—2 **3 Claims**



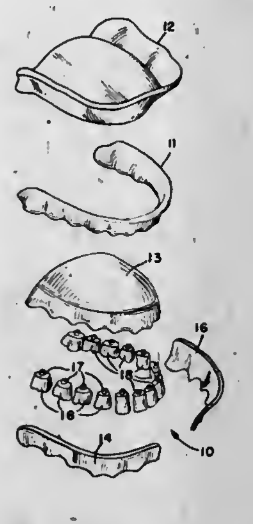
1. A pad for artificial dentures which is formed from a material which does not irritate mucous tissues and which defines a thin soft flexible cushion having first and second opposite major surfaces for detachably but securably engaging a dental plate of a user to an adjacent gum to enable the user to wear the plate in proper manner without discomfort, the first surface having a plurality of small spaced recesses which act as suction cups and secure the first surface to the adjacent gum by forces of suction alone, the second surface having another plurality of small spaced recesses which act as suction cups and secure the second surface to the adjacent plate by forces of suction alone, the open ends of all recesses being flush with the main surfaces containing same.

3,886,660
CONTROL UNIT FOR DENTAL EQUIPMENT
Henry M. Thornton, Jr., and Richard E. Plowman, both of York, Pa., assignors to Dentsply Research & Development Corp., Milford, Del.
Filed Apr. 4, 1969, Ser. No. 822,806
Int. Cl. A61c *7/00*
U.S. Cl. 32—22 **12 Claims**



1. A dental control unit comprising in combination, a substantially horizontal plate-like base arranged to be supported stationarily, a housing detachably connectable to said base, a plurality of compact control modules positioned in side-by-side relation within said housing and operable respectively to control the operation of different dental instruments, each module comprising a sub-frame having a portion complementary to said base, means detachably connecting said complementary portions of said sub-frame of said modules to said base, dental utility supply control valves connected to said sub-frame of each module and supported thereby, supporting wall means connected to and supported by the rear portion of said base and extending upwardly therefrom, dental utility manifold means supported directly and compactly within said housing by said wall means, conduits connected between said control valves of said modules and manifold means, a bezel supported by the forward portion of said base and engaged by the forward portion of said housing, and front face panels respectively carried by said sub-frames of said modules and arranged in side-by-side relation to each other relative to said bezel to comprise a composite planar front wall of said housing and said bezel overlying the edge portions of said composite arrangement of front face panels.

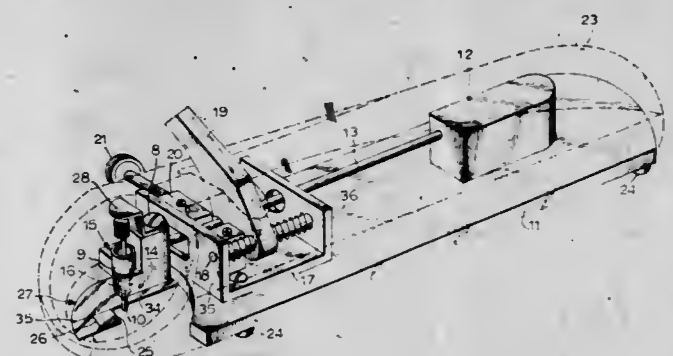
3,886,661
DENTAL PROSTHETIC DEVICE TEACHING AID
Max A. Neill, Hampton, Va., assignor to The Neill Technique, Inc., Hampton, Va.
Continuation of Ser. No. 67,553, Aug. 27, 1970, abandoned. This application Aug. 21, 1972, Ser. No. 282,120
Int. Cl. A61c *19/00*
U.S. Cl. 32—71 **10 Claims**



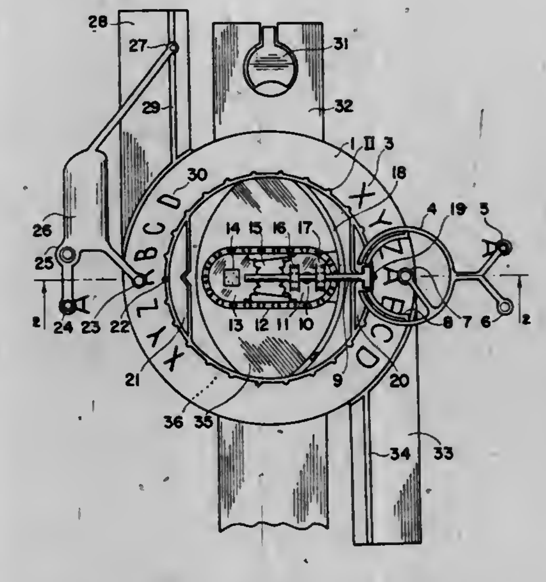
1. A teaching aid for instruction of terminology of dental prosthetic devices comprising:
a plurality of components including a dental prosthetic base plate; a biterim adapted to mate with said base plate; a plurality of teeth, each including key means adapted for receipt by said biterim; and a plurality of flanges adapted to mate with said base plate, said biterim, and said teeth; an adhesive adapted for adhering said components together to form a model of a dental prosthetic device; and a set of instructions for teaching the form and terminology of a dental prosthetic device.

3,886,662
SINGLE LEVER CONTROLLED GEOMETRIC WRITING INSTRUMENT
Eugene E. Zang, Centerville, Va., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.
Filed June 21, 1974, Ser. No. 481,719
Int. Cl. B43l *13/00*
U.S. Cl. 33—18 R **10 Claims**

1. A geometric instrument comprising:
a mounting frame;
a control assembly for a writing instrument rigidly attached to said frame;
a writing instrument movable by said control assembly;
a writing alignment guide with a straight edge attached to said frame and extending outward therefrom; and
means in said control assembly for moving said writing instrument to engage a writing surface to cause a dot to be formed thereon, and by further action of said means, cause said writing instrument to be moved generally perpendicular to said alignment guide straight edge to form a solid line from said dot without moving said frame on the surface.

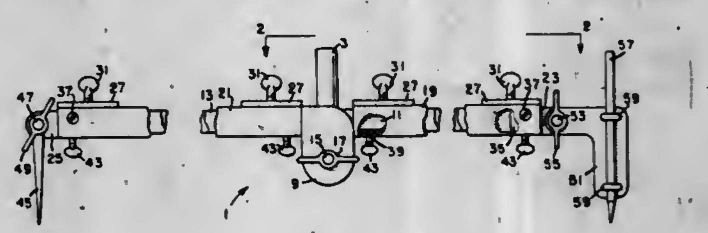


3,886,663
LETTERING SET
Hyok Sang Lew, 1620 East Blacklidge, Tucson, Ariz. 85719
Filed Apr. 13, 1973, Ser. No. 350,723
Int. Cl. B43l *13/10*
U.S. Cl. 33—23 D **9 Claims**



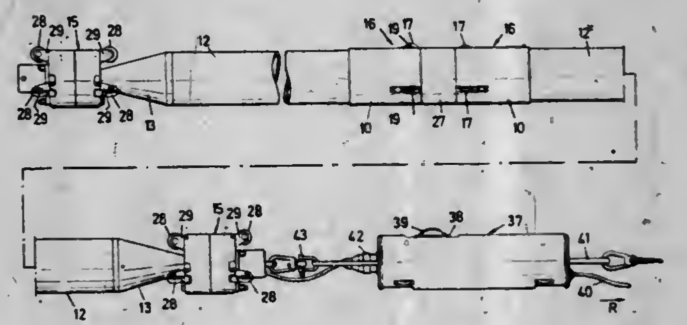
1. In a lettering apparatus for transcribing characters from a template onto a drawing surface, said apparatus comprising:
a. a base-platform movable on the drawing surface;
b. a first gear nonrotatably secured to said base-platform on a post;
c. a second gear rotatably secured to a plate near one extremity of said plate, said plate pivotally secured to said post near the other extremity of said plate;
d. means for inter-connecting said first and second gears; whereby, pivotal movement of said plate in one direction results in equal angular rotation of said second gear in another direction to maintain the constant angular orientation of said second gear;
e. receiving means disposed on said second gear, for slidably receiving a first scribing device to said second gear, a first scribing device slidable received in said receiving means, said receiving means providing linear movement of said first scribing device relative to said second gear in a first direction generally parallel to said drawing surface while restraining said first scribing device from rotating about an axis parallel to the axis of said second gear; and
f. said pivotal movement of said second gear about said post defining and providing the movement of said first scribing device connected to said second gear in a second direction generally parallel to said drawing surface and generally transverse to said first direction, said first and second directions not being parallel to one another,; whereby, said first scribing device is movable on said drawing surface in both said first and second directions and restrained from rotation about its own axis.

3,886,664
EXTENSIBLE BEAM COMPASS
Frederick J. Coil, 109 Latham Trailer Ct., Latham, N.Y. 12110
Filed May 1, 1974, Ser. No. 465,808
Int. Cl. B43l *9/04*
U.S. Cl. 33—27 C **10 Claims**



1. An adjustable, extensible beam compass for drawing circles and arcs normal to the work surface and whose radii can range from minimum to the maximum extension of said compass; said compass comprising tubing members, extensible arms, wedging members, a handle member, a pointer and a bracket; said tubing members each receiving therein end portions of said extensible arms which overlap and tapered wedging members, interposed said extensible arms said tubing members carrying means operable to move said wedging members to releasably lock together said extensible arms, wedging members and tubing members, means pivotally mounting said arms and said handle member, means pivotally mounting one of said arms and said pointer, means pivotally mounting one of said arms and said bracket, and said bracket having means for adjustably mounting and carrying a pencil.

3,886,665
MONITORING APPARATUS
Michael David Lowen, Berkhamsted, England, assignor to John Laing & Son Limited, London, England
Filed Apr. 24, 1973, Ser. No. 354,070
Claims priority, application United Kingdom, May 4, 1972, 20794/72
Int. Cl. G01b *5/20, 5/24*
U.S. Cl. 33—174 R **11 Claims**



1. A monitoring apparatus for measuring varying radii of curvature along an axis of a bore, said apparatus comprising an elongated rigid body member for traversing within the bore, said body member having a longitudinal axis;
a pair of supporting assemblies spaced a predetermined distance from each other to define a chord along said axis of said body member, each said support assembly being universally mounted at a respective end of said body member and having at least three elements urged outwardly to engage an inner surface of the bore to accurately position said axis of said body member relative to the bore;
a carriage mounted for radial movement relative to said body member, said carriage including means engaging

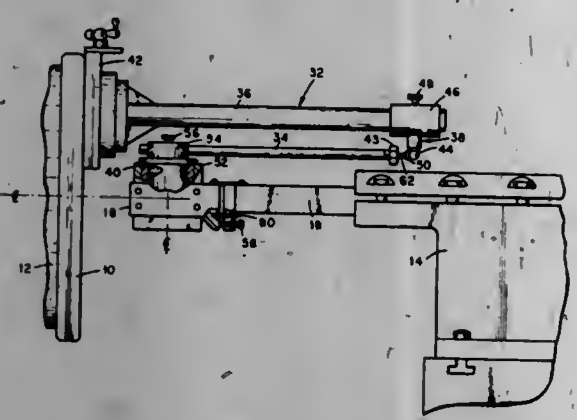
said inner surface of the bore for centering said carriage with respect thereto; and

measuring means mounted on said carriage for indicating radial displacements of said carriage relative to said body member to determine the distance between said chord and the inner surface of bore taken on a line normal to said chord.

3,886,666
APPARATUS FOR MEASURING TOOL PATH ACCURACY

Charles H. Thompson, Oak Ridge, and Fred W. Jones, Concord, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 20, 1973, Ser. No. 381,203
Int. Cl. G01b *5/20*
U.S. Cl. 33—174 P **7 Claims**

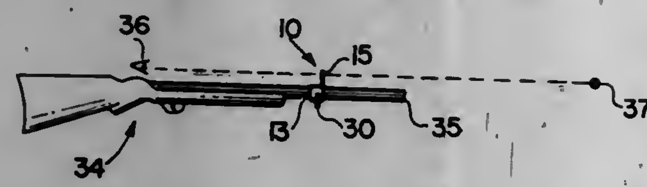


1. An apparatus for use with a machine tool adapted to machine an orbicular structure of a uniform radius and comprising a rotatable spindle and a tool carriage supporting a tool holder and a cutting tool wherein the path generated by the cutting tool is controlled by a preselected program; said apparatus utilized for measuring deviations of the path actually generated by the cutting tool from a path defining an arc having a uniform radius, comprising relative motion support means disposed in place of said tool holder, a mechanical coupling projecting between and connected to said spindle and relative motion support means with said mechanical coupling having an effective length corresponding to the length of said uniform radius, pivot means intermediate the spindle and the relative motion support means for effecting pivotal movement of said mechanical coupling without varying the effective length of the latter, and sensing means carried by said mechanical coupling for measuring changes in the effective length of the latter as the machine tool is directed through its program with said changes being indicative of said deviations.

3,886,667
GUN SIGHT ATTACHMENT

Carl E. Rueb, 2211 Murphy Rd. N.E., Calgary, Alberta, Canada

Filed June 22, 1973, Ser. No. 372,536
Int. Cl. F41g *1/00*
U.S. Cl. 33—233 **5 Claims**

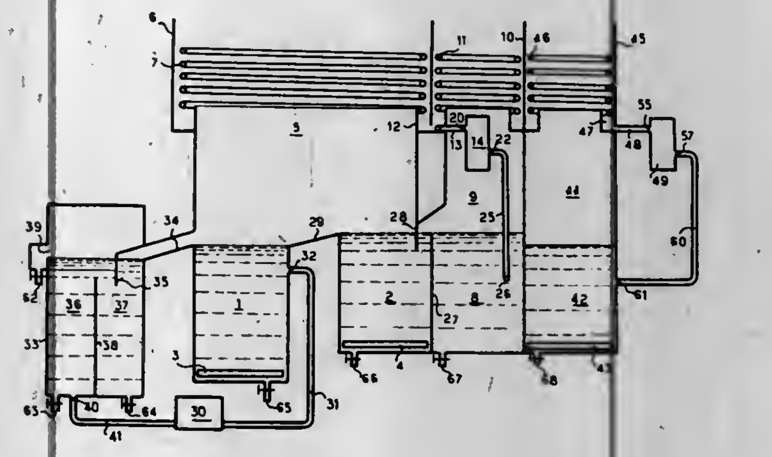


1. In combination, a shotgun having a stock and a barrel, said barrel extending from a rear end at which it joins the stock to a front end, and a sight means for preventing vertical over shooting or under shooting of a target, said sight means including a sight attachment positioned approximately halfway between said gun barrel ends, said attachment comprising a rectangular frame defining a rectangular sight opening, said rectangular frame being formed by a pair of thin spaced apart parallel horizontal bars extending horizontally across the top of the barrel perpendicular to the axis thereof and forming the long sides of the said rectangular frame and a pair of thin vertical bars shorter than the horizontal bars and interconnecting the ends of the horizontal bars to form the short sides of said rectangle, the lower one of said horizontal bars being located close to the barrel such that when the cheek of the shooter is improperly positioned too high with respect to the stock of the gun, the barrel forward of the sight will appear within the rectangular frame of the sight and means for attaching the said attachment to the gun barrel.

3,886,668
DRYING OF ARTICLES

Jean-Pierre Remond, Massy-Villaine; Jean-Robert Thebault, Paris, and Jean-Claude Vitat, Antony, all of France, assignors to Rhone-Progil, Courbevoie, France

Filed May 15, 1974, Ser. No. 469,953
Claims priority, application France, May 16, 1973, 73.17693
Int. Cl. F26b *3/00*
U.S. Cl. 34—9 **8 Claims**

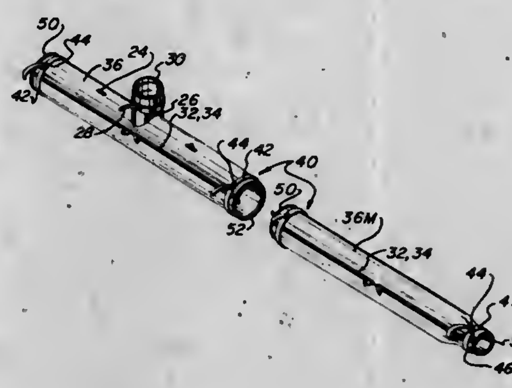


6. Apparatus for removing water from the surface of an article by immersion in a liquid composition which is not miscible with water comprising a water-removal tank for containing said composition having means for heating the composition therein, at least one decantation tank for separating water from said composition and a recycling circuit for the liquid composition connecting the decantation tank to the water-removal tank, a first rinsing tank having means for heating rinsing liquid contained therein, positioned adjacent the water-removal tank, having a space situated above the water-removal tank and first rinsing tank being surrounded by walls, a condenser about the upper parts of the walls, means for passing excess liquid from the first rinsing tank into the water-removal tank and means for passing excess liquid from the water-removal tank into the decantation tank, a second rinsing tank having a space thereabove being surrounded by walls, a condenser about the upper parts of the walls, means for passing excess liquid from the second rinsing tank into the first rinsing tank, means for recovering the condensates obtained by condensation of vapor rising respectively in the space above a water-removal tank and the first rinsing tank and in the space above the second rinsing tank, means for eliminating any water contained in said condensates and means for passing the condensed solvent into the second rinsing tank, and a third rinsing tank having means for heating liquid contained therein, having a space above the third rinsing tank surrounded by walls, a condenser about the upper parts of the walls, means for eliminating any water contained in the condensate obtained therefrom and means for passing the condensed solvent into the third rinsing tank.

3,886,669
AIR DRYER JACKET FOR UNDERGROUND ELECTRICAL CABLES

Thurman A. Pelsue, 3706 So. Hibiscus Way, Denver, Colo. 80237

Filed Oct. 31, 1974, Ser. No. 519,641
Int. Cl. F26b *25/00*
U.S. Cl. 34—107 **5 Claims**

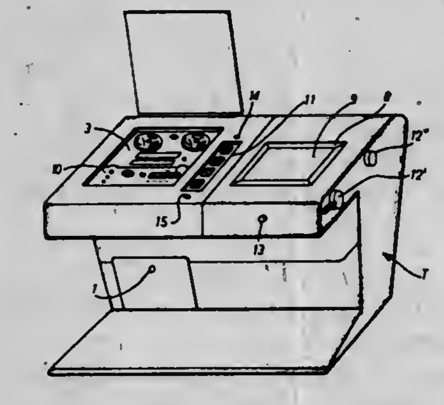


1. The air dryer jacket assembly which comprises in combination: a pair of elongate generally rectangular sheets of heat and moisture-resistant material of the same length, mating elements of a first two-part zipper fastener affixed to adjacent side margins of the pair of sheets effective upon actuation to detachably join same together in side-by-side relation, mating elements of a second two-part zipper fastener affixed to the remote side margins of said pair of sheets effective when brought together and fastened to cooperate with said first zipper fastener in fastened condition to form a single elongate tubular body therefrom open at both ends, means located adjacent opposite ends of the tubular body thus formed operative upon actuation to draw same into a gathered cuff around a workpiece inside thereof, collar-forming means located intermediate the ends of one of said sheets communicating the interior thereof, and one or more drain openings disposed in the other of said sheets.

3,886,670
AUDIO-VISUAL EDUCATIONAL APPARATUS

Rene Lucien, 56 Blvd. Maillot, Neuilly-sur-Seine, France (92200), and Madame Maryvonne LeHenaff, Ker Voa Doue, Louannec, France (22700)

Filed Dec. 7, 1972, Ser. No. 313,170
Claims priority, application France, Dec. 8, 1971, 71.44086; Aug. 2, 1972, France 72.27936
Int. Cl. G09b *7/00*
U.S. Cl. 35—9 A **5 Claims**

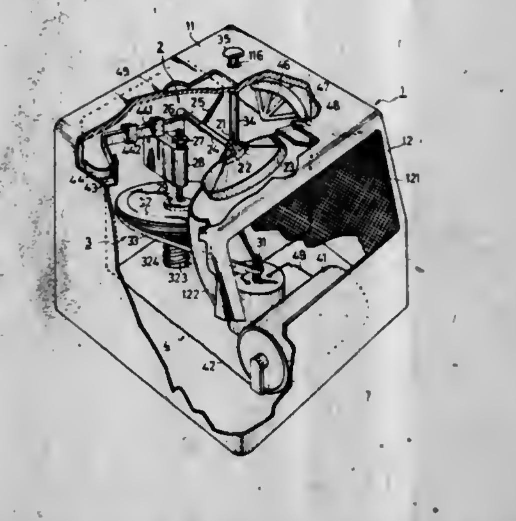


1. A scripto audio-visual educational apparatus comprising a slide projector, a screen on which images of the slides can be projected, a tape recorder having at least two tracks, means for operating said tape recorder in synchronism with said projector, means for memorizing selected slides and acting on said projector and on said tape recorder, means including controls for operating the apparatus in successive stages, a roll of translucent paper, said translucent paper being arrangeable on said screen, and means independent of said projector and tape recorder for winding said translucent paper in one direction or the other on said screen, whereby the paper is adapted for reception of student written or drawn responses, the latter means including motors and switch means controlling said motors.

3,886,671
LINGUISTIC SELF LEARNING DEVICE

Hsing-Ching Liu, Taipei, China /Taiwan, assignor to Hsing-Ching Liu and Ching Huei Wei, both of Taipei, China /Taiwan

Filed May 2, 1974, Ser. No. 466,391
Int. Cl. G09b *5/06;* **G11b** *25/04*
U.S. Cl. 35—35 C **12 Claims**



1. Linguistic self-learning device comprising a case, a recess on top of said case having cuttings therein, a record card to be played for insertion in said recess and having multi-track recording of a plurality of language pronunciations on one side and a picture and words of corresponding languages printed on the other side, said card having position selective projections to match desired ones of said cuttings, a playing unit in said case under said recess movable between first and second positions and having a needle movable in an arcuate slot in said recess, a spring biasing said unit to said second position, a loud speaker swivelly connected to said needle, a shaft connected to said needle, driving means for said shaft comprising an electric motor operatively connectable with a friction disc at the end of said shaft, manually operable clutch means operatively associated with said driving means, and an electric circuit including a limit switch for said motor biased to closed position, whereby when said card is inserted in said recess with said multi-track recording in position to be engaged by said needle and said clutch means is operated, said playing unit is moved to said second position by said spring and said limit switch is moved under its bias to closed position to commence a playing cycle, said playing unit then moving to said first position and said limit switch being operated to open position to open said circuit and complete the playing cycle.

3,886,672
APPARATUS FOR PLAYING AN EDUCATIONAL GAME INCLUDING CODE ORIENTING MEANS

Walter Hesener, 66 Rue de Prulay, 1217 Meyrin, Geneva, Switzerland

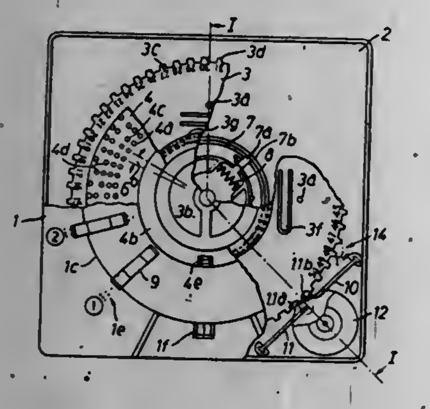
Division of Ser. No. 129,469, March 30, 1971, Pat. No. 3,780,453. This application July 25, 1973, Ser. No. 382,503The portion of the term of this patent subsequent to Dec. 25, 1990, has been disclaimed.
Int. Cl. G09b *3/00*
U.S. Cl. 35—48 R **15 Claims**

1. Apparatus for playing an educational game comprising:

a. a housing;

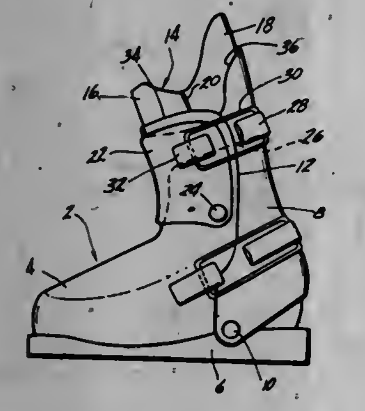
b. at least one setting means operable from outside the housing to be moved into any one of at least two answer

positions, each such answer position being representative of one of several possible answers to a given question;
c. support means carrying the setting means and constructed to allow the setting means to move relative to the support means;
d. code bearing means supported by and at least partly concealed within the housing and movable relative to the support means;
e. a plurality of code means on the code bearing means adapted to co-operate with the said at least one setting means;
f. a code orienting means engageable with one of the support means and the code bearing means whereby the code orienting means and the selected one of the support means and the code bearing means can be fixed together in any one of a plurality of relative positions;
g. means movably mounting the code orienting means for movement, together with the selected one of the support means and the code bearing means, with respect to the other one of the support means and the code bearing means, said movement being in a direction other than the direction of movement of a setting means to an answer position;
h. first indicating means indicating the position of the code orienting means relative to the selected one of the support means and the code bearing means; and
i. second indicating means indicating the position of the code bearing means relative to the setting means.



3,886,673
SKI BOOT WITH FORWARD LEAN WEDGE
Donald R. Check, Glastonbury, and Lawrence L. Kilbourn, Middletown, both of Conn., assignors to Olin Corporation, New Haven, Conn.

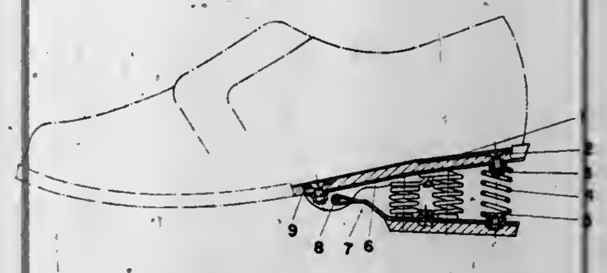
Filed July 5, 1974, Ser. No. 486,265
Int. Cl. A43b *00/00*
U.S. Cl. 36—2.5 AL **8 Claims**



1. A ski boot comprising a first portion which, when the boot is worn, surrounds a lower portion of the lower leg of the wearer, and a second portion which receives the foot of the wearer, said first portion comprising:
a. a front part having an upper terminal edge;
b. a rear part connected to said front part for pivotal movement with respect thereto, said rear part having an upper terminal edge;
c. first means for securing said rear part to said front part to establish a desired combined predetermined circumferential dimension for said upper terminal edges of said front and rear parts;
d. an opening formed in said front part and extending through said upper terminal edge of said front part, said opening forming opposed side edges thereof which can be offset from each other to increase the effective circumferential extent of said upper terminal edge of said front part thereby increasing the percentage of said combined predetermined circumferential dimension provided by said upper terminal edge of said front part; and
e. a member for insertion into said opening to retain said side edges in a predetermined offset relationship whereby said first means will pull said rear part pivotally toward said front part in proportion to the distance between said offset edges of said opening to establish a given minimum forward lean angle for the boot.

3,886,674
ARTICLE OF FOOTWEAR
Rafael Saurina Pavia, Plaza del Caudillo No. 8, San Juan de Enova, Spain

Filed Nov. 23, 1973, Ser. No. 418,495
Claims priority, application Spain, Nov. 23, 1972, 185992
Int. Cl. A43b *21/30*
U.S. Cl. 36—38 **7 Claims**



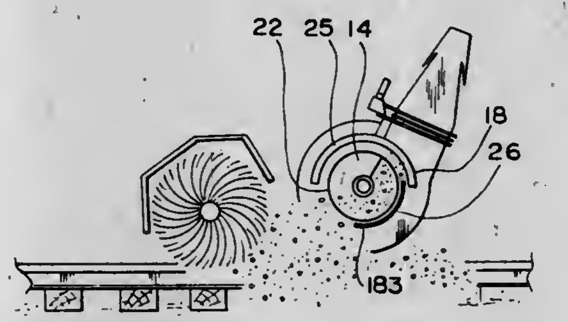
1. In an article of footwear, a combination comprising a sole having a toe end and a heel end; a heel located at said heel end and having one portion closer to and another portion farther from said toe end, said heel including a ground-engaging part having a surface facing said sole, and a plate part overlying said surface and having in the region of said one portion a bend extending towards said sole; pivot means connecting said bend with said sole, so that said heel can pivot about a transverse axis extending parallel to the plane of said sole; biasing means interposed between and bearing upon said heel and said heel end of said sole; so as to normally maintain said other portion spaced from said sole and to resiliently resist pivoting of the heel toward said sole; and connecting means connecting said biasing means with said heel and said sole, respectively.

3,886,675
ADJUSTABLE AUGER COVER FOR SNOW BLOWER
Hubert Maisonneuve, and Helmut von Beckmann, both of Columbia, S.C., assignors to Canron Inc., Phillipsburg, N.J.

Filed May 17, 1974, Ser. No. 471,127
Int. Cl. E01h *8/06*
U.S. Cl. 37—25 **19 Claims**

1. An apparatus for clearing snow from the roadbed of and about the rails of railroad track comprising a rotatable, elongated sweeping device, first support means for mounting said sweeping device at the front of a rail vehicle in a track sweeping position, auger means including at least one auger rotatable about a horizontal axis, and shroud means, second support means for mounting said auger means on said vehicle in

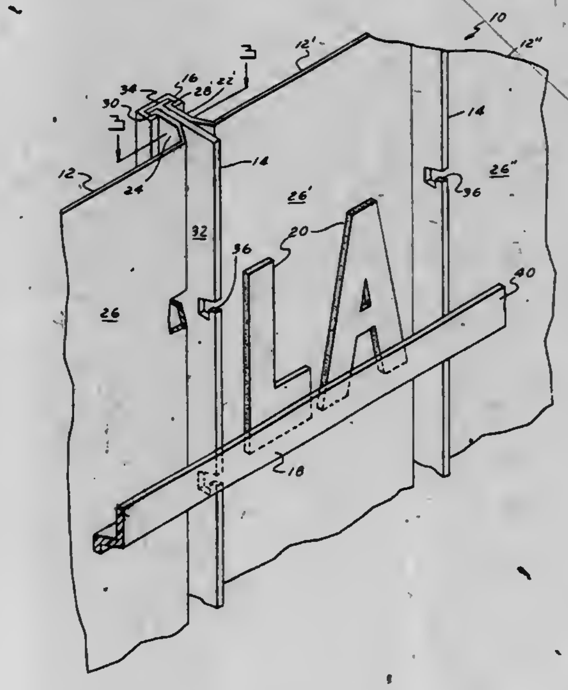
front of said sweeping device, said shroud means covering an area extending around a substantial portion of the circumference of said auger and including a first shroud member pivotable between a front and a rear position, whereby, in operation, when said first shroud member is in said front position, said sweeping device sweeps snow forwardly and upwardly



and said auger means catches snow swept by said sweeping device and removes the caught snow to a suitable location away from said track, and when said first shroud member is in said rear position, said auger means contacts snow entering said auger means directly from the front of said auger means and removes the snow to said suitable location.

3,886,676
SIGN FACING ASSEMBLY
Louis Alfonso, 207 Churchill St., Pittsfield, Mass. 01201

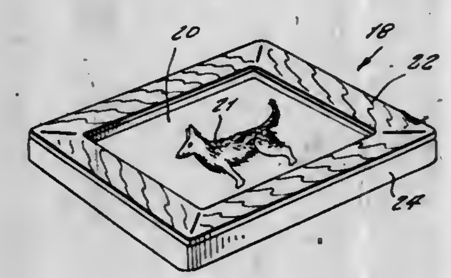
Filed Dec. 28, 1973, Ser. No. 429,101
Int. Cl. G09f *07/08*
U.S. Cl. 40—125 F **6 Claims**



1. A sign facing assembly comprising a plurality of panels, said panels having each side thereof directed rearwardly is a plane substantially perpendicular to the front of said panel and having its extreme edges directed inwardly of each side so as to face each other, a T-shaped rib interposed between and abutting the sides of adjacent panels, said T-shaped rib having its main flange extending forwardly toward the front of said panels, a C-shaped interlocking member disposed in contact with the cross member of said T-shaped rib and the edges of said adjacent panels to thereby hold said adjacent panels together as a single unit and means for supporting characters or other indicia including a track disposed across the width of said sign facing assembly affixed to the main flanges of said T-shaped ribs.

3,886,677
BORDER FRAME FOR PICTURES
Harry L. Behring, and George Spector, both of c/o 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

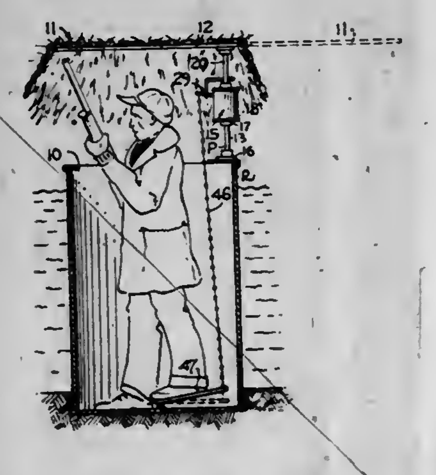
Filed Sept. 12, 1973, Ser. No. 396,608
Int. Cl. G09f *1/10*
U.S. Cl. 40—152 **2 Claims**



1. A picture framing device for conveniently mounting and framing a picture with an inexpensive decorative border comprising a rigid rear base in combination with a picture frame border mounted peripherally on the front face of said base encompassing a picture on said base, said border being secured to said base by means whereby said border is movable from one position in planar alignment with said picture to other positions projecting beyond the picture surface, wherein said means comprises an inflatable tube mounted on said base, said border being secured to the outer surface of said tube, wherein the base includes a peripheral recess to receive said tube and said border is in planar alignment with the picture when the tube is minimally inflated.

3,886,678
CAMOUFLAGE REMOVER ON DUCK BLIND
Samuel E. Caccamo, 1102 Camino Pablo, San Jose, Calif. 95125

Filed Oct. 10, 1974, Ser. No. 513,660
Int. Cl. A01m *31/02*
U.S. Cl. 43—1 **5 Claims**

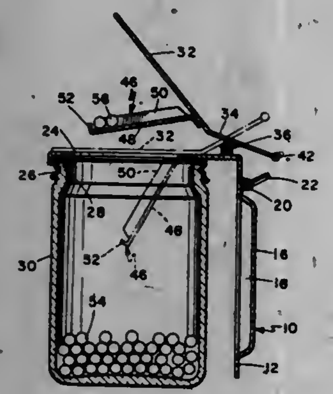


1. In combination with a camouflage cover adapted to overlie and conceal the occupant of a duck blind from above and a support having an axis offset relative to center of such blind and cover to afford swinging movement of the cover from above said blind; means for automatically removing such cover from over the blind comprising:
a. a shaft having its upper end secured to the periphery of such cover and its lower end journaled for turning movement in an axis of such offset support;
b. spring means normally urging said shaft in one direction for swinging the cover thereon out of recovering relation to said duck blind;
c. means for releasably latching said shaft into a a position in which the cover thereon is over the duck blind; and

d. lever means operable by pressure applied thereto by the occupant of said blind for releasing said releasable latching means.

3,886,679
FISH BAIT DISPENSER

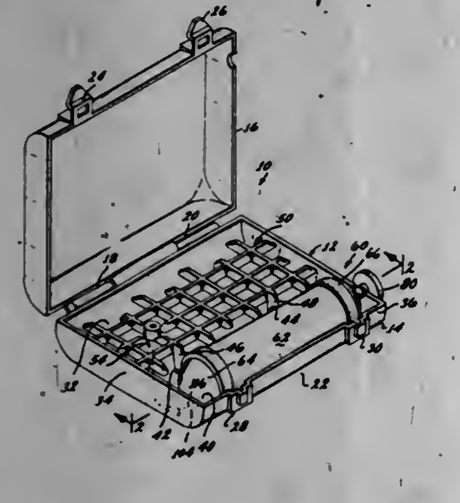
Sam A. Marcell, 8532 Troy, Lemon Grove, Calif. 92045
Filed July 3, 1974, Ser. No. 485,458
Int. Cl. A01k *97/04*
U.S. Cl. 43—55 **9 Claims**



1. A fish bait dispenser comprising:
a. a mounting bracket for a bait jar;
b. a lid pivoted to said mounting bracket to cover the mouth of said jar when in closed position and pivotable into an open position;
c. bait-holding means mounted to said lid and extending into said jar when said lid is closed and capable of engagement with a portion of the bait in said jar;
d. said bait holding means being carried by said lid to a position outside of said jar when said lid is pivoted into said open position.

3,886,680
SIMULATED CAMP-STOVE TOY

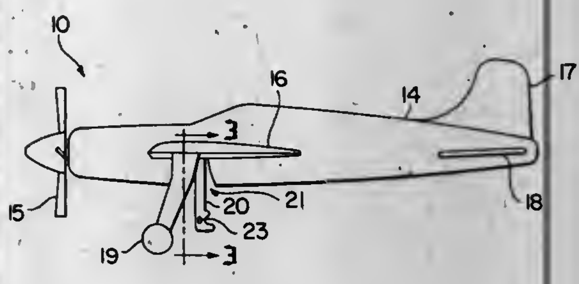
Hubert Rich, Westminster, and Robert R. Rosas, Long Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Sept. 27, 1973, Ser. No. 401,527
Int. Cl. A63l *33/30*
U.S. Cl. 46—39 **2 Claims**



1. A simulated camp-stove toy, comprising:
1. a carrying case;
2. an air-outlet orifice mounted in said carrying case;
3. an air pump mounted in said carrying case, said air pump comprising;
A. a hollow cylindrical member;
B. first and second end caps closing said cylindrical member;
C. a piston rod slideably mounted in one of said end caps said piston rod having a first end extending beyond said one of said end caps outside said cylindrical member and a second end extending beyond said one of said end caps inside said cylindrical member;
D. a metering orifice provided in the other of said end caps;
E. a piston assembly slideably mounted on said piston rod intermediate said first and second ends thereof;
F. plate means affixed to said second end of said piston rod for engaging said piston assembly to move it toward said one of said end caps when said first end of said piston rod is moved away from said one of said end caps exteriorly of said cylindrical member; and
G. a power spring encompassing said piston rod and having one end bearing against said piston assembly and another end bearing against said one of said end caps for moving said piston assembly on a pumping power stroke toward said other of said end caps when said first end of said piston rod is released after said movement away from said one of said end caps;
4. conduit means placing said metering orifice in fluid communication with said air-outlet orifice; and
5. simulated cooking-vessel means mounted in said carrying case in fluid communication with said air-outlet orifice.

3,886,681
CONTROL MEMBER FOR TOY AIRPLANE

Gabriel Marason, Jr., Los Angeles, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Aug. 29, 1973, Ser. No. 392,846
Int. Cl. A63h *27/04*
U.S. Cl. 46—77 **3 Claims**

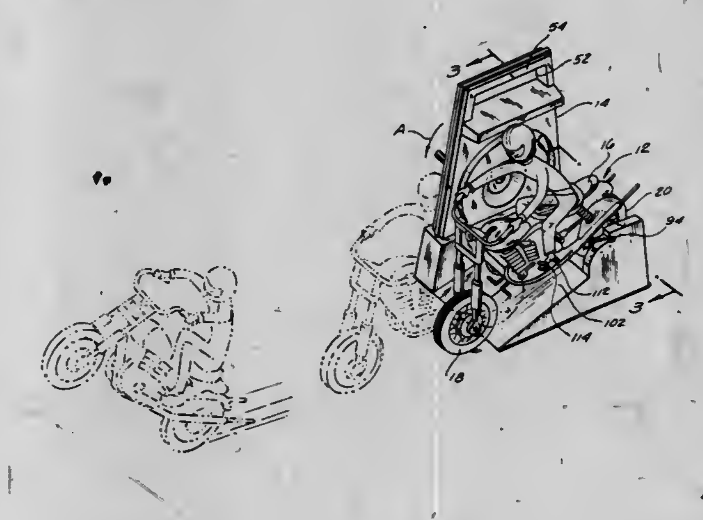


1. A toy airplane comprising:
a fuselage having an open channel normal to the longitudinal axis of said fuselage;
control means located within said open channel and connected to said airplane, said control means being rotatably mounted for allowing said airplane to be flown in both a clockwise direction, and a counterclockwise direction, and either right side up or upside down, said control means including a first end and a second end, said first end being pivotally mounted to said airplane and said second end including an opening; and
control line means adapted to be coupled to said opening of said second end of said control means for controlling the flight of said airplane.

3,886,682
TOY VEHICLE AND LAUNCHER

Michael Ieda, Ft. Solanga, and Frank Ventura, Commack, both of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.
Filed Feb. 1, 1974, Ser. No. 438,821
Int. Cl. A63h *29/20, 17/16*
U.S. Cl. 46—202 **12 Claims**

1. A toy vehicle and launcher therefor, comprising, in combination, a hollow vehicle body having ground engageable wheels rotatably mounted in the body; a flywheel motor mounted in said body in driving engagement with at least one of said ground engageable wheels; and a rotary drive member mounted in said body and operatively connected to said flywheel to rotate the flywheel when the drive member is rotated; and a launching platform for said vehicle including a base, means on said base for supporting said vehicle with at least one ground engageable wheel in an elevated position out of engagement with the base at a higher level than the other of said ground engageable wheels and for limiting the direction of movement of the vehicle off the launching platform to the driving direction of said one ground engageable wheel, and separate drive means for simultaneously rotating said drive member and for urging said vehicle in a direction opposite to its driving direction and into engagement with said supporting means on the base with said one ground engageable wheel in its elevated position during such rotation, said drive means being adapted to automatically release said vehicle from engagement with said supporting means when the drive to said drive member is stopped, whereby said flywheel is rotated and energized by said drive means and said vehicle is automatically released by said drive means when said flywheel is energized.



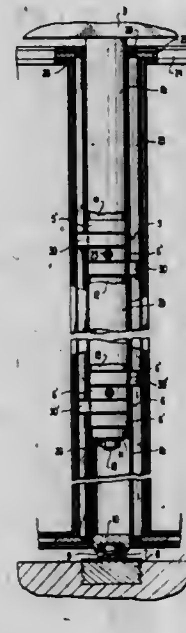
3,886,683
DEGRADABLE PLASTIC

Donald E. Hudgin, Princeton Junction, and Murray Reich, Princeton, both of N.J., assignors to Princeton Chemical Research, Inc., Princeton, N.J.
Filed Nov. 27, 1970, Ser. No. 93,393
Int. Cl. C08f *3/12, 45/58*
U.S. Cl. 47—9 **3 Claims**

1. In the growing of an agricultural crop in a field in which the field is at least partially covered with a plastic film for a predetermined growth period, the improvement which comprises ascertaining, from the meteorological data for the geographic area in which said field is located, the amount of TALU for said predetermined growth period, and covering said field with a film having a thickness up to about 100 mils and comprising a polymer comprising at least about 75% by weight of units of butene-1, being over 50% isotactic and having a molecular weight in excess of about 40,000, and about 0.01 to 5% by weight of a stabilizer, the thermal treatment of said polymer prior to the time when it is applied to said field as a film having been such as to reduce its initial stability by at least about 5,000 TALU, said film having a stability approximately that of the TALU determined but at least about 5,000 but not in excess of about 70,000 TALU, whereby the film will degrade after said predetermined growth period, the degradation being accelerated or decelerated in accordance with an acceleration or deceleration of crop growth due to climactic conditions.

3,886,684
REVOLVING DOOR HANGER ASSEMBLY

Amuel E. Sheckells, Evansville, Ind., assignor to International Steel Company, Evansville, Ind.
Filed Oct. 4, 1973, Ser. No. 403,461
Int. Cl. E05d *15/02*
U.S. Cl. 49—44 **8 Claims**



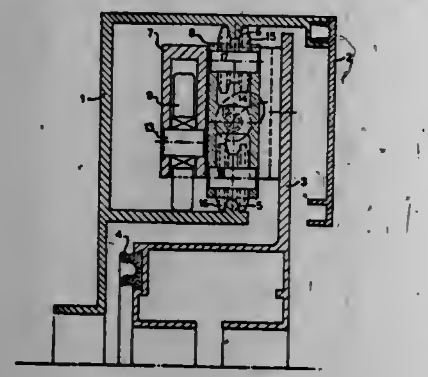
1. A hanger assembly for supporting the wings of a revolving door on the door center shaft comprising, ring means mounted on said center shaft in coaxial relationship therewith comprising a respective pair of rings for supporting each door wing on said center shaft, the rings of each pair being spaced vertically from each other on the center shaft, first detent means connected between said ring means and said center shaft whereby under normal operating conditions said ring means rotates with said center shaft, each door wing including a marginal frame, the vertical portion of the marginal frame adjacent the center shaft including vertical bar means, a radial knuckle provided on each ring, the vertical bar means of each door wing extending through the knuckles in a respective pair of rings to pivotally connect the door wing thereto, and second detent means connected between said ring means and the vertical bar means of the door wings for holding the door wings in operative, radiating position with respect to said center shaft, said first and second detent means being releasable when a predetermined torque is applied to the door wings allowing the ring means to rotate relative to the center shaft and the door wings to pivot relative to the ring means, whereby the door wings are collapsed into compact parallelism.

3,886,685
IRON WORK FOR HORIZONTAL DISPLACABLE WINGS OF WINDOWS, DOORS OR SIMILAR THINGS

Reinhard Riphagen, Vijverlaan, 408 Krimpen a/d Ijsel, Netherlands
Filed July 25, 1973, Ser. No. 382,498
Claims priority, application Netherlands, July 28, 1972, 7210404
Int. Cl. E05d *15/10, 13/02*
U.S. Cl. 49—209 **1 Claim**

1. A guide-rail roller suspension means which comprises in combination, a support frame having an upper rail and a lower rail disposed thereon, a H-shaped member having an upper wheel and a lower wheel supported thereby, said upper and lower wheels disposed to run along said upper rail and said lower rail respectively, bearing member projecting along opposite sides of the H-shaped member in the direction of travel of said upper and lower wheels, lever-installation having side

surfaces containing arcuate cut-outs, said bearing members disposed within said cut-outs, a suspended member disposed to support a frame closing member, said suspended member being secured to one edge wall of the lever-installation, a wheel supported by the lever-installation opposite the suspended member, and a surface for supporting said wheel, said surface having a groove cut-out portion at a frame closing location whereby upon passage of the wheel to the groove, the weight of the suspended member and attachments causes closing of a frame by movement in a horizontally, downwardly, and frame contacting position.



3,886,686

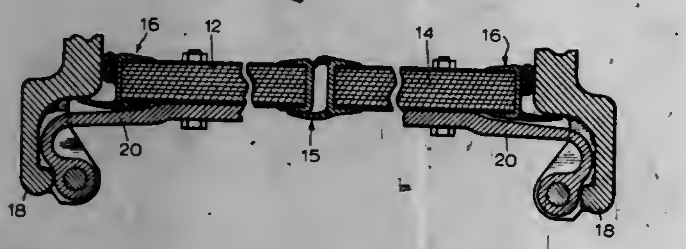
DOOR CLOSURE SEAL

Burton A. Urbanick, La Grange, Ill., assignor to Met-L-Wood Corporation, Chicago, Ill.

Filed May 22, 1973, Ser. No. 362,659

Int. Cl. E06b *7/22*

U.S. Cl. 49—488 **1 Claim**



1. A composite member adapted to define an edge gasket for a container door or the like as well as a dynamic closure seal with a member adjacent to said door, said composite member comprising:
  edge gasket means including an elongated channel member, of a relatively rigid plastic material, having a pair of opposed leg portions adapted for securely receiving an edge portion of said container door intermediate said opposed leg portions;
  first dynamic sealing means, of a relatively pliable plastic material, comprising a first sealing member composed of an elongated leg portion integrally formed with said channel member and directed oppositely to said channel leg portions;
  second dynamic sealing means, of a relatively pliable plastic material similar to said first dynamic sealing means, comprising a second sealing member composed of a hollow and resilient member integrally formed with said channel member, spaced laterally from said first sealing member and directed oppositely to said channel leg portions, said second dynamic sealing means further including an elongate, flexible and resilient tubular insert member disposed within said hollow member for providing further resilience for said second dynamic sealing means;
  said hollow member being partially removed to expose the tubular insert in order to provide an adequate seal along corners of said edge gasket, and said first and second sealing members being constructed and arranged for effecting first and second spaced and independent seals with said container door.

3,886,687

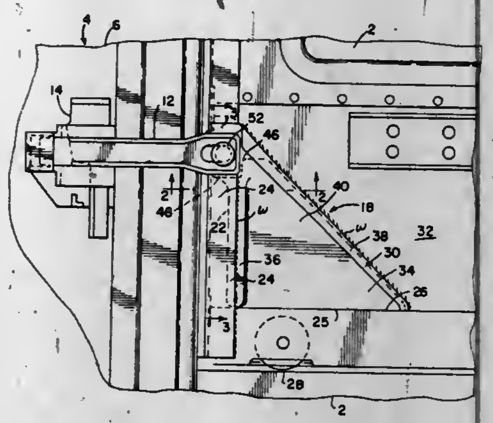
RAILROAD CAR DOOR CONSTRUCTION

Harold E. Hesch, St. John, and John W. Hutchison, Crown Point, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed June 10, 1974, Ser. No. 477,955

Int. Cl. E06b *3/00*

U.S. Cl. 49—503 **8 Claims**



1. In a railroad car sliding door,
  a door edge section,
  a generally right triangular shaped elongated gusset mounted on the door edge section,
  said gusset having a vertical edge, a base edge and a sloped hypotenuse edge,
  the junction of the upper portions of the vertical and hypotenuse edges having an apex portion,
  an enlarged boss mounted on the apex portion and having a hasp pin projecting outwardly therefrom for pivotally mounting a hasp thereon for attachment to a hasp locking device on the car.

3,886,688

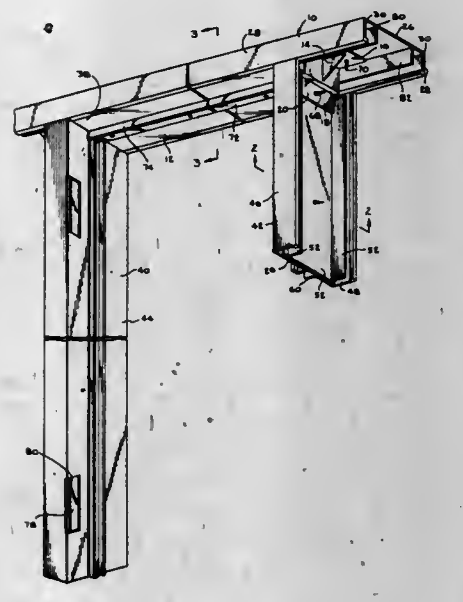
FIRE RESISTANT DOOR FRAME ASSEMBLY

Douglas Ragland, Houston, Tex., assignor to Ragland Manufacturing and Construction Company, Houston, Tex.

Filed Jan. 14, 1974, Ser. No. 432,973

Int. Cl. E06b *1/12*

U.S. Cl. 49—504 **17 Claims**



1. A door frame assembly for mounting in a door opening in a wall comprising:
  a header section, said header section including a partition cap extending across the top of said door opening, said partition cap being generally channel shaped and having a web and a pair of limbs, said limbs extending downwardly toward said opening on opposite sides of said wall and having cap limb surfaces facing said door opening; and a fascia plate removably disposed in said partition cap between said limbs and having opposite first and second end portions and a lower surface disposed no lower than said cap limb surfaces and facing said door opening;
  means defining a first open space longitudinally adjacent said first end portion of said fascia plate; and
  vertically disposed first and second side sections on opposite sides of said door opening, said first side section having an upper end abutting said cap limb surfaces of said partition cap and contiguous but unattached to said first end portion of said fascia plate whereby said fascia plate can slide past said upper end of said first side section and a part of said first end portion can move into said first open space upon longitudinal expansion of said fascia plate.

3,886,689

APPARATUS FOR FORMING A TROCHOIDAL SURFACE

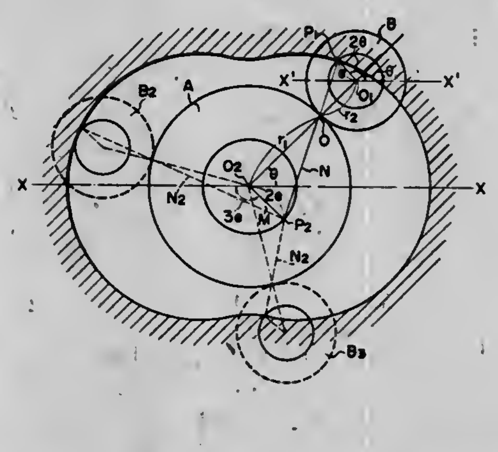
Tsutomu Yoshino, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Oct. 4, 1973, Ser. No. 403,483

Claims priority, application Japan, Oct. 5, 1972, 47-100067

Int. Cl. B24b *5/16;* **B23c** *3/04*

U.S. Cl. 51—43 **10 Claims**



1. Apparatus for forming a trochoidal surface comprising a stationary sun gear, a plurality of planetary gears disposed around and meshing with said sun gear at equ-distant angular positions, each of said planetary gears having a gear ratio of 1:2 to said sun gear, a plurality of rotatable forming tools each having a working surface, one of said forming tools being mounted on each of the planetary gears so that the forming tool working surface is positioned at a point offset by a predetermined distance from the center of the associated planetary gear, means for revolving said planetary gears, a plurality of tool mounting heads for mounting each of said forming tools on the associated planetary gear, each of said tool mounting heads comprising a swingable arm axially slidably engaging said tool and a planetary gear shaft for carrying said swingable arm, said shaft being coaxial with said offset point on the associated planetary gear, a plurality of levers extending along a line through said offset point on each planetary gear and intersecting said meshing point between the related planetary gear and the sun gear, said lever having one end longitudinally slidably receiving the related swingable arm, the other end of the lever being pivotally mounted on a member which is rotatable about an axis coaxial with said sun gear at a common point offset from the axis of the sun gear a distance equal to two times the offset distance of the offset point associated with each planetary gear, and means for displacing each of said forming tools along said swingable arm so as to compensate for any wear of the working surface thereof.

3,886,690

INSTALLATION FOR AUTOMATIC POLISHING

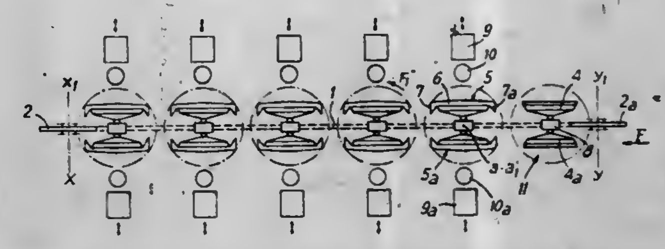
Bruno Plantevin, Rueil, and Jacques Touchard, Fontenay-le-Fleury, both of France, assignors to Regie Nationale des Usines Renault, Billancourt, France

Filed Nov. 27, 1973, Ser. No. 419,246

Claims priority, application France, Nov. 28, 1972, 72.42268

Int. Cl. B24b *5/00, 7/00, 9/00, 47/02*

U.S. Cl. 51—80 A **6 Claims**



1. An installation for polishing workpieces comprising
  means for supporting a pair of laterally spaced workpieces to be polished,
  means for advancing said workpiece supporting means in step by step manner along a work path comprising two spaced sprockets, a sprocket chain looped thereabout and means for driving the chain for circulating movement about the sprockets,
  loading and unloading stations disposed at an end of said chain loop,
  polishing stations spaced along the work path and comprising a pair of polishing heads disposed in opposed relation laterally of said work path symmetrically about the plane which includes said axis of workpiece rotation and said work path direction, and
  means for rotating said workpiece support means at least 180° about an axis perpendicular to the direction of travel of the said chain.

3,886,691

MACHINE FOR TRIMMING AND BEVELLING OPHTHALMIC LENSES

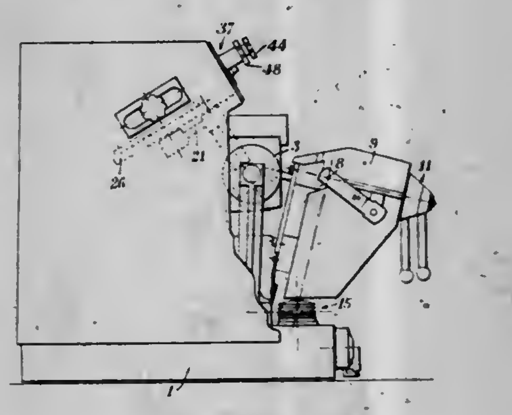
Jean-Marie Godot, Brunoy, France, assignor to Essilor International, Joinville Lepont, France

Filed Oct. 9, 1974, Ser. No. 513,391

Claims priority, application France, Oct. 9, 1973, 73.35999

Int. Cl. B24b *9/14*

U.S. Cl. 51—101 LG **2 Claims**



1. A machine for trimming and bevelling ophthalmic lenses, comprising a frame structure carrying a tool and a contact feeler adapted to engage a trimming templet, said tool and contact feeler determining together a feeler-tool line, a rotatably driven spindle for supporting said templet and a lens to be edged, and having its axis parallel to said feeler-tool line, a support movable in relation to said frame and having said spindle rotatably mounted therein, connecting and guide means for connecting said spindle support to said frame and for so guiding said spindle support that, during penetration of

the tool into the lens material as a consequence of the relative movement between said frame and said spindle support, an operative portion of the tool remains substantially on a portion of a so-called meniscus sphere centred to the spindle axis and located within the lens thickness, said connecting and guide means comprising a pair of parallel connecting-rods of same length, pivoted at one end to said spindle support and at the opposite end to said frame, a universal joint being provided for pivotally connecting each connecting-rod to said frame, the universal joints having their centres aligned on a straight line parallel to said feeler-tool line.

3,886,692

MACHINES FOR TRIMMING AND BEVELLING OPHTALMIC LENSES

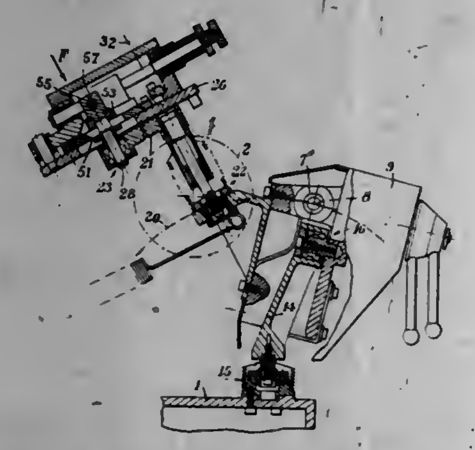
Jean-Marie Godot, Brunoy, France, assignor to Essilor International (Compagnie Generale d'Optique), Joinville-le-Pont, France

Filed Oct. 9, 1974, Ser. No. 513,497

Claims priority, application France, Oct. 9, 1973, 73.36000

Int. Cl. B24b *9/14*

U.S. Cl. 51—101 LG **6 Claims**



1. A machine for trimming and bevelling ophthalmic lenses, which comprises a frame structure supporting a tool and a contact feeler for engaging a trimming templet, said tool and feeler defining together a feeler-tool line, rotatably driven spindle for supporting said templet and a lens to be edged, and having its axis parallel to said feeler-tool line, a support movable in relation to said frame and having said spindle rotatably mounted therein, connecting and guide means for connecting said spindle support to said frame and guiding same in such a manner that, during penetration of said tool into the lens material as a consequence of the relative movement between said frame and said spindle support, and operative portion of the tool remains substantially on a portion of a so-called sphere meniscus sphere centered to the spindle axis and located within the lens thickness, said guide means comprising at least one meniscus-forming rod pivoted at one end to said frame and at the opposite end to said spindle support, and having a length equal to the radius of said meniscus sphere, said spindle being movable during the relative movements between said frame and said spindle support between two endmost position corresponding to minimum and maximum radii, respectively, of the lens trimming templets, and means for adjusting the radius of said meniscus sphere, said adjustment means comprising second guide means allowing shift of the pivotal connection of said meniscus-forming rod on said frame along a path extending substantially parallel to the chord of a circular arc centered to said operative portion of the tool, having a radius equal to the length of said meniscus-forming rod and described by the point of the spindle axis which is located at a distance from the operative portion of the tool equal to the length of said meniscus-forming rod when said spindle is moved between its two endmost positions, and blocking means for holding said pivotal connection of said meniscus-forming rod at a selected point along said path.

3,886,693

GRINDING MACHINE FOR MACHINING POLYGONAL WORKPIECES

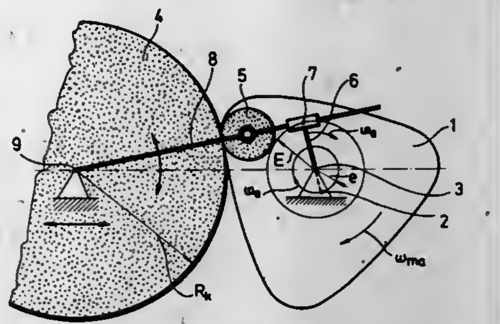
József Tajnafői; Károly Gellért; Károly Hidasi; László Gribovszki; Sándor Vékony, all of Miskolc, Hungary, assignors to Nehezipari Muszaki Egyetem, Miskolc-Egyetemvaros, Hungary

Filed Apr. 9, 1974, Ser. No. 459,378

Claims priority, application Hungary, Apr. 24, 1973, NE 509

Int. Cl. B24b *5/16*

U.S. Cl. 51—105 EC **5 Claims**



1. A grinding machine comprising a grinding tool, means for rotating said grinding tool about a fixed axis, means for rotating a polygonal workpiece about its own axis in contact with said driving tool, means for rotating said axis of said workpiece about an eccentric axis at a speed of rotation equal to the speed of rotation of said workpiece about its own axis multiplied by the number of sides of said polygonal workpiece, and a correcting mechanism for changing the angular velocity of rotation of the workpiece about said eccentric axis in those sections of that motion which are associated with the grinding of the sides of the polygon while maintaining constant the speeds of rotation of said grinding tool about said fixed axis and of said workpiece about its own axis.

3,886,694

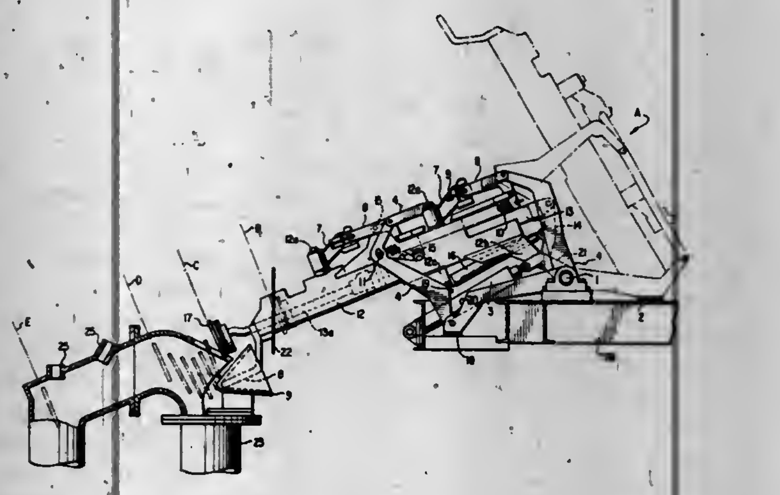
ASCENSION PIPE CLEANING APPARATUS WITH SELF-NDEXING SUSPENSION

Emmanual Victor Gouye, Pittsburgh, Pa., assignor to The United States of America as represented by the United States Environmental Protection Agency, Washington, D.C.

Filed Sept. 26, 1974, Ser. No. 509,466

Int. Cl. B24b *19/00*

U.S. Cl. 51—170 PT **7 Claims**



1. An apparatus for removing deposited material from the interiors of the elbows of a row of gas ascension pipes at the top of a battery of horizontal coking chambers having a coal charging larry car movable over the top of the battery alongside the row of ascension pipes into position for charging the chambers of the battery severally, said apparatus comprising: a cradle means having a first male to female indexing means mounted at one end, said cradle being flexibly supported on said larry car by means of a suspension system which permits said cradle to move freely in the vertical and lateral planes while remaining parallel to its original orientation;

- a ram means having a piston rod extending therefrom which is pivotally mounted within said cradle means to said cradle means and to said suspension system;
- an abrading means mounted on the free end of said piston rod and reciprocable with said piston rod;
- a means for said ram means forward from its inoperative position under the upper lip of the gooseneck opening of a gas ascension pipe to its operative position;
- a matching second male to female indexing means to said first male to female indexing means which is mounted on the outside of said gas ascension pipe such that when said cradle is moved forward the indexing means mounted thereon engages the matching indexing means and moves the ram means and cradle means vertically and laterally to an orientation on the axis of said gas ascension pipe.

3,886,695

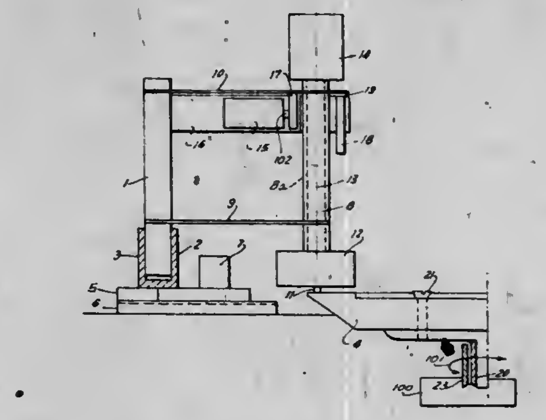
METHOD FOR GRINDING A GEM STONE

Maximo Elbe, Hamburg, Germany, assignor to Colorant Schmuckstein GmbH, Hamburg, Germany

Filed May 17, 1973, Ser. No. 361,037

Int. Cl. B24b *1/00, 9/16*

U.S. Cl. 51—283 **4 Claims**



1. In a method of grinding a gem stone, particularly a diamond, the steps of placing a gem stone to be ground against a rotating grinding wheel; turning said gem stone relative to said grinding wheel for determination of an ideal orientation of said gem stone relative to said grinding wheel; measuring the frictional heating of said gem stone; controlling the contact pressure at which said gem stone contacts said grinding wheel, as a function of the temperature of said gem stone and in such a manner as to maintain said temperature constant; determining the amount of material removal which takes place during the preceding steps; terminating the turning of said gem stone when said ideal orientation is reached; and grinding respective facets of said gem stone with said grinding wheel.

3,886,696

MOUNTING DEVICE FOR OPTICAL LENSES

Erhard Brück, Heuchelheim, Germany, assignor to Wilhelm Loh Kommanditgesellschaft, Wetzlar, Germany

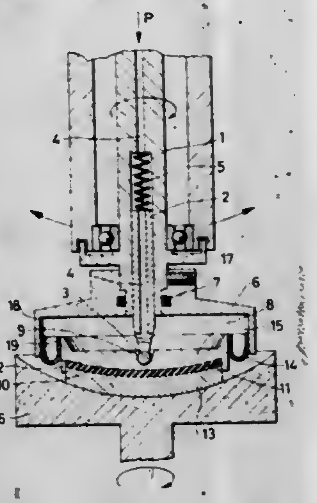
Filed Oct. 1, 1973, Ser. No. 402,321

Claims priority, application Germany, Oct. 26, 1973, 2252503

Int. Cl. B24b *5/16*

U.S. Cl. 51—216 LP **6 Claims**

3. In a mounting chuck for optical lenses for use in a grinding and polishing machine, comprising a movable rod and and lens holder which is connected to said movable rod through universal joint means, the improvement comprising an annular part mounted on said rod and movable therewith and a roll bellows which is generally stiff in a circumferential direction but flexible in an axial direction for connecting said lens holder to said annular part, said roll bellows effecting a torque transmission from said annular part to said lens part and being sealingly engaged with said annular part and said lens holder to define a fluid tight chamber therebetween, said universal joint means being located in said fluid tight chamber and passageway means for supplying pressurized fluid to said fluid tight chamber to urge said lens holder axially away from said annular part so that said universal joint means only functions to center said lens holder and absorb very small radial and axial forces.



3,886,697

METHODS FOR FINISHING AN APERTURE

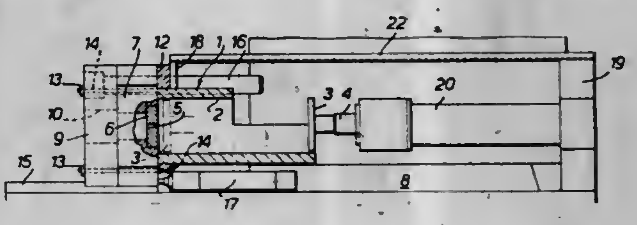
Edward George Feldcamp, 60 Roberts Burns Ave., Benhall, Cheltenham, England

Continuation of Ser. No. 299,247, Oct. 20, 1972, abandoned, which is a division of Ser. No. 73,110, Oct. 17, 1970, Pat. No. 3,699,725. This application Aug. 22, 1974, Ser. No. 499,780

Claims priority, application United Kingdom, Sept. 17, 1969, 45940/69

Int. Cl. B24b *1/00, 5/40, 5/48*

U.S. Cl. 51—317 **3 Claims**



1. A method of finishing an opening in an extrusion tool having an intended extrusion direction, comprising mounting the tool in a holder and extruding an abrasive compound through the opening under pressure in the intended extrusion direction only and into a free space in which the compound is not closely confined, the compound being of solid extrudable nature such that it extrudes into the free space in a shape which simulates the extrusion which would result if the tool were put into service at that time.

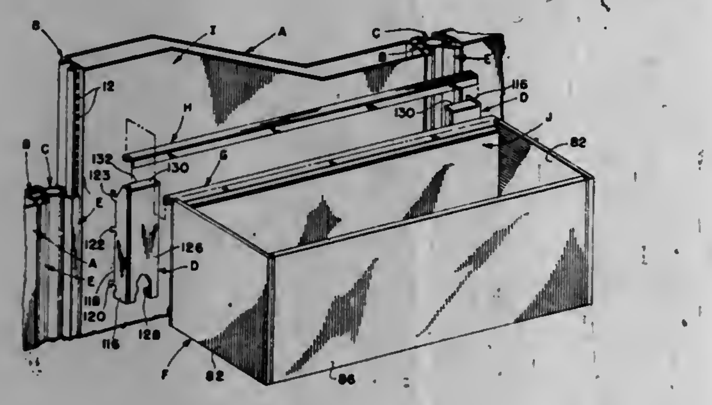
3,886,698
PANEL AND STRUCTURAL UNITS FOR WALL ASSEMBLIES

Richard L. Raith, Solon, and Joseph A. Davenport, Middleburg Heights, both of Ohio, assignors to Hauserman, Inc., Cleveland, Ohio

Continuation of Ser. No. 370,477, June 15, 1973, abandoned. This application Aug. 19, 1974, Ser. No. 498,418

Int. Cl. A47g *29/02*

U.S. Cl. 52—36 **36 Claims**



1. In a panel system, a panel having a vertical row of slots along the edge thereof, a bracket having a face plate and an inwardly turned end plate, inwardly projecting tabs on said end plate adapted to engage in selected slots to support said bracket at a desired elevation on said panel with the face plate thereof extending generally parallel to said panel, an accessory mounted on said bracket, and support means on said face plate operative to support said accessory without direct engagement between said accessory and said panel.

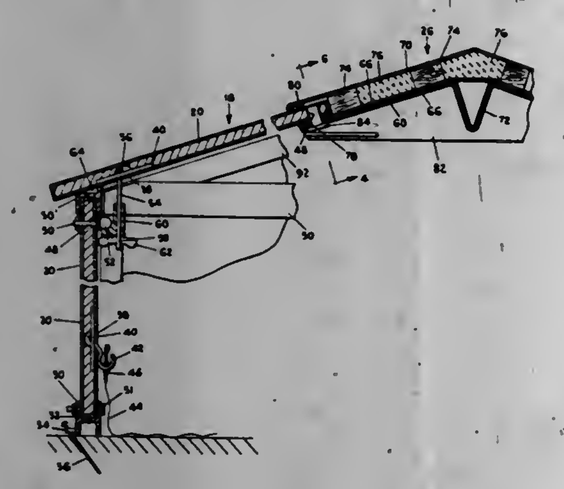
3,886,699
PORTABLE BUILDING STRUCTURE

Paul F. Bergmann, Jr., 445 Channel Rd., North Muskegon, Mich. 49445

Filed Aug. 2, 1974, Ser. No. 494,239

Int. Cl. E04b *1/343*

U.S. Cl. 52—90 **18 Claims**



15. A portable and demountable building structure having a plurality of walls joined together to form an enclosure, and a roof demountably secured and covering said enclosure, the improvement which comprises:

- said roof formed of a plurality of substantially equal sized panel members joined together at the sides thereof;
- a central ridge connector, said ridge connector being rigid in nature and providing a central support for said roof panels, said ridge connector having slots at opposite sides thereof for receiving an edge of panel members; and
- means for rigidly and demountably securing said panel members to said ridge connector at said slots.

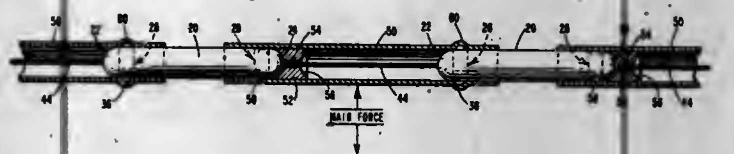
3,886,700
COLLAPSIBLE STRUCTURAL MEMBER

William M. Lambert, 1516 Beaver Dam Rd., Point Pleasant, N.J. 08742

Filed Aug. 27, 1973, Ser. No. 391,763

Int. Cl. E04b *1/343;* **E04h** *12/18*

U.S. Cl. 52—108 **15 Claims**



1. A collapsible structural member comprising:

- a plurality of rigid elongated inner elements arrangeable in spaced end-to-end relationship and connected together by flexible connecting means attached to adjacent pairs thereof, each of said inner elements being of a first length,
- a plurality of rigid elongated open-ended outer elements coaxial with said inner elements and arrangeable in alternating relationship with said inner elements, said flexible connecting means extending through the interior of said outer elements, said outer elements being axially relatively movable with respect to said inner elements between an extended position engaging opposite end portions of a pair of adjacent of said inner elements to create a continuous rigid structural member and a retracted position spaced from one of the said pair of adjacent said inner elements to allow said structural member to be collapsed and folded, each of said outer elements being of a second length at least substantially equal to said first length so that said inner elements are positionable substantially entirely within said outer elements when said outer elements are in said retracted position, whereby the effective combined length of all of said inner and outer elements in said retracted position is substantially less than the effective combined length of all of said inner and outer elements when said outer elements are in said extended position,
- the cross-sectional configuration of said outer elements and said inner elements being so related to one another as to minimize lateral and angular movement between said inner and outer elements when said outer elements are in said extended position.

3,886,701
TOP FOR A SKYLIGHT SIDE MEMBER

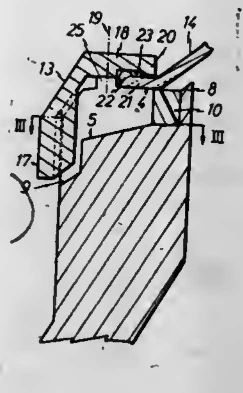
Pierre Emmanuel Eugene Jean Bogaert, Dijk 20, Wemmel, Belgium

Filed Mar. 5, 1973, Ser. No. 337,921

Claims priority, application Luxembourg, Mar. 10, 1972, 64942; Mar. 17, 1972, 64988

Int. Cl. E04b *7/18;* **E04d** *3/03*

U.S. Cl. 52—200 **3 Claims**



1. A mounting top for the outwardly extending horizontal edge portions of a skylight comprising:

- a frame having at least one elongated side which has a raised inner edge portion, an intermediate horizontal surface portion below the raised inner edge portion and an outer surface sloping downwardly from the horizontal surface portion,
- a plurality of alined upright supports spaced along said outer surface, each having a horizontal upper bearing surface above the level of the intermediate surface for supporting the outer horizontal side member of a skylight, an upstanding rib member on the upper surface of each upright support parallel to the inner edge of the frame side for abutting the peripheral edge of the horizontal edge portion of the skylight,
- the space between the supports forming downwardly sloping passageways and the rear ends of the supports being adjacent the intermediate horizontal portion of the frame side to form therewith a plurality of channels,
- and a water permeable sealing member seated on said intermediate portion of the frame side engaging the underside of the horizontal edge portion of the skylight when seated on the upright supports, to form a ventilation block.

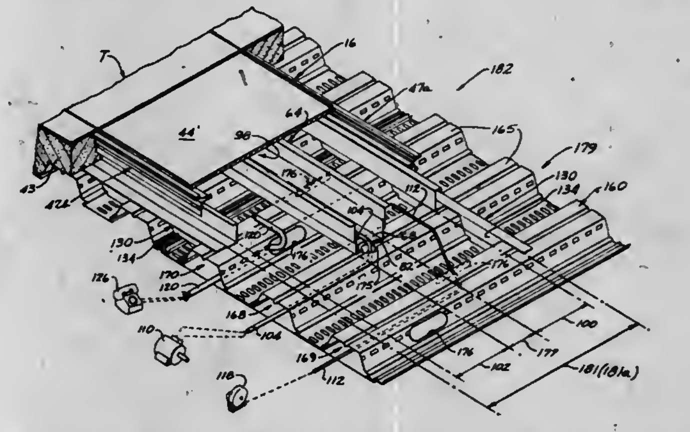
3,886,702
METAL CELLULAR FLOORING UNIT FOR BOTTOMLESS ELECTRICAL CABLE TRENCH

Frank W. Fork, Allison Park, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 342,478, March 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 158,769, July 1, 1971, Pat. No. 3,721,051. This application July 17, 1974, Ser. No. 489,173

Int. Cl. E04b *5/46;* **E04f** *17/08*

U.S. Cl. 52—221 **21 Claims**



1. In a metal cellular flooring unit comprising a corrugated upper metal sheet presenting alternating crests and valleys and webs connecting adjacent ones of said crests and said valleys, and a correlative lower metal sheet secured to said upper metal sheet along contiguous portions thereof and cooperating therewith to define spaced-apart generally parallel enclosed cells; and marginal connecting means along the opposite longitudinal sides of said flooring unit adapting said flooring unit for interconnection with other flooring units; the improvement comprising:

- said flooring unit having a transverse region intermediate of its ends, said transverse region having a width of up to about 50 inches;
- said flooring unit having a single crest access opening and at least one web access opening residing within said transverse region;
- said crest access opening being formed solely in the crest of a first cell and establishing communication between the interior of said first cell and the space above said flooring unit, said crest access opening constituting the only useful access opening in said first cell within said transverse region; and
- said web access opening being formed solely in one web of a second cell and establishing communication between the interior of said second cell and the space above the valley adjoining said one web.

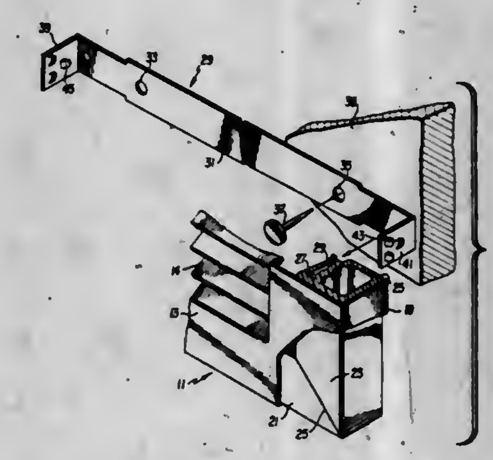
3,886,703
DECORATIVE SHUTTER AND MOUNTING MEANS THEREFOR

Donald L. Rousey, Des Plaines, Ill., assignor to Questor Corporation, Toledo, Ohio

Filed Mar. 20, 1974, Ser. No. 453,163

Int. Cl. E04c *2/38;* **E06b** *7/08*

U.S. Cl. 52—473 **4 Claims**



1. A decorative shutter device for securing to an exterior of a house comprising

- an integral plastic skin having a peripheral substantially flat section and an interior slat-like area;
- an integral flange about the periphery of said flat section substantially perpendicular to said flat section;
- a rigid foam frame secured in abutting relationship within said flat section and said flange, said frame having a substantially rectangular cross section; and
- a wall integral with said frame and substantially parallel with said frame opposite said flange;
- said wall and said frame forming a channel for accepting a fastener extending outwardly from said exterior of said house.

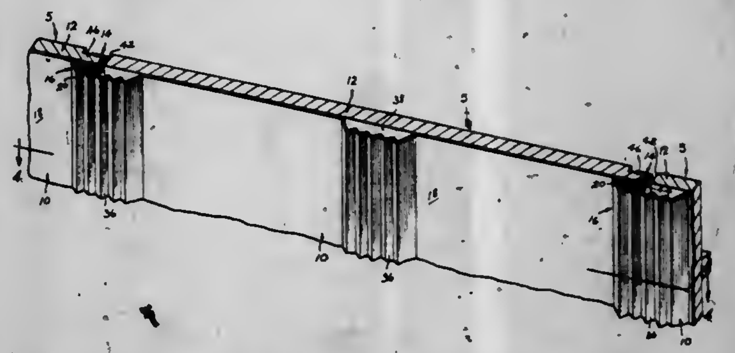
3,886,704
BUILDING SIDING UNIT WITH INTERLOCKING BACKING BOARD AND OUTER PANEL

Lee H. Mattes, South Bend, Ind., assignor to Mastic Corporation, South Bend, Ind.

Continuation-in-part of Ser. No. 197,031, Nov. 9, 1971, Pat. No. 3,780,483. This application Aug. 3, 1973, Ser. No. 385,444. The portion of the term of this patent subsequent to Dec. 25, 1990, has been disclaimed.

Int. Cl. E04c *2/26, 2/34*

U.S. Cl. 52—530 **2 Claims**

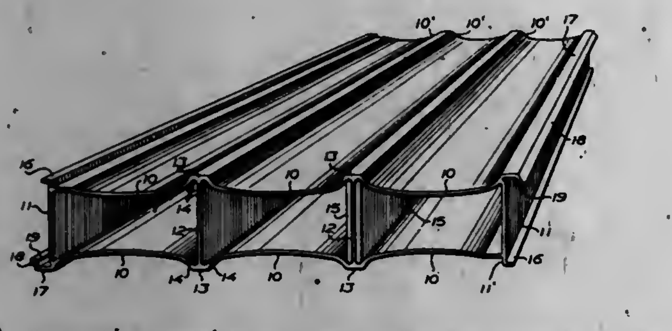


1. A siding unit for a building or like structure comprising an outer panel and a backing board, said outer panel including spaced longitudinal edge portions and a face portion extending between said edge portions, one of said edge portion including a web extending rearwardly of said face portion and terminating in an inturned lip spaced from said face portion to define hook means, retainer means extending along said one edge portion, the other of said edge portion extending rearwardly and terminating in an inturned lip, said retainer means receiving in slidable interlocking cooperating the lip of said

other edge portion of an outer panel in the adjacent siding course, said backing board having spaced side edges and front and rear faces extending between said side edges, the rear face of said backing board terminating spacedly from one of said side edges to define a lip portion of reduced thickness at said one side edge, said backing board having its rear face positioned against said structure with the other of its side edges extending adjacently along and lapping the web of said one edge portion of an outer panel in another adjacent siding course and having its front face located in substantially the same plane as the front face of the backing board in said another adjacent siding course, the lip portion of said first mentioned backing board being spaced from said structure, means securing said first mentioned backing board only to said structure, said first mentioned backing board lapping the outer panel in said another adjacent siding course only at its said web, said first mentioned outer panel having the lip of its other edge portion interlocking with the retainer means of the outer panel in said another adjacent siding course, the hook means of said first mentioned outer panel being fitted over and behind the lip portion of said first mentioned backing board with the web of said first mentioned outer panel overlying the one side edge of said first mentioned backing board, whereby said first mentioned outer panel is retained in position against said structure by the outer panel in said another adjacent siding course and said first mentioned backing board, said outer panels having lower end edges, a horizontally extending retainer bracket, means securing said retainer bracket to said structure, said outer panels abutting said retainer bracket at said end edges.

3,886,705
HOLLOW STRUCTURAL PANEL OF EXTRUDED PLASTICS MATERIAL AND A COMPOSITE PANEL STRUCTURE FORMED THEREOF

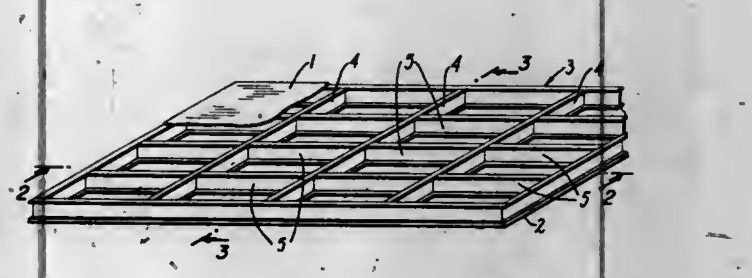
Georg Valentin Cornland, Helsingborg, Sweden, assignor to Hoganas AB, Helsingborg, Sweden
Continuation-in-part of Ser. No. 122,531, March 9, 1971, abandoned. This application Apr. 30, 1973, Ser. No. 355,376
Int. Cl. E04c *1/10, 1/30*
U.S. Cl. 52—586 **1 Claim**



1. A composite panel structure including a number of hollow structural panels of extruded plastics material, each panel comprising mutually spaced interparallel end walls, at least two intermediate I-beams spaced from the end walls and extending along the end walls in parallel therewith, each I-beam having a web and flanges on each end and integral therewith, which flanges extend along the web and project on both sides of the web generally perpendicular thereto to form substantially planar outer surfaces of the beams, portions on the inner surface of each flange forming channels extending along the web one on each side of the web, the channels formed by opposite flanges of an I-beam opposing each other on the respective sides of the web to receive a stiffening member extending along the web, opposite side walls extending between and joined to the I-beam flanges and the end walls and spanning the spaces therebetween, the side walls having a concave outer surface and a convex inner surface and bounding, together with the end walls and the I-beams, a number of individual cavities, and connecting means on the end walls for interconnecting panels adjoining each other and comprising first and second flanges formed at first and second ends of each of said end walls, of which said first flanges on the opposite end walls of adjoining panels are formed as hook-shaped portions and are diagonally opposed to each other and are joined to said first end of each said end wall by a reverse curve connecting web, said side wall being joined to said reverse curve connecting web portion of said end wall, said second flanges on the opposite end walls of adjoining panels are diagonally opposing each other and have a planar surface generally parallel to said I-beam flanges and are formed each on an extension of the second end of each said end wall extending beyond the adjoining side wall, said hook-shaped first flanges on adjacent end walls of adjoining panels receiving each one of the second flanges on such end walls, each said first flanges including a substantially planar surface extending generally parallel to said planar I-beam flanges and being of substantially the same width and at the same level as said I-beam flanges, an outwardly projecting slanting lip extending from the free end of said planar surface of said first flange and terminating in a ledge projecting inwardly substantially in parallel with said planar surface of said first flange, said planar surface of each said first flanges together with the associated lip and ledge forms said hook-shaped portions, outer planar strip surface portions on said side walls and connected to said extensions, each said strip surface portion extending along an associated extension, each said outer planar strip surface portions abutting said ledge portion of an adjacent panel when said panels are joined, and forming, together with said ledge portion and said extension, a labyrinth seal between said panels, and at least one wedge insertable between adjacent end walls of adjoined panels for forming a spacer between said panels, said wedge having edge surfaces which extend along the first and second flanges formed at the end walls of each of said adjoined panels, pressing each said first flange into firm engagement with each said adjacent second flange.

3,886,706
BUILDING SANDWICH PANELS

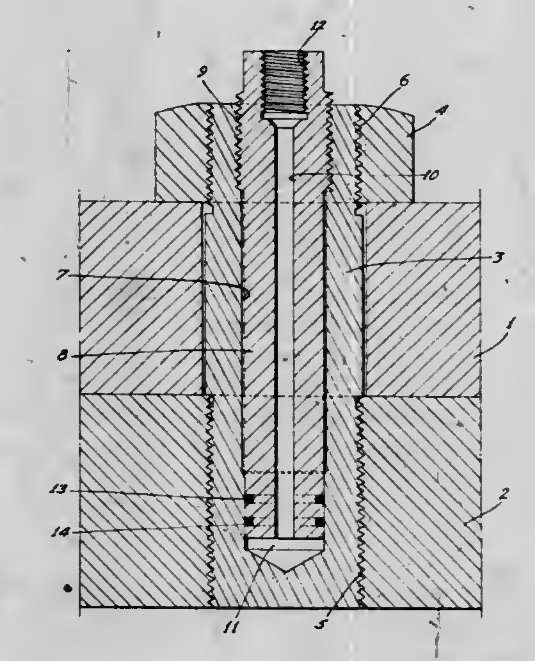
William H. Baker, Cowan Farm Rd., Rock Hill, S.C. 29730
Continuation-in-part of Ser. No. 99,868, Dec. 21, 1970, abandoned, Continuation-in-part of Ser. No. 257,441, May 26, 1972, abandoned. This application Aug. 31, 1973, Ser. No. 393,691
Int. Cl. E04b *2/28;* **E04c** *2/38*
U.S. Cl. 52—615 **57 Claims**



1. A modular building sandwich panel unit comprising a load-supporting frame composed of an interlocking network of a plurality of more than two beams extending substantially in parallel in the load-supporting direction from one end to the other end of the frame and a plurality of more than two beam cross supports extending between the load-supporting beams and interlocked therewith so as to impart structural rigidity to the network, the beams being apertured and the beam cross supports interlocking therewith at the apertures, the tops of the beam cross supports on at least one side being lower than the tops of the beams on that side; and spacer or adaptor members attached to the tops of the beam cross supports bringing them to the same level as the tops of the beams at least one facing panel attached to the spacer or adaptor members; and means for removably attaching the facing panel to the frame.

3,886,707
DEVICE FOR ACHIEVING AN AXIALLY PRE-STRESSED JOINT

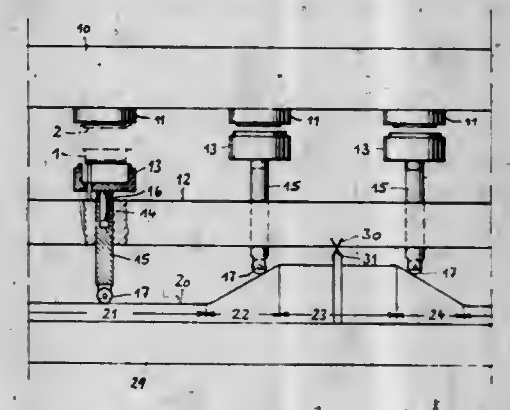
Karl Helge Konstantin Heldt, Partille, Sweden, assignor to SKF Industrial Trading & Development Company, Jutphaas, Netherlands
Filed Dec. 15, 1972, Ser. No. 315,470
Claims priority, application Sweden, Feb. 7, 1972, 1364/72
Int. Cl. F16b *5/02*
U.S. Cl. 52—758 F **3 Claims**



1. The combination comprising at least two parts having openings therein to receive a prestressed screw joint for connecting the parts, said screw joint consisting of an elongated screw member engaged in the openings in said parts and having a first portion axially securing said screw member in one of said parts in at least one direction and having a threaded second portion axially spaced from said first portion, a nut member engageable with said second portion for axial takeup against the other part, means defining a central axial bore in said screw member having an opening at the axial end thereof receiving said nut member and terminating in a bottom wall adjacent said first portion of said screw member, a piston rod mounted in said bore and means securing said piston to said screw member adjacent the opening end of said bore, said piston rod extending into said bore with the lower axial end face thereof spaced closely adjacent said bottom wall of said bore, and located closely adjacent the connection of said screw member in said one part, the major portion of the outer peripheral surface of said piston rod extending axially from a first plane transverse to its axis below its connection to said screw member to a second transverse plane adjacent its lower end face being radially spaced from said bore to provide an annular space therebetween and a means defining an axial channel in said piston rod for conveying a pressure medium into the space defined by the axial end face of said piston rod and the bottom wall of said bore thereby to effect axial expansion of said screw member, and sealing means between the lower end of said piston rod and the wall of said, the outer peripheral surface of said screw member confronting the surface defining the opening in said other part being spaced therefrom to permit free axial expansion of said screw member upon pressurization of said space.

3,886,708
APPARATUS FOR SEALING CONTAINERS

Otto Guse, Viersen, Germany, assignor to Robert Bosch Verpackungsmaschinen G.m.b.H., Waiblingen, Germany
Filed May 3, 1974, Ser. No. 466,794
Claims priority, application Germany, May 7, 1973, 2322947
Int. Cl.² B65B *7/28, 51/14*
U.S. Cl. 53—329 **3 Claims**

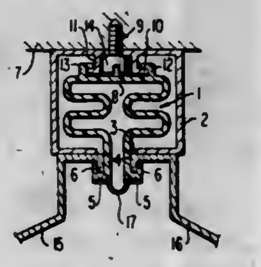


1. An apparatus for sealing lids on containers made, at least partially, of thermoplastic material comprising, in combination:

a. a plurality of welding units, each welding unit including one heated die and a holder for receiving a container sought to be sealed, and each said welding unit being spaced from adjacent welding units by at least a given distance measured between corresponding points on these welding units;
b. endless conveyor means for supporting and moving said welding units in sequence through a welding station while maintaining substantially spacing between adjacent ones of said welding units; and
c. fixed cam means in said welding station, a portion of said cam means being arranged to cause mutual compression between each one of said heated dies and a corresponding one of said holders so as to press a lid on a container as each welding unit passes through said welding station, and said portion of said cam means being shorter in length than said given distance between adjacent ones of said welding units.

3,886,709
WALL FACING ARRANGEMENT

Robert Krah, Troisdorf-Sieglar, and Alfons Gehrke, Cologne, both of Germany, assignors to Dynamit Nobel AG, Germany
Filed Sept. 25, 1972, Ser. No. 291,597
Claims priority, application Germany, Sept. 24, 1971, 2147907
Int. Cl. E04b *1/68*
U.S. Cl. 52—460 **28 Claims**



1. A wall facing arrangement comprising:
at least one face panel having a facing surface extending generally parallel to a fixed building wall or the like, and mounting means for mounting said face panel to the fixed building wall or the like.

- wherein said mounting means includes resilient means for providing a resilient interconnection between at least two opposed edge portions of said face panel and said wall such that substantial resilient movements of said face panel in the direction of said wall and in directions parallel to said wall are permitted,
- wherein the resilient means includes sidewalls bent in a meander shape in cross-section at least along a part of their length, and
- wherein the sidewalls have outwardly projecting ends which are resilient in the longitudinal direction.

3,886,710

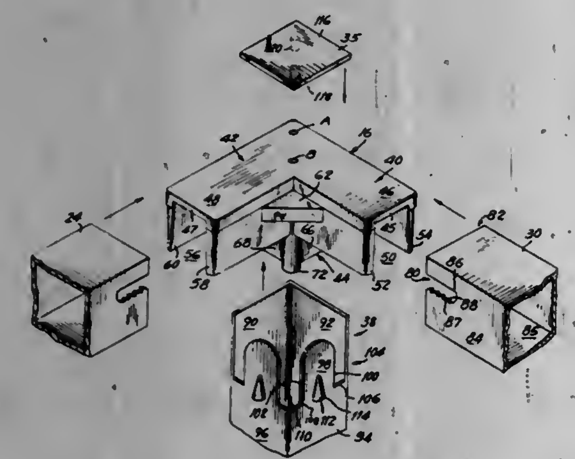
TABLE CONSTRUCTION

Franz Krause, East Port, and Austin T. Shulberg, Bright Waters, both of N.Y., assignors to Classic Games Company, Inc., Deer Park, N.Y.

Filed June 26, 1973, Ser. No. 373,653

Int. Cl. E04b *1/00*

U.S. Cl. 52—758 H **7 Claims**



1. Apparatus comprising a one-piece plastic connector, said connector including a first stub, a second stub and a third stub, said first stub intersecting with said second stub and being perpendicular to said second stub, said third stub extending away from the intersection of said first and second stubs, means extending between said first and second stubs for supporting a plate of material and for use in securing tubular rods to said first and second stubs, a first tubular rod, said first tubular rod having an elongated axis and a first end and a second end, a slot located at said first end of said first tubular rod, said first end of said first tubular rod tightly surrounding said first stub with said extending means partially received in said slot.

3,886,711

METHOD FOR FORMING CAULKING TUBE CARTRIDGES

Don R. Brothers, Canfield, and Edwin D. Stewart, Austintown, both of Ohio, assignors to Century Industries Corporation, New Waterford, Ohio

Filed June 12, 1974, Ser. No. 478,443

Int. Cl. B65b *7/28, 3/00*

U.S. Cl. 53—14 **2 Claims**

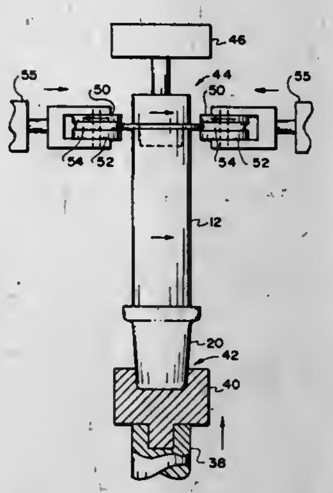
1. A method for forming a caulking cartridge of the type including a cylindrical body which holds the caulking material and having a nozzle end and a piston end, comprising the steps of:

a. providing a generally cylindrical rotatable anvil member adapted to be closely received within the piston end of the caulking cartridge;

b. providing a flange ring member including a cylindrical open-ended section having a flange extending radially outwardly from one end thereof;

c. providing a protective cap adapted to snap on the nozzle end of the caulking tube;

d. positioning the cylindrical open-ended section of the flange ring member in the piston end of the cartridge with the flange overlying the end edge of the body and axially aligning the cap with the cartridge; and,



e. axially aligning the piston end of the cartridge with the anvil and applying sufficient axial force to move the anvil into the piston end of the cartridge to cause the cap to snap onto the nozzle end of the body and rotating the body and the anvil relative to a deforming means and deforming the flange with said means into a bead about the piston end of the cartridge.

3,886,712

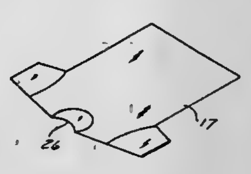
METHOD OF PACKAGING T-SHIRTS

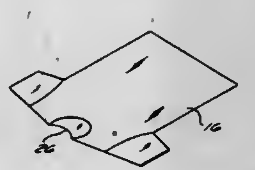
John D. Sylvester, Garden City, N.Y., assignor to Amscomatic Inc., Long Island City, N.Y.

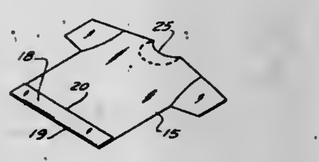
Filed Aug. 9, 1974, Ser. No. 495,988

Int. Cl. B65b *63/04*

U.S. Cl. 53—21 FW **5 Claims**







1. A method of packaging three T-shirts in a single container comprising the steps of:

a. laying out a first and a second of the shirts superposed in flat condition and in registry, the front of the first shirt facing away from the second shirt,

b. folding the bottom part of a third shirt upon itself along a line parallel to the bottom edge of the shirt,

c. placing the three shirts in superposed relation with the longitudinal axes of all the shirts parallel, the third shirt being against the second shirt and the fold line of the third shirt being adjacent to the collar of the second shirt,

d. placing a stiffener board against the exposed face of the shirt farthest from the first shirt,

e. folding over the stiffener board the bottoms of the first and second shirts, the top of the third shirt, and the sides of all the shirts,

f. then folding the tops of the first and second shirts and the bottom of the third shirt over the stiffener board, and

g. inserting the folded shirts as a unit into a container.

3,886,713

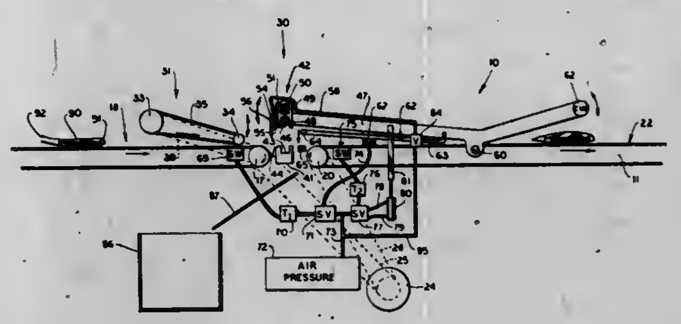
BAG CLOSING METHOD AND APPARATUS

William O. Mitchell, Vidalia; Charles S. Hamm, Covington, and Joseph David Williams, Winder, all of Ga., assignors to Oxford Industries, Inc., Atlanta, Ga.

Filed Oct. 16, 1973, Ser. No. 406,787

Int. Cl. B65b *1/24, 7/06*

U.S. Cl. 53—24 **9 Claims**



9. A method of closing the open end of a bag about a garment or the like comprising moving an open bag with a garment therein along a horizontal path with the open end of the bag following the garment, detecting the movement of the garment past a predetermined position along the path, gripping the bag at a first position on the bag behind the garment in response to the detection of the garment, and closing the bag at a second position on the bag behind the garment in response to the gripping of the bag.

3,886,714

MACHINE FOR MAKING AND FILLING SACHETS

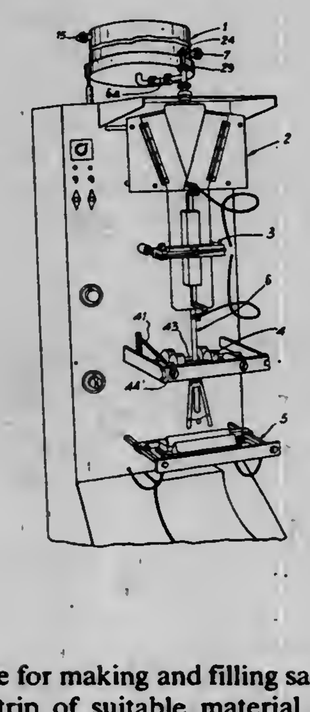
Roland de la Poype, Paris, France, assignor to Prepac (S.A.R.L.), Villejuif, France

Filed July 11, 1974, Ser. No. 487,799

Claims priority, application France, Aug. 13, 1973, 73.29661

Int. Cl. B65b *9/12*

U.S. Cl. 53—180 **7 Claims**



1. A machine for making and filling sachets, produced from at least one strip of suitable material, comprising a frame which supports an upper reservoir, a delivery pipe extending downwards from the reservoir, at least one longitudinal welding press arranged to form a tubular sheath from the strip, sheath-feeding rollers driven rotationally and arranged to grip and feed the sheath downwardly, the said rollers being mounted on the frame below the longitudinal welding press, and a transverse welding press mounted on the frame below the rollers, wherein the upper reservoir is of known constant level kind, wherein the delivery pipe is provided at its lower end with a valve seat and a valve associated with the seat is mounted on a rod which extends longitudinally inside the pipe and is adjustable in position in the longitudinal direction in relation to the pipe and wherein a cam-shaft supported by the frame is driven rotationally by a single motor and is provided with three cams arranged respectively mechanically to control the operation of the longitudinal welding press, the sheath-feeding rollers, and the transverse welding press.

3,886,715

ENVELOPE STUFFING MACHINE

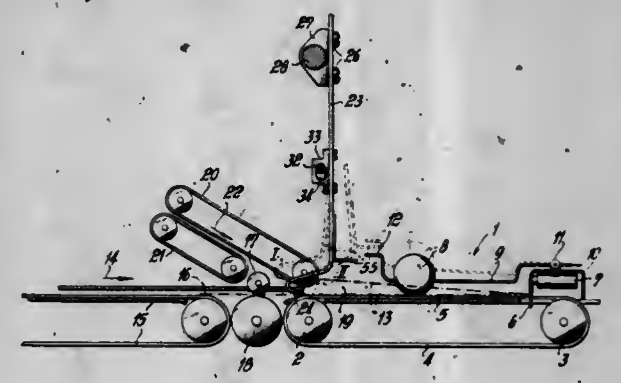
Wilfried Dorer, Robberg, Germany, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Feb. 14, 1974, Ser. No. 442,470

Claims priority, application Germany, Apr. 26, 1973, 2321129

Int. Cl. B65b *43/26*

U.S. Cl. 53—384 **7 Claims**



1. Apparatus for opening and holding open the mouth of an envelope at a filling station of an envelope stuffing machine, comprising:

- an envelope feed path for feeding said envelope along a predetermined plane to said filling station;
- a pair of pivotable arms disposed in a generally normal direction to said envelope feed path, said arms being equipped with a hook-shaped spreading member;
- means for supporting said arms in spaced apart parallel relation on first and second support means extending transversely of said arms, said first support means defining a pivoting axis for said arms;
- support mounting means on said first and second support means permitting displacement of the arms in a vertical direction relative to said predetermined plane; and
- drive means for intermittently imparting rotary motion to said second support means causing said spreading members to move on a generally circular path from a rest position clear of the mouth of the envelope and into an operative position holding open the mouth of said envelope and returning to said rest position after said envelope had been stuffed.

3,886,716

ELECTRICALLY POWERED GRASS TRIMMER

Jerry W. Sellers, Lexington, Tenn., assignor to Rockwell International Corporation, Pittsburgh, Pa.

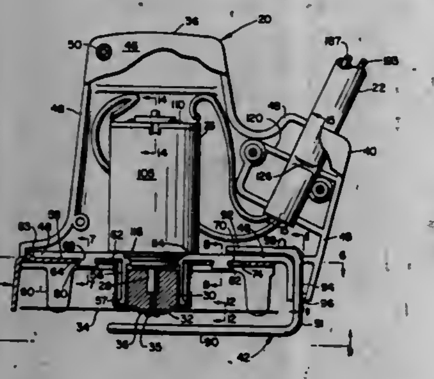
Filed Feb. 26, 1973, Ser. No. 335,928

Int. Cl. A01d *35/26;* **A01g** *3/06*

U.S. Cl. 56—17.4 **8 Claims**

1. In an electrically powered grass trimmer, a split motor housing longitudinally divided into a pair of separately

formed, mating shells, means for securing said shells together, an electric motor mounted in said housing, a grass-cutting blade located below said housing and drive connected to said motor for rotation about a substantially vertical axis when the housing is in an upright position, an elongated member extending from said housing, handle means positioned on said elongated member remote from said housing, and a support structure carried by said housing and having a portion underlying said blade and adapted to seat on the ground to limit the approach of said blade to ground, said structure being trapped at an end region between interior surfaces of said shells and secured in place only by separable seating surface engagement with interior surfaces of said shells.



3,886,717

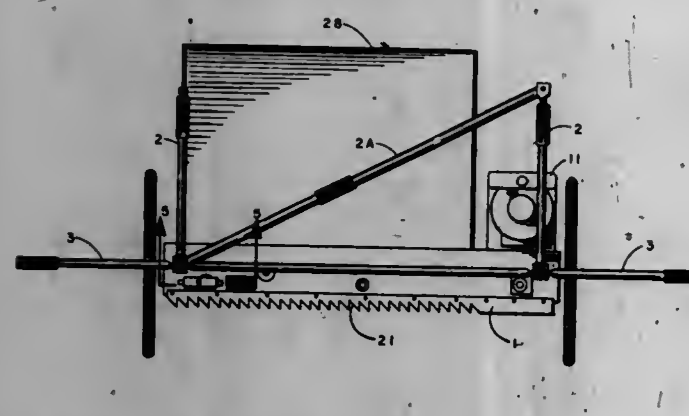
MAN-PROPELLED, SELF-POWERED REAPER

Chester A. White, 813 Ram Trl. S.E., Albuquerque, N. Mex. 87123

Filed July 5, 1973, Ser. No. 376,608

Int. Cl. A01d *53/06*

U.S. Cl. 56—201 **8 Claims**



1. A man carried reaper for use in relatively small areas to harvest various types of grain, comprising:

a cutter-bar powered by an integrally mounted gasoline engine;

said cutter-bar being suspended at its end from vertical hangers of a support frame extending upward in a plane perpendicular to the normally horizontal plane of the cutter-bar;

the tops of the vertical hangers being attached to a top horizontal support member connecting the two hangers and extending outwardly therefrom so as to be carried by one man at each end of the reaper;

a rearwardly extending control handle attached near the top of each vertical hanger of the support frame, permitting either of the two men to control the position of the cutter-bar by rotating the cutter-bar about the longitudinal axis of the top horizontal support member; and

means for controlling the operation of the gasoline engine, said control means being mounted on one end of said top horizontal support member.

3,886,718

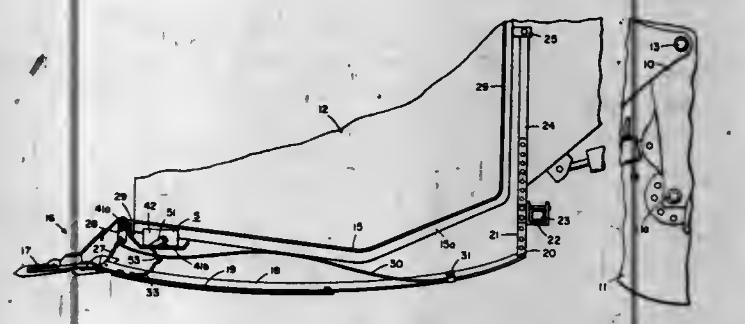
AUTOMATIC HEADER HEIGHT CONTROL SYSTEM FOR COMBINES AND THE LIKE

John M. Talbot, P.O. Box 9, Numa, Iowa 52544

Filed May 17, 1974, Ser. No. 470,921

Int. Cl. A01d *67/00*

U.S. Cl. 56—208 **15 Claims**



1. In an agricultural machine including a main body having means for transporting the body over agricultural terrain and an adjustable portion movable with respect to the main body for raising and lowering movements relative to the terrain independently of movement of the main body along the terrain, the adjustable portion including working means for operation closely above the terrain and disposed extensively along a direction transversely of that of the travel of the machine along the terrain, the working means depending from and being floatably connected to the adjustable portion for raising and lowering movements relative thereto between predetermined limits independently of said movements of the adjustable portion and the main body, and power means for effecting said movements of the adjustable portion, the power means having electrically activated control means for operating the same, the improvement comprising: a plurality of sensing means carried by one of the adjustable portion and the working means and spaced from each other along said transverse direction, the sensing means being responsive to the distance of the working means from the adjustable portion at selected points along said transverse direction and operable independently of each other, and an electrical and electronic control circuit electrically interconnecting each sensing means and the power control means for automatically activating the latter in response to signals provided by the sensing means, the sensing means having a first set of positions providing a first set of signals for activating the power control means to effect said raising movement of the adjustable portion in the event the distance of the working means at one of said selected points therealong is less than a predetermined minimum from the adjustable portion as the machine travels along the terrain, the sensing means having a second set of positions providing a second set of signals for activating the power control means to effect said lowering movement of the adjustable portion in the event the distance of the working means at all of a plurality of said selected points therealong is greater than a predetermined maximum from the adjustable portion as the machine travels along the terrain.

3,886,719

CONTINUOUS LOADING STACKER

Harold Keith Garrison, Newton, and Martin Eugene Pruitt, Hesston, both of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Dec. 5, 1973, Ser. No. 422,092

Int. Cl. A01d *85/00*

U.S. Cl. 56—344 **20 Claims**

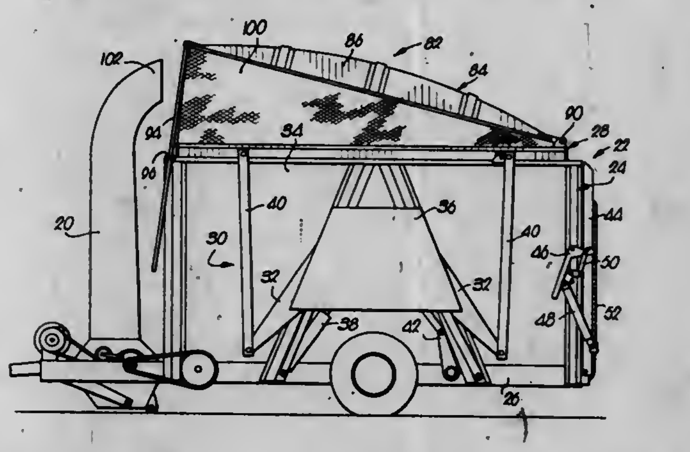
1. In a continuous loading-stacking machine, a

hollow, crop-receiving body having a lower, open top section provided with a bed and an upper, open bottom section provided with a roof;

apparatus operable continuously as the machine is advanced for picking up a crop off a field and feeding the same into the body while the upper section is raised,

said lower section being provided with means supporting the upper section for vertical reciprocation whereby, upon lowering of the upper section from time to time during continuous machine advancement, said roof thereof will move toward the bed against the crop collected in the body to compress said collected crop;

said roof being disposed for deposit of the crop thereupon during reciprocation of the upper section; and



structure carried by the roof thereabove for confining the crop on the roof during said reciprocation,

said roof having an opening communicating with the body and a gate closing the opening during feeding of the crop onto the roof,

there being means for opening the gate from time-to-time to discharge the accumulated crop from the roof into the body.

3,886,720

DEVICE FOR APPLYING FILAMENTARY MATERIAL ABOUT A WORKPIECE

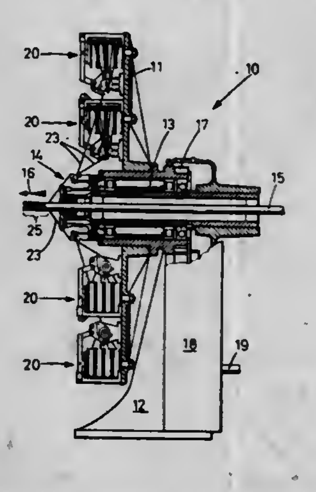
Max Ostermann, Wuppertal-Barmen, Germany, assignor to W. & M. Ostermann, Wuppertal, Germany

Filed Feb. 13, 1974, Ser. No. 442,125

Claims priority, application Germany, Feb. 16, 1973, 2307764

Int. Cl. B65h *81/08*

U.S. Cl. 57—13 **12 Claims**



1. In an apparatus for applying filamentary material to a workpiece, a combination comprising output means from which filamentary material is pulled off under tension to be applied to the workpiece; supply means carrying a supply of the filamentary material and being rotatable in response to withdrawal of such material which is being furnished to said output means; braking means displaceable between a first and a second operative mode in which it respectively permits and prevents rotation of said supply means and withdrawal of the filamentary material from the same, said braking means including a first roller about which said filamentary material is trained; loop-forming means including a second roller about which said filamentzry material is also trained and permanently tending to move with said second roller from an inoperative position to an operative position in which it forms a storage loop from a length of said filamentary material intermediate said output means and said supply means, said loop-forming means being responsive with movement to said operative position to a displacement of said braking means into said first mode and causing displacement of said braking means back into said second mode as a consequence of the formation of the loop, whereby said output means can withdraw filamentary material only from said loop until said length of filamentary material is used up and said loop-forming means is moved to said inoperative position; release means for displacing said braking means into said first mode in automatic response to movement of said loop-forming means toward said inoperative position; and preventing means for preventing contacting of said first and second rollers responsive of the relative positions assumed by the same.

3,886,721

METHOD FOR OVER-END WINDING OF YARNS

Kenneth Andrew Key, Abergavenny, and Clive William Hooper, Newport, both of England, assignors to Imperial Chemical Industries Limited, London, England

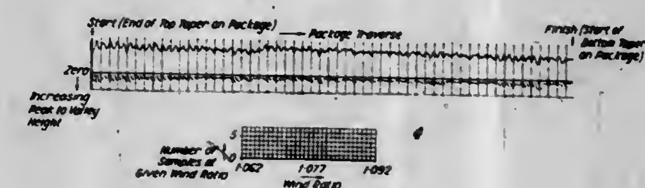
Division of Ser. No. 884,772, Dec. 23, 1969, abandoned, which is a continuation of Ser. No. 695,736, Jan. 4, 1968, abandoned.

This application May 30, 1973, Ser. No. 365,196

Claims priority, application United Kingdom, Jan. 17, 1967, 2476/67

Int. Cl. D01h *1/24, 1/02, 1/36*

U.S. Cl. 57—156 **5 Claims**



1. A process for producing a yarn package substantially free from ridges comprising winding the yarn into a package by means of a ring and traveller and spindle assembly with ring tilt of which the wave amplitude is greater than the traverse increment per revolution of the point of lay according to one or more values of at least substantially constant wind ratio calculated to avoid regions of patterning in the package and maintaining the wind ratio programme at least during a part of the winding, said wind ratio being obtained by continuously monitoring traveller speed, deriving an electrical signal from said monitored traveller speed, and regulating a parameter of said process by means of said electrical signals.

3,886,722

PROCESS FOR PRODUCING POLYESTER TEXTURED YARN

Kikuo Hori; Hidehiko Okada, and Masakazu Fujita, all of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Aug. 13, 1973, Ser. No. 387,629

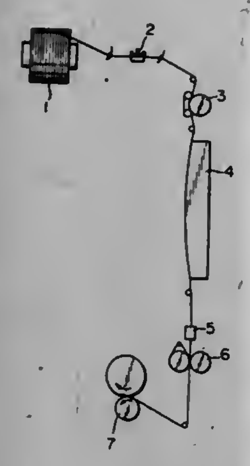
Claims priority, application Japan, Aug. 17, 1972, 47-81782

Int. Cl. D02g *1/00*

U.S. Cl. 57—157 TS **17 Claims**

1. A process for producing a polyester textured yarn which comprises drawing and simultaneously false-twisting an undrawn polyester yarn using a draw texturing apparatus equipped with a heat-treating heater and a false twister between feed rollers and draw rollers, wherein the undrawn polyester yarn has a birefringence (Δn) of 0.01 to 0.05, and the draw ratio (DR) is adjusted to a value expressed by the following equations according to the birefringence of the undrawn polyester yarn

$-1.8349 \log \Delta n - 1.1376 \leq DR \leq -2.1789 \log \Delta n - 1.3509$



and

$DR \leq 2.8.$

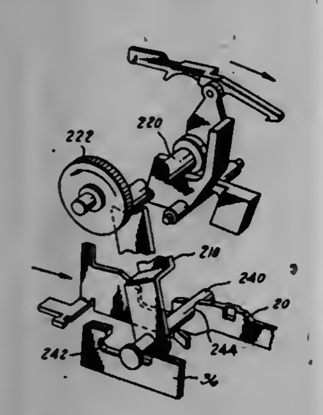
3,886,723
ALARM CLOCK TIMER

Robert L. Boyles, Wayland, Mass., assignor to General Electric Company, Bridgeport, Conn.

Division of Ser. No. 388,770, Aug. 16, 1973. This application June 21, 1974, Ser. No. 481,883

Int. Cl. G04b *23/06*

U.S. Cl. 58—21.15 **5 Claims**



1. An automatic alarm clock mechanism comprising:
a. an alarm vibrator arm;
b. a vibrator shutoff lever having an alarm on position out of engagement with said vibrator arm and an alarm off position in engagement with said vibrator arm;
c. an automatic alarm shutoff lever pivotally coupled to on said vibrator shutoff lever;
d. a member rotated as a function of time; and
e. a drive member eccentrically positioned on said member rotated as a function of time and movable into engagement with said automatic alarm shutoff lever for automatically moving the automatic alarm shutoff lever and the vibrator shutoff lever to an off position.

3,886,724
LIQUID CRYSTAL DISPLAY WATCH

Masaaki Kamiya, Matsudo, Japan, assignor to Kabushiki Kaisha Dianl Seikosha, Japan

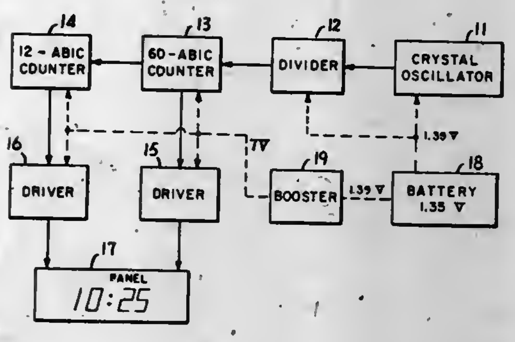
Filed Feb. 19, 1974, Ser. No. 443,185

Claims priority, application Japan, Feb. 23, 1973, 48-23354

Int. Cl. G04c *3/00;* **G04b** *19/30;* **H02j** *3/10*

U.S. Cl. 58—23 BA **4 Claims**

1. An electronic timepiece circuit comprising, an oscillator having a given frequency output, a frequency divider dividing the output of said oscillator, a divide-by-60 counter which counts modulo 60 counting output pulses of said frequency divider corresponding to minutes, a divide-by-12 counter which counts modulo 12 in series with the first-mentioned counter counting pulses corresponding to hours, a first driver connected to receive the output of the second-mentioned counter, a second driver connected to receive the output of the first-mentioned counter, a display panel displaying the output of said first driver as a digital output representation of time in hours, and displaying the output of the second driver as a digital output representation of time in minutes, a battery energizing said oscillator and said frequency divider, and a voltage booster comprising an astable blocking oscillator connected to said battery for boosting the output of said battery and applying it to both of said counters and both of said drivers.



3,886,725
DIGITAL TIMEPIECE

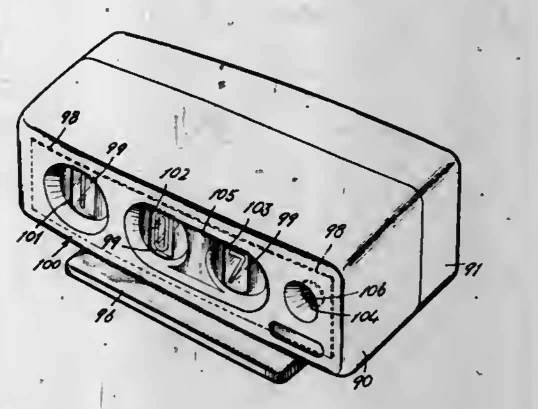
Masao Izawa; Kiyoto Ohlawa, both of Sakaki-machi, and Yookichi Yuasa, Tokura, all of Japan, assignors to Agatsuma Seiki K. K., Japan

Filed Nov. 20, 1973, Ser. No. 417,493

Claims priority, application Japan, Nov. 24, 1972, 47-134554; June 1, 1973, 48-63945; July 6, 1973, 48-79800

Int. Cl. G04b *19/30, 19/02*

U.S. Cl. 58—50 R **10 Claims**



1. A digital timepiece comprising an intermediate gear rotated continuously by a synchronous motor, an engaging protrusion integral with said intermediate gear, a series of intermittently rotative members arranged on a first plate and actuated in successive order and intermittently by said engaging protrusion, at least three rotary drums mounted on said intermittently rotative members, a plurality of light sources arranged on a second plate and positioned in each said rotary drum, and a cover enclosing and holding said motor, intermittently rotative members, rotary drums and light sources, said rotary drums being adapted to display characters for single digit of minute indications, two digits of minute indications and hour indications, said characters being formed of light-transmitting material, said covering being provided with a plurality of opening for displaying an indication unit of each of said rotary drums, and the light rays emitted from said light sources being emitted directly toward the outside through the characters of said light-transmitting construction and the openings of the covering.

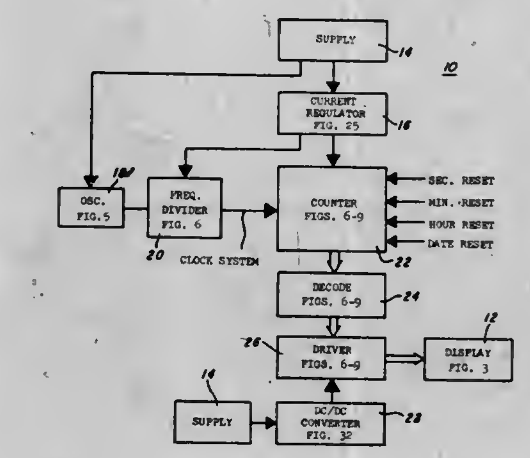
3,886,726
ELECTRONIC TIME KEEPING SYSTEM

Clark R. Williams, and Robert H. Schnurr, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 19, 1972, Ser. No. 264,212

Int. Cl. G04b *19/30, 11/24, 27/00*

U.S. Cl. 58—50 R **6 Claims**



1. A battery operated electronic timekeeping device comprising in combination:
a. current regulator means for producing constant current from a battery voltage source on the order of 1 volt;
b. a frequency source;
c. first circuit means coupled to said frequency source for providing a system clock signal;
d. logic means including counter means responsive to said system clock signal and operative to provide time data, said counter means being implemented by current driven bipolar integrated circuitry coupled to and driven by said current regulator means;
e. display means having a plurality of display elements for respectively displaying time data, and
f. voltage drive circuit means coupled to said display means and said logic means, said voltage drive circuit means being operable to impress drive voltages across said display in accordance with said time data.
g. time setting means coupled to the logic means for setting the status of the respective display elements independently of the other elements.

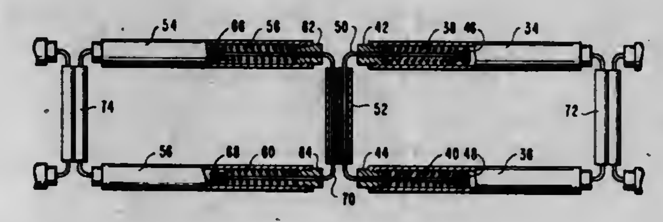
3,886,727
EXPANDABLE BELT

Richard Bower, 3708 Crownridge Dr., Sherman Oaks, Calif. 91403

Filed Sept. 4, 1973, Ser. No. 394,322

Int. Cl. F16g *13/24*

U.S. Cl. 59—79 B **9 Claims**



1. An expandable belt comprising a plurality of tubing, a collar adapted to attach to said tubing, a chain passing through a hole in the collar, a spring in said tubing held by an eyelet attached to the end of the chain, a connector adapted to receive said chain, and said tubing is threaded internally and said collar is threaded externally.

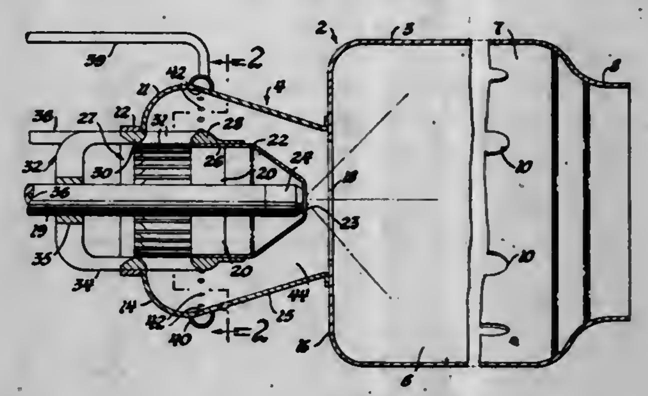
3,886,728
COMBUSTOR PRECHAMBER

Ronald E. Quinn, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed May 1, 1974, Ser. No. 465,754

Int. Cl. F02c *3/00, 7/22*

U.S. Cl. 60—39.23 **4 Claims**



1. A combustion liner for a gas turbine combustion apparatus or the like comprising a wall extending from an upstream end to a downstream end of the liner defining, in flow sequence, a prechamber, a reaction zone, a dilution zone, and an outlet for combustion products, the prechamber wall having a substantially circular cross section; means for delivering fuel to the inner surface of the prechamber wall; means defining an annular radial outflow air inlet at the upstream end of the prechamber, the air inlet extending circumferentially and axially of the prechamber upstream of the fuel delivering means; an air swirling and throttling cylinder disposed across the said air inlet movable axially of the prechamber, the cylinder bearing a set of swirl vanes adapted to direct the air outwardly and circumferentially from the inlet into the prechamber, the area of the set of swirl vanes being variable by axial movement of the cylinder to vary primary air flow into the liner.

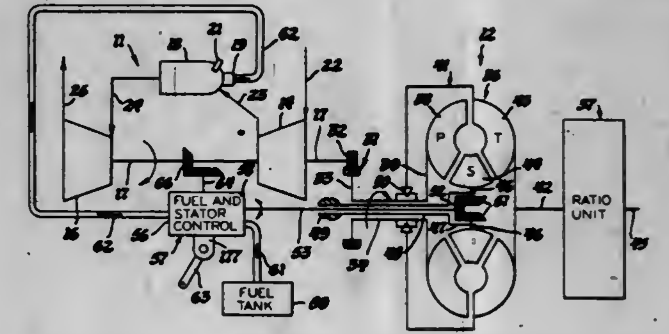
3,886,729
GAS TURBINE WITH THROTTLE RESPONSIVE HYDROKINETIC TORQUE CONVERTER AND THROTTLE RESPONSIVE HYDROKINETIC TORQUE CONVERTER

Charles A. Amann, Bloomfield Hills, and David C. Sheridan, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 30, 1973, Ser. No. 392,855

Int. Cl. F02d *9/02;* **F16d** *33/04*

U.S. Cl. 60—39.24 **19 Claims**



1. In a power train; an input member providing an input drive adapted to be driven by an engine; a load member for driving a load; a hydrokinetic torque converter having a stationary housing, a pump connected to said input member, a turbine connected to said load member, a stator and variable capacity means movable from a full rated power capacity position through a range of positions including an intermediate power capacity position to a closed minimum power capacity position operative to provide variable power capacity drive to the turbine; a throttle control means having a throttle

lever movable from a closed position through a first range of movement to an intermediate position for providing idle speed fuel feed for engine variable power and from intermediate position through a second range of movement for providing increasing fuel feed to full rated engine power position to provide input member power increasing as a function of input member speed; and capacity control means operatively connected to said variable capacity means and said throttle control means operative in response to movement of said throttle control lever from said closed position to said intermediate position to move said variable capacity means from said closed position to increase capacity as a function of throttle lever movement to increase idle speed power capacity with increased idle fuel feed.

12. In a power train; a single shaft gas turbine engine providing power varying as a variable rate function of engine speed up to rated power at rated speed, an input member driven by said engine; a load member for driving a load; a hydrokinetic torque converter having a stationary housing, a pump connected to said input member, a turbine connected to said load member, a stator and variable capacity means movable from full power capacity position through a range of positions to a minimum power capacity position; throttle control means connected to said engine having a throttle lever movable from a closed position through a first range of movement to an intermediate position providing idle speed fuel feed for maintaining idle speed with increased power for said engine throughout the first range of movement and movable from intermediate position through a second range of movement providing increasing fuel feed to full rated power at rated speed at full throttle; and capacity control means operatively connected to said variable capacity means, and said throttle control means operative in response to movement of said throttle lever from said closed position to said intermediate position to move said variable capacity means from said closed position to said intermediate position as a function of throttle movement to provide increased idle speed power capacity and substantially equally increased idle speed engine power.

3,886,730

GOVERNING DEVICE FOR A GAS TURBINE SYSTEM

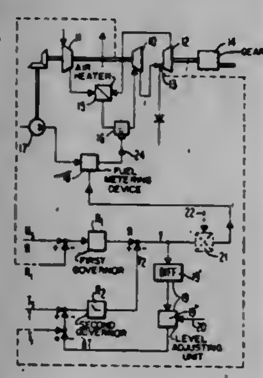
Christian Greune, Furstenfeldbruck; Friedrich Hackl, Neu-Esting, and Karl Maier, Munich, all of Germany, assignors to Motoren-und Turbinen-Union Munich GmbH, Germany

Filed Dec. 21, 1972, Ser. No. 317,306

Claims priority, application Germany, Dec. 21, 1971, 2163344

Int. Cl. F02c *9/08*

U.S. Cl. 60—39.28 R **11 Claims**



1. In a gas turbine system including a combustion chamber receiving combustion air from a turbine driven compressor and a fuel metering device for metering the flow of fuel to said combustion chamber, a governing arrangement for controlling said fuel metering device comprising first governor means responsive to a first engine operating characteristic for generating a first control signal, a sensor having an inherent response delay for sensing a second engine operating characteristic, second governor means connected to said sensor for generating an adjusting signal, logic means responsive to the first control signal and the adjusting signal for providing an output fuel flow control signal for application to said fuel metering device, and control means responsive to variations in said output fuel flow control signal and a signal representing a third engine operating characteristic for automatically controlling said second governor means to compensate for the inherent response delay of said sensor, said control means including a differentiating circuit means for differentiating the output fuel flow control signal, signal level adjusting means responsive to said third engine operating characteristic and the output of said differentiating circuit means for generating a signal representing an additive value for the value insufficiently sensed by said sensor as a result of the response delay, and a first summing junction receiving the output of said sensor and the output of said signal level adjusting means for controlling said second governor or means.

3,886,731

GOVERNING DEVICE FOR A GAS TURBINE SYSTEM

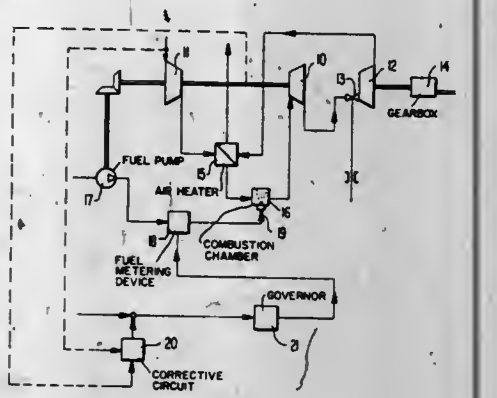
Christian Greune, Furstenfeldbruck, and Friedrich Hackl, Neu-Esting, both of Germany, assignors to Motoren-und Turbinen-Union Munchen GmbH, Germany

Filed Dec. 22, 1972, Ser. No. 317,776

Claims priority, application Germany, Dec. 22, 1971, 2163804

Int. Cl. F02c *9/08*

U.S. Cl. 60—39.28 T **8 Claims**



1. A governing system for controlling the fuel flow to a gas turbine engine having a combustion chamber receiving compressed air from a compressor and fuel from a fuel metering device, comprising a governor providing a control signal to control said fuel metering device, means for generating a speed correction signal at constant turbine speed or power lever angle in response to the related values of engine speed and temperature at the inlet of said compressor, and a summing junction for summing said speed correction signal and a desired speed signal, the output of said summing junction being applied in control of said governor at constant turbine speed or power lever angle.

3,886,732

INTERNAL COMBUSTION ENGINE HAVING COAXIALLY MOUNTED COMPRESSOR COMBUSTION CHAMBER, AND TURBINE

Joseph A. Gamell, Kalamazoo, Mich., assignor to Joseph Gamell Industries, Incorporated, Kalamazoo, Mich.

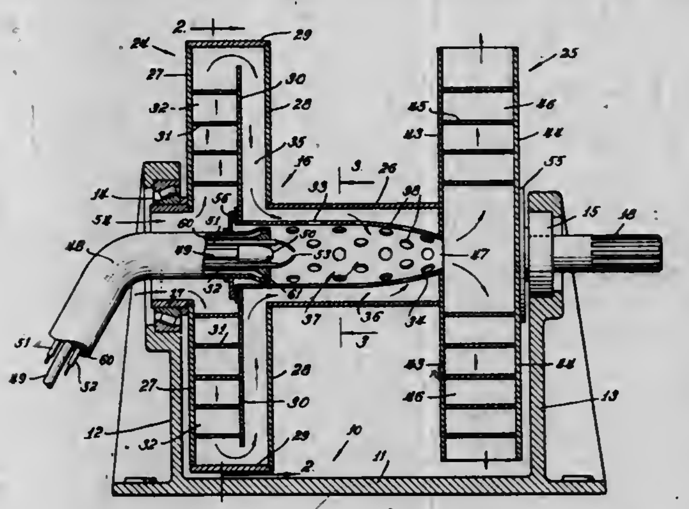
Filed Sept. 27, 1973, Ser. No. 401,206

Int. Cl. F02c *3/14*

U.S. Cl. 60—39.35 R **4 Claims**

1. An internal combustion engine of the turbine type comprising in combination:

1. a support,
2. an integral rotor combination rotatably mounted on said support, said rotor combination comprising:
   a. A compressor comprising a first outer radial wall, a second outer radial wall, a peripheral axial wall connecting said first and second outer radial walls, and an inner radial wall mounted intermediate said first and second outer radial walls and of smaller diameter than said outer radial walls, and a spiral web intermediate said first outer wall and said inner wall having its edges affixed to said walls, cooperating to define a spiral chamber,
   b. a turbine having a power shaft operatively connected thereto,
   c. a tubular housing connected at one end to said compressor and at the other end to said turbine, said inner radial wall and said second outer radial wall of said compressor cooperating to define a radial duct communicating with said tubular housing,
   d. means defining a combustion chamber within said tubular housing, said compressor, said turbine, said tubular housing and said combustion chamber all being coaxially mounted, and
3. a fuel duct mounted on said support extending through the axis of said compressor and having a fuel supply jet at the end thereof for supplying fuel to said combustion chamber.



3,886,733

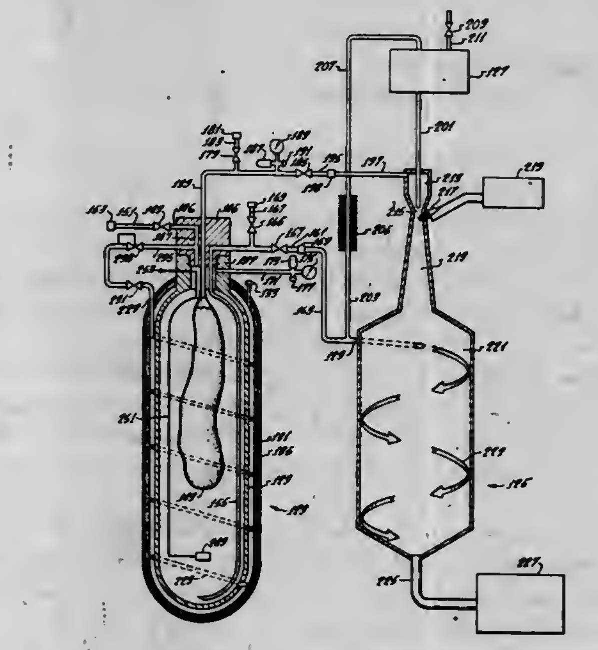
PNEUMATIC ENERGY SOURCE UTILIZING LIQUID OXYGEN

Joseph A. Connell, Fountain Valley, Calif., assignor to NRG Incorporated, Phoenix, Ariz.

Filed Aug. 24, 1973, Ser. No. 391,233

Int. Cl. F02g *3/00;* **F17c** *7/02*

U.S. Cl. 60—39.48 **20 Claims**



1. Apparatus for producing pneumatic power, comprising:
an insulated vessel, comprising:
a first container for storing liquified inert gas at an elevated pressure; and
a second container within said first container for storing liquified oxygen, said second container permitting heat flow from said liquified oxygen to said liquified inert gas when a temperature differential exists therebetween, said second container including means for applying said elevated pressure of said liquified inert gas to said liquified oxygen to pump said liquified oxygen from said second container;
means for storing a hydrocarbon fuel; and
a combustion chamber fluidly connected to said storing means and said insulated vessel comprising:
means for combining said liquified oxygen with said hydrocarbon fuel to produce a high temperature flame; and
means for injecting said liquified inert gas into said high temperature flame.

3,886,734

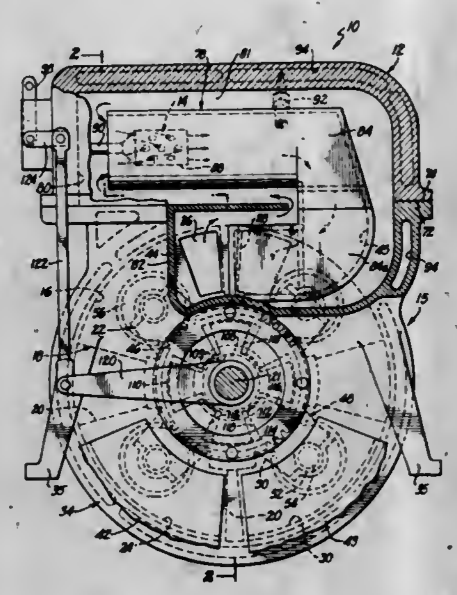
CONTINUOUS COMBUSTION ENGINE

Richard G. Johnson, 2611 W. Ave. N.-12, Palmdale, Calif. 93550

Filed May 23, 1973, Ser. No. 363,030

Int. Cl. F02g *3/00*

U.S. Cl. 60—39.61 **9 Claims**

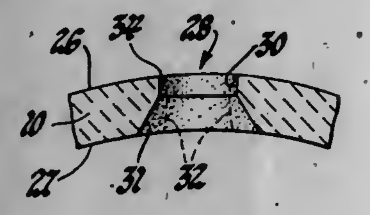


1. A continuous combustion engine comprising:
a combustion chamber containing a fuel burner,
a housing, a rotary shaft supported in said housing, an annular power cylinder in said housing about said shaft, pistons in and movable around said cylinder and defining with the cylinder working chambers between the adjacent pistons, and means connecting said pistons, housing, and shaft for effecting reciprocating motion of said pistons in timed relation during movement of said pistons around said cylinder in a manner such that said working chambers undergo alternate expansion and contraction during their movement around said cylinder with said pistons and that said shaft is rotated by movement of said pistons around said cylinder, and
valving means for effecting admission of air to each working chamber through an intake phase for compression of said air and transfer of the compressed air to said combustion chamber through a port in said housing during contraction of the working chamber for heating through a transfer phase by fuel combustion of the air in said combustion chamber to produce a hot pressurized working fluid, transfer of said working fluid to the working chamber through a port in said housing during expansion thereof through a power phase to drive said pistons around said cylinder and thereby said shaft in rotation, and exhausting

of the spent working fluid from the working chamber through an exhaust phase.

3,886,735
CERAMIC COMBUSTION LINER

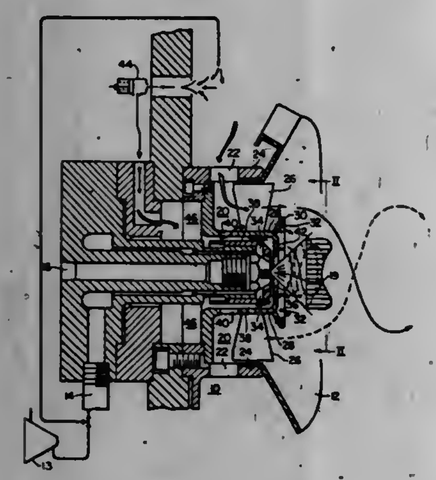
John A. Irwin, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Apr. 1, 1974, Ser. No. 456,602
Int. Cl. F02c *1/00;* **F23d** *15/00*
U.S. Cl. 60—39.65 **11 Claims**



1. A combustion apparatus comprising a combustion liner defining a space for combustion of fuel, the liner having a wall of ceramic material defining the exterior of the liner and defining ports for admission of air into the liner, the air being significantly cooler than the liner in normal operation of the combustion apparatus, and means for reducing thermal stresses in the wall due to local cooling of the wall by air streams entering through the ports providing a barrier contracting the entrance to the ports so that the air streams remain substantially clear of the wall, thus minimizing transfer of heat from the wall to the streams.

3,886,736
COMBUSTION APPARATUS FOR GAS TURBINE

Katsuyuki Kawaguchi, Akashi, Japan, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Oct. 31, 1973, Ser. No. 411,497
Claims priority, application Japan, Nov. 9, 1972, 47-111619
Int. Cl. B05b *7/10;* **F02c** *3/00*
U.S. Cl. 60—39.74 R **4 Claims**



1. A combustion apparatus for a gas turbine having a combustion chamber, a fuel supply, a compressor to supply a pressurized air for combustion, a supply of pressurized atomizing fluid to atomize the fuel, said combustion apparatus comprising:

a fuel supply nozzle having at least one port in communication with said combustion chamber and disposed to direct the flow of fuel to said combustion chamber;

an atomizing fluid chamber having walls which define at least one duct disposed to direct atomizing fluid into said combustion chamber so that it converges with fuel flowing thereto;

a plenum chamber comprised of walls disposed about said atomizing fluid chamber;

a first array of angularly arranged ports disposed through said wall of said plenum chamber and disposed about said fuel nozzle, said first array of angularly arranged ports providing jets of air to promote vortecular motion to the fuel in said combustion chamber;

a frustoconical baffle having its small diameter edge attached to said walls of said plenum chamber, said baffle being annularly disposed about said nozzle;

a second array of angularly arranged ports disposed through said baffle about said fuel nozzle, said second array of angularly arranged ports providing jets of air to promote mixing and increase vortecular motion of the combustion components;

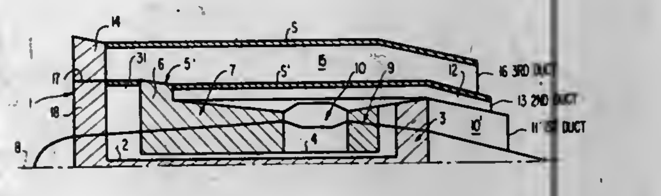
an arcuate chamber disposed radially outwardly of said plenum chamber, said arcuate chamber having walls with inlet ports therethrough, said arcuate chamber being in communication with said compressor and said combustion chamber, and a generally radially extending array of vanes disposed across said arcuate chamber for causing the air passing therethrough to have a vortecular motion as it enters the combustion chamber;

said first and second arrays of ports and said array of vanes each directing generally the same angle to the fluid passing thereby, with respect to the axis of the combustion chamber;

said array of vanes and said first and second arrays of ports being arranged as to cause the air and fuel to follow a vortecular motion, and to increase the turbulence therein, thereby reducing the smoke generated therewith.

3,886,737
TURBOJET ENGINES OF MULTI-SHAFT AND MULTI-FLOW CONSTRUCTION

Hubert Grieb, Unterpfaffenhofen, Germany, assignor to Motoren-und Turbinen-Union Munchen GmbH, Germany
Filed Aug. 22, 1973, Ser. No. 390,485
Claims priority, application Germany, Aug. 22, 1972, 2241283
Int. Cl. F02k *3/06*
U.S. Cl. 60—226 R **38 Claims**



1. A turbojet engine comprising:

first fluid energizing means for energizing a first fluid stream,

second fluid energizing means for energizing a second fluid stream,

third fluid energizing means for energizing a third fluid stream,

first duct means for conducting said first fluid stream to a propulsion nozzle arrangement where said first fluid stream is discharged at a first jet velocity,

second duct means for conducting said second fluid stream to said propulsion nozzle arrangement where said second fluid stream is discharged in annular surrounding relationship to said first fluid stream and at a second jet velocity,

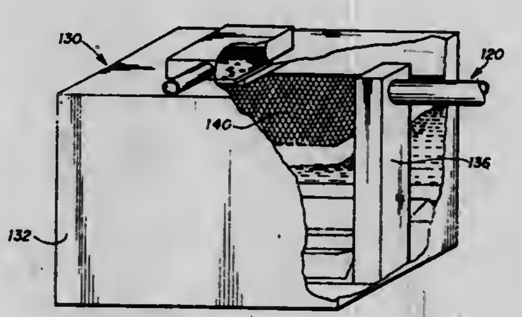
third duct means for conducting said third fluid stream to said propulsion nozzle arrangement where said third fluid stream is discharged in annular surrounding relationship to said second fluid stream and at a third jet velocity,

wherein said first jet velocity is greater than said second jet velocity and said second jet velocity is greater than said third jet velocity.

wherein said third fluid energizing means includes a radially outer portion of a first rotatable fan means arranged immediately upstream of inlet means to said third duct means, wherein said second fluid energizing means includes a second rotatable fan means arranged downstream of said first fan means and immediately upstream of inlet means of said second duct means, wherein flow into all of said duct means passes through said first fan means, wherein flow into only said first and second duct means passes through said second fan means, and wherein said first and second fan means operate at different rotational speeds with respect to one another.

3,886,738
DIESEL ENGINE FOR USE IN MINES

Gerald Bruce Sien, Carlsbad, N. Mex., assignor to Sien Equipment Company, Carlsbad, N. Mex.
Filed Apr. 23, 1973, Ser. No. 353,519
Int. Cl. F02b *75/10*
U.S. Cl. 60—277 **12 Claims**



1. A diesel engine for use in mines which comprises:

an air filter for receiving intake air;

an intake flame arrester for receiving the air flowing from the air filter and comprising opposed bells adapted to clamp a flame arrester member therebetween;

an emergency air cut-off valve for receiving the air flowing from the intake flame arrester and adapted for selective manual actuation to terminate air flow into the engine;

an intake manifold for receiving the air flowing through the air filter, the intake flame arrester, and the emergency air cut-off valve and for directing the air to the cylinders of the engine;

an exhaust manifold for receiving exhaust gases from the cylinders of the engine;

means for directing cooling liquid through the exhaust manifold and thereby partially cooling the exhaust gases passing therethrough;

means for spraying water into the exhaust gases flowing from the exhaust manifold and thereby further cooling the exhaust gases by means of vaporization of the water spray;

a scrubber for receiving the exhaust gases flowing from the exhaust manifold and water vapor entrained therein, said scrubber comprising:

  an enclosure for receiving a substantial quantity of water;

  means for directing the exhaust gases and the water vapor entrained therein to a point beneath the surface of the water in the enclosure;

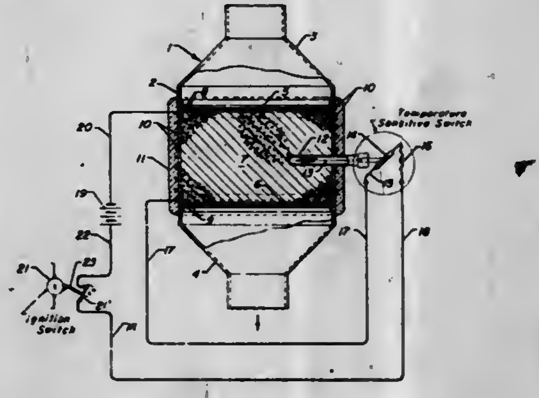
  baffle means comprising inverted trough-shaped baffle members extending the length of the enclosure and mounted beneath the surface of the water in the enclosure for distributing the exhaust gases and the water vapor entrained therein beneath the surface of the water in the enclosure; and

  water retainer means mounted within the enclosure above the surface of the water and comprising an expanded metal member extending substantially parallel to the bottom of the enclosure and throughout the entire length and width of the enclosure and throughout the entire length and width of the enclosure for removing entrained water vapor from the exhaust gases flowing from the scrubber, and

exhaust gas diffuser means comprising a horizontally disposed conduit having outlet holes formed through it at a plurality of axially spaced points for receiving the exhaust gases flowing from the scrubber and for discharging the exhaust gases to the surrounding atmosphere.

3,886,739
HEATING OF CATALYTIC CONVERTER CASING

Richard K. Lee, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Nov. 9, 1973, Ser. No. 414,583
Int. Cl. F01n *3/00, 3/14*
U.S. Cl. 60—286 **4 Claims**



1. In a combination of a catalytic converter and a control system therefor, said combination being utilized for effecting the conversion of an internal combustion engine exhaust gas stream passing through said catalytic converter, the improvement comprising, a converter housing having a wall portion surrounding a catalyst section therein, an electrical power source, a resistance heating means encompassing at least a part of said wall portion of said converter housing, said resistance heating means being in interconnection with said electrical power source, a temperature response means immersed in said catalyst section being responsive to the temperature therein, an ignition key means in interconnection with said engine for providing electrical power to said engine, a switch means in interconnection with said key means, said temperature responsive means and said electrical power source, said temperature responsive means actuating said switch means to thereby cut off said electrical power source to said resistance heating means at a predetermined temperature when the ignition key means provides power to said engine, and conversely closing said switch means to provide electrical power to said resistance heating means at a predetermined temperature when said ignition key means is deactuated and said engine is thereby deactuated, thereby to preclude rapid cooling of said converter housing and consequent compressive crushing action therefrom on the encompassed catalyst within said catalyst section after engine cut-off and while said catalyst is in a high temperature expanded state resultant upon ordinary engine operation.

3,886,740
HYDRODYNAMIC TORQUE CONVERTER WITH HYDRAULICALLY ENERGIZED ONE-WAY ROLLER CLUTCH

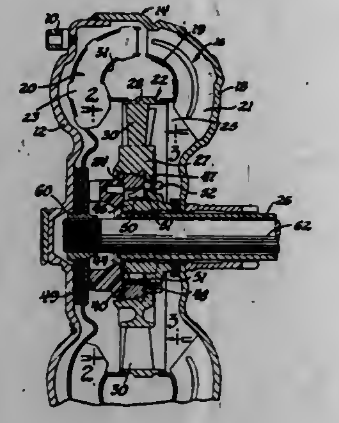
Frank S. Krok, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed June 17, 1974, Ser. No. 480,045
Int. Cl. F16d *33/00*
U.S. Cl. 60—341 **2 Claims**

1. In a hydraulic torque converter having a bladed pump and a bladed turbine discharging hydraulic fluid into the inlet of the bladed pump through a bladed stator operatively connected to a ground sleeve by a one-way roller clutch for pro-

viding torque multiplying and fluid coupling modes of operation, the improvement comprising:

a roller energizer for locating the rollers of said roller clutch at a position of incipient wedging engagement with the clutch races responsive to the flow of hydraulic fluid in said hydraulic torque converter during the operation thereof,

said roller energizer being mounted in said torque converter for rotation relative to said clutch races and having a plurality of fingers individually engaging said rollers and a plurality of paddles disposed in the hydraulic fluid between the outlet of said stator and the inlet of said pump.



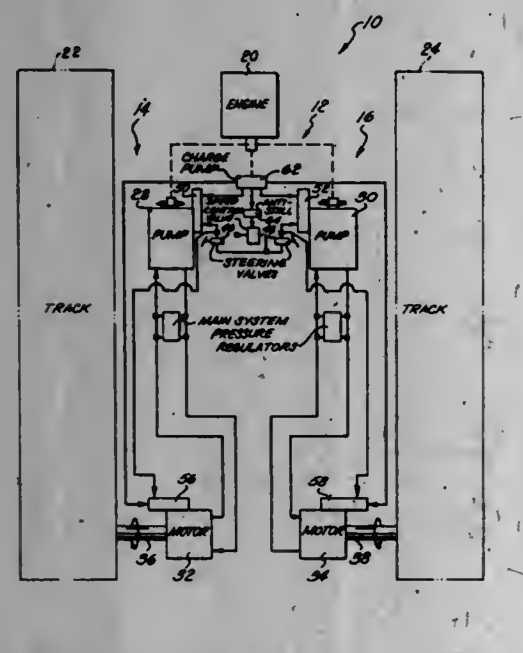
3,886,741
HYDROSTATIC TRANSMISSION ANTI-STALL SYSTEM

Harold R. Ward, Marshall, Mich., assignor to Eaton Corp., Cleveland, Ohio

Continuation-in-part of Ser. No. 356,720, May 3, 1973, abandoned. This application Mar. 13, 1974, Ser. No. 450,280

Int. Cl. F16h *39/46*

U.S. Cl. 60—431 **15 Claims**



1. An apparatus for controlling the operation of a hydrostatic transmission driven by a prime mover and having a variable displacement hydrostatic unit, said apparatus comprising motor means for varying the displacement of the hydrostatic unit and the output speed of the hydrostatic transmission, anti-stall means for effecting operation of said motor means to vary the displacement of the hydrostatic transmission upon the occurrence of an impending overloading of the prime mover, and rate control means for retarding operation of said anti-stall means in response to a rapid increase in the loading of the prime mover.

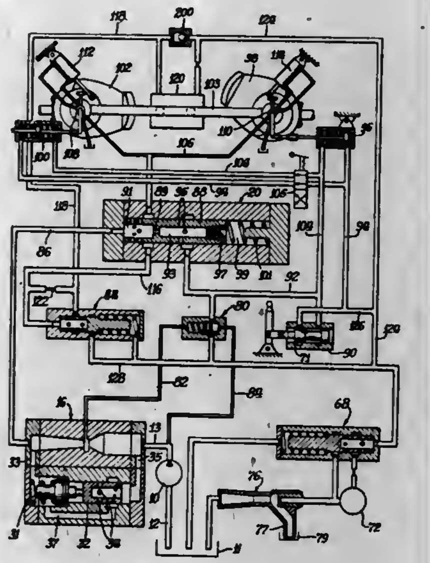
3,886,742
SINGLE PUMP HYDROSTATIC TRANSMISSION CONTROL AND SUPPLY SYSTEM

Gordon W. Johnson, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 427,087, Dec. 12, 1973. This application Sept. 20, 1974, Ser. No. 507,759

Int. Cl. F15b *11/02*

U.S. Cl. 60—488 **4 Claims**



1. A supply and control system for a hydrostatic transmission including; a source of fluid under pressure, flow control valve means for providing a constant volumetric rate of fluid flow, first fluid communication means between said source and said flow control valve means, speed control valve means for regulating the flow of fluid from said constant volumetric rate of flow provided by said flow control valve means to speed control means of said hydrostatic transmission, second fluid communication means between said speed control valve means and said flow control valve means, and third fluid communication means between said speed control valve means and said speed control means of said transmission.

3,886,743
HOT-GAS RECIPROCATING ENGINE AND CONTROL DEVICE

Jacobus Hubertus Abrahams, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 307,998, Nov. 20, 1972. This application Nov. 23, 1973, Ser. No. 418,297

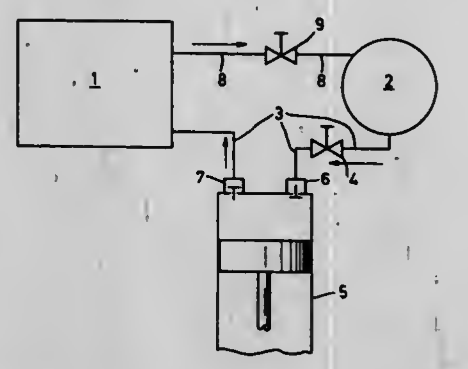
Claims priority, application Netherlands, Dec. 2, 1971, 7116550

Int. Cl. F03g *7/06*

U.S. Cl. 60—521 **4 Claims**

1. In a hot-gas engine operable with a working medium and including a working space, the improvement in combination therewith of means for controlling the quantity by weight of working medium in the working space, comprising a storage container for working medium, a compressor with a low pressure inlet and a high-pressure outlet, first and second ducts communicating said storage container with said working space, and first and second controllable valve means respectively in said ducts, said first duct means communicating said

storage container via said first valve with said compressor inlet, and communicating said compressor outlet with said working space, and said second duct means communicating said container via said second valve with said working space.



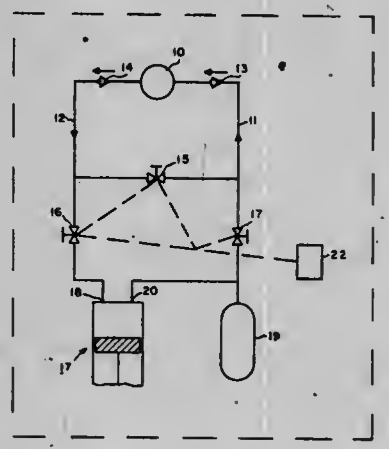
3,886,744
POWER-CONTROL SYSTEM FOR STIRLING ENGINES

Hendrik A. Jaspers, Ossining, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed July 22, 1974, Ser. No. 490,728

Int. Cl. F03g *7/06*

U.S. Cl. 60—521 **8 Claims**



1. In a Stirling engine which includes a working space where a working gas is cycled between high and low pressures, the improvement in combination therewith of a power regulating system comprising a storage container with a bellows therein separating first and second chambers, the first chamber containing working gas, the second chamber containing a binary liquid-vapor mixture, the power-regulating system further comprising a supply conduit for conducting gas from said first chamber to said working space, and a dump conduit for discharging gas from said working space to said first chamber, and valve means for selectively regulating said gas flows in said supply and dump conduits, said gas in the first chamber being maintained at a substantially constant pressure since said mixture in the second chamber will vaporize and condense respectively according to the decrease or increase of gas in the first chamber.

3,886,745
HYDRAULIC ACTUATING DEVICE

Fukumi Kaida; Risaburo Nonaka, both of Kawagoe; Takeo Sugii, Tokyo, and Tetsuo Haraikawa, Funabashi, all of Japan, assignors to Tokico Ltd., Fujimi and Nippon Oils and Fats Co. Ltd., Tokyo, both of, Japan

Filed Dec. 21, 1973, Ser. No. 427,104

Claims priority, application Japan, Dec. 27, 1972, 48-584

Int. Cl. F15b *13/04*

U.S. Cl. 60—533 **3 Claims**

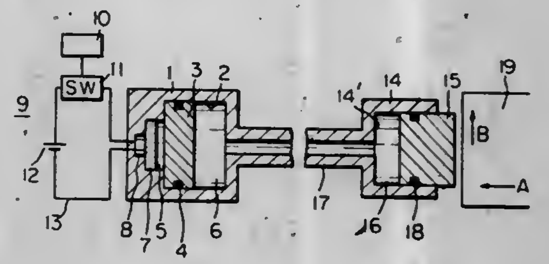
1. A hydraulic actuating device, comprising:

a gas generating means having a first piston reciprocally slidable in a fluid tight relation therein, said means having a first chamber adjacent to the piston on one side thereof, a predetermined amount of self-combustible material in said chamber, and an igniting means therefor in igniting relationship with said material;

detecting means for detecting an emergency condition, and an electric circuit to which said detecting means is connected and connected to said igniting means for issuing an igniting signal to said igniting means upon detection of an emergency condition by said detecting means;

said gas generating means having a second chamber on the other side of said piston;

an actuating cylinder communicating with said second chamber and having a second piston slidable therein, with a liquid filling the space between one side of said second piston and said other side of said first piston in said gas generating means; whereby, when said igniting means is actuated by said signal transmitting means to ignite said self-combustible material, gas pressure produced thereby is applied to said first piston on said one side thereof, thus exerting pressure on the liquid on said other side of the first piston which is transmitted to the actuating cylinder to actuate said second piston.



3,886,746
POWER ASSISTED MASTER CYLINDER ASSEMBLIES

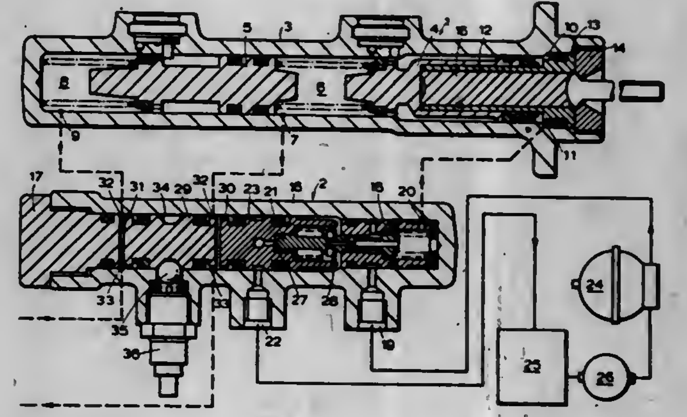
Glyn Phillip Reginald Farr, Kenilworth, England, assignor to Girling Limited, Birmingham, England

Filed Nov. 28, 1973, Ser. No. 419,662

Claims priority, application United Kingdom, Nov. 30, 1972, 55397/72; Feb. 20, 1973, 8177/73

Int. Cl. F15b *15/18;* **B60f** *17/06;* **B60r** *25/08*

U.S. Cl. 60—547 **5 Claims**



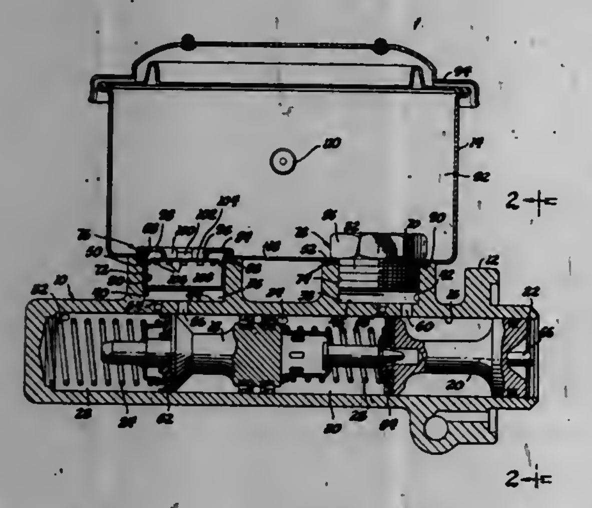
1. A power-assisted master cylinder assembly comprising a master cylinder which includes a cylinder body, a primary and a secondary piston arranged in tandem in said body, a primary and a secondary pressure space being defined ahead of said primary and said secondary piston respectively, an outlet from each of said pressure spaces for connection to a primary and secondary brake circuit respectively, a power chamber in said cylinder body behind said primary piston and an inlet to said power chamber for connection to a source of fluid under pressure; and a control valve assembly which includes valve means for controlling the supply of fluid from said source to said power chamber, and means for operating said valve

means in response to three conditions; firstly to pressure in both of said primary and secondary pressure spaces when both brake circuits are operational, secondly to pressure in said secondary pressure space in the event of a failure of said primary circuit, and thirdly to pressure in said primary space in the event of a failure of said secondary circuit.

3,886,747
MASTER CYLINDER ASSEMBLY AND RESERVOIR FOR SAME

Duane H. Harwick, Kettering, and Dwight W. McDaniel, Trotwood, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 19, 1974, Ser. No. 462,355
Int. Cl. F15b *7/08*
U.S. Cl. 60—585 **2 Claims**



1. A master cylinder reservoir arrangement comprising:

a master cylinder body having a first fluid reservoir chamber formed therein with an open top, a bottom provided with a compensation port, and a cylindrical side wall having an internally threaded section adjacent the open top;

a main fluid reservoir body defining a second fluid reservoir chamber having a side wall and a removable sealing top and a bottom, said bottom having an aperture therein positioned over said first fluid reservoir chamber and being at least as large as said first fluid reservoir chamber open top;

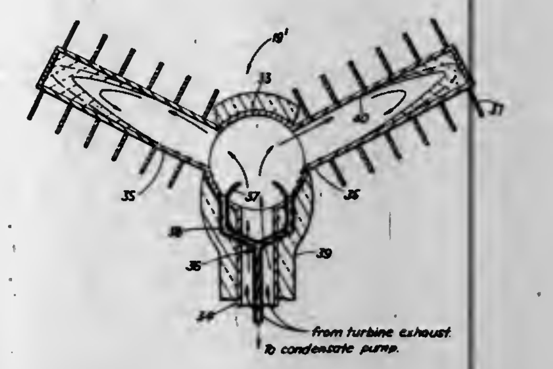
and means securing said main fluid reservoir body to said master cylinder body comprising a tubular member having an externally threaded section and a standpipe section of greater diameter than said externally threaded section to provide a shoulder therebetween, said externally threaded section extending through said aperture and threaded into said internally threaded section of said first fluid reservoir chamber cylindrical side wall with said shoulder tightly engaging said second fluid reservoir chamber bottom to retain said main fluid reservoir body on said master cylinder body, said standpipe section extending upwardly into said second fluid reservoir chamber to provide a dam extending above said second fluid reservoir chamber bottom.

3,886,748
CLOSED RANKINE CYCLE POWER PLANT AND CONDENSER THEREFOR

Lucien Yehuda Bronicki, Rehovoth, Israel, assignor to Ormat Turbines (1965) Ltd., Yavne, Israel

Filed Aug. 29, 1973, Ser. No. 391,164
Claims priority, application Israel, Sept. 5, 1972, 40295
Int. Cl. F01k *25/08*
U.S. Cl. 60—651 **11 Claims**

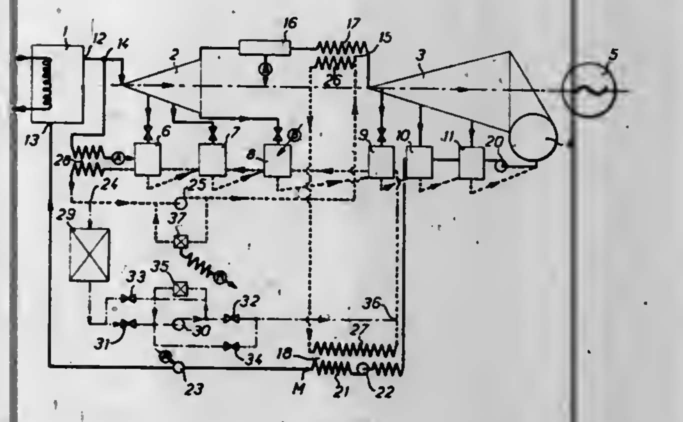
1. A closed Rankine cycle power plant comprising an organic fluid with a freezing point above the effective ambient temperature, a boiler for vaporizing the fluid from its liquid state, a turbine for expanding the vapor and driving a load such as an electric generator, a condenser exposed to a heat sink at ambient temperature for converting the turbine exhaust vapors to a liquid at a lower temperature and pressure than in the boiler, and means for feeding the condensed liquid back into the boiler, the condenser having means for effecting the freezing of condensate on the inside of the condenser without blocking the flow of vapors into the condenser.



3,886,749
STEAM POWER STATIONS

Pierre Henri Pacault, Ville D'Avray, France, assignor to Babcock-Atlantique Societe Anonyme, Paris, France

Filed July 10, 1973, Ser. No. 377,952
Claims priority, application France, July 13, 1972, 72.25450; Jan. 26, 1973, 73.02789; Jan. 26, 1973, 73.02790
Int. Cl. F01k *3/00*
U.S. Cl. 60—652 **29 Claims**



1. A method of operating a steam power station with a variable-demand network, the station comprising a generating installation including a heat source, a steam generator, at least one steam turbine, and an accumulator adapted to draw heat from the installation by transfer with a heat-transfer fluid; said method comprising the steps of storing said heat and subsequently restoring it to the installation for operation of same, characterized by the fact that the heat-transfer fluid for the transferring of heat between the installation and the accumulator is in heat-exchange relation with steam of which at least a part has performed mechanical work in said turbine.

3,886,750
OIL CONTAINMENT APPARATUS

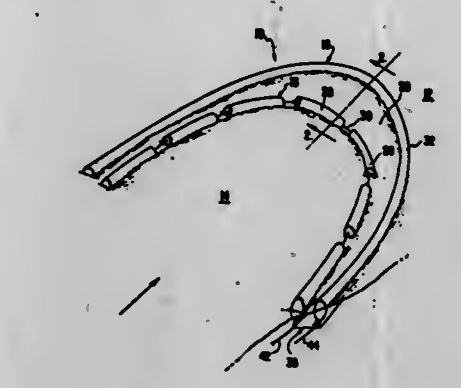
Ray R. Ayers, and Errol V. Seymour, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 81,305, Oct. 16, 1970, abandoned. This application Apr. 24, 1972, Ser. No. 247,079
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 F **15 Claims**

1. Apparatus for controlling a spill of floating liquid pollutant on a water surface experiencing a relative current velocity therepast comprising:

spaced apart buoyant float means defining therebetween a capture area;

means defining a path of water movement generally horizontally into the capture area and generally downwardly out of the capture area; and



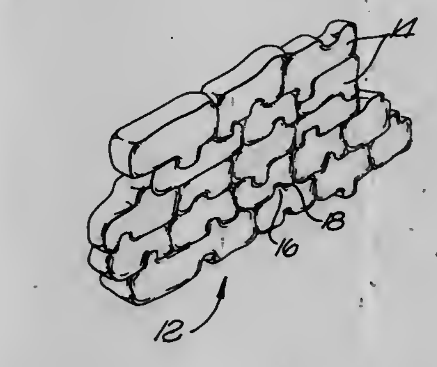
flow restriction means in the inlet to the capture area;

flow restriction means in the outlet from the capture area for reducing the flow velocity in the capture area below the relative current velocity, the outlet flow restriction being effectively greater than the inlet flow restriction.

3,886,751
AQUATIC CONSTRUCTION MODULE AND METHOD OF FORMING THEREOF

Mauricio Porraz Jimenez Labora, Bosque de Moctezuma No. 9, Mexico City, Mexico

Filed Nov. 12, 1973, Ser. No. 415,059
Int. Cl. E02b *3/00, 7/08*
U.S. Cl. 61—3 **6 Claims**



1. A construction module for in situ placement of aggregate comprising:

a collapsible bag of nonporous material, said bag being collapsible for storage and transportation, and expandable for filling with aggregate;

said bag having an inlet means including an outwardly extending protuberance for receiving said aggregate at the construction site;

said bag having an outlet means including an outwardly extending protuberance for relief of pressure build-up in said bag as aggregate is inserted therein;

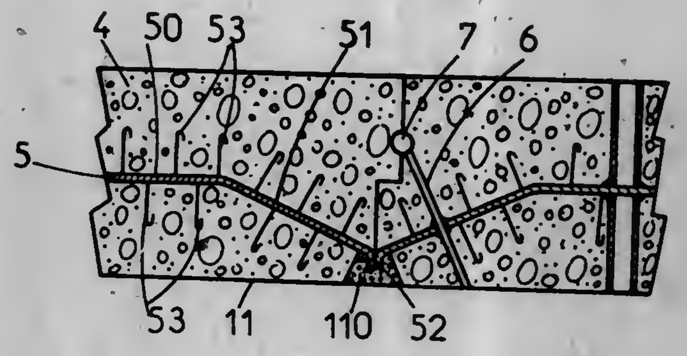
means disposed in said inlet and outlet means including a rod permanently affixed therein and extending through said protuberance into said bag for retaining said inlet and outlet means open during the filling of said bag with said aggregate; and

means formed on said bags for interlocking adjacent filled bags with each other for preventing movement of said bags due to water movement against said bags comprising an elongate inlet and an elongate outlet and a metal reinforcing rod centrally positioned in said inlet and outlet extending parallel to the axis of said inlet and outlet, said outlet enabling air to escape from said bag when said aggregate is fed into said bag.

3,886,752
PREFABRICATED ELEMENT FOR WALL CONSTRUCTION

Gaston Denoor, Grenoble, France, assignor to B.V.S., Grenoble, France

Filed Nov. 29, 1973, Ser. No. 419,926
Claims priority, application France, Jan. 9, 1973, 73.00560
Int. Cl. E21d *11/08*
U.S. Cl. 61—45 R **2 Claims**



2. A prefabricated element for use in the construction of a fluid-tight wall comprising a plurality of such elements positioned side by side with their lateral faces in contact, said element comprising:

a body of moulded material;

an impermeable sheet member embedded in said body and adhering thereto, said sheet member having a rim extending about the periphery thereof and tangentially to the lateral faces of said body, such that when two such elements are positioned side by side, said rims of said sheet members of said elements contact each other, the element being an arch-stone of rectangular form having an intrados face, a curved extrados face and four lateral faces, chamfers along the edges of the intrados face, into which said rims of said sheet member extend, said sheet member having a curved central portion extending in the central portion of the arch-stone, and four inclined lateral faces each projecting into said chamfer of said intrados face and being extended by said rim tangential to the plane of the corresponding lateral face, a mortar injection tube passing through said sheet member and extending from the intrados face, and said tube opening into a recess formed in a lateral face of the element extending along the lateral face between the sheet member and the extrados face.

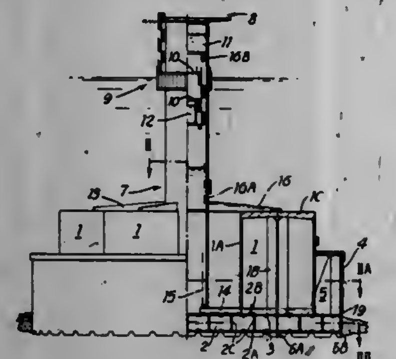
3,886,753
SUBMERSIBLE STRUCTURES

Jal Nariman Birdy, 61, Summit Rd., Northolt, Middlesex, and Shirley Bowers Stubbs, 3, Birkdale Rd., Ealing, Longdon, W5, both of England

Filed Mar. 28, 1973, Ser. No. 345,757
Claims priority, application United Kingdom, Apr. 4, 1972, 15546/72
Int. Cl. E02b *17/00;* **B65g** *5/00;* **B65d** *11/00*
U.S. Cl. 61—46.5 **12 Claims**

1. A submersible structure that can be floated to a desired location and then caused to sink so as to rest on the water bed, the structure comprising a reinforced concrete cellular base, a pluraliity of reinforced concrete hollow containers upstanding from said reinforced concrete cellular base, a solid reinforced concrete perimeter wall also upstanding from the base and completely encircling said containers to form an upwardly open interior space which is capable of holding water, at least one reinforced concrete hollow column extending from the cellular base to above water level in use of the structure, valves and ducting extending from the interiors of the containers and the cellular base to services situated inside the column, whereby, from the floating condition, the structure can be caused to sink by supplying ballast water to said interior space between the containers and the outer perimeter wall, to the

interior of the cellular base and to the interiors of the containers, and whereby the structure can be refloated by pumping these zones dry and a separator chamber in said column connected by said ducting to said containers, said separator chamber being at a level in said column to be below the water level in the submerged condition of the structure to reduce by external hydrostatic pressure, the bursting forces due to the storage of liquid in said containers.



3,886,754

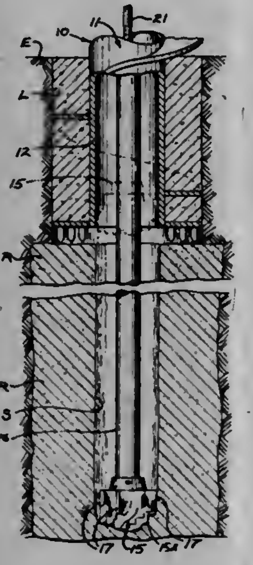
METHOD OF EXTENDING AUGERED PILE CAVITY THROUGH ROCK OR LIKE OBSTRUCTION

Lee A. Turzillo, 2078 Glengary Rd., Akron, Ohio 44313

Filed July 27, 1973, Ser. No. 383,454

Int. Cl. E02d *5/34, 15/04*

U.S. Cl. 61—53.64 **4 Claims**



1. A method of forming a pile or like column in an earth situs including a rock-like formation, comprising the steps of screwing a hollow-shafted, spiral-flighted auger axially into the earth of the situs to drill a cavity therein to a depth encountering the rock formation; operating a hollow-shafted rock drill through the hollow shaft of the auger, with a drill bit presented inwardly, to drill a cavity extension of selective depth and given diameter in the rock formation; applying fluid pressure means within the rock cavity to remove the drilled rock cuttings therefrom through the auger shaft; withdrawing the rock drill through the auger shaft; such hollow shaft of such rock drill having an outer diameter substantially less than the inner diameter of the auger shaft, and such drill bit including peripherally spaced rock cutting blades and guide means including axially extending edges on the blades of substantial axial extent having an outer diameter slightly less than the inner diameter of such auger shaft which engage the rock cavity wall and extend into the auger shaft during withdrawal of the rock drill to guide the drill bit from the cavity extension axially into the hollow shaft auger; and feeding pressurized, self-hardenable, fluid material into the cavity and cavity extension to form a columnar body.

3,886,755

METHOD FOR LOCATING AN UNDERGROUND CABLE

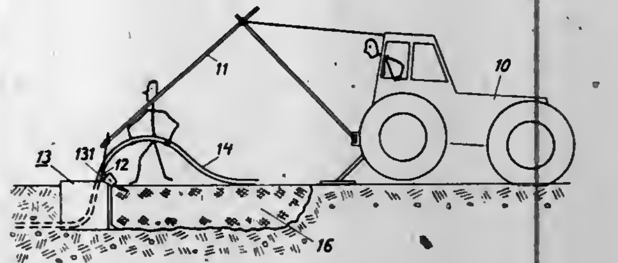
Holger Alexander Lundin, Enskede, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed June 6, 1973, Ser. No. 367,425

Claims priority, application Sweden, June 21, 1972, 8164/72; Feb. 20, 1972, 23400/72

Int. Cl. A01b *3/64;* **F16l** *1/00;* **A01b** *13/08*

U.S. Cl. 61—72.6 **7 Claims**



1. A method of laying an underground cable, said method comprising the steps of:

providing a digging assembly including a movable but stationarily operating power plant, a digging tool, a cable laying tool and a pulling mechanism coupled at one end to the power plant and extendable to a selected distance, the extended end of the mechanism being attachable to either tool;

moving the power plant to a location selected for laying an underground cable;

attaching the digging tool to the pulling means and extending the same to a position at which the digging tool is at a selected distance from the power plant;

activating the power plant for pulling back the digging tool to effect loosening of the strip of ground along the withdrawal path of the digging tool to prepare said ground for laying a corresponding length of cable;

detaching the digging tool and attaching the cable laying tool and again extending the pulling means along the length of the strip of loosened ground; and

reactivating the power tool for pulling the cable laying tool back to the power plant while simultaneously paying out cable from the cable laying tool and placing the cable in space cleared by the cable laying tool in the ground by and while pulling back said cable laying tool.

3,886,756

SEPARATION OF GASES

Rodney John Allam, Guildford, and Bernard Ramsay Bligh, Hampton Hill, both of England, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 1, 1973, Ser. No. 356,264

Claims priority, application United Kingdom, May 10, 1972, 21984

Int. Cl. F25j *3/100*

U.S. Cl. 62—13 **6 Claims**

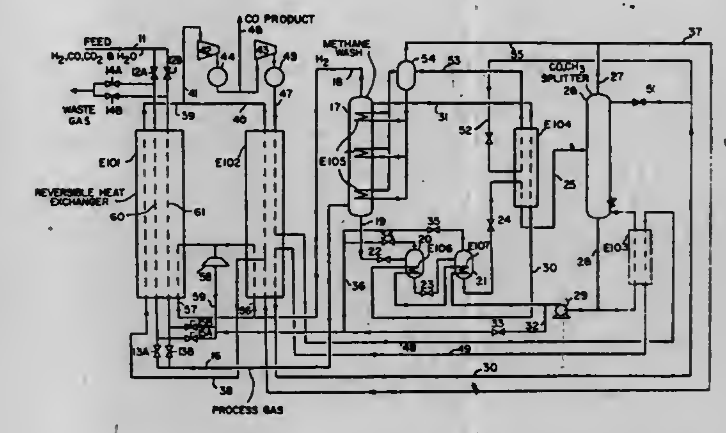
1. A method of separating a feed gas mixture obtained by the steam reforming of natural gas followed by the removal of a substantial portion of the carbon dioxide by an absorption process and the water vapor by condensation which mixture contains hydrogen, carbon monoxide, not more than 1 mol. % carbon dioxide, not more than 1 mol. % water vapor and small quantities of nitrogen and methane for the production of carbon monoxide which comprises:

a. passing said feed mixture through and cooling said mixture in a first set of passages in a heat exchanger containing at least two sets of passages to deposit said carbon dioxide and water vapor in solid form on the inner surface thereof;

b. countercurrently passing a hydrogen-rich stream at a pressure lower than that of said feed gas mixture through and warming said stream in a second, adjacent set of passages in said heat exchanger;

c. periodically passing said feed gas mixture through and cooling said mixture in said second set of passages to deposit said carbon dioxide and water vapor on the inner surface thereof and countercurrently passing said hydrogen-rich stream through and warming said stream in said first set of passages to re-evaporate substantially all of the solid carbon dioxide and ice deposited on the inner surface thereof;

d. passing the cooled feed gas mixture from said heat exchanger into the bottom of a methane wash column;



e. expanding the hydrogen stream recovered from the top of said column and recycling at least a part of said hydrogen to said heat exchanger as said hydrogen-rich stream;

f. letting down the pressure of the liquid withdrawn from the bottom of said wash column to effect further hydrogen removal;

g. partially vaporizing said liquid from step (f) and passing the resulting stream into a distillation column to separate carbon monoxide product from the methane; and

h. recovering said carbon monoxide product.

3,886,757

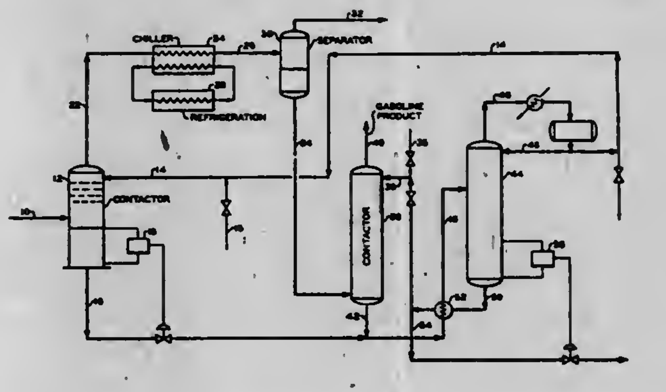
REDUCTION OF HYDRATE FORMATION IN A NATURAL GAS STREAM BY CONTACTING WITH ANIT-FREEZE AGENT

William A. McClintock, and Merlin O. Clark, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 101,372, Dec. 24, 1970, abandoned. This application Dec. 3, 1973, Ser. No. 421,367

Int. Cl. F25j *3/00*

U.S. Cl. 62—20 **8 Claims**



1. In a process for reducing the moisture content of a moisture-containing stream of natural gas without substantail moisture removal prior to introducing an antifreeze agent into said gas stream, wherein said gas, which is at an atmospheric temperature in the range 40°–125°F, is contacted in a first contacting zone with an amount of an aqueous liquid solution containing 51 to 90 weight percent of a low boiling (high vapor pressure) desiccant-antifreeze agent and 49 to 10 weight percent water at a temperature in the range 40°–125°F and pressure conditions sufficient to absorb a major portion of said moisture from said gas and simultaneously vaporize an amount of said agent into said gas which is sufficient to prevent solids formation in subsequent low temperature processing of said gas, said thus-treated gas is then chilled to a temperature sufficient to condense substantially all of the propane and heavier hydrocarbons therefrom leaving a residue gas rich in methane and ethane, and a liquid stream comprising said condensed propane and heavier hydrocarbons, water, and said agent, but at a temperature sufficiently above the eutectic freezing point for the water-agent solution to prevent freezing of the water-agent solution and formation of solids during said chilling, the improvement comprising the steps of:

a. contacting said separated liquid stream with water in a countercurrent contacting zone under conditions sufficient to substantially extract said agent from said condensed propane and heavier hydrocarbons;

b. recovering overhead essentially agent-free said condensed propane and heavier hydrocarbons from said countercurrent contacting zone;

c. passing a bottoms stream comprising water and said agent from said countercurrent contacting zone to a fractionation zone;

d. withdrawing an overhead stream comprising 51 to 90 weight percent of said agent and 49 to 10 weight percent of water from said fractionation zone;

e. returning said overhead stream of step (d) to said first contacting zone as at least a portion of said agent used therein;

f. withdrawing a bottoms stream comprising water from said fractionation zone; and

g. adjusting the water content of said aqueous solution of said agent in said overhead stream by adjusting conditions in said fractionation zone of step (d) so as to control the water content of said withdrawn overhead stream of step (d).

3,886,758

PROCESSES FOR THE PRODUCTION OF NITROGEN AND OXYGEN

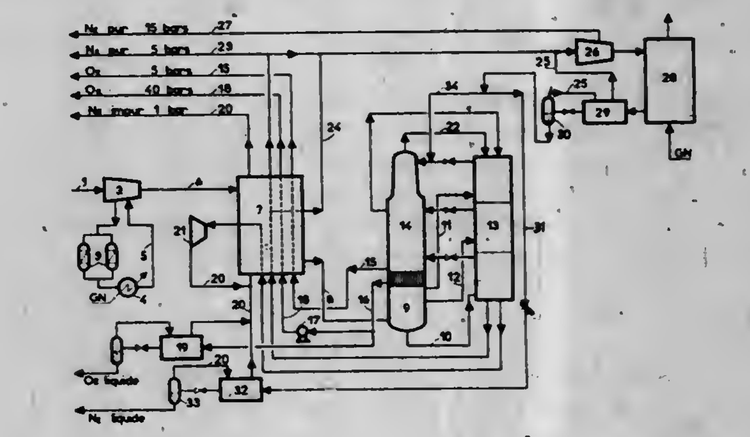
Guy Perrotin, Sucy-en-Brie, and Jean-Pierre Anselmini, Paris, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des procedes Georges Claude, Paris, France

Continuation of Ser. No. 69,591, Sept. 4, 1970, abandoned. This application Aug. 23, 1973, Ser. No. 390,943

Claims priority, application France, Sept. 10, 1969, 69.30785

Int. Cl. F25j *3/02*

U.S. Cl. 62—30 **4 Claims**



1. A process for separating air into oxygen and nitrogen, while vaporizing liquefied natural gas, comprising:

a. cooling and at least partially liquefying a compressed feed stream of air, by heat exchange with at least a part of oxygen and nitrogen separated from air;

b. separating said liquefied air feed stream in at least a rectification zone under a pressure substantially above atmospheric pressure, into oxygen and nitrogen, whereby at least said nitrogen is obtained under said pressure substantially above atmospheric;

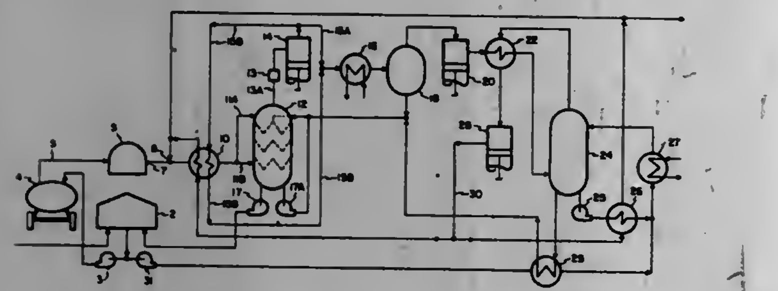
c. work expanding at least a part of said nitrogen in gaseous phase to around atmospheric pressure, and heating said expanded part in heat exchange with the compressed air feed stream;
d. compressing a stream of said oxygen in liquid phase above said pressure substantially above atmospheric;
e. vaporizing and heating said compressed oxygen stream in heat exchange with at least said air feed stream;
f. heating another part of said nitrogen in gaseous phase to a temperature below ambient temperature;
g. compressing a stream of said heated nitrogen;
h. at least partially condensing said compressed nitrogen stream in countercurrent heat exchange with liquefied natural gas being vaporized, wherein said compressed stream of nitrogen is liquefied under a lower pressure than the pressure at which liquefied natural gas is vaporized in heat exchange with said compressed stream;
i. expanding at least a part of said liquefied nitrogen stream to said pressure substantially above atmospheric and returning said part to the top of said rectification zone as reflux.

3,886,759

METHOD FOR RECOVERY OF HYDROCARBON VAPORS

Gerald P. McNamee, 2320 Riverside Dr., Santa Ana, Calif. 92706

Filed Jan. 26, 1973, Ser. No. 326,606
Int. Cl. F17c *13/00*
U.S. Cl. 62—54 **8 Claims**



1. A method of recovering hydrocarbon vapors from a hydrocarbon vapor-air mixture which is being expelled from a vessel during the filling of said vessel with hydrocarbons comprising the steps of

controlling the hydrocarbon content of said vapor/air mixture by controlling the temperature thereof,
controlling the volume of said vapor/air mixture and passing said vapor/air mixture into a compressor,
compressing said vapor/air mixture to form a compressed mixture,
cooling said compressed mixture, and
passing said compressed mixture into a first absorber to form and absorbed mixture having a liquid hydrocarbon at a controlled temperature whereby said liquid hydrocarbon removes a substantial protion of said hydrocarbon vapor from said compressed mixture.

3,886,760

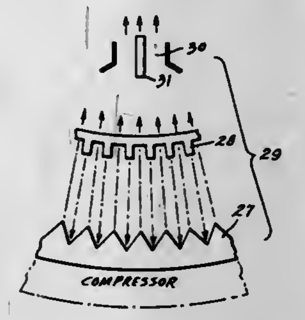
METHOD OF INDIRECT HEAT EXCHANGE

Stephen Wyden, 1158 E. 8 St., Brooklyn, N.Y. 11230

Filed Sept. 3, 1970, Ser. No. 70,299
Int. Cl. F25b *1/00*
U.S. Cl. 62—114 **24 Claims**

1. A method of heat exchange wherein the coolant is a fluid, comprising a two phase mixture, wherein one phase is a gas, either an aerosol or foam, comprising the steps of:

passing the coolant into a chamber in direct contact with another chamber containing a material to be cooled, permitting thermal exchange between the coolant and the material through the wall between the two chambers, removing the coolent after absorbing the heat of the material, and compressing the coolant,



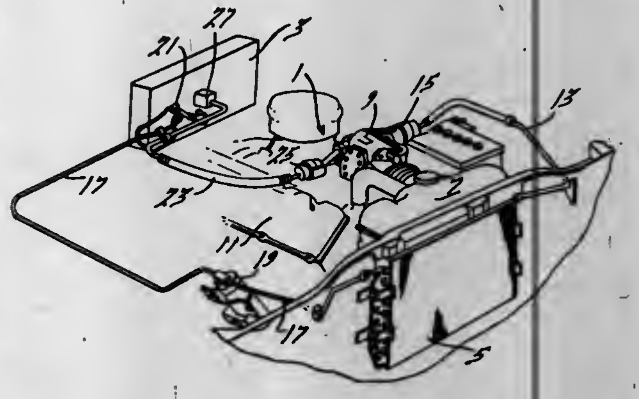
thereby maximizing the heat absorption and heat release capabilities of the coolant and utilizing the compressibility of the fluid.

3,886,761

THERMOSTATICALLY OPERATED SUCTION THROTTLING VALVE

Mario P. Santini, Clarkston, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 3, 1971, Ser. No. 120,575
Int. Cl. F25b *41/04*
U.S. Cl. 62—217 **2 Claims**



1. Air conditioning apparatus comprising a compressor having a suction and a discharge side, an evaporator, a condenser, a first line joining the discharge side of said compressor to an inlet in said condenser, a second line joining an outlet in said condenser to an inlet in said evaporator, and a third line joining an outlet from said evaporator to the suction side of said compressor, said line joining said evaporator to said compressor including means for throttling the flow of refrigerant from said evaporator to said compressor, said means including a housing having an inlet at one end and an outlet adjacent the other end, movable valve means in said housing adapted to move between an open position in which refrigerant flow therethrough is established and a substantially closed position in which refrigerant flow therethrough is substantially blocked, and temperature responsive means for controlling the movement of said movable valve means, said temperature responsive means being responsive to the temperature of refrigerant in leaving said evaporator, said valve means including a valve member portion and a valve seat portion, a retainer connected to said valve member portion, temperature responsive means in said retainer means adapted to contract in response to a decrease in the temperature of refrigerant therearound and to expand in response to an increase in the temperature of refrigerant therearound, a diaphragm extending across one end of said retainer, a rod one end of which engages said diaphragm and movable relative to said valve member portion, the other end of said rod being adjacent said other end of said housing and held against movement in one direction beyond a predetermined point by engagement thereof with said other end of said housing, and means biasing said retainer means and diaphragm in said one direction, said valve

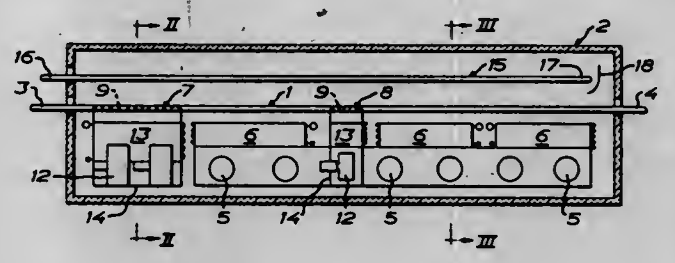
member portion being held in said open position by said rod when the temperature of refrigerant around said temperature responsive materials is above a predetermined temperature which results in freezing of condensate on said evaporator and said temperature responsive material is of a predetermined volume, said means biasing said retainer means in said one direction moving said valve member portion toward said valve seat portion and said substantially closed position when the temperature of said temperature responsive materials approaches said predetermined temperature and the volume of said temperature responsive materials is being reduced at least one passage in one of said portions for permitting the passage of refrigerant therethrough when said valve member portion is seated on said seat portion.

3,886,762

APPARATUSES FOR FREEZING ARTICLES OF FOOD AND SIMILAR PRODUCTS

Sven-Olle H. Rothstein, and Sture Aström, both of Helsingborg, Sweden, assignors to Frigoscandia Contracting AB, Helsingborg, Sweden

Filed Aug. 28, 1973, Ser. No. 392,217
Claims priority, application Sweden, Sept. 15, 1972, 11910/72
Int. Cl. F25d *25/04*
U.S. Cl. 62—380 **5 Claims**



1. Apparatus for freezing articles of food and similar products, comprising between side walls a perforated conveyor feeding the product through a freezing chamber, and at least one device, delimited to a small part of the length of said conveyor, for directing a gaseous refrigerant up through the conveyor in order to set the product in motion during freezing, wherein said device comprises a perforated bottom mounted immediately underneath said conveyor and permitting a controlled fluidized bed to be maintained above it, the space allowed for said fluidized bed being defined by the side walls and the product on the conveyor before and after the location of the perforated bottom.

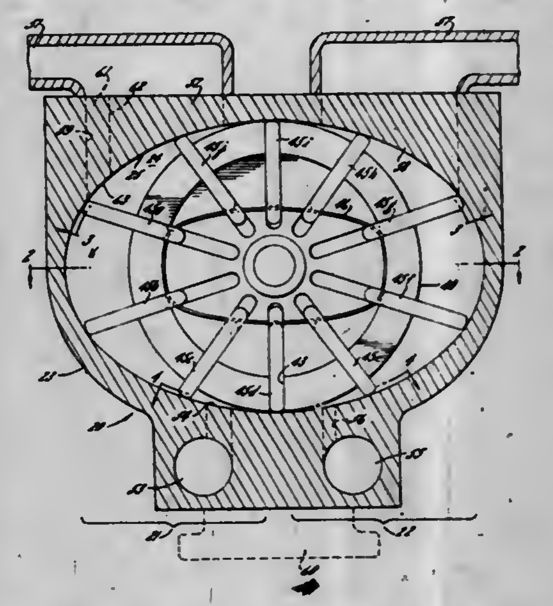
3,886,763

SELF-DRIVEN REFRIGERATOR

Thomas C. Edwards, Casselberry, Fla., assignor to The Rovac Corporation, Maitland, Fla.

Filed Feb. 26, 1974, Ser. No. 445,839
Int. Cl. F25d *17/04*
U.S. Cl. 62—402 **8 Claims**

1. A rotary compressor-expander for use as a refrigeration device in conjunction with a pressurized fluid source having a pressure above the ambient level, comprising in combination, a stator including a compressor chamber and an expander chamber, the compressor and expander chambers each having inlet and outlet ports, vane-type rotor means rotatably mounted within the chambers and having a plurality of vanes maintained substantially in contact with the walls of the chambers for defining individual segments, end plates for supporting the rotor means and sealing the chambers and the segments therewithin, rotation of the rotor means serving to progressively decrease the volume of the compressor segments and increase the volume of the expander segments, the inlet port of the compressor chamber being connected to the pressurized fluid source, a heat exchanger connected between the compressor outlet port and the expander inlet port for removing heat from the fluid being cooled while maintaining a substantially constant fluid pressure, the compressor and expander chambers being non-symmetrically constructed so that the differential change in volume in the expander chamber per revolution is greater than the differential change in volume in the compressor chamber in such revolution with the result that the rotor is driven by the potential energy in the pressurized fluid being cooled.

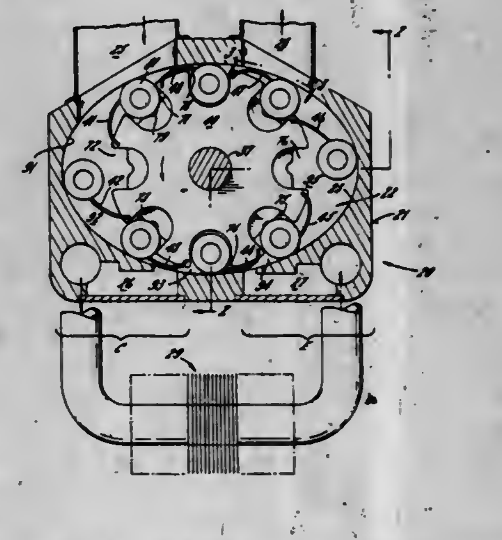


3,886,764

COMPRESSOR-EXPANDER HAVING TILTING VANES FOR USE IN AIR CONDITIONING

Thomas C. Edwards, Casselberry, Fla., assignor to The Rovac Corporation, Maitland, Fla.

Filed July 29, 1974, Ser. No. 492,608
Int. Cl. F25d *9/00*
U.S. Cl. 62—402 **23 Claims**

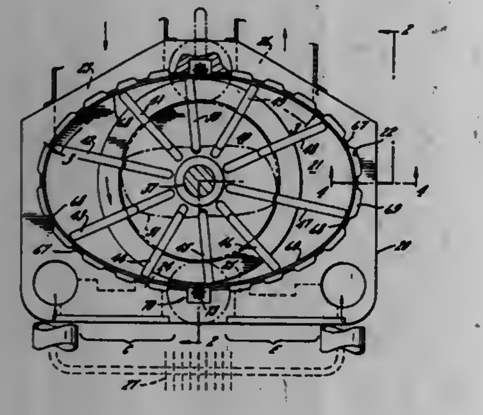


1. In a compressor-expander for use in air conditioning, the combination comprising a housing defining a chamber of oval cross section having a compression side and an expansion side and enclosed by end plates, a cylindrical rotor, extending between the end plates and having shafts journaled therein, means defining compression side inlet and outlet ports as well as expansion side inlet and outlet ports, a heat exchanger interposed between the compression side outlet port and the expansion side inlet port, the rotor having a plurality of axially-extending vanes secured to its periphery and extending between the end plates, the vanes being retreatingly angled with respect to the direction of rotor rotation, each of the vanes being in the form of a laminated leaf spring secured cantilever-fashion to the rotor along its inner edge, each of the vanes having a sealing member in the form of an enlargement extending along the outer edge for sealing against the wall of the chamber the sealing member carrying rollers at its ends for riding against the wall of the chamber and for establishing running clearance between the sealing member and the wall, the sealing member having a curved profile as viewed axially generally following the contour of the rollers so that the run-

ning clearance of the vane with respect to the wall of the chamber remains substantially constant in all phase positions of the rotor.

3,886,765
COMPRESSOR-EXPANDER HAVING THERMAL ISOLATION AND ADJUSTMENT FEATURES

Thomas C. Edwards, Casselberry, Fla., assignor to The Rovac Corporation, Maitland, Fla.
Filed July 29, 1974, Ser. No. 492,885
Int. Cl. F25d *9/00*
U.S. Cl. 62—402 **23 Claims**



1. In a compressor-expander for use in air conditioning, the combination comprising a housing defining a chamber having an outer wall of oval profile having a compression side and an expansion side and enclosed by end plates, a cylindrical rotor extending between the end plates and having a shaft journalled therein, means defining compression side inlet and outlet ports as well as expansion side inlet and outlet ports, a heat exchanger interposed between the compression side outlet port and the expansion side inlet port, the rotor having a plurality of radially movable and outwardly biased vanes extending into engagement with the end plates, a liner in the form of a flexible strip of oval profile covering the outer wall and having port openings in respective communication with the ports in the housing so that a charge of air drawn in between adjacent vanes at the compression side inlet port when the rotor is rotated: (a) is compressed with increase in temperature due to heat of compression, (b) flows at substantially constant pressure through the heat exchanger where heat of compression is absorbed and then (c) expands in the expansion side to produce a sharp drop in temperature for discharge in the cold state through the expansion side outlet port, the liner being of thin cross section for limited heat conductivity and having a layer of insulation between it and the outer wall for preventing flow of heat through the housing from the compression side to the expansion side.

3,886,766
UNIVERSAL JOINT

Emil C. Selmek, Temperance, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Dec. 3, 1973, Ser. No. 421,469
Int. Cl. F16d *3/26*
U.S. Cl. 64—17 R **9 Claims**

1. A universal joint comprising a first yoke having a first pair of spaced arms,

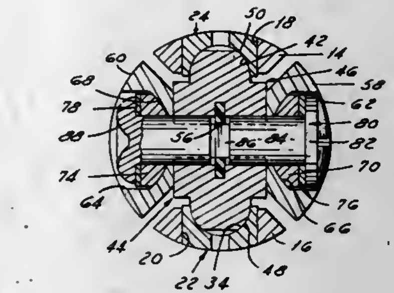
a pair of bearing members pivotally engaging said first pair of arms,

a second yoke having a second pair of spaced arms,

a pivot member extending between said second pair of arms,

means pivotally connecting said pivot member to said second pair of arms,

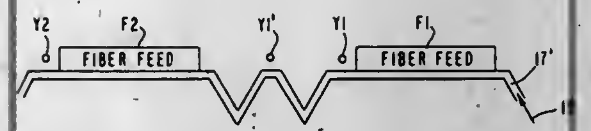
said pivot member being interposed between said pair of bearing members,



said pivot member being constructed to hold said bearing members in engagement with said first pair of arms.

3,886,767
METHOD OF MODIFYING A PILE FABRIC MACHINE

Philip A. Dargie, Andover, Mass., assignor to Malden Mills, Inc., Lawrence, Mass.
Filed Sept. 20, 1973, Ser. No. 399,144
Int. Cl. D04b *9/14, 9/12*
U.S. Cl. 66—9 B **2 Claims**

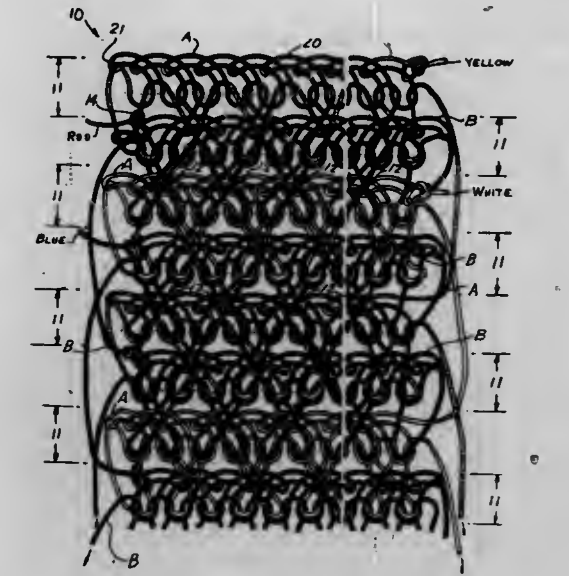


1. The method of modifying a pile-fabric knitting machine which has alternating fiber-feed and yarn-feed stations in the direction of the needle travel for increasing the rate of fabric production comprising the step of adding a yarn-feed station following at least one yarn-feed station on the machine without providing another fiber-feed station therebetween such that the modified machine contains at least two yarn-feed stations for controlling the formation of respective separate courses arranged one after the other in the direction of the needle travel without any fiber-feed station being positioned therebetween, whereby on the modified machine two courses, only one of which has pile fabric held by its constituent loops, are formed in place of the single course formed on the machine before it is modified, which two courses may be controlled to have the same fiber weight per unit area as said single course be increasing the rate at which fiber is fed during the formation of said only one course.

3,886,768
CROSS STITCH CROCHETED FABRIC

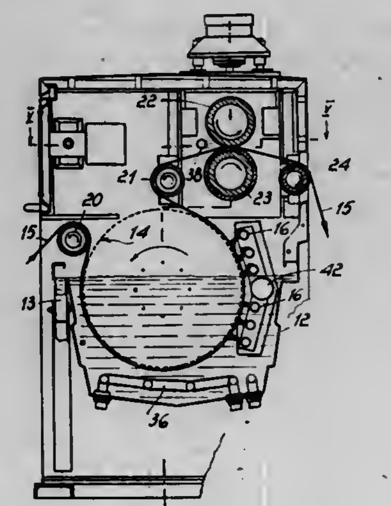
Shirley Anderson, 6547 Lang Ave., Sacramento, Calif. 95823
Filed Feb. 1, 1973, Ser. No. 328,506
Int. Cl. D04b *21/00*
U.S. Cl. 66—195 **3 Claims**

1. A crocheted reversible fabric having opposite sides with opposite faces with the stitch pattern duplicated on each face having a plurality of spaced apart parallel ribs on one side of the fabric connected to a plurality of spaced apart parallel ribs on the opposite side of the fabric, a plurality of spaced apart cross stitches extending between and connecting adjacent ribs on one side of the fabric and a plurality of spaced apart cross stitches extending between and connecting adjacent ribs on the other side of the fabric, said cross stitches overlying the ribs on the side of the fabric opposite said cross stitches.



3,886,769
WIDTH WASHING PLANT, PARTICULARLY FOR DELICATE FABRICS

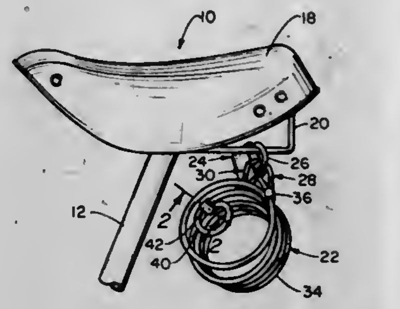
Fulvio Conti, P.O. Box 28 Via Carnovali 88, Bergamo, Italy
Filed June 18, 1973, Ser. No. 371,312
Claims priority, application Italy, Feb. 26, 1973, 20857/73
Int. Cl. B05c *3/138, 5/02*
U.S. Cl. 68—15 **11 Claims**



1. An open width washing plant for unfolded fabric, particularly for delicate fabrics, comprising a unit for introducing the fabric into the plant, a plurality of wash stations, at least one box for storing the fabric, and a unit for collecting the fabric treated in the plant, in which each of said wash stations comprises a wash tank containing liquid, at least one rotating drum on a portion of which rests the fabric, said drum being partially immersed in said wash tank and having its axis of rotation disposed in a direction transverse to the direction of movement of the fabric, a plurality of spray elements disposed adjacent to at least one portion of the external surface of said drum and projecting liquid againt it, a portion of said spray elements being disposed above and a portion below the surface of the liquid contained in said wash tank, means for spreading the fabric out in a direction substantially transverse to its direction of movement being disposed upstream and downstream of said rotating drum, and means for wringing the fabric disposed downstream of said rotating drum.

3,886,770
DOUBLE LOCKING SECURITY APPARATUS

Gordon F. Smith, Santa Barbara, Calif., assignor to Helistrand, Inc., Santa Barbara, Calif.
Filed Jan. 2, 1974, Ser. No. 430,165
Int. Cl. E05b *73/00*
U.S. Cl. 70—18 **9 Claims**



1. A double locking security apparatus comprising:

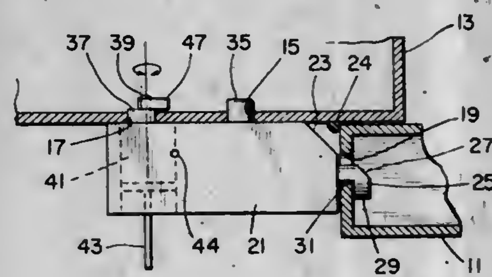
an extended length of a continuous constant diameter cable having a pair of ends;

a first loop attached to one of said ends and a second loop attached to the other of said ends; and

a third loop connected to said continuous cable intermediate said first and second loops, said third loop being an integral part of said continuous cable and forming a full circle, said continuous cable being extendable around an article and the shackle of a padlock is to be passed through each of said loops thereby creating two separate locking areas within the confines of said continuous cable.

3,886,771
KEYED REMOVABLE DOOR LOCK

Milton Robins, Marina Del Rey, Calif., assignor to Packaging Techniques, Inc., El Segundo, Calif.
Filed Mar. 12, 1973, Ser. No. 340,320
Int. Cl. E05b *65/08*
U.S. Cl. 70—90 **12 Claims**



1. A device for prohibiting relative movement of a pair of structures which are otherwise relatively movable comprising a body having

a plurality of surfaces thereon which are substantially parallel to adjacent surfaces of the structures,

a first pin means extending normally from a first of said surfaces and having

chamfer means on one side of the leading edge thereof and

lip means on the opposite side thereof, and

a second pin means extending normally from a second of said surfaces, said second pin means having

pivot means at the extremity thereof and offset from the axis thereof and

flange means, having a substantially identical periphery as that of said pin, mounted on said pivot means.

3,886,772
KEY HOLDER

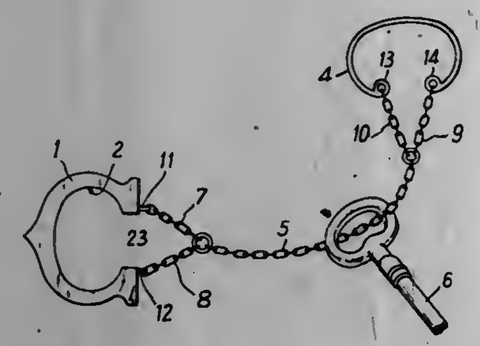
Robert Hocq, Boulogne-sur-Seine, France, assignor to Societe FrancoHispano-Americaine, (Francispam) · Saint-Gratien, France

Filed Nov. 26, 1973, Ser. No. 418,987

Claims priority, application France, Nov. 29, 1972, 72.42415

Int. Cl. A47g *29/10*

U.S. Cl. 70—456 R 7 Claims



1. Key holder which comprises an arcuate, generally C-shaped rigid member having an elongated concave surface defining the inner edge of the C, said concave surface being provided with a median groove extending lengthwise thereof, an arcuate resilient member mating with said groove and dimensioned to be received within said groove without protruding radially therefrom, and a chain connected by one of its ends to said rigid member and by its other end to the resilient member.

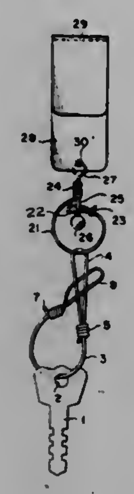
3,886,773
KEY HOLDER

Welbourne D. McGahee, Melbourne, Fla., assignor to Loop-A-Line, Inc., Melbourne, Fla.

Filed Apr. 22, 1974, Ser. No. 463,084

Int. Cl. A44b *15/00, 21/00*

U.S. Cl. 70—457 4 Claims



1. A key holder comprising a storage loop, a left slim elongated loop on one end of said storage loop for receiving keys on said storage loop, a right enlarged elongated loop on the other end of said storage loop, said storage loop being made of springy wire whereby said left loop is reversibly passable over said right loop, a special connector including a loop interconnectible with said storage loop, an eye on one end of said special connector loop, an end connector on the other end of said special connector loop, a shank member passing through said end connector and said eye on said special connector loop, said shank member having a head positioned below said eye on said special connector loop, and means on the other end of said shank member for restraining movement of said end connector.

3,886,774
METHOD AND MEANS FOR SHOT PEENING OF TUBES

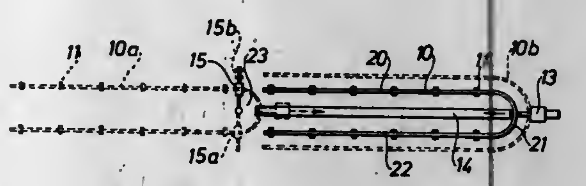
Sven Sixten Stromstedt, and Sven Borje Bystrom, both of Sandviken, Sweden, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim, Ruhr and Mannesmannrohren-Werke Aktiengesellschaft, Dusseldorf, both of, Germany

Filed May 22, 1974, Ser. No. 472,470

Claims priority, application Sweden, May 30, 1973, 73076820

Int. Cl. C21d *7/06*

U.S. Cl. 72—53 7 Claims



1. Method of shot peening the external surface of a tube that is partly straight and partly curved, using an assembly of shot peening nozzles arranged concentrically around and directed towards the tube, according to which for shot peening a straight portion of the tube the nozzle assembly is held stationary and the tube is moved in a straight path with said straight portion passing through the nozzle assembly, while for shot peening a curved portion of the tube the tube is held stationary and the nozzle assembly is moved about the curved portion.

3,886,775
DIE FOR MANUFACTURING RODS OR WIRE OF COMPOUNDS MATERIAL WITH NON-ROUND CROSS-SECTION

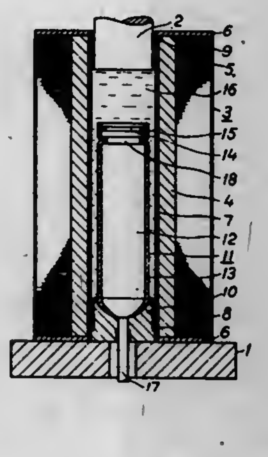
Torsten Korsell; Hans Larker; Erik Lundblad, and Jan Nilsson, all of Robertsfors, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Mar. 21, 1974, Ser. No. 453,388

Claims priority, application Sweden, Apr. 10, 1973, 73050114

Int. Cl. B21c *25/02*

U.S. Cl. 72—60 7 Claims



1. Die for manufacturing rods with a core of aluminium or an aluminium alloys and a casing of copper or a copper alloy by hydrostatic extrusion of a compound billet having an inlet portion having an outer part and a cup-shaped bottom part and a die opening in the bottom part having longer and shorter sides, the tangents to the generatrices to the bottom part forming a continuously increasing angle from the outer part to the die opening, the tangents to the bottom part of the generatrices in axial section through the die perpendicular to the longest side of the die opening, forming an angle (2 α) which is between 120° and 180°, the outer part of the die being a conical part which merges into the cup-shaped bottom part.

3,886,776
END STOP FOR A FORMING MACHINE

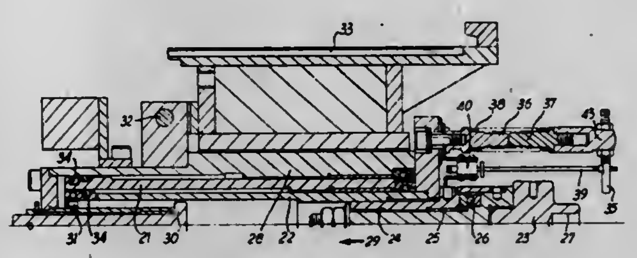
David Ian Hudson, Nottingham, England, assignor to Raleigh Industries Limited, Nottingham, England

Filed Feb. 26, 1974, Ser. No. 445,919

Claims priority, application United Kingdom, Feb. 28, 1973, 10152/73

Int. Cl. B21h *9/00*

U.S. Cl. 72—71 19 Claims



1. A bar stop for a forming machine comprising a part movable in relation to the remainder of the stop, means enabling said part to be moved between the forming tools of said machine and up to the end of a bar to be formed, means operative to restrict the movement of the part in a direction opposite to the first mentioned direction under the action of the bar, and means operative to release the restriction to accommodate growth in the bar in the opposite direction during a forming operation.

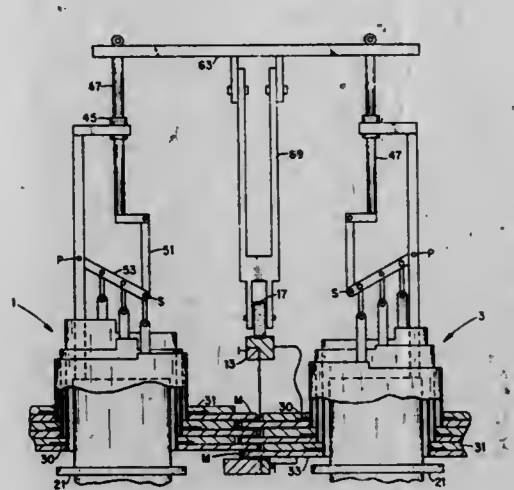
3,886,777
BELLOWS-FORMING APPARATUS

Charles E. Harless, West Paducah, Ky., and Ward G. Taylor, Vienna, Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 19, 1974, Ser. No. 507,493

Int. Cl. B21d *15/06*

U.S. Cl. 72—84 10 Claims



1. An apparatus including a pair of parallel and axially extending rotatable assemblies for cooperatively forming convolutions in a blank positioned therebetween and thus effecting progressive shortening of said blank in a direction transverse to said convolutions, each of said assemblies including a rotatable shaft carrying a plurality of axially movable, circular mandrels, the mandrels of one assembly in interleaving relation with those of the other assembly; the improvement comprising first and second pluralities of axially slidable sleeves respectively mounted to the shafts of said assemblies, said sleeves circumferentially supporting individual ones of said mandrels, each of said sleeves coaxial with its respective mandrel.

3,886,778
APPARATUS FOR THE ROLLER STAMPING OF THIN SHEETS, ESPECIALLY STARTING SHEETS FOR ELECTROLYTIC PRODUCTION OF COPPER

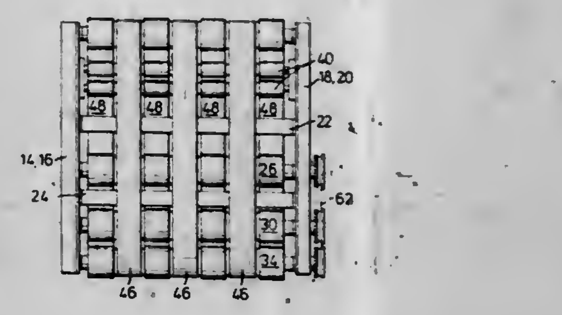
Olov Carl Gustav Wennberg, 16, Champ du Vert Chasseur, Bruxelles, Belgium

Filed June 18, 1973, Ser. No. 370,622

Claims priority, application Sweden, June 19, 1972, 8056/72

Int. Cl. B21d *5/16*

U.S. Cl. 72—180 3 Claims



1. Apparatus for corrugating thin sheets, comprising a pair of opposed contoured rollers each of which has a plurality of cylindrical portions thereon of alternately large and small diameter that register with respective portions of alternately small and large diameter on the other said roller, a plurality of endless bands passing about said rollers, alternate bands passing about said small portions of one said roller, the remaining bands passing about said small portions of the other said roller, said bands having a length substantially greater than the periphery of said rollers and a width about equal to the axial length of the said small portions about which they pass, and further rollers having axes parallel to said stamping rollers and about which the remaining portions of said bands are trained.

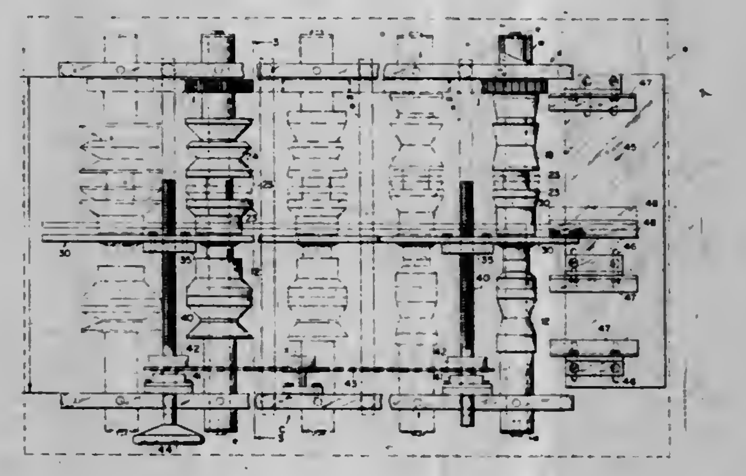
3,886,779
MACHINE FOR ROLL FORMING VARIABLE WIDTH PROFILES

Lamont R. McClain, Mehlville, Mo., assignor to Engel Industries, Inc., Ballwin, Mo.

Filed Apr. 17, 1974, Ser. No. 461,542

Int. Cl. B21d *5/08*

U.S. Cl. 72—181 10 Claims



2. In a roll forming machine in which metal strips are progressively formed to a profile, the machine being of the type having at least two parallel side frame assemblies at a substantially fixed spacing, a succession of pairs of upper and lower powered roll spindles mounted by and perpendicular to and rotatable in said frame assemblies, power train means to rotate said spindles, and complementary upper and lower forming roll sets thereon, each set including an axially constant roll and an axially shiftable roll,

the invention comprising
- laterally shiftable frame means parallel and intermediate to said fixed frame assemblies and having apertures through which said roll spindles pass, said shiftable frame means being adjacent to the shiftable rolls and remote from the contstant rolls,
- means to shift said laterally shiftable frame means, and
- rotation-permitting and thrust transfer means connecting the shiftable frame means and the shiftable rolls,
- whereby to establish and change a spacing, common to all of said spindles, between the shiftable rolls and the constant rolls on the spindles simultaneously.

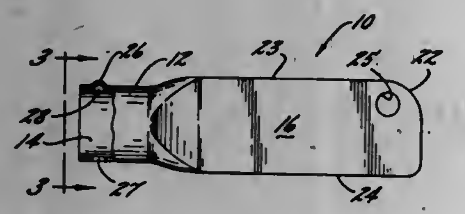
3,886,780
METHOD OF MAKING A TUBULAR KEY CONSTRUCTION

Morris Falk, Palm Springs, Calif., assignor to Fort Lock Corporation, River Grove, Ill.

Division of Ser. No. 323,980, Jan. 15, 1973, abandoned. This application June 17, 1974, Ser. No. 479,866

Int. Cl. B21d *53/42*

U.S. Cl. 72—324 **1 Claim**



1. The method of forming a lock actuating protrusion on a formed tubular key having a tubular shank and a generally flat handle portion, the shank being adapted to be inserted in an annular keyway of an axial pin tumbler lock, comprising the steps of forming an opening radially through one side of the tubular key shank and inserting a forming tool through said opening and deforming the opposite side of said tubular shank radially outward to form a generally dome shaped projection on the outer surface of the tubular shank.

3,886,781
FORCE EQUALIZED EXTERNAL STRIPPER FOR METALWORKING MACHINES AND THE LIKE

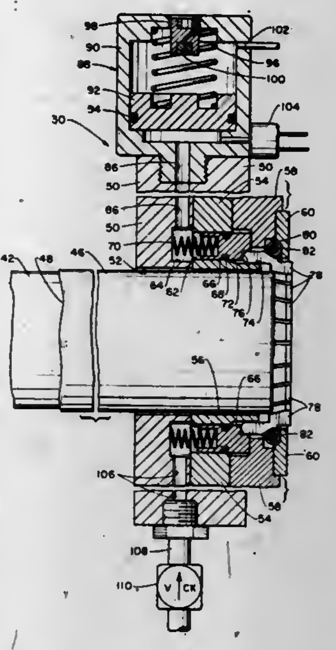
Elpidifor Paramonoff, Los Angeles, and Ralph M. Main, San Pedro, both of Calif., assignors to Standun, Inc., Compton, Calif.

Filed June 19, 1974, Ser. No. 480,620

Int. Cl. B21d *45/00*

U.S. Cl. 72—344 **26 Claims**

1. In a stripping device of the type wherein frames means mounts a multiplicity of circumferentially adjacent fingers about an axially reciprocal ram movable therethrough with said fingers engaging a leading edge of a tubular article on said ram and stripping said article from said ram during said ram movement; the improvements comprising: reactor means operably connected to each of said fingers for normally urging each of said fingers generally axially to a pre-set maximum forward position ready to be contacted by said article leading edge and exerting a minimum reactive force against each of said fingers during individual movement of each of said fingers rearwardly from contact of that finger by said article leading edge dependent on said article leading edge contour until substantially all of said fingers have been so contacted, said reactor means after substantially all of said fingers have been so contacted exerting a substantially immovable reactive force against all of said fingers collectively in the then individual



rearward movement positions of each of said fingers to cause said fingers collectively to strip said article.

3,886,782
HAND RIVETER

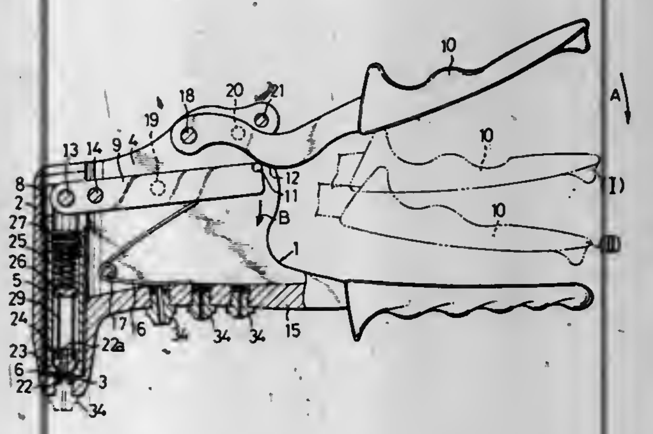
Ukio Miyamoto, Osaka, Japan, assignor to Vessel Tool Company, Ltd., Osaka, Japan

Filed July 8, 1974, Ser. No. 486,426

Claims priority, application Japan, July 19, 1973, 48-85202

Int. Cl. B21j *15/34*

U.S. Cl. 72—391 **2 Claims**



1. A hand riveter comprising divided jaws, a jaw spring for elastically pressing the jaws, a jaw pusher interposed between the jaws and the jaw spring to deliver the elastic force of the jaw spring to the jaws, a jaw case housing the jaws, the jaw spring and the jaw pusher and having a tapered bore for receiving the jaws in elastic contact wth the inner peripheral surface of the tapered bore, a fixed handle having at its head portion a hollow body acommodating the jaw case therein movably axially thereof, a nosepiece mountable from outside into the hollow body to open the jaws away from each other and movable handle means mounted on the jaw case to lift the jaw case and opposing the fixed handle, the movable handle means being composed of a first movable handle having a rolling member at its one end and a separate second movable handle in the form of a bell crank and formed at its base portion with a cam surface curved progressively gently rearward, the rolling member being substantially in elastic contact with the cam surface, the first and second movable handles being pivoted individually so as to serve as a double lever mechanism.

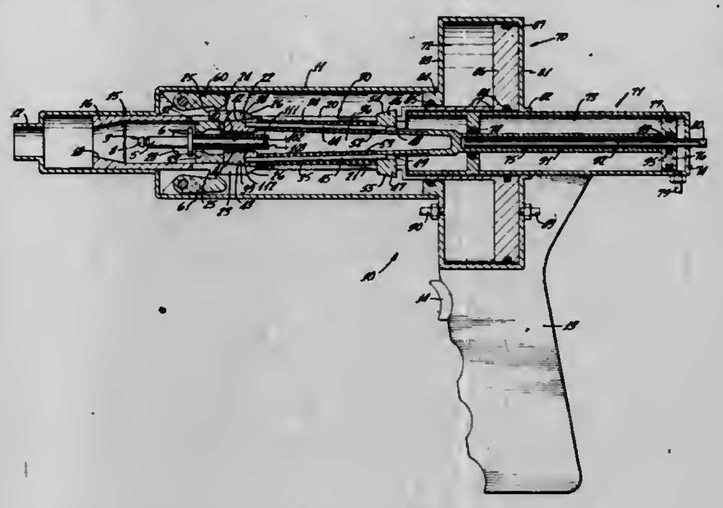
3,886,783
AUTOMATIC LOADING BLIND RIVETER

Richard F. Hirsch, 708 W. 38th St., San Pedro, Calif. 90731

Filed July 25, 1974, Ser. No. 491,929

Int. Cl. B21j *15/34*

U.S. Cl. 72—391 **15 Claims**



1. A riveter for setting blind rivets of the type including a tubular sleeve having an annular head at one end thereof and a mandrel extending through the sleeve, the mandrel having an enlarged head adjacent the other end of the sleeve, said blind riveter comprising:
- a housing adapted to be held stationary during operation of said riveter, said housing having a nose through which said rivets pass;
- a first elongate, hollow slide member mounted for axial movement relative to said housing, one end of said first slide member being positioned adjacent said nose of said housing;
- magazine means for feeding rivets laterally into said housing;
- a second elongate, hollow slide member mounted for axial movement coaxially with and within said first slide member, one end of said second slide member being operative to contact said head of said rivet sleeve and to advance said rivet through said first slide member to a setting point beyond said one end of said first slide member and said nose of said housing, said rivet mandrel extending into the hollow center of said second slide member;
- means connected to said housing for releasably locking said second slide member at said setting point with said one end thereof engaging said head of said rivet sleeve;
- a pair of opposed jaw members carried by said second slide member and being mounted for limited axial and lateral movement relative thereto for releasably gripping said rivet mandrel; and
- means at said one end of said first slide member for engaging said jaw members and for simultaneously urging said jaw members into firm gripping engagement with said rivet mandrel and pulling said jaw members axially, with said first slide member, away from said one end of said second slide member, thereby setting said rivet.

3,886,784
HIGH PRESSURE DEW AND FROST POINT INDICATOR

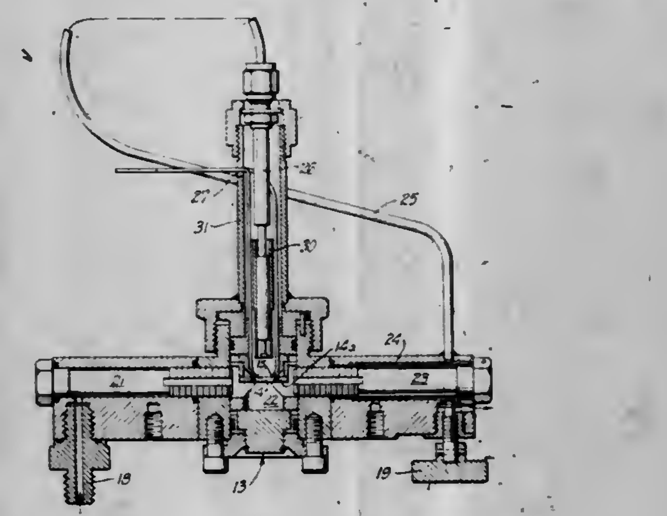
Robert S. Sheldon, Northridge, Calif., assignor to Air-Dry Corp., Northridge, Calif.

Filed Mar. 15, 1973, Ser. No. 341,589

Int. Cl. G01h *25/02*

U.S. Cl. 73—17 A **5 Claims**

1. A dew and frost point indicator for measuring the amount of water vapor in a sample gas stream, said indicator including cryostat means of the Joule-Thompson expansion process type, means for passing gas through said cryostat to expand said gas to atmospheric pressure to provide cold outlet gas from said tip, a mirror disposed in front of said tip, the flow of said cold gas being directed against the back of said mirror to chill said mirror, a sample chamber disposed in front of said mirror, said sample chamber being closed off from said cryostat, means for passing a sample gas stream through said sample chamber at ambient temperature, whereby frost is formed only on the front of said chilled mirror by condensation from the sample stream, means for optically observing the initital formation of frost on the front of said mirror, means for measuring the temperature of said mirror at the time of said initial formation of frost, said cryostat means including thin helically wound high pressure tubing, said tubing having cooling fins,



means for directing the output of said tip over said cooling fins for additional cooling, said tubing mounted within a tightly fit jacket, said cooling fins defining a helical path within said jacket and around said tubing, means for directing the cold output from said tip along said helical path to cool said fins and tubing, and means for supplying gas from said sample stream to said cryostat to operate said cryostat, said mirror comprising two adjacent concentric mirrors thermally insulated from each other, one of said mirrors being cooled by said cryostat and the other of said mirrors remaining at substantially ambient temperature.

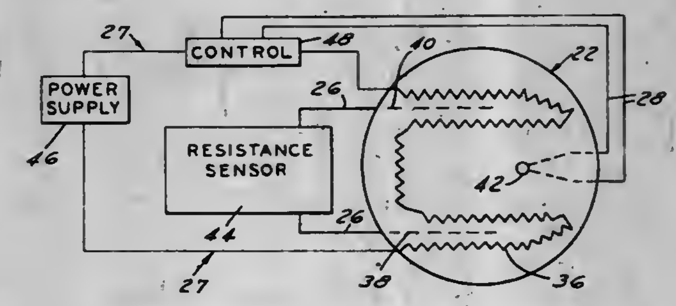
3,886,785
GAS SENSOR AND METHOD OF MANUFACTURE

Henry L. Stadler; Tseng-ying Tien, both of Ann Arbor; Michael J. Esper, Detroit, and Donald J. Romine, Southfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 391,424, Aug. 23, 1973, which is a continuation of Ser. No. 198,515, Nov. 15, 1971, abandoned. This application Aug. 31, 1973, Ser. No. 393,698

Int. Cl. G01n *7/02, 31/00*

U.S. Cl. 73—23 **11 Claims**



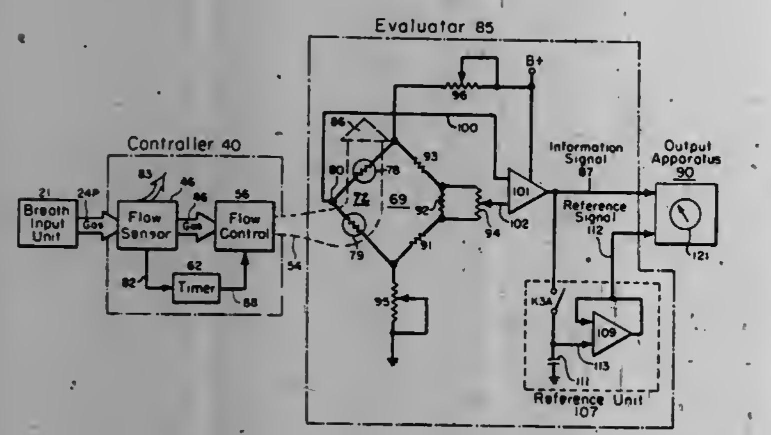
1. A sensor for sensing the partial pressure of oxygen comprising:
- a porous, sintered ceramic sensor body having a modulus of rupture greater than about 11,000 psi;
- a pair of electrodes embedded in said body and spaced apart so that at least a portion of the sensor body is interposed between said electrodes;

and electrical means connected to said pair of electrodes for responding to changes in the inter-electrode resistance;
said porous sensor body being comprised of ceramic material having a density less than about 85% of theoretical density.

3,886,786
NULL MEMORY SYSTEM FOR A GAS ANALYSIS SYSTEM

Joseph P. Hoppesch, Streamwood; Donald H. Ward, Glen Ellyn, and James R. Tomashek, Wooddale, all of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Sept. 20, 1971, Ser. No. 181,805
Int. Cl. G01n *33/16*
U.S. Cl. 73—27 R **2 Claims**



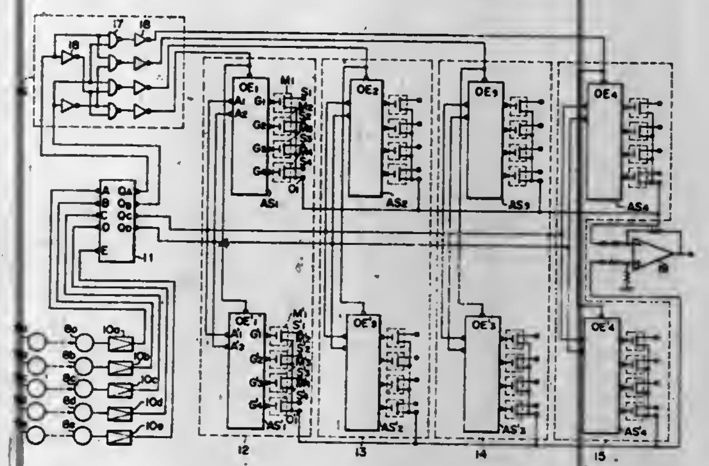
1. In a gas tester of the type having a detector which receives gas samples and produces a d.c. signal whose maximum amplitude during a period of exposure to a sample is a function of certain gases contained in those samples, the improvement comprising:
means for storing and continuously reproducing over a period a single amplitude d.c. signal;
means for generating a reference d.c. amplitude signal from the detector just prior to the introduction of a sample of gas to be tested therein and for storing that generated reference signal on said signal storing means; and
means coupled to said signal storage means and to the detector for producing an output proportional to the difference in the outputs thereof,
whereby drift is minimized and accuracy of output is increased.

3,886,787
METHOD OF AND APPARATUS FOR MEASURING PHYSICAL QUANTITIES OF A ROTATING BODY

Toshio Akatsu, Tokyo, and Toshimitsu Fujiyoshi, Kashiwa, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 30, 1973, Ser. No. 411,176
Claims priority, application Japan, Nov. 2, 1972, 47-109409
Int. Cl. G01b *7/18*
U.S. Cl. 73—88.5 R **10 Claims**

1. A method of measuring physical quantities of a rotating body at many measuring points thereof, comprising
a step of converting said physical quantities to corresponding electrical signals by measuring devices provided at said measuring points;
a step of changing over switching circuits incorporated in said rotating body and connected with the output terminals of said measuring devices, in response to signals from outside or inside of said rotating body so as to sequentially deliver said electrical signals; and
a step of taking said sequentially delivered electrical signals out of said rotating body,

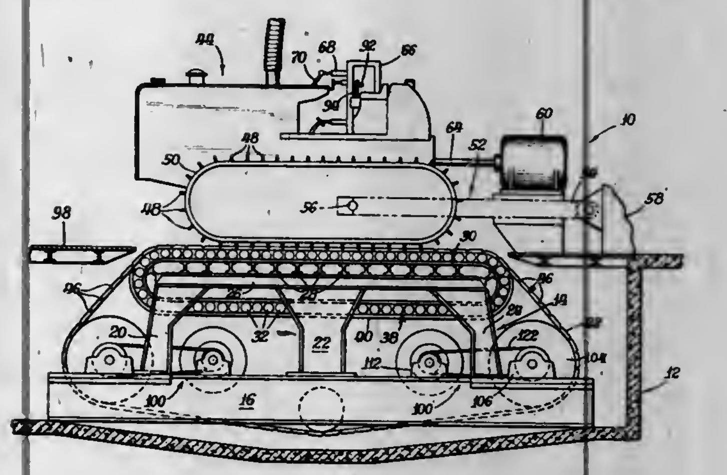


wherein said switching circuits are changed over by light signals from outside said rotating body.

3,886,788
TRACTOR TEST CELL

Harold W. Jeter, Jr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 4, 1973, Ser. No. 394,167
Int. Cl. G01l *5/13*
U.S. Cl. 73—117 **9 Claims**



1. A testing device for a vehicle having a ground-engaging drive mechanism comprising: a frame; an endless belt on which the ground-engaging drive mechanism of the vehicle may be disposed; means associated with the frame and belt for supporting the belt and the vehicle disposed thereon relative to the frame, and allowing the belt to travel along its length relative to the frame; and means for limiting movement of the so-disposed vehicle relative to the frame, and comprising the ground-engaging drive mechanism defining a plurality of projecting ground-engaging members, and wherein the belt defines a plurality of recessed areas sized and spaced so that the projecting members of the drive mechanism seat therein.

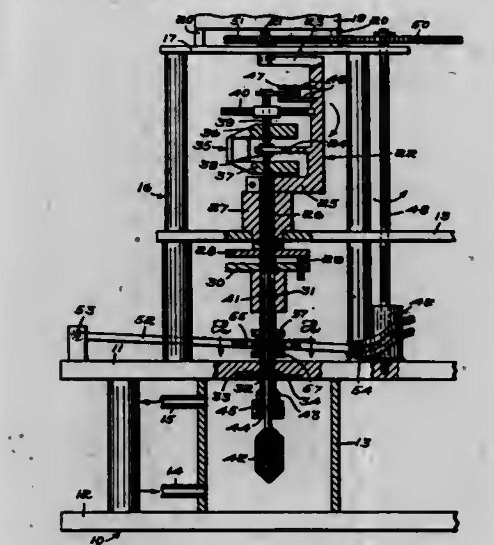
3,886,789
VISCOMETER

Donald W. Brookfield, 168 Massapoag Ave., Sharon, Mass. 02067

Division of Ser. No. 211,935, Dec. 27, 1971, abandoned. This application Aug. 31, 1973, Ser. No. 393,553
Int. Cl. G01n *11/16*
U.S. Cl. 73—59 **5 Claims**

1. A viscometer comprising a chamber, a motor, means positively driven by said motor and including first and second tubular shaft sections, means interconnecting said shaft sections in axial alignment with said second section axially movable relative to the first section, said second section extending into said chamber, said chamber provided with a seal through

which said second section extends and relative to which said second section is slidable and rotatable, a shaft extending through said tubular section and rotatable independently thereof, a torsional connection between said shaft and said

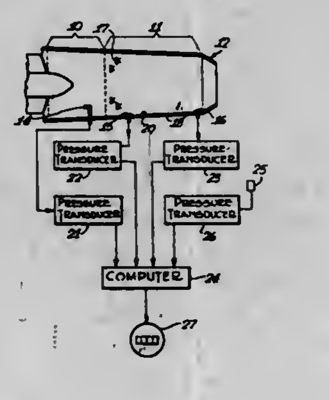


positively driven means outside said chamber, said shaft including a drag exposed in said chamber, a seal through which said shaft extends and carried by said second section, and means to reciprocate said second section.

3,886,790
APPARATUS FOR DETERMINING THE GROSS THRUST OF A JET ENGINE

Edelbert G. Plett, Belle-Mead, N.J., assignor to Control Data Canada, Ltd., Willowdale, Ontario, Canada

Filed Mar. 18, 1974, Ser. No. 452,278
Claims priority, application Canada, Apr. 27, 1973, 169738
Int. Cl. G01m *15/00*
U.S. Cl. 73—117.4 **3 Claims**



1. Apparatus for use in a jet type engine having a diffuser, a tailpipe, and a nozzle, for determining the total pressure at the entrance to the nozzle, comprising:
first pressure responsive means for detecting the total pressure P_{T5} in the diffuser and providing a first signal representative of said total pressure,
second pressure responsive means for detecting the static pressure P_{SN} at the nozzle entrance and providing a second signal representative of said static pressure,
third–pressure responsive means positioned between the upstream side of the diffuser and the nozzle entrance and upstream of said second pressure responsive means, for detecting the static pressure P_{S8} and providing a third signal representative of said static pressure, and
computer means for combining said first, second and third signals to determine iteratively the nozzle total pressure P_{TN} according to the relationship

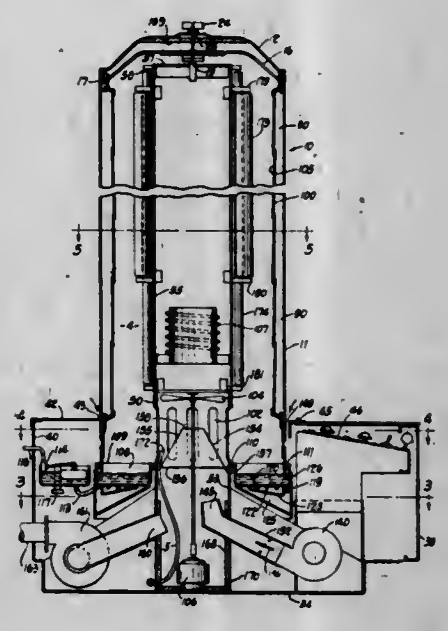
$$P_{TN} = \eta(P_{TN}, P_{T5}, P_{S8}, P_{SN}, C_1, C_2, \gamma, K_1)$$

where
C_1 is a dimensionless constant related to tailpipe geometry
C_2 is a dimensionless constant related to the fluid flow characteristics in the tailpipe,
γ is the means ratio of tailpipe gas specific heats, and
K_1 is a dimensionless constant used to obtain a prediction of the flameholder region total pressure,
and to provide a fourth signal representing said nozzle total pressure P_{TN}.

3,886,791
CYCLIC TEST APPARATUS

Paul R. Grossman, Alliance, Ohio, assignor to Q-Panel Company, Cleveland, Ohio

Filed July 23, 1973, Ser. No. 381,910
Int. Cl. G01n *17/00*
U.S. Cl. 73—150 R **48 Claims**



1. A testing apparatus for simulating the effects of natural weathering comprising a housing adapted to have a test atmosphere or gas therein, a central axis, conduit means disposed in said housing and extending along said axis, means for mounting test panels or samples in equidistant relationship with and radially, outwardly of said conduit means, and means for circulating the atmosphere in said housing in one direction across and in functional engagement with said test panels or samples and the same atmosphere and in the opposite direction through said conduit means.

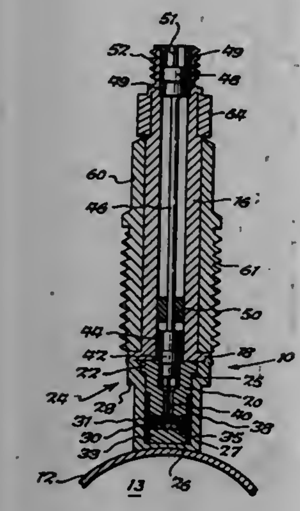
3,886,792
CONFORMAL PRESSURE TRANSDUCER FOR AMMUNITION TESTING

Nicholas D. Change, West Seneca, and Michael T. Riggs, Batavia, both of N.Y., assignors to PCB Piezotronics, Inc., Depew, N.Y.

Continuation-in-part of Ser. No. 234,017, March 13, 1972, abandoned. This application July 23, 1973, Ser. No. 381,700
Int. Cl. G01l *5/14*
U.S. Cl. 73—167 **11 Claims**

1. Apparatus for testing ammunition fired from a test body such as a gun barrel having an interior chamber for holding an unmodified ammunition cartridge and an access opening communicating with a portion of the outer wall surface of said cartridge said apparatus comprising:
a. a housing adapted to be connected in the access opening of the test body;
b. piston means on one end of said housing and having a contoured end surface conforming to the outer surface of the ammunition cartridge;
c. piezolectric means within said housing and mechanically connected to said piston means;
d. whereby when said contoured end surface of said piston means firmly contacts and conforms to the outer surface

of the ammunition cartridge, pressure developed in response to firing of the cartridge is applied through the cartridge to said contoured end surface to deform said piezoelectric means to generate an electrical output signal proportional to the applied pressure; and



e. circuit means connecting the electrical output of said piezoelectric means to means providing information of pressure amplitude.

3,886,793

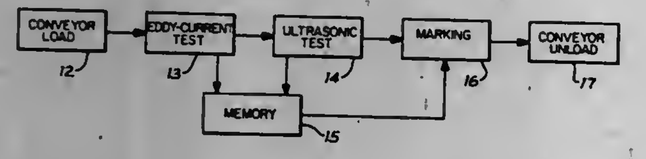
PROJECTILE BODY TESTING MACHINE

Henry E. Cramer, Loogootee; James M. Gerkin; Dale L. Groh, both of Bedford, and Gale A. Groh, Mitchell, all of Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 9, 1974, Ser. No. 432,021

Int. Cl. G01m *3/16*

U.S. Cl. 73—167 **7 Claims**



1. A machine for non-destructive testing of projectile bodies comprising,

a plurality of cradles each adaptable for holding one projectile body to be tested,
conveyor means for moving said plurality of cradles,
first means for raising a projectile body above its cradle for an eddy-current inspection test,
an eddy-current probe for applying an eddy-current test to said projectile bodies,
means for moving said eddy-current probe into a cavity in said raised projectile while said probe is rotating whereby said probe is moved in a helical pattern into and out of said cavity,
second means for raising a projectile body above its cradle and rotating said projectile body for an ultrasonic test,
an ultrasonic transducer for applying an ultrasonic test to a projectile body raised by said second means,
means for moving said transducer along the longitudinal axis of a projectile body raised by said second means,
memory means for indicating projectile bodies that are determined to be defective by said eddy-current inspection test and said ultrasonic test, and
means for marking projectile bodies that have been tested and determined to be sound.

3,886,794

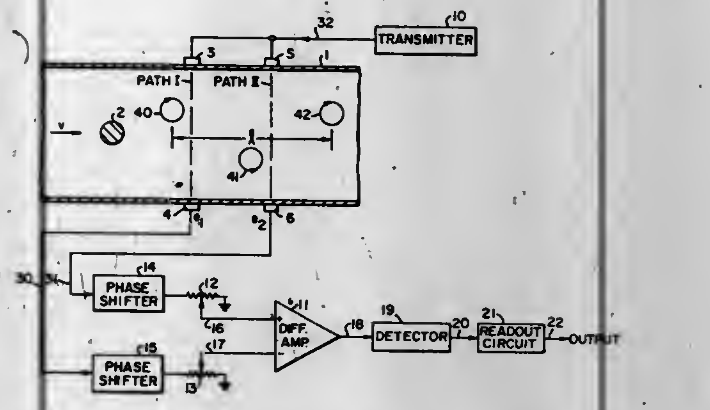
FLOWMETER APPARATUS AND METHOD

James L. McShane, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 11, 1974, Ser. No. 450,273

Int. Cl. G01f *1/00*

U.S. Cl. 73—194 B **27 Claims**



1. The method of measuring the velocity of relative movement between a fluid and an object immersed therein, said object creating periodic fluid disturbances in a pattern along a direction of disturbances, said periodic disturbances being characteristic of said velocity, said method comprising the steps of:

directing individual acoustic signals along at least two respective separate acoustic paths in the fluid at an angle to said direction of disturbances, and with at least one of said paths being through said disturbances;
receiving said acoustic signals after traveling along said paths whereby at least one acoustic signal is modulated by said periodic disturbances thereby to provide a signal having a modulation envelope;
combining the received acoustic signals into a combined signal of increased modulation index relative to the modulation index of the received acoustic signals;
and deriving a representation of the modulation of said combined signal as an indication of said velocity.

3,886,795

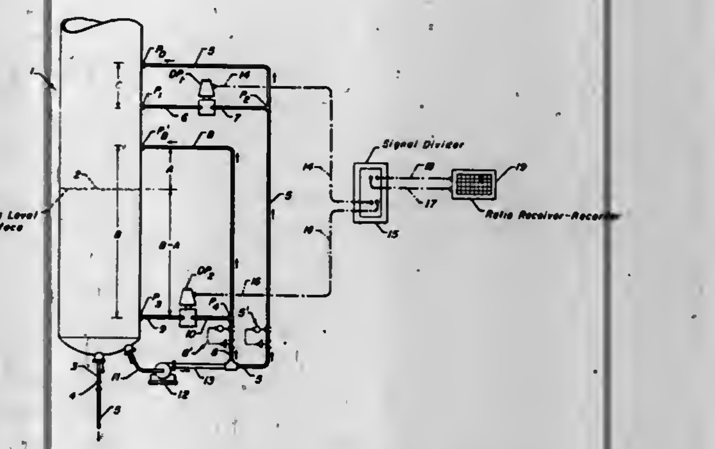
LIQUID INTERFACE LEVEL DETERMINING SYSTEM

Herbert Lytle Thompson, Park Ridge, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 19, 1973, Ser. No. 417,344

Int. Cl. G01f *23/14*

U.S. Cl. 73—299 **7 Claims**



1. An apparatus system for locating an interface between liquids of different density that are collected within a confined chamber, with such system comprising in combination,

a. a first and second spaced apart levels of conduit connections to an upper portion of said chamber to provide pressure sensing contact with the lower density liquid at said two spaced levels;
b. means connecting each of said levels for pressure sensing to a first differential pressure transmitting device;
c. a third level of conduit connection and of pressure sensing to said chamber at a position below said first spaced apart connections to said chamber to also be in contact with said lower density liquids;
d. a fourth level of conduit connection means and of pressure sensing connective to a lower level in said chamber for contact with the higher density liquid being collected therein;
e. means connecting said third and fourth connection levels for pressure sensing to a second differential pressure transmitting device;
f. liquid outlet means from a lower portion of said chamber connective to pump means and to additional conduit means which is connective to said conduit connections at said first and said third sensing levels, and to the higher pressure level side for each of said differential pressure transmitting devices to thereby add hydrostatic pressure from the higher density liquid to each such side;
g. signal divider means connective to said two devices to divide the differential pressure signals from said devices; and
h. a signal divider readout means to provide a ratio output reading which can be calibrated to indicate an interface position below said third level of pressure sensing.

3,886,796

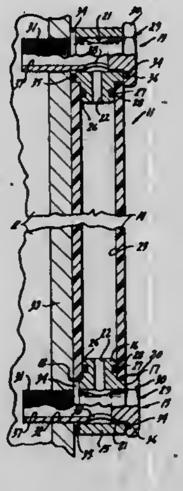
LIQUID LEVEL GAUGE

Donald G. Gruett, Manitowoc, Wis., assignor to Oil-Rite Corporation, Manitowoc, Wis.

Filed Nov. 16, 1970, Ser. No. 89,701

Int. Cl. G01f *23/02*

U.S. Cl. 73—328 **4 Claims**



1. In a gauge for indicating the liquid level in a tank, a pair of vertically spaced hollow end members, the respective end members having a cylindrical projection extending therefrom in facing and axially aligned relation, said projections having an axial through bore communicating with the hollow interior of the corresponding end member and a circumferential groove exteriorly thereof, a rigid transparent plastic tubular sight member interposed between said end members and having a cylindrical bore adapted to receive the end member projections in opposed relation and said sight member comprising the sole connection between the opposed end members, said plastic tubular sight member being generally rectangular in section to provide greater material thickness at the respective corners to in effect provide for vertical columns along the respective edges corresponding to such corners to enhance the strength of the sight member, an O-ring seal disposed in the grooves of the respective end member projections and sealingly engaging with the tubular member to seal the connections between the tubular member and the respective end members, and hollow fastening means connecting at least one of said end members to the tank for mounting the gauge and placing the liquid contents of the tank in communication with the sight member.

3,886,797

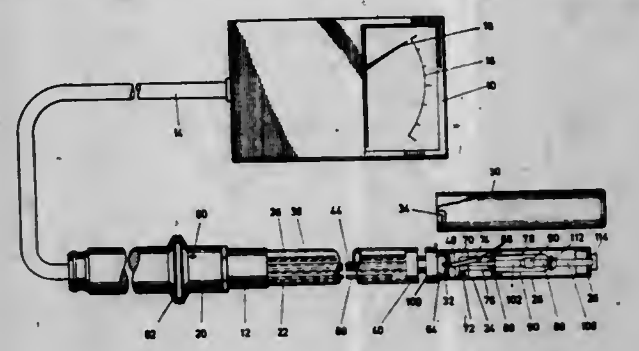
DEVICE FOR MEASURING THE HUMIDITY OF GASES

Hans Bauer, Fuchsweg 2, 782 Titisee-Neustadt, Germany

Filed Oct. 18, 1973, Ser. No. 407,462

Int. Cl. G01n *25/64*

U.S. Cl. 73—335 **28 Claims**



1. A device for measuring the humidity of gases, comprising, in combination: probe means including two closed chambers, at least the first or "wet" chamber being made at least in part of a gas-permeable filter material with a pore size allowing water molecules in the air to pass freely, thus constituting means for equalizing air humidity in said first chamber with that of the outside, and for preventing outer air streams to reach said first chamber, the second chamber being a "dry" chamber; a supply tank for an evaporating liquid, a porous evaporator body in said first chamber, two temperature-sensitive electric resistors, respectively disposed in said chambers, and means for substantially uniformly supplying said liquid to said evaporator body which latter surrounds a first one of said resistors; a voltage source and an electrical circuit for passing a noticeable current through at least said first resistor so as to increase its temperature, said circuit including electric differentiating means for comparing the resistance values of said resistors; indicator means connected to the latter for reading therefrom humidity values of a gas in the neighborhood of said probe in proportion to the established resistance values; an absorbent rod in said supply tank extending towards the rear of said probe means; a collecting receptacle at the end of said supply tank opposite to that having said chambers thereat; a pressure-compensating capillary connecting said supply tank with said receptacle; and an aerating tube leading from said receptacle to the outside, at a point where possibly exiting liquid does not cause any disturbance.

3,886,798

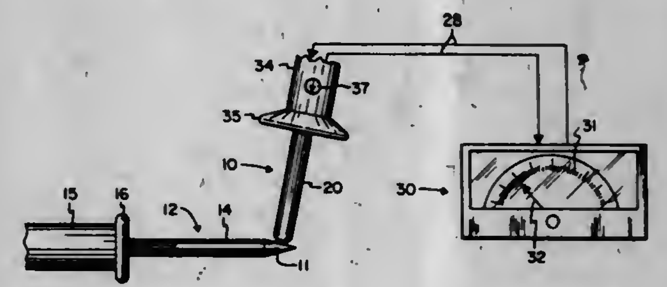
TEMPERATURE PROBE

William S. Fortune, 14250 Dearborn St., Panorama City, Calif. 91402

Filed Aug. 22, 1973, Ser. No. 390,591

Int. Cl. G01k *1/14*

U.S. Cl. 73—343 R **3 Claims**



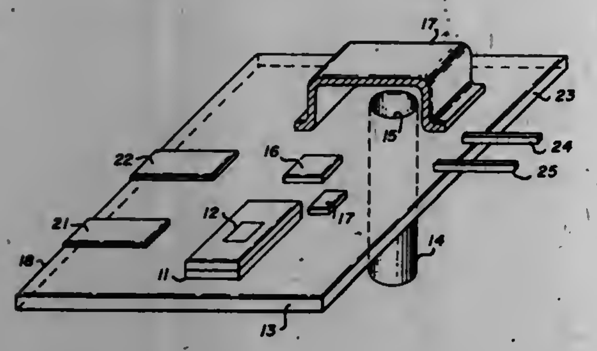
1. A temperature probe and fixture for measuring the temperature of a soldering instrument at the tip thereof during soldering, said temperature probe including:

- a. a thermocouple having a junction for measuring the temperature;
- b. an outer metallic tube surrounding said thermocouple;
- c. a button closing one end of said tube and consisting of a metal capable of being coated with a soldering compound; and
- d. a fixture for securing said temperature probe to the soldering instrument, said fixture having a first portion capable of being attached to the soldering instrument;
- e. means on said first portion for clamping it to the soldering instrument;
- f. said fixture having a second portion rigidly secured to said first portion and bearing an element capable of receiving said temperature probe; and
- g. means cooperating with said element and said second portion for adjustably securing said temperature probe to the soldering iron.

3,886,799
SEMICONDUCTOR PRESSURE TRANSDUCER EMPLOYING TEMPERATURE COMPENSATION CIRCUITS AND NOVEL HEATER CIRCUITRY

Richard J. Billette, Dublin, and John Vennard, Los Altos, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sept. 24, 1973, Ser. No. 399,937
Int. Cl. G01l *9/04*
U.S. Cl. 73—398 AR **10 Claims**



1. A semiconductor pressure transducer apparatus comprising

a semiconductor body comprising a substrate and a surface layer of a material of a first conductivity type, said body having a cavity region formed therein, said cavity region including a thin wall section formed by a section of said surface layer, said thin wall section being flexible responsive to pressure exerted across said thin wall section,

an electrical bridge circuit formed in said thin wall section of said surface layer and comprising four resistor arms, two opposed nodes of said bridge forming a bridge input, the two other opposed nodes of said bridge forming a bridge output, each of said bridge resistors being formed by a diffusion of a dopant of opposite conductivity type to that of the surface layer into said thin semiconductor wall section,

circuit means for applying a voltage to the input nodes of said bridge circuit, said circuit means including a common collector node formed by said layer of said semiconductor material of said first conductivity type,

a Zener diode formed in said surface layer comprising an emitter, a collector coupled to said common collector node, and a base coupled to one input node of said bridge,

a temperature compensation circuit for said Zener diode comprising

a first transistor formed in said surface layer having an emitter coupled to the emitter of said Zener diode, a base, and a collector coupled to said common collector node, and a pair of resistors coupled in series between said common collector node and the emitter of said first transistor, the junction node between said two resistors being coupled to the base of said first transistor,

a temperature compensation circuit coupled between another input node of said bridge and said common collector node comprising

a second transistor formed in said surface layer having an emitter coupled to said other bridge input node, a collector coupled to said common collector node, and a base, and

a pair of resistors coupled in series between said common collector node and the emitter of said second transistor, the junction node between said two resistors being coupled to the base of said second transistor, and

a heating circuit thermally well coupled to the piezoresistor bridge for heating the thin wall section for the cavity region comprising a transistor formed in said thin wall section comprising

a base region diffused in said surface layer,

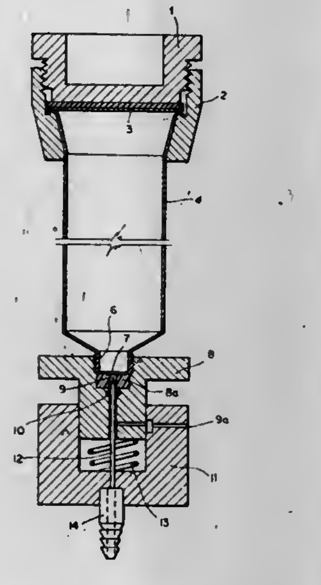
an emitter diffused in said base region, and

a collector region common to said common collector node, said base and emitter region having output leads to which energy pulses may be applied to heat the thin semiconductor wall section.

3,886,800
GAS SAMPLING DEVICE

John R. Boehringer, 427 Parkview Dr., Wynnewood, Pa. 19096

Filed Oct. 15, 1973, Ser. No. 406,235
Int. Cl. G01n *1/24*
U.S. Cl. 73—421.5 R **15 Claims**



1. Gas sampling device comprising a sealed crushable tube having a puncturable segment therein, an opening closed by a resealable, openable closure and a piston snugly fitting within said tube and removable through said opening, said tube, said closure, and said piston all being composed of a material inert and non-absorbent with respect to any gases to be tested.

3,886,801
DECOMPRESSION METER

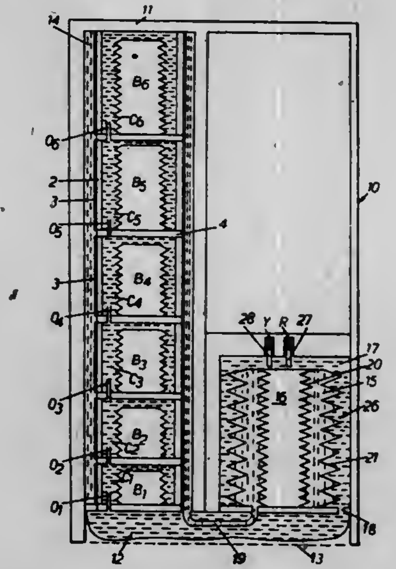
Brian Andrew Hills, Bembridge, England, assignor to National Research Development Corporation, London, England

Filed Oct. 30, 1973, Ser. No. 411,043
Claims priority, application United Kingdom, Oct. 30, 1972, 50003/72
Int. Cl. G06g *5/00*
U.S. Cl. 73—432 R **8 Claims**

1. A decompression meter as hereinbefore defined, comprising:

- a. first means responsive to the ambient total pressure for generating a first liquid pressure signal;

- b. second means responsive to the ambient total pressure for generating a varying second liquid pressure signal which represents the solution pressure of oxygen and nitrogen in body tissue and has a value representative of the local partial pressure of a dissolved gas in capillary blood and a rate of change proportional to said ambient total pressure for simulating gradual absorption of a gas in solution in body tissue, said second means comprising analogue means for simulating gradual absorption of oxygen and nitrogen in solution in body tissue at various radially successive concentric annuli of body tissue around a capillary blood vessel;
- c. third means responsive to said first and second liquid pressure signals for sensing in the analogue of each of said annuli a condition of excess of the value of said second signal over the value of said first signal; and



- d. fourth means responsive to said excess condition to simulate liberation of a dissolved gas as gaseous phase in body tissue and for generating a third signal to indicate the presence of said gaseous phase, said fourth means being constructed to sense excess over said first signal of a predetermined fraction of the second signal which fraction corresponds to the partial pressure of nitrogen in solution in the body tissue as a fraction of the total solution pressure of oxygen and nitrogen in the tissue;
- e. said third means being adapted to sense local excess of said predetermined fraction of said second liquid pressure signal in the analogue of each of said radially successive annuli over said first signal.

3,886,802
MULTISPEED TIMER DRYER CONTROL

Anthony Mason, Saint Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 29, 1973, Ser. No. 364,731
Int. Cl. F16h *3/76, 5/06, 55/04;* **H01h** *7/08;* **F16d** *19/00*
U.S. Cl. 74—3.5 **9 Claims**

1. For use in a clothes dryer, a multispeed timer appliance control comprising:

a timer motor;

at least one rotatably mounted control cam for controlling dryer operation; and

a gear train connecting said timer motor and said cam in driving engagement, said gear train including

a first gear connected to rotate said cam,

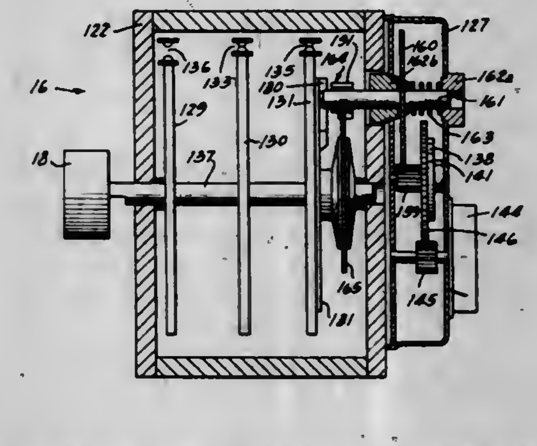
a shaft mounted for rotation and axial displacement;

a second gear mounted on said shaft for engagement with said first gear, said second gear including a first section having a first number of teeth and a second section axial displaced from said first section and having a second number of teeth, and

cam means movable with said first gear to cam and displace said shaft to shift the gear ratio of said gear train by engaging and disengaging said first gear and the first and second sections of said second gear,

whereby said first gear is rotated at a first speed when said first section of said second gear is in engagement with said first gear and at a second speed when said second section of said second gear is in engagement with said first gear, said first and second speeds differing by said shift in gear ratio.

5. In a timer appliance control for a clothes dryer, said timer having a dial control knob and a camstack of a plurality of cams is mounted on a rotatable shaft and driven through a control program by a timer motor via a gear train, the improvement therein of means for driving the camstack at different speeds, comprising:



a first gear in the gear train connected to the shaft; a second gear in the gear train including at least first and second axially disposed sections having different numbers of teeth for engagement with the teeth of said first gear; means mounting one of said first and second gears for axial movement relative to the other; and

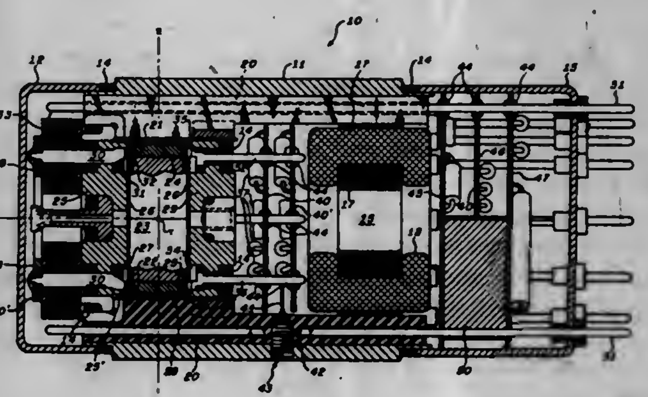
means operable to displace the axially movable gear to shift the gear ratio betwen said first and second gears,

whereby said first gear is rotated at a first speed when said first section of said second gear is in engagement with said first gear and at a second speed when said second section of said second gear is in engagement with said first gear, said first and second speeds differing by said shift in gear ratio.

3,886,803
FLUID BEARING GYROSCOPE

Peter E. Jacobson; Arthur W. Lane, and Paul E. Ashley, all of Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 6, 1973, Ser. No. 348,546
Int. Cl. G01c *19/18*
U.S. Cl. 74—5.6 D **20 Claims**



1. A gyroscopic apparatus for navigable craft comprising

housing means having a longitudinal axis and a sealed internal cavity formed therein by axial fluid thrust bearing surfaces and a cylindrical magnetic saturation ring enclosing said thrust bearing surfaces,

rotor means having external surfaces which conform to the internal surfaces of said cavity but of slightly smaller

over-all dimensions for providing a hydrodynamic bearing gap whereby upon rotation said rotor means is hydrodynamically suspended within said sealed cavity,
stator means disposed within said housing and displaced from said sealed internal cavity along said longitudinal axis for producing a rotating magnetic field, and
magnetic coupling means perimetrically disposed with respect to said stator means and said rotor means for providing a flux path between said stator means and said rotor means for the lines of flux in said rotating magnetic field whereby said rotor rotates about said longitudinal axis in response to said rotating magnetic field, contaminants produced by said stator means are prevented from entering said internal sealed cavity, and said stator means is removable from said housing means without disassembling said sealed internal cavity or said magnetic coupling means.

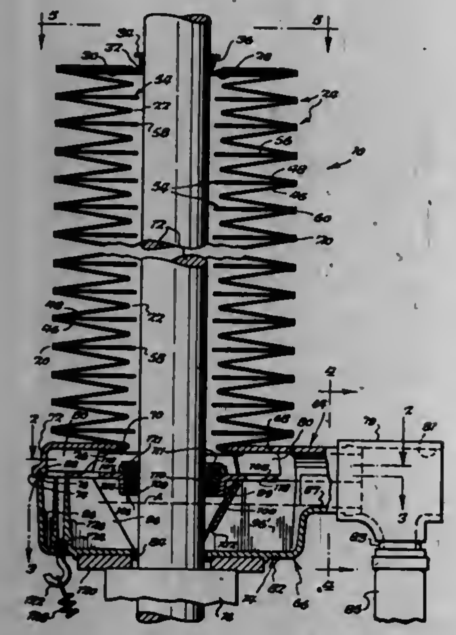
3,886,804
POLISHED ROD PROTECTOR AND RECEIVER

Mason C. Winfield, Jr., Orchard Park, N.Y., assignor to Rodgard Manufacturing Co., Inc., Orchard Park, N.Y.

Continuation-in-part of Ser. No. 249,261, May 1, 1972, Pat. No. 3,796,103. This application Apr. 6, 1973, Ser. No. 348,702

Int. Cl. F16j *15/50*

U.S. Cl. 74—18.2 **10 Claims**



1. A polished rod protector comprising; in combination with a polished rod mounted for reciprocation, an elongated extensible member of resiliently yieldable material having alternating inner and outer diameter portions along the length thereof joined by radial walls forming adjacent convolutions, means mounting said member about said rod for extension and retraction with said rod, and support members extending from adjacent said outer diameter portions inwardly beyond said inner diameter portions for reinforcing said outer diameter portions against inward collapse upon extension of said extensible member and also maintaining said inner diameter portions in spaced relation to said rod.

3,886,805
CRANK GEAR FOR THE CONVERSION OF A TRANSLATIONAL MOTION INTO ROTATION

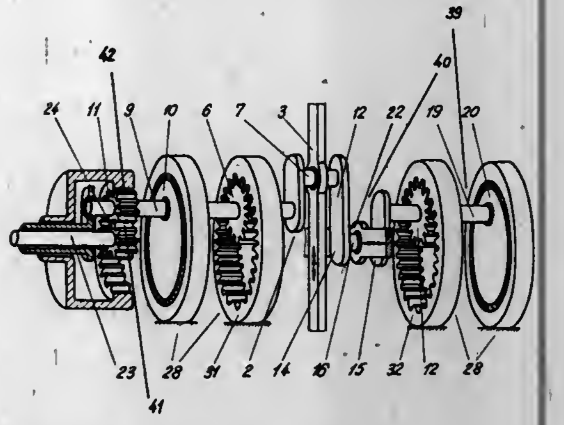
Ivan Koderman, Nadgorica/Jeza 95 61231 Lubliana, Crnuce, Yugoslavia

Filed Apr. 9, 1974, Ser. No. 459,281

Int. Cl. F16h *37/12*

U.S. Cl. 74—52. **4 Claims**

1. A crank gear for converting linear motion of at least two connecting rods arranged in a 90° relationship to each other and coupled together according to the Cardan principle into rotary motion comprising, a housing, an internal gear fixed within the housing, an eccentric planetary crankshaft within said housing, a crankpin on said crankshaft journaling each of said connecting rods, an external gear rigidly secured on said crankshaft which hobs with said internal gear, a guide wheel having a diameter equal to the pitch diameter of said external gear and concentric therewith, a flange on the guide wheel secured to said external gear, a butt shaft secured to and extending coaxially from said guide wheel, a flywheel eccentrically mounted on said butt shaft, means fixed to said housing concentric with said internal gear and surrounding said flywheel for journaling the flywheel and supporting said butt shaft, and gear means on the end of said butt shaft for take-off of power.



3,886,806
OPERATING LEVER FOR ACTUATING A GEAR-SHIFTING MEANS MOUNTED ON A BICYCLE

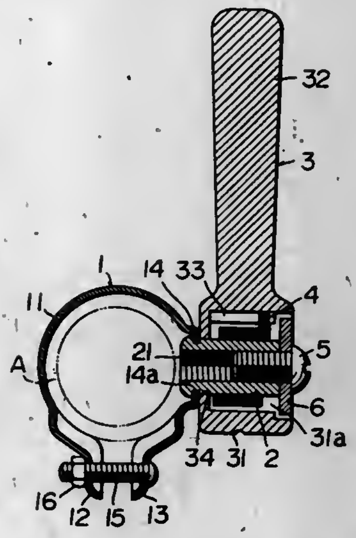
Masashi Nagano, Osaka, Japan, assignor to Shimaro Industrial Co., Ltd., Japan

Filed May 22, 1973, Ser. No. 362,845

Claims priority, application Japan, July 20, 1972, 47-72909; July 20, 1972, 47-72910; July 20, 1972, 47-72911

Int. Cl. G05g *5/16;* **F16d** *49/02*

U.S. Cl. 74—491 **12 Claims**



1. An apparatus for operating a gear-shifting means for bicycles comprising an operating lever, a control cable connected to said operating lever and arranged to be connected to the gear shifting means, a return spring associated with said control cable for returning said gear shifting means to a certain position, said operating lever arranged to pull said control cable against the action of said return spring for releasing the cable and shifting the gear shifting means, said operating lever comprising a fixed shaft unrotatably mounted to a bicycle through a fixture means, a lever body rotatably supported on said fixed shaft and connected to one end of said control cable, a spring means fastened around said fixed shaft, having one end retained by said lever body and the other end kept in slidable contact with said fixed shaft, said spring means being formed, when in released state, to have a smaller inner diameter than the outer diameter of said fixed shaft and adapted to be fastened around said shaft in the direction where it can be released when moved against said return spring, and said spring means arranged for maintaining said lever body against said return spring in a position where said lever body has been moved for shifting said gear shifting means.

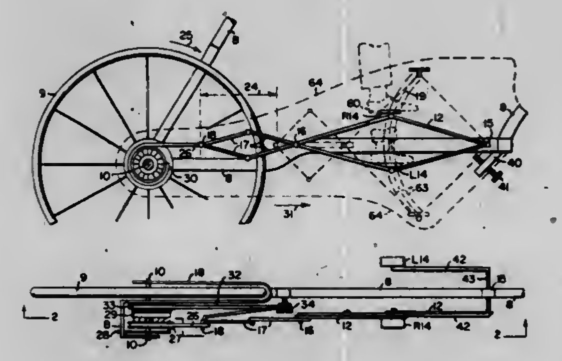
3,886,807
BICYCLE OPERATING MEANS

Robert P. Ellis, 350 Lomas Santa Fe Dr., Solana Beach, Calif. 92075

Filed Sept. 17, 1973, Ser. No. 397,641

Int. Cl. G05g *1/04*

U.S. Cl. 74—521 **8 Claims**



1. In a bicycle or similar vehicle, a means for manually propelling same, said means comprising a lazy-tong mechanism a front horizontally extending joint thereof being attached to the frame of said bicycle, the substantially vertically disposed joints of said lazy-tong mechanism having foot pedals pivotally attached thereto, and the rear horizontally disposed joints being attached to a U-shaped rack, the arms of said U-shaped rack being slightly flexible and the inwardly projecting edges thereof being provided with sharp pointed teeth, the teeth on the upper arm being inclined forwardly while the teeth on the lower arm are inclined rearwardly, and an extending axle on the rear wheel of said bicycle, a pinion secured to said axle, the said pinion having teeth on its periphery, said teeth being inclined to mesh with the teeth of the U-shaped arms when either of said arms contact said pinion and to slide over said teeth on said pinion when the teeth of the opposite arm is in mesh with the teeth of said pinion.

3,886,808
ENGINE VALVE LIFTER GUIDE

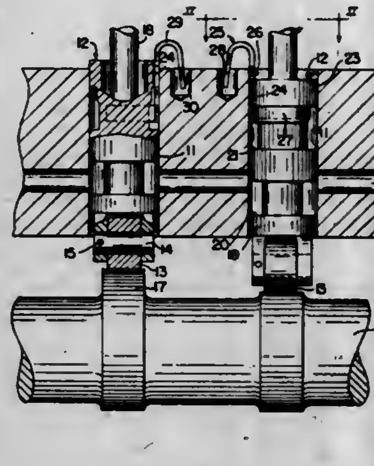
Robert L. Weber, Lacon, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 318,518, Dec. 26, 1972. This application Sept. 26, 1973, Ser. No. 401,068

Int. Cl. F16h *53/06*

U.S. Cl. 74—569 **5 Claims**

5. A one-piece guide in combination with a spool member reciprocally mounted in a support member, said spool member having a longitudinally disposed first guide means and a circumferentially disposed second guide means thereon, said guide comprising a first guide portion disposed in said first guide means, a pair of arcuately shaped second guide portions extending from said first guide portion and disposed in said second guide means, and anti-rotation means for preventing rotation of said spool member relative to said support member.



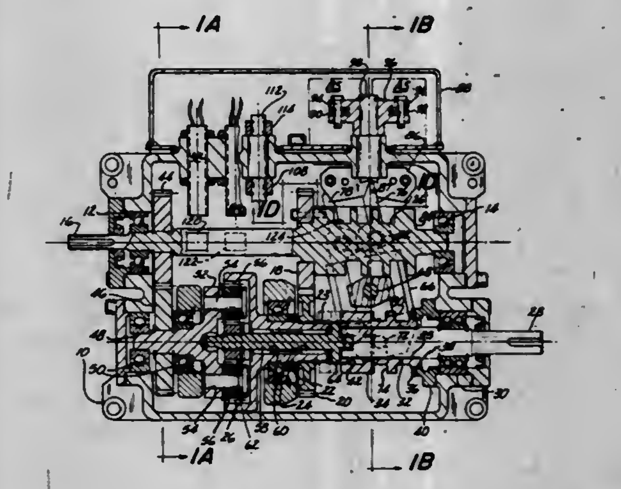
3,886,809
POSITIVE DRIVE CONTINUOUS GEAR MESH SHIFTING TRANSMISSIONS

Laszlo J. Kiss, 7044 Paige, Warren, Mich. 48091

Filed Aug. 7, 1972, Ser. No. 278,377

Int. Cl. F16h *37/06, 37/00, 3/38, 35/02*

U.S. Cl. 74—681 **35 Claims**



1. A positive constant gear-mesh positive clutch speed change system for a primary drive system having a primary input member, at least two primary output ratio determining members, and a primary output driven member selectively alternatively connected with said ratio determining members for first and second determined output rotational values, said speed change system comprising a planetary ratio alternator drive system and an automatic mechanical shifter system both drivingly connected with said primary input member at least during ratio changes, wherein:

a. said planetary ratio alternator drive system comprises a planetary input member, a planetary output member and a planetary reaction member constantly operably connecting the planetary input and output members, their relative ratios and output speeds being determined by the rotational value of said reaction member, and means continuously driving said reaction member alternately between minimum and maximum rotational value functions to effect continuous alternate rotation of said planetary output member between rotations synchronous with said ratio determining members; and

b. said shifter system comprises means effecting selective operative connection of said primary output driven member with said ratio alternator planetary output member synchronously with said ratio alternator drive system functions for changing the primary input to output member relative ratios.

19. The system as in claim 1 including reduction gearing constantly drivingly connected with and intermediate said primary input member and said ratio alternater planetary input member.

3,886,810
HYBRID POWER SYSTEM

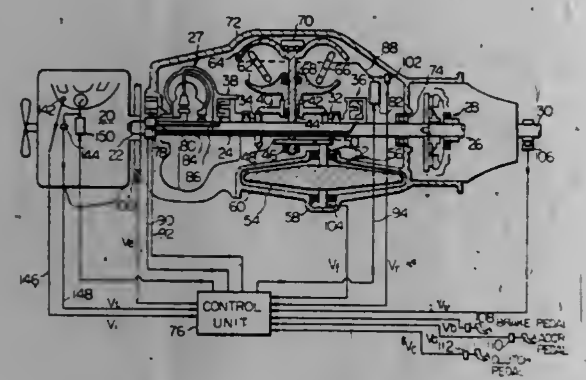
Hiroshi Sugiyama, Hiratsuka; Toshio Hirota, Yokohama; Jun Kakei, Yokohama, and Yoshiji Kabasawa, Yokohama, all of Japan, assignors to Nissan Motor Company Limited, Takara-machi, Kanagawa-ku, Yokohama, Japan

Filed Sept. 21, 1973, Ser. No. 399,373

Claims priority, application Japan, Sept. 22, 1972, 47-94592; Sept. 22, 1972, 47-94593; Oct. 31, 1972, 47-108506

Int. Cl. F16h *33/02*

U.S. Cl. 74—751 **5 Claims**



1. A hybrid power system for a motor vehicle, comprising a prime mover, a power output shaft, an intermediate shaft connected between said prime mover and said power output shaft, releasable coupling means connected between said intermediate shaft and said power output shaft for disconnecting the power output shaft from the intermediate shaft when the coupling means is actuated, a flywheel releasably engaging said intermediate shaft, a stepless speed change unit interconnected between said flywheel and said intermediate shaft for steplessly varying a ratio between the revolution speeds of said intermediate shaft and said flywheel, and control means responsive to revolution speeds of said prime mover and said flywheel for producing a first signal representative of an amount of energy stored on said flywheel and a second signal representative of a differential speed between said prime mover and said flywheel, said control means comprising a signal generator which produce a first control signal when said first signal is representative of a flywheel energy larger than a first reference level, a second signal when said first signal is representative of a flywheel energy larger than a second reference level which is higher than said first reference level, and a third control signal when said first signal is representative of a flywheel energy larger than a third reference level which is higher than said second reference level, wherein the power output from said prime mover is imparted partly to said power output shaft and partly to said flywheel for increasing the energy on the flywheel when said second signal is smaller than a predetermined level and concurrently said first control signal is present and wherein said flywheel is disengaged from said prime mover in response to said third control signal and is brought into driving engagement with said power output shaft through said coupling means in response to said second control signal so that the power output shaft is driven from both said prime mover and said flywheel when the second control signal is present.

3,886,811
EPICYCLIC CHANGE SPEED HUBS

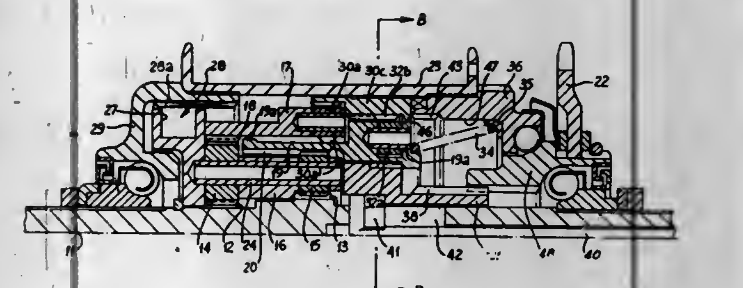
Anthony William Hillyer, Loughborough, England, assignor to Raleigh Industries Limited, Nottingham, England

Filed Mar. 11, 1974, Ser. No. 449,773

Claims priority, application United Kingdom, Mar. 28, 1973, 14826/73

Int. Cl. F16h *5/42, 57/10, 5/04*

U.S. Cl. 74—750 B **16 Claims**



1. An epicyclic change-speed hub comprising a hub axle, a hub shell a plurality of sun gears secured to the said axle, a respective plurality of planet gears for each such sun gear, a respective gear ring for each plurality of planet gears, each plurality of planet gears being in mesh with its respective sun gear and with its respective gear ring, the respective pluralities of planet gears being supported on a common planet cage, respective unidirectional clutch means drivingly connecting each gear ring and the planet cage with the hub shell and an axially adjustable coupling means adapted to receive a drive motion from an input member and selectively cooperable with the planet cage or with one of the gear rings for transmitting a drive motion thereto, one of said gear rings being axially shiftable with respect to the hub and being adapted according to its position in the axial direction of the hub to render inoperative a first unidirectional clutch means connecting said axially adjustable gear ring with the hub shell and also able to render a second unidirectional clutch means associated with said fixed ring inoperative, and coupling means between said common planet cage and said axially adjustable coupling means being adapted automatically to be mutually disengaged, if in a condition of engagement on reverse motion of the coupling means.

3,886,812
MARKING APPARATUS INCLUDING A VERTICAL COLUMN SERVING FOR GUIDING AND HOLDING A MARKING ARM

Franz Freund, Aschaffenburg, Germany, assignor to Mora Fabrik fuer Mebgeraete H. Freund, Germany

Filed Jan. 28, 1974, Ser. No. 436,907

Claims priority, application Germany, Jan. 30, 1973, 2304401

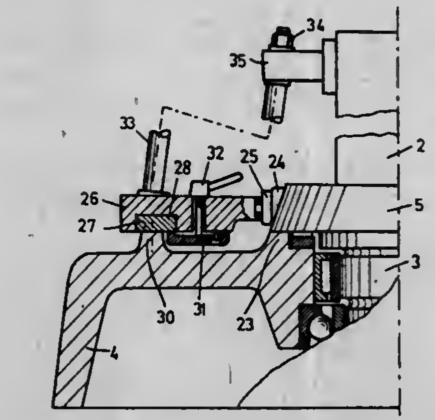
Int. Cl. B23b *29/00*

U.S. Cl. 74—813 L **20 Claims**

1. A marking apparatus of the type in which an apparatus arm is mounted on a vertical column having the bottom end thereof rotatably mounted in a base plate and lockable by a locking means at selected rotary positions with respect to said base plate, said apparatus comprising:

a guide rail spaced outwardly from the bottom of said column;

a radial arm secured at one end to said column and extending outwardly therefrom to engage said guide rail; and



an oblique strut extending from an upper portion of said column to said radial arm.

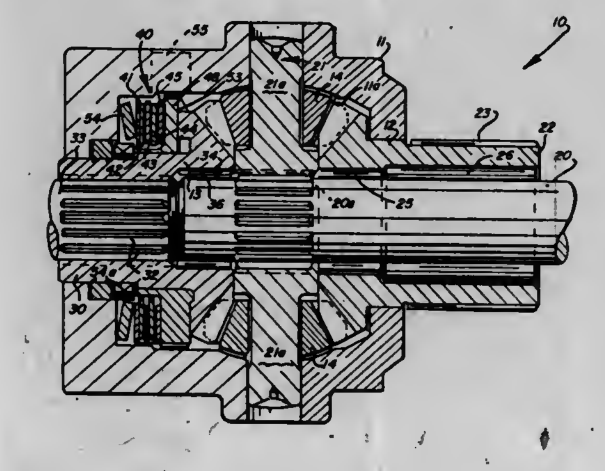
3,886,813
DIFFERENTIAL

Jerry F. Baremor, Marshall, Mich., assignor to Eaton Corp., Cleveland, Ohio

Filed Apr. 10, 1974, Ser. No. 459,631

Int. Cl. F16h *1/44*

U.S. Cl. 74—710.5 **6 Claims**



1. Apparatus comprising a pair of output drives, a differential interposed between said output drives and enabling differential rotation to occur between said output drives upon different loads being applied thereto, said differential comprising differential gearing drivingly connected with said output drives and including gears which are relatively rotatable to provide said differential rotation of said outputs, and means responsive to a predetermined degree of differentiating action of said differential gearing to lock up said differential gearing and releasable upon a predetermined torque being applied to said differential gearing due to windup of said output drives when said differential gearing is locked up.

3,886,814
COOLING CIRCUIT FOR A VEHICLE TRANSMISSION

David E. Bullard, Washington, and Jan K. Allen, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 14, 1973, Ser. No. 388,189

Int. Cl. F16h *47/08;* **F16d** *33/00*

U.S. Cl. 74—730 **7 Claims**

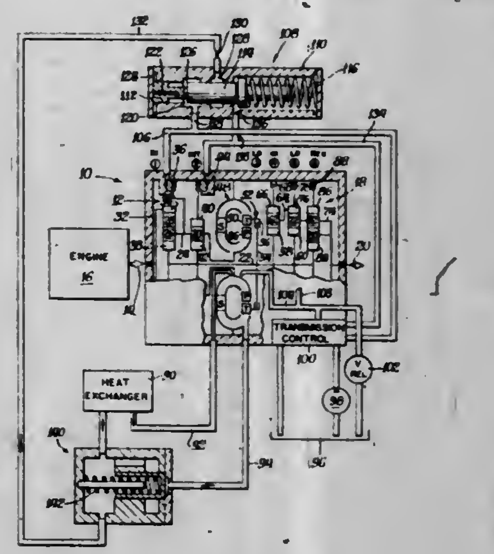
1. In combination with a transmission including working fluid and a torque converter, rotatable at relatively higher and lower speeds:

a heat exchanger;

first means communicating the working fluid with the heat exchanger so that rotation of the torque converter causes flow of the working fluid from the transmission to the heat exchanger through the first communicating means, through the heat exchanger, and back to the transmission, a higher rate of rotation of the torque converter increasing such flow;

fluid pressure means; and

second means communicating the working fluid with the heat exchanger so that the fluid pressure means cause flow of the working fluid from the transmission to the heat exchanger through the second communicating means, through the heat exchanger, back to the transmission only upon the rate of rotation of the torque converter falling below a chosen level,



wherein the second communicating means comprise valve means actuatable to provide such communication through the second communicating means only upon the rate of rotation of the torque converter falling below the chosen level to allow said fluid pressure means to cause flow of the working fluid from the transmission to the heat exchanger through the second communicating means, through the heat exchanger, and back to the transmission.

3,886,815
MULTI-SPEED REVERSIBLE GEARING

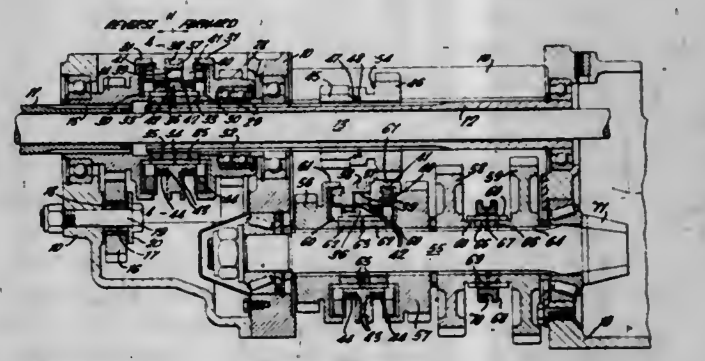
Thomas Eastwood, Huddersfield, England, assignor to David Brown Tractors Limited, Meltham, Huddersfield, England

Filed Apr. 29, 1974, Ser. No. 464,952

Claims priority, application United Kingdom, May 18, 1973, 23696/73

Int. Cl. F16h *3/02*

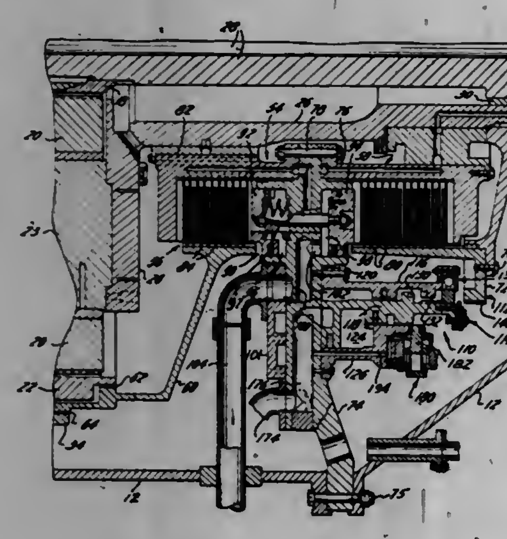
U.S. Cl. 74—745 **5 Claims**



1. A gearbox comprising forward and reverse gearing including a synchromesh clutch and connecting an input shaft to an intermediate shaft; multi-range gearing connecting the intermediate shaft to a layshaft parallel to the intermediate shaft, said multi-range gearing comprising a cluster of two

gears of mutually different pitch circle diameters slideable on splines on the intermediate shaft so that one of said gears can be brought into mesh with one gear secured on or integral with the layshaft or alternatively the other of said gears can be brought into mesh with another gear secured on or integral with the layshaft; and variable-speed gearing connecting the layshaft to an output shaft parallel to the layshaft and comprising a plurality of gears of mutually different pitch circle diameters secured on or integral with the layshaft and consisting of or including those gears on said shaft forming part of the multi-range gearing gears rotatably mounted on the output shaft and each meshing constantly with one of the gears on the layshaft, and clutch means for selectively connecting one of the gears rotatably mounted on the output shaft driveably to said shaft.

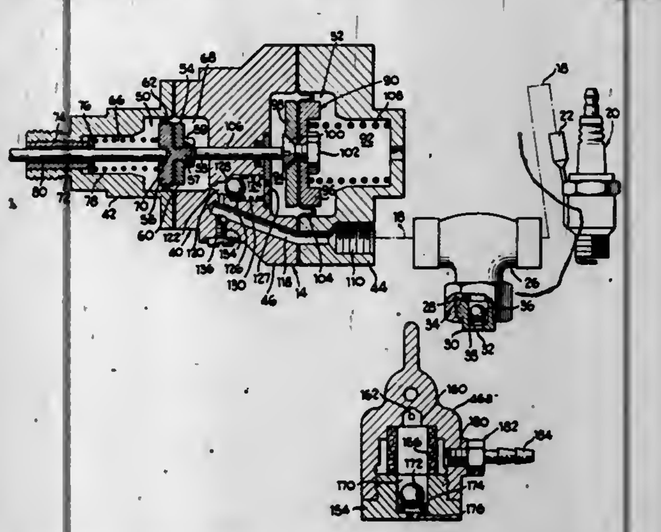
3,886,816
BIDIRECTIONAL PLANETARY GEAR TRANSMISSION
Angelo De Feo, Totowa Boro, and Harry N. Price, Elmwood Park, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.
Filed Oct. 1, 1973, Ser. No. 402,295
Int. Cl. F16h *57/10, 37/06*
U.S. Cl. 74—764 **5 Claims**



1. In a bidirectional planetary gear transmission having a housing, an output means connected to the planetary gear assembly disposed in the housing to be rotatively driven by the planetary gear assembly alternately in opposite directions by arresting alternately the planetary gear carrier and the ring gear of the planetary gear assembly and having pressurized fluid friction brake mechanism operative from a disengaged position to an engaged position wherein the planetary gear carrier is connected to the housing to be thereby arrested and cause the planetary gear assembly to effect rotation of the output means in a predetermined direction, the combination of:

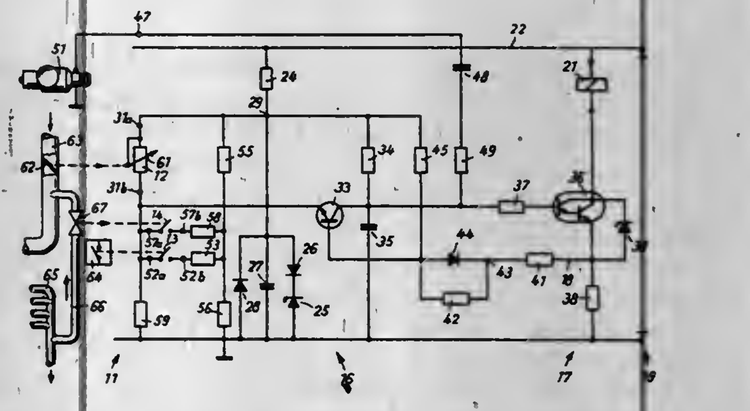
- a. a locking means operative in an engaged position to secure the planetary gear carrier to the housing and against rotation thereby permitting said brake mechanism to be disengaged;
- b. said locking means comprising:
  - b-1. a first member supported by the housing for reciprocative movement;
  - b-2. a second member connected for conjoined rotation with the planetary gear carrier and relative to said first member;
  - b-3. a first stop means carried by said first member;
  - b-4. a second stop means carried by said second member;
  - b-5. actuating means for moving said first member relative to said second member so that said first stop means is brought into rotative alignment with said second stop means to thereby prevent rotation of said second member and gear carrier; and
  - b-6. pilot means carried by said first member and coacting with said first and second stop means to guide said first and second stop means into rotative alignment and abutment to prevent rotation of said second member and said planetary gear carrier.

3,886,817
ENGINE TORQUE SENSOR DEVICE
Howard C. Paul, Des Plaines, and John J. Tuzson, Evanston, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.
Division of Ser. No. 365,779, May 31, 1973. This application July 12, 1974, Ser. No. 487,830
Int. Cl. B60k *23/02*
U.S. Cl. 74—861 **5 Claims**



1. A mechanism for developing a signal responsive to engine torque output of an automotive engine including a torque responsive actuator adapted to be connected to the control system of an automatic transmission driven by said engine, said actuator including a piston movable to transmit said signal to said transmission, a conduit connecting said piston to at least one cylinder of said engine whereby said piston will move in response to the pressure in said cylinder as an indication of torque load, and said actuator including a safety device comprising a second piston in operative association with said first piston, said second piston also being connected to said cylinder pressure to prevent actuation of said first piston by said second piston, and biasing means for said second piston adapted to move said second piston and thereby said first piston in response to an absence of cylinder pressure so as to provide a high torque load indication to said transmission.

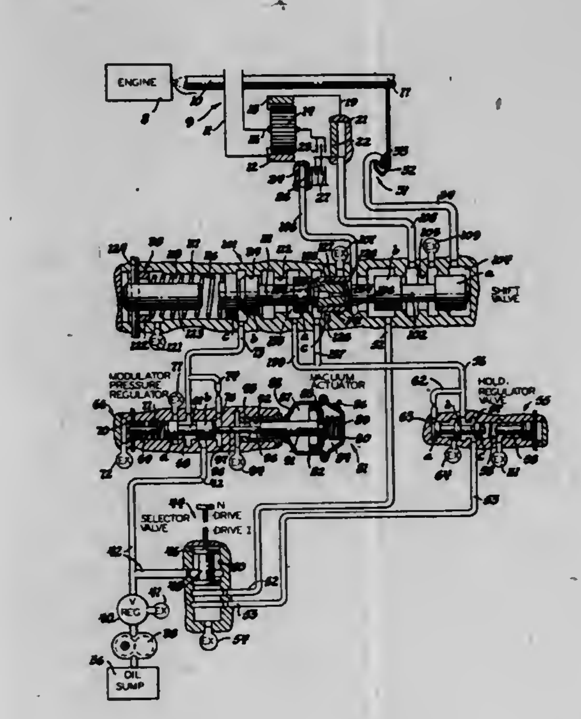
3,886,818
CONTROL SYSTEM FOR THE MAIN CONTROL PRESSURE OF A MOTOR VEHICLE AUTOMATIC TRANSMISSION
Bert Wurst, Moglingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Sept. 17, 1973, Ser. No. 397,760
Claims priority, application Germany, Oct. 14, 1972, 2250440
Int. Cl. B60k
U.S. Cl. 74—866 **18 Claims**



1. A control system for controlling the main control pressure of the automatic transmission of an internal combustion engine, comprising:

- a source of electric voltage;
- input transducer means (11) for converting mechanical position into electrical signals including a variable resistance, the ohmic value of which is controlled by the position of the engine throttle (62), said variable resistance (12) having a non-linear relation between resistance and throttle position, whereby said input transducer has a predetermined non-linear relation between input magnitude and output magnitude;
- amplifying evaluation circuit means (15) responsive to said input transducer means (11), and
- output transducer means (19) controlled by the electrical output of said evaluation circuit means (15) for mechanically controlling said main control pressure.

3,886,819
TRANSMISSION SHIFT CONTROL
Carl A. Lentz, Mooresville, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 5, 1973, Ser. No. 412,866
Int. Cl. B60k *21/00*
U.S. Cl. 74—868 **13 Claims**



1. a transmission; multiratio gear means having an input, output, low drive fluid operated means for establishing a low ratio drive between said input and output and high drive fluid operated means for establishing a high ratio drive between said input and output; a source of fluid under pressure; governor means connected to said source and said output providing a governor pressure varying with output speed; torque demand means responsive to engine torque demand providing a torque demand signal varying with torque demand; shift control means including a bore and shift valve means movable in said bore connected to said source, said low and high drive means, said governor means and said torque demand means, operative in a downshift position to connect said source to said low drive fluid operated means, operative in an upshift position to connect said source to said high drive fluid operated means and biased in an upshift direction by said governor signal and having torque demand biasing means movable in said bore connected to said torque demand means and responsive to said torque demand signal operative in a downshift position to engage and provide an upshift resisting bias to said downshifted shift valve means and in an upshift position to engage and provide a downshift bias to said upshifted shift valve means for automatic shifting at increasing and higher upshift speeds and lower downshift speeds with increasing torque demand, said shift valve means and said biasing means having engaging end portions within said bore; and manual downshift means having downshift area means on said engaging end portions and manual downshift fluid supply means selectively manually controlled to supply downshift pressure to said bore to act on said downshift area means of said biasing means to hold said biasing means in said upshift position, to act on one area said downshift area means of said shift valve means when said shift valve means is upshifted to downshift said shift valve means at a higher speed than said automatic downshift, and to act on said downshift area means of said shift valve means when said shift valve means is downshifted to prevent an upshift until a speed substantially higher than said manual downshift speed.

13. In a transmission; multiratio gear means having an input, an output and fluid operated means for selectively establishing a low ratio drive and a high ratio drive; source means providing fluid under pressure; governor means connected to said gear means providing a governor signal varying with speed; torque demand signal means responsive to engine torque demand providing a torque demand signal varying with torque demand; shift control means operatively connected to said source means, said governor means, said torque demand signal means and said fluid operated means controlled by said governor signal and torque demand signal for automatic upshifting at higher speeds with increasing torque demand to upshift position and downshifting at lower speeds to downshift position and operative to control the supply of fluid between said source and said fluid operated means to establish said low ratio drive in downshift position and said high ratio drive in upshift position; said shift control means including a shift valve assembly having a bore, a shift valve element and a control valve element both slidable in said bore between upshift and downshift position and each having an adjacent end portion, governor bias means responsive to said governor signal to bias said shift valve element to upshift position, torque demand biasing means responsive to said torque demand signal biasing said control valve element to downshift position and to continuously engage said adjacent end portions for movement of said valve elements as a unit during said automatic shifting; manual downshift signal means manually selectively providing a manual downshift fluid pressure to said bore between said adjacent end portions in all positions of said valve elements; and downshift means having controlled area means with a first area means exposed to pressure in said bore at all times and a second area means on said adjacent end portion of said shift valve element, area control means with a third area means on said adjacent end portion of said control valve element, a restricted exhaust from said second area means, restriction means for flow from said first area means to said second area means having a more restricted passage than said restricted exhaust when said shift valve is upshifted and a less restricted passage than said restricted exhaust when said shift valve is downshifted and operative in response to said downshift pressure in said bore acting on said third area means to position said control valve element in said upshift position to provide when said shift valve element is in upshift position downshift pressure acting on said first area means, flowing through said more restricted passage over said second area means and to said restricted exhaust to provide not more than a low pressure acting on said second area means for a small downshift bias and to provide when said shift valve element is in downshift position downshift pressure acting on said first area means and flowing through less restricted passage, over said second area means and to said restricted exhaust to provide downshift pressure on said second area means for a large downshift bias to provide manual hysteresis by manual downshift pressure for upshifts at high speed and downshifts at a lower speed.

3,886,820

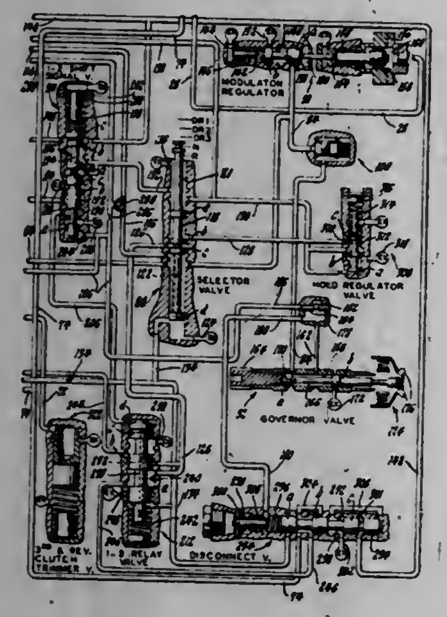
TRANSMISSION AND CONTROL

Carl A. Lentz, Mooresville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 383,767, July 30, 1973, abandoned. This application Nov. 28, 1973, Ser. No. 419,696

Int. Cl. B60k *21/02*; **F16h** *3/74*

U.S. Cl. 74—869 **3 Claims**



1. A control for a power transmission driven by a two-spool turbine engine having a compressor and compressor drive turbine on one shaft and a power turbine on the other shaft, and a fuel burner effective to heat the compressor discharge air and deliver the same to each turbine, the engine further having a rate of fuel supply control and a compressor discharge chamber wherein the pressure increases with increased compressor shaft speed and with increased air density and thereby represents turbine power comprising a plurality of selectively operable fluid operated friction drive establishing means for establishing a plurality of forward drives and a reverse drive in said transmission and one of said drive establishing means being operated in the low forward drive and the reverse drive; fluid source means for providing fluid pressure in said control; shift valve means, including manual valve means selectively moveable to forward, neutral and reverse drive positions and being in fluid communication with said fluid source means for directing fluid pressure to said fluid operated friction drive establishing means; means responsive to the compressor discharge pressure; and engagement control valve means in fluid communication with said shift valve means and said one of said friction drive establishing means for controlling the operation of said one of said friction drive establishing means including control chamber means in fluid communication with the means responsive to compressor discharge pressure for preventing engagement of said one friction drive establishing means when either (a) the manual valve means is in the forward drive position and the compressor discharge pressure is below a predetermined value or (b) the manual valve means is moved from neutral to the reverse drive position and the compressor discharge pressure is above a predetermined value.

3. A control for a power transmission driven by a two-spool turbine engine having a compressor and compressor drive turbine on one shaft and a power turbine in the other shaft, and a fuel burner effective to heat the compressor discharge air and deliver the same to each turbine, the engine further having a rate of fuel supply control and a compressor discharge chamber wherein the pressure increases with increased compressor shaft speed and with increased air density and thereby represents turbine power comprising a plurality of selectively operable fluid operated friction drive establishing means for establishing a plurality of forward drives and a reverse drive in said transmission and one of said friction drive establishing means being operated in the low forward drive and the reverse drive; fluid source means for providing fluid pressure in said control; shift valve means; including manual valve means selectively moveable to forward, neutral and reverse drive positions and being in fluid communication with said fluid source means for directing fluid pressure to said fluid operated friction drive establishing means; governor means in fluid communication with said fluid source means for establishing a governor control pressure in said control; compressor discharge pressure responsive means in fluid communication with said fluid source means for providing an engine power signal in said control; and engagement control valve means in fluid communication with said shift valve means and said one of said friction drive establishing means for controlling the operation of said one of said friction drive establishing means including a valve spool, passage means interconnecting the valve spool, said shift valve means and said one friction drive establishing means, first control chamber means in fluid communication with the engine power signal of said compressor discharge pressure responsive means and operatively connected with said valve spool for controlling movement of said valve spool to control fluid pressure in said one friction drive establishing means when the manual valve means in the forward drive position and the engine power is below a predetermined value, and second control chamber means in fluid communication with said governor means and operatively connected with said valve spool for controlling fluid pressure in said one friction drive establishing means to prevent a forward to reverse interchange in said transmission when the governor control pressure is above a predetermined value.

3,886,821

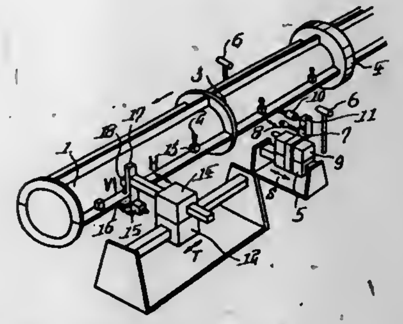
AUTOMATIC FASTENING DEVICE WITH BOLTS FOR CONCRETE MOLDS

Takeshi Tokunaga; Toshiaki Maekawa, both of Hitachi; Takeshi Uno, Tokyo; Tadashi Akagi, Shimodate; Nobuyuki Abe, Shimodate; Takeo Kume, Shimodate; Yukio Ohnishi, Shimodate, and Yasumi Shimomura, Tokyo, all of Japan, assignors to Nippon Concrete Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 19, 1974, Ser. No. 490,085

Int. Cl. B25b *13/00, 21/00*

U.S. Cl. 81—54 **1 Claim**



1. An automatic bolt-fastening device for molds for forming concrete piles or the like, comprising a manipulator arranged for movement relative to the mold and carrying a bolt driver unit operable to tighten or loosen the fastener bolts on the mold, detector means arranged upstream of said manipulator with respect to the movement of the mold relative thereto to detect the fastener bolts and radially projecting members of the mold with the aid of an image information taken by an industrial television camera, feeler means arranged on said manipulator for feeling engagement with the fastener bolt detected, the arrangement being such that said bolt driver unit is accurately positioned for bolt tightening or loosening operation only when a fastener bolt is detected by said detector means and is moved into a position clearing any of the radially projecting members of the mold when such member is detected.

3,886,822

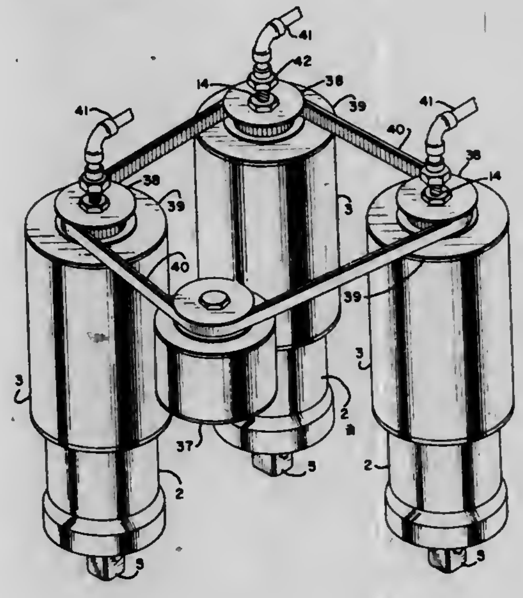
POWER WRENCH WITH ROTATIVELY MOUNTED MOTOR

Reginald W. Pauley, Belle Mead, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation of Ser. No. 325,390, Jan. 22, 1973, abandoned. This application Apr. 22, 1974, Ser. No. 462,597

Int. Cl. B25b

U.S. Cl. 81—52.4 R **12 Claims**



1. A power wrench comprising:

A wrench body; a rotary motor housing rotatively mounted in said wrench body; a motor rotor rotatively mounted in said motor housing for plural revolutions therein; a spindle connected to said motor rotor to be driven thereby, said spindle being adapted to be connected to a fastener for driving the fastener, means for controlling the rotation of said motor housing relative to said spindle in order for said spindle to drive a fastener, said means allowing said motor housing to rotate relative to said spindle when said spindle is stalled and applying a torque to a fastener to cause such torque to pulsate in value.

3,886,823

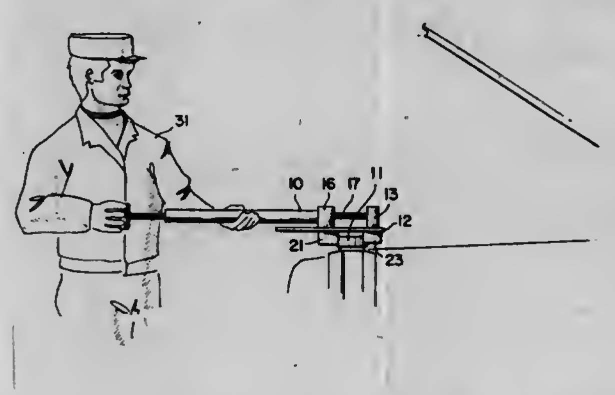
RADIATOR CAP REMOVER TOOL

David P. Gonzalez, and Odette A. Peacock, both of Hollywood, Calif., assignors to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Mar. 21, 1974, Ser. No. 453,270

Int. Cl. B25b *13/16*

U.S. Cl. 81—175 **2 Claims**



1. A tool for use in safely removing a cap of a radiator, with the user at a safe distance from the radiator cap, comprising a pair of jaws slidably mounted with respect to each other, with one of said jaws fixed at the end of a hollow tube, and the other jaw rotatably fixed to the end of a threaded rod enclosed in said tube, said rod fitted in threaded engagement with female threads formed in the interior wall of said tube, with the opposing interior faces of the jaws each formed in a concave shape, said threaded rod extending at its free end past the tube, with a handle fitted to the free rod end,

one of said jaws fixed to a plate to which the other jaw is slidably mounted, said plate located adjacent each of the jaws and oriented perpendicular to the axis of a radiator cap gripped by the jaws, so that said plate may serve as a rest for positioning the plate on the top of the radiator cap to be rotated by the tool.

3,886,824

METHOD AND APPARATUS FOR DEFLASHING HOLLOW PLASTIC ARTICLES

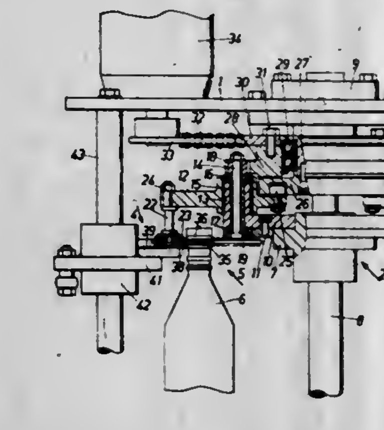
Edmond Michel, Brussels, and Marcel Duikers, La Hulpe, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed Dec. 27, 1973, Ser. No. 428,896

Claims priority, application France, Jan. 5, 1973, 73.00441

Int. Cl. B23b *1/00, 5/14*

U.S. Cl. 82—47 **12 Claims**



1. In a process for deflashing the neck of hollow plastic articles, after they have been released from the mold in which they were fabricated and partially cooled, which process includes cutting off the neck flash of each such article gradually by a cutting component while causing the hollow article to execute a translational movement while maintaining its axis perpendicular to the cutting component, and a rotational movement about its longitudinal axis, the improvement comprising: removing each cut-off flash from the cutting component by removal means; and removing each article whose flash has not been completely cut-off from the cutting component by the same removal means.

3,886,825

METHOD FOR MECHANICALLY CUTTING FLANGES FROM PRESHAPED STEEL CONSTRUCTION MEMBERS

Ichiro Tanaka, 4-3 Kudegadanisho, Nishinomiya, Japan

Division of Ser. No. 387,251, Aug. 10, 1973, Pat. No. 3,848,499. This application July 5, 1974, Ser. No. 485,930

Int. Cl. B26d *1/00, 7/02, 5/12*

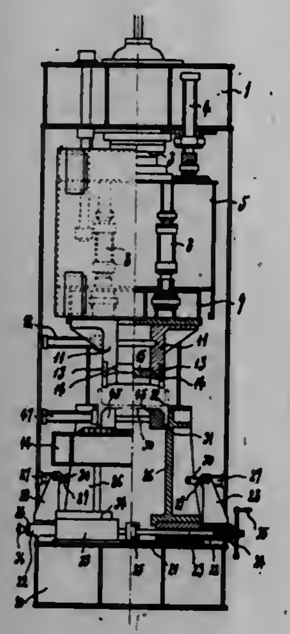
U.S. Cl. 83—13 **1 Claim**

1. A method of cutting off opposite flanges from the connecting web of shaped steel articles wherein the cutting is done at the junctions between inner faces of the flanges and said web, said method comprising the steps of:

a. supporting the shaped section by its opposite flanges so that the connecting web is exposed at opposite junctions with said flanges;

b. moving a pair of generally parallel disposed cutting edges in concert transversely toward and into engagement with exposed connecting web so as to effectively shear the flanges therefrom at said junction points;

c. adjustably moving a pair of rigid parallel combined protective and supportive members respectively oppositely toward and then away from one another to first make room for initially positioning for supporting the shaped section in a predetermined position relative to the cutting edges, and for subsequently gripping the opposed inner faces of the flanges thereby with supporting means engaging the outer faces of the flanges; and



d. subsequently moving said combined protective and supportive members yieldingly away while continuing to support the web of the shaped steel section during the cutting thru of said cutting edges toward said supportive members.

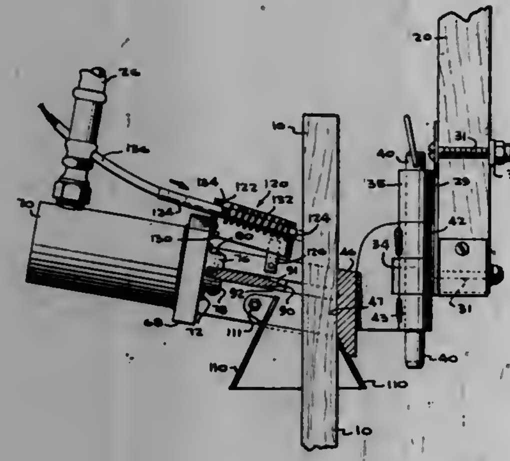
3,886,826
SURVEYING APPARATUS STAKE CUTTER

Robert L. Brown, 881 George Washington Hwy., Chesapeake, Va. 23323

Filed Aug. 20, 1974, Ser. No. 499,072

Int. Cl. B26d *5/12, 7/02*

U.S. Cl. 83—13 **14 Claims**



1. An apparatus for providing a vertically oriented stake having a top end termination at a desired elevation, said apparatus comprising a vertically movable support member, cutting means capable of severing a stake and selectively operable stake clamping means mounted on said support member for vertical movement adjacent a stake having a top end termination above said desired elevation for clampingly engaging said stake to prevent movement of said support member relative to said stake and indicator means on said support member indicative of the elevation of the cutting means so that actuation of said stake clamping means can be effected when the cutting means is at said desired elevation to maintain said cutting means at said desired elevation until said cutting means is actuated to provide a stake having a top end termination at said desired elevation.

3,886,827
BREAD SLICING MACHINE

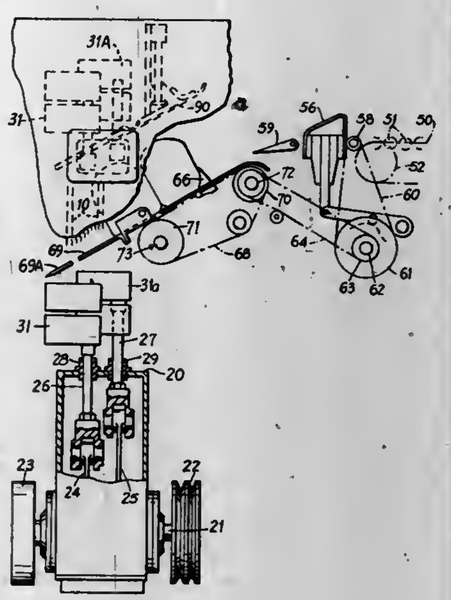
Thomas Joseph McCarthy, Richmond, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed Feb. 14, 1974, Ser. No. 442,531

Claims priority, application United Kingdom, Feb. 15, 1973, 7603/73

Int. Cl. B26d *1/46, 4/02*

U.S. Cl. 83—56 **6 Claims**



5. Method of slicing a loaf of bread including the steps of: advancing a plurality of loaves on a conveyer at an angle with respect to a plurality of slicing blades disposed in overlapping adjacent relation with respect to one another being mounted on a pair of V shaped frames; engaging the loaf with the apex of the V blade array at one corner of said loaf; urging said loaf to engage said plurality of overlapped slicing blades whereby said blades being overlapped with respect to one another by an amount equal to of from 20–80 percent of the width of such blades, enabling the action of said overlapping blade surfaces to guide the slices being cut by the reciprocating action of said blades; and guiding the completely sliced loaf away from cutting blades.

3,886,828
SHEAR

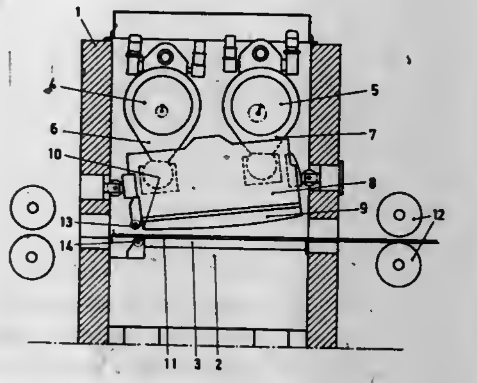
Adolf Muller, Hilchenbach-Dahlbruch, Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

Filed May 17, 1974, Ser. No. 470,747

Claims priority, application Germany, June 7, 1973, 2329095

Int. Cl. B23d *15/08, 27/00*

U.S. Cl. 83—150 **3 Claims**



1. Slitting shears for rolled sheet metal, having a bow-shaped upper knife executing a roll-cut movement and having a stationary, straight lower knife, whereby the upper knife in relationship to the lower knife can be pre-adjusted to different sheet metal thicknesses and different penetrations,

characterized by the fact that ahead of the penetration point (10) of the upper knife (9) on the upper knife carrier (8) is position a roller (13) which extends slightly beyond the cutting edge of the upper knife (9).

3,886,829
DEVICE FOR SHEARING ROD SECTIONS IN AN AUTOMATIC MULTI-STAGE CROSS-FED PRESS

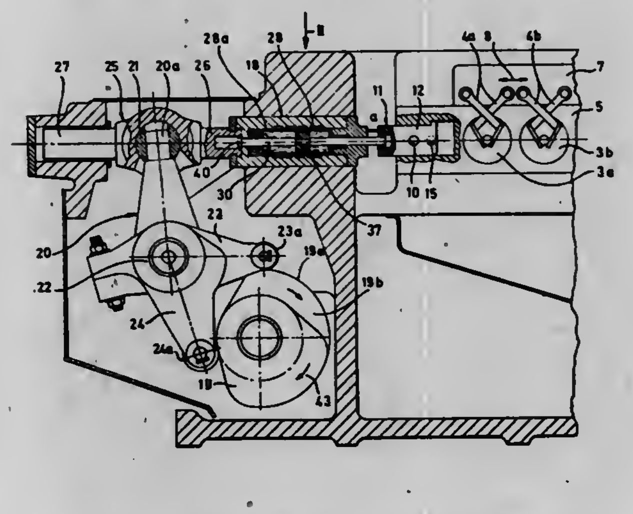
Roger Criblez, Bottmingen, Switzerland, assignor to Hatebur Umformmaschinen AG, Basel, Switzerland

Filed Apr. 29, 1974, Ser. No. 465,405

Claims priority, application Germany, May 5, 1973, 2322770

Int. Cl. B26d *3/16*

U.S. Cl. 83—198 **9 Claims**



1. A device for shearing rod sections in an automatic multi-stage cross-fed press, such a device comprising a cutter carriage for shearing rod sections from a rod feed stock, an impact carriage, said impact carriage being arranged co-axially with said cutter carriage, a reciprocable drive arrangement, said drive being rigidly coupled to the impact carriage, said drive having a drive stroke which enables the impact carriage to impinge on the cutter carriage during the final portion of a drive stroke to thereby transmit to said cutter carriage the energy necessary to perform a shearing operation, a coupling element, said coupling element interconnecting said impact carriage and said cutter carriage, said coupling element being rigidly connected to one of said carriages and being connected to the other carriage so that it is movable over a relatively small portion of the movement of that carriage and a braking device, said braking device being adapted to engage one of said cutter carriages or coupling element to arrest the relative movement between said cutter carriage and said impact carriage in both directions of the reciprocable movement.

3,886,830
CUTTING DEVICES FOR SUBDIVIDING MOVING ELONGATED STOCKS

Helmut Holthoff, Glehn, and Cyril Pazderka, Dusseldorf-Oberkassel, both of Germany, assignors to Firma Friedrich Kocks, Dusseldorf, Germany

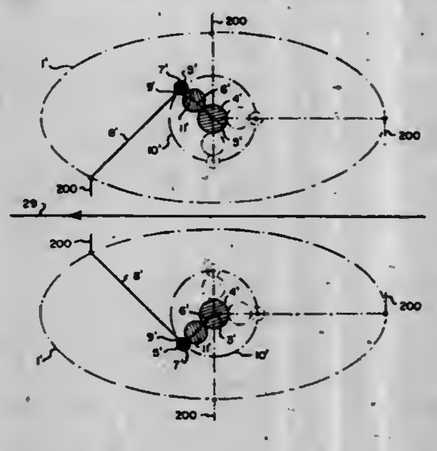
Filed May 9, 1973, Ser. No. 358,651

Claims priority, application Germany, May 24, 1972, 2225118

Int. Cl. B23d *25/06*

U.S. Cl. 83—285 **30 Claims**

1. A cutting device for subdividing moving elongated stock, especially strip- or rod-shaped or tubular rolled stock, in which each cutting tool moves in a substantially flat curve through a cutting zone during cutting and through a relatively sharp curve at each end of the cutting zone comprising a cutting tool, a carrier arm pivotally mounted at one end and free at the other, said cutting tool disposed on a free end section of said carrier arm which, when in use, describes a locus first guide means acting on said carrier arm by which it can be guided to and through the stock at a speed which at least over the length of a stock cutting path is synchronised with the speed of the stock, a linkage system of at least two levers in which the carrier arm is the last lever, all of which are effectively in the same plane, and which are pivotally connected one to another, one end of a first lever of the linkage system remote from the carrier arm being mounted for rotation about a fixed axis, a second lever in the linkage system being pivotally connected to the first lever about a common pivotal axis spaced from the fixed axis and second guide means are coupled to the second lever so that, when in use, the first lever, and with it the common pivotal axis, is rotated in a circular path about the fixed axis of rotation whilst part of the second lever in the region of the common pivotal axis also is rotated in the circular path but in addition is caused by the second guide means to pivot about the rotating common pivotal axis.



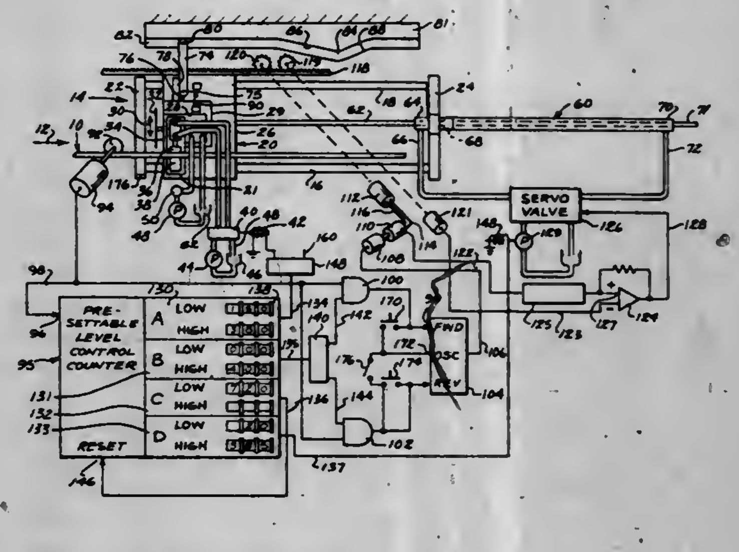
3,886,831
ELECTROHYDRAULICALLY CONTROLLED CUT OFF SAW

Anthony G. Law, East Cleveland, Ohio, and James E. Johnson, Smithfield, Mich., assignors to Chase Brass and Copper Co., Cleveland, Ohio, by said Anthony G. Law

Filed Apr. 24, 1974, Ser. No. 463,772

Int. Cl.^{2} B26D *1/56*

U.S. Cl. 83—294 **7 Claims**



1. A cut off saw comprising

a cut off saw moveable along the path of travel of stock to be cut, and moveable transversely through the path of travel of the stock to cut the stock;

hydraulic cylinder means connected to said saw for moving said saw along the path of travel of the stock in a forward direction the same as the direction of travel of the stock, and in a reverse direction opposite to the direction of travel of the stock;

electrohydraulic control means for controlling the hydraulic cylinder means during the forward and return movement of the saw;

pulse generating means for producing a plurality of pulses each indicative of a predetermined increment of travel of the stock;

means responsive to said pulses for moving said saw along the path of travel of the stock to a predetermined position with respect to the stock and at a speed corresponding to the speed of travel of the stock;

means for traversing the saw to cut the stock;

means responsive to a predetermined number of pulses to operate said electrohydraulic control means to stop movement of the saw in the forward direction; and

means responsive to a second predetermined number of pulses to return the saw to a start position.

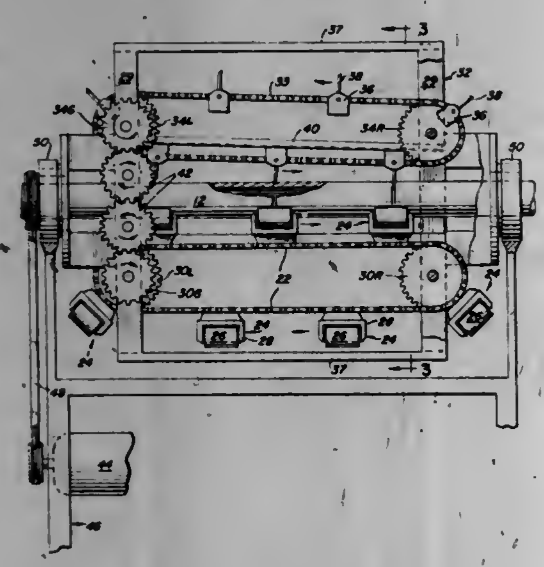
3,886,832
CUTTING APPARATUS

Michael R. Harris, Norwood, N.J., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 15, 1973, Ser. No. 416,062

Int. Cl. B23d *25/04;* **B26d** *1/56*

U.S. Cl. 83—308 **3 Claims**



1. A cutting apparatus comprising spaced cutting means secured at predetermined intervals to a continuous conveyor traversing a fixed path, means for axially driving a tubular member in a non-rotating condition along an axial path, said continuous conveyor and said cutting means traversing a path segment intersecting the axial path of said tubular member whereby said cutting means sequentially engage outer peripheral portions of said tubular member while proceeding along said path segment, a rotatable yoke through which said tubular member passes, supportably engaging said continuous conveyor and the cutting means mounted thereon; means connected to said yoke for rotating said yoke about said tubular member; said cutting means and continuous conveyor being substantially evenly spaced from said tubular member longitudinal axis in all positions of their rotatable movement whereby said cutting means may cut said tubular member about its entire periphery; said cutting means approaching said tubular member in the direction of tubular member axial movement whereby said cutting means penetrates said tubular member to an increasingly greater depth as said cutting means proceed along said path segment and said tubular member moves axially through said yoke.

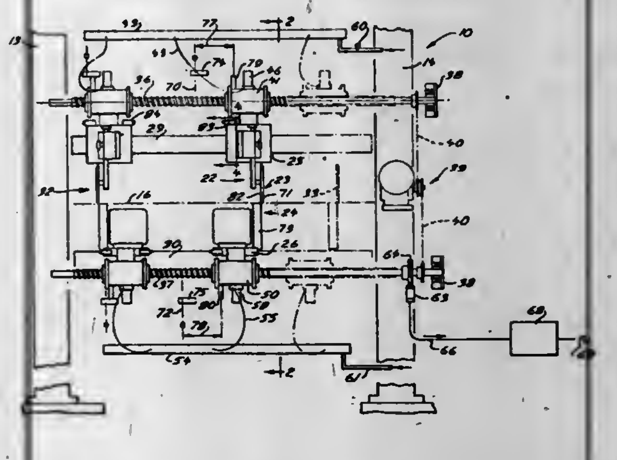
3,886,833
APPARATUS TO EFFECT REMOTE AUTOMATIC POSITIONING OF WEB SLITTER

John Wollerston Gunn, Vancouver, British Columbia, and Leonard Adolphus Murphy, North Vancouver, British Columbia, both of Canada, assignors to Elworthy and Company Ltd, Burnaby, British Columbia and MacMillan Bloedel Limited, Vancouver, British Columbia, both of, Canada

Filed May 1, 1974, Ser. No. 465,824

Int. Cl. B26d *1/24;* **B23d** *19/06*

U.S. Cl. 83—499 **14 Claims**



1. A positioning apparatus to effect remote automatic positioning of a slitting device for use in a slitting machine for slitting longitudinally to a required width a web of sheet material passing through the machine, the slitting machine having at least one slitting device having upper and lower complementary slitter portions, each portion mounted on a respective slitter base, the web passing between the portions; the machine further having two parallel rails extending transversely across the web, one rail being mounted on each side of the web, the positioning apparatus having transmission means co-operating with each slitter portion for moving the slitter portions along the rails, the transmission means including:

- i. two rotatable feed screws extending transversely across the web and disposed parallel to the rails, each feed screw being adjacent a respective rail,
- ii. a feed nut engaging one feed screw and cooperating with a respective slitter base so as to be free to rotate with the feed screw and relative to the slitter portion in a free wheeling mode, and to be locked relative to the slitter base in a feed mode,
- iii. clutch means cooperating with the respective slitter base and the feed nut and adapted to be operated remotely, the clutch means permitting relative rotation between the nut and the slitter base in the free wheeling mode, and to prevent relative rotation between the nut and the slitter base in the feed mode,
- iv. brake means cooperating with the respective slitter base and a respective rail and adapted to be operated remotely so as to lock the slitter base relative to the rail in the free wheeling mode;

the positioning apparatus further including:

- v. reversible drive means to rotate the two feed screws so that in the feed mode a complementary pair of slitter bases are driven at equal speed in the same direction,
- vi. electrical datum switch means fixed relative to and adjacent a respective rail and adjacent a datum of a particular slitting device, the switch being adapted to be actuated by a respective slitter base as the slitter base traverses the rail,
- vii. a counter cooperating with one feed screw to count the revolutions of the feed screw from a particular instant so as to permit determination of position of a particular slitter base from a respective datum thereof,
- viii. electronic control means cooperating with the clutch means, the brake means, the drive means, the datum switch means and the counter, the electronic control means having an input to receive instructions relating to desired slitter position relative to the datum switch means thereof,

so that to effect remote positioning of the slitters, the feed screws are driven with the clutch engaged so as to traverse the slitter portions concurrently from an old position towards a respective datum, the clutch means being disengaged and the brake means engaged when datum switch is actuated; and when the feed screws are driven in an opposite direction with the clutch re-engaged and revolutions of the screw are counted by the counter the slitter portions are traversed along the rails and the positions thereof from the datum are determined from the number of revolutions of the feed screw, so that when the desired new location of the slitter portion is reached the clutch is disengaged, thus stopping the slitter portion, and the brake means is actuated.

3,886,834
ELECTRONIC MUSICAL INSTRUMENT CAPABLE OF MODULATION CONTROLLING A SECOND KEYBOARD SECTION TONE SIGNAL IN ACCORDANCE WITH A FIRST KEYBOARD SECTION TONE SIGNAL

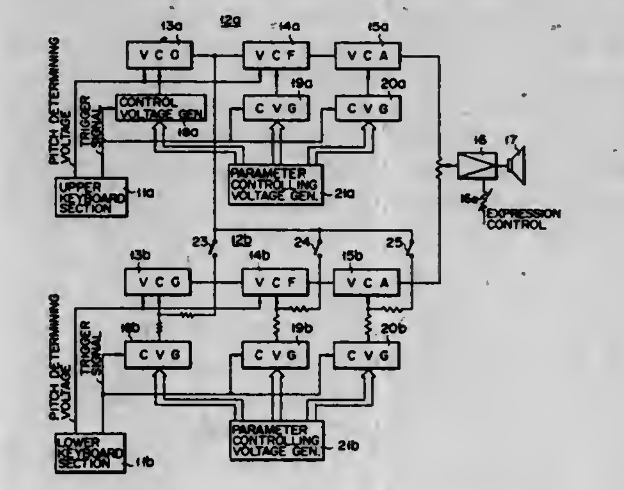
Eisaku Okamoto, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed May 8, 1974, Ser. No. 467,892

Claims priority, application Japan, May 11, 1973, 48-52367; Sept. 8, 1973, 48-105447; Sept. 8, 1973, 48-105448

Int. Cl. G10h *1/04, 5/00*

U.S. Cl. 84—1.17 **13 Claims**



1. An electronic musical instrument comprising:

a first keyboard section including a plurality of keys and means for generating a pitch determining voltage having a magnitude which is a function of the note of an operated key;

a second keyboard section including a plurality of keys and means for generating a pitch determining voltage having a magnitude which is a function of the note of an operated key;

a first musical tone signal producing means connected to said first keyboard section and including a first voltage controlled oscillator means for generating in response to the pitch determining voltage a tone signal having a frequency which is a function of the note of the operated key on said first section;

a second musical tone signal producing means connected to said second keyboard section and including a second voltage controlled oscillator means for generating in response to the pitch determining voltage a tone signal having a frequency which is a function of the note of the operated key on said second keyboard section;

sound reproducing means connected to said first and second musical tone signal producing means; and

means for coupling a tone signal from said first musical tone signal producing means to said second voltage controlled oscillator means to thereby modulate the frequency of a tone signal produced by said second oscillator means.

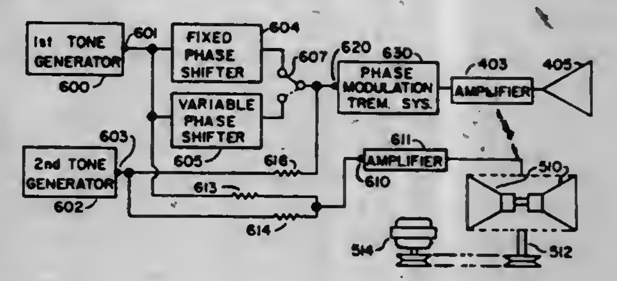
3,886,835
TREMULANT AND CHORUS GENERATING SYSTEM FOR ELECTRICAL MUSICAL INSTRUMENTS

Richard H. Peterson, 11748 Walnut Ridge Dr., Palos Park, Ill. 60464

Continuation of Ser. No. 44,276, June 6, 1970, abandoned, and a continuation-in-part of Ser. No. 656,925, July 28, 1967, abandoned. This application Oct. 15, 1973, Ser. No. 406,411

Int. Cl. G10h *1/02*

U.S. Cl. 84—1.24 **13 Claims**



1. A stereophonic tremulant system for an electrical musical instrument comprising:

a source of electrical signals representative of music;

a first transmission channel having an input and output and including a first loudspeaker connected to said output;

a second transmission channel having an input and an output and including a second loudspeaker connected to said output;

first modulation means connected between said input and output of said first transmission channel for continuously phase modulating signals in said first channel so that the resulting frequency modulation of said first channel signals is greater at low signal frequencies than at high signal frequencies;

second modulation means connected between said input and output of said second channel for continuously modulating signals in said second channel so that the resulting frequency modulation of said second channel signals is greater at high frequencies than at low frequencies; and means for applying the same signals from said source of electrical signals to both said first and said second transmission channel inputs.

3,886,836
ELECTRONIC MUSICAL INSTRUMENT CAPABLE OF GENERATING TONE SIGNALS HAVING THE PITCH FREQUENCY, TONE COLOR AND VOLUME ENVELOPE VARIED WITH TIME

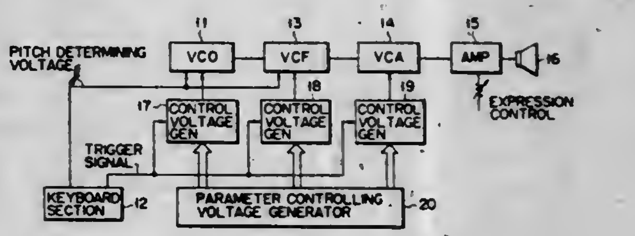
Teruo Hiyoshi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Apr. 19, 1974, Ser. No. 462,398

Claims priority, application Japan, Apr. 11, 1973, 48-41016; Apr. 21, 1973, 48-45429; Apr. 21, 1973, 48-45430; Apr. 21, 1973, 48-45431

Int. Cl. G10h *1/02, 5/00*

U.S. Cl. 84—1.26 **13 Claims**



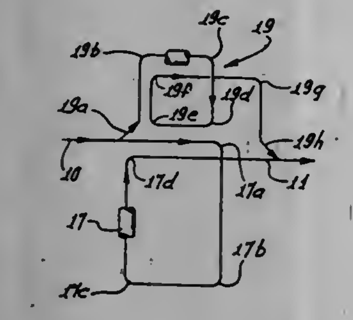
1. An electronic musical instrument comprising:

a keyboard section including means for generating in response to key operation a pitch determining voltage having a magnitude representing the note of any operated key and a trigger signal indicating the at least one of a depression and release operation of the key;

voltage controlled oscillator means coupled to said keyboard section for generating in response to the pitch determining voltage a tone signal having a pitch frequency corresponding to the note of the operated key;
voltage controlled filter means connected to the output of said voltage controlled oscillator means for imparting a tone color to the output signal of said oscillator means;
control voltage generating means for generating in response to the trigger signal from said keyboard section control voltages the amplitude values of which vary as a function of time, said control voltages being coupled to said oscillator means and filter means to control the oscillator frequency and frequency characteristics thereof respectively;
the control voltages from said control voltage generating means representing controlled parameters which include an initial level, normal level, attack level, attack time from the initial level to the attack level during a key depression time, first decay time from the attack level to the normal level, and second decay time from the normal level to the initial level during a key release time;
parameter controlling voltage generating means coupled to said control voltage generating means for controlling the parameters of the control voltages of said control voltage generating means; and
sound reproducing means connected to the output of said voltage controlled filter means.

3,886,837
MUSICAL HORN ACOUSTIC PATH MODIFICATIONS

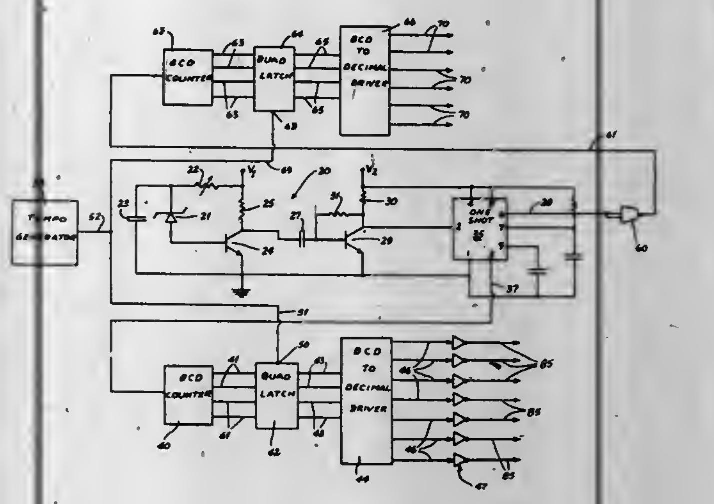
Mark S. Veneklasen, 12338 Montana Ave., Apt. 11, Los Angeles, Calif. 90049
Filed June 18, 1973, Ser. No. 371,126
Int. Cl. G10d *7/10*
U.S. Cl. 84—388 **29 Claims**



1. In a horn having a mouthpiece and a bell, he combination comprising;
a. tubing and valving providing a direct relatively shorter acoustic path between said mouthpiece and said bell and including a loop section, and an alternate acoustic path longer than the direct path and including a crook section, both of said acoustic paths having multiple bends,
b. the valving movable to control which of said sections is connected in the acoustic path between said mouthpiece and bell,
c. the relatively shorter acoustic path including said loop section having at least as many bends as the relatively longer acoustic path including said crook section, and wherein
d. said valving has separate loop and crook passages for the shorter and longer acoustic paths respectively, the loop passages being substantially tortuous and the crook passages being substantially straight.

3,886,838
DEVICE FOR TEACHING MUSICAL NOTE RECOGNITION

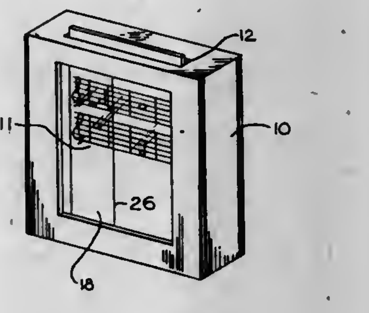
Robert John Scherrer, 8146 Gannon St., St. Louis, Mo. 63130
Filed Feb. 21, 1974, Ser. No. 444,531
Int. Cl. G09b *15/00*
U.S. Cl. 84—470 **20 Claims**



1. A device for teaching musical note recognition comprising a display screen, means on the display screen defining selected musical scales, a series of electrically activated means representing notes on the musical scales, electric circuit means, said electric circuit means including means for generating update signals and means responsive to said update signals for automatically activating random ones of said note representing means.

3,886,839
OPTICAL METRONOME

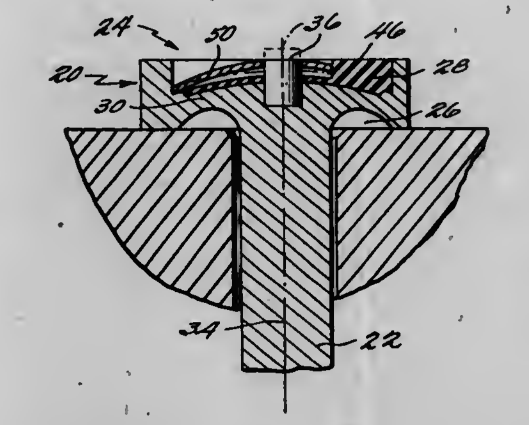
Juan M. del Castillo, Risco 119, Mexico City, Mexico
Filed Mar. 1, 1972, Ser. No. 230,701
Int. Cl. G10b *15/00*
U.S. Cl. 84—484 **2 Claims**



1. An optical metronome comprising
means to hold a sheet of music,
a pair of spaced rollers with one of said rollers mounted on each side of said holding means,
a continuous transparent web passing around and between said rollers and in front of said holding means,
at least two vertical lines drawn on said transsparent web transversely of said web,
means to move said rollers to move said vertical lines past said holding means in timed relation to the music on a sheet held in said holding means, and
a casing enclosing the metronome having a slot positioned over said holding means to receive a sheet of music.

3,886,840
BOLT HEAD WHICH MEASURES AND MAINTAINS PRELOAD

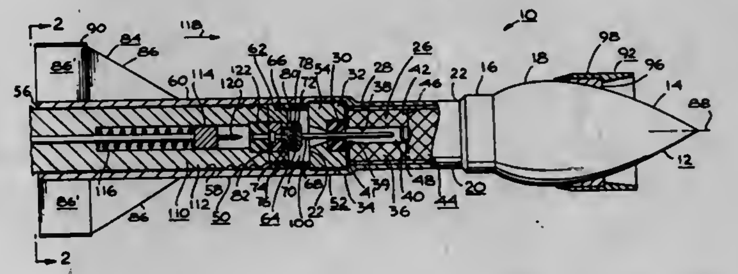
Robert B. Bossler, Bloomfield, Conn., assignor to Kaman Aerospace Corporation, Bloomfield, Conn.
Continuation-in-part of Ser. No. 299,799, Oct. 24, 1972, Pat. No. 3,812,758. This application June 22, 1973, Ser. No. 372,667The portion of the term of this patent subsequent to May 28, 1991, has been disclaimed.
Int. Cl. G01l *5/00*
U.S. Cl. 85—62 **8 Claims**



1. A bolt comprising:
a first member having a shaft portion extending along a bolt axis and terminating in a head with a first annular recess on one side of said head between a surface for bearing against a clamped member and the juncture of said shaft and said head and a second annular recess on the opposite side of said head so as to define a ring between said recesses which deflects along the bolt axis with increasing and decreasing load and having an indicator pin with a portion joined to said defined ring for movement therewith and a portion extending out of said defined ring away from said shaft portion, and
a transverse buckled column mounted in said second recess and having a central passage through which said indicator pin extends so that said column and indicator pin deflect in opposite directions with increasing and decreasing load and the relative position of said pin and said buckled column indicates the load on said bolt.

3,886,841
ROCKET POWERED ROUND

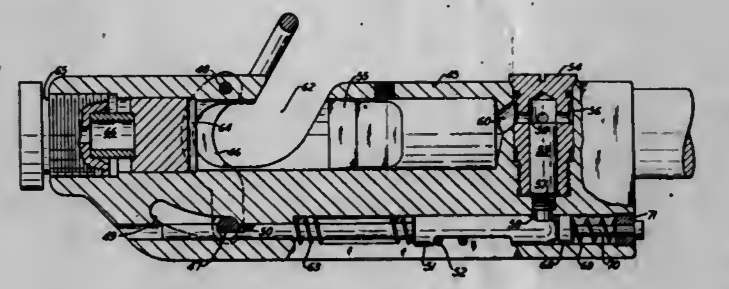
Matthew S. Smith, 4400 Sarah Apt. 29, Burbank, Calif. 91505, and Ernest A. Filippi, 18776 Kenya St., Northridge, Calif. 91324
Filed May 29, 1973, Ser. No. 364,658
Int. Cl. F41f *3/04*
U.S. Cl. 89—1 F **12 Claims**



1. A rocket powered round of the type having a launch phase and a powered phase of flight and for launching from a spike launcher of the type having an elongated spike for insertion into the round for support thereof during launch, and comprising, in combination:
a war head having a forward end, an aft end and an external surface having a predetermined configuration;
a rocket motor means having:
a forward end coupled to said aft end of said war head; an aft end spaced from said forward end;
a rocket propellant grain positioned within said rocket motor means intermediate said aft end and said forward end thereof; and
a nozzle portion having a preselected nozzle area and coupled to said aft end and communicating with said rocket propellant grain;
a tail pipe having a forward end coupled to said aft end of said rocket motor means and an aft end spaced a first preselected distance from said forward end thereof, external walls, and internal walls defining a tubular passageway extending from said forward end to said aft end of said tail pipe;
a launch cartridge means detachably mounted in said tubular passageway of said tail pipe adjacent said forward end thereof and restrained therein by first predetermined force, and said launch cartridge means having:
a body member in spaced relationship to said aft end of said rocket motor means to define an initial launch volume therebetween:
a launch cartridge means in said body member for generating pressurized launch gases in said initial launch volume for the condition of ignition thereof for launching the round and initiating ignition of said rocket propellant grain, and said pressurized launch gases exerting a second predetermined force between said launch cartridge means and said rocket motor means greater than said first predetermined force to detach said launch cartridge,
whereby said elongated spike of said spike launcher is inserted into said tubular passageway of said tail pipe for abuttment against said launch cartridge means, and said launch cartridge means falls from said aft end of said tubular passageway of said tail pipe for the condition of the round launched from the spike launcher.

3,886,842
SELF-COCKING EXPLOSIVELY ACTUATED CABLE CUTTER WITH SHOCK ABSORBER

Joseph L. Giebel, Pittsburgh, and Ernest E. Temple, Murrysville, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.
Division of Ser. No. 163,949, July 19, 1971, Pat. No. 3,780,689. This application Sept. 10, 1973, Ser. No. 395,578
Int. Cl. B26d *1/00*
U.S. Cl. 89—1 B **8 Claims**



1. In an explosively actuated cable cutter having a frame provided with a barrel containing a cutting chisel, and means for detonating an explosive charge to drive the chisel forward, an anvil slidably mounted in the frame in front of the chisel and spaced therefrom, a crushable shock absorber in front of the anvil, and a rigid end wall in said frame in front of the shock absorber and against which the shock absorber is crushed when the anvil is moved forward by the impact of the chisel against the anvil.

3,886,843

PNEUMATIC APPARATUS FOR FIRING AN AUTOMATIC FIRING WEAPON

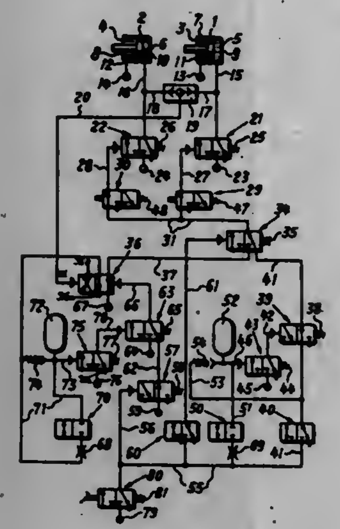
Gunter Wilhelm Hoffmann, Le Lignon, and Gilbert Magnollay, Romanel, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Buhrle, Zurich, Switzerland

Filed Feb. 12, 1974, Ser. No. 441,807

Claims priority, application Switzerland, Mar. 2, 1973, 3084/73

Int. Cl. F41d *11/02*

U.S. Cl. 89—136 **6 Claims**



1. A pneumatic apparatus for firing an automatic firing weapon, comprising a cylinder which can be impinged with air from a compressed air source, a first valve for controlling actuation of said cylinder, a second valve which is open in its starting position, said second valve being closed upon actuating said first valve in order to interrupt the infeed of air to said cylinder.

3,886,844

SMALL ARM

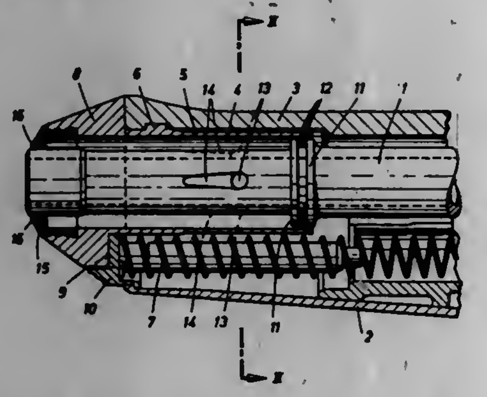
Hannes Kepplinger, and Karl Wagner, both of Steyr, Austria, assignors to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Nov. 30, 1973, Ser. No. 420,539

Claims priority, application Austria, Dec. 6, 1972, 10400/72; Oct. 24, 1973, 9021/73

Int. Cl. F41d *11/12*

U.S. Cl. 89—191 A **6 Claims**



1. A small arm, which comprises

a barrel-carrying member,

a barrel fixed in said barrel-carrying member and provided on its outside peripheral surface with a piston and formed with transverse bore means, which communicate with the inside of the barrel and open on the outside peripheral surface thereof before said piston, said outside peripheral surface being formed with recess means which extend and taper forwardly from said transverse bore means,

an action slide which comprises a cylinder, which is spaced around said barrel and defines therewith an annular chamber, which is sealed by said piston and defined by flow-obstructing means spaced from said piston beyond said transverse bore means, said action slide being capable of a recoil movement relative to said barrel so as to decrease the size of said annular chamber, and

a counterrecoil spring, which cooperates with said action slide and tends to move said action slide opposite to the direction of said recoil movement.

3,886,845

GEAR FINISHING MACHINES

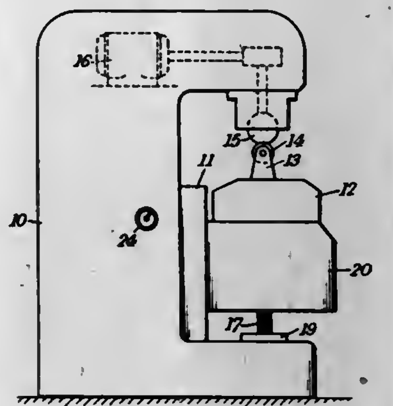
Brian Hodgson, Rowlands Gill, England, assignor to Machine Tool Divisional Services Limited, England

Filed June 8, 1973, Ser. No. 368,446

Claims priority, application United Kingdom, June 9, 1972, 27101/72

Int. Cl. B23f *19/08*

U.S. Cl. 90—1.6 **4 Claims**



1. A gear finishing machine comprising a tool gear, means for supporting a workpiece so that it may be run in mesh with the tool gear, means for imparting rotation to one of said meshing members, means for imparting radial infeed to one of said meshing members thereby generating a load on said tool gear, said infeed means including a non-rotatable nut and a screw engaging said nut and being rotatable so as to impart radial feed to said one meshing member, means for subjecting said nut to a back-up hydraulic pressure to resist said load, said screw being free from hydraulic pressure, and means for relieving the hydraulic pressure to permit said screw to move away from the other meshing member when the load on the tool gear exceeds a predetermined value.

3,886,846

METHOD FOR TESTING ACCURACY OF MACHINE TOOL CONTROL PROGRAMS

Roger E. Bodine, 17541 Santa Paula Circle, Fountain Valley, Calif. 92708

Filed Mar. 8, 1971, Ser. No. 122,192

Int. Cl. B23c *1/16*

U.S. Cl. 90—11 C **1 Claim**

1. The method of testing the accuracy of a control program by which a cutting machine is to cut a workpiece secured to the machine to selected size and shape which method comprises the steps of:

creating a block of material more easily worked than the material from which the workpiece is to be cut and which has a size greater than said selected size by casting the block of thermo setting plastic;

securing said block to the cutting machine in the position the workpiece is to occupy when secured to the machine;

causing the machine to cut said block in accordance with the control program;

causing the piece formed by cutting the block to be compared with a standard whereby errors in the shape of said piece are detected;

adding epoxy adhesive in putty form to areas of said block following cutting of the block by said machine under the control of said program;

altering the program; and

causing the block, after hardening of the putty, to be recut by said machine in accordance with the modified control program.

3,886,847

PANTOGRAPH COPY MILLING MACHINE WITH DRAWING TRACING DEVICE

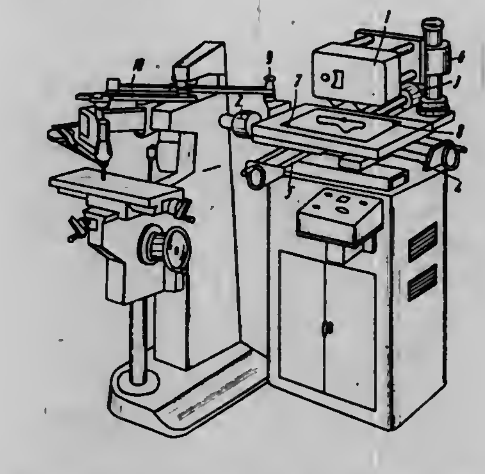
Franz Kuhlmann, Wilhelmshaven, Germany, assignor to Franz Kuhlmann KG, Prazisionsmechanik und Maschinebau, Bad Lauterberg, Harz, Germany

Filed Apr. 27, 1972, Ser. No. 247,992

Claims priority, application Germany, Apr. 30, 1971, 7116898

Int. Cl. B23c *1/16*

U.S. Cl. 90—13.8 **5 Claims**



1. A machine for milling in accordance with a prepared pattern, said machine comprising:

a milling machine having a frame, a work tool and a planar work piece support table, said milling machine having means to provide a first relative motion between said work tool and said work piece support table, said first relative motion being parallel to the plane of said work piece support table, and said milling machine having means to provide a second relative motion between said work tool and said work piece support table, said second relative motion being perpendicular to the plane of said work piece support table and being controlled independently of said first relative motion; and

a tracing device comprising;

a planar pattern support table;

an electro-optical reading head disposed adjacent said pattern support table for automatically following the lines of the pattern mounted thereon;

means for providing a first relative motion between said reading head and said pattern support table in response to electrical signals generated by said reading head while automatically tracing lines on the pattern on said pattern support table, said first relative motion being parallel to the plane of said pattern support table; and means for providing second relative motion between said reading head and said pattern support table for adjustments in focusing said reading head with respect to said pattern, said second relative motion being perpendicular to the plane of said pattern support table and being independent of said first relative motion; and a multi-link pantograph mechanism having a fixed pivot attached to the frame of said milling machine and having one link pivoted thereto and projecting therefrom, and another link pivotally connected to the moving member of said milling machine, said projecting link having its distal end pivotally attached to the moving member of said tracing device, thereby transmitting said first relative motion of said tracing device on a modified scale to said milling machine to cause similar first relative motion to occur between the work tool and the work piece support table.

3,886,848

PRESSURE OPERATED DIRECTIONAL CONTROL VALVE

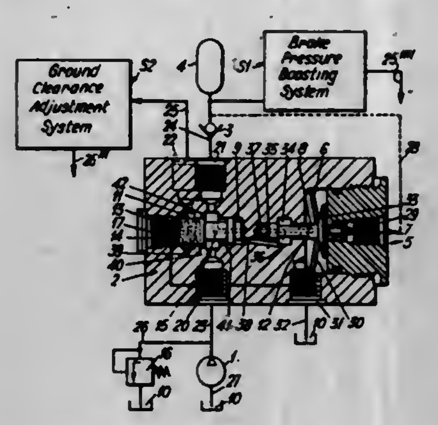
Ludwig Budecker, Frankfurt, Main, and Hubertus Von Grunberg, Niederhochstadt, both of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Apr. 3, 1974, Ser. No. 457,444

Claims priority, application Germany, May 12, 1974, 2324059

Int. Cl. F15b *11/16*

U.S. Cl. 91—412 **28 Claims**


Ground Clearance Adjustment System
Brake Pressure Boosting System

1. An apparatus including first and second utilization systems each having an inlet and requiring higher and lower predetermined pressures to operate the same, respectively, a fluid pressure accumulator having a port in communication with said first system inlet, a check valve having an inlet, and an outlet, said check valve outlet being in communication with said accumulator port and said first system inlet, said check valve being adapted to close when the accumulator pressure is above that in said check valve inlet, a pump having an inlet and an outlet, and third means connecting said pump outlet to said check valve inlet, said third means comprising: a valve body having first and second inlets, and first and second outlets, said first and second inlets being connected to said pump outlet and said check valve outlet, respectively, said first and second outlets being connected to said check valve inlet and said second system inlet, respectively; a main valve mounted in said body in a manner movable from a first position to a second position different from said first position, and vice versa, said main valve providing communication between said first inlet and said second outlet when located in said first position thereof, said main valve closing off communication between said first inlet and said second outlet when located in said second position thereof, resilient means mounted in said body in a position biasing said main valve to said second position thereof, said main valve having a surface, said main valve being movable in a predetermined direction opposite the direction in which at least a component of force is applied thereto by said resilient means, said body defining a chamber with said surface, said main valve being movable in said predetermined direction by a fluid under pressure in said chamber; conduit means forming a restriction connecting said chamber with said first inlet; a pilot valve mounted in said body and being actuable to open and to closed positions when the accumulator pressure is at lower and higher different predetermined pressure, respectively; operator means mounted in said second inlet to actuate said pilot valve, said body having a first path therethrough providing free and open communication from said chamber to one side of and through to the other side of said pilot valve, said body having a vent port, said body also having a second path therethrough providing free and open

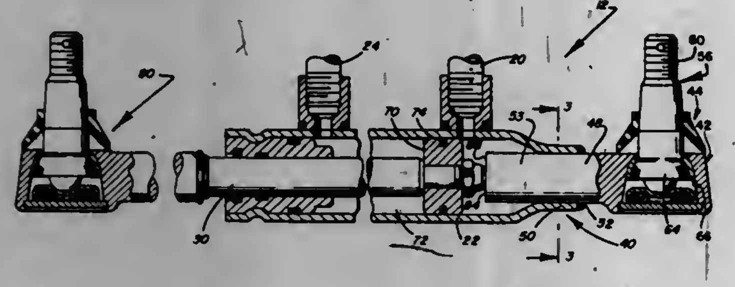
communication from said pilot valve one side to said vent port.

3,886,849

POWER STEERING SYSTEM

Maurice P. Roberts, Otterbein, and Harold K. Clendenen, Lafayette, both of Ind., assignors to TRW Inc., Lafayette, Ind.

Filed Dec. 3, 1973, Ser. No. 421,228
Int. Cl. B62d *5/10;* **G16j** *1/22*
U.S. Cl. 92—168 **5 Claims**



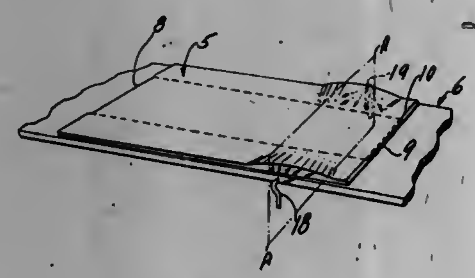
1. Apparatus for use in a power steering system to effect actuation of a steering linkage, said apparatus comprising a cylinder having a wall at least partially defining a cylindrical chamber, said cylinder having a rod end and a head end located at opposite ends thereof, said cylinder wall having a main portion of a first internal diameter and a swaged head end portion defining an opening of a second internal diameter which is different than said first internal diameter, a piston slidably disposed within said chamber, a piston rod connected with said piston and extending from the rod end of said cylinder, a ball and socket assembly connected directly to said swaged head end portion of said cylinder wall, said socket assembly including a ball, an outwardly projecting ball stud fixedly connected with said ball, a socket wall at least partially defining a recess for receiving said ball, and a socket rod integrally formed with said socket wall and extending transversely to said ball stud, said socket rod extending through said opening defined by said swaged head end portion of said cylinder wall, and means for fixedly and sealingly interconnecting said socket rod and said swaged head end portion of said cylinder wall to prevent relative movement therebetween and fluid leakage therebetween.

3,886,850

METHOD OF FORMING FLAT BOTTOMS ON BAGS OF CREASABLE MATERIAL

John B. Cole, Bratenahl, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed May 23, 1973, Ser. No. 362,888
Int. Cl. B31b *33/26*
U.S. Cl. 93—35 SB **1 Claim**



1. A method of producing a bag with a flat bottom from a bag-forming material provided as a flattened tube having symmetrically opposite longitudinally extending pleats folded laterally inwardly to a uniform predetermined depth to provide two superimposed edges at each side of the tube, said edges occurring as two laterally opposite upper edges and two laterally opposite lower edges when said flattened tube assumes a horizontal planate position, comprising the steps of: providing in the form of a bag a section of said flattened tube continuously sealed in a straight seal line across one end of the bag, to band together all adjacent surfaces including those of said pleats, the other end of the bag being freely openable;

supporting said bag substantially in a plane on a flat surface with said lower edges next to said surface in a flat substantially deflated condition;

with reference to a fold plane in transverse perpendicular relation to the general plane of the bag located at an approximate distance from said seal line equal to twice the depth of either of said pleats, said plane having a near side and a far side in reference to said seal line, holding both lower edges at locations along said far side in juxtaposition to said plane in fixed adjacent relation to the plane of said flat surface;

gripping both upper edges along areas in juxtaposition to, and on the far side of, said plane in a manner maintaining said material between the gripped areas in taut condition, and advancing said gripped upper edges with the taut material therebetween over said held areas of the lower edges and other intermediate bag surface in close to slidable relation therewith toward said openable end to bring a longitudinally advanced portion of the bag theretofore extending between fold line and the gripped areas measuring twice said pleat depth into a taut condition;

rotating a means gripping said areas about its far side before completing its movement to place said longitudinally advanced portion of the bag in a taut condition; and

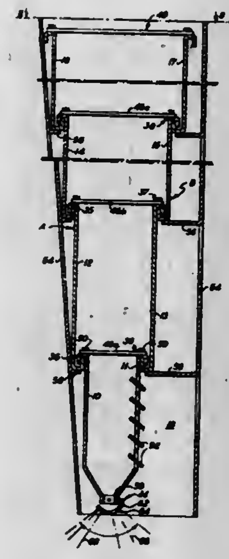
pressing the entire advanced bag portion against the underlying bag portion to develop fold lines which define and outline said flat bottom.

3,886,851

AIR CURTAIN DEVICE

Erling Berner, Box 9, Allison Park, Pa. 15101

Continuation-in-part of Ser. No. 241,925, April 7, 1972, abandoned. This application Mar. 14, 1973, Ser. No. 339,774
Int. Cl. F24f *9/00*
U.S. Cl. 98—36 **36 Claims**



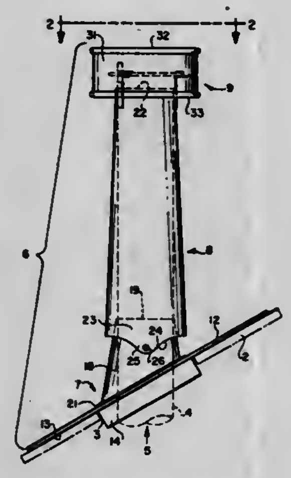
1. In combination, an air screen device mountable near a wall opening comprising closure elements movable from open through intermediate to closed positions across said wall opening, means for moving said closure elements between open and closed positions in said wall opening, said closure elements comprising spaced-apart inner and outer sections enclosing a central duct-like passageway for air comprising a plenum chamber variably sized with the position of said closure elements, said plenum chamber having a fixed end disposed near an edge of said wall opening, a blower having an air outlet, said plenum communicating at its fixed end with the outlet of said blower for receiving an air screen supply of air therefrom for passage through said duct-like passageway between sections and an outlet nozzle member in an opposite movable end of said plenum to intercept and distribute air passing between said sections as an air screen across said wall opening when the closure is in open to intermediate positions in said wall opening, each spaced-apart section of said closure comprising an assembly of a series of adjacent panels separably joined together at their edges and guide means at the opposite ends of each section supported on said wall opening, securing both sections for sliding movement across said wall opening, whereby each section of said closure may slide in said guide means in parallel spaced-apart movement across said opening.

3,886,852

ROOF JACK STRUCTURE

Salvador J. Acosta, 4895 Tonino Dr., San Jose, Calif. 95123

Filed Dec. 18, 1972, Ser. No. 316,133
Int. Cl. F23l *17/02*
U.S. Cl. 98—60 **4 Claims**



1. A roof jack assembly adapted for installation on the roof of a building in association with a flue vent connector tube projecting above the roof through an aperture therein, comprising:

a. a roof flashing unit comprising a flat flash plate having an aperture therein and adapted to be superimposed over the aperture in the roof;

b. a tubular roof safe secured by one end to one surface of said flash plate in association with said aperture therein and providing an open end remote from said flash plate;

c. a roof safe extension sleeve having one end thereof pivotally mounted on said roof safe so that said open end of the roof safe projects inwardly into said roof safe extension sleeve;

d. a baffle assembly mounted on the end of said roof safe extension sleeve remote from said roof safe, said baffle assemmbly including a tubular baffle member circumscribing the upper end of said roof safe extension sleeve and supported thereby, and a flat baffle plate rotatably supported for detachability in spaced relationship to the open upper end of said roof safe extension sleeve; and

e. strap means disposed between the upper end portion of said roof safe extension sleeve and said tubular baffle member circumscribed thereabout and including a lock lug, said flat baffle plate including an aperture and being detachably secured to said strap means in a manner to permit rotation of the flat baffle plate to effect alignment of the lock lug and aperture and effect detachment thereof from the strap means for purposes of inspection after the roof jack assembly has been installed; and

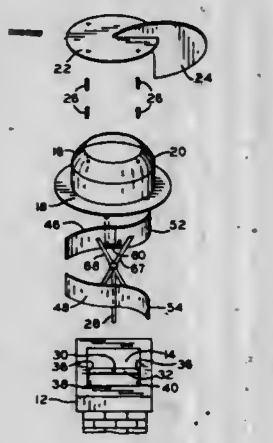
f. means for limiting penetration of said roof safe extension sleeve by said flue vent.

3,886,853

CHIMNEY DAMPER

George W. Werling, 2410 Wysstead Dr., Fort Wayne, Ind. 46819, and James Edward Voirol, 1152 Oakdale Dr., Fort Wayne, Ind. 46807

Filed Mar. 28, 1974, Ser. No. 455,528
Int. Cl. F23l *17/10*
U.S. Cl. 98—71 **7 Claims**



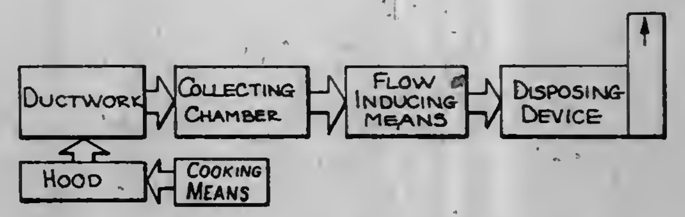
5. An improved flue damper comprising mounting means disposed within the flue opening, vane means rotatably supported on said mounting means and having relatively movable closure means whereby wind force on said vane means force said closure means together to provide a closure for said flue opening and hood means also mounted on said mounting means to provide an aperture coverable by said closure means.

3,886,854

APPARATUS FOR DISPOSING OF AIRBORNE PARTICULATE MATTER AND COOKING MEANS

Clifford Culpepper, Jr., Charlotte, N.C., assignor to Aero-Dyne Manufacturing, Inc., Charlotte, N.C.

Filed Jan. 31, 1973, Ser. No. 328,247
Int. Cl. B01d *50/00*
U.S. Cl. 98—115 K **1 Claim**

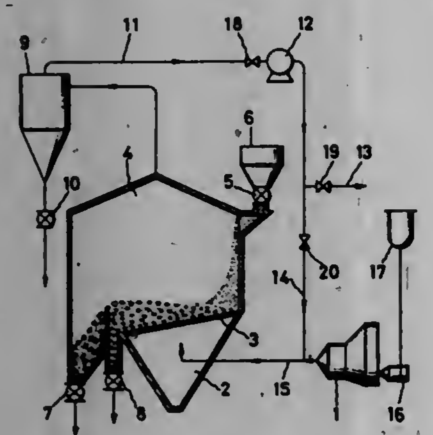


1. The combination of cooking means disposed in a food preparation area within a building for the preparation of food and from which particles of grease and the like become airborne liquid particulate matter, air flow guide means for directing air flow and including a hood positioned above said area and said cooking means and duct means extending from said hood, means for inducing air to flow from said area within the building into and through said hood and said duct means at such velocities as to entrain with the flowing air at least the major portion of airborne particulate matter originating in said area and for conveying the particulate matter in an unrestricted manner from said area, an elongate container having a generally right circular cylindrical inner wall surface and interposed between said duct means and said air flow inducing means in series flow relation with said air flow inducing means for receiving the flowing air and conveyed particulate matter, directing means operatively associated with said elongate container for directing flowing air and conveyed particulate matter entering said container generally at a right angle to the longitudinal axis of said container and tangentially to said inner wall surface and for directing flowing air and particulate matter longitudinally and circularly within said container and in a first direction generally along said longitudinal axis for

accelerating and sharply turning flowing air to leave the container generally along the longitudinal axis in a direction opposite the first direction therealong for separating most of the conveyed particulate matter from the flowing air and for retaining the separated particulate matter while passing the flowing air and the remainder of the conveyed particulate matter onward toward said air flow inducing means, and combustion means for burning the remainder of the conveyed particulate matter and located outside the building in series flow relation with said flow inducing means and said elongate container, said combustion means receiving flowing air and the remainder of the conveyed particulate matter and having a plurality of flame holder members arranged to define a plane perpendicular to the flow direction of the flowing air and at which combustion of the remainder of the conveyed particulate matter occurs while the flowing air passes to the ambient atmosphere.

3,886,855
APPARATUS FOR EFFICIENTLY ALPHIZING A LARGE MASS OF A CEREAL

Jiyuichi Nara, 14-9 Higashiooi 4-chome, Shingawa-ku, Tokyo, Japan
Division of Ser. No. 303,025, Nov. 2, 1972. This application Aug. 10, 1973, Ser. No. 387,240
Claims priority, application Japan, Jan. 17, 1972, 47-6785
Int. Cl. A23l *1/18*
U.S. Cl. 99—323.11 **7 Claims**

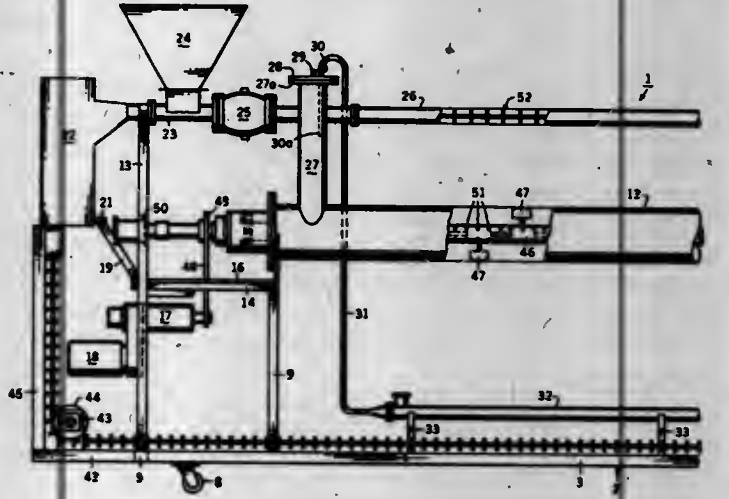


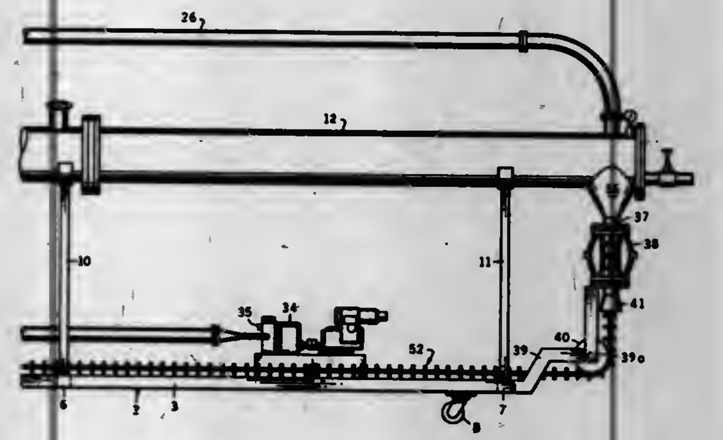
1. An apparatus for converting a cereal to an α-state comprising: a fluidizing column; a metering means for feeding the cereal material into said column; a hot air chamber positioned on the bottom thereof; an inclined perforated plate positioned between the hot air chamber and the fluidizing column for directing hot air at an inclination with respect to the vertical across the flow of cereals, said hot air flow also being in the general direction of cereal flow; an air heating furnace for supplying hot gas to the hot air chamber; and means for removing product from the column.

3,886,856
CONTINUOUS COOKER

George W. Paugh, St. Louis, Mo., assignor to Ralston Purina Company, St. Louis, Mo.
Division of Ser. No. 188,383, Oct. 12, 1971, Pat. No. 3,764,343. This application Feb. 16, 1973, Ser. No. 333,106
Int. Cl. A47j *27/00;* **A23b** *9/00*
U.S. Cl. 99—443 C **9 Claims**

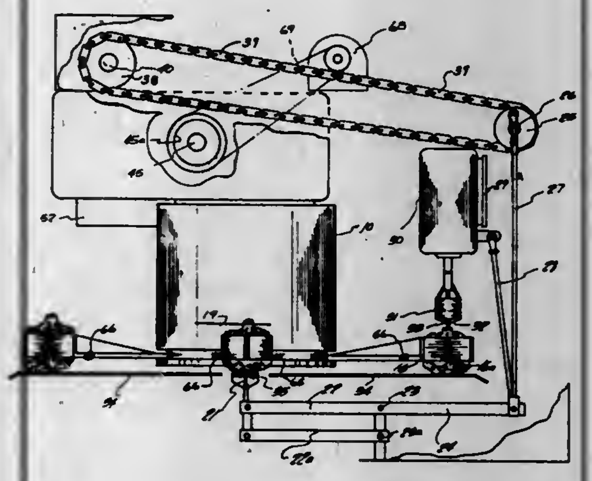
1. Apparatus for continuously cooking foods under pressure comprising a frame, a driven endless conveyor on said frame, said endless conveyor having a plurality of conveying members thereon, a food inlet and outlet portion on said conveyor, a pair of restriction means about said conveyor between said inlet and outlet, cooking means connected to said frame and having an inlet and an outlet connected to said endless conveyor between said restrictor means, said cooking means including conveying means for moving the food from the inlet to the outlet thereof as the food is cooked under pressure and each restriction means including means for forming a fluid pressure seal with said conveying members as they are moved therethrough to maintain a predetermined pressure within said cooking means as the food is supplied to and discharged therefrom.





3,886,857
APPARATUS FOR CORING CAULIFLOWER HEADS

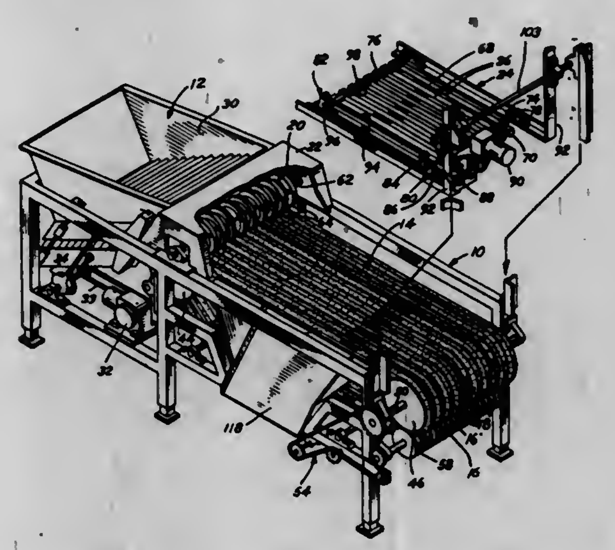
Richard J. Goodale, P.O. Box 268, Watsonville, Calif. 95076
Filed Apr. 18, 1973, Ser. No. 352,181
Int. Cl. A23n *15/02*
U.S. Cl. 99—563 **5 Claims**



5. In apparatus for processing products having stems and cores such as cauliflower heads, the combination of a turret adapted to be rotated, a loading station, a segmenting and stemming station, a coring station and an unloading station, means connected with the turret for holding a product for progressive movement from station to station after being loaded thereon with the stem and exposed at the loading station, said segmenting and stemming stations comprising a first knife adapted to contact and sever the stem from the product and segmenting knife adapted to be moved through the product in a direction towards and from the opposite side of the product from the first knife while the first knife is in contact with the product to hold it against movement with the segmenting knife, the coring station comprising a flat plate on which the product rests and a coring means adapted for movement into the core of the product for removal of the core, and the unloading station comprising means allowing removal of the product from the apparatus.

3,886,858
FOOD TRIMMING

Owen H. Evans; Lewis E. Lawson, both of LeSueur, Minn.; Michel L. Montaigne, and Gordon A. Muir, both of Aptos, Calif., assignors to Green Giant Company, LeSueur, Minn.
Filed Sept. 28, 1973, Ser. No. 401,950
Int. Cl. A23n *15/04*
U.S. Cl. 99—643 **35 Claims**

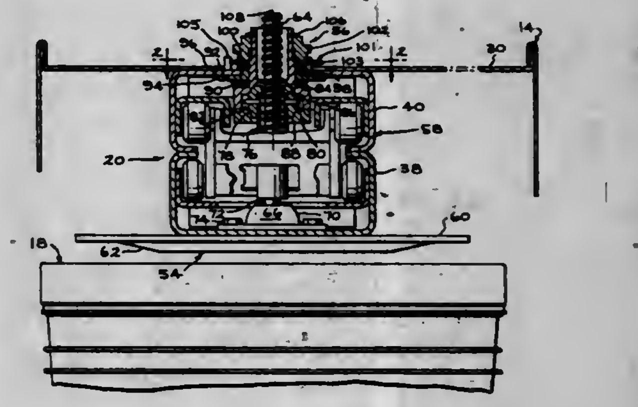


1. Apparatus for the trimming of projections from globular articles, comprising
- guide means extending over a substantial part of said apparatus, said guide means defining a channel of substantial length for the movement of said articles therethrough and also defining a slot therein for the extension of the projections on said articles therethrough, said slot extending over substantially the entire length of said channel,
- resilient means positioned on one side of said guide means opposite said slot,
- means for effecting movement relative to each other of at least one of said resilient means and guide means alternately and repeatedly in directions toward and away from the other into and out of engagement with the articles when the articles are disposed in said channel,
- motion imparting means for imparting forces to the articles in said channel to cause the articles to move along the length of said channel and to rotate about at least two axes of rotation perpendicular to each other, whereby the projections of the articles extend through said slot, and
- projection removing means positioned on the side of said guide means opposite said resilient means and adjacent said slot for removing said projections from said articles when the projections extend through said slot.

3,886,859
COMPACTOR BRAKE

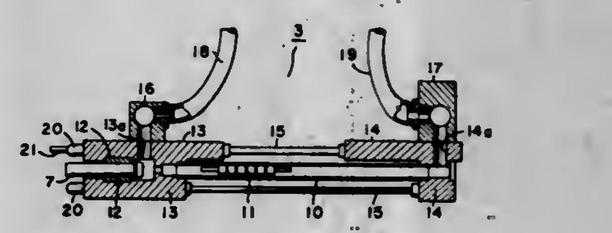
Albert L. Hardy, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Apr. 26, 1974, Ser. No. 464,468
Int. Cl. B30b *1/18*
U.S. Cl. 100—53 **5 Claims**

1. In a household refuse compactor of the type having: frame means providing a compacting chamber including an access opening thereinto; a door mounted for movement between positions opening and closing the access opening; means for supporting an open-topped container in the chamber; a pressure plate for movement into and out of the container for compressing refuse therein; screw-type drive means supported by the frame means for vertically reciprocating the pressure plate, the screw-type drive means including screw means; means mounting the plate on the screw means; and rotatable driving means for driving the screw means; the improvement comprising brake means rotatably mounted in abutting engagement with said frame means and said driving means, said brake means being adapted to rotate through an arc in response to a tightening force between said frame means and said driving means to engage stop means, thereby releasably arresting the rotary motion of said driving means.



3,886,860
MARKING PRESS DEVICE

Teruma Hayakawa, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation-in-part of Ser. No. 263,432, June 16, 1972, abandoned. This application Jan. 2, 1974, Ser. No. 430,087
Claims priority, application Japan, June 17, 1971, 46-43435
Int. Cl. B44b *5/00*
U.S. Cl. 101—4 **9 Claims**



1. An automatic marking press device comprising:
- a truck movably disposed upon guide rails;
- marking press means supported by said truck for marking a plate;
- a driving mechanism connected to said truck for moving said truck forwardly and backwardly upon said guide rails whereby said truck and said marking press means are able to be moved relative to said plate to be marked;
- auxiliary driving means for moving said marking press means longitudinally, laterally, and rotatably within a horizontal plane relative to said truck whereby the relative position between said truck and said marking press means and between said marking press means and said plate to be marked may be adjusted;
- means for automatically stopping said driving mechanism of said truck; and
- retractable contact rod means projecting from said marking press means toward said plate to be marked and adapted to be retracted, upon contacting said plate to be marked as said marking press means is moved toward said plate to be marked by said driving mechanism, for actuating said means for automatically stopping said driving mechanism of said truck.

3,886,861

SQUEEGEE MOUNT TO INDEPENDENTLY ADJUST SQUEEGEE ANGLE AND PRESSURE

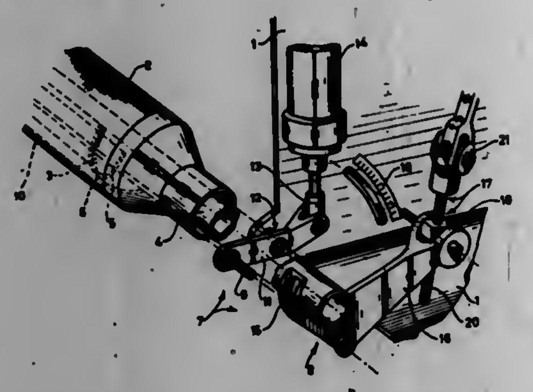
Lodewijk Anselrode, St. Anthonis, Netherlands, assignor to Stork Amsterdam N.V., Sportlaan, Amstelveen, Netherlands

Filed Feb. 29, 1972, Ser. No. 230,330

Claims priority, application Netherlands, Mar. 16, 1971, 7103481

Int. Cl. B41f *15/42*

U.S. Cl. 101—119 **5 Claims**



1. In a screen printing machine, the combination of a frame, a squeegee supporting means comprising a tubular member positioned within a rotatable cylindrical stencil, said tubular member having both its ends protruding outwardly beyond both edges of the stencil, a squeegee secured to said supporting means and having an elongated edge for contacting the inner surface of said rotatable cylindrical stencil, and adjustable suspension means mounted on said frame connected to both ends of said squeegee supporting means and comprising at least one mounting member pivotable about an axis coextensive with said edge of the squeegee for tilting said squeegee and supporting means about said axis to vary the angle of nip between the squeegee and the screen without changing the compressive force of the squeegee.

3,886,862

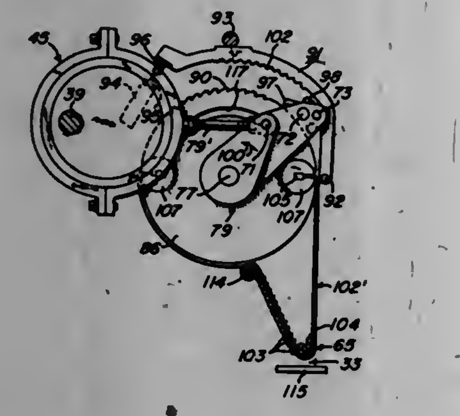
SELECTIVE PRINTING APPARATUS

Paul H. Hamisch, Jr., Bellbrook, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Nov. 24, 1970, Ser. No. 92,367

Int. Cl. B41j *7/34*

U.S. Cl. 101—109 **7 Claims**



1. Apparatus for printing, comprising: an elongated, flexible printing band having a plurality of type elements extending in a lengthwise direction, support means about which said printing band is passed so that one type element is brought to a printing zone at any one time, a ratchet coupled to said printing band, drive means including a pawl driven along a predetermined path and cooperable with said ratchet, and means for actuating said pawl into cooperation with said ratchet at a selected point along its path so that said printing band is moved through a predetermined distance to bring the selected type element into the printing zone.

3,886,863

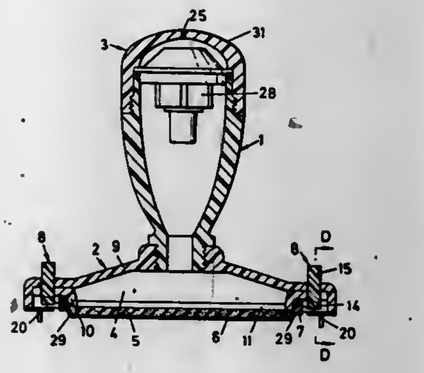
STENCIL STAMP WITH AIR VALVE AND PROTECTIVE STENCIL

Carmel John Angelo Carabott, Brenchley, and Jaffray Stuart Ross, Worthing, both of England, assignors to Stenprint Limited, Littlehampton, England

Filed Mar. 9, 1973, Ser. No. 339,499

Int. Cl. B41f *15/36;* **B41n** *1/24*

U.S. Cl. 101—125 **8 Claims**



1. A stencil stamp comprising
a hollow base with apertures in one wall;
an ink reservoir in said hollow base supplying ink to said apertures from the inner surface of said wall;
a porous pad having a first surface abutting the outer surface of said one wall and a second surface spaced therefrom;
a stencil releasably attached to the second surface of said porous pad by the viscosity of the ink; and
a rigid frame attached to the stencil whereby said frame and said stencil are spaced from but not directly attached to the base;
a part of said frame projecting beyond the level of said attached stencil with respect to a surface to be inked to contact said surface prior to the contact thereof by said stencil to protect said stencil from abrasion.

5. A stencil stamp in accordance with claim 4 and further comprising
at least two plungers mounted on the base operable to push against the frame to eject the frame and the stencil together from the base.

3,886,864

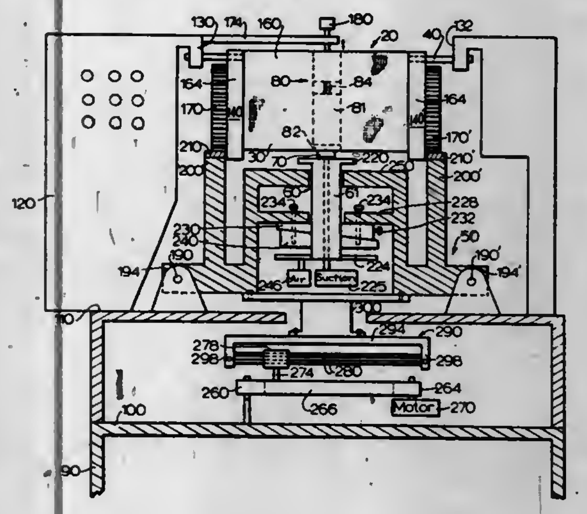
TRIANGULAR DRIVE FOR SCREEN PRINTER

Ivar F. Larsson, P.O. Box 916, Wellfleet, Mass. 02601

Filed Oct. 25, 1973, Ser. No. 409,760

Int. Cl. B41l *13/16;* **B41f** *15/26*

U.S. Cl. 101—126 **5 Claims**



1. Silk-screen printing apparatus comprising

a horizontally movable work-piece support table,
a work-piece support carried by said table,
first means coupled to said table by which said table can move horizontally forward and backward along a predetermined path,
a rotatable screen-carrying frame rotatably mounted on a horizontal shaft disposed transverse to said predetermined path in which said table moves,
mechanical means directly coupling together said table and said frame whereby when said table moves along said path, said frame rotates on said shaft, and including
driving means for driving said work-piece support table backward and forward in said predetermined path,
said driving means including three sprockets disposed in a common horizontal plane parallel to said table with their centers defining a triangle having a base, a first side, and a second side,
the base of said triangle being oriented transverse to said path which said table traverses, said first side being oriented at an angle to said path, and said third side being oriented generally parallel to said path,
a drive chain threaded around said sprockets and movable along a triangular path corresponding to said triangle,
a motor coupled to one of said sprockets, and
a mechanical coupling between said chain and said support table, and including a bracket slidably mounted thereon and slidable in a direction parallel to the base of said triangle and transverse to said predetermined path, said bracket exerting no force on said mechanical coupling and on said table when it moves in said direction parallel to the base of said triangle,
said bracket being secured to and moving with said chain along said triangular path, said bracket exerting a driving force on said table in one direction along said predetermined path when it moves with said chain along said first side of said triangle and in the opposite direction when it moves with said chain along said second side of said triangle.
a screen, carrying a pattern to be printed on a work-piece, secured to said frame, said screen and its pattern moving with respect to said work-piece support when said frame and said table move with respect to each other.

3,886,865

PLANOGRAPHIC PRINTING PLATES COMPRISING ORGANIC POLYSILOXANES

Michihiro Ohto, Tokyo; Atsumi Noshiro, Kanagawa; Minoru Takamizawa, and Yoshio Inoue, both of Gunma, all of Japan, assignors to Dai Nippon Printing Co., Ltd., Japan

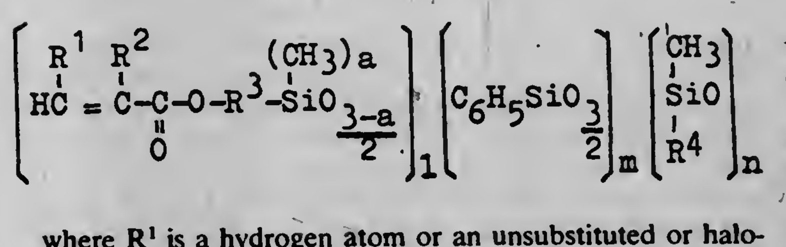
Filed May 3, 1974, Ser. No. 466,603

Claims priority, application Japan, May 9, 1973, 48-51332

Int. Cl. G03c *1/68;* **G03f** *7/10*

U.S. Cl. 101—456 **5 Claims**

1. A planographic printing plate comprising a base plate having ink-receptive and ink-repellent areas thereon, said ink-repellent area being covered with an adhesively bonded layer of a polymerized and cured composition which comprises:
a. a photopolymerizable organopolysiloxane of the general formula



$$\left[\begin{matrix} R^1 & R^2 & & (CH_3)a \\ HC= & C- & C-O-R^3- & SiO_{\frac{3-a}{2}} \\ & & \overset{\|}{O} & \end{matrix}\right]_l \left[C_6H_5SiO_{\frac{3}{2}}\right]_m \left[\begin{matrix} CH_3 \\ SiO \\ R^4 \end{matrix}\right]_n$$

where R^1 is a hydrogen atom or an unsubstituted or halogen-substituted phenyl radical including chlorophenyl and bromophenyl; R^2 is a hydrogen atom or a methyl radical; R^3 is a divalent hydrocarbon radical having 1 to 3 carbon atoms, including methylene, ethylene and propylene; R^4 is a methyl or trifuoropropyl radical; *a* is 0 or 1; *l*, *m* and *n* are each a positive integer with the proviso that *n* exceeds 25 while *n/l* and *n/m* are from 25 to 2,000, and from 2.5 to 50, respectively;
b. a photosensitizer, and
c. a solvent.

3,886,866

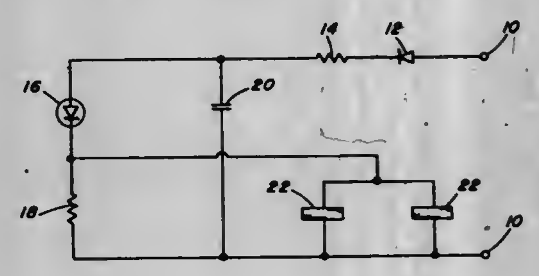
CAPACITOR - CONTACT FUZE SYSTEM

Ernest F. Fohrmann, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 24, 1972, Ser. No. 310,528

Int. Cl. F42c *11/00*

U.S. Cl. 102—70.2 R **10 Claims**



1. A capacitor-contact fuzing system for use in an explosive device, comprising:
a capacitor;
a detonator connected to said capacitor;
an electronic switch connected to said capacitor and said detonator for enabling the firing of said detonator when the voltage across said capacitor increases to a predetermined magnitude and
means connected to said capacitor for decreasing the capacitance thereof in response to deceleration of said explosive device whereby said decrease in capacitance increases the voltage across said capacitor.

3,886,867

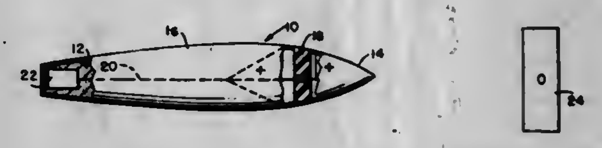
CONTACT FUZE

Philip Krupen, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 23, 1956, Ser. No. 573,574

Int. Cl.² F42C *11/00*

U.S. Cl. 102—70.2 R **5 Claims**



1. An ordnance device comprising: a first conductive element, an explosive material contained in the first conducting element, an insulating material, a forward conductive element attached by the insulating material to the first element, a detonator means for setting off the explosive material responsive to an electrical current, one side of said detonator means connected to the first element, an electrical lead connecting the other side of said detonator means to the forward conductive element, and means for electrostatically charging the two elements to approximately the same potential; so that when an aforesaid conductive element touches an object with a different electrostatic potential a current flow passing through said detonator means sets off the explosive material.

3,886,868

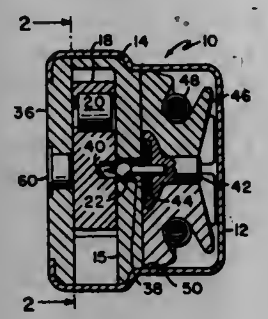
SPINNING BOMBLET FUZE

George Webb, Richmond, Ind., assignor to Avco Corporation, Cincinnati, Ohio

Filed Aug. 9, 1973, Ser. No. 386,933

Int. Cl. F42c *15/26*

U.S. Cl. 102—79 **1 Claim**



1. A spin armed fuze for use in munitions comprising:

a slider housing, said housing being formed with a channel therein;

a slider mounted in said channel for sliding movement therealong;

first locking means engaging said slider for locking said slider in the safed position, said locking means being responsive to centrifugal force to unlock said slider;

a firing pin mass;

a firing pin being secured to said mass and axially projecting therefrom and extending through said slider housing;

said slider being formed with a bore therein for receiving said firing pin in the safed position;

a detonator carried in said slider maintained in an out of line position relative to said firing pin in the safed position;

a spring mounted between said firing pin mass and said slider housing for retracting said firing pin from said slider bore before the arming spin rate is reached whereupon said slider will move along said channel to position said detonator in line with said firing pin;

a plurality of centripetally responsive weights complementally formed relative to said mass, the outer peripheral edge of said weights being rounded to permit a rocking action thereabout such that said weights can be rocked radially outwardly; and

a garter spring encircling in engaging fashion the outer periphery of said weights, said spring being in biasing contact with said weights and urging said weights inwardly into engagement with said mass so as to overcome said retracting spring and hold said firing pin in the safed position, said weights overcoming the force of said encircling spring and rocking radially outwardly in response to the centrifugal forces generated before the fuze reaches the arming spin rate, said weights rocking outwardly about said rounded edge a sufficient distance to permit said mass to be urged in an axial direction a sufficient distance to remove said firing pin from said slider bore and wherein upon impact said weights will rock inwardly thereby acting against said mass to drive said firing pin into said detonator.

3,886,869

THRUST RESPONSIVE PINCH WHEEL DRIVE MECHANISM

Keith W. Tantlinger, Coronado, Calif., assignor to Rohr Industries Inc., Chula Vista, Calif.

Filed June 5, 1974, Ser. No. 476,735

Int. Cl. B61b *13/12*

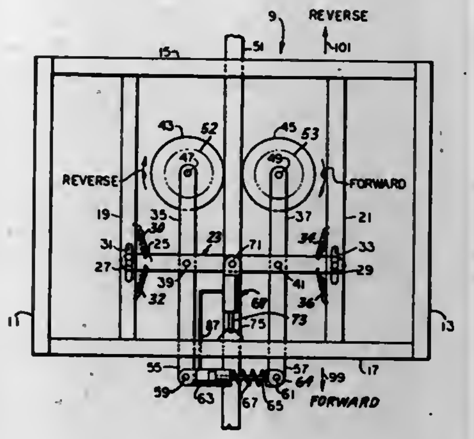
U.S. Cl. 104—147 R **11 Claims**

1. Pinch wheel drive mechanism for a track guided vehicle mounted on a track having oppositely facing reaction surfaces thereon, said mechanism comprising:

pinch wheel support means mounted on the vehicle for limited movement relative thereto,

a pair of pinch wheels journaled on the support means and movable toward and away from each other, said pinch wheels being in rolling engagement with such oppositely facing track reaction surfaces,

power drive means operatively connected to apply driving torque to at least one of the pinch wheels and thereby urge the pinch wheel support means in a selected direction,



hydraulic pressure generating means operatively interposed between the vehicle and the pinch wheel support means for actuation by movement of the pinch wheel support means relative to the vehicle, and

hydraulic pressure responsive means openly communicating with the pressure generating means and operatively connected to the pinch wheels to urge the pinch wheels toward increased gripping engagement with their respective reaction surfaces upon an increase of hydraulic pressure transmitted from the pressure generating means to the pressure responsive means.

3,886,870

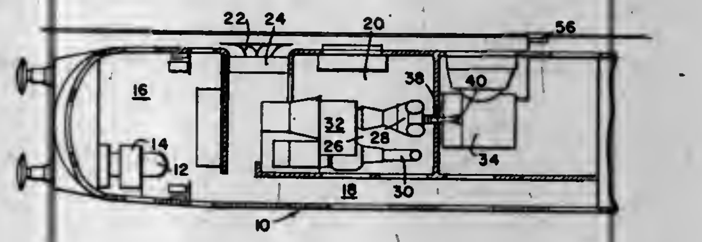
GAS TURBINE AND ELECTRIC DRIVE LOCOMOTIVE

Andre E. Pelabón, Paris, France, assignor to ANF Frangeco S.A., Hauts de Seine, France

Filed Apr. 13, 1973, Ser. No. 350,808

Int. Cl. B61c *7/04, 9/36, 9/38*

U.S. Cl. 105—61.5 **2 Claims**



1. In a railway train of the type wherein at least one of the cars comprises a power car which includes prime mover means for propelling said train, the combination including a single free running gas turbine engine contained in said car, an electric engine contained in said car to be energized from a source exterior to said car, gearbox means including reversing gear means for mechanically transmitting motive power to the wheels of at least one of the bogies of said power car, and coupler means for selectively coupling said gas turbine engine and said electric engine to said gearbox means to transmit power selectively from only one prime mover means during any particular operational period, whereby each of said engines may selectively directly supply power to the same bogie wheels for propelling said train through the coupler means in either direction.

3,886,871

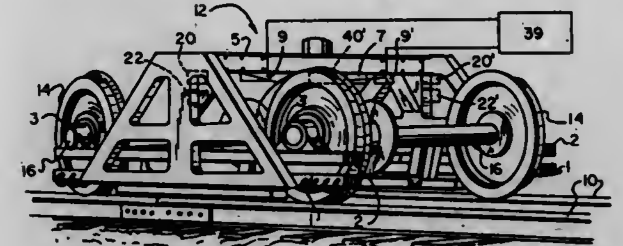
RAILWAY TRUCK MAGNETIC SUSPENSION

James A. Ross, and Bert C. Harris, both of La Jolla, Calif., assignors to Rohr Industries Inc., Chula Vista, Calif.

Filed May 8, 1972, Ser. No. 251,118

Int. Cl. B61f *5/04;* **F16c** *39/06;* **F16f** *6/00*

U.S. Cl. 105—157 R **15 Claims**



1. An improved attractive magnetic suspension and vertical damping apparatus for providing an air gap spaced apart support between the bolster and side frame assembly and surface supported portions of the truck of a high speed vehicle comprising:

elongated ferromagnetic side frames carried by said surface supported portion;

elongated electromagnets having windings and carried by said bolster and side frame assembly portion, each of said electromagnets positioned below one of said ferromagneitc side frames in opposing spaced relation therewith for magnetic attraction therebetween; and

active control means for constantly varying the strength of the force fields of said electromagnets responsive to the length of said gap and to the vertical movement of the bolster and side frame assembly portion for maintaining a predetermined spaced gap relationship and damping control between said bolster and side frame assemblies and surface supported portions.

3,886,872

METHOD AND COMPOSITION FOR REMOVAL OF SOOT AND DEPOSITS FROM HEAT EXCHANGE SURFACES OF COMBUSTION UNITS

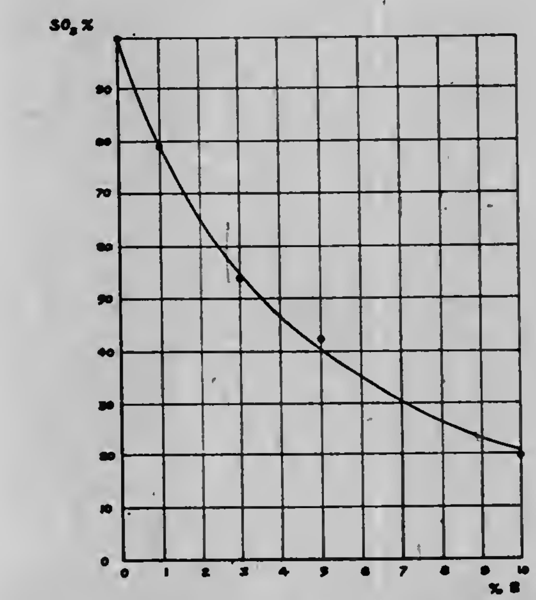
Walter Tony Mallen, Orebro, Sweden, assignor to Nitro Nobel AB, Gyttorp, Sweden

Filed Mar. 20, 1973, Ser. No. 342,931

Claims priority, application United Kingdom, Mar. 25, 1972, 14105/72

Int. Cl. C10l *9/02*

U.S. Cl. 110—1 J **5 Claims**



1. A method for the removal of soot and deposits from heat exchange surfaces of a combustion unit comprising charging to said combustion unit while operating a mixture of more than fifty percent of a nitrate and a minor percent of borax, said mixture being capable of forming a catalytically inactive compound with iron and vanadium oxides under combustion conditions, and continuing the operation of said combustion unit at its normal operating temperature for a sufficient period of time to cause the deposits to crack and/or loosen from the said surfaces.

3,886,873

METHOD IN THE DESTRUCTION OF WASTE BY GASIFICATION AND COMBUSTION

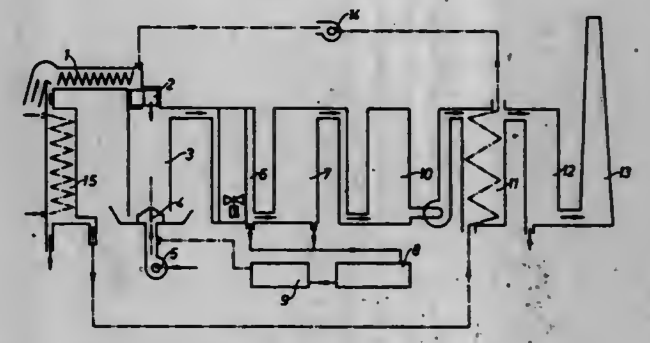
Hans Edvin Sundqvist, and Karl Erik Gustav Andersson, both of Motala, Sweden, assignors to AB Motala Verkstad, Motala, Sweden

Filed June 5, 1973, Ser. No. 367,096

Claims priority, application Sweden, June 15, 1972, 7913/72; Dec. 15, 1972, 16450/72

Int. Cl. F23b *7/00*

U.S. Cl. 110—8 R **4 Claims**



1. In a method for the destruction of waste by generating gas from the waste in a gas generator and delivering the gas to a combustion chamber for combustion thereof, the improvement comprising separating water-soluble hydrocarbons from the generated gas and continuously recycling said water-soluble hydrocarbons by returning said hydrocarbons to the gas generator prior to the combustion of the generated gas.

3,886,874

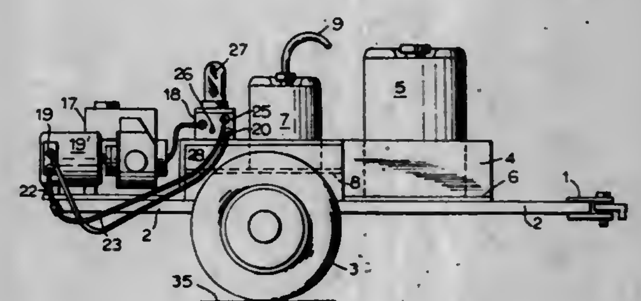
SUB-SURFACE ROOT FERTILIZER AND PROBE

Edward A. Platz, Opossum Rd., Bellemead, N.J. 08502

Division of Ser. No. 245,959, April 21, 1972, Pat. No. 3,783,804. This application Aug. 3, 1973, Ser. No. 385,326

Int. Cl. A01c *23/02*

U.S. Cl. 111—7.4 **14 Claims**



1. Apparatus for sub-surface root fertilization, comprising:

a frame;

a platform mounted on said frame for holding a plurality of tanks, at least one tank mounted on said platform;

pumping means attached to said frame, said pumping means including control means associated therewith, the input of said pumping means communicating with one of said tanks;

a generally cylindrical probe having a flow passage for fluid flow within said probe, said probe having a mounting chuck at one end and a conical tip at the other end, the output of said pumping means communicating with said fluid passage within said probe, said fluid passage including at least one aperture through the walls of said probe near said conical end, said control means including timing means adjustable throughout the range of 0.2 second to 60 seconds, said timing means determining the amount of fluid pumped out through said probe by controlling the duration of operation of said pumping means;

and an impact hammer means non-rotatably attached to said chuck end of said probe for driving said probe beneath the surface of the ground.

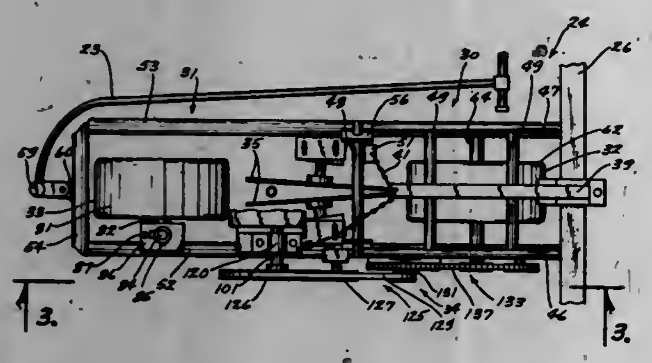
3,886,875
PLANTER APPARATUS

Arnold E. Ernst, Wolverton, Minn. 56594

Filed Nov. 21, 1973, Ser. No. 417,741

Int. Cl. A01c *5/00*

U.S. Cl. 111—85 **8 Claims**



1. A planter apparatus comprising;

a tool bar adapted to be attached to the A-frame of a conventional tractor;

a U-frame pivotally connected at one end to said tool bar;

an H-frame rockably secured substantially centrally intermediate its ends to said U-frame, whereby said H-frame is rockable relative to said U-frame;

a pair of ground engaging wheels rotatably mounted to the front and rear of said H-frame drive means on said H-frame;

a pair of discs rotatably mounted on said H-frames intermediate said wheels and mounted thereon for making an incision in the ground; and

means mounted on said H-frame and operatively connected to said drive means operative during movement of said tool bar for discharging seed into said incision.

3,886,876
APPARATUS FOR THE CLOSING OF THE TOE OF A CIRCULARLY KNIT STOCKING

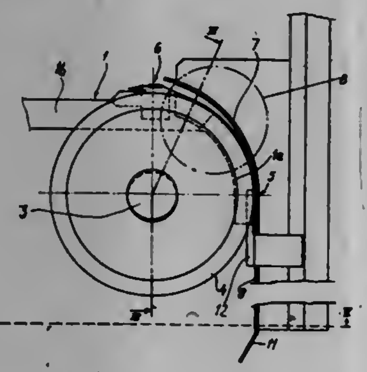
Viggo Sparso, Virum, Denmark, assignor to Hans Christian Andersen, Kastanienbaum, Switzerland

Filed Apr. 25, 1974, Ser. No. 464,229

Claims priority, application Denmark, Apr. 27, 1973, 2310/73

Int. Cl. D05b *7/00*

U.S. Cl. 112—27 **4 Claims**



1. An apparatus for the closing of the toe of a circularly knit stocking which is knit from yarn forming a stocking web with a thickened bead along the edge of an opening to be closed by means of the apparatus, said apparatus comprising a stationary flat stocking toe support having a curved edge portion, a presser foot engageable with said stocking toe support to clamp the toe portion of a stocking between said presser foot and said support, said presser foot being rotatable about a central axis thereof and having a clamping edge substantially concentric with said curved edge portion of said stocking toe support and spaced at a small distance therefrom, toe closing means disposed at a seaming station adjacent said curved edge portion of said stocking toe support, and a pair of superposed jaws having marginal portions defining between them a guiding channel having a longitudinal slot, said channel being so disposed as to receive the superposed bead halves of a stocking, the stocking web extending through said channel slot, said guiding channel having a first free end at which the superposed bead halves of the stocking can be introduced into the channel for sliding movement therealong, said channel having a first portion extending to a delivery position adjacent the curved edge of said support for introducing the stocking web, extending through the channel slot, between said support and said presser foot, said channel having a

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3,886,877
UNIVERSAL LOCKSEAMER MECHANISM

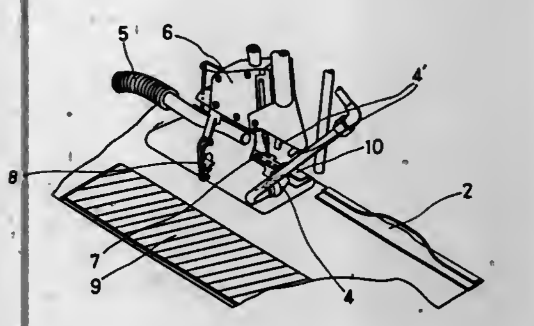
Hachiro Akaishi; Shigeo Busuzima, both of Kiriu; Morio Katayama, Ashikaga, and Akinori Kan, Kiriu, all of Japan, assignors to Kabushiki Kaisha Gunpo, Japan

Filed Dec. 27, 1973, Ser. No. 428,733

Claims priority, application Japan, Dec. 29, 1972, 48-770

Int. Cl.² D05b *21/00, 35/02*

U.S. Cl. 112—121.15 **1 Claim**



1. An improved lockseamer mechanism for use with a three thread type of sewing machine having a body and a needle, comprising:

a principal guide gauge formed of thin stainless steel sheet and removably coupled to said sewing machine body, said principal guide gauge being adapted to guide cloth having a straight edge or an edge curved in either direction;

a table, said sewing machine being positioned on said table, said table having permanent magnets buried therewithin; a supplementary guide gauge formed of thin stainless steel sheet and supported on said table by said permanent magnets;

a plurality of air jet nozzles mounted adjacent said principal guide gauge and operatively directed thereto;

an adjustable source of compressed air coupled to said nozzles, air streams being thereby directed toward said principal guide gauge for positioning cloth therewithin;

an electric eye positioned between said principal gauge and said sewing machine needle and operatively coupled such that said needle operates when said electric eye detects the presence of said cloth;

vacuum means positioned behind said needle for attracting said cloth thereto; and

a band roller positioned adjacent said principal guide gauge for advancing cloth having relatively large dimensions, whereby cloth can be automatically fed to the sewing machine once it is placed in the gauge.

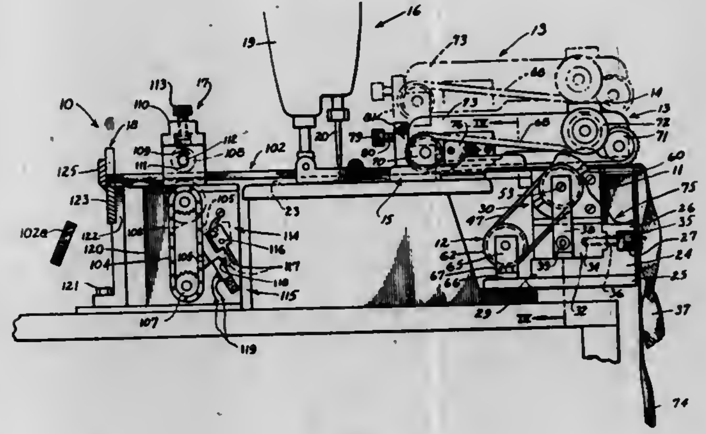
3,886,878
AUTOMATIC FABRIC HANDLING APPARATUS

Charles Block, North Bellmore, N.Y., assignor to Joseph Galkin Corporation, Hicksville, N.Y.

Filed Mar. 29, 1973, Ser. No. 346,070

Int. Cl. D05b *37/08*

U.S. Cl. 112—121.27 **28 Claims**



1. Fabric trimming apparatus for use with sewing machines, or the like, comprising, in combination: first and second support blocks movably supported upon a base platform, said support blocks disposed in spaced relationship with respect to one another and being formed with upwardly extending and second projections, respectively; first and second stationary cutting blades removably secured to said first and second projections, respectively; first and second rotary cutting blades supported by first and second journalled shafts and cooperatively engaging said first and second stationary cutting blades, respectively; first and second sprocket means carried by said first and second shafts for independently driving said first and second rotary cutting blades; first and second adjustment means for independently controlling contact pressure between said first and second pairs of rotary and stationary cutting blades, respectively; and positioning means for selectively varying the distance between said first and second support blocks, thereby varying the width of fabric to be trimmed thereby.

3,886,879
SHIRT FRONT ASSEMBLY, METHOD AND APPARATUS

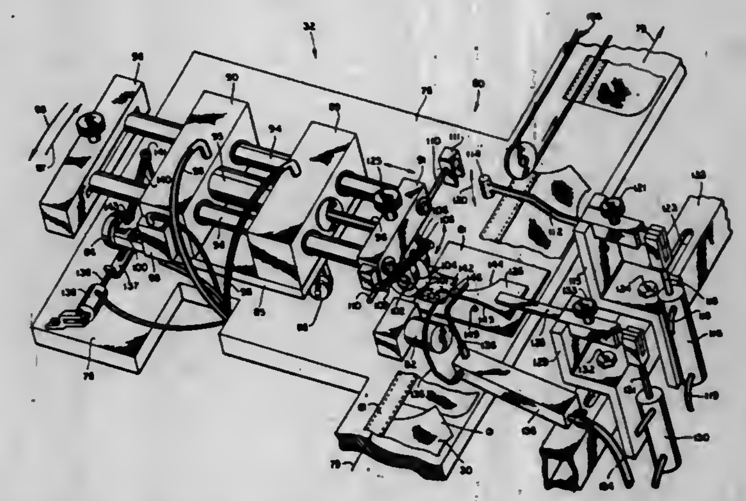
Wade W. Frost, Vidalia, Ga., and William C. Sandlin, Waco, Tex., assignors to Oxford Industries, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 391,645, Aug. 27, 1973, which is a division of Ser. No. 243,753, April 13, 1972, Pat. No. 3,780,682, which is a continuation-in-part of Ser. No. 79,031, Oct. 8, 1970, Pat. No. 3,675,604. This application May 6, 1974, Ser. No. 467,052

Int. Cl. D05b *37/04*

U.S. Cl. 112—130 **12 Claims**

1. A fabric cutter for cutting apart a series of shirt front assemblies connected together by a continuous connected series of center plait pattern parts comprising means for conveying the shirt front assemblies along a predetermined path, sensing means for detecting the presence of the leading and trailing portions of each of the shirt front assemblies of the connected series of shirt front assemblies and temporarily stopping the conveying of the connected series of shirt front assemblies as the leading and trailing portions of the shirt front assemblies move past a cutting station, cutting means at said cutting station for cutting away the leading and trailing ends of the center plait pattern parts of each of the shirt front assemblies while the conveying of the shirt front assemblies has stopped.



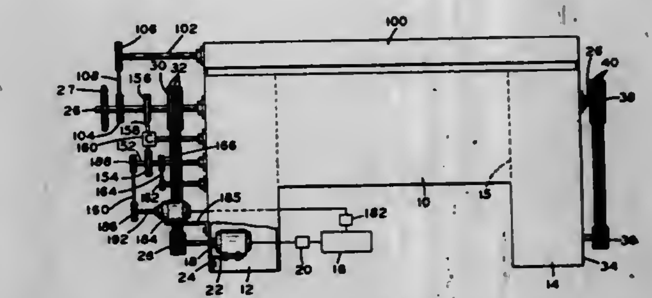
3,886,880
TUFTING MACHINE NEEDLE DRIVE DISENGAGING MECHANISM AND METHOD OF PRODUCING TUFTED MATERIAL USING SAME

John A. Watson, Sr., Lafayette, Ga., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed May 4, 1973, Ser. No. 357,109

Int. Cl. D05c *15/10*

U.S. Cl. 112—266 **7 Claims**



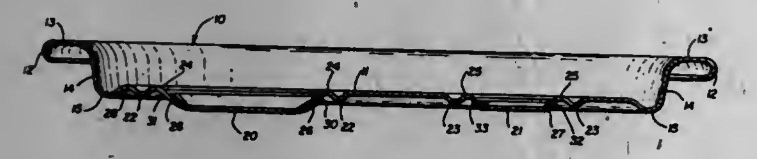
1. In a tufting machine for producing cut pile material by tufting yarn through a backing to form loops and cutting said loops, said tufting machine having an electric motor, a main drive shaft connected to said motor, a needle drive rocker shaft driven by said main drive shaft through a needle drive cam and connecting rod and a needle drive disengaging means, said needle drive rocker shaft in turn driving a tufting needle, a looper drive shaft driven by said main drive shaft, said looper drive shaft moving a looper, a knife drive shaft driven by said main drive shaft, said knife drive shaft moving a knife, backing feed drive shaft driven by said main drive shaft, said backing feed drive shaft moving a backing feed roll, and the yarn feed drive shaft driven by said main drive shaft, said yarn feed drive shaft moving said yarn feed roll, the improvement comprises an auxiliary power means, said needle drive disengaging means for disengaging said needle drive rocker shaft from said main drive shaft and thereby stopping the movement of said tufting needle for use in combination with said auxiliary power means connected to said backing feed drive shaft to drive said backing feed roll and advance the backing through the tufting machine when said backing feed drive shaft is not driven by said main drive shaft, said needle drive disengaging means having two operative positions, one being the position wherein said needle drive disengaging means couples said main drive shaft to said needle drive rocker shaft which causes the needle to reciprocate and tuft yarn through said backing as the machine is operating and the other being the position wherein said needle drive disengaging means disengages said main drive shaft from said needle drive rocker shaft thereby stopping the needle reciprocation which

stops the tufting of yarn through said backing even though all other parts of the machine are operating, a means for moving said needle drive disengaging means into either of said two operative positions at any one instance in time, and a clutch means through which the backing feed drive shaft is driven by the main drive shaft for disengaging the main drive shaft from the backing feed drive shaft and for reengaging the main drive shaft to the backing feed drive shaft, said auxiliary power means is actuated only after said clutch means is actuated to disengage said main drive shaft from said backing feed drive shaft, said auxiliary power means advances said backing without having any other parts of said machine operating and for a time sufficient to advance the untufted backing through said tufting machine a predetermined distance, by using said needle drive disengaging means in conjunction with said auxiliary power means a cut pile material may be produced having a portion thereof untufted.

3,886,881
METHOD OF MAKING A PRESS TAB CONTAINER END FROM A METALLIC SHELL

Ronald A. Pearce, Lakewood, and Thomas R. Herrmann, Wheat Ridge, both of Colo., assignors to Coors Container Company, Golden, Colo.

Filed Dec. 3, 1973, Ser. No. 420,773
Int. Cl.^{2} B21D *51/26*
U.S. Cl. 113—121 C **3 Claims**



1. The method of making a press tab container end from a metallic shell, said end having a hinged pour opening closure tab and a hinged pressure release vent closure tab, which comprises the steps of

- a. providing a metallic shell consisting of a generally flat central portion and a peripheral drawn and curled area which has gasket compound in said drawn and curled area,
- b. forming in the shell an upwardly opening circular groove surrounding each of the proposed areas of a pour opening closure tab and a pressure release vent closure tab, and forming a rib located radially inwardly of each of said grooves,
- c. lancing the metal slightly radially inwardly of the top of said ribs to cut the tab areas and small circumferential parts of said ribs from the shell excepting where the tabs are joined hingedly to the shell,
- d. reforming the shell to flatten and enlarge the tab areas,
- e. coining the reformed shell to make the tab edges underlie surrounding shell areas, and
- f. applying a sealant to the shell to cover the seam between the overlapping tabs and surrounding shell surfaces to provide an air and fluid tight seal.

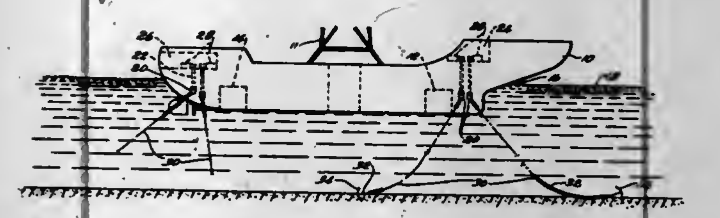
3,886,882
MOORING APPARATUS FOR ICE-BREAKING DRILL SHIP

Russell B. Thornburg, Palos Verdes Peninsula, and Klemme M. Jones, Escondido, both of Calif., assignors to Global Marine Inc., Los Angeles, Calif.

Filed Apr. 23, 1973, Ser. No. 353,690
Int. Cl. B63b *35/10, 35/44, 21/14*
U.S. Cl. 114—40 **4 Claims**

1. An ice-breaking drill ship for operation in ice-covered waters, including operation while moored over a fixed submerged location in the presence of ice movable laterally relative to the submerged location, comprising, in combination,

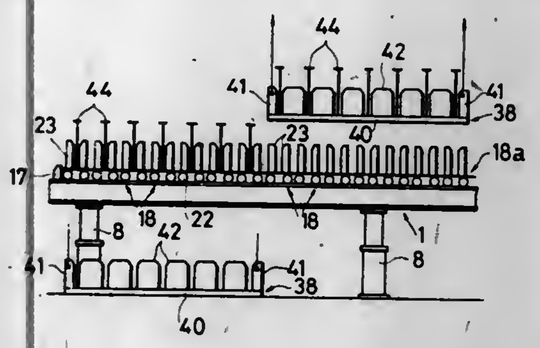
- a. a ship-form hull,
- b. means in the hull operable for inducing pitching motions of the hull effective at the bow, including during periods when the hull is moored, for breaking any surrounding ice below the bow, and
- c. means for mooring the hull to a plurality of submerged anchor points disposed about a desired fixed submerged location and for adjusting the heading of the hull while so moored into the direction of movement of ice over the submerged location including
  - i. a plurality of winches mounted to the hull adjacent the bow and stern thereof,
  - ii. hawseholes in the hull in association with the winches for passage of mooring lines therethrough from the winches to the exterior of the hull, the hawseholes opening through the hull substantially below the waterline of the hull, and
  - iii. a rotatable fairlead mounted in the hull at the opening of each hawsehole for rotation about substantially the axis of the hawsehole for guiding a mooring line into the hawsehole from the exterior of the hull from any direction, whereby the heading of the ship, while moored and during operation of the pitch inducing means, may be changed by controlled selective operation of the winches to take in and pay out mooring lines extending from the winches via the hawseholes to submerged anchor points disposed about the desired fixed location.



3,886,883
APPARATUS FOR DISPOSING LONGITUDINALS FOR CONSTRUCTING HULL BLOCKS

Minoru Odaka, Ichiharashi, Japan, assignor to Mitsui Shipbuilding and Engineering Co. Ltd., Tokyo, Japan

Filed Apr. 9, 1974, Ser. No. 459,286
Claims priority, application Japan, Apr. 10, 1973, 48-40535
Int. Cl. B63b *3/18*
U.S. Cl. 114—65 R **1 Claim**

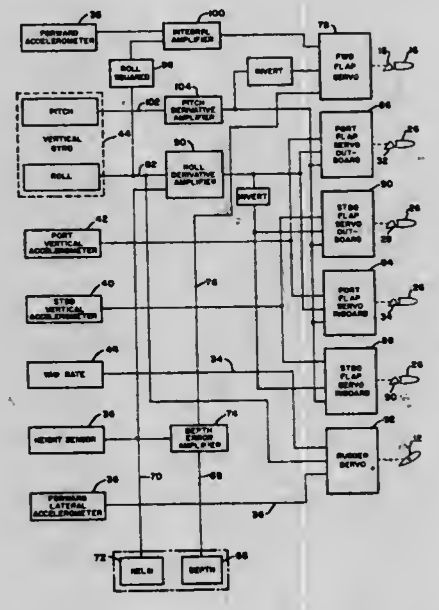


1. An apparatus for disposing longitudinals for constructing hull blocks comprising supports each of which having guide rails on the top thereof, traveling pallets provided on said supports, each pallet having a pair of holding plates for holding a longitudinal and being connected to adjacent pallets by flexible connecting means for keeping a predetermined distance between pallets, driving means for moving said pallets, a crane, transporting pallets suspended from said crane for transporting longitudinals to said traveling pallets and for transferring them onto the traveling pallets, each transporting pallet having a plurality of holding plates for holding longitudinals arranged in a manner such that longitudinals held by the holding plates can be received by said traveling pallets while said pallets are closely arranged on said supports, parallel jigs mounted to said supports for receiving and holding longitudinals after said traveling pallets have been moved to a spaced-apart position, and means for assembling said longitudinals to transverses, and means for lifting and lowering either the said supports or the jigs to effect a transfer thereto.

3,886,884
CONTROL SYSTEM FOR HYDROFOIL

Donald R. Stark, Seattle, and Irving A. Hirsch, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 31, 1972, Ser. No. 302,559
Int. Cl. B63b *1/28*
U.S. Cl. 114—66.5 H **17 Claims**



1. In a control system for a hydrofoil craft having forward and aft foils, the combination of separate port and starboard flap means on at least one of said foils, rudder means associated with said foils, means for generating a command signal for turning said craft, means responsive to said command signal for initially actuating said separate flap means to cause said craft to bank about its roll axis in the direction of a desired turn, means for sensing banking of the craft about its roll axis in response to actuation of the separate flap means, and apparatus coupled to said sensing means for thereafter actuating the rudder means to turn the craft in said direction of desired turn.

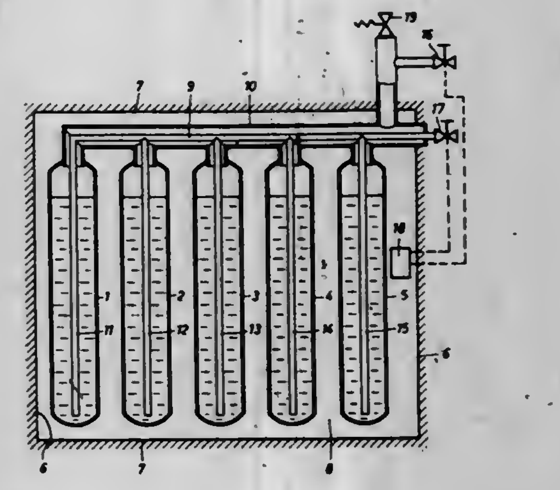
11. In a control system for a hydrofoil craft having forward and aft foils, the combination of control flap means on the forward foil, flap means on the aft foil, means for sensing the height of said craft above the surface of the water when it is foil-borne and for producing an electrical signal proportional to said height, means for producing an electrical signal proportional to desired height of said craft above the water, means for comparing said first and second electrical signals to derive an error signal when the first and second signals are not the same, and means responsive to said error signal for controlling the position of only the control flap means on the forward foil to cause the hydrofoil craft to rise or descend until said error signal is zero.

15. In a control system for a hydrofoil craft having forward and aft foils, the combination of flap means on the forward foil, separate pairs of port and starboard flaps on the aft foil, a first pair of hydraulic actuators for actuating one port and one starboard flap of each pair, a second pair of hydraulic actuators for actuating the other flap of each pair of port and starboard flaps, a single hydraulic actuator for the forward flap means, a first source of fluid under pressure for actuating the first pair of hydraulic actuators, a second source of fluid under pressure for actuating the second pair of hydraulic actuators, and shuttle valve means for connecting said single actuator for the forward flap means to either the first or second source of fluid under pressure.

3,886,885
CONTAINER SYSTEM FOR THE STORAGE AND/OR TRANSPORTATION OF LIQUEFIED GAS

Rudolf Becker, and Wolfgang Becker, both of Munich, Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Apr. 26, 1973, Ser. No. 354,887
Claims priority, application Germany, July 31, 1972, 2237699
Int. Cl. B63b *25/12*
U.S. Cl. 114—74 A **1 Claim**



1. A system for the storage and/or transport of a low-temperature liquefied gas, said system comprising:

- a plurality of thermally insulated walls defining an open-space storage chamber;
- a plurality of generally upright vertically elongated liquefied-gas storage receptacles disposed in said chamber in spaced relationship in a row, each of said receptacles having a bottom portion adapted to receive a liquefied gas and an upper portion forming a vapor space above the liquefied gas in said receptacle;
- a first conduit network communicating with said vapor spaces of all of said receptacles of said row within said chamber, said first conduit network comprising:
- a horizontal large-cross-section dust spaced directly above said receptacles and extending along said row over all of the receptacles thereof;
- a respective large diameter pipe fixed centrally to each of said receptacles and extending vertically therefrom to terminate at said duct while communicating between the respective vapor space and said duct, and
- a vertical riser extending upwardly from said duct through one of said walls, said duct having an end extending into another of said walls;
- a second conduit network communicating with said bottom portions of said receptacles and entirely received in said receptacles and said first network within said chamber, said second network including a first-horizontal tube of relatively small cross-section extending through said duct and emerging therefrom at said one end outside said chamber, and respective small-cross-section second tubes extending vertically from said first tube through said pipes and reaching downwardly into said receptacles substantially to the bottoms thereof;
- a pressure relief valve communicating with said riser for venting said first network; and
- respective controllable valves connected to said first network and to the end of said first tube emerging from said duct and selectively operable for charging said receptacles with liquefied gas and discharging liquefied gas from said receptacles.

3,886,886

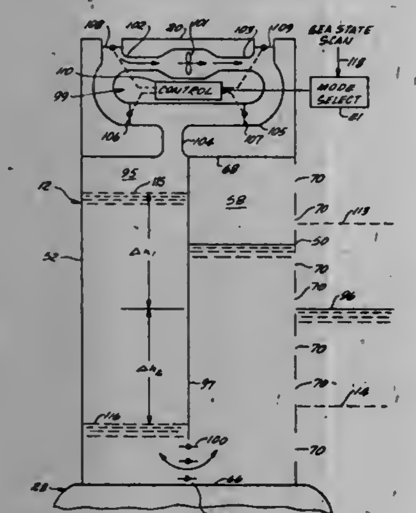
PASSIVE SHIP MOTION STABILIZATION SYSTEM WITH ACTIVE ASSIST FOR HIGH AMPLITUDE MOTIONS

Edward Olen Anders, Houston, Tex., assignor to Global Marine Inc., Los Angeles, Calif.

Filed Feb. 28, 1974, Ser. No. 446,700

Int. Cl. B63b *43/06*

U.S. Cl. 114—125 **8 Claims**



1. A motion stabilization system for a floating vessel having a buoyant hull comprising a first tank extending vertically in the hull from a first selected location below the load waterline to a second selected location above the waterline and having at least one vertical boundary thereof defined by the hull shell, a plurality of vertically spaced openings from the tank through the shell, some of the openings being located below the waterline and some of the openings being located above the waterline, a second tank extending vertically in the hull from about the elevation of the first location to about the elevation of the second location, means providing water flow communication between the lower ends of the tanks and having an effective water flow rate therethrough greater than the effective water flow rate through said openings, and air flow means communicating with the upper extent of the second tank operable alternately to generate superatmospheric air pressure in the second tank and to generate subatmospheric air pressure in the second tank.

3,886,887

SYSTEM FOR CONTROLLING THE POSITION OF A FLOATING VESSEL

Sinclair Upton Cunningham, and Douglas Jackson, both of East Kilbride, Scotland, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

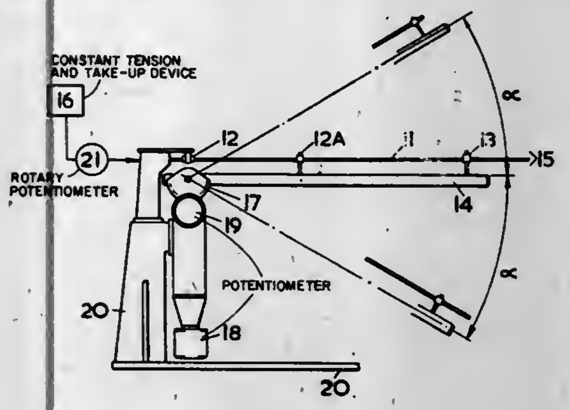
Filed Feb. 5, 1973, Ser. No. 329,401

Claims priority, application United Kingdom, Feb. 4, 1972, 5249/72

Int. Cl. B63b *21/00*

U.S. Cl. 114—230 **5 Claims**

1. A system for controlling the position of a moored floating vessel comprising a reference datum fixed relative to the moorings of said vessel, propulsion means capable of moving the vessel, logic means controlling the propulsion means, and position detecting apparatus for providing output signals related to any difference(s) between the actual position and heading of the vessel and the required position and heading in relation to said reference datum, the position detecting apparatus including a base fixable to the vessel, on said base a head pivoted so as to be able to turn in two planes mutually at right angles, a first means for producing output signals related in sign and magnitude to any change in angle of the pivoted head from a predetermined angle in either said plane, a cord having a first end so located that the cord can be guided so as to pass through said pivoted head and having a second end adapted to be fixed to said reference datum means for maintaining said cord in tension whereby the pivoted head can turn in response to any change in angular direction of the cord therethrough, a second means for producing an ouptut signal related to the length of any portion of the cord lying at any time between the second end thereof and the pivoted head, and means for feeding said output signals from the position detecting apparatus to the logic means to cause said logic means to so control the propulsion means that the position of the vessel is altered in such a manner that the difference(s) is reduced in magnitude.



3,886,888

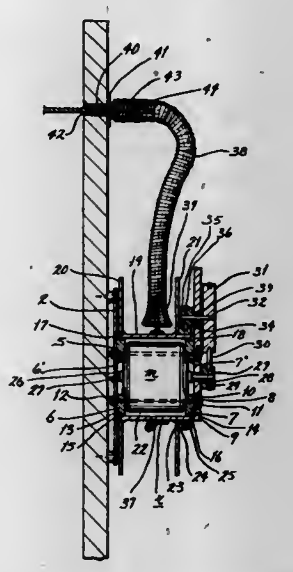
SKI ROPE RETRIEVING DEVICE

Charles O. Parsons, 1 Decorah Dr., St. Louis, Mo. 63141

Filed Oct. 1, 1973, Ser. No. 402,269

Int. Cl. B63p *21/00*

U.S. Cl. 114—235 WS **11 Claims**



1. A ski rope retrieving device comprising a support, first and second spaced-apart end plates planarwise parallel to said support, a prime mover disposed between said first and second end plates, said first end plate being proximate said support, said second end plate being remote from said support, means mounting said first and second end plates and said prime mover upon said support, said end plates having parallel portions projecting beyond said prime mover, bearing means provided upon said end plate projecting portions, a ski rope storage member having a cylindrical body portion supported for rotation about its longitudinal axis on said bearing means and being enclosingly disposed about said prime mover and cooperating with said end plates to define a housing for said prime mover, first and second side flanges mounted upon, and projecting radially outwardly of, said cylindrical body portion of said storage member being rotatable therewith and cooperating with the outer surface of said cylndrical portion to define a storage zone for a ski rope, said first side flange being proximate said support, said second side flange being remote from said support, a drive shaft provided on said prime mover, said second end plate having an opening through which said drive shaft extends laterally beyond said second end plate and said second flange, and motion transmission means interconnecting said drive shaft and said cylindrical portion of said storage member laterally beyond said second flange for effecting rotation of the said cylindrical portion of said storage member upon operation of said prime mover.

3,886,889

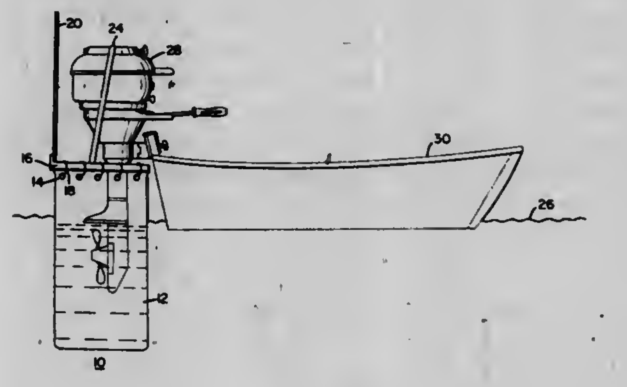
PORTABLE CLEANING DEVICE FOR OUTBOARD MOTORS

Anthony John Burger, 5225 Oberlin Ave., Lorain, Ohio 44053

Filed June 7, 1973, Ser. No. 368,040

Int. Cl. B63b *59/00*

U.S. Cl. 115—.5 R **1 Claim**



1. In combination with an outbard motor drive unit and boat, including:

- a flexible inelastic sack of substantial strength, having one open end;
- a plurality of equally spaced grommets placed on said sack, placed on a line substantially parallel to the open end of said sack, and positioned adjacent the open end of said sack;
- lacing means;
- a rigid shaped frame member completely closed upon itself and having a cicumference substantially equal to that of the open end of said sack; said frame member adapted to receive said open end of said sack, said sack being affixed thereto by said lacing means in cooperation with said grommets and said frame;
- a longitudinal handle pivotly fixed on said frame to rotate in a plane perpendicular to the water surface containing said boat, for positioning the combination of said frame and said sack about said outboard motor drive unit;
- a stop member including an upwardly extending rectangular bar fixed to said frame and positioned adjacent said pivotly fixed longitudinal handle positioning said handle between said stop member and said frame member, and further, such that said stop member lies in the pivotal plane of said handle, thereby inhibiting all movement of said handle past said stop member; and
- a support strap affixed to the combination of said frame and said sack for holding said combination about said outboard motor drive unit, thereby allowing the filling of the clean liquid into the interior of said sack and retaining said clean liquid in intimate contact with said outboard drive unit, thereby further preventing the outboard drive unit from being in contact with any foreign elements.

3,886,890

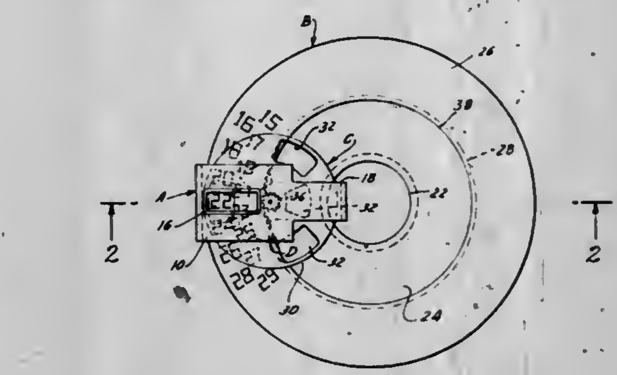
CHANNEL INDICIA DISPLAY DEVICE

Richard D. Gibson, Wilbraham, and Robert D. Whelan, Springfield, both of Mass., assignors to General Instrument Corporation, Clifton, N.J.

Filed June 4, 1973, Ser. No. 366,324

Int. Cl. H03j *1/02*

U.S. Cl. 116—124.3 **12 Claims**



1. A channel designation display device for use in TV or the like comprising a rotatable member having situated thereon two sets of numerals representing channel designations, said sets being arranged on said member in the form of concentric rings, each of said sets forming one of said rings, and masking means comprising a fixed opaque mask situated in front of said disc and having a transparent window aligned with a portion of both of said numeral sets and having a first dimension substantially equal to the combined width of a numeral in each of said sets and the second dimension substantially equal to the height of one of the numerals and, interposed between said member and said window, a rotatable mask having two sets of alternating opaque and transparent regions, said regions being arranged in concentric rings, each of said region sets forming one of said rings, one of said mask rings being offset relative to the other by a given angle, means for operably connecting said rotatable mask to said member, such that the rotation of said member causes said rotatable mask to alternatively mask portions of said window corresponding to first one and then the other of said numeral sets, thus permitting visibility of only a single numeral on one of said numeral sets at any one time.

3,886,891

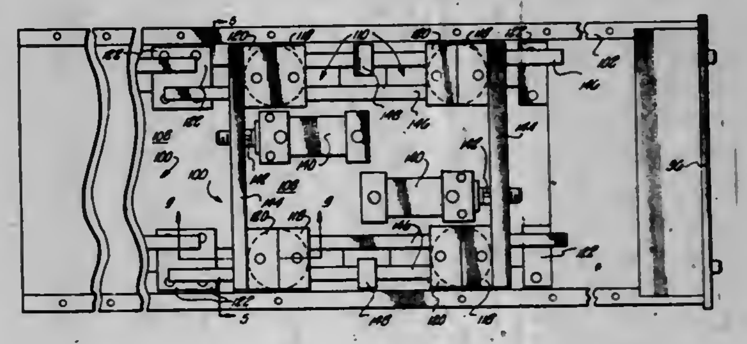
WORK HOLDER WITH FLUID PURGE MEANS

Donald F. Hardy, Horseheads, N.Y., assignor to Dart Industries Inc., Los Angeles, Calif.

Continuation-in-part of Ser. Nos. 232,455, March 7, 1972, and Ser. No. 232,413, March 7, 1972, Pat. No. 3,765,712. This application June 28, 1973, Ser. No. 374,298

Int. Cl. B05c *11/14*

U.S. Cl. 118—1 **14 Claims**



1. A clamping mechanism adapted to grip an article at one end thereof such mechanism further being suitable for immersion into a first fluid medium and including a split clamp jaw assembly with at least two mating members having in recess therein of the approximate size and shape of said article one end so as to firmly grasp yet loosely surround same, a support

arrangement mounting said members in juxtaposition and opposite one another, actuating means interconnected with said members to alternately move same into contact one with the other and then into said juxtaposition responsive to predetermined signal means at least one of said members further having a conduit communicating with said recess, a fluid source connected with said conduit and recess and propelling a second fluid medium therethrough in such volumes as to exclude said first medium therefrom.

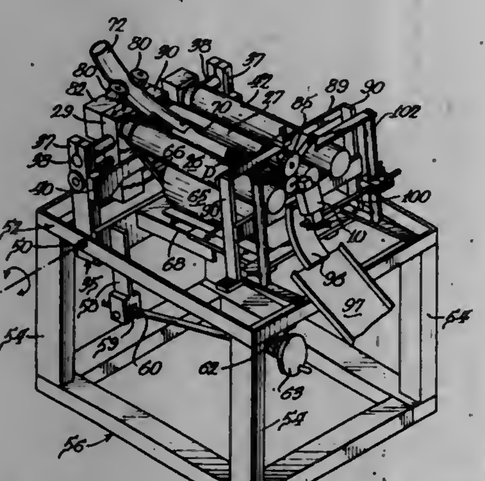
3,886,892
DISC ADVANCING AND PROCESSING APPARATUS

Leroy C. Walls, Valparaiso, Ind., assignor to Lewals, Inc., Chesterton, Ind.

Filed Nov. 20, 1972, Ser. No. 308,145

Int. Cl. B05c *5/00*

U.S. Cl. 118—2 **16 Claims**



1. A disc handling apparatus, comprising,

a. means for supporting a plurality of similar circular discs on edge in adjacent relationship in a generally cylindrically shaped row,

b. means for spinning the discs in the row about the longitudinal axis of the row,

c. means for advancing the row of discs toward a discharge station where the successive discs fall off the supporting means, and

d. means mounted in alignment with said discharge station for momentarily directing a spray of coating fluid toward the spinning end disc at the discharge station before it falls off the supporting means.

3,886,893
APPARATUS FOR APPLYING WAX TO THE SIDE SURFACES OF VEHICLES

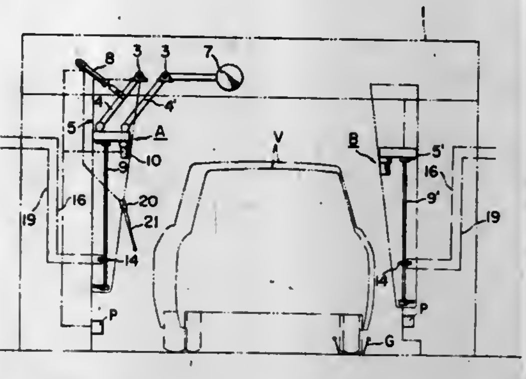
Shigeo Takeuchi, 2, Kiba-cho, Minato-ku, Nagoya, Japan

Filed Aug. 30, 1973, Ser. No. 393,136

Claims priority, application Japan, Nov. 27, 1972, 47-117935

Int. Cl. B05c *5/00*

U.S. Cl. 118—2 **1 Claim**



1. An apparatus for applying wax to the side surfaces of vehicles, comprising: a portal frame structure through which a vehicle can progress, a guide rail laid on the ground under said portal frame structure in a position adjacent to one side thereof to guide the vehicle through said portal frame structure, a wax ejecting system including a pair of wax guns arranged on the opposite side portions of said portal frame structure and having respective orifices directed substantially horizontally and inwardly of said portal frame structure, a first support frame secured to said portal frame structure on that side thereof adjacent to said guide rail, a second support frame hung on said portal frame structure on the opposite side thereof through the intermediary of a parallel link mechanism, two vertical rods journaled on said respective support frames for oscillation about their own axes and respectively supporting said wax guns at substantially the same level, biasing means for normally urging said second support frame to swing outwardly of said portal frame structure, actuator means coupled to said wax ejecting system to operate the same and including a pneumatic actuator operable to cause said second support frame to swing inwardly of said portal frame structure against the bias of said biasing means, sensor means arranged on said second support frame to sense the adjacent side surface of the vehicle progressing through said portal frame structure and operable to control said pneumatic actuator in a manner so that the wax gun associated with said second support frame is held at all times spaced a predetermined distance from the adjacent side surface of the vehicle, and drive means associated with said vertical rods to cause oscillatory rotation thereof about their own axes.

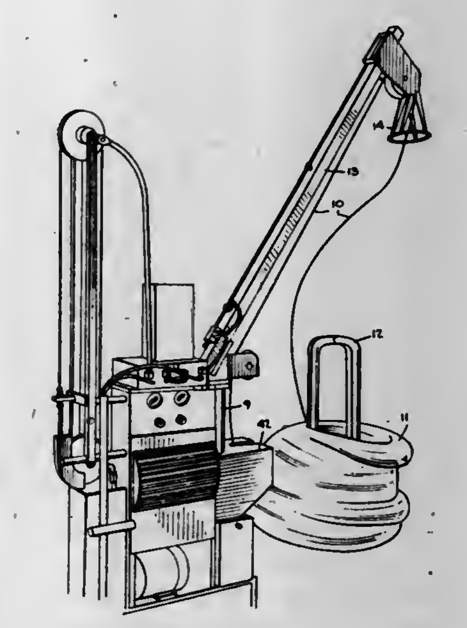
3,886,894
APPARATUS FOR CLEANING AND COATING WIRE

Oliver R. Brekle, Pell City, Ala., assignor to M & B Metal Products Company, Leeds, Ala.

Filed Dec. 14, 1972, Ser. No. 315,201

Int. Cl. B05c *11/06, 5/00*

U.S. Cl. 118—6 **17 Claims**



1. Apparatus for preparing rod for drawing, the rod having brittle scale and other impurities on its outer surface, the apparatus comprising:

feeding means for continuously supplying a substantially constant supply of rod from a rod source comprised of a frame,

a rod receiving means for receiving rod from a rod supply source, said rod receiving means being movably mounted on said frame to move from a first upper position maintaining tension in said rod and a second lower position,

means for detecting the occurrence of a predetermined imperfection in said rod thereby causing said receiving means to move to said second position on said frame,

means responsive to the position of said rod receiving means on said frame, connected to a power supply for the apparatus to shut off the power to the apparatus upon the occurrence of the predetermined imperfection,

a mechanical descaling means receiving said rod from said rod receiving means for bending the received rod to loosen at least a portion of the brittle scale on the outer surface of the rod and adapted to advance the rod to the input of a cleaning means,

said cleaning means cleaning the outer surface of the rod and adapted to receive rod from the descaling means and to advance it in a longitudinal path through the cleaning means, the cleaning means comprising two abrasively coated resilient rotating drums, each of which is mounted on its own shaft having means connected thereto to rotate each of the abrasively coated means about its own shaft in frictional engagement with the outer surface of the rod, means for orbiting both rotating resilient means in an orbit about the circumferential outer surface of the advancing rod, the orbiting and rotational movement of the abrasively coated resilient means scraping the outer surface of the rod to thereby remove substantially all scale from the surface of the rod,

means for coating the cleaned rod received from the cleaning means, the means comprising means for flowing a coating solution on the outer surface of the rod, and means for heating the coated rod to bake the coating on to the cleaned outer surface of the rod, and

means continuously delivering the cleaned, coated rod to the input of the drawing apparatus through which the wire is pulled by the wire drawing apparatus.

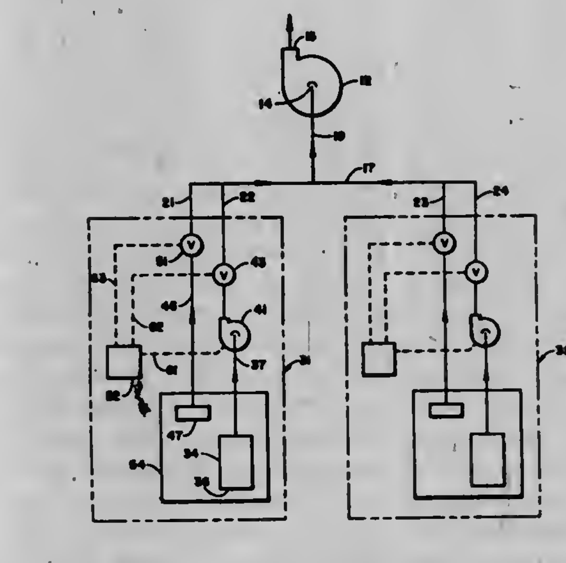
3,886,895
APPARATUS FOR TREATING PARTICULATE MATTER WHILE IN A FLUIDIZED STATE

John Michael Schlamersdorf, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Nov. 16, 1972, Ser. No. 307,200

Int. Cl. C23c *13/08*

U.S. Cl. 118—7 **3 Claims**



1. A surge free apparatus for treating particulate matter in a fluidized state in a plurality of treating units each of which operates in a substantially independent manner, the apparatus comprising,

means for causing a flow of gas having an inlet consisting essentially of a manifold having a plurality of intakes, and an outlet, and

a plurality of treating units, each treating unit consisting essentially of a fluidized bed chamber having means for gas flow therethrough and into one of said intakes said chamber gas flow means including means disposed between the chamber outlet and said one intake for boosting flow of gas through said chamber to provide compensation means for pressure loss occurring when treating particulate matter in said fluidized bed chamber, means for bypass gas flow external to said chamber and into another of said intakes, and means for cooperatively regulating flow of gas through said chamber gas flow means and said bypass gas flow means so as to maintain a substantially constant flow of gas from said treating unit into said manifold, whereby, each of said treating units is substantially free of a surge of flow of gas regardless of operational status of other treating units.

3,886,896
DEVICE FOR PLASMA DEPOSITING OF THIN LAYERS ONTO SUBSTRATES

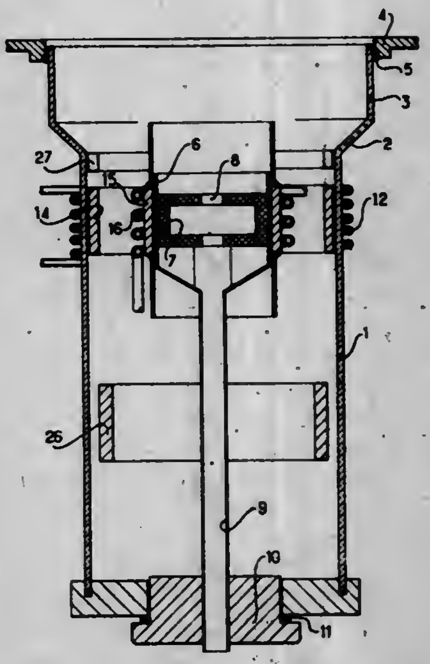
Jean Van Cakenberghe, Beersel, Belgium, assignor to Compagnie Industrielle des Telecommunications CIT-Alcatel, Paris, France

Filed July 9, 1974, Ser. No. 486,933

Claims priority, application France, July 13, 1973, 73.25855

Int. Cl. C23c *13/12*

U.S. Cl. 118—49.1 **7 Claims**



1. Device for vapor depositing a thin layer under vacuum onto a substrate, comprising:

a chamber kept under vacuum, limited by an insulating wall, one part of which is cylindrical;

means supporting at least one substrate in an upper section of said chamber;

a cylindrical hollow body arranged axially in the cylindrical part of the chamber, lined on its inside with the substance to be deposited, connected to a source of gas arriving in the hollow body at a predetermined pressure and in alignment with said at least one substrate;

an induction coil placed on the outside of the chamber, arranged round the cylindrical part of the chamber, in the vicinity of the latter, at the height of the hollow body and connected to a high-frequency voltage source whereby to generate a plasma to evaporate said substance;

means for concentrating the electromagnetic field inside the hollow body

formed by two concentric conductive cylinders (14 and 15) electrically connected together, constituting the secondary winding of an impedance transformer whose primary winding is formed by the induction coil; and means to cool said cylindrical hollow body.

3,886,897
POWDER APPLICATOR

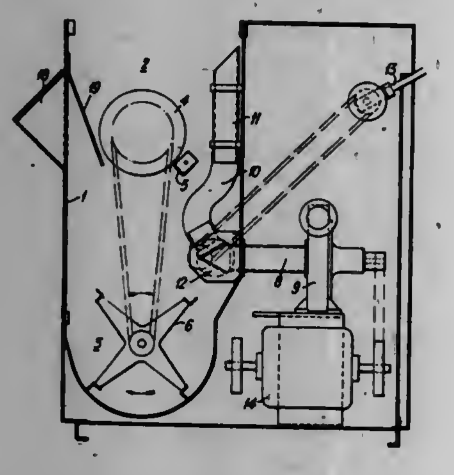
Derek Keith Unwin, Sutton, England, assignor to Chandor Limited, Storrington, England

Filed Feb. 22, 1974, Ser. No. 444,872

Claims priority, application United Kingdom, Feb. 23, 1973, 8864/73

Int. Cl. B05b *7/14*

U.S. Cl. 118—309 **10 Claims**



1. Dusting apparatus including an enclosed dusting chamber, a dusting material hopper, means to pervade the gaseous atmosphere within said hopper with dusting material contained therein, means to transfer dust laden air from said hopper to said dusting chamber for delivery to an article to be dusted therein, proportioning means to vary the relative proportions of dust and air in said dust laden air to vary the amount of dusting material delivered to the article, an air filter associated with said dusting chamber for extracting dusting material from air flowing through the filter, and means operative to extract air from said dusting chamber through said filter so as to tend to establish a negative pressure differential between the interior and the exterior of said chamber such that air entering said chamber from the exterior thereof aids the containment within said chamber of the dusting material.

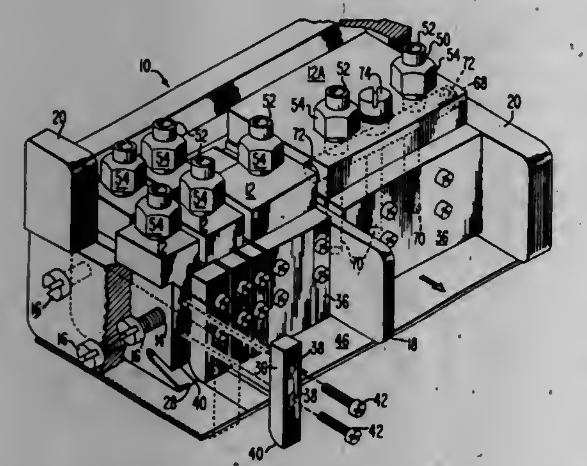
3,886,898
MULTIPLE, CONTIGUOUS STRIPE, EXTRUSION COATING APPARATUS

James Anthony Colegrove, Rochester, and Dunham Briggs Seeley, Fairport, both of N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 19, 1973, Ser. No. 426,022

Int. Cl. B05c *5/02*

U.S. Cl. 118—411 **3 Claims**



1. Apparatus, for continuously coating a plurality of stripes on to at least one surface of a sheet member, comprising: at least two rigid block-like members, each said block-like member having upper and lower surfaces, one and other side surfaces and leading and trailing surfaces, each said block-like member having an opening therein which extends from said one side surface and along said trailing surface to said other side surface so as to form first and second apertures in said one and other side surfaces, respectively, and a third aperture in said trailing surface, said opening also extending from said third aperture angularly upward toward said upper and leading surfaces, said trailing surface including a generally convex surface portion extending from said lower surface to said third aperture, said convex surface portion also extending from said first aperture and along said trailing surface to said second aperture, said convex surface portion forming a lip at said third aperture, each block-like member also including at least one hole therein which extends from said upper surface to said opening and providing communication between said upper surface and said opening, each said hole being adapted for enabling coating material to enter said hole at said upper surface, enter said opening from said communicating hole and become discharged from said opening over said lip at said third aperture; at least one relatively thin separator member located between each two of said block-like members so as to close said second and first apertures of said one and other side surfaces of said two block-like members, respectively, and to separate coating material in the opening of one block-like member from coating material in the opening of the other of said two block-like members, each said separator member also having an edge surface which is substantially flush with at least said lower surfaces of said two block-like members; at least two rigid end frame members between which said at least two block-like member and intermediate separator member are secured, said first and second apertures of said one and other side surfaces of said two block-like members, respectively, being closed by one and the other, respectively, of said end frame members; at least two rigid block-like dam members, each having upper and lower surfaces, one and other side surfaces and leading and trailing surfaces, each dam member being associated with a different block-like member such that the leading surface of a dam member abuts a trailing surface of a block-like member, each dam member including a generally convex surface portion between its lower surface and its leading surface, the convex surface portions of each block-like member and each dam member associated therewith being spaced-apart to define a gap through which the coating material may be discharged from said opening in said block-like member, said convex surface portion of said dam member extending for a short distance beyond said gap and lip in a direction away from the trailing surface of said block-like member and toward the trailing surface of said dam member; means associated with each dam member and the block-like member associated with said dam member for adjusting the vertical position of said dam member relative to said associated block-like member so that the size of said gap may be selectively varied; a backing member mounted beneath the lower surfaces and flush edge surfaces of said block-like members and separator members, respectively, and spaced-apart from said surfaces by a distance to form a passage sufficient to receive said sheet to be coated so that said sheet is sandwiched between said backing member and said lower surfaces and flush edge surfaces of said block-like members and said separator members, respectively, said sheet being slidable in a direction from said leading surfaces toward said trailing surfaces so that coating materials from each said opening may discharge through said gaps as well as under said extending convex portions of said dam members on to a surface of said sheet in order to form stripes of said coating materials on said surface of said sheet as said sheet is slidably moved, said separator members enabling the discharging coating materials from said openings to form wet seals thereat on said sheet and parallel, stripes of said materials on said sheet so that each said stripe have straight edges; and a support member for said backing member.

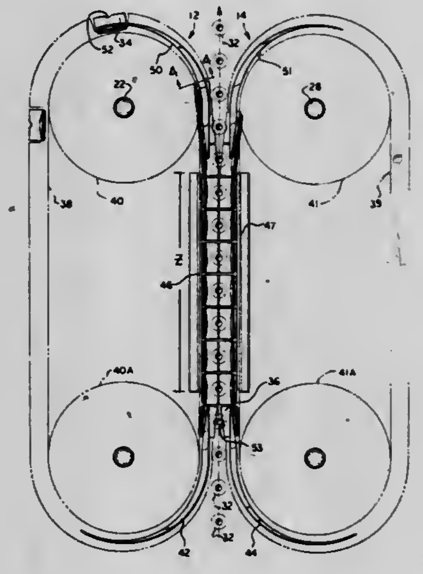
3,886,899
MOVING MASK FOR SHIELDING ARTICLES

John R. Johnson, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed June 25, 1973, Ser. No. 372,974

Int. Cl. B05c *11/14*

U.S. Cl. 118—504 **22 Claims**



1. Apparatus for masking a portion of articles which are traveling in a substantially linear path through an article treatment zone comprising, in combination:

mask means for shielding a portion of each individual article in said treatment zone to prevent treatment of the shielded portion of said article, said mask means including a plurality of complementary pairs of shield members, one of each pair being located on one side of the path of travel of said articles and the other of each pair being located on the opposite side of said path of travel;

transport means connected to said mask means for moving said mask means with said traveling articles;

mounting means, connected to said shield members and said transport means, for supporting said shield members in a location movable toward and away from the path of travel of said articles, said mounting means comprising;

a plurality of complementary pairs of plate members made of resilient material, suspended from said transport means at one end thereof and having the opposite end thereof terminating in a horizontal portion substantially perpendicular to said article and extended substantially to the center line of the path of travel of said articles, said horizontal portion having a cutout portion extending from the peripheral edge of said horizontal portion and shaped to allow a portion of said article to be engaged by said horizontal portion without interference with the travel of said article; and

drive means for moving said transport means in synchronism with said articles.

3,886,900
APPARATUS FOR DEVELOPING A LATENT CHARGED IMAGE

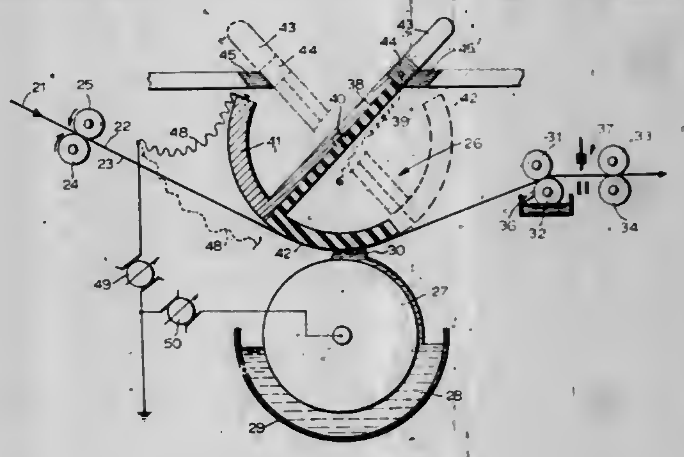
Phillippe M. Deshayes, Neuville Les Dieppe, and Guy Paul Weber, Arques La Bataille, both of France, assignors to La Cellophane, Paris, France

Continuation-in-part of Ser. No. 277,059, Aug. 1, 1972. This application July 31, 1973, Ser. No. 384,264

Claims priority, application France, Aug. 2, 1972, 72.27802

Int. Cl. G03G *13/00*

U.S. Cl. 118—637 **7 Claims**



1. Apparatus for uniformly developing a latent charged image carried on electrophotographic paper having an image side and a reverse side comprising:

a first field member including a main support surface;

a bath of charged liquid toner;

a second field member including a conductive roller partially immersed in said liquid toner bath and having a peripheral surface close to but spaced from said main support surface of said first field member;

transport means for moving the electrophotographic paper past said main support surface with the reverse side contacting said main support surface and the image side facing and spaced from said peripheral surface of said conductive roller;

drive means for rotating said conductive roller at a speed to form a thin layer of liquid toner on said peripheral surface of said conductive roller, said liquid toner forming a meniscus of liquid toner at the surface of the image side of the electrophotographic paper whereby liquid toner is uniformly distributed on the charged areas of the electrophotographic paper;

said main support surface of said first field member including a first conducting support surface and a second non-conducting support surface; and

selecting means for selectively positioning one of said conducting and non-conducting support surfaces in position to support said electrophotographic paper.

3,886,901
FOLDED CAT BOX AND FILLER MATERIAL PACKAGE

Charles R. Zeitter, Grand Rapids, Mich., assignor to Lowe's, Inc., Cassopolis, Mich.

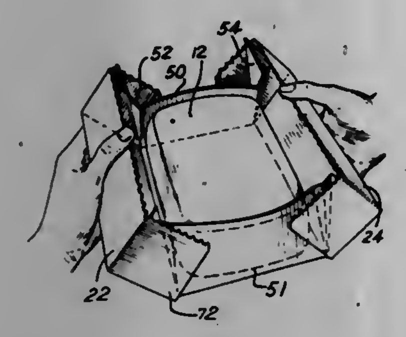
Filed May 10, 1974, Ser. No. 468,680

Int. Cl. B65d *25/14*

U.S. Cl. 119—1 **8 Claims**

1. A folded cat box and filler material package, comprising a rectangular bottom panel, end walls connected to two opposite edges of said bottom panel and extending at right angles thereto, side walls connected to the other two opposite edges of said bottom panel and extending at right angles in the same direction as said end walls, foldable corners interconnecting the adjacent ends of said end and side walls, a top panel secured to the upper edges of said side walls and having end sections extending downwardly over the outside surface of said end panels and being secured to the respective foldable corners, a tear strip disposed near the longitudinal center of

said top panel and extending through said end sections for separating said top panel into two sections to form opposite



walls of the unfolded box, and a package of litter sealed in said box for use therein when the box is opened and unfolded.

3,886,902

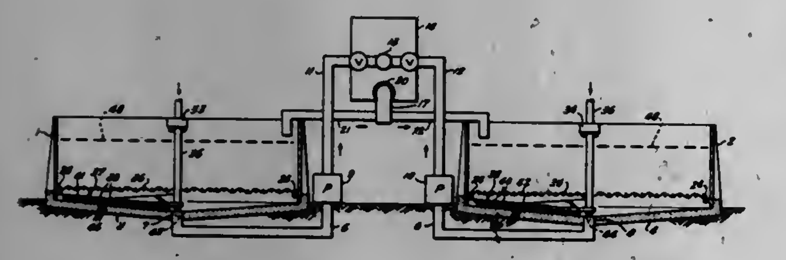
RECIRCULATING FISH RAISING TANK SYSTEM WITH CLEANABLE FILTER

Robert C. Haynes, 1607 Broadmoor St., Brownwood, Tex. 76801

Filed Jan. 2, 1974, Ser. No. 429,723

Int. Cl. A01k *61/00*

U.S. Cl. 119—3 **6 Claims**



1. A recirculating fish raising tank system with cleanable filter including a filter means, at least one tank, means for removing waste material from each tank and transmitting the waste material with water from each tank into the filter means, means for transmitting the filtered water back into the tank, means for aerating the water in each tank, and means for backwashing and cleaning the filter in which each tank has a bottom which is sloped downwards towards its center in which the means for removing waste material from each tank includes rotating brush means for stirring up the waste material on the bottom of each tank and a drain pipe extending down from the center of the bottom of each tank, in which the means for transmitting the waste material with water from each tank into a filter means includes, in addition to the drain pipe, pump means connected to the drain pipe and pipe running from the pump means into the upper part of the filter means, in which the means for transmitting the filtered water back into each tank includes a pipe running from the lower part of the filter means into each tank, said pipe having numerous perpendicular extensions each having structure defining holes, and in which the means for aerating the water in each tank is also the means for rotating the brush at the bottom of each tank and includes a free swivelling pipe mounted at the center and parellel to the sides of each tank through which compressed air is introduced, said pipe having an extension parallel to the bottom of each tank and structure defining numerous small holes in said extension, the brush elements also being mounted in said extension so that the compressed air emanating from the holes in the said extension aerates the water and causes the extension with attached brush elements to rotate.

3,886,903

METHOD OF SPAWNING AND CULTURING OF SWEET SMELTS

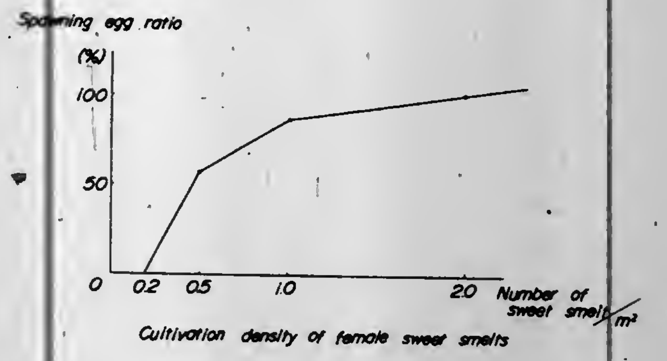
Toshiro Yamada, 32-3. Deki-machi, Anan, Japan

Filed Jan. 17, 1974, Ser. No. 434,002

Claims priority, application Japan, Feb. 8, 1973, 48-15826

Int. Cl. A01k *61/00*

U.S. Cl. 119—3 **7 Claims**



1. A method of spawning and culturing sweet smelts comprising the steps of:

providing a culture pond having a surface with a desired surface area and a gravel spawning bed;

circulating water through said culture pond;

placing hormone-administered mature female sweet smelts in said culture pond such that the cultivation density of said female sweet smelts is at least 0.5 female sweet smelt per square meter of said surface area;

placing mature male sweet smelts in said culture pond, with the number of said male sweet smelts being at least equal to the number of said female sweet smelts;

allowing said male and female sweet smelts to spawn and fertilize eggs;

separating said male and female sweet smelts from said eggs; and

incubating said eggs.

3,886,904

ARTIFICIAL SEA WATER SOLUTION AND COMPOSITION FOR MAKING THE SAME

John M. King, Mentor, Ohio, assignor to Aquarium Systems, Inc., Eastlake, Ohio

Filed July 20, 1973, Ser. No. 381,164

Int. Cl. A01k *61/00*

U.S. Cl. 119—3 **24 Claims**

1. A composition which, when dissolved in water, produces an artificial sea water solution, said composition comprising the following ingredients based on the total weight of said composition: about 67.23 to about 68.59 weight percent sodium chloride, about 16.82 to about 17.16 weight percent magnesium sulfate, about 8.50 to about 8.66 weight percent magnesium chloride, about 3.73 to about 3.81 weight percent calcium chloride, about 1.84 to about 1.89 weight percent potassium chloride, about 0.512 to about 0.522 weight percent sodium bicarbonate, about 0.202 to about 0.206 weight percent sodium bromide, about 0.0465 to about 0.0514 weight percent strontium chloride, about 0.0209 to about 0.0231 weight percent sodium silicate, about 0.00928 to about 0.01030 weight percent manganese sulfate, about 0.00492 to about 0.00544 weight percent sodium orthophosphate, about 0.00220 to about 0.00268 weight percent lithium chloride, about 0.00220 to about 0.00268 weight percent sodium molybdate, about 0.00113 to about 0.00138 weight percent aluminum sulfate, about 0.000376 to about 0.000459 weight percent rubidium chloride, about 0.000238 to about 0.000291 weight percent zinc sulfate, about 0.000225 to about 0.000276 weight percent potassium iodide, about 0.000125 to about 0.000153 weight percent cobalt sulfate, and about 0.0000250 to about 0.0000306 weight percent copper sulfate.

3,886,905

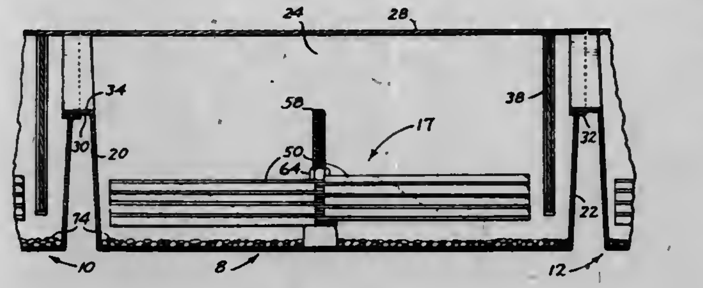
FISH PROPAGATION METHOD

William J. McNeil, P.O. Box 1054, Auke Bay, Alaska 99821

Filed Oct. 4, 1973, Ser. No. 403,435

Int. Cl. A01k *61/00*

U.S. Cl. 119—3 **6 Claims**



1. A method of propagating fish from fish eggs comprising preparing on a perforate support submerged in water a deposit of fertilized eggs,

incubating the eggs in said deposit to produce alevins therefrom, which alevins include attached yolk sacs which are the remnants of the eggs from which the alevins were produced,

allowing said alevins with attached yolk sacs to leave said support by escaping downwardly through the perforations of said support,

permitting the alevins on escaping through said perforations to nestle within the interstices of a rugose substrate with the alevins sheltered about their sides by such substrate, and

further incubating said alevins with such nestled in the interstices of said substrate during the period that yolk sacs are absorbed by said alevins to produce the fry.

3,886,906

STEAM GENERATOR

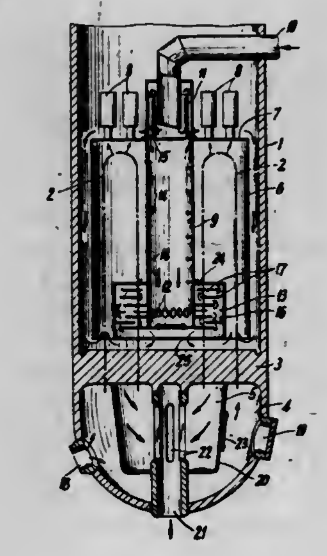
Hubert Wolfgarten, Oberhausen, Germany, assignor to Gutehoffnungshutte Sterkade Aktiengesellschaft, Oberhausen, Germany

Filed Dec. 6, 1973, Ser. No. 422,288

Claims priority, application Germany, Dec. 6, 1972, 2259629

Int. Cl. F22b *1/06*

U.S. Cl. 122—32 **2 Claims**



1. A steam generator comprising a casing, a tube sheet, a bundle of U-shaped tubes having inlet and outlet legs mounted within said casing directing the flow of the heating agent, a shell encasing said bundle having a top cover plate, steam separators on said top plate, said bundle of tubes fixedly secured to said tube sheet and arranged symmetrically about the longitudinal axis of the steam generator, a pre-heating chamber encircling said outlet legs near said tube sheet for preheating the feed-water, the sides of said chamber extending axially, the supply means lying between the tubes of the tube bundle and extending into said chamber for admitting feedwater into said pre-heating chamber, said supply means comprises a pipe extending near said tube sheet, said pipe comprises outlet openings above said top cover plate, and said outlet openings having a flow throttling means for permitting a specified portion of the feedwater to flow around said steam separators.

3,886,907

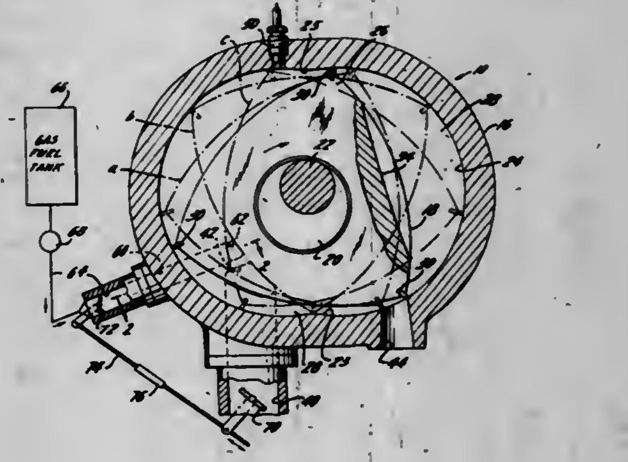
GAS FUELED ROTARY ENGINE

Robert W. Loyd, Jr., Wyckoff, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Dec. 12, 1973, Ser. No. 423,881

Int. Cl. F02b *53/04*

U.S. Cl. 123—8.13 **8 Claims**



1. A rotary combustion engine comprising:

a. an outer body having a peripheral wall and axially-spaced side walls defining an internal cavity therebetween and also having first and second intake ports and an exhaust port with the inner surface of said peripheral wall having a multi-lobe profile;

b. a shaft coaxial with said outer body cavity and having an eccentric portion;

c. an inner body of generally polygonal profile journaled on said eccentric portion for relative rotation within said outer body, the apex portions of said inner body having sealing cooperation with said multi-lobe surface to define a plurality of working chambers which vary in volume in response to said relative rotation and the communication of said ports with said chambers being controlled by said relative rotation;

d. a first passage for supplying a gaseous-type fuel at an above atmospheric pressure through said first intake port to said working chambers;

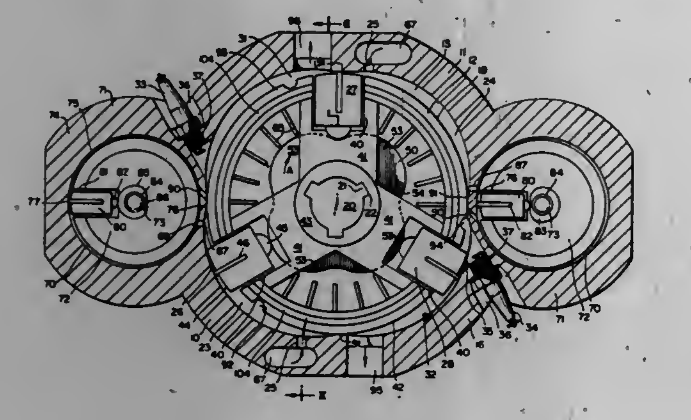
e. a second passage for supplying only air through said second intake port to said working chambers; and

f. said two intake ports being so shaped and positioned that the second port opens to a working chamber before the first port and closes after the first port and in which said first intake port opens to a working chamber after the exhaust port is closed to that chamber.

3,886,908
ROTARY INTERNAL COMBUSTION ENGINE

Ivan Ruzic, 2110 Main St. E., Saskatoon, Saskatchewan, Canada

Filed Dec. 14, 1973, Ser. No. 425,168
Claims priority, application Canada, Oct. 18, 1973, 183753
Int. Cl. F02b *53/08*
U.S. Cl. 123—8.31 **8 Claims**

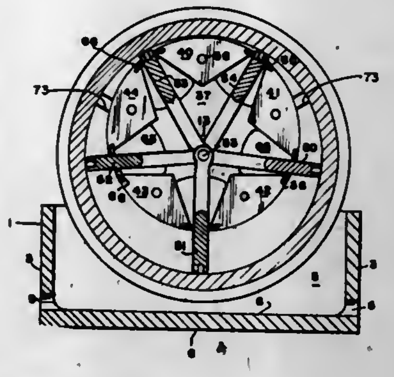


1. An internal combustion rotary engine comprising a main stator casing defining a main rotor chamber therein, a main rotor rotatably mounted in said main rotor chamber and combining with said main stator casing to form separate combustion chamber means and intake chamber means, primary vanes mounted in said main rotor, the radially outer end of each vane maintaining contact with an adjacent internal surface of said main stator casing during rotation of said main rotor, each primary vane passing through said combustion and intake chamber means respectively during rotation of said main rotor, intake passage means for transferring a mixture of fuel and air into said intake chamber means, exhaust passage means for transferring exhaust gases resulting from combustion out of said combustion chamber means, ignition means for igniting a mixture of fuel and air in said combustion chamber means, compression means for compressing a quantity of said mixture of fuel and air, said compression means comprising a compressor stator casing defining a compressor rotor chamber; a compressor rotor rotatably mounted in said compressor rotor chamber and combining with said compressor stator casing to form a compression chamber, said compressor stator casing being located radially outwardly from the centre axis of the main rotor and separated from said main rotor chamber, first passage means for transferring a quantity of said mixture of fuel and air in said intake chamber means to said compression chamber, second passage means for transferring a compressed quantity of said mixture of fuel and air from said compression chamber to said combustion chamber means, release means for releasing said compressed quantity of fuel and air into said combustion chamber means through said second passage means in timed relation with respect to the passage of each of said primary vanes through said combustion chamber means, wherein said release means comprise recesses in the periphery of the main rotor, one recess being located to the rear of and spaced apart a predetermined distance from each primary vane, the rearward position of each recess being relative to the direction of rotation of the main rotor and said predetermined distance determining the time of release of said compressed quantity into said combustion chamber.

3,886,909
ROTARY INTERNAL COMBUSTION ENGINE

Vernon L. Balsbaugh, Rt. 2, Box 68, Dallas, Oreg. 97338
Continuation-in-part of Ser. No. 155,773, June 23, 1971, abandoned. This application June 11, 1973, Ser. No. 369,089
Int. Cl. F02b *55/14*
U.S. Cl. 123—8.45 **12 Claims**

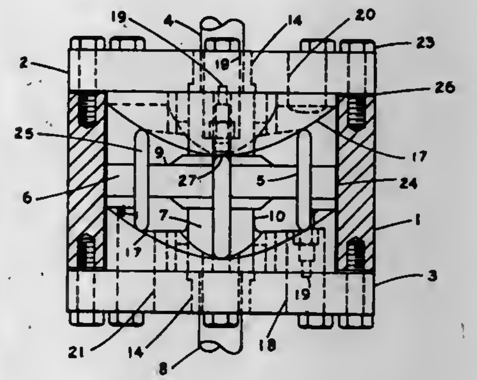
1. An internal combustion engine comprising:
a pair of rotors and means for interconnecting said rotors for rotation at different speeds for progressive relative rotation,
and dividing means between said two rotors to form therebetween combustion, exhaust, intake and compression chambers as the two rotors rotate and one progresses with respect to the other,
wherein said dividing means extend from one rotor in slidable contact with the other rotor as one of said rotors progresses with respect to the other, the axes of said rotors being offset.



3,886,910
ROTARY, MULTI-CHAMBERED, INTERNAL COMBUSTION ENGINE

Richard Arnold Vrooman, 22628 87th West, Edmonds, Wash. 98020

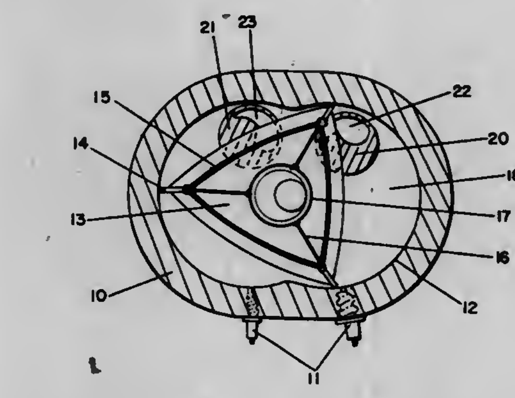
Filed Oct. 12, 1973, Ser. No. 405,868
Int. Cl. F02b *55/14*
U.S. Cl. 123—8.45 **4 Claims**



1. In a rotary internal combustion engine, a circular housing enclosing a circular disk rotor coincident and symetrical about the same centerline, multiple radially oriented slots machined in the rotor disk in which is fitted multiple gas seal barriers constrained in displacement means parallel to said rotor disk center-line axis thus joined with the rotor to form a single assembly, said gas seal barriers trapped between two contoured cam surfaces means functioning as force transmitters for inducing motion to said rotor disk, left and right hand cover plates enclosing upon and supporting by bearing means said rotor assembly forming an integral structure by attaching bolt means with the circular housing enclosing said rotor disk and multiple gas seal barriers, said left and right hand cover plates contain integrally contoured cam surfaces displacement means with left hand cover plate maximum displacement means coincident to right hand cover plate minimum displacement means, combustable mixture ignition means located at or near maximum compression position contoured cam displacement means; combustable mixture intake means through each cover plate into combustion chamber formed by any two adjacent gas seal barriers, the contoured cam surface, the rotor disk face, and the rotor hub surface; combustable mixture compressing or expanding means as contoured cam profile increases or decreases displacement means, exhaust means through cover plates expelling spent combustable mixture from said combustion chamber, power output means through shaft attaching means to rotor disk hub.

3,886,911
INTERNAL COMBUSTION TROCOIDAL ROTARY ENGINES WITH ROTATABLE INTAKE AND EXHAUST PORTS

Otto G. Glatt, 169 Boiling Springs Ave., East Rutherford, N.J.
Filed Dec. 17, 1973, Ser. No. 425,521
Int. Cl. F02b *55/14, 53/06*
U.S. Cl. 123—8.45 **5 Claims**

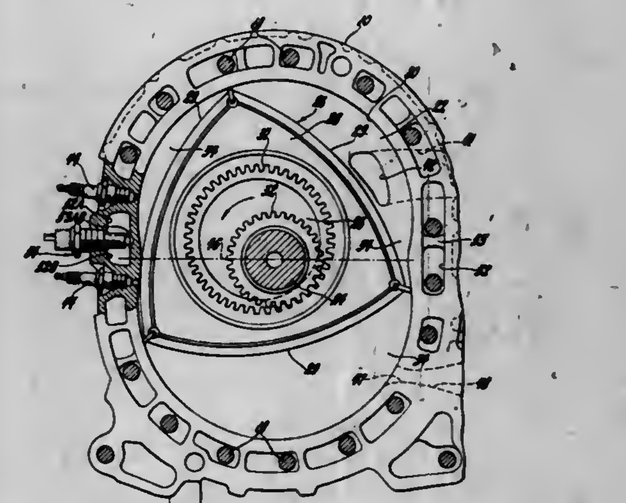


1. A rotary internal combustion engine of the trochoidal type comprising:
a housing having epitrochoidal inner chamber of at least two lobes,
a triangularly shaped rotor eccentrically journalled within said housing,
seal means on said rotor whereby said seal means are in sealing relationship with the surface of said epitrochoidal chamber,
at least two spark plugs mounted on said housing,
an intake port means and an exhaust port means, each of said port means having a variable opening means for rotatably journalling said intake port means and exhaust port means on said housing,
and means responsive to the speed of said engine for controlling the rotation of said respective port means to vary the exposed opening of said respective variable port opening accordingly whereby the size of the port opening increases with engine speed.

3,886,912
ROTARY ENGINE HEAT SENSING ARRANGEMENT

Robert J. Haglund, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Feb. 8, 1974, Ser. No. 440,666
Int. Cl. F02b *55/14*
U.S. Cl. 123—8.47 **3 Claims**

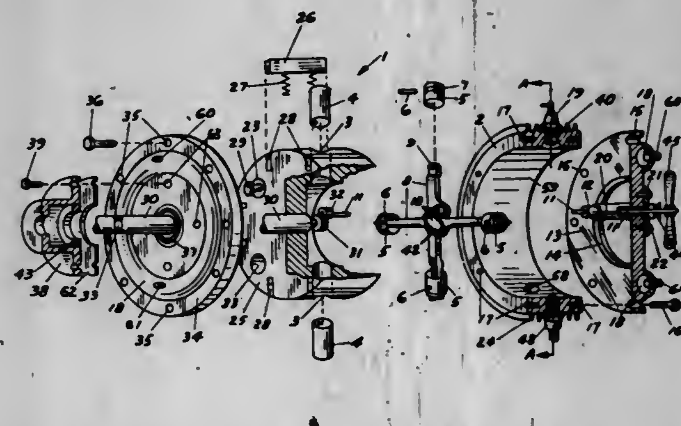
1. An internal combustion rotary engine having a stationary body comprising a rotor housing having an outer peripheral wall and a multi-lobed inner peripheral wall and a pair of end wall housings having oppositely facing internal end walls cooperatively defining a cavity, a crankshaft rotatably mounted in said stationary body having an eccentric located in said cavity, a multi-apex rotor rotatably mounted on said eccentric having sides opposite said end walls and a plurality of faces opposite said inner wall, means for causing said rotor and said crankshaft to turn in a fixed speed relationship while said rotor planetates with a fixed relationship to said rotor housing, said rotor faces and said end walls and said inner wall cooperating to provide a plurality of working chambers that are spaced about and move with said rotor within said rotor housing while varying in volume as said rotor planetates, said stationary body having an intake passage that is opened by said rotor to said chambers as they expand to deliver an air-fuel mixture thereto, a spark plug mounted in said rotor housing for igniting the air-fuel mixture in said chambers, said stationary body having an exhaust passage that is opened by said rotor to said chambers during their contraction to receive exhaust gas therefrom, peripherally spaced axially extending coolant passages in said rotor housing spaced by radially extending ribs between said inner wall and said outer wall, and heat sensor means including a heat input body connected to only said outer wall in the hotest region of said rotor housing and received with space completely thereabout in a hole in one of said ribs so as to be open to coolant in the coolant passages normally separated by said one rib, said heat input body having its most direct heat input area at the inner end thereof spaced opposite and closest to the outer side of said inner wall so that said heat sensor means senses the heat of said inner wall by convection and also conduction through coolant between said most direct heat input area and said inner wall and when there is no coolant by radiation through the space normally occupied by coolant and also conduction through said one rib and the connection of said heat input body with said outer wall.



3,886,913
ROTARY-PISTON INTERNAL COMBUSTION ENGINE

James G. Blanchard, 2022 S. Kirkwood St., Shreveport, La. 71108

Filed May 22, 1974, Ser. No. 472,499
Int. Cl. F02b *57/02*
U.S. Cl. 123—44 D **10 Claims**



1. A rotary-piston internal combustion engine comprising:
a. a housing fitted with at least one fuel ignition means, intake and exhaust ports, and an essentially cylindrical housing inside surface;
  b. a forward cover plate in removable cooperation with the forward end of said housing and a rear cover plate in removable cooperation with the rear end of said housing to close said housing;
  c. a rotor having a cavity partially through the center thereof and a plurality of opposed cylinder apertures radially disposed therein, said cylinder apertures commu-

nicating from the outer periphery of said rotor to said cavity;

d. a shaft carried by said rotor, one end of said shaft being journaled for rotation in said forward cover plate and the opposite end of said shaft terminating in said cavity;

e. a hollow drive pin mount fitted in cooperation with said rear cover plate;

f. a drive pin journaled for rotation in said hollow drive pin mount;

g. coupling means in cooperation with said opposite end of said shaft and said drive pin to effect rotation of said drive pin when said rotor is caused to rotate and said shaft rotates;

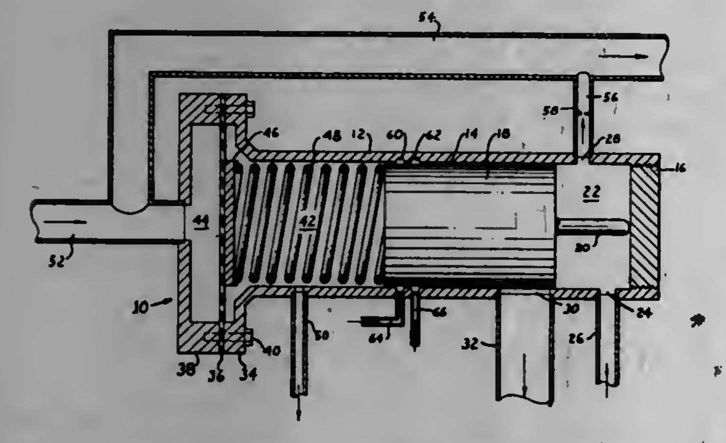
h. at least one piston arm, the ends of which are adapted to extend into two of said opposed cylinder apertures, and the centers of which are fitted with a slot for engagement with said drive pin mount; and

i. a plurality of pistons carried by said ends of said at least one piston arm and adapted to register with said opposed cylinder apertures whereby when said rotor is caused to rotate, said slot in said piston arm traverses said drive pin mount and said pistons are caused to reciprocate radially in said cylinder apertures.

3,886,914
LUBRICANT METERING SYSTEM

Daniel C. Ahrns, and Robert W. Morrison, Jr., both of Westland, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 14, 1973, Ser. No. 424,985
Int. Cl. F01m *1/18*
U.S. Cl. 123—73 AD **11 Claims**



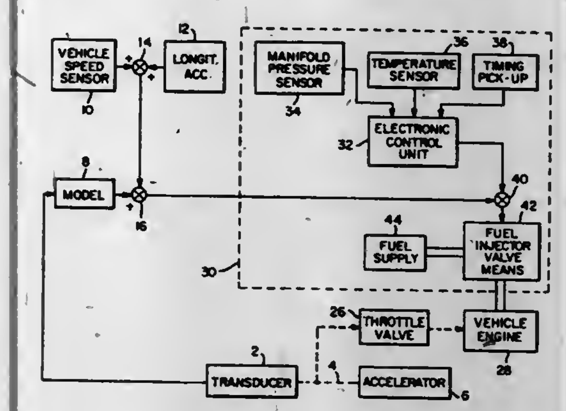
1. A lubricant metering system for an engine comprising:
a fuel flow sensing means constructed to provide a signal proportional to engine fuel flow rate,
a lubricant supply means constructed to provide a flow of lubricant under pressure,
a lubricant metering device connected to said supply means and constructed to control the flow of lubricant from said supply means,
said lubricant metering device being connected to said fuel flow sensing means and constructed to portion the output of said supply means in response to said signal.

3,886,915
PASSIVE ADAPTIVE ENGINE CONTROL SYSTEM FOR IMPROVED VEHICLE DRIVEABILITY

Lael B. Taplin, Livonia, Mich., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Sept. 28, 1973, Ser. No. 401,760
Int. Cl. F02d *11/10;* **B60k** *31/00*
U.S. Cl. 123—102 **8 Claims**

1. In a vehicle engine of the type whereby the engine is operator controlled through an accelerator, the improvement comrpising:
means connected to the accelerator and responsive to the operator controlled displacement thereof for providing a signal corresponding to a desired response of the vehicle, including a transducer connected to the accelerator for providing a signal corresponding to the displacement thereof and a model connected to the transducer and responsive to the signal therefrom for providing the desired vehicle response signal;
means for providing a signal corresponding to the actual response of the vehicle;

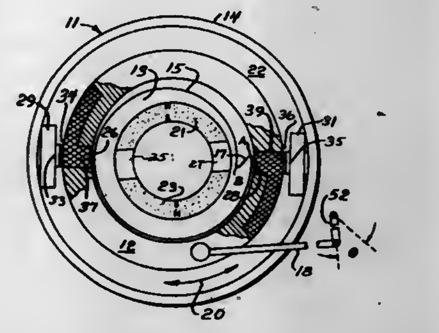


means for combining the desired and actual response signals and for providing a signal corresponding to the difference therebetween; and
means connected to the difference signal means, the accelerator and the engine for controlling the engine in response to the difference signal and the accelerator displacement.

3,886,916
TIMING MECHANISM FOR BREAKERLESS IGNITION SYSTEMS

Robert McDougall Henderson, Williams Bay, Wis., assignor to Colt Industries Operating Corp., New York, N.Y.

Continuation-in-part of Ser. No. 242,324, April 10, 1972, abandoned. This application Aug. 20, 1973, Ser. No. 389,680
Int. Cl. F02p *5/02*
U.S. Cl. 123—117 R **6 Claims**

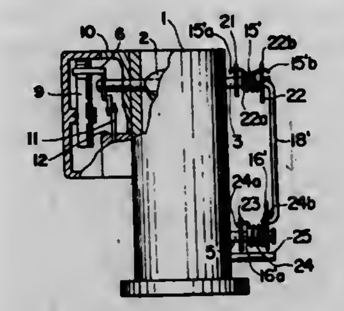


1. A timing mechanism for a breakerless ignition system, comprising, in combination, a rotor, means for providing a magnetic flux field, a flux responsive means including a triggering coil, a triggering core for the coil, a mechanically adjustable element movable to a selected angular position relative to said triggering core, magnetic pole piece means mounted with said element, said pole piece means including a flux conductor section and a pole shoe section, said rotor including a discrete triggering point on its periphery, said rotor moving past the flux conductor section and thereby developing a triggering signal, the manually adjustable element being movable to move the pole piece means, and said pole piece means when moved being effective to change the point at which triggering occurs, while still maintaining a section of the pole shoe adjacent said triggering core so as to develop a trigger voltage of a selected amplitude.

3,886,917
CARBURETOR WITH AUTOMATIC CHOKE

Masahiko Nakada; Hirobumi Matsumoto, and Nobuyuki Kobayashi, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed June 5, 1973, Ser. No. 367,220
Claims priority, application Japan, July 13, 1972, 47-69620
Int. Cl. F02m *1/10, 1/02*
U.S. Cl. 123—119 F **1 Claim**



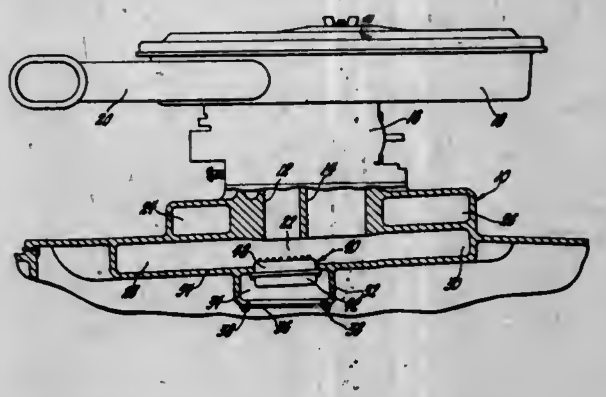
1. In a carburetor assembly having a throttle valve and equipped with an automatic choke including a choke valve, and thermostatic means responsive to exhaust gas temperature for controlling operation of said choke valve, the improvement including means for rendering operation of said choke valve dependent upon the position of said throttle valve, said improvement comprising, in combination,
a choke valve shaft connected with said choke valve to rotate concurrently with displacement thereof,
a throttle valve shaft connected with said throttle valve to rotate concurrently with displacement thereof,
a throttle lever revolvably mounted upon said throttle valve shaft,
a choke arm revolvably mounted upon said choke valve shaft,
means defining a slot in said throttle lever,
a linkage arm connected between said choke arm and said slot in said throttle lever,
a choke valve coil spring, concentrically located about said choke valve shaft and having a pair of ends, with one of said ends connected to impart a spring force to said choke valve shaft and with the other of said ends being connected to said choke arm, and
a throttle valve coil spring concentrically located about said throttle valve shaft and having a pair of ends, one of said ends being connected with said throttle valve shaft and the other of said ends being connected with said throttle lever,
said slot in said throttle lever being configured to impart a force from said throttle lever to said linkage arm only after said throttle lever has reached a predetermined position by displacement of said throttle valve beyond a predetermined location.

3,886,918
HEATED MANIFOLD

Edward N. Cole, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 4, 1973, Ser. No. 394,186
Int. Cl. F02m *31/00*
U.S. Cl. 123—122 AC **4 Claims**

1. A heated manifold assembly for use in evaporating fuel particles during cold engine starts comprising an intake manifold having a carburetor riser bore therein, an induction passage within said intake manifold for receiving air-fuel mixture from the carburetor riser bore, transverse runners in said manifold for directing air-fuel mixture from the induction passageway to intake valves of the engine, means including a box having openings for collecting liquid fuel droplets from said riser bore, a heat transfer plate located in said box below the intake riser bores in the floor of the intake manifold, means for heating the heat transfer plate with exhaust flow for raising the temperature thereof upon cold engine start, valve means located in said induction passage between said riser bore and said box openings for diverting intake air-fuel mixture into said box and against said heated plate during cold engine start, said valve means including means responsive to engine temperature for closing said box openings to reduce

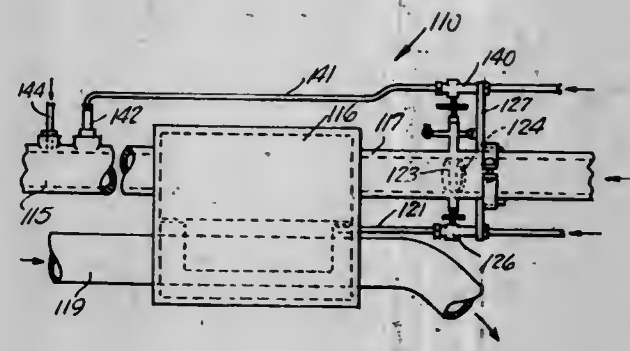


flow of air-fuel mixture across said heated plate and diverting said flow from the induction passage to the transverse runners when the engine reaches a predetermined temperature thereby to prevent excessive heating of the air-fuel mixture passing from the carburetor to the intake valves of the engine when it is heated to a predetermined temperature level.

3,886,919
LIQUID FUEL GASIFIER

Allen M. Freeman, 4133 Moriah Way, North Highlands, Calif. 95660

Filed Aug. 8, 1973, Ser. No. 386,547
Int. Cl. F02m *17/18*
U.S. Cl. 123—133 **2 Claims**

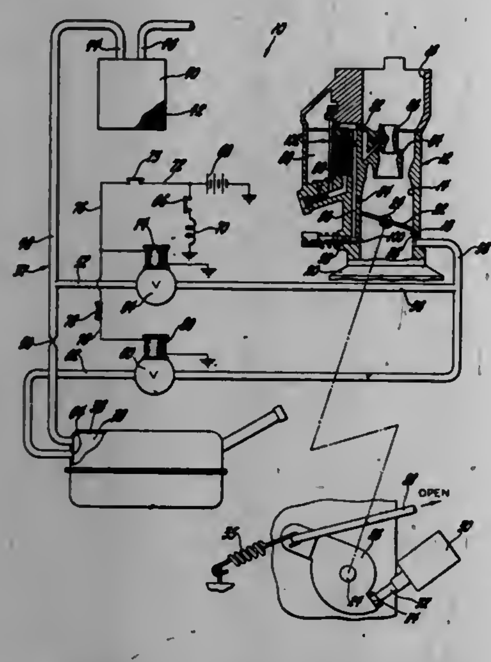


1. A fuel system for internal combustion engines comprising an exhaust pipe extending from said internal combustion engine, a chamber, said exhaust pipe extending through said chamber with said chamber sealed to said exhaust pipe, a hollow tube extending into said chamber and having an open end directed toward said exhaust pipe for directing liquid fuel against said exhaust pipe, conduits connected to the upper portion of said chamber for directing a flow of air through said chamber, a baffle extending generally horizontally in said chamber above said hollow tube and below said conduit for concentrating the exhaust pipe heat on the fuel while preventing the flow of air from contacting said exhaust pipe, said baffle being spaced from the sides of said chamber to permit fuel vaporized on said exhaust pipe to rise and mix with the air flowing through said chamber, a liquid fuel control valve connected to said hollow tube, a butterfly valve mounted in the conduit extending to said chamber for controlling the flow of air through said chamber, manually adjustable mechanical means interconnecting said liquid fuel control and said butterfly valves to permit adjustment of the air/fuel ratio provided by said valves, and manually controlled means connected to said mechanical means for simultaneously controlling said valves.

3,886,920
AUTOMOTIVE VAPOR CHOKE

Henry J. Van Dusen, III, Huntington Woods, and Paul T. Vickers, Royal Oak, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 12, 1974, Ser. No. 460,442
Int. Cl. F02m *59/00*
U.S. Cl. 123—136 **3 Claims**



1. In a vapor choke system for an internal combustion engine of the type including a throttle controlled air-fuel supply carburetor for fuel flow to an intake manifold the improvement comprising: means including a throttle position solenoid for closing the throttle during engine cranking operations, means defining a vapor port in communication with the intake manifold, a vaporized fuel air source, first vapor supply means having valve means therein to direct vapor from said source to said port, said valve means being conditioned opened when the throttle is closed to cause intake manifold vacuum produced by engine cranking to draw vapors from said source to produce a precharge of vaporized air-fuel in the intake manifold during engine cranking so as to produce improved cylinder combustion at engine start, and means responsive to engine start to condition said throttle positioning solenoid to open said throttle to a curb idle position, and means to sequentially modulate further vaporized air-fuel flow from said source to modulate the richness of fuel flow to the intake manifold in accordance with engine operating conditions.

3,886,921
ELECTRONIC CONTROL SYSTEM FOR THE VELOCITY OF A MACHINE ELEMENT

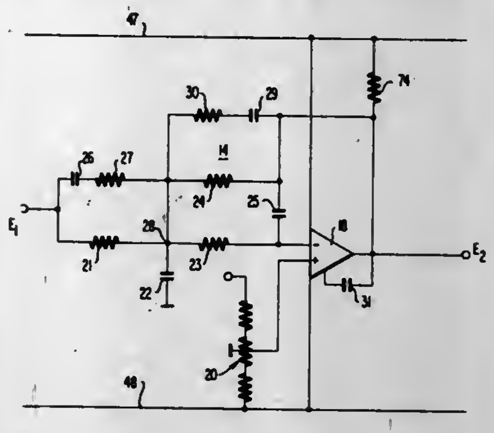
Gunther Hafner, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Apr. 25, 1972, Ser. No. 247,335
Claims priority, application Germany, Apr. 26, 1971, 2120459
Int. Cl. F02m *39/00*
U.S. Cl. 123—139 E **29 Claims**

1. An apparatus for controlling a Diesel engine at a predetermined velocity comprising an injection pump means for injecting a controlled amount of fuel into the engine and an electronic control means attached to an end face of said pump means for controlling the amount of fuel injected into the engine, said electronic control means including

a transmitter means producing an a.c. voltage having a frequency proportional to the actual velocity of the engine and having an electric signal derived from the a.c. voltage which actuates a control element influencing the velocity of the machine element in the sense of a cancellation of a deviation from the predetermined velocity, said transmitter means being a premagnetized inductive pick-up means responding to the passing of the teeth of a gear of the engine, ,

a pulse former means operatively connected to the transmitter means which forms from the a.c. voltage substantially rectangular pulses of substantially equal length and substantially equal height having a frequency proportional to the velocity, wherein rectangular pulses are formed in the pulse former means from the a.c. voltage supplied by the transmitter means and of these rectangular pulses the falling flanks are used for triggering a monostable multivibrator means which, after unblocking by the falling flank, remains unblocked during an accurately defined substantially constant time interval and then reverts to its blocked condition so that the average value of the pulse output corresponds to the velocity of the machine element as represented by the rotational speed of the gear, said operating voltage of the multivibrator means being stabilized by means of a Zener diode, the stabilized voltage source for the comparison voltage being derived from the Zener diode to which is also connected the multivibrator means,



a control stage means operatively connected with the pulse former means in which a d.c. voltage representing the desired velocity is compared with the electric signal reproducing the actual velocity and a d.c. output voltage is produced proportional to the deviation from the desired value,

said control stage means being operable as a proportional control element with simultaneous differentiating, integrating and low-pass effect, wherein the limit frequency of the low-pass lies below the frequenices of the transmitter means,

an output stage means operatively connected with the control stage means and operable to control the control element corresponding to the output signal of the control stage means,

means for achieving the low-pass effect, said means including the pulse output of the pulse former means being connected with one input of an operational amplifier means of the control stage means by way of an RC-element and by way of a resistor having a resistance value approximately equal to 1/5 to 1/10 of the resistance of the RC-element and connected in series with the resistor of the RC-element and the output of the operational amplifier means of the control stage means being connected by way of a high ohmic negative feedback means with the point of connection of the aforementioned resistors and by way of a condenser with said one input, wherein the pulse output of the pulse former means is additionally connected to said point of connection by way of a series circuit including a further condenser and a further resistor, the capacity of said further condenser being larger and the value of said further resistor being smaller than the corresponding values of the parallel-connected RC-element,

a series circuit consisting of condenser and resistor means connected in parallel to the high ohmic negative feedback means, the resistance of said last-mentioned resistor means being considerably smaller than the high ohmic negative feedback means,

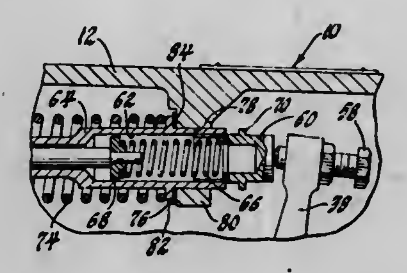
said operational amplifier means of said control stage means being provided with an output compensation including a condenser means of small capacity, and

means for chopping the d.c. output voltage of the control stage means in the output stage means into a rectangular pulse voltage with an average value substantially equal to the d.c. output voltage of the control stage means and for feeding to an adjusting magnet consituting the control element, wherein the adjusting magnet constituting the control element is prestressed in the closing direction by a spring.

3,886,922
ENGINE SPEED GOVERNOR WITH PEAK LOAD CONTROL

Charles H. Frick, Pontiac, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 17, 1973, Ser. No. 397,964
Int. Cl. F02d *1/04*
U.S. Cl. 123—140 R **3 Claims**



1. A maximum-minimum speed limiting governor in combination with a compression-ignition engine having a fuel rack actuator for varying fuel input to the cylinders, said governor comprising

a housing,

first actuating means in said housing and connectible with such fuel rack actuator, said actuating means being movable between maximum and minimum fuel positions,

engine speed responsive means in said housing and connected with said first actuating means, said speed responsive means being movable between maximum and minimum speed positions and arranged such that movement thereof toward said maximum speed position moves said first actuating means toward its minimum fuel position and movement of said speed responsive means toward its minimum speed position moves said first actuating means toward its maximum fuel position,

support means in said housing and having a cylindrical bore with an annular abutment surrounding said bore at one end thereof,

a cylindrical plunger received for reciprocating movement in said bore, said plunger having an annular flange extending axially opposite said abutment,

a cap member reciprocably received within a recess in said plunger and low speed spring means in said recess and biasing said cap member outwardly therefrom and into engagement with and urging said speed responsive means toward its maximum speed position, said cap member having a flange stop thereon engagable with the end of said plunger to limit compression of said low speed spring and provide a non-yielding connection between said plunger and said speed responsive means at operating speeds above a preset engine idle speed,

a high speed spring received on said plunger and acting between said annular flange and said housing so as to bias said annular flange toward said support abutment, and

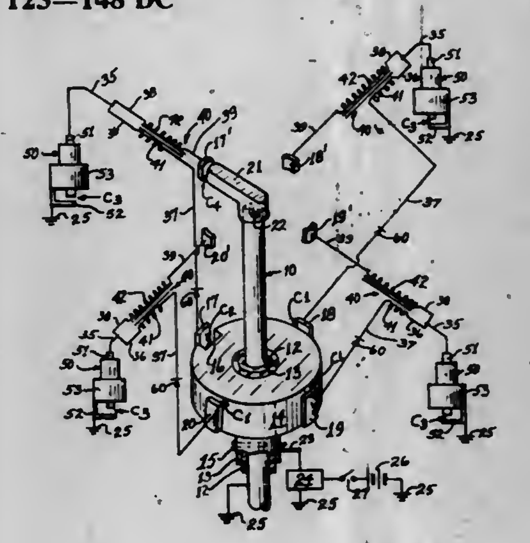
a peak load control spring acting between said abutment and said annular flange and opposing the bias of said high speed spring during the initial portion of the travel of said plunger flange away from said abutment,

said speed responsive means being operable to apply a force increasing with increasing engine speed against said low and high speed springs through said cap member and plunger such that said low speed spring is partially compressed in the idle speed range and said high speed spring is partially compressed in the maximum speed range, said peak load control spring acting to reduce the maximum engine fuel input near the maximum speed range so as to maintain a relatively constant maximum engine horsepower over a range of operating speeds adjacent the maximum speed range.

3,886,923
INDUCTIVE DISCHARGE IGNITION SYSTEM

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Filed July 11, 1973, Ser. No. 378,273
Int. Cl. F02p *1/00;* **H01h** *39/00*
U.S. Cl. 123—148 DC **8 Claims**



1. An ignition system having igniters, and a shaft driven during operative mode of said system, the combination comprising:

first rotary switching means comprising a generally circular member driven by said shaft during said operative mode, said member having an outer periphery, an aperture at said outer periphery, and a plurality of first electrode means at said outer periphery positioned at regular intervals,;

a plurality of transformers, each of the transformers having a primary and secondary winding, one of the primary windings being connected to only one of said first electrode means; and

second rotary switching means comprising an arm one end of which is mounted on said shaft and the other end of said arm describing a circular path during said operative mode, and a plurality of second elecrode means, equal in quantity to said first electrode means, positioned at locations described by said circular path at regular intervals, one of the secondary windings being connected to only one of said second electrode means.

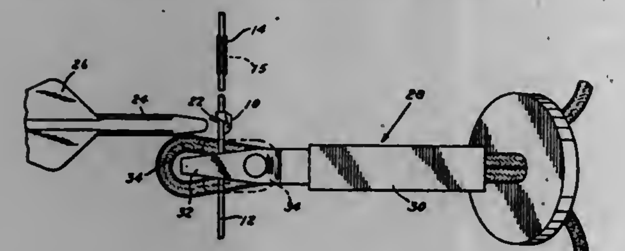
3,886,924
ARCHERY BOW WITH NOCKING POINT ON THE BOWSTRING

John C. Chesnick, 4070 Marshall, Wheat Ridge, Colo. 80033

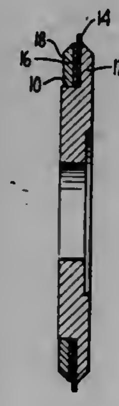
Filed Aug. 16, 1971, Ser. No. 172,125
Int. Cl. F41b *5/00*
U.S. Cl. 124—23 R **5 Claims**

1. In an archery bow wherein a bowstring is stretched between opposite ends of the bow and an arrow has a nock at one end provided with a notch to receive the bowstring, the improvement comprising:

a nocking point attached to the bowstring including a collar affixed in surrounding relation to the bowstring and an alignment tail connected to and extending from said collar in closely spaced parallel relation to the bowstring, and said alignment tail further extending rearwardly of the bowstring to define a nocking position on the bowstring adjacent to said collar and insertable with the bowstring into the open notch at the end of the arrow to prevent twisting of the bowstring relative to the arrow when the arrow is positioned on the nocking point.



3,886,925
CUTTING WHEEL
Barrie F. Regan, 1760 Manor Dr., Hillsborough, Calif. 94010
Continuation-in-part of Ser. No. 371,712, June 20, 1973, abandoned. This application Sept. 9, 1974, Ser. No. 504,449
Int. Cl. B28d *1/04*
U.S. Cl. 125—15 **1 Claim**

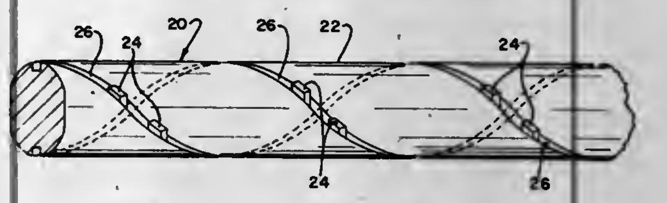


1. An improved cutting wheel for dicing semi-conductor wafers which comprises a wheel body having a hub portion and an integral peripheral flange surrounding said hub portion with said hub portion having a shoulder extending axially from said flange, a cutting disc having a thickness in the range 0.001 to 0.20 inch formed of abrasive particles embedded in an electroformed matrix of nickel electroformed onto said flange on the same side thereof as said shoulder and projecting radially from said flange, a support ring having a diameter sufficiently less than that of the cutting disc to leave the periphery of the cutting disc exposed mounted on said hub engaging said shoulder with said support ring engaging said cutting disc, and a layer of elastomeric adhesive between said ring, said flange and said cutting disc.

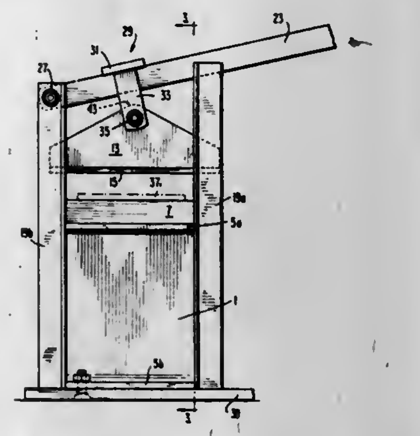
3,886,926
WIRE SAW
George H. Hall, P.O. Box 244, Westford, Mass. 01886
Filed July 19, 1973, Ser. No. 380,831
Int. Cl. B28d *1/08*
U.S. Cl. 125—21 **7 Claims**

1. A wire saw comprising, in combination;

an elongated, flexible, substantially cylindrical, metallic body having at least one helical slot along its length, and a plurality of blocks of composite, comminuted abrasive in a bonding matrix mounted in said slot in spaced apart relation along said body by a braze comprising a layer of an elastically pliant metal having high thermal conductivity bonded to both said body and blocks by a metallic material which has a melting point below the melting point of both said matrix and body.



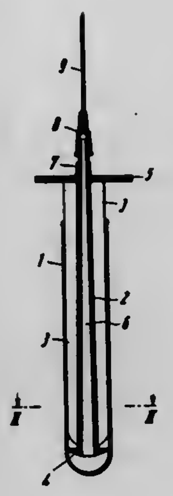
3,886,927
STONE CUTTER
John Henry Chattin, 10603 Crocus St., Orlando, Fla. 32807
Filed Feb. 25, 1974, Ser. No. 445,764
Int. Cl. B28d *1/32*
U.S. Cl. 125—23 C **4 Claims**



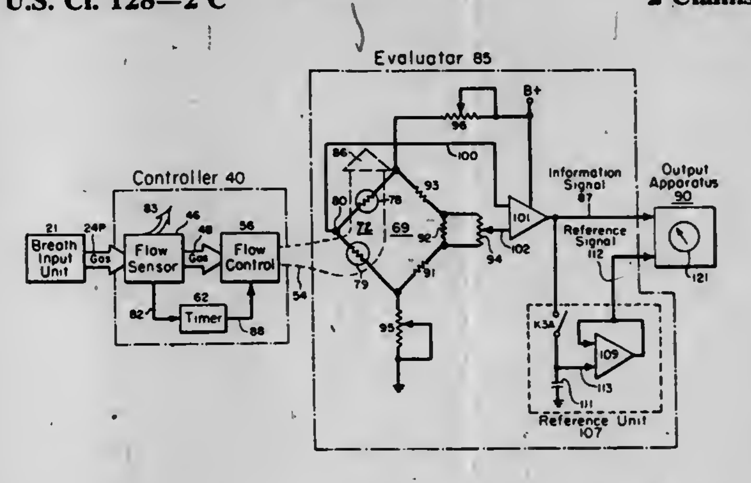
1. A portable, manually operated, non-hydraulic cutting device capable of accurately cutting a relatively thin and hard piece of stone comprising a stationary first blade means and a movable second blade means, each of said blade means having a substantially continuous cutting edge defined by two intersecting surfaces, each of said surfaces being inclined at an angle of less than 90° but greater than 0° from the common aligned plane of said cutting edges; guide means slidably retaining said movable second blade means at its lateral ends and aligning said stationary first blade means with said movable second blade means such that the cutting edges of said stationary first blade means and said movable second blade means are retained in substantially the same plane; anvil means located above said movable blade means for receiving a precussion blow and transmitting the force of said blow to the blade means thereby driving said blade means toward each other to cause the cutting of said stone; downwardly extending means connecting said anvil means to said movable blade means by a pivotal connection located at a point intermediate the lateral ends of said movable blade means, said movable blade means being retained in said guide means so as to be capable of substantial pivotal movement about said pivotal connection; and handle means extending between said guide means and extending between said anvil means and said movable blade means for moving said movable second blade means into and out of cutting alignment with said stationary first blade means.

3,886,928
DEVICE FOR THE EXTRACTION OF BLOOD
Walter Sarstedt, 5223 Numbrecht, Rommelsdorf, Germany
Filed Oct. 13, 1972, Ser. No. 297,219
Claims priority, application Germany, Oct. 13, 1971, 2150884; Sept. 16, 1972, 2245584
Int. Cl. A61m *1/00*
U.S. Cl. 128—2 F **9 Claims**

1. A device for the extraction of blood by means of a suction effect comprising a tube having a closed end and an open end, a one-piece piston assembly cooperatively telescoped within said tube, said piston assembly comprising a piston having an aperture therethrough, a hollow piston rod extending from said piston in communication with the aperture therein and extending out through said tube open end, said piston being in sealed engagement with the interior of said tube and said piston rod having axially elongated generally radially extending wings guidedly engaging the interior of said tube, said piston rod having a free end in the form of means for the reception of a needle in sealed engagement, a transversely disposed handle on said piston rod adjacent said free end for withdrawing said piston assembly from said tube to produce a suction within said piston rod, said hollow piston rod has a tapered bore, said bore decreasing in cross section from said piston towards said free end whereby a maximum suction is effected at said piston rod free end.



3,886,929
BREATH TESTER NULL MEMORY SYSTEM
Joseph P. Hoppesch, Streamwood; Donald H. Ward, Glen Ellyn, and James R. Tomashek, Wooddale, all of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.
Division of Ser. No. 181,805, Sept. 20, 1971. This application May 4, 1973, Ser. No. 357,154
Int. Cl. A61b *5/08*
U.S. Cl. 128—2 C **2 Claims**



1. A breath alcohol concentration detection system comprising:

breath input unit means for receiving deep lung breath from a subject;

means for sensing the flow of gas through said input unit;

an evaluator connected to receive a sample of the gas flowing through the input unit, to evaluate the alcohol concentration in the received gas sample, and to produce an output signal in response to the detected alcohol concentration, said evaluator including:

an alcohol detector including a bridge circuit which receives the gas sample from the input unit, and which produces an information signal that varies with the alcohol concentration of the received gas sample;

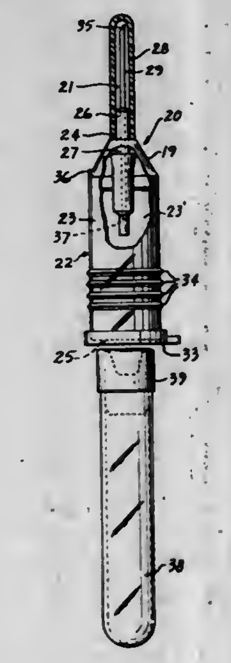
means for providing a reference signal, comprising signal storage means connected such that operation of the detector prior to receiving the gas sample from the breath input unit establishes said reference signal based on the imbalance initially present in the detector bridge circuit, which reference signal is stored in the signal storage means for subsequent use in comparison with the information signal, to minimize drift problems and enhance accuracy in the system;

a comparator, coupled both to the means for providing a reference signal and to said detector, for comparing the information signal with the stored reference signal and for producing a "fail" output signal whenever the information signal from the detector reaches a predetermined relationship with respect to the reference signal;

output apparatus means connected for operation in response to receipt of the output signal from said evaluator; and

means, operative in response to said flow sensing means, for insuring that said output apparatus is activated, in response to the output signal of said evaluator indicating the gas sample is from said deep lung breath, resulting from an essentially continuous and uninterrupted flow of breath over a threshold level for a predetermined period of time of such a duration to insure that the gas sample obtained is deep lung breath.

3,886,930
BLOOD COLLECTING ASSEMBLY
George R. Ryan, Waukegan, Ill., assignor to Abbott Laboratories, Inc., North Chicago, Ill.
Continuation of Ser. No. 138,990, April 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 715, Jan. 5, 1970, abandoned. This application Nov. 28, 1973, Ser. No. 419,659
Int. Cl. A61b *5/14*
U.S. Cl. 128—2 F **7 Claims**



1. A holder, cannula and valve assembly for collecting blood, comprising: a holder having a generally tubular longitudinally extending passageway open at one end and having an end portion opposite the open end, a cannula extending longitudinally and connected to the end portion of said holder, said cannula having an interior marginal end terminating in the passageway at a piercing end and having an exterior marginal end extending exteriorly of said holder and terminating at a vein-piercing end, said interior marginal end having an opening through which blood can pass, valve means received about said interior marginal end of said cannula and connected to

said holder, said valve means including air vent means providing communication from said cannula opening, through said air vent means, into said passageway, and to the atmosphere, and mounting means for said valve means connected to the end portion of said holder and enabling lengthwise shifting movement of the valve means relative to the cannula from a first position in which said cannula opening communicates with the atmosphere to provide a blood telltale at said cannula opening when said vein-piercing end has pierced the vein of a patient to a second position at which said cannula opening is closed off from the atmosphere by said valve means to prevent additional blood from passing out of said cannula opening until blood is to be collected, said valve means being composed of a material which is cannula pierceable, resealable and sufficiently transparent to enable visual observation of the blood telltale through the valve means.

3,886,931
ELECTRODIAGNOSTIC APPARATUS

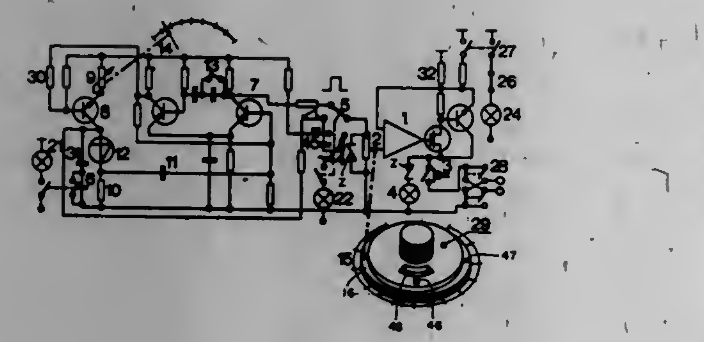
Hans Rodler, Karntnerstrasse 161, 8053 Graz-Neuhart, Austria

Filed Dec. 1, 1972, Ser. No. 311,263

Claims priority, application Austria, Dec. 1, 1971, 10360/71

Int. Cl. A61b *5/05*

U.S. Cl. 128—2.1 R **7 Claims**



1. An electrodiagnostic apparatus comprising:
constant-current-generating means provided with adjusting means for varying the magnitude of the output current thereof;
mode-selector means connected to said constant-current-generator means for alternately positioning same in a sawtooth-wave mode and in a square-wave mode; and
indicator means including a stationary support carrying a logarithmic scale, a setting member displaceable relatively to said support and provided with first marking means co-operating with said scale to give an accommodation-threshold reading upon a testing of a patient with said output current in said sawtooth-wave mode, and a coacting member displaceable relatively to said support independently of said setting member and provided with second marking means co-operating with said scale to give a rheobase reading upon a testing of a patient with said output current in said square-wave mode, at least one of said members being coupled with said adjusting means for entrainment thereby, said setting member being further provided with numerical indicia and said coacting member being further provided with third marking means co-operating with said indicia for giving an accommodation-quotient reading upon displacement of said members into positions respectively determined by said adjusting means during rheobase and accommodation-threshold measurements.

3,886,932
OVERCURRENT PROTECTIVE CIRCUIT

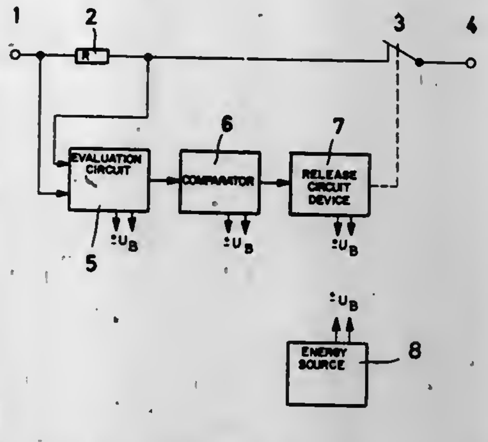
Klaus Suessmilch, Munich, Germany, assignor to Fritz Schwarzer GmbH, Munich, Germany

Filed Feb. 14, 1974, Ser. No. 442,537

Claims priority, application Germany, Aug. 8, 1973, 2340123

Int. Cl. A61b *5/04*

U.S. Cl. 128—2.1 R **11 Claims**



11. Electro-medical patient monitoring equipment comprising circuit means for monitoring certain vital signs of said patient, terminal means for conductively connecting said patient to said circuit means, and overcurrent patient-protective means comprising seriatim: means for sensing current flow in said terminal means, means for converting said current flow to a DC voltage, means for generating a reference voltage, means for comparing said DC voltage with said reference voltage, means for generating a signal when said DC voltage exceeds said reference voltage, means for maintaining said signal for a predetermined period of time, and electromechanical switch means responsive to operation of said signal generating means for interrupting said current flow.

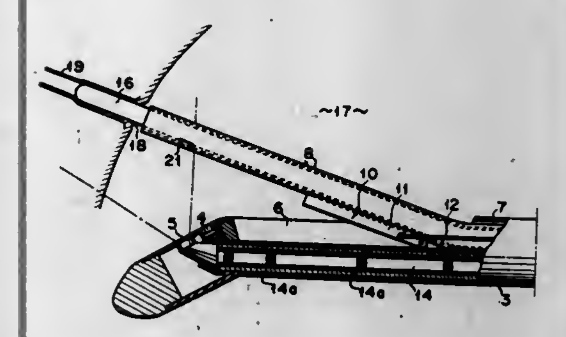
3,886,933
URETERAL CATHETER DEVICE

Toshiyuki Mori, and Kunio Kinoshita, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1973, Ser. No. 404,992

Int. Cl. A61b *1/30*

U.S. Cl. 128—7 **5 Claims**



1. A ureteral catheter device comprising a cystoscope including an insert body insertible into the human body, a control body positioned outside the human body, an observation optical system for permitting the interior of a bladder to be observed outside the human body and an illumination optical system for illuminating the interior of the bladder; a flexible guide tube adapted to be inserted through the control body into the cystoscope, the forward end of said flexible guide tube being extendible through said insert body; and a flexible elongated member adapted to be removably inserted through the guide tube and extended through the forward end of the flexible guide tube into the interior of a ureter whereby said guide tube can be further inserted with the elongated member as a guide to permit its forward end to project into the interior of the ureter.

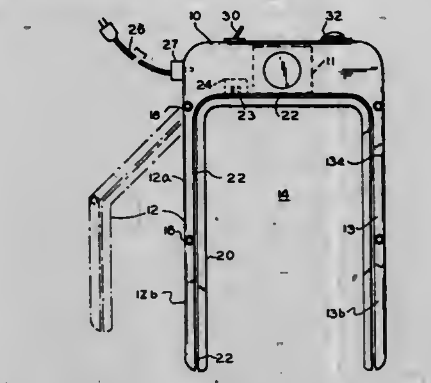
3,886,934
HEAT-MASSAGE DEVICE FOR PHYSICAL THERAPY

Bruce Ivan Doty, 3039 Freeland Rd., Central Point, Oreg. 97501

Filed Mar. 25, 1974, Ser. No. 454,139

Int. Cl. A61h *29/00*

U.S. Cl. 128—24.1 **9 Claims**



1. A heat-massage device for physical therapy comprising:
a housing,
a pair of articulated gripping arms extending unidirectionally from opposite ends of said housing,
said gripping arms and said housing having substantial width dimensions and defining an open-ended space for receiving a body portion of a person to which said device is applied,
said gripping arms being hinged at their respective connections to said housing and at elbows intermediate their lengths to provide hinged inner and outer arm portions for wrapping said arms about said body portion,
heating pad means lining the body-contacting inner surfaces of said arms and housing,
and vibrator means carried within said housing.

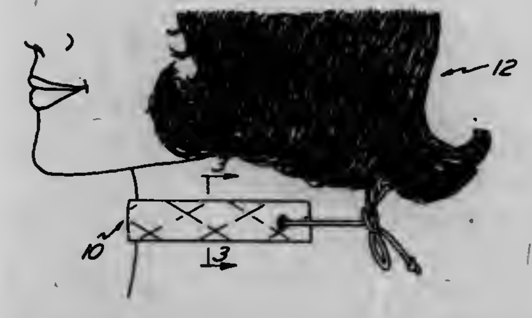
3,886,935
NECKBAND APPLICATOR

Mary Sprague, 302 Moorsgate, Andalusia, Pa. 19020

Filed Apr. 1, 1974, Ser. No. 456,973

Int. Cl. A61h *15/00*

U.S. Cl. 128—57 **7 Claims**



1. A neckband for applying creams or medicaments to the neck of a person, comprising: a tubular material of a predetermined length and a flexible cross section; and means for connecting the ends of the tubular material to enable said tubular material to be maintained in contact with the neck of the person enabling a rolling massaging movement of the neckband while applying a medicament or cream to the neck of the person when worn.

3,886,936
HYDROTHERAPY UNIT

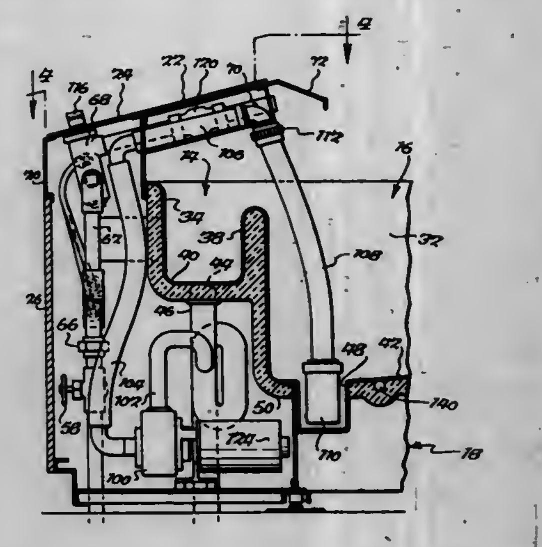
Jon W. Wehrenberg, Rt. 394 Poland Center, Kennedy, N.Y. 14747

Filed Sept. 28, 1973, Ser. No. 401,616

Int. Cl. A61h *9/00*

U.S. Cl. 128—66 **13 Claims**

1. A hydrotherapy unit for performing a patient treating operation comprising in combination:
an upwardly open immersion section characterized as being bounded by non-apertured bottom and upstanding wall portions and sized to at least partially receive a patient therewithin during said patient treating operation;
fresh water supply means isolated from said immersion section for directing fresh water downwardly thereinto;
a drain section separated from said immersion section by one of said upstanding wall portions, said one wall portion



being lower than others of said upstanding wall portions whereby water supplied to said immersion section by said supply means may overflow from said immersion section into said drain section;
drain means for removing overflow water from said drain section; and
additional drain means removably insertable downwardly into said immersion section for withdrawing water therefrom at the completion of said patient treating operation.

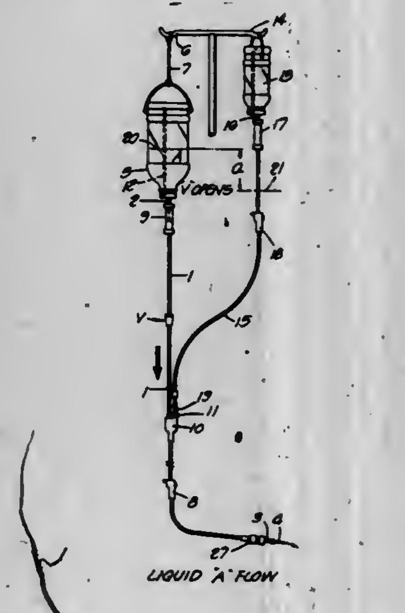
3,886,937
MEDICAL ADMINISTRATION SET FOR DISPENSING PLURAL MEDICAL LIQUIDS

Donald E. Bobo, Canoga Park, and Charles J. McPhee, Sylmar, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Continuation of Ser. No. 114,946, Feb. 2, 1971, abandoned. This application May 7, 1973, Ser. No. 357,677

Int. Cl. A61m *05/14*

U.S. Cl. 128—214 R **4 Claims**



1. In a system for administering two liquids which includes an administration tube with an upper liquid receiving end, a lower dispensing end, a drip housing between the administration tube ends, a side port below the drip housing, and the system has a secondary tube with an upper liquid receiving

end and a lower end connected to the side port of the administration tube, the improvement which comprises:

A first non-pressurized liquid container having liquid therein and connected to the upper end of the administration tube; a second non-pressurized liquid container having liquid therein and connected to an upper end of the second tube; a valve in the administration tube between the drip housing and side port, which valve has a movable internal structure that is normally closed when liquid pressure at opposite ends of the valve are equal, but which valve's internal structure moves to open a passage for liquid flow at a rate of 250 ml/hr with a pressure drop of less than 20 inches of water applied across the valve caused by liquid in the second container dropping below the liquid level in the first container by a distance of less than 20 inches; a puncturable resealable diaphragm closing off the side port; a tubular cannula connected to a lower end of the second tube and extending through the diaphragm; and there is a flow regulator on the administration tube between the side port and lower dispensing end for maintaining a generally constant liquid flow rate from either of the two non-pressurized containers.

3,886,938

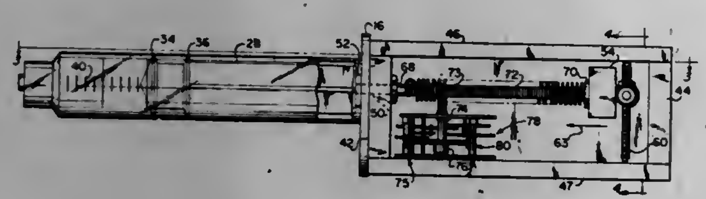
POWER OPERATED FLUID INFUSION DEVICE

Anthony W. Szabo, Livingston, N.J., and Louis R. M. Del Guercio, Larchmont, N.Y., assignors to Anthony Scala, Livingston, N.J., a part interest

Filed Oct. 23, 1973, Ser. No. 408,264

Int. Cl. A61m *5/20*

U.S. Cl. 128—218 A **2 Claims**



1. Portable, automatic fluid infusion apparatus for administering a predetermined amount of fluid at a predetermined rate over an extended time period, the device comprising

- an elongate housing attachable to a user;
- a syringe mounted at one end of said housing in axial alignment therewith said syringe comprising an elongated container having an orifice through one end thereof and a piston mounted for longitudinal movement within said container for forcing fluid through the said orifice;
- a mechanical power means coupled to and in axial alignment with said piston for longitudinally moving said piston, said power means including rack means;
- a mechanical timing mechanism mounted on said housing and coupled to said power means for permitting only a predetermined rate of longitudinal movement of said piston by said power means, thereby providing a predetermined flow of said fluid from said syringe, said mechanical timing mechanism including a main spring, an escapement mechanism, gearing mechanism connected to and rotated by said main spring, said escapement mechanism permitting a controlled rate of rotation of said gearing mechanism, a rotatable main shaft extending outwardly from said gearing mechanism and rotated thereby, said main shaft having a pinion mounted at the outwardly extending end thereof and in engagement with said rack means, and means for winding said main spring; a first centering means transversely rigidly mounted on said rack means for bearing against opposite sides of said housing during the longitudinal movement of said rack means for maintaining the axial alignment of said rack means and said piston in a first, transverse plane;
- a second centering means transversely, rigidly mounted on said rack means perpendicular to said first centering means for bearing against at least one further side of said housing, other than said opposite sides, during the longitudinal movement of said rack means for maintaining the axial alignment of said rack means and said piston in a second, transverse plane, said second transverse plane being perpendicular to said first transverse plane; and
- a helical spring attached at a first end to the end of said housing at which said syringe is mounted and attached at the other end to said first centering means for longitudinally urging said rack means into engagement with said piston for the longitudinal movement thereof, said pinion of said mechanical timing mechanism restraining the longitudinal movement of said rack means to a predetermined rate determined by the rotational speed of said pinion, and thereby permitting a predetermined amount of fluid to be forced by said piston through said orifice during a predetermined time.

3,886,939

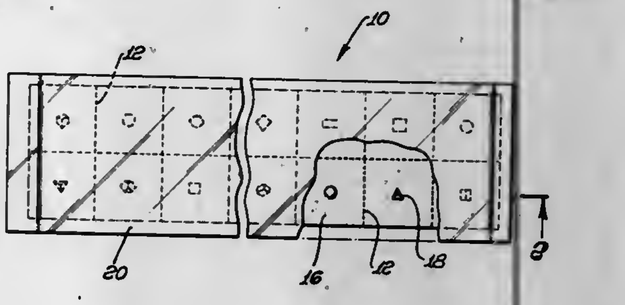
DEVICE FOR ALLEVIATING MUSCULAR DISCOMFORT

Steve Boxer, 1438 Benedict Canyon Dr., Beverly Hills, Calif. 94710

Filed Sept. 4, 1973, Ser. No. 394,118

Int. Cl. A61f *7/02*

U.S. Cl. 128—268 **8 Claims**



1. A process for alleviating muscular discomfort by placing on the affected skin area a plurality of individual devices comprising a longitudinally flat base material having a medicated adhesive layer thereon throughout its length, each of said adhesive layers having at least one rigid object of a shape so as to not easily penetrate the skin affixed thereto, applying pressure to said device to seat said rigid objects and said layers firmly in contact with said skin area, and maintaining said pressure contact of said medicated layer and said objects to said affected area for a suitable length of time to provide alleviation of said muscular discomfort.

3,886,940

CAPSULE

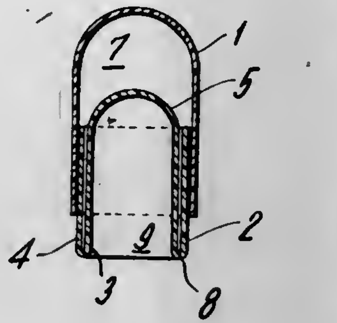
Gerd Hunger, Munich, Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed June 8, 1971, Ser. No. 151,032

Claims priority, application Germany, July 10, 1970, 2034336; July 10, 1970, 7026065

Int. Cl. A61m *31/00*

U.S. Cl. 128—271 **7 Claims**



1. A two piece capsule comprising a first tubular half open at one end and a second tubular half open at one end, the side

wall of said second half being folded over externally on itself at the open end, the second half fitting telescopically, closed end forward, into said first half and forming a chamber between the closed ends of said halves.

3,886,941

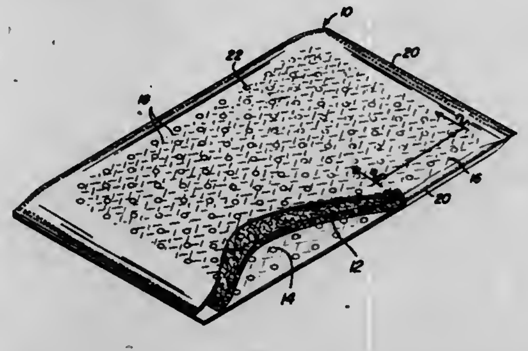
DIAPER INSERT

John J. Duane, White Plains, N.Y., and Charles B. Lindner, Darien, Conn., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 18, 1974, Ser. No. 480,522

Int. Cl. A41b *13/02*

U.S. Cl. 128—287 **11 Claims**



1. A diaper insert which comprises, in combination, at least one absorbent pad disposed between a liquid impermeable hydrophobic topsheet and a liquid impermeable hydrophobic bottom sheet, each of said sheets having a plurality of valvular openings therein, said valvular openings being substantially closable to retard back flow of liquid absorbed by said absorbent pad through said valvular openings, and a system of dimples disposed on each of said topsheet and bottom sheet, said dimples having a frequency of at least one per square inch of absorbent pad area.

3,886,942

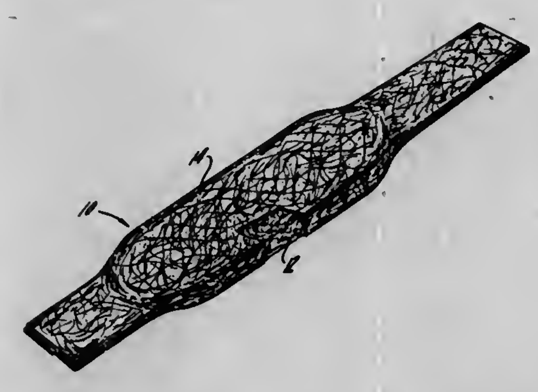
SANITARY NAPKIN

Leo J. Bernardin, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 15,164, Feb. 27, 1970, abandoned. This application Apr. 29, 1974, Ser. No. 464,970

Int. Cl. A61f *13/16*

U.S. Cl. 128—290 **6 Claims**



1. A sanitary napkin comprising an inner core of absorbent material having a shape and size adaptable to absorb body menstrual fluids and a cover enclosing said inner core, said cover, in the body contacting area thereof, consisting of a nonwoven, porous and dry formed web having a basis weight of about 0.25 – 1 oz./yd.^{2}, said web consisting of unfinished polyolefin or polyester fibers, said unfinished fibers being characterized by fiber surfaces which are devoid of lubricants, antistatic, or wetting agents, said web being intermittently autogenously bonded at discrete bond areas occupying about 5–50% of the web area and disposed in a density of about 50–3200/inch^2 to permit the passage of menstrual fluid therethrough and into the absorbent core under the body pressures of normal usage to provide a substantially dry surface feel to the wearer.

3,886,943

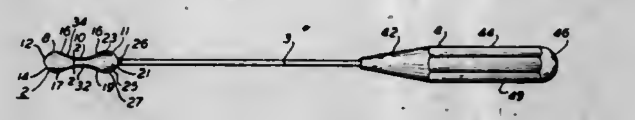
SURGICAL INSTRUMENT

Aphrodite P. Skiff, 5 Darley Rd., Plainview, N.Y. 11803, and John C. Rauth, 22 Winkle Point Dr., Eaton's Neck, N.Y. 11768

Filed Aug. 10, 1973, Ser. No. 387,494

Int. Cl. A61b *17/32, 17/22*

U.S. Cl. 128—305 **9 Claims**



1. A surgical instrument for removing plaque from blood vessels comprising

- a handle having a long tubular member
- an arcuate blade member describing an arc of less than half a circle connected to said long tubular member and having an outer surface of larger radius and an inner surface of smaller radius, said smaller radius being substantially larger than the diameter of said tubular member, including
- a distal non-cutting section having a rounded outer edge
- a proximal non-cutting section
- a midsection having a cutting edge positioned longitudinally between said distal and proximal sections, said cutting edge being positioned at a radius which does not exceed the radius of the outer surface.

3,886,944

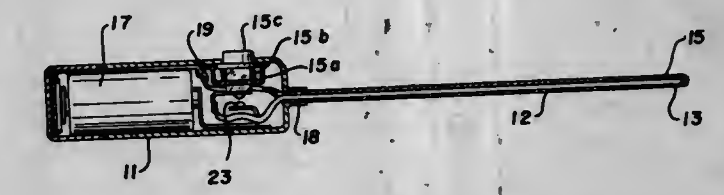
MICROCAUTERY DEVICE

Khosrow Jamshidi, 610 Winston Court, Minneapolis, Minn. 55118

Filed Nov. 19, 1973, Ser. No. 416,760

Int. Cl. A61b *17/36;* **A61h** *3/06*

U.S. Cl. 128—303.1 **4 Claims**



1. Means for cauterizing elongated and unnatural openings of small diameter formed in a body with a small diameter biopsy needle stylet and comprising:

- a. gripping handle means having an elongated hollow tubular metallic shaft of small diameter stainless steel extending from one end thereof;
- b. said tubular metallic shaft consisting of a tubular shaft portion having a generally cylindrical tip portion with a closed hemispherical tip at the end thereof, said closed tip portion being disposed at the distal end of said tubular shaft portion opposite said handle means, said tubular shaft portion having a certain first electrical conductivity, and said tip portion having an electrical conductivity which is significantly less than that of said tubular shaft portion;
- c. an electrical conductor disposed within the confines of said tubular metallic shaft and being arranged generally coaxially therewithin, means for coupling said electrical conductor and said tubular shaft portion to opposite poles of a source of electrical energy, said electrical conductor extending from said handle means to the inner surface of said closed tip end of said tubular metallic shaft and having a layer of electrical insulation disposed generally coaxially therearound, and being secured electrically to

the inner wall of said closed tip portion adjacent the distal end thereof.

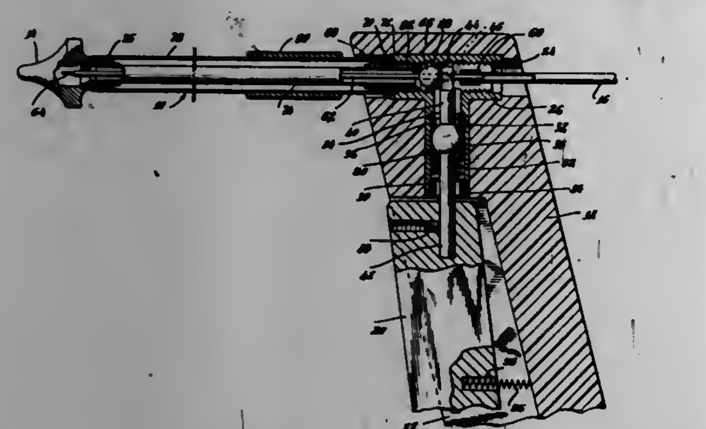
3,886,945
CRYOSURGICAL APPARATUS

Joseph G. Stumpf, Fairfield, and Joseph F. Andera, Trumbull, both of Conn., assignors to Frigitronics of Conn., Inc., Shelton, Conn.

Continuation-in-part of Ser. No. 262,543, June 14, 1972, Pat. No. 3,807,403. This application Nov. 7, 1973, Ser. No. 413,684

Int. Cl. A61b *17/36;* **B05b** *1/00*

U.S. Cl. 128—303.1 **10 Claims**



1. A gas operated cryosurgical instrument which comprises: a handle defining a socket therein; a movable first valve member in said handle; a tubular exhaust conduit terminating at one end in a hollow tip of high thermal conductivity, the other end defining a second valve member and including means detachably securing said exhaust conduit seated within said socket; a gas delivery conduit mounted in said handle and extending through said socket and through said exhaust conduit when so secured and terminating at a nozzle within said tip; means for selectively advancing said first valve member against said second valve member to close said exhaust conduit when said exhaust conduit is fully seated within said socket; and means for limiting the movement of said first valve member to prevent closure of said exhaust conduit when the conduit is not fully seated within said socket.

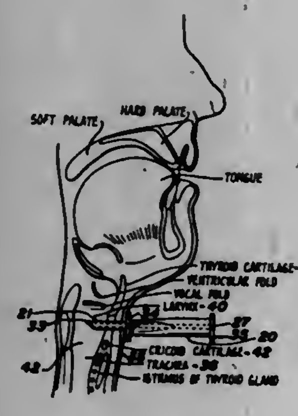
3,886,946
TRACHEA INSTRUMENT

Vernon E. Hyde, P.O. Box 285, Pebble Beach, Calif. 93953

Filed Nov. 9, 1973, Ser. No. 411,181

Int. Cl. A61b *17/24;* **A61m** *16/00*

U.S. Cl. 128—305 **4 Claims**



1. A tracheotomy instrument for non-professional emergency use providing air passage to the lungs of a victim to avoid asphyxiation comprising a straight tubular knife in the form of a right circular cylinder having an outer end and a cutting end, said cutting end being slanted to provide an oval opening sharpened into a continuous cutting edge with a rounded point and a handle of greater diameter than said tubular knife immovably secured to the outer end of said tubular knife with a uniform axial passage continuously through said knife and said handle, said handle having a radially outwardly extending stop limiting penetration of said cutting end to entry of the oval opening into the trachea without scraping or penetration of the posterior wall of the trachea upon insertion at right angles to the vertical axis of the trachea.

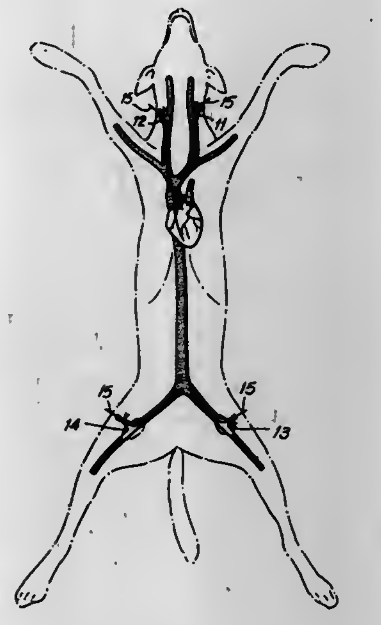
3,886,947
NON-THROMBOGENIC CATHETER

Philip N. Sawyer, Brooklyn, N.Y., assignor to Meadox Medicals, Inc., Oakland, N.J.

Filed Apr. 13, 1973, Ser. No. 351,051

Int. Cl. A61b *5/02;* **A61m** *25/00*

U.S. Cl. 128—348 **7 Claims**



1. A catheter suitable for introduction of monitoring devices and of solutions of foods, drugs and contrast media into veins and arteries, and having no more than negligible tendency to deposit thrombus or cause thrombosis, thrombophlebitis, periphlebitis or fibrosis, comprising a tubular structure suitable for insertion into a natural or artificial opening in a body, said tubular structure including an outer surface consisting of an acidic copolymer partially neutralized with sodium or potassium so that on intravascular insertion of said catheter the outer surface of said catheter becomes negatively charged as the result of release of positive Na^+ or K^+ ions into the environment, said negatively charged surface being non-thrombogenic.

3,886,948
VENTRICULAR SHUNT HAVING A VARIABLE PRESSURE VALVE

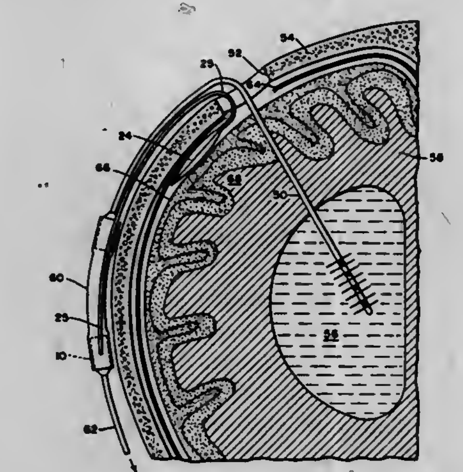
Salomon Hakim, Bogota, Colombia, assignor to Hakim Company Limited, Saint Vincent, British W. Indies

Continuation-in-part of Ser. No. 280,451, Aug. 14, 1972. This application Jan. 30, 1974, Ser. No. 437,767

Int. Cl. A61m *27/00*

U.S. Cl. 128—350 V **8 Claims**

1. A cerebral-spinal fluid shunt system comprising:
- a conduit for venting fluid from a patient's cerebral-spinal fluid system;
- a conduit for draining cerebral-spinal fluid into a selected drainage site within the patient's body;
- means for sensing the force exerted by the brain in the dural region;
- a one-way bypass valve connecting said vent conduit and said drain conduit, said bypass valve including biasing means for maintaining a pressure differential between said vent conduit and said drain conduit; and
- means interconnected with said biasing means responsive to said sensing means for adjusting the biasing of said bypass valve as a function of the sensed force thereby to maintain said force substantially at the desired level.



3,886,949
BABY SOOTHER

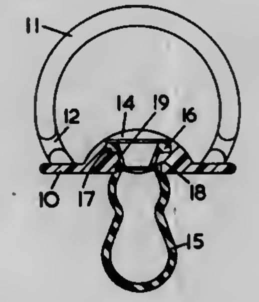
Eric Kenneth Hurst, London, and Ronald Keith Moore, Kempsey, both of England, assignors to Lewis Woolf Griptight Limited, Birmingham, England

Filed Dec. 12, 1973, Ser. No. 426,678

Claims priority, application United Kingdom, Dec. 14, 1972, 57798/72

Int. Cl. A61j *17/00*

U.S. Cl. 128—360 **3 Claims**



1. A baby soother having a shield with two sides, a resilient teat on one side and a handle on the other side, comprising an integral shield and handle structure, said handle being substantially arcuate in shape, the arcuate shaped handle having ends integral with said other side of said shield, said ends being joined to said shield at positions diametrically opposite to each other,. said handle being substantially circular in corosssection throughout most of its arcuate shape but having narrow neck portions adjacent each end but spaced from said other side of said shield to form integral resilient hinge means, said neck portion having a degree of resilience to cause the handle to normally stand up on said shield but permitting it to be hinged on the shield by the baby, said shield having a centrally disposed enlarged boss, said boss having a stepped bore therethrough extending from one side to the other, said bore having shoulders therein with the shoulders being disposed in the bore at the respective opposite sides of the shield, said resilient teat being hollow and having beads surrounding an open end thereof, said beads being adapted to interfit with said shoulders to hold said teat projecting from said one side of the shield, a double headed plug fitted into the open end of the teat situated in said bore, the head at one end of said plug being smooth and said plug having a shape fitting within and filling said bore, and said plug engaging the beads on the open end of the teat to hold them interfitted with said shoulders while the head on the other end of said plug holds the plug in place.

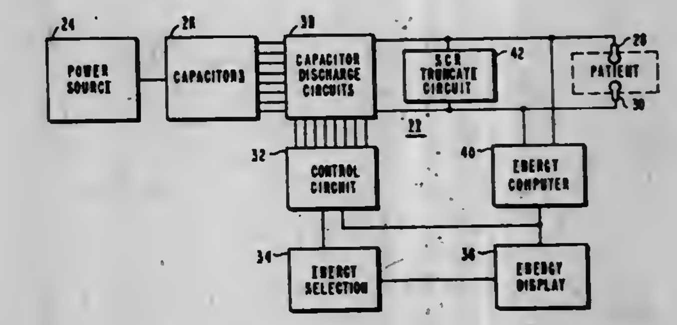
3,886,950
DEFIBRILLATOR

Donald C. Ukkestad, Newbury Park; Donald C. Hancock, Thousand Oaks, and Donley J. Valiquette, Camarillo, all of Calif., assignors to Spacelabs, Inc., Chatsworth, Calif.

Filed Oct. 1, 1973, Ser. No. 402,401

Int. Cl. A61n *1/36*

U.S. Cl. 128—419 D **12 Claims**



1. A defibrillator for delivering electrical current to a plurality of patient electrodes comprising:
- a plurality of electrodes;
- a plurality of capacitors coupled to the electrodes;
- means coupled to the capacitors and including a power source for charging the capacitors;
- means coupled to the capacitors for initiating discharge of at least one of the capacitors to initiate generation of a current pulse; and
- means coupled to the capacitors and responsive to the initiating of discharge of at least one of the capacitors for subsequently discharging at least one other capacitor during the discharge of said at least one of the capacitors to continue the generation of the current pulse.

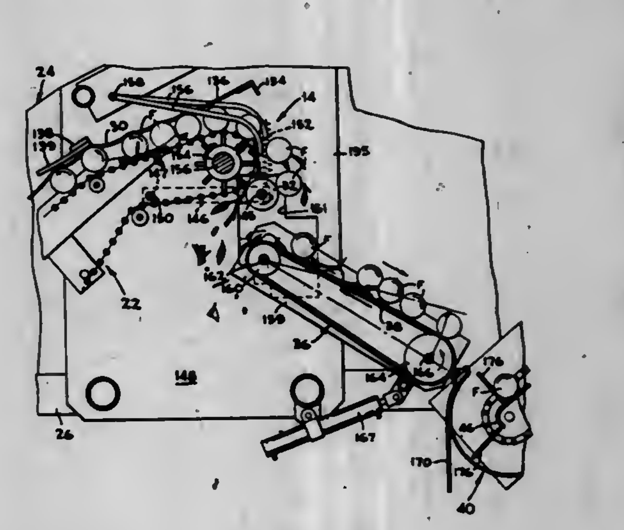
3,886,951
TRASH SEPARATOR

Leon R. McRobert, 611 Spring St., Ocoee, Fla. 32761

Division of Ser. No. 247,146, April 22, 1972, Pat. No. 3,828,534. This application Aug. 6, 1973, Ser. No. 386,140

Int. Cl. A01d

U.S. Cl. 130—30 R **2 Claims**



1. A trash separator for rollable articles, comprising an upwardly driven, upwardly inclined bar conveyor having spaced rods thereon for supporting rollable articles, debris and defective articles which resist rolling;
- a stationary, flexible draper lying above, parallel to and adjacent to the upper run of said first conveyor in position to engage the upper surfaces of the articles to cause the articles to roll up said first conveyor and dislodge the fine debris clinging to the articles, with the fine debris being allowed to fall between the bars of said first conveyor to the ground below;

means for anchoring one end of the draper to said first conveyor;

force applying means bearing against said draper from above and being movable to allow the articles to roll upwardly therepast, while precluding movement of the articles in a generally downward direction;

a second conveyor comprising an upwardly driven, upwardly inclined imperforate roughened belt conveyor having its upper run moving upwardly in a direction opposite to that of the direction of movement of said first conveyor with respect to the horizontal, and having the upper end of its upper run disposed in position immediately below the upper end of said first conveyor so as to receive the articles and remaining debris discharged from the upper end of said first conveyor, wherein the upper run of said second inclined conveyor carries the fine debris and defective, non-rollable articles over the upper end of said second conveyor for discharge therefrom, the inclination of said second inclined conveyor being sufficient to allow the rollable articles to roll down and off the lower end of said inclined conveyor, whereby said second inclined conveyor is so arranged that the debris and defective articles discharged from said second inclined conveyor fall under said first conveyor in the same general area where falls the fine debris dislodged by and through said first conveyor;

a third conveyor comprising an upwardly driven, upwardly inclined conveyor having the lower end of its upper run disposed in position immediately below the lower end of said second inclined conveyor so as to receive the rollable articles discharged from said second inclined conveyor and having its upper run moving in the same direction as that of the upper run of said first conveyor with respect to the horizontal, wherein said third inclined conveyor carries the rollable articles to a collection point.

3,886,952

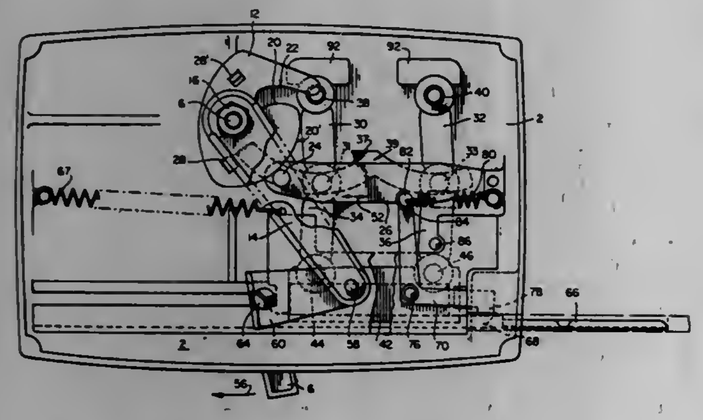
CIGARETTE MAKING MACHINE

Arnold Kastner, 10220 Armand Lavergne, Montreal North, Quebec, Canada

Filed Feb. 13, 1974, Ser. No. 441,956

Int. Cl. A24c *5/42*

U.S. Cl. 131—70 **6 Claims**



1. A cigarette making machine of the type wherein a compacted wad of tobacco of elongate generally cylindrical shape is injected into a cigarette paper tube, comprising a casing and a hollow nipple secured to the casing to receive an open end of a cigarette tube, a tobacco compacting chamber formed within the casing and an opening in the casing providing access to the chamber, and a tobacco compacting member movable in the chamber to tobacco receiving and tobacco compacting positions, and toggle links means consisting of a toggle arm, and first and second pairs of toggle links for moving the tobacco compacting member, and a movable plunger and attached injection spoon for moving a wad of tobacco from the chamber through the nipple and inject the wad into the cigarette tube, and an operator arm for moving the plunger and spoon, and a cigarette tube retaining lever pivotable under spring action to retain the cigarette tube on the nipple during injection thereinto of a wad of tobacco, and a handle secured to a cam plate having cam surfaces, rotational movement of the handle resulting in rotation of the cam plate and movement of the operator arm, and a cam stud carried adjacent one end of the toggle arm and in contact with the said cam surfaces wherein rotation of the cam plate imparts movement to the toggle link means, inner ends of said two pairs of toggle links being pivotally secured to pivot studs provided on the toggle arm, with outer ends of the first pair of toggle links being pivotally carried by pivot studs provided on the casing, and outer ends of the second pair of toggle links being pivotally secured to pivot studs provided on the tobacco compacting member, and circular bearing surfaces provided on the casing and on the tobacco compacting member for sliding engagement with circular bearing surfaces provided on the outer ends of the said first and second pairs of toggle links, inner ends of the toggle links of the first pair in sliding engagement with circular bearing surfaces molded integrally with and adjacent inner ends of the toggle links of the second pair, and circular bearing surfaces provided on inner ends of the toggle links of the first and second pairs in sliding engagement with circular bearing surfaces provided on and adjacent inner ends of the toggle links of the second and first pairs respectively, the circular bearing surfaces bearing reactive forces resulting from compacting of tobacco into a wad.

3,886,953

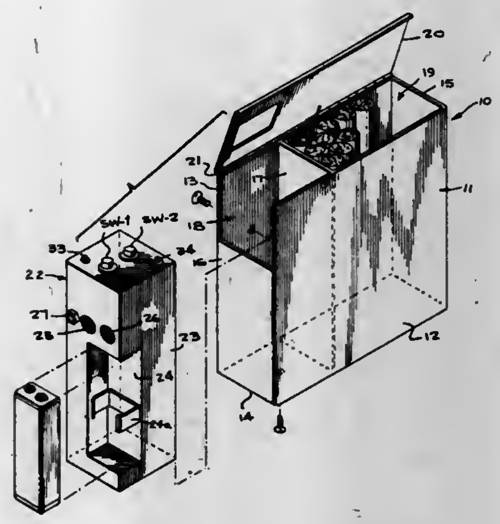
ELECTRONIC SMOKING INHIBITING DEVICE

John W. Pope, P.O. Drawer 45246, Dallas, Tex. 75235

Filed May 9, 1974, Ser. No. 468,380

Int. Cl. A24f *15/06*

U.S. Cl. 131—170 A **22 Claims**



1. Apparatus for inhibiting cigarette smoking, comprising a cigarette case having a cigarette storage compartment, a moveable lid normally closing said compartment and moveable to an open position permitting access to the compartment for removal of a cigarette, releasable latch means for releasing said lid to move to open position responsive to actuation of a lid opening actuator; smoking inhibiting means carried by the case administering faradic shock punishment to a user person operating the case under predetermined conditions comprising first delay means for delaying release of the lid for a predetermined pre-opening delay period following actuation of the latch means, second electrical delay means for producing a shock initiating signal a predetermined post-opening delay period following opening of said lid, an electrical faradic shock generator for producing a faradic shock electrical signal responsive to said initiating signal, and an electrically conductive shock applying device to be conductively connected to said shock generator and to be supported in contact with the skin of the user for applying the faradic shock signal to the user to produce the shock punishment.

3,886,954

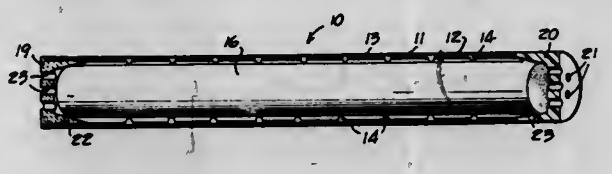
FIRE SAFETY CIGARETTE

Johannes Hermanus Hannema, and Lena Touw Nio Hannema, both of 547 Dolores, Apt. 5, San Francisco, Calif. 94110

Filed Mar. 13, 1974, Ser. No. 450,744

Int. Cl. A24d *1/11*

U.S. Cl. 131—175 **9 Claims**



6. A method of encapsulating a cylinder of tobacco to define a disposable encapsulated cigarette comprising:

forming a double-walled tubular housing having an inner and an outer wall defining an annular space between said walls;

forming at least the inner wall of a non-flammable material;

supporting a cylinder of tobacco on a plurality of protrusions disposed on the inner surface of the inner wall;

permanently capping said housing at each end thereof by permanently securing to each end an identical end cap provided with a plurality of air passages therethrough and with sealing means for preventing ingress of air from the interior of the housing to said air passages.

3,886,955

CIGARETTE AND THE LIKE FILTER AND METHOD FOR PRODUCING SAME

James W. Johnson, 17526 Brush St., and Gladys Janet Knapp, 300 Whitmore, both of Detroit, Mich. 48203

Filed Nov. 16, 1973, Ser. No. 416,457

Int. Cl. A24f *7/04*

U.S. Cl. 131—261 R **13 Claims**

1. A process for producing an absorptive filter material having good drawing properties for cigarettes and the like smoking articles comprising:

a. providing a quantity of human hair,
b. depositing said hair in an aqueous solution of sodium bicarbonate,
c. boiling said hair-containing solution for a sufficient time so that further boiling of said hair in a fresh sodium bicarbonate solution produces no discoloration of said fresh solution,
d. separating said hair from said solution,
e. drying said hair so that a residue of sodium bicarbonate remains thereon, and
f. packing the thus treated hair into a filter receptacle for use with said smoking article.

3,886,956

DENTAL FLOSS HOLDER

Walter A. Cash, P.O. Box 160, Missoula, Mont. 59801

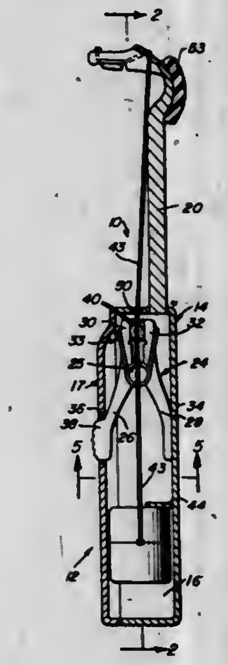
Filed Dec. 7, 1973, Ser. No. 422,781

Int. Cl. A61c *15/00*

U.S. Cl. 132—91 **5 Claims**

1. A dental floss holder, comprising, in combination:

a. a support, the support including a housing having a cavity, a cover selectively enclosing the cavity, and a supply means for furnishing floss;
b. head means connected to the support for holding floss in position to clean between teeth;
c. gripping means for selectively retaining floss held by the head means, the gripping means being arranged in the cavity, and the gripping means arranged between the supply means and head means along a path of floss passing from the supply means to the head means, the gripping means including a pincer having a pair of elements pivotally connected together and arranged forming a pair of cooperating handles and a pair of cooperating jaws, and a spring biasing the jaws toward one another and gripping floss passing therebetween, resilient pieces mounted on the jaws for facilitating gripping of the floss, one of the handles being arranged abutting a wall of the housing and the other of the handles arranged in an opening provided in the housing and the other of the handles arranged in an opening provided in the housing for selective movement toward the one of the handles for opening the jaws and releasing the floss.



3,886,957

COIN PACKAGING APPARATUS

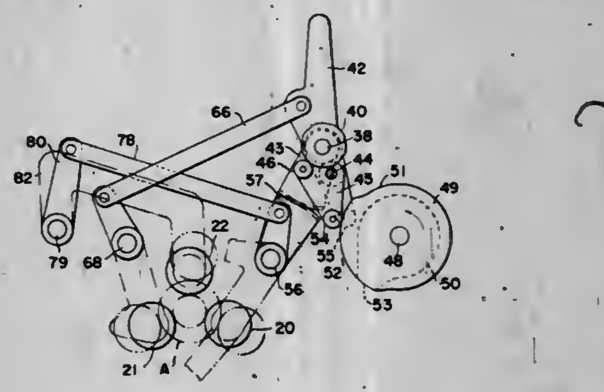
Masatoshi Ushio, Himeji, Japan, assignor to Glory Kogyo Kabushiki Kaisha, Hyogo, Japan

Filed Jan. 3, 1974, Ser. No. 430,516

Claims priority, application Japan, Jan. 12, 1973, 48-6420

Int. Cl. G07d *9/00*

U.S. Cl. 133—1 A **5 Claims**



1. In a coin packaging apparatus of the type including coin stacking means for arranging a predetermined number of coins of the same diameter into a neat stack, a plurality of wrapping rolls including at least one movable roll, said rolls arranged annularly in parallel spaced relationship to each other, means operatively positioned for directing the stack of coins to a wrapping position between said wrapping rolls, means operatively coupled to said wrapping rolls for imparting rotation to at least some of said wrapping rolls and hence to the stack of coins held therebetween, and means operatively positioned for supplying a wrapper to be wound around the stack of coins as said coin stack rotates together with said wrapping rolls, the improvements comprising:

transferring means operatively coupled to said movable wrapping roll for moving the movable wrapping roll toward the other wrapping rolls from a predetermined position irrespective of the diameter of coins to be wrapped and prior to movement of the stack of coins to the wrapping position thereof;

stopping means operatively positioned for stopping the movement of said movable wrapping roll at a position corresponding to the diameter of the stack of coins and spaced by a distance from the periphery of said stack of coins, said stop being made prior to wrapping operation and in the midst of the movement of said movable wrapping roll;

releasing means operatively coupled for releasing said stop means for continuing movement of the movable wrapping roll until said movable roll is brought into contact with the periphery of the coin stack to be wrapped; and

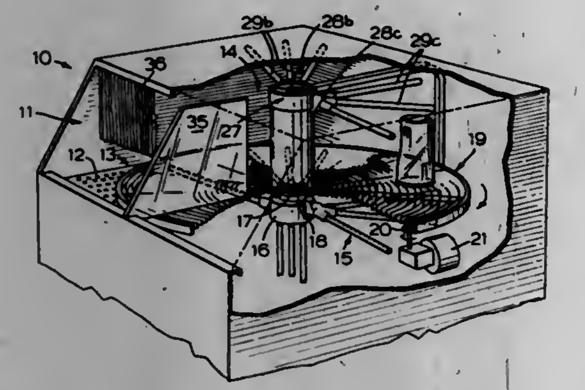
restoring means operatively coupled to said movable wrapping roll for restoring said movable wrapping roll to said predetermined position irrespective of the diameter of coins after the wrapper is supplied to the wrapping position and is wound around the coin stack by the plurality of wrapping rolls.

3,886,958

APPARATUS FOR WASHING ARTICLES

Howard Diebel, Village of Jordan Station, Ontario, and Albert Deman, Village of Vinemount, Ontario, both of Canada, assignors to Moyer Diebel Limited, Jordan Station, Ontario, Canada

Filed Aug. 29, 1973, Ser. No. 392,719
Int. Cl. B08b *3/02*
U.S. Cl. 134—80 **3 Claims**



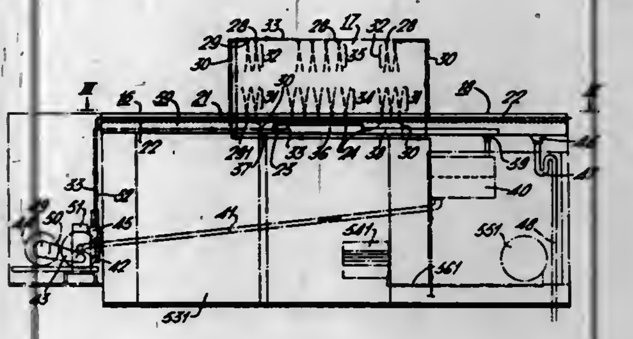
1. Apparatus for washing articles, the apparatus comprising a frame, a central bearing member mounted by the frame and adapted to receive pipe means for conveying liquids thereto, a rotary conveyor mounted by the bearing member for rotation about a vertical axis to convey the articles mounted thereon through a pre-rinse station, a wash station and a rinse station each of which extends over a sector of the conveyor of predetermined angular extent, motor means operatively connected with the conveyor to rotate it at a predetermined speed, a set of radially-extending spray pipes for each of the said stations extending from the said central bearing member over a sector of angular extent corresponding to that of the respective station, being detachably connected to the central bearing member by a single common detachable mechanical pipe connection having a respective axis that extends radially from the said vertical axis and receiving a respective liquid from said pipe means, each of said detachable mechanical pipe connections between each set of spray pipes and the bearing member being mechanically non-interchangeable to ensure connection of each set of spray pipes only to operate in the respective station.

3,886,959

GLASS WASHING MACHINE

Reginald W. Stott, 4021 Farrington St., Burnaby, British Columbia, Canada

Filed May 14, 1973, Ser. No. 360,009
Claims priority, application Canada, May 18, 1972, 142481
Int. Cl. B08b *3/02*
U.S. Cl. 134—134 **12 Claims**



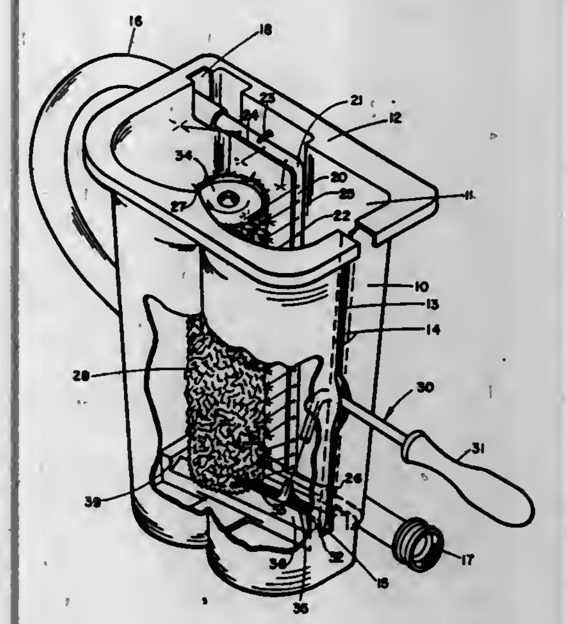
1. An improved washing machine comprising: a conveyor table having a loading station provided with infeed driven roller conveyor means and a take-off station provided with outfeed driven roller conveyor means; a washing station intermediate said loading station and said take-off station of said conveyor table, said washing station including transversely extending driven roller conveyors, a plurality of transversely extending lower hollow tubes, disposed between selected ones of said driven roller conveyors and dispersed along the length of the conveyor, each lower tube being provided with a plurality of upwardly directed spray nozzles, for directing spray vertically upwardly substantially perpendicular to said lower hollow tubes, the upper level of each such hollow tube being coincident with the upper level of the conveyor rollers, and an upper hood, said upper hood including a plurality of upper, hollow transversely extending tubes disposed vertically above said lower hollow tubes, each said upper hollow tube being provided with downwardly directed nozzles, for directing a spray of wash water vertically downwardly substantially perpendicularly to said upper hollow tubes.

3,886,960

PAINT ROLLER CLEANING APPARATUS

Ralph A. Krueger, 820 Appalachee Ave., Winter Park, Fla. 32789

Filed Oct. 23, 1973, Ser. No. 408,723
Int. Cl. B08b *3/02*
U.S. Cl. 134—138 **10 Claims**



1. A paint roller cleaner comprising in combination:

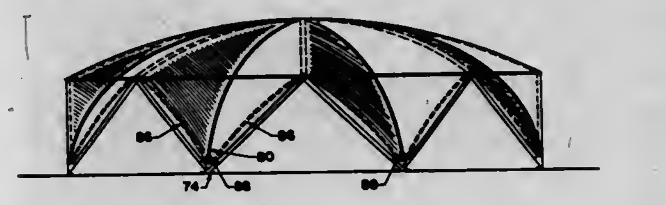
- a. a hollow casing open at both ends and adapted to receive a paint roller;
- b. an enlongated channel located in said casing and having a plurality of openings therein facing the interior of said casing for spraying the length of a paint roller in said hollow casing;
- c. fluid channel connection means located exterior said hollow casing and connected to said elongated (pipe) channel for attaching a fluid source;
- d. said casing having an elongated slot therein extending from said opening along one side thereof for receiving a paint roller handle;
- e. a bottom portion of said casing having an elongated grooved track for receiving a portion of a paint roller handle to hold and guide said paint roller during cleaning thereof whereby sliding said handle in said groove provides additional coverage of fluid sprayed on said roller from said fluid channel;
- f. drain means for allowing the escape of fluid from said (casing) groove whereby a paint roller handle guides the roller while it is being cleaned in said hollow casing without removal from the handle.

3,886,961

PRESTRESSED MEMBRANE STRUCTURE

David H. Geiger, 788 Riverside Dr., New York, N.Y. 10032, and Horst Berger, 18 Chestnut Dr., Hastings on Hudson, N.Y. 10706

Division of Ser. No. 234,238, March 13, 1972, Pat. No. 3,807,421. This application Oct. 26, 1973, Ser. No. 409,779
Int. Cl. E04b *1/347;* A43f *1/00*
U.S. Cl. 135—1-R **12 Claims**



1. A building structure including a plurality of flexible arches, a flexible membrane operatively connected to said arches in a folded configuration having ridges and valleys therebetween with said flexible arches being located at said ridges, and a plurality of prestressed flexible cables respectively located in the valleys formed in the membrane between two adjacent arches to hold said membrane in tension against said arches, whereby said arches are braced against buckling by said membrane to form a relatively rigid structure; said arches being formed of normally flat flexible members arranged to extend radially with respect to each other, to define a generally circular dome structure; and said structure including means for maintaining said flexible members in an arched configuration; said prestressed cables holding said membrane against said flexible arches upon downward flexing of said arches and said flexible arches holding said membrane against said prestressed cables during upward movement of said arches whereby said membrane is held in tension against said arches under substantially all load conditions to brace said arches against buckling.

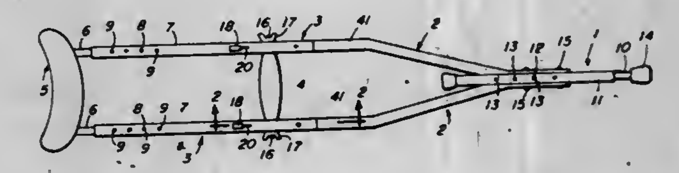
3,886,962

FOLDING CRUTCH

Damon Diamontis, 520 Mt. Auburn St., Watertown, Mass. 02172

Filed June 20, 1973, Ser. No. 371,722
Int. Cl. A61h *3/02*
U.S. Cl. 135—49 **3 Claims**

1. In a crutch, first and second arm portions, means connecting said arm portions in fixed parallel relationship, first and second leg portions, means connecting said leg portions in fixed parallel relationship, first telescoping joint means connecting said first arm portion to said first leg portion for movement between a first position and a second position, second telescoping joint means connecting said second arm portion to said second leg portion for movement between a first position and a second position, said joint means comprising means for fixing said leg portions in parallel coplanar relationship to said arm portions in said first position, and allowing said leg portions to be swung into overlapping and non-coplanar relationships to said arm portions in said second position, first latch means operably connected to said first telescoping joint means, second latch means operably connected to said second telescoping joint means, said latch means each being operable to a first stable position in which



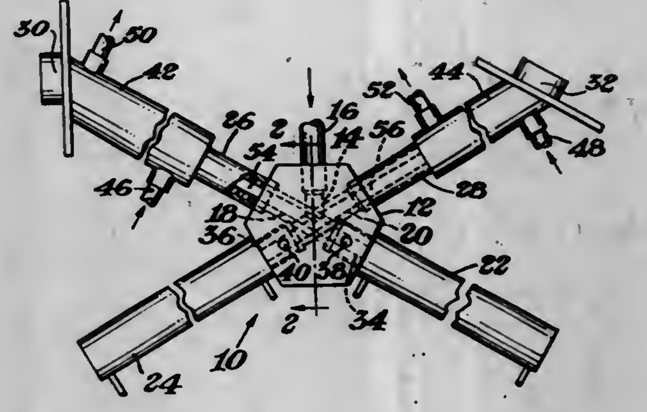
its associated joint means is locked in said first position, said latch means each being operable to a second stable position in which said telescoping joint means may be moved to their second positions when and only when both of said latch means is in said second position, each of said latch means comprising manually operable means movable between first and second positions, locking means movable between locking and unlocking positions, and resilient means for urging said locking means toward said locking position, said resilient means comprising detent means engaged by said manually operable means in said second position of said manually operable means for moving said locking means to said unlocking position.

3,886,963

VALVE

Elvis E. Jones; William A. Mays, and William F. Smith, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 10, 1973, Ser. No. 404,960
Int. Cl. B29f *1/05*
U.S. Cl. 137—334 **3 Claims**



1. A valve assembly for directing a moldable material into a mold cavity, the assembly including the combination of:

a valve body;

a first flow bore and second flow bore which extend through the valve body, which intersect with each other within the valve body, which are positioned transverse to each other within the valve body, which communicate with a first and second mold cavity, and wherein each bore is adapted for carrying moldable material into the first and second mold cavities;

an inlet bore which extends into the valve body, which communicates with the first and second flow bores, and which is adapted to carry a moldable material into the first and second flow bores;

a first plunger rod which fits slidably within the first flow bore, and which will extend, in advance position, beyond the point at which the inlet bore communicates with the first flow bore;

a second plunger rod which fits slidably within the second flow bore and which will extend, in advance position, beyond the point at which the inlet bore communicates with the second flow bore;

means connected to the first and second plunger rods for independently advancing and retracting the said rods within the first and second flow bores, to thereby alternately direct the moldable material into the first or second mold cavity.

3,886,964

SHUTOFF APPARATUS

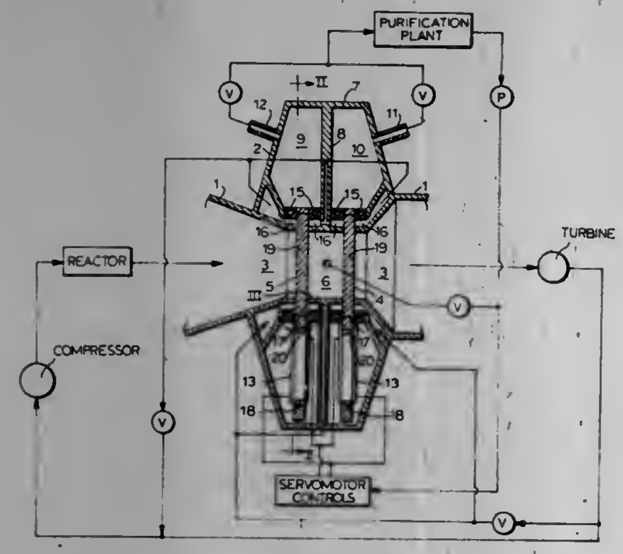
Klaus Uhlig, Zurich, Switzerland, assignor to Brown Boveri-Sulzer Turbomaschinen Aktiengesellschaft, Zurich, Switzerland

Filed Nov. 12, 1973, Ser. No. 415,130

Claims priority, application Switzerland, Nov. 17, 1972, 16762

Int. Cl. F16k *49/00*

U.S. Cl. 137—340 **9 Claims**



1. Shutoff apparatus for a conduit conveying a high temperature, high pressure medium comprising

a. a housing including a duct for said medium and an external wall spaced therefrom;

b. a pair of adjustable gates in the housing movable between two positions in which, respectively, they close and open the duct, and which, in the closed position, bound a barrier chamber within the duct;

c. a supply passage through which a barrier medium may be delivered to the barrier chamber;

d. a partition located between the planes of the gates and extending between the duct and the external wall to thereby divide the intervening space into two sub-chambers;

e. a discharge passage for leading medium out of each sub-chamber;

f. actuating means situated wholly within the housing and serving to move the gates between said two positions;

g. sealing elements reacting between the housing and the gates and effective to inhibit leakage of medium along and from the duct in said closed position and to inhibit leakage of medium from the duct in said open position;

h. cooling chambers interposed between the sealing elements and the duct and bounded in part by portions of the gates in both of said open and closed positions; and

i. cooling passage means through which a cooling medium may be passed through the cooling chambers.

3,886,965

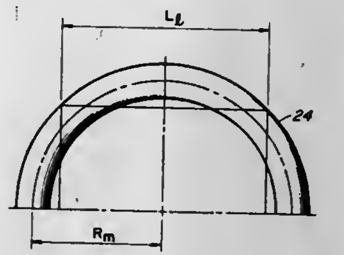
LINKAGE GEOMETRY FOR A SLURRY SYSTEM

James H. Tarter, Royal Oak, Mich., and David L. McCain, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 298,691, Oct. 18, 1972, abandoned. This application Oct. 10, 1973, Ser. No. 404,946

Int. Cl. F16l *25/00, 11/04*

U.S. Cl. 137—355.16 **6 Claims**



1. In a system comprising a longitudinally movable flexible tubular slurry hose means having an axis and a plurality of spaced movable support means, said movable support means being adapted to support said flexible tubular slurry hose means above the surface of the earth and said flexible tubular slurry hose and movable support means being coactive with arcuate turn guides to move therearound while maintaining equal effective length of said flexible tubular slurry hose, and a means for interconnecting said movable support means, said means for interconnecting said movable support means comprising long and short linkage means alternately pivotally connected together between each of said movable support means along the center line of said slurry hose means, means for rigidly securing said slurry hose means to said short linkage means, and means maintaining each pivotal connection uniformly spaced transversely from said arcuate turn guide when said long and short linkage means traverse therearound.

3,886,966

HYDRAULIC PRESSURE CONTROL UNIT

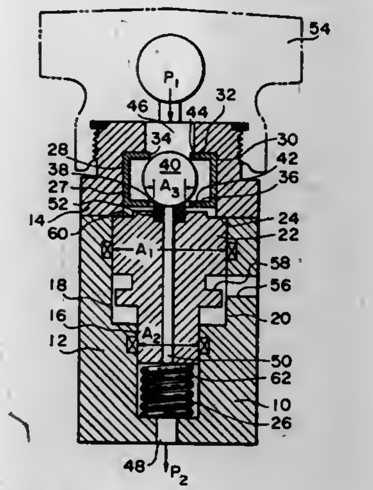
Keiichiro Yabuta, and Yoshitaka Koike, both of Yokohama, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Dec. 17, 1973, Ser. No. 425,128

Claims priority, application Japan, Dec. 18, 1972, 47-12672

Int. Cl. F16k *45/00*

U.S. Cl. 137—493.2 **3 Claims**



1. A hydraulic pressure control unit adapted to be connected between a source of fluid under pressure and a hydraulic actuator, comprising:

a housing having an inlet for connecting to the source and an outlet for connection to the actuator;

a valve spool movable within a longitudinal bore in said housing between a first position at which fluid communication between the inlet and the outlet is blocked, and a second position at which fluid communication between the inlet and outlet is allowed;

said valve spool defining therethrough an axial bore and having a large end thereof communicating with the inlet and a small end thereof communicating with the outlet;

a valve seat fixed to a portion of said large end of said valve spool and surrounding said axial bore;

biasing means to urge said valve spool toward said first position; and

a valve element adapted to engage with said valve seat and thereby block fluid communication between the inlet and the outlet through said axial bore unless said valve spool has been moved from said first position to said second position;

fluid from the source being able to move said valve spool from said first to said second position and thereby flow through said axial bore to the outlet only if its pressure is above a predetermined value.

3,886,967

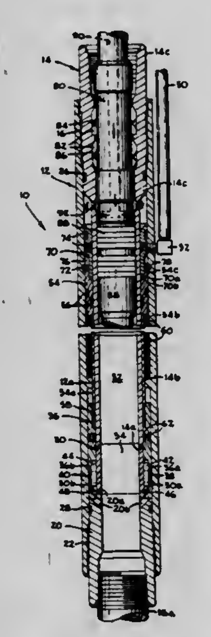
DOWNHOLE SAFETY BALL VALVE

Norman A. Nelson, Houston, Tex., assignor to FMC Corporation, San Jose, Calif.

Filed Sept. 24, 1973, Ser. No. 400,082

Int. Cl. E21b *33/00*

U.S. Cl. 137—495 **7 Claims**



1. A downhole safety valve assembly for controlling the flow of well fluids, said assembly comprising

1. a tubular housing element,
2. an inner concentric fluid-conducting sleeve element secured to and spaced from the housing element, said sleeve element forming a well fluid flow passage through said valve assembly,
3. a ball valve for controlling flow through said flow passage,
4. a control piston slidable in the annular space between said housing and sleeve elements and having ball valve operating means at its lower end portion,
5. spring means in said space and extending between said housing element and said control piston for urging said control piston to its valve closed position,
6. a floating piston in said space and above said control piston,
7. control piston retainer means slidably mounted between said pistons,
8. means cooperable with said retainer means for facilitating releasable retention of said control piston in its valve opening position by said retainer means,
9. a port in said housing for supplying fluid under pressure directly to the upper end of said control piston for opening said ball valve,
10. a port in said sleeve element for supplying fluid under pressure directly from the flow passage to the upper end of said floating piston for moving said control piston to its valve opening position via said retainer means, said retainer means thereupon releasably retaining said control piston in its valve opening position, and
11. means on said floating piston for holding said retainer means in its control piston retaining condition.

3,886,968

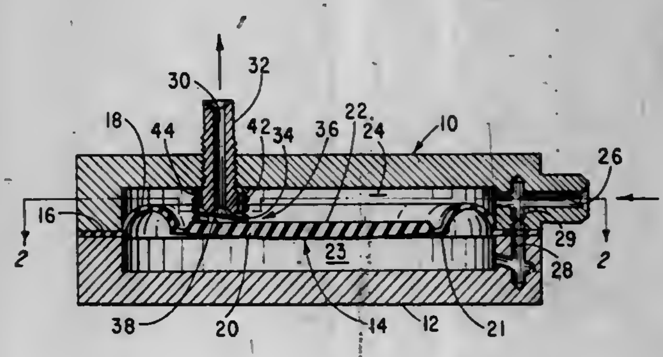
FLOW CONTROL DEVICE

Donald K. Murrell, La Mirada, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 22, 1974, Ser. No. 463,015

Int. Cl. G05d *7/01*

U.S. Cl. 137—501 **12 Claims**



1. A flow control device comprising

a casing having inlet means and outlet means;

control valve means disposed in said casing for controlling flow between said inlet means and said outlet means;

diaphragm means including a flexible outer portion and a thickened central portion mounted in said casing, the flexible outer and thickened central portions being movable to operate said control valve means, said diaphragm means having first and second sides on the flexible outer and thickened central portions defining first and second chambers, respectively, in said casing, said outlet means being disposed in said casing in off centered relation to said thickened central portion, said first chamber communicating with said inlet means, said second chamber communicating with said outlet means, and said thickened central portion on said second side of said diaphragm means having an off centered portion disposed adjacent said flexible outer portion and said outlet means to be exposed to outlet pressure;

said control valve means including a valve member carried on said off centered portion adjacent said outlet means; and

means for establishing communication between said first and second chambers such that the area of said second side of said diaphragm means with the exception of said off centered portion adjacent said outlet means is exposed to inlet pressure and the area of said first side of said diaphragm means in exposed to inlet pressure whereby a force differential exists across said diaphragm means to move said diaphragm means to tend to close said control valve means when inlet pressure increases or outlet pressure decreases and to tend to open said control valve means when inlet pressure decreases or outlet pressure increases.

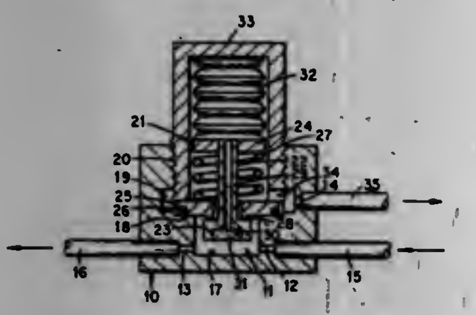
3,886,969
TIME DELAY VENT VALVE

Michael L. Shira, Castro Valley, and Robert H. Henderson, Livermore, both of Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 23, 1973, Ser. No. 365,299

Int. Cl. F16k *31/12*

U.S. Cl. 137—509 **12 Claims**



1. A time delay valve comprising: a housing defining a chamber therein, said housing comprising a first body portion and a second body portion interconnected by mating threaded sections of said first and second body portions, a piston-like member positioned in said chamber and having spaced end portions interconnected by a shank portion having a cross-sectional area smaller than said end portions, one of said end portions having a larger cross-sectional area than the other end portion, said housing being provided with a fluid inlet in open communication with a lower portion of said chamber, and with an exhaust port in communication with a central portion of said chamber, said central portion of said chamber having a cross-section greater than the cross-section of said lower portion of said chamber, means intermediate said lower portion and said central portion of said chamber defining a valve seat, said other end portion of said piston-like member being positioned to cooperate with said valve seat defining means such that a fluid seal is provided therebetween preventing fluid flow between said lower portion and said central portion of said chamber, means located in an upper portion of said chamber having a cross-section less than said central portion of said chamber and defining a pressure accumulator in fluid communication with said one end portion of said piston-like member, said lower, central, and upper portions of said chamber being in axial alignment with one another, said piston-like member being provided with a channel extending therethrough providing fluid communication between said lower portion of said chamber and said pressure accumulator means, and means forming a fluid flow restrictor and functioning as a time delay positioned in said channel, said fluid flow restriction forming means comprising a porous member positioned in an enlarged section of said channel such that a portion of the fluid flowing from said inlet into said lower portion of said chamber passes through said porous member into said pressure accumulator means thereby acting on the larger cross-sectional area of said one end portion of said piston-like member forcing said other end portion thereof away from said valve seat defining means and allowing fluid to pass from said lower portion to said central portion of said chamber and exhaust through said exhaust port.

3,886,970
FLUID PRESSURE CONNECTOR AND BREAK-AWAY UNIT

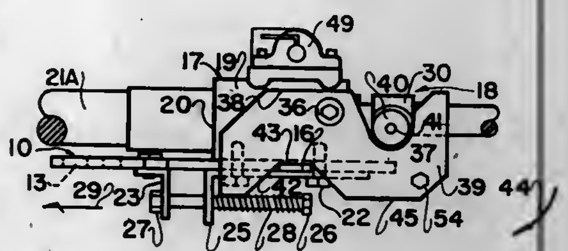
Percy Barlow, 444 4th St., Weyburn, Saskatchewan, and Roderick Bruce Barlow, 96 Rupert Dr., Saskatoon, Saskatchewan, both of Canada (S7K1B3)

Filed Mar. 29, 1973, Ser. No. 345,953

Int. Cl. F16l *37/12, 37/22, 37/28*

U.S. Cl. 137—561 R **8 Claims**

7. In a fluid coupling assembly for detachably connecting a first coupler portion to a second coupler portion and which includes a source of fluid pressure, a reservoir, an operating valve, and hydraulic lock means between said operating valve and said first coupler portion; the improvement consisting of support means, said first coupler portion being mounted upon said support means for limited endwise movement thereon, spring means reacting between said support means and said first coupler portion normally biassing said first coupler portion in a direction away from said second coupler portion, means on said first coupler portion for detachably locking said second coupler portion into engagement with said first coupler portion, said means including means for unlocking said second coupler portion from said first coupler portion when a pull is exerted between said portions greater than the strength of said spring means, and means for releasing fluid pressure within said first coupler portion to facilitate connection of said second coupler portion to said first coupler portion, said coupling assembly including a pair of fluid pressure lines connected to said first coupler portion, said last mentioned means including a valve assembly operatively connected between said fluid pressure lines and means to operate said valve means to connect said lines to said reservoir, and means to mount said first coupler portion upon said support means, said last mentioned means including an elongated slot formed through said support means and bolt means engaging through said slot and into said first coupler portion, said means for detachably locking said second coupler portion into engagement with said first coupler portion including a piar of side plates pivotally mounted one upon each side of said first coupler portion, a projection extending upon each side of said second coupler portion and a recess in each of said side plates engageable by said projections when said second coupler portion is connected to said first coupler portion, and means co-operating between said support means and said side plates for pivoting said side plates out of engagement with said projections when said first coupler portion is moved in the opposite direction of said second coupler portion upon said support means against pressure of said spring means, each projection including a cylindrical boss journalled for rotation to said second coupler portion.



3,886,971
APPARATUS FOR REGULATING THE RATIO OF MIXING OF TWO FLUID FLOWS

Jorgen Schjerning Lundsgaard, Bontvedvej 29, 5700, and Hans Peter Degn, Karlskilde, 5633, Knarreborg, both of Denmark

Filed Mar. 20, 1973, Ser. No. 343,134

Claims priority, application Denmark, Mar. 20, 1972, 1297/72

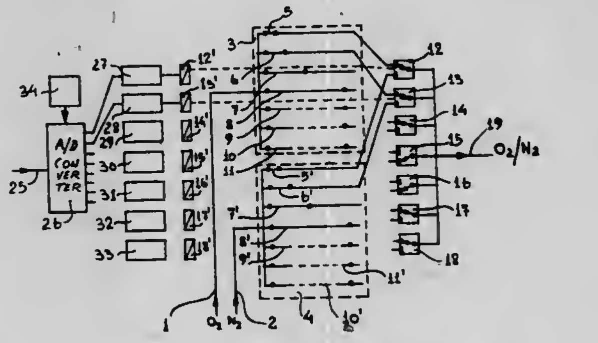
Int. Cl. B01f *5/00*

U.S. Cl. 137—599 **4 Claims**

1. An apparatus for regulating the ratio of mixing two fluids from separate fluid supplies while maintaining a constant overall flow rate of the fluids, the apparatus comprising:

two identical sets of parallel connected flow resistors, the ratios of the fluid conductivities of said resistors of each set being in accordance with a binary system;

valve means including a plurality of two-way valves for connecting said resistors into the flow path of a respective fluid, the inlets of each of said sets being connected to a respective fluid supply and the outlets of said flow resistors of said sets having the identical fluid conductivity being connected to inlets of a respective said two-way valve such that only one flow resistor of each conductivity valve is connected at a time for enabling flow in its respective flow path, and the outlets of said two-way valves being interconnected for combining the fluids into a single flow path.



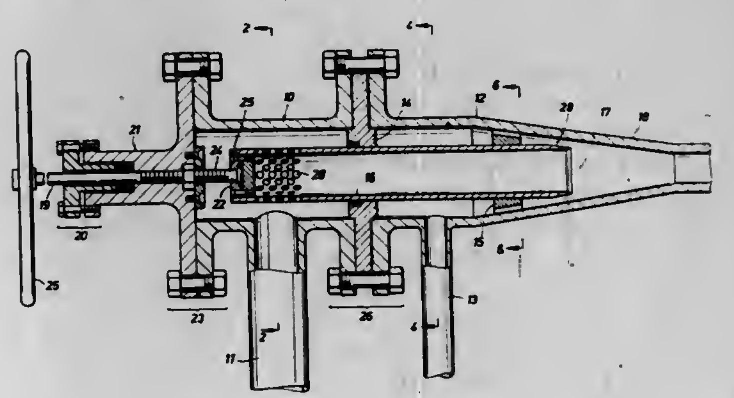
3,886,972
CORE FLOW NOZZLE

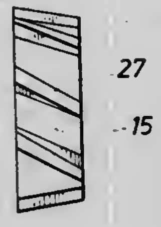
Paul R. Scott, Houston, Tex.; Victor J. Chavez, New Orleans, La., and Vitold R. Kruka, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 6, 1973, Ser. No. 422,249

Int. Cl. F17d *1/16;* **F16k** *19/00*

U.S. Cl. 137—602 **10 Claims**





1. A nozzle for establishing core flow of a viscous fluid inside an annulus of a low viscosity fluid comprising a tubular body having two chambers, the first chamber having an inlet for a viscous fluid and the second chamber having an inlet for a low viscosity fluid, the second chamber having a conical taper at one end disposed away from the first chamber, a tubular member axially aligned within the two chambers, one end of the tubular member being located within the first chamber and being open to admit viscous fluid thereinto, the other end of said tubular member being disposed adjacent the conical taper of said second chamber and being axially movable within said chamber to control the velocity of low viscosity fluid, means for axially moving the tubular member within the two chambers, and a flow director within the second chamber to further align the tubular member therewithin, the flow director comprising flow directing louvers disposed at an angle to impart a swirling action to the low viscosity fluid.

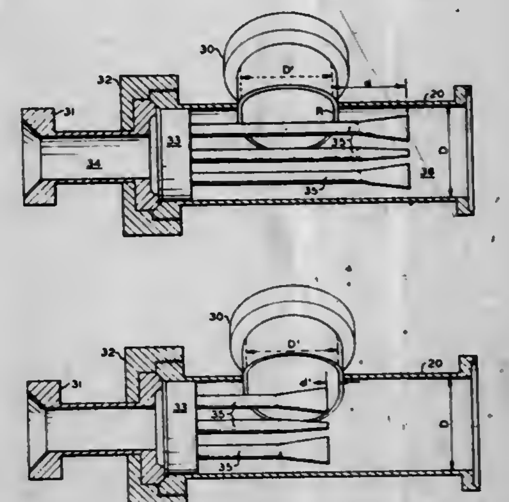
3,886,973
PRODUCTION OF A VARIEGATED PRODUCT

Alfred W. Kinney, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 9, 1973, Ser. No. 377,449

Int. Cl. F16k *19/00*

U.S. Cl. 137—604 **27 Claims**



7. Apparatus for injecting a stream of generally liquid material into a stream of generally plastic material comprising:

tee means having a generally straight tubular chamber with substantially uniform diameter D and length of at least 2D with an upstream inlet and a downstream outlet, said tee means also having an intermediate inlet downstream of said upstream inlet, the downstream edge of said intermediate inlet being located a distance of at least D upstream from said downstream outlet, said intermediate inlet having a diameter at least substantially equal to D, said intermediate inlet being operably connected to a plastic material supply means so as to permit the flow of plastic material through said intermediate inlet to said chamber; a liquid material supply means operatively secured to said upstream inlet; and

at least one ribbon tube having an upstream end and a flattened downstream end forming a downstream ribbon tube opening with a cross section of substantially greater length than width, each said ribbon tube being operably connected at its upstream end to said upstream inlet so as to provide a flow of liquid material through said ribbon tube into said mixing chamber.

3,886,974
VALVE

Curt Arnold Bjorklund, Box 99, Ulricehamn, Sweden

Filed Feb. 22, 1973, Ser. No. 334,559

Claims priority, application Austria, Mar. 3, 1972, 1826/72; Sweden, Nov. 27, 1972, 15402/72

Int. Cl. F16k *23/00*

U.S. Cl. 137—613 **2 Claims**

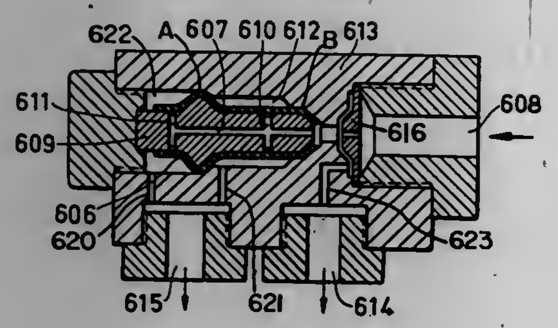
1. A valve device for a fluid line comprising in combination:

a. a valve chamber,
b. a fluid inlet to said valve chamber, a fluid outlet from said valve chamber that is spaced away from said fluid inlet, and a fluid flow channel connecting said fluid inlet and fluid outlet,
c. a variable pressure chamber located intermediate said fluid inlet and fluid outlet resp. associated to said outlet,
d. an expandable member disposed across said variable pressure chamber, said expandable member being adapted to be moved from one position to another within said fluid pressure chamber in response to fluid force applied to its surface,

e. a first passageway connecting one side of said expandable member with said fluid flow channel at a point intermediate its ends,

f. a second passageway connecting the other side of said expandable member with said fluid flow outlet at a point beyond the outlet end of said fluid flow channel,

g. a resilient disc positioned between said fluid inlet and the beginning of said fluid flow channel, said resilient disc being provided with a centrally located hole, and



h. a fluid return passageway which starts at a point between the downstream side of said resilient disc and the upstream end of said fluid flow channel, which passageway is cut off from said fluid inlet by said resilient disc under normal fluid flow conditions and open to said fluid flow channel and inlet at pressure conditions below said normal fluid flow pressure conditions.

3,886,975

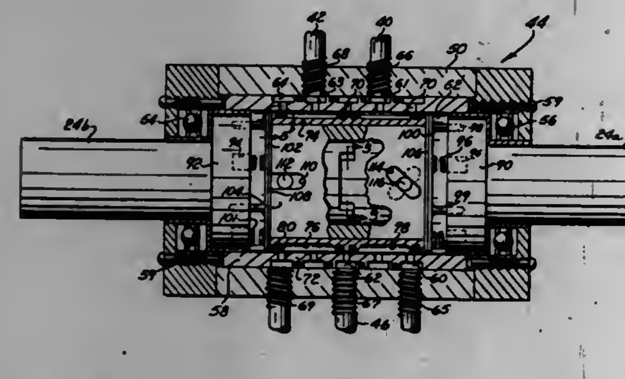
VALVE ASSEMBLY

John J. Kristof, and Geza A. Thiry, both of Marion, Ohio, assignors to Sycon Corporation, Marion, Ohio

Division of Ser. No. 150,433, June 7, 1971, Pat. No. 3,763,957. This application July 23, 1973, Ser. No. 382,285

Int. Cl. F16k *11/02*

U.S. Cl. 137—625.42 **8 Claims**



1. A valve comprising,

a valve housing having an axially extending chamber formed therein,

an inlet and a plurality of outlet ports in said housing communicating with said chamber,

rotatable shaft means extending into said chamber,

said shaft means including a rotatable input shaft having an end portion disposed in said chamber and a rotatable output shaft having an end portion disposed in said chamber,

lost motion coupling means for interconnecting said input and output shafts and for enabling limited relative rotation to occur between said input and output shafts,

sleeve means disposed in a telescopic relationship with said end portions of said input and output shafts,

means for effecting rotation of said sleeve means with said input shaft upon rotation of said input shaft,

means cooperating with said sleeve means and said shaft means to shift said sleeve means axially of said shaft means upon relative rotation between said input and output shafts,

valve piston means disposed in said chamber on said sleeve means for directing fluid flow between said inlet and outlet ports,

said sleeve means being rotatable relative to said valve piston means and said housing upon rotation of said input shaft,

said valve piston means being axially shiftable with said sleeve means between a center position where said inlet port is isolated from said outlet ports and a plurality of positions where said inlet port is in communication with selected outlet ports, and

means for connecting said valve piston means and said sleeve means for unitary shifting movement and for enabling relative rotation to occur between said valve piston means and sleeve means.

3,886,976

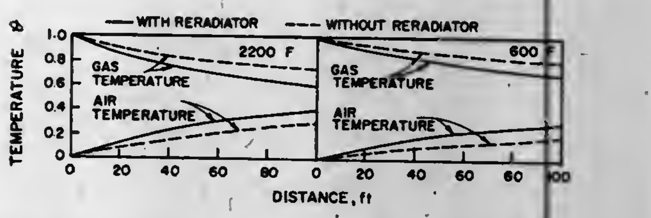
RECUPERATOR HAVING A RERADIANT INSERT

Alan Kardas, Chicago; Dennis H. Larson, Bridgeview, and John D. Nesbitt, Chicago, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Oct. 25, 1973, Ser. No. 409,399

Int. Cl. F15d *1/02*

U.S. Cl. 138—38 **2 Claims**



1. A recuperator for use in a heat-exchange stack furnace having hot gases at temperatures of approximately 2000°F and higher flowing through it and having a diameter exceeding approximately 5 feet and a height of up to approximately 100 feet such that there is no capability of increasing the mass velocity of the hot gases through the stack by taking a higher pressure drop along the flow path through the stack for heating combustion air flowing in an annulus formed outside the recuperator and between the wall of the stack furnace, said recuperator comprising, in combination: a shell wall of tubular construction; a reradiator in the form of a floating extended surface disposed within said tubular shell wall and providing an additional area accepting heat by convection and radiation from said hot gases flowing through said shell wall, said heat being retransmitted to said shell wall by continuous-spectrum radiation, whereby the rate of transfer of heat from said hot gases across the shell wall to the combustion air flowing in the annulus outside the shell wall is enhanced, said reradiator being a cylindrical, coaxial reradiator which separates the flow of said hot gases into two streams whose temperatures differ depending on the relative sizes of the diameters of said cylindrical coaxial reradiator and said shell wall, the diameter of said cylindrical coaxial reradiator being proportioned to balance the temperatures of said two streams.

3,886,977

PLUG FOR PIPES UNDER PRESSURE

Gerard Dorgebray, La Chaussee, d'Ivry, France (28260)

Filed July 27, 1973, Ser. No. 383,107

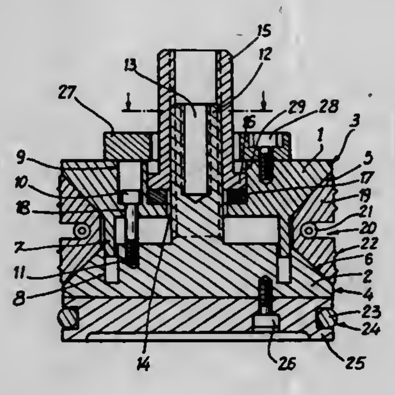
Claims priority, application France, Aug. 4, 1972, 72.28206

Int. Cl. F16l *55/12*

U.S. Cl. 138—89 **5 Claims**

1. Plug for pipe under pressure which comprises two coaxial end plates which are mounted for relative translation, each having a peripheral frusto-conical surface facing the other and having the same taper, a plurality of jaws consisting of a number of circumferentially spaced sectors of a ring having a cylindrical circumferential surface, the diameter of which surface approximates the inner diameter of the pipe to be plugged, said sectors occupying the space between the two

frusto-conical surfaces of the end plates, means for retaining said sectors in said space, sealing means mounted on one of the end plates and constituting with said one end plate a closure completely blocking said pipe, a threaded spigot fixed to one of the plates and passing through the other, the end of said spigot being axially tapped to receive a threaded operating rod, a nut screwed onto the outside of said spigot and overlapping said other end plate, and at least one elongated connecting means extending between said coaxial end plates, parallel to the axis of said end plates and preventing relative rotation of said end plates, one end of each connecting means being longitudinally slidable within one of said end plates between fixed abutments which limit the axial movement of said end plates relative to each other.



3,886,978

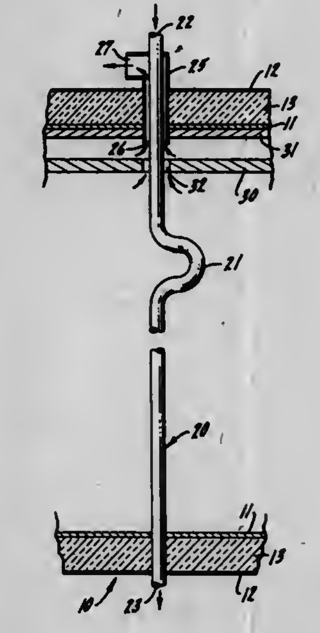
GAS VENT

Ronald G. Deeks, Oakville, Ontario, Canada, assignor to Procor Limited, Lincolnshire, Ill.

Division of Ser. No. 130,423, April 1, 1971, Pat. No. 3,730,200. This application Oct. 5, 1972, Ser. No. 295,321

Int. Cl. F16l *55/00*

U.S. Cl. 138—103 **3 Claims**



1. In a vessel containing hot molten sulphur therein and having a layer of sulphur crust formed on the top surface thereof, an improved apparatus for venting hydrogen sulphide gas from the vessel, comprising:

a. conduit means passing through said sulphur crust for receiving a hot fluid therethrough to melt a hole in said sulphur crust about the outer periphery of said conduit means and permit trapped hydrogen sulphide gas to pass upward therethrough; and

b. vent means concentric with said conduit means having one end in fluid communication with the area above said sulphur crust and the other end in fluid communication with the outside of said vessel for venting hydrogen sulphide gas from said area above said sulphur crust to the outside of said vessel.

3,886,979

SHIRRED TUBULAR FOOD CASINGS HAVING A BARRIER COATING

Jerome J. M. Rasmussen, South Stickney Twp., Marinette County, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Aug. 1, 1972, Ser. No. 276,919

Int. Cl. A22c *13/00*

U.S. Cl. 138—118.1 **6 Claims**

1. A shirred and compressed length of tubular cellulosic food casing comprising a tubular cellulosic food casing of extended continuous length that is shirred and compressed into a shortened length thereof, said tubular casing provided with a moisture content of at least about 10% and a continuous moisture and gas impermeable barrier coating adhered to at least one surface thereof, said coated casing also provided with an extensibility characteristic measured at 32°F of at least 4%, said shirred tubular food casing being suitable for use in the processing and storage of food products where loss of moisture therefrom and oxidation thereof is to be prevented.

3,886,980

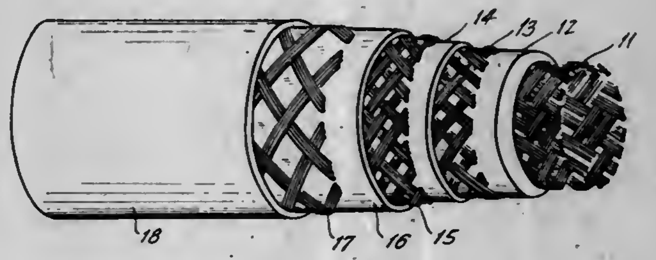
STEAM HOSE DESIGN

Arthur M. Elson, Hamilton Twsp., Mercer County, N.J., assignor to Acme-Hamilton Manufacturing Corporation, Trenton, N.J.

Filed May 21, 1973, Ser. No. 362,087

Int. Cl. F16l *11/08*

U.S. Cl. 138—127 **7 Claims**



1. For use in coupling a steam generating source to steam operated equipment, a relatively light weight flexible cylindrical shaped hose assembly for conveying steam at pressures in excess of 150 psi said hose assembly comprising:

a seamless lightweight braided inner sleeve;

a first seamless tubular layer of steam resistant resilient material surrounding said inner sleeve;

a second seamless braided intermediate sleeve surrounding said first tubular layer and having braids formed of a plurality of wire strands collectively adapted to withstand the high pressures developed within the bore of the hose assembly and to enhance the ability of the hose assembly to retain its normal cylindrical shape;

a second seamless steam heat resistant tubular cover layer formed of a resilient material and surrounding said intermediate sleeve;

said inner sleeve being affixed to the inner surface of said first seamless tubular layer and defining the inner wall of the hose assembly, said inner sleeve comprising braided strands of steam and heat resistant glass yarn interlaced to form a closed woven sleeve exposed to the steam passing through the bore of the hose assembly for preventing particles which may break away from said first seamless tubular layer from entering into the flow of steam passing through said bore.

3,886,981

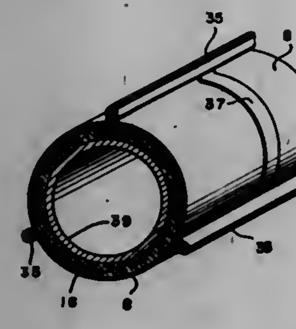
PIPELINE INSULATION MEANS

Kay E. Eliason, Fort Madison, Iowa, assignor to Atlantic Richfield Company, Philadelphia, Pa.

Division of Ser. No. 196,630, Nov. 8, 1971, Pat. No. 3,774,281. This application July 30, 1973, Ser. No. 383,957

Int. Cl. F16l *9/14*

U.S. Cl. 138—149 **7 Claims**



1. An insulated pipeline having a plurality of insulation sections secured against the pipe by longitudinal and circumferential securing means at insulating section joints wherein said longitudinal securing means is a double fold standing rib seam formed by doubly folding pairs of flanges extending radially outward from the longitudinal edges of circumferentially adjacent insulation sections and said circumferential securing means comprises batten straps free of exposed edges.

3,886,982

APPARATUS FOR EFFECTING THE RAPID FILLING OF CONTAINERS WITH LIQUID

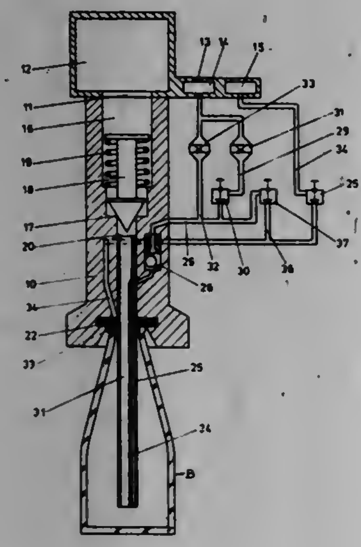
Gerhard Uth, and Alfred Rentel, both of Bad Kreuznach, Germany, assignors to Seitz-Werke G.m.b.H., Bad Kreuznach, Germany

Filed July 10, 1973, Ser. No. 378,035

Claims priority, application Germany, July 12, 1972, 2234120

Int. Cl. B65b *31/00*

U.S. Cl. 141—39 **7 Claims**



1. An apparatus for filling containers, such as bottles, with liquid and comprising; a filling pipe adapted for insertion into the container from above to dispose the lower end of the pipe near the bottom of the container, a liquid supply chamber, means connecting said supply chamber to the upper end of said pipe, a chamber for gas under pressure, a gas relief chamber, a seal surrounding said pipe and adapted for sealingly engaging the mouth of a container when the pipe is inserted into the container, a first valve connected between said pressure gas chamber and the container side of said seal to communicate the gas pressure chamber with the container when the mouth of the container is engaged by said seal, a gas return passage leading from the lower end of said pipe upwardly and including a lateral opening near the top of the container, a main conduit connecting the upper end of said passage with said relief chamber and having a first flow restrictor therein, a check valve in said main conduit between said passage and said first restrictor, which opens away from said first flow restrictor, said check valve being normally open and closing in response to liquid flowing from the passage into said main conduit, a second valve connected in parallel with said first flow restrictor and having a second flow restrictor in series therewith, and a third valve connected between the side of said first valve which is remote from said gas pressure chamber and said main conduit between said check valve and said first flow restrictor.

3,886,983

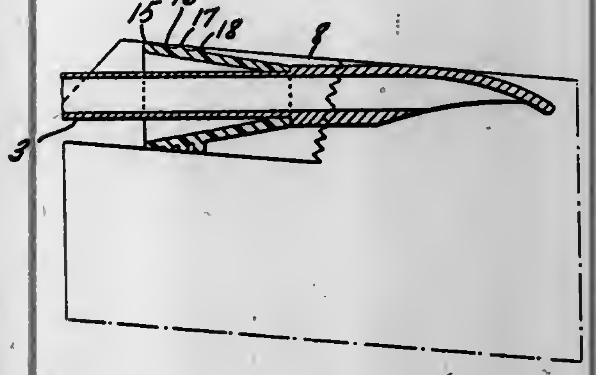
SACK-FILLING DEVICE

Zeth Forssen, and Gosta Lindius, both of Malmo, Sweden, assignors to Aktiebōlaget Cementa, Malmo, Sweden

Filed June 24, 1971, Ser. No. 156,497

Int. Cl. B65b *1/16, 1/18, 1/28, 3/17, 39/04*

U.S. Cl. 141—68 **5 Claims**



1. A sack-filling device for filling particulate material into sacks provided with a sack valve without entrainment of air in the filled sack, permitting air within the sack to vent while preventing entry of outside air during the filling operation, comprising, in combination, a sack-filling means smaller in external diameter than the inside diameter of the sack valve, defining an annular space between its outside wall and the inside wall of the sack valve, and adapted to extend into the sack valve to feed particulate material into the sack; and a sealing insert of resilient material in the form of a truncated cone attached to the sack-filling means; the sealing insert being provided with ridges running circumferentially about the insert, to improve sealing between the sealing insert and the inside wall of the sack valve, having a wide end and a narrow end and having axial apertures only at the wide and narrow ends, coaxially embracing the sack-filling means and disposed across the annular space between the sack valve and the sack-filling means, sealing engaging in a secured and closed relationship the outside of the sack-filling means at the narrow end, and sealingly engaging in a flexible relationship the inside of the sack valve at the wide end, to substantially close off the annular space, the sack-filling means having a recessed portion on its exterior wall, and the sealing insert at its narrow end sealingly engaging the sack-filling means at the recess, the insert being sufficiently resilient to flex away automatically from the inside wall of the sack valve and open the seal therewith for egress of gas via the annular space from within the sack when under high gas pressure therewithin, or under stress applied to the insert by the sack under the weight of particulate material filled therein.

3,886,984

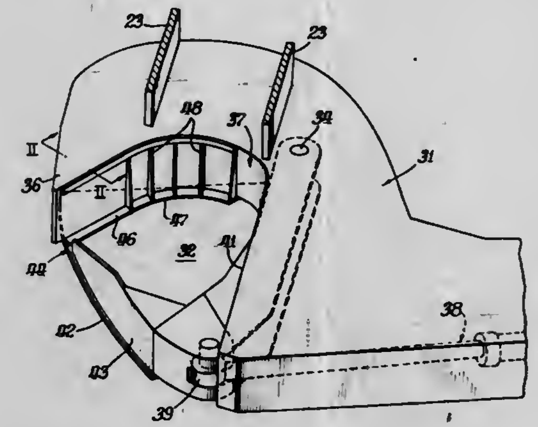
TREE HARVESTER SHEAR ASSEMBLY WITH FIXED AND MOVABLE BLADES

Henry L. Engel, New Lenox, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 3, 1974, Ser. No. 475,848

Int. Cl. B27c *9/00*

U.S. Cl. 144—3 D **11 Claims**



1. A tree harvester unit for mounting on a vehicle comprising

- a shear frame adapted for attachment in generally horizontal and transverse arrangement to a longitudinal axis of the vehicle,
- a fixed jaw secured to the shear frame and extending outwardly from the vehicle,
- a movable cutting blade pivoted to the shear frame and extending outwardly from the vehicle while in a retracted position to form an opening in combination with the jaw and a portion of the shear frame intermediate the jaw and movable blade for receiving a tree, the movable blade being pivotable toward the jaw and intermediate frame portion to secure the tree within the opening as it is being severed,
- motor means interconnected between the movable blade and shear frame,
- a fixed blade extending along the jaw and intermediate frame portion in facing relation to the movable blade to penetrate the tree as the tree is urged thereagainst by severing movement of the pivoted blade, the fixed blade being slightly offset to permit movement therepast of the pivoted blade, and
- guide means extending perpendicularly from the fixed blade to limit penetration of the fixed blade and facilitate movement of the severed tree relative to the fixed blade.

3,886,985

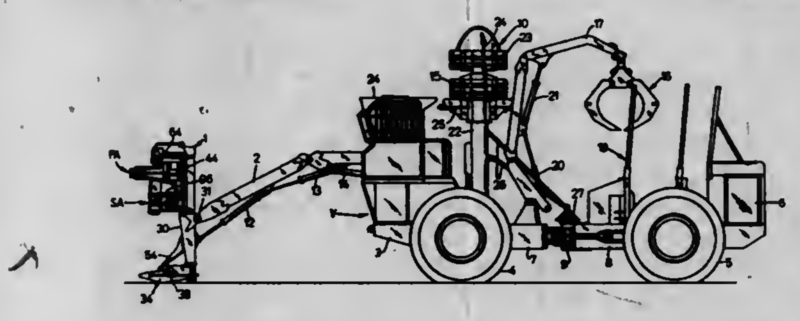
MULTIPLE TREE HARVESTER AND METHOD FOR HARVESTING TREES

Anthony Iarocci, and William John Willows, Both of Brantford, Ontario, Canada, assignors to Koehring Canada Limited, Brantford, Ontario, Canada

Filed Apr. 5, 1974, Ser. No. 458,328

Int. Cl. B27h *1/00*

U.S. Cl. 144—309 AC **19 Claims**



1. A multiple tree harvester for cutting and accumulating trees, one at a time, said harvester having a support frame, a primary pair of arms and a secondary pair of arms movably mounted on said support frame for cooperating to gather a plurality of trees, one at a time, said pairs of arms being vertically spaced on said support and from one another; said pairs of arms being shiftable between an open, tree receiving position and a closed, tree holding position; power means attached to each of said pairs of arms and for selectively moving each of said pairs of arms between their open tree receiving position and their closed, tree holding position, and power operated tree severing means located generally below said arms for severing said trees which are to be accumulated.

3,886,986

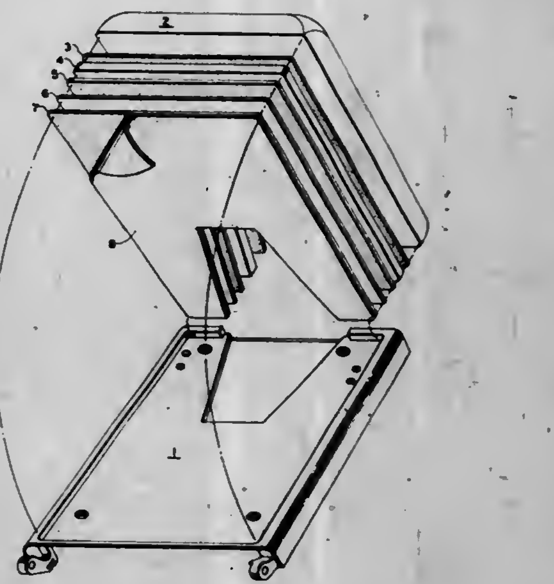
LEATHER LAMINATE FOR CAMERA HOUSING

Andrew Renzullo, Nashua, N.H., and George D. Suokko, Plainville, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 24, 1972, Ser. No. 300,157

Int. Cl. B65d *65/14, 65/40*

U.S. Cl. 150—52 J **9 Claims**



1. In a photographic camera which includes a camera housing, the improvement wherein said housing has adhered thereto by means of a layer of pressure-sensitive adhesive, in inverse order:

- a leather element having a surface adapted to be exposed to the environment;
- a layer of adhesive substantially continuously coated over the surface of the leather element opposed to the surface adapted to be exposed to the environment; and
- a metallic component stiffer than said leather element adhesively attached to the coated side of the said leather element.

3,886,987

ELASTIC SURFACE EXPOSURE WRAPPER FOR SOAP CAKES

Frederick E. Schuchman, Gateway Towers, Pittsburgh, Pa. 15222

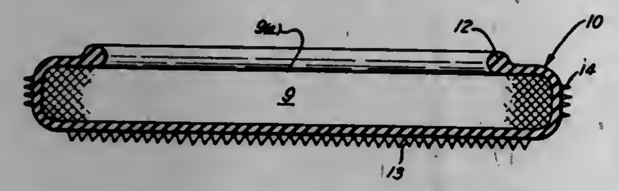
Continuation-in-part of Ser. No. 246,355, April 21, 1972, abandoned. This application Apr. 20, 1973, Ser. No. 353,126

Int. Cl. B65d *65/02*

U.S. Cl. 150—52 **1 Claim**

1. A protective wrapper for soap cakes consisting of a pocket made of thin, elastic, very thin flexible, non self supporting, shapeless water impervious, imperforate sheet material adapted to be snugly stretched over, and to assume the shape of, various sizes of soap cakes; the said pocket having an opening therein of maximum area, when the pocket is unstretched, substantially less than the total unstretched surface area of the pocket sheet material, the surface of said pocket sheet material being continuous and unbroken except

for said opening, the inside surface of said pocket sheet material being substantially smooth, the said outside surface being rough, and an elastic bead integral with said sheet bordering said opening.



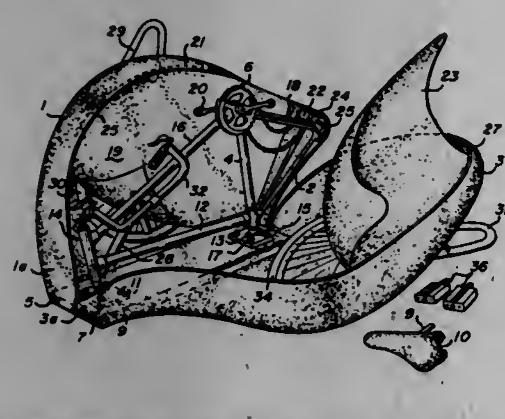
3,886,988
BICYCLE BAG

Wayne E. Garrett, San Mateo, and John W. McKean, Jr., Woodside, both of Calif., assignors to Jeanne P. Garrett, San Mateo, Calif., a part interest

Filed July 19, 1973, Ser. No. 380,614

Int. Cl. B65b *11/00*

U.S. Cl. 150—52 R **19 Claims**



1. A bag having right and left side panels of flexible fabric material;

a rigid elongated base at the bottom of said bag coupled to said panels; said bag being sufficient in size to receive the partially disassembled components of a bicycle, including two wheels and bicycle frame thereof and said base being of a length slightly greater than the distance between the head tube and the seat tube of said bicycle frame and said bag being of a width to fit a wheel in between each side panel and a bicycle frame in side-by-side arrangement;

coupling means connected to said base for holding said bicycle frame in a predetermined standing position relative to said base so that the center of gravity of said frame remains over said base; and

fastening means for joining together said right and left panels to close the bag.

3,886,989
SELF-THREADING NUT

John Strange, Llanishen, Wales, assignor to Firth Cleveland Fastenings Ltd., England

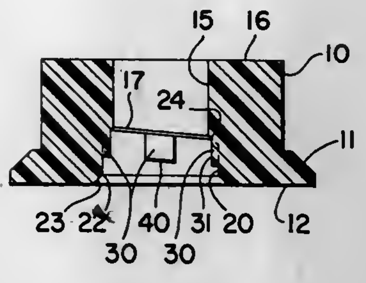
Filed Feb. 11, 1974, Ser. No. 441,526

Claims priority, application United Kingdom, July 17, 1973, 34021/73

Int. Cl. F16b *39/284, 37/00*

U.S. Cl. 151—7 **7 Claims**

1. A self-threading fastener adapted for self-threading engagement with an externally threaded member, said fastener comprising a body having a threaded member receiving bore therethrough, said bore having a plain, smaller diameter portion adjacent one end, an enlarged diameter portion adjacent the other end and a stepped juncture interposed said smaller and enlarged diameter portions, said stepped juncture being defined by a chamfered surface extending radially outwardly in a direction toward said enlarged diameter bore portion, said enlarged diameter bore portion having a plurality of circumferentially spaced, radially inwardly and axially extending thread engaging ribs made of a deformable material which terminate at their innermost ends at the stepped juncture, said ribs having inner radial faces which together define a diameter which is larger than the diameter of said smaller diameter bore portion whereby said ribs are adapted to be progressively engaged by a leading edge of an externally threaded member so that relatively small amounts of material are displaced initially from the ribs prior to self-threading engagement of the externally threaded member through the smaller diameter bore portion, the ends of the ribs remote from the smaller diameter bore portion and the stepped juncture both defining a helix of equal angle in respect to the longitudinal axis of the bore.



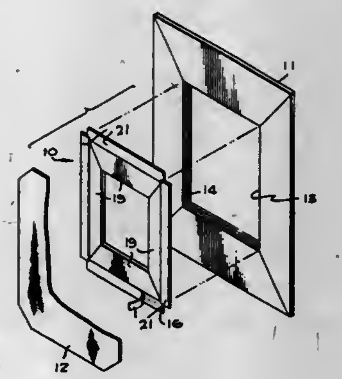
3,886,990
INTEGRAL UNIVERSAL STRETCHER BAR

Joseph C. Campione, 1156 Wilcox Ave., Monterey Park, Calif. 91745

Filed Apr. 23, 1973, Ser. No. 353,693

Int. Cl. B44d *3/18*

U.S. Cl. 160—374.1 **4 Claims**



1. An assembly for stretching a canvas comprising:

a substantially rectangular base having an opening therein; a plurality of flaps;

flexible means pivotally securing one of said flaps to each side of said base, said flaps extending outwardly away from the side of said base in spaced complementary relationship thereto;

means for (maintaining) securing said flaps to the sides of said base in complementary juxtaposition to the sides of said base, whereby a canvas secured to said flaps is maintained in a taut condition between said flaps and the sides of said base.

3,886,991
METHOD AND APPARATUS FOR CONTROLLING THE WITHDRAWAL OF HEAT IN MOLDS OF CONTINUOUS CASTING INSTALLATIONS

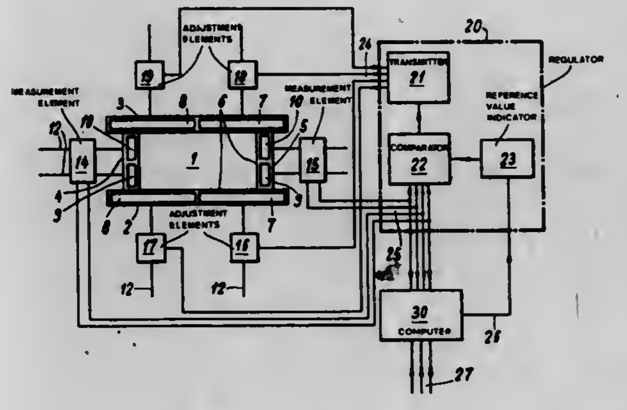
Walter Meier, Winterthur, and Werner Bruderer, Feldmeilen, both of Switzerland, assignors to Concast AG, Zurich, Switzerland

Filed Apr. 16, 1973, Ser. No. 351,772

Claims priority, application Switzerland, Apr. 18, 1972, 5666/72

Int. Cl. B22d *11/02*

U.S. Cl. 164—4 **6 Claims**



1. A method of controlling the withdrawal of heat from a cast strand by means of a cooling agent during continuous casting of metals, comprising the steps of casting the strand in a continuous casting mold having several cooling regions adjacent one another around the periphery of the mold and constituting several ducts for the cooling agent, measuring the quantity of heat withdrawn at least at given ones of the cooling regions, comparing the withdrawn quantities of heat with reference values for such quantities of heat which are to be withdrawn and which reference values are dependent upon the shape of the mold, to thereby determine contact of the skin of the strand against the walls of the mold, and as a function of the deviations of the withdrawn quantities of heat and the reference values of such quantities of heat which are to be withdrawn determined by the comparison operation controlling the quantity of heat withdrawn at least at one cooling region adjoining a measured region so as to control the contact of the strand skin and mold wall.

3,886,992
METHOD OF TREATING METAL MELTS WITH A PURGING GAS DURING THE PROCESS OF CONTINUOUS CASTING

Hermann Maas, Bochum; Horst Abratis, Hagen Atw, and Claus Raeune, Hattingen, all of Germany, assignors to Rheinstahl Huettenwerke AG, Essen, Germany

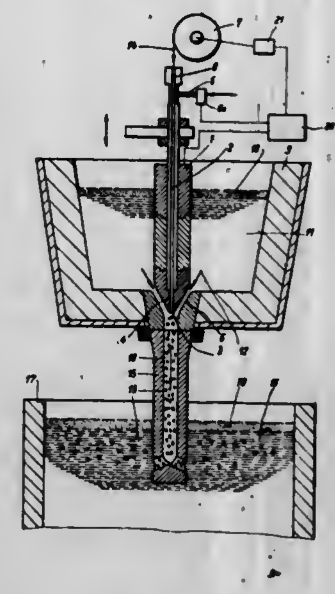
Filed May 26, 1972, Ser. No. 257,421

Claims priority, application Germany, May 28, 1971, 2126606

Int. Cl. B22d *11/10*

U.S. Cl. 164—56 **11 Claims**

1. A method of treating metal melts during continuous casting for suppressing the formation of undesirable oxidic non-metallic inclusions, comprising the steps of enclosing the teeming metal to a point below the surface of the metal pool in a continuous casting mold to avoid contact with the ambient atmosphere, covering the surface of the pool with a layer of slag, and introducing small volumes of purging gas in bubble form into the metal melt at the location where such metal melt begins to form a teeming jet, so that the injector-like action of the melt divides the gas into a multiplicity of very small bubbles which are carried into the mold by the melt.



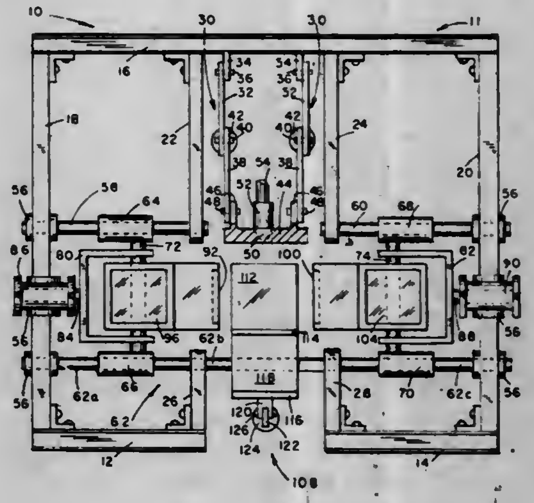
3,886,993
SAND MOLDING APPARATUS

Sam Larkin, 254 Beach 140th St., Belle Harbor, N.Y.

Filed May 30, 1973, Ser. No. 365,095

Int. Cl. B22c *15/02*

U.S. Cl. 164—211 **12 Claims**



1. Compacting chamber arrangement for sand molding apparatus comprising a pivotally mounted chamber support member movable in an oscillatory manner between two angular positions about an axis; first and second sand mold compacting chambers provided on said chamber support member, said first and second chambers being angularly spaced about the pivotal axis of said chamber support member, and means for oscillatorily moving each of said chambers to a sand filling and sand compacting station of the sand molding apparatus in one angular position of said chamber support member and subsequently to a sand mold ejecting station of the sand molding apparatus in the other angular position of said chamber support member, said first and second chambers each comprising a pair of spaced parallel walls to form a chamber having open sides and an open top, the open sides being adapted to receive the compacting rams of the sand molding apparatus and the open top being adapted to receive sand to be compacted and adapted to be covered by a cover plate of the sand molding apparatus.

3,886,994
DEVICE FOR MAKING A CASTING OF A DIRECTIONALLY SOLIDIFIED ALLOY

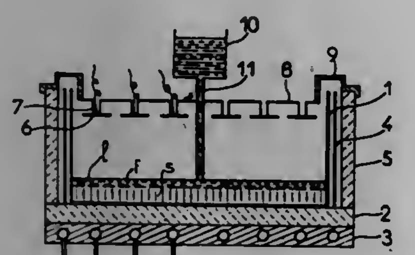
Bernard Daigne, Chatillon, and Francois Girard, Paris, both of France, assignors to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.), Chatillon-sous-Bagneux, France

Division of Ser. No. 301,638, Oct. 27, 1972, Pat. No. 3,838,729. This application May 28, 1974, Ser. No. 473,365

Claims priority, application France, Nov. 5, 1971, 71.39703

Int. Cl. B22d *27/02*

U.S. Cl. 164—250 **11 Claims**



1. Device for casting parts and ingots of a metallic alloy with an ordered structure obtained by the progressive solidification of a liquid alloy and comprising a thin walled mould, means for introducing into the mould an alloy with suitable initial composition, means for heating the liquid phase of the alloy introduced into the mould and means for cooling the lower portion of the mould, wherein :

a. the means for introducing the alloy comprise at least one duct and means for maintaining the lower end of the duct at a constant distance from the free surface of the liquid phase,

b. the heating means are constituted by elements radiating the heating energy and facing said free surface,

c. the lateral walls of the mould are surrounded by heat insulating walls.

3,886,995
CONTINUOUS CASTING INSTALLATION EQUIPPED WITH MOLD SUPPORT PIVOTABLE OUT OF A CASTING POSITION

George Bollig, Meerbusch; Klaus Brock, Dusseldorf, and Alfred Niendorf, Glehn, all of Germany, assignors to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

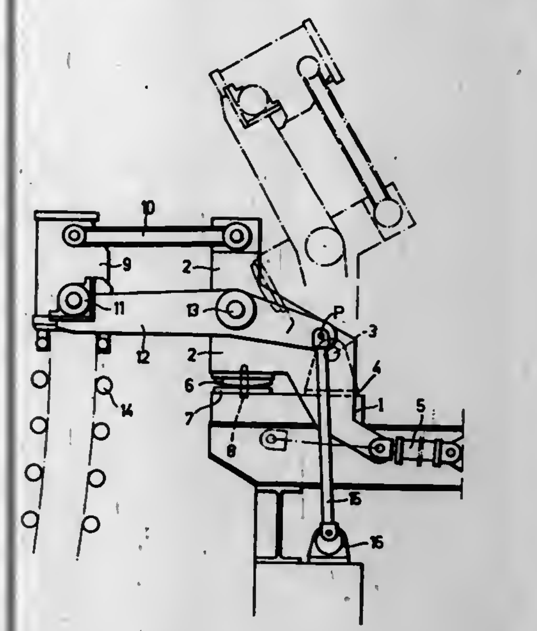
Filed June 7, 1974, Ser. No. 477,183

Claims priority, application Germany, June 9, 1973, 2329561

Int. Cl. B22d *11/04, 27/08*

U.S. Cl. 164—260 **4 Claims**

1. A continuous casting installation comprising a mold support, means for mounting the mold support to be upwardly pivotable about a substantially horizontal pivot axis out of a casting position, a mold guided in the direction of its lengthwise axis at the mold support, a frame, an oscillation drive anchored at said frame, said oscillation drive including a connecting rod, an oscillation lever operatively engaging with the mold, means for pivotably mounting the oscillation lever at the mold support for pivotable movement about a pivot axis, said connecting rod being hingedly connected with the oscillation drive, means providing a hinge connection of the oscillation lever with the connecting rod and arranged in such a manner with respect to the pivot axis of the mold support that during upward rocking of the mold support the pivotal movement of the oscillation lever relative to the mold support, and which pivotal movement is dependent upon the momentary standstill position of the mold within the oscillation stroke, is located within the range of the oscillation stroke of the mold.



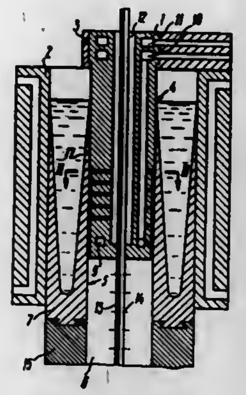
3,886,996
DEVICE FOR PRODUCING INTERNAL CYLINDRICAL SPACE IN INGOTS

Aron Yakovlevich Tseitlin, ulitsa Metallurgov, 41, kv. 42; Oleg Viktorovich Martynov, ulitsa Pervomaiskaya, 2, kv. 31; Jury Nikolaevich Ordinarisev, ulitsa Bunkernaya, 16, kv. 20; Vladimir Nikolaevich Ordinartsev, ulitsa Stoletova, 5, kv. 1; Evgeny Pavlovich Tishkin, ulitsa Michurina, 129, kv. 42; Sergei Sergeevich Tikhonov, ulitsa Metallurgov, 1-a, kv. 6, and Alexeevich Vladimir Belousov, 2 proezd Metallurgov, 6, kv. 96, all of Tula, U.S.S.R.

Filed Mar. 13, 1973, Ser. No. 340,748

Int. Cl. B22d *11/02*

U.S. Cl. 164—283 M **3 Claims**



1. A device for producing cylindrical spaces in ingots on a plant for the continuous casting of metals comprising: a metallic rod-like mandrel having an external surface which is in agreement with the internal space of the ingot being cast; said mandrel having holes disposed circumferentially thereon for the passage of a cooling agent, said holes being in communication with each other; a central bore being disposed inside said mandrel along its axis; means for feeding the cooling agent to the internal space of the ingot being cast in the section located after said mandrel in a direction of movement of the ingot, said feeding means being arranged axially inside said central bore with the formation between said means for feeding the cooling agent to the internal space of the ingot being cast and the internal surface of said bore of a clearance serving for discharging gas-water emulsion that is formed in the course of cooling of the ingot being cast; said mandrel having longitudinal slots disposed on its external surface in its section along its length where the strength of a metal skin formed on the internal surface of the ingot being cast precludes its sagging into said longitudinal slots which serve for drawing through the gas-water emulsion forming when the cooling agent is fed into the internal space of the ingot being cast after said mandrel to provide a more intense and uniform cooling of the internal space of the ingot; each of said longitudinal slots being connected with said central bore through a port.

3,886,997
METHOD OF OPERATING A HEAT EXCHANGER

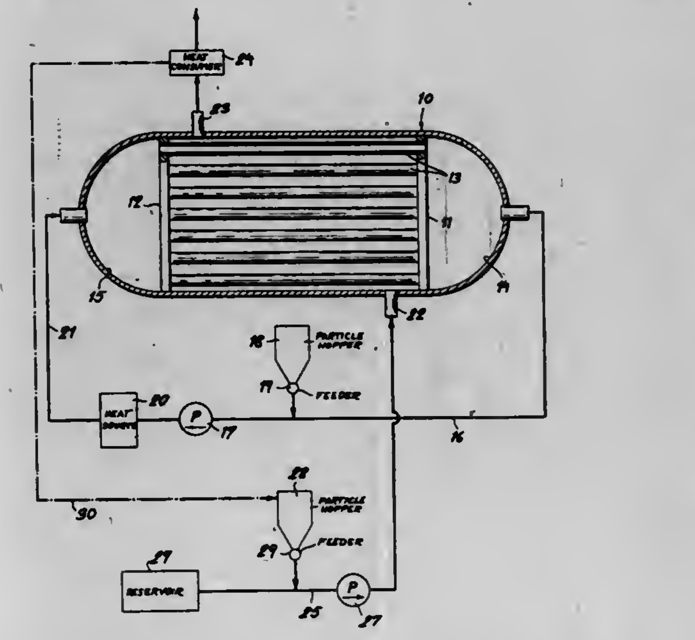
Ludolf Plass, Kronberg, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 9, 1973, Ser. No. 404,680

Claims priority, application Germany, Oct. 6, 1972, 22489914

Int. Cl. F28d *13/00*

U.S. Cl. 165—1 **6 Claims**



1. In a method of operating a heat exchanger wherein a liquid heat-exchange fluid is passed in contact with a heat exchanger surface, the improvement which comprises suspending in said fluid particulate solids physically and chemically inert to said liquid heat-exchange fluid with an average particle size of 10 to 150 microns in an amount of 0.5 to 20% by volume and such that the suspension has a Reynolds number of 10,000 to 70,000 at the average velocity of the liquid heat-exchange fluid in contact with said surface based on a flow channel of a diameter of 1 centimeter.

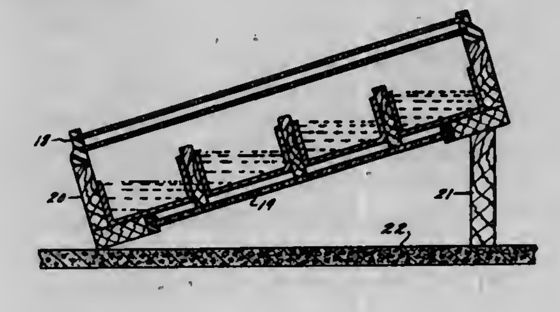
3,886,998
COMBINATION SOLAR WATER HEATER AND CHILLER

Richard J. Rowekamp, 3626 Glenmore Ave., Cincinnati, Ohio 45211

Filed Sept. 6, 1973, Ser. No. 394,789

Int. Cl. F25b *13/00*

U.S. Cl. 165—2 **9 Claims**



2. A method for heating and cooling a group of buildings comprising, in combination, alternately by season, adding and removing a few materials from a basic structure so that by interchanging materials two different solar phenomina result, one which chills water by exposing it to cool night air, the other heating water by exposing it to sunlight, enclosing a large number of said interchangeable structures within a fenced area, periodically filling and draining said structures after water has been heated or chilled to a satisfactory temperature, storing said heated or chilled water, pumping said heated or chilled water into a radiator and blowing air through it into a duct system so as to heat or cool all the rooms of the buildings, storing the de-energized water, chilling said water by using an interchangeable solar structure comprised basically of a bank of narrow and shallow and uncovered containers, modifying said solar structure seasonally and alternately by applying a transparent panel to the top and an insulating cover to the bottom so as to seal it tight and prevent heat losses while exposing water to sunlight, said pumping of water and blowing of air being accomplished periodically by automatically controlling their flow by using control devices and related equipment.

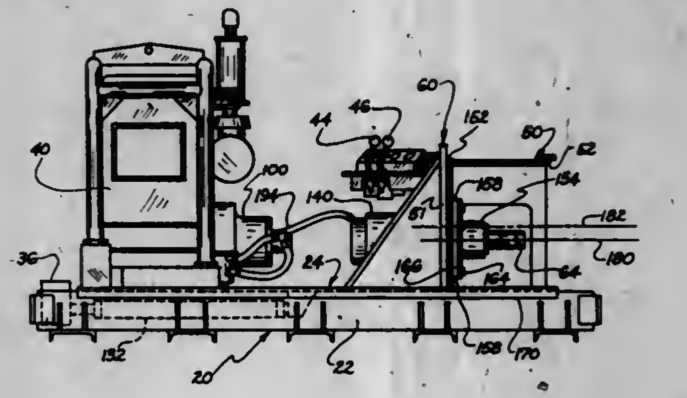
3,886,999
PORTABLE EARTH BORING MACHINE

William S. Appleman, Ashland, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 20, 1974, Ser. No. 471,439

Int. Cl. E21b *3/02*

U.S. Cl. 173—159 **4 Claims**



1. A portable earth boring machine comprising, in combination, track means; frame means mounted for movement along said track means; an engine; pump means driven by said engine; thrust plate means mounted on said frame means forwardly of said engine and pump, said thrust plate means including a vertically disposed slot; fluid motor means in circuit with said pump means and mounted on said thrust plate means for vertical movement between upper and lower fluid motor positions, said fluid motor including an auger drive shaft extended through said slot; a lower casing pusher ring mounting means on said thrust plate means for mounting a smaller pusher ring concentric with said auger drive shaft in said lower position; and an upper casing pusher ring mounting means on said thrust plate means for mounting a larger pusher ring concentric with said auger drive shaft in said upper position.

3,887,000
CONTROL SYSTEM COMPRISING DIFFERENTIAL AMPLIFIER WITH DUAL CURRENT COMPARATOR HAVING TWO OUTPUTS SEPARATED BY A DEADBAND

Hubert B. Pinckaers, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

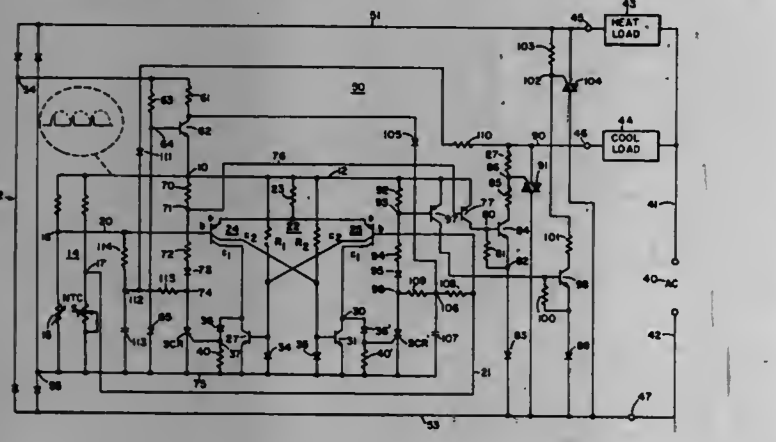
Division of Ser. No. 295,398, Oct. 5, 1972. This application Feb. 25, 1974, Ser. No. 445,405

Int. Cl. F25h *29/00*

U.S. Cl. 165—26 **3 Claims**

1. In a temperature control system an improved dual output differential amplifier and current comparator circuit for selectively providing an electrical output at either of a first or a

second output terminal in response to a signal where said first and second output terminals are connected to control heating load means and cooling load means comprising:
- first solid state current control means having a control electrode, an input electrode and first and second current source electrodes;
- second solid state current control means having a control electrode, an input electrode and first and second current source electrodes;
- conductive means including impedance means connecting said input electrodes together and to a first energizing terminal;
- circuit means for connecting said control electrodes to a control signal such that said first and second current control means are normally conductive and in which said control signal is a temperature responsive impedance network;



- first and second solid state current comparator means each having a plurality of terminals comprising at least a first control input terminal, a second input terminal, and a common terminal, said first comparator means second input terminal being connected to said first current control means first current source electrode, said second comparator means second input terminal being connected to said second current control means first current source electrode and, said common terminals of said first and second current comparator means being connected to a second energizing terminal;
- and connection means conductively connecting said second current source electrode of said first current control means to said second comparator means first control input terminal, and said second current source electrode of said second current control means to said first comparator means first control input terminal whereby said first and second current comparator means are normally biased to conduction.

3,887,001
TEMPERATURE CONTROL

Robert Lewis Bickerdike, Alton; William Norman Mair, Farnham, and Evan Samuel Thomas, Farnborough, all of England, assignors to The Secretary of State of Defence in Her Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

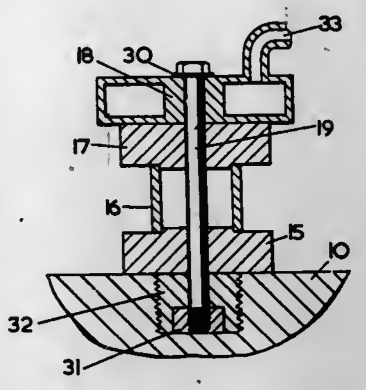
Filed July 9, 1973, Ser. No. 377,658

Claims priority, application United Kingdom, July 14, 1972, 33072/72

Int. Cl. F28f *7/02*

U.S. Cl. 165—81 **5 Claims**

1. In a device having a temperature gradiant thereacross, as from deposition of an alloy from the vapour phase, a temperature controllable collector having a thick metal plate which has a first face adapted to receive deposited alloy and a second face opposite the first face;
- a plurality of heat sink members attached in efficient thermal contact with said second face, the heat sink members being provided with internal channels for the passage of coolant; and
- flexible connecting means connecting at least some of the heat sink members and arranged to remain leak tight despite expansion or contraction of the apparatus due to heating and
- wherein the number, spacing and contact area of the heat sink members are selected so that the radii of curvature



(r) of the said second face of the thick metal plate and of the contracting faces of the heat sink members caused by thermal distortion at the operating temperature are substantially the same as determined by the formula: $r=(K/a)Q$, where K is thermal conductivity, a is the coefficient of linear thermal expansion and Q is the heat flux per circuit area.

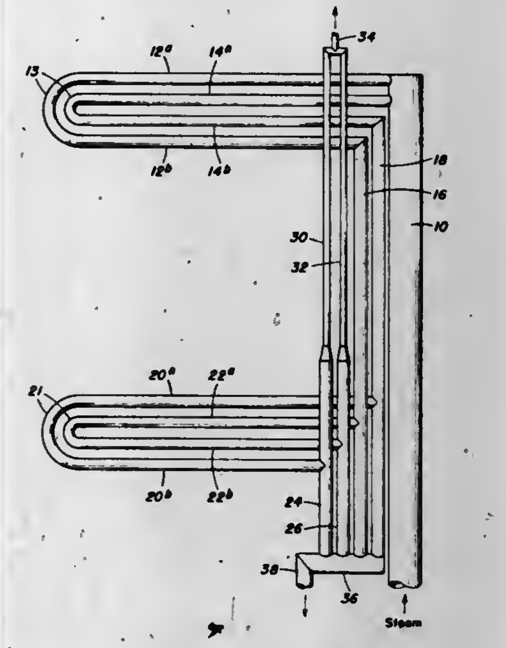
3,887,002
AIR-COOLED HEAT EXCHANGER WITH AFTER-CONDENSER

Willem Schoonman, Wyckoff, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Jan. 28, 1974, Ser. No. 436,877

Int. Cl. F28b *1/06*

U.S. Cl. 165—113 **7 Claims**



1. In an air-cooled heat exchanger for condensing vapors, having a main condensing section comprising a first outer plurality of U-shaped tubes having upstream legs connected to a vapor inlet manifold and downstream legs connected to a first condensate manifold, a first inner plurality of U-shaped tubes connected at one end to a vapor inlet manifold and at the other end to a second condensate manifold, and means for directing air to flow over the external surfaces of the tubes, the improvement comprising an after-condensing section comprising third and fourth condensate manifolds, a second outer plurality of U-shaped tubes connected at one end to the second condensate manifold and at the other end to the third condensate manifold, a second inner plurality of U-shaped tubes having upstream legs connected to the first condensate manifold and downstream legs connected to the fourth manifold, the second inner plurality of U-shaped tubes being located within the space enclosed within the second outer plurality of U-shaped tubes, means for draining condensate from the third and fourth condensate manifolds, means for condensate vapor from the second outer and inner pluralities of U-shaped tubes, the tubes being so disposed that the same air stream passes over the external surfaces of the tubes of the first and second inner and outer pluralities.

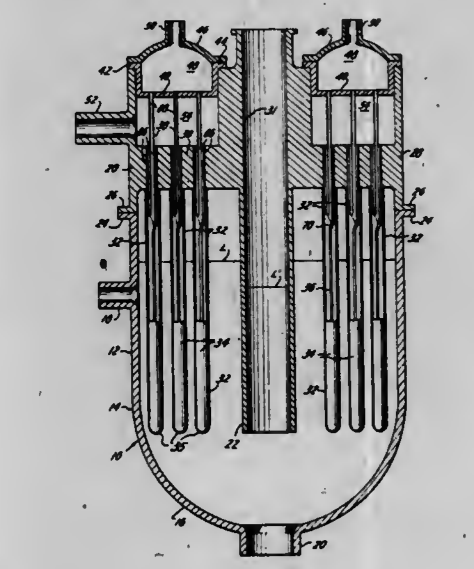
3,887,003
BAYONET TUBE HEAT EXCHANGER

John Polcer, Florham Park, and Robert O. Barratt, Parsippany, both of N.J., assignors to Foster Wheeler Corporation, Livingston, N.J.

Continuation-in-part of Ser. No. 254,150, May 17, 1972, abandoned. This application Oct. 2, 1972, Ser. No. 293,957

Int. Cl. F28d *7/12*

U.S. Cl. 165—142 **6 Claims**



1. A bayonet tube type heat exchanger comprising:
- an upper tube sheet;
- a main tube sheet having a plurality of holes;
- a secondary fluid inlet between said upper tube sheet and said main tube sheet;
- a secondary fluid outlet above said upper tube sheet;
- a heat section below said main tube sheet sealed off from said secondary fluid by said main tube sheet;
- a plurality of bayonet tube assemblies each one comprising:
  - an outer tube open at the top thereof where it is connected to the main tube sheet at one of said tube sheet holes and closed at its bottom, said outer tube extending into said heat section;
  - an inner tube coaxial with said outer tube the bottom of said inner tube being adjacent to the closed end of said outer tube the top of said inner tube being in said heat section adjacent to and below said main tube sheet;
  - a steam tube extending from within said outer tube to said upper tube sheet;
  - a device within said tube sheet hole between said inner tube and said steam tube, said device having a generally cylindrical outer tubular section flared inward at its bottom and a generally cylindrical inner tubular section extending coaxially within said outer tubular section, said inner tubular section at its bottom communicating through a first opening in said outer section with the space between said inner tube and said outer tube, said inner tube communicating with the space between said outer tubular section and said inner tubular section through a second opening in said outer tubular section;
  - whereby, secondary fluid travelling upward through said bayonet tube assembly in the space between said inner tube and said outer tube toward said steam tube when passing through said main tube sheet, will pass through said first opening and then through said inner tubular section and unheated secondary fluid passing down said bayonet tube assembly through said main tube sheet will pass downward through the space between said inner tubular section and said outer tubular section and then through said second opening into said inner tube.

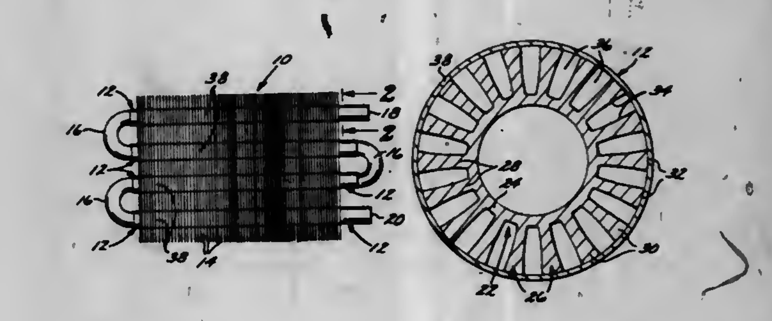
3,887,004
HEAT EXCHANGE APPARATUS

Theodore A. Beck, Riverside, Calif., assignor to Hayden Trans-Cooler, Inc., Corona, Calif.

Filed June 19, 1972, Ser. No. 263,931

Int. Cl. F28f *1/42*

U.S. Cl. 165—179 **15 Claims**



1. A tubular heat exchange conduit which comprises an elongated central tubular core, a plurality of elongated, generally longitudinally arranged, circumferentially spaced heat transfer fins extending generally radially outwardlly from said core, both sides of each of said fins being concavely curved in the general radial direction throughout substantially their entire radial width, with their outer edges being thicker than inner portions thereof and an elongated, tubular shell peripherally engaged about and in heat conducting abutting relationship with the outer edges of said fins, said core, fins and shell defining a plurality of fluid flow channels between adjacent pairs of the fins.

3,887,005
STORM CHOKE

Gary W. Rosenwald, Tulsa, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed Oct. 3, 1972, Ser. No. 294,745

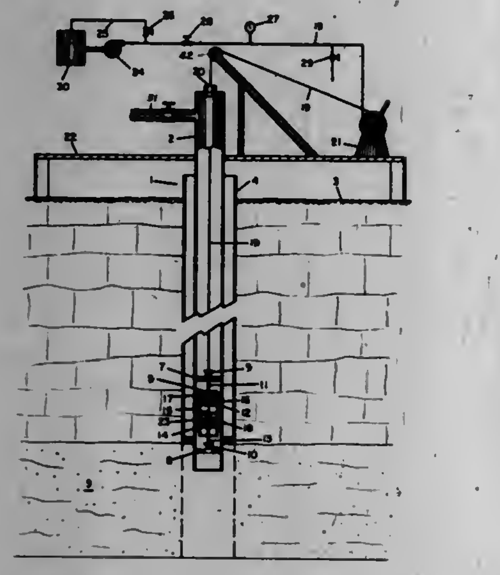
Int. Cl.^{2} F28D *1/06*

U.S. Cl. 166—72 **15 Claims**

1. In a producing well having a production tubing which extends below the surface to a producing reservoir, apparatus for controlling flow of fluid through the production tubing which comprises:
- a. upper and lower valve seats, each located within the production tubing,
- b. operable upper and lower valve discs, each located within the production tubing and adapted to respectively engage and mate with the upper and lower seats when operated,
- c. separate operating means for continuously urging each valve disc toward engagement with its respective seat,
- d. mechanical means for selectively securing the upper valve discs in a position off of its seat and for releasing the

upper disc for movement by its respective operating means, and

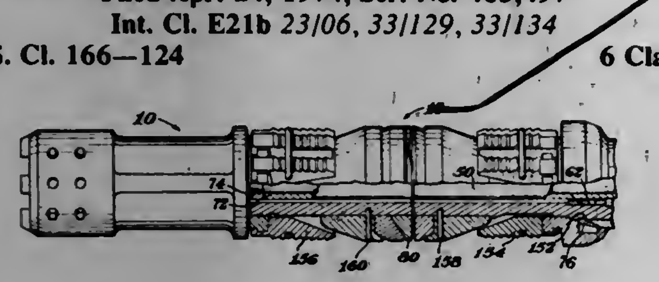
e. hydraulic means for securing the other valve lower disc in a position off of its seat and for releasing the disc for movement by its respective operating means.

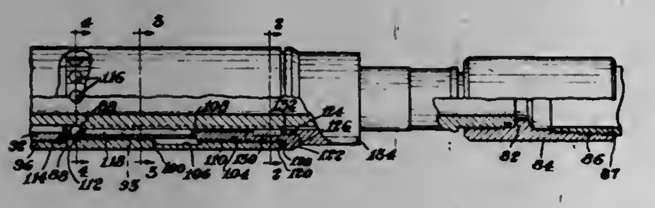


3,887,006
FLUID RETAINER SETTING TOOL

Charles A. Pitts, Wichita Falls, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 24, 1974, Ser. No. 463,497
Int. Cl. E21b *23/06, 33/129, 33/134*
U.S. Cl. 166—124 **6 Claims**



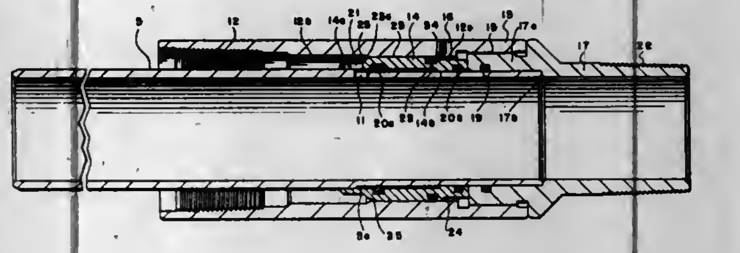


1. A cement retainer setting tool for down hole use in a well bore wherein it is coupled to the lower end of a string of tubing, comprising an elongated hollow mandrel having an upper end and a lower end, an elongated tubular stinger element, said upper end of said mandrel being coupled to said tubing string and said lower end being coupled to one end of said stinger element, said tubing, mandrel and stinger element being in axial alignment, means adjacent to said lower end of said mandrel for coupling a cement retainer device in swiveling relationship with respect to said mandrel, an outer housing having an outer and inner wall and an upper and lower end, said outer housing surrounding said mandrel in spaced relationship with respect thereto from its lower end part to near its upper end part, said outer housing having an array of left hand threads along its inner wall, said left hand threads being disposed at its upper end part, said outer housing having a recessed inner wall part adjacent to the part of said array of left hand threads which is remote from said upper end of said outer housing, a tubular sleeve having an inner and outer wall and upper end and lower end parts, said sleeve fitting between said mandrel and said outer housing and having an array of left hand threads on said outer surface of said upper end part, said last mentioned threads being coupled to said array of said left hand threads of said outer housing, said tubular sleeve having an array of bores extending therethrough, said bores lying generally along a plane perpendicular with the longitudinal axis of said mandrel, said mandrel having a recessed part adjacent to said bores, said bores each containing a detent element, the thickness of said detent elements being such that they extend from said outer housing into recessed part of said mandrel, said recessed inner wall part of said outer housing being disposed no further from said detent elements than the length of said array of left hand threads, and means mechanically coupling said tubular sleeve to said mandrel whereby right hand rotation of said mandrel rotates said sleeve and said left hand threads thereon to force said outer housing downwardly with respect to said mandrel until said detent elements retract into said recessed inner wall part to permit limited lowering of said mandrel through said outer housing.

3,887,007
WELL PACKER ZONE ACTIVATED VALVE

David Lewis Abney, Stafford, and Robert Carl Williams, Spring, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 411,984, Nov. 1, 1973, Pat. No. 3,860,068. This application Oct. 11, 1974, Ser. No. 513,977
Int. Cl.² E21B *23/06;* **G05D** *11/00*
U.S. Cl. 166—224 A **4 Claims**



1. A valve assembly for selectively applying the higher of two available fluid pressures to a well packer assembly, said two fluid pressures arising in the internal bore passage of the tubing string attached to said well packer assembly and the formation pressure below said well packer assembly; said valve assembly comprising:

inner mandrel means having an internal bore passage communicating through said packer assembly to the tubing string above said packer assembly;

outer housing means located concentrically about said inner mandrel means and forming an annular passage therebetween;

first port means between said inner mandrel means internal bore passage and said annular passage;

second port means in said housing means between said annular passage and the well formation; and,

valve member means in said annular passage responsive to fluidic pressure from said first and second port means and adapted to move in response to the higher of said two pressures to block the port means communicating the lower of said pressures.

3,887,008
DOWNHOLE GAS COMPRESSION TECHNIQUE

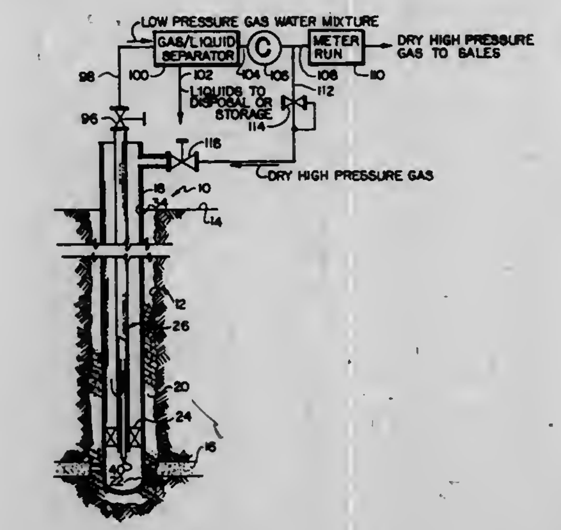
Charles L. Canfield, 5014 Cape Romain, Corpus Christi, Tex. 78412

Filed Mar. 21, 1974, Ser. No. 453,251
Int. Cl. E21b *43/00*
U.S. Cl. 166—267 **12 Claims**

1. A method of continuously producing natural gas for a period of time at the surface from a well providing a first fluid passage affording communication between the surface and an

underground formation which produces both natural gas and a liquid wherein the formation flowing pressure and/or the produced gas volume are insufficient to continuously flow the gas and liquid through the first passage to the surface and a second fluid passage extending from a source of natural gas at a second pressure greater than the formation flowing pressure toward the formation, the method comprising the contemporaneous steps of

1. continuously delivering natural gas from the source through the second passage to a power fluid nozzle inlet of a gas jet compressor located adjacent the formation and accelerating the power gas to a supersonic velocity in a suction chamber downstream of the nozzle;
2. continuously withdrawing natural gas and liquid from the formation and directing the same into the low pressure suction chamber of the gas jet compressor;


LOW PRESSURE GAS WATER MIXTURE
GAS/LIQUID SEPARATOR
C
METER RUN
DRY HIGH PRESSURE GAS TO SALES
LIQUIDS TO DISPOSAL OR STORAGE
DRY HIGH PRESSURE GAS

3. sequentially deaccelerating the gas through a supersonic diffuser and then through a subsonic diffuser for raising the pressure thereof, the subsonic diffuser comprising a high pressure outlet side of the compressor in communication with the first passage;
4. continuously withdrawing a mixture of the gases of steps (1) and (2) and the liquid of step (2) from the subsonic diffuser at a pressure intermediate the formation flowing pressure and the power fluid inlet pressure and at a volume sufficient to overcome the effect of gravity on liquid droplets;
5. continuously passing the mixture upwardly through the first passage to the surface;
6. continuously removing liquid from the mixture at the surface; and
7. continuously delivering at least part of the gas to sales.

8. Apparatus for producing natural gas from a formation which produces both natural gas and a liquid wherein the formation flowing pressure and/or the produced gas volume are insufficient to continuously flow the gas and liquid to the surface, the apparatus comprising:

conduit means extending from the surface to a location adjacent the formation providing a fluid passage therebetween;

a jet compressor, carried by the conduit means adjacent the lower end thereof, including a power gas nozzle having a subsonic convergent inlet section and a divergent supersonic outlet section, a housing in communication with the divergent nozzle outlet section and providing a low pressure inlet in communication with the formation, and a diffuser including a supersonic convergent inlet section in communication with the divergent nozzle outlet section and the housing, and a subsonic divergent outlet section in communication with the fluid passage;

a source of natural gas at a first pressure greater than the formation flowing pressure and means placing the source in communication with the power gas nozzle inlet for reducing the pressure in the housing and for discharging a mixture of natural gas and liquid through the diffuser outlet at a second pressure intermediate the formation flowing pressure and the first pressure and at a volume sufficient to overcome the effect of gravity on liquid droplets in the mixture;

a flow line connected at the surface to the conduit means for receiving the mixture therefrom;

a free water knockout in the flow line for removing the liquid; and

a meter run in the flow line downstream of the free water knockout for measuring gas flowing therethrough.

3,887,009
DRILLING MUD-CEMENT COMPOSITIONS FOR WELL CEMENTING OPERATIONS

Geo. L. Miller, Houston, Tex., and Horst K. F. Barthel, Hamburg, Germany, assignors to Oil Base, Inc., Houston, Tex., by said Miller and Oil Base Germany, G.m.b.H., Hamburg, Germany, by said Barthel

Filed Apr. 25, 1974, Ser. No. 463,899
Int. Cl. E21b *33/13, 33/14*
U.S. Cl. 166—292 **3 Claims**

1. A method for cementing a well borehole being drilled with a salt water or brine based drilling fluid less than 5 pounds per barrel swellable clay, which comprises:

a. admixing said drilling fluid with an additive composition comprising about 9 to about 40 parts by weight magnesium oxide, about 12 to about 50 parts by weight magnesium sulfate and from about 20 to about 60 parts by weight magnesium carbonate or dolomite to provide a hardenable composition of pumpable viscosity and containing from about 20 to about 40 percent by weight water;

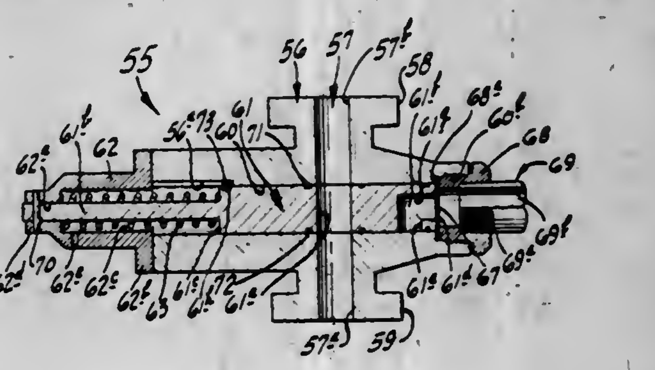
b. pumping said hardenable composition to the desired interval in said well borehole; and

c. ceasing fluid circulation in said borehole to permit said hardenable composition to harden at said desired interval.

3,887,010
WELL FLOW CONTROL METHOD

Phillip S. Sizer, and George G. Grimmer, both of Dallas, Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

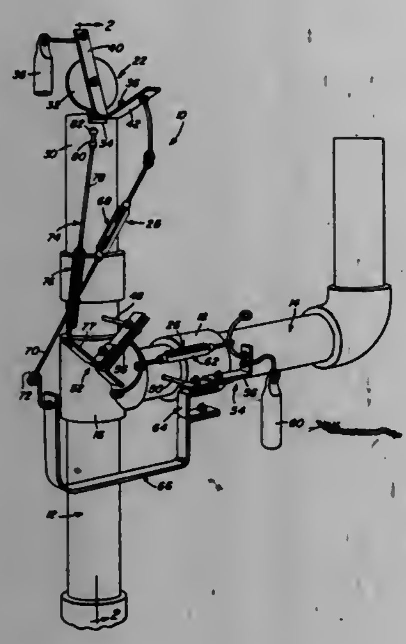
Division of Ser. No. 130,972, April 5, 1971, abandoned. This application Feb. 8, 1973, Ser. No. 330,700
Int. Cl. E21b *43/00*
U.S. Cl. 166—314 **8 Claims**



1. A method of controlling flow from a well having a flow conductor therein for conducting well fluids from a producing formation through a Christmas tree having a control valve connected therein to a production flow line at the surface, said method including: producing well fluids from the well producing formation through the flow conductor and the Christmas tree to the production flow line; automatically closing off flow of well fluids from the well flow conductor to the surface production flow line; and introducing control fluid under pressure into said well flow conductor upstream of said closure while flow is closed off from the surface production flow line to load the well to prevent the escape of well fluids from the formation through the flow conductor.

3,887,011
FIRE EXTINGUISHER

Samuel Dokes, and Alvin K. Isaiah, both of New Orleans, La., assignors to Steven R. Plotkin and David Gertler, both of New Orleans, La., part interest to each
Filed June 4, 1974, Ser. No. 476,286
Int. Cl. A62c *3/02*
U.S. Cl. 169—69 **8 Claims**



1. A fire extinguisher for oil wells, comprising, in combination:

a. a first pipe connected to a well and extending from the well to an outlet end;

b. a second pipe branching from the first pipe;

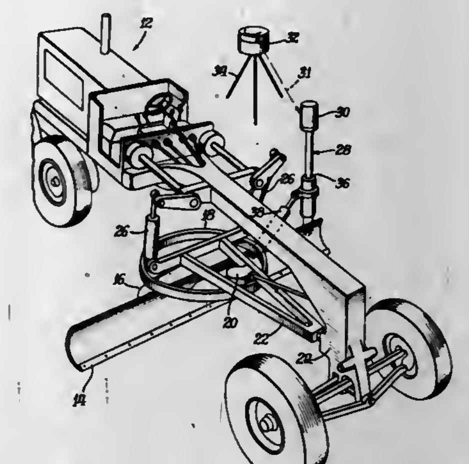
c. valve means for normally unblocking the first pipe and blocking the second pipe, the valve means including a first valve arranged normally-open in the first pipe between the second pipe and the outlet end of the first pipe, a second valve arranged normally-open at the outlet end of the first pipe, and a third valve arranged normally-closed in the second pipe; and

d. actuating means responsive to the presence of a fire in the first pipe for causing the valve means to open the third valve in the second pipe and close the first and second valves in the first pipe for smothering fire contained in the first pipe between the first and second valves.

3,887,012
AUTOMATIC LEVELLING SYSTEM FOR EARTH WORKING BLADES AND THE LIKE

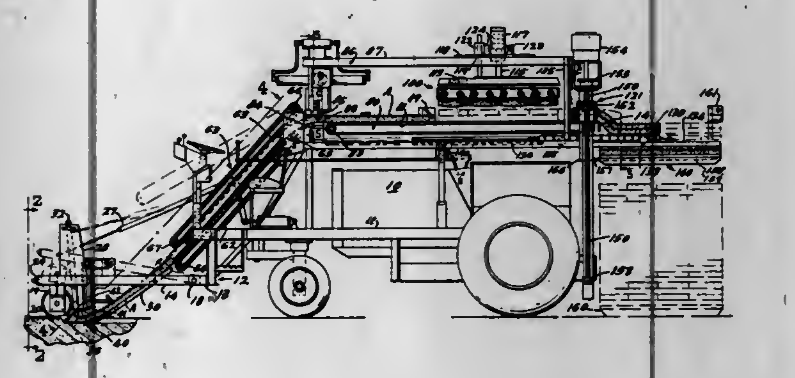
Rolland Dale Scholl, Peoria; Donald Frederick Coleman, Dunlap; Edward Lawrence Johnson, Peoria, and William Edward Streight, East Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Dec. 3, 1973, Ser. No. 421,119
Int. Cl. E02f *3/76*
U.S. Cl. 172—4.5 **11 Claims**

1. In an earthworking implement control system for maintaining an implement in a fixed relationship to a plane comprising means for producng a narrow beam of radiant energy of a fixed wave length, means for sweeping said beam throughout the plane to produce pulsating radiation at any site in the plane, a multidirectional receiving control mounted on the implement for receiving the beam comprising a receiving means including a plurality of sets of at least two series connected angularly disposed light actuated cells for producing an electric signal in response to impingement of said beam thereon, spacer means for supporting said sets of cells in a stacked vertical relationship so that there is at least a first set of said cells and a second set of said cells spaced from said first set across a null region, a plurality of mutually parallel opaque planar members horizontally disposed on opposite sides of said sets of cells and thereby defining said null region between said sets so said planar members are operable to define at least three beam defining channels, and circuit and power means responsive to an electric signal from said cells for moving said implement in a direction when one of said sets produces an electrical signal whereby the null region of said receiving means is moved into the plane of said beam.



3,887,013
SOD CUTTING AND STACKING MACHINE

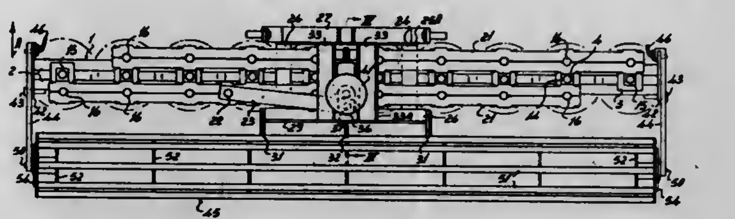
Wilbur Helberg, Bowling Green, Ohio, assignor to Tri-County Machine Products, Inc., Grand Rapids, Ohio
Filed June 24, 1974, Ser. No. 482,091
Int. Cl.^{2} A01B *45/04;* **B65G** *57/00*
U.S. Cl. 172—20 **19 Claims**



1. An apparatus for cutting and stacking lengths of sod comprising, a wheeled chassis for traversing a sod field, a horizontal cutting mechanism at the forward end of the chassis having means for cutting from the field a plurality of continuous parallel ribbons of sod as the chassis traverses the field, means for conveying such cut sod ribbons in generally parallel fashion from the cutting mechanism rearwardly on said chassis, means rearward of the cutting mechanism for transversely severing the advancing parallel ribbons into groups of strips of generally equal length, means for rotating alternate groups of severed strips at right angles to other groups of strips, and means for stacking such rotated and non-rotated groups of severed strips in criss-cross fashion to provide a vertical stack of sod strips.

3,887,014
SOIL CULTIVATORS

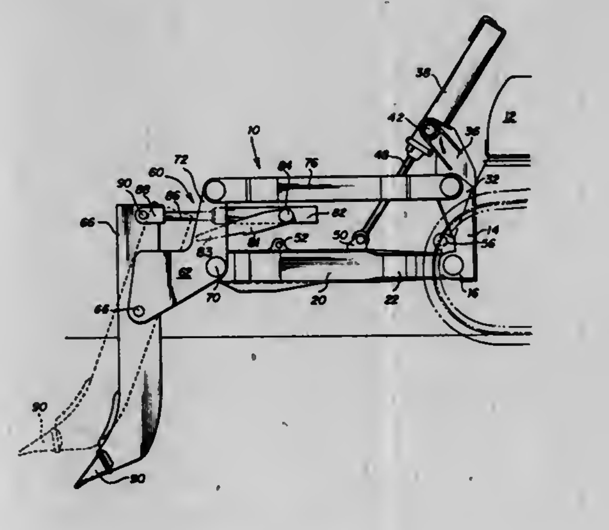
Cornelis Van Der Lely, 7 Brüschemrain, Zug, Switzerland
Continuation of Ser. No. 144,462, May 7, 1971, abandoned. This application Sept. 27, 1973, Ser. No. 401,144
Claims priority, application Netherlands, May 19, 1970, 7007194
Int. Cl. A01b *33/00*
U.S. Cl. 172—54 **15 Claims**



1. A soil cultivator attachment comprising a movable frame and a plurality of soil-working members with downwardly extending tines supported on said frame, said soil-working members being positioned side-by-side in a single row that extends transverse to the direction of travel, each soil-working member comprising a support rotatably mounted on an upwardly extending shaft and each of said tines being mounted on its corresponding support, driving means interconnecting the upwardly extending shafts of said soil-working members, said driving means including eccentric means mounted on said attachment and a horizontally extending driving rod means, said driving rod means being in driving connection with each of said shafts to rotate the same and oscillate said soil-working members and tines to and fro through the soil, the upper ends of said shafts being supported and journalled in said cultivator attachment, said tines being offset with respect to their corresponding upwardly extending shafts, said offset being such that adjacent soil-working members work overlapping paths when oscillated, said frame having attachment means at the forward end thereof for coupling to a prime mover.

3,887,015
CONVERTIBLE RIPPER AND GOUGER AND TOE TRIMMER

Leon O. Kelley, P.O. Box 488, Stamford, Tex. 79553
Filed Apr. 30, 1973, Ser. No. 355,870
Int. Cl. A01b *63/10, 63/32;* **A01g** *23/06*
U.S. Cl. 172—254 **1 Claim**



1. A plow assembly comprising:

a frame having first, second, third and fourth links for connection to a prime mover; means on said first link for rigid connection to the prime mover; said second link comprising a pair of parallel spaced linkage bars, a cross-bar rigidly connecting said spaced linkage bars; a first connection means on said first link for selectively pivotally connecting one end of each of said linkage bars at a first point on said first link; a second connection means on said first link for selectively pivotally connecting said one end of each of said linkage bars to a second point on said first link; said third link positioned to extend parallel to said second link when said second link is connected to said first link at the first point of connection; said third link having a pair of outwardly diverging arms at one end, said outwardly diverging arms having their ends pivotally connected to said first link at a point spaced away from the first and second points of connection of said second link, said third link extending parallel to said second link when said second link is connected to said first link at the first point; said fourth link pivotally attached between the ends of said linkage bars of said second link opposite the ends connected to said first link and the end opposite said diverging portion of said third link;

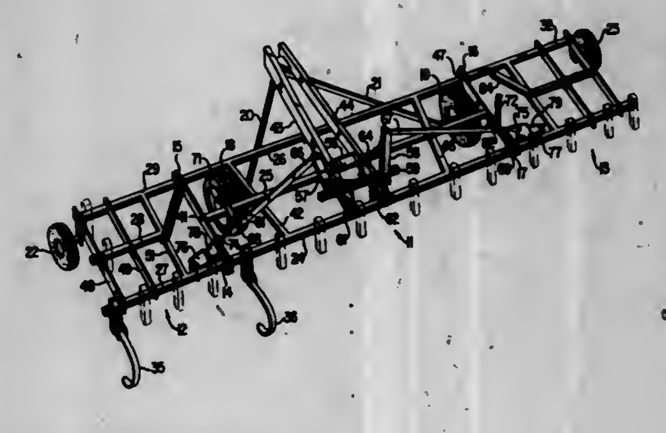
a first variable link hydraulic cylinder assembly with one end pivotally attached to said first link and the other end pivotally attached to said third link for raising and lowering said frame relative to said first link, said cylinder being centrally positioned to extend between said bars of said second link;

a shank assembly having a shank and a downwardly curved toe, said shank being pivotally connected to said fourth link in either a first or second position, said toe pointing down and away from said first link in said first position and down and towards said first link in said second position; and

a second variable link hydraulic cylinder positioned to extend between said bars of said second link and with one end pivotally connected to said fourth link and with its other end pivotally connected to said shank on said shank assembly, said second cylinder operable to pivot said shank with respect to said fourth link to operate said plow assembly as a highway cut trimmer when said shank is in said first position and as a gouger when said shank is in said second position.

3,887,016
FIELD CULTIVATOR WING LIFT

Loren F. Hansen, Ankeny, Iowa, assignor to Koehring Company, Milwaukee, Wis.
Division of Ser. No. 314,679, Dec. 13, 1972. This application May 30, 1974, Ser. No. 474,589
Int. Cl. A01b *23/04, 73/00*
U.S. Cl. 172—311 **5 Claims**



1. A cultivator comprising:

A. at least two frame sections;

B. pivot means connecting said frame sections together in side-by-side relationship for movement of a first frame section relative to a second frame section between a working position substantially in horizontal alignment with said second frame section and a transport position obliquely over said second frame section; and

C. power means connected to said first frame section including a reciprocating power source and a multibar linkage, said power means:

1. effecting raising said first frame section from said working position to an interim position upon movement of said power source in a first direction,
2. effecting movement of said first frame section from said interim position to said transport position upon movement of said power source in a second direction opposite to said first direction,
3. effecting movement of said first frame section from said transport position to said interim position upon the next movement of said power source in said first direction, and
4. effecting movement of said first frame section from said interim position to said working position upon the next movement of said power source in said second direction.

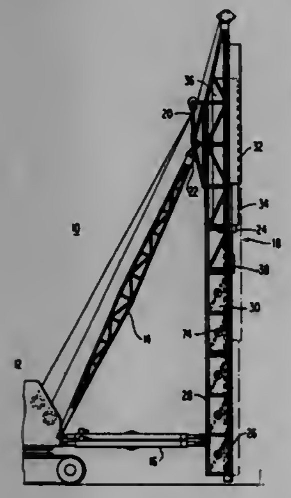
3,887,017
MODULAR LEADS FRAME WITH NOISE ABATEMENT SYSTEM AND PILE FEEDER

Leonard L. Frederick, 15 Crestview Ter., Whippany, N.J. 07981

Continuation-in-part of Ser. No. 142,173, May 11, 1971, Pat. No. 3,747,689. This application May 14, 1973, Ser. No. 359,782

Int. Cl. B21j

U.S. Cl. 173—46 **14 Claims**



1. In a pile driving machine including a boom, a leads frame operatively associated therewith and a pile driving hammer, the improvement comprising: a plurality of noise abating shield members; means mounting said shield members to said leads frame to thereby abate the noise resulting from the driving impact of the hammer against the pile; and drive means, wherein said shield members are mounted to said leads frame such that a first set of said shield members are stationary and mounted to said leads frame to extend for substantially the full height of said leads frame and a second set of said shield members are engageable with said drive means and movable thereby, said second set of shield members being adjacent to the operative position of said drive hammer relative to the pile being driven.

3,887,018
FLUID DRIVEN HAMMERS

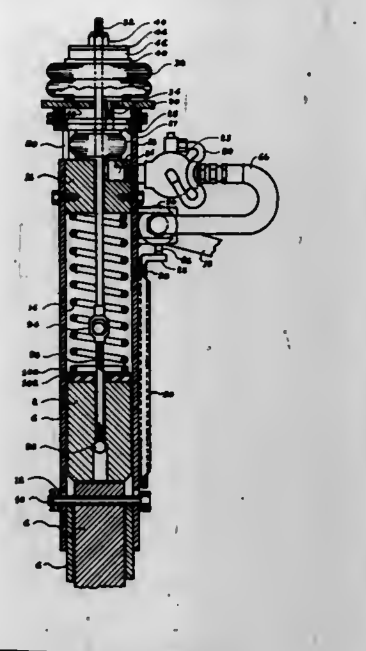
Murray L. Jayne, 8609 Lakeshore Dr., Kenosha, Wis. 53140

Filed Jan. 25, 1974, Ser. No. 436,483

Int. Cl. B25d *9/00*

U.S. Cl. 173—120 **8 Claims**

1. An impact tool comprising a frame including an elongated housing open at one end, a hammer element longitudinally movable within said housing, resilient means connected to said frame and to said hammer element in relation to urge said hammer element in one direction, fluid actuated means on said frame, means permanently connected with said fluid actuated means, extending to and connected in fixed relation with said hammer element in position to move said hammer element, when said fluid actuated means is activated, in the other direction, and valve means connected to said fluid actuated means and constituted to suddenly release pressure fluid from said fluid actuated means to exhaust said fluid actuated means to free said fluid actuated means and said hammer element to be propelled in the first mentioned direction by said resilient means.



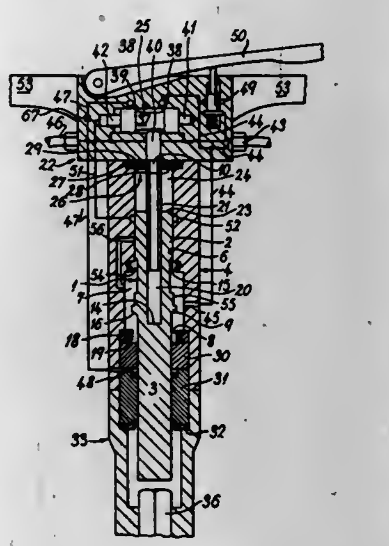
3,887,019
HYDRAULIC PERCUSSIVE IMPLEMENT

Lionel Arthur Reynolds, Painswick near Stroud, and David Richard James, Hasfield, both of England, assignors to A. F. Hydraulics Limited, England

Filed May 1, 1972, Ser. No. 249,223

Int. Cl. B25d *9/26*

U.S. Cl. 173—134 **26 Claims**



1. A hydraulically-operated percussive implement which includes:

a. a casing,
b. first and second chambers within the casing,
c. a striker piston reciprocable within the casing,
d. means for introducing pressurised fluid into said chambers and for controlling the fluid pressures in said chambers,
e. said striker piston having a relatively large first effective piston area which partly bounds the first chamber and is acted upon when pressurized fluid is introduced into the first chamber to cause the striker piston to execute a working stroke,

f. said striker piston also having a relatively small second effective piston area which partly bounds the second chamber is acted upon by pressurized fluid introduced into the second chamber, and when the fluid pressure in the first chamber is reduced, to cause the striker piston to execute a return stroke,
g. said second chamber having a wall at the end thereof remote from the first chamber which is formed with a sealed aperture through which an end portion of the striker piston projects,
h. the casing including tool holding means for locating a tool so as to be struck by the end of the striker piston towards the end of the working stroke thereof,
i. a collar on that portion of the striker piston which passes through the second chamber, said collar having opposing effective surface areas which are normally both exposed to the pressure in the second chamber and being of such dimensions as to permit of passage of fluid in the second chamber around the collar during normal reciprocatory movement of the striker piston,
j. an overshoot dashpot cavity situated at the end of the second chamber remote from the first chamber and positioned so that, in the event that the length of the working stroke should exceed a normal length as a result of removal of external resistance to advance of the tool, the collar will enter the cavity to trap fluid therein,
k. the effective area of the collar presented to the dashpot cavity being substantially in excess of the second effective piston area of the striker piston, and
l. restrictor means provided as the sole path for escape of fluid trapped in the cavity on entry thereinto of the collar.

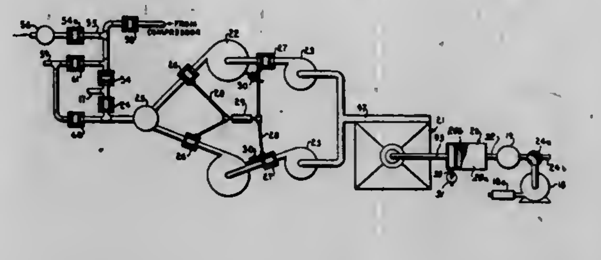
3,887,020
APPARATUS FOR GEOLOGICAL DRILLING AND CORING

John D. Chaffin, 851 Haverford Ave., Pacific Palisades, Calif. 90272

Continuation-in-part of Ser. No. 132,001, April 7, 1971, abandoned. This application Jan. 15, 1973, Ser. No. 323,852

Int. Cl. E21b *21/00;* **E21c** *7/02*

U.S. Cl. 175—206 **10 Claims**



1. An apparatus for drilling and recovering geological samples comprising:

A. rotary drilling means having a hollow drill stem and a drill bit secured to the lower end thereof for forming continuous bore holes in the earth;
B. means for raising and lowering said drill stem and means for rotating said drill stem and bit;
C. means for creating a vacuum in said hollow stem whereby a current of air is sucked down through an annulus formed between the drill stem and the earth and is drawn up the inside of said drill stem while entraining the drilled material from the bore hole;
D. separator means for removing the drilled material from the air stream;
E. means for guiding the air and entrained material from the top of the drill stem to the separator means; and
F. means selectively positionable for disconnecting the vacuum means, the separator means and the entrained material guiding means and for connecting a drilling fluid pump to the drill stem for pumping drilling fluid down the drill stem.

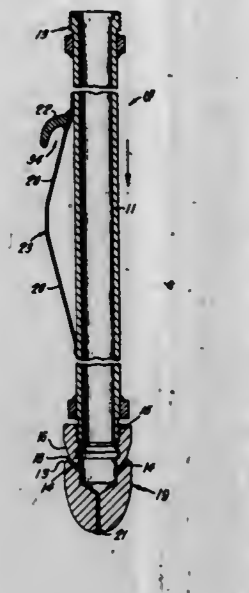
3,887,021
METHOD AND APPARATUS FOR BORING DRAIN HOLES IN GROUND

Ketil E. Elbert, 631 Cote St., Antoine Rd., Westmount, Quebec, Canada

Filed Feb. 4, 1974, Ser. No. 439,142

Int. Cl. E21b *7/18*

U.S. Cl. 175—422 **6 Claims**



1. A boring device for boring a hole in soft ground, such as clay or the like, and for insertion of a drain element in said hole, said device comprising a rigid hollow tubular body having a nozzle at an end thereof and connectable means at an opposite end for securement to water delivery means, said nozzle having a forwardly directed jet orifice and at least two retro-directed orifices for causing penetration of said body into said ground, and hook means secured to an outer wall of said tubular body for releasably engaging an end of said drain element to be positioned in a hole bored by said device.

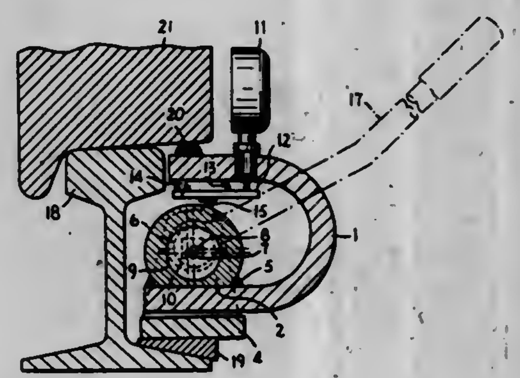
3,887,022
RAILWAY VEHICLE-LOAD MEASURING METHOD AND DEVICE

Tzvyatko Penchev Stanev, Sofia, Bulgaria, assignor to DSO "Bulgarski Darjavni Jeleznitzi", Sofia, Bulgaria

Filed Aug. 16, 1973, Ser. No. 388,888

Int. Cl. G01g *19/02*

U.S. Cl. 177—146 **3 Claims**

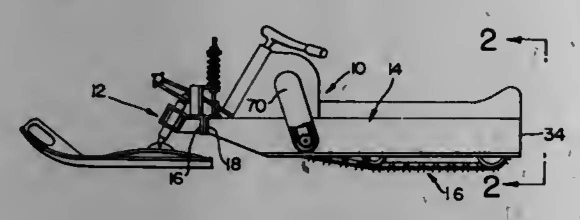


1. An apparatus for measuring the load of a vehicle wheel, comprising a support, a U-shaped shackle on said support having a lower arm and an upper arm, said arms being relatively deflectable, a crankshaft journaled on said support and having an eccentric portion received between said arms, a bushing fixed to the lower arm and receiving said eccentric portion, a rocker arm fulcrumed on said bushing and having one end engaged by the upper arm of said shackle, a compressive-force guage on said upper arm engaging another end of

said rocker arm, and a manual lever connected to said shaft for raising said lower arm, thereby bringing said upper arm into engagement with said wheel and causing relative deflection of said upper and lower arms and rotation of said rocker arm.

3,887,023
SNOWMOBILE REAR DRIVE CONSTRUCTION

Carl P. Henning, 1231 Stellma La., Rochester, Mich. 48063
Filed Feb. 27, 1973, Ser. No. 336,250
Int. Cl. B62m *27/02*
U.S. Cl. 180—5 R **17 Claims**



1. In a snowmobile rear drive construction, the combination comprising

a framing structure having a top plate web portion, depending leg members at each lateral side thereof and a forward transverse rib member conjoined to each other,

dual drive tracks,

a longitudinally extending, vertically disposed, substantially planar medial support plate member affixed to said top plate web portion and said forward transverse rib member and disposed between said dual drive tracks,

an engine driven front end cross shaft rotatably mounted upon said framing structure,

a drive track support frame structure for each said drive tracks pivotally mounted upon said cross shaft and slidingly engaged with said medial support,

slide guide means affixed to each said drive track support frame structure and slidable upon and relative to said medial support,

a longitudinally extending guide frame for each said drive tracks secured to each said drive track support frame structure,

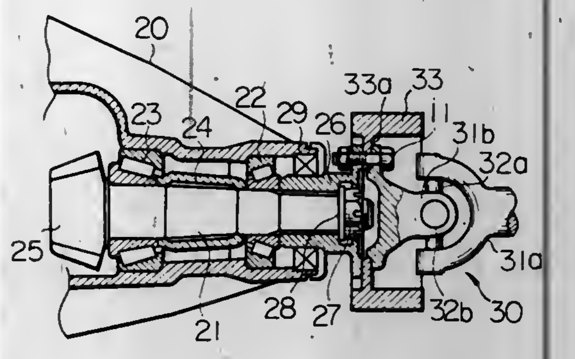
a drive sprocket for each said drive tracks fixedly mounted on said cross shaft and rotatable therewith, and in engagement with said drive track to drive the same upon and about said guide frame,

and an equalizing member pivotable and retained upon said medial support plate member intermediate its ends, extending transversely and to either side thereof, disposed for bearing engagement upon each said drive track support frame structure to maintain said drive tracks in substantially parallel ground plane terrain contact.

3,887,024
MOTOR VEHICLE DRIVE LINES

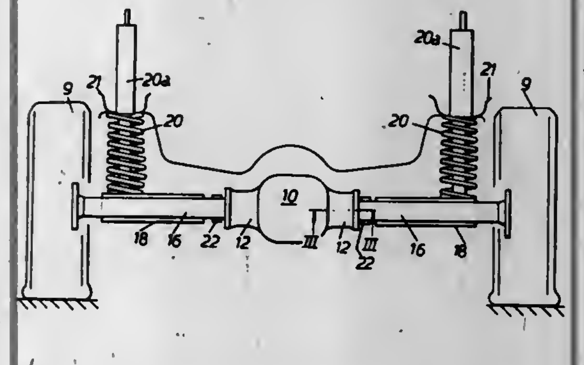
Koichi Takahashi, and Eiichi Abe, both of Yokohama, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan
Filed May 16, 1972, Ser. No. 253,875
Claims priority, application Japan, Nov. 12, 1971, 46-89785
Int. Cl. B60k *17/22;* **B60b** *17/16*
U.S. Cl. 180—70 P **5 Claims**

1. A driven vehicle comprising a vehicle body, a propeller shaft and a final drive unit, the final drive unit comprising a pinion drive shaft rotatable supported by pinion bearings in an axle housing, a spacer provided on a portion of the pinion drive shaft spacing the bearings from each other, a pinion driving flange provided on the pinion drive shaft and rotatable therewith, and a rear yoke of a rear universal joint fixedly connected to and rotatable with the pinion driving flange, and an inertial mass of a predetermined weight coaxially coupled with and rotatable with the pinion drive shaft, said inertial mass having a circular wall section interposed between said rear yoke said pinion driving flange and secured thereto said mass being positioned with its center of gravity aligned with the axis of said pinion drive shaft adjacent a forward end portion thereof, so as to increase the predetermined magnitude of the moment of inertia of the pinion drive shaft to cause a reduction in the otherwise occurring resonance frequency of the pinion drive shaft and in the vibrations produced in the final drive unit and therefrom transmitted to the vehicle body.



3,887,025
RIGID REAR AXLE SUSPENSION SYSTEMS

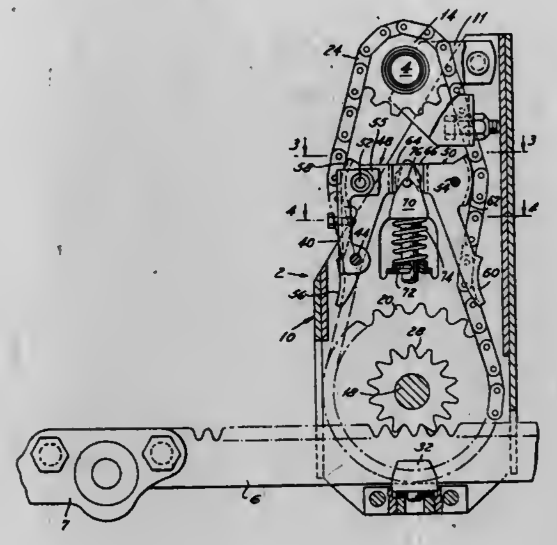
Helmut Kaltwasser, Eltville, Germany, assignor to General Motors Corporation, Detroit, Mich.
Filed Dec. 3, 1973, Ser. No. 420,759
Claims priority, application Germany, Dec. 23, 1972, 2263374
Int. Cl. B62d *21/00*
U.S. Cl. 180—73 TL **6 Claims**



1. A rigid rear axle suspension system for a motor vehicle, utilising non-guiding suspension springs, comprising a differential housing, a pair of axle tubes rotatably supported at inboard ends thereof by respective laterally opposed portions of the differential housing, a pair of longitudinal control arms projecting in a forward direction from the respective axle tubes, means fixedly securing a rear end of each control arm to the respective axle tube, means disposed at a front end of each control arm for providing an articulated connection to a portion of the vehicle frame, a pair of longitudinal cantilever arms projecting in a forward direction from the respective axle tubes, means fixedly securing a rear end of each cantilever arm to the respective axle tube, a cross-member mounted on the differential housing for pivotal movement about a longitudinal centre axis, means providing an articulated connection between a front end of each cantilever arm and a respective end of the pivotal cross-member, and means providing resilient take-up of changes in lateral spacing between the pivotal cross-member and the respective axle tubes, corresponding to vehicle cornering or other conditions involving unequal travel of said suspension springs.

3,887,026
MOTOR VEHICLE POWER STEERING DEVICE

William D. Allison, Grosse Pointe Farms, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Sept. 24, 1973, Ser. No. 400,439
Int. Cl. B62d *5/08*
U.S. Cl. 180—79.2 **2 Claims**



1. A power steering device for a motor vehicle comprising: a driving sprocket constructed to be connected to a steering wheel,

a driven sprocket constructed to be connected to a pinion gear,

a chain drivingly interconnecting said driving sprocket and said driven sprocket,

a laterally translatable toothed rack in meshed engagement with said pinion gear,

said rack being constructed to be connected to an element of the steering linkage system of said motor vehicle,

a chain tensioner means engaging said chain,

said chain tensioner means being displaceable in response to the transmission of a force from said driving sprocket through said chain to said driven sprocket,

a power steering valve having first and second valve control means,

said first valve control means being actuatable in response to displacement of said tensioner means,

said second valve control means being actuatable by means independent of said first valve control means and said tensioner means,

said power steering valve being constructed to direct power steering fluid to a hydraulic motor that is arranged to apply a force to said element of said steering linkage system in response to the actuation of either said first or second valve control means.

3,887,027
STEERING MECHANISM WITH LATERAL FORCE CORRECTION

William D. Allison, Grosse Pointe Farms, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Sept. 24, 1973, Ser. No. 400,440
Int. Cl. B62d *5/08*
U.S. Cl. 180—79.2 **7 Claims**

1. A power steering device for a motor vehicle comprising: a power steering valve constructed to be operatively interposed between a power steering pump and a power steering booster cylinder,

first and second mutually independent valve control means operatively connected to said power steering valve,

said power steering valve being constructed to direct power steering fluid from said pump to said booster cylinder in response to the actuation of either of said valve control means,

one of said valve control means being constructed to be automatically actuated in response to manual actuation of a motor vehicle steering gear,

sensing means constructed to provide a signal in response to a force arranged to deviate said vehicle from a predetermined course,

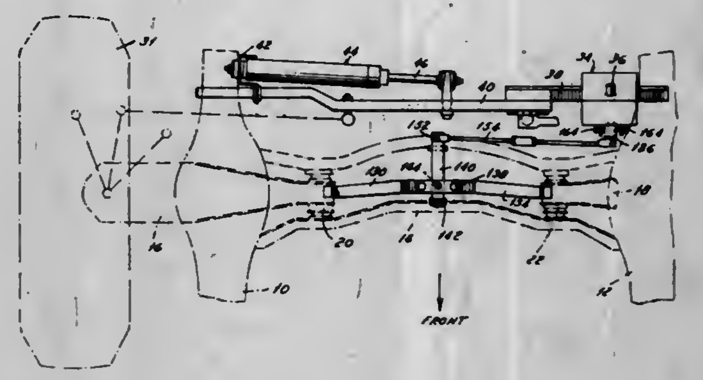
the other of said valve control means being constructed to be automatically actuated in response to said signal provided by said sensing means,

sprung and unsprung motor vehicle components,

a suspension arm interconnecting said components,

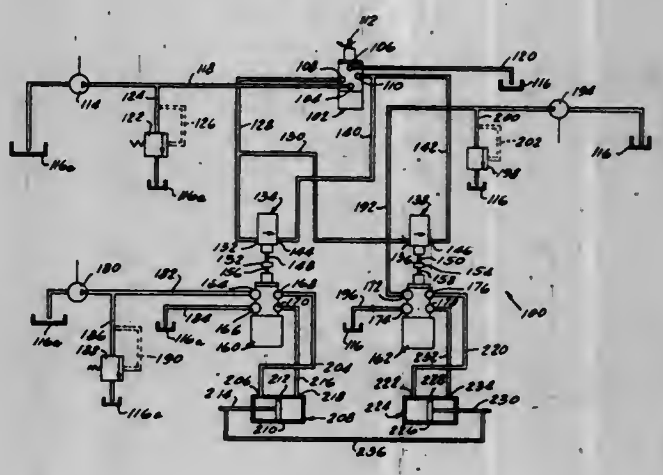
resilient bushing means connecting said arm to said sprung component,

said sensing means constructed to provide said signal in response to deflection of said resilient bushing means.



3,887,028
STEERING SYSTEM

Raymond L. Goff, and Jim L. Rau, both of Lafayette, Ind., assignors to TRW Inc., Cleveland, Ohio
Filed Feb. 25, 1974, Ser. No. 445,209
Int. Cl. B62d *5/08*
U.S. Cl. 180—79.2 R **13 Claims**



1. A vehicle steering system comprising,

two independent vehicle steering systems which when actuated either together or individually will effect vehicle steering, each of said steering systems including,

a steering cylinder connected to effect vehicle steering upon actuation thereof,

a metering mechanism for metering fluid flow to said steering cylinder, and

a valve for directing that flow to said steering cylinder, and

means for operating each system upon operator actuation thereof,

said metering mechanism and said valve for each system comprising parts of a fluid controller having an input shaft which when turned effects actuation of said valve and said metering mechanism, said means for operating said systems comprising means for effecting rotation of said input shaft of each of said fluid controllers, and

said means for effecting rotation of said input shaft comprising a fluid motor connected with the shaft and a mechanism operated upon turning of the vehicle steering wheel for actuating said fluid motor.

3,887,029
ANTI-THEFT DEVICES

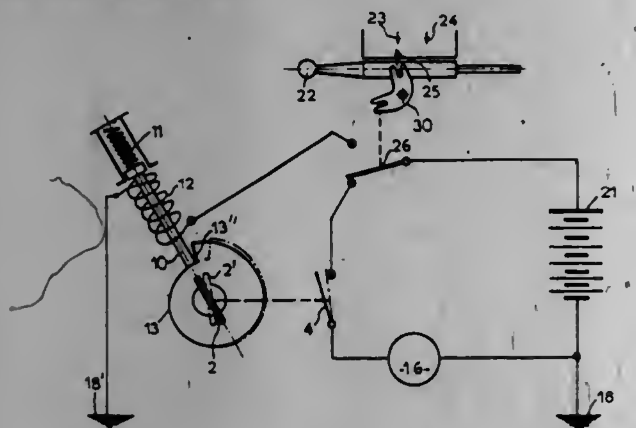
Paul Lipschutz, Croissy-Sur-Seine, and Jean Leroy, Saint-Cyr-L'Ecole, both of France, assignors to Societe d'Exploitation des Brevets Neiman, Neuilly s/Seine, France

Division of Ser. No. 182,385, Sept. 21, 1971, Pat. No. 3,782,493, which is a continuation-in-part of Ser. No. 47,706, June 19, 1970, Pat. No. 3,688,861. This application Oct. 17, 1973, Ser. No. 407,405

Claims priority, application France, Sept. 28, 1970, 70.34733

Int. Cl. B60r *25/02*

U.S. Cl. 180—114 5 Claims



1. In an anti-theft device having a lock including key-operated means, a bolt adapted to engage a control element of an automotive vehicle with a Diesel engine and with mechanical engine starting means, said lock including key-operated means having a first position in which the bolt is engaged with the control element and a second position in which the bolt is disengaged from said control element, and blocking means adapted to block the movement of said key-operating means, the improvement consisting in that said device comprises means for operatively connecting said blocking means to said engine starting means, said connecting means being responsive to the engine starting position of said engine starting means to block the movement of said key-operated means from said second into said first position, and responsive to the non-starting position of said engine starting means to permit movement of said key-operated means between said two positions.

3,887,030
DUCT SYSTEMS FOR AIR CUSHION VEHICLES

Christopher John Fitzgerald, 6 A'Beckett St., Coburg, Australia (3058), and Robert Keith Wilson, 176 Woods St., West Newport, Australia (3015)

Filed Dec. 11, 1973, Ser. No. 423,796

Claims priority, application Australia, Dec. 15, 1972, 1647/72; July 2, 1973, 3886/73

Int. Cl. B60v *1/14*

U.S. Cl. 180—121 18 Claims

1. An air cushion vehicle comprising:

a base;

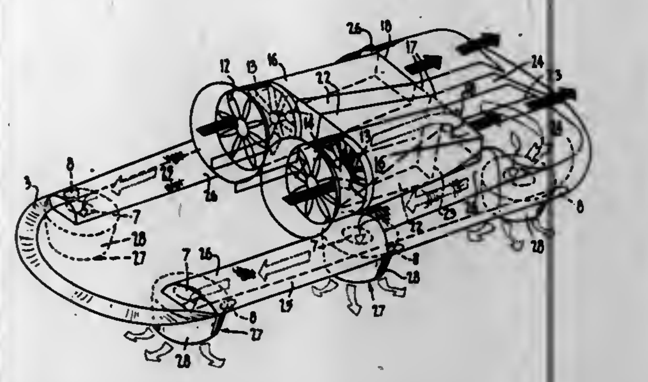
power supply means located on the base comprising two axial flow fans located on opposite sides of the fore-aft mid-line of the vehicle;

stator means immediately downstream of said fans;

two separate and independent duct systems each connected to and supplied, in use, by a respective one of said fans and located on opposite sides of said mid-line;

splitter means positioned immediately downstream of said stator means for dividing each duct system into a propulsion duct and an air cushion duct;

the propulsion ducts extending rearwardly to adjacent the rear end of the vehicle, said propulsion ducts being positioned laterally closer to the sides of said vehicle than the openings of the air cushion ducts to said fans, and said propulsion ducts converging towards their outlets to provide means to pressurize said air cushion ducts; and



said air cushion ducts each including a first portion extending rearwardly and a second portion extending forwardly of the vehicle, said rearwardly extending portion including a diffuser debouching into a chamber of relatively large cross-sectional area intermediate said rearwardly and forwardly extending portions.

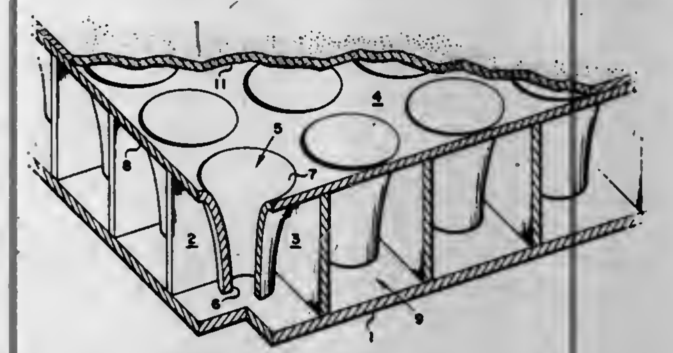
3,887,031
DUAL-RANGE SOUND ABSORBER

Leslie S. Wirt, Newhall, Calif., assignor to Lockhead Aircraft Corporation, Burbank, Calif.

Filed June 11, 1973, Ser. No. 369,100

Int. Cl. E04b *1/84*

U.S. Cl. 181—33 G 10 Claims



1. Wide-range apparatus for the absorption of an ambient sound field, comprising:

means defining a sound-confining chamber; and,

an acoustical horn having a predetermined cutoff frequency and having a sound-receiving mouth at one end and a smaller throat at the other end of the horn path, said path being characterized by a continuously changing cross-sectional area along its length, said horn being nested within said chamber so as to have said mouth acoustically coupled to the exterior of said chamber and said throat acoustically coupled to the interior of said chamber, the internal volume defined by said chamber and said horn comprising a damped helmholtz resonator whereby incoming sound above said cutoff frequency will be propagated from said mouth towards said throat whereupon said sound will be reflected back toward said mouth due to the discontinuity at the junction of said throat and said chamber, thereby causing destructive cancellation between incoming and reflected sound waves, and whereby the inertia of the air mass in said horn resulting from incoming sound below said cutoff frequency is just compensated by the air confined in said chamber so as to cause helmholtz resonance to occur within said chamber.

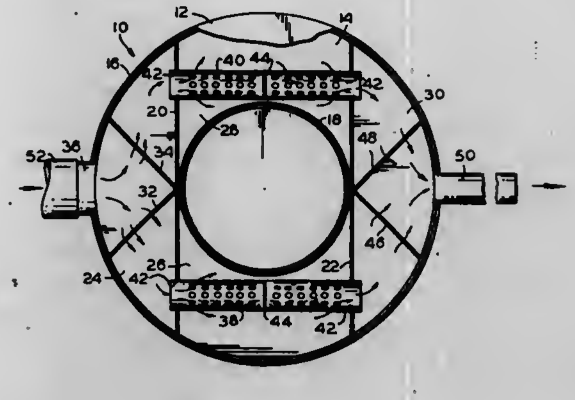
3,887,032
MUFFLERS

Frank N. Harris, 4761 S.W. Martha St., Portland, Oreg. 97221

Filed Aug. 2, 1974, Ser. No. 494,224

Int. Cl. F01n *1/02*

U.S. Cl. 181—59 14 Claims



1. In an improved muffler,

toroidal chamber means,

inlet means opening into one portion of the toroidal chamber means,

outlet means opening into a second portion of the toroidal chamber means spaced around said toroidal chamber means from said one portion,

a pair of partitions dividing the toroidal chamber means into an inlet chamber, an outlet chamber, and two side chambers between the inlet chamber and the outlet chamber, one of the partitions having inlets to the side chambers and the other partition having outlets to the outlet chamber,

and baffle means in the side chambers between the inlets and the outlets.

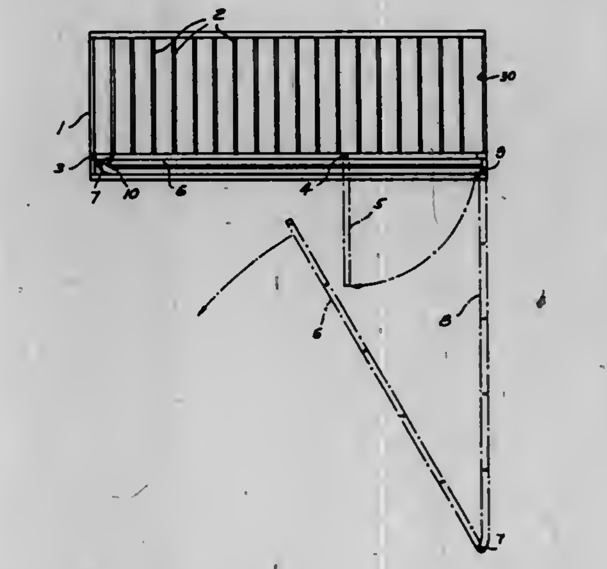
3,887,033
FIRE ESCAPE

Harry V. Breinig, 8660 Burton Way, Los Angeles, Calif. 90048

Filed Jan. 4, 1974, Ser. No. 430,894

Int. Cl. E06c *9/10*

U.S. Cl. 182—78 3 Claims



1. A fire escape for use with a building having a window, said building comprising:

a frame having three interconnected vertical walls and a horizontal rectangular floor secured to the bottom of the walls;

means securing said frame to the outside of the building in front of the window, the non-adjacent two of said walls being separated by a space which is adjacent the window;

a trapdoor pivotally connected the floor;

a folded ladder pivotally connected to said floor and disposed below the trapdoor, the ladder being in folded sections, the topmost section supporting the door in place whereby the door falls to vertical position when the ladder unfolds, the door being spaced from the ladder to define a space through which escapees can pass from the window to the ladder; and

means to release said ladder whereby it unfolds to vertical position for use by gravity.

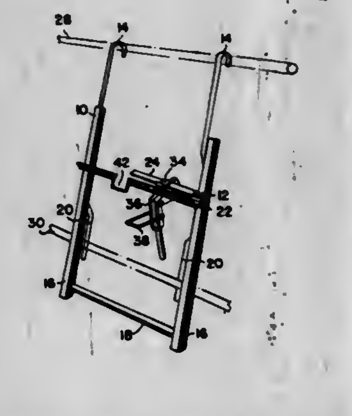
3,887,034
PORTABLE PIPE CLAMP

John Walter Sawatzky, Belmont, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,374

Int. Cl. E06c *7/48*

U.S. Cl. 182—129 1 Claim



1. A device for clamping of a flexible conduit, pipe or tube, which device may be fitted about the rungs of a ladder, with said device hooking over the horizontal rungs of a ladder installed in the vertical position,

said device including two longitudinal support members joined by a cross member perpendicular to the two support members with the upper end, in the installed position of each support member, terminating in an open hook of a size to fit about a ladder rung and with each support member being fitted with an opened hook member at its rear of a size to fit about a second rung of a ladder to which the device is attached, together with a clamping device for clamping a pipe which is fixed to the two support members so as to lie generally parallel to a rung of an attached ladder, with the clamping device consisting of two opened angled members rotatably joined to each other, in which

one of the clamp members is fixed to both support arms of the device with the other clamp member being fitted in rotatable relation to the fixed clamp member, with the rotatable clamp member being of shorter length than the fixed clamp member and with an undercut section of the fixed clamp member located adjacent to the end of the rotatable clamp member so that a pipe secured by both clamp members may be cut by a saw without the saw engaging the fixed clamp member.

3,887,035
COMPRESSOR OIL PUMP WITH FILTER

Billy B. Hannibal, Tecumseh, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

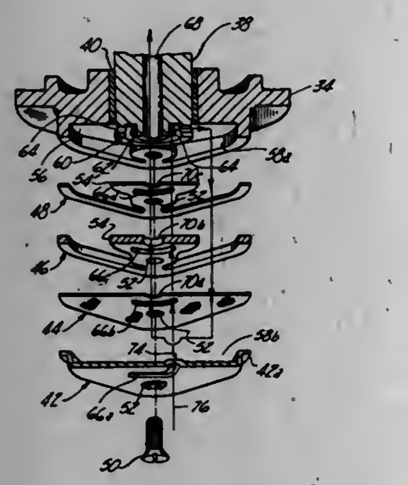
Filed Mar. 21, 1974, Ser. No. 453,280

Int. Cl. F01m *1/10*

U.S. Cl. 184—6.16 12 Claims

1. An oil pump and filter device for a gas compressor comprising in combination a crankshaft with a lubricating oil passage extending generally axially therein from one end thereof, a sump for lubricating oil disposed adjacent the crankshaft, a housing with said one end of the crankshaft journalled therein, a discharge chamber formed in cooperation with said housing adjacent said one end of said crank-

shaft, a centrifugal impeller received in said discharge chamber and fixed to said crankshaft for rotation therewith, said impeller having an inlet chamber communicating with both lubricating oil in the sump and said discharge chamber for discharging oil into said discharge chamber at a higher pressure than the oil in the sump in response to rotation of said impeller by the crankshaft, and a filter positioned in flow communication with said discharge chamber for filtering therethrough the flow of oil after it is discharged from said impeller and before entering the axial oil passage of the crankshaft.

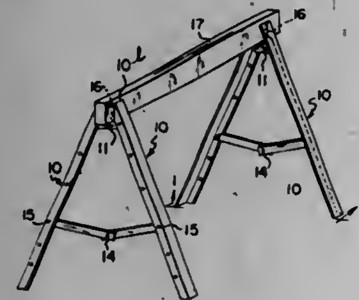


3,887,036
COLLAPSIBLE SAWHORSE STRUCTURE
Stanley H. Telban, 682 Meadowland Dr., Richmond Heights, Ohio 44143

Filed June 10, 1974, Ser. No. 477,591

Int. Cl. F16m *11/00*

U.S. Cl. 182—186 **1 Claim**



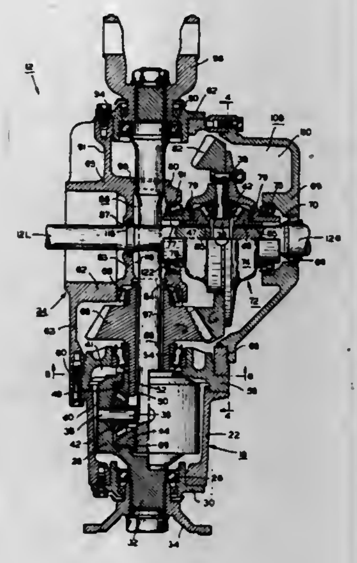
1. A collapsible sawhorse structure comprising a pair of linear rigid legs, as a fulcrum support a short rigid bar, pivot pins joining opposite ends of said bar to each of said legs near the top and spaced equally from the upper ends thereof, a locking toggle located between said legs and having two right links of equal length, a pivot connecting the inner ends of said links, a pivot connecting the outer end of each link to its associated leg more than half-way down each leg, said last named pivots being equally spaced from the bottoms of said legs, means limiting the swinging of said links in a direction to spread said legs about said fulcrum pivot pins to a position where said toggle breaks slightly downwardly, each of said legs being a structural metal angle having a first leg extending at right angles to an associated stringer and a second leg extending parallel to said stringer, said pivot pin connections to said legs passing through said first leg, and a series of sharp saw tooth shape biting projections facing inwardly on the upper ends of said first legs above said fulcrum support bar so positioned that, when they have well entered into a stringer, the uppermost end of said second leg firmly engages said stringer and braces an assembled sawhorse against stress endwise of said stringer, said projections embedded in said stringer providing the sole connection between said legs and said stringer, whereby a wooden stringer may be placed with its opposite ends respectively between the spread upper ends of two of said pairs of legs spaced along said stringer while the lower portions of said legs below said bar are at least partially collapsed, then said lower portions of said legs may be spread about said fulcrum pivot pins until said toggles break slightly downwardly thus causing said biting projection to bite into said wooden stringer to firmly fix the connections of each of said pairs of legs to said stringer. stringer.

3,887,037
LUBRICATION SYSTEM FOR DIFFERENTIALS
Raymond P. Haluda, South Bend, Ind., and Kenneth W. Nelson, Niles, Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Mar. 20, 1974, Ser. No. 452,872

Int. Cl. F01m *9/12*

U.S. Cl. 184—6.12 **18 Claims**



1. In an axle assembly of the type having a bevel gear drive, including a pinion gear and a ring gear, and further including an axle differential attached to said ring gear and rotatable about the axis of rotation of said ring gear, said axle differential including a generally closed differential carrier housing, a cross disposed within said carrier housing and connected for rotation with the carrier housing, a planetary gear carried by said cross, a pair of coaxial side gears on opposite sides of said cross rotatable about the ring gear axis of rotation and in mesh with said planetary gear, and a pair of coaxial oppositely projecting axle shafts each operatively connected with one of said side gears for conjoint rotation therewith; an axle housing containing and journalling said gear drive and axle differential and providing a lubricant sump below said gear drive, with said bevel pinion and ring gears rotating through the lubricant within said sump and a lubricant system for said axle differential which differential is located entirely above the normal lubricant sump level, the improvement characterized in that said lubrication system comprises in combination;

a. a separate lubricant reservoir in said axle housing substantially completely above the lubricant level of said sump with one of said axle shafts projecting through said reservoir and said pinion gear being journalled in said reservoir wall;

b. first lubricant collection channel means formed in an upper portion of said axle housing and having one end opening near the rotation path of said ring gear and the other end opening into said reservoir;

c. second lubricant collection channel means formed in another upper portion of said axle housing and having one end opening near the rotation path of said pinion gear and the other end opening into said reservoir;

d. said one axle shaft that projects through said reservoir being substantially below the top of said reservoir and being in substantial sealing relationship with said reservoir toward the hub end of said one axle shaft at its exit area from said reservoir; and

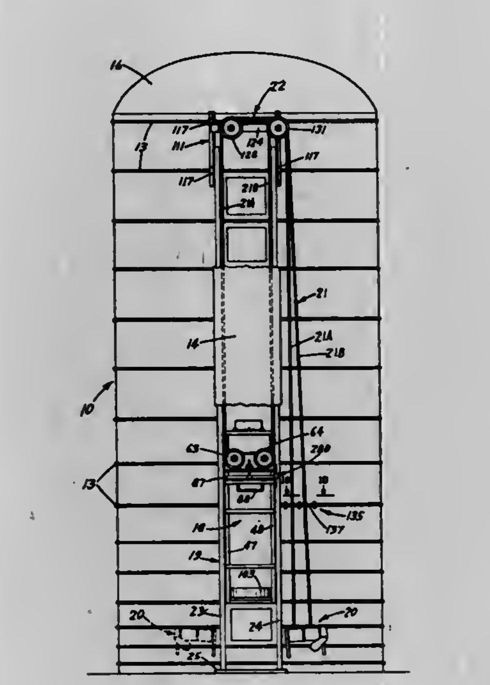
e. lubricant delivery passage means from said reservoir for said axle differential having one end opening into said reservoir at the entrance area of said one axle shaft into said reservoir and the other end opening into said differential, thereby permitting lubrication of said axle differential while being located entirely above said axle sump lubricant level.

3,887,038
LIFT APPARATUS
Floyd E. Buschbom, Long Lake; Glen Dale Hansen, Maple Plain, and Walter W. Wolfe, Mound, all of Minn., assignors to Veda, Inc., Long Lake, Minn.

Filed Jan. 19, 1973, Ser. No. 325,173

Int. Cl. B66b *5/12*

U.S. Cl. 187—27 **32 Claims**



1. A lift apparatus for use with a structure comprising: a carriage, track means locatable adjacent to the structure for guiding the carriage up and down in a generally upright path, winch means for moving the carriage, said winch means having rotatable drum means, reversible drive means drivably connected to the drum means to rotate the drum means, said drive means including a motor operable to selectively rotate said drum means in opposite directions, cable means connected to the drum means and carriage, means adjacent to the upper end of the track means for accommodating the cable means, said cable means extended from the drum means over the means adjacent to the upper end of the track means and to the carriage whereby on operation of the drive means in one direction the drum means rotates to wind the cable on the drum means so that the carriage is moved upwardly in the upright path and on operation of the drive means in the opposite direction the drum means rotates to unwind the cable from the drum means so that the carriage means moves downwardly in the upright path, means to sense the load tension of the cable means, said means to sense the tension being operable to stop the motor in response to a reduction of load tension on the cable means and maintain the cable means in tension and hold the cable means in operative relation with the drum means.

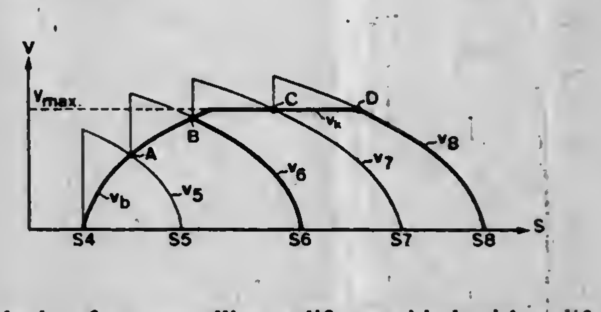
3,887,039
DEVICE FOR CONTROLLING A LIFT OR THE LIKE
Klaus Boniek, Berlin, Germany, assignor to Inventio Aktiengesellschaft, Hergiswil/NW, Switzerland

Filed Apr. 8, 1974, Ser. No. 459,198

Claims priority, application Switzerland, Apr. 18, 1973, 5838/73

Int. Cl. B66b *1/28*

U.S. Cl. 187—29 R **8 Claims**



1. A device for controlling a lift provided with a lift-car which is displaceable along a lift-shaft interconnecting a plurality of storeys, the device comprising drive means responsive to a control signal to displace the lift car along the shaft, a plurality of storey switch devices each associated with a respective storey and each arranged to generate a storey signal when the lift is displaced past the respective switch device, lift-call signal processor means provided with storage means to store lift-call signals for respective storeys and with stepping means having a respective stepping stage corresponding to each storey, the processor means generating a halt signal when the stepping means reaches a stepping stage corresponding to a storey for which a lift-call signal is stored in the storage means, first signal generator means responsive to an initiating signal to generate a control signal which increases towards a predetermined maximum value to control the acceleration of the lift and which — during travel of the lift at its maximum speed — is maintained at said predetermined maximum value, second signal generator means for generating a succession of retardation signals each of which initially has a respective maximum value and which decreases in value to correspond at any moment to the maximum lift-car speed permissible for the service of the next servable storey, comparator means to compare the signal generated by the first signal generator with the respectively present retardation signal, the comparator means — the absence of the halt signal — being responsive to a predetermined difference in magnitude between the compared signals to generate a stepping pulse and — in the presence of the halt signal — to apply the respectively present retardation signal to the drive means, the stepping means being stepped on through a switching step on departure of the lift-car from its initial location at the start of each journey and being stepped on through a switching step in response to each stepping pulse generated by the comparator means, the second signal generator means being responsive to each stepping movement of the stepping means to generate a further retardation signal, wherein the second signal generator means comprises means for generating a series of distance-analogue signals each corresponding in magnitude to the distance between storeys immediately successive in the direction of travel of the lift car, means for connecting successive ones of the distance-analogue signals in a stepwise manner to output means of the distance-analogue signal generator on the occurrence of each stepping movement of the stepping means, means for disconnecting the distance-analogue signals in a stepwise manner from the output means on the occurrence of each storey signal, integrator means for integrating a signal provided by an actual value signal generator mechanically coupled to the drive means, the output signal of the integrator meane being of zero value at the beginning of each lift-car journey and being re-set to zero value on the occurrence of each storey signal, difference signal generator means to provide an output signal equal at each instant to the difference between the output signal of the distance-analogue signal generator and of the integrator means, and root former means

having input means connected to the output of the difference signal generator means.

3,887,040

BRAKE LINING THICKNESS MONITORING DEVICE

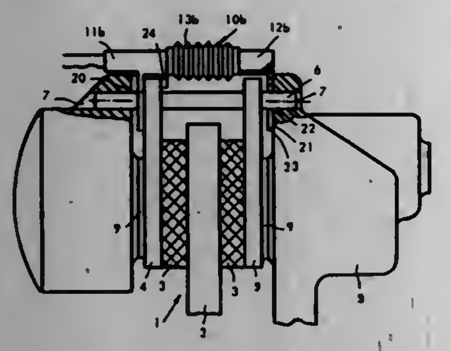
Ernst-Ulrich Simon, Oberursel, and Horst Ullrich, Schoeneck, both of Germany, assignors to VDO Adolf Schindling AG, Hamburg, Germany

Filed Nov. 8, 1973, Ser. No. 413,869

Claims priority, application Germany, Nov. 10, 1972, 2254990

Int. Cl. F16d *66/02*

U.S. Cl. 188—1 A **8 Claims**



1. A device for monitoring the thickness of a brake lining of a disc brake, having a disc with a brake shoe and lining on each side thereof, particularly in automotive vehicles provided with a power source, comprising:

two monitoring parts, a resistance and a slider;
an indicator of the thickness of the brake lining;
two telescoping members, mounted for relative axial movements one within the other externally of the said brake shoe and perpendicularly thereto;
a resilient protective sleeve surrounding the junction of said two telescoping members;
said resistance carried by one said telescoping member;
said slider carried by the other said telescopic member;
at least one of said two monitoring parts mounted in operative engagement with the outer side of said disc.

3,887,041

DISC BRAKES

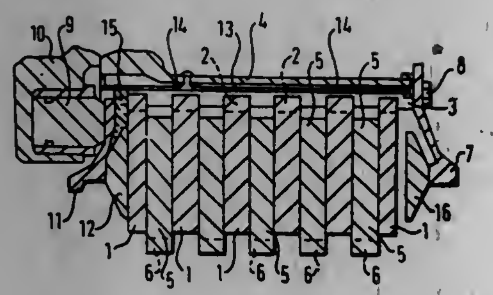
Denis Frederick Malone, Coventry, England, assignor to Dunlop Limited, London, England

Filed Dec. 18, 1973, Ser. No. 425,844

Claims priority, application United Kingdom, Dec. 19, 1972, 58655/72

Int. Cl. F16d *55/36*

U.S. Cl. 188—71.5 **4 Claims**



1. A multi-plate wheel disc brake comprising a number of annular stator discs axially slidably coupled with a non-rotatable torque-taking structure at their inner peripheries and interleaved with a number of annular rotor discs axially slidably coupled at their outer peripheries with the wheel, a brake-applying mechanism arranged to axially displace the discs into frictional engagement, the torque-taking structure comprising a torque tube having a plurality of longitudinally extending, circumferentially spaced keys and heat shield means between each adjacent pair of keys mounted in spaced relation to the torque tube, the inner peripheries of the stators being formed with circumferentially spaced keyways which respectively engage the keys of the torque tube, and the inner diameter of each stator between adajcent pairs of keyways being great enough to clear the heat shield means, said heat shield means between each adjacent pair of keys of the torque tube comprising an elongated strip of sheet metal which is secured to the torque-tube by heat-insulated mounting means adapted to maintain the heat shield in spaced relation to the torque tube and an annular air excluding member which in combination with the torque-taking structure and the remainder of the brake structure substantially eliminates the axial flow of air through the brake adjacent the inner periphery of the stators.

3,887,042

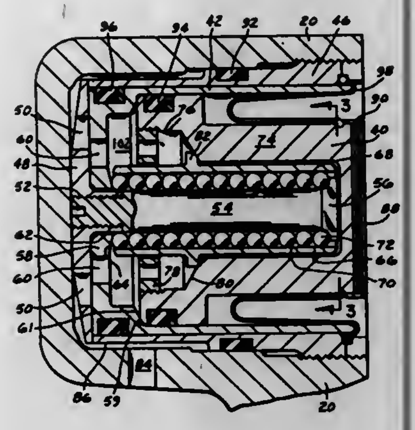
PISTON AND EXTENSIBLE CYLINDER THEREFOR

Richard J. Ditlinger; Richard W. Kerr, and Lyle E. Massing, all of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed July 22, 1974, Ser. No. 490,631

Int. Cl. F16d *65/52*

U.S. Cl. 188—71.8 **10 Claims**



1. Extensible fluid pressure actuated apparatus including a piston slidably carried in a cylinder for a multiple disc aircraft disc brake provided with fixed piston carrier means providing limited axial travel for the piston carried thereby, said fluid pressure actuated apparatus comprising:

a controlled source of pressurized fluid;
a fluid pressure responsive cylinder slidably carried in said carrier means and having an end wall;
a fluid pressure responsive piston slidably carried in said cylinder;
passage means communicating said cylinder and said piston with said pressurized fluid;
a fixed retaining member having an axially spaced apart relationship with said end wall and engageable therewith; stop means including a plurality of spherical members arranged in column form and interposed between said fixed stop member and said end wall whereby the axial position of said end wall relative to said retaining member is dependent upon the number of spherical members in said column; and
means operatively connecting said piston and said stop means for displacing one or more of said spherical members from said column in response to axial movement of said piston away from said end wall to permit said cylinder to axially follow said piston under the influence of said pressurized fluid acting thereagainst.

3,887,043

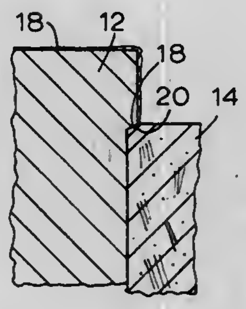
REPLACEMENT PADS FOR BRAKE ASSEMBLIES

Jack F. Hernick, Toronto, Ontario, Canada, assignor to Royal Industries, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 152,606, June 14, 1971, abandoned, which is a continuation-in-part of Ser. No. 794,214, June 1, 1969, abandoned. This application Apr. 17, 1973, Ser. No. 351,904

Int. Cl. F16d *65/02*

U.S. Cl. 188—73.1 **1 Claim**



1. In a motor vehicle having a disc brake assembly for frictional engagement with a rotor disc, the steps of:

installing an original set of brake pads in said disc brake assembly, each said pad having a friction surface engageable with a friction zone on said rotor disc bordered by inner and outer peripheries to which the edges of the original brake pad reach when it is in engagement with said friction zone;
operating said motor vehicle and the disc brake assembly over a period of time producing wearing of said brake pad and incrustations encroaching on said friction zone at its outer periphery, at least, thereby reducing the effective radial width of said friction zone below its original width; replacing said worn original pad with a replacement pad corresponding in substantially all respects to the original pad with the exception that it is slanted at its outer edge to slightly diminish its effective friction surface by an amount sufficient to preclude its engagement with said incrustations and enable its friction surface to seat properly on said friction zone, the slant extending only over an initial portion of the thickness of the replacement pad to permit the friction surface to attain its desired dimensions by wearing away of the slanted portion in initial use of the replacement pad and leaving a substantial thickness of the pad with a friction surface of desired dimensions to be worn away in further use of the replacement pad.

3,887,044

SPOT-TYPE DISC BRAKE

Jochen Burgdorf, Offenbach, and Dieter Eikenberg, Frankfurt-Rodelheim, both of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Mar. 11, 1974, Ser. No. 450,034

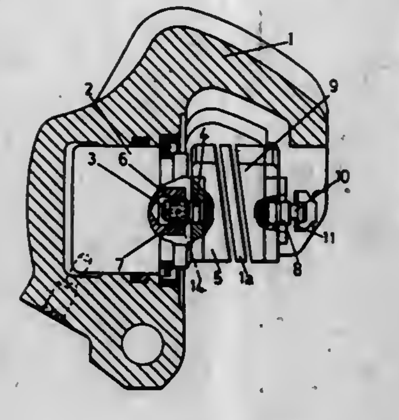
Claims priority, application Germany, Mar. 20, 1973, 2313693

Int. Cl. F16d *69/04*

U.S. Cl. 188—73.5 **8 Claims**

1. An arrangement to support the brake shoes of a spot-type disc brake comprising:

a housing;
a caliper connected to said housing and embracing a brake disc;
a brake actuation device disposed in said housing;
a first brake shoe associated with said actuation device;
a second brake shoe associated with said caliper remote from said actuation device;
a first supporting bolt secured to the middle zone of said first brake shoe having a given outer diameter;
a ring of elastic material disposed on an end of said first bolt adjacent said actuation device, said ring of elastic material having an outer diameter greater than said given outer diameter; and
a bore in said actuation device to receive said first bolt and said ring of elastic material, said first bolt being supported by said ring of elastic material under prestress in said bore.



3,887,045

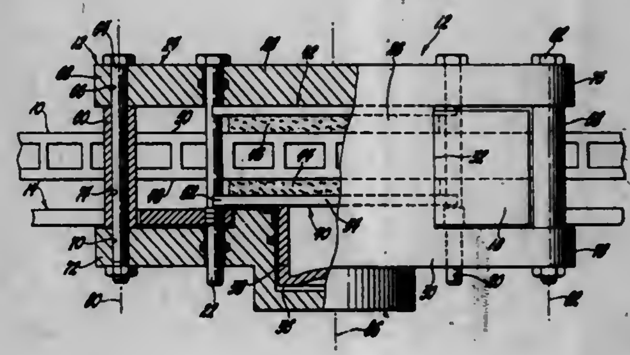
DISC BRAKE CALIPER ASSEMBLY AND METHOD

Edward J. DeHoff, Dayton, and Donald M. Flory, Arcanum, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 12, 1974, Ser. No. 460,375

Int. Cl. F16d *65/02*

U.S. Cl. 188—73.3 **3 Claims**



1. A disc brake assembly comprising:

a caliper housing of generally U-shaped cross section and having a bridge section and a pair of legs joined by said bridge section;
oppositely acting brake pad assemblies on said pair of legs; a brake actuator associated with one of said brake pad assemblies and on one of said legs and movable when actuated to exert brake apply forces through said caliper housing and said brake pad assemblies tending to spread said legs;
and spacer means for said pair of legs extending therebetween in compression preload and prestressing said caliper housing by holding said legs in substantially parallel relation, the amount of prestress forces being required to be taken up by actuation of said actuator before said brake apply forces exerted through said caliper housing act to tend to spread said legs beyond the spread thereof established by the compression preload of said spacer means, said spacer means acting in a plane extending transversely through said legs and said brake actuator and parallel to but spaced from said bridge section.

3,887,046

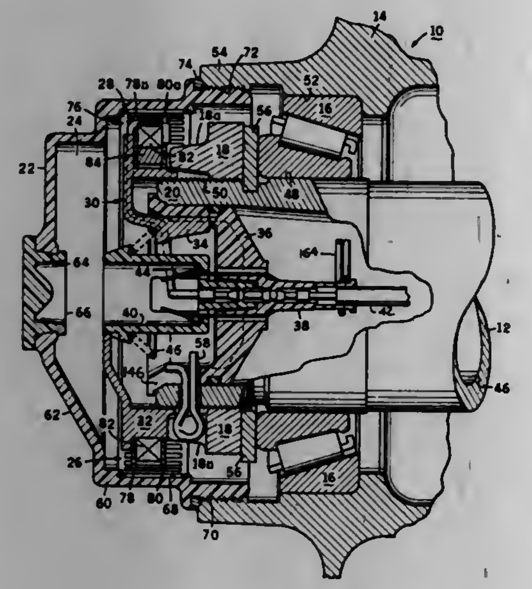
QUICK INSTALLATION VEHICLE WHEEL SENSOR

Richard C. Bueler, Des Peres, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed May 17, 1974, Ser. No. 470,947

Int. Cl. B60t *8/00*

U.S. Cl. 188—181 A **6 Claims**



1. In a vehicle wheel antilock system of the type including a wheel speed sensor, the sensor mounted on an axle adjacent at least one of the vehicle wheels, the sensor having a rotor and a stator and including a generally annular stator mounting ring carrying a first portion of a varying electrical signal generating means including a coil in cooperation with a second portion of the varying electrical signal generating means carried by the rotor, the improvement comprising:

- a. means formed on the stator mounting ring for mounting the ring on the axle in a predetermined radial orientation;
- b. means mounted on the axle for receiving the ring;
- c. electrical connector means for electrically interconnecting the ring and the means for receiving the ring; and
- d. means resiliently interconnecting the ring and at least one of the electrical connectors.

3,887,047

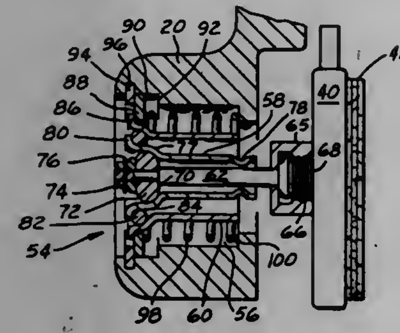
AUTOMATIC BRAKE ADJUSTER AND RESET HAVING EXTENSIONABLE FEATURE

Eugene E. Harnish, and Richard F. Horner, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed Aug. 9, 1973, Ser. No. 387,093

Int. Cl. F16d *65/54*

U.S. Cl. 188—196 R **7 Claims**



1. Automatic brake adjusting and reset apparatus for a multiple disc disc brake having an axially movable fluid pressure actuated pressure plate for applying the brake comprising:

an annular housing provided with a plurality of circumferentially spaced-apart cavities;

a first radially deformable tubular member disposed in each of said cavities and provided with a stop member adjacent one end thereof;

a second radially deformable tubular member coaxial with said first tubular member and adapted to telescope relative thereto;

a support member fixedly secured to said pressure plate and extending therefrom into each of said cavities;

a first deforming member fixedly secured to said support member and frictionally engaged with said first tubular member 'for deforming the same in response to axial movement thereof;

a second deforming member interposed between said first and second tubular members and frictionally engaged with said second tubular member for deforming the same in response to axial movement therethrough;

first and second spaced-apart fixed stop means engageable with said second tubular member and defining brake released and brake applied positions thereof;

resilient means operatively connected to said second tubular member for urging the same into engagement with said first stop means;

said first and second tubular members being actuated by said pressure plate in response to pressurization of the latter to apply the brake;

said second tubular member engaging said second stop means to prevent subsequent movement of said first and second tubular members whereupon said first deforming member is urged axially through said first tubular member to the extent permitted by said stop member to progressively compensate for wear of the frictional surfaces of said multiple discs;

said second deforming member being urged axially through said second tubular member by said first tubular member following engagement of said first deforming member with said stop member to extend the range of adjustment of said pressure plate beyond that provided by said first tubular member;

said resilient means urging said second tubular member off said second stop means into engagement with said first stop means to thereby establish a predetermined brake running clearance upon depressurization of said pressure plate and release of said brake.

3,887,048

SHIP'S PROPULSION PLANT

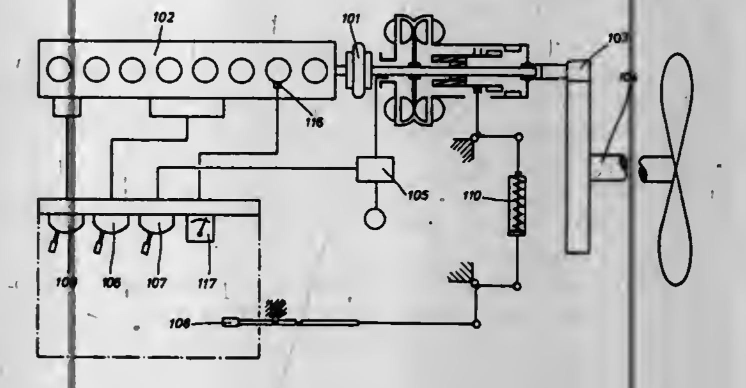
Ernst Jahnel, Augsburg; Erich John, Gersthofen, both of Germany, and Harold Sinclair, Folkestone, England, assignors to Messrs. Zahnraderfabrik Renk Aktiengesellschaft, Augsburg, DT

Filed Sept. 25, 1973, Ser. No. 400,661

Claims priority, application Germany, Sept. 29, 1972, 2247964

Int. Cl. F16d *39/00, 9/00*

U.S. Cl. 192—3.28 **18 Claims**



1. A ship's propulsion plant comprising:

a propulsion engine;

a drive shaft connected to said engine;

a propeller;

a driven shaft coupled to said propeller;

a variable-filling hydrodynamic coupling having an impeller and a turbine wheel, said impeller being rigidly connected to said drive shaft and said turbine wheel being rigidly connected to said driven shaft;

a selectively engageable mechanical coupling to by-pass said hydrodynamic coupling to connect said drive shaft to said driven shaft; and

control means for setting the power of said engine, for setting the filling of said hydrodynamic coupling and for shifting said by-pass coupling;

wherein said by-pass coupling comprises:

a one-way safety coupling element; and

means for directly transmitting propulsion torque of said engine to said propeller and for automatically disengaging said one-way safety coupling element when reverse torque between said engine and said propeller exceeds a predetermined limiting value.

3,887,049

HYDRAULIC CONTROLS FOR TRANSMISSION AND BRAKE SYSTEMS WITH PRESSURE BOOSTER

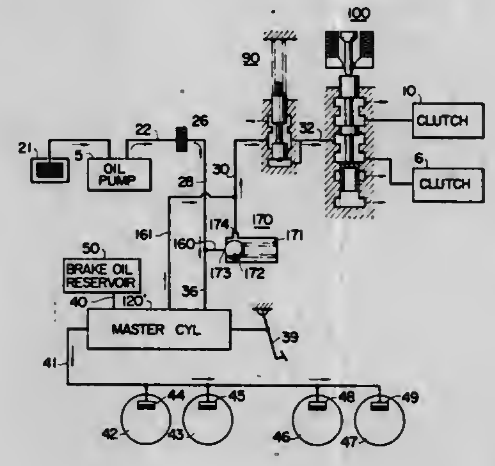
Shin Ito, and Hiroshi Kawaguchi, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 182,736, Sept. 22, 1971, Pat. No. 3,774,734. This application Mar. 15, 1973, Ser. No. 341,485

Claims priority, application Japan, Sept. 24, 1970, 45-82979

Int. Cl. B60k *29/00*

U.S. Cl. 192—4 A **3 Claims**



1. In a hydraulic brake control system having a control circuit connected to a transmission and to a brake system in a vehicle including a transmission, brake means for said vehicle, wheel cylinder means for actuating said brake means, and a brake pedal movable between a first and a second position for applying a braking force to said system, the combination comprising master cylinder means in hydraulic communication with said wheel cylinder means for converting force applied through said brake pedal into a corresponding hydraulic pressure, means responsive to movement of said brake pedal for doubling the hydraulic pressure in dependence upon the position of said brake pedal, means for effecting speed change in said transmission, a hydraulic pressure source, a hydraulic pump connected to said hydraulic pressure source, and connecting means extending between said pump and both said means for effecting a speed change and said means for doubling said hydraulic pressure for supplying doubled hydraulic pressure from said pump to each of said means, said connecting means comprising a first passage for connecting said oil pump directly to said master cylinder, a second passage for connecting said speed change means to said first passage, a relief valve positioned in said second passage, and a third passage connected between said master cylinder means and said second passage bypassing said relief passage.

3,887,050

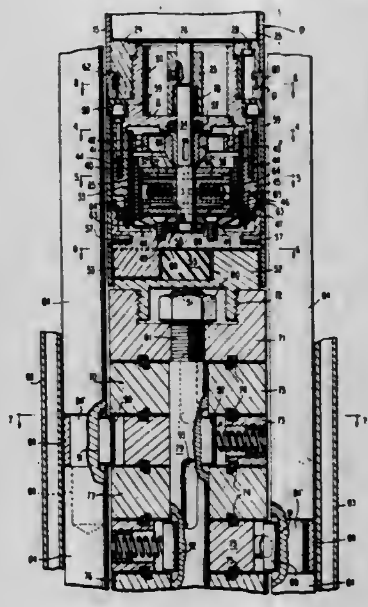
GEARING WITH CENTRIFUGAL BRAKE FOR REVOLVING DOOR

Amuel E. Sheckells, Evansville, Ind., assignor to International Steel Company, Evansville, Ind.

Division of Ser. No. 210,385, Dec. 21, 1971, Pat. No. 3,766,686. This application Apr. 5, 1973, Ser. No. 348,307

Int. Cl. E05d *15/02*

U.S. Cl. 192—4 R **8 Claims**



1. A speed control device for a revolving door, said door having fixed and rotational mounting parts, said device comprising a rotational speed change unit including a gear anchored to one of said mounting parts, a coacting deflectable gear attached to the other mounting part and positioned to engage the first-named gear, an eccentric operator for said deflectable gear and creating a traveling deflection wave around the deflectable gear to thereby induce relative rotation between the deflectable and first-named gears, and a centrifugal force actuated brake means driven by said eccentric operator and serving when active to arrest relative rotation between said fixed and rotational mounting parts.

3,887,051

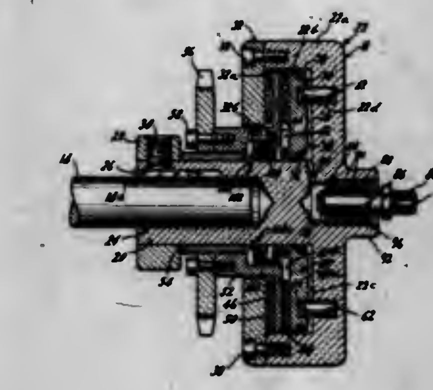
FLUID-OPERATED CLUTCH WITH WEAR LIMITING STOP

Fred A. Bignell, Emporium, Pa., assignor to Emporium Specialties Co., Inc., Austin, Pa.

Filed Mar. 20, 1974, Ser. No. 452,932

Int. Cl. F16d *25/00*

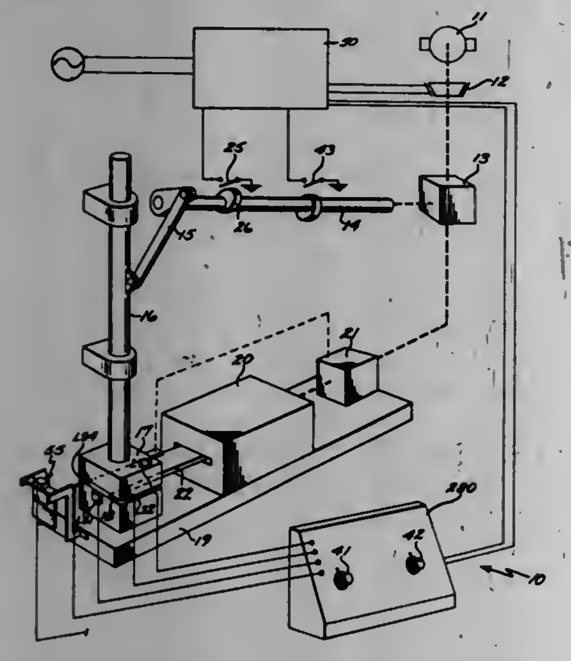
U.S. Cl. 192—85 AA **5 Claims**



1. A fluid-operated clutch comprising a clutch housing including an elongated central hub, a facing plate and a backing plate spaced from and coaxial with said facing plate to form an internal cavity within said clutch housing, a driving

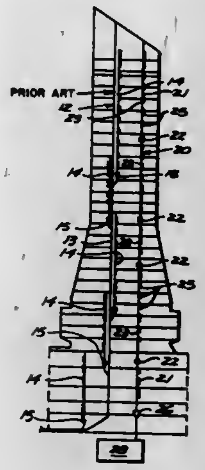
clutch plate positioned within said internal cavity and about said central hub, coupling means mounting said driving clutch plate for rotation with said clutch housing and for axial movement toward and away from said facing plate, said driving clutch plate and said facing plate forming a variable volume chamber with said central hub, a driven assembly positioned between said driving clutch plate and said backing plate and mounted for rotation on said central hub, said driven assembly including a driven clutch plate having friction means thereon for driving said driven clutch plate when said driving clutch plate is moved away from said facing plate into operative engagement with said driven clutch plate, a cup-shaped member disposed within said internal cavity between said driven assembly and said central hub, a return spring disposed within said cup-shaped member and surrounding said central hub, one end of said return spring engaging one face of said driving clutch plate for urging said driving clutch plate out of engagement with said driven assembly, means axially fixing said cup-shaped member relative to said central hub, said cup-shaped member including means being constructed and arranged for preventing contact between said driving clutch plate and said driven clutch plate when said friction means wears out, passage means in said clutch housing for the entry of fluid into said chamber to increase the volume thereof for moving said driving clutch plate into engagement with said driven assembly, and rotatable fluid coupling means connected to said clutch housing at said passage means for delivering a supply of fluid to said chamber to operate said clutch.

3,887,052
MACHINE TOOL MONITORING UNIT
Gordon P. Del Faro, 23529 Dolorosa, Woodland Hills, Calif. 91364, and Eugene E. Valentine, 11557 Dellmont Dr., Tujunga, Calif. 91042
Filed Nov. 7, 1973, Ser. No. 413,586
Int. Cl. F16p *3/20;* **B65h** *63/06*
U.S. Cl. 192—127 **14 Claims**



1. An electrical monitoring and control unit for monitoring and controlling the operation of a cyclic machine tool, comprising, in combination:
first sensing means adapted to register selected cyclic events of the machine tool for producing first switching signals indicative thereof;
gating means connected to receive said first switching signals in predetermined combination for producing a gated output signal indicative of the status of any one or more of selected ones of said first switching signals when selected other ones thereof are in a predetermined status;
second sensing means adapted to register selected projections in said machine tool for producing second switching signals indicative thereof; and
main switching means connected for receiving said gated output signal and said second switching signals for effecting a machine shut down concurrent with the receipt of either one thereof.

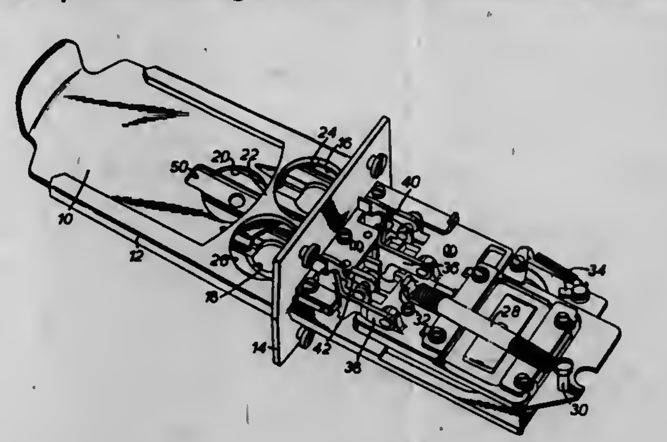
3,887,053
GRAVITY CHUTE SYSTEMS
Peter H. Luiten, Monrovia, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.
Filed Nov. 2, 1973, Ser. No. 412,360
Int. Cl. B65g *11/00;* **E04f** *17/12*
U.S. Cl. 193—34 **10 Claims**



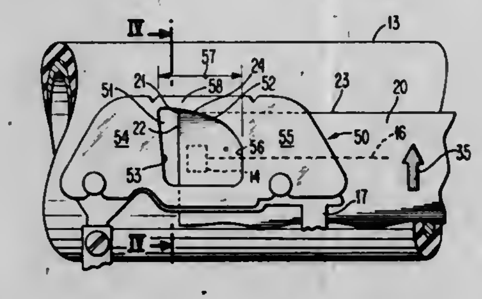
1. In a gravity chute system for conveying deposited objects, the improvement comprising in combination:
a substantially vertical riser conduit;
means for dividing said riser conduit into a plurality of stationary riser conduit sections distributed along said riser conduit;
said dividing means including means for essentially closing each of said riser conduit sections in one position against passage of objects therethrough;
means operatively associated with said riser conduit for depositing objects in said riser conduit sections from the outside of said riser conduit;
means connected to said dividing means for opening said riser conduit sections whereby to permit deposited objects to proceed toward a bottom section of said riser conduit;
means operatively associated with said riser conduit for removing said deposited objects from a bottom region of said riser conduit; and
means for venting each of said closed riser conduit sections.

3,887,054
COIN SLIDE MECHANISM
Kenneth Rinaldo Allen, Woodford, England, assignor to Essex Engineering Works (Wanstead) Limited, London, England
Filed Nov. 2, 1973, Ser. No. 412,449
Claims priority, application United Kingdom, Nov. 12, 1972, 52841/72
Int. Cl. G07f *5/06*
U.S. Cl. 194—92 **9 Claims**

1. A coin slide mechanism comprising a guide track, mounting means for securing said guide track generally horizontally to a wall, a coin slide having first, second and third apertures therein and mounted slidably in said guide track for movement between extended and fully depressed positions, said coin slide being normally biased to said extended position in which said apertures are exposed for receiving respective coins resting flat on said guide track, and said first and second apertures being disposed side by side adjacent said mounting means on opposite sides of a center line of said coin slide and said third aperture being disposed further from said mounting means than said first and second apertures and overlapping said center line when said coin slide is in said extended position, full stroke ratchet means for ensuring that the coin slide cannot be returned to its extended position from a partially depressed position without completing its stroke once the ratchet means is engaged, and coin testing means for preventing depression of the coin slide from said extended position to said fully depressed position at least if one or more of said apertures is empty, said guide track extending to support coins in said apertures during movement of said coin slide substantially to said fully depressed position and then to allow said coins to drop out of said coin slide, said coin testing means including first and second levers disposed and resiliently biased to engage edge regions of the faces of coins of sufficient size in said first and second apertures and to prevent continued depression of said coin slide with a coin of insufficient size in at least one of said first and second apertures, said levers being disposed and arranged to apply a force to a coin in said third aperture for ejecting the coin from said third aperture.

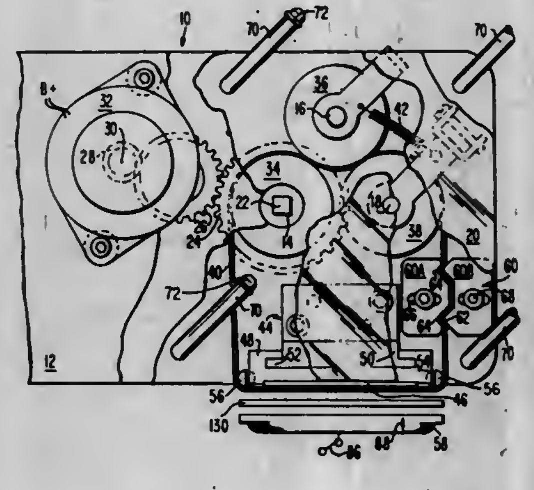


3,887,055
CARD HOLDER
Benjamin George Pastrick, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 13, 1973, Ser. No. 424,500
Int. Cl. B41j *13/12*
U.S. Cl. 197—135 R **5 Claims**



1. A printer including print forming mechanism, and a writing sheet support platen, said print forming mechanism and said platen defining a printing point and writing line therebetween, means for feeding a writing sheet into operative interposition between said print forming mechanism and said platen in a paper feed direction that is normal to said writing line, and means for holding the writing sheet against said platen at said printing point comprising: a plate-like body, means supporting said plate-like body adjacent said platen at said printing point, said plate-like body comprising a pair of side portions that extend in said paper feed direction and are spaced laterally on opposite sides of said printing point, and an upper bridging portion positioned above said printing point and interconnecting said side portions, said side and upper bridging portions thereby respectively defining side and upper edges of an open portion through which said print forming mechanism is enabled to have print cooperation with the writing sheet supported by said platen, said plate-like body being configured to urge the writing sheet into close adjacency with said platen at said printing point; wherein the improvement comprises:
said upper bridging portion of said plate-like body defining an upper camming edge of said open portion that extends transverse to said paper feed direction at a unidirectional angle other than substantially 90° throughout the entire space between said side portions.

3,887,056
DEMOUNTABLE-PLUGGABLE TENSIONING AND RE-INKING RIBBON CARTRIDGE
Jerry Hans Lehmann, Rochester, N.Y., assignor to Burroughs Corporation, Detroit, Mich.
Filed Mar. 23, 1973, Ser. No. 344,268
Int. Cl. B41j *33/10*
U.S. Cl. 197—168 **10 Claims**

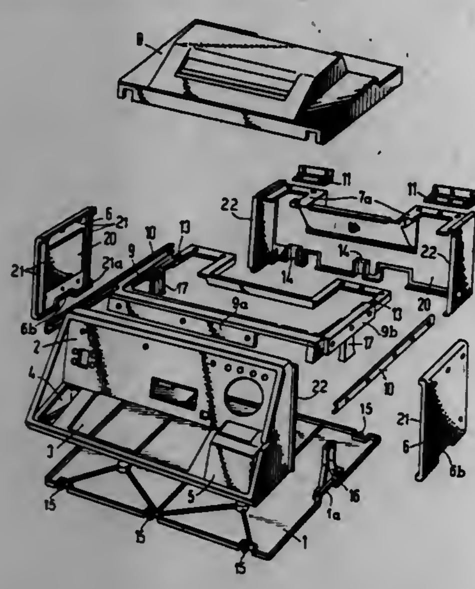


1. A demountable continuous re-inking ribbon cartridge comprising:
a base support member,
a signature plate holder including means demountably receiving a signature plate having an impression producing area thereon operably associated therewith so that said signature plate can be replaced at will,
a continuous ribbon for inking said signature plate,
means for continuously inking said ribbon, said inking means being physically arranged to entrap said ribbon constraining the ribbon against lateral movement, and
braking means for said ribbon, including means for maintaining said ribbon in taut condition over the impression producing area of said signature plate whereby said ribbon is caused to weave back and forth prior to entering the impression producing area effectively regulating the tautness of the ribbon.

3,887,057
HOUSING FOR ELECTRICALLY OPERATED TYPEWRITERS AND SIMILAR MACHINES
Horst Stahl, Weidach; Guenther Vorbach, Schwindegg Upper BarViria; Erich Brunnthaler; Wolfgang Hezel, both of Wolfratshausen, and Wolfgang Flath, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Aug. 22, 1973, Ser. No. 390,394
Claims priority, application Germany, Aug. 30, 1972, 2242569
Int. Cl. B41j *29/08*
U.S. Cl. 197—186 B **14 Claims**

1. In a housing for apparatus which may require servicing, such as electrically operated typewriters and similar machines of which telex machines are an example:
base means for supporting thereon apparatus to be housed;
a housing shell comprising upright wall members including a front wall member, a rear wall member, and two opposite side wall members;
a generally ring-shaped frame member;

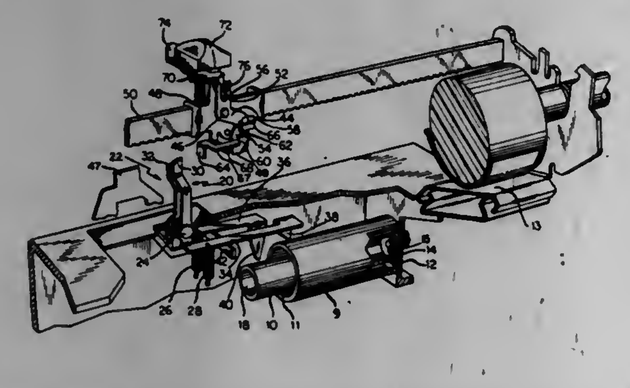
means securing upper end portions of all of said wall members to said frame member;
supporting post means extending upwardly from opposite sides of said base means; and



coupling means carried by said frame member for engaging in separable supporting relation with said post means to permit lifting of the housing shell away from the base means to expose apparatus supported by the base means.

3,887,058
DUAL TONE MARGIN SIGNAL FOR TYPEWRITERS

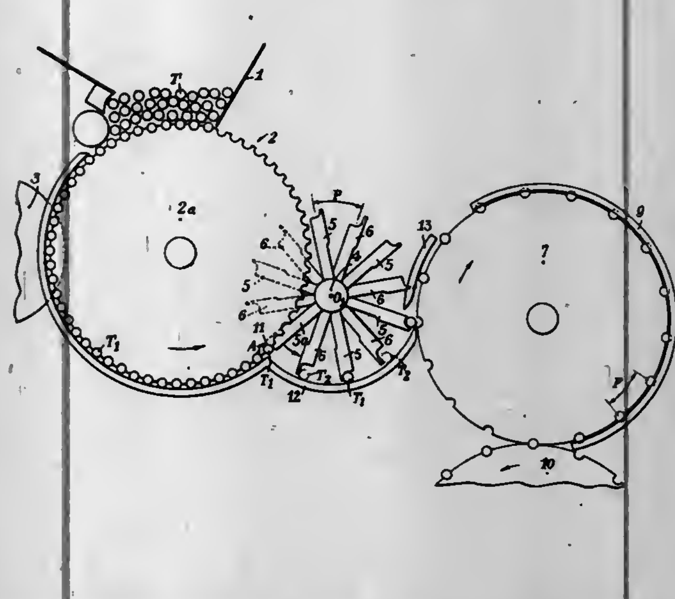
Ernest F. Lohr, Homer, N.Y., assignor to SCM Corporation, New York, N.Y.
Filed Dec. 3, 1973, Ser. No. 421,198
Int. Cl. B41j *29/46*
U.S. Cl. 197—192 **3 Claims**



1. An audible signal mechanism for indicating the end of a line-of-write in a typewriter having a frame including an abutment and a carriage supported on the frame and movable relative to the frame, a carriage rack fixed on the movable carriage and a margin stop adjustably supported on the carriage and movable relative to the carriage comprising:
an actuator assembly pivotally supported about a first pivot on the margin stop including an adjustment lever pivotally supported on a knob of the margin stop and an adjustable actuator coupled to said adjustment lever by a motion transmitting means therebetween;
a pair of L-shaped actuable members pivotally supported about a second pivot on the frame comprising, a plurality of rigid arms extending upwards of said second pivot into the path of said actuator for engagement and disengagement by said actuator when said actuator traverses the frame, a plurality of flexible arms terminating in a plurality of hammer members and extending laterally of said second pivot for contacting the frame abutment and deflecting beyond the frame abutment when said rigid arms are engaged and disengaged by said actuator; and
a first resonating element horizontally supported on the frame and a second resonating element co-axially supported within said first resonating element with a portion of said second resonating element projecting from said first resonating element, said resonating elements positioned below said hammer members for sequentially striking by said hammer members for effecting a plurality of sequential audible signals for indicating the end of line-of write.

3,887,059
DEVICE FOR ALIGNING CYLINDRICAL ARTICLES

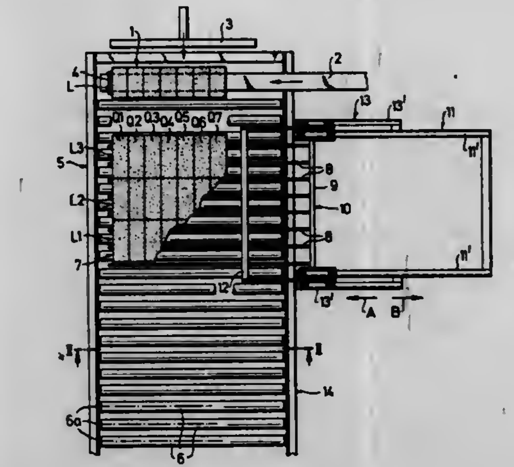
Jean Verjux, Pavillons sous Bois, France, assignor to Usines Decoufle, Paris, France
Filed Dec. 21, 1973, Ser. No. 427,095
Claims priority, application France, Jan. 4, 1973, 73.00228
Int. Cl. B65g *47/00*
U.S. Cl. 198—20 C **3 Claims**



1. Device for aligning sections of cylindrical articles, particularly double-length filter tips in the form of plugs, for cigarette manufacturing comprising
a source of filter tip supply units;
a rotatable cutting drum having peripherally equal spaced first grooves to receive the plugs therein from said supply source;
a rotatable re-centering drum having peripherally equal spaced second grooves;
intermediate conveyor means located between said drums and associated therewith to transfer said plugs from said cutting drum to said re-centering drum;
said conveyor means comprising a first rotatable conveyor and a second rotatable conveyor, both said conveyors being mounted on a common axis and having the same speed of rotation;
said first conveyor comprising a plurality of first equal-sized radially extending equal-angularly spaced arms, each arm having a first notch formed at its outer end and adapted to remove an individual plug from a first groove in said cutting drum for transfer to a second groove in said re-centering drum;
said second conveyor comprising a plurality of second equal-sized radially extending equal-angularly spaced arms, each second arm having a second notch formed at its outer end and adapted to remove an adjacent individual plug from said first groove in said cutting drum for transfer to a following second groove in said re-centering drum;
said plurality of second arms being individually angularly spaced with respect to said first arms so that any individual arm on one said conveyor is located midway between two individual adjacent arms of the other said conveyor;
the outer diameters of said arms of said first and second conveyors being equal; and
said second notches of said second arms extending further radially inwardly than said first notches of said first arms.

3,887,060
APPARATUS AND METHODS FOR FORMING ROWS OF SELECTIVELY SPACED ARTICLES

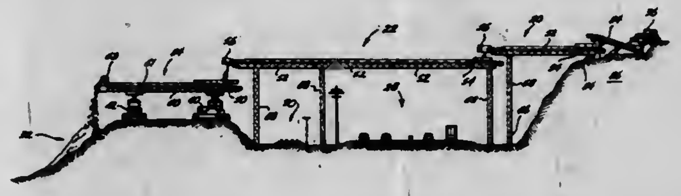
Hermann Kamhues, Laggenbeck, Germany, assignor to C. Keller u. Co., Laggenbeck, Germany
Filed Mar. 7, 1974, Ser. No. 448,830
Claims priority, application Germany, Mar. 15, 1973, 2312946
Int. Cl. B65g *47/32*
U.S. Cl. 198—30 **15 Claims**



6. Apparatus for forming at least one row of articles wherein selected articles are selectively spaced from one another, said apparatus comprising a support; means for assembling a plurality of articles on said support closely adjacent one another in a longitudinally extending row; carrier means for lifting a selected number of said articles off said support; means mounting said carrier means and the articles carried thereby for movement along a path extending in a direction longitudinally of said row; stop means occupying a position in the path of movement of the articles carried by said carrier means; and means mounting said stop means for conjoint movement with and at the same speed of said carrier means in said direction and for movement relative to said carrier means for selected periods of time in the opposite direction for interrupting movement of the articles carried by said carrier means, the interruption of movement of articles carried by said carrier means effecting discharge of a selected number of said articles from said carrier means in a row and the time intervals between successive periods of such interruption establishing a selected spacing between successive articles discharged from said carrier means.

3,887,061
PORTABLE MODULAR MATERIALS DISTRIBUTION SYSTEM

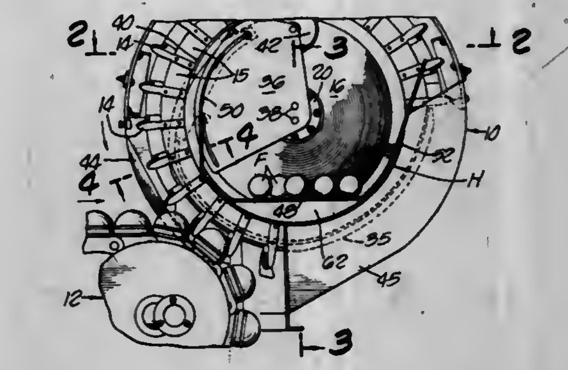
Henry R. Hopkins, 7201 92nd St. S.E., Mercer island, Wash. 98040
Filed Aug. 3, 1972, Ser. No. 277,818
Int. Cl. B65g *65/28*
U.S. Cl. 198—36 **14 Claims**



12. A modular conveyor trestle section comprising:
a plurality of rectangular trusses of substantially equal lengths having their elongate sides joined together, each end of the trestle section lying substantially in a plane perendicular to the plane of said trusses and having a rectangular shape, coupling means affixed to each end of said trestle section, said coupling means being of a first type on a given corner and being of an opposite type at the corresponding longitudinally opposite end corner, coupling means of said first type being located on one set of diagonal corners at both ends of said section and coupling means of said opposite type being located on the other set of diagonal corners at both ends of said trestle section, said coupling means of said first type capable of mating with coupling means of said opposite type to join together end to end a plurality of said trestle sections to form an integrated conveyor trestle,
a plurality of belt-supporting roller means mounted on one side of trestle section.

3,887,062
SIDE ENTRY HOPPER FOR ROTARY FRUIT FEEDER

Ronald C. Bushman, Hacienda Heights, Calif., assignor to Brown International Corporation, Covina, Calif.
Filed Feb. 26, 1973, Ser. No. 336,031
Int. Cl. B65g *47/18*
U.S. Cl. 198—52 **6 Claims**



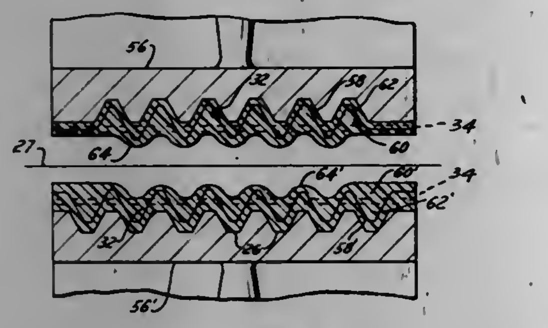
1. In a fruit processing apparatus wherein a side entry hopper supplies fruit of generally spherical configuration to an open side of an upright rotary fruit feeder that has a circumferential series of pockets which are open from above as they pass through the bottom portion of their circular orbit;
the improvement comprising:
the bottom of the hopper being in the form of a substantially flat surfaced ramp inclined downward towards said bottom portion of the circular orbit to cause the fruit to roll gravitationally down the ramp towards the pockets,
a terminal portion of the ramp dropping off and conforming to the arcuate path of the pockets to urge fruit gravitationally into the individual pockets as the pockets pass through the bottom of the circular orbit;
said terminal portion of the ramp having the configuration of a concave surface of a portion of a cone having its lower edge conforming to the curvature of said bottom portion of the circular orbit.

3,887,063
CONVEYOR APPARATUS

Juan T. Villanueva, and Jesus T. Villanueva, 150 Apo St., Sta Mesa Hgts., both of Quezon City, Philippines
Continuation-in-part of Ser. No. 830,449, Jan. 4, 1969, Pat. No. 3,670,366. This application June 1, 1972, Ser. No. 258,875
Claims priority, application Philippines, June 4, 1968, 9282
Int. Cl. B65g *15/14*
U.S. Cl. 198—165 **10 Claims**

1. A conveyor arrangement, comprising, in combination, a first endless conveyor arrangement comprising first elongated endless conveyor means having a first run; and a second endless conveyor arrangement comprising second elongated endless conveyor means having a second run adjoining said first run, the facing surfaces of said first and second runs defining together an elongated path for fibrous material to be transported gripped between said first and second runs oriented in direction transverse to the elongation of said first and second

runs, said surface of said first run having a first undulating transverse cross-sectional configuration, and said first elongated endless conveyor means being comprised of a plurality of parallel endless flexible first elongated conveyor sections spaced apart from each other in direction transverse to the elongation of said first sections to define a plurality of elongated parallel first spaces and to impart to said surface of said first run said first undulating transverse cross-sectional configuration, and said surface of said second run having a second undulating transverse cross-section configuration exactly complementary to said first undulating transverse cross-sectional configuration, and said second elongated endless conveyor means being comprised of a plurality of parallel endless flexible second elongated conveyor sections spaced apart from each other in direction transverse to the elongation of said second sections to define a plurality of elongated parallel second spaced and to impart to said surface of said second run said second undulating transverse cross-sectional configuration, and wherein along said first and second runs said sections of each conveyor means project in direction from the respective one of said runs towards the other one of said runs and into respective ones of the plurality of elongated parallel spaces of the other one of said conveyor means, with said surfaces of said first and second runs mating uniformly in transverse direction due to the exactly complementary undulating transverse cross-sectional configurations of said surfaces of said first and second runs.



3,887,064
WALKING BEAM CONVEYOR IN A FURNACE

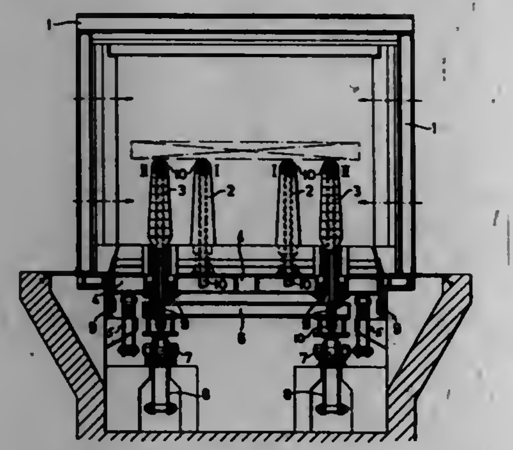
Heinz Brockmann, Duesseldorf, Germany, assignor to Brodu Industrie-Ofenbau GmbH & Co. KG, Duesseldorf, Germany

Filed Oct. 26, 1973, Ser. No. 410,238

Claims priority, application Germany, Oct. 30, 1972, 2253105

Int. Cl. F27b *9/14*

U.S. Cl. 198—219 **4 Claims**



1. In a heat tunnel having a walking beam conveyor arrangement for transporting work through said heat tunnel in a horizontal feed direction wherein the conveyor arrangement comprises, in combination, a first vertically reciprocable work-supporting beam, a second horizontally reciprocable work-supporting beam, each of the first and second beams having a substantially horizontal work-contacting surface, and actuating means for relatively moving the first and second beams in timed relation in alternate engagement with the work to advance the work through the heat tunnel, the improvement wherein the second beam is provided with facilities for vertical reciprocation to a height chosen such that the uppermost position of its work-supporting surface is substantially level with the uppermost position of the work-supporting surface of the first beam, and wherein the actuating means includes facilities for maintaining the work-supporting surface of each of the first and second beams in its uppermost position when in contact with the work.

3,887,065
CIGARETTE SETTING DEVICE

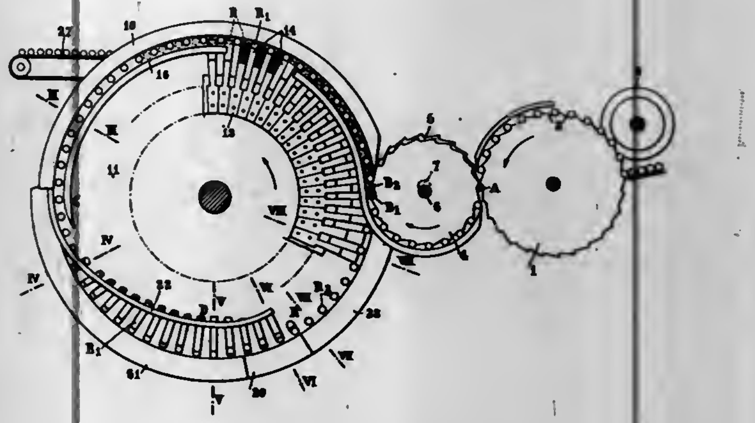
Jean Verjux, Pavillons Sous Bois, France, assignor to Usines Decoufle, Paris, France

Filed Dec. 3, 1973, Ser. No. 421,271

Claims priority, application France, Dec. 27, 1972, 72.46423

Int. Cl. B65g *47/24*

U.S. Cl. 198—280 **3 Claims**



1. Device for turning over cigarettes when they are parallely spaced and proceeding in a continuous row comprising

rotary supply means for the cigarettes;

a rotating circular drum in close association with said rotary supply means to receive the cigarettes therefrom;

said drum having a horizontally extending shaft to provide for rotation of said drum in a vertical plane, said drum including a plurality of cavity means equally spaced around the periphery of said drum, each side cavity means adapted to receive a respective cigarette therein delivered from said supply means;

fixed internal and external circular means located along said drum periphery to define sliding support and guide means for the cigarettes in said cavity means as the cigarettes move along said drum periphery;

said circular guide means being in contact with the cigarettes from a first location on said drum periphery where cigarettes are delivered to said drum to a second location on said drum periphery, said drum periphery providing a path of movement for the cigarettes from said first location to said second location extending around the upper portion of said drum periphery;

fixed elongated ramp means having one end thereof located at said second location in said path of movement to be contacted by an end of each moving cigarette, said ramp means extending inwardly into said drum in an arcuate shape;

additional external circular guide means extending along said drum periphery from said second location to support the other end of each moving cigarette when the cigarette is in contact with said ramp means;

said one end of said ramp means located on one side of said additional external guide means, and said ramp means extending smoothly adjacent the lower portion of said drum periphery from its one end to its other end, said other end of said ramp means being positioned at a third location on the other side of said additional external guide means whereby the one end of each cigarette as it moves in contact with said ramp means is lifted from said cavity means and rotated inwardly toward said shaft and then rotated further so that the one end of each cigarette has been rotated 180° at said third location and repositioned in said cavity means; and

conveyor means to receive the turned cigarettes from said cavity means.

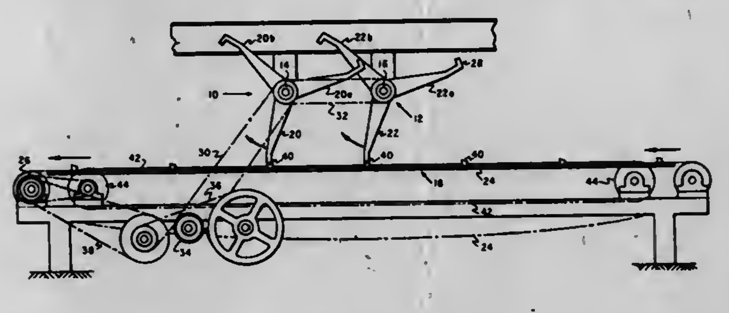
3,887,066
AUTOMATIC BOARD TURNER

Hendrik Houtsager, Beaverton, Oreg., assignor to Moore Dry Kiln Company of Oregon, Portland, Oreg.

Filed July 20, 1973, Ser. No. 380,997

Int. Cl. B65g *47/24*

U.S. Cl. 198—285 **16 Claims**



1. A method of advancing boards transversely at spaced intervals and automatically inverting said boards to permit inspection of both sides thereof, said method comprising:

a. advancing said boards on a conveyor having respective projecting lugs regularly spaced along its line of travel for engaging and positioning the leading edges of said respective boards;

b. rotating an arm about an axis positioned above and transverse to the direction of travel of said conveyor, said arm being adaptable when depending from said axis adjacent the bottom of its arcuate path to engage the leading edge of a respective one of said advancing boards and lift said edge with a tipping motion tending to invert said board backwardly away from a respective lug as said arm rotates forwardly and upwardly; and

c. frictionally urging said board forward on said conveyor by means of a speed-up belt underlying said conveyor and traveling in the same direction but at a greater linear speed than said lugs, thereby maintaining the engagement between said board and said arm until said board has been completely inverted and thereafter accelerating said inverted board forwardly into engagement with said respective lug.

3,887,067
PACKAGE

Peter C. Collura, Los Altos, Calif., and Michael A. Kipp, Glen Ridge, N.J., assignors to Container Corporation of America, Chicago, Ill.

Filed Jan. 2, 1973, Ser. No. 319,973

Int. Cl. B65d *5/50*

U.S. Cl. 206—45.14 **1 Claim**

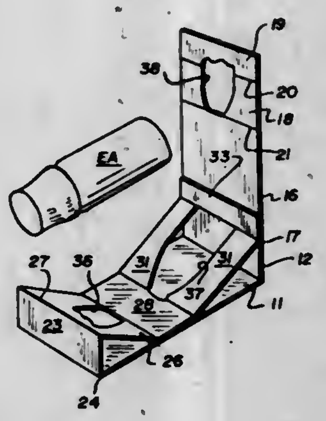
1. An open ended package for displaying and retaining a generally elongated article of merchandise, said package being formed from a cut and scored blank of paperboard or the like, comprising:

a. interconnected closing, end, backing, and cradling panels and a pair of closing flaps having article exposing apertures;

b. said article cradling panels including:
  i. first, second and third panel elements wherein said second and third elements have article receiving apertures;
  ii. an attaching panel element;

c. a securing flap foldably joined to said third panel element;

d. said attaching panel element being secured to the top side of said backing panel, said securing flap being attached to the underside of said closing panel, and one of said closing flaps being secured to the top side of said second cradling panel element;



e. said first cradling panel element being positioned in substantially vertical position between said backing panel and said second cradling panel element with said second cradling panel element being inclined downwardly toward said attaching panel;

f. said third cradling panel element being inclined from said attaching panel upwardly toward said closing panel and being foldably joined to said securing flap which is attached to the underside of said closing panel.

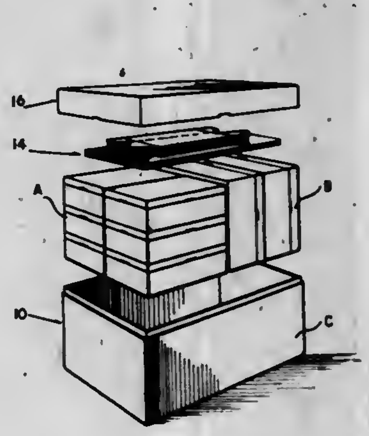
3,887,068
MODULAR MAILING CONTAINER SYSTEM AND PROCESS

Paul Noel Ghione, Box 111, Station A, Berkeley, Calif. 94702

Filed Aug. 20, 1973, Ser. No. 390,067

Int. Cl. B65d *71/00*

U.S. Cl. 206—223 **20 Claims**

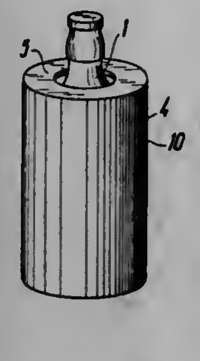


1. A mailing container system, or kit, comprising a plurality of self-sealing, plastic modules defining no more than three different predetermined sizes and shapes and a plurality of folding cartons, each of said cartons configured to correspond to and receive one of said modules to form a complete mailing container ready for mailing; each of said modules having a lid and a base, the walls thereof defining a rectangular and cross-sectional configuration with each external and internal surface of each module lying in a single plane; a plurality of at least one of said modules adapted to be disposed within at least one other of said modules together with the corresponding folding cartons thereof to form said kit.

3,887,069

DOUBLE FLASK FOR THE RECEPTION OF TWO LIQUIDS

Manfred Diwo, 16a Waldstrasse 5511, Wellen, Germany
Filed July 2, 1973, Ser. No. 375,356
Claims priority, application Luxembourg, July 17, 1972, 65740
Int. Cl. B65d *11/16, 21/00*
U.S. Cl. 206—229 3 Claims

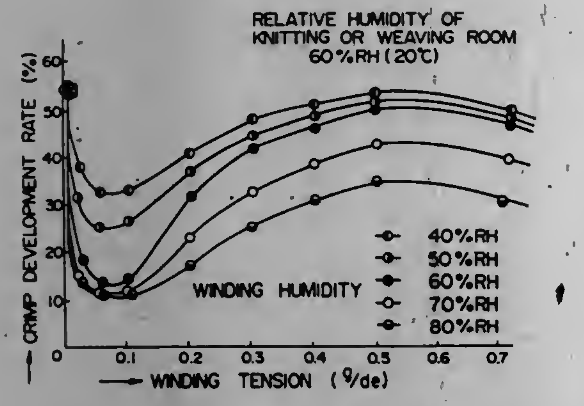


1. A double flask for reception of two different liquids, such as whisky and mineral water, soda water or another spirit that is to be mixed with water, comprising an inner body having an upper slender body portion, an enlarged lower body portion of a diameter greater than the diameter of the slender body portion and a shoulder portion connecting said upper and lower body portions, an annular container disposable around said inner bottle slender body portion and having foil cap sealing means and encircling label means connecting said annular container and said inner bottle lower body portion for maintaining said inner bottle and said annular container in integrated relationship.

3,887,070

PACKAGE OF CRIMPED THERMOPLASTIC SYNTHETIC YARNS AND METHOD OF WINDING UP SAME

Koji Tajiri; Fumio Nagatoshi, and Masateru Terano, all of Mihara, Japan, assignors to Teijin Limited, Osaka, Japan
Filed Sept. 14, 1973, Ser. No. 397,358
Claims priority, application Japan, Sept. 18, 1972, 47-92847; Nov. 1, 1972, 47-10879
Int. Cl. B65d *65/16, 85/04*
U.S. Cl. 206—392 6 Claims

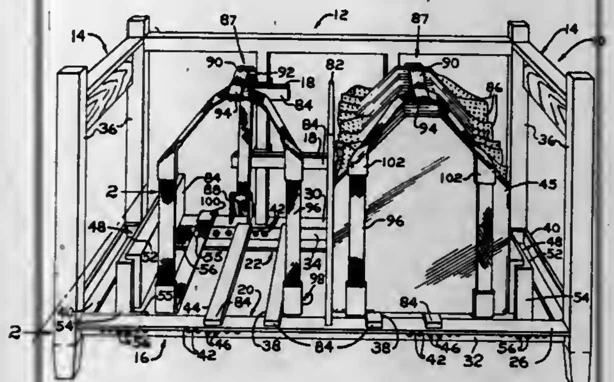


1. A package of a crimped yarn of thermoplastic synthetic fibers, said package either being one having a winding hardness of above 70° when the moisture content of the yarn at the inner layered portion of the package is less than the equilibrium moisture content at the relative humidity of the atmosphere to be used at the time of the knitting or weaving operation or being one having a winding hardness of less than 70° when the moisture content of the yarn at the inner layered portion of the package is greater than the equilibrium moisture content at the relative humidity of the atmosphere to be used at the time of the knitting or weaving operation.

3,887,071

ARTICLE TRANSPORTING RACK

Ronald J. Thomaswick, Kittanning, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed June 29, 1973, Ser. No. 375,197
Int. Cl. B65d *85/48*
U.S. Cl. 206—454 10 Claims



1. An improved article transporting rack of the type having a first pair of standards and a second pair of standards in spaced relationship to the first pair of standards; a supporting backwall secured between the first pair of standards; a frame mounted between and attached to the first and second pair of standards; and a base mounted on the frame to support the articles, the improvement comprising:

the frame comprising:

a pair of solid, rigid members each having a vertical leg and a horizontal leg, a one of said rigid members secured to the first pair of standards with the horizontal leg extended toward the second pair of standards and the vertical leg extended upward and the other one of said rigid members secured to the second pair of standards with the horizontal leg extended toward the first pair of standards and the vertical leg extended upward;

the horizontal leg of each of said solid rigid members supports the base in a horizontal plane;

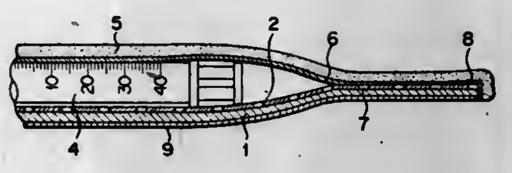
the vertical leg of each of said solid members prevents movement of the base toward and away from the back wall; and

means attached to the frame for securing the articles on the rack.

3,887,072

PACKAGE

Norio Koremura, Fujinomiya, Japan, assignor to Jintan Terumo Co., Ltd., Tokyo, Japan
Filed June 27, 1973, Ser. No. 373,935
Claims priority, application Japan, June 30, 1972, 47-65485
Int. Cl. B65d *73/00*
U.S. Cl. 206—484 7 Claims

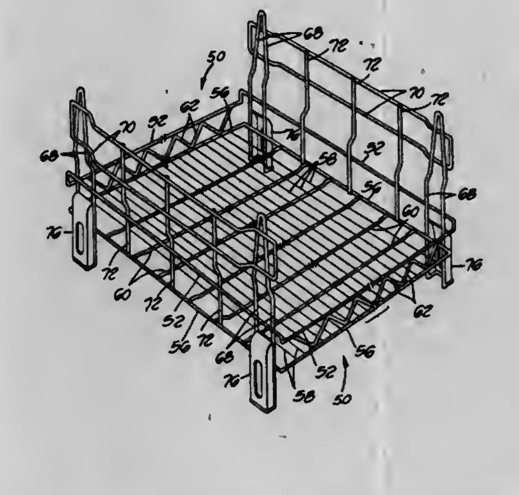


1. A package for an article such as surgical instrument, comprising first and second sheets enclosing an article therebetween, said first sheet comprising a paper layer and a thermosetting plastics layer thereon, said thermosetting plastics layer extending over a peripheral portion of said paper layer and having a plurality of cutouts therein exposing underlying areas of said paper layer, and said second sheet comprising a layer of thermoplastic material, wherein said thermosetting layer on said peripheral portion of said first sheet is in contact with a peripheral portion of said thermoplastic material layer of said second sheet, said thermoplastic material of said second sheet extending through said cutouts in said thermosetting plastics layer and being bonded to said exposed underlying areas of said paper layer.

3,887,073

NESTABLE-STACKABLE RECEPTACLE

James D. Wilson, Newport Beach, Calif., assignor to Banner Metals, Inc., Compton, Calif.
Filed June 11, 1973, Ser. No. 368,745
Int. Cl. B65d *21/04*
U.S. Cl. 206—507 2 Claims



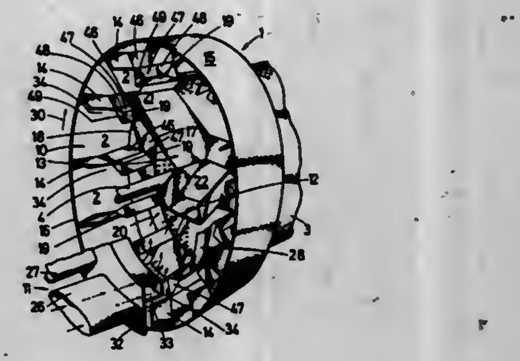
1. A receptacle capable of being stacked or nested with receptacles of like construction, including: a first wire rod extending as a closed rectangular loop around the periphery of the receptacle, said closed rectangular loop having spaced and parallel side portions, having spaced and parallel end portions, and having four corners; means attached to said wire rod to define a bottom for the receptacle; and further wire rods forming elongated side brackets attached to said wire rod at the respective corners of the rectangular loop, said side brackets extending upwardly to define corresponding upper support members displaced downwardly from the plane of the bottom of the receptacle and extending downwardly to define corresponding lower support members displaced downwardly from the plane of the bottom and in respective vertical alignment with the upper support members, each of said further wire rods defining an inverted U-shape to provide an apex at the upper end of the corresponding side bracket, and each of the further rods being formed with the lower end thereof configured into a bent-over looped end portion.

3,887,074

APPARATUS FOR CONTINUOUSLY SEPARATING AND DISCHARGING HEAVY FOREIGN MATTERS FROM BEETS

Andre Henri Bausler, St. Jean Geest, Belgium, assignor to Raffinerie Tirlemontoise, Brussels, Belgium
Filed Oct. 1, 1974, Ser. No. 510,968
Claims priority, application Belgium, Nov. 12, 1973, 807191
Int. Cl. B03b *3/34*
U.S. Cl. 209—158 13 Claims

1. Apparatus for separating and discharging continuously heavy foreign matter from beets or similar articles which are conveyed by floating inside a trough, which comprises at a break in the trough, a pocket lying below the trough level and means for generating a rising liquid stream inside said pocket, said pocket comprising one of the pockets on a rotating wheel with pockets distributed over the internal circumference thereof, said wheel rotating in front of said means for generating which comprises at least one means for supplying the pockets with a rising liquid stream, arranged on the lower portion of the wheel path, the pockets being provided with an outlet passageway for the rising liquid stream directed inside the wheel, the apparatus comprising moreover a means for recovering and discharging foreign matter from the wheel,

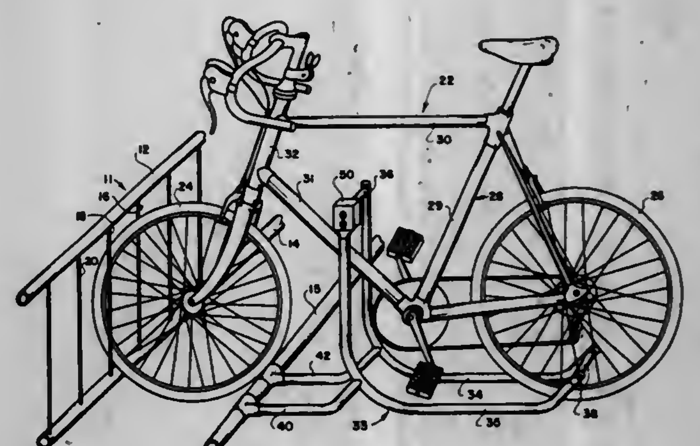


said device being arranged underneath the upper portion of the wheel path.

3,887,075

BICYCLE RACK

Jack E. Harvey, 1521 N. High St., Columbus, Ohio 432201
Filed Aug. 9, 1973, Ser. No. 387,163
Int. Cl. E05b *73/00;* **A47f** *7/00*
U.S. Cl. 211—5 8 Claims



1. A system for supporting and securing a plurality of bicycles comprising in combination:

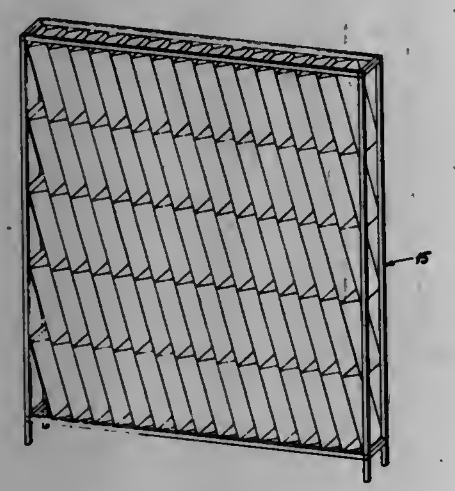
at least one bicycle rack, having at least one space of a size suitable to receive one bicycle, there being a plurality of spaces overall;

means comprising a longitudinally slidable bar element associated with each said space for optionally securing a bicycle in any one of said plurality of spaces and for optionally securing additional bicycles in others of said plurality of spaces;

means comprising a separate two-key lock for each of said spaces and its associated bar element for at times preventing releasing longitudinal movement of the associated bar element, said locks each having two cylinders having separate unlike keys appropriate to each of said cylinders, and each lock having means for insuring that at least one of said keys remains in the lock at all times, one of said keys for each lock being unique for said lock and the other being a key which is operable with all of the locks of said system.

3,887,076
DOCUMENT FILING RACK

Mogens Drost Larsen, Teglvaerksvej 22, Jyderup, Denmark
Filed Mar. 13, 1973, Ser. No. 340,676
Claims priority, application Denmark, Mar. 15, 1972, 1208/72
Int. Cl. A47f *5/00;* **B42f** *17/00*
U.S. Cl. 211—10 **3 Claims**

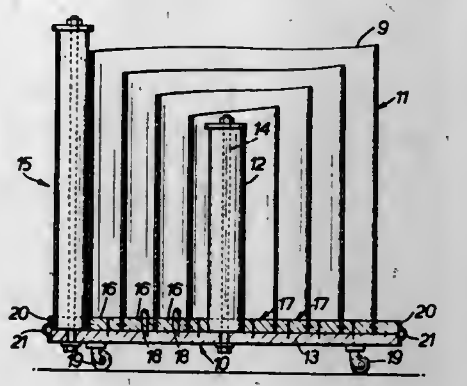


1. A document filing rack comprising a plurality of wall-forming elements including end elements assembled as a unit so as to form a plurality of box shaped compartments having inclined side walls and top and bottom walls extending substantially perpendicularly thereto, each of said elements except said end elements consisting of a plate bent generally to Z-shape having a central portion and two end portions extending perpendicularly thereto in opposite directions, each of said end portions being provided at its free edge with one or more turned-out, deformable flaps defining projections thereon which are in engagement with pockets formed in or provided on the central portion of an adjacent element a short distance from one end thereof and on the surface facing away from the adjacent end portion, said turned-out flaps being bent at substantially right angles to said end portions, each of said end elements being L-shaped and including a central wall having flap receiving pockets adjacent a free edge thereof extending perpendicularly to said central wall, the end portions on said end elements having bent flaps engaging the pockets of the adjacent elements, the uppermost corner of each document compartment being disposed substantially vertically above the diametrically opposed lowermost corner of the same compartment.

3,887,077
CONTAINERS OR RACKS FOR SHEET MATERIAL

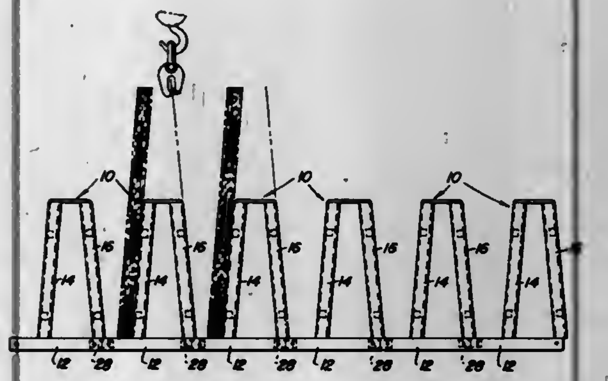
Martin Oscar Frey, Hill House Gloucestershire, Newnham, England
Filed Feb. 11, 1974, Ser. No. 441,323
Claims priority, application United Kingdom, Feb. 27, 1973, 9678/73
Int. Cl. A47f *1/16*
U.S. Cl. 211—45 **6 Claims**

1. A container for cut sheets of thin flexible sheet material, comprising a rigid base formed with a spiral groove, a continuous coiled spiral wall formed of a thin sheet of synthetic plastics material, which is sufficiently rigid to be self-supporting but sufficiently flexible to be capable of being wound into a spiral, and has a smooth anti-friction surface, said wall having a plurality of turns, with successive turns spaced apart to form a coiled slot, having a substantially continuous open upper entry, the lower parts of the said wall being anchored in the spiral groove of said base, which locates the said wall in the required coiled configuration, the inner end of said wall being arranged to provide a closed hollow central cylinder, and the outer end of said wall being formed to close off the outer end of said coiled slot.



3,887,078
UNITIZED MODULAR RACK FOR VERTICAL STORAGE OF FLAT SHEET MATERIALS

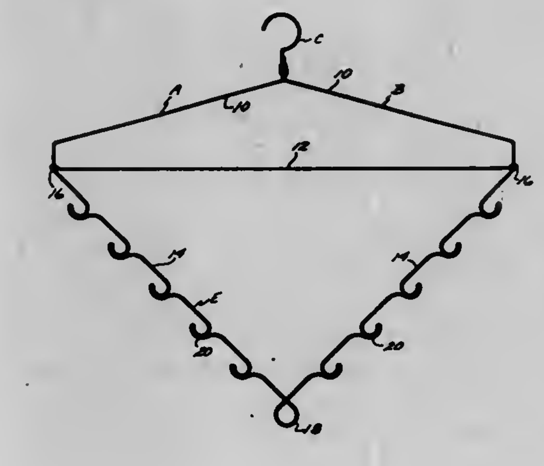
Richard S. Jay, Evanston, Ill., assignor to Jarke Corporation, Chicago, Ill.
Continuation-in-part of Ser. No. 386,569, Aug. 8, 1973. This application Nov. 26, 1973, Ser. No. 418,859
Int. Cl. A47f *7/00*
U.S. Cl. 211—50 **6 Claims**



1. A unitized module adapted for interconnection with one or more other such modules to form a modular rack for storage materials comprising, in combination,
a base member having a leading end and a trailing end each of said leading and trailing ends being provided with connecting means for interconnecting adjacent base members,
said base member formed by at least one base rail, said base rail having a forward support bar mounted thereon and spaced rearwardly from said leading end of said base member and extending upwardly therefrom,
said base rail further including a rear support bar mounted thereon and extending upwardly therefrom, said rear support bar overhanging the trailing end of said base member thereby to form a connecting offset,
said forward and rear support bars interconnected by a top frame member,
said leading end of one module cooperating with the connecting offset trailing end of a next adjacent module such that the point of interconnection between adjacent modules is removed from contact with the materials stored in said rack,
whereby interconnection of one unitized module with an adjacent module is accomplished by inserting the leading end of said base member of one module into the connecting offset trailing end of the next adjacent module such that said rear support bar overrides the leading edge of adjacent base members thereby to conceal the point of interconnection between adjacent unitized modules from the materials stored within said rack.

3,887,079
MULTI-PURPOSE CLOTHES HANGER COMBINATION

Beatrice L. Crew, 5120 Abbott Rd., South Gate, Calif. 90280
Filed Feb. 8, 1974, Ser. No. 440,672
Int. Cl. A47f *5/08*
U.S. Cl. 211—118 **1 Claim**

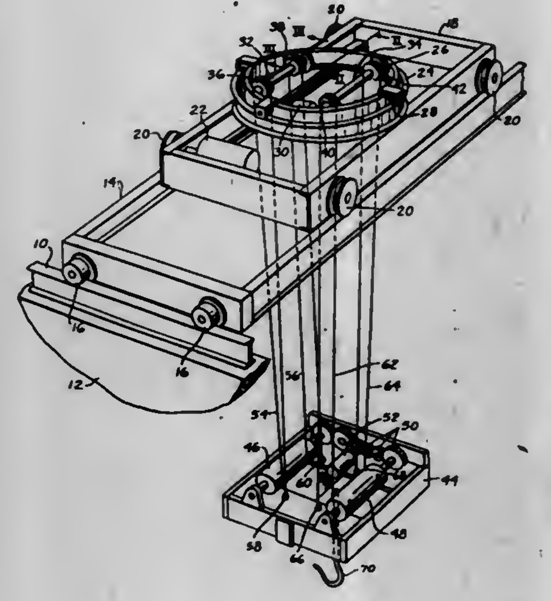


1. In combination with a first wire clothes hanger of the type that includes a cross bar engaging wire hook that has two oppositely disposed wire arms depending downwardly at an angle from the lower ends thereof and the arms on their lower ends connected by a wire cross piece, a device for supporting a plurality of clothes hangers parallel to one another and substantially normal to said cross piece, said device including: a V-shaped wire member that has two spaced ends on which eyes are formed that pivotally engage said cross piece, said V-shaped wire member when not in use capable of being pivoted to a first position to overlie said first coat hanger for said first coat hanger and device to occupy a minimum of space when not in use by said coat hanger lying substantially within the confines of said V-shaped member, but said V-shaped wire member capable of occupying a second position where it depends from said cross piece, with said V-shaped wire member having a number of spaced engageable hooks defined thereon that may be removably engaged by the hooks on a plurality of second clothes hangers to removably support said second clothes hangers parallel to one another in fixed spaced relationship when said V-shaped wire member is in said second position and said hook of said first clothes hanger engage said cross bar, and said cross bar when said V-shaped wire member is in said second position and not supporting said second clothes hanger capable of supporting a garment in a folded position thereon.

3,887,080
CRANE STRUCTURE

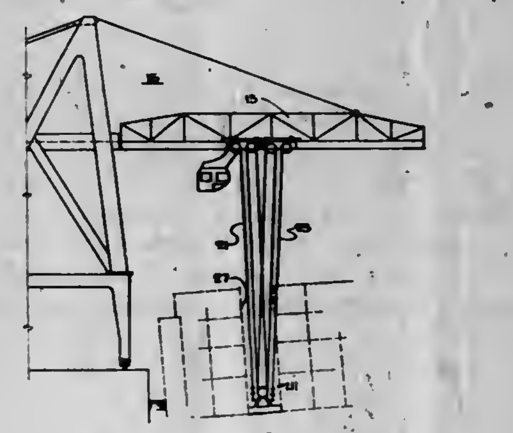
Ray Wilson, R.R. No. 1, Box 102, West Alexandria, Ohio 45381
Filed June 29, 1973, Ser. No. 374,924
Int. Cl. B66c *17/06*
U.S. Cl. 212—11 **14 Claims**

1. In a crane structure having a main frame moveable along stationary rails in one direction and a trolley moveable along the main frame in another direction; a load frame, drum means rotatable in said load frame, cable means connected to said drum means and leading upwardly therefrom, a carrier member adjacent said trolley, first means connecting said cable means to said carrier member in load transmitting relation thereto, and second means rotatably supporting said carrier member on said trolley, said second means being disposed beneath the top of said trolley and fixedly connected thereto.



3,887,081
BALL ROTATION SHEAVE RELEASE

Charles Barrier Gill, San Mateo, Calif., assignor to Fruehauf Corporation, Alameda, Calif.
Filed Nov. 2, 1971, Ser. No. 194,877
Int. Cl. B66d *1/38*
U.S. Cl. 212—128 **5 Claims**



1. In a sway arrest system for cargo container handling lifting spreaders having sway arrest lines reeved through sheaves mounted on opposite sides of said spreaders, a bail rotation sheave release means for providing a tension release for the sway arrest lines, and for providing vertical side clearance for said lines from cell guides when a spreader is lowering a cargo container into a ship's hold, comprising
moveable bails securing said sway arrest sheaves to said spreader,
toggle linkage for moving said bails upwardly and inwardly from the down position with respect to said spreader, and power means for moving said toggle linkage to the up position and for locking said toggle linkage in the down position.

3,887,082

SYSTEM FOR HANDLING SURFACE-FINISHING LAYERS IN THE PRODUCTION OF PRESSED BOARD

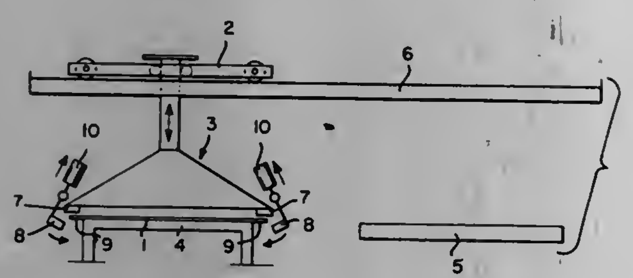
Manfred Posselt, Viersen, Germany, assignor to G. Siempelkamp & Co., Krefeld, Germany

Filed Feb. 28, 1973, Ser. No. 336,734

Claims priority, application Germany, Mar. 1, 1972, 2209691

Int. Cl. B66c *1/22*

U.S. Cl. 214—1 BB **2 Claims**



1. A system for the manipulation of a stack of surface-finishing layers applicable to a substrate in the formation of pressed board, comprising:

- a table receiving said stack with opposite edges thereof overhanging said table;
- horizontal track means extending from said table to a location horizontally spaced therefrom;
- a carriage shiftable horizontally along said track means from a position overlying said table to said location;
- a support vertically displaceable on said carriage;
- respective clamps on said support along opposite edges thereof, said clamps each having a pair of relatively movable clamp jaws engageable with said overhanging edges of said stack on said table for displacement of said stack to said location, each of said clamps having a fixed jaw on said support and having a movable jaw swingable about a horizontal axis parallel to the overhanging edges of said stack, said fixed jaws lying in a common horizontal plane, a respective axle defining each of said axes and journaled on said support, a first fluid responsive device on said support for rotating each axle, and a second fluid-responsive device on each axle and carrying the respective movable jaw for shifting said movable jaw transversely and relative to the respective axle, said jaws each extending the full length of said stack; and
- means providing a stack-receiving surface at said location.

3,887,083

SYSTEM FOR MOVING AND ALIGNING MODULAR HOUSE UNITS ONTO A FOUNDATION

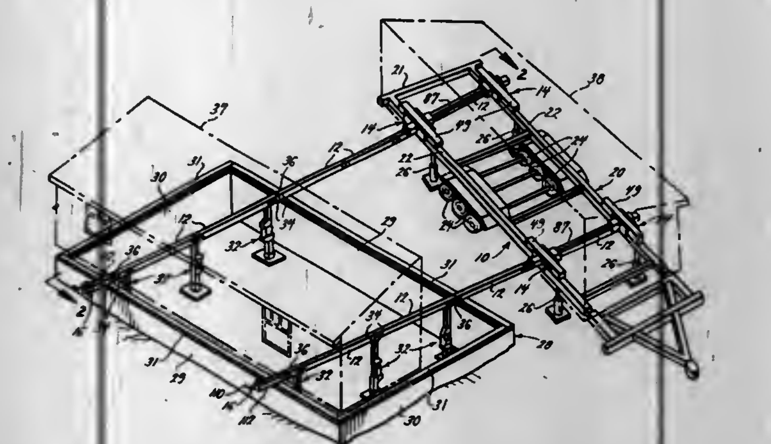
Bobby G. Baxter, Warrenton, Mo., assignor to The Binkley Company, Warrenton, Mo.

Continuation-in-part of Ser. No. 216,204, Jan. 7, 1972, Pat. No. 3,794,186. This application Mar. 8, 1973, Ser. No. 339,081

Int. Cl. B65g *67/24*

U.S. Cl. 214—1 H **10 Claims**

1. A module moving system for placing a module unit on a site foundation comprising means for supporting the module unit alongside the foundation, spaced tracks extending from between the module and support means across the foundation, first antifriction bearing means between the module and tracks for movement of the module along the tracks, second antifriction bearing means located between the module and the tracks for allowing transverse movement of the module relative to at least all but one of the tracks as the space between the tracks varies along their length, means between the first and second antifriction bearing means for providing rotation of the module unit relative to the tracks, and means for applying force to move the module along the tracks.



3,887,084

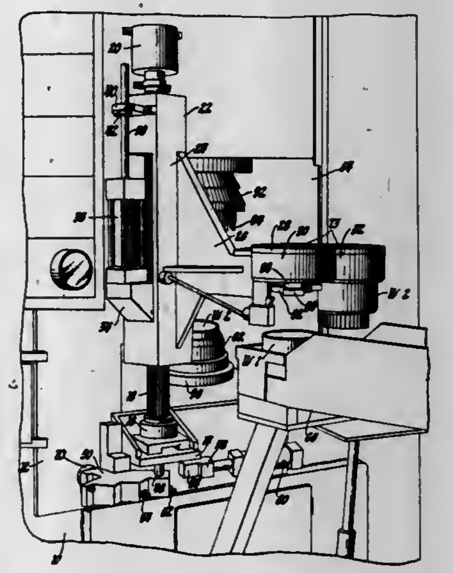
WORKPIECE TRANSFER DEVICE FOR PRODUCTION MACHINES

Sam Gallo, Flint, and James R. Pennington, Clio, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 23, 1973, Ser. No. 353,561

Int. Cl. B65g *47/04*

U.S. Cl. 214—1 BB **2 Claims**



1. A device for cycling workpieces between a workpiece loading-unloading station into and out of a machine having vertically oscillating workpiece support means therein comprising a single horizontally extending arm, a support plate secured to one end of said arm, separate and independent first and second workpiece holding chuck means for independently gripping and holding first and second separate workpieces, securing means for fastening said chuck means in a side-by-side relationship on one end of said arm, each of said chuck means extending vertically from said support plate and each having opposing workpiece gripping means relatively movable toward and away from one another for selectively releasing and gripping separate first and second workpieces, vertically-extending track means supporting said arm for movement in a vertical direction and for clockwise and counterclockwise turning movement into and out of said machine, first motor means for vertically moving said arm and said first and second chuck means to predetermined positions with respect to said track means, a pivot axis, means mounting said track means for turning movement with respect to said pivot axis, second motor means for turning said track means and said arm with respect to said pivot axis, first stop means operatively connected to said track means for stopping the turning movement of said track means and said arm in a first rotary direction at a first station within said machine whereby said arm and a first of said chuck means can be vertically moved on said track means to pick up a finished workpiece from said workpiece support means from any vertical position thereof, second stop means operatively connected to said track means for stopping subsequent turning movement of said track means and said arm in said first rotary direction at a second station within said machine whereby said arm and said second of said chuck means can be vertically moved on said track means to load an unfinished workpiece onto said workpiece support means, and control means for subsequently effecting the turning movement of said track means and said arm in a second rotary direction opposite to said first rotary direction to move said finished workpiece out of said machine toward said loading-unloading station, and third stop means operatively connected to said track means for limiting the turning movement of said track means and said arm to a position vertically aligned with said loading-unloading station so that said first chuck means can unload finished workpiece and simultaneously said second chuck means can be loaded with an unfinished workpiece.

3;887,085

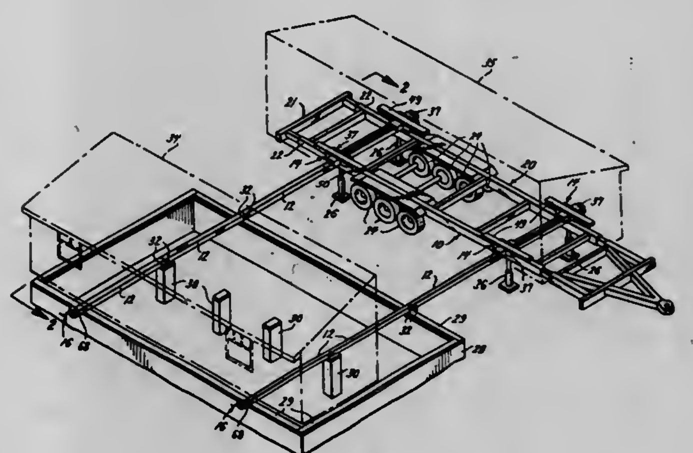
PREFABRICATED HOUSE MODULE MOVING SYSTEM

Bobby G. Baxter, Warrenton, Mo., assignor to The Binkley Company, Warrenton, Mo.

Division of Ser. No. 216,204, Jan. 7, 1972, Pat. No. 3,794,186. This application Dec. 5, 1973, Ser. No. 421,758

Int. Cl. B65g *67/24*

U.S. Cl. 214—1 H **7 Claims**



1. A roller pad for use in a system for moving a module unit over tracks and onto a site foundation comprising a body portion, first roller means for supporting the body portion for movement along a track, a roller track segment, second roller means for supporting the roller track segment on the body portion for transverse movement of the roller track segment relative to the track, the roller track segment adapted for supporting a portion of the module thereon, and adjustable means for securing the roller track segment in a selected fixed transverse position relative to the track, whereby the roller track segment is adjustable transversely relative to the track to a selected fixed transverse position.

3,887,086

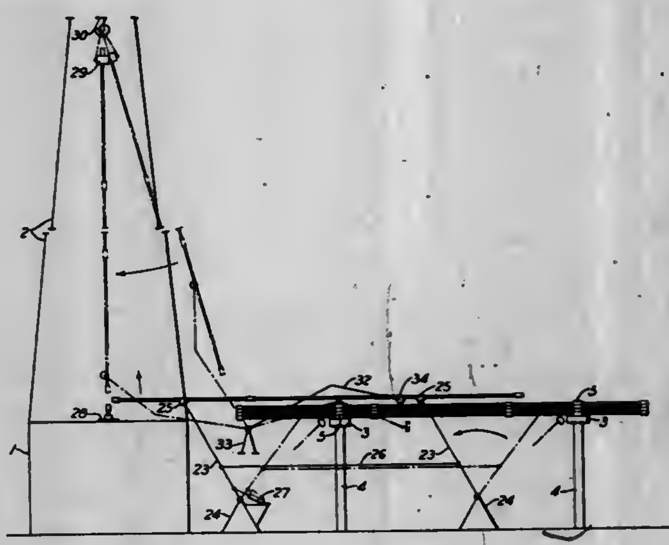
PIPE RACKER

Homer J. Woolslayer, and Cecil Jenkins, both of Tulsa, Okla., assignors to Lee C. Moore Corporation, Tulsa, Okla.

Filed June 14, 1974, Ser. No. 479,296

Int. Cl. E21b *19/14*

U.S. Cl. 214—2.5 **9 Claims**



1. A pipe racker comprising laterally spaced elongated trays for supporting transversely thereof a plurality of parallel reclining pipestands at one side of a transfer zone, means for indexing said trays lengthwise across said transfer zone, transfer means for lifting each successive pipestand at said transfer zone from said members and moving it lengthwise a predetermined distance to locate its leading end at an elevating position in an oil well derrick, a steady arm normally extending lengthwise of the pipestands adjacent said transfer zone, means pivoting the end of said arm that is nearest said elevating position on a transverse horizontal axis, means connected to the other end of the arm for engaging the bottom of each lifted pipestand, and means for then swinging said arm upwardly and over toward said elevating position to control the trailing end of the engaged pipestand while its leading end is being elevated at said elevating position.

3,887,087

APPARATUS FOR STACKING LOOSELY ADJACENT ARTICLES

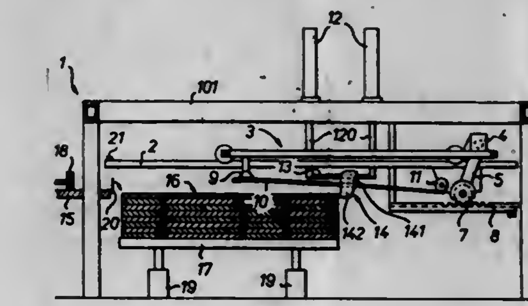
Bernhard Max Glaus, St. Gallen; Guido Maag, Niederstetten, and Hermann Knus, Gossau, all of Switzerland, assignors to Ulrich Steinemann AG Maschinenfabrik, St. Gallen, Switzerland

Filed Mar. 13, 1973, Ser. No. 340,661

Claims priority, application Switzerland, Mar. 27, 1972, 4541/72

Int. Cl. B65g *57/09*

U.S. Cl. 214—6 DK **6 Claims**



1. Apparatus for stacking loosely adjacent articles, said apparatus comprising:

- at least one normally generally horizontal plate having an upper face for receiving said articles and having exposed front and rear edges;

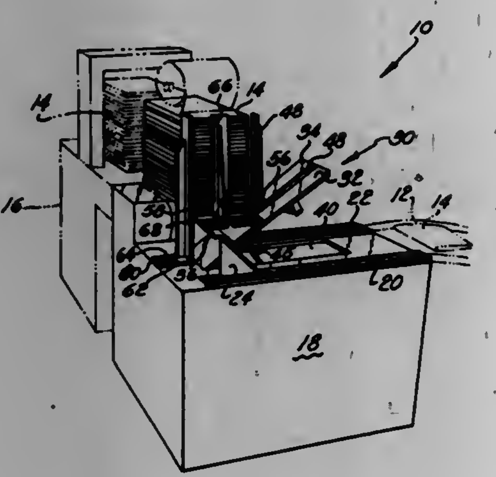
- means for guiding and moving said plate longitudinally forwardly and rearwardly, said entire plate being maintained substantially planar during said guiding and moving by said means for guiding and moving; and,
- a stripper positioned above said upper face effective to remove said articles therefrom as said plate is moved longitudinally rearwardly;
- wherein said horizontal plate is constructed of a resilient flexible material which is incapable of supporting itself.

3,887,088
METHOD AND APPARATUS FOR FORMING A VERTICAL STACK OF SIGNATURES

Victoriano Fernandez-Rana, and Carlton V. Hageman, both of Easton, Pa., assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Mar. 18, 1974, Ser. No. 452,201
Int. Cl. B65h *31/06, 31/34*

U.S. Cl. 214—6 C **20 Claims**



1. Apparatus for forming a dense, shingled array of signatures into a vertical stack comprising:

- support means mounted in a first position for supporting signatures in a dense, shingled relationship including an inclined support surface against which a side surface of the signatures rest and a lower support for engaging the lower edges of the signatures;
- actuating means for moving said support means from said first position to a second position wherein said inclined support surface extends generally horizontally; and,
- pusher means operable at least when said support means is in said second position for applying a force against the edges engaging said lower support to bring the lower edges into generally vertical alignment relative to said inclined support surface.

3,887,089
PARKING DEVICE

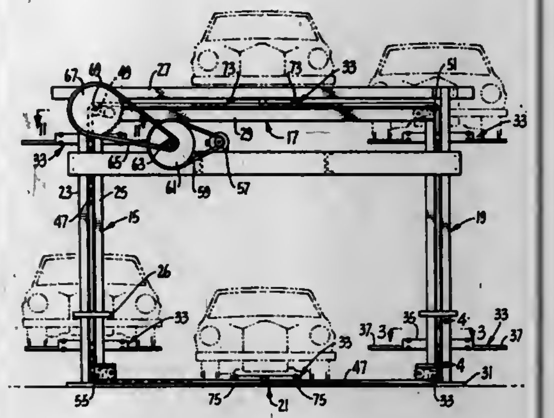
Geoffrey Francis, 717 Sutter, San Francisco, Calif. 94104

Filed Sept. 13, 1973, Ser. No. 396,743
Int. Cl. E04h *6/06*

U.S. Cl. 214—16.1 B **1 Claim**

1. In a parking device wherein a plurality of car carriers move on a generally rectangular path with means for moving said car carriers around said path while maintaining the car carriers in a horizontal plane at all times, the improvement comprising:

- a. a first set of four sprockets, said sprockets being located at the four corners of a first rectangular path,
- b. a second set of four sprockets, said sprockets being located at the four corners of a second rectangular path,
- c. said first and second sets of four sprockets being congruent and having the same top and bottom horizontal planes but being offset laterally with respect to each other,
- d. a first chain trained around the first set of sprockets, and a second chain trained around the second set of sprockets.
- e. a plurality of car carriers, each of said carriers being of a generally flat rectangular configuration with relatively long side members and relatively short end members,
- f. a crank shaft extending from each of said carriers at one end thereof, each of said crank shafts having a crank arm extending from the crank shaft at right angles to the crank shaft,



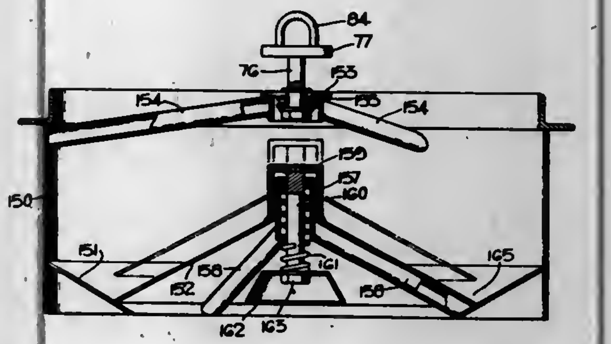
- g. the length of said crank shafts being substantially equal to the distance by which the first and second sets of sprockets are offset laterally to each other,
- h. the terminal end of each crank arm having a crank pin extending therefrom, said pin being generally parallel to said crank shaft,
- i. means for pivotally attaching each of said crank shafts to fixed positions on said first chain,
- j. means for pivotally attaching each crank pin to fixed positions on said second chain while maintaining each crank arm horizontal, and
- k. means for moving said first and second chains around said first and second sets of sprockets.

3,887,090
HOIST PANS AND HOIST PAN HANDLING APPARATUS

Bernard S. Reckseit, Cincinnati, and George A. Burgess, Fairfield, both of Ohio, assignors to Sweco, Inc., Los Angeles, Calif.

Division of Ser. No. 206,568, Dec. 9, 1971, Pat. No. 3,791,539, which is a division of Ser. No. 825,862, May 19, 1969, Pat. No. 3,697,006. This application Nov. 15, 1973, Ser. No. 415,990
Int. Cl. B65g *65/32*

U.S. Cl. 214—17 C **4 Claims**



1. A hoist pan for use in a material handling system for mills comprising

- a housing having at least a circular peripheral portion,
- means coupled with said housing for supporting said housing for rotation about the central axis thereof, said means comprising a bearing assembly and arm means coupled between said bearing assembly and said housing,

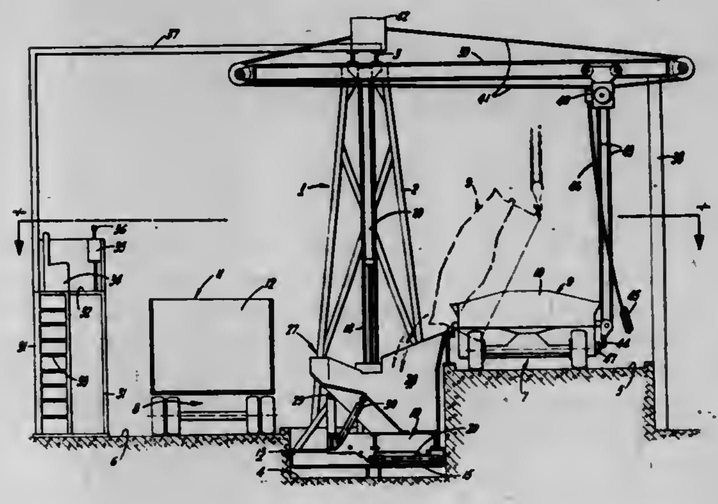
- an insert mounted within said housing near the lower extremity thereof,
- a movable bottom mounted within said housing comprising a substantially conical member mounted for up and down movement within said housing, the outer periphery of which engages said insert to close said pan, and
- spring biasing means coupled with said movable bottom of said insert for normally closing said bottom, said spring biasing means comprising a spring housing mounted substantially coaxially within said housing and coupled with said insert, said spring housing containing a spring therein, and said conical member including a shaft extending through said spring housing and terminating in an actuator near the central lower extremity of said pan means for engaging a central projection of a mill for causing said bottom to raise and dump the contents of said pan means into said mill.

3,887,091
TRANSFER APPARATUS FOR BULK GRAPES

Charles Herbert Buck, Acampo, Calif., assignor to Liberty Winery, Inc., Acampo, Calif.

Filed May 18, 1973, Ser. No. 361,660
Int. Cl. B65g *67/02*

U.S. Cl. 214—38 R **3 Claims**



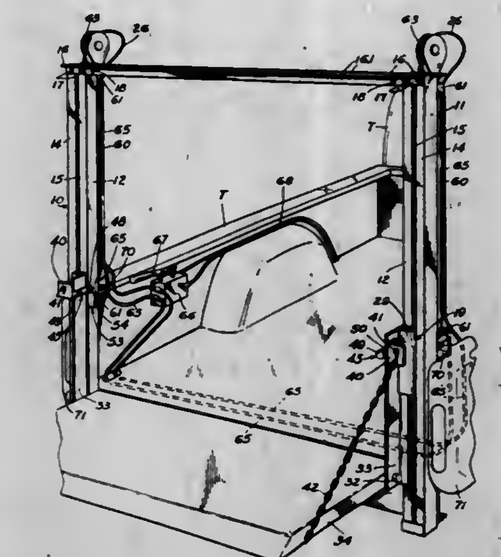
1. Apparatus for transferring bulk grapes from the bin of a field cart at an unloading station to a bin of a highway truck at an adjacent but spaced-apart loading station, comprising a main frame upstanding between such stations, a power-actuated elevator guided on the main frame for vertical movement between a lowered position and a raised position, and a power-actuated transfer bin unit supported on the elevator and adapted in the lowered position of said elevator to receive bulk grapes discharged from the field cart and in the raised position of such elevator to discharge such bulk grapes into the bin of the highway truck; the elevator including a bed-like carriage thereon, the transfer bin unit being supported by the carriage, means mounting the carriage on the elevator for guided shifting movement laterally of the main frame to dispose the transfer bin unit adjacent the unloading station when the elevator is in lowered position and to dispose the transfer bin unit adjacent the loading station when the elevator is in raised position, and power means between the elevator and carriage operative to so shift the latter; and the transfer bin unit including a longitudinal row of separate side-by-side bins, means pivotally mounting the separate bins on the carriage for independent tilting but all in a like direction to discharge into the bin of the highway truck at the loading station when the transfer bin unit is adjacent thereto, and power means between the carriage and the separate bins operative to selectively and independently tilt said bins in such like direction.

3,887,092
TAIL GATE LIFT MECHANISM

Richard A. Leet, 3118 Williamsburg Ave. N.W., Warren, Ohio 44485

Filed Mar. 16, 1973, Ser. No. 341,883
Int. Cl. B60p *1/44*

U.S. Cl. 214—75 T **1 Claim**



1. A tail gate lift mechanism for attachment to the rear portion of a truck, comprising:

- a pair of elongated hollow members, each attached to one side of the truck at the rear thereof and extending vertically, each member having a longitudinally extending slot,
- a roller assembly disposed within each hollow member for vertical movement therein, each roller assembly having a leg portion extending through a respective slot,
- a tail gate member connected to each leg portion outwardly of the related hollow member.
- a tail gate pivotally connected between said tail gate members,
- power means connected to said roller assemblies to elevate the same and thus the tail gate,
- latch means supported for movement with said tail gate and operable to stop unintentional movement of the latter below the level of the bed of said truck, said latch means comprising a short tube connected to said tail gate member, a rod slidably carried within said tube, and a stop secured to a hollow member, said rod engaging said stop to limit downward movement of said tail gate, said rod being movable to a retracted position clear of said stop to permit movement of said tail gate to a position below the level of said truck bed,
- said tail gate when swung to position closing the rear of said truck bed automatically moving said rod to an extended position for engagement with said stop.

3,887,093
BOAT TRAILER

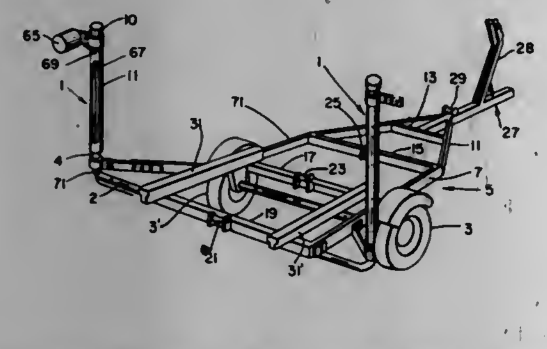
Gerald D. Howell, 802 Harrison Rd., Longview, Tex. 75601

Filed June 1, 1972, Ser. No. 258,775
Int. Cl. B60p *1/52*

U.S. Cl. 214—84 **7 Claims**

1. A boat trailer comprising a trailer frame mounted on wheels, a pair of L-shaped cylindrical guide members located one on each side of said trailer frame with the horizontal portions of the L-shaped guide member traversing beneath the respective sides of the trailer frame near its loading end, a tubular interconnecting member, said horizontal portions of the L-shaped member being in telescoping engagement with

said interconnecting member to provide lateral movement of the L-shaped guide members relative to said frame, means for mounting the respective L-shaped members to the sides of the trailer frame comprising a bracket provided with means through which the horizontal portion of the L-shaped member slides, an adjustable support member attached at one end to the vertical portion of said L-shaped member and at the other end to the trailer frame, said vertical portion of said L-shaped guide member being provided with a rotatable tube of resilient material.



3,887,094
CONVEYANCE OF ELECTRODES FOR ELECTROLYTIC CELLS IN ELECTROREFINING

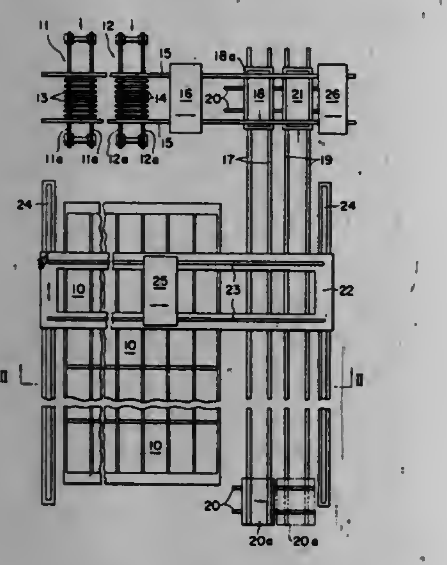
Hiroshi Ikeda; Yukio Matsubara, and Ginichi Yamaguchi, all of Iwaki, Japan, assignors to Onahama Seiren Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1974, Ser. No. 452,343

Claims priority, application Japan, July 7, 1973, 48-76846

Int. Cl. B66b *17/00*

U.S. Cl. 214—89 **11 Claims**



1. A method of conveying anode and cathode sheets into and out of an array of open-top electrolytic cells mounted on a floor and including a series of parallel rows of cells, wherein said anode and cathode sheets are each provided with a pair of lugs or the like so as to be supported vertically in a suspended manner throughout the entire process of conveyance, said method comprising the steps of:

providing a traveling bridge spanning said array of cells in a direction parallel to said series of rows and movable transversely of said rows;

conveying fresh anode and cathode sheets as vertically suspended and alternately arranged successive sets of anode and cathode sheets along a conveying path transverse to said series of rows to the adjacency of said array of electrolytic cells at a position in alignment with a selected row of cells;

moving said bridge to a position in alignment with said selected row of cells;

moving a traveling hoist on said bridge along the length thereof to a starting position directly above said fresh set of sheets which have been conveyed to said starting position;

moving said hoist reciprocally between said starting position and each of the positions of all the cells of said selected row to carry fresh sets of sheets successively into all the cells of said selected row and to carry used sets of sheets in the cells to said starting position successively on the way back of said hoist to the starting position for exchange of the sets in the cells;

maintaining said bridge in said position in alignment with said selected row until the exchange of the sets in all the cells in said selected row has been completed; and

moving said bridge to another position in alignment with another selected row of cells to repeat the above mentioned operation.

3. A conveying system in an electrolytic metal refining plant, for conveyance of anode and cathode sheets into and out of an array of open-top electrolytic cells mounted on a floor and including a series of parallel rows of cells, wherein said anode and cathode sheets are each provided with a pair of lugs or the like so as to be supported vertically in a suspended manner throughout the entire process of conveyance, said system comprising:

means for conveying said anode and cathode sheets as a vertically suspended and alternately arranged set of anode and cathode sheets along a conveying path parallel to said series of rows to the adjacency of said array of electrolytic cells;

a pair of spaced apart rail means parallel to said conveying path with said array of electrolytic cells and said conveying path interposed therebetween;

a traveling bridge riding on said spaced apart rail means so as to be movable in both directions along the same and spanning said array and said conveying path in a direction parallel to said series of rows at a height close to the top of said array; and

a traveling hoist movable on said bridge along the length of the same, said hoist including means for picking up a set of alternating anode and cathode sheets from said conveying means and then lowering the set into a desired one of said electrolytic cells in such a manner that said anode and cathode sheets are released in the desired electrolytic cell with their relative positions unchanged.

3,887,095
POWER-OPERATED VEHICLE

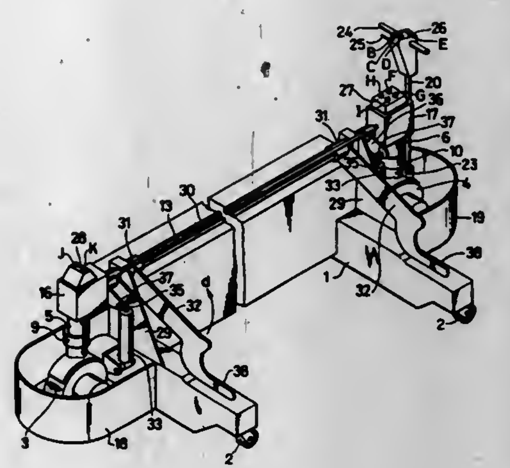
Seiichi Suzuki, Shiga, Japan, assignor to Todo Seisakusho Ltd., Kyoto-shi, Japan

Filed June 24, 1974, Ser. No. 482,411

Claims priority, application Japan, Mar. 18, 1974, 49-31457

Int. Cl. B60p *1/16*

U.S. Cl. 214—130 R **6 Claims**



1. A power-operated vehicle for transporting a beam, comprising, in combination:

1. a base having a front portion and a rear portion,
2. a front wheel at the front portion and a rear wheel at the rear portion of the base,
   a. the front and rear wheels being independently driven,
      3. support shafts pivotal about a vertical axis and mounting the front and rear wheels on the base for pivoting the wheels about the vertical axis whereby the vehicle base is steered in the direction of the wheel pivoting,
4. a connector bar interconnecting the support shafts for pivoting the shafts in unison,
5. a steering shaft operably connected to one of the support shafts for pivoting the shaft in a direction transverse to the vertical axis thereof,
6. a braking control means for the wheels carried by the steering shaft,
7. control means for controlling forward and reverse motion as well as high and low speed motion of the wheels,
8. another control means operatively associated with the other support shaft for controlling forward and reverse motion of the wheel supported by the other support shaft in low speed motion,
9. freely rotatable rollers mounted on the vehicle base laterally offset from the front and rear wheels and forming a quadrangular wheeled support therefor,
10. a pair of beam support arms mounted on the vehicle base for relative movement in respect of each other along a horizontal axis,
    a. each beam support arm having a free end defining a recess for receiving and supporting a beam to be transported upon movement of the support arms in respect of each other in correspondence to the length of the beam,
11. hydraulic jack means for pivoting the support arms about the horizontal axis, and
12. a control lever for operating the hydraulic jack means.

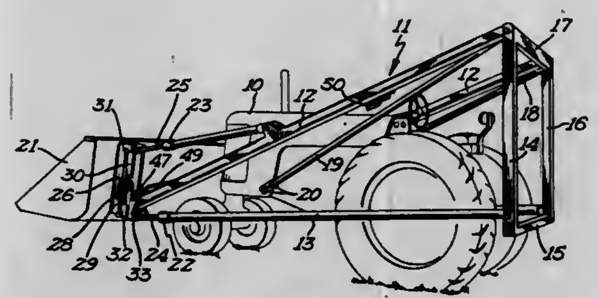
3,887,096
QUICK ATTACHMENT AND RELEASE DEVICE

Lloyd R. Wieland, Dazey, N. Dak. 58429

Filed Oct. 11, 1973, Ser. No. 405,625

Int. Cl. E02f *3/70*

U.S. Cl. 214—145 **8 Claims**



8. A quick attachment and release device for releasably attaching a first member to a second member which comprises:

a rectangular key having a substantially planar major and a minor dimension pivotally mounted to said first member for rotation about the transverse axis of said key;

a C-shaped bracket secured to said second member to permit registration with said rectangular key, and having an inner surface with a maximum inside dimension slightly greater than said major dimension and an opening smaller than said major dimension and greater than said minor dimension to thereby permit entry of said key into said bracket; and

means for orienting said rectangular key for passage through said opening of said C-shaped bracket and for pivoting said rectangular key to orient said key with said minor dimension of said rectangular key substantially contiguous with said inner surface of said C-shaped bracket for locked engagement therewith.

3,887,097
APPARATUS FOR AUTOMATIC LOADING AND UNLOADING OF AN ELEVATOR CABIN

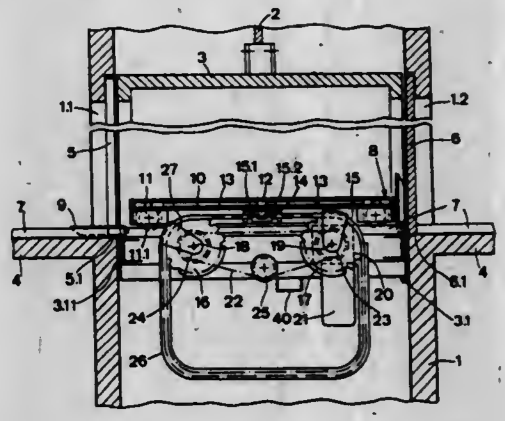
Ernst Ach, Ebikon, Switzerland, and Walter Herding, Amberg, Germany, assignors to Inventio Aktiengesellschaft, Hergiswil NW, Switzerland

Filed Mar. 29, 1974, Ser. No. 456,061

Claims priority, application Switzerland, Apr. 2, 1973, 4714/73

Int. Cl. B65g *47/00*

U.S. Cl. 214—730 **8 Claims**



1. An apparatus for the automatic loading and unloading of an elevator cabin having an elevator cabin floor at a story of a building, comprising at least one transport carriage which can be moved along with the elevator cabin, a driven buckling-resistant roller chain, guide means for the roller chain beneath the floor of the elevator cabin, said transport carriage being provided with an entrainment member secured thereto and facing the cabin floor, the buckling-resistant roller chain engaging via the entrainment member with the transport carriage for selectively moving the transport carriage out of and into the elevator cabin at a story of the building, said transport carriage being capable of assuming a starting position in the elevator cabin, said buckling-resistant roller chain being provided with two confronting terminal elements, wherein in the starting position of the transport carriage in the elevator cabin both confronting terminal elements of the buckling- resistant roller chain engage with said entrainment member, said terminal elements confronting one another until one of said terminal elements disengages from said entrainment member, drive means incorportating two synchronously rotating sprocket wheels for driving the buckling-resistant roller chain, said sprocket wheels being rotatably mounted behind one another at the cabin floor one on each side of the entrainment member of the transport carriage when located in its starting position, each sprocket wheel having associated therewith one of said terminal elements, and wherein during travel of the transport carriage in the one or the other direction of travel one of said terminal elements defines a forwardly located terminal element, said forwardly located terminal element upon passing the associated sprocket wheel being disengaged from the entrainment member and upon return movement of the transport carriage being re-engaged with said entrainment element, and the other terminal element in the engaged position with the entrainment member transmitting a driving force to the transport carriage.

3,887,098
MATERIAL HANDLING APPARATUS

Clayton L. Brundige, Rochester, and William H. Bechman, Williamsville, both of N.Y., assignors to Eaton Corp., Cleveland, Ohio

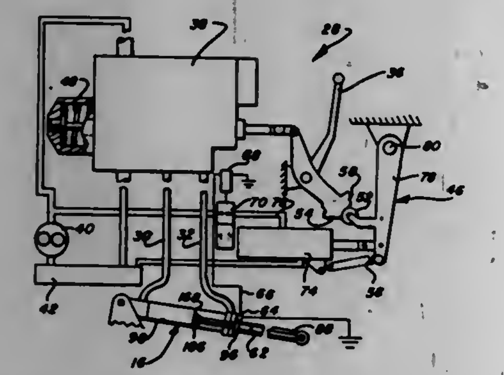
Filed Sept. 28, 1973, Ser. No. 401,685

Int. Cl. E02f *3/84*

U.S. Cl. 214—762 **14 Claims**

1. A material handling apparatus comprising bucket means for carrying materials, motor means for moving said bucket means between first and second positions, a magnet having

first and second magnetic poles, detector means actuable under the influence of the magnetic field emanating from said magnet to provide an output signal upon movement of said bucket means to said second position, means connected to said motor means for effecting relative movements between said magnet and detector means to reduce the distance between said magnet and detector means during movement of said bucket means from said first position to said second position, said magnet being disposed in such an orientation relative to said detector means that said first magnetic pole is closer to said detector means than said second magnetic pole during movement of said bucket means toward said second position, and pole shading means comprising a member made of a magnetizable material disposed adjacent to said first magnetic pole for diffusing the portion of the magnetic field associated with said first magnetic to a greater extent than the portion of the magnetic field associated with said second magnetic pole to insure actuation of said detector means only when said second magnetic pole is adjacent said detector means thereby preventing premature actuation of said detector means by said first magnetic pole during movement of said bucket means toward said second position.



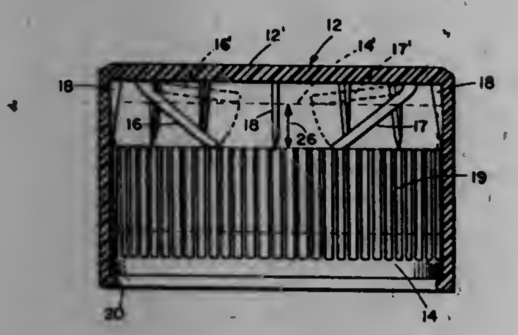
3,887,099
CONTAINER SAFETY CLOSURE

Robert N. Gillman, South Plainfield, N.J.; Anthony J. Koehne, Severna Park, and Harry O. Baughan, III, Baltimore, both of Md., assignors to Poly-Seal Corporation, Baltimore, Md.

Filed Nov. 1, 1973, Ser. No. 411,701

Int. Cl. B65d *55/02, 85/56;* **A61j** *1/00*

U.S. Cl. 215—220 **1 Claim**



1. A safety closure for a threaded cylindrical neck portion surrounding an opening in a container comprising:

- a. said closure having an inner and outer plastic cap member, each cap member being provided with a closed top portion, a cylindrical side wall portion and an open bottom, the cylindrical side wall being in a plane at right angles to the closed top portion;
- b. the outer surface of the cylindrical side wall of the inner cap being serrated to a point above its open end, leaving a narrow unserrated band about the said open end;
- c. the outer cap member being of slightly larger diameter and of greater height than the inner cap wherein the outer cap is adapted to encase the inner cap in a free rotatable and axially slideable movement relative to the inner cap;
- d. a bead extending about the lower inner surface of the outer cap for retaining the outer cap in position over the inner cap;
- e. a pair of resilient members having one end of each member secured to the inner surface in diametrical relationship adjacent the outer peripheral edge of the inner top surface having their free ends angled toward the center of the cap, wherein the free ends of the said resilient members are adapted to engage the outer surface of the closed end of the inner cap at an angle when the two caps are in assembled relationship;
- f. a plurality of tapered splines integrally formed on the inner surface of the outer cap member of substantially one third the length of the side wall of the outer cap member beginning at a point above the upper surface of the top portion of the inner cap when the caps are in normal extended position and tapered upwardly and outwardly in the direction of the center of the outer cap terminating at the inner surface of the top portion of the outer cap for engaging the recesses located between the said serrations on the outer surface of the side wall of the inner cap for rotating the inner cap in either direction when engaging the said recesses when the outer cap is depressed to a point where the splines of the outer cap engage the said recess of the inner cap.

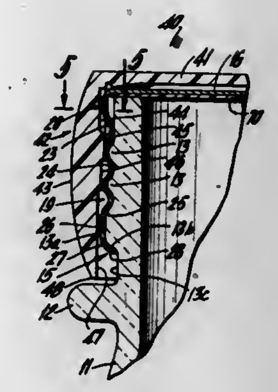
3,887,100
ANTI STRIP OVERCAP FOR METAL SCREW CAPS FOR BOTTLES OR CONTAINERS

Monroe J. Coven, and Chester C. Moss, both of Brooklyn, N.Y., assignors to Monarch Wine Co., Inc., Brooklyn, N.Y.

Filed Oct. 25, 1973, Ser. No. 409,762

Int. Cl. B65d *41/32*

U.S. Cl. 215—256 **9 Claims**



1. The combination of an overcap and a screw cap, said overcap being of substantially rigid material and having a top wall, an annular skirt extending downwardly therefrom and formed at its inner surface with an annular knurled ring forming alternating vertical ridges and grooves, said screw cap having a top wall and a skirt and being formed with a knurled ring complementary to the knurled ring of the skirt of said overcap and engaged therewith, and being disposed within said overcap, engagement of said knurled rings being such as to rotate the overcap together with said screw cap in one direction, when the screw cap is free to rotate below and to rotate the overcap in said direction relative to the screw cap without damage to either the overcap or screw cap when the screw cap is not free to rotate.

3,887,101
SPEAKER BOX CABINET AND METHOD OF MANUFACTURING THE SAME

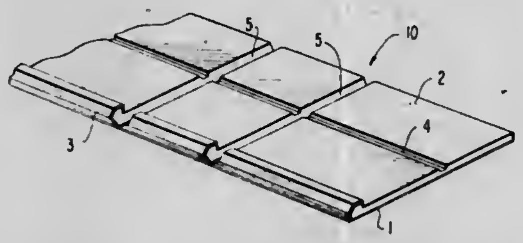
Hisao Adachi, Fukuroi, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed June 11, 1973, Ser. No. 368,930

Claims priority, application Japan, June 10, 1972, 47-68465[U]

Int. Cl. A47b *81/06*

U.S. Cl. 220—4 F **4 Claims**



1. In a speaker box cabinet or the like formed be bending a laminated sheet comprising a thin film outer layer bonded to a thick inner backing layer along spaced parallel deep bend grooves extending through the inner backing layer to the outer film layer, the improvement wherein: at least one shallow groove extends longitudinally of said laminated sheet within said inner layer to correct for camber of said sheet prior to forming said deep bend grooves and bending the sheet at said deep grooves, with said deep bend grooves extending uniformly throughout their length, completely through said thick inner layer but not into said thin film outer layer.

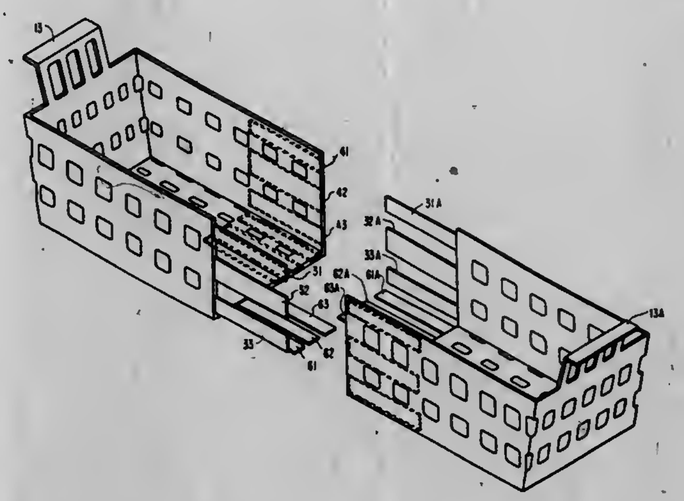
3,887,102
VENTILATED, ADJUSTABLE SIZE, OPEN TOP RECEPTACLE

Donald C. Earley, 166 S. Arcadia Pk., Lexington, Ky. 40503

Filed Feb. 7, 1974, Ser. No. 440,529

Int. Cl. B65d *11/14*

U.S. Cl. 220—8 **8 Claims**



1. An adjustable size open-top basket having two substantially identical molded segments telescopically fitted together, each of said segments comprising an end wall, bottom member joined to said end wall and having an array of tunnel portions extending toward said end wall and an array of plate portions projecting from the distal end of the bottom member, the entire array of tunnels being spaced laterally from the array of plates and with the number of plates being equal to the number of tunnels, first and second side walls integrally joined to each of the adjacent edges of the end wall and of the bottom member, said first side wall having an array of tunnels projecting toward said end wall and said second side wall having an array of plates projecting from its distal end, whereby upon arranging of one basket segment in juxtaposition to the other segment the projecting plates of one segment will engage with a telescopic sliding fit into the corresponding tunnels of the other segment permitting variation of the size of the basket while avoiding collapse of the basket under substantial loading by the contents of the basket.

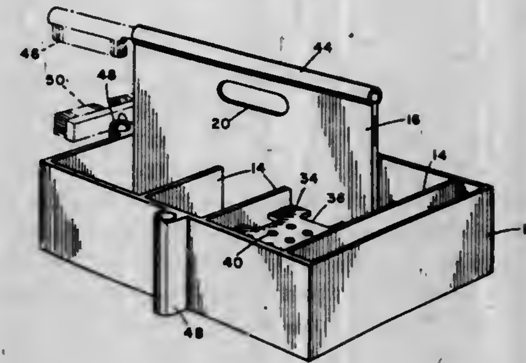
3,887,103
SWIMMING POOL EQUIPMENT CARRYING CASE

Edward Spooner, 5431 Bahia Ln., La Jolla, Calif. 92037

Filed Apr. 23, 1973, Ser. No. 353,541

Int. Cl. B65d *1/36*

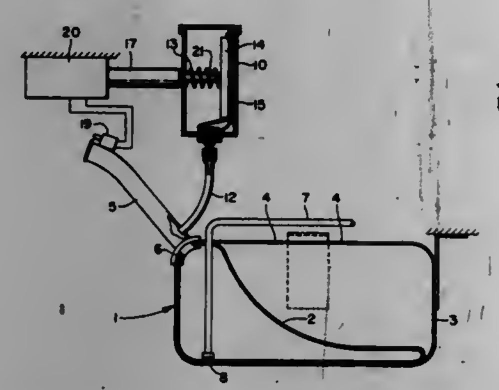
U.S. Cl. 220—20 **1 Claim**



1. A carrying case adapted for swimming pool maintenance equipment including equipment items having simple cylindrical handles, said case comprising:

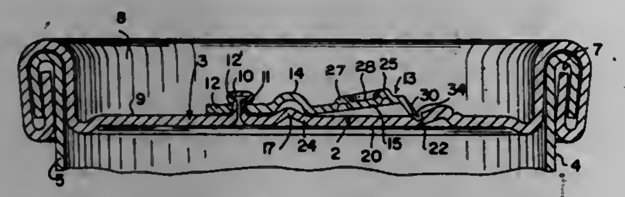
- a. a box having two sides, two ends, a bottom and being open at the top;
- b. means dividing the interior of the box into open-topped compartments, each compartment being shaped and dimensioned to receive a specific item of swimming pool maintenance equipment;
- c. one of said compartments being elongated, defined in part by one of said ends, and extending the full length thereof to receive a skimmer net;
- d. said dividing means including a central partition wall parallel to said sides and extending vertically from said bottom to well above said sides, ends and dividing means and extending from adjacent said elongated compartment to the end remote therefrom to effectively prevent spillover of equipment items from one side of the case to the other;
- e. said partition wall having a handgrip opening near the top thereof;
- f. said dividing means defining two substantially equal-sized chemical compartments diagonally disposed relative to one another in said box whereby said box is substantially balanced in use;
- g. one of said compartments having a tray well above said bottom and recessed below the upper edges of said dividing means, sides and ends and having apertures therethrough for holding tools spaced from said bottom and thus retained in dry condition and out of contact with any water inadvertantly admitted into the carrying case;
- h. a hollow open-ended cylinder mounted along the upper edge of said partition wall and extending the substantial length thereof for receiving an elongated brush handle; and
- i. a plurality of hollow vertical cylindrical sockets mounted on the exterior of said box and being open at both ends whereby elongate-handled brushes may be carried therein regardless of handle length.

3,887,104
SEALED GAS TANK
David F. Cole, 99 Elmridge Rd., Mansfield, Ohio 44907
Filed Oct. 7, 1970, Ser. No. 78,786
Int. Cl. B65d *87/16*
U.S. Cl. 220—85 B **3 Claims**



1. A sealed tank for gas and other volatile liquids comprising a flexible container which expands and collapses during liquid filling and removal to accommodate the liquid contained therein, a fill pipe connected to said container through which said container is filled, a cap for sealing said fill pipe, a liquid discharge line connected to said container, a collapsible expansion chamber connected to said container providing additional space for expansion of the liquid within said container, and spring means pressing against said expansion chamber for collapsing said expansion chamber during filling of said container to prevent entrapment of air and gas vapors in said expansion chamber.

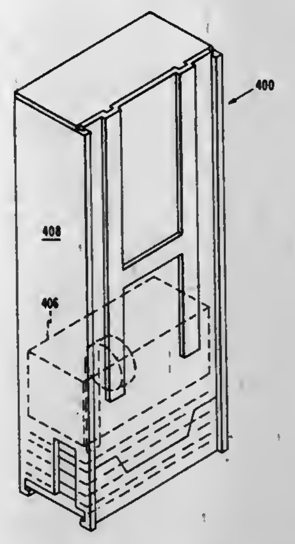
3,887,105
NON-DETACHABLE TEAR FLAP AND TAB FOR CONTAINERS
Wayne T. Chiappe, Hinsdale, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Nov. 23, 1973, Ser. No. 418,322
Int. Cl. B65d *41/02*
U.S. Cl. 220—277 **10 Claims**



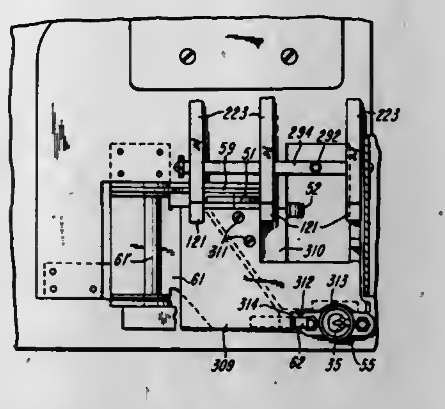
1. An easy opening container comprising an end panel having a portion defining a flap severable from the panel to provide an opening and having a tab anchored to the container, said tab having a disk-like flap-overlying portion with finger-protection means comprising a depression thereon for retaining the finger of a user in essentially centered relation to the flap-overlying portion which upon entering the opening maintains the finger away from the edge of said opening.

3,887,106
TICKET CARTRIDGE AND HOPPER AND STACKER THEREFOR
Paul Marlin Charlson; Charles Donald Green; William John Harris, all of Rochester, Minn., and Keith Erwin Inman, Leander, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 7, 1973, Ser. No. 413,749
Int. Cl. B65h *1/06*
U.S. Cl. 221—197 **6 Claims**

5. A stacker station for receiving generally rectangular merchandising tickets comprising a cartridge of rectangular cross section having a bottom, said bottom being defined by a pair of side flanges extending inwardly from side walls of the cartridge and being discontinuous to provide a ticket entrance slot in the bottom at a ticket entrance end of the cartridge, rolls positioned below said cartridge, means for drivingly rotating at least one of said rolls, said rolls being positioned in such position as to move a merchandising ticket through said slot in the bottom of the cartridge and thus into the cartridge.



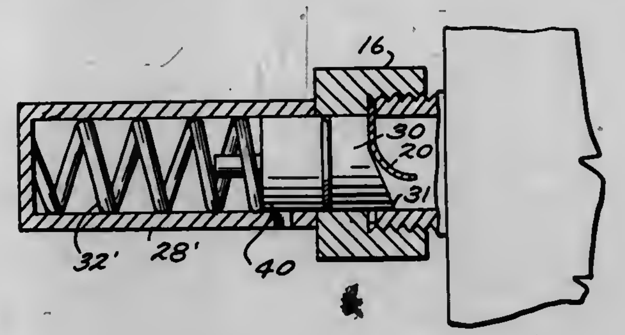
3,887,107
PINNING MACHINE
Harold N. Grushon, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Division of Ser. No. 320,340, Jan. 2, 1973, Pat. No. 3,837,554. This application Apr. 1, 1974, Ser. No. 456,711
Int. Cl. B65h *31/20*
U.S. Cl. 221—241 **8 Claims**



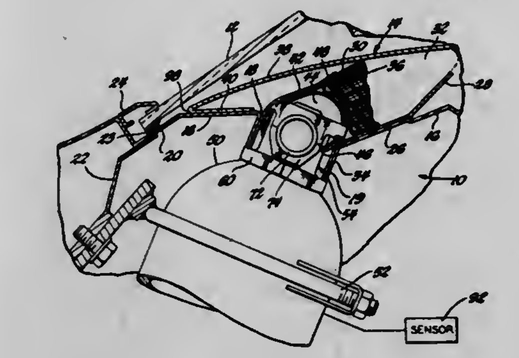
1. A pinning machine, comprising: means for receiving a stack of tags, means for feeding tags from the stack to a utilization device, a relatively removable side guide urged against the side of the stack to accommodate tags of different widths, a pusher for pushing the stack toward the feeding means, and means responsive to the pusher when the pusher has reached a predetermined position in which the stack is depleted or nearly depleted for preventing the side guide from moving into the space occupied by the stack.

3,887,108
PRESSURE RELEASE METHOD
Marvin L. McDaniel, 11222 Astronaut Blvd., Orlando, Fla. 32809, and Michael Ivashuk, 1800 S.W. Seventh Ave., Pompano Beach, Fla. 33060
Filed May 15, 1972, Ser. No. 253,510
Int. Cl. B67b *7/24*
U.S. Cl. 222—1 **2 Claims**

1. A method for quickly releasing fluid under high pressure from a container thereof through an aperture having a diaphragm covering the aperture and sealed around its periphery to the container, said method comprising urging a pointed piercing means through the diaphragm at a location immediately adjacent the periphery of the aperture to form a flap having a free edge portion and an opposite supported portion which is integral with the remainder of the flap; and ripping out the flap from the sealed circumferential edge supported portion of the diaphragm by means of the pressure of the fluid in the container acting against the flap and creating a moment of force which bends the flap about its remaining supported portion.

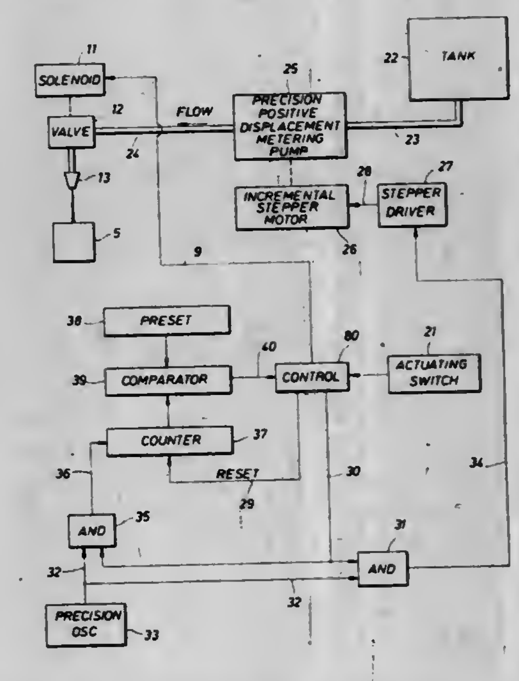


3,887,109
VALVE ARRANGEMENT FOR A VEHICULAR INFLATABLE CUSHION
Herbert A. Libkie, Marlette, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed May 13, 1974, Ser. No. 469,311
Int. Cl. B60r *21/10*
U.S. Cl. 222—3 **2 Claims**



1. For use with a housing containing an automotive inflatable cushion and having a cylindrical extension formed at an intermediate point along the underside thereof; a diffuser mounted in said housing adjacent said inflatable cushion and having a first opening formed at an intermediate point along the underside thereof and a second opening formed in the upper side thereof, and an inflator; an improved valve and connector arrangement therefor, comprising a valve member having a hexagonally-shaped central portion, means formed on one end thereof for connection with said inflator, and a cylindrical portion formed on the other end thereof, an axial passage formed through said valve member and an end-cap formed on said cylindrical portion, a transverse passage formed through said cylindrical portion adjacent said end-cap, a tubular member having tapered end surfaces formed on the ends thereof and being mounted in said transverse passage, said tapered end surfaces extending beyond the ends of said transverse passage, two pairs of aligned slots formed in oppositely disposed sides of said diffuser, said two pairs of slots being spaced a predetermined distance apart along the axis of said diffuser, a pair of resilient locking members each having tabs formed at the upper end thereof for mounting in said respective pairs of aligned slots, an opening formed in each of said resilient locking members, said valve member being operatively connected to said diffuser by having said cylindrical portion thereof inserted through said cylindrical extension and said first opening such that said tapered ends of said tubular member cause said resilient locking members to spread against the restraint of said tabs in said respective aligned slots until said ends of said tubular member snap through said respective locking member openings.

3,887,110
DISPENSING METHODS AND APPARATUS
Lawrence C. Porter, Palos Verdes Peninsula, Calif., assignor to The Upjohn Company, Kalamazoo, Mich.
Continuation of Ser. No. 71,144, Sept. 10, 1970, abandoned. This application Sept. 18, 1972, Ser. No. 289,858
Int. Cl. B67d *5/30*
U.S. Cl. 222—16 **5 Claims**

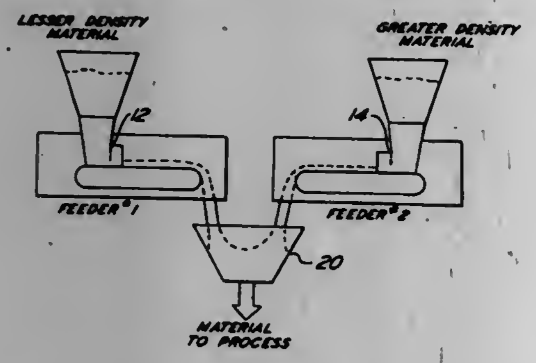


1. A system for dispensing a predetermined amount of material into a receptacle or the like, comprising
- pulse generating means for producing electrical actuating pulses,
- gating means interconnected with said pulse generating means and openable for passing said actuating pulses,
- transfer means interconnected with said gating means for dispensing a preselected discrete quantity of said material in response to each actuating pulse received from said pulse generating means,
- counting means interconnected with said gating means for receiving and counting pulses,
- preset means for providing a functional representation of a predetermined number of said actuating pulses,
- comparator means interconnected with said preset and counting means for providing a completion signal when the number of actuating pulses received and counted by said counting means corresponds with said functional representation, and
- control means for opening said gating means for passing pulses to said transfer and counting means and closing said gating means and resetting said counting means in response to said completion signal from said comparator means.

3,887,111
DENSITY CONTROL FEEDER SYSTEM
Kenneth W. Bullivant, Turnersville, N.J., assignor to K-Tron Corporation, Glassboro, N.J.
Filed June 7, 1973, Ser. No. 367,981
Int. Cl. B67d *5/08*
U.S. Cl. 222—57 **8 Claims**

1. A method of feeding variable density material at a preselected density, comprising the steps of:
- feeding material having a density less than the preselected density through a first controllable digital feeder;
- feeding material having a density greater than the preselected density through a second controllable digital feeder;

generating digital signals responsive to a preselected set point density and to the actual density of the material fed by both said first and second controllable feeders; and

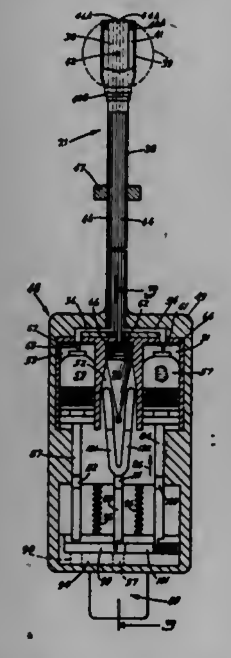


controlling the rate of feed of said first and second controllable feeders in response to said generated signals to provide a material having the preselected density.

3,887,112
APPARATUS FOR PUNCTURING AND COLLAPSING A CONTAINER

Lee R. Bolduc, Minneapolis, and Eugene A. Dickhudt, St. Paul, both of Minn., assignors to Population Research Incorporated, Fridley, Minn.

Filed May 18, 1973, Ser. No. 361,418
Int. Cl. B67b *7/26*
U.S. Cl. 222—85 **32 Claims**

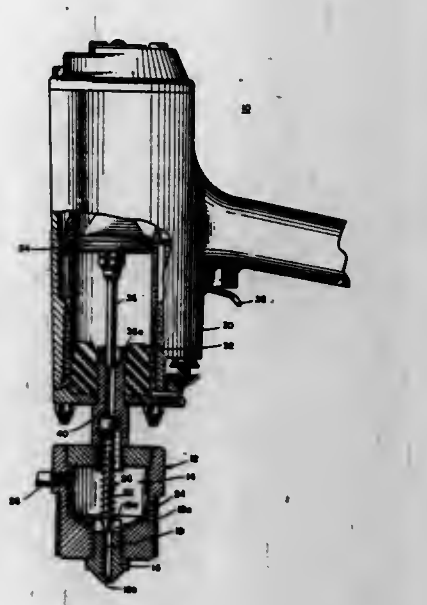


1. An apparatus for sequentially dispensing a first fluid, a second fluid, and a third fluid comprising: a housing having a first chamber, a second chamber, and a third chamber, first container means storing the first fluid located in the first chamber, second container means storing the second fluid located in the second chamber, third container means storing the third fluid located in the third chamber, first needle means operable to puncture the first container means, second needle means operable to puncture the second container means, third needle means operable to puncture the third container means, means having a passage for receiving a first fluid from the first container means, a second passage for receiving the second fluid from the second container means, and a third passage for receiving the third fluid from the third container means, first movable means operable to cause the first needle means to pierce a portion of the first container means whereby the first fluid flows from the first container means to the first passage, second movable means operable to cause the second needle means to pierce the second container means whereby the second fluid from the second container means flows to the second passage, third movable means operable to cause the third needle means to pierce the third container means whereby the third fluid from the third container means flows to the third passage, actuator means operable to sequentially move the first movable means, the second movable means, and the third movable means whereby the first fluid, second fluid, and third fluid are sequentially dispensed into the first passage, second passage, and third passage, respectively.

3,887,113
APPARATUS FOR FASTENING ARTICLES

Allen R. Obergfell, Park Ridge, Ill., assignor to Duo-Fast Corporation, Franklin Park, Ill.

Continuation of Ser. No. 172,980, Aug. 19, 1972, abandoned, which is a division of Ser. No. 776,712, Nov. 18, 1968, Pat. No. 3,616,034. This application July 19, 1973, Ser. No. 380,620
Int. Cl. G01f *11/00*
U.S. Cl. 222—146 HE **2 Claims**



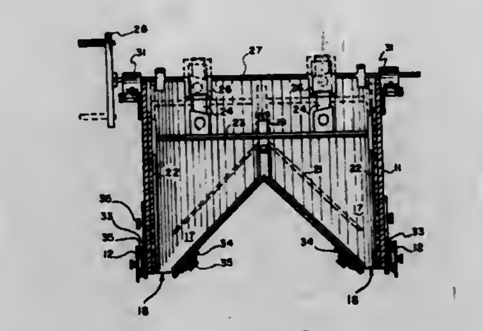
1. Apparatus for driving adhesive through a solid workpiece to the interface thereof with a base member, said apparatus comprising in combination:

a portable hand-held tool including a housing and a handle;
a nose portion supported on said housing in a fixed position relative to said housing and adapted to be placed adjacent the workpiece;
a pneumatic cylinder in said housing and a piston in said cylinder movable toward and away from said nose portion;
control means including a trigger disposed adjacent said handle for moving said piston in a drive stroke toward said nose portion;
said nose portion including a first chamber for containing a body of liquid adhesive;
heating means mounted on said nose portion for heating said adhesive to a temperature sufficient to maintain said adhesive in a viscous condition;
an elongated second chamber in said nose portion substantially smaller than said first chamber, said second chamber having an inlet communicating with the first chamber at one end to permit liquid adhesive to flow from the first chamber into the second chamber;
a plunger supported in said nose portion extending through the first chamber and mounted for reciprocating movement along a path between a first position substantially removed from the second chamber and a second position at least partly in said second chamber;
a nozzle including a restricted orifice leading from said second chamber to the exterior of said nose portion;
means for normally urging said plunger toward said piston and out of said second chamber; and
a drive member supported by said piston and normally spaced from said plunger;
said drive member striking said plunger during said drive stroke for driving said plunger into said adhesive cylinder to propel said viscous adhesive from said nozzle at high speed in order to drive said adhesive through the solid workpiece by its own inertia and into the interface between the workpiece and the base member.

3,887,114
MORTAR LAYER

Augusto Villanovich, 558 St. Clair St., Chatham, Ontario, Canada

Filed Aug. 2, 1973, Ser. No. 384,959
Claims priority, application Canada, June 7, 1973, 173524
Int. Cl. A01c *15/00*
U.S. Cl. 222—176 **4 Claims**



1. A mortar layer for laying viscous mortar of a uniform width and thickness onto a surface comprising a body having an internal chamber with an upper viscous mortar storage region and two contiguous depending leg regions relatively spaced a predetermined distance, said leg regions extending into terminal openings disposed lateral to the direction of movement of the layer, a single flat surfaced agitator having an inverted V-shaped cross-section including arms and an apex, the apex disposed within the storage region of the chamber and one arms fo the agitator extending into each of said leg regions, for shaking the viscous mortar therein, means to activate the agitator, and means for moving the body along the surface and to constrain the terminal openings at a predetermined distance from the surface, such said viscous mortar of uniform thickness and width is deposited onto the surface as the layer passes over it.

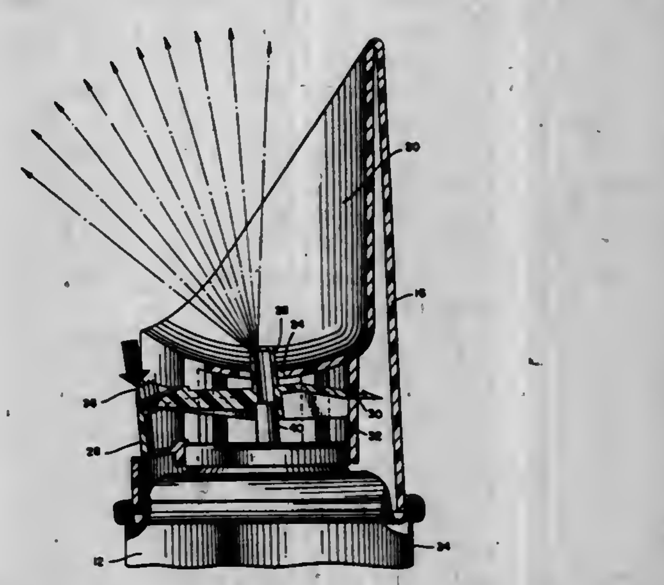
3,887,115
PACKAGE FOR AN UNDERARM SPRAY PRODUCT

Tor Petterson, Palos Verdes Peninsula, Calif., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Nov. 29, 1973, Ser. No. 420,040
Int. Cl. B65d *83/14*
U.S. Cl. 222—402.13 **10 Claims**

1. A container-delivery device for an underarm spray product, comprising:

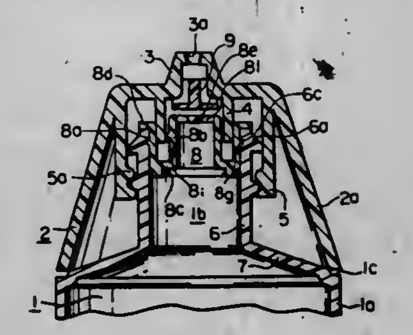
means to contain said product, said means having a lateral wall configured to be readily grasped in hand and a discharge port, said means defining an axis line;
conduit means connected with said port, extending from said container means and terminating in a spray orifice for discharge centered along a reference line which forms an acute angle with said axis line;
valve means to control the flow of said product through said spray orifice;
actuator means connected to said valve means; and
a head member connected to said container means and elongated in a direction along said axis line, said head including a surface which defines a passageway for and surrounds said spray orifice, said orifice being near the center of said surface, said surface terminating in an edge which defines a plane substantially normal to said reference line, said surface being concave whereby said spray orifice is substantially recessed from said edge and said surface approximates a three-dimensional mirror image of the human axilla.



3,887,116
RECEPTACLE FOR LIQUID MATERIAL

Seiichi Ishikawa; Yooichi Miya, both of Tokyo; Ryoji Odate, Yokohama, and Yasui Kumai, Okegawa, all of Japan, assignors to Shiseido Co., Ltd., Japan

Continuation-in-part of Ser. No. 285,635, Sept. 1, 1972. This application Apr. 24, 1974, Ser. No. 463,848
Int. Cl. B67d *3/00*
U.S. Cl. 222—520 **6 Claims**



1. A dispenser for liquids comprising: a main body for containing liquid therein to be dispensed including an externally threaded cylindrical neck portion; a cap having an outer wall, an open end portion, a closed end portion having a centrally disposed first aperture therein, an inner cylindrical member disposed inside said can and fixed at one end thereof to said closed end portion about said first aperture and projecting from said closed end portion, an intermediate cylindrical member disposed inside said cap about said inner cylindrical member and fixed at one end thereof to said closed neck portion and projecting therefrom a greater distance than said inner cylindrical member and having an internally threaded portion engageable with said externally threaded neck portion, whereby said cap is movable toward and away from said neck portion in response to rotation thereof relative to said main body; means for preventing leakage of liquid to the external surface of said neck portion during use comprising a first cylindrical member, means fluidtightly mounting said first cylindrical member in said neck portion, a second cylindrical member having an open end portion and a closed end portion having at lease one second aperture therein and disposed coaxially within said first cylindrical member and spaced therefrom to define a cylindrical slot receiving said inner cylindrical member therein, means providing a fluidtight seal between said second cylindrical member and said inner cylindrical member comprising a ring shaped rib around the outer

surface of said second cylindrical member and projecting therefrom in engagement with the inner surface of said inner cylindrical member and urging said inner cylindrical member towards said first cylindrical member thereby providing a fluidtight seal between said second cylindrical member and said inner cylindrical member and means connecting the open end portion of said second cylindrical member and one end portion of said first cylindrical member and for providing a fluidtight seal therebetween; and a closure member disposed between said first aperture and said second aperture and having means defining a fluid passage therein and connected to said cap and movable therewith in response to the rotation of said cap with respect to said main body from a sealing position wherein said closure member seals said second aperture to a non-sealing position wherein said closure member is spaced apart from said second aperture permitting liquid in the main body to pass through said second aperture and said fluid passage and then through said first aperture.

3,887,117

SLIDE CLOSURE PLATES AND METHOD FOR PREVENTING MELT PENETRATION

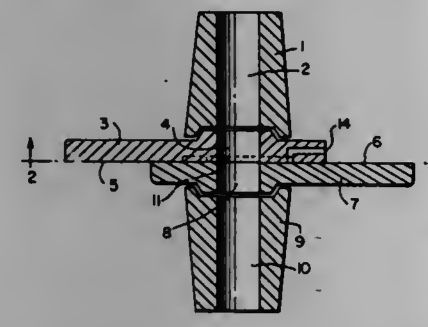
Hans Reinhard Fehling, Zug, Switzerland, assignor to Didier-Werke AG, Wiesbaden, Germany

Filed Apr. 19, 1974, Ser. No. 462,573

Claims priority, application United Kingdom, Apr. 27, 1973, 20118/73

Int. Cl. B22d *37/00*

U.S. Cl. 222—542 **6 Claims**



1. In a slide closure for the spout of liquid metal containing vessels, particularly large capacity steel-pouring vessels, such slide closure including a fixed bottom plate and a movable sliding plate, each of said plates having through-flow openings therethrough and contacting sliding surfaces, the improvement comprising:
   a U-shaped channel in the sliding surface of said bottom plate around the through-flow opening thereof, the ends of the legs of said channel being spaced from each other by a distance greater than the diameter of the through-flow opening in said slide plate;
   said slide plate through-flow opening, during sliding movement of said slide plate, being movable between said channel legs; and
   means for supplying inert gas to said channel.

3,887,118

DEVICE FOR FORMING PLEATED CURTAINS

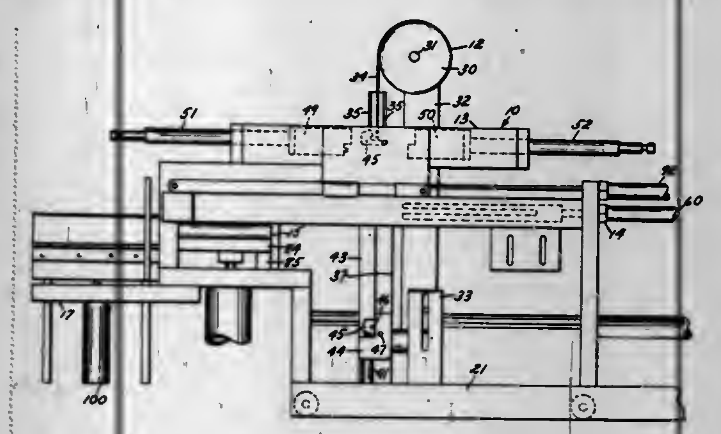
Stanley Levenstein, 50-01 Rockaway Beach Blvd., Far Rockaway, N.Y.

Filed Sept. 12, 1974, Ser. No. 505,476

Int. Cl. A41h *43/00;* **D06j** *1/00*

U.S. Cl. 223—28 **7 Claims**

1. A device for use in conjuction with a sewing machine for forming a plural fold pleat in piece goods along an edge thereof prior to a sewing operation permanently holding said formed pleat, in which one of said folds comprises a false pleat formed from a separate piece of material of a length less than the width of said piece goods, and inserted between folds formed in said piece goods, said device comprising: a frame element forming a supporting means, a fabric strip supply means carried by said frame element, fabric strip severing means receiving a continuous strip of material from said supply means, and cutting the same into predetermined lengths; means receiving said predetermined lengths and folding same longitudinally to form a finished false pleat, means received said finished false pleat and positioning the same at a pleat forming location; means forming multiple folds in said piece goods at said location at periodic intervals therealong, said false pleat receiving means being selectively positionable between a pair of folds formed by said fold forming means to complete a composite pleat including actual folds and said false pleat in juxtaposed position, whereby said composite pleat may be manually removed from said fold forming means, and subsequently sewn together.



3,887,119

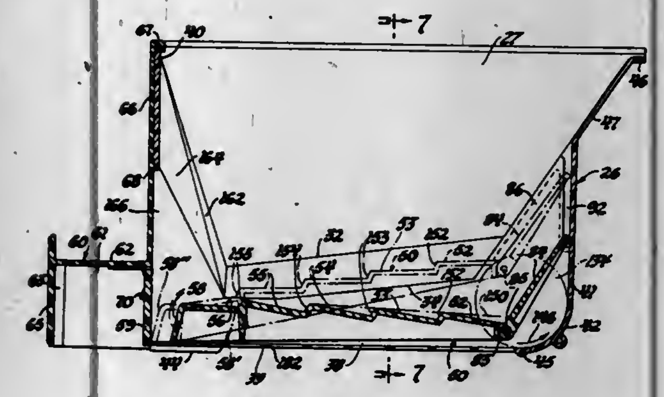
ICE DISPENSING DEVICE WITH OSCILLATING RAM

Jost S. Sucro, Dayton, and Louis D. Benasutti, Fairborn, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 30, 1973, Ser. No. 420,361

Int. Cl. G01f *11/00*

U.S. Cl. 222—247 **4 Claims**



1. An ice piece dispenser comprising; a container for receiving and storing ice pieces, said container including a front wall having a dispensing opening therein, a longitudinally extending trough formed in the bottom wall of said container with said trough having a planar substantially horizontally disposed base, an elongated ram disposed in said trough, said ram having a forward end face with its lower edge supported on said trough base for reciprocal movement thereon, said ram having its rearward end secured by a pivotal connection to eccentric drive means for movement of said pivotal connection in a circular path, a plurality of longitudinally spaced ice piece engaging steps formed on the upper surface of said ram, whereby eccentric movement of said pivotal connection, through rotation of said drive means, will cause said ram forward end face to move forwardly and rearwardly in a substantially horizontal path in said trough, forward travel of said ram causing said ice piece engaging steps to be raised out of said trough and into said container for advancing the ice pieces toward said dispensing opening, said trough having a predetermined depth relative to said ram whereby said ice piece engaging steps are lowered from said container and into said trough during rearward travel of said ram, and passage means in said container forward wall allowing selected one or more of the ice pieces in said container to fall by gravity into the forward end of said trough during the rearward movement of said ram forward end face, whereby the subsequent forward travel of said ram forward end face pushes the selected ice piece or pieces in said trough through said dispensing opening.

3,887,120

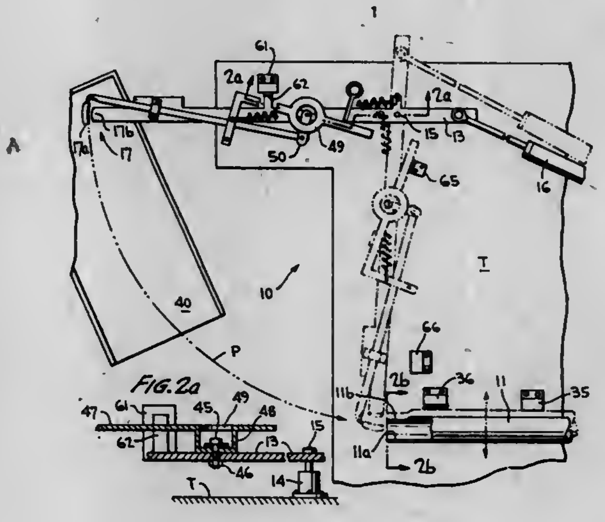
HOSIERY HANDLING METHOD AND APPARATUS

John D. Harrill, Shelby, N.C., assignor to Marvel Specialty Company, Inc., Paducah, Ky.

Filed Sept. 25, 1974, Ser. No. 509,058

Int. Cl. A41h *43/00*

U.S. Cl. 223—43 **20 Claims**



10. A hosiery handling apparatus for turning, separating and stacking hose from a string comprising:
   a hollow tubular form for receiving the hosiery string, said form having an open mouth forming one end,
   a source of vacuum connected to the opposite end of said form to evert the first in-line hose through the mouth and into the form,
   means for separating said hose from said string, and
   means for pulling said hose off the open end of said form after eversion, whereby the hose is separated from said string and delivered away from said form along a predetermined path.

3,887,121

APPARATUS FOR TRANSFERRING FABRIC STRIP BETWEEN ENDLESS TRANSPORTER CHAINS

Rudolf Reich, 545 Neuwied, An-der Ringstr. 6, Germany

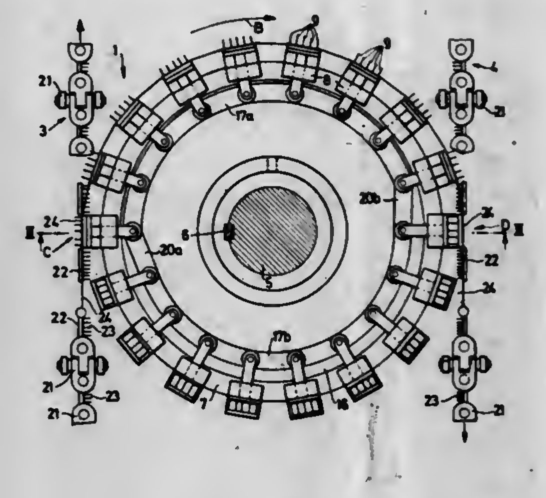
Filed Apr. 23, 1973, Ser. No. 353,664

Claims priority, application Germany, May 27, 1972, 2225970

Int. Cl. B65h *17/38*

U.S. Cl. 226—53 **8 Claims**

1. Apparatus for shuttle type embrodery machines for transferring a fabric strip from the pins of an endless fabric transporter chain to the pins of another endless fabric transporter chain comprising
   a. a transfer disc with outwardly projecting pins,
   b. fabric transporter chains which run in opposite directions to each other and have pins mounted on bars thereon
   c. the pins being mounted so that at a point of contact between said transporter chains and said transfer disc two different pins engage the fabric strip adjacent to each other
   d. the transfer disc and the fabric transporter chains running at the same circumferential speed.



3,887,122

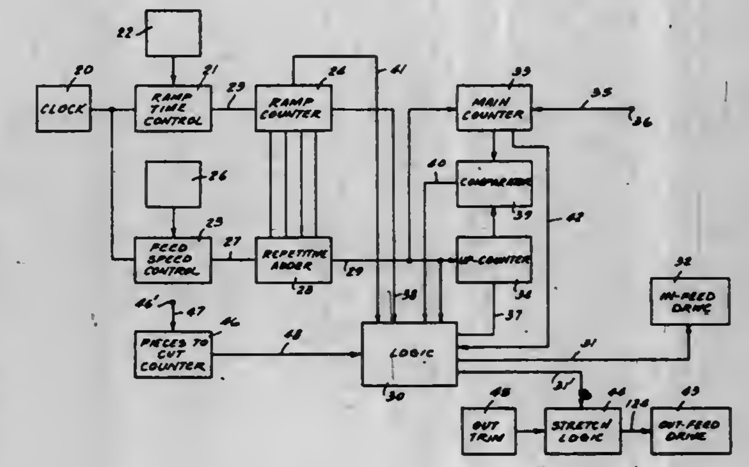
PRESS FEEDER CONTROL APPARATUS

Marcel R. Sommeria, Palos Heights, Ill., assignor to Hyper-Loop, Inc., Bridgeview, Ill.

Filed Jan. 2, 1973, Ser. No. 320,272

Int. Cl. B65h *17/22*

U.S. Cl. 226—136 **14 Claims**



1. In apparatus for controlling the movement of a member from a first position to a second position including drive means operable in response to a train of pulses having a separate pulse for each increment of movement of said member, the combination comprising: a main counter, means presetting said main counter to manifest a quantity proportional to the distance between said first and second positions, generating means for generating a pulse train having a manually adjustable pulse repetition rate, means for connecting said pulse train to said main counter for decrementing said counter with each pulse of said pulse train, and means adapted for connecting said pulse train with said drive means, said generating means including means for varying the pulse repetition rate of said pulse train, decreasing said pulse repetition rate to substantially zero when said member reaches said second position.

3,887,123
PACKAGING ARRANGEMENT

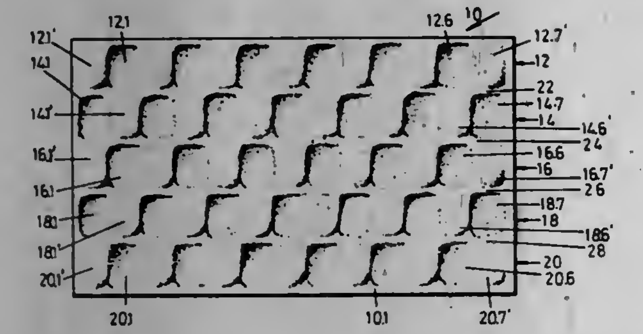
Pieter Anthon Hattingh, Paarl, South Africa, assignor to Bakke Industries Limited, Dal Josafat, Paarl, South Africa

Filed May 23, 1973, Ser. No. 363,147

Claims priority, application South Africa, May 23, 1972, 72/3503

Int. Cl. B65d *1/00, 85/34*

U.S. Cl. 229—2.5 **10 Claims**



1. An apple packing tray for packing a plurality of apples comprising a generally rectangular sheet of generally non-stretchable, shock absorbent material with a general plane, the sheet being provided with a number of adjacent longitudinal substantially parallel rows of alternating uninterrupted pockets and caps displaced in opposite directions out of the general plane and arranged such that transverse rows of alternating pockets and caps are formed, the pockets and caps being of substantially similar shape and size, and each being shaped along a longitudinal section plane as a continuously circularly curved segment having a height, measured from the general plane to the top of a cap or bottom of a pocket, equal to substantially less than half its radius.

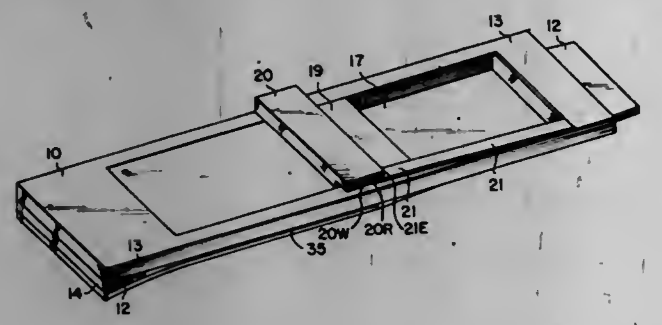
3,887,124
CONTAINER BOX CLOSURE

John E. Skau, 7913 Wyandot St., Denver, Colo. 80221

Filed Dec. 5, 1973, Ser. No. 422,524

Int. Cl. B65d *47/00, 83/00*

U.S. Cl. 229—7 SC **1 Claim**



1. A reusable one-piece closure assembly that may be readily installed on a conventional paperboard box to serve as a closable orifice of the box, comprising two members in the form of strips of material which are fastened together at a common end so as to clamp together a side of box lying between the two members when the inner member is pushed through a slit in the side of a box, with the exterior member fitted with a slidable door member to alternately open or close an orifice in the exterior member,

said slidable door member and said exterior member fitted with safety latch means to latch the slidable door member in the closed position of the slidable door member,

said safety latch means comprising a flexible flat spring strip, one end of which is mounted to the exterior surface of the exterior member to lie between the slidable door member and the exterior member in the open position of the slidable door member, with the other end of the spring strip member projecting, in the closed position of the slidable door member, into a recess in the exterior face of the slidable door member and against a wall of said recess, said slidable door member being freely slidable over said flat spring member when the flat spring member is manually depressed against the exterior member.

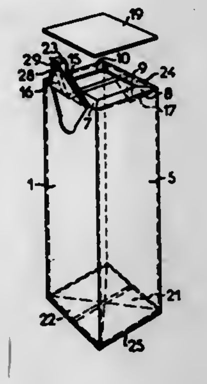
3,887,125
SEMI-RIGID IMPERVIOUS PACKAGE FOR LIQUID PRODUCTS

Joseph-Charles Trentesaux, Leers, Belgium, assignor to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 228,021, Feb. 22, 1972, abandoned. This application Mar. 26, 1974, Ser. No. 454,836

Int. Cl. B65d *5/56, 25/14*

U.S. Cl. 229—7 R **3 Claims**



1. An impervious package comprising:
- a container formed by a number of panels into a rigid enclosure of polygonal cross section;
- a rigid cap and a rigid base sealing said enclosure at respective ends thereof;
- means for fixing said cap and said base to said enclosure ends, said means comprising at least a flap hinged to each cap end of said panels, said flaps at at least the cap end of the enclosure forming a flat continuous flange cross-bracing the enclosure, one panel having tear line perforations therein constituting, together with at least part of the hinge between said one panel and the related flap, a tab hinged to said enclosure and allowing partial opening of the container; and
- at least one impermeable lining within the container, said lining comprising a flexible tube sealed at both ends which respectively correspond to the cap and base ends of the enclosure.

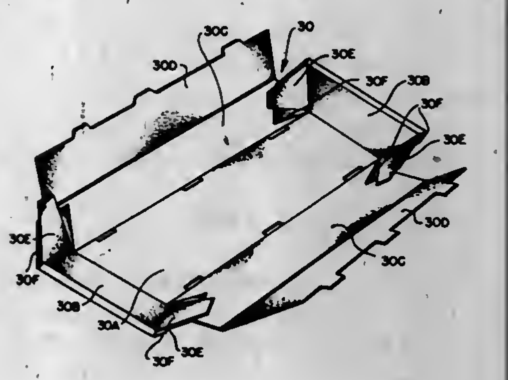
3,887,126
RECEPTACLE

James D. Wilson, Newport Beach, Calif., assignor to Banner Metals Division Intercole Automation, Inc., Compton, Calif.

Filed Mar. 4, 1974, Ser. No. 447,821

Int. Cl. B65d *5/22*

U.S. Cl. 229—34 R **2 Claims**



1. A rectangular receptacle formed of pasteboard, or the like, and intended to be supported in a tiered condition on wires on a wheeled rack, comprising: a first rectangular panel forming a bottom for the receptacle and having a series of slots extending along each side thereof; a first pair of up-turned rectangular panels integral with the respective side edges of said first rectangular panel and forming sides for the receptacle; a second pair of down-turned rectangular panels integral with the respective outer side edges of the panels of the first pair and co-acting with the respective inner faces of the panels of the first pair; a series of projections integral with the outer side edge of each panel of the second pair extending into said slots to maintain the sides of the receptacle in an upright position; a third pair of up-turned rectangular panels integral with the respective end edges of said first rectangular panel and forming ends for the receptacle; a pair of side flaps integral with the respective end edges of each of the panels of the third pair and received between the panels of the first and second pairs to hold the panels of the third pair in an upright position; a fourth pair of down-turned panels integral with the outer edge of each panel of the third pair, a fifth pair of up-turned panels integral with the outer edge of each panel of the fourth pair and positioned between and in surface engagement with the panels of the fourth pair and the panels of the third pair to form handles for the receptacle and supports for suspending the receptacle from the wires of the wheeled rack, and end flaps integral with the end edges of each of these panels of the fourth pair and received between the panels of the first and second pair to hold the panels of the fifth pair turned within the panels of the fourth pair.

3,887,127
METHOD OF AND CONTROL CIRCUIT FOR ADMIXING AIR

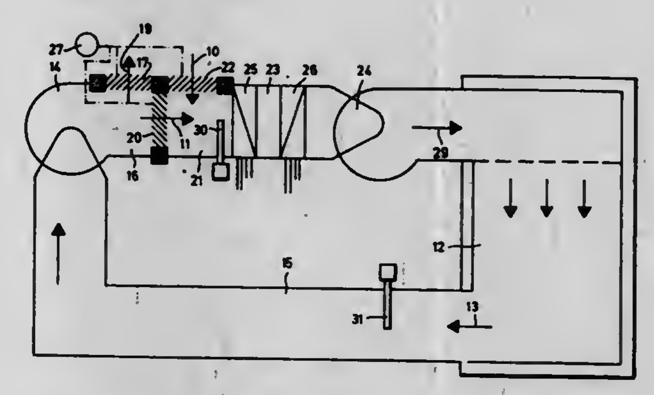
Fritz Jauss, Schonaich, Germany, assignor to Zentra Albert Burkle Kommanditgesellschaft, Schonaich, Germany

Filed Oct. 2, 1973, Ser. No. 402,922

Claims priority, application Germany, Oct. 2, 1972, 2248284

Int. Cl. F24f *11/00*

U.S. Cl. 236—91 **29 Claims**



1. An electric control circuit including means which sense an air heat-related parameter for generation of signals which influence position of a control member which regulates the admixing of outside air into recirculating air in ventilation or air conditioning systems where, during winter operation, the outside air portion of the mixture, starting with a first predetermined onset point, is smaller, the lower is the air heat-related sensed parameter; and where, during summer operation, the outside air portion of the mixture, starting with a second predetermined onset point, is smaller, the higher is the air heat-related sensed parameter; said electric control circuit comprising a first channel for winter operation and a second channel for summer operation, each of said channels being constantly operational, said first channel being responsive to said sensed heat-related parameter only below said first onset point for providing a first output signal, and said second channel being responsive to said sensed heat-related parameter only above said second onset point for providing a second output signal; means responsive to the output signals from said first channel and said second channel for adjusting the position of said control member; whereby the circuit function automatically changes between winter and summer operational modes as required without aid from any special switching device.

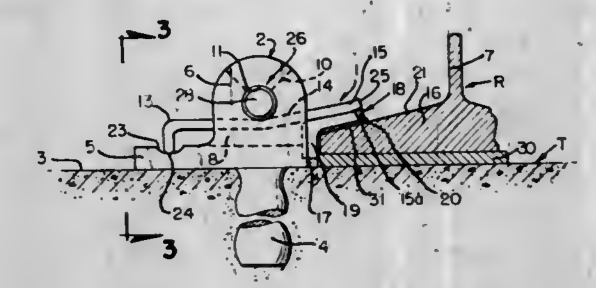
3,887,128
RAIL FASTENER

Emerson J. Ruble, Hinsdale, Ill., assignor to Portec, Inc., Oak Brook, Ill.

Filed June 13, 1974, Ser. No. 479,127

Int. Cl. E01b *9/48*

U.S. Cl. 238—349 **12 Claims**



1. A rail fastener for securing a rail base flange upon a crosstie, including, an anchor member fixed upon the upper surface of said crosstie adjacent the edge of said rail base flange, said anchor member provided with a pair of upstanding sidewalls, a longitudinally extending spring clip disposed between said sidewalls and having a rail section at one end overlying said rail base flange and a pivot arm section at the other end downwardly directed toward said crosstie upper surface, a cross pin overlying said clip and engaging said sidewalls to downwardly deflect said clip in an area intermediate said rail section and pivot arm section, a bridge spanning the upper portion of said anchor member sidewalls and said bridge having a bottom bearing surface against which the upper portion of said cross pin abuts.

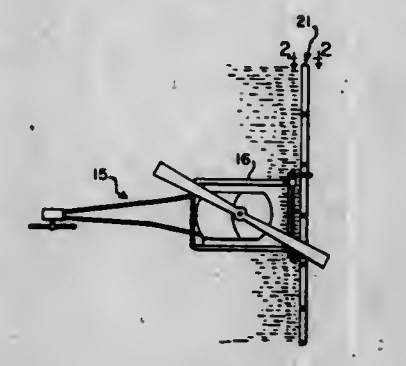
3,887,129
ACCESSORY ATTACHMENT FOR A VEHICLE USED FOR FLUID SPRAYING OF VEGETATION

Harold F. Brown, 10307 South Indian River Dr., Fort Pierce, Fla. 33450

Filed Apr. 19, 1974, Ser. No. 462,498

Int. Cl. B05b *15/02, 17/02, 1/30*

U.S. Cl. 239—119 **4 Claims**



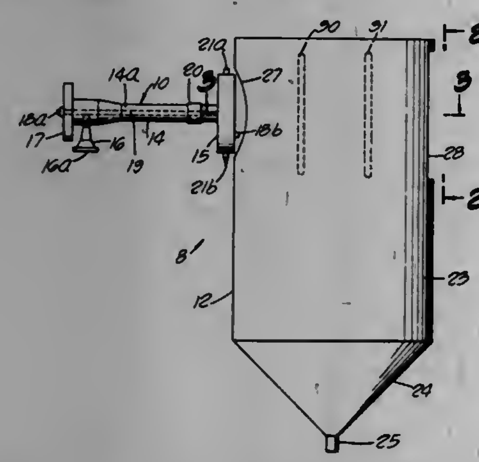
1. In an apparatus connectable to a vehicle for spraying a fluid, the combination of:
- a. an elongated boom having central supports for attachment to the vehicle and the boom having a rigid hollow strong front section that extends the full length of the beem with a plurality of keyed in shorter movable spraying sections in alignment and rearwardly of the front section, said front section carrying the fluid to be sprayed, said keyed in movable sections interconnectable in alignment and provided with valve means that is opened by the connecting movement of each section,

- b. a fluid tube with a valve connected between the vehicle and the elongated boom to carry the fluid to be sprayed under pressure from the boom,
- c. said movable spraying sections provided with a plurality of spray tubes laid in laminar formation and each movable section provided with inlet ports that are movable to an alignment position with the ports of the front section for spraying and movable out of alignment to stop spraying.

3,887,130
SULFUR PELLETIZING

William W. Chalmers, Calgary, Alberta, Canada, assignor to Canadian Occidental Petroleum, Ltd., Calgary, Alberta, Canada

Filed Sept. 20, 1973, Ser. No. 399,258
Int. Cl. B05b *15/00*
U.S. Cl. 239—132.5 **6 Claims**



1. A sulfur pelletizing gun having a barrel sealed at one end and a head with a back plate attached to the second end of said barrel, said barrel containing a coaxial conduit running the length of the barrel and defining a first chamber which is adapted to transport molten sulfur therethrough and a second chamber separate from, but adjacent to said first chamber adapted to transport a heating fluid therethrough which will supply sufficient heat to maintain the sulfur in said first chamber in a molten state, said barrel having first and second inlets in communication with said first and second chambers respectively and first and second outlets in communication with said first and second chambers respectively said head having a face plate opposite said back plate which is perpendicular to the central axis of the barrel, said head having sulfur and heating chambers in communication with said first and second outlets respectively for receiving molten sulfur and heating fluid respectively; said heating chamber being adjacent to said sulfur chamber so that heat from heating fluid passing through said heating chamber will maintain sulfur in said sulfur chamber in a molten state, said heating chamber having an outlet in said head, said head having a nozzle attached to said face plate, said nozzle having a plurality of apertures with central axes perpendicular to said face plate and parallel to the barrel's central axis, which are in communication with said sulfur chamber and through which jets of molten sulfur can be ejected.

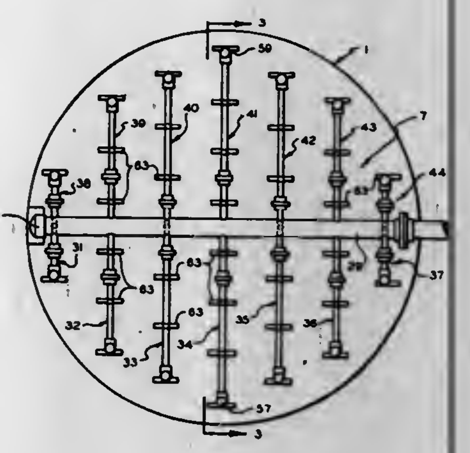
3,887,131
FLUID DISTRIBUTOR

Joseph R. Bourne, De Witt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed May 31, 1974, Ser. No. 475,086
Int. Cl. B05b *1/20*
U.S. Cl. 239—110 **5 Claims**

1. Apparatus for distributing downwardly through an area a liquid in a mass transfer, counterflow relationship with a gas flowing upwardly through the area, said apparatus comprising: a generally horizontally disposed main header for receiving liquid to be distributed; and

a plurality of branch lateral lines extending transversely from said main header, said branch lateral lines each including:

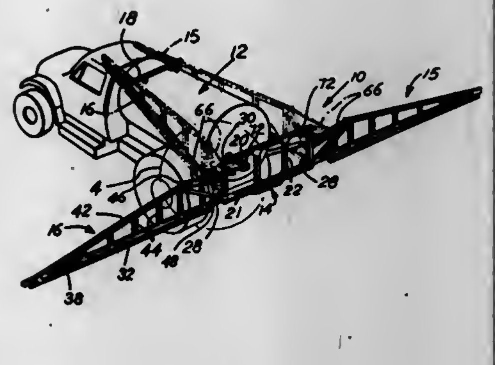


a generally horizontal portion joined at one end to said main header, said horizontal portion having a set of spaced ports for discharging liquid across said area; and a vertical riser at the other end of the horizontal portion for receiving surges of liquid flowing through said horizontal section.

3,887,132
BOOM ASSEMBLY

Gerald L. Widmer, 1176 Roselawn, Paxton, Ill. 60957

Filed Aug. 12, 1974, Ser. No. 496,629
Int. Cl. B05b *1/20*
U.S. Cl. 239—166 **12 Claims**



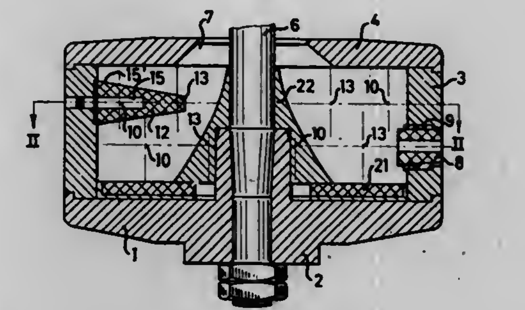
1. A spray boom assembly including frame means adapted to be mounted for transport on a vehicle, at least one spray boom, and mounting means mounting said spray boom to said frame means for movement both horizontally and in elevation between rigged-out and rigged-in positions, wherein the improvement in said assembly comprises:

urging means for urging said boom between said rigged-out and rigged-in positions,
movable lift link means for guiding said boom between said rigged-out and rigged-in positions and elevating said boom as said boom moves toward said rigged-in position, said lift link means comprising first and second rigid members,
pivot means mounting one of said rigid members to said boom and to said other rigid member and mounting the other of said rigid members to said frame means, and
stop means to prevent the pivotal movement of at least one of said rigid members to effect elevation of said spray boom when said spray boom is moved by said urging means.

3,887,133
ATOMIZER WHEEL FOR THE ATOMIZATION OF SLURRIES

Orla Straarup, Copenhagen, and Paul Otto Gunther Helmich, Hillerod, both of Denmark, assignors to Aktieselskabet Nro Atomizer, Soborg, Denmark

Filed Dec. 17, 1973, Ser. No. 425,654
Claims priority, application United Kingdom, Dec. 18, 1972, 58419/72
Int. Cl. B05b *3/10;* **F23d** *11/08;* **B04b** *11/00*
U.S. Cl. 239—224 **11 Claims**

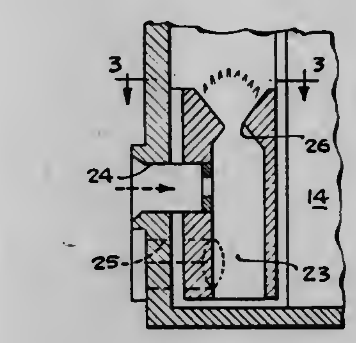


1. An atomizer wheel for the atomization of slurries, comprising a central hub, a substantially cylindrical side wall defining an annular bowl-shaped space concentric with said hub and being formed with a number of ejection orifices, a number of bushings of a wear-resistant material each of which is inserted in an individual one of said orifices so as to project with one end into said bowl-shaped space a distance from the inner side of the side wall and a number of spoke-like projections arranged in said bowl-shaped space with one end of each projection situated in the region between the side wall and the ends of said wear-resistant bushings facing the central hub.

3,887,134
GAS BURNER

David Solomon Hacker, Evanston, Ill., assignor to John Mohr & Sons, Chicago, Ill.

Filed Apr. 1, 1969, Ser. No. 811,988
Int. Cl. B05b *7/00*
U.S. Cl. 239—404 **3 Claims**



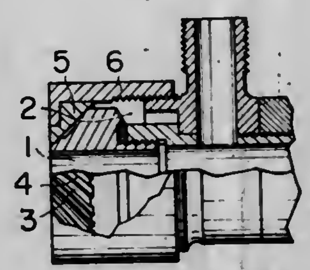
1. A regenerative stove burner assembly for low caloric fuel gas, said burner assembly including, in combination,

structure forming a burner chamber,
said burner chamber being elongated in an axial direction, and having an axial cross-section formed generally in the shape of a pair of adjacent, opposed circle segments,
a fuel gas inlet conduit,
a combustion air inlet conduit,
at least one of said inlet conduits opening into the burner chamber generally tangentially with respect to the circular arc of one of said circle segments,
said fuel gas and combustion air inlet conduits being disposed in opposed relation to one another to thereby provide intimate intermixing of said fuel gas and combustion air, and
said burner chamber terminating in a venturi shaped burner nozzle constructed and arranged to support a flame a short distance downstream from the most constricted portion of the nozzle,
said burner assembly being composed of ceramic material, whereby it may be located within a regenerative stove.

3,887,135
GAS-ATOMIZING NOZZLE BY SPIRALLY ROTATING GAS STREAM

Shigetake Tamai, No. 46488-90, Ikuta, Kawasaki-shi, Kanagawa, Japan

Filed Nov. 15, 1973, Ser. No. 416,148
Int. Cl. B05b *7/10*
U.S. Cl. 239—406 **2 Claims**

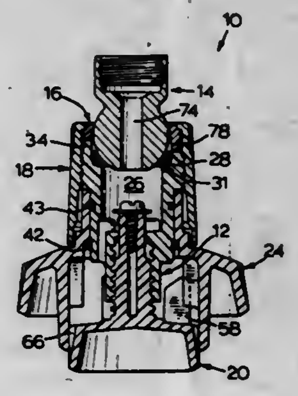


1. An air-atomizing nozzle comprising: a truncated main body forming a tapered surface of revolution, semi-spiral grooves being identical in form and configuration and symmetrically disposed at circumferentially spaced positions within the tapered surface of the body, a correspondingly tapered cover closely covering said grooved surface of the truncated body and forming semi-spiral air passageways, said truncated body having at its axis a passageway for liquid and said semi-spiral grooves being of such configuration that the focal point of said semi-spiral grooves on the tapered surface of the truncated body coincides with the imaginative apex or focal point of the main body, and wherein said semi-spiral grooves comprise grooves formed by transcribing on the tapered surface of the truncated body of the nozzle a pattern comprising a pair of stream lines on the sink side of a hydrodynamic dipole by plane projection and forming said semi-spiral grooves in conformance with the transcribed pattern at each circumferentially spaced groove location such that the focal point of the semi-spiral grooves coincides with the dipole sink point and with the axis of the truncated body.

3,887,136
ADJUSTABLE SHOWER HEAD

Leslie T. Anderson, London, Ontario, Canada, assignor to Emco Limited, London, Ontario, Canada

Filed July 8, 1974, Ser. No. 486,691
Claims priority, application Canada, Aug. 3, 1973, 178138
Int. Cl. B05b *1/18*
U.S. Cl. 239—460 **6 Claims**



1. A shower head comprising,
- a. a body having a through passage therein for conveying a liquid to be sprayed,

b. connector means for connecting said body to a source of fluid, said connector means having a through passage formed therein and terminating in a ball-shaped end, said through passage of said connector means opening into said through passage of said body,
c. a clamping collar,
d. a first seat on said clamping collar adapted to seat on a hemisphere of said ball-shaped end of said connector,
e. a second seat on said body adapted to seat on a hemisphere of said ball-shaped end,
f. a clamping member clamping said collar with respect to said body with said first seat and said second seat disposed on diametrically opposed sides of said ball-shaped end,
g. said clamping collar interlocking with said body to prevent rotation of said collar with respect to said body about a common axis of rotation, and
h. adjustable valve means mounted on said body for adjusting the character of the spray discharged from said head.

3,887,137
CENTRIFUGAL PRESSURE NOZZLE

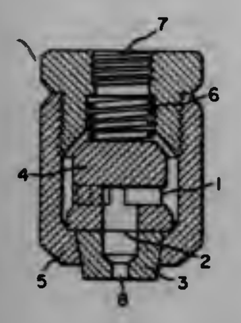
Masayoshi Nakamura, Koshigaya; Tadayoshi Tamura, Yachiyo, and Sadao Toyoda, Funabashi, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1974, Ser. No. 458,768

Claims priority, application Japan, Apr. 13, 1973, 48-043791

Int. Cl. B05b *1/34*

U.S. Cl. 239—468 **5 Claims**



1. A spray nozzle having a swirl chamber constituted by a cylindrical hollow portion contiguous to a frusto-conical hollow portion, characterized in that several fluid inlets are provided so as to open in the swirl chamber, and the ratio A/A′ of the total sectional area A of the fluid inlets 1 to the sectional area A′ of the cylindrical hollow portion of the swirl chamber 2 is in the range of 0.5 to 1.0.

3,887,138
IRRIGATION DEVICE

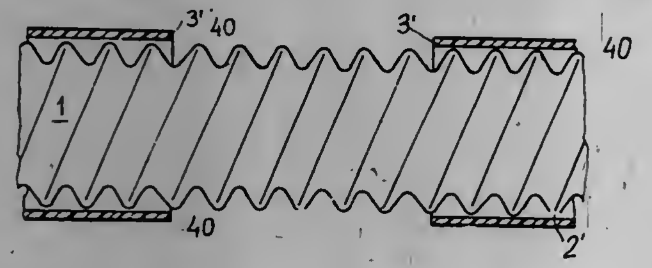
Gideon Gilead, 5 Nicaragua St., Jerusalem, Israel

Filed Jan. 17, 1974, Ser. No. 434,193

Claims priority, application Israel, Jan. 17, 1973, 41342

Int. Cl. B05b *15/00*

U.S. Cl. 239—542 **8 Claims**



1. An irrigation device comprising:
an elongated continuous hollow hose for conveying fluid through the interior thereof and formed with a helical fluid flow passage of predetermined pitch between the inner and outer surfaces thereof, said helical passage having an axis substantially coaxial with the longitudinal axis of said hose;
a plurality of holes extending through said inner surface of said hose at predetermined spaced axial distances along said hose, each of said holes coupling the interior of said hose to said helical passage for fluid transmission therebetween;
a plurality of fluid discharge ports extending through said outer surface of said hose each being disposed a predetermined axial distance along said hose from a respective one of said holes in said inner surface and each coupling said helical passage to the region exterior of said hose;
whereby fluid flowing axially through the interior of said hose flows outwardly from said interior of said hose through each of said plurality of holes into said helical passage and thence through said helical passage for discharge through each of said plurality of ports, the fluid discharged from each of said ports being selectively determined by the axial length of said helical passage between respective adjacent ones of said holes and ports.

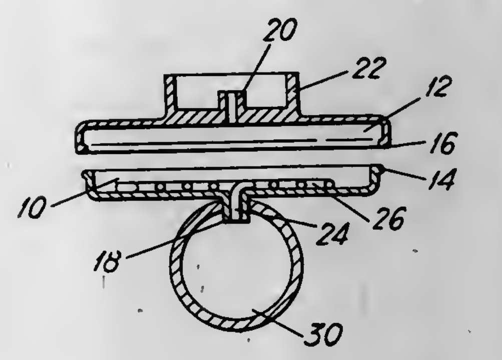
3,887,139
TRICKLE IRRIGATION EMITTER

Denis N. Pearce, Hornton, England, assignor to Illinois Tool Works Limited, Bucks, England

Filed May 17, 1974, Ser. No. 471,102

Int. Cl. B05b *15/00*

U.S. Cl. 239—542 **10 Claims**



1. An emitter for a trickle irrigation system comprising a housing defining a chamber and inlet and outlet ports opening into the chamber, and a substantial length of fine diameter tubing which has freedom to move in said chamber in response to flucuations of the pressure of fluid flowing through said tube and which lies within said chamber and connects to one only of the said inlet and outlet ports.

3,887,140
FUEL INJECTION ARRANGEMENT

Karl Hofmann, Aldingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Jan. 21, 1974, Ser. No. 435,171

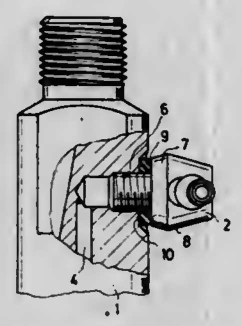
Claims priority, application Germany, Feb. 17, 1973, 2308001

Int. Cl. B05b *1/00, 15/06*

U.S. Cl. 239—600 **10 Claims**

1. A fuel injection arrangement for internal combustion engines comprising, in combination: a nozzle holder for hold-

ing a fuel injection nozzle, and a readily separable hose coupling member screwed into said nozzle holder, said coupling member being a screw nipple having at least one hosereceiving spout to which a hose may be removably connected.



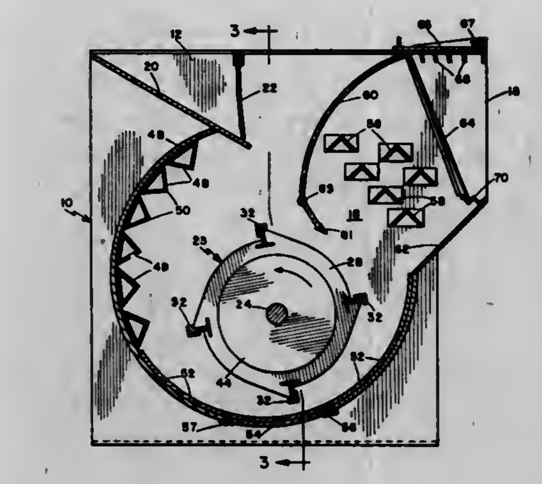
3,887,141
IMPACT-ATTRITION MILL UTILIZING AIR FLOW

Peter M. Francis, Reno, Nev., assignor to Industrial Mining Machinery Corporation, Reno, Nev.

Filed Sept. 17, 1973, Ser. No. 397,662

Int. Cl. B02c *13/09*

U.S. Cl. 241—52 **8 Claims**



1. The improvement in a mill for the crushing, milling and classification of dry ore and other friable materials comprising the combination with a housing and a drive motor of the following:
an ore intake chute;
a fine particle outlet means;
a primary reduction chamber within said housing;
an impact rotor connected to the said motor nonconcentrically mounted within said primary reduction chamber such that upon rotation of said rotor an air flow is produced directionally from said intake chute through said primary reduction chamber to said fine particle outlet means;
a plurality of impact bars mounted upon said rotor, extending outward from the periphery of said rotor;
a secondary reduction chamber intermediate said primary reduction chamber and said fine particle outlet, and separated from the primary reduction chamber and the ore intake chute by a deflector wall terminating in a movable flap structure;
attrition means within said secondary reduction chamber, obstructing a straight line passage of particles from said primary reduction chamber to said outlet means;
a plurality of elongated angular members depending inwardly from the walls of the primary reduction chamber, said members being so positioned as to provide impingement surfaces for particles driven by the said impact rotor, the longitudinal axes of said members being parallel with the axis of the said impact rotor.

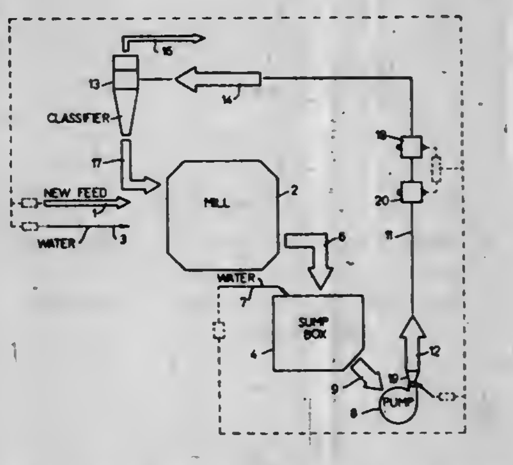
3,887,142
ORE GRINDING CIRCUIT

Richard E. McElvain, 2916 Pelham Rd., Madison, Wis. 53713

Filed June 21, 1973, Ser. No. 372,034

Int. Cl. B02c *17/00*

U.S. Cl. 241—79 **5 Claims**



1. An ore grinding circuit comprising ore feeding means, ore grinding means, a sump, a centrifugal pump and a cyclone classifier connected in series so as to feed said classifier with a continuous flow of slurry by said pump and return the cyclone underflow to said grinding means, said pump and classifier being interconnected by a conduit line which in a vertically extending portion thereof includes a constricted section near said pump affording a solids re-entry zone wherein the slurry discharged from the pump is under the influence of the pump impeller's centrifugal force and linear velocity as developed within the pump.

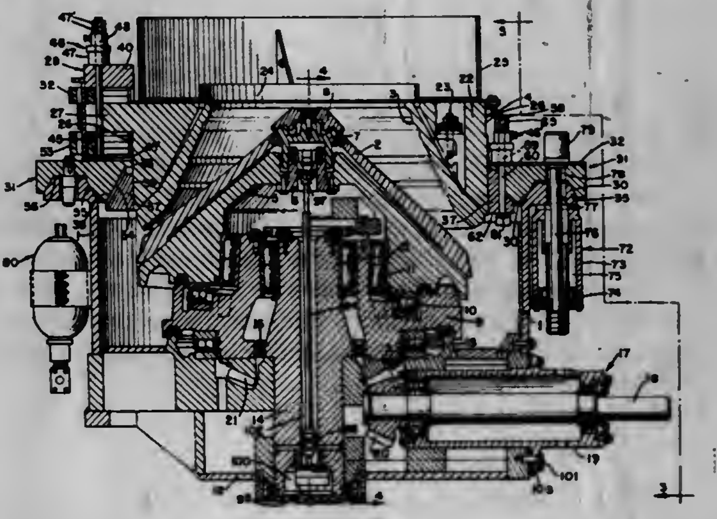
3,887,143
GYRATORY CRUSHER

George T. Gilbert, Bayport, and Anton W. Chryst, Minneapolis, both of Minn., assignors to Portec, Inc., Oak Brook, Ill.

Filed May 28, 1974, Ser. No. 473,574

Int. Cl. B02c *2/04*

U.S. Cl. 241—215 **12 Claims**



1. A crusher including, a peripheral frame provided with an uppermost annular V-way, a conical crusher mantle mounted within said frame, a bowl assembly disposed above said mantle and including a cylindrical body having an outer cylindrical periphery of lesser diameter than said peripheral frame, an annular support ring surrounding said bowl body and vertically displaceable relative thereto, said support ring provided with a downwardly facing annular cavity mating with said frame V-way and adapted to be supported thereupon, said support ring having an inwardly facing wedge surface radially spaced from said bowl body outer periphery, a segmented bowl clamp ring surrounding said bowl assembly intermediate said outer periphery and said support ring wedge surface, said

segmented clamp ring having an outwardly facing wedge surface juxtaposed said support ring wedge surface, a plurality of bolts carried by each segment of said clamp ring and passing upwardly through said support ring, stop means on the upper distal portion of said bolts, fluid-actuated expansible means surrounding said bolts intermediate said stop means and said supporting ring whereby, actuation of said expansible means urges said clamp ring segments upwardly against said support ring as said two juxtaposed wedge surfaces force said segmented clamp ring radially inwardly to clamp said bowl assembly to said support ring.

3,887,144

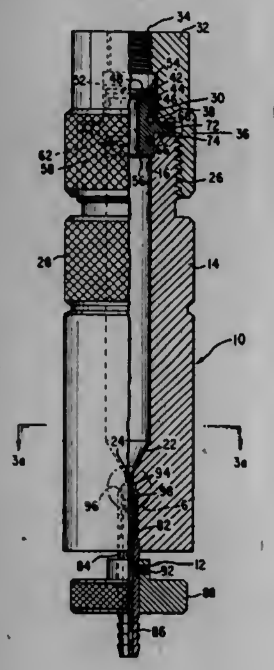
CYTOLOGICAL CELL DISRUPTION APPARATUS

Warren I. Schaeffer, Manor Woods Apartments, No. 28, Kennedy Dr., South Burlington, Vt. 05401

Filed June 25, 1974, Ser. No. 482,846

Int. Cl. B02s *19/00*

U.S. Cl. 241—301 **10 Claims**



1. A cell disruption apparatus comprised of a hollow pressure chamber, said chamber having one conical interior end wall the apex of which defines an outlet port; a manually operated valve having a generally conical plug and a rotary valve stem which seals said port, said plug and stem having discharge passages therethrough; the opposite end of said chamber being open; said chamber having exterior threads adjacent said open end; closure cap threadedly engaged with the open end of said chamber, said cap having a hollow interior receiving the end of a changeable filter assembly, said cap also having an inlet aperture; and seal means positioned between said cap and said filter assembly and said filter assembly and said chamber.

3,887,145

TEXTILE TREATMENT TUBE

Josef Egyptien, Aachen, and Walter Henning, Alsdorf-Begau, both of Germany, assignors to Messrs. Jos. Zimmermann, Aachen, Germany

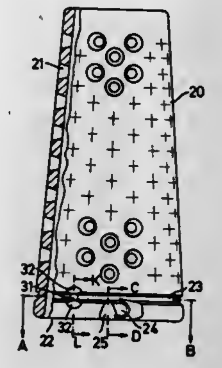
Filed Aug. 17, 1973, Ser. No. 389,424

Claims priority, application Germany, Aug. 24, 1972, 2241683

Int. Cl. B65h *75/28*

U.S. Cl. 242—125.1 **11 Claims**

1. A textile treatment tube comprising a casing having a thread holding device at its lower end, said thread holding device including at least one thread holding cantilever arm means mounted with an inner end at a distance from the lower edge of the tube on the outside of said casing and extending outwardly to its outer end substantially in the circumferential direction of the casing and a thread gripping depression provided in the casing circumferentially adjacent the inner end of said cantilever arm means on the side of the arm opposite the direction in which the arm extends outwardly.



3,887,146

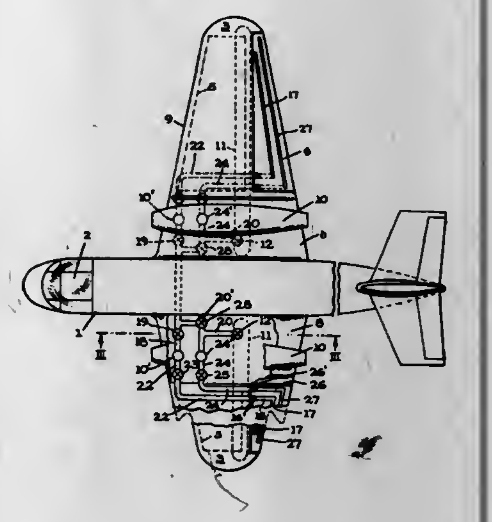
AIRCRAFT WITH COMBINATION STORED ENERGY AND ENGINE COMPRESSOR POWER SOURCE FOR AUGMENTATION OF LIFT, STABILITY, CONTROL AND PROPULSION

Cooper B. Bright, Cambridge, Md., assignor to Rutgers University, New Brunswick, N.J.

Continuation of Ser. No. 174,268, Aug. 23, 1971, abandoned, which is a continuation of Ser. No. 831,389, June 9, 1969, abandoned. This application Jan. 11, 1974, Ser. No. 432,489

Int. Cl. B64c *29/04, 15/14*

U.S. Cl. 244—12 R **19 Claims**



14. A V/STOL aircraft comprising an airframe, a source of fluid under pressure on said airframe, at least one structural element of said frame forming a fluid storage accumulator for storing fluid under pressure for limited duration use during landing and take-off at and below unaugmented power-on stall speeds, said source of fluid under pressure deriving said fluid from other than the exhaust gases from the aircraft's fuel combustion; first pilot-controlled valve means for supplying fluid under pressure from said source to said accumulator, second pilot-controlled valve means in the aircraft for supplying fluid under pressure from said accumulator and from said source for augmented wing lift for limited duration during landing and take-off at and below unaugmented power-on stall speeds by increasing the momentum of the boundary layer, said second pilot-controlled valve means directing fluid under pressure over surfaces of the aircraft for creating lift and aircraft stability control and for thrust for limited duration during landing and take-off at and below unaugmented power-on stall speeds whereby the aircraft may perform short take-off and landing.

3,887,147

APPARATUS AND METHOD FOR AUGMENTING THE LIFT OF AN AIRCRAFT HAVING SHORT TAKE-OFF AND LANDING CAPABILITIES

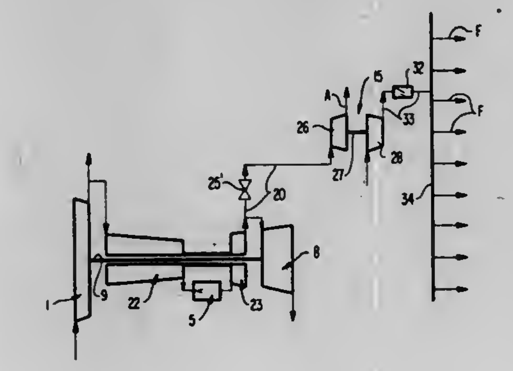
Hubert Grieb, Unterpfaffenhofen, Germany, assignor to Motoren-und Turbinen-Union Munchen GmbH, Germany

Filed Aug. 13, 1973, Ser. No. 387,639

Claims priority, application Germany, Aug. 12, 1972, 2239822

Int. Cl. B64c *21/04, 21/06*

U.S. Cl. 244—42 CC **39 Claims**



1. Apparatus for augmenting the lift of an aircraft having at least one cruise engine of the type having a plurality of turbines driven by hot combustion gases from the engine; said apparatus comprising:

- compressed air generator means separate from said engine, high lift means including air flow directing means for directing air flow energized by said compressed air generator means,
- hot gas extraction means for extracting a portion of the hot gases from said engine at a position upstream of a low pressure one of said turbines,
- and hot gas conducting means for conducting said portion of the hot gases to said compressed air generator means to drive said compressed air generator means,
- wherein said at least one cruise engine is of multiple-spool, multiple-stream construction with said turbines being arranged in series with one another, and wherein said hot gas extraction means includes means for extracting said portion of the hot gases at a position intermediate the most downstream and the second most downstream of said turbines, said most downstream turbine being said low pressure one of said turbines.

39. A method of augmenting the lift of an aircraft having at least one cruise engine of the type having a plurality of turbines driven by hot combustion gases from the engine and of multiple-spool, multiple construction with said turbines arranged in series with one another; said method comprising:

- extracting hot gases from said engine at a position intermediate the most downstream and the second most downstream of said turbines, said most downstream of said turbines being a low pressure one of said turbines,
- driving compressed air generator means separate from said engine by directing said extracted hot gases thereto.
- and energizing high lift means with said compressed air generator means effecting at least one of suction of boundary layer air from a wing means of said aircraft and exhausting of compressed air over the surface of said wing means.

3,887,148

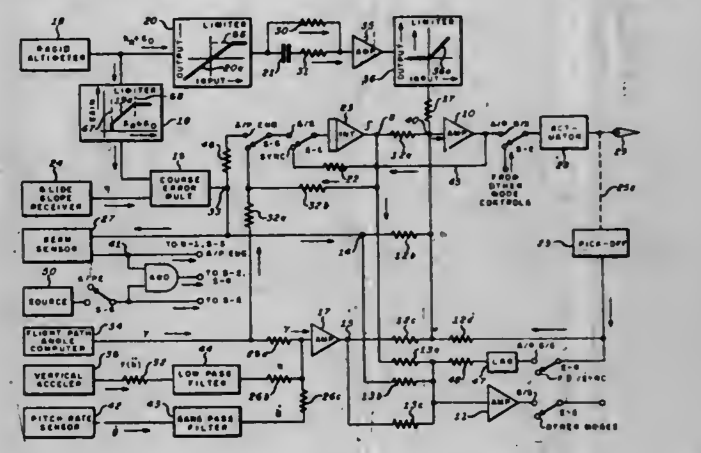
AIRCRAFT GLIDE SLOPE COUPLER AND LANDING SYSTEM

Bernard T. Devlin, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 19, 1973, Ser. No. 426,264

Int. Cl. B64c *13/18*

U.S. Cl. 244—77 A **7 Claims**



1. Apparatus for guiding a craft to a landing with respect to a radio defined path, comprising:

- means for providing a first output signal representative of craft altitude above a landing surface,
- flare computer means including first asymmetric limiter means and responsive to said first output signal for providing a second output signal only for a signal of predetermined input polarity,
- second asymmetric limiter means responsive to said first output signal for producing a third output signal,
- glide slope receiver means for producing a fourth output signal representative of the displacement of said craft from said radio defined path,
- multiplier means for producing a product output signal proportional to the product of said third and fourth output signals,
- flight path angle computer means for deriving a fifth output signal,
- circuit means for combining said second, fifth, and product output signals for selective control of the attitude of said craft about the pitch axis thereof, said fifth output signal substantially reducing the effects of wind shear in the approach to landing.

3,887,149

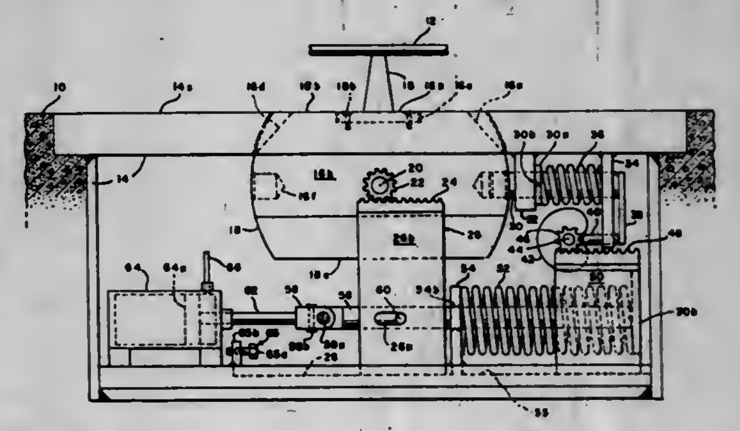
RETRACTABLE PENDANT SUPPORT

William J. Malinowski, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 2, 1974, Ser. No. 511,137

Int. Cl. B64f *1/02*

U.S. Cl. 244—110 C **4 Claims**



1. Apparatus for raising and lowering an aircraft arresting pendant from and to a runway surface comprising:

a rotatable table having first and second horizontal surfaces;
- a pendant support secured to said first table surface;

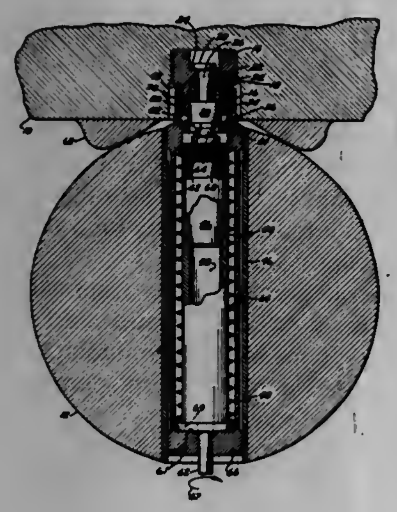
motive means operatively connected to said table for pivoting said table between a first position wherein said first table surface is coplanar with said runway surface and a second position wherein said second table surface is coplanar with said runway surface;

bias means operatively connected to said motive means for normally urging said table to said first position.

3,887,150

INTERNAL EJECTOR MECHANISM

Thaddeus Jakubowski, Jr., Long Beach, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.
Continuation-in-part of Ser. No. 329,657, Feb. 5, 1973, abandoned. This application May 20, 1974, Ser. No. 471,670
Int. Cl. B64c *1/22*
U.S. Cl. 244—137 R **5 Claims**



1. An internal ejector mechanism for releasably retaining a separable unit with a carrier unit, said mechanism comprising: a disposable ejector cylinder attached to said separable unit, a piston within said cylinder with a cartridge therein and a movable plunger actuator thereover,

said cylinder terminating in an annular ejector housing ring with an inwardly directed flange,

a mounting lug secured to said carrier unit, said lug having downwardly extending walls defining a mounting lug cylinder,

a ball retention plunger vertically movable within said mounting lug cylinder and of substantially the same diameter size as that of the inner diameter of said mounting lug cylinder,

said mounting lug cylinder having a plurality of openings into which are mounted balls adapted for radial movement therein,

said plunger having a shaft of reduced diameter at its lower end to permit inward movement of said balls, said plunger having a truncated conical portion between its two diameters for urging said balls outwardly upon downward movement of said plunger,

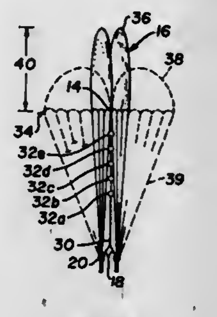
said balls fitting under said flange to retain said disposable ejector cylinder with said mounting lug,

said cartridge being operable to move said plunger upwardly to free said balls from said flange to separate said units whereupon on actuation of said cartridge said piston moves relatively to said mounting lug cylinder to unlatch said units and also to impart a separation force therebetween.

3,887,151

APPARATUS AND METHOD FOR CONTROLLING THE INFLATION TIME AND APPLIED SNATCH FORCES ON A PARACHUTE

Jon T. Matsuo, El Centro, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Nov. 28, 1973, Ser. No. 419,851
Int. Cl. B64d *17/34*
U.S. Cl. 244—152 **4 Claims**



FIRST STAGE
(Very Low Airspeed)
0 to 75 Kts.

3. Anti-squid means for a parachute canopy comprising:
a control line;

attachment means at both ends of said line for connecting to the apex of said canopy and to a load, respectively;

a plurality of means intermittently located along said line for foreshortening the length of the control line;

said foreshortening means being releasable upon the application of a predetermined tensile force on said line;

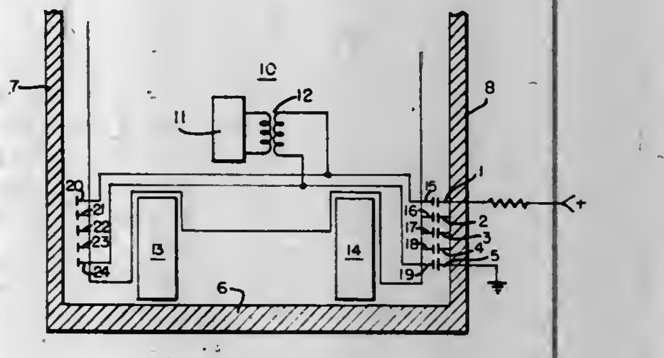
each foreshortening means operable by different values of tensile forces;

whereby a sequential lengthening of said line can be achieved depending on the applied tensile forces.

3,887,152

AUTOMATIC VEHICLE PROTECTION SYSTEM

Roger Eblovi, Fairport, N.Y., assignor to General Signal Corporation, Rochester, N.Y.
Filed Oct. 1, 1973, Ser. No. 402,415
Int. Cl. B61l *21/06*
U.S. Cl. 246—37 **7 Claims**



1. A vehicle detection and signaling system comprising,

a sectionalized signal rail supplied with energy of one type and with signaling energy different from energy of said one type,

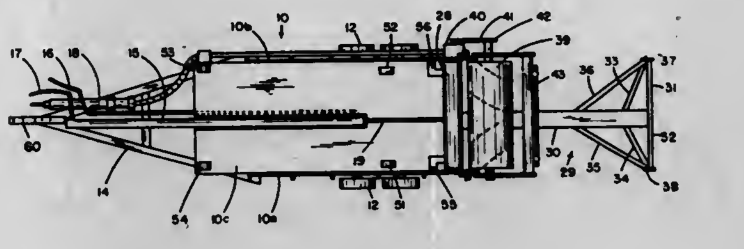
and vehicle detection means connected to each section of said sectionalized signal rail and responsive only to energy of said one type,

vehicle carried means conductively engaging said signal rail and impedance means connected to said vehicle carried means, said impedance means providing a low impedance path to ground for energy of said one type.

3,887,153

ATTACHMENTS FOR UNLOADING DEVICES

Daniel W. O'Reilly, and Joseph D. O'Reilly, both of Rt. No. 3, Goodhue, Minn. 55027
Filed Nov. 5, 1973, Ser. No. 412,690
Int. Cl. A01c *19/00;* **E01c** *19/20*
U.S. Cl. 239—676 **9 Claims**

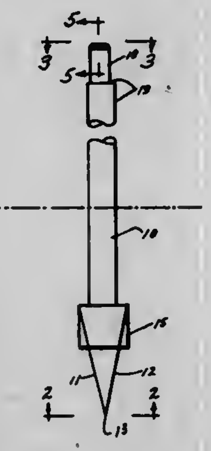


1. An attachment for the surface of an unloading device for unloading bulk material which has a tendency to adhere to the surface of the unloading device comprising:
- a container member for receiving bulk material and having means for confining the bulk material therein;
- a flexible member attached to said means for confining the bulk material therein;
- a pusher member mounted in said container member for forcing the bulk material out of said container member, said pusher member including a pliable scraper member for sliding along said flexible member to thereby clean the flexible member as the pusher member slides along said flexible member.

3,887,154

SUPPORT

John W. Cornett, 195 Minnick St., Franklin, Ohio 45005
Filed Feb. 15, 1974, Ser. No. 442,822
Int. Cl. A45f *3/44;* **E02d** *5/80*
U.S. Cl. 248—156 **5 Claims**

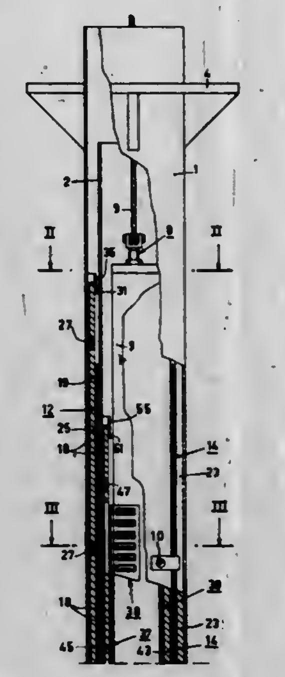


1. A support for an object such as a mail box, bird feeder, and the like comprising
- a hollow annular member having wall portions converging adjacent one end thereof and forming a chisel-like end and having
- a frusto-conical sleeve connected to said annular member and having an included angle between opposed wall portions thereof substantially corresponding to the angle included between said converging wall portions and having
- a pair of oppositely positioned ribs depending radially and outwardly from said sleeve, and
- a wick within said annular member adjacent said chisel-like end, said wick being supported by said latter member and extending outwardly therefrom through an opening therein to admit entry of liquid into said latter member and to effect removal of liquid therefrom by capillary action.

3,887,155

TELESCOPING SUPPORT MECHANISM

Silvio Bertalot, Malnata, Varese, Italy, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 7, 1973, Ser. No. 422,912
Claims priority, application Italy, Dec. 7, 1972, 23966/72
Int. Cl. F16c *19/00*
U.S. Cl. 248—333 **7 Claims**

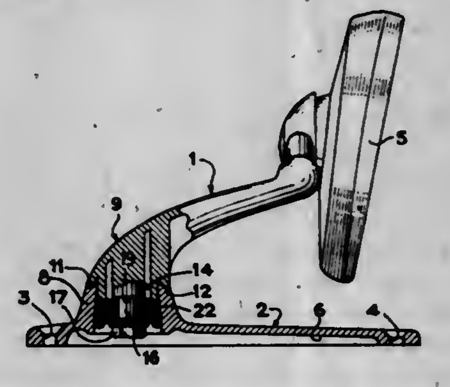


1. A telescoping support mechanism comprising an outer tublar member of substantially square cross-section, an inner tubular member of similar and smaller square cross-section adapted to slide telescopically within said first member with an annular space difined between said members with facing, spaced-apart inner and outer surfaces respectively of said outer and inner members on each of the four sides of said square, namely side A, opposite side AA, side B between sides A and AA, and side BB opposite side B, bearing means between said facing surfaces on each of said four sides, a race intermediate said bearing means and outer surface on sides A and B, spring means intermediate each of said races and said adjacent inner surface urging said race, adjacent bearing means, and outer surface on sides A and B into a non-backlash fit, and further urging said facing surfaces and intermediate bearing means of side AA into a non-backlash fit, side B having non-backlash means similar to side A with corresponding non-backlash fit on sides B and BB.

3,887,156

EXTERIOR DRIVING MIRROR FOR AN AUTOMOBILE VEHICLE

Charles Hugonnier, 93, Rue de Prony, 75 Paris, France
Filed Jan. 25, 1974, Ser. No. 436,811
Int. Cl. B60r *1/04*
U.S. Cl. 248—475 A **12 Claims**



1. An exterior driving mirror for an automobile vehicle comprising a base for securing to a vehicle body, an arm

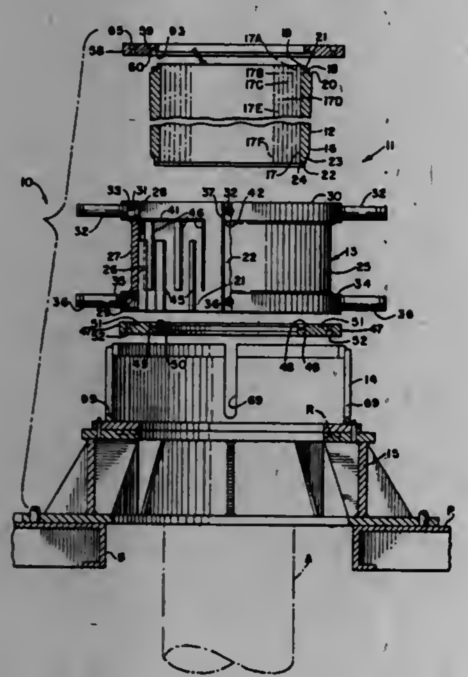
having a first end portion and a second end portion, a mirror mounted on said first end portion of the arm, the base having a socket defining a bore having a longitudinal axis, means for securing said second end portion of the arm to said socket in such manner that a blow on the arm of a predetermined magnitude causes release of the arm from the base, said means comprising a first abutment surface on the arm, a second abutment surface on the base, the first abutment and second abutment surfaces being in abutting relation axially of the bore when the arm is assembled with the base, a retaining ring of deformable material having an inner surface and an outer surface which is engaged in and in contact with the bore, a ring-expanding collar having an outer surface which is convergent toward said second end portion of the arm and coaxial with the bore and engaged in the ring in contact with said inner surface, means defining a rigid axial abutment for the ring in the bore adjacent said second end portion of the arm, an element securing the collar to said second end portion of the arm and exerting on the collar a force axially of the bore toward said second end portion of the arm and urging the convergent outer surface of the collar axially of the bore and the ring and thereby clamping the ring against the bore and radially compressing the ring and axially compressing the ring against said axial abutment, the ring being capable of elastically deforming and withdrawing from between the collar and the bore upon application of said blow.

3,887,157

CRYSTALLIZER MOLD

Charles J. Apatoczky, York, Pa., assignor to Teledyne, Inc., York, Pa.

Filed Aug. 9, 1973, Ser. No. 387,136
Int. Cl. B22d *27/04*
U.S. Cl. 249—79 13 Claims



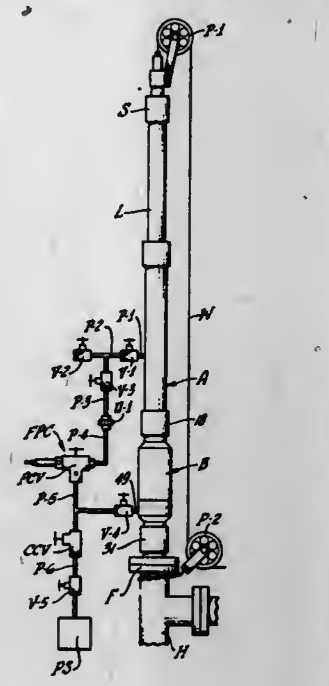
1. A crystallizing mold for cooling and shaping weld metal, comprising a coolant jacket, a weld metal engaging mold supported within said coolant jacket and defining with said coolant jacket a plurality of separate cooling zones, baffle means in each of the cooling zones defining a tortuous coolant fluid flow passage through each zone, coolant fluid inlet and outlet means for each passage to circulate the coolant fluid through each zone to cool the mold supported within the jacket and thus cool weld metal engaged by the mold, a pair of similar annular retaining rings secured to the upper and lower edges, respectively, of the jacket, and interengaging channel and wall means on said mold and retaining rings to accurately position and maintain said mold in said jacket.

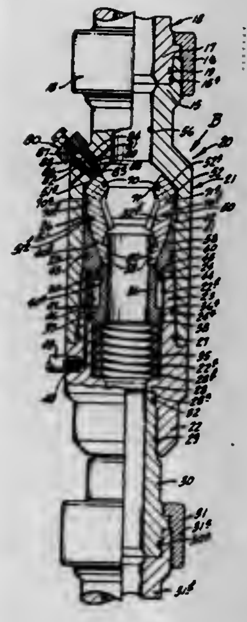
3,887,158

BLOW OUT PREVENTERS

Jodie E. Polk, Bukit Timah, Singapore, assignor to Otis Engineering Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 144,011, May 17, 1971, abandoned. This application Mar. 22, 1973, Ser. No. 343,652
Int. Cl. E21b *33/06*; F16k *31/363*
U.S. Cl. 251—1 11 Claims





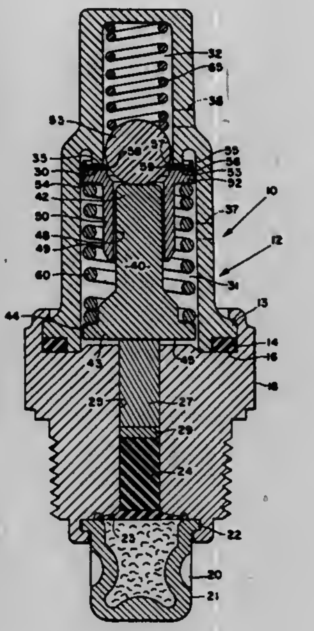
1. A blowout preventer comprising: a body having a flow passage therethrough; a seat in the body surrounding the passage; closure means in the body movable between open and closed positions; tubular operating means in the flow passage of said housing connected with said closure means and movable in said housing for moving said closure means between open and closed positions; means biasing said operating means for moving said closure means to closed position; fluid pressure actuating means on said operating means and said body operable by control fluid pressure applied thereto for moving said closure means to open position, said biasing means moving said operating means to move said closure means to closed position automatically when control fluid pressure is relieved from said fluid pressure actuating means; means conducting control fluid pressure from a remote separate source of control fluid under pressure to said actuating means for causing movement of said closure means to open position; pilot control valve means communicating with the flow passage of said body on the downstream side of said closure means and with said means conducting control fluid to said actuating means and actuated responsive to a predetermined decrease in pressure in said housing on said downstream side of said closure means to relieve control fluid pressure from application to said actuating means to permit said biasing means to move the operating means to move the closure means to closed position; and check valve means in said means conducting control fluid pressure from said remote source to said actuating means between said remote source and said actuating means operable to cut off escape of control fluid pressure from said remote source when said pilot valve is actuated to relieve application of control fluid pressure to said actuating means.

3,887,159

PORTED VALVE AND SEALING MEANS THEREFOR

Frank E. Obermaier, Lombard, and Arthur A. Scott, Mount Prospect, both of Ill., assignors to Eaton Corp., Cleveland, Ohio

Filed May 21, 1973, Ser. No. 362,557
Int. Cl. F03g *7/06*
U.S. Cl. 251—11 5 Claims



1. A ported valve comprising:

a housing defined a configured chamber therein, and wherein said housing has an internal shoulder extending within aid chamber, said shoulder separating said chamber into said first and second portions and said shoulder is defined as an annular rib having an apex which defines a line of demarcation between said first and second chamber portions, said first chamber portion extending on one side of said shoulder and said second chamber portion extending on the other side thereof;

a first and second port spaced along said hosuing, said first port communicating with the first portion of said chamber and said second port communicating with a second portion of said chamber;

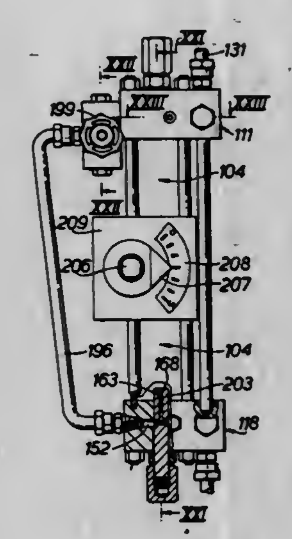
valving means within said chamber isolating said first portion of said chamber from said second portion in a firsts normally-closed position of said valve and providing communication between said first portion and said second portion in a second actuated position of said valve; said valving means including a resilient valve seat defined as an annular resilient disc within said first portion of said chamber and abutting said shoulder and having a central opening extending therethrough, a support member carrying said seat, said valve seat support member including an annular base portion approximately the size of said valve seat and a rim extending from the periphery of said base, said rim tapering inwardly over said base to retain said valve seat therein, first biasing means including a first spring within said first chamber portion biasing said seat into sealing engagement with said shoulder and contacting said support member to compress said seat into sealing engagement with said first and second portions of said chamber, a ball-type member normally positioned in contact with said opening and said seat, second biasing means contacting said valve member biasing into sealing engagement with said seat and actuating means to displace said valve member from said seat to provide communication between said first and second chamber portions.

3,887,160

FLUID OPERATED ACTUATOR FOR MOVABLE MEMBERS

John Cusveller, Moonee Ponds, Victoria, Australia, assignor to Sperry Rand Australia Limited, Victoria, Australia

Division of Ser. No. 73,508, Sept. 18, 1970, Pat. No. 3,688,644. This application Aug. 15, 1972, Ser. No. 280,879
Int. Cl. F16k *31/12*
U.S. Cl. 251—31 27 Claims



1. An actuator system including: a fluid operated actuator connectable to a member and being operable to cause movement of said member; said actuator including a cylinder and a force transmitting element which is movable axially within said cylinder under the influence of fluid pressure and is operatively connected to said member to be actuated; said force transmitting element dividing the interior of said cylinder transversely into two chambers; said cylinder having means operatively connected to both of said chambers whereby pressurized fluid may be introduced to or removed from either of said chambers through said means according to the desired direction of movement of the force transmitting element; a source of pressurized fluid; control means operable to connect said fluid source to a fluid circuit of said actuator to cause operation of the actuator; relief means connected into said fluid circuit and being operable to prevent the fluid pressure acting on said actuator from reaching a predetermined level; cut-off means operable to render the relief means inoperative when said actuator adopts a particular operative position but when in said operative position still permitting pressurized fluid to be introduced or exhausted from either cylinder chamber through said means connected to both of said chambers to enable continued operation of said actuator and movement of said force transmitting element and member; and indicator means connected to said fluid circuit so as to be operated when the pressure acting on said actuator reaches said predetermined pressure, and thereby indicates the operative position of said actuator and consequently the position of the said member connected thereto.

3,887,161

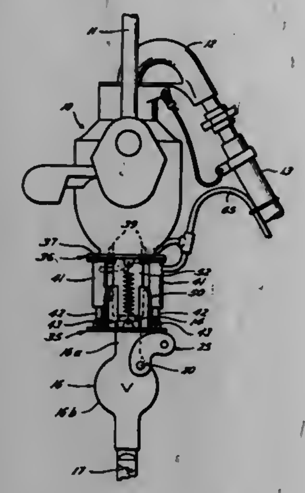
ARRANGEMENT FOR CLOSING A KELLY-COCK SUPPORTED ON A ROTARY SWIVEL WITH A STEM THEREFROM

Joseph R. Kubelka, Jr., 1100 Mary Lee St., Franklin, La. 70538

Filed Oct. 3, 1972, Ser. No. 294,663

Int. Cl. F16k *31/143*

U.S. Cl. 251—58 **3 Claims**



1. An arrangement for use with a swivel having a rotatable stem to remotely close a kelly-cock carried by the rotatable stem and wherein the kelly-cock includes a member having a longitudinal bore therethrough, a valve in the member for controlling flow through the bore, and projection means connected to the valve and extending externally of the kelly-cock for manual engagement to open and close the valve, the improvement comprising:

- a. support means;
- b. said support means comprising plate means carried by the swivel and guide means depending therefrom and surrounding at least a portion of the swivel stem;
- c. means connected with the projection means externally of the kelly-cock for moving the valve in the kelly-cock to closed position;
- d. driver means carried by said support means and movable relative to said support means for moving said means connected with the projection means externally of the kelly-cock to effect closing of the valve;
- e. said driver means comprising:
  - 1. engaging means to engage said means connected with said projection means; and
  - 2. stabilizer means between said engaging means and said support means to aid in stabilizing said driver means as it moves; and
- f. means to effect movement of said driver means relative to said support means; and
- g. said means to effect movement of said driver means including fluid operated piston means and cylinder means with piston rod means connected to the piston means and the cylinder means and piston rod means being connected between said support means and driver means.

3,887,162

GLANDLESS SOLENOID VALVE FOR CORROSIVE MEDIA

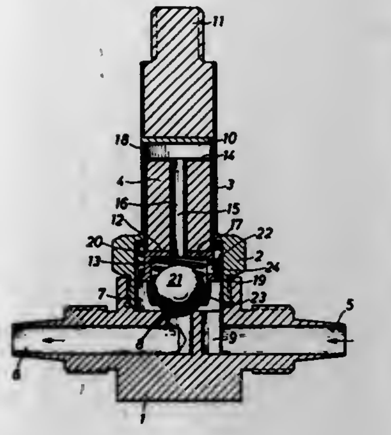
Heinz Antoni, Leopoldshafen, and Carl Hans Leichsenring, Graben-Neudorf, both of Germany, assignors to Gesellschaft für Kernforschung GmbH, Karlsruhe, Germany

Filed May 14, 1973, Ser. No. 360,007

Claims priority, application Germany, May 26, 1972, 2225689

Int. Cl. F16k *31/06*

U.S. Cl. 251—129 **6 Claims**



1. A solenoid valve, including a valve body having means defining an inlet, an outlet and a valve seat disposed therebetween; a hollow sleeve attached to said valve body and extending therefrom; a solenoid winding surrounding the sleeve; a solenoid core accommodated in the sleeve at a location remote from the valve body; a solenoid armature movable within the sleeve; and a valve ball cooperating with the valve seat and actuated by the armature; the improvement comprising

- a. a carrier slidably received in said sleeve for movement towards and away from said core, said carrier including
  - 1. means defining an entirely closed first chamber adjacent said solenoid core, said solenoid armature being disposed entirely in said first chamber;
  - 2. means defining a second chamber adjacent said valve seat, said valve ball being disposed in said second chamber;
  - 3. wall means defining an opening in said second chamber, said opening being oriented towards said valve seat, said wall means retaining said valve ball in said second chamber;
  - 4. a tube affixed to said means defining said first chamber, said tube maintaining communication between said second chamber and an interior part of said sleeve, said interior part being situated externally of said carrier and adjacent said first chamber;
  - 5. means defining, behind said valve ball, a connecting opening in said means defining said second chamber for maintaining a continuous communication between said second chamber and an inner space in said valve body adjacent said valve seat; and
- b. spring means disposed in said second chamber for urging said valve ball into retaining engagement with said wall means, said valve ball having a portion protruding outwardly from said second chamber to cooperate with said valve seat.

3,887,163

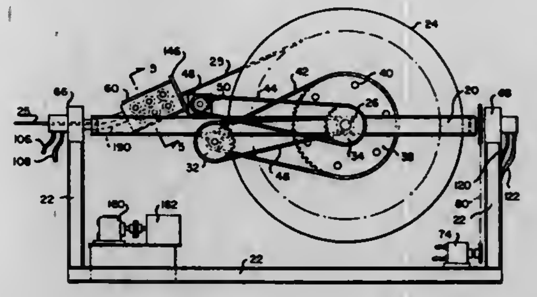
APPARATUS FOR INSERTING CABLE OR THE LIKE IN CONDUITS

Charles J. Prange, Cridersville, Ohio, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Dec. 10, 1973, Ser. No. 423,437

Int. Cl. H02g *1/00*

U.S. Cl. 254—134.3 FT **6 Claims**



1. Apparatus for inserting rod into and retrieving rod from a conduit comprising a support structure, a carriage mounted on said support structure for rotation about a first axis, a reel rotatably mounted on said carriage for rotation about a second axis, a length of rod adapted to be wound on an unwound from said reel, rod drive means mounted on said carriage to feed said rod from said reel including rollers in driving engagement with said rod along a line tangent to the point where the rod diverges from said reel, guide means on said carriage adjacent to the side of said drive means from which the rod emerges when said rod is being fed from said reel to guide said rod in an arc of curvature whereby the run of said rod is changed in direction from said line of tangency to substantially the axis of rotation of said carriage, said arc of curvature having a larger radius than the arc of curvature of the rod when wound on the reel.

3,887,164

WINCH

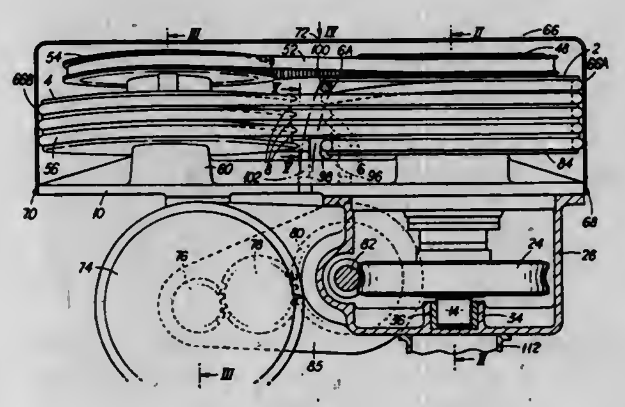
William Charles Coombs, The Cottage, Wood Ln., Iver, Buckinghamshire, England

Continuation of Ser. No. 89,942, Nov. 16, 1970. This application Oct. 10, 1972, Ser. No. 295,973

Claims priority, application United Kingdom, Nov. 21, 1969, 57189/69The portion of the term of this patent subsequent to Aug. 14, 1990, has been disclaimed.

Int. Cl. B66d *1/74*

U.S. Cl. 254—175.5 **3 Claims**



1. A power driven cable winch comprising in combination: a housing; first and second rotatable drums each having a periphery provided with cable-receiving tracks including a first dual-width track, the first drum having its axis set squarely in the housing and the second drum being separated therefrom by an intermediate space and having its axis offset in the housing such that cable passing between the drums in the tracks travels in a straight line; a worm and worm wheel drive by means of which the rotatable drums are rotated from a motor; a cable tensioning means constituted by a pressure plate combined with the first of the rotatable drums to form a final cable-receiving track; a cable entering and leaving the winch through said intermediate space in directions substantially normal to the axis of the first drum, the cable entering the winch tangent to the squarely-set first drum and winding more than one complete turn thereabout in said dual-width track and then passing multiple turns between and around both drums in said tracks and finally making a last turn in said final track against said cable tensioning means, said cable tensioning means being such as to act on constantly differing adjacent portions of the cable, said portions of the cable always being of the same length; and a metal casing supported by said housing and covering said drums, the inner surfaces of the casing being located adjacent to the peripheries of both drums and shaped to press lightly against the cable as it passes therearound with sufficient pressure to maintain the cable in the tracks.

3,887,165

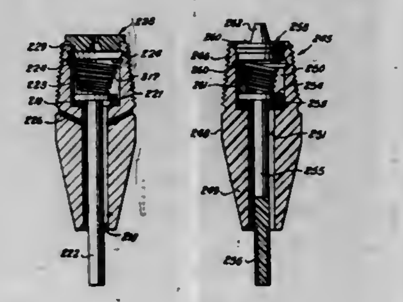
WATERING VALVE FOR ANIMALS

Earl Clayton Thompson, 448 S. First St., Hewitt, Tex. 76643

Continuation-in-part of Ser. Nos. 99,154, Dec. 17, 1970, abandoned, and Ser. No. 161,532, July 12, 1971, Pat. No. 3,698,431. This application Oct. 13, 1972, Ser. No. 297,454

Int. Cl. F16k *1/16*

U.S. Cl. 251—339 **8 Claims**



1. A water dispensing valve for animals comprising

an elongated housing; passage means extending longitudinally through said housing including a valve chamber and an outlet passage of smaller cross-section than said valve chamber communicating said valve chamber with the outlet end of the housing; transverse shoulder means between said valve chamber and outlet passage defining an annular valve seat;

a valve closure member comprising an elongated stem of smaller cross-section than that of said outlet passage, and a radially enlarged head for sealing engagement with said annular valve seat; said stem extending through said outlet passage and beyond the housing outlet end;

a frusto-conical shaped compression spring in said valve chamber for urging said closure member head into engagement with said valve seat;

at least two axially spaced, annular retaining groove means in said housing passage means for axially and radially retaining the larger end of said spring with its smaller end bearing on said closure head; the larger end of said spring having a normal diameter greater than the diameter of said retaining groove means, whereby said spring is urged into a selected one of said groove means for selective positioning of said spring relative to said housing.

3,887,166
MIXER

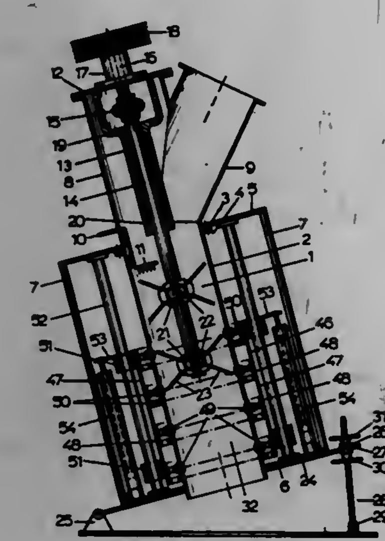
Christiaan Marie Van Ginneken, J.Obrechtlaan 14, Bussum, Netherlands

Filed Jan. 30, 1974, Ser. No. 437,951

Claims priority, application Netherlands, Nov. 27, 1973, 7316182

Int. Cl. B01f *7/04*

U.S. Cl. 259—2 **20 Claims**



1. A mixer, comprising an elongated, substantially cylindrical, upright sleeve of flexible material, such as rubber, which forms the wall of a mixing chamber, a supply inlet for solid material debouching at the upper end of said sleeve, supply means for liquid being provided underneath said supply inlet, said sleeve accommodating a central mixing shaft coupled to a drive means, said mixing shaft bearing blade holders with blades fitted therein, said blade holders each being rotatable through 360° about an axis of rotation which is perpendicular to the mixing shaft and being fixable in any position by a locking member, said blades extending solely in the upper part of said sleeve and a free granulating space being situtated underneath said blades in said sleeve, deforming means being in contact with the outer surface of said sleeve and being displaceable by displacement means with respect to said sleeve in the longitudinal direction of the mixing shaft.

3,887,167
APPARATUS FOR MANUFACTURE OF ORGANIC ISOCYANATES

Carl F. Irwin, New Castle, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

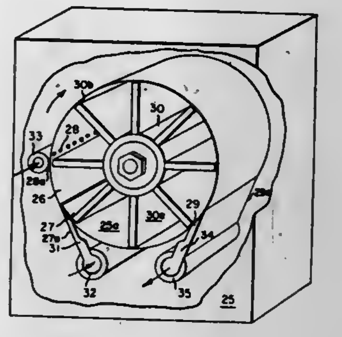
Division of Ser. No. 113,939, Feb. 9, 1971, which is a continuation-in-part of Ser. No. 846,210, July 30, 1969, abandoned, which is a continuation-in-part of Ser. No. 687,293, Dec. 1, 1967, abandoned. This application Feb. 22, 1973, Ser. No. 334,599

Int. Cl. B01f *7/04*

U.S. Cl. 259—9 **21 Claims**

1. An apparatus for mixing fluids which comprises

1. a cylindrical vessel whose end walls and tubular side wall define a cylindrical chamber,
2. a rotor mounted for coaxial rotation within said chamber and having blades whose length is such that there is an annular space between the outer ends of the blades and the tubular inner wall of the vessel whose thickness is equal to about 0.1–20 percent of the diameter of said chamber during rotation of the rotor,
3. at least two inlet means for introducing fluids to be mixed into said annular space during rotation of the rotor, said inlet means comprising a first and second continuous feeding means capable of continuously feeding a fluid through said side wall into said annular space at a substantially uniform rate at numerous points along a narrow path in said side wall, said narrow path being about 80–100 percent as long as said wall and substantially parallel with the rotor axis, and
4. outlet means for removing mixed fluids from said annular space during rotation of the rotor, said outlet means comprising an orifice means in said side wall located at an angular distance of about 135°–300° in the direction of rotor rotation from said second continuous feeding means.



3,887,168
MIXING APPARATUS

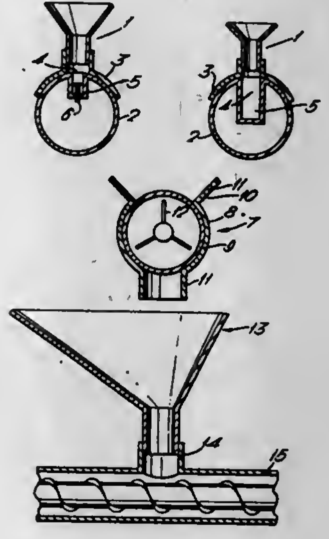
Frank Brooks, Atherton, England, assignor to Foscolor Limited, Lancashire, England

Filed Oct. 16, 1973, Ser. No. 407,032

Claims priority, application United Kingdom, Oct. 16, 1972, 47664/72

Int. Cl. B01f *9/08*

U.S. Cl. 259—16 **5 Claims**



1. Apparatus for delivering to a receiver a mixture in predetermined proportions of particulate materials, comprising:

a source of each of the materials;
a mixing device;
metering means adapted at each actuation thereof to feed a measured quantity of each material from the respective source to the mixing device;
the mixing device comprising a cylinder and a rotary mixer blade therein, the cylinder having an opening in its wall and being rotatable about its axis between a first position in which the opening is disposed adjacent said metering means to receive the measured quantities of materials from the metering means and a second position in which the opening is disposed adjacent said receiver to deliver the materials thereto;
and drive means for actuating the metering means, for moving the cylinder of the mixing device from its first to its second position, and for rotating the mixer blade during such movement.

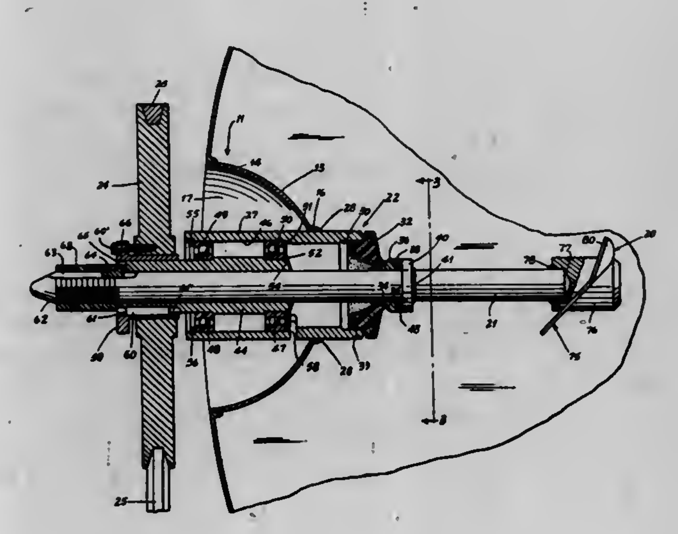
3,887,169
AGITATOR AND TANK APPARATUS

Frank L. Maynard, 2604 Weatherby, Springfield, Mo. 65807

Filed July 9, 1973, Ser. No. 377,660

Int. Cl. B01f *7/06*

U.S. Cl. 259—109 **7 Claims**



1. An agitator and tank apparatus comprising a tank having an annular vertical wall for containing a liquid to be mixed, an agitator having a rotating shaft and an impeller means mounted thereto, means for mounting the agitator in the vertical wall of the tank for rotation of the shaft and impeller means with the impeller means located within the tank and the axis of rotation of the impeller means being generally horizontal, means for rotating the shaft and impeller means in a direction to draw the liquid from the location of the tank opposite the mounting means and move it in a direction toward the mounting means, and deflection means between the impeller and mounting means for directing the impelled liquid outwardly in opposite directions around the annular wall of the tank to meet at the location of the tank opposite the mounting means.

3,887,170
INJECTION UNIT FOR AN INJECTION MOULDING MACHINE

Friedrich Heindl, Schwertberg, Austria, assignor to Ludwig Engel KG, Schwertberg, Austria

Filed June 7, 1974, Ser. No. 477,503

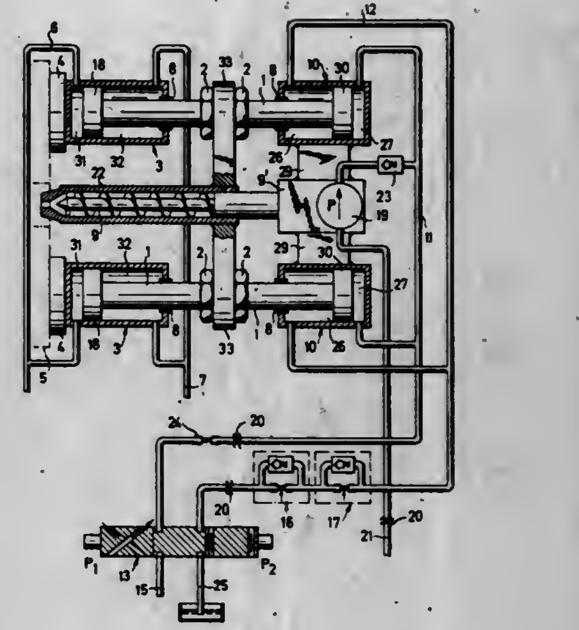
Claims priority, application Austria, June 19, 1973, 5404/73

Int. Cl. B29b *1/06*

U.S. Cl. 259—191 **3 Claims**

1. An injection unit for an injection moulding machine, in particular for processing thermoplastic materials, said unit comprising:

a rotatable screw which is disposed in an axially displaceable material cylinder and which is axially displaceable relative to said cylinder;
respective separate hydraulic cylinders for separately moving said cylinder and screw;
said cylinder being fixedly connected to bar members which are displaceable by first hydraulically actuated pistons operable within said hydraulic cylinders of said cylinder; and
said bar members having thereon second pistons which are slidable within said cylinders of said screw, said cylinders of said screw being operatively connected to said screw.



3,887,171
APPARATUS FOR PURIFYING IN CONTINUOUS CASTING SILICON- AND/OR ALUMINIUM-KILLED STEEL

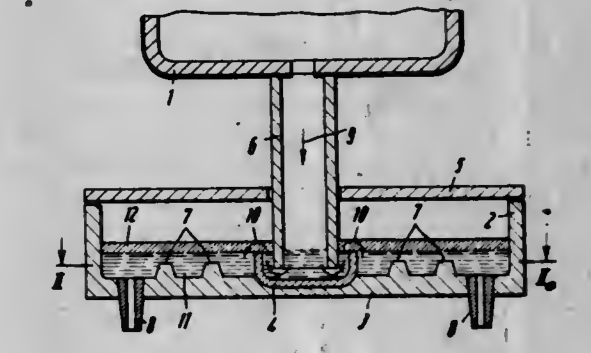
Herbert Neuhaus, Duisburg, Germany, assignor to Klöckner-Werke AG, Duisburg, Germany

Filed Nov. 28, 1973, Ser. No. 419,708

Claims priority, application Germany, Mar. 12, 1973, 2312137

Int. Cl. C21c *7/00*

U.S. Cl. 266—34 R **4 Claims**



1. Apparatus for purifying molten silicon- and/or aluminium-killed steel with the aid of a purifying slag upon the molten metal in a continuous casting process and disposed between the casting ladle and a continuous casting machine comprising:

a tundish,
a tube extending from the casting ladle into the tundish and

terminating just above the bottom of the tundish,
a trough in the bottom of the tundish,
a guidance for the molten metal defined by the tube and trough for directing the molten metal upwardly in soft touching contact with the purifying slag.

3,887,172
APPARATUS FOR THE TREATMENT OF A MOLTEN METAL BATH

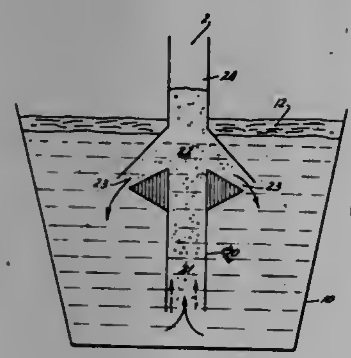
Alfred Funck, Differdange, and Arthur Schummer, Esch/Alzette, both of Luxembourg, assignors to Acieries Reunies de Burbach-Elch-Dudelange S.A. Arbed, Luxembourg

Filed Mar. 7, 1973, Ser. No. 338,668

Claims priority, application Luxembourg, Mar. 8, 1972, 64926

Int. Cl. C21c *7/00*

U.S. Cl. 266—34 A **8 Claims**



1. An apparatus for the treatment of molten metal in a bath thereof, comprising a receptacle receiving said bath of molten metal overlain by a slag layer; a circular-cross-section riser immersed in the molten metal and open at the bottom thereof; gas-injector means at the bottom of said riser for injecting gas into the molten metal and inducing an upward flow of a gas/-metal mixture therein; a generally frustoconical decanting chamber on said riser at a location spaced above the bottom thereof and provided with a plurality of downwardly and outwardly trained radially extending nozzles for discharging molten metal into the melt upon separation of gas from the molten metal, said nozzles including angles of 30° to 55° with the axis of said riser; and a circular cross-section extension of said chamber extending through said layer and opening upwardly thereabove for discharging the gas separated from said mixture, the cross-section of said extension being greater than that of said riser.

3,887,173
BLAST FURNACE CONSTRUCTION

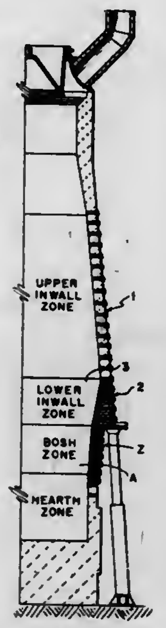
Berhl E. Wishon, Bethel Park, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 22, 1974, Ser. No. 435,550

Int. Cl. C21b *7/06*

U.S. Cl. 266—43 **6 Claims**

1. In a blast furnace construction having an upper inwall zone, a lower inwall zone, a bosh zone and a hearth zone, a refractory lining in at least the lower inwall and bosh zones consisting essentially of a plurality of rows of refractory brick and a layer of pitch impregnated ceramic fiber board sandwiched between a number of rows to absorb the thermal expansion of the brick and resist attack by slags.



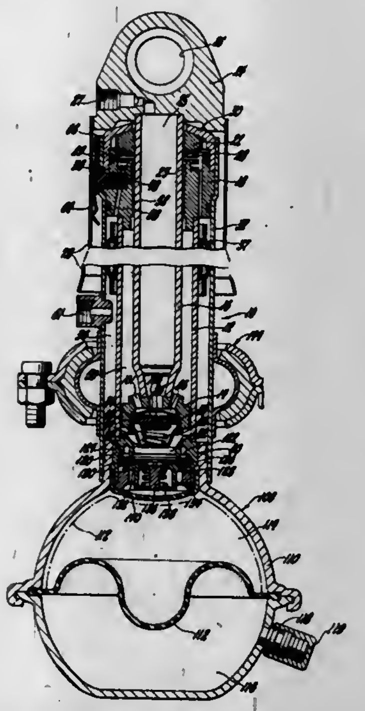
3,887,174
SHOCK ABSORBER AND LEVELER UNIT

James E. Whelan, Dayton, Ohio, and George W. Jackson, Fort Lauderdale, Fla., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1973, Ser. No. 419,515

Int. Cl. B60g *11/26*

U.S. Cl. 267—64 R **4 Claims**



1. A combination shock absorber and leveler unit for a vehicle comprising in combination a pressure cylinder operatively connected to a first vehicle mass, piston means mounted in said pressure cylinder, said piston means having a piston mounted for axial movement in said pressure cylinder and a piston rod connecting said piston to a second vehicle mass adapted to be leveled with respect to said first vehcle mass, a piston rod guide for said piston rod secured to one end of said pressure cylinder, inlet means for supplying hydraulic fluid to said pressure cylinder, an exhaust chamber, a hydraulic fluid discharge port for said exhaust chamber to exhaust hydraulic fluid from said unit, an exhaust-only valve operatively connected to said pressure cylinder for controlling the discharge of fluid from said pressure cylinder into said exhaust chamber and into said discharge port, said exhaust-only valve comprising a valve element movably mounted in said piston rod guide between opened and closed positions, an actuator operatively connected to said piston means and disposed radially outwardly from one end of said valve responding to vehicle load condition to actuate said valve to maintain the vehicle at a substantially level height, said actuator having an internal wall disposed at differing distances from one end of said valve for effecting movement thereof, hydro-pneumatic accumulator means for accumulating hydraulic fluid fed to said unit and to provide an uplift force for said piston means to raise one of said vehicle masses with respect to the other of said vehicle masses, and auxiliary valve means operatively connecting said exhaust chamber to said unit to feed said unit with hydraulic fluid in response to operation of said unit when said unit demands a higher rate of hydraulic fluid flow from said accumulator means than can be provided by said accumulator means.

3,887,175
QUINIDINE ALGINATE AND PROCESS OF PREPARATION THEREOF

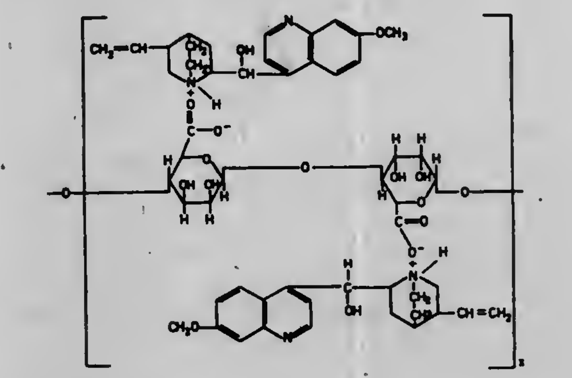
Pierre E. Cochard, and Roger Vandecauter, both of Brussels, Belgium, assignors to Laboratoires G.-A. Cochard, Brussels, Belgium

Filed Nov. 16, 1971, Ser. No. 199,219

Claims priority, application Belgium, Nov. 19, 1970, 96.509; Nov. 8, 1971, 110.261

Int. Cl. A61k *27/00*; C08b *19/10*

U.S. Cl. 260—209.6 **11 Claims**



1. Quinidine alginate.

11. The process of claim 7 wherein following settlement of the reaction product, the mixture is brought to a low temperature, separation is made by centrifugation and the product is then washed with chloroform.

3,887,176
SHEET COLLATOR

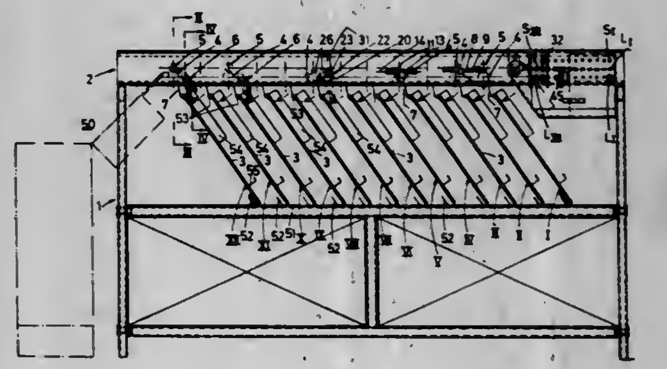
Jean Paulus, Anderlecht, and Christian Pierre Bourg, Hevillers, both of Belgium, assignors to C. P. Bourg, Belgium

Filed Dec. 12, 1972, Ser. No. 314,345

Int. Cl. B65h *39/02*

U.S. Cl. 270—58 **6 Claims**

1. In a sheet collator including a plurality of loading pockets arranged along a horizontal line between a head end and an outlet end of the collator with each pocket having an injection end, ejector rollers mounted in each loading pocket and engaging the top sheet of a packet of sheets therein to project, responsive to momentary activation of the ejector rollers, the top sheet partially out of its loading pocket, mounting means for the ejector rollers in each pocket, each mounting means including a rotatable roller shaft carrying the ejector rollers; an ejector drive shaft for the roller shaft, and a driving connection between the drive shaft and the roller shaft, ejector operating means operable to rotate the drive shaft, clutch means interposed between the operating means and the ejector drive shaft, and conveying means located at the ejection ends of and adjacent to the loading pockets for engaging each projected sheet to complete the withdrawal of the sheet from its pocket and to direct the sheet toward the outlet end of the collator: the improvement comprising, in combination, a respective ejector pinion mounted for free rotation one each ejector drive shaft and constituting said operating means, each ejector pinion having a hub portion; driving means operable to continuously rotate said ejector pinions; a respective spindle means secured to each drive shaft in coaxial alignment with the hub portion of the associated ejector pinion; each clutch means being contsituted by a respective helical spring having a number of turns fixedly embracing the associated spindle means and a number of turns embracing the hub portion of the associated ejector pinion, and biased to wind around such hub portion in a direction to tightly grip the hub portion to establish, in the tightened condition, a driving connection between the associated ejector pinion and the associated spindle for driving of the associated drive shaft; each helical spring having a respective stop means on the turns thereof embracing the hub portion of the associated ejector pinion; and respective retainer means arranged in the path of movement of each stop means around the hub portion of the associated ejector pinion to engage the latter to retain the associated helical spring in a non-tightened condition for free rotation of the associated ejector pinion on the associated drive shaft; respective electro-mechanical operating means operable to retract each retainer means out of the path of the stop means of the associated helical spring for tightening of the associated helical spring to couple the associated ejector pinion to the associated drive shaft for conjoint rotation; and a sequencing electric switch device in controlling relation with said electro-mechanical operating means and operable to energize said electro-mechanical operating means momentarily and in seriatim, beginning with the electro-mechanical operating means of the first loading pocket adjacent the head end of said collator and continuing to the last loading pocket adjacent the outlet end of the collator.



3,887,177
SHEET FEEDING MECHANISM

Silvio T. Farfaglia, Fulton; Robert G. Halpin, Minetto, and Ronald E. Bock, Fulton, all of N.Y., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 7, 1973, Ser. No. 395,027

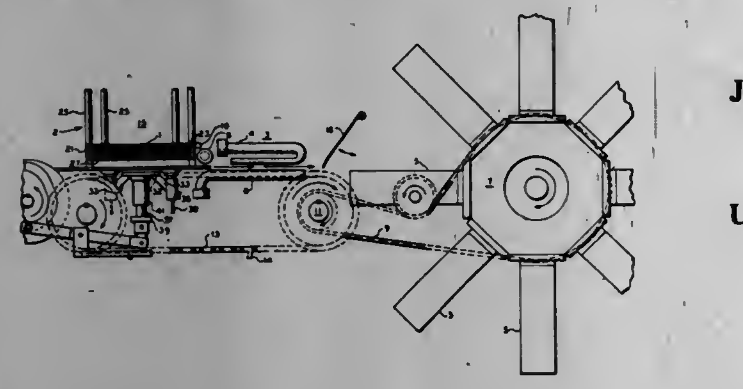
Int. Cl. B65h *3/08*, *5/02*

U.S. Cl. 271—12 **7 Claims**

3. Apparatus for feeding discrete sheets which comprises a conveyor means having a conveyor run on which said sheets are to be transported and having means for engaging sheets deposited on said conveyor run;
a supply magazine means for containing a plurality of said sheets, means for mounting said supply magazine means over said conveyor run;
transfer means for successively withdrawing individual sheets from said supply magazine means and for depositing each thus withdrawn individual sheet on said conveyor run, said transfer means comprising at least one suction cup, means mounted beneath said conveyor run

adapted to move said at least one suction cup upwardly through said conveyor run into engaging contact with the bottom one of said sheets in said supply magazine means and then to return said at least one suction cup downwardly through said conveyor run to deposit the withdrawn sheet on said conveyor run, and means for maintaining a vacuum in said at least one suction cup from the time said at least one suction cup contacts the bottom sheet in said supply magazine to the time the withdrawn sheet is deposited on said conveyor run;

means for periodically activating said conveyor means, and means for reciprocating said at least one suction cup to withdraw the bottom one of said sheets in said supply magazine means; and



holding means for maintaining the position of the thus deposited sheet on said conveyor run until after said thus deposited sheet is contacted by said means for engaging, said holding means comprising first and second hold-down means positioned to engage the upper surfaces of opposite edges of the sheet being deposited on said conveyor run; each said hold-down means comprising a first shaft, a hold-down bar, means mounting said hold-down bar on said first shaft for rotation therewith, a second shaft, means for longitudinally moving said second shaft responsive to the vertical movement of said at least one suction cup, and means responsive to the longitudinal movement of said second shaft for rotating said first shaft and the associated hold-down bar.

3,887,178
SHEET FEEDING ASSEMBLY INCLUDING AUTOMATIC STACK REPLACEMENT AND ALIGNING MEANS

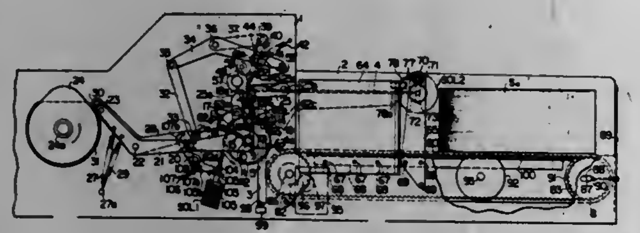
Sakae Fujimoto, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed July 9, 1973, Ser. No. 377,381

Claims priority, application Japan, July 24, 1972, 47-73924

Int. Cl. B65h *3/08*

U.S. Cl. 271—30 R **13 Claims**



1. In a sheet feeding apparatus having a tray supporting a first stack of sheets and a feeding mechanism for removing sheets from the stack on the tray and feeding the sheets out of the apparatus one at a time, the improvement comprising:

elevating means for continuously raising the tray from a bottom position as the feeding mechanism feeds out the sheets so that the successive top sheets of the first stack are maintained substantially at a predetermined height and for lowering the tray to the bottom position when the last sheet has been fed out;

sensing means disposed at the tray for sensing when the last sheet of the first stack has been fed out by the feeding mechanism and for generating a signal indicative thereof;

conveyor means arranged adjacent to the tray for supporting a second stack of sheets, and being responsive to said signal to move the second stack of sheets to the tray to be fed out; and

alignment means for urging and aligning side edges and rearward edges of the stack of sheets on the tray, and being responsive to said signal to clear the path of movement of the second stack of sheets while they are being moved to the tray.

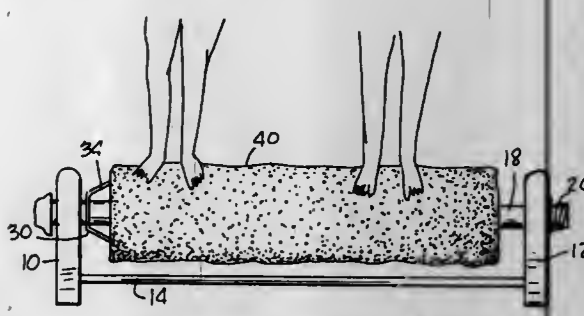
3,887,179
LOG ROLLING APPARATUS WITH ADJUSTABLE FRICTION STRUCTURE

John T. Klepper, and George Morse, both of 3303 Quinlan St., Yorktown Heights, N.Y. 10591

Filed Oct. 19, 1973, Ser. No. 408,121

Int. Cl. A63b *23/06*

U.S. Cl. 272—1 E **1 Claim**



1. A game comprising:

a horizontal frame adapted to rest upon a suitable horizontal surface;

a horizontally elongated roller rotatably disposed about the frame somewhat above the surface, the roller having a horizontal axle;

a spongy hollow horizontal cylindrical sleeve disposed around the roller, the sleeve having an outer surface which resembles the bark of a tree and is roughened to enable the feet of the players to contact the sleeve surface in a non-slip manner; and

means to adjust the rotational friction of the roller in the frame to adjust the force required to rotate the roller, the rotational friction adjustment means including a disc having a hole through which one end of the axle extends, spring loaded manually operable means to move the disc along the axle toward or away from one end of the frame and a plurality of arms secured at one end to the disc and having opposite ends engaging suitable supports disposed in the one roller end, the arms and supports being symmetrically disposed about the axle.

3,887,180
EXERCISE APPARATUS FOR BEDRIDDEN PATIENTS

Bernard H. Berman, 685 N. Wade Ave., Washington, Pa. 15301

Division of Ser. No. 313,193, Dec. 7, 1973, abandoned. This application July 8, 1974, Ser. No. 486,329

Int. Cl. A63b *23/04*

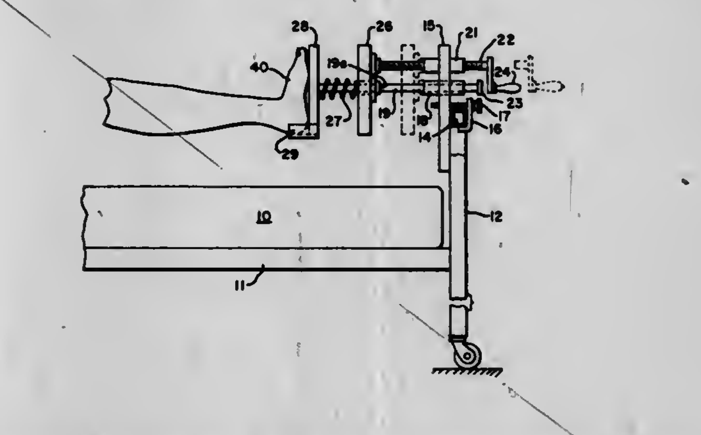
U.S. Cl. 272—58 **7 Claims**

1. An exercise apparatus for use in combination with a hospital patient's bed or the like having an end frame whereby a patient situated in the bed undergoes active exercise of distal extremities, comprising:

a mounting plate including means for attachment to said end frame,

a platen adapted to be vertically disposed above the patient-bearing surface of said bed, board means for engagement with the feet of a patient occupying said bed to undergo

active exercise and movable by said patient from a rest position with respect to said platen, resilient means projecting from said platen for biasing said board means away from said end frame and parallel to the patient bearing surface of said bed and,



means for horizontally displacing said platen relative to said mounting plate and relative to the rest position of said board means.

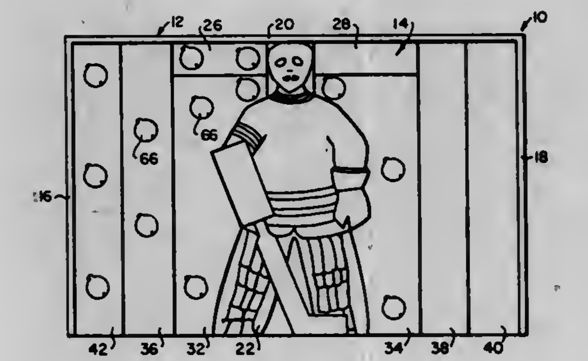
3,887,181
GOAL SHIELD

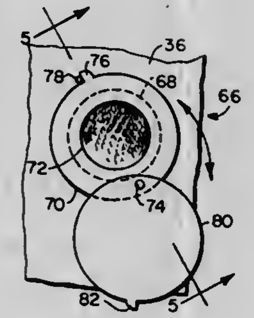
John Samaras, 983 Memorial Dr., Cambridge, Mass. 02139

Filed Oct. 13, 1972, Ser. No. 297,293

Int. Cl. A63b *69/00*

U.S. Cl. 273—1 B **4 Claims**





1. A goal shield comprising:

a. a frame having a substantially U-shaped profile in cross section, said frame including a pair of side members and a top cross member;

b. a body coplanar with said frame, said body including first, second, third, fourth, and fifth panels;

c. a plurality of fastening means mounted to said frame and said body, said fastening means including first, second and third members, said third member adapted to readily engage and disengage said first and second members, said first member detachably mounted to said second member when said first and second members are engaged by said third member;

d. said first panel connected to one of said side members, said top cross member, and said second panel;

e. said second panel connected to said top cross member, said first panel, said third panel, and said fourth panel;

f. said third panel connected to said top cross member, said second panel, said fifth panel;

g. said fourth panel connected to said second panel and said fifth panel;

h. said fifth panel in the form of a hockey goal keeper, said fifth panel detachably connected to said top cross member, said third panel, and said fourth panel;

i. at least two of said first members mounted on each said first, second and third panels, at least one of said first members mounted on adjacent sides of each said first, second and third panels;

j. at least two of said second members mounted on said frame, at least one second member mounted on one of said side members and on said top cross member;

k. a first plate rotatably mounted to said body at a forward face thereof, said first plate rotatably between a first position and a second position, said body formed with a through hole, said through hole covered by said first plate when said first plate is in said first position, said through hole exposed when said first plate is in said second position; and

l. a second plate rotatably mounted to said body at the forward face thereof, said second plate rotatable between a first position and a second position, said first and second plates having substantially circular profiles, said through hole and said first and second plate being coaxial, said second plate formed with a through hole having a diameter less than the diameter of said through hole formed in said body, said first plate having a diameter larger than said through hole formed in said second plate, said through hole formed in said second plate covered when said first plate is in said first position and exposed when said first plate is in said second position, a portion of said through hole formed in said body covered when said first plate is in said second position and said second plate is in said first position, all of said through hole formed in said body exposed when said first plate is in said second position and said second plate is in said second position.

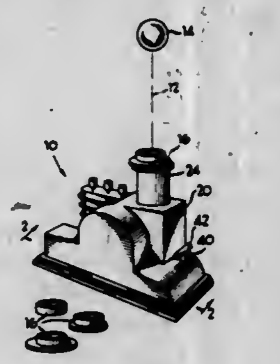
3,887,182
FLUID STREAM GAME APPARATUS

Jeffrey D. Breslow, Highland Park, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 10, 1973, Ser. No. 423,102

Int. Cl. A63f *9/00*

U.S. Cl. 273—1 E **12 Claims**



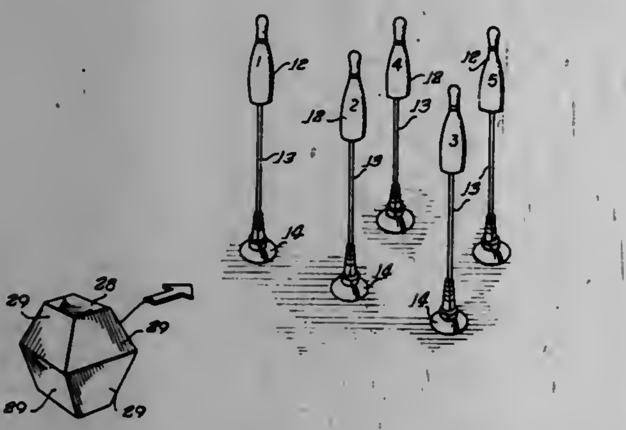
9. A game apparatus comprising:

a housing having an air blower mounted therein and a nozzle formed thereon for directing an air stream generally upwardly from the air blower;

a lightweight spherical ball which is supportable over the nozzle by the force of the air stream; and

a plurality of manually stackable playing pieces each having a generally flat ring-shaped annular fluid blocking portion, the annular width of the fluid blocking portions of certain playing pieces being of different widths, a generally centrally located opening defined by the interior periphery of said fluid blocking portion through which the air stream can pass when the playing pieces are properly stacked on top of said nozzle, an upstanding cylindrically-shaped stacking portion formed on the fluid blocking portion and surrounding said openings so that the stacking portions of the plurality of stacked playing pieces form a hollow cylinder and define an air stream path of travel when said stack of playing pieces is supported on the nozzle, whereby said ball is caused to fall whenever the fluid blocking portion of a playing piece is interposed a sufficient length of time between the nozzle and the ball thereby interrupting the fluid stream when the playing pieces are moved to stacking position.

3,887,183
MODIFIED BOWLING GAME AND APPARATUS THEREFOR
Martin P. Saso, 7S510 Route 83, Clarendon Hill, Ill. 60514
Substitute for Ser. No. 315,440, Dec. 15, 1972, abandoned.
This application Apr. 24, 1974, Ser. No. 463,664
Int. Cl. A63b *67/00*
U.S. Cl. 273—41 **6 Claims**



1. Game apparatus for playing a modified bowling game of the kind wherein projectiles are manually tossed and directed toward a plurality of targets arranged in a predetermined pattern on a substantially flat and smooth playing field area surface from a position horizontally spaced from the targets in an attempt to strike the same, comprising, a projectile; and a plurality of target assemblies, each of said target assemblies including a target having a configuration substantially resembling one vertical half of a bowling pin, said target being made of relatively lightweight non-metallic material, and means for supporting said target on said playing field area surface in a generally upright position vertically spaced above said playing area surface including an elongated, slender rod having a relatively long end section extending from one end of the rod and a relatively short end section extending from the opposite end of the rod, means for attaching said target to said relatively long end section of said rod, and an enlarged base member connected to said relatively short end section of said rod, said base member being detachably connectible to said playing field area surface solely by vacuum..

3,887,184
HAND-HELD AND MANIPULATED CATCH BALL GAME
Joseph Cavaliere, 276 E. 24th St., Paterson, N.J. 07514
Filed Jan. 18, 1974, Ser. No. 434,388
Int. Cl. A63b *71/02*
U.S. Cl. 273—96 R **2 Claims**

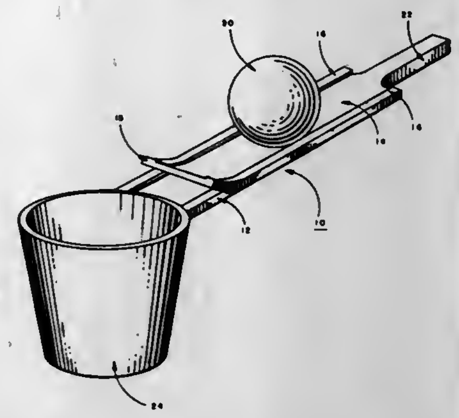
1. A hand held and manipulated catch ball game assembly comprising:

a support;

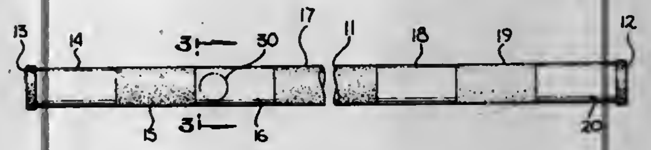
a ball launching ramp attached to said support;

said ramp having ball retaining side walls and an upturned ball launching end;

a ball receiving receptical attached to said support adjacent to said upturned end; and a handle attached to said support opposite said upturned ramp end for manipulating said assembly to launch said ball into said receptacle, said handle, said ramp and said ball receiving receptacle aligned along the longitudinal axis of said ramp, said ball receiving receptacle having a ball receiving opening whose axis is perpendicular to the longitudinal ramp axis.



3,887,185
TILTING TUBE WITH ROLLING MEMBER GAME
Patrick M. Landreville, 1352 W. Gwava, Oxnard, Calif. 93030
Filed July 19, 1974, Ser. No. 490,111
Int. Cl. A63f *7/04*
U.S. Cl. 273—109 **8 Claims**



1. A hand-held device capable of being employed as a game of skill and a testing device requiring sight-hand coordination and manual dexterity comprising:

a. an elongated tubular member having enclosed ends, said elongated member having a first and second clear sections disposed on opposite ends, a first and second opaque section disposed inwardly and adjacent said first and second clear sections, third and foruth clear sections disposed inwardly and adjacent said first and second opaque sections and a third opaque section disposed between said third and fourth clear sections, said elongated member defining an internal path; and,

b. a movable means disposed within said elongated member capable of moving along said path;

whereby said device can be tilted causing said movable means to move through said path and appear alternately in said third and fourth clear sections without appearing in said first or second clear sections.

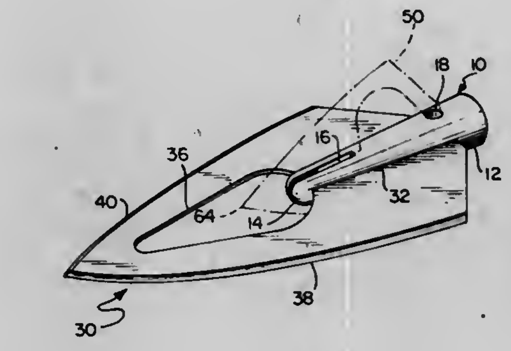
3,887,186
BROADHEAD
Oscar N. Matlock, Jr., Pine Bluff, Ark., assignor to Brunswick Corporation, Skokie, Ill.
Filed Feb. 19, 1974, Ser. No. 443,311
Int. Cl. F41b *5/02*
U.S. Cl. 273—106.5 B **10 Claims**

9. An arrowhead comprising:

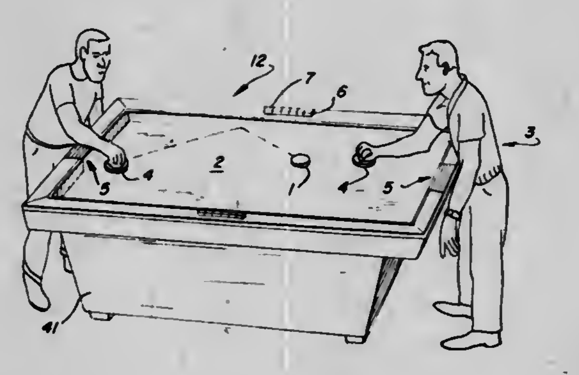
a ferrule having a conical body with a rounded tip on the forward end of said ferrule, a planar slot in said ferrule extending rearward from the forward end of said ferrule into said conical body, and a pair of circular holes located on opposite sides of said conical body, the center of said circular holes being coplanar with said planar slot;

a flat primary blade securely brazed on the outside of said conical body, said main blade lying in a plane substantially perpendicular to that of said planar slot, and extending forward well beyond said rounded tip, said primary blade having an opening in the portion of said main blade which projects beyond said rounded tip; and

a flat auxiliary blade having a forward portion thereof positioned within said planar slot, said forward portion extending forward beyond said rounded tip and terminating in a pointed tip located within said primary blade opening, said auxiliary blade having a pair of fastening members, one of which is adapted to fit in each of said circular holes.



3,887,187
AIR CUSHION TABLE GAME
Phillip E. Crossman, Ada; Robert C. Kenrick, Grand Haven, and Robert W. Le Mieux, Spring Lake, all of Mich., assignors to Brunswick Corporation, Skokie, Ill.
Division of Ser. No. 179,659, Sept. 13, 1971, Pat. No. 3,773,325. This application Sept. 17, 1973, Ser. No. 397,694
Int. Cl. A63f *3/00*
U.S. Cl. 273—126 A **14 Claims**



6. A game comprising, in combination:

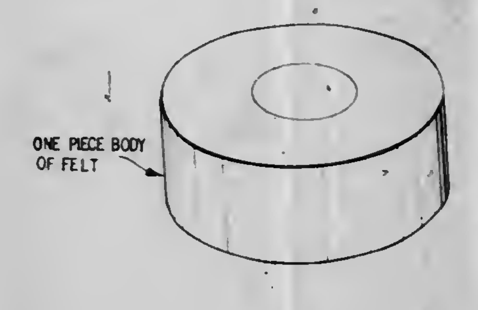
an air bed having means for creating an air cushion above a playing surface,

a bumper strip defining a boundary of the playing surface upon said air bed,

a game piece having an area and weight such that it floats upon said air cushion during play and is capable of moving over the playing surface generally without touching it, a goal associated with the playing surface, and

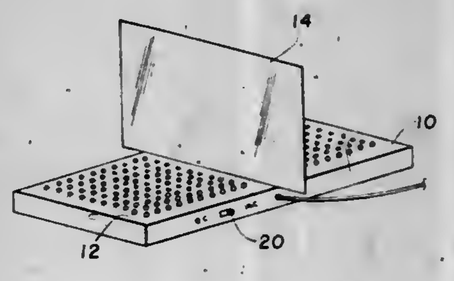
means for engaging said game piece so as to cause it to move upon said air cushion and over said playing surface.

3,887,188
PRACTICE HOCKEY PUCK OF FELT MATERIAL
Gerald J. Beauchamp, Beloeil, Quebec, and Thomas A. Kelly, Pointe Claire, Quebec, both of Canada, assignors to Beaukel, Ltd., Quebec, Canada
Filed Nov. 27, 1973, Ser. No. 419,447
Claims priority, application Canada, Nov. 30, 1972, 157889
Int. Cl. A63b *71/00*
U.S. Cl. 273—128 R **6 Claims**



1. A hockey puck suitable for practice on non-ice smooth surfaces, said puck having substantially the size and shape as a conventional hockey puck and including a cylindrical body of felt and a ballast weight within said body, the diameter of said cylindrical body being greater than its height.

3,887,189
WORD BOARD GAME
Milton Dawes, 3415 Girouard, Apt. 1010, Montreal 236, Quebec, Canada
Filed June 8, 1973, Ser. No. 368,113
Int. Cl. A63f *3/00*
U.S. Cl. 273—130 AB **5 Claims**



1. A two person word game comprising:

a game board having two like horizontal sections divided by a vertical partition disposed therebetween and extending upwards therefrom, each section having a like number of lamp socket receiving positions arranged in rows and columns, there being at least twenty seven such positions, each section having a single letter of the alphabet disposed adjacent each position and associated therewith, there being more positions than letters of the alphabet whereby at least some of the letters are associated with more than one position;

a plurality of sockets equal in number to said positions, each socket being disposed at a corresponding position;

means connecting each socket on one section in series with a corresponding socket in the other section to form a corresponding series circuit;

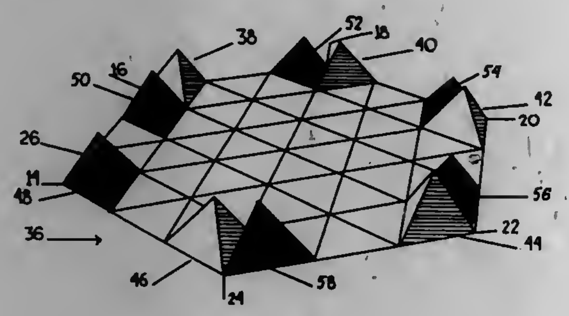
means connecting all of said circuits electrically in parallel;

means to supply electric power to said parallel connected circuits; and

a plurality of lamps, at least some lamps being removable, disposed in sockets in both sections.

3,887,190
BOARD GAME APPARATUS

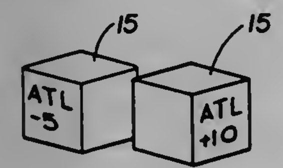
Victor H. Ameri, 33 Elm Ave., Mill Valley, Calif. 94941
Filed July 26, 1973, Ser. No. 382,739
Int. Cl. A63f *3/00*
U.S. Cl. 273—131 L **1 Claim**



1. A game apparatus comprising:
- a board having markings thereon defining a plurality of fifty four equilateral congruent board triangles, each being contiguous on at least two sides with other board triangles; said plurality of triangles defining a hexagonal configuration, and
- a plurality of four-sided playing members, each side of each playing member defining an equilateral triangle congruent with the triangle defined by each other side of that playing member, and congruent with the triangle defined by each side of each other playing member, and congruent with each of the plurality of board triangles, each playing member having a triangular side positioned on a board triangle to cover and conform to said triangle, each playing member being movable by rotation of that playing member generally about one leg of the triangle defined by the side of the playing member positioned on the playing surface into an unoccupied area of the playing surface, until another triangular side of the playing member is seated on the playing surface and wherein there are twelve playing members, six thereof being distinguishable from the remaining six, whereby the ratio of playing members to board triangles is 12 to 54.

3,887,191
FOOTBALL BOARD GAME APPARATUS

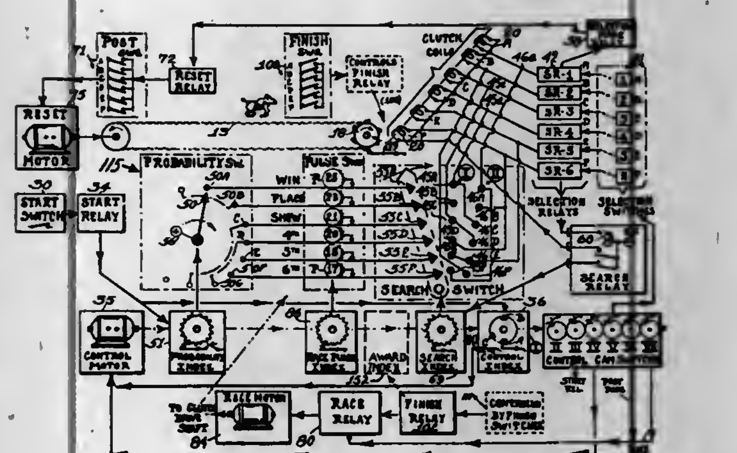
Charles H. Lucas, Kansas City, Mo., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed Oct. 5, 1973, Ser. No. 404,100
Int. Cl. A63f *3/00*
U.S. Cl. 273—134 DB **2 Claims**



1. A competitive game of simulated football comprising
- a plurality of playing cards, each marked as a football field with parallel lines indicating a pair of opposed goal lines and additional parallel lines located at uniform intervals between said goal lines, with each playing card fitted with holes located across the length of the marked football field of a size to individually retain a marker fitted with a dowel pin, with the quantity of such playing cards being sufficient to supply each player with one such card,
- a plurality of said markers of a quantity to provide each playing card with one of said markers,
- a plurality of play blocks of a quantity to provide a group of play blocks for each of a plurality of players, each play block marked with indicia indicating the results of an individual football play and each bearing indicia identifying the play block with a specific football team.
- the holes in the playing card being on said parallel lines, and the play result indicia on each play block including a numeral which is a multiple of said uniform interval and identified by an indicium as either a gain or a loss, representing respectively a playing distance towards or away from a goal line.

3,887,192
RANDOM SELECTIVE SWITCHING APPARATUS

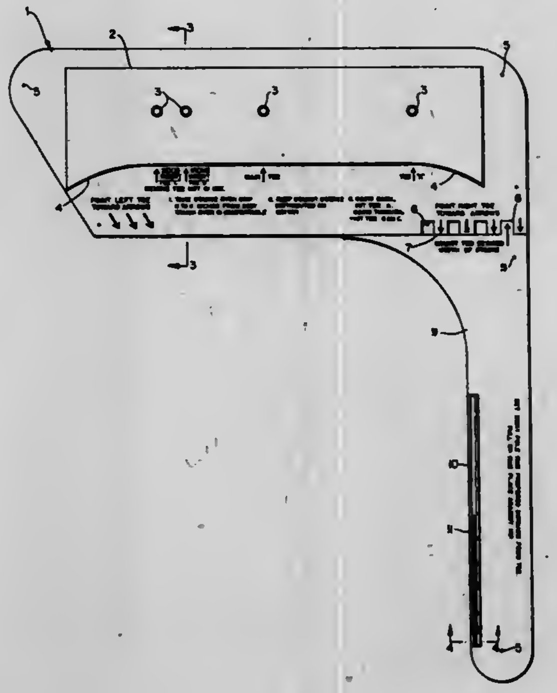
Joseph Edward Lally, McHenry, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.
Continuation of Ser. No. 321,579, Jan. 8, 1973, abandoned, which is a division of Ser. No. 110,563, Jan. 28, 1971, Pat. No. 3,709,493. This application Dec. 17, 1973, Ser. No. 425,259
Claims priority, application United Kingdom, Sept. 29, 1970, 46322/70
Int. Cl. A63f *9/00*
U.S. Cl. 273—138 A **9 Claims**



6. Program selection apparatus including a chance operating factor and comprising at least two start-stop type rotary switches one of which is designated a probability switch and has probability contacts engageable by a rotary probability contactor in various stopping positions thereof, and the other of which is designated a search switch and has a rotary search contactor and a plurality of sets of program contacts engageable thereby in various stopping positions thereof, said switches being cooperable in selection duty cycles to effect operational program connections for one or another of said sets of program contacts; a master control circuit including drive means actuated thereby and operative to initiate a said duty cycle and set said contactors in motion; selection switch means operative selectively to establish a search circuit enabling some contact in one or another of said sets of program contacts as a determinant search contact; first circuit means operative responsive to actuation of said selection switch means to effect a stopping of the probability contactor in engagement with some probability contact and enable the search contactor to connect the same with any enabled determinant search contact it encounters; and second circuit means operative responsive to interconnection of an enabled probability contact and an enabled determinant search contact to effect stoppage of the search contactor in program-connecting engagement with the particular set of program contacts containing the determinant search contact which effects such stoppage.

3,887,193
GOLF PRACTICE DEVICE

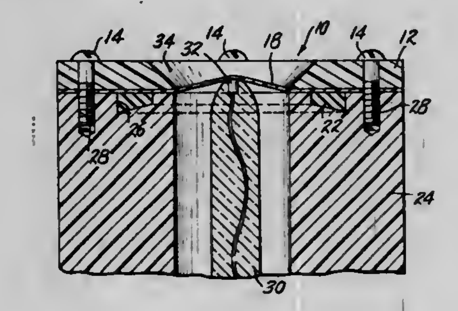
Carlyle Eugene Stanley, 7075 Idelwood Rd., Falls Church, Va. 22043
Filed Nov. 28, 1973, Ser. No. 419,803
Int. Cl. A63b *69/36*
U.S. Cl. 273—186 R **9 Claims**



1. A golf practice device for use in perfecting a golf swing comprising in combination: a base having affixed thereto a turf-like mat, wherein said base and said turf-like mat include a plurality of linearly disposed ball supporting means, and wherein said base has a leg extending substantially perpendicularly from one side of said base; having affixed thereto a vertically adjustable indicating member which provides linear and arcuate motion substantially along a longitudinal axis of the perpendicular extension.

3,887,194
MEMBRANE TENSIONING MEANS AND THE USE THEREOF

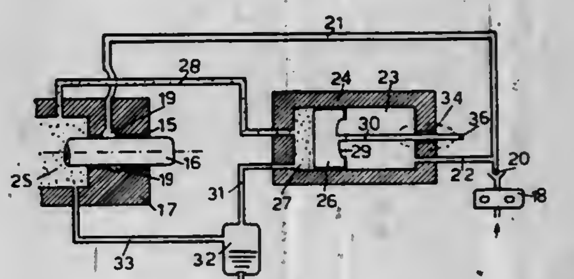
Joe A. Porter, Whittier, and Allen F. Dageforde, Santa Ana, both of Calif., assignors to Betz Laboratories, Inc., Trevose, Pa.
Filed Mar. 7, 1974, Ser. No. 449,140
Int. Cl. F16j *9/00, 15/00*
U.S. Cl. 277—1 **16 Claims**



1. The combination of a flexible membrane held in tension against a surface in sealing engagement with respect to said surface, a groove formed in said surface and compressible sealing means loosely positioned in said groove, adjustable clamping means overlying said groove and exerting a compressive force against said membrane and also against said sealing means said groove being of such design as to cause said sealing means upon compression to flow in said groove and then expand outwardly of said groove to engage said membrane and to tension and substantially seal said membrane against said surface.

3,887,195
HIGH PRESSURE SHAFT SEAL DEVICE

Constantino Vinciguerra, Firenze, Italy, assignor to Nuovo Pignone, S.p.A., San Donato Milanese, Italy
Filed Apr. 24, 1973, Ser. No. 353,956
Claims priority, application Italy, Apr. 24, 1972, 23500/72
Int. Cl. F16j *9/00*
U.S. Cl. 277—2 **3 Claims**



1. A device for accumulating and regulating high pressure oil for use in an oil shaft seal of a high working pressure gas blower, comprising:
- a high pressure metallic cylinder; a piston slidably positioned within said cylinder and dividing the interior thereof into a first chamber and second chamber; means for maintaining the first chamber in fluid communication with and charged by the gas in the blower; pump means for supplying high pressure oil from a source, conduit means for delivering said high pressure oil to said shaft seal, said conduit means including a, branch line for delivering high pressure oil to said second chamber, and means located upstream of the branch line junction for preventing back flow of oil to said pump means, the cylinder defining a regulating port aligned with and in fluid communication with said second chamber; said piston having a rod extending therefrom through said port, said rod providing a differential pressure area across said piston to cause said second chamber to have a greater pressure than said first chamber, whereby gas is prevented from leaking into the second chamber; said rod further having an outwardly tapered cross-section adjacent its free end, whereby the rod cooperates with the port to vary the flow of oil therethrough in response to movement of said piston, said port being adapted to be closed when said pump means fails to deliver pressurized oil and the oil within said second chamber being delivered to the seal by the movement of the piston under influence of gas pressure in said first chamber.

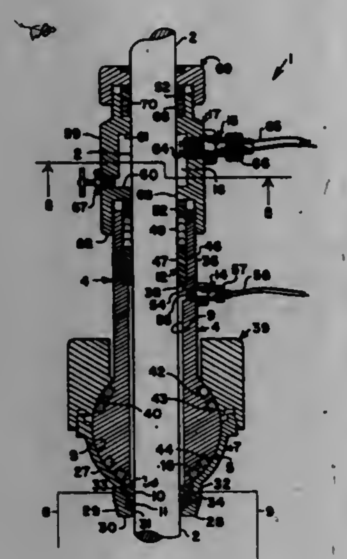
3,887,196
SELF ALIGNING STUFFING BOX

William Neil Renfrow, 3306 58 St., Lubbock, Tex. 79408
Filed Oct. 9, 1973, Ser. No. 404,768
Int. Cl. F16j *15/00*
U.S. Cl. 277—2 **5 Claims**

1. A self aligning well head structure for use with an oil well tubing and a pumping unit reciprocating a polished rod extending into the well tubing and connected to a string of sucker rods, said self aligning well head structure comprising:
a. a body member having walls defining a cavity adapted to receive a portion of a sphere;
  b. a tubular portion extending from said body member and having a side wall and an end wall with a bore therethrough, said tubular portion having a recess coaxial with said bore and communicating with the cavity in said body member, said tubular portion of said body member being adapted to be mounted on an oil well christmas tree;
  c. a tubular bushing member having opposite ends and positioned in said tubular portion of said body member and having one end thereof in engagement with the end wall of said tubular portion and a side wall defining a bore adapted to slidingly receive an oil well polished rod dur-

ing reciprocable movement thereof, said tubular bushing member being smaller than said recess for limited lateral movement of said bushing member and oil well polished rod;

d. a rod guide member having a generally spherical end portion received in the cavity in said body member and an elongated tubular portion extending from the spherical end portion and having a side wall defining a bore therethrough, said spherical end portion engaging the other end of said bushing member and having a bore therethrough communicating with and coaxial with the bore through the tubular portion of said rod guide member, said bores through the tubular portion of the body member and through the spherical end portion and tubular portion of the rod guide member being larger than the polished rod providing a clearance greater than the limited lateral movement of said bushing member and polished rod;



e. a retainer mounted on said body member and having walls engaging said spherical end portion of said rod guide member for retaining same in the cavity in said body member; and

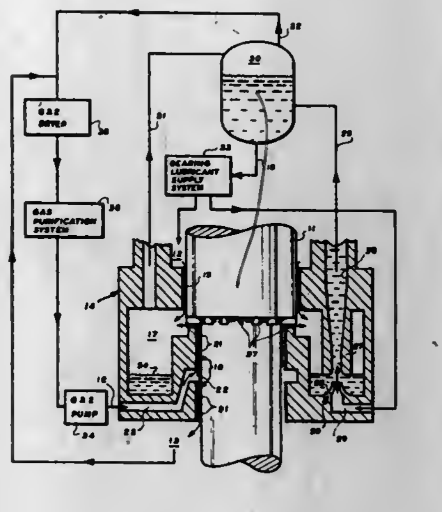
f. seal means mounted on said tubular portion of said rod guide member and adapted to slidingly and sealingly engage the oil well polished rod during reciprocable movement thereof.

3,887,197
SEAL SYSTEM

Davorin D. Kapich, La Jolla, and Glenn C. Thurston, Del Mar, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Mar. 17, 1972, Ser. No. 235,570
Int. Cl. F16j *15/40*
U.S. Cl. 277—15 **2 Claims**

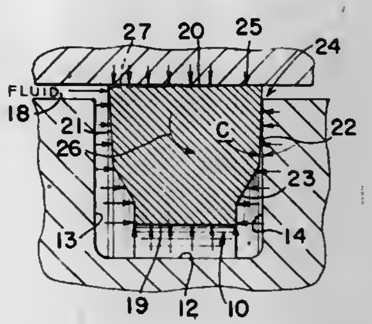
1. A seal system for a shaft which extends vertically between a first region in which a liquid is present and a second region in which a gas is present, comprising, a seal housing defining an annular land and an annular labyrinth for facing on the shaft, said land being spaced axially along the shaft above said labyrinth, said seal housing further defining an annular fluid collection cavity for communicating with the space between said land and the shaft and the space between said labyrinth and the shaft, said seal housing further defining an annular recess in said labyrinth intermediate the ends thereof, means for introducing the liquid into the space between said land and the shaft, means for introducing the gas into said annular recess, a nozzle for injecting the liquid into said cavity at a level below the level of liquid therein, said nozzle being vertically oriented to inject the liquid vertically upward, and a diffuser communicating with said cavity and aligned to receive fluid from said nozzle for removing liquid and gas entrained therein from said cavity.



3,887,198
PRESSURE BALANCED RING SEAL

William M. McClure, East Peoria, and Keith K. Klintworth, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 26, 1973, Ser. No. 409,792
Int. Cl. F16j *15/16*
U.S. Cl. 277—27 **14 Claims**

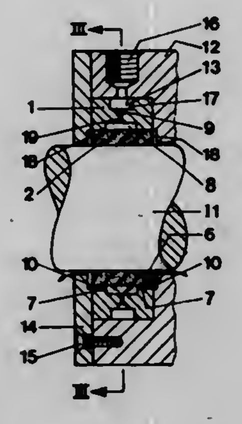


1. A rigid annular ring seal comprising, when viewed in cross section, radially spaced inner and outer faces joined together by axially spaced side faces, at least a substantial portion of at least one of said side faces being completely tapered circumferentially therearound and radially inwardly from said outer face toward said inner face to form an acute angle with respect to said outer face which is slightly less than 90°, said first member being rotatably mounted in a bore formed in a second member, said ring seal freely seated in unsecured relationship in an annular groove formed in said first member to position its outer face closely adjacent to annular surface portions forming said bore to maintain an annular portion of said tapered side face in sealing contact with only an outer portion of a side wall of said groove, located adjacent to said bore, and to fully expose said inner face and said side faces to pressurized fluid, said tapered side face being disposed to diverge radially inwardly with respect to said side wall, toward said inner face.

3,887,199
PRESSURE MEDIUM OPERATED FRICTIONLESS SEAL ASSEMBLY

Yngve Bertil Sundqvist, Partille, Sweden, assignor to SKF Industrial Trading and Development Company B.V., Amsterdam, Netherlands

Filed Dec. 19, 1973, Ser. No. 426,281
Claims priority, application Sweden, Dec. 22, 1972, 16855/72
Int. Cl. F16j *15/24, 15/40*
U.S. Cl. 277—74 **19 Claims**



1. A pressure-medium operated frictionless seal assembly for sealing a gap between two members, coaxially rotatable relative one another, comprising a first ring of rigid material and a second ring, said rings being insertible into said gap and mountable each against one of said relatively rotatable members coaxially with the axis of rotation, each one of said rings having at least two annular surface portions, coaxial with the axis of rotation, said portions abutting only respective corresponding surface portions on the other of said rings at least when the sealing device is mounted in the gap, said second ring being elastically deformable at least at the annular surface portion associated therewith, two of said annular surface portions of at least one of said rings being spaced apart by an intermediate annular groove, and a plurality of channels extending through said first ring and opening into said groove for permitting pressure medium to be fed into said groove and building up pressure in said groove such that each annular surface portion on said second ring will be elastically deformed and lifted from the corresponding annular surface portion of said rigid first ring, thereby forming a narrow annular gap between said first and second rings, through which narrow annular gap said pressure medium can leak out to the ambient.

3,887,200
ROTARY SEAL ASSEMBLY

Frederick S. Engelking, and Donald F. Durham, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 27, 1973, Ser. No. 391,861
Int. Cl. R16j *15/34*
U.S. Cl. 277—88 **4 Claims**

1. A rotary seal assembly comprising an annular cupped casing having an inner cylindrical tubular portion,

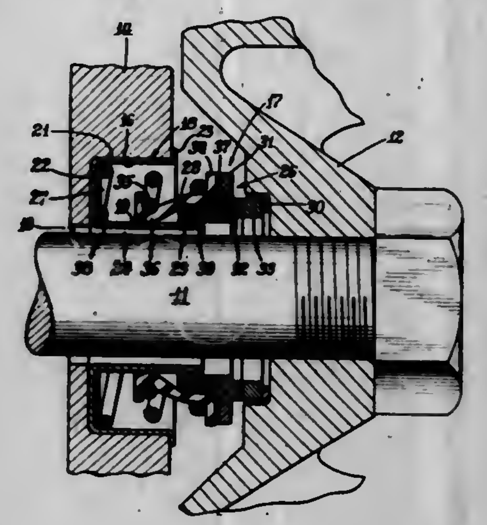
an outer cylindrical wall portion spaced coaxially outward from said inner tubular portion, and

an annular end wall interconnecting said inner tubular portion and said outer wall portion,

an annular face seal member coaxially disposed about the free end of said inner tubular portion of said casing,

a tubular resilient seal member having one end sealingly engaging said outer cylindrical wall portion and the other end engaging friction means for sealing and coupling said end of said tubular seal member to said annular face seal member,

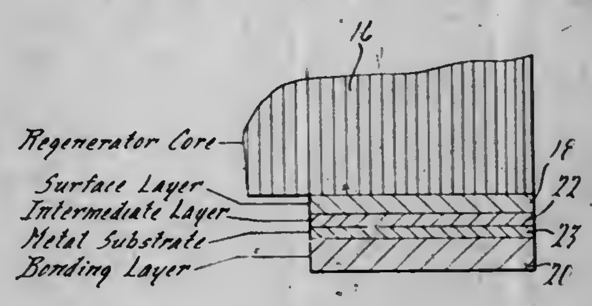
a compression spring coaxially disposed in the annulus defined between said inner tubular portion and said outer wall portion and resiliently acting axially between said end wall of said casing and the friction means acting on said face seal member, a rotating seal disposed between said face seal member and a hub of a rotatable shaft, and said friction means and said compression spring defining torque accommodating means for accommodating excess torque exerted by said rotating seal against said face seal member so that said face seal member is permitted to rotate relative to said casing and said tubular seal member to relieve resulting stress on components of said rotary seal assembly.



3,887,201
RUBBING SEAL MATERIAL FOR CERAMIC HEAT EXCHANGER

V. Durga Nageswar Rao, Woodhaven, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 19, 1973, Ser. No. 417,444
Int. Cl. F28d *19/00*
U.S. Cl. 277—96 R **12 Claims**



1. A high temperature rubbing seal for use with a ceramic matrix of a gas turbine regenerator, said seal comprising a metallic substrate, a sealing surface layer and at least one intermediate layer between the surface layer and the substrate, said surface layer having a smooth outer sealing surface adapted to slidably engage the adjacent surface of the regenerator matrix, said surface layer being comprised of approximately 75 to 85 percent copper and cuprous oxide, 9 percent sodium fluoride, 11 percent lithium fluoride and copper nitrate.

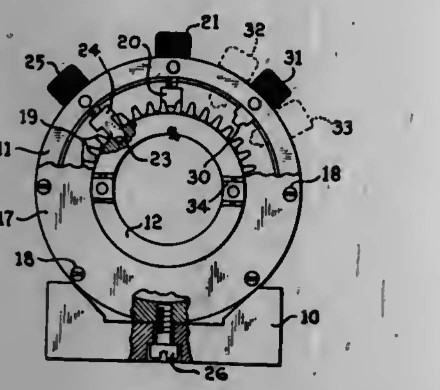
3,887,202
SPEED GRIND FIXTURE

Bruno J. Zapart, P. O. Box 1217, Hot Springs, Ark. 71901

Continuation-in-part of Ser. No. 306,178, Nov. 13, 1972, abandoned. This application Sept. 10, 1974, Ser. No. 504,482
Int. Cl. B23q *17/04;* **B23b** *31/36;* **B24b** *41/06*
U.S. Cl. 279—5 **10 Claims**

1. A workpiece holder comprising an outer cylindrical housing, a hollow open-ended generally cylindrical spindle extending concentrically within said housing and projecting forwardly therefrom, a forward annular closure rigidly secured to said housing, a rearward annular closure including a

rearwardly extending concentrically disposed manipulating ring attached to said spindle, bearing means within said housing rotatably supporting said spindle, a row of 36 equally spaced radially directed and outwardly tapered spindle teeth extending concentrically around the spindle, the circumferential spacing between the inmost points between each pair of the interspaces at each side of each tooth subtending an angle of ten degrees at the axis of rotation of the spindle, a plurality of circumferentially spaced, radially movable spindle-

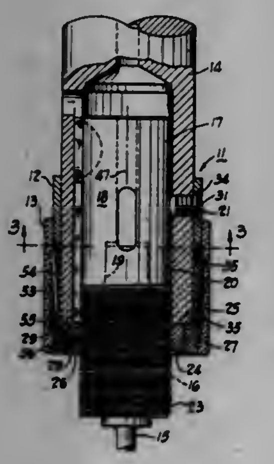


engaging indexers mounted along the exterior of said housing, said indexers projecting radially inward through the wall of the housing to removable engagement with selected pairs of adjacent teeth along the adjoining tapered surfaces of the teeth for precluding rotary movement of the spindle, said indexers including at least a first and a second indexer spaced respectively for movement along radial planes subtending an angle in degrees at the axis of the spindle which is the product of the number ten and a mixed number, and clamping means effective to removably secure a workpiece to the revoluble spindle.

3,887,203
QUICK CHANGE CHUCK

Milton L. Benjamin, Moreland Hills, and Wilbur N. Miles, Chagrin Falls, both of Ohio, assignors to Erickson Tool Company, Solon, Ohio

Filed July 9, 1973, Ser. No. 377,635
Int. Cl. B23b *31/20*
U.S. Cl. 279—50 **12 Claims**



11. A quick-change chuck to hold a tool with a nut thereon in the open front end of a tubular spindle,

said nut adapted to abut the open end of the spindle and to have a threaded adjustment on the tool for shifting the tool in an axial direction relative to the spindle,

said nut having a shoulder at the junction of the outer face with a generally cylindrical outer surface of the nut,

said chuck comprising, in combination,

a locking sleeve adapted to surround the tubular spindle,

means to secure said locking sleeve to the spindle,

a movable control sleeve surrounding said locking sleeve,

a plurality of chuck fingers resiliently supported in said locking sleeve and extending toward the front end of said locking sleeve,

a tapered foot on the front end of each of said fingers engageable with the shoulder of the nut,

a shoulder on the inner surface of the front of said control sleeve engaging with the heels of said feet,

a taper on one of said control sleeve shoulder and said heels of said feet to establish a first angle of engagement relative to said axis,

the angle of taper of said feet being at least three times said first angle of engagement,

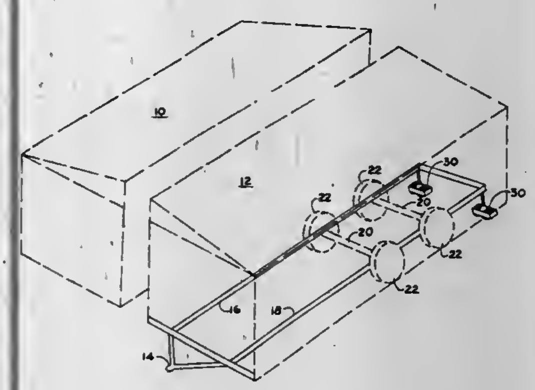
a plurality of apertures in said locking sleeve substantially parallel with said axis,

and spring means including individual springs in said apertures acting between said sleeves to urge said control sleeve shoulder in an axial direction to urge said feet radially inwardly to lock onto the adjusting nut and lock a tool axially within the tubular spindle.

3,887,204
DOLLY APPARATUS

Leslie Rex Austin, 598 Hermes, Encinitas, Calif. 92024

Filed Mar. 22, 1974, Ser. No. 453,867
Int. Cl. B60k *25/00*
U.S. Cl. 280—3 **7 Claims**



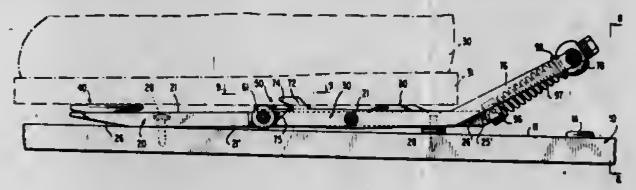
1. Dolly means for lifting a mobile home and shifting said home laterally comprising a frame, roller means supporting said frame and journaled therein for shifting said home, and lifting means supported by said frame and upwardly directed to engage the undersurface of said home on its underframework, said roller means including at least a pair of rollers with their axes of rotation parallel and spaced apart, said lifting means comprising jack means located on a vertical axis extending between said axes of a rotation, said frame having first and second invertible faces, said jack means having support means on said frame operative to support said jack means in either of the invertible positions of said frame, and said roller means having bearings closer to said first face of said frame than to said second face so that said jack means will be lower in one position of said frame than the other so as to engage this underframeworks of mobile homes which are closer to the ground than others.

3,887,205
SAFETY SKI BINDING

James Mitchell Edmund, 5262 Olde Stage Rd., Boulder, Colo. 80302

Filed Sept. 18, 1973, Ser. No. 398,447
Int. Cl. A63z *9/08*
U.S. Cl. 280—11.35 K **36 Claims**

1. A safety ski binding which includes a ski plate adapted to be fastened onto the ski, a boot plate means adapted to be fastened to the bottom side of the sole of the ski boot intermediate its heel and toe portion, supporting means secured to the sides of the ski plate for cooperation with the boot plate means and lever means pivotally secured to the side of the ski plate rearwardly of the support means and having forwardly extending boot plate engaging portions to hold by spring-action the boot plate means onto the surface of the support means in the engaged position of the ski binding while enabling the boot plate means to ride over the support means in case of a forward fall with predetermined force, and spring means for resiliently urging the lever means in the engaging position with a predetermined force when the binding is engaged,



wherein anti-friction means are arranged between the front portion of the ski plate and the boot sole, said anti-friction means comprising:

a first washer means,

a second washer means with low-friction surfaces,

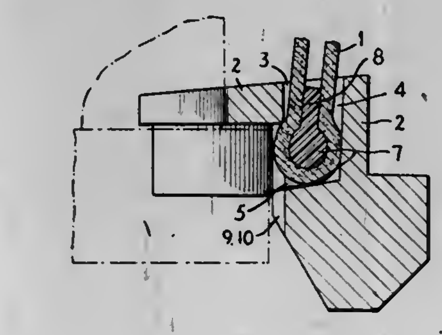
a disk means with low-friction surfaces,

and holding means for holding said first washer means and second washer means fixedly with respect to the ski plate with one side of said second washer means being supported at said first washer means and the other side of said second washer means supporting said disk means.

3,887,206
SECURITY BINDINGS FOR SKIS

Georges Pierre Joseph Salomon, Annecy, France, assignor to S.A. Francois Salomon & Fils, France

Division of Ser. No. 95,143, Dec. 4, 1970, Pat. No. 3,778,072.
This application Oct. 5, 1973, Ser. No. 404,373
Claims priority, application France, Dec. 5, 1969, 69.42070
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 N **2 Claims**

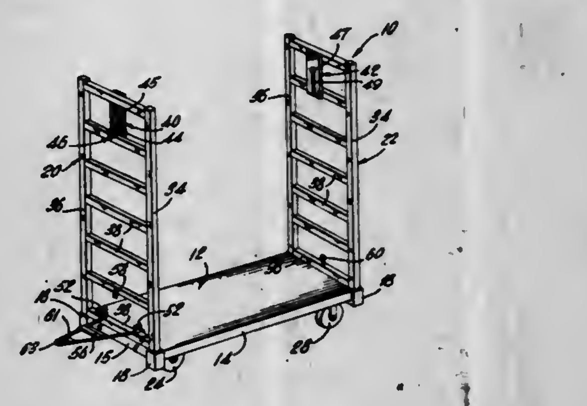


1. A device for connecting a ski to a skier comprising: a body portion connectable to a ski during use of the device and having means therein defining a bore having a stepped configuration with a smaller cross-sectional portion and a larger cross-sectional portion, and a slot which opens at one end into said bore and at the other end at the surface of said body portion; a lashing connectable to a skier during use of the device and having a folded portion defining a loop received within said bore and extending outwardly therefrom through said slot; and an elongated locking member inserted into the interior of said loop continuously wedging said loop against the bore surface to effect locking of said lashing to said body portion irrespective of whether said lashing is in a tensioned or slackened condition, said locking member comprising a pin having a shank portion extending through the interior of said loop and into said smaller cross-sectional portion, and a head portion force fitted into said larger cross-sectional portion to thereby maintain said lashing locked to said body portion.

3,887,207
CART

John M. Gotsch, Jr., Westfield, N.J., assignor to Gauer Metal Products, Inc., Kenilworth, N.J.

Filed Mar. 1, 1973, Ser. No. 337,099
Int. Cl. B62d *39/00*
U.S. Cl. 280—33.99 T **9 Claims**

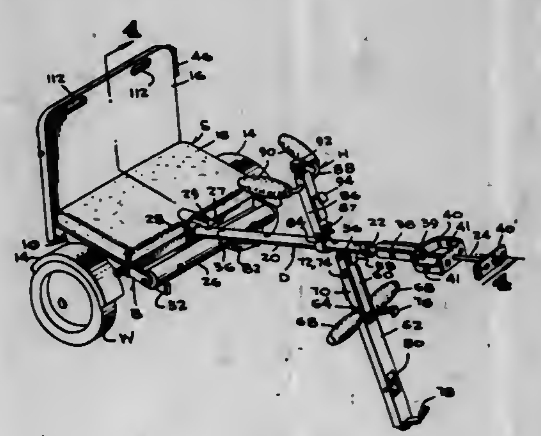


1. A cart comprising a deck member, a pair of end members detachably mounted upright at opposite ends of said deck member, at least one end member from another cart of similar design being supportable by the deck member contiguous to one of the end members, and retaining means integral with each of the end members for releasably interlocking the at least one end member with said one of the end members when contiguous thereto, and wherein said retaining means of each end member comprises a projecting member extending from one side of the end member for releasably engaging an adjacent end member when the end member is moved so that its projecting member is moved into a predetermined relation with the adjacent end member and then lowered relative thereto.

3,887,208
COLLAPSIBLE AND PORTABLE UTILITY CART

Paul Vidal, 8409 14th Ave., Langley Park, Md. 20783

Filed Jan. 18, 1974, Ser. No. 434,688
Int. Cl. B62b *1/10*
U.S. Cl. 280—36 C **19 Claims**



1. A collapsible, portable, hand-and-vehicle-pullable utility cart and child's stroller comprising in combination:

a. cart body means including a generally planar first supporting member disposable selectively at both generally parallel and transverse attitudes relative to a supporting surface on which the cart is used, said body means also having at least two axially aligned supporting wheels rotatably connected thereto;

b. said cart body means including a second generally planar supporting member pivotally connected adjacent a rearwardmost side of said first-mentioned generally planar supporting member and disposed to be foldable toward and away therefrom; said first-mentioned planar supporting member constituting a seat portion for a child to ride upon; said second planar member constituting both a seat back and a transverse rearwardmost support for any items carried in association with said first-mentioned supporting member, and said seat and seat back members having complementary abutment portions and link means for maintaining predetermined selective relative adjusted positions between fully open and folded close positions;

c. drawbar means including a longitudinally extended drawbar attached to a forward side of said cart body means and having a free end projecting forwardly therefrom;

d. an articulated cart-supporting leg having one end pivotally connected to said drawbar means at a point spaced forwardly of said cart body means, with the other end operatively engageable on the cart-supporting surface to maintain the cart in a stabilized, normal utility use condition when at rest on said wheels and not being pulled;

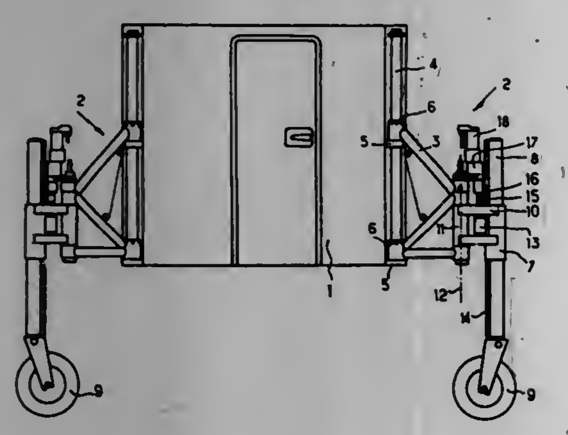
e. child's foot-supporting members attached to said articulated supporting leg;

f. said articulated supporting leg being of composite form including second pivotal means interconnecting first and second composite-forming leg portions so as to facilitate selective relative folding movement of said leg portions; cooperative means on mid-leg portions to releasably lock them in rigid coextensive aligned conditions; and

g. said pivotally connected supporting leg disposed so as to be adjusted between a forwardmost extended cart-stabilizing position and a rearwardly folded or retracted cart-pulling position, attendant movement of said cart supporting leg about said pivotal connection with said drawbar means.

3,887,209
LOAD-HANDLING APPLIANCE

Henri Blanc, 21 Boulevard de Beausejour, Paris 16eme, France
Filed Jan. 9, 1974, Ser. No. 431,969
Claims priority, application France, Jan. 10, 1973, 73.00753
Int. Cl. B62d *61/12*
U.S. Cl. 280—43.21 **3 Claims**



1. Load-handling appliance comprising a plurality of mobile assemblies adapted to be secured to the load, each assembly including:

a bracket;

a vertical axle fast with the load about which the bracket can swivel and along which the bracket can slide;

means for securing said bracket to said axle against said sliding movement;

a worm gear;

a sleeve paralleled with said vertical axle, attached to and adapted to pivot relative to said bracket and to support the worm gear;

a rack bar for engagement with the worm gear;

a support member slidably mounted in said sleeve and being fast with the rack bar,

an electric motor speed-reducer assembly having an output shaft to which the worm gear is coupled;

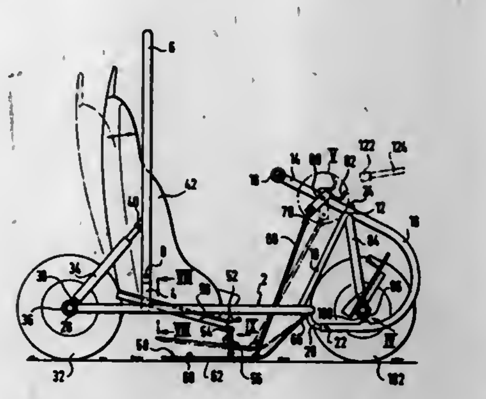
an eccentric collar secured to said motor speed-reducer assembly,

pivot means mounted on said bracket and supporting said eccentric collar for pivotal movement about an axis which is coaxial with the pivotal axis of the sleeve relative to the brackets, and

a coupling sleeve connecting said worm and said output shaft, said pivot means including an extension upon which said eccentric collar is slidably mounted, said extension including means for locking the collar in an upper and lower position thereof on said extension.

3,887,210
DOWNHILL RACING CART

Peter Funke, Munich, Germany, assignor to ISPOW AG, Chur, Switzerland
Filed Jan. 4, 1974, Ser. No. 430,757
Claims priority, application Germany, Oct. 16, 1973, 2351938; Jan. 9, 1973, 2300822
Int. Cl. B62b *11/00;* **F16d** *63/00*
U.S. Cl. 280—87.01 **8 Claims**



1. A cart comprising:

a. a frame having a median plane upright in the normal operating condition of the cart;

b. a plurality of wheels rotatably mounted on said frame for engagement with a surface on which the cart travels;

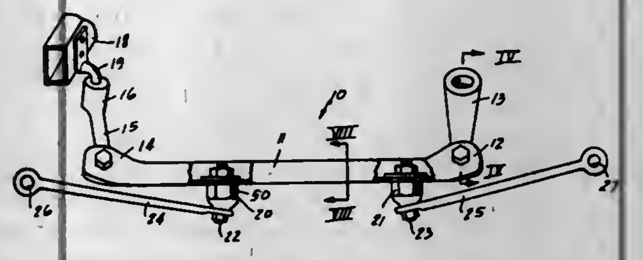
c. a driver's seat mounted on said frame for tilting movement about an axis transverse to said plane, said seat facing in a forward direction;

d. a hook mounted on said frame and spaced from said seat in a forward direction; and

e. coupling means coupling said hook to said seat for pivotally moving the hook between an inoperative position and an operative position during said tilting movement.

3,887,211
STEERING LINKAGE

Sylvester S. Mazur, Detroit, Mich., assignor to TRW Inc., Cleveland, Ohio
Filed Aug. 17, 1970, Ser. No. 64,404
Int. Cl. B62d *7/16*
U.S. Cl. 280—95 R **10 Claims**

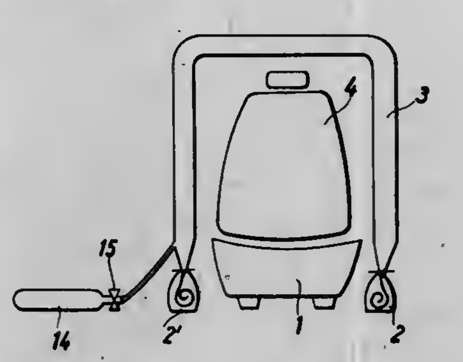


1. In a vehicle steering linkage, the improvement of a stamped centerlink member, said centerlink member substantially U-shaped in cross section having punched openings adjacent either end thereof in the side legs of the U for attachment of pitman arm and idler arm assemblies and stamped openings through the bight thereof intermediate the ends for attachment of tie rod sockets.

5. In a steering linkage for attachment to dirigible wheels of a vehicle incorporating tie rods each attached at one end to a centerlink and at the opposite end to a dirigible wheel, the improvements of one piece tie rods attached to said centerlink, said centerlink having axially elongated slots, said tie rods having adjusting means axially shiftable in said slots, and locking means on said adjusting means securing said adjusting means in selected fixed positions in said slots, whereby the points of attachment of said tie rods to the said centerlink may be moved to provide for toe adjustment of the dirigible wheels of the vehicle attached to the ends of the said tie rods.

3,887,212
SAFETY BELT FOR MOTOR VEHICLES

Per-Olaf Weman, Haslah, Germany, assignor to Sigmatex AG Basel, Basel, Switzerland
Filed Dec. 20, 1972, Ser. No. 316,953
Claims priority, application Germany, Dec. 24, 1971, 2164544
Int. Cl. B60r *21/10*
U.S. Cl. 280—150 SB **6 Claims**



1. Safety belt apparatus for a motor vehicle comprising: a hip belt adapted to be fastened across the hips of an occupant in the vehicle, said hip belt having two ends, said hip belt secured at the two ends to the vehicle, at least one belt roller attached to an end of said hip belt, and at least one traction means which unrolls the hip belt from the belt roller when the car door is opened and releases the belt so that it can be rolled up by the belt roller to bear tightly on the body of the occupant when he is seated in a seat of the vehicle; and wherein said traction means is a gas cartridge, said hip belt is tubular and is connected to said gas cartridge supplying gas to inflate said hip belt overcome the pull of said belt roller upon opening of the vehicle door adjacent said seat.

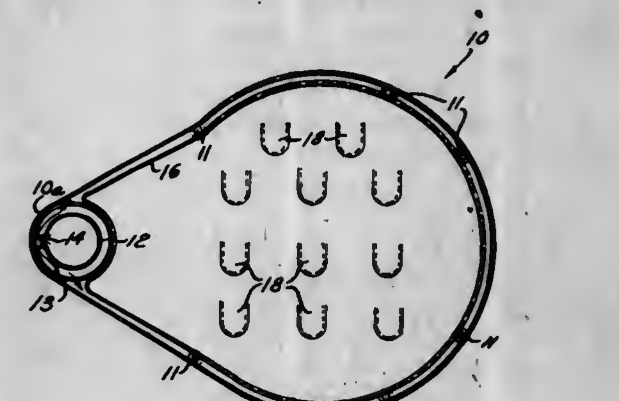
3,887,213
INFLATABLE VEHICLE OCCUPANT RESTRAINT AND SYSTEM THEREFOR

George W. Goetz, Detroit, Mich., assignor to Eaton Corp., Cleveland, Ohio
Filed Feb. 28, 1973, Ser. No. 336,862
Int. Cl. B60r *21/08*
U.S. Cl. 280—150 AB **11 Claims**

1. An inflatable vehicle occupant restraint system comprising:

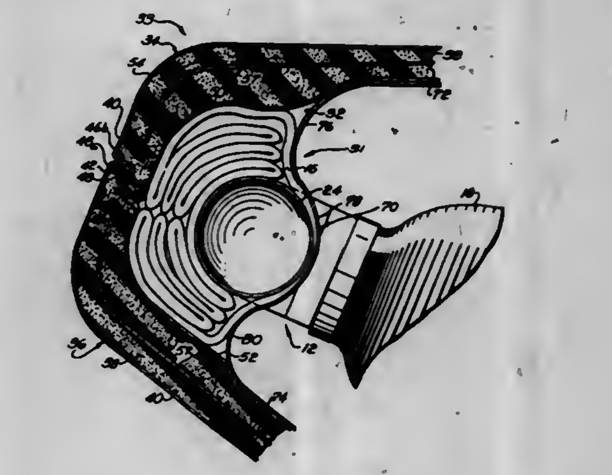
a. a fluid source means operative to emit fluid under pressure;

b. an inflatable confinement having a collapsed inoperative condition and an expanded operative condition, wherein said confinement has, (i) an inflatable framework disposed adjacent the wall of said confinement and communicating with said fluid source means such that, upon inflation of said framework, said confinement is expanded to the operative condition, (ii) one-way valve means disposed in the wall of said confinement and operable to open upon inflation of said framework, and expansion of said confinement to permit atmospheric air to flow into the interior of said confinement, said valve means including at least one patch having an excess of material and having the entire periphery thereof attached to the wall of said confinement, said patch being expandable upon expansion of said confinement to define in cooperation with the confinement wall a secondary chamber and to open said valve means, said patch having at least one outlet aperture formed therein with the wall of said confinement having at least one inlet aperture formed therein, said wall aperture being staggered from said patch aperture, said patch being collapsible against the confinement wall to prevent air flow through said staggered apertures to close said valve means upon contact of the confinement by the vehicle occupant.



3,887,214
INFLATABLE VEHICLE OCCUPANT RESTRAINT SYSTEM AND MEANS FOR SUPPORTING SAME

Darrell S. Brawn, Livonia, Mich., assignor to Eaton Corp., Cleveland, Ohio
Division of Ser. No. 164,721, July 21, 1971, Pat. No. 3,756,617, which is a division of Ser. No. 857,666, Sept. 15, 1969, Pat. No. 3,640,546. This application Aug. 29, 1973, Ser. No. 392,705
Int. Cl. B60r *21/08*
U.S. Cl. 280—150 AB **3 Claims**



1. An inflatable vehicle occupant restraint system comprising:

a. an inflatable confinement expandable from a collapsed nonoperative configuration to an expanded operative configuration for restraining a vehicle occupant;

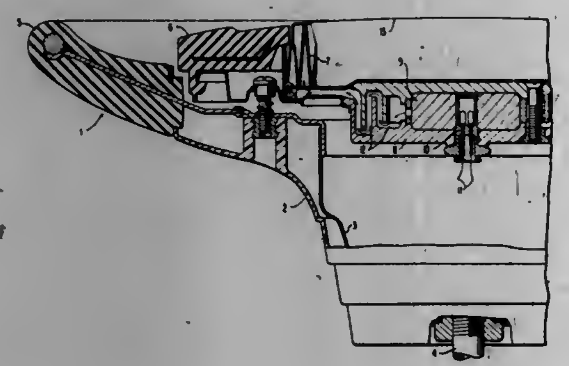
b. fluid supply means operable in response to a vehicle collision to release pressurized fluid for inflating said confinement;

c. means for directing said released fluid into said confinement, said directing means including diffuser means, said confinement in the collapsed configuration being disposed about said diffuser means;

d. means for supporting said fluid supply and said diffuser means on the vehicle, said supporting means having portions thereof arcuately shaped and formed in contracurvature, said portions being deformable to absorb at least part of the energy of the vehicle occupant upon impact of the occupant with said diffuser means; and
e. a plurality of separate closure sections disposed over said collapsed confinement with each of said closure sections having a protective casing and a core of resilient deformable material, said sections being operable to absorb at least a portion of the energy of said occupant upon impact therewith, said sections being operable on expansion of said confinement.

3,887,215
SAFETY STEERING FOR MOTOR VEHICLES

Wilhelm Albrecht, Vaihingen/Enz; Helmut Patzelt, Fellbach, and Peter-Matthias Hoheisel, Esslingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany
Filed Oct. 4, 1973, Ser. No. 403,531
Claims priority, application Germany, Oct. 5, 1972, 2248925
Int. Cl. B60r *21/10*
U.S. Cl. 280—150 AB **10 Claims**

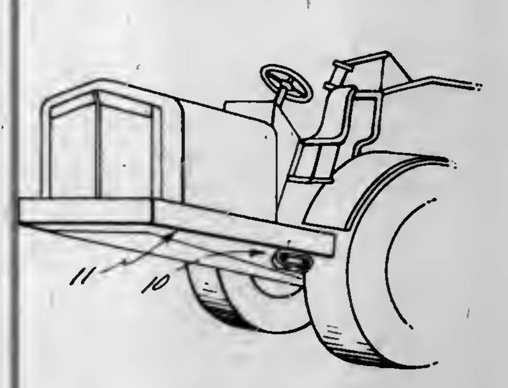


1. A safety steering device for a vehicle comprising
plastically deformable deformation means arranged between a steering wheel and the upper end of a steering spindle,
padded plate means arranged inside the steering wheel rim, said padded plate means having a surface lying approximately in the plane of the steering wheel rim, and
a structural unit including gas cushion means for automatically inflating upon a predetermined condition of the vehicle and gas generator means for producing inflating gas into said gas cushion means upon said predetermined condition, said structural unit being arranged between said deformation means and said padded plate means wherein said padded plate means surrounds a portion of said gas cushion means lying approximately in the plane of the steering wheel rim, said gas cushion means being arranged in a folded-together state prior to the occurrence of said predetermined condition and surrounded at a central area of the padded plate means, the folded-together gas cushion means simultaneously forming padding within the central area.

3,887,216
VEHICLE STEP ASSEMBLY

Gary D. Perry, Lubbock, Tex., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio
Filed Aug. 5, 1974, Ser. No. 495,123
Int. Cl. B60r *3/02*
U.S. Cl. 280—163 **5 Claims**

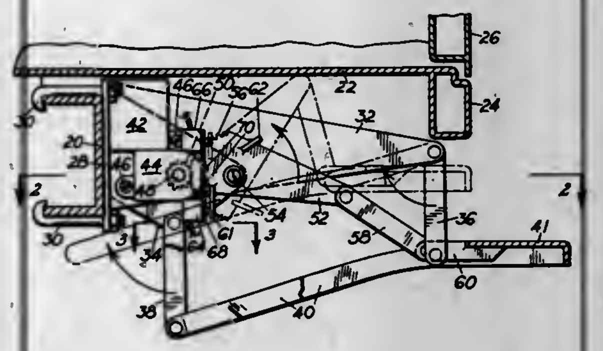
1. A step assembly for use with a vehicle to be operated in rough terrain, said step assembly comprising
a. a loop of flexible material, said loop having sufficient strength to support the weight of a man, and sufficient width and strength to resist the horizontal displacement of said step assembly when assembled and subjected to the horizontal component of the force of a man stepping on said step assembly,



b. a step plate attached to the inside portion of the bottom of said loop,
c. a clamping plate attached to the inside portion of the top of said loop, and
d. means for clamping said clamping plate to a generally downwardly facing mounting surface on the vehicle frame.

3,887,217
RETRACTABLE STEP FOR VEHICLES

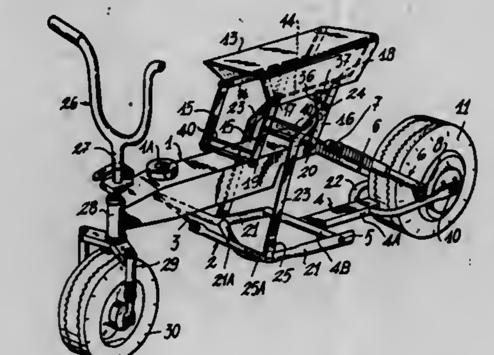
Walter W. Thomas, Rt. 1, Box 130B, Clatskanie, Oreg. 97016
Continuation-in-part of Ser. No. 196,836, June 23, 1972. This application Dec. 3, 1973, Ser. No. 421,082
Int. Cl. B60r *3/02*
U.S. Cl. 280—166 **1 Claim**



1. A retractable step for high clearance vehicles of the type having a longitudinally extending frame member, comprising
a. a vertical base plate,
b. releasable clamp means on said base plate arranged to secure said base plate vertically against the side of the frame member of the vehicle,
c. a pair of support arms extending integrally from said base plate at right angles thereto whereby to be disposed laterally of the vehicle,
d. a third support arm extending integrally from said base plate at right angles thereto and between said pair of support arms,
e. a step plate,
f. a pair of side frames extending integrally from said step plate toward said base plate,
g. said side frames extending angularly inwardly toward each other from said step plate,
h. a pair of depending links pivotally connected between respective ones of said support arms and said side frames,
i. a third depending link pivotally connected between said third support arm and an inward end of said side frames,
j. said pair of depending links and said third depending link being arranged upon pivoted movement in one direction to raise and retract said side frames and upon pivoted movement in the other direction to lower and extend said side frames,
k. a lever arm pivotally mounted intermediate its ends on said third support arm in parallel relation to the latter,
l. a gear segment on one end of said arm,
m. pivot link means connecting the other end of said lever arm to said step plate,
n. and reversible electric motor means mounted on said base plate having an output shaft with a pinion gear thereon in meshing engagement with said lever arm gear segment for rotating the latter to move said side frames between their raised and lowered positions.

3,887,218
COLLAPSIBLE VEHICLE

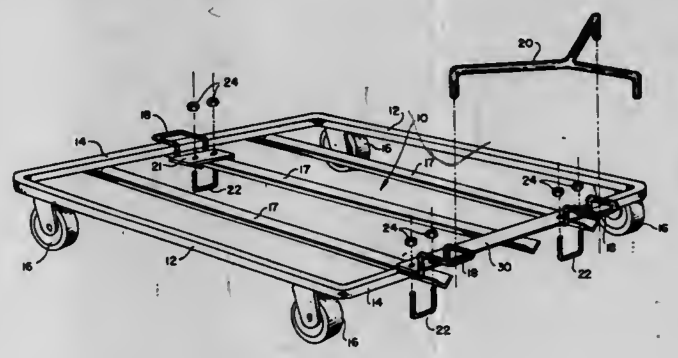
Rosario Di Blasi, Via Messina 6, Francofonte, Italy
Filed Feb. 4, 1974, Ser. No. 439,031
Claims priority, application Italy, Feb. 28, 1973, 20983/73
Int. Cl. B60k *15/00*
U.S. Cl. 280—278 **8 Claims**



1. A collapsible vehicle, preferably two-wheeled and powered vehicle including a saddle, comprising a frame formed of at least one articulated quadrilateral connected by at least one control rod to at least one lever joining said saddle to one side of said articulated quadrilateral, whereby the rotation of the saddle and lever as well will cause through said lever the deformation of said articulated quadrilateral.

3,887,219
DETACHABLE COUPLER ADAPTER FOR ROLLING BASE DOLLIES

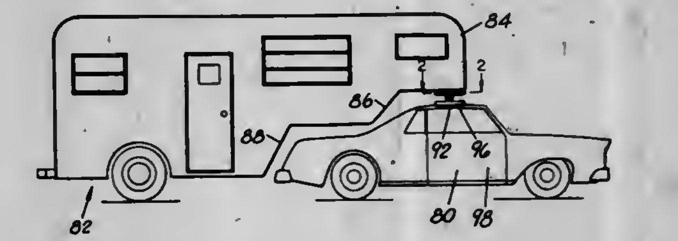
James D. Wilson, Newport Beach, Calif., assignor to Banner Metals Division Intercole Automation, Inc., Compton, Calif.
Filed May 20, 1974, Ser. No. 471,218
Int. Cl. B60d *1/14*
U.S. Cl. 280—408 **1 Claim**



1. A detachable coupler adapter for intercoupling wheeled carriages such as rolling base dollies, and the like, each of the carriages having a peripheral rod-like member forming a rectangular base with two end edges and two side edges and a plurality of elongated bottom support members extending in spaced and parallel relationship from one of the end edges to the other across the area circumscribed by said rod-like member, said adapter including a first loop member mounted at one of the end edges of the base; second and third loop members mounted at spaced positions at the other end edge of the base, bracket means for mounting the individual loop members on the base, said bracket means including a first transverse strip attached to said first loop member and a first U-shaped bolt extending around one of said bottom support members and through holes in the first transverse strip to mount the first loop member on the base, and said bracket means including a second transverse strip attached to said second and third loop members, and second and third U-shaped bolts respectively extending around two of said bottom support members and through holes in said second transverse strip to mount the second and third loop members on the base, and a three-pronged bar member having a hooked configuration at the end of each prong, so that two of the prongs of the bar member detachably engage the second and third loop members of one of the wheeled carriages, and so that the third prong of the bar member detachably engages the first loop member of another of the wheeled carriages.

3,887,220
HITCH FOR TRAILERS OVERHANGING A CAR BODY

Percy P. Hall, 4103 W. Main St. Apt. 21, Kalamazoo, Mich. 49007
Division of Ser. No. 306,042, Nov. 13, 1972. This application Oct. 5, 1973, Ser. No. 403,774
Int. Cl. B62d *53/00*
U.S. Cl. 280—423 R **5 Claims**



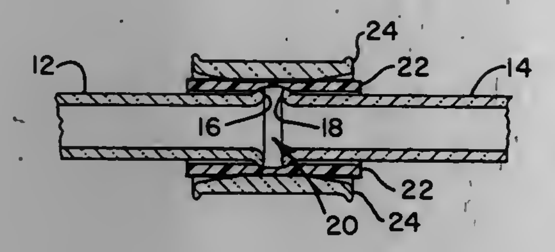
1. A hitch between trailers and towing vehicles in which the trailer has a forward end elevated above and adapted to be connected to an upper part of the vehicle, said hitch comprising:
A. a pair of upwardly opening yoke members,
B. means connecting said yoke members in transversely aligned relation adjacent opposite sides and over the top of the body of said vehicle,
C. an upper bearing plate having a transverse width of the order of one foot attachable in fixed lapped relation to an exposed under surface of the front end of said trailer,
D. a lower bearing plate approximately coextensive with said upper bearing plate and permanently connected in coasting relation thereto by a central vertical pivot,
E. a transverse support bar rigidly connected to said lower bearing plate and projecting beyond the sides thereof,
F. and rocker pins carried by the ends of said support bar and projecting therefrom in position to be removably received in said yoke members.

3,887,221
JOINT COUPLING

Niels O. Young, Mason, N.H., assignor to Block Engineering, Inc., Cambridge, Mass.
Filed June 15, 1973, Ser. No. 370,355
Int. Cl. F16l *17/00*
U.S. Cl. 285—236 **18 Claims**

1. A coupling, comprising in combination:
a pair of elongate tubes;
a connecting sleeve; and
a relatively substantially rigid locking sleeve comprising a one piece, relatively short cylinder having an inside taper: one of said pair of elongate tubes or said connecting sleeve being relatively substantially rigid and the other being relatively distortable, said pair and said connecting

sleeve being dimensioned so as to be engageable with each other at a junction,

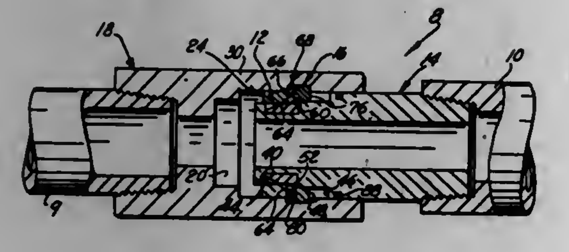


said locking sleeve surrounding said relatively distortable one at said junction and being dimensioned so that its inside taper distorts said relatively distortable one and squeezes said pair and said connecting sleeve together adjacent said junction.

3,887,222

COUPLING WITH PUSH-PULL RELEASE

Harry H. Hammond, Middleburg, Ohio, assignor to The Hansen Manufacturing Company, Cleveland, Ohio
Filed July 25, 1974, Ser. No. 491,790
Int. Cl. F16l ***37/00***
U.S. Cl. 285—307 **6 Claims**

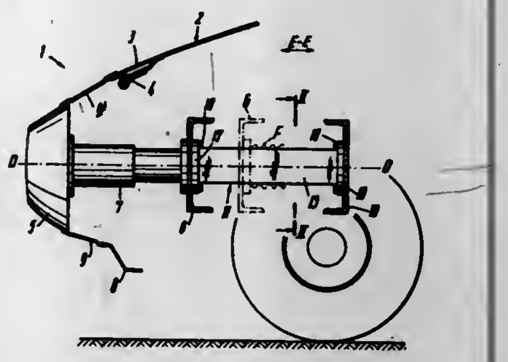


1. A coupling assembly for connecting a plurality of conduits in fluid communication, said coupling assembly comprising a socket connected with one of the conduits, said socket including socket wall means for at least partially defining a socket chamber and stop surface means for defining a stop surface disposed in said socket chamber and for at least partially defining an opening of a predetermined size, a plug connected with the other of the conduits and adapted to be received in said socket chamber, a resilient lock ring disposed on said plug, said lock ring having a generally circular retaining surface adapted to engage said stop surface when said plug is disposed in a first position in said socket chamber to thereby hold said plug in said socket chamber, said lock ring being deflectable between a first condition in which said retaining surface on said lock ring has an outside dimension which is greater than the size of the opening formed by said stop surface and a second condition in which said retaining surface on said lock ring has an outside dimension which is less than the size of the opening formed by said stop surface to enable said lock ring to pass through the opening formed by said stop surface, and cam means disposed in said socket chamber inwardly of said stop surface for resiliently compressing said lock ring from said first condition to said second condition upon movement of said plug element axially inwardly from said first position to a second position and for retaining said lock ring in said second condition during axially outward movement of said plug as at least a portion of said lock ring passes through the opening formed by said stop surface.

3,887,223

COLLISION ENERGY DISSIPATION APPARATUS FOR A PASSENGER MOTOR VEHICLE

Ulrich Bez, Gerlingen, Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Germany
Filed Dec. 20, 1973, Ser. No. 426,543
Claims priority, application Germany, Dec. 20, 1972, 2262293
Int. Cl. B60r ***19/04***
U.S. Cl. 293—70 **28 Claims**



1. Collision energy dissipation apparatus for a vehicle of the type having an end part and a relatively rigid vehicle frame structure spaced from the end part; said apparatus comprising: first tube element means disposed between the end part and the frame structure,

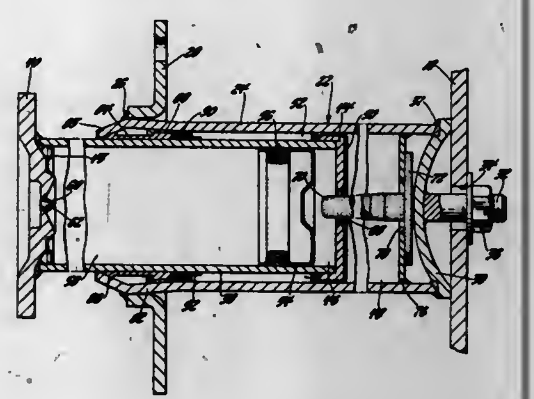
second tube element means disposed between the end part and the frame structure in surrounding relationship to said first tube element means,

and plastically deformable foam means disposed inside of a hollow space formed inside of said tube element means, wherein said foam means and said first and second tube element means are configured for dissipating collision energy forces acting on said end part in a direction toward said frame structure by plastic deformation of said foam means and by plastic deformation of said tube element means while at least portions of said first and second tube element means move relative to one another.

3,887,224

IMPACT ENERGY ABSORBER WITH RADIALLY ADJUSTABLE FLOW METERING

Frank H. Browne, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Apr. 1, 1974, Ser. No. 456,560
Int. Cl. B60r ***19/06;*** **F16f** ***9/342***
U.S. Cl. 293—85 **4 Claims**

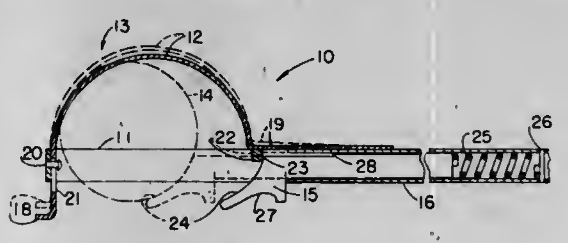


1. An impact energy absorber unit for mounting a bumper assembly to a vehicle body structure comprising first and second cylinders providing first and second fluid chambers therein, support means mounting said first cylinder for telescoping movement with respect to said second cylinder between an extended position and a retracted position, said first cylinder having a cap secured to one end thereof, said cap dividing said cylinders into first and second hydraulic chambers, each of said chambers having oil therein, said cap having a fixed centralized orifice formed therein providing hydraulic communication between said chambers, an elongated metering rod projecting into said orifice and extending longitudinally in said unit, an annular support disc secured to the interior cylindrical wall of said second cylinder adjacent to one end thereof, said support disc having an enlarged central opening therethrough, said metering rod extending through said central opening, said metering rod having an enlarged base member integral therewith which directly covers said central opening, said central opening providing clearance for said metering rod to allow said metering rod to adjust radially with respect to said orifice to meter a predetermined flow of oil from said first chamber to said second chamber in response to the telescoping movement of said first cylinder into said second cylinder.

3,887,225

GOLF BALL RETRIEVER

Roy L. McKee, 1506 Wagon Wheel, Garland, Tex. 75040
No Drawing. Filed June 24, 1974, Ser. No. 482,243
Int. Cl. A63b ***57/00***
U.S. Cl. 294—19 A **10 Claims**

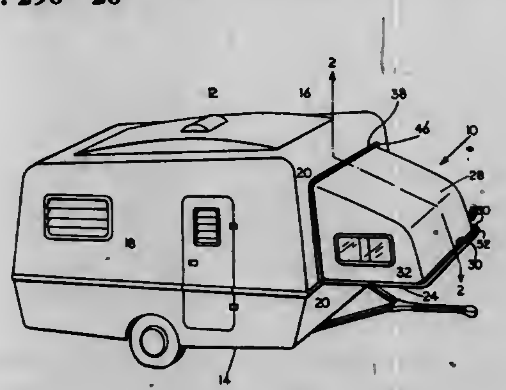


1. In a ball retriever; a semi-enclosed ball cage including a fixed-position generally circumferential rib member, and a rib member having a resiliently deflectable extension with a plunger shoulder locking projection; a ball retaining plunger with a plunger position locking shoulder; hollow shaft means attached to said cage members and to an extension handle; and resilient plunger driving means positioned in said hollow shaft means.

3,887,226

TRAILER PULL-OUT UNIT

Ralph Stewart Hart, 1521 Lorne Park Rd., Mississauga, Ontario, Canada
Filed Mar. 2, 1973, Ser. No. 337,583
Int. Cl. B60p ***3/32***
U.S. Cl. 296—26 **2 Claims**

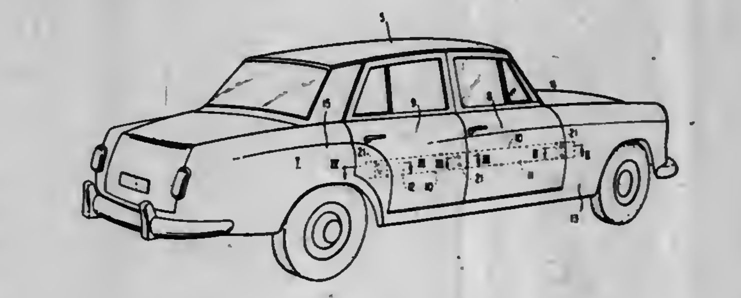


1. A mobile structure having a wall provided with a rectangular opening defining a plurality of edges having at least one horizontal edge thereto; an extension to said structure comprising a floor panel extensible outwardly of said horizontal edge of said opening; a cover panel extensible outwardly of said opening from an edge thereon opposite said horizontal edge from which said floor panel extends; side panels connecting said floor and cover panels together to provide rigidity to said extension; said floor panel being pivotable on said horizontal edge of said opening allowing said extensionn to be rotatably moveable from a closed position within said structure to an open position externally of said structure; a seal secured to an edge of said opening opposite to said edge on which said floor panel is pivoted and including internally and externally projecting portions thereto; a flange projecting outwardly of the edge of said cover remaining within said structure, said flange bearing against said internally projecting portion of said seal when said extension is positioned externally of the said structure, said floor panel at its outer edge opposite that on which it is pivoted having a flanged plate projecting outwardly therefrom and generally parallel therewith; said externally projecting portion of said seal being receivable into and contained by said flanged plate when said extension is in said closed position within said structure.

3,887,227

INSTALLATION FOR THE PROTECTION OF MOTOR VEHICLE BODIES AGAINST LATERAL IMPACTS

Franz Deckert, Sindlefingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany
Continuation of Ser. No. 872,823, Oct. 31, 1969, abandoned. This application Oct. 14, 1971, Ser. No. 189,093
Claims priority, application Germany, Nov. 2, 1968, 1806716
Int. Cl. B60r ***21/02***
U.S. Cl. 296—28 R **48 Claims**



1. An installation for the protection of motor vehicle bodies against lateral impacts, characterized in that a wall means of the body disposed within the passenger space is reinforced by at least one tension means extending in the longitudinal direction, said tension means being securely connected in front and in the rear thereof with reinforced parts of the front and rear portion of the vehicle, said tension means being at least one tension member for converting substantially all lateral impact forces against said at least one tension member into tensional forces to be absorbed by said reinforced parts.

3,887,228

FOLDABLE WHEELCHAIR AND KIT THEREFOR

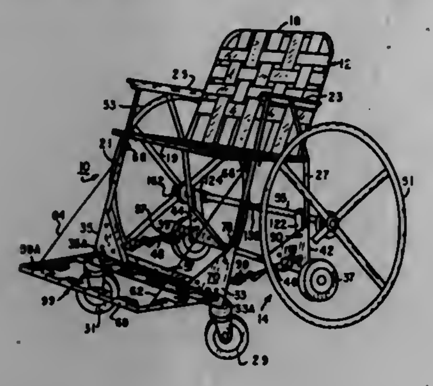
Philip E. Ingerson, 4825 96th St., Oak Lawn, Ill. 60453
Filed Nov. 28, 1973, Ser. No. 419,607
Int. Cl.^{2} A47C ***4/28***
U.S. Cl. 297—39 **9 Claims**

6. A kit adapted to be attached to a foldable chair of the type having a lightweight frame with interwoven flexible webs secured thereto to form a seat, a back, and a U-shaped front leg structure and a U-shaped rear leg structure and foldable between a use position and a storage position, comprises:

a rear pair of generally flattened, hollow cup-shaped corner brackets adapted to fit over and to receive the corners of the rear U-shaped leg structures and adapted to be secured in place thereon;

a pair of wheels connected to the rear pair of brackets for partially and rollably supporting the chair over the supporting surface;

a front pair of generally flattened, hollow cup-shaped corner brackets adapted to fit over and to receive the corners of the front U-shaped leg structure and adapted to be secured in place thereon; a pair of casters connected to the front pair of brackets for partially and rollably supporting the chair over a supporting surface; and at least one elongated strut element connected between one of said rear pair of brackets and one of said front pair of brackets.



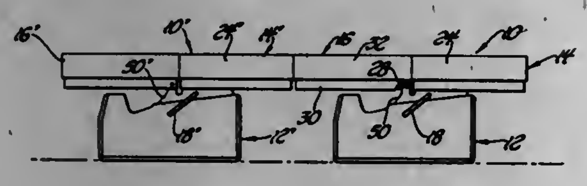
3,887,229
CONVERTIBLE SEAT

Robert W. Plume, Sterling Heights, Mich., assignor to Travel Products, Inc., Washington, Mich.

Filed Feb. 11, 1974, Ser. No. 441,080

Int. Cl. B60n *1/10;* **A47c** *13/00*

U.S..Cl. 297—65 **14 Claims**



1. A convertible seat comprising a base member, a seat bottom support member mounted on the base member, a seat bottom cushion holder mounted on the seat bottom support member and adapted to receive a seat cushion, a seat back support member, a seat back cushion holder mounted on the seat back support member and adapted to receive a seat back cushion, said seat back support member being mounted on the seat base member for pivotal motion in the fore and aft direction relative to the seat bottom support member by a pivot element disposed below the level of the upper surface of the seat bottom cushion, one of said cushion holders being movably mounted on the respective said support member for movement toward and away from said pivot element, said seat back support member being disposed in an erect position to make a seat and being pivotally movable in the aft direction to a prone position to make a bed, and means connected with said one of the said holders for moving it relative to its support member toward the pivot element when the seat back support member is pivoted downwardly to convert the seat to a bed whereby said cushions on said holders may be positioned edge to edge without a gap therebetween in the bed.

3,887,230
FASTENING MEANS FOR PASSENGER SEATS

Uwe Gröning, Hamburg, and Uwe Lüthgens, Buxtehude, both of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

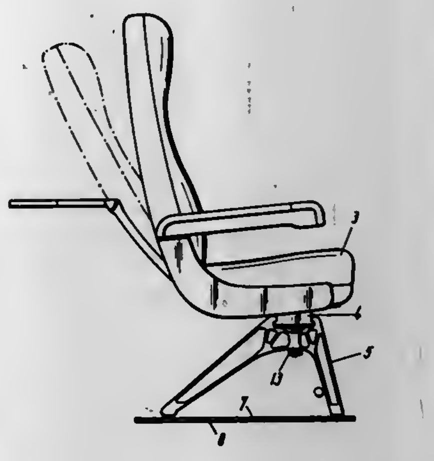
Filed June 24, 1974, Ser. No. 482,073

Claims priority, application Germany, June 29, 1973, 2333037

Int. Cl. A47c *4/02*

U.S. Cl. 297—232 **5 Claims**

1. A securement arrangement for passenger seats for use on aircraft and various types of vehicles, same having a bar on their undersides, on which bar there are arranged movably and securably base structures which support the seats, comprising the improvement wherein the base structures have a locking pin which engages a bore of the bar by means of spring force and that between the underside of the bar and a sliding surface of the base structures there is provided a wedge spring which can be clamped by means of a knurled screw.



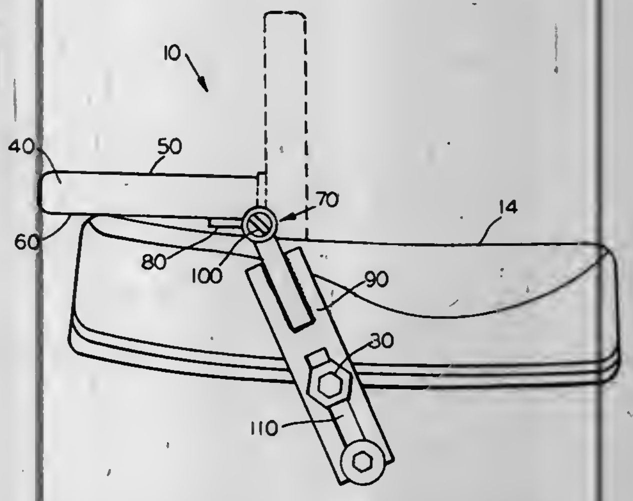
3,887,231
BACKREST FOR WHEELED VEHICLES

Frank J. Bochynsky, Highland Park, N.J., assignor to The Byke Co., Highland Park, N.J.

Filed Jan. 28, 1974, Ser. No. 437,177

Int. Cl. A47c *3/00*

U.S. Cl. 297—366 **4 Claims**



1. A bracket structure for a vehicle, said vehicle including a frame and a seat for the driver.

said structure comprising

a bracket secured to said frame on one side of the driver's seat,

a ratchet wrench comprising a handle, a rotatable shaft, and a switch for operating said wrench to permit said shaft to rotate clockwise or counter-clockwise,

said handle of said ratchet wrench being disposed adjacent to the driver's seat and secured to said bracket,

said rotatable shaft being disposed parallel to said seat, and a backrest secured to said rotatable shaft and disposed rearwardly of said driver's seat in position to bear against the back of the driver.

operation of said switch permitting said shaft to rotate and to move said backrest into and out of operative relation with the motorcycle driver sitting on said seat.

3,887,232
HINGE ARRANGEMENT FOR A FOLDING CAR SEAT

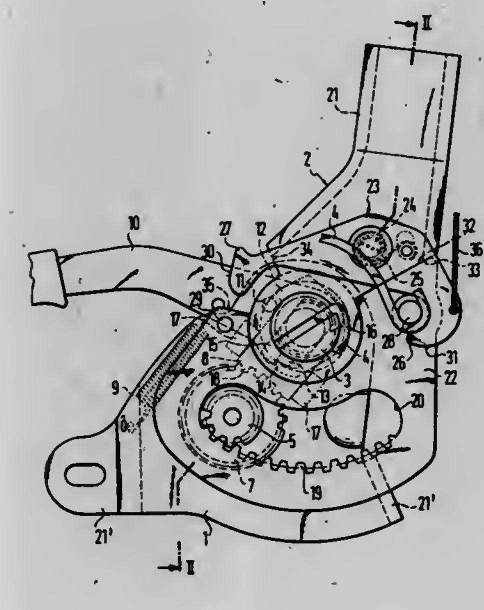
Emil Dinkel, Weidach, Germany, assignor to Metallwerk Max Brose & Co., Coburg, Germany

Filed May 7, 1974, Ser. No. 467,626

Claims priority, application Germany, June 6, 1973, 2328908

Int. Cl. B60n *1/02*

U.S. Cl. 297—367 **8 Claims**



1. A hinge arrangement for a seat of a motor car comprising:

- a. first, second, and third hinge plate members;
- b. a pivot pin connecting said members for relative angular movement thereof about a first axis;
- c. first engaging means mounted on one of said second and third members for pivoting movement about a second axis;
- d. two second engaging means on the other one of said second and third members and alignable with said first engaging means respectively by pivoting of said second and third members relative to each other about said first axis between two terminal positions,
  1. respective portions of said second and third members enveloping said first axis and being axially juxtaposed,
  2. respective other portions of said second and third members projecting from said juxtaposed portions in a direction away from said axis,
  3. the combined axial thickness of said juxtaposed portions being approximately equal to the axial thickness of one of said other portions,
  4. said one portion being axially coextensive with each of said juxtaposed portions;
- e. yieldably resilient means biasing said first engaging means toward engagement with the aligned second engaging means; and
- f. securing means for securing said second member to said first member in each of a plurality of angular positions, said securing means including
  1. a toothed segment on said second member circularly arcuate about said first axis,
  2. a toothed wheel rotatably mounted on said first member in meshing engagement with said segment, and
  3. blocking means for blocking rotation of said wheel.

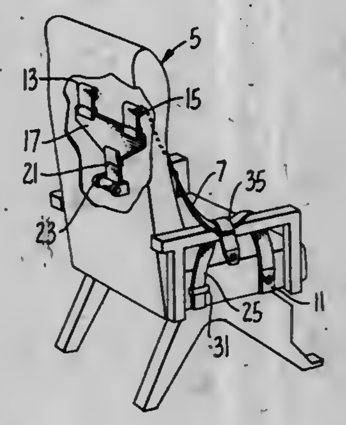
3,887,233
SHOULDER HARNESS AND LAP BELT RESTRAINT SYSTEM

Albert P. Garavaglia, Saratoga, and Dennis S. Matsuhiro, San Jose, both of Calif., assignors to The United States of America as represented by the National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Continuation of Ser. No. 282,738, Aug. 22, 1972, abandoned. This application Mar. 19, 1974, Ser. No. 452,767

Int. Cl. A62b *35/00*

U.S. Cl. 297—389 **8 Claims**



1. A restraint system for safely and securely restraining a person to a chair when a severe chair deceleration is encountered comprising:

a chair having a back section for supporting said person's torso and a seat section for supporting said person's buttocks, said seat section having a forward portion remote from said back section and a rearward portion near said back section;

first and second shoulder straps each having first and second ends;

said first ends of said shoulder straps being fastened to said forward portion of said seat section and said first ends being spaced approximately the width of said person's thighs;

first and second lap straps each having first and second ends;

first and second spring-loaded, acceleration-sensitive strap retractors located at said rearward portion of said seat seciton and connected to said first ends of said first and second lap straps, respectively.

said first and second retractors being spaced approximately the width of said person's buttocks;

means for buckling together said second ends of said lap straps, said buckling means being substantially on an imaginary line vertically bisecting said person;

said first and second lap straps each having an eye adjacent said second ends;

said shoulder straps being threaded through said eyes, respectively, and said lap straps being free to move along said shoulder straps; and

third spring-loaded, acceleration-sensitive strap retractor secured to said back section and connected to said second ends of said shoulder straps, respectively.

3,887,234
FURNITURE SUBFRAME

William R. Curtis, New Castle, and David C. Trimble, Yorklyn, both of Del., assignors to Hercules Incorporated, Wilmington, Del.

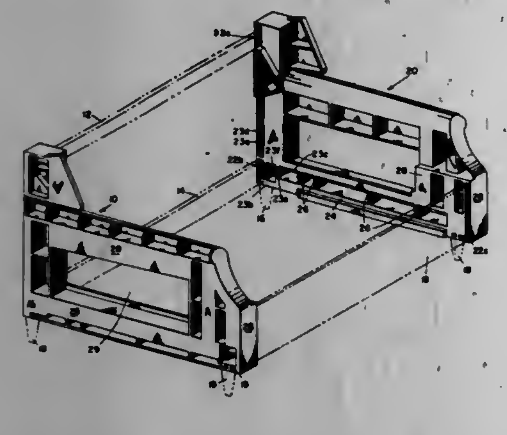
Filed Mar. 28, 1974, Ser. No. 455,774

Int. Cl. A47c *7/00*

U.S. Cl. 297—440 **4 Claims**

1. A furniture subframe comprising:

a pair of symmetrical load bearing, unitary, plastic subframes, each of said subframes being comprised of a plurality of joined plate sections, said subframes being disposed in essentially parallel, mirror image like spaced apart relationship to each other, each of said subframes including at least one load bearing recepticle integral with said subframe, said recepticles each having at least four plate sections each connected at one end thereof to and



radiating outwardly from the sides of said recepticles to brace said recepticles and interconnect said recepticles with said subframes; and

an interconnecting member having opposite ends thcreof contained within said recepticles to connect said subframes.

3,887,235

ASSEMBLY FOR HYDRAULIC EXTRACTION OF SHEET-LIKE MINERAL DEPOSITS SECTIONED INTO PANELS BY A SYSTEM OF PASSAGEWAYS

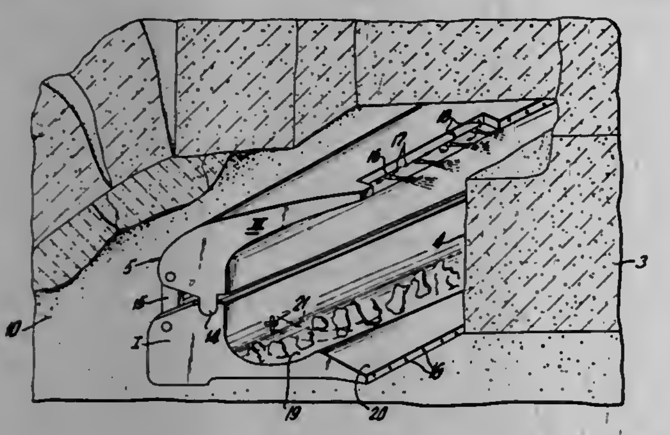
Manfred Koppers, Duisburg, Germany, assignor to Rheinstahl AG, Germany

Filed Feb. 11, 1974, Ser. No. 441,481

Claims priority, application Germany, Feb. 15, 1973, 2307413

Int. Cl. E21c *25/60*

U.S. Cl. 299—1 **17 Claims**



1. In an assembly for hydraulic extraction of a sheet-like mineral deposit, which has been sectioned by a system of passageways into panels limited laterally by roadways extending parallel to the direction of advance of the workings, by a hydromechanically operating device including at least one high pressure hydraulic nozzle mounted on a supporting structure and adapted to dislodge the working face of the deposit, extending between the roadways, by a high pressure jet of hydraulic fluid; the improvement comprising, in combination, said supporting structure including a single rectilinear shield-like structural member, having a channel cross-section open toward said working face, and which is rigid longitudinally against bending and extends, parallel to said working face, between two roadways; drag means extending along the two roadways and acting on respective opposite end portions of said structural member to move the latter in said direction of advance; and a plurality of high pressure hydraulic nozzles movably mounted on said structural member for discharging high pressure jets of hydraulic fluid against said working face over the entire length thereof.

3,887,236

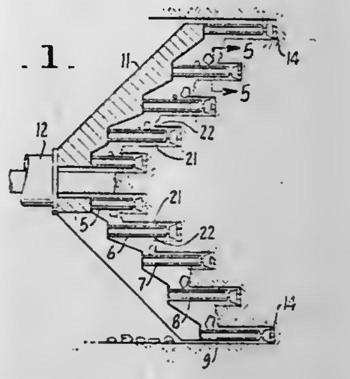
APPARATUS AND METHOD FOR CUTTING AND BREAKING ROCK

James G. Patrick, Hillsborough, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Filed June 15, 1973, Ser. No. 370,388

Int. Cl. E21b *9/18;* **E21c** *41/00*

U.S. Cl. 299—10 **8 Claims**



1. A continuous mining machine for excavating an in-place mass of rock or other solid material comprising

a plurality of concentric annular cutter heads spaced apart and echeloned in the direction of excavation;

means for rotating said cutter heads;

at least one cutter mounted on each cutter head for cutting an annular groove in said mass as the cutter heads advance; and

breaking means for applying breaking force to undisturbed bands of material between said grooves cantilevered from said in-place mass, said breaking means being mounted behind said cutters and including a breaking wheel supported within the annular cutter head and extendible radially from the annular cutter head to apply a breaking force to the adjacent band of undisturbed material, and reaction means operatively connected with the breaking wheel to distribute the breaking force reaction from the breaking wheel to the in-place mass.

3,887,237

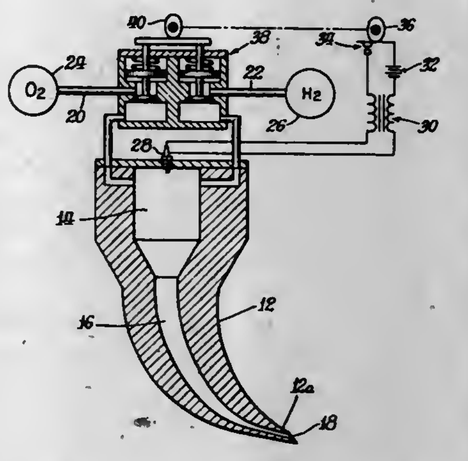
RIPPER WITH REPETITIVE EXPLOSIVE DEVICE FOR ROCK BREAKING

John M. Bailey, Dunlap, and Delwin E. Cobb, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 7, 1973, Ser. No. 367,727

Int. Cl. A01b *13/08*

U.S. Cl. 299—13 **4 Claims**



1. A method of fracturing rock or hard soil formations comprising:

providing a ripper shank having a width that is less than the thickness thereof and a pointed tip, a combustion chamber, and converging passage communicating said chamber with a forwardly directed port in said tip of said shank;

forcing the tip of said shank into a solidified formation to create fissures forward thereof;

introducing a combustible gaseous mixture into said fissures created by said ripper shank by way of said port; and

igniting said gaseous mixture in said fissures by generating a detonation wave in the combustion chamber which propagates along said converging passage into said fissures.

3,887,238

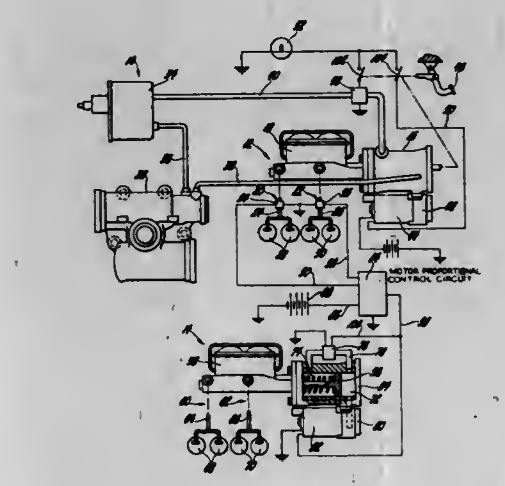
TRACTOR-TRAILER BRAKING SYSTEM WITH VARIABLE MOTOR SPEED CONTROL DEVICE

Ronald W. Bennett, Miamisburg, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 13, 1974, Ser. No. 450,839

Int. Cl. B60t *13/16*

U.S. Cl. 303—7 **4 Claims**



1. A vehicle tractor and trailer brake system comprising:

a tractor brake system including means generating pressure for system brake operation in accordance with the braking effort demand of the vehicle operator,

a trailer brake system including a brake booster having as a power pressure source a pump and a variable speed electric motor driving said pump to generate the booster power pressure,

pressure transducer means in said tractor brake system sensing the pressure of and the amount of said generated pressure,

and an electric motor control circuit electrically connected to said pressure transducer means and said electric motor to control the operation of said pump in accordance with the sensing action of said transducer to generate booster power pressure in said tractor brake system brake booster which is directly proportional to the sensed pressure generated in said tractor brake system.

3,887,239

METHOD AND APPARATUS FOR CONTROLLING THE SPEED OF A VEHICLE

Thomas H. Engle, Cape Vincent, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Mar. 5, 1973, Ser. No. 337,990

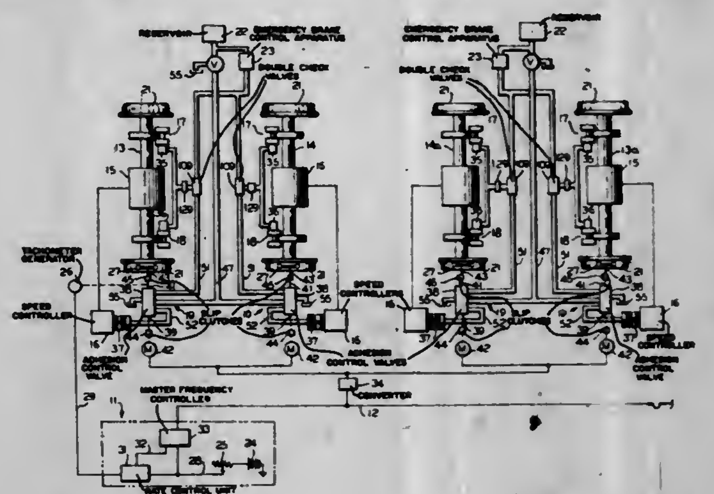
Int. Cl. B60t *8/06*

U.S. Cl. 303—21 B **16 Claims**

1. A vehicle control system having brakes for controlling the several wheels of a vehicle and control apparatus governing braking in accordance with sensing desired and actual vehicle speeds wherein the improvement comprises;

a. first means for sensing a desired speed for the vehicle,

b. second sensing means for sensing actual tangential tread speed for one wheel of the vehicle and for generating a feedback signal characteristic of the speed of the wheel,



c. frequency generating means governed jointly by the first sensing means and the feedback signal of the second sensing means for generating a master frequency signal,

d. adhesion control means for selectively governing braking torque on said one wheel in accordance with a comparison of the master frequency signal and the tangential tread speed sensed by the second sensing means.

3,887,240

ANTILOCK CONTROL SYSTEM FOR VEHICLES

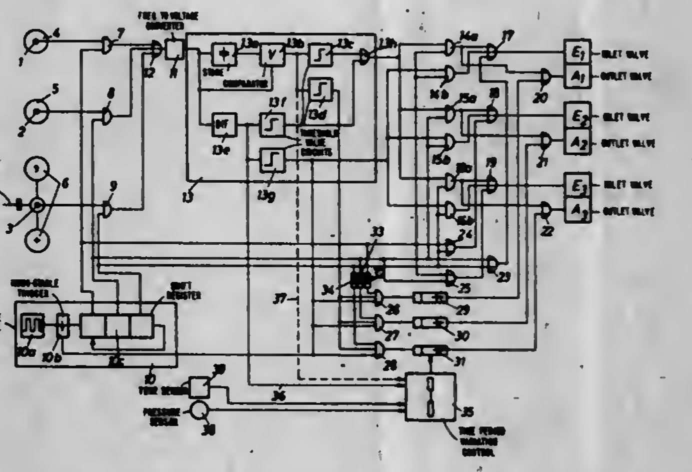
Heinz Leiber; Jurgen Gerstenmeier, both of Leimen, and Wolfgang Korasiak, Ketsch, all of Germany, assignors to Teldix GmbH, Heidelberg, Germany

Filed Dec. 6, 1973, Ser. No. 422,145

Claims priority, application Germany, Dec. 6, 1972, 2259724; Aug. 7, 1973, 2339912

Int. Cl. B60t *8/08*

U.S. Cl. 303—21 P **38 Claims**



1. An antilock control system for the braking system of a wheeled vehicle comprising at least two sensors, each associated with a different wheel or group of wheels of the vehicle and providing signals related to the rotary behavior of the wheels, an evaluation channel for evaluating signals fed to it from said sensors, first switching means for connecting said sensors to said evaluation channel in succession in a rhythm independent of the control channels for controlling brake pressure at the wheels associated with said sensors, second switching means acting in synchronism with said first switching means for switching the output of said evaluation channel in succession to said control channels, and storage means connected into said control channels for storing signals from said evaluation channel for use in the associated control chan-

nel when said associated control channel is disconnected by said second switching means from said evaluation channel.

3,887,241

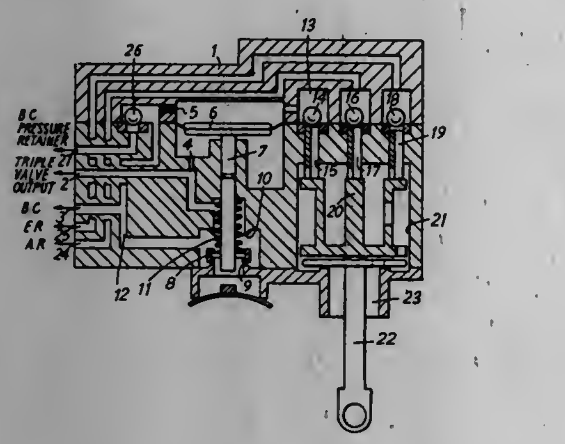
BRAKE CYLINDER RELEASE VALVES

David John Wickham; Jack Washbourn, and Philip Norman Paginton, all of London, England, assignors to Westinghouse Brake & Signal Co. Ltd., London, England

Filed Feb. 19, 1974, Ser. No. 443,747

Int. Cl. B60t *15/02*

U.S. Cl. 303—68 **3 Claims**



1. A brake cylinder release valve device for interposing in a fluid path between a brake cylinder and a fluid operable brake control valve and operable to close said path and vent the brake cylinder, said release valve device comprising a fluid pressure input port for connection to a control valve and a fluid pressure output port for connection to a brake cylinder, a pressure difference responsive member, a vent communicable with said output port, valve means operable by said pressure responsive member for normally opening the passage between said input and output ports and closing said vent, a relatively restricted fluid connection between said output port and one side of said pressure responsive member but clear of the flow path from said output port to said vent, a relatively less restricted fluid connection between said input port, said vent and the other side of said pressure responsive member, and a manually operable vent valve connected to said one side of said pressure responsive member for venting said one side and reversing the state of said valve means when sufficient pressure exists at the input port to move said pressure responsive member, whereby to close the passage between said input and output ports and open said vent to said output port.

3,887,242

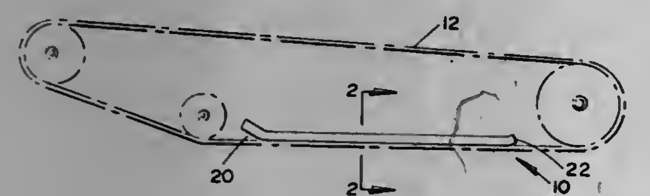
SLIDE BAR FOR A TRACK SUSPENSION SYSTEM

Paul E. Russ, Sr., Englewood, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Mar. 22, 1971, Ser. No. 126,811

Int. Cl. B62d *55/10*

U.S. Cl. 305—24 **7 Claims**



1. In a wheel substitute land vehicle of the type having at least one endless track with an inner surface, frame means for suspending the track from the vehicle, and means in cooperation with the frame means for supporting the inner surface of the track, wherein improvement in the support means comprises:

at least one slide bar suspended from the frame means to be in substantially longitudinal alignment in relation to the track, said slide bar having a track engaging surface for engaging and supporting the track along the inner surface, the track engaging surface having at least one groove which defines edges near the track engaging surface.

3,887,243

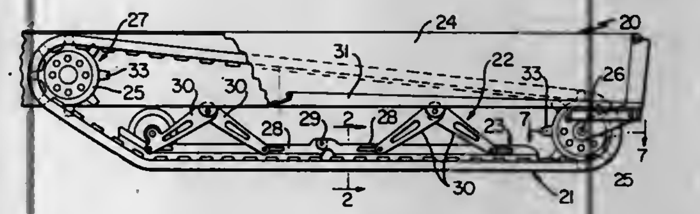
ENDLESS TRACK

Guy Noel Chaumont, Tring-Jonction, Quebec, Canada, assignor to Dayco Corporation, Dayton, Ohio

Filed Apr. 22, 1974, Ser. No. 463,072

Int. Cl. B62d *55/24*

U.S. Cl. 305—24 **20 Claims**



1. An endless track adapted to be moved in an endless path and comprising, a main body made primarily of an elastomeric material and having a ground engaging surface an inside surface, a plurality of reinforcing members extending substantially perpendicular to said endless path, a plurality of openings in said main body arranged in at least one rectilinear row with each opening being closely adjacent an associated reinforcing member, and a plurality of metal clips each supported in clamped relation around an associated reinforcing member and each clip being adapted to be engaged by a toothed sprocket wheel which is adapted to drive said track in its endless path.

3,887,244

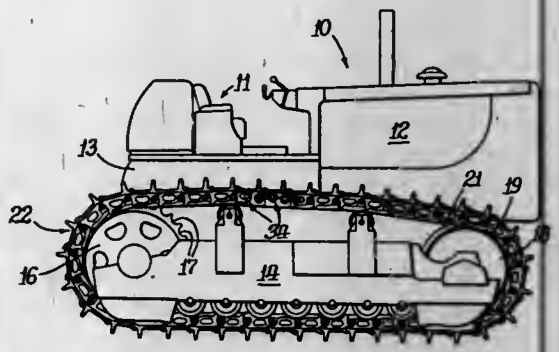
RESILIENT MID-PITCH LUG FOR AN ENDLESS TRACK

Glenn M. Haslett, Peoria, and Harold L. Reinsma, Dunlap, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 30, 1973, Ser. No. 420,720

Int. Cl. B62d *55/08*

U.S. Cl. 305—57 **11 Claims**



1. In an endless track assembly of the type used on a vehicle provided with a drive sprocket having teeth and notches alternately disposed about the circumference of the sprocket, said track assembly comprising a pair of laterally unstanding link elements; parallel pin and bushing elements secured to and interconnecting respectively opposite ends of the links; a track shoe secured to the bottoms of said links; the improvement comprising a resilient impact lug reinforced by reinforcing means including a wear resistant material secured to the contact end of said impact lug, said lug being releasably secured to the shoe midway between the bushing elements, said impact lug having a topmost portion of greater height from the track shoe than the topmost portion of the adjacent bushings whereby initial contact is made by said lug so that impact energy is absorbed by the lug prior to engagement of an adjacent bushing.

3,887,245

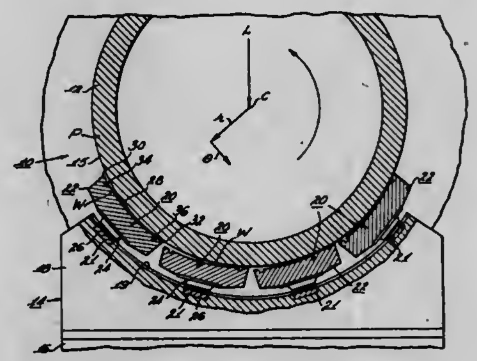
PIVOTED PAD BEARING APPARATUS AND METHOD FOR BIDIRECTIONAL ROTATION

Keith E. Rouch, Greendale, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Apr. 8, 1974, Ser. No. 459,120

Int. Cl. F16c *17/06*

U.S. Cl. 308—1 R **12 Claims**



1. In combination a rotable journal, a pivoted bearing pad in supporting relation to said journal for bidirectional rotation of said journal, stationary structure supporting said pivoted bearing pad for pivotal movement, said pivoted bearing pad including a journal bearing surface extending in a generally circumferential and also in a generally axial direction of said journal whereby to be in supporting relation to said journal for bidirectional rotation of said journal, said journal bearing surface including opposite circumferentially spaced first and second edges, said first and second edges being respectively the leading and the trailing edges for one direction of rotation of said journal, said first and second edges being respectively the trailing and the leading edges for the opposite direction of rotation of said journal, said leading edge being at the circumferential end of said pivoted bearing pad first reached by a given point on the periphery of said journal for any given direction of rotation of said journal, said trailing edge being at the circumferential end of said pivoted bearing pad last reached by said given point for any given direction of rotation of said journal, said bearing pad including a pivotal support located substantially midway between said first and said second edges, a first and a second lubricant discharge means in the journal bearing surface of said pivoted bearing pad respectively contiguous but spaced from said first and said second edges, means effective on both directions of rotation of said journal for connecting a pressurized supply of lubricant to the lubricant discharge means contiguous the leading edge of said pivoted bearing pad for any given direction of rotation of said journal, and for discontinuing the flow of lubricant to the lubricant discharge means contiguous the trailing edge of said pivoted bearing pad for any given direction of rotation of said journal, whereby to provide a lubricant film pressure profile at said journal bearing surface of said bearing pad which causes an offset pivot effect particular for each direction of rotation of said journal member while still maintaining a mechanically centrally located pivot for said pivoted bearing pad.

3,887,246

ANTI-FRICTION BALL BEARING ASSEMBLY

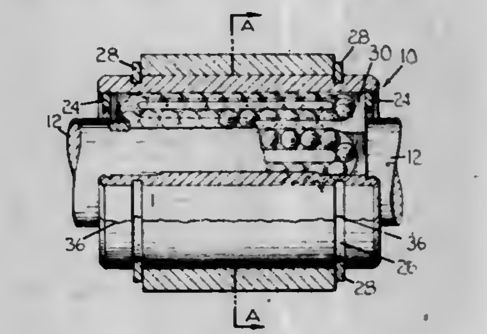
Albert R. McCloskey, Fairfield, Conn., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 17, 1974, Ser. No. 434,355

Int. Cl. F16c *17/16*

U.S. Cl. 308—6 C **8 Claims**

1. An anti-friction ball bearing assembly, adapted for mounting within a housing comprising an outer sleeve and an inner sleeve concentrically fitting within said outer sleeve, said inner sleeve having a central opening for the passage of a shaft therethrough, said inner sleeve having a number of tracks defining paths for the circulation of balls between said sleeves and said shaft during movement between said shaft and said bearing assembly, said balls, during a portion of their circula-



tion path, contacting said shaft and the inner surface of said outer sleeve at a plurality of raceway surfaces provided thereon, said outer sleeve having a longitudinal fracture line such that said outer sleeve acts as a biasing means on said balls to effect a preloaded force between said shaft and said balls and said outer sleeve.

3,887,247

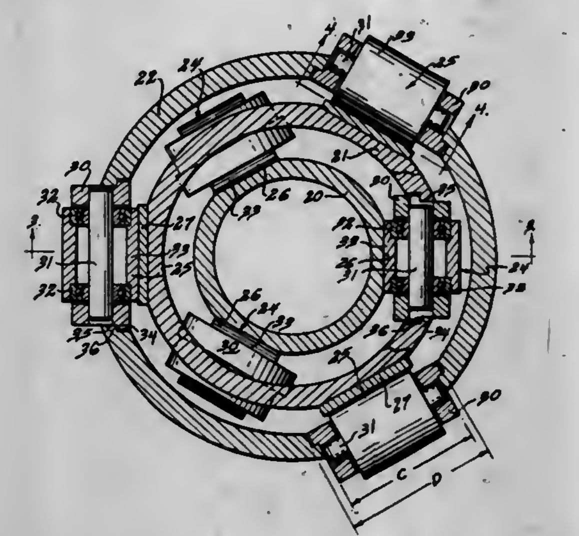
BEARING MOUNTING FOR TELESCOPING TUBES

Johan E. A. Graae, Elmhurst; Aloysius R. Jamrog; Anthony S. Kelecius, both of Chicago, and Donald P. Mingesz, Naperville, al of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 25, 1974, Ser. No. 445,739

Int. Cl. F16c *29/04*

U.S. Cl. 308—6 B **2 Claims**



1. In an assembly of telescoping tubes including at least a hollow outer tube with an inner tube positioned within and capable of translation through the hollow outer tube, the outer tube having an opening extending radially from the inner wall of the outer tube, and a bearing mounted in a mounting structure positioned on the outer tube in rotatable contact with said inner tube, said mounting structure for the bearing comprising; a shelf in the form of a portion of the inner wall of the outer tube extending outwardly from the perimeter of the opening recessed from surrounding portions of the inner wall, and a mounting piece for holding and positioning the bearing, said mounting piece having a first end from which said bearing protrudes and a second end on the opposite side of said mounting piece from said first end, said second end being of cross sectional configuration capable of being inserted into the opening and having a shoulder in the form of a solid projection extending outwardly from the body of said mounting piece between said first end and said second end, the cross section of said mounting piece through said shoulder being of

such shape that with said second end of said mounting piece positioned within said opening said cross section of said mounting piece through said shoulder extends beyond the opening at the inner wall and is encompassed within said recess and said shoulder is in contact with said shelf so that with said mounting piece positioned within the opening said bearing is in rotatable contact with the exterior surface of the inner tube and forces exerted by the inner tube against the bearing act to displace said mounting piece radially from and axially to the inner tube, said shelf in contact with said shoulder and said second end positioned within said opening acting to oppose said displacement, thereby maintaining the bearing in position within the opening and in rotatable contact with the inner tube.

3,887,248
SLIDE-ARTICULATION BEARING FOR TILTABLE CONVERTERS

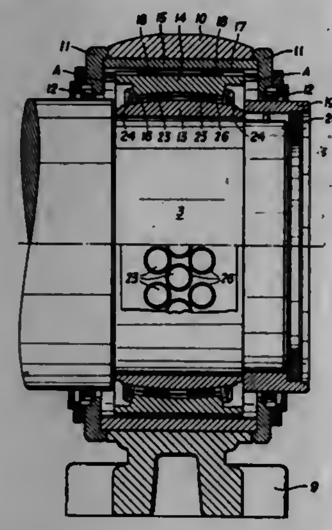
Ernst Riegler, Enns, Austria, assignor to Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Mar. 27, 1973, Ser. No. 345,292

Claims priority, application Austria, Mar. 28, 1972, 2664/72

Int. Cl. F16c *13/04, 17/10*

U.S. Cl. 308—15 **11 Claims**



1. A slide-articulation bearing for tiltable converters comprising a bearing housing, and in said housing an inner ring, an outer ring, and between said inner and outer rings a cage having recesses, and slide elements fixed in said recesses, framed by particular means and supporting on their slide faces the inner ring; the outer ring being designed as a slide bushing and having on an outer circumference at least one slide face integral with the outer ring, so that the bearing is axially displaceable within the bearing housing, the outer ring being made of unalloyed, quenched and tempered carbon steel with a strength of 55 to 70 kp/mm².

3,887,249
JOURNAL BEARING FOR SUPPORTING BOTH RADIAL LOADS AND AXIAL THRUST LOADS

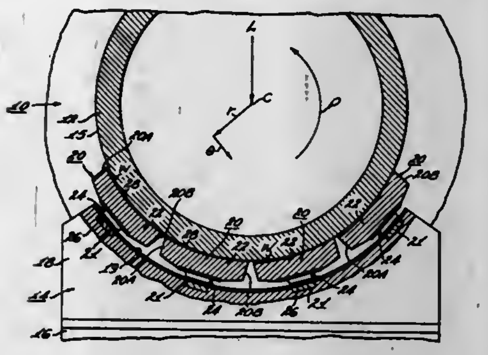
Keith E. Rouch, Greendale, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Apr. 8, 1974, Ser. No. 459,116

Int. Cl. F16c *17/06*

U.S. Cl. 308—73 **11 Claims**

1. In combination, a rotatable journal member, a pivoted pad bearing supporting said journal member for rotation, stationary structure supporting said pivoted pad bearing for pivotal movement, said pivoted pad bearing including a journal bearing surface extending in a generally circumferential and also in a generally axial direction of said journal member whereby to journal said journal member for rotation, said journal member including a thrust shoulder contiguous an axial end of said pivoted pad bearing, said pivoted pad bearing including at an axial end thereof a thrust surface adapted to cooperate with said thrust shoulder whereby to resist axial thrust forces on said journal member, said thrust shoulder on said journal member and said cooperating thrust surface on said pivoted pad bearing both lying in planes substantially parallel to each other and inclined to the plane of the radial load-circumferential load on said journal bearing surface, whereby to minimize the moment induced on said pivoted pad bearing by the resultant force acting on said thrust surface.



3,887,250
GODET FOR USE IN DRAWING APPARATUS AND DRUM DRYER UNITS

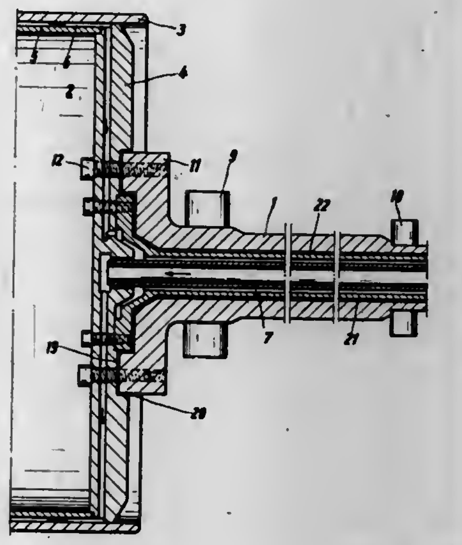
Heinz Fleissner, Frankfurt am Main, Germany, assignor to VEPA AG, Switzerland

Division of Ser. No. 221,941, Jan. 31, 1972, Pat. No. 3,831,666, which is a continuation-in-part of Ser. No. 121,890, March 8, 1971, Pat. No. 3,738,423. This application June 21, 1974, Ser. No. 481,824

Claims priority, application Germany, Jan. 30, 1971, 2104392

Int. Cl. F16c *37/00*

U.S. Cl. 308—76 **6 Claims**



1. A godet comprising a cylindrical shell for transporting fiber, a rotatable bearing shaft secured to an end wall of said cylindrical shell, a lubricated bearing for allowing rotation of said shaft, a lubricant seal for the shaft, said shaft being disposed in a bearing housing and extending toward the outside of the housing through a wall of the housing, said godet being characterized in that underneath the shaft and underneath the lubricated bearing, a lubricant return means is provided in the housing wall for directing leaking lubricant back into said housing.

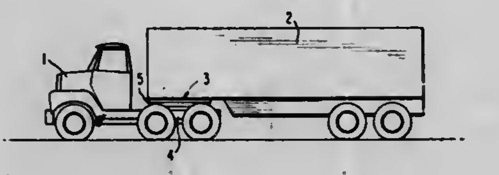
3,887,251
TRACTOR AND TRAILER FIFTH WHEEL BEARING ATTACHMENT

Roy H. McKay, 6305 Mahoning Ave., Youngstown, Ohio 44515

Filed Aug. 6, 1974, Ser. No. 495,252

Int. Cl. B62d *53/08*

U.S. Cl. 308—136 **6 Claims**



1. In a fifth wheel assembly including an upper trailer plate mounting a king pin and a lower slotted tractor plate adapted for locking engagement with said king pin, the improvement comprising an anti-friction device between said fifth wheel plates, said device comprising a bushing journaled on the king pin, a first bearing plate detachably secured to the upper trailer plate, said first bearing plate being centrally apertured for receiving the upper end portion of said bushing, a flange at the bottom of said bushing, a second bearing plate mounted for rotation on said flanged bushing, a split washer connected to the second bearing plate and engaging the flange of the bushing for holding the bushing in operative position on said king pin, said second bearing plate being frictionally engageable with and by said tractor plate and rotatable therewith, and a third plate positioned between said first and second bearing plates and mounted for free rotation about the bushing, said third plate incorporating lubricating means on both surfaces to substantially eliminate friction between said first and second bearing plates.

3,887,252
LIGHT OPERATED GUARD

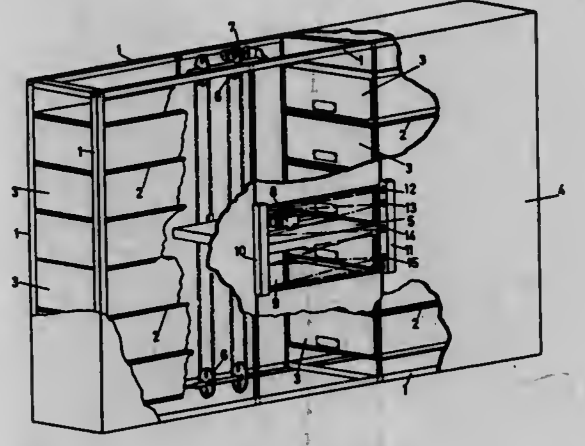
Paul Fuller, Romford, England, assignor to Roneo Vickers Limited, London, England

Filed Dec. 4, 1973, Ser. No. 421,719

Claims priority, application United Kingdom, Dec. 6, 1972, 56370/72

Int. Cl. A47b *77/08*

U.S. Cl. 312—223 **7 Claims**



1. A light operated guard for a path which may be traversed by a person or part of a person, for the purpose of raising an alarm, closing the path or stopping dangerous machinery or the like in said path, comprising means for producing a beam of light, means for modulating the beam of light at a predetermined and substantially constant frequency, a system of mirrors positioned adjacent boundaries of the path for reflecting the beam of light back and forth across the path, a photosensitive electrical device at the end of the beam of light remote from the means for producing a beam of light for generating an electric signal of said predetermined frequency, and an electric circuit connected to said photo-sensitive device for producing an output signal responsive to said electric signal only when the light of said predetermined frequency and of a predetermined amplitude falls on said photo-sensitive device, said electric circuit including means activated by said output signal for inhibiting the raising of an alarm, the closing of the path or stopping of dangerous machinery or the like, whereby interruption of said beam of light will prevent production of said output signal thereby precluding activation of said inhibiting means.

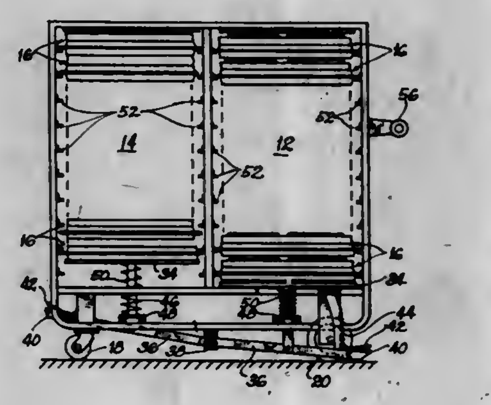
3,887,253
FOOD SERVICE CART

John A. Bridges, and W. Burk Wyatt, both of Nashville, Tenn., assignors to Aladdin Industries, Incorporated, Chicago, Ill.

Filed Jan. 14, 1974, Ser. No. 433,069

Int. Cl. A47b *67/02*

U.S. Cl. 312—250 **11 Claims**



1. An institutional food delivery system for maintaining food temperature constant during transporting comprising:

food trays capable of nesting one on top of the other to form a stack of trays;

a portable cart having at least one side loading compartment for receiving said trays therein, and including

means for nesting said trays in said compartment during transport to a desired location, and

means for supporting said trays in an unnested condition to permit loading and unloading from the side of said compartment.

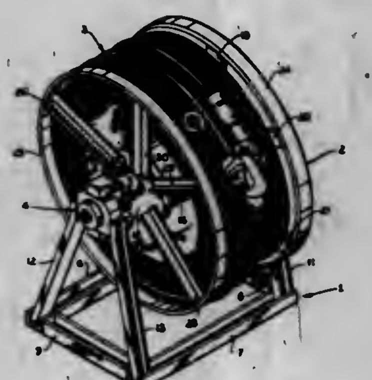
3,887,254
ELECTRIC GROUNDING APPARATUS

Alfred R. Landis, Decatur, Ga., and Sammie B. Torrence, Carthage, Tenn., assignors to Kearney-National Inc., Atlanta, Ga.

Filed Jan. 25, 1974, Ser. No. 436,749

Int. Cl. H01r *39/00*

U.S. Cl. 339—5 R **8 Claims**



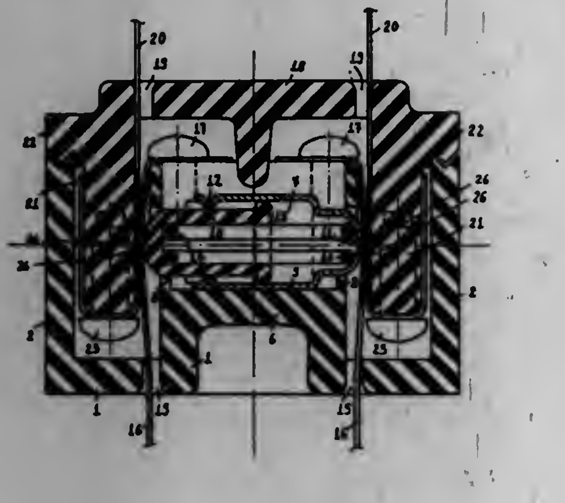
1. Electric grounding apparatus comprising a conductive frame arranged for connection to a device to be grounded, a conductive reel rotatably mounted on said frame, flexible conductive grounding means electrically connected with and

adapted to be wound on said reel, bearing means rotatably mounting said reel on said frame, and shunt means of substantially less impedance than said bearing means and electrically interconnecting said reel and said frame, said shunt means comprising magnetic means secured to and electrically connected with said frame and forming a slidable contact with said reel.

3,887,255

MULTIPLE COUPLING CONNECTOR FOR ELECTRICAL CONNECTION

Giuseppe Codrino, Via Stazione, Quattordio, Italy
Filed May 31, 1973, Ser. No. 365,764
Claims priority, application Italy, June 16, 1972, 25788/72
Int. Cl. H05k *1/02*
U.S. Cl. 339—17 L **8 Claims**



1. An apparatus for the multiple electrical connection of ribbon-like conductors, comprising a first element formed with an elongated recess bounded by an inner peripheral wall surface and having an open end and a longitudinally spaced closed end; a pair of transversely spaced first apertures formed in said first element at said closed end and communicating with said recess, so that first ribbon-like conductors may be inserted through said apertures to overlie said inner wall surface at transversely spaced locations; a second element formed with an elongated projection receivable with clearance in said recess through said open end thereof, and with a wall portion which overlies said open end when said projection is received in said recess, said projection having an outer peripheral wall surface and said transverse wall having a pair of transversally spaced second apertures through which second ribbon-like conductors may be inserted to overlie said outer wall surface so as to be each juxtaposed with one of said first ribbon-like conductors when said projection is received in said recess; and biasing means in said projection and operative to deflect said second ribbon-like conductors outwardly away from said outer wall surface and into conductive contact with the respectively juxtaposed first ribbon-like conductors.

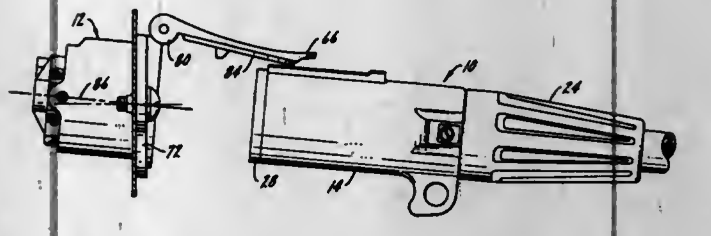
3,887,256

TRACTOR-TRAILER ELECTRICAL CONNECTOR

Boleslaw Klimek, Des Plaines, and Victor Mastis, Hinsdale, both of Ill., assignors to The Berg Manufacturing Company, Des Plaines, Ill.
Filed Mar. 27, 1973, Ser. No. 345,349
Int. Cl. H01r *13/44*
U.S. Cl. 339—44 M **3 Claims**

1. In an electrical connector assembly having a connector and a receptacle,

said connector including a housing, a cable receiving aperture at one end thereof, a flexible cable support attached to said housing at said cable receiving aperture, said cable support being formed of a material to be in sealing contact with a cable therein, a plurality of female contact members positioned within the housing adjacent the opposite end thereof, and a plurality of openings in said opposite end in alignment with said female contact members, a cable clamp within said connector housing including a clamp member and a spring having end portions and a central portion positioned about said clamp member, an adjustment member engaging said spring and urging said clamp member into engagement with a cable therein, said clamp member having a generally arcuate outer surface including a groove and an inner surface formed and adapted to mate with a cable outer surface, said central portion of said spring being positioned within said groove of said clamp member, with the outer surface of said end portions of said spring being in contact with and restrained by an inner surface of said connector housing, movement of said adjustment member radially inward of said housing causing at least said central portion of said



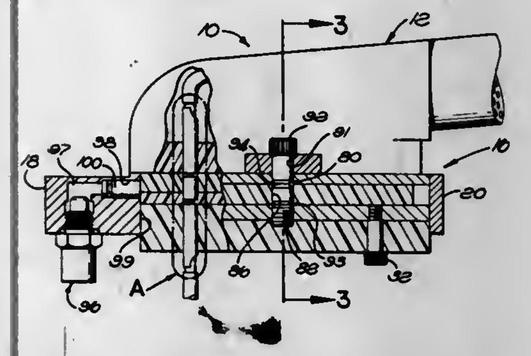
spring to translate radially of said housing and apply greater clamping pressure upon said clamping member and the cable positioned within the housing,

said receptacle including a housing, a plurality of cable receiving apertures at one end thereof, the opposite end of said housing having an opening and a cover therefor, a plurality of male contact members in said receptacle housing in alignment with said apertures, said male contact members being adapted to be inserted in said female contact members when said connector and receptacle are assembled, mounting means attached to said receptacle housing, the longitudinal axis of said receptacle housing forming an angle with said mounting means which is slightly different from 90° and sufficient to cause any moisture within said receptacle housing to accumulate adjacent the cover thereof.

3,887,257

ELECTRICAL CONNECTOR

George J. Panek, Phoenix, and Michael E. McCrea, Tempe, both of Ariz., assignors to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Jan. 2, 1974, Ser. No. 429,598
Int. Cl.² H01R *13/62, 25/00*
U.S. Cl. 339—45 M **15 Claims**



1. A switching electrical connector comprising:

plug and receptacle connector members;

a fixed insulator in each of said connector members carrying aligned "butt" contacts;

a movable insulator in one of said connector members mounted for sliding movement laterally between said fixed insulators from a first position to a second position; a bore in said movable insulator extending perpendicular to the path of movement of said movable insulator, in said first position of said movable insulator said bore therein being aligned with said "butt" contacts and in said second position of said movable insulator said bore being out of alignment with said "butt" contacts;

a pair of movable contacts in said bore;

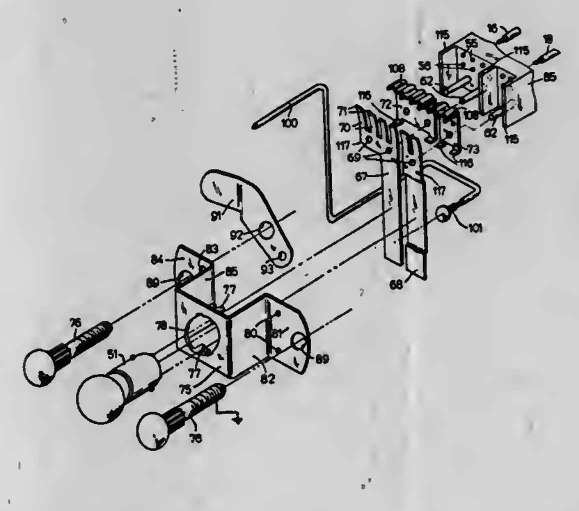
means biasing said movable contacts apart urging said movable contacts to extend outwardly beyond the opposite faces of said movable insulator so that when said movable insulator is in said first position, said movable contacts will engage said "butt" contacts; and

means on said one connector member for shifting said movable insulator from said first position to said second position to break the engagement between said movable contacts and said "butt" contacts.

3,887,258

WIRE CONNECTOR MEANS FOR VEHICLE LAMP

Alton J. Cunningham, Slinger; David W. Wendt, Janesville, and Bernard R. Weber, Elm Grove, all of Wis., assignors to Wesbar Corporation, West Bend, Wis.
Filed Nov. 30, 1973, Ser. No. 420,646
Int. Cl. H01r *9/12*
U.S. Cl. 339—95 D **20 Claims**



1. As a wire connection means in a vehicle lamp: an insulated housing having walls defining a cavity, at least one of said walls having a wire receiving opening extending therethrough; an electrically conductive contact plate rigidly mounted within said cavity and comprising a base portion and a free-standing portion extending transversely from said base portion in a direction away from said one wall; said base portion being provided with a wire receiving hole in registry with said wire receiving opening and said free-standing portion being provided with a wire receiving groove in alignment with said wire receiving hole in said base portion; an electrically conductive contact member electrically connected to said base portion of said contact plate and having a curved resilient locking tongue extending from said base portion toward said free-standing portion; and means for mechanically securing said contact plate and said contact member to each other and to said housing; said locking tongue terminating in an edge, said locking tongue being resiliently movable to accommodate insertion of a wire through said wire receiving opening and said wire receiving hole and along said groove between said locking tongue and said upright portion and to entrap said wire between said edge and said free-standing portion of said contact plate.

3,887,259

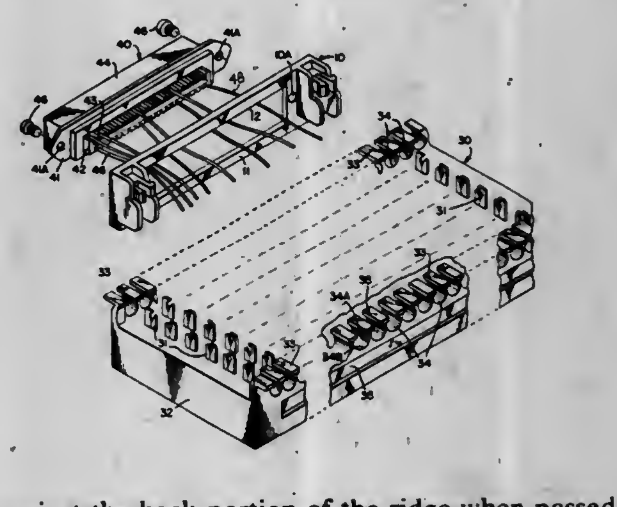
CONNECTOR RETAINING ADAPTER

George E. Ayer, Endicott, N.Y., assignor to Bunker Ramo Corporation, Oak Brook, Ill.
Filed Oct. 17, 1973, Ser. No. 407,127
Int. Cl. H01r *13/46*
U.S. Cl. 339—119 R **5 Claims**

1. A connector retaining adapter for mechanically joining an electrical connector and a wiring terminal block, said electrical connector having a mounting flange and a rear contact portion connected to a plurality of individual conductors, said terminal block having a foundation supporting a plurality of electrical terminals and at least one side with a raised ridge having a row of apertures therethrough normally receiving individual conductors, and an elongated recess of constant width extending below the apertures and parallel to said row, said adapter comprising:

a base for receiving the mounting flange of the electrical connector, said base including an opening for conductors from the electrical connector;

at least one flexible arm extending from each end of said base in a direction perpendicular thereto, each arm being shaped to pass through an aperture of the terminal block when flexed and with a latching portion extending laterally from the end of each arm, which latching portion



abuts against the back portion of the ridge when passed through an aperture; and

at least one stabilizing flange extending from each end of said base in the same direction as said flexible arms and in juxtaposition with each of said flexible arms, each stabilizing flange having

an upper portion of such dimensions from said base that when the latching portion of the juxtaposed flexible arm abuts the back portion of thc ridge of said terminal block, said upper portion of the stabilizing flange abuts the opposite side of the ridge, and

a lower portion of such dimension from said base as to project beyond said upper portion and to the bottom of said elongated recess in said terminal block when the latching portion of the juxtaposed flexible arm abuts the back portion of the ridge of said terminal block.

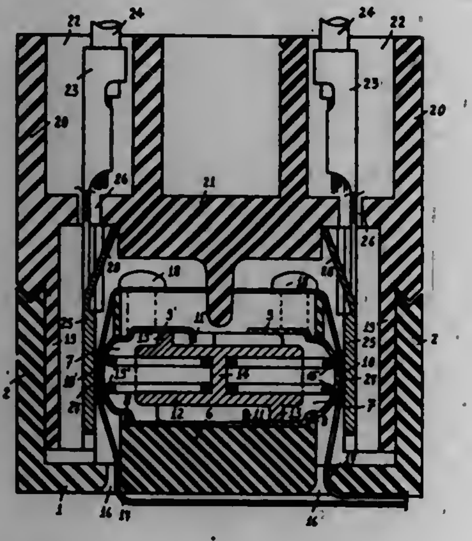
3,887,260

MULTIPLE COUPLING CONNECTOR FOR ELECTRICAL CONNECTION BETWEEN FLEXIBLE RIBBON-LIKE CONDUCTORS AND CIRCULAR CROSS-SECTION CABLES

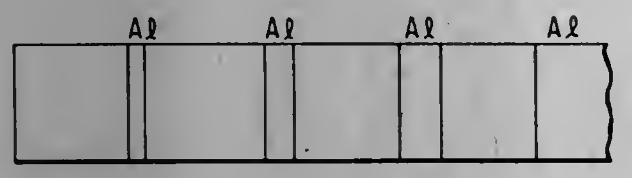
Guiseppe Codrino, Via Stazione, Quattordio, Italy
Filed Apr. 17, 1973, Ser. No. 351,955
Claims priority, application Italy, June 16, 1972, 25787/72
Int. Cl. H01r *13/54*
U.S. Cl. 339—176 MF **13 Claims**

1. An apparatus for the multiple electrical connection of ribbon-like conductors with circular cross-section cables, comprising a first element formed with an elongated recess bounded by an inner peripheral wall surface and having an open end and a longitudinally spaced closed end; a second element formed with an elongated projection receivable with clearance in said recess through said open end thereof, and with a transverse wall portion which overlies said open end when said projection is received in said recess, said projection having an outer peripheral surface; a pair of transversely spaced first apertures formed in said first element at said closed end and communicating with said recess; a pair of transversely spaced second apertures formed in said second

element at said transverse wall and communicating with said recess so that ribbon-like conductors may be inserted through said second apertures to overlie said inner wall surface at transversely spaced locations; a pair of socket elements each formed with a first longitudinal portion having an end shaped to receive a circular cross-section cable and an other end, a second longitudinal portion having a conductive surface and extending from said other end of said first longitudinal portion into said recess, and a third longitudinal portion intermediate said first and second longitudinal portions and engageable with said first element so as to secure said socket element when said socket element is received in one of said first apertures with said second portion overlying said outer peripheral wall surface and being juxtaposed with one of said ribbon-like conductors; and biasing means in said projection and operative to deflect said ribbon-like conductors outwardly away from said outer wall surface and into conductive contact with said respectively juxtaposed second longitudinal portions of said socket elements.

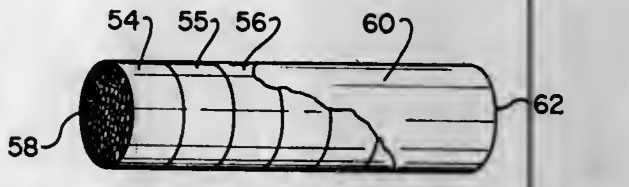


3,887,261
LOW-LOSS REFLECTION COATINGS USING ABSORBING MATERIALS
Eberhard A. Spiller, Mt. Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 23, 1973, Ser. No. 344,405
Int. Cl. G02b *5/28, 5/30*
U.S. Cl. 350—1 **1 Claim**



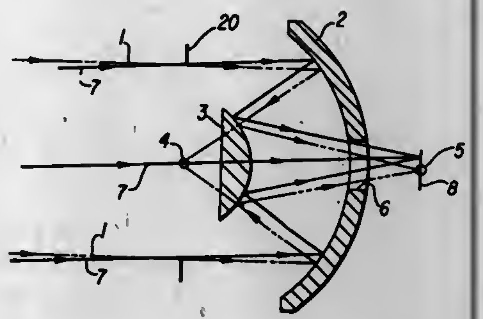
1. A reflective structure for optical waves comprising an array of alternate layers of high and low absorbing elements wherein said alternate layers are coated on top of each other, said array including a plurality of thin film elements having a relatively high absorption index separated by and coated on material having a relatively low absorption index to provide an alternating difference in said absorption indices to produce a plurality of reflecting boundaries which, when positioned in the path of an incident optical wave produce standing incident and reflected waves as a result of said differences in said absorption indices, said alternate layers being arranged relative to each other so that said high absorption elements are located in the nodes of said incident and reflected waves to form a nonperiodic structure wherein the thickness of the absorbing layers monotonically vary from one end of said array to the other, said thinner absorbing layers being located at the end of said array in the path of said incident optical wave.

3,887,262
LIGHT EQUALIZER AND METHOD OF MAKING SAME
Henry H. Blau, Jr., Wayland, and Paul L. Kebabian, Somerville, both of Mass., assignors to Environmental Research & Technology, Inc., Concord, Mass.
Filed Apr. 5, 1974, Ser. No. 458,124
Int. Cl. G02b *5/20, 5/14, 27/00*
U.S. Cl. 350—1 **10 Claims**



1. A light equalizer for providing substantially uniform distribution of light across an output aperture, said equalizer comprising in combination;
- a plurality of light transmissive elements each having opposed surfaces, said elements being arranged in a stack substantially along a common axis with all of said surfaces, except the end surfaces of said stack, adjacent at least one other surface of another said element, said end surfaces respectively constituting an input aperture and said output aperture;
- at least one of said elements providing a multiplicity of light scattering centers; and
- an internally reflective cover disposed over substantially all of the exterior surface of said stack, except said end surfaces.

3,887,263
HIGH RESOLUTION WIDE FIELD SCAN SYSTEM
William S. Thompson, III, McKinney, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Sept. 7, 1967, Ser. No. 666,215
Int. Cl. G02b *17/00*
U.S. Cl. 350—7 **16 Claims**

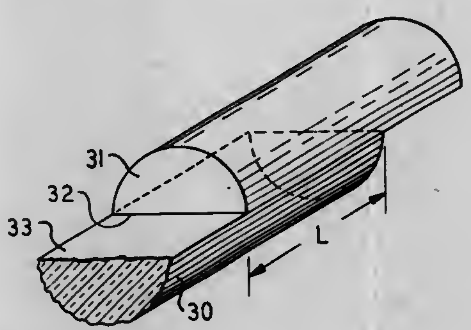


1. An optical system comprising:
a. a spherical primary mirror having an aperture therein,
b. an aspheric secondary mirror disposed to intercept rays from said primary mirror, and
c. means for rotating said aspheric secondary mirror about the optical axis of said primary mirror,
d. an entrance pupil located at the center of curvature of said primary mirror, whereby rays entering the system through said pupil are reflected by said primary mirror to said aspheric secondary mirror and thence through said aperture to focus at a point behind said primary mirror.

3,887,264
OPTICAL FIBER WITH ASYMMETRIC INDEX PROFILE
Rudolf Kompfner, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed May 18, 1973, Ser. No. 361,516
Int. Cl. G02b *5/14*
U.S. Cl. 350—96 WG **5 Claims**

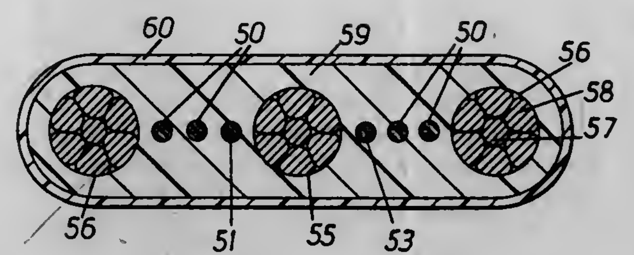
1. A pair of optical waveguides, each of which includes an elongated core, characterized in that:

- each waveguide has a region along which the core portion has at least one planar surface that extends in a direction parallel to the direction of wave propagation;
- the refractive index of each of said core portions decreases continuously in a transverse direction from a maximum at a point along said planar surface, to a minimum at the surfaces of said core;



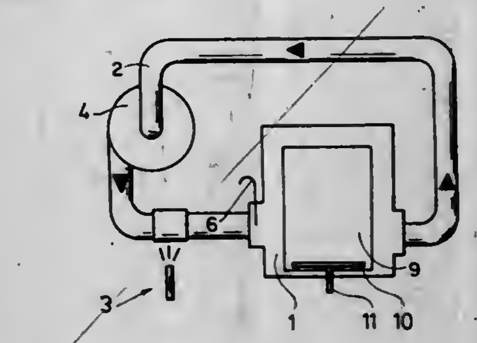
- the planar surfaces of said core portions overlap and are in contact to form a splice;
- and in that said overlapping core portions are surrounded by material having a refractive index that is no greater than the minimum refractive index at said core surfaces.

3,887,265
OPTICAL GUIDES
David Saul Margolis, London, and John Edward Taylor, Cookham, both of England, assignors to British Insulated Callender's Cables Limited, London, England
Filed Nov. 8, 1973, Ser. No. 413,826
Claims priority, application United Kingdom, Nov. 10, 1972, 52097/72
Int. Cl. G02b *5/16*
U.S. Cl. 350—96 B **20 Claims**



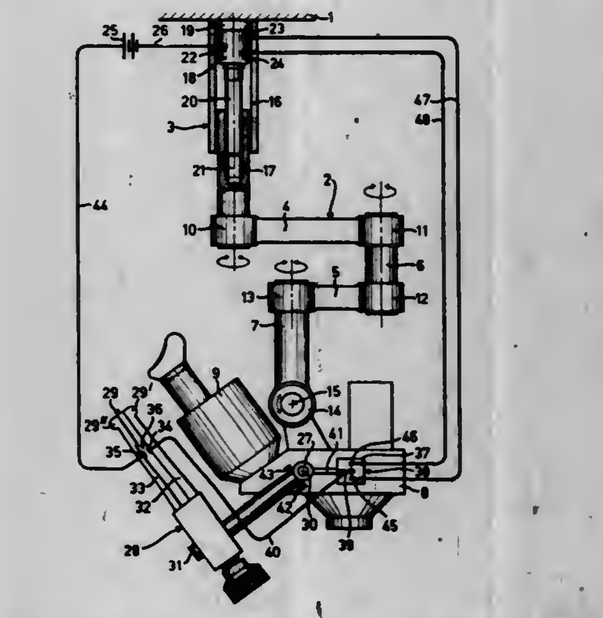
1. An optical cable comprising at least one optical bundle including a plurality of elongate optical elements, each consisting of at least one optical fibre, the optical elements being at least partially embedded in and mutually separated by encapsulating material in a predetermined configuration throughout substantially the whole length of the optical bundle, the encapsulating material being of such a nature that relative movement between the embedded optical elements is at least substantially reduced and that the position of each optical element, with respect to the positions of the other optical elements is maintained substantially constant to provide for ready identification of an optical element at any transverse cross-section along the length of the bundle, at least one separate elongate non-optical reinforcing member; and, surrounding the bundle or bundles and the reinforcing member or members, an outer protective sheath; the reinforcing member or members being of such a material and of such a cross-sectional area having regard to the material or materials and cross-sectional area of the bundle or bundles that the reinforcing member or members at least substantially reduce the strain that would otherwise be imparted to the or each bundle when the cable is stressed such a way as to tend to subject the or any optical fibre of the bundle to a tensile force.

3,887,266
CIRCULATING AIR OVEN
Pekka Juhani Saario, Martinkatu 31, Hyvinkaa, Finland
Filed Dec. 28, 1973, Ser. No. 429,173
Claims priority, application Finland, Oct. 16, 1973, 3204/73
Int. Cl. F27b *17/00*
U.S. Cl. 432—152 **3 Claims**



1. A circulating air oven for the baking of bakery products in flowing hot air, said oven comprising a baking chamber having an air inlet and outlet, a circulating air duct connected to said chamber at said inlet and outlet thereof, a heater for heating the circulating air in said air duct, a blower in said duct with a drive motor for circulating air through said duct and said baking chamber, and a shut-off means in said duct downstream of the blower for controlling the flow of air circulating to said chamber in order to control the air circulation in said chamber.

3,887,267
APPARATUS FOR ADJUSTING AN OPTICAL OBSERVATION DEVICE
Rudolf Heller, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland
Filed June 3, 1974, Ser. No. 475,859
Claims priority, application Switzerland, June 18, 1973, 8852/73
Int. Cl. G02b *21/24*
U.S. Cl. 350—85 **2 Claims**



1. An apparatus for adjusting an optical observation instrument, comprising:
- an optical observation instrument having a housing,
- a stand including an instrument support component, means for freely moving the support component in a substantially horizontal plane, adjustment motor means having two directions of movement for respectively adjusting the support component in vertical direction upwards and downwards,
- bearing means having a substantially horizontally extending axis and supporting the housing of the instrument at the support component,

- a preselection switch means incorporating two electrical contact pieces and having one closed-contact and one opened-contact position,
- a reversing switch means incorporating one reversing electrical contact piece and two static electrical contact pieces and having two closed-contact positions of the reversing contact piece respectively with the one and the other static contact piece, the reversing switch means further incorporating a coupling element for mechanical actuation of the reversing contact piece and a housing rigidly secured to the housing of the instrument,
- a switching circuit for energizing the motor means including the preselection switch means for turning-on and turning-off the motor means, each closed-contact position of the reversing switch means controlling one respective direction of movement of the motor means, the reversing contact of the reversing switch means being electrically connected to one contact of the preselection switch,
- an adjustment element incorporating a lever arm rigidly connected to the coupling element and an end part constructed as a mouthpiece having two portions each rigidly connected to one respective contact of the preselection switch means and movable to approach each other against a restoring force when bitten together by an operator thereby to actuate the preselection switch means to the closed-contact position, and
- pivot means having a substantially horizontally extending axis and supporting the adjustment element at the instrument housing while permitting pivotal movement of the adjustment element and of the coupling element connected thereto for actuating the reversing switch means to one of two closed-contact positions.

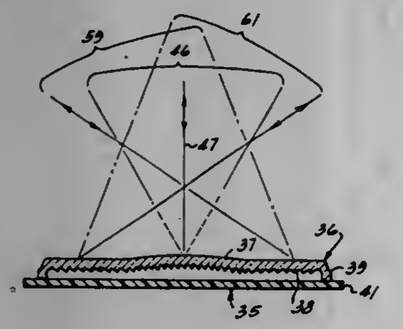
3,887,268
FLASHING REFLECTOR SYSTEM

Gerald Golden, Highland Park, and James D. Kennedy, Streamwood, both of Ill., assignors to Beatrice Foods Company, Elgin, Ill.

Continuation-in-part of Ser. No. 355,796, April 30, 1973, abandoned. This application Feb. 19, 1974, Ser. No. 443,476

Int. Cl. G02b *5/12*

U.S. Cl. 350—99 **5 Claims**



1. An assembly for producing a light flashing effect comprising in combination
   - A. a rotatable wheel member having a wheel axis,
   - B. a reflector unit having at least one region comprised of transparent solid material and having a region axis normal thereto, said region having formed therein a group of cube corner reflector elements, such elements each having a central optical axis, each respective such optical axis being both disposed substantially parallel to the respective such optical axes of the other such elements in said group, and inclined at a predetermined angle relative to said region axis, said region being retroreflective of light directed thereon at least over an angle of from about 20° to 70° relative to said region axis in the direction of said predetermined angle,
   - C. mounting means to mount said reflector fixedly to a side portion of said wheel member,
   - D. said wheel member, said reflector and said mounting means coacting together so that, when said wheel is rotated, said reflector is adapted to retro-reflect light intermittently so as to produce a flashing light signal viewable within a viewing angle of at least about 20° to 70° relative to said wheel axis once during each 360° of wheel rotation.

3,887,269
SUPERTELESCOPIC LENS SYSTEM

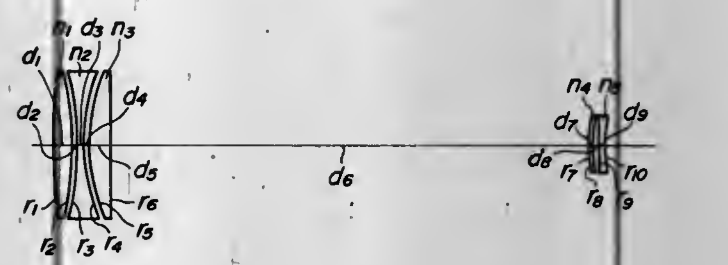
Jihei Nakagawa, Tokyo, Japan, assignor to Olympus Opitcal Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 224,720, Feb. 9, 1972, abandoned. This application Oct. 26, 1973, Ser. No. 410,256

Claims priority, application Japan, Feb. 10, 1971, 46-5377

Int. Cl. G02b *9/60, 13/02*

U.S. Cl. 350—216 **5 Claims**



1. A supertelescopic lens system comprising a positive single first lens, a negative single second lens, a positive single third lens, said first, second and third lenses forming a front group of the lens system, a positive single fourth lens, and a negative single fifth lens, said fourth and fifth lenses being separated from said front group of the lens system by a large air space, and the whole lens system being such that the four conditions
   1. $0.45f < f_{123} < 0.6f$,
   2. $n_2 > 1.7$ and $n_3 > 1.7$,
   3. $0.20f < r_7 < 0.26f$ and $0.11f < r_{10} < 0.13f$, and
   4. $0.45f < f_4 < 0.6f$

are satisfied where f is the composite focal length of the whole lens system, f_{123} the composite focal length of the front group of the lens system, f_4 the focal length of the fourth lens, and r_i, d_i and n_i (i=1, 2, 3, ...) the radii of curvature of respective lenses, axial thicknesses of the respective lenses or air spaces between adjacent lenses and refractive indexes of the respective lenses.

3,887,270
STYLUS DEVICE FOR THE VISION OF IMAGE SEQUENCES

Alfred Lazarus, and Jean-Jaques Lazarus, both of 2, Rue Friese, Strasbourg, France (67000)

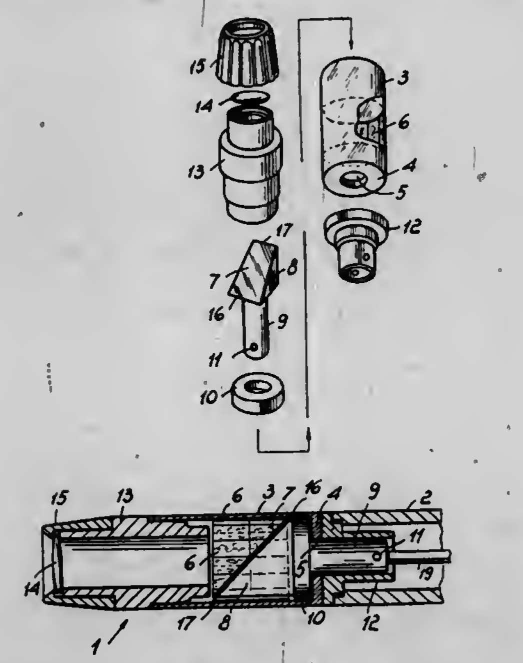
Filed Apr. 3, 1974, Ser. No. 457,612

Claims priority, application Italy, Apr. 3, 1973, 22521/73

Int. Cl. G02b *27/02*

U.S. Cl. 350—241 **1 Claim**

1. Stylus device for viewing image sequences, comprising a cylindrical sleeve, an eyepiece situated in the proximity of one end of said sleeve, a plurality of photographic images disposed as a ring on the inner wall of said sleeve, and a 45° mirror situated in said sleeve in a position corresponding with said images, in which said sleeve is constructed of translucent material for the through illumination of the images over its entire extension along which said plurality of images is disposed, said mirror having a surface shaped substantially as an isosceles trapezoid with its minor base adjacent to, and its major base remote from the eyepiece, the surface of said mirror being dimensioned in such a manner as to subtend an image or a whole number of images, said sleeve being rotatable with respect to said mirror, which is kept at rest with respect to the observer.



3,887,271
OPTICAL ELEMENT HAVING THEREIN PHOTOCHROMIC AND FLUORESCENCE-QUENCHING PATTERNS AND A METHOD FOR MANUFACTURING SAME

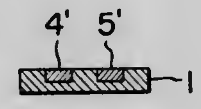
Kazunori Yamaguchi; Takeo Itimura; Teruo Kaneko, all of Tokyo, and Hiroshi Yamamoto, Kawasaki, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed June 19, 1974, Ser. No. 480,943

Claims priority, application Japan, June 25, 1973, 48-70762

Int. Cl. G01t *1/11*

U.S. Cl. 250—458 **12 Claims**



1. An optical element containing therein a pattern having photochromic and fluorescence-quenching properties and another pattern having the fluorescence-quenching property alone, which comprises in combination:
   - a. a fluorescent glass body containing therein an ion-exchangeable ion;
   - b. a first metal ion capable of inducing both photochromism and fluorescence-quenching; and
   - c. a second metal ion other than said first metal ion capable of inducing the fluorescence-quenching alone,

   said ion-exchangeable ion in said glass body being ion-exchanged with said first and second metal ions to enable said metal ions to be penetrated into said glass body and to form the required patterns in the inner surface of said glass body.

3,887,272
PROCESSING FLUID DISCHARGING APPARATUS FOR MULTIPURPOSE FILM CASSETTES

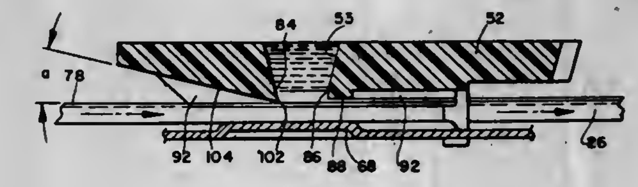
Lucretia J. Weed, Boston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 13, 1973, Ser. No. 424,555

Int. Cl. G03c *11/00*

U.S. Cl. 352—130 **4 Claims**

1. An applicator for treating with processing fluid an exposed strip of photographic film material having a light sensitive emulsion on one surface so as to develop viewable images on such film strip, said applicator comprising a housing including a chamber configured to receive such processing fluid, said housing including a processor nozzle having a surface formation configured to confront the emulsion layer on the film strip and having an opening through said surface formation for depositing a layer of processing fluid on at least a portion of such emulsion intermediate the margins of such film strip when relative motion is effected between such film strip and said housing so as to advance such film strip across said nozzle surface, said opening having leading and trailing edges in relation to the relative motion of such film strip during processing, said surface formation extending forwardly of said leading edge and rearwardly of said trailing edge, and said surface formation forwardly of said leading edge being inclined so such film strip so as to form with said film an angle converging towards said opening and terminating in a knife-like leading edge of said opening.



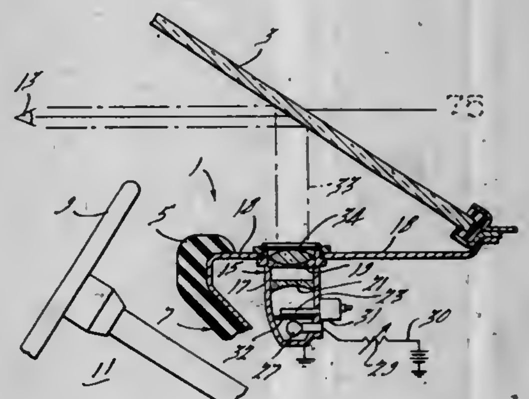
3,887,273
SPEEDOMETER OPTICAL PROJECTION SYSTEM

David Griffiths, North Plainfield, N.J., assignor to Conrad J. Friedemann, Bloomfield Hills, Mich.

Filed July 27, 1973, Ser. No. 383,244

Int. Cl. G03b *21/00, 21/28*

U.S. Cl. 353—14 **6 Claims**

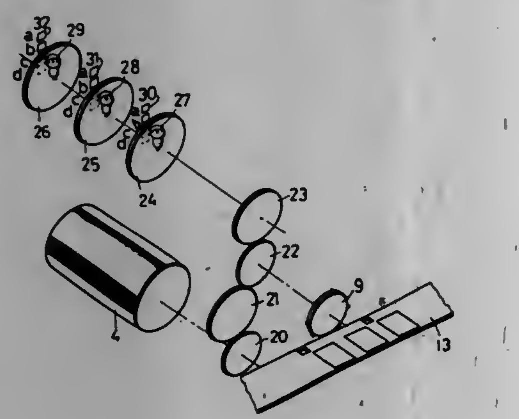


1. In a vehicle with an instrument panel including a speedometer or the like having a movable scale with indicia providing vehicle condition information for the vehicle operator, a system for projecting said information as a luminous image at infinite focus substantially in the operator's forward field of view comprising a transparent windshield concave to the interior of the vehicle and of substantially spherical curvature, a projection lens for projecting parallel light rays on the inside surface of said transparent windshield, a light source for illuminating said scale and located on the opposite side of the scale from the lens, and an optical correcting element in the system for sharply focusing said image to overcome aberration produced by the curvature of the windshield, said scale being positioned at less than the focal length of the projection lens to correct for focus shift produced by curvature of the windshield.

3,887,274
FILM FRAME SELECTING APPARATUS FOR A PROJECTOR

Kenjiro Kachi, Aichi; Morio Takeichi, Inazawa; Yasumasa Nakamura, Nagoya; Yoichi Inomata, Anjo, and Mitsuru Nakano, Toyota, all of Japan, assignors to Elmo Company, Limited, Nagoya, Japan

Filed Sept. 15, 1973, Ser. No. 289,328
Int. Cl. G03b *21/11, 23/12*
U.S. Cl. 353—26 **11 Claims**



1. In a projector adapted for selective reproduction of the image or images placed in a particular frame or series of frames on a strip of film, the improvement comprising:

means for transporting the film including means for engaging the film;

incremental Motion pulse operated motor means for driving said film transport means;

circuit means for controlling the operation of said motor means;

means for generating a binary coded comparison signal corresponding to a particular frame of the film;

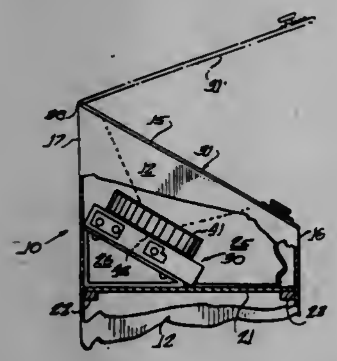
means for generating a command signal indicative of a particular frame bearing a particular image to be reproduced;

and comparison circuitry means for comparing said comparison signal with said command signal, and for forming a pulse operating signal for said motor means until coincidence of said two signals.

3,887,275
AUTOMATIC SLIDE MUSIC STAND

Kenneth D. Heist, 3118 Edmond, Billings, Mont. 59102

Filed July 1, 1974, Ser. No. 484,542
Int. Cl. G03b *21/10, 23/02*
U.S. Cl. 353—74 **2 Claims**



1. A music stand for use be musicians to display a musical score, the score being set forth on a sequential series of slides, the stand comprising:

a cabinet having a pair of supporting leg members extending from a top portion with the top portion being disposed at an upward incline slanting upwardly from the front to the back thereof with the top completely covering the cabinet top portion;

a compartment formed interiorly of the top portion of the cabinet and opening out of the top thereof;

means pivotally mounting the top to the cabinet to provide selective access to the compartment;

a viewing screen defined in said top and having a front surface exterior of the top and back disposed toward said compartment;

a slide projector mounted in said compartment and having a controllable slide-changing means associated therewith to operate the means in forward or reverse direction;

a light source associated with the projector to project the slide image onto the back surface of the viewing screen;

manually operable means for selectively varying the intensity of the light source;

a control switch for selectively energizing and de-energizing the projector and light source;

first electro-mechanical control means for operating the slide-changing means in a forward direction, the first control means having a manually adjustable timer operatively associated therewith, the timer adapted to be preset to any desired time interval for operation of the first control means to automatically sequence the slides, the time interval being selectable by the user;

second electro-mechanical control means for operating the slide-changing means in a reverse direction;

a control panel mounted on the top member and having the panel control switch, brighteners control, and adjustable timer mounted thereon for ease of access and use; and

foot operated means for selectively energizing either the first or second control means for operating the slide-changing means in forward or reverse direction for sequential slide selection and projection, the foot operated means including a flat rectangularly shaped bottom member operatively associated with a similarly shaped top member, a rocker element disposed intermediate to top and bottom members between the opposite ends thereof to define a rocking support for the top relative to the bottom, a first switch disposed adjacent to one end of the bottom member and operated by contact with the adjacent end of the top member, a second switch disposed adjacent the opposite end of the bottom member and operated by contact with the adjacent end of the top member, the first switch being electrically connected to the first control means and the second switch being electrically connected to the second control means whereby the user may select the mode of operation by a rocking movement of the foot on the foot operated means to selectively energize either the first or second switch.

3,887,276
RAPIDLY ACCESSIBLE OPTICALLY STORED INFORMATION

Burton Ross Clay, Wayland, and Douglas Alan Gore, Bedford, both of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 134,383, April 15, 1971, abandoned. This application Oct. 18, 1972, Ser. No. 298,706
Int. Cl. G02b *27/00*
U.S. Cl. 353—26 **1 Claim**

1. An optical information retrieval system comprising: a film having a series of frames which has recorded at each frame

thereof a first hologram of an information object,

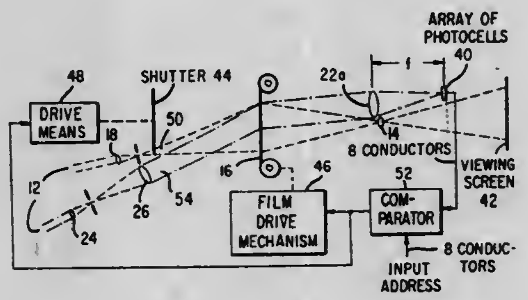
and a second hologram of the Fraunhofer form over a majority of the area of said frame of a binary encoded index object said first hologram being recorded with a first reference beam and said second hologram being recorded with a second reference beam, said first and second reference beams each having a unique and different angle of incidence upon said film;

means for continuously driving said film;

means for applying first and second coherent light beams to the moving film at incident angles substantially identical to the incident angles of said first and second reference beams respectively, so as to reconstruct an image of said information objects and of said binary encoded index objects;

a viewing screen and means for projecting said image of said information objects upon the viewing screen;

an array of light sensing elements disposed at the position of said image of said binary encoded index objects for detecting the binary code of said index objects during movement of said film and for producing a binary output



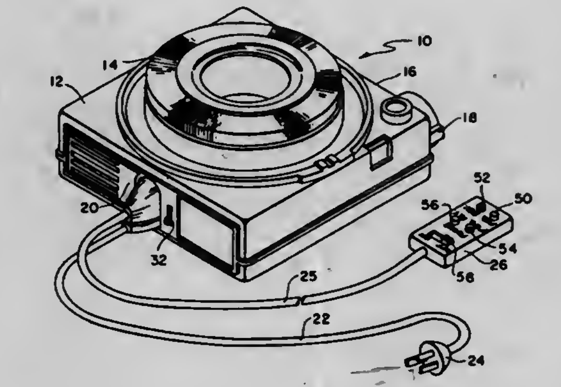
signal indicative thereof, the image of each said index object from a particular frame remaining stationary and superimposed over said array of light sensing elements during the entire time that any portion thereof is in the second coherent light beam; and

comparator means adapted to receive a binary address signal associated with a frame of recorded information object and connected to receive the array binary output signal, said comparator means having an output signal connected to said film driving means for stopping said film when the received signals correspond.

3,887,277
APPARATUS FOR REMOTELY CONTROLLING A SLIDE PROJECTOR

Charles William Tepper, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 14, 1974, Ser. No. 479,322
Int. Cl. G03b *23/00*
U.S. Cl. 353—103 **6 Claims**



1. In an improved control mechanism for remotely controlling an automatic slide projector having operatable means for applying an electrical signal of alternating polarity to said projector and a housing in which is included means energizable for effecting a particular predetermined projector control operation, and an electrical cable having at least one conductor interconnecting the housing and said control mechanism for selectively controlling said projector, said control mechanism compising:

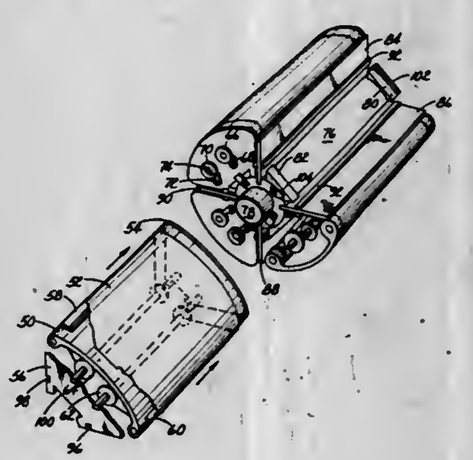
a. switch means connected to said one conductor leading to said projector and movable into first and second positions; and

b. electrical circuit means operatively associated with said switch means, said electrical circuit means including means for defining a first circuit when said switch means is in said first position responsive to a particular polarity of the alternating electrical signal for actuating said operatable means to remove electrical power for said projector and means for defining a second circuit when said switch means is in said second position responsive to a polarity of the alternating signal opposite to said particular polarity for enabling said energizable means to be energized so that the predetermined projector control operation can be effected.

3,887,278
MULTI-SECTION DRUM ASSEMBLY

James Andrew Kolibas, Broadview Heights, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Dec. 3, 1973, Ser. No. 421,219
Int. Cl. G03g *5/10, 15/00*
U.S. Cl. 355—16 **7 Claims**



1. A photoconductor drum assembly for an electrophotographic reproduction apparatus, said assembly comprising;

a stationary support,

a rotary member mounted to said support for rotation about an axis,

a plurality of frame structures mounted to said rotary member, each frame structure including a support surface,

a photoconductor element carried by each of said plurality of frame structures, each photoconductor element comprising a web which extends between a supply location and a take-up location of the associated frame structure with an intermediate portion of the web engaging said support surface, and

releasable fastening means associated with each of said frame structures normally fastening such to said rotary member independently of the other frame structures and for selectively releasing such for movement relative to said rotary member independently of the other frame structures, said fastening means upon release permitting the associated frame structure to be displaced axially of said rotary member for convenient servicing or the like.

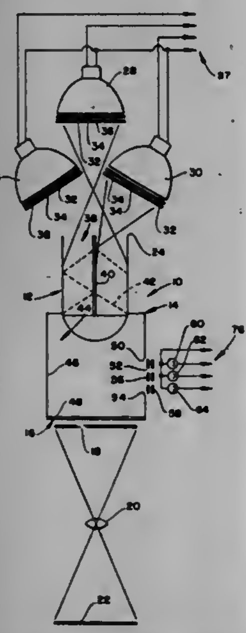
3,887,279
TRICOLOR ADDITIVE SYSTEM FOR A COLOR HEAD

Randolph D. Rubin, 301 W. Ohio, Midland, Tex. 79701

Filed Jan. 2, 1974, Ser. No. 429,574
Int. Cl. G03b *27/76*
U.S. Cl. 355—38 **18 Claims**

1. Method of making color prints from a color negative spaced between a lamphouse and an image producing lens wherein the lamphouse is optically coupled with an enlarger to provide a single source of component light comprised of a plurality of different primary colors, comprising the steps of: supplying said component light with an electrically powered illuminating apparatus for each primary color;

selecting a color intensity for each of the different primary colors;
establishing an electrical reference signal for each primary color, with the magnitude of each said electrical reference signal being representative of the color intensity selected for a primary color;
connecting the last said illuminating apparatus in series with a control means, so that electrical current flowing through the illuminating apparatus can be controlled;
controlling the color intensity of a color component of the component light in proportion to the magnitude of said electrical reference signal;
transmitting a sample of the component light through a filter means which establishes a light source for each different primary color;
measuring the intensity of the transmitted light for each different primary color;
providing an electrical intensity signal which is proportional to said measured intensity;

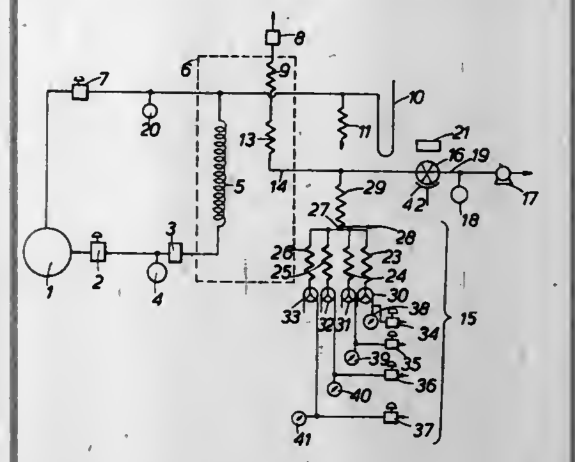


amplifying said electrical intensity signal, conditioning said amplified signal, and connecting the amplified signal to cause the average power applied to the illuminating apparatus to produce the desired light intensity measured for each different primary color;
electronically comparing the electrical intensity signal to said electrical reference signal;
changing said electrical reference signal to a value to cause said electrical intensity signal to attain the selected color intensity;
using a Triac as the control means, and connecting said amplified signal to said Triac by a programmable unijunction transistor by interposing a transformer between the transistor and the Triac and arranging the circuitry whereby a reduction in light intensity will result in triggering the Triac earlier in its cycle to thereby provide a higher power to the illuminating means.

3,887,280
ANALYTICAL APPARATUS AND METHOD OF ANALYSIS

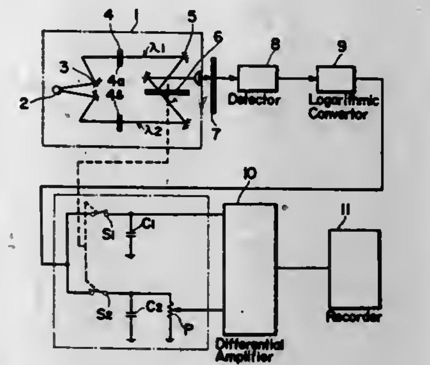
William Ronald McLean, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England
Continuation of Ser. No. 135,836, April 21, 1971, abandoned.
This application Apr. 2, 1973, Ser. No. 346,911
Claims priority, application United Kingdom, Apr. 28, 1970, 20366/70; Apr. 27, 1970, 41246/70
Int. Cl. G01j *3/30*
U.S. Cl. 356—85 **20 Claims**

1. A method of analysis which comprises introducing a carbon-containing sample to a plasma in the presence of helium and a carbon lay-down suppressing amount of a scavenger for carbon, said scavenger being introduced separately before the sample is dissociated, resolving radiation emitted by the plasma according to its frequency, detecting the intensity of radiation characteristic of an element and determining the quantity of the element present from the intensity of radiation so detected.



3,887,281
SPECTROPHOTOMETRIC MEASUREMENT SYSTEM

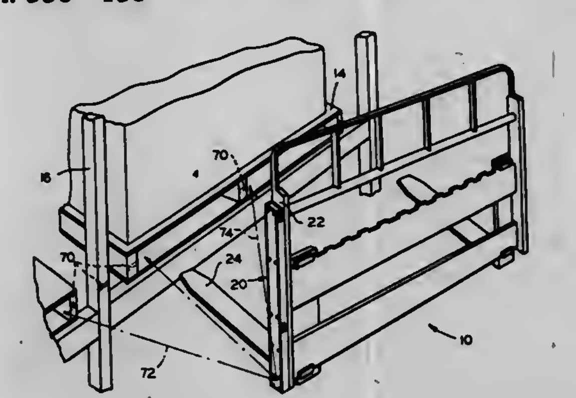
Takashi Kurita; Hiroshi Yamamoto, and Hideki Makabe, all of Kyoto, Japan, assignors to Shimadzu Seisakusho Ltd., Japan
Filed Mar. 31, 1971, Ser. No. 129,667
Claims priority, application Japan, Mar. 31, 1970, 45-27162
Int. Cl. G01j *3/42, 3/48;* **G01n** *21/22*
U.S. Cl. 356—96 **2 Claims**



1. A spectrophotometric measurement system comprising: first means for scanning a first beam of light having first and second wavelength components over a sample of a material, the constituents of which occupy a substantially fixed position within said material, to be spectroanalyzed, said first and second wavelength components impinging upon said sample along the same light path;
second means, disposed relative to said sample upon which said first beam of light has impinged, for receiving said first beam of light after it has impinged upon said sample and for generating first and second electrical signals representative of the intensities of said first and second wavelength components, said second means comprising means for separating said first beam of light, after it has impinged upon said sample, into first and second portions, a first filter disposed in alignment with the direction of said first portion of the separated beam of light and adapted to pass a beam of said first wavelength therethrough, a second filter disposed in alignment with the direction of said second portion of the separated beam of light and adapted to pass a beam of said second wavelength therethrough, a first image receiving unit for receiving an image of the sample to be analyzed, said image being carried by said first separated beam portion, and a second image receiving unit adapted to receive an image of the sample which is carried by said second separated beam portion;
third means, responsive to said first and second electrical signals generated by said second means, for producing a third signal representative of the ratio of said first and second signals, said third means including first and second amplifier means, respectively disposed to amplify the outputs of said first and second image receiving units, an arithmetic amplifier coupled to the output of said first amplifier means and a reference signal input, for comparing the output of said first amplifier means with said reference signal, to thereby control said first amplifier means in response to variations in the output of said first amplifier means, and for supplying the output from said arithmetic amplifier to said second amplifier means as a gain control signal; and
fourth means, responsive to the output of said third means, for recording variations in the ratio of the intensities of said first and second wavelengths, said fourth means comprising means for displaying the signal output of said second amplifier.

3,887,282
CONCAVE CONIC REFLECTOR

Howard C. Hansen, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.
Filed Feb. 22, 1974, Ser. No. 446,195
Int. Cl. G01b *11/26*
U.S. Cl. 356—138 **19 Claims**

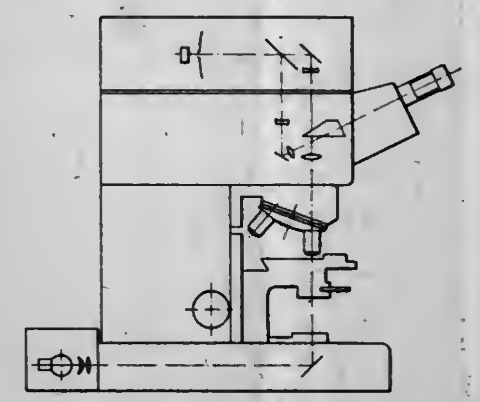


1. In a collimated light generating device for referencing the position of load handling devices and the like, a light reflective element comprising a truncated portion of a substantially concave conical light reflective surface, said light reflective surface being adapted to redirect the rays of light of a substantially collimated beam which are directed onto the reflective surface from a predetermined location into a diverging plane of light substantially collimated in one dimension and adapted to appear as an intense line of light on an adjacent surface.

3,887,283
OPTICAL SYSTEM FOR A MICROSCOPE PHOTOMETRY ATTACHMENT

Kurt Merstallinger, and Klaus P. Schindl, both of Vienna, Austria, assignors to C. Reichert Optische Werke, AG, Vienna, Austria
Filed Apr. 1, 1974, Ser. No. 456,485
Claims priority, application Austria, Apr. 4, 1973, 2940/73
Int. Cl. G01j *1/42;* **G02b** *23/02*
U.S. Cl. 356—219 **5 Claims**

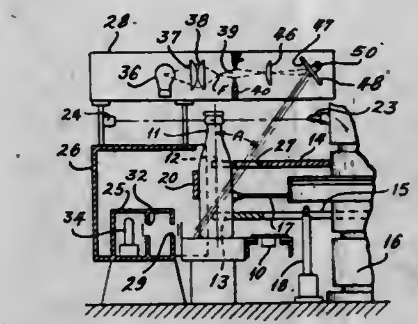
1. In a microscope having an objective, an inclined binocular eyepiece, and a beam deflector associated therewith aligned along an observation axis for viewing an object, the improvement comprising means to move said beam deflector out of the observation axis to provide an alternate observation axis, a positive reflective element aligned on said alternate observation axis, optical means to image said object on said positive reflecting element, said positive reflective element having an aperture axially located therein, means for performing photometric analysis located behind said aperture and permitting photometric evaluation of the corresponding portion of the object imaged on the positive reflecting element,



and reflecting means to deflect the object image reflected by the positive reflective element along said alternate observation axis to said eyepiece to provide the observer simultaneous viewing of said object and said aperture.

3,887,284
SCUFFED CONTAINER DETECTOR

James R. Gender, Kirkwood, and Siamac Faani, Ferguson, both of Mo., assignors to Barry-Wehmiller Company, St. Louis, Mo.
Filed Nov. 14, 1973, Ser. No. 415,615
Int. Cl. G01n *21/16, 21/32*
U.S. Cl. 356—240 **10 Claims**



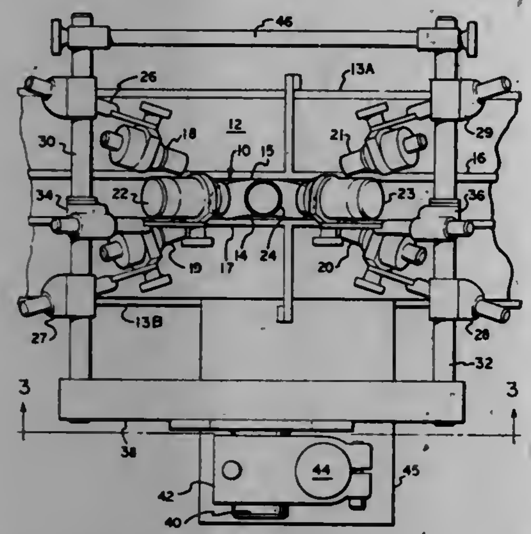
10. Apparatus for detecting objectionable scuff conditions in the wall of transparent containers comprising means to move containers single file through a detection station, a source of light above said station oriented to direct light angularly downwardly toward the containers, said projected light being in the form of a narrow and well defined beam to pass through the container and illuminate the area normally scuffed, a light sensitive member spaced horizontally from and positioned at the opposite side of the station from said projected light beam, said member responding to a predetermined level of light to generate a container reject signal, and means between the containers moved through the station and said light sensitive member to limit the field of view by said light sensitive member to the illuminated area of the containers where scuffing normally occurs, said light sensitive member generating a reject signal for any container having an objectionable scuffed condition causing a diffused light emitting area to generate a light brightness response equal at least to said predetermined level of light.

3,887,285
FLASK INSPECTION

William L. Fry, Lafayette, and Stanislav A. Sacha, Oakland, both, Calif., assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed Feb. 28, 1974, Ser. No. 446,662
Int. Cl. G01n *21/16, 21/32*
U.S. Cl. 356—240 **8 Claims**

1. Apparatus for inspecting glass containers, said glass containers having an elongated neck portion which merges with

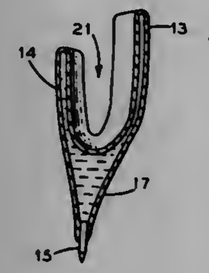
a shoulder portion and a generally elliptical main body cross section with an elongated longitudinal dimension with respect to the transverse dimension, which comprises, in combination:
means for transporting said glass containers in single file and in an upright position to and through an inspection zone along a fixed centerline of travel;



means, positioned in said inspection zone, for illuminating the junction of said neck and shoulder portions along the transverse dimension only of said glass containers;
light responsive means for sensing reflection from defects occurring at said illuminated junction; and.
signal generating means for generating a signal in response to reflection sensed by said light responsive means.

3,887,286
FINGER-TIP WRITING INSTRUMENT

Jackson P. Bucey, 41 Schoefield Rd., Rochester, N.Y. 14617
Filed Feb. 4, 1974, Ser. No. 439,294
Int. Cl. B43b *7/00*
U.S. Cl. 401—7 **8 Claims**

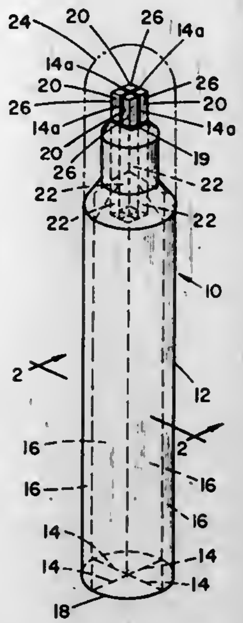


1. In a finger-tip writing instrument comprising an elongated body portion adapted to fit on the end of a finger through one end and provided with writing means at the other end, said body portion including a hollow portion wherein a supply of ink is stored, said ink supply being in communication with said writing means, the improvement wherein said body portion is formed of a material adapted to flex in use, and wherein said body portion consists at least in part of opposed longitudinal members, said opposed members forming channels comprising a longer upper member arced to encompass the top side of said finger and an opposed shorter lower member arced to encompass the lower side of said finger, said upper member being of such length as to cover the first joint of said finger.

3,887,287
MULTI-COLOR MARKING IMPLEMENT

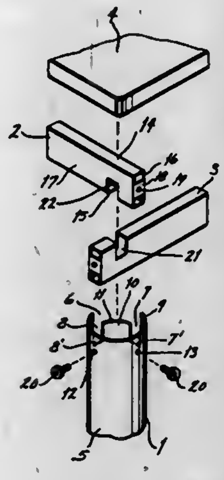
Dale M. Rosh, Jr., R.D. No. 1, Dallastown, Pa. 17313
Filed Feb. 28, 1974, Ser. No. 446,724
Int. Cl. B43k *27/08*
U.S. Cl. 401—35 **2 Claims**

1. A multi-color marking implement having an elongated tubular body closed at one end thereof and at the opposite end thereof a plurality of marking units comprising in combination, a cluster of elongated thin rib members extending longitudinally within said body and engaging each other at adjacent edges with the opposite edges thereof engaging the inner walls of said body to form a plurality of elongated integrally contained stationary ink retaining partition chambers, said ribs extending between the opposite interior ends of said body and outward therefrom at the marking unit end to form separation and support means for nibs, each of said separation and support means enclosing between the sides thereof at the marking unit of said body, a stationary nib formed from material adapted to absorb and respectively retain a different color ink with one end of said nibs being flush with the outer extremity of said ribs and portions of said ribs being exposed outwardly from said separation and support means of the marking end of said implement to provide a marking surface for each nib, and said chambers and nibs respectively being adapted to contain and feed inks of different colors therefrom for selective use of the same for marking purposes.



3,887,288
CORNER CONSTRUCTION

Harold Glaser, St. Louis, Mo., assignor to James Daivd, Inc., Maryland Heights, Mo.
Filed Jan. 8, 1974, Ser. No. 431,617
Int. Cl. F16d *3/00;* **F16g** *11/00*
U.S. Cl. 403—219 **15 Claims**

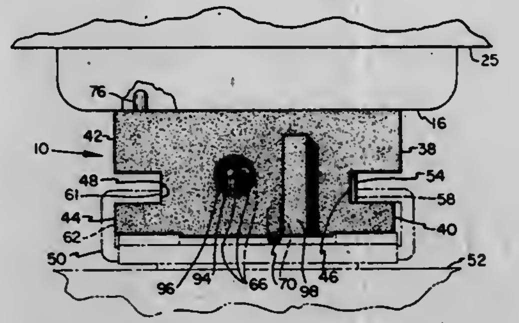


1. A corner construction for furniture and the like comprising a tubular upright having a side wall and a bore open at its normally upper end, a first frame bar, a second frame bar,

cooperative means provided on said first and second frame bars for interengaging same in an intersecting zone wherein the longitudinal axes of said bars are in perpendicular relationship, said intersecting zone being spaced from the adjacent ends of said bars, the said adjacent end of each bar abutting against the inner face of the upright side wall, and means fixedly engaging each of said bars at their said adjacent ends to the upright side wall with the points of engagement being spaced apart through an angle of approximately 90°.

3,887,289
FRICTION FOOT ATTACHMENT

David C. Smart, Westminster, Colo., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Sept. 20, 1973, Ser. No. 399,200
Int. Cl. A44b *17/00*
U.S. Cl. 403—315 **1 Claim**

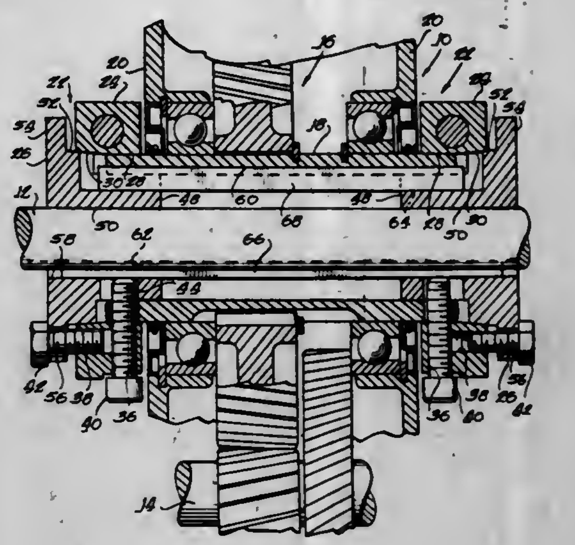


1. A foot means of I-shaped configuration for attachment to a mounting shoe of photographic equipment wherein said shoe is of a C-shaped configuration and is manufactured to any one of a number of different tolerances, comprising a hollow body constructed of high friction material, said body having a hollow portion within the vertical portion of said foot means, said hollow portion being formed by two opposite internal walls whose outer surfaces are walls engageable by said shoe, a bow shaped leaf spring retained in a compressed position within said hollow portion of said body to continuously apply a biasing force in an outward direction between and against said two opposite internal side walls of said body, one of said side walls that forms a vertical portion of said I-shaped hollow body having an opening extending therethrough, the other of said side walls being compressible said bow shaped leaf spring having a portion thereof extending through said opening, said portion of said leaf spring being positioned for compression into said body by a first open end of any selected one of said C-shaped shoes as said body is mounted thereon and to thereby effect a transmission of a force through the remaining part of said leaf spring and outward joint movement thereof with the side wall of said body opposite said wall having said opening thereby to effect a squeezing of said last-mentioned side wall into a firmly mounted frictional engagement against a second open end of said selected shoe, whereby firm attachment of said foot means to any selected one of said shoes is effected notwithstanding that said shoes are not within the same manufacturing tolerance.

3,887,290
SHAFT CONNECTING APPARATUS

Charles F. Taylor, Boulder, Colo., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Aug. 9, 1974, Ser. No. 496,428
Int. Cl. F16n *1/20*
U.S. Cl. 403—370 **14 Claims**

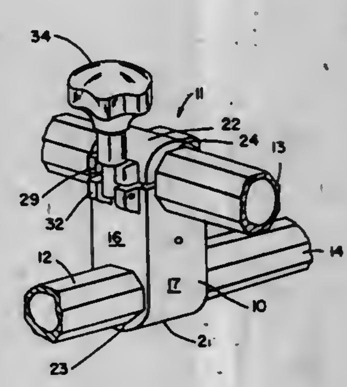
1. Apparatus for connecting and locking a first shaft to a second shaft of larger diameter comprising;
a split grip ring having its internal bore to receive said first shaft and having an external tapered shoulder portion;
a split reinforcing ring having a portion of its internal bore substantially complimentary to said tapered portion of said grip ring and which engages said portion of said grip ring, so that when drawn toward each other said grip ring shrinks to grip said first shaft;
said reinforcing ring also having a portion of its internal bore engaging said second shaft;



means to radially clamp said reinforcing ring to said second shaft and to said grip ring; and
means to axially draw said grip ring toward said reinforcing ring to thereby shrink and grip said first shaft.

3,887,291
CLAMP JOINT FOR SEPARATED MEMBERS

Robert J. Langren, Alameda, Calif., assignor to Hosmer/Dorrance Corporation, Campbell, Calif.
Filed June 10, 1974, Ser. No. 478,056
Int. Cl. F16b *2/06*
U.S. Cl. 403—391 **3 Claims**



1. A frame joint for joining two structural members, comprising:
a housing having first and second passages extending therethrough, each slidably receiving one of the structural members;
a first pin disposed within said housing between said first and second passages and impinging at either end on the structural members, said first pin including a hole extending diametrically therethrough, and a second pin extending through said hole and anchored at both ends thereof in said housing;
securance means joined to said first passage for releasably retaining the structural member therein and for increas-

ing the impingement of said first pin on both structural members;
said securance means including a cover hingeably secured to said housing and forming a portion of said first passage, and tightening means for securing said cover to said housing and driving the structural member within said first passage to impinge on said first pin, said first pin being disposed in pressure transmitting relationship between the structural members to effect pressure clamping of the members in respective passages.

3,887,292
SPANNING JOINTS

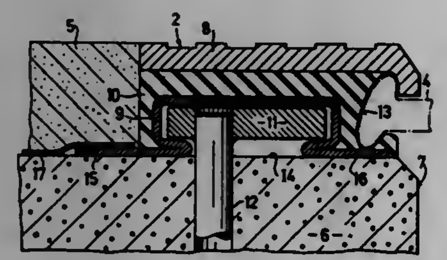
Waldemar Koster, Forsbach, Germany, assignor to Firma Korber-AG, Glarus, Switzerland

Filed Sept. 3, 1974, Ser. No. 501,951

Claims priority, application Germany, Nov. 15, 1973, 2357108

Int. Cl. E01c *11/02*

U.S. Cl. 404—69 **8 Claims**



1. In a device for spanning expansion joints in roads, comprising: marginal bodies of metal and elastomeric material anchored in the joint margins in an opposed arrangement and disposed adjoining the road surface and the joint, said bodies having a lateral groove with an aperture which is open in the direction of the joint for the sealing accomadation of members of an elastic expansion body covering the joint, the improvement in which each marginal body comprises an intermediate layer of rubber, on the underside of which is a metal mounting anchored in the joint margin; and on the upper surface of the intermediate layer there is a metal plate, the groove being defined at least in part by the intermediate layer, the metal mounting and the metal plate.

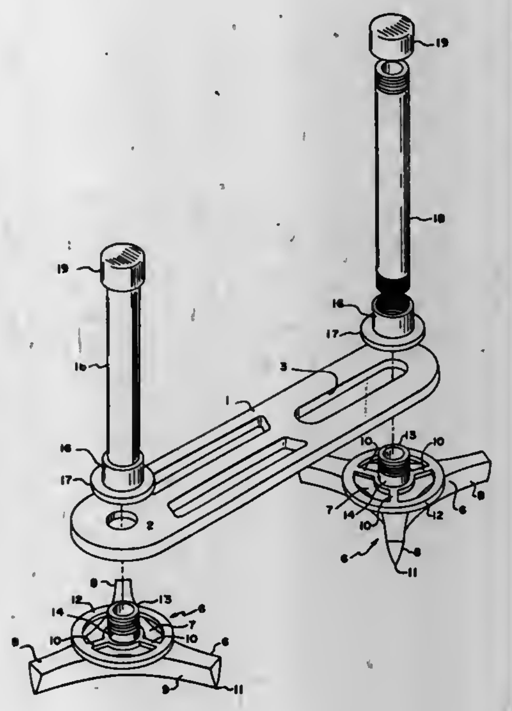
3,887,293
METHOD FOR IMPRINTING NON-REPEATING STONE PATTERNS IN FRESH CONCRETE

Bradshaw Bowman, Carmel, Calif., assignor to Bomanite Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 288,672, Sept. 13, 1972, Pat. No. 3,807,888. This application Apr. 9, 1974, Ser. No. 459,266

Int. Cl. E01c *19/00*

U.S. Cl. 404—72 **3 Claims**



1. A method for imprinting non-repeating stone patterns in fresh concrete comprising the steps of forming a concrete slab on the ground, imprinting a series of generally star shaped impressions in the fresh concrete to form a corner imprint in the stone pattern, interconnecting the corner imprints by impressing a groove into the fresh concrete between the end portions of adjacent star shaped impressions.

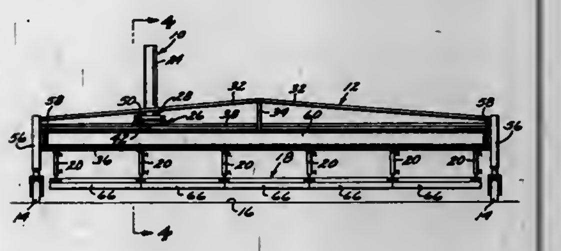
3,887,294
CONCRETE IMPRINTING APPARATUS AND METHOD

John E. Leon, 10165 Swallow Ave., Fountain Valley, Calif. 92708

Filed Nov. 15, 1973, Ser. No. 416,008

Int. Cl. E01c *23/02*

U.S. Cl. 404—89 **11 Claims**



1. A concrete imprinting apparatus comprising:

a frame including means operative to position said frame over a slab of partially set concrete;

imprinting tool means, including a plurality of interengaged tool segments located in adjacent relation and movable relative to one another to conform to the contour of a non-planar slab of concrete, said tool segments each including upwardly projecting impact sections;

a plurality of pressing means carried by said frame and actuable upon said plurality of tool segments, respectively, at points other than said impact sections to urge said tool segments into pressing engagement with said concrete;

an impactor;

impactor raising means supporting said impactor and actuable to release said impactor to fall under the force of gravity for striking said impact sections of said tool means; and

locating means carried by said frame and operative to adjust the position of said impactor relative to said tool means.

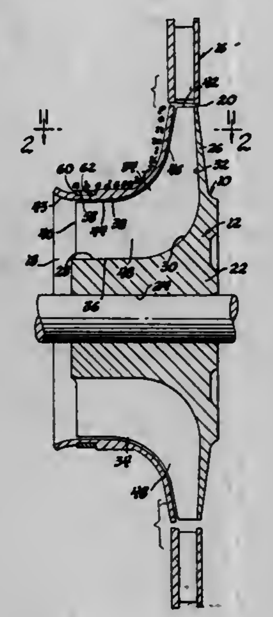
3,887,295
COMPRESSOR INLET CONTROL RING

Mason Kwok Yu, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 3, 1973, Ser. No. 421,033

Int. Cl. F04d *31/00*

U.S. Cl. 415—116 **2 Claims**



1. A centrifugal compressor comprising a stationary shroud with an inner wall having an axial inlet and a radial outlet, a continuously open inwardly converging inlet lip on said shroud fixedly connected with respect to said axial inlet to form a flow transition therebetween, a rotor including a hub adapted to be connected to a drive shaft, said hub including a hub wall having an axial inlet and a radial outlet a plurality of rotor blades supported on said hub wall including a radially outer tip and an axial leading edge and a radial trailing edge thereon, each of said rotor blades defining a flow passage therebetween bound by the inner wall of said stationary shroud and the hub wall and having a flow discontinuity negative pressure region at said tip from the axial leading edge through a part of the chamber length of said tip, a gap in the inner wall of said stationary shroud located circumferentially therearound at the flow transition between said inlet lip and said axial inlet, said gap being in communication with atmospheric pressure exteriorly of said stationary shroud and overlying the rotor blade tips immediately downstream of the leading edge of each of said rotor blades, an annular control ring movable with respect to said gap for regulating the communication between atmosphere and the inner wall of said stationary shroud to produce a controlled bleed of atmosphere to said negative pressure region to produce a uniform pressure and velocity gradient from the inlet to the outlet of each of the said flow passages with the total pressure and indicated air angle of compressed flow through the passages being uniform from the radial outlet of the shroud inner wall to the hub wall.

3,887,296
VIBRATION ABSORBING SYSTEMS

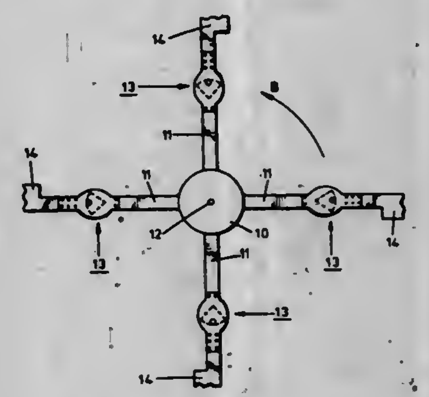
Noel Mills, Yeovil; David Ernest Hall Balmford, Sherborne, and James Edwin Saunders, Bradford Abbas near Sherborne, all of England, assignors to Westland Aircraft Limited, Yeovil, England

Filed Oct. 23, 1973, Ser. No. 408,748

Claims priority, application United Kingdom, Nov. 6, 1972, 51088/72

Int. Cl. B64c *27/32*

U.S. Cl. 416—145 **4 Claims**



1. In a rotary wing aircraft having a main rotor system including a rotor hub and a plurality of rotor blades extending radially therefrom, a vibration absorbing system including at least three vibration absorbers mounted symmetrically about a generally vertical axis of rotation of the rotor system for rotation in a plane generally perpendicular to the rotational axis, each vibration absorber including a housing having an aperture formed therein which extends in a direction generally parallel with the axis of rotation, the aperture being defined in part by an outboard hollowed surface disposed with the concave portion thereof facing the axis of rotation, a spherical ball retained in the aperture so that during rotation of the rotor system the ball is retained in contact with the hollowed surface by centrifugal force, said hollowed surface having a first radius in a first plane generally perpendicular to the plane of rotation so that during operation the absorber cancels or reduces a vibration force of a particular frequency in said first plane, and a second and different radius in a second plane generally coincident or parallel with the plane of rotation so that during operation the absorber simultaneously cancels or reduces a vibration force of a different frequency in said second plane.

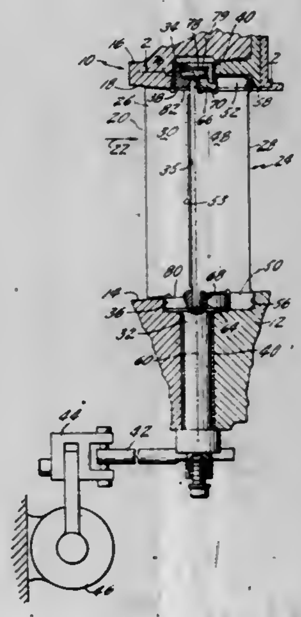
3,887,297
VARIABLE LEADING EDGE STATOR VANE ASSEMBLY

Michael John Welchek, Meriden, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed June 25, 1974, Ser. No. 482,955

Int. Cl. F01d *17/12*

U.S. Cl. 415—161 **5 Claims**



1. A variable stator vane assembly for turbomachinery comprising:

casing means including inner annular casing means having inner surface means and outer annular casing means having outer surface means, said inner and outer surface means defining an annular gas flow path therebetween;

a plurality of stator vanes circumferentially spaced within said flow path, each including a radially extending airfoil, said airfoil including a downstream stationary portion extending from said inner to said outer casing means and an upstream movable portion extending from said inner to said outer casing means, said movable portion including a continuous downstream edge, each of said stator vanes also including an inner spindle and an outer spindle, said inner and outer surface means each including openings therein for accommodating said spindles, said spindles being rotatably disposed therein, each spindle including a circular surface extending across said opening, said inner and outer spindles of each vane also having a common axis of rotation rearward of said downstream edge, said movable portion of said airfoil being fixedly secured to both said inner and outer spindles for rotation therewith, said circular surfaces having a diameter larger than the thickness of said airfoil and overhanging said downstream end of said movable portion, each of said spindles having a cavity therein open at said circular surface thereof and centered on said spindle axis of rotation, said stationary portion of said airfoil having a forward portion and a rearward portion, said rearward portion being secured to said casing means, said forward portion including pin means extending into said cavities of both said inner and outer spindles, said pin means having an axis common to said spindle axis of rotation; and

actuation means connected to said stator vanes for rotating said movable portions thereof.

3,887,298

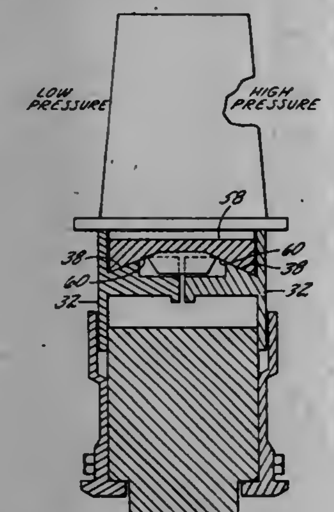
APPARATUS FOR SEALING TURBINE BLADE DAMPER CAVITIES

John R. Hess, Middletown, and Joseph R. Kozlin, West Hartford, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed May 30, 1974, Ser. No. 474,756

Int. Cl. F01d *5/26*

U.S. Cl. 416—220 **7 Claims**



1. In a gas turbine having an axis of rotation, a wheel assembly comprising:

a turbine disk having a circumferentially extending rim with root connecting means spaced along the rim and first and second faces which are substantially perpendicular to the axis of rotation;

a plurality of turbine blades extending radially from the disk, each blade having a root which engages the root connecting means and a platform spaced apart radially from the root by a neck extension;

a plurality of seal plates, each of which abuts the first face of the disk at the rim and the neck extensions of two adjacent turbine blades and has a support section extending between the neck extensions of the adjacent blades; a plurality of vibration dampers each of which is located between the neck extensions of two adjacent blades in a position radially outward from the support of the seal plate, and has a sloped surface facing, and in contact with, the support section of the seal plate which is urged against the first face of the disk by axial components of centrifugal loads during rotation of the wheel assembly; a first sideplate which is in surface contact with the first face of the disk and covers the root portions of a plurality of turbine blades; and

a second sideplate which is in surface contact with the second face of the disk and covers the root portions of a plurality of turbine blades.

3,887,299

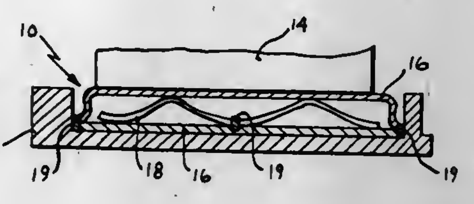
NON-ABRADABLE TURBINE SEAL

Daniel Profant, Glastonbury, Conn., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 28, 1973, Ser. No. 392,381

Int. Cl. F01d *11/08*

U.S. Cl. 415—174 **3 Claims**



1. In a turbine engine comprising a rotating blade member and a surrounding fixed shroud wherein said improvement comprises a non-abradable seal having an outer housing located within and fixed to said shroud, said outer housing being made of an easily deformable foil material and a thin deformable foil material of sine-wave configuration being located within said outer housing with the peaks and depressions of the sine-wave being directed axially and facing the rotating blade member; thereby allowing for the lateral displacement of said seal under the action of said rotating blade member.

3,887,300

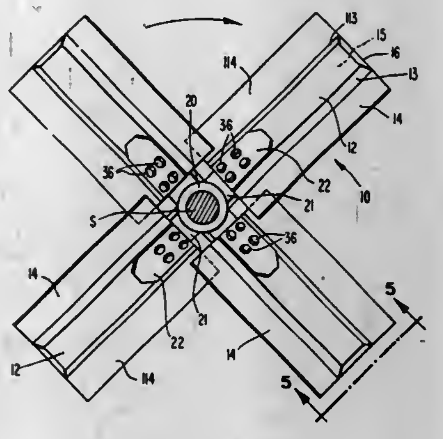
MIXER IMPELLER

Jerome B. Quinn, Kennett Square, Pa., assignor to Philadelphia Gear Corporation, King of Prussia, Pa.

Continuation-in-part of Ser. No. 359,421, May 11, 1973. This application Apr. 11, 1974, Ser. No. 460,105

Int. Cl. B01f *7/24*

U.S. Cl. 416—210 **18 Claims**



1. In combination:

a. an impeller shaft having an axis of rotation;

b. bracket arms secured to said shaft and extending radially outwardly therefrom;

c. impeller blades attached to said bracket arms, said impeller blades comprising:

c-1. a hat section having a crown, opposite brim portions, and side walls inter-connecting said crown and opposite brim portions and forming a hat-section cavity;

c-2. a flat cover plate secured to opposite brim portions and extending across said hat-section cavity and forming, with said brim portions, a forward flat face for said impeller blade;

d. and means connecting the radially-inward end portion of said impeller blade to said bracket arms in such disposition that the forward flat face of said impeller blade is inclined relative to the plane of the rotational axis of said impeller shaft.

3,887,301

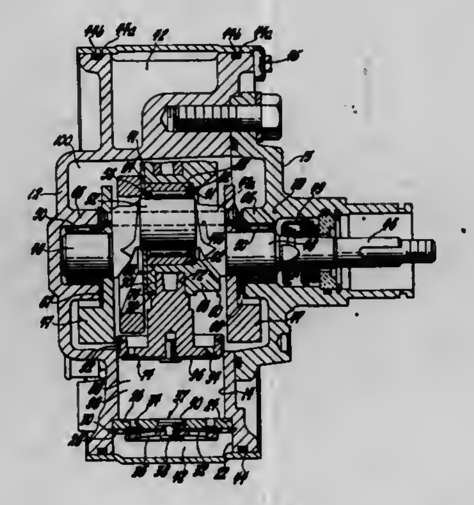
RADIAL COMPRESSOR HAVING IMPROVED PRESS-FIT PISTONS

Harry D. Henkel, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 416,932, Nov. 19, 1973, abandoned. This application June 28, 1974, Ser. No. 483,963

Int. Cl. F04b *1/04*; B23p *15/00*

U.S. Cl. 417—53 **9 Claims**



1. A radial compressor of the type including a cast cylinder housing having cross bores including cylinder walls therein along axes normal to each other, said housing having one closed end and a removable cylinder head closing its other end; a drive shaft rotatably mounted in said housing and said cylinder head, an eccentric on said drive shaft, a slider block rotatably mounted on said eccentric, a pair of yokes disposed normal to each other and having bearing surfaces in engagement with normal surfaces of said slider block, pairs of piston assemblies connected to each yoke so that the pistons extend oppositely from each other from said yokes, said piston assemblies being press-fit connected to said yokes providing a stable connection therebetween, said press-fit connection comprising an aluminum stem on each of said piston assemblies and an aluminum socket on its respective yoke, the diameter of said stem before the press-fit connection being larger than the diameter of said socket and one of said stem or said socket having a thin surface plating of soft metal having the characteristic to form a lubricant as the stem is pressed into the socket thereby to facilitate the press-fit connection, said pistons including a piston-skirt having a sealing ring disposed around the skirt providing a bearing surface between said piston skirt and the cylinder walls of said cross bores, the bearing surface of said sealing ring being sufficiently wide to accomplish a fluid tight seal while providing substantial area of engagement preventing metal-to-metal contact between said piston skirts and said cylinder walls, and valve means to direct fluids to and from the cross bores.

5. A method of press-fitting an aluminum compressor piston to an aluminum compressor yoke to form a stable connection suitable for reciprocation at high speeds along an axis and subject to concurrent lateral cocking forces of like frequency and comprising the steps of forming a socket on the aluminum yoke, forming a stem on the aluminum piston with an interference dimension with respect to the socket, immersion plating one of said stem and said socket in a sodium stannate chemical immersion plating solution to a tin thickness of substantially at least 0.00004 inch; and pressing said stem into said socket wihtout galling either said stem or said socket while controlling the press of said stem with respect to said yoke to an amount at which the final inertial load between said stem and said yoke will not cause deformation of said socket, thereby to form said stable connection.

3,887,302

TORQUE RESPONSIVE REGULATING APPARATUS FOR A PUMP

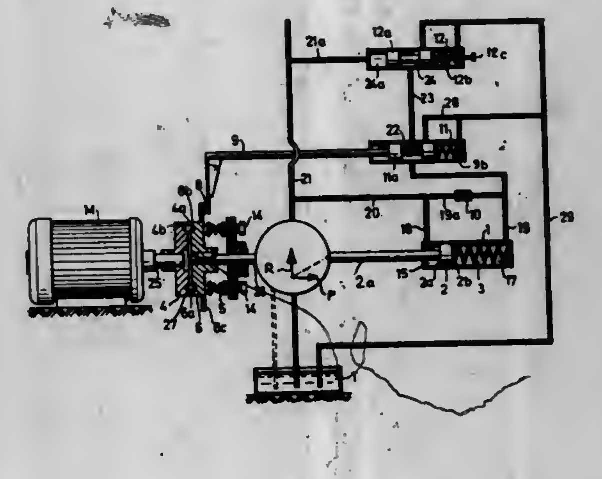
Wilhelm Appel, Lohr, Main, Germany, assignor to G. L. Rexroth GmbH, Lohr, Main, Germany

Filed Aug. 4, 1972, Ser. No. 277,929

Claims priority, application Germany, Aug. 6, 1971, 2139362

Int. Cl. F04b *49/00*

U.S. Cl. 417—212 **8 Claims**



1. Torque responsive regulating apparatus comprising a pump having an input means, a high pressure fluid inlet, and a low pressure reservoir; a drive motor having an output means; torque responsive means having a normal position and an actuated position, and moving to said actuated position when the torque transmitted from said motor to said pump exceeds a predetermined torque; regulating operating means for varying the volume displaced by said pump and including a hydraulic operating motor having an operating piston and an operating cylinder; control means operated by said torque responsive means in said actuated position to actuate said regulating operating means to reduce the volume displaced by said pump, said control means including a control valve and a control slide operated by said torque responsive means to control the flow of fluid in said hydraulic operating motor; a hydraulic circuit including conduits for connecting said pressure fluid outlet and said reservoir with said operating cylinder of said hydraulic operating motor and with said valve cylinder of said control valve; and pressure responsive means responsive to the pressure of the pump and connected with said control valve to operate the same to actuate said regulating operating means when the pressure in said pump exceeds a predetermined pressure.

3,887,303

HERMETICALLY SEALED MOTOR COMPRESSOR

Takashi Matsuzaka; Tsuneo Koga, both of Fuji, and Kazuya Komiyama, Kamakura, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Jan. 19, 1971, Ser. No. 107,681

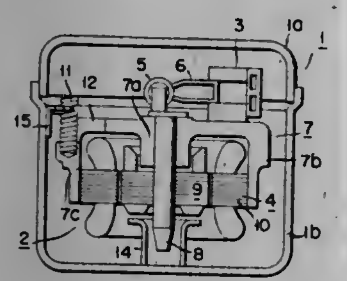
Claims priority, application Japan, Oct. 9, 1970, 45-100176

Int. Cl. F04b *17/00*; F16f *15/00*

U.S. Cl. 417—363 **6 Claims**

1. A hermetically sealed motor compressor including:

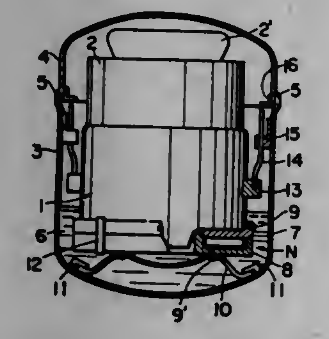
a hermetically sealed casing;
a compressor body housed in said casing and comprising a generally cup-shaped frame having a generally circular rim extending downward therefrom, said frame being provided at the upper portion thereof with a plurality of substantially equally spaced notches for causing the interior of said frame to communicate with the outside thereof, the bottom of each of said notches constituting the horizontally flat upper surface of said rim;
a plurality of generally L-shaped one piece spring hangers equal in number to the number of said notches, each spring hanger comprising a fitting portion fixed to said casing and an arm portion extending inwardly of said casing from said fitting portion, said spring hangers being disposed in said casing at a substantially equal peripheral spacing and with the free ends of said arm portions jointly defining an inscribed circle having a diameter larger than the outside diameter of said frame;
a plurality of springs equal in number to the number of said notches, each spring having the lower end portion thereof fitted into a spring socket provided on the upper surface of the rim at the respective notch, and having the upper end portion thereof connected with the arm portion of the respective spring hanger by means of said free end of said arm portion being inserted between two adjacent coils of the upper end portion of the respective spring; and
a substantially semicircular spring-engaging groove provided on at least one of the upper and lower surfaces of the arm portion of said spring hangers to receive one of the coils of its respective spring.



3,887,304
COMPRESSOR CONSTRUCTION

Takashi Otaki, Okazaki, and Yoshiaki Aihara, Nagoya, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Sept. 20, 1973, Ser. No. 399,046
Claims priority, application Japan, Oct. 25, 1972, 47-10619
Int. Cl. F04b *17/00*
U.S. Cl. 417—363 **6 Claims**

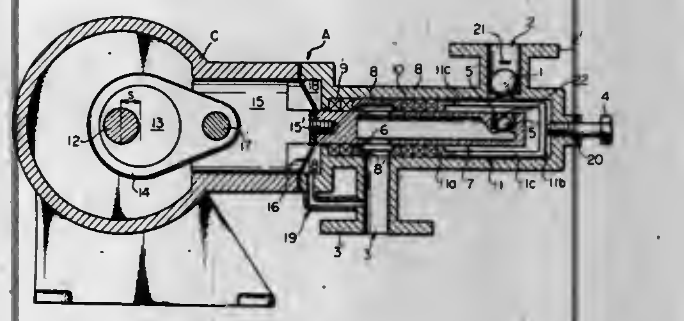


1. A compressor construction comprising a closed casing, a motor compressor body arranged within said casing and having a rotor rotatable about an axis of rotation, spring means for supporting said motor compressor body in said casing at a location spaced from the interior of said casing, a damping liquid comprising a lubricating oil contained in the lower portion of said casing, and damper stopper means connected to said compressor body and including first and second stopper elements, said first stopper element being secured to said compressor body, said second stopper element being supported below said first stopper element within said housing, each of said first and second stopper elements having radially extending blades, the blades of said first stopper member being interengaged between the blades of the second stopper member, the blades of said second stopper member defining chambers therebetween with escape openings for the passage of the damping liquid during the relative movement of said stopper members and the blades thereof and a support spring supporting said second stopper element and mounted in said housing in the damping liquid and being connected to said second and said housing in a manner to prevent rotation of said second element but to permit some vertical movement thereof.

3,887,305
RECIPROCATING PUMP

Kazuichi Ito, No. 1463-4, Ichibu-cho, Ikoma-shi, Nara-ken, Japan

Filed Apr. 17, 1973, Ser. No. 351,825
Claims priority, application Japan, July 18, 1972, 47-310
Int. Cl. F04b *49/00*
U.S. Cl. 417—439 **2 Claims**

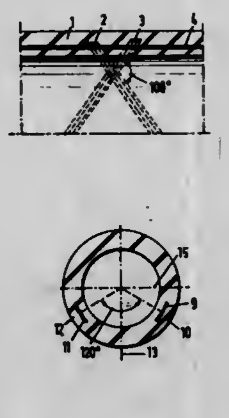


1. In a reciprocating pump, the combination of
1. a cylindrical casing having two closed ends,
2. a liquid discharge conduit near one end of the cylindrical casing,
   a. a check valve being mounted in the discharge conduit,
   3. a liquid inlet conduit near the outer end of the cylindrical casing,
4. a partition means dividing the cylindrical casing into a suction chamber adjacent the other end and a discharge chamber adjacent the one end,
   a. the partition means including a lantern ring having a bore communicating with the inlet conduit and gland packings adjacent the lantern ring and providing a seal between the lantern ring and the suction and discharge chambers, respectively,
5. a flexible sealing member closing the other end of the cylindrical casing, the sealing member and the partition means defining the suction chamber therebetween,
6. a housing having an open end in alignment with the other end of the cylindrical casing,
   a. the flexible sealing member being held between the open end of the housing and the other end of the cylindrical casing,
7. a tubular plunger defining an axial bore reciprocably received in the cylindrical casing in an axial passage of the lantern ring, the tubular plunger having two ends and one of the plunger ends being connected to the flexible sealing member,
   a. an inlet port being arranged in the plunger adjacent the one end thereof and communicating with the axial bore,
   b. an outlet port being arranged in the plunger adjacent the outer end thereof and communicating with the axial bore, and
   c. a check valve being mounted in the outlet port,
8. a drive means mounted in the housing and connected to the one end of the tubular plunger for reciprocating the plunger in the cylindrical casing between positions wherein the inlet port is in and out of register with the inlet conduit, and
9. a conduit interconnecting the suction chamber and the liquid inlet conduit.

3,887,306
PERISTALTIC PUMP AND HOSE THEREFOR

Jan Willem Gerritsen, Raadhuisstraat 75 a,, Alphen a/d Rijn, Netherlands

Filed Jan. 29, 1974, Ser. No. 437,702
Claims priority, application Netherlands, Jan. 31, 1973, 7301380
Int. Cl. F04b *43/18, 43/12, 45/06*
U.S. Cl. 417—477 **8 Claims**

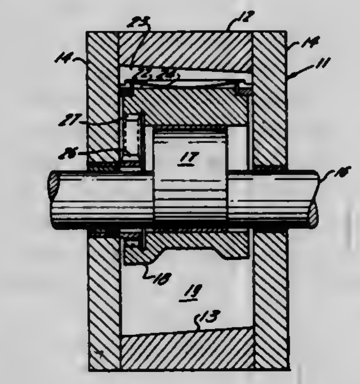


1. A peristaltic pump comprising a plurality of thrust rollers mounted for rotation and movable in a circular orbit around a central shaft, an arcuate support track concentrically around part of said orbit, and a hose of uniform thickness reinforced with threads of strong material, such as steel, said hose being arranged to be locally squeezed shut by said thrust rollers against said support track, characterized in that reinforcing threads extending in the longitudinal direction of the hose are embedded exclusively in two wall zones of said hose, said wall zones, as viewed in the cross-section of the hose, being located in a relatively small sector and symmetrically on opposite sides of a diameter perpendicular to said central shaft.

3,887,307
ROTARY MECHANISM WITH DIE-CAST TROCHOIDAL HOUSING

Winthrop B. Pratt, North Haledon, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Apr. 30, 1974, Ser. No. 465,477
Int. Cl. F01c *1/02*
U.S. Cl. 418—61 A **7 Claims**

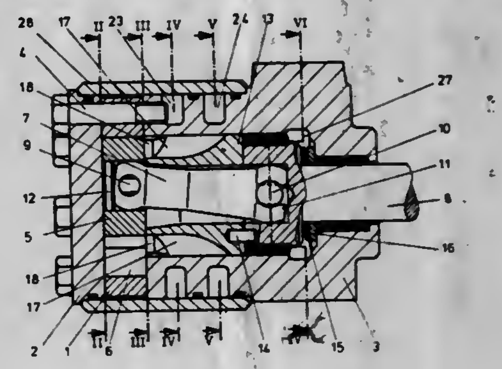


1. A rotary mechanism having a housing comprising a peripheral shell having a generally trochoidal inner surface and a pair of side walls defining therein a rotor cavity, a shaft journaled by the side walls coaxially with the peripheral shell and having an eccentric portion within the rotor cavity, a rotor of generally polygonal profile having a plurality of apex portions and rotatably mounted on the shaft eccentric portion, the rotor apex portions sweeping the inner trochoidal surface in sealing relation thereto, wherein the improvement comprises:
   a. the peripheral shell being a die-cast member, the inner trochoidal surface thereof being tapered in the axial direction from the side adjacent one side wall to the side adjacent the opposite side wall, the amount of taper being from about ½° to about 1½° and
   b. the rotor having at each apex portion sealing means sweeping the inner trochoidal surface of the peripheral shell, the sealing means comprising a slot having radial depth and axial extent in each rotor apex portion, and a sealing strip disposed in each slot with the radially outer edge of the sealing strip parallel to the tapered inner trochoidal surface and resiliently urged into sealing contact therewith.

3,887,308
VALVE PORTING ARRANGEMENT FOR A GEROTOR

Karl-Heinz Liebert, Schwabisch Gmund, Germany, assignor to Zahnradfabrik Friedrichshafen AG, Germany

Filed Apr. 30, 1973, Ser. No. 355,411
Claims priority, application Germany, Apr. 29, 1972, 2221183
Int. Cl. F01c *1/02;* **F03c** *3/00;* **F04c** *1/02*
U.S. Cl. 418—61 B **16 Claims**



1. In a fluid displacing device, a housing (3) having separate ports (24 and 25) and to which an internal gear (1) is fixed, an external gear (5) in mesh with the internal gear to form pressure chambers (6) within the internal gear, a power shaft (8) and articulated means (7) coupling the shaft to the external gear for imparting planetary movement thereto causing expansion and contraction of said pressure chambers, a fluid distributing system including a flow controlling member (13) mounted on the coupling means having a radially outer valve surface and an axial end surface in sliding contact with the external gear, means directly connecting the flow controlling member to the power shaft for rotation thereof at the same speed as the external gear to control flow of fluid at said valve surface to and from the ports and conduit means (17–18) mounted in the flow controlling member to form passages in continuous fluid communication with the pressure chambers and said valve surface of the flow controlling member for conducting said flow of fluid between said ports and said pressure chambers during rotation of the power shaft.

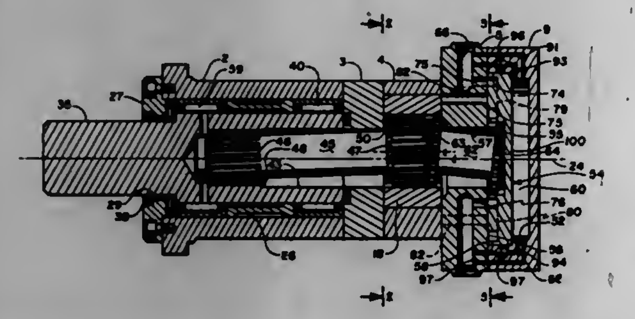
3,887,309
HIGH PRESSURE EXPANSIBLE CHAMBER DEVICE

Wayne B. Easton, 3001 W. 96th St. Cir., Bloomington, Minn. 55431

Filed Jan. 10, 1974, Ser. No. 432,196
Int. Cl. F01c *1/02;* **F03c** *3/00;* **F16k** *25/00*
U.S. Cl. 418—61 B **3 Claims**

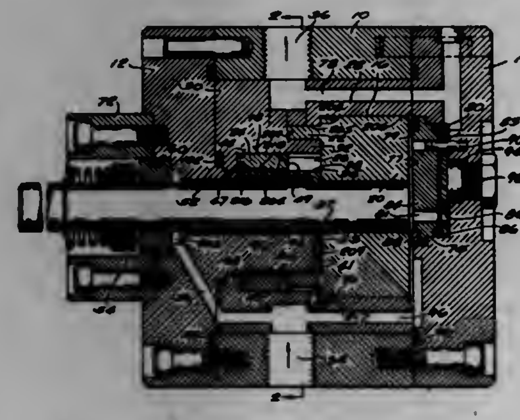
1. A fluid pressure operated device of the expansible chamber type comprising a casing, expansible chamber means, a valve block having a fluid transfer surface, said valve block

having a plurality of expansible chamber feeding and exhausting passages having fluid communication with said expansible chamber means and having openings in said transfer surface, a valve having a surface engaging said transfer surface, said valve surface having recessed feeding and exhausting sections,reversible inlet and outlet passages in said valve block having openings in said transfer surface and respective constant fluid communication with said feeding and exhausting sections of said valve, said valve block inlet passage and said valve feeding section forming fluid inlet path means, said valve block outlet passage and said valve exhausting section forming fluid outlet path means, said valve being cyclically movable relative to said transfer surface with said feeding and exhausting sections thereof sequentially feeding and exhausting said expansible chamber passages, said casing forming a valve biasing pressure chamber for said valve, first restrictor passage means between said inlet path and said chamber and second restrictor passage means between said outlet path and said chamber to provide a predetermined valve biasing pressure in said chamber intermediate the fluid pressures in said inlet and outlet passages, the magnitude of said biasing pressure being dependent on which one of said reversible inlet and outlet passages is used as an inlet passage, said first and second restrictor passage means each including at least two passages with at least one passage thereof being a one-way passage and at least one other passage thereof being a two-way passage and drive means between said expansible chamber means and said valve.



3,887,310
HYDRAULIC PUMP/MOTOR WITH HYDROSTATICALLY BALANCED ROTORS

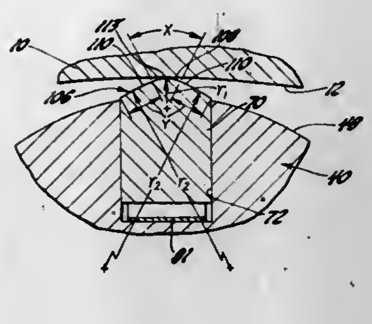
Karol Gerber, 3336 E. Whittaker Ave., Cudahy, Wis. 53110
No Drawing. Filed July 2, 1973, Ser. No. 376,031
Int. Cl. F01c *1/10, 21/00;* **F03c** *3/00*
U.S. Cl. 418—72 **12 Claims**



1. In a pump/motor unit having a housing with a rotor chamber, a liquid inlet at one side of the chamber and a liquid outlet at the other side of the chamber, said inlet and outlet providing for passage of liquid through said chamber, power and idler rotors in said chambers, said rotors having intedigitable teeth, bearings upon which said rotors turn, the improvement for hydraulically balancing hydrostatic pressure on the idler rotor and comprising pressure chamber means between the idler rotor and its bearing, said pressure chamber means comprising narrow grooves, the bearing surfaces between said grooves being wider than the grooves and defining hydraulic film spaces fed by said grooves and duct means from the rotor chamber to said grooves to conduct pressurized liquid to said pressure chamber means and counter-balance the hydrostatic pressure of said liquid on the idler rotor, said idler rotor having a cylindrical hub, said pressure chamber means comprising a plurality of such narrow grooves disposed radially in one axial end of said hub and running out at the inner surface of the hub and a like plurality of such narrow grooves extending axially along the inside of said hub and running out at the end of the hub and intercommunicating with said radial grooves.

3,887,311
ROTARY MACHINE APEX SEAL

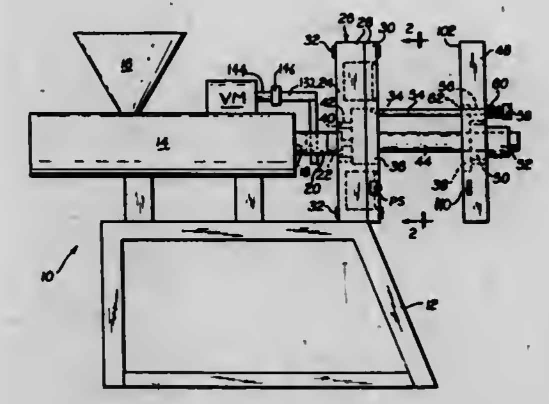
Paul J. Louzecky, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 28, 1974, Ser. No. 455,564
Int. Cl. F01c *19/02*
U.S. Cl. 418—113 **3 Claims**



1. A rotary machine having an internal peripheral wall and oppositely facing side walls coooperatively defining a cavity, said peripheral wall defined by a curve that is parallel to and spaced outwardly a predetermined oversize dimension from a multi-lobed generated closed curve, a crankshaft having an eccentric in said cavity, a multi-lobe rotor rotatably mounted on said eccentric, said rotor having a plurality of apexes that remain adjacent said peripheral wall as said rotor and said crankshaft rotate, said rotor having peripheral faces extending between pairs of said apexes that cooperate with said cavity walls to define a plurality of working chambers that vary in volume and move with said rotor, an apex seal mounted at each said apex on said rotor having an outwardly facing convex sealing surface that has moving line contact with said peripheral wall as said rotor and said crankshaft rotate for sealingly separating adjacent working chambers, each said sealing surface symmetrical to a radial plane through the axis of said rotor and the associated rotor apex that determines an apex seal angle with respect to a plane perpendicular to the line of tangency to said peripheral wall at the line of sealing contact, said apex seal angle varying between ± a maximum apex seal angle as said rotor and said crankshaft rotate, each said sealing surface having two identical end portions contiguous with a center portion located therebetween, said center portion centered on the radial plane through the associated rotor apex and having a constant radius of curvature substantially equal to said oversize dimension, and said end portions located at identical angular locations either side of the radial plane through the associated rotor apex and tangent to said center portion and having constant radii of curvature substantially equal to the radius of curvature of said peripheral wall at said maximum apex seal angle.

3,887,312
INJECTION MOLDING APPARATUS

Eugene G. Seary, 33 Alide Ave., Hillcrest Binghamton, N.Y. 13901
Continuation of Ser. No. 157,605, June 28, 1971, abandoned, which is a continuation of Ser. No. 822,655, May 7, 1969, abandoned. This application Nov. 21, 1972, Ser. No. 308,477
Int. Cl. B29f *1/03, 1/06*
U.S. Cl. 425—3 **10 Claims**



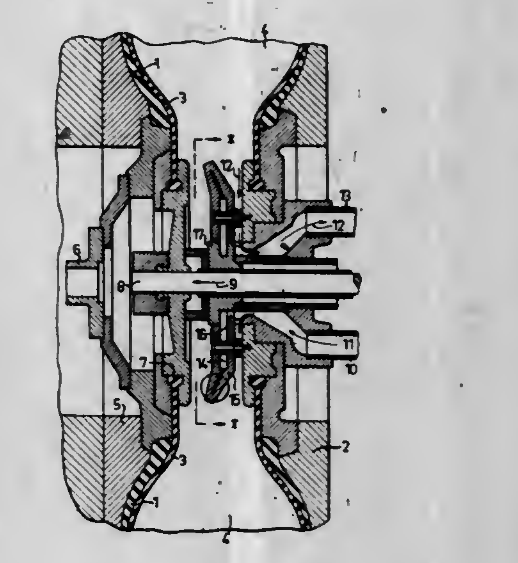
1. In an injection molding apparatus including a pair of platens relatively movable between closed and open positions for closing and opening a mold, means for moving said platens into and out of said two relative positions comprising:

a. an electro-magnetic winding embedded in one of said platens;
b. circuit means for energizing said winding with a magnetizing current in one direction for attracting said other platen thereto to close said platens;
c. means for biasing said platens to their open position; and
d. circuit means for energizing said winding with a current in the reverse direction of a value sufficient to reduce residual magnetism to a degree that said baising means can move said platens to said open position but below a value to reclose said platens.

3,887,313
VULCANIZING DEVICE FOR OPEN HOLLOW BODIES, ESPECIALLY TOROIDAL RAW PNEUMATIC TIRES

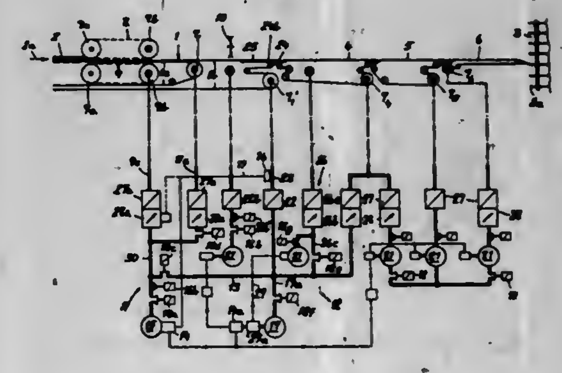
Roland Jaedicke, Hemmingen-Westerfeld, and Ulfert Schmidt, Hannover, both of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany
Filed Oct. 25, 1973, Ser. No. 409,581
Int. Cl. B29h *5/02*
U.S. Cl. 425—42 **7 Claims**

1. A curing device for open hollow bodies, especially toroidal raw pneumatic tires, which includes in combination: a mold, mold receiving means for receiving a mold for a hollow body to be cured, hollow heat carrying means movable selectively into and out of a hollow body inserted into the interior of the mold in said mold receiving means and adapted in its interior to receive and carry a heating substance, conveying means associated with said heat carrying means for conveying a heating substance into said heat carrying means when the latter is inserted into the hollow body to be cured, said conveying means including nozzle means forming the inner end of said conveying means, said nozzle means including housing means defining a chamber and provided with opening means communicating with the interior of said heat carrying means, tubular means having an inlet communicating with said chamber and having an outlet communicating with the interior of said heat carrying means, and a nozzle having an inlet communicating with said conveying means and having a mouth adjacent said inlet of said tubular means, whereby heating substance passing from said nozzle into said tubular means draws heating substance from said chamber into said tubular means while intermixing with said last mentioned heating substance.



3,887,314
SYSTEM FOR THE PRODUCTION OF PRESSED BOARD

Egon Andresen, Nieder-Ramstadt; Wolfgang Reiners, Kapellen, Kr. Moers, and Alfons Klassen, Krefeld, all of Germany, assignors to G. Siempelkamp & Co., Krefeld, Germany
Filed June 29, 1973, Ser. No. 374,982
Claims priority, application Germany, June 29, 1972, 2231802; Sept. 9, 1972, 2244315
Int. Cl. B29j *5/08;* **B29d** *7/14*
U.S. Cl. 425—135 **12 Claims**



1. In an apparatus for the production of pressed board comprising a press having upper and lower press belts and transport conveyors for advancing a layer of compressible material into, through and beyond said press, said conveyors including a press-traversing belt, said press-traversing belt at least intermittently being synchronized with said press belts, the improvement which comprises a first drive operatively connected to said press belts for driving same, a second drive operatively connected to said conveyors and independent of said first drive, and further comprising means for mechanically synchronously coupling said drives for accelerating said belts to a normal operating speed for compression of said layer between said press belts, and for decoupling said drives upon attainment of said speed, said first drive including a motor, a device responsive to the torque at said press-traversing belt for producing a control signal upon decoupling of said drives by the last-mentioned means, and means responsive to said signal

for controlling said motor to maintain synchronism of said press-traversing and press belts.

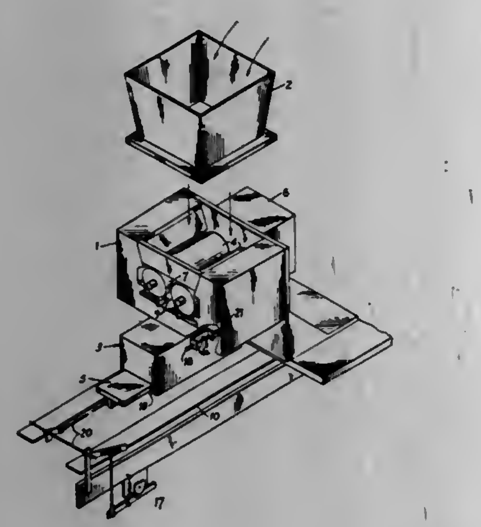
3,887,315
APPARATUS FOR METERING AND SHAPING MATERIALS

Malcolm E. Phillips, Jr., Richmond, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed Oct. 5, 1973, Ser. No. 403,870

Int. Cl. A01j *17/00;* **A21c** *5/00*

U.S. Cl. 425—209 **6 Claims**



1. An apparatus for the production of discrete portions of material from a source of supply including: a first chamber provided with contra rotating roller means for introducing a stream of material to be divided; means for receiving such material and urging the forward movement of the material through a predefined area further downstream; a second chamber provided with a plurality of predefined channels for receiving material from the point of exit of said first chamber to enable further distribution of said material; said second chamber being juxtapositioned with respect to said first chamber, being provided with manifolding means having adjustable baffle means disposed therein for controllably distributing said stream of material in its course of travel; orifice means disposed at a point proximate the exit of said second chamber enabling the egress of said material and means cooperatively associated with said orifice means being defined by movable orifices conforming in cross-section substantially to that of said fixed orifices including contoured knife portions adapted to co-act with the contour of said fixed orifices for forming said discrete portions of material exiting from said orifice means.

3,887,316
APPARATUS FOR INJECTION-BLOW-MOLDING HOLLOW ARTICLES

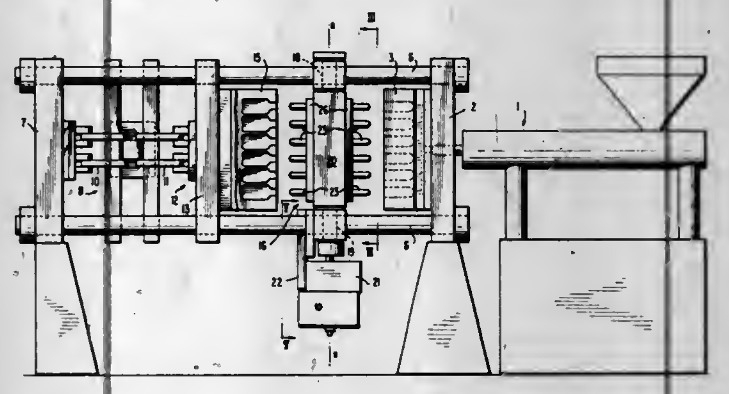
Borge Hestehave, 8031 Beechwood Dr., Alta Loma, Calif. 91701

Filed Aug. 2, 1972, Ser. No. 277,274

Int. Cl. B29c *5/06*

U.S. Cl. 425—242 B **16 Claims**

1. A machine for making articles of moldable material such as plastics and the like by sequentially injection molding a parison around a mandrel and blow molding the parison to form the finished hollow articles; said machine comprising: an injection molding station, a blow molding station, an intermediate station arranged between said injection molding station and said blow molding station and including an open space, mandrel means including at least one mandrel for forming a core support for a parison to be injection molded at the injection molding station, transfer means for transferring said mandrel and associated parison from said injection molding station to said blow molding station, clamping mold means arranged adjacent said mandrel and having a mold surface configuration corresponding to the final desired shape of a portion of the hollow article to be made, said clamping mold means being connected to said transfer means for movement with said mandrel from said injection molding station to said blow molding station, said clamping mold means including a plurality of parts forming a disengageable clamping connection with said portion of the hollow article for holding said parison on said mandrel during transfer from said injection molding station to said blow molding station, clamping means for normally maintaining said clamping mold means in clamping engagement with said parison throughout the transfer from the injection molding station to the blow molding station, and selectively actuable first disengaging means for selectively releasing said clamping mold means when said parison is at said intermediate station adjacent said open space to facilitate removal of said parison from said mandrel during shut down and start up of the machine, wherein said clamping mold means includes two parts, and wherein said clamping means includes spring means normally biasing said two parts toward one another, and wherein said first disengaging means includes a cam and toggle arrangement for moving said two parts away from one another against the action of the spring means.



3,887,317
PRESSING APPARATUS

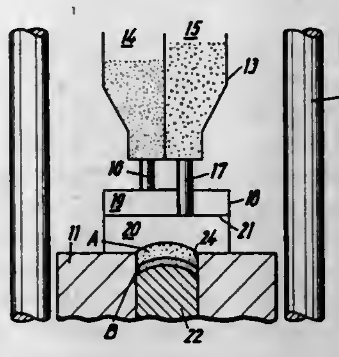
Werner Plocher; Horb Ihlingen; Franz Kuhl, all of Herdecke, and Bernhard Hüttermann, Glinde, all of Germany, assignors to Jurid Werke GmbH, Glinde and Maschinenfabrik Lauffer & Butscher, Muhlen, both of, Germany

Filed June 3, 1974, Ser. No. 476,148

Claims priority, application Germany, June 6, 1973, 2328700

Int. Cl. B30b *11/02, 15/30*

U.S. Cl. 425—257 **8 Claims**



1. A pressing apparatus for transforming volumes of powder-like material into compacted bodies, comprising

a table,

a die chamber within said table and having a filling opening defined by parts of said table,

compacting means cooperating with said die chamber for compacting the contents thereof,

guideway means laterally spaced from said filling opening,

a connecting portion on said table between said guideway means and said filling opening,

a plurality of charging frames, each frame defining a hollow space and having an open top for receiving powder-like material, and an open bottom for the discharge of said material,

first means for moving said frames along said guideway means,

second means for moving said frames out of said guideway means and along said connecting portion on top of said filling opening and back, and

means for closing said bottom opening outside of said filling opening.

3,887,318
CONTINUOUSLY OPERATING PRESS

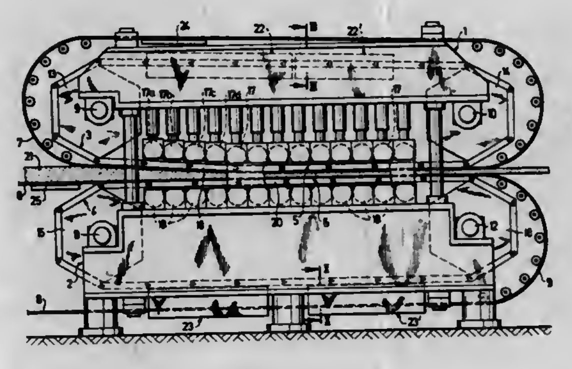
Albert DeMets, Kachtem, Izegem, Belgium, assignor to Bisonwerke Bahre & Greten GmbH & Co. Kg, Germany

Filed Mar. 8, 1973, Ser. No. 339,039

Claims priority, application Germany, Mar. 8, 1972, 2211191; Apr. 24, 1972, 2220074

Int. Cl. B29c *15/00*

U.S. Cl. 425—371 **26 Claims**



1. A press for producing boards such as chipboards, fibreboards, and the like; said press comprising:

a first movable endless belt formed of heatable belt parts,

a second movable endless belt formed of heatable belt parts, guiding and moving means for guiding and moving said first and second belts with respective outer surfaces of said belts in facing relationship and moving in the same direction over a material pressing portion of the respective travel paths of said belts such that material forming said boards can be conveyed by and compressed between said belts along said material pressing portion of said respective travel paths,

and heating means for heating at least one of said first and second belts, said heating means including at least one flame burner directing a heating flame against a portion of at least one of said belts and burner exhaust gas conducting means for directing exhaust gases from said at least one flame burner against portions of at least one of said belts which are spaced from said portion being directly heated by said heating flame.

3,887,319
APPARATUS FOR THE EXTRUSION OF ULTRA HIGH MOLECULAR WEIGHT POLYMERIC RESINS

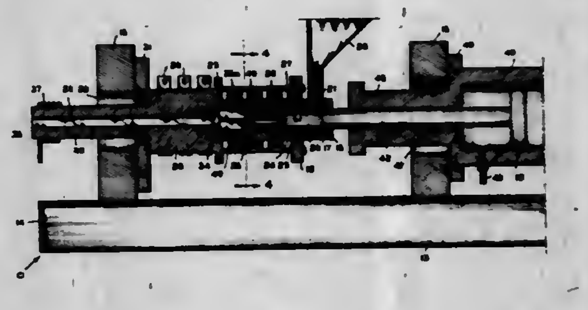
Robert A. Cottingham, York, Pa., assignor to The Polymer Corporation, Reading, Pa.

Filed Dec. 8, 1972, Ser. No. 313,233

Int. Cl. B29f *3/08*

U.S. Cl. 425—379 R **7 Claims**

1. Apparatus for the extrusion of a continuous length of ultra high molecular weight polyethylene, said apparatus including a precompression chamber; means for delivering successive charges of particulate ultra high molecular weight polyethylene to said precompression chamber; a preheating chamber connected to said precompression chamber in axial alignment therewith, the diameter of said preheating chamber being substantially identical to that of said precompression chamber; heating means for maintaining the temperature in said preheating chamber at predetermined level; an elengated die connected to said preheating chamber in axial alignment therewith, said die having an elongated passageway provided with a tapered inlet portion adjacent one end thereof and a discharge orifice adjacent the other end thereof extending therethrough, said tapered inlet portion increasing substantially in diameter from a profile complementary to that of said elongated passageway to a size complementary to that of said preheating chamber; the transverse area relationship between the diameter of the preheating chamber and the profile of the elongated die passageway being on the order of 3:1 temperature control means extending substantially the entire length of said die for creating a predetermined maximum temperature at the die inlet for insuring the formation of a homogeneous mass and gradually reducing to a lower level as the extrusion exits from said discharge orifice; and reciprocable ram means mounted in axial alignment with said precompression chamber for successively compacting and advancing charges of particulate ultra high molecular weight polyethylene through said preheating chamber and into said die passageway.



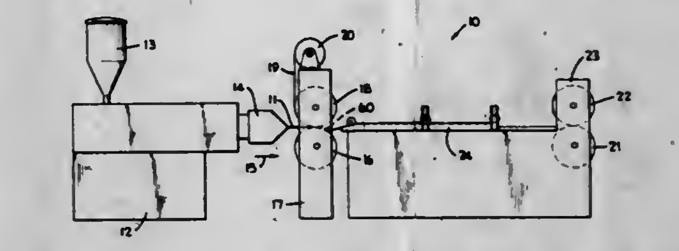
3,887,320
METHOD AND APPARATUS FOR CONTINUOUSLY FORMING PLASTIC SHEET AND CORRUGATING WITH VACUUM PRESSURE

Richard H. Erlewine; Charles W. Richter, III, and Arthur J. Calpha, Jr., all of Marion, Ind., assignors to General Plastics Corporation, Marion, Ind.

Filed Apr. 13, 1973, Ser. No. 350,727

Int. Cl. B29c *17/04*

U.S. Cl. 425—384 **5 Claims**



1. An apparatus for producing grooves in a sheet of plastic comprising:

a supporting bed for receiving said sheet including a heated portion and an adjacent cooled portion, said bed further including a top surface with a plurality of ridges and grooves formed on said top surface extending through the length of said cooled portion and at least partially through the length of said heated portion, said bed having holes extending through said top surface in said grooves to facilitate air removal;

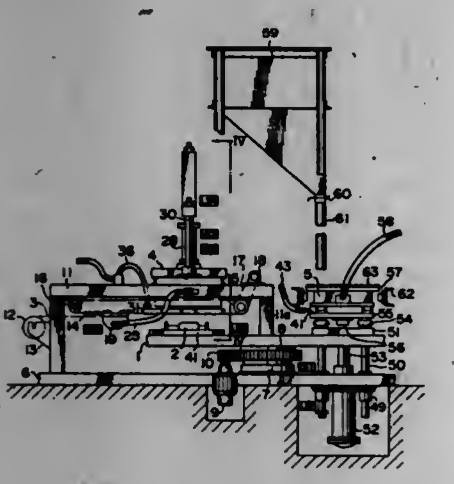
heating means operable to controllably heat said heated portion to maintain said sheet in a soft condition;

cooling means operable to controllably cool said cooled portion for the cooling and hardening of said sheet;
air means operable to withdraw air through said holes in said bed creating a vacuum in said grooves of said bed between said sheet and said bed forcing said sheet into said grooves of said bed;
said bed including a pair of longitudinally extending edge portions with said ridges and grooves positioned therebetween, said edge portions having top surfaces with passages extending therethrough connected to said air means which is operable to withdraw air through said passages effecting an airtight seal between said edge portions and said sheet moving thereon and further comprising:
said edge portions each having a slot extending the length thereof; and
pressure means projecting into said slot with said sheet forced between said pressure means and said slot.

3,887,321
VACUUM SEALED MOLDING APPARATUS

Itsuo Hijikata, Nagoya; Masayoshi Kasazaki, and Hideto Terada, both of Toyokawa, all of Japan, assignors to Sintokogio Ltd., Japan

Division of Ser. No. 334,708, Feb. 22, 1973, Pat. No. 3,843,301. This application Apr. 30, 1974, Ser. No. 465,568
Claims priority, application Japan, Feb. 23, 1972, 47-19154; Feb. 23, 1972, 47-19155
Int. Cl. B29c *17/04*
U.S. Cl. 425—388 **2 Claims**

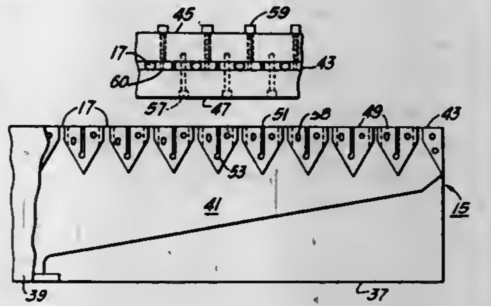


1. A vacuum sealed molding apparatus comprising
means for transferring a pattern fixed on a pattern plate from a first position to a second position and then from said second position to said first position, said second position being apart from the first position and provided with means for supplying a charge of heat resisting particulate material into a flask which is conveyed to said second position;
covering sheet supplying means disposed at a third position apart from said first and second positions for holding a web of a covering sheet of synthetic resin in a roll form; a frame member movable from said first position to said third position and then from said third position to said first position and consisted of surrounding side walls forming an open end thereof and a vacuum chamber provided along the side walls having a slot to draw said covering sheet to said slot by vacuum suction, said frame member being operative to hold said covering sheet on the surface of said open end by said vacuum suction when it is moved to said third position and to pull out said sheet from said supplying means when being moved to said first position whereby said pulled out sheet is supplied at the third position so that said frame member moved again to the third position is adapted to hold said sheet;
means for causing vertical movement of said frame member holding said sheet or said pattern transferred to said first position relatively toward each other so as to apply said covering sheet on the surfaces of the pattern and the pattern plate and means disposed at the second position for causing vertical movement of said flask or said pattern relatively so as to set the flask on the pattern covered with the covering sheet and then remove said pattern from the flask after molding.

3,887,322
EXTRUDER DIE FOR MULTIPLE STREAM EXTRUSION

Keith G. Johnson, Pittsburgh, and Anthony Paul Limbach, Downingtown, both of Pa., assignors to Arco Polymers, Inc., Glenolden, Pa.

Filed Nov. 28, 1973, Ser. No. 419,812
Int. Cl. B29f *3/04*
U.S. Cl. 425—466 **2 Claims**

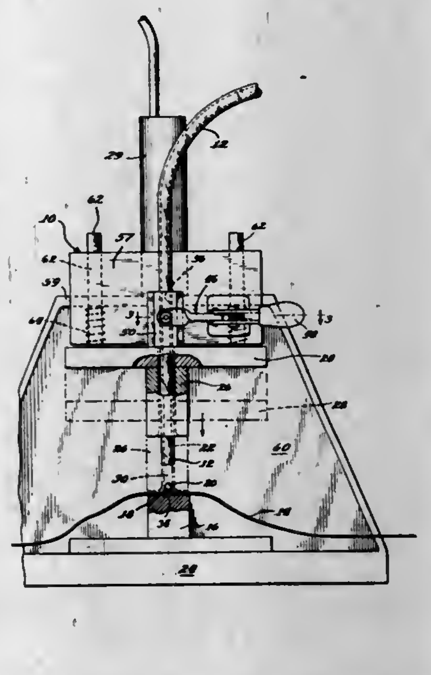


1. An extrusion die for producing a plurality of streams of extrudate comprising a housing having an inlet and a discharge port and a plenum connecting said inlet and discharge port, said discharge port being a slot-like, horizontally disposed opening having mounted therein a plurality of flow-divider means for dividing said slot into a plurality of orifices, each of said divider means having a fixed side and an adjustable side, said adjustable side being laterally adjustable in relation to the fixed side of an adjacent divider means to control the size of the orifices.

3,887,323
DIE ASSEMBLY FOR HEAT-SEALING TUBING ENDS TO SHEETING IN TRANSVERSE RELATIONSHIP

William Richard Bratten, Waukegan, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed June 24, 1974, Ser. No. 482,387
Int. Cl. B29c *27/00*
U.S. Cl. 425—521 **7 Claims**

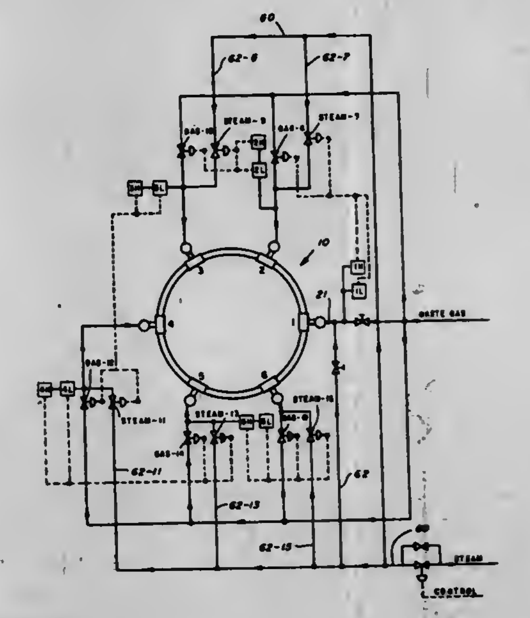


1. A die assembly for use in heat-sealing an end of a plastic tubular member to a sheet member positioned in transverse relation thereto, including a first die having a first die face defining a protrusion surrounded by a generally flat face portion of said die face, said protrusion being proportioned to be received in the bore of said tubular member; and a tubular second die for receiving said tubular member, said tubular second die defining a second die face at one end thereof proportioned for cooperative sealing action with said first die face; and means for moving said die faces together with portions of said tubular member and sheet member positioned therebetween for said cooperative sealing action; the improvement comprising, in combination:
said protrusion defining a junction surface with the flat face portion, said surface being concavely curved as measured along planes containing the longitudinal axis of said protrusion, said concavely curved surface defining, in said planes, arcs of closed curves having radii of at least 1/32 inch;
said tubular second die having a bore which defines, as part of said second die face, an outwardly bevelled bore end portion, whereby said outwardly bevelled bore end portion and said concavely curved surface cooperate to facilitate the spreading of said end of the tubular member outwardly over said sheet member during said cooperative sealing action, to create a seal of increased strength.

3,887,324
METHOD FOR NON-POLLUTING COMBUSTION OF WASTE GASES

Robert D. Reed; John Smith Zink; Robert F. Schwartz, all of Tulsa, Okla.; Horst Glomm, Frankfort, Germany; John C. Corble, St. Albans, England, and Harold F. Koons, Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Division of Ser. No. 216,659, Jan. 10, 1972, Pat. No. 3,779,689. This application Oct. 15, 1973, Ser. No. 406,210
Int. Cl. F23d *13/20*
U.S. Cl. 431—5 **6 Claims**

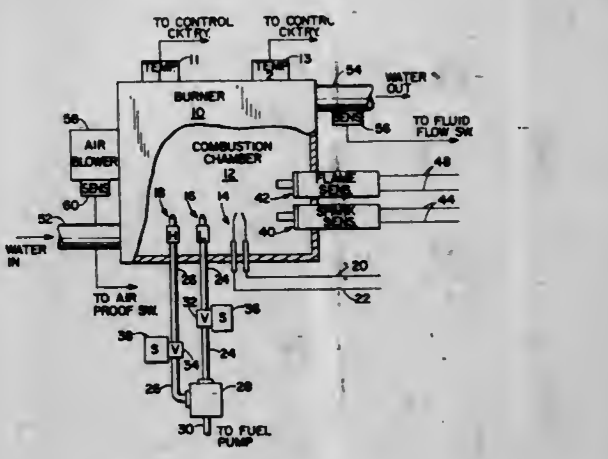


1. A method of burning variable quantities of waste gas comprising the steps of:
flowing a purge gas through a conduit to a first gas-air mixing and burner stage immediately prior to the flowing of said waste gas through said conduit;
flowing said waste gas through said conduit to said first burner stage;
igniting said waste gas-air mixture; and the additional steps of:
sensing a pressure or flow condition of said waste gas;
flowing a purge gas through a second gas-air mixing and burner stage responsive to an increase of said pressure or flow;
flowing said waste gas to said first and said second burner stages responsive to further increase in flow and pressure; and
igniting said waste gas-air mixture.

3,887,325
CONTROL METHOD AND APPARATUS FOR BURNERS

John F. Finger, and Merle E. Pochop, both of Beresford, S. Dak., assignors to Sioux Steam Cleaner Corporation, Beresford, S. Dak.

Filed May 29, 1973, Ser. No. 364,826
Int. Cl. F23n *5/20*
U.S. Cl. 431—6 **3 Claims**



1. A method of operating a burner for heating a flowing fluid, the burner having first and second operating temperatures associated therewith, and a combustion chamber for highly volatile explosive fuel requiring an operating combustion air pressure, the method including the following steps:
a. sensing the first operating temperature;
b. sensing the fluid flow;
c. sensing the air pressure;
d. forming a spark only if the sensed first operating temperature, fluid flow, and air pressure are within predetermined operating ranges;
e. directly visually sensing the spark;
f. providing a small amount of said volatile fuel to the combustion chamber only if the spark is visually sensed, the spark igniting the fuel, which in burning forms a flame that is low;
g. sensing the flame;
h. sensing the second operating temperature; and
i. providing a large amount of said volatile fuel to the combustion chamber only if the flame is sensed and the second operating temperature is within a predetermined operating range, the low flame igniting the large amount of fuel which in burning forms a flame that is high.

3,887,326
KILNS AND FURNACES

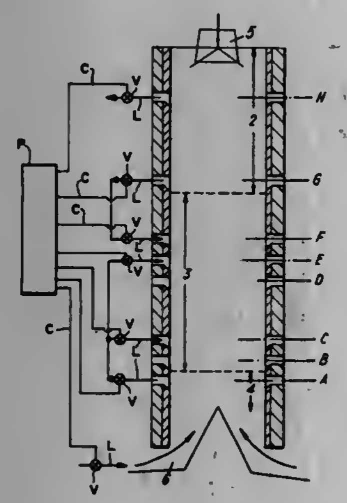
Harry Townley, Buxton, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 222,071, Jan. 31, 1972, abandoned. This application Sept. 21, 1973, Ser. No. 399,740
Claims priority, application United Kingdom, Feb. 8, 1971, 4122/71
Int. Cl. F23n *1/02;* **F27b** *1/10*
U.S. Cl. 432—14 **26 Claims**

1. In a process for operating a vertical shaft kiln which has a plurality of burners disposed around the shaft and through which solid granular material passes downwardly through the shaft and is contacted while in the shaft with hot gaseous fluid, the improved method of obtaining substantially uniform heat treatment of the material leaving the shaft which comprises controlling the flow pattern of said hot gaseous fluid in a manner to obtain a temperature distribution of the hot gaseous fluid in the shaft which is asymmetrical in a horizontal plane at a given level in the shaft so that heating of the downwardly moving material passing through said plane is non-uniform across the shaft and varying the flow pattern of said hot gaseous fluid in a manner to change the asymmetrical temperature distribution at said given level in accordance with

a predetermined sequence, all the granular material passing downwardly through the kiln receiving substantially the same overall heat treatment.

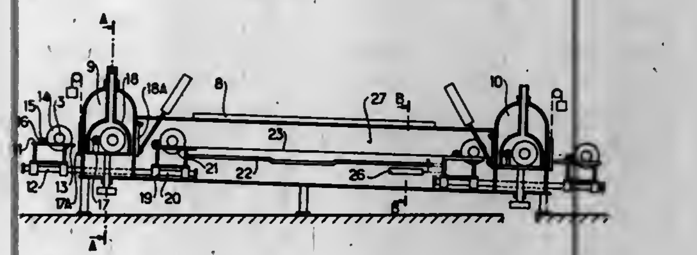
22. A vertical shaft kiln comprising: a shaft through which solid granular material passes downwardly during operation of the kiln; a plurality of burners disposed symmetrically around the shaft at a plurality of levels in the shaft for introducing hot gaseous fluid into the shaft; means for controlling the flow pattern of the hot gaseous fluid in the shaft in a manner to obtain at each of a plurality of levels a temperature distribution of the hot gaseous fluid which is asymmetrical in a horizontal plane so that heating of downwardly-moving material passing through each of said planes is non-uniform across the shaft; and programming means for varying the control means in a manner to change the asymmetrical temperature distribution at said levels in accordance with a predetermined sequence so that all the granular material passing downwardly through the kiln receives substantially the same overall heat treatment.



3,887,327
TUNNEL KILN FOR THE HEAT TREATMENT OF PRODUCTS HAVING A CIRCULAR CROSS-SECTION

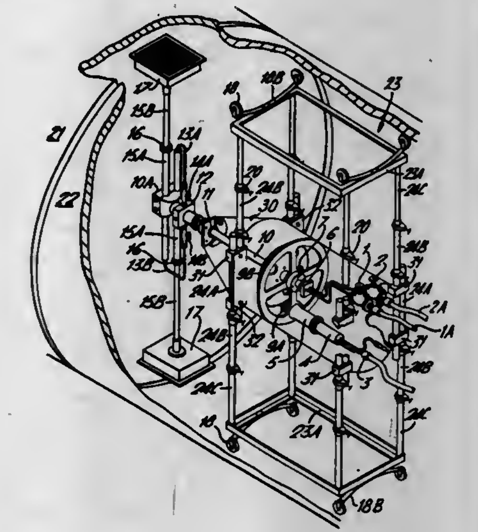
Jean Weber, Tarbes, and Jean Moussou, Bagneres De Bigorre, both of France, assignors to Ceraver, Paris, France
Filed Apr. 25, 1974, Ser. No. 464,091
Claims priority, application France, May 8, 1973, 73.16587
Int. Cl. F27b *9/24*
U.S. Cl. 432—124 **13 Claims**

1. In a tunnel kiln for the heat treatment of products having a circular cross-section by moving them along a longitudinal axis of the kiln, the improvement comprising: a drum mounted for rotation about its axis and for progressing through said kiln by rolling along the longitudinal axis thereof, and means for supporting said products within said drum for rotation about their axis at right angles to the longitudinal axis of the kiln and for simultaneously travelling in a circular path about the axis of said drum and at right angles to the longitudinal axis of said kiln.



3,887,328
HEAT TREATMENT APPARATUS

Paul Thomas Maddock, 92 Alltwen Hill Pontardaive, Swansea Glamorganshire, England
Filed Feb. 4, 1974, Ser. No. 439,330
Claims priority, application United Kingdom, Feb. 8, 1973, 6129/73
Int. Cl. F23d *13/26*
U.S. Cl. 432—224 **7 Claims**



1. Heat treatment apparatus for heating the internal surface of a metal pipe, comprising a rotatable supply pipe for a gaseous fluid which is alignable with the axis of the metal pipe, at least one radial supply pipe for the gaseous fluid extending perpendicularly from the axis of the rotatable supply pipe, a heater mounted at one end of the radial supply pipe, the radial supply pipe being of telescopic construction and having a socket portion which is clamped to the rotatable supply pipe and extends equally on both sides of the rotatable supply pipe and an inner portion which extends from one end of the socket portion and is of substantially the same length as the socket portion, and a branch supply pipe connected between the other end of the socket portion of the radial supply pipe and the rotatable supply pipe.

CHEMICAL

3,887,329
HEXAMETHYL PHOSPHOTRIAMIDE-DYE COMPOSITIONS

Gert Hegar, Schoenenbuch; Hans-Joerg Angliker, Basel; Walter Lang, Pfeffingen; Hans Wilhelm Liechti, Oberwill, Baseland, and Branimir Milicevic, Riehen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland
Continuation of Ser. No. 222,673, Feb. 1, 1972, abandoned, which is a continuation of Ser. No. 34,560, May 4, 1970, abandoned. This application Feb. 22, 1974, Ser. No. 446,200
Claims priority, application Sweden, May 5, 1969, 6832/69; Apr. 2, 1970, 4884/70
Int. Cl. D06p *1/38*
U.S. Cl. 8—171 **13 Claims**

1. A stable dye concentrate consisting essentially of at least one substantially pure dyestuff and hexamethylphosphotriamide, said concentrate containing from about 20 to about 50 percent by weight of dyestuff.

3,887,330
SULFUR-HYDROCARBON SLURRY PIPELINE TRANSPORTATION CONTAINING AN INORGANIC CORROSION INHIBITOR

Richard J. Horvath, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.
Continuation-in-part of Ser. No. 36,994, May 13, 1970, abandoned. This application Jan. 8, 1973, Ser. No. 321,885
Int. Cl. B65g *53/04;* **C23f** *11/16*
U.S. Cl. 21—2.5 R **2 Claims**

1. A method for preventing the sulfur corrosion of ferrous materials in contact with a sulfur-hydrocarbon slurry comprising admixing ammonium polysulfide with the slurry, the ammonium polysulfide comprising an aqueous solution of from about 0.01% to about 10% by weight based on total slurry.

3,887,331
METHOD FOR EVALUATING PETROLEUM RESERVOIRS

Bernard A. Baldwin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed May 13, 1971, Ser. No. 143,214
Int. Cl. C10g *1/04;* **G01n** *33/24*
U.S. Cl. 23—230 EP **5 Claims**

1. A method for evaluating a core sample to determine the fluid-surface interactions of recoverable organic material retained within the core sample which method comprises determining relative amounts of the different types of recoverable organic material retained within the core sample at various degrees of tenacity by (a) seriatim elution of said organic material from the core sample with solvents of successively greater solvent strength and (b) characterization of the functional groups and classes of compounds in each eluted fraction thereby determining the surface of interest for recovery of oil.

3,887,332
METHOD OF DETERMINING UNSATURATED IRON BINDING CAPACITY IN SERUM

Kazuei Takase, and Junji Morikawa, both of Tokyo, Japan, assignors to Eiken Chemical Co., Ltd., Tokyo, Japan
Filed Apr. 5, 1973, Ser. No. 348,097
Claims priority, application Japan, Apr. 12, 1972, 47-36643
Int. Cl. G01n *33/16*
U.S. Cl. 23—230 B **4 Claims**

1. A method of determining the unsaturated iron binding capacity of transferrin in serum comprising the steps of:

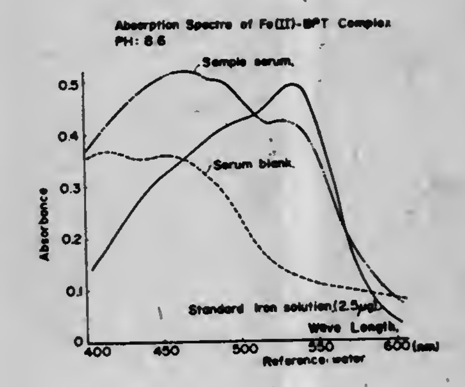
preparing a standard solution of iron chelate in which a known amount of iron is bound with nitrilotriacetic acid by using a buffer solution of pH 8.4 to 8.6;

adding the said standard iron solution to a sample serum in order to saturate the iron binding capacity of transferrin in the said serum;

reducing the excessive iron remaining unbound with transferrin by adding a salt of ascorbic acid to the said saturated solution;

developing a color by adding sodium bathophenanthroline to the said reduced solution, and

determining the absorbance of the said colored solution.



3,887,333
LIQUID SENSITOMETRY PROCESS FOR PHOTOGRAPHIC EMULSIONS

Norihisa Mimura; Takao Uehaka, and Hisatoyo Kato, all of Kanagawa, Japan
Continuation of Ser. No. 188,059, Oct. 12, 1971, abandoned. This application Nov. 9, 1973, Ser. No. 414,498
Claims priority, application Japan, Oct. 9, 1970, 45-89103
Int. Cl. G01m *21/20, 33/00;* **G03c** *5/26*
U.S. Cl. 23—230 R **5 Claims**

1. A process of continuously determining the photographic characteristics of a photographic silver halide emulsion, which process comprises the steps of:

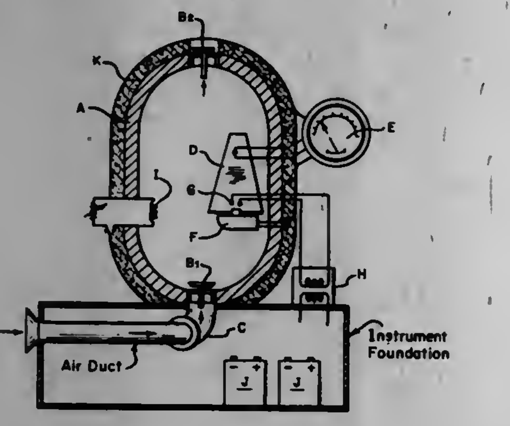
a adding a developing solution to a first sample of a photographic emulsion which has not been exposed to light and to a second sample of the photographic emulsion which has been exposed to a predetermined quantity of light;

b continuously measuring the development rate during the development of each of said samples by using light having a wavelength to which the photographic emulsion is not sensitive and measuring the amount of said light absorbed by each of said samples; and

c comparing the resultant measurements for each of said samples to determine the photographic properties of the photographic emulsion.

3,887,334
OXYGEN METER

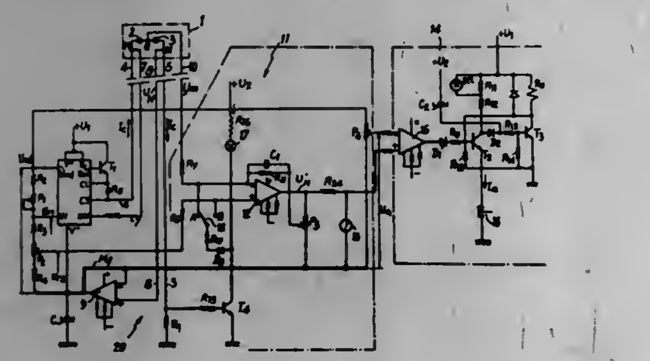
Julius Bago, 83-10 35th Ave., Jackson Heights, N.Y. 11372
Filed Apr. 13, 1973, Ser. No. 350,305
Int. Cl. G01n *25/32, 31/12*
U.S. Cl. 23—232 E **7 Claims**



1. The method of measuring the oxygen content of the atmosphere which comprises enclosing a sample of the atmosphere in a closed vessel, delivering fuel to the interior of the vessel, igniting the fuel, and measuring the temperature at a point within the vessel.

3,887,335
ELECTRICAL MEASURING AND MONITORING APPARATUS UTILISING A REMOTE DETECTOR

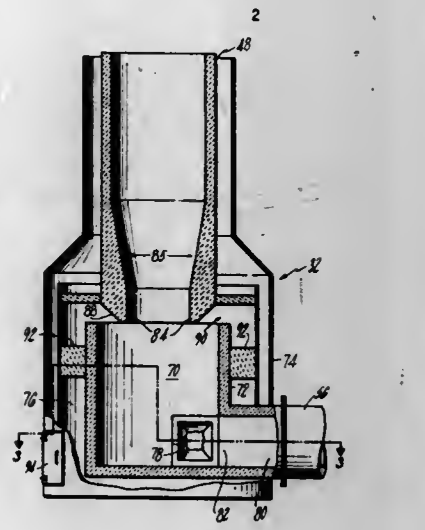
Maurice Boutonnat, Verneuil-En-Halatte, France, assignor to Charbonnages de France, Paris and MSA de France, Asnieres, both of, France
Filed Nov. 27, 1973, Ser. No. 419,371
Claims priority, application France, Nov. 29, 1972, 72.42382
Int. Cl. G01n *27/16;* **G05f** *1/40, 1/60*
U.S. Cl. 23—254 E **3 Claims**



1. An electrical apparatus for measuring and monitoring a parameter, comprising measuring and monitoring means for generating a measurement signal, detector means adapted for connection to said measuring and monitoring means and adapted for being spaced at a distance therefrom, conductors connecting said measuring and monitoring means and said detector means and feeding voltage and current to the detector means and transmitting to the measuring and monitoring means information obtained by the detector means, said measuring and monitoring means including a supply source for feeding direct current to the detector means and including a control circuit coupled to and operable to maintain a constant voltage at the detector means, said detector means including sensing elements adapted to generate a measurement signal in the form of a direct voltage, and a servo-controlled floating ground connected to said measuring and monitoring means and controlled at least in part thereby to provide for said measuring and monitoring means a reference potential which is controlled to be at least substantially equal to the voltage applied to the detector means.

3,887,336
INCINERATION SYSTEMS AND METHODS

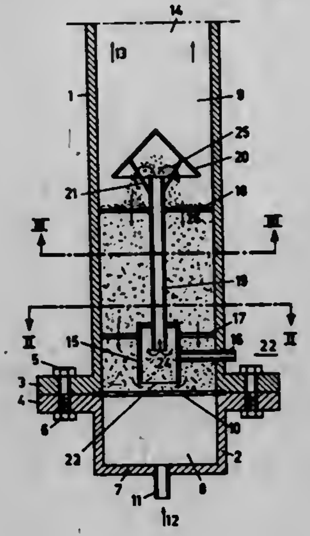
Bruce R. Hutchinson, 25 Crestview Dr., Bloomfield, Conn. 06804; Bruce H. Hunter, 53 Oak Rd., Longmeadow, Mass. 01106, and Robert H. Brooks, 239 Auburn Rd., West Hartford, Conn. 06119
Division of Ser. No. 125,752, March 18, 1971. This application Apr. 25, 1973, Ser. No. 354,167
Int. Cl. F23c *9/04;* **F23g** *7/06*
U.S. Cl. 23—277 C **8 Claims**



1. An afterburner device comprising:
a combustion chamber having a generally cylindrically shaped wall, said combustion chamber being open at its upper end;
a particulate collection chamber disposed about the exterior of said combustion chamber;
means for tangentially injecting a gaseous effluent into said combustion chamber adjacent the bottom thereof;
means for injecting a flame into the path of the gaseous effluent in said combustion chamber;
temperature responsive means for controlling said flame injecting means whereby a temperature sufficiently high to insure complete combustion of the effluent is maintained in the said combustion chamber; and
afterburner exhaust stack means supported concentrically of and generally above the open upper end of said combustion chamber, said exhaust stack means having a lower end, said lower end of said exhaust stack means defining an outlet orifice for gases from said combustion chamber, the lower end of said exhaust stack means which defines said outlet orifice bein of smaller diameter than said combustion chamber, the wall of said combustion chamber cooperating with said lower end of said exhaust stack means to define an annular discharge port adjacent the open upper end of said combustion chamber, said annular discharge port providing communication between said combustion chamber and said collection chamber.

3,887,337
FLUIDIZATION COLUMN

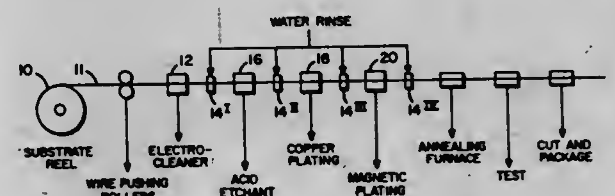
Freddy Francois Eugene Descamps, Halle; Georges Luciaan Dumont, and Walter Remi Adele Goossens, Mol, all of Belgium, assignors to Studiecentrum Voor Kernenergie SCK, Brussels, Belgium
Filed Aug. 21, 1972, Ser. No. 282,226
Claims priority, application Belgium, Aug. 19, 1971, 771545
Int. Cl. B01j *1/00;* **F26b** *17/14;* **B01f** *13/02*
U.S. Cl. 23—284 **1 Claim**



1. A fluidization column comprising a hollow body, a perforated plate across the body which separates the body internally into a lower space and an upper space, a fluidization gas inlet opening into the body lower space, an outlet from a top of the body upper space, a bell in the body upper space, said bell opening downward, being spaced from and facing the perforated plate, the spacing between said perforated plate and the bell lower edge being about 1 cm and the ratio of the bell lower side area to the plate lying between ½ and 1/10, an open-top riser pipe in the body upper space with the lowermost end of said riser pipe operatively connected through the top of said bell, the ratio of the bell lower side area to the riser pipe cross-section lying between 3 and 50, and a duct for supplying supplementary gas to the riser pipe, the inlet of which duct lies outside the body and which duct opens into the side of the bell.

3,887,338
PLATED WIRE MEMORY

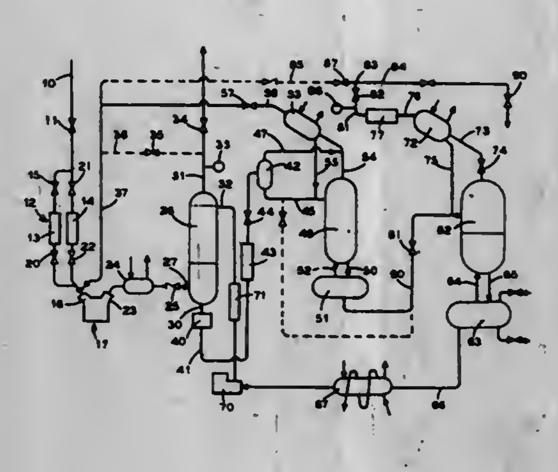
Guy DiGuilio, Philadelphia, Pa., assignor to Sperry Rand Corporation, Blue Bell, Pa.
Division of Ser. No. 375,266, June 29, 1973, Pat. No. 3,853,717. This application Apr. 22, 1974, Ser. No. 463,002
Int. Cl. B23p *3/00;* **G11c** *11/02;* **C22c** *19/00*
U.S. Cl. 29—191.6 **5 Claims**



1. An improved plated wire memory device having a smooth non-magnetic wire substrate of the group consisting of beryllium-copper and phosphor bronze, a nodular intermediate layer of copper, the improvement comprising:
- a. a magnetic film deposited upon said intermediate layer comprising by weight in the range of about 17–18% Fe, 2–5% Co and 0.5–2.0% P and the balance essentially nickel,
- b. whereby said memory is operative in the NDRO mode, and
- c. said film being substantially non-magnetostrictive.

3,887,339
INDUSTRIAL TECHNIQUE

Donald Hancher Robertson, Madison Heights, Va., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.
Filed Nov. 19, 1973, Ser. No. 417,434
Int. Cl. B01d *53/14*
U.S. Cl. 55—66 **3 Claims**



1. In a process for purifying radioactive krypton and xenon mixed with a carrier gas that comprises the steps of compressing the gas mixture, contacting the gas mixture with a fluorocarbon solvent to absorb said krypton and xenon and a residual amount of said carrier gas in said solvent thereby to load said solvent, contacting said loaded solvent with more fluorocarbon solvent vapor to separate said residual carrier gas from said loaded solvent and leave a solvent that is rich in radioactive krypton and xenon, contacting said krypton and xenon rich solvent with further fluorocarbon solvent vapor to separate the krypton and xenon gas from said solvent, and drying the krypton and xenon gas to further purify the gas, the improvement comprising registering the radioactivity of said purified gas to selectively store the purified gas when the intensity of the registered radioactivity exceeds a preselected level and reintroduce the purified gas into the process when the intensity of the registered radioactivity is below said level.

3,887,340
METHOD FOR SCRUBBING GASES DERIVED FROM BASIC OXYGEN FURNACES

Yuan Tsun Hsu, Cornwells Heights, and K. Robert Lange, Huntingdon Valley, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.
Filed Aug. 29, 1974, Ser. No. 501,574
Int. Cl. B01d *47/06*
U.S. Cl. 55—72 **7 Claims**

1. A method of scrubbing flue gases derived from a basic oxygen furnace used in steel production which comprises treating said gases with an aqueous medium containing from about 0.5 to 300 parts per million of a combination of
- i. a water soluble sulfonated polystyrene, and
- ii. a compound having the formula: $(X)_2N-R-N(X)_2$, wherein R is a lower alkylene of from 1 to 7 carbon atoms, X is hydrogen or the group $-CH_2PO_3M_2$, where M is a water-soluble cation, the compound further characterized in that at least one and preferably all X's are $-CH_2PO_3M_2$

3,887,341
METHOD OF AND APPARATUS FOR AUTOMATIC CLEANING OF AN AIR FILTER

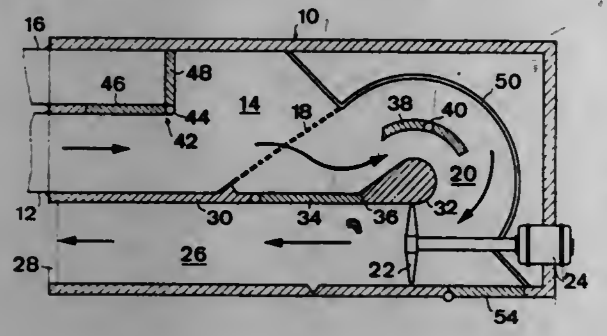
Hanspeter Sutter, Uster, Switzerland, assignor to Luwa AG, Zurich, Switzerland

Filed Jan. 15, 1973, Ser. No. 323,973

Claims priority, application Switzerland, Jan. 20, 1972, 814/72

Int. Cl. B01d *46/04*

U.S. Cl. 55—96 **12 Claims**



1. A method for automatically cleaning an air filter, comprising the steps of guiding a working air current containing contaminants in a predetermined direction of travel through the air filter from an upstream side to a downstream side thereof, suddenly deflecting a part of the working air current which has passed the downstream side of the filter to impinge the filter in the form of a shock wave at the downstream side of said filter, partially shutting off the working air current flowing on the downstream side of the filter and traveling in said predetermined direction, and deriving the energy of the shock wave from the working air current due to the sudden deflection of the part of the working air current.

3. An apparatus for automatically cleaning an air filter, comprising a filter housing, an air filter within the filter housing dividing said filter housing into a raw air compartment and a clean air compartment, an inlet opening communicating with the raw air compartment, a blower having a suction side and a pressure side, the suction side of the blower being in flow communication with the clean air compartment, deflecting means mounted for movement between two positions, said deflecting means in one position communicating the pressure side of the blower with the atmosphere, said deflecting means in the other position communicating the pressure side of the blower with the clean air compartment and providing a bypass flow path from the pressure side of the blower to the clean air compartment during cleaning of the filter, means for at least partially shutting-off the suction side of the blower with respect to at least a portion of the clean air compartment, and means for simultaneously actuating the shut-off means together with the deflecting means.

3,887,342
LIQUID-GAS SEPARATOR UNIT

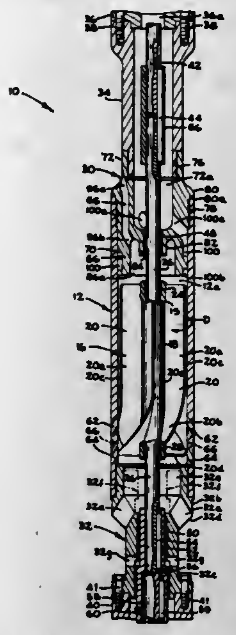
Philip R. Bunnelle, Santa Clara, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Nov. 10, 1972, Ser. No. 305,645

Int. Cl. B01d *19/00*

U.S. Cl. 55—203 **38 Claims**

1. A liquid-gas separator unit comprising, in combination, means defining a chamber having first and second longitudinally spaced portions, impeller means disposed within the chamber between the first and second chamber portions, said impeller means including vanes configured to impart circular motion to liquid after first imparting upward motion to the liquid, means connected to the impeller means for rotating said impeller means, intake means communicating with the first chamber portion for admitting a liquid-gas mixture into said first chamber portion, discharge means communicating with the second chamber portion for discharging the liquid and gas components of the mixture from said second chamber portion after such components have been separated within the chamber by the rotation of the impeller means, said discharge means including passage means for conveying the gas component from the impeller means, said discharge means further including passageway means for conveying the liquid component from the impeller means without causing an abrupt change in the direction and velocity of the liquid component as it flows into the passageway means.



3,887,343
POCKET OR BAG FILTER WITH DUST RECIRCULATION

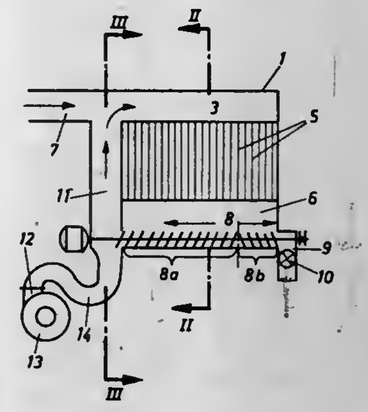
Adolf Margraf, 4961 Wendthagen, Im Haberkamp 196, Germany

Filed Mar. 22, 1973, Ser. No. 343,804

Claims priority, application Germany, Mar. 28, 1972, 2214983

Int. Cl. B01d *51/04*

U.S. Cl. 55—262 **5 Claims**



1. A filtering apparatus comprising:

a housing provided with partition means dividing same into a purification chamber and an exit manifold, said purification chamber being subdivided into a multiplicity of parallel filter sections communicating with said exit manifold, said housing further forming a dust-collecting trough extending underneath said filter sections and communicating therewith;

a supply duct for incoming dust-laden gas to be purified, said supply duct opening onto said filter sections for delivering a continuous flow of said gas to filtering surfaces thereof adapted to retain accompanying solids;

extractor means in said trough for removing dust particles descending from said filter sections, said extractor means including a first and a second conveyor element for transporting predetermined fractions of accumulating dust to opposite ends of said trough, said housing being provided with a channel communicating with said supply duct and with one of the ends of said trough;

blower means communicating with said channel for driving one of said fractions of accumulated dust back into said supply duct; and

discharge means at the other end of said trough for removing the other of said fractions from said housing.

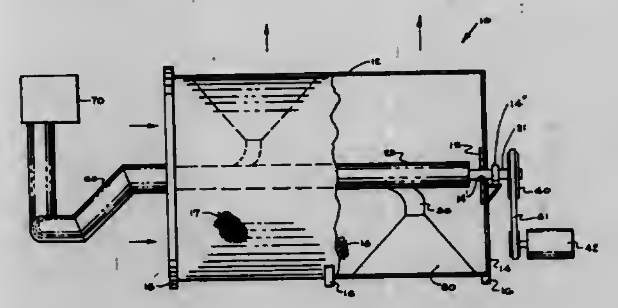
3,887,344
SELF-CLEANING FILTER

Randall E. Smith, Rt. 10, Box 312, Spartanburg, S.C. 29303

Filed Nov. 19, 1973, Ser. No. 417,418

Int. Cl. B10d *46/24*

U.S. Cl. 55—294 **15 Claims**



1. A self-cleaning air filter comprising:

a. a stationary cylindrical housing, said housing having one closed end and one end for receiving air to be filtered and having filter media secured therewithin immediately adjacent said housing and at least partially around the circumference thereof, said housing having at least one channel in a wall thereof, said channel extending longitudinally thereof;

b. a manifold supported for rotation centrally along said housing;

c. at least one nozzle positioned along said manifold and in communication therewith, said nozzle residing immediately adjacent said filter media inside said housing;

d. means to rotate said manifold and said nozzle around the interior of said housing whereby substantially all of the filter media around said housing is subjected to said at least one nozzle, said at least one channel in said wall of said housing being of sufficient size to receive accumulations of waste that will not pass between said nozzle and said filter media, whereby said accumulations of waste are forced ahead of said nozzle, fall into said channel, and pass into said nozzle from within said channel; and

e. suction supply means in communication with said manifold and said at least one nozzle, whereby suction in said nozzle removes said materials from said filter media and said channel as said nozzle moves therearound.

3,887,345
GAS CHROMATOGRAPH INJECTION SYSTEM

Glenn E. Pollock, Belmont; Milton E. Henderson, Mountain View, and Ralph W. Donaldson, Jr., Sunnyvale, all of Calif., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 180,962, Sept. 16, 1971, abandoned. This application Feb. 27, 1974, Ser. No. 446,564

Int. Cl. B01d *15/08*

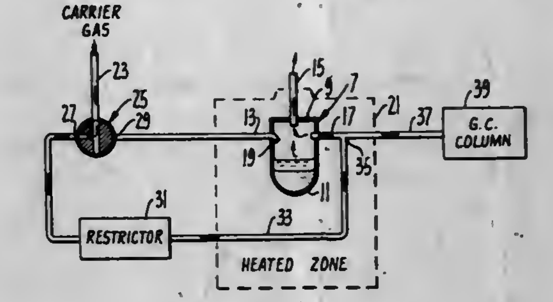
U.S. Cl. 55—386 **6 Claims**

1. An injection system for a gas chromatographic column comprising in combination:

a. an injection chamber for receiving a sample to be analyzed;

b. valve means for controlling the flow of carrier gas;

c. said chamber having three conduits leading into said chamber, a first conduit for inserting a sample into said chamber and for venting gas and solvent, a second conduit connected through a restrictor to said valve means and to said chamber for injecting carrier gas into said chamber, and a third conduit connected to said valve means and said chromatographic column for injecting gas into said chamber and for sweeping a vaporized sample into said chromatographic column;



d. means for closing said 1st conduit; and

e. flash heating means for heating said chamber and for vaporizing said sample.

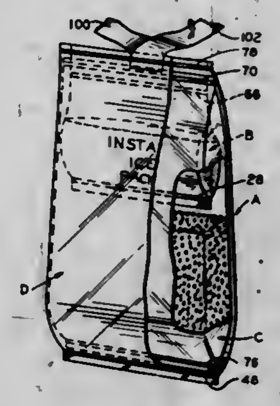
3,887,346
CHEMICAL THERMAL PACKAGE WITH THREE SEPARATE CHAMBERS

Lynn Ellynn Erdman, P.O. Box 30182, Cleveland, Ohio 44130

Continuation-in-part of Ser. No. 178,071, Sept. 7, 1971, abandoned. This application Feb. 11, 1974, Ser. No. 441,243

Int. Cl. F25d *5/00*

U.S. Cl. 62—4 **1 Claim**



1. A chemical package A containing at least one chemical reactant (72) and an activating liquid (60) and comprising three generally rectangular outer, second and inner containers,

each of said containers being constructed from a thin flexible material and having a continuous sidewall with the ends thereof hermetically sealed by lateral seams, the outer container being a protective cover enveloping the second container, the second container containing a predetermined amount of a chemical reactant and enveloping the inner container, the inner container containing a predetermined amount of the activating liquid,

one end of said inner container being closed after filling with the activating liquid by a lateral seam (66) spaced at a distance from said liquid so as to provide room for expansion thereof,

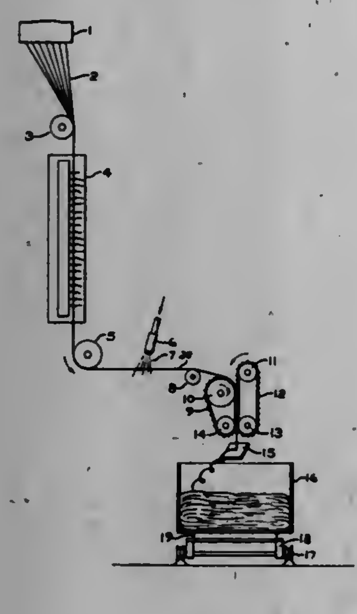
said one end of said inner container being positioned at one end of said second container by a lateral seam (70) on said second container, said dual lateral seams assuring that the activating liquid will not flow from the inner container in the event one of said dual lateral seams should be broken,

said inner and second containers being positioned at one end of said outer container by a lateral seam (78) assuring that said inner container holding said activating liquid and said second container holding said chemical reactant will not float within said outer container, and further assuring that the activating liquid will not flow from the inner container in the event both of said dual lateral seams should be broken.

3,887,347
METHOD OF PACKAGING GLASS STRAND

Walter J. Reese, North Huntington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 1, 1974, Ser. No. 457,014
Int. Cl. C03c *25/02*; **C03b** *37/02*
U.S. Cl. 65—3 **6 Claims**



1. A method of collecting fibrous glass strand comprising drawing a plurality of glass fibers from a molten glass source; applying size to said fibers as they are being drawn; drying the fibers to remove substantially all of the moisture therefrom; rewetting the fibers to supply 2 to 6 percent by weight water therein; passing the moisture laden fibers in strand form into a container in random layers and drying the strand in said container to remove a substantial portion of the moisture applied to the strand during the moisture treatment step.

3,887,348
GLASS COLORING PROCESS

Emile Plumat, Gilly; Jean Schottey, Montignies-sur-Sambre, and Francois Toussaint, Montignies Le Tillful, all of Belgium, assignors to Glaverbel S.A., Watermael-Boitsfort, Belgium

Continuation of Ser. No. 293,032, Sept. 28, 1972, abandoned. This application June 27, 1974, Ser. No. 485,843
Claims priority, application Luxembourg, Oct. 1, 1971, 63992
Int. Cl. C03c *21/00*
U.S. Cl. 65—30 **11 Claims**

1. A process for imparting a yellow coloration to soda-lime-silica glass bodies of ordinary composition containing a small concentration of reducing ions in at least the surface layers of a portion thereof and having no visible coloration, comprising the steps of:

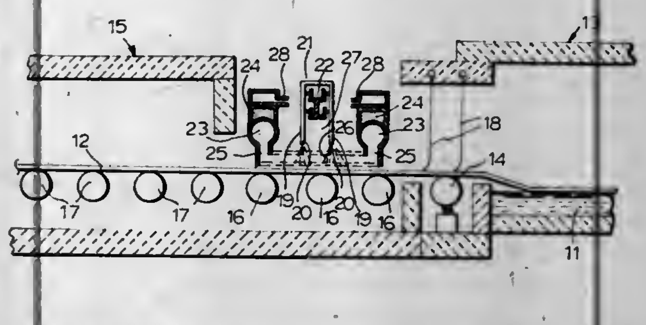
placing the surface of such a body which is associated with such surface layers in contact with a contacting medium composed of a mixture of molten metal salts, which mixture includes a silver salt present in a concentration of between 0.01 percent and 3 percent, by weight, and furnishing reducible silver ions capable of being reduced by the reducing ions in the surface layers in such a manner as to impart a yellow coloration to the body; said placing being under concentration, temperature and time conditions such as to cause such reducible ions to diffuse into such body surface layers without giving a significant visible coloration to the glass; and

subsequent to such diffusion, heating such body to a temperature above the strain point of the glass and higher than the temperature employed during said step of placing for a time sufficient to cause the body to develop a yellow coloration.

3,887,349
APPARATUS FOR MANUFACTURING RIBBON GLASS HAVING A METAL OXIDE COATING

Naotomo Akashi, Maizuru, and Katsuji Fujimoto, Ichihara, both of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Nov. 27, 1973, Ser. No. 419,280
Claims priority, application Japan, Dec. 6, 1972, 47-122932
Int. Cl. C03c *17/00*
U.S. Cl. 65—161 **2 Claims**



1. In an apparatus for manufacturing ribbon glass having as part thereof means for forming a metal oxide coating on the surface of ribbon glass which is positioned at a spraying locale between means for forming ribbon glass and a lehr or within the lehr, said means for forming a metal oxide coating including spray guns which face the surface of the ribbon glass and movable across the ribbon glass, means for feeding metal compound solution to the spray guns, means for spraying the solution from the spray guns, a pair of exhaust ducts disposed on both sides of the path of travel of the spray guns having suction ports facing downwardly from the exhaust ducts and an exhaust system connected to the exhaust ducts, the improvement comprising wind duct means having openings in the spraying locale, defined by the exhaust ducts and the ribbon glass, for blowing a heated gas into the spray locale, a gas burner means connected to the wind duct means, and diluent air-intake openings disposed in said wind duct means between said burner means and said openings for supplying diluent air to control the temperature of the products of combustion from said gas burner means..

3,887,350
FLUID COOLING OF GLASS MOLDS

Charles W. Jenkins, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

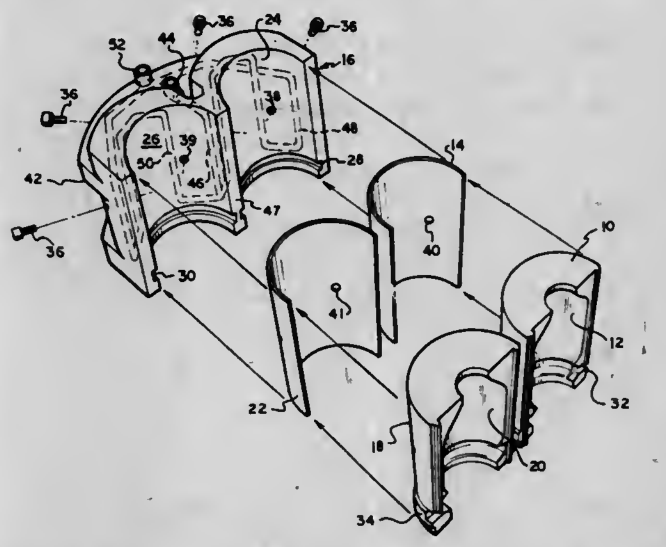
Filed Feb. 11, 1974, Ser. No. 441,664
Int. Cl. C03b *9/38*
U.S. Cl. 65—267 **10 Claims**

1. A split mold for forming heated thermoplastic materials wherein each mold section comprises, in combination:

an insert portion having a front face including a cavity shaped in the form desired for the thermoplastic material to assume and a rear face;

an insert holder, substantially surrounding said rear face of said insert portion, having formed therein a plurality of inter-connected fluid passages, said passages having an inlet and an outlet; and

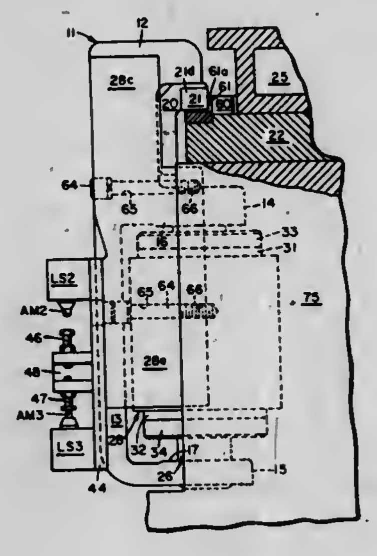
a heat insulating sleeve, positioned between said insert portion rear face and said insert holder and in contact with substantially the entire interface area of both, said inter-connected passages being positioned proximate to but separated from said heat insulating sleeve, said insulating sleeve being formed of a material having a heat conductivity value of between one hundred and twenty times less and ten times less than the heat conductivity value of the material of said insert portion and said insert holder, said insert portion, heat insulating sleeve and insert holder being secured together as a unit.



3,887,351
COMBINED TURRET POSITIONER AND CLAMP ASSEMBLY FOR GLASS PRESSING MACHINE

Frederick A. Dahlman, Corning, N.Y.; Raymond J. Mras, deceased, late of Lisle, N.Y., and by Carl A. Mras, executor, Lisle, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed July 29, 1974, Ser. No. 492,510
Int. Cl. C03b *11/00*
U.S. Cl. 65—305 **4 Claims**



1. In combination with a rotatable turret of a turret-type glass pressing machine having a circular row of mold adaptors equally spaced apart about a peripheral portion thereof with means adapted to successively index said adaptors to each of a plurality of positions including a glass pressing position at which an anvil is arranged under and adjacent to said turret in close proximity thereto, a combined turret positioner and hold-down clamp assembly for said glass pressing position, such assembly comprising;

A. circular rail means including a plurality of similar arcuate and slightly spaced apart rail segments extending about said turret adjacent the outer periphery thereof and equal in number to said mold adaptors, each such rail segment embodying in the upper surface thereof a channel, each such channel being congruent with the others and each having a vertical cross-sectional configuration of an inverted truncated isoceles triangle and each rail segment being similarly located adjacent an associated one of said mold adaptors with the channel in the respective segment precisely positioned in relation to the respectively associated adaptor;

B. a vertically actuable wedge member at said glass pressing position, said wedge member including a portion having a cross-sectional configuration corresponding to said configuration of each said channel and such wedge portion being normally positioned above said rail means in close proximity thereto;

C. motor means for actuating said wedge member downwardly and said wedge portion into each said channel as each respective rail segment is indexed to said glass pressing position and for thereafter actuating such wedge portion out of each such channel; and

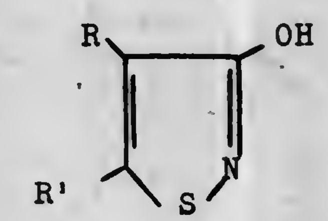
D. control means for energizing said motor means in a first mode to start said downward actuation of said wedge member as the leading upper edge of each respective channel is moved vertically below the corresponding lower edge of the wedge portion of such wedge member and to continue such downward actuation until the ends of the wedge portion are in firm contact with the ends of the respective channel and said turret is actuated into firm contact with said anvil, and for thereafter energizing said motor means in a second mode to actuate said wedge portion upwardly out of each respective channel.

3,887,352
CONTROL OF MICROORGANISMS WITH 3-HYDROXYISOTHIAZOLES

Sheldon N. Lewis, Willow Grove; George A. Miller, Glenside, and Andrew B. Law, Levittown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 855,046, Sept. 3, 1969, abandoned, which is a continuation-in-part of Ser. No. 672,427, Oct. 3, 1967, abandoned, which is a continuation-in-part of Ser. No. 621,766, March 9, 1967, abandoned. This application Feb. 3, 1972, Ser. No. 223,350
Int. Cl. A01n *9/12*
U.S. Cl. 71—67 **3 Claims**

1. A method for controlling the growth of bacteria, fungi, or algae in a locus subject to contamination by bacteria, fungi, or algae which comprises contacting the bacteria, fungi, or algae in the locus with an amount effective to adversely affect the growth of the bacteria, fungi, or algae of a compound of the formula



wherein R is hydrogen, $(C_1\text{-}C_4)$alkyl, carboxy, carb$(C_1\text{-}C_4)$alkoxy,

carbamoyl, nitro, halogen, or cyano, and R′ is hydrogen, $(C_1\text{-}C_4)$alkyl, $(C_1\text{-}C_4)$haloalkyl, aralkyl of up to 8 carbon atoms, aryl of up to 8 carbon atoms,

halogen, $(C_1\text{-}C_4)$alkylsulfinyl, aralkylsulfinyl of up to 8 carbon atoms, $(C_1\text{-}C_4)$alkylsulfonyl, aralkylsulfonyl of up to 8 carbon atoms, $(C_1\text{-}C_4)$alkylthio, aralkylthio of up to 8 carbon atoms, alkylamino of up to 8 carbon atoms, arylamino of up to 8 carbon atoms, or aralkylamino of up to 8 carbon atoms, or a salt of said compound with a strong acid, or a salt of said compound with an alkali metal cation, an alkaline earth metal cation, a transition metal cation, a quaternary ammonium cation, a quaternary phosphonium cation, or a primary, secondary, or tertiary organic base cation.

3,887,353

DIETHYL BETAAMINOETHYLPHOSPHONATE AS AN ALGAECIDE

Al F. Kerst, Alma, Mich., and John D. Douros, Jr., Gaithersburg, Md., assignors to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 156,940, June 25, 1971, Pat. No. 3,764,677. This application Mar. 9, 1973, Ser. No. 339,680

Int. Cl. A01n *9/00*

U.S. Cl. 71—67 **16 Claims**

1. A method of killing and inhibiting the growth of algae which comprises contacting said algae with diethyl betaaminoethylphosphonate in an amount effective to kill and inhibit the growth of said algae.

3,887,354

METHOD FOR FACILITATING THE HARVEST OF FRUIT

Milton C. Archer, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sept. 21, 1973, Ser. No. 399,663

Int. Cl. A01n *9/12*

U.S. Cl. 71—90 **10 Claims**

1. A method for facilitating the harvest of fruit which comprises applying an effective concentration of 4,5-dibromothiophene-2-carboxylic acid to fruit bearing trees or plants within 2 weeks of the date of harvest.

3,887,355

HERBICIDAL COMPOSITION AND METHODS EMPLOYING N-(1-ALKEN-1-YL)-AMINO-S-TRIAZINE COMPOUNDS

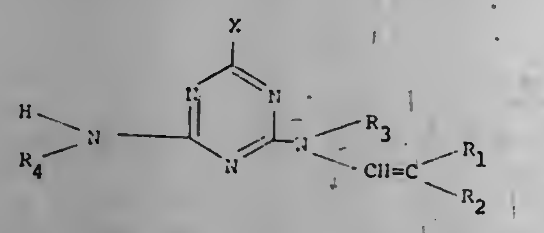
John P. Chupp, Kirkwood, and Ching C. Tung, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 243,091, April 11, 1972, abandoned, which is a division of Ser. No. 103,881, Jan. 4, 1971, Pat. No. 3,784,544. This application June 17, 1974, Ser. No. 479,933

Int. Cl. A01n *9/22*

U.S. Cl. 71—93 **16 Claims**

1. Herbicidal method which comprises applying a herbicidal amount of a composition comprising at least one herbicidal adjuvant and at least one compound of the formula



where X represents chloro or alkylthio of a maximum of 4 carbon atoms;

R_1 represents alkyl of a maximum of 2 carbon atoms;

R_2 represents alkyl of a maximum of 4 carbon atoms;

R_3 and R_4 each represents alkyl of a maximum of 4 carbon atoms.

3,887,356

HERBICIDAL COMPOSITIONS AND METHODS EMPLOYING N-(1-CYCLOALKEN-1-YL)-AMINO-S-TRIAZINE

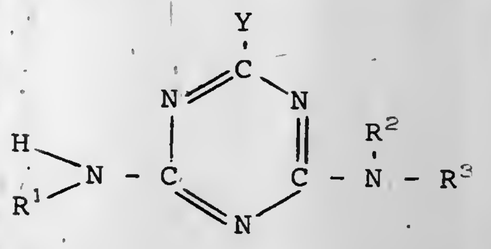
John P. Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 297,109, Oct. 12, 1972, abandoned, which is a division of Ser. No. 127,625, March 24, 1971, Pat. No. 3,714,162. This application June 17, 1974, Ser. No. 480,183

Int. Cl. A01m *9/22*

U.S. Cl. 71—93 **23 Claims**

1. Herbicidal method which comprises applying a herbicidal amount of a composition comprising at least one herbicidal adjuvant and at least one compound of the formula



wherein Y is chloro, alkoxy or alkylthio containing up to 4 carbon atoms, R^1 is alkyl or alkoxyalkyl containing a maximum of 8 carbon atoms, R^2 is alkyl containing a maximum of 8 carbon atoms provided that the sum of the carbon atoms in the groups represented by R^1 and R^2 is at least 4, and R^3 is a 1-cyclopenten-1-yl, a 1-cyclohexen-1-yl, a 1-cyclohepten-1-yl or a lower alkyl or lower alkoxy substituted 1-cyclopenten-1-yl, 1-cyclohexen-1-yl or 1-cyclohepten-1-yl group.

3,887,357

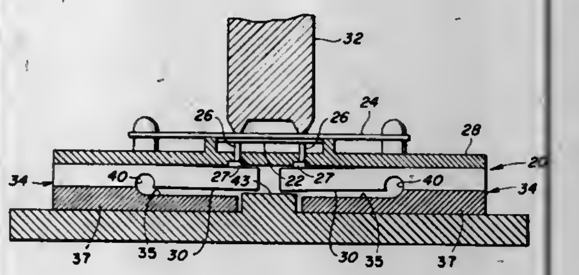
METHOD FOR FACILITATING THE HARVEST OF FRUIT

Milton C. Archer, Olivette, and John E. Franz, Crestwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

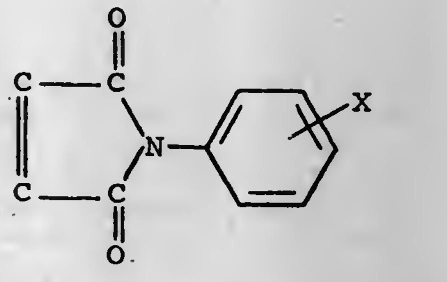
Filed Oct. 31, 1973, Ser. No. 411,584

Int. Cl. A01n *9/22*

U.S. Cl. 71—95 **10 Claims**



1. A method for facilitating the harvest of fruit from non-deciduous trees which comprises applying to the fruit bearing trees, within 2 weeks of the date of harvest, an effective amount of a compound of the formula



wherein X is 2-chloro, 4-chloro, 3-nitro, 4-methyl or 4-methoxy.

3,887,358

METHOD FOR FACILITATING THE HARVEST OF FRUIT

Milton C. Archer, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sept. 25, 1973, Ser. No. 400,575

Int. Cl. A01n *9/20*

U.S. Cl. 71—104 **10 Claims**

1. A method for facilitating the harvest of fruit which comprises applying an effective concentration of 3,5-dichloro-4-hydroxyphenylisothiocyanate to fruit bearing trees or plants within 2 weeks of the date of harvest.

3,887,359

REDUCTION OF SILICON DIOXIDE BY MEANS OF CARBON IN ELECTRIC FURNACE

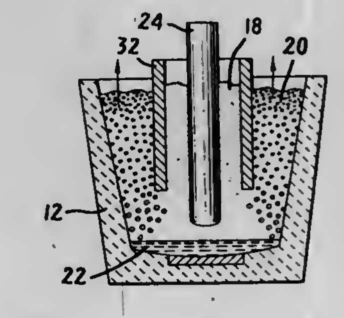
Rolf Enger, Oslo; Kristian Piene, Svelgen; Nils Skreien, Skedsmokorset; Audun Saethre, Oslo, and Jan-Erik Thorslund, Nittedal, all of Norway, assignors to Elkem-Spigerverket A/S, Oslo, Norway

Filed Jan. 16, 1973, Ser. No. 324,114

Claims priority, application Norway, Jan. 25, 1972, 173/72

Int. Cl. C21c *5/52;* **C01b** *33/02*

U.S. Cl. 75—11 **10 Claims**



1. In the method of producing silicon and silicon-containing alloy products in an electric furnace which involves the reduction of SiO_2 with carbon reducing reagent by energy supplied by one or more electrodes in the furnace, the improvement which comprises the steps of feeding at least a major amount of the reaction SiO_2 material in the charge into the furnace separate from the carbon reducing reagent in the charge and establishing at least two separate zones in the furnace one of which has a major amount of SiO_2 material and the other of which has a major amount of carbon reducing reagent and wherein reaction off gases from the reduction of SiO_2 pass through one or more zones rich in carbon reducing agent.

3,887,360

METHODS AND FURNACES FOR STEEL MANUFACTURE BY DIRECT REDUCTION AND MELTING OF IRON ORE

Magnus Gustav Georg Tiberg, Hallefors, Sweden, assignor to Aktiebolaget Svenska Kullagerfabriken, Gothenburg, Sweden

Continuation of Ser. No. 21,873, March 23, 1970, abandoned. This application July 19, 1972, Ser. No. 273,225

Claims priority, application Sweden, Mar. 26, 1969, 4267/69

Int. Cl. C21b *11/00, 11/10*

U.S. Cl. 75—46 **9 Claims**

1. A method for the manufacture of steel from iron ore in a furnace plant including two furnace zones having arranged therebetween a connecting zone for transferring reducing gas, and which comprises:

A. generating a reduced gas in a first furnace zone;
B. said first furnace zone containing iron;
C. charging scrap iron into a second furnace zone;
D. continuously introducing finely dressed ore into said second furnace zone at the top of said second furnace zone;
E. passing said reducing gas into said second furnace zone and intimately contacting said reducing gas with said finely dressed ore to partially reduce said finely dressed ore;
F. then passing said reducing gas through the charge of scrap iron to remove fine particles of non-reduced iron ore entrained in said reducing gas and to bring particles of reduced iron to clad on the scrap iron charge;
G. said iron in said first furnace zone being prereduced finely dressed ore and scrap iron prepared by above steps (C) to (F);
H. melting and carrying out the final reduction of said iron in said first furnace zone;
I. reversing the functions of the furnace zones; and
J. repeating the process steps.

3,887,361

TREATMENT OF ORGANIC EFFLUENTS FROM THE HALCON PROCESS TO PRECIPITATE THE METAL USED AS CATALYST

Hans Lemke, Asnieres, France, assignor to Produits Chimiques Ugine Kuhlmann, Saint-Denis, France

Filed Feb. 15, 1973, Ser. No. 332,875

Claims priority, application France, Feb. 29, 1972, 72.06864

Int. Cl. C22b *3/00;* **C07d** *1/08*

U.S. Cl. 75—108 **6 Claims**

1. The process for treating the residual organic effluents derived from the process of epoxidation of olefins with hydroperoxides in the presence of a basic organic salt of molybdenum, tungsten, titanium, vanadium niobium or tantalum catalyst so as to precipitate the catalyst which comprises:

a. heating the effluents or distillation residues of the effluents with from about 5 to 50 percent by weight of tertiarybutyl alcohol to a temperature between about 100°C to 300°C in a closed vessel or under reflux; and
b. separating the resulting precipitate containing substantially all of the molybdenum, tungsten, titanium, vanadium, niobium or tantalum metal originally present in the effluent or distillation residues of the effluents.

6. In the process for the epoxidation of olefins with hydroperoxides in the presence of a basic organic salt of molybdenum, tungsten, titanium, vanadium, niobium or tantalum catalyst, the improvement thereof comprising the treatment of the effluents or distillation residues of the effluents by the process of claim 1.

3,887,362

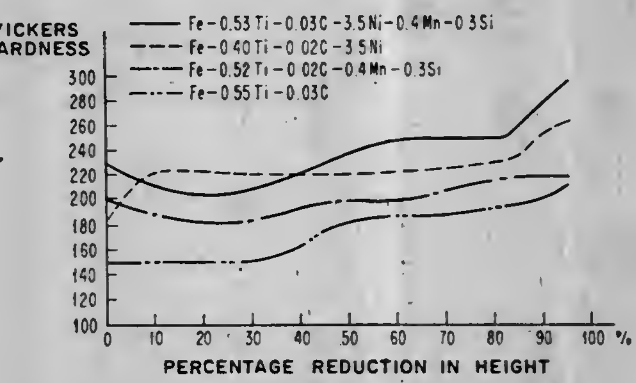
NITRIDABLE STEELS FOR COLD FLOW PROCESSES

Maria Ronay, Briarcliff Manor, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1972, Ser. No. 316,212

Int. Cl. C22c *37/00, 39/00*

U.S. Cl. 75—123 K **1 Claim**



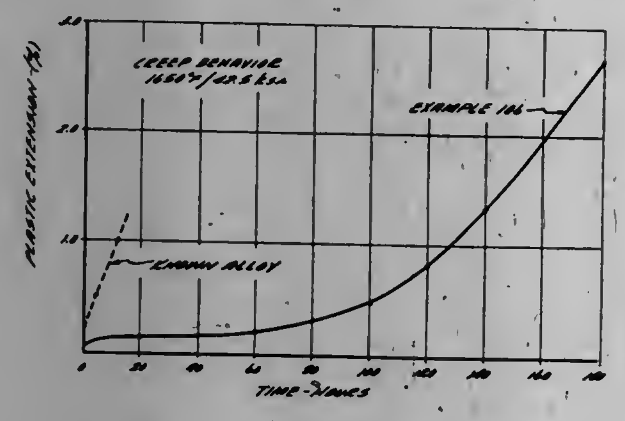
1. A steel alloy consisting essentially of 0.005 – 0.03 weight percent of carbon, 0.5 – 0.75 weight percent of titanium, 3.5 weight percent nickel, 0.3 weight percent of silicon, 0.4 weight percent manganese and the balance iron.

3,887,363

NICKEL-BASE SUPERALLOY CAST ARTICLE

Russell W. Smashey, Loveland, and Carl S. Wukusick, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 18, 1973, Ser. No. 426,092
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 8 Claims



5. A cast Ni-base superalloy characterized by the substantial absence of NiAl, carbon, carbides and Ti and consisting, in atomic percent, essentially of 4–11 Cr, 5–16 Al, about 0.5–5 Re, up to about 10 V, up to about 15 Co, up to about 5 Ta, up to about 5 W, up to about 1 Mo, up to about 2.5 Mn, up to about 2.5 Rh, with the balance essentially nickel and incidental impurities.

3,887,364

SUPERCONDUCTING MATERIALS

Ushio Kawabe; Mitsuhiro Kudo; Shigeo Fukase, and Masato Ishibashi, all of Tokyo, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 1, 1972, Ser. No. 311,148
Claims priority, application Japan, Dec. 1, 1971, 46-96271
Int. Cl. C22c *27/00;* H01l *1/04*
U.S. Cl. 75—174 14 Claims

1. A superconducting material having high critical temperature, said material being an alloy represented by the formula: Nb-Al-M, wherein M is an element selected from the group consisting of 0.05–3.8 atomic percent of Te, 0.05–2.4 atomic percent of Y, 3.2–4.2 atomic percent of Y, 0.05–3.2 atomic percent of Ce, 0.05–2.7 atomic percent of Pr, 0.05–2.7 atomic percent of Eu, 0.05–2.1 atomic percent of Ca and 0.05–7.2 atomic percent of Zn, wherein the amount of Nb is in a range of 74–80 atomic percent and the balance of said alloy is Al and very minor amounts of unavoidable impurities.

3,887,365

PROCESS FOR MAKING SHEETS WITH PARALLEL PORES OF UNIFORM SIZE

Joseph M. Sherfey, Lanham, Md., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Mar. 24, 1971, Ser. No. 127,480
Int. Cl. B22f *5/00*
U.S. Cl. 75—214 25 Claims

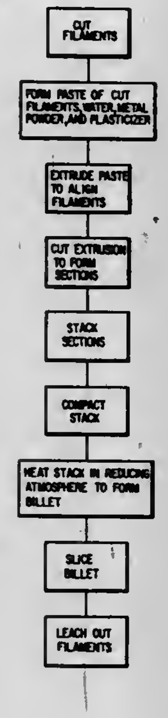
1. A process for making sheets with parallel pores of substantially uniform size comprising the steps of:

forming a plurality of longitudinal sections, said longitudinal sections comprising longitudinally arrayed filaments surrounded by a mixture including, in powdered form, the material of which said sheets are to be formed;

stacking said plurality of longitudinal sections with their lingitudinal axes substantially in parallel;

forming a billet of said plurality of stacked longitudinal sections;

slicing, to a predetermined sheet thickness, said billet at right angles to the longitudinal axes of the plurality of longitudinal sections making up said billet to form a sheet; and


CUT FILAMENTS
FORM PASTE OF CUT FILAMENTS, WATER, METAL POWDER, AND PLASTICIZER
EXTRUDE PASTE TO ALIGN FILAMENTS
CUT EXTRUSION TO FORM SECTIONS
STACK SECTIONS
COMPACT STACK
HEAT STACK IN REDUCING ATMOSPHERE TO FORM BILLET
SLICE BILLET
LEACH OUT FILAMENTS

removing said longitudinally arrayed filaments from the sheet.

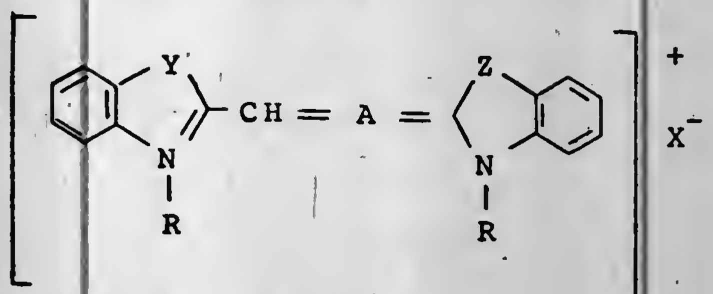
3,887,366

CYANINE PIGMENTS IN ELECTROPHOTOGRAPHIC PROCESSES

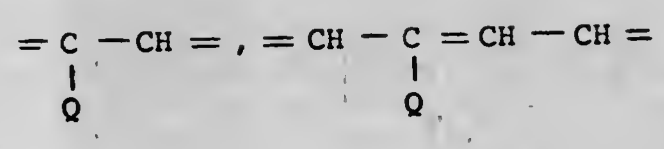
Robert Bruce Champ, and Meredith David Shattuck, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 30, 1971, Ser. No. 129,637
Int. Cl. G03g *5/06*
U.S. Cl. 96—1 PC 8 Claims

1. In an electrophotographic reproduction process which comprises selectively rendering portions of a photoconductor electrically conductive by selective exposure to light, the improvement according to which the photoconductor comprises polymolecular aggregates less than five microns in size of a pigment having the formula:

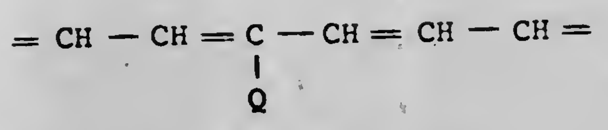


wherein R is selected from the group consisting of methyl, ethyl and allyl, X is selected from the group consisting of the chloride, bromide and iodide ions, Y and Z are each selected from the group consisting of O, S and Se, and A is selected from the group consisting of hydrocarbon chains having the formula



$$=\underset{Q}{C}-CH=,\ =CH-\underset{Q}{C}=CH-CH=$$

and



$$=CH-CH=\underset{Q}{C}-CH=CH-CH=$$

wherein Q is selected from H, CH_3 and C_2H_5.

3,887,367

METHOD FOR TEMPERATURE STABILIZING PHOTORECEPTORS

Delmer Gene Parker, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 26, 1973, Ser. No. 427,967
Int. Cl. G03g *17/00*
U.S. Cl. 96—1 R 6 Claims

1. A method for controlling photoreceptor fatigue effects in selenium-arsenic-containing xerographic photoreceptors evidenced by variations in charging level, poor image resolution and deletions due to high dark discharge rates, the improvement comprising heating and maintaining the photoreceptor at about constant temperature at a point within the range of about 10 percent – 30 percent above ambient conditions and no higher than about 40°C.

3,887,368

COMPOSITION

John C. Schottmiller, Penfield; Francis W. Ryan, Pittsford, both of N.Y., and Charles Wood, Sycamore, Ill., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 798,750, Feb. 12, 1969, abandoned, which is a continuation-in-part of Ser. No. 674,267, Oct. 10, 1967, Pat. No. 3,627,573, which is a continuation-in-part of Ser. No. 550,215, May 16, 1966, abandoned. This application July 23, 1973, Ser. No. 381,643
Int. Cl. G03g *5/02*
U.S. Cl. 96—1.5 3 Claims

1. A xerographic member having a single photoconductive layer which is contained on a supporting electrically conductive substrate, said layer comprising a vitreous selenium-bismuth composition with the bismuth comprising about 0.5 to 2.0 atomic percent, with the balance substantially selenium.

3,887,369

ORGANIC PHOTOCONDUCTIVE ELEMENT WITH INTERLAYER AND ADHESION PROMOTING ADDITIVE

Hiroshi Matsuno, and Ichiro Endo, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1973, Ser. No. 412,828
Claims priority, application Japan, Nov. 6, 1972, 47-110942
Int. Cl. G03q *5/06*
U.S. Cl. 96—1.5 15 Claims

1. An electrophotographic photosensitive member comprising a support; and overlying said support an intermediate barrier layer having a thickness of less than 10 microns for preventing electric deterioration and fatigue due to repeated use, said intermediate barrier layer consisting essentially of (1) a copolymer of maleic anhydride and an alkyl vinyl ether wherein the alkyl moiety thereof has from 1 to 12 carbon atoms or (2) mixtures of (a) copolymers of alkyl vinyl ethers wherein the alkyl moiety thereof has from 1 to 12 carbon atoms and alkyl half esters of maleic acid and (b) homopolymers of vinyl pyrrolidone having an average molecular weight of from 4,000 to 360,000 or copolymers of vinyl pyrrolidone with vinyl monomers copolymerizable therewith having an average molecular weight of from 4,000 to 360,000; and overlying said intermediate barrier layer a photoconductive layer consisting essentially of an organic photoconductor and from 1 to 10% by weight, based on the weight of the organic photoconductor, of a copolymer of vinylidene chloride and an acrylic acid alkyl ester.

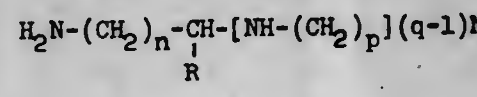
3,887,370

DYE TRANSFER ACCELERATION WITH POLYAMINE COMPOUNDS

Yasushi Ohyama, and Hideo Sumitani, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Jan. 3, 1973, Ser. No. 320,822
Claims priority, application Japan, Jan. 7, 1972, 47-4528
Int. Cl. G03c *5/54, 7/00, 5/30, 1/40*
U.S. Cl. 96—29 D 7 Claims

1. In a color development dye transfer method in which a color photograph is obtained quickly by using a dye transfer color photographic material comprising a portion composed mainly of a photosensitive silver halide emulsion layer containing a non-diffusible coupler capable of splitting off a diffusible anionic dye by coupling, in combination with a portion composed mainly of a dye transfer layer containing a cationic higher polymer mordanting agent layer capable of fixing therein the diffused anionic dye, subjecting the photographic material to exposure and color development to fix in the dye transfer layer the anionic dye splitted off by the coupling reaction, and then removing the unnecessary photosensitive emulsion layer portion therein by leaving the dye transfer layer in which a desired color image is formed, the improvement which comprises accelerating the dye transfer rate of color development by affecting dye transfer in the presence of a mixture of an alcohol and at least one of polymethylenepolyamine derivative having the general formula,



$$H_2N-(CH_2)_n-\underset{R}{CH}-[NH-(CH_2)_p](q-1)NH_2$$

wherein R is a hydrogen atom or a lower alkyl group; and *n*, *p* and *q* are individually a positive integer of from 1 to 9, 2 to 4, and 1 to 4, respectively without directly introducing said polymethylenepolyamine derivative directly into said silver halide emulsion layer.

3,887,371

PHOTOGRAPHIC METHOD FOR PRINTING VIEWING-SCREEN STRUCTURE INCLUDING TREATMENT OF EXPOSED COATING WITH AMMONIUM COMPOUND

Ratib Sofar Baker, Kinzer, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 10, 1973, Ser. No. 423,474
Int. Cl. G03c *5/00*
U.S. Cl. 96—36.1 10 Claims

1. A photographic method for printing a viewing-screen structure upon a supporting surface comprising:

a. applying to said supporting surface a coating comprised of a dichromatizable organic binder and a dichromate photosensitizer for said binder,
b. exposing said coating to a pattern of actinic energy, said exposure including both heat energy and ultraviolet energy,
c. wetting said exposed coating with a dilute aqueous solution of an ammonium compound,
d. and then flushing said exposed coating with an aqueous solvent to remove the more-soluble portions of the coating and those less-soluble portions of said coating that have been exposed solely to heat energy, while retaining in place the less-soluble portions of said coating that have been exposed to ultraviolet energy.

3,887,372

PHOTOGRAPHIC ELEMENTS AND PROCESSES FOR PRODUCING FORMAZAN DYE IMAGES OF ENHANCED STABILITY

David S. Bailey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 2, 1973, Ser. No. 384,858

Int. Cl. G03c *5/24, 1/52*

U.S. Cl. 96—48 R **70 Claims**

1. In a photographic element having a support and at least one radiation-sensitive image recording layer thereon comprised of a source of labile hydrogen atoms, a tetrazolium salt capable of reduction to a formazan dye and a photoreductant capable of forming a base activatible reducing agent precursor on exposure to actinic radiation in the presence of said labile hydrogen atoms, the improvement in which said tetrazolium salt includes dye stabilizing tetrazole nucleus substituents which are, collectively, predominantly electronegative so that the algebraic sum of the Hammett sigma values of the tetrazole nucleus substituents are

a. in excess of 0.78 or

b. in excess of 0.40 when said tetrazole nucleus is provided with a ring substituent bonded to said tetrazole nucleus at a first ring position and including a single substituent ortho to said first ring position.

65. An image recording process comprising converting a photoreductant capable of forming a base activatible reducing agent precursor on exposure to actinic radiation, within a selected areal portion of a radiation-sensitive layer of a photographic element, to a reducing agent precursor by imagewise exposing the photoreductant to actinic radiation while in reactive contact with labile hydrogen atoms,

activating the precursor with a base to form a reducing agent; and

reducing to produce a formazan dye of enhanced stability a tetrazolium salt including dye stabilizing tetrazole nucleus substituents which are, collectively, predominantly electronegative so that the algebraic sum of the Hammett sigma values of the tetrazole nucleus substituents are

a. in excess of 0.78 or

b. in excess of 0.40 when the tetrazole nucleus is provided with a ring substituent bonded to the tetrazole nucleus at a first ring position and including a single substituent ortho to the first ring position.

3,887,373

NON-POLLUTING PHOTORESIST DEVELOPING PROCESS

Robert G. Hays, Scottsdale; Henry G. Hughes, Phoenix, and William L. Hunter, Scottsdale, all of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 350,246, April 11, 1973. This application Dec. 12, 1973, Ser. No. 424.138

Int. Cl. G03f *7/08*

U.S. Cl. 96—36 **3 Claims**

1. A process for developing a cyclized polyisoprene photoresist composition coated on a substrate after imagewise exposure which comprises applying a saturated hydrocarbon naphtha or cyclohexane solvent to the unexposed portions of said photoresist coating to remove the unexposed portions while allowing the exposed portions to remain on said substrate said composition comprising a cyclized polyisoprene containing double bonds and 2,6-bis(p-azido benzylidene)-4-methylcyclohexanone as a sensitizer.

3,887,374

TETRAZOLIUM ALT PHOTOREDUCTIVE IMAGING

Ralph T. Brongo; James C. Fleming, and Joseph W. Manthey, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 2, 1973, Ser. No. 384,859

Int. Cl. G03c *5/24, 1/52*

U.S. Cl. 96—48 R **67 Claims**

1. In a photographic element having a support and at least one radiation-sensitive image recording layer, the improvement in which said image recording layer is comprised of a source of labile hydrogen atoms, a tetrazolium salt capable of reduction to a formazan dye and a photo-reductant capable of producing a base activatible reducing agent precursor on exposure to actinic radiation in the presence of said labile hydrogen atoms.

3,887,375

RESTRAINERS FOR RAPID ACCESS, AIR STABLE, REGENERABLE, METAL CHELATE DEVELOPER SOLUTIONS

Norman Newman, and Richard S. Fisch, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 24, 1973, Ser. No. 391,510

Int. Cl. G03c *5/30*

U.S. Cl. 96—66.5 **14 Claims**

1. A rapid access, air-stable, regenerable metal chelate developer solution, the metal chelate selected from the group consisting of iron, titanium, and vanadium chelate developers, including therein as fog restrainer halide and a compound selected from the group consiting of 2-mercaptobenzothiazole L-thiazolidine-4-carboxylic acid, and N-methylbenzothiazolium p-toluene sulphonate.

2. The developer solution of claim 1 wherein the metal chelate developer solution comprises an aqueous solution of a metal chelate developer and at least one developer selected from gallic acid, tannic acid, amidol and 2,5-di-tert-butyl hydroquinone.

3,887,376

PHOTOGRAPHIC ELEMENTS, COMPOSITIONS AND PROCESSES

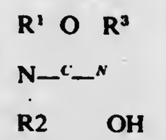
Burton D. Wilson; Paul E. Woodgate, both of Rochester, and Richard W. Henn, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 252,036, May 10, 1972, abandoned. This application June 13, 1974, Ser. No. 479,024

Int. Cl. G03c *5/26, 5/30*

U.S. Cl. 96—66 R **4 Claims**

1. A photographic processing composition comprising an alkaline development activator and an N-hydroxyurea silver halide developing agent, said N-hydroxyurea silver halide developing agent being represented by the formula:



$$\begin{array}{ccc} R^1 & O & R^3 \\ N— & C & —N \\ R2 & & OH \end{array}$$

wherein R^1 is hydrogen, alkyl containing 1 to 4 carbon atoms or aryl containing 6 to 10 carbon atoms; R^2 is hydrogen, alkyl containing 1 to 4 carbon atoms or aryl containing 6 to 10 carbon atoms; R^3 is hydrogen, alkyl containing 1 to 4 carbon atoms or aryl containing 6 to 10 carbon atoms.

3,887,377

ANTISTATIC PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Nobuo Yamamoto; Masakazu Yoneyama; Wataru Ueno, and Takayuki Inayama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

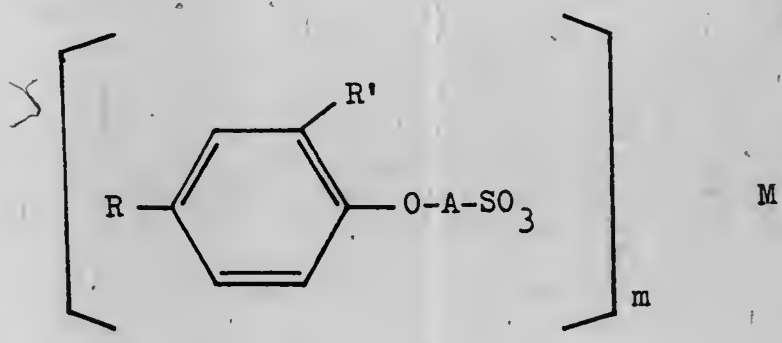
Filed July 19, 1973, Ser. No. 380,795

Claims priority, application Japan, July 22, 1972, 47-73542; Oct. 24, 1972, 47-106487

Int. Cl. G03c *1/82*

U.S. Cl. 96—87 A **11 Claims**

1. An antistatic photographic light-sensitive material having thereon a surface layer comprising a non-gelatin containing binder and an antistatic compound represented by the following general formula:



wherein R and R′, which may be the same or different, each represents an aliphatic hydrocarbon residue having 1–22 carbon atoms, the sum of carbon atoms or R and R′ being 6–40, A represents a divalent aliphatic hydrocarbon residue having 4–8 carbon atoms in total, M represents a hydrogen atom, a metal atom or a quaternary ammonium salt, and m represents a number corresponding to the valence of M.

3,887,378

IMAGE RECORDING AND RECEIVING MATERIALS

Alfons Klein, Dusseldorf; Anita Von Konig, Leverkusen, both of Germany; Albert Lucien Poot, Kontich, Belgium, and Karlfried Wedemeyer, Cologne-Stammheim, Germany, assignors to Agfa-Gevaert, Mortsel, Belgium

Filed Apr. 12, 1974, Ser. No. 460,534

Claims priority, application Germany, Apr. 16, 1973, 2319080

Int. Cl. G03c *1/02*

U.S. Cl. 96—114.1 **18 Claims**

1. An image reproduction material selected from the group consisting of a recording material and an image-receiving material comprising a layer which contains a substantially light-insensitive silver salt, a reducing agent and a toner, characterized in that it contains a hydroxyindane as reducing agent.

3,887,379

PHOTORESIST AZIDE SENSITIZER COMPOSITION

Nicholas J. Clecak, San Jose, and Robert J. Cox, Los Gatos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 239,794, March 30, 1972, abandoned. This application Aug. 15, 1973, Ser. No. 388,706

Int. Cl. G03f *7/08;* **G03c** *1/72*

U.S. Cl. 96—115 R **5 Claims**

1. A negative resist composition comprising a poly-(2-chlor-1,3-butadiene) and in an amount of from 0.5 to 10 percent by weight of the weight of the photosensitive polymer, a photosensitizer selected from the group consisting of 6-Azido-2-(4-p-dimethylaminophenyl-2,4-butadienyl(-N-methylbenzenthiazolium iodide, 6-Azido-3-methyl-2-3-[3-(6-azido-3-methylbenzothiazolylidene) propene]benzothiazolium iodide, 6-Azido-3-methyl-2-(p-dimethylaminostyryl) benzenethiazolium iodide, and N-Methyl-4-(6-azido-3-methyl-2-benzenethiazolylidenemethylene) quinolinium iodide.

3,887,380

DIRECT POSITIVE SILVER HALIDE PHOTOGRAPHIC EMULSION

Keisuke Shiba; Masanao Hinata; Reiichi Ohi; Arkira Sato; Koutarou Yamasue, all of Minami-Ashigara, Japan, and Tokibaru Kondo, deceased, late of Minami-Ashigara, Japan (by Yoshiharu Kondo, legal representative), assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan,

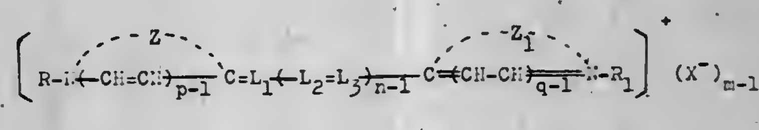
Continuation-in-part of Ser. No. 149,272, June 2, 1971, abandoned. This application Aug. 21, 1973, Ser. No. 390,264

Claims priority, application Japan, June 2, 1970, 45-47380; June 2, 1971, 46-18670; Germany, June 2, 1971, 2127346; France, June 2, 1971, 71.19938; Canada, June 2, 1971, 114642; Belgium, June 2, 1971, 104148

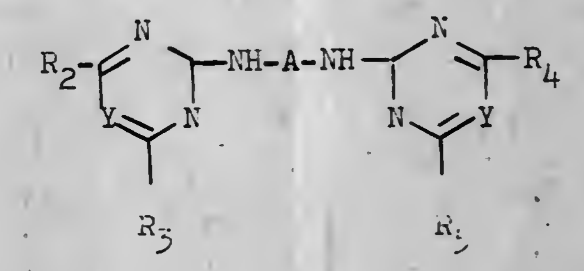
Int. Cl. G03c *1/14*

U.S. Cl. 96—126 **15 Claims**

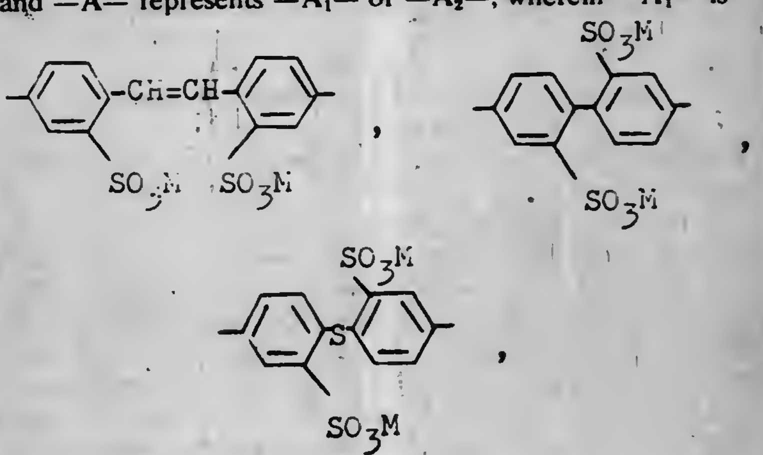
1. A direct positive silver halide photographic emulsion comprising fogged silver halide and a combination of at least a sensitizing halogen accepting cyanine dye represented by the formula (I)

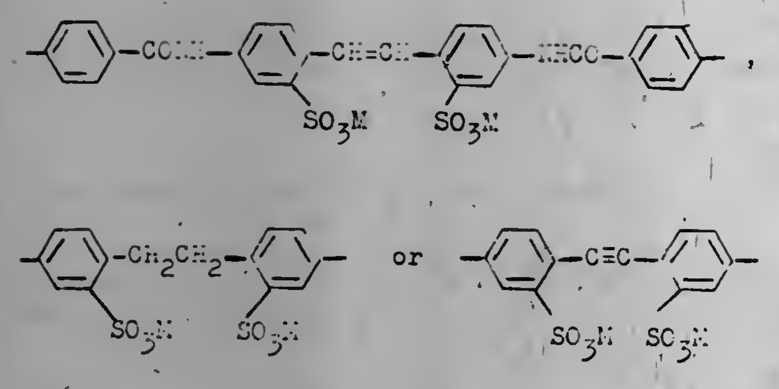


wherein Z and Z_1 each represents non-metal atoms necessary to complete a thiazole nucleus, an oxazle nucleus, a selenazole nucleus, a thiazoline nucleus, an oxazoline nucleus, a quinoline nucleus, an isoquinoline nucleus, a benzimidazole nucleus, or a 3,3′-dialkylindolenine nucleus, R and R_1 each represents an alkyl group or an aryl group, L_1, L_2 and L_3 each represents a methine group, *p* and *q* each represents 1 or 2, *n* represents 1, 2 or 3, *m* represents 1 or 2, and X represents an anion, together with at least a compound represented by the following formula (II)

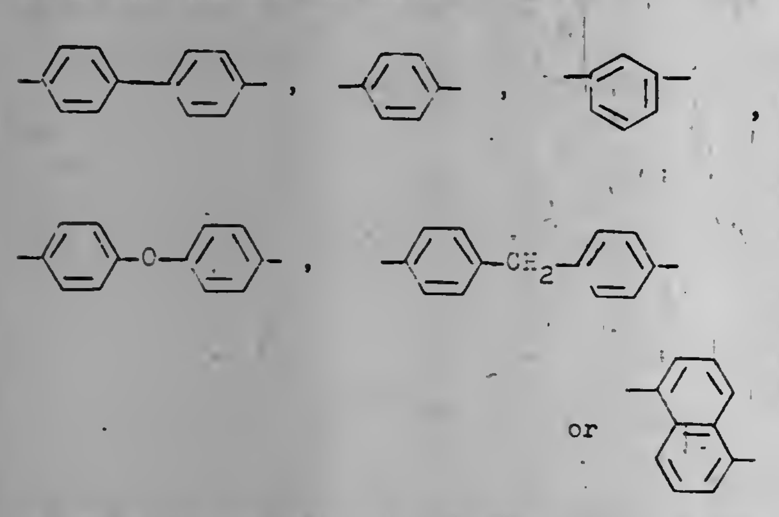


wherein Y represents =CH— or =N—; R_2, R_3, R_4 and R_5 each represents a hydrogen atom, a hydroxy group, an alkoxy group, an aryloxy group, a halogen atom, a heterocyclic nucleus, an alkylthio group, heteracryclothia group an arylthio group, an amino group, an alkylamino group, arylamins group a heterocycloamino group, an aryl group or a mercapto group; and —A— represents —A_1— or —A_2—, wherein —A_1— is





wherein M represents a hydrogen atom or a cation which affords water solubility, and wherein $—A_2—$ is



with the proviso that when —A— represents $—A_2—$, at least one of R_2, R_3, R_4 and R_5 is a substitutent containing a $—SO_3M$ group, in which M is as described above.

3,887,381
SPECTRAL SENSITIZATION OF PHOTOGRAPHIC LIGHT-SENSITIVE EMULSION

Keisuke Shiba, and Motohiko Tsubota, both of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Continuation of Ser. No. 111,501, Feb. 1, 1971, abandoned. This application Mar. 30, 1973, Ser. No. 346,386

Claims priority, application Japan, Jan. 30, 1970, 45-8231

Int. Cl. G03c *1/10, 1/18*

U.S. Cl. 96—127 **28 Claims**

1. A method for sensitizing spectrally, a photographic light sensitive emulsion, comprising silver halide dispersed in a hydrophilic colloid comprising

a. dissolving a methine dye containing at least one water-soluble group in an organic solvent having a water solubility of 10% by weight or less at 35°C,

b. dispersing the solution in a member selected from the group consisting of water and a hydrophilic colloid of 2% by weight or less, and

c. subsequently to the dispersing step, adding the dispersion to the light-sensitive silver halide emulsion.

3,887,382
DISPOSABLE PATTERN, COMPOSITION FOR INVESTMENT CASTING

Paul Solomon, 3500 University, Highland Park, Ill. 60035

Filed Oct. 13, 1972, Ser. No. 297,352

Int. Cl. B28b *7/34;* **C08h** *9/06*

U.S. Cl. 106—38.8 **4 Claims**

1. In a two-phase thermoplastic pattern forming composition comprising a thermoplastic pattern material and a finely divided solid filler material, the improvement consisting essentially of utilizing, as said filler material, decachlorobiphenyl having a chlorine content of about 71.5% and a melting point higher than that of the thermoplastic pattern material and present in an amount from about 5% to about 70% by volume of the pattern forming composition.

3,887,383
GOLD CONTAINING COMPOSITIONS FOR PRODUCING LUSTER FILMS ON SOLID SUBSTRATES

Edward P. Nesteruk, Somerset, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Division of Ser. No. 193,547, Oct. 28, 1971, Pat. No. 3,811,925. This application Mar. 7, 1974, Ser. No. 449,056

Int. Cl. C23r *3/00*

U.S. Cl. 106—1 **18 Claims**

1. An organic solvent composition suitable for coating solid substrates comprising a major amount of organic solvent having in solution minor amounts of gold and silver thio organic compounds sufficient for said composition to be suitable for providing a colored, adherent coating when applied to a solid substrate, said composition having sufficient of said thio compounds to provide about 0.2 to 4.5 weight percent gold and about 0.05 to 4.5 weight percent silver in said composition and a minor amount of iron 1,3-beta diketonate sufficient to provide about 0.5 to 8 weight percent of iron in said composition.

3,887,384
TOUGH REFRACTORY OXIDE EUTECTIC ARTICLE

Charles O. Hulse, South Glastonbury, and John A. Batt, Ellington, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 27, 1974, Ser. No. 446,578

Int. Cl. C04b *35/48*

U.S. Cl. 106—57 **2 Claims**

1. A directionally solidified refractory oxide composite article comprising a matrix phase consisting essentially of a compound of calcium oxide and zirconium oxide and a reinforcing phase consisting essentially of zirconium oxide embedded therein in the form of lamellae substantially oriented in the direction of principal anticipated stress.

3,887,385
DRY LIGHT-WEIGHT CEMENT COMPOSITION

Bernardus B. Quist, Amsterdam, and Jacobus J. M. Zuiderwijk, Rijswijk, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 9, 1974, Ser. No. 468,306

Claims priority, application Netherlands, May 17, 1973, 7306868

Int. Cl. C04b *7/02*

U.S. Cl. 106—96 **8 Claims**

1. A dry light-weight cement composition for use in an underground borehole, which composition comprises a mixture of cement, bituminous particles which are precipitated from a residual crude oil fraction and aluminum silicate particles, in which mixture more than 90% by weight of the bituminous particles are smaller than 700 microns, more than 90% by weight of the particles of the aluminum silicate are smaller than 30 microns, and from about 0.5 – 2.0 parts of weight of cement and less than about 0.2 part by weight of aluminum silicate are present per 1 part by weight of bitumen.

3,887,386
GLASS FIBRES AND COMPOSITIONS CONTAINING GLASS FIBRES

Amalendu Jyoti Majumdar, Watford, England, assignor to National Research and Development Corporation, London, England

Division of Ser. No. 127,361, March 23, 1971, Pat. No. 3,783,092, which is a continuation-in-part of Ser. No. 649,463, June 28, 1967, abandoned, and a continuation-in-part of Ser. No. 748,645, July 30, 1968, abandoned, and a continuation-in-part of Ser. No. 31,184, March 26, 1970, abandoned. This application July 24, 1973, Ser. No. 382,173. The portion of the term of this patent subsequent to Jan. 1, 1991, has been disclaimed.

Claims priority, application United Kingdom, Apr. 3, 1969, 17448/69; Aug. 4, 1967, 35901/67; July 11, 1966, 31025/66; Feb. 2, 1967, 5070/67

Int. Cl. C04b *18/22, 31/06*

U.S. Cl. 106—99 **16 Claims**

1. A composite fibre/cementitious product comprising fibrous material distributed throughout a cement matrix as a reinforcing material and subject where the surface is exposed to the cement matrix, to the corrosive action of said matrix, in which the reinforcing material is primarily a glass having per se a degree of alkali-resistance such that when tested in the form of an abraded fibre of length 2½ inches and diameter of from 0.4 to 1.0×10^{-3} inches said fibre has a tensile strength of at least 100,000 p.s.i. after treatment with saturated aqueous $Ca(OH)_2$ solution at 100°C for 4 hours followed by successive washings at ambient temperature with water, then with aqueous hydrochloric acid (1%) for 1 minute, water, acetone, followed by drying, said fibre experiencing not more than 10% reduction in diameter during said test.

3,887,387
SHAPED ZIRCONIUM OXIDE BODIES OF HIGH STRENGTH

Hans Sturhahn, Esslingen-Liebesbronn, Germany, assignor to Feldmuhle Anlagen- und Produktions- Gesellschaft mit beschrankter Haftung, Oberkassel, Germany

Filed Feb. 11, 1974, Ser. No. 441,646

Int. Cl. C04b *35/48*

Claims priority, application Germany, Feb. 16, 1973, 2307666

U.S. Cl. 106—57 **13 Claims**

1. A shaped body essentially consisting of sintered polycrystalline zirconium oxide and 2.5% to 3.5% of at least one oxide of the group consisting of oxides of magnesium, calcium, rare earth metal, cadmium, manganese, cobalt, and titanium, 75% to 95% of said body consisting of cubic crystals, said body having a density greater than 5.5 g/cm³, and the material of said body having a flexural strength of at least 30 kp/mm², all percent values being by weight.

3,887,388
CEMENT MANUFACTURE

Soren Bent Christiansen, Copenhagen Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed July 2, 1973, Ser. No. 375,372

Claims priority, application United Kingdom, July 10, 1972, 32232/72

Int. Cl. C04b *7/44*

U.S. Cl. 106—100 **34 Claims**

1. A method of removing at least a portion of gaseous compounds containing at least one of alkali, chlorine and sulphur from the exit gases of a rotary kiln in which cement raw meal is burnt to cement clinker with a view to subsequent cement manufacture comprising the steps of dividing the hot exit gases from the rotary kiln into a main gas flow and a separate divisional flow; directing the main gas flow through a suspension preheater for preheating cement raw meal prior to feeding the raw meal into the kiln; directing a plurality of individual relatively cool generally spherical solid condensation bodies of at least one of iron and ceramic material to pass through said divisional flow substantially under the influence of gravity in a manner which permits direct contact between said hot exit gas of said divisional flow and said bodies such that gaseous compounds containing at least one of alkali, chlorine and sulphur are condensed to form a coating on at least a portion of the surface of said bodies; removing said condensation bodies from said divisional gas flow; removing at least a portion of said condensed gaseous compounds from said condensation bodies; and redirecting said bodies into said divisional gas flow for the continuous removal of the gaseous compounds from the exit gases of said kiln.

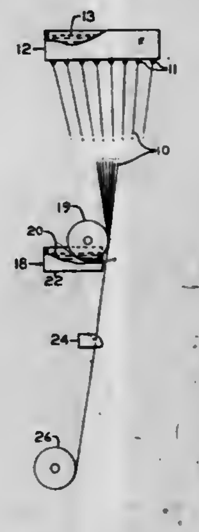
3,887,389
FIBER GLASS SIZING FOR USE IN TIRE CORD MANUFACTURING

Jerry C. Hedden, Shelby, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 26, 1973, Ser. No. 326,740

Int. Cl. C08b *27/60, 27/58*

U.S. Cl. 106—212 **4 Claims**



1. A glass fiber forming size, useful for sizing glass fibers which reinforce elastomers to provide improved flex fatigue resistance, consisting essentially of: an aqueous starch mixture consisting essentially of; 45 to 55 percent by weight of a high amylose starch component having an amylose content of about 50 to about 60 percent by weight, and 45 to 55 percent by weight of a water-repellent low amylose starch component having crosslinks therein, having an amylose content of about 20 to 30 percent by weight; 0.5 to 3 percent by weight of a member of the group consisting of a paraffin wax and a microcrystalline wax; 0.4 to 1% by weight of a silane coupling agent; and about 0.75 to 1.25 percent by weight of a non-ionic wetting agent.

3,887,390
CONCENTRATED STABLE AQUEOUS EMULSIONS OF WATER-REPELLENT AGENTS AND PROCESS FOR MAKING THEM

Hans Deiner, Hainhofen, Germany, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Aug. 13, 1973, Ser. No. 387,877

Claims priority, application Germany, Aug. 18, 1972, 2240597

Int. Cl. C08h *9/06*

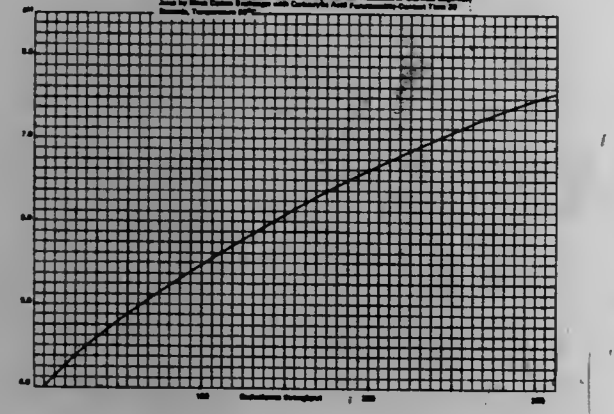
U.S. Cl. 106—271 **18 Claims**

1. A concentrated stable aqueous emulsion of a water-repellent agent comprising a Werner type chromium complex salt of a higher molecular weight fatty carboxylic acid, the molar ratio of chromium to fatty acid present in the emulsion being in the range of 1:0.55 to 1:2, and emulsified paraffin in an amount of 800 to 4,000 grams per g-atom of chromium, wherein the solids content of the emulsion is greater than 15%, based on the weight of the emulsion.

3,887,391
PROCESS FOR THE DECALCIFICATION SUGAR BEET JUICE

Karlheinz W. R. Schoenrock; Preston Richey, and Hugh G. Rounds, all of Ogden, Utah, assignors to The Amalgamated Sugar Company, Ogden, Utah

Filed Feb. 19, 1974, Ser. No. 443,612
Int. Cl. C13d *3/02, 3/14*
U.S. Cl. 127—46 A **5 Claims**



1. A process which comprises the steps of (a) treating sugar beet juice, after second carbonation, with the hydrogen form of a resinous carboxylic type cation exchanger arranged in a column for the reduction of calcium ion in the juice, at a flowrate of between 20 and 200 resin bedvolumes per hour and at a temperature of 70°–95° C and for a contact time of between 20 seconds and 3 minutes; (b) realkalizing the so-treated juice with magnesium oxide to a pH between 7.5 and 9.5 and thereafter (c) filtering the realkalized juice to remove excess magnesium oxide and insoluble impurities.

3,887,392
MATERIAL TREATMENT METHOD

Arthur Y. C. Tang, Framingham, Mass., assignor to General Diode Corporation, Framingham, Mass.

Filed Nov. 23, 1973, Ser. No. 418,369
Int. Cl. B08b *7/00*
U.S. Cl. 134—1 **3 Claims**

1. A method of cleaning a material substrate, having impurities which are capable of being dissolved in and co-vaporized with solvent on the application thereto of microwave energy, the method consisting essentially of: providing a porous carrier sheet; impregnating said carrier sheet with said solvent; positioning said impregnated carrier sheet in contact with said material substrate; applying microwave energy to said impregnated carrier sheet so as to generate heat therein and thereby vaporize said impurities and said solvent and remove the same from said material substrate.

3,887,393
BATTERY HOLDER ASSEMBLY

Mervin W. La Rue, Jr., Barrington, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 15, 1972, Ser. No. 315,387
Int. Cl. H01m *1/00*
U.S. Cl. 136—173 **4 Claims**

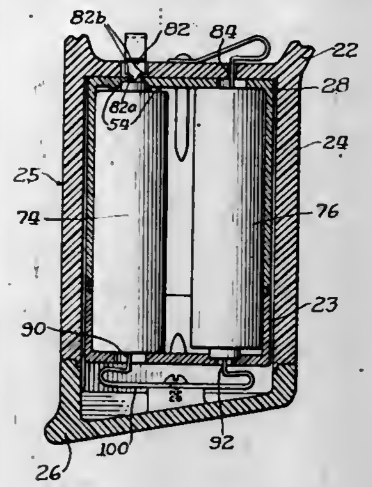
1. A battery holding assembly for elongate battery cells of the type having a central protruding positive terminal at one end and a negative terminal surface at the opposite end, said assembly comprising:

an elongate cassette for receiving and retaining a predetermined number of said battery cells in a side-by-side assembled relationship, said cassette comprising a first portion and a detachable second portion with one end wall formed as a part of said first portion and an opposite end wall formed as a part of said second portion, said first portion being attachable to said second portion in only two possible 180° rotated orientations;

means projecting longitudinally within said cassette for defining a longitudinal compartment for each of said predetermined number of batter cells, said cassette end walls providing for each battery cell compartment a pair of aligned contact-receiving apertures, a first one of said pair of aligned contact-receiving apertures having a minor diameter and a second one of said pair of contact receiving apertures having a major diameter larger than said minor diameter;

spacer means providing a raised surface region on the interior surface of each of said end walls adjacent the first one of each of said pair of aligned apertures and configured to form a socket for receiving the protruding positive battery terminal only, whereby electrical contact may be prevented with the negative terminal of a battery cell should the battery cell be improperly inserted in said cassette in reversed polarity orientation; and

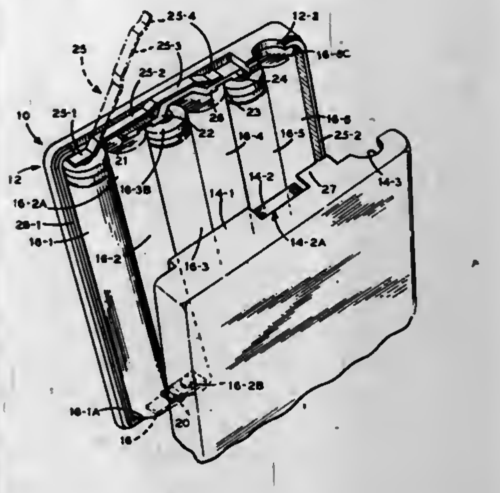
a receiver housing for longitudinally receiving said cassette, said receiver housing having a pair of end walls each including a predetermined number of inwardly protruding electrical contact elements positioned to enter said contact-receiving apertures of said cassette for establishing electrical contact with said battery cells when said battery cells are properly oriented in said cassette, said electrical contact elements including a negative electrical contact element having a dimension larger than the minor diameter and smaller than the major diameter.



3,887,394
BATTERY CARTRIDGE WITH HOLLOW CASE OF MINIMUM WEIGHT AND DIMENSIONS

Gordon E. Kaye, Garrison, N.Y., assignor to P. R. Mallory & Co. Incorporated, Indianapolis, Ind.

Filed Sept. 4, 1973, Ser. No. 394,031
Int. Cl. H01m *1/02*
U.S. Cl. 136—173 **14 Claims**



1. A battery for use with a portable apparatus, comprising a plurality of cells electrically connected in predetermined

electrical relation, and providing two electrode terminals of the battery;

a case for said cells, consisting of a hollow shell of two cofitting and mating parts having their internal surfaces shaped to fittingly engage and hold said cells in place;

said case having two windows for access from outside the case to said two electrode terminals of said battery, within said case, for engagement by two external circuit electrode terminals correspondingly positioned on an external apparatus to be serviced by said battery;

and means on said case to cooperate with a predesigned element of said apparatus for requiring the case to be properly positioned and also preventing the case from being improperly positioned in movement to its operating position relative to said apparatus, to assure proper engagement of said internal battery electrode terminals and said external circuit electrode terminals, whereby proper circuit connections will be made between said battery and the circuitry of said apparatus when the battery case is inserted to its operating position on said apparatus.

3,887,395
COBALT-RARE EARTH MAGNETS COMPRISING SINTERED PRODUCTS BONDED WITH COBALT-RARE EARTH BONDING AGENTS

Donald L. Martin, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,127
Int. Cl. H01f *1/04*
U.S. Cl. 148—31.57 **4 Claims**

1. A cobalt-rare earth alloy permanent magnet having an area greater than 4 square inches and substantially uniform permanent magnet properties throughout, said magnet consisting essentially of at least two sintered products bonded together by a magnetic bonding agent, each said sintered product consisting essentially of compacted particulate cobalt-rare earth permanent magnet alloy having pores which are substantially non-interconnecting and a density of at least 87%, said magnet being produced by depositing a layer of particles ranging in size up to 10 microns of a magnetic solid bonding agent on the bonding surface of one of said sintered products, said agent consisting essentially of cobalt-rare earth alloy containing the rare earth component in an amount at least 10 atom % greater than that of the alloy of the sintered products being bonded with the maximum amount of rare earth component being 80 atom % with at least 1% by volume of said agent passing through a liquid phase at an elevated temperature ranging up to 1,250°C, contacting the bonding surface of the second sintered product with said deposited bonding agent substantially coextensively therewith, and heating the resulting assembly in an atmosphere in which it is substantially inert to a temperature at which said bonding agent passes through said liquid phase and ranging from 900° to 1,250°C to bond said sintered products producing a solid bonded sintered product.

3,887,396
MODULAR ELECTROCHEMICAL CELL

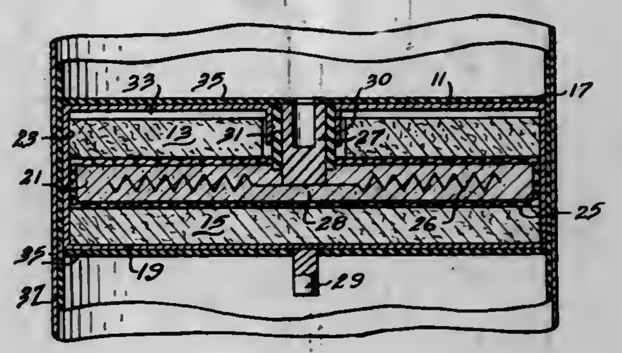
William J. Walsh, Naperville; Albert A. Chilenskas, Western Springs, both of Ill.; Elton J. Cairns, Troy, Mich., and Paul A. Nelson, Wheaton, Ill., assignors to The United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 15, 1973, Ser. No. 416,311
Int. Cl. H01m *43/00*
U.S. Cl. 136—6 L **8 Claims**

1. A modular, secondary electrochemical cell including an anode containing an alkali metal reactant, a cathode containing a chalcogen and a molten electrolyte including ions of said alkali metal, the improvement comprising:

a hollow housing having a small height relative to breadth; first and second anode structures adjacent to the inner end surfaces of said housing and in electrical contact with said housing, said anode structures including a porous, solid substrate with said alkali metal reactant within the interstices of said substrate;

a cathode structure disposed between said anode structures, said cathode structure comprising a porous, mass during operation of said cell;



a porous layer of electrically insulative material immersed in said electrolyte intermediate said cathode and anode structures for preventing direct anode to cathode contact; and

first and second electrical terminals in coaxial alignment with said housing at the upper and lower end surfaces thereof.

3,887,397
HIGHLY CONDUCTIVE STABLE ELECTROLYTE FOR LITHIUM BATTERIES

Robert J. Horning, Sellersville, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 2, 1974, Ser. No. 430,027
Int. Cl. H01m *17/02, 43/06*
U.S. Cl. 136—6 LN **3 Claims**

1. In a current producing cell having a Lithium anode, an electrolyte of methyl formate having $LiAsF_6$ dissolved therein and a cathode inert to said electrolyte, the improvement comprising:

a minor portion of $LiBF_4$ dissolved in said methyl formate.

3,887,398
PREVENTION OF DETERIORATION OF LEAD DIOXIDE

David Singman, Rockville, Md., assignor to United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 28, 1973, Ser. No. 419,821
Int. Cl. H01m *35/00*
U.S. Cl. 136—26 **8 Claims**

1. An electrode for an electrical cell comprising a base plate having a layer of an active allotrope of lead dioxide and containing less than 0.4 coulombs/in^2 of oxidizable material.

3,887,399
METHOD FOR PRODUCING ELECTRICAL ENERGY WITH CONSUMABLE ALUMINUM ANODE

Harvey N. Seiger, Granada Hills, Calif., assignor to Textron Inc., Providence, R.I.

Filed May 10, 1971, Ser. No. 141,880
Int. Cl. H01m *29/04*
U.S. Cl. 136—86 A **9 Claims**

1. A method for obtaining electrical energy, comprising the steps of:

providing a battery assembly comprising an aqueous substantially neutral electrolyte, a consumable anode in said electrolyte, said anode comprising about 98 weight percent or more aluminum, and a permeable, electrically conductive cathode in said electrolyte; and

introducing elemental halogen fluid internally of said cathode for diffusion therethrough into contact with said electrolyte;

said electrolyte comprising a strongly ionized salt, and including at least 10^{-5} mole/liter of mercury ion, as activating ions for said aluminum, said salt being so selected that the open circuit voltage of said assembly is about 2.5 volts or higher.

3,887,400
METHOD AND APPARATUS FOR ELECTROCHEMICALLY PRODUCING AN ELECTRIC CURRENT

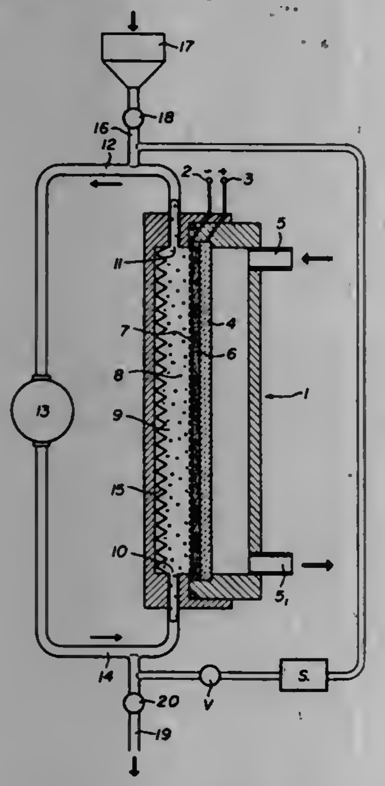
Denis Doniat, Moillesulaz/Ge.; Klaus Beccu, Troinex/Ge., and Augusto Porta, Geneva, all of Switzerland, assignors to Battelle Memorial Institute S.A. Automobiles Citroen

Continuation of Ser. No. 151,094, June 8, 1971, abandoned. This application May 14, 1973, Ser. No. 360,175

Claims priority, application Switzerland, June 9, 1970, 3619/70

Int. Cl. H01m *29/04*

U.S. Cl. 136—86 A **7 Claims**



1. A method of producing electric power by electrochemical oxidation of zinc powder in an alkaline galvanic cell having a solid positive electrode in the form of an oxygen or metal oxide electrode operatively associated with a negative current collector for contact with the zinc powder undergoing oxidation during discharge, said method comprising the steps of:

producing electric current by effecting circulation of a suspension, formed of zinc powder in an alkaline electrolyte, along a closed-loop path which is composed, on the one hand, of a first part wherein are effected the steps of providing flow of the entire suspension under agitated flow conditions along the surface of the negative current collector and of causing repeated impingement of the suspended zinc particles on said surface to thereby undergo repeated momentary oxidations and, on the other hand, of a second part wherein the suspension containing the said zinc particles carrying thereon the products of said momentary oxidations is removed from the collector and made to circulate without contacting the said collector so as to continually provide transfer of said products of said momentary oxidations from the suspended zinc particles to the bulk of the electrolyte of the suspension circulating along said second part before renewed flow thereof along the said collector, whereby said circulation along the closed-loop path provides continuous discharge, by a rapid succession of said momentary oxidations, with continual recycling of said suspension to said collector from said second part, said suspension which is being recycled to said collector containing said zinc particles from which said oxidation products have been removed and which are composed of zinc in a sufficient amount to insure substantially constant current delivery by the cell, whereby said zinc particles are gradually consumed in a succession of rapid passages thereof through the cell during discharge.

3,887,401
MAGNETIC PARTS AND METHOD OF MANUFACTURING SAME

Max Hetzel, Biel, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Switzerland

Filed Apr. 16, 1973, Ser. No. 351,324

Claims priority, application Switzerland, May 5, 1972, 6741/72

Int. Cl. H01f *1/00*

U.S. Cl. 148—121 **6 Claims**

1. A method of manufacturing small maagnetizable parts to eliminate rest magnetism therefrom, said parts being of the size range suitable for incorporation into wrist watches and like mechanical appliances, said method comprising the steps of:

heating the parts by combustion process during a first interval of time to a temperature substantially above the Curie point of the parts while maintaining said parts in a shielded heating environment free of any magnetic fields greater than about 5 Oersted;

rapidly cooling said parts to an annealing temperature above the Curie point while maintaining said shielded environment;

maintaining said parts at said annealing temperature over a second interval of time; and,

slowly cooling said parts to room temperature.

3,887,402
METHOD FOR PRODUCING HIGH DENSITY STEEL POWDERS

Yoshikazu Kondo, Yokohama, and Mitsuo Ohhori, Kudamatsu, both of Japan, assignors to Kozo Yoshizaki, Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 428,013

Claims priority, application Japan, Dec. 25, 1972, 47-129379

Int. Cl. B22f *9/00*

U.S. Cl. 148—126 **14 Claims**

1. A method for producing high density steel powders, suitable for powder metallurgy; characterized in that atomized steel powders and atomized alloy steel powders, having 0.02 to 0.38 percent by weight of carbon and 0.20 to 0.50 percent by weight of oxygen contained, and wherein the quantitative relation of carbon to oxygen can meet the equation $C\% = K{\cdot}O\%$ (K=0.375 to 0.75), are heated at 600° to 1,250°C in inert gas, whereby reduction as well as decarburization and softening are simultaneously carried out.

3,887,403
PROCESS AND SOLUTION FOR REMOVING TITANIUM AND REFRACTORY METALS AND THEIR ALLOYS FROM TOOLS

Dolphus L. Coggins, Berkeley, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 269,133, July 5, 1972, abandoned. This application Oct. 15, 1973, Ser. No. 406,237

Int. Cl. C23f *1/02;* **C09k** *3/00*

U.S. Cl. 156—7 **7 Claims**

1. A composition for removing refractory metals, titanium and alloys of refractory metals and alloys of titanium from a metallic based tool without attacking the metal base, said composition being acidic and comprising: about 0.7% to about 17.5% by weight of a source of fluoride ions calculated as hydrofluoric acid; from about 0.9% to about 22.5% by weight of COOH radical provided by a COOH supplying material selected from the group consisting of mono and dicarboxylic acids of 1 to 6 carbon atoms; about 49% to about 24.97% by weight of a hydroxylated carboxylic acid selected from the group of hydroxylated mono, di or tricarboxylic acids of 1 to 6 carbon atoms and containing from 1 to 5 hydroxyl groups, and the remainder being water.

3,887,404
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

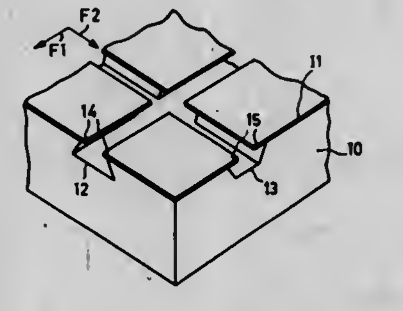
Jean-Paul Chané, Yerres, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 23, 1973, Ser. No. 326,038

Claims priority, application France, Jan. 27, 1972, 72.02669

Int. Cl. H01l *5/00, 7/64*

U.S. Cl. 156—8 **21 Claims**



1. A method of producing a semiconductor device comprising at least one recess, comprising the steps of:

a. providing a body comprising a surface portion that defines a substantially flat surface, said surface portion consisting essentially of an $A^{III}B^{V}$ material;

b. providing a mask at said surface to cover a first portion thereof;

c. selectively etching only a part of said surface that is uncovered by said mask by subjecting said part to an oxidizing etchant passed through an opening in said mask; and

d. selectively etching said part by separately subjecting said part of said surface portion to a gaseous acid etchant passed through an opening in said mask.

3,887,405
METHOD AND COMPOSITION FOR CLEANING COPPER SURFACES

Jaan-Jiue Fong, Tolland, and Merton M. Beckwith, Rockville, both of Conn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 10, 1974, Ser. No. 468,645

Int. Cl. C23f *1/00*

U.S. Cl. 156—18 **12 Claims**

1. A mild etchant for copper workpieces consisting essentially of an aqueous solution of 60–240 grams per liter of an alkali metal monopersulfate, 15–500 parts per million of a water-soluble inorganic chloride compound, sulfuric acid in an amount sufficient to provide a pH of 0.2–1.8, and up to 10 grams per liter of an alkali metal sulfate.

3,887,406
PRODUCTION OF BUILDING BOARD

Thomas Gwynne, Loughborough, England, assignor to BPB Industries Limited, London, England

Filed Oct. 24, 1972, Ser. No. 300,351

Claims priority, application United Kingdom, Oct. 22, 1971, 49277/71; May 15, 1972, 22650/72

Int. Cl. B32b *3/18, 31/12*

U.S. Cl. 156—42 **7 Claims**

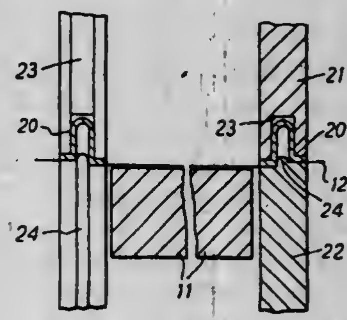
1. A method for the production of lined cementitious board comprising the steps of:

continuously advancing a first sheet in a generally horizontal plane;

providing a reinforcing strip of rigid material formed with a section of desired non-planar profile;

supplying such reinforcing strip to the upper surface of at least one lateral edge of said first sheet and securing said strip to said edge with such profile in a first orientation relative to said plane;

depositing an aqueous slurry of cementitious material on the upper surface of said first sheet;



folding the lateral edges of said first sheet upwards as the sheet advances and rotating said strip therewith from said first orientation into the orientation and disposition said strip will have in the finished board, without alteration of the profile of said strip;

laying a second sheet over said slurry and the upwardly folded lateral edges of said first sheet;

forming said slurry to the desired thickness;

and securing said two sheets together at their lateral edges whereby said strip is incorporated in the formed board.

3,887,407
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE WITH NITRIDE OXIDE DOUBLE LAYER FILM

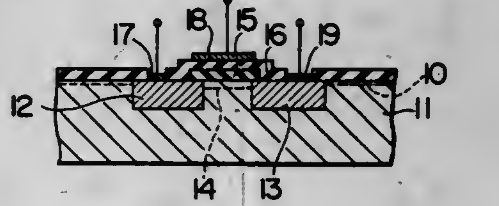
Minoru Ono, Kodaira, and Toshimitu Momoi, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

Division of Ser. No. 65,383, Aug. 20, 1970, Pat. No. 3,788,913, which is a division of Ser. No. 701,988, Jan. 31, 1968, abandoned. This application Oct. 17, 1973, Ser. No. 407,223

Claims priority, application Japan, Feb. 3, 1967, 42-6608; Feb. 3, 1967, 42-6609

Int. Cl. H01l *7/50*

U.S. Cl. 156—11 **2 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:

a. forming a semiconductor substrate with a PN junction the entire termination of which is covered with a first insulating film consisting essentially of silicon dioxide;

b. forming a hole in the first insulating film so as to expose a surface portion of said semiconductor substrate, while maintaining the entire termination of said PN junction covered with said first insulating film;

c. covering the entire exposed upper surface of said first insulating film, the entire side walls in said hole of said first insulating film, and the exposed surface portion of said semiconductor substrate with a second insulating film consisting essentially of silicon nitride, so that said second insulating film is spaced from the termination of said PN junction;

d. completely covering said first and second films, except for a portion of said second film directly contacting the surface of said semiconductor substrate at a location in said hole spaced from the portion of the surface covered with said first insulating film, with a corrosion resistive mask; and

e. exposing the combination thus composed to an etchant to partially etch away the portion of said second insulating film not covered with said corrosion resistive mask, so as not to expose said first insulating film to said etchant.

3,887,408
METHOD OF FORMING PERMEABLE POLYMERIC LINER ON ABSORBENT DIAPERS, WOUND DRESSINGS, CATAMENIAL PADS AND THE LIKE

Charles E. Hoey, Marlton, N.J., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Apr. 24, 1973, Ser. No. 354,062

Int. Cl. B32b *5/18;* **A61f** *13/18*

U.S. Cl. 156—78 **5 Claims**

1. In a process of making a flexible absorbent pad comprising a top layer of soft polymeric foam material prepared from an ethylenically unsaturated acrylic monomer which is permeable to liquids, an underlying layer of liquid-absorbent material, and a bottom film of flexible moisture-impervious material, the improvement comprising foaming said polymer in the form of an aqueous latex, applying it to the absorbent layer, the foam having a wet density of about 0.1 to about 0.5 grams per cm^3 and a wet thickness of about 4 mils to about 45 mils, drying the foam without substantially reducing its thickness and crushing the foam to a thickness of between about 5 percent and about 35 percent of the thickness of the original wet foam material, whereby a textile-like laminate is obtained, the foam in dry form being collapsed.

3,887,409
VINYL STRUCTURE HAVING AN EMBOSSED TOP LAYER AND A FOAM BASE

Willard E. McCreary, Lancaster, and Elvin M. Weidman, Willow Street, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 7, 1972, Ser. No. 312,813

Int. Cl. B32b *31/26*

U.S. Cl. 156—79 **1 Claim**

1. The technique for forming an embossed two-layer plastisol sheet material comprising the steps of depositing a first foamable plastisol material on a carrier structure, depositing a second embossable plastisol material of substantially the same composition as the first plastisol layer over top of the first plastisol layer, said second plastisol layer having a lower temperature fusing point than said first plastisol layer, heating both layers to a temperature above the fusing temperature of the first plastisol layer to fuse both plastisol layers and to foam the foamable layer, cooling both layers and then reheating just the second plastisol layer to a temperature of about 300°F which is approximately the fusing temperature of said second plastisol layer and which is about 100°F below the fusing temperature of said first plastisol layer and embossing just the second plastisol layer.

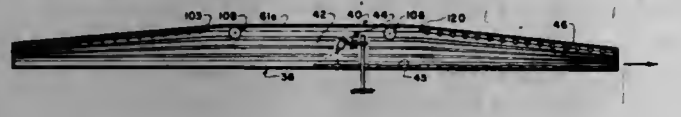
3,887,410
METHOD FOR FABRICATING DOUBLE-SKIN FOAM CORE CONSTRUCTION PANELS

Robert G. Lindner, Sewickley, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Sept. 5, 1973, Ser. No. 394,503

Int. Cl. B32g *5/18*

U.S. Cl. 156—79 **9 Claims**



1. A method of fabricating a foam filled construction panel which comprises a liner sheet, a facing sheet, and a foamed-in-place foam core, the two sheets having central webs, first edges and second edges, said method including:

aligning the two sheets with the central webs thereof in confronting relation;

joining the two sheets by means of a resilient strip connection along adjacent first edges thereof;

diverging the two sheets along second edges thereof remote from said resilient strip connection, thereby to provide an opening therebetween;

introducing foamable foam forming ingredients through said opening between the second edges of the two sheets and onto at least one of the sheets;

converging the two sheets along the second edges thereof to position the central webs thereof in confronting relation, while the foam forming ingredients therebetween are actively foaming and increasing in volume; and

retaining the two sheets in the confronting relation until the foam forming ingredients have completed their foaming and volume expansion, and provide a foamed-in-place core which connects the two sheets.

3,887,411
MAKING A TRIPLE DENSITY ARTICLE OF SILICON NITRIDE

Michael U. Goodyear, Plymouth; Andre Ezis, Gross Ile, and Karsten H. Styhr, Farmington, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 20, 1973, Ser. No. 426,832

Int. Cl. C04b *39/12*

U.S. Cl. 156—89 **7 Claims**

1. A method of making a triple density article of silicon nitride which comprises the steps of:

compacting a mixture consisting of from about 95 to 99.5% by weight silicon nitride particles and from about 5 to 0.5% by weight of a densification aid to at least 98% of theoretical density by use of heat and pressure thereby to form a first element of silicon nitride;

forming the general shape of a second element by (a) injection molding silicon metal particles and a carrier to form the general shape of said second element, and (b) heating said second element to burn out said carrier;

forming the general shape of a third element by a slip casting operation, said slip casting being accomplished from a slip containing silicon metal particles suspended in a vehicle;

sintering said third element in an inert atmosphere for a time and at a temperature sufficient to increase the strength of said third element, the inert atmosphere being formed of a gas which will not react with the silicon metal particles;

positioning said third element adjacent at least a portion of the surface area of said second element in a manner such that a small space exists between at least a portion of said two elements;

bonding said second element to said third element by a slip casting operation in which a slip containing silicon metal particles suspended in a vehicle is applied to said space existing between said two elements to build up silicon metal particles in said space;

nitriding said bonded second and said third elements in a single operation so that both of said elements are converted substantially to pure silicon nitride and are joined to one another at the area of the slip cast bonding operation;

bringing a surface area of said first element into close association with a surface area of said third element;

holding said associated surfaces of said first and said third elements so they do not move with respect to one another; and

forming a bond between said associated surfaces of said first and said third elements by applying heat to both elements and pressure on one of said elements while the other of said elements is held thereby to force a portion of the silicon nitride forming said surface area of said one element into bonding relationship with said surface area of the other element.

3,887,412
METHOD OF MAKING A TRIPLE DENSITY SILICON NITRIDE ARTICLE

Karsten H. Styhr, Farmington; Andre Ezis, Grosse Ile, and Michael U. Goodyear, Plymouth, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 20, 1973, Ser. No. 426,835

Int. Cl. C03b *29/00*

U.S. Cl. 156—89 **6 Claims**

1. A method of making a triple density article of silicon nitride which comprises the steps of:

compacting a mixture consisting of from about 95 to 99.5% by weight silicon nitride particles and a carrier from about 5 to 0.5% by weight of a densification aid to at least 98% of theoretical density by use of heat and pressure thereby to form a first element of silicon nitride;

forming the general shape of a second element by (a) injection molding silicon metal particles and a carrier to form the general shape of said second element, and (b) heating said second element to burn out said carrier;

forming the general shape of a third element in physical association with the general shape of said second element by slip casting said third element adjacent to at least a portion of said second element, said slip casting being accomplished from a slip containing silicon metal particles suspended in a vehicle;

nitriding said second and said third elements in a single operation so that both of said elements are converted substantially to pure silicon nitride and are joined to one another at the area of slip casting contact;

bringing a surface area of said first element into close association with a surface area of said third element;

holding said associated surfaces of said first and said third elements so they do not move with respect to one another; and

forming a bond between said associated surfaces of said first and said third elements by applying heat on all the elements and pressure on at least one of said elements while the other of said elements is held thereby to force a portion of the silicon nitride forming said surface area of said one element into bonding relationship with said surface area of the other element.

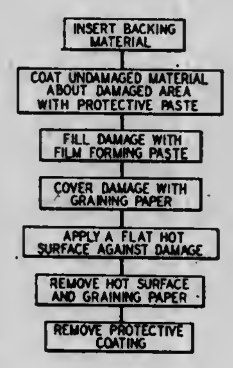
3,887,413
METHOD FOR REPAIRING PLASTIC MATERIALS

Lawrence Speer, Barbertown, N.J., assignor to Vinyltron Corporation, Amsterdam, N.Y.

Filed Aug. 7, 1973, Ser. No. 386,345

Int. Cl. B32b *35/00*

U.S. Cl. 156—94 **7 Claims**


INSERT BACKING MATERIAL
COAT UNDAMAGED MATERIAL ABOUT DAMAGED AREA WITH PROTECTIVE PASTE
FILL DAMAGE WITH FILM FORMING PASTE
COVER DAMAGE WITH GRAINING PAPER
APPLY A FLAT HOT SURFACE AGAINST DAMAGE
REMOVE HOT SURFACE AND GRAINING PAPER
REMOVE PROTECTIVE COATING

6. A process for repairing a damage in plastic or leather-like fabrics comprising the steps of placing a backing member in contact with the material to be repaired for defining a void with the edges of said damage, coating the undamaged material surrounding said damage with a heat insulating paste, filling said void with a mixture of a film forming material and a plasticizer, covering said void with a vinyl release paper, applying a flat hot surface to the vinyl release paper for a time and at a temperature to cure said mixture and removing said flat surface, said paper and said coating, wherein said heat insulating paste comprises a mixture of Bentonite and talc in water.

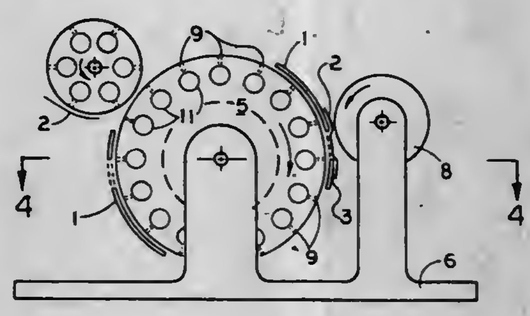
3,887,414
ENVELOPE WINDOW PATCHING

Robert Cohn, Millbrae, Calif., assignor to Champion International Corporation, Hamilton, Ohio

Filed Mar. 26, 1973, Ser. No. 345,165

Int. Cl. B31b *1/82*

U.S. Cl. 156—108 **7 Claims**



1. A process of applying a window patch to a container blank such as an envelope or web for formation into a window container and having a window cut out comprising the steps of

A. Feeding a strip of hot melt coated transparent or translucent window patch material;

B. Severing a patch from said strip by cutting off a predetermined length of it;

C. Feeding said blank or web material to a rotating cooled vacuum drum with a cylindrical outer surface and securing it uniformly over its entire surface area by vacuum to said cylindrical surface of said drum;

D. Depositing said patch over the window cut out area in said blank or web and holding it in place uniformly over its entire surface area within the marginal confines of said window cut out by vacuum thereby pulling the patch down in its free area into the window opening; while leaving the marginal edges of the patch overlying the marginal edge areas circumscribing the window cut out area; and

E. Moving said blank or web with the patch on it on said drum convex surface through a nip formed by rotating said drum against a rotating heated roll so that the heated roll contacts only the overlapped marginal edges of said patch and said blank or web circumscribing said window cut out whereby the hot melt adhesive is softened sufficiently to adhere said patch to said blank only in said overlapped areas.

3,887,415
PANEL WITH DECORATIVE BARK SURFACE AND METHOD OF MAKING THE SAME

Armin Elmendorf, Portola, and Roland Etzold, Mountain View, both of Calif., assignors to Elmendorf Research, Inc., Palo Alto, Calif.

Filed May 16, 1973, Ser. No. 360,704

Int. Cl. B32b *31/32, 31/14, 5/16;* **B27l** *11/00*

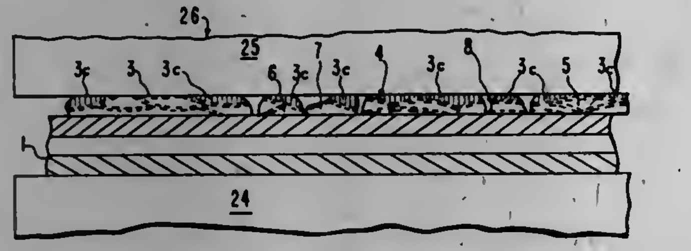
U.S. Cl. 156—154 **8 Claims**

1. A method of producing a panel having decorative bark facing which comprises the following steps:

placing bark flakes and chips on an adhesive-coated lignocellulosic substrate in a single layer; and applying pressure and compressing the flakes until pressure is exerted onto most of both the flakes and the chips and until both are bonded to the substrate in a single layer.

8. A method of producing a hard, decorative bark facing on a ligno-cellulosic substrate which includes in part the following steps:

placing bark flakes in a single layer on an adhesive-coated substrate with open spaces between the flakes;



depositing bark chips in two or more layers onto the surface with most of the chips in the spaces between the flakes; applying pressure to compress the flakes until pressure is exerted onto all of the flakes and chips in contact with the adhesive coat;

maintaining the pressure until all the flakes and chips in contact with the adhesive coat are bonded to the substrate in substantially a single layer; and

abrading the surface to remove the chips not bonded to the substrate and to remove soft tissue from the flakes and chips bonded to the substrate.

3,887,416

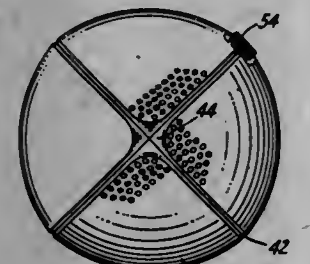
METHOD OF MANUFACTURING A LEATHER COVERED FOOTBALL

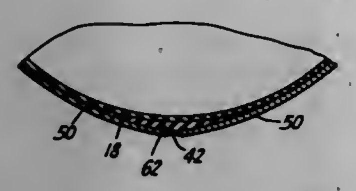
Herbert E. Tebbetts, Jr., Huntington Beach, Calif., assignor to AMF Incorporated, White Plains, N.Y.

Filed Jan. 22, 1973, Ser. No. 325,572

Int. Cl. B65c *3/26;* **A63b** *5/00*

U.S. Cl. 156—156 **1 Claim**





1. In the method of making a leather panel covered football comprising essentially an inner ellipsoid shaped rubber bladder, four exterior leather panels, and an intermediate bladder reinforcing layer, all bonded together, the improvement of inherently building into said football the shape, bounce, feel and flight characteristics of a hand sewn leather football, said method comprising winding a reinforcing cord on said bladder, covering said cord with a layer of rubber, and then bonding four leather panels to said rubber layer, said improvement comprising the additional method step of prior to covering said rubber layer with said leather panels covering said rubber layer with four longitudinally extending and circumferentially equidistantly spaced rubber side panels having integral central raised seams and tapered side portions, and with two end panels having two right angle crossed integral raised seams and tapered side portions, so that the ends of the crossed raised seams are aligned with the ends of the side panel raised seams, whereby said leather panel covered football has weighted ends, and an out of round shape similar to a hand sewn leather football in that its diameter is gradually enlarged at said seams.

3,887,417

NON-WOVEN FABRICS

Barrie Linton Davies, Pontypoal, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 817,796, April 21, 1969. This application Nov. 3, 1971, Ser. No. 195,203

Int. Cl. D04h *3/08*

U.S. Cl. 156—181 **8 Claims**

1. In a process for making a non-woven fibrous web of continuous filaments bonded at their cross-over points, said process being of the kind including the steps of forming a web of continuous filaments of a type which are capable of elongating at least 3% and effecting elongation and bonding of the filaments at their cross-over points while restraining the web from change in length or width, the improvements comprising effecting and completing the elongation of said filaments under said restraint before said bonding step, and subsequently effecting said bonding step without effecting any increase in filament length so as to produce a filament configuration within the web wherein at least 10% of the filaments lie at an angle of between 45° and 90° to the plane of the web at the mid-plane of the web, thereby producing a web having improved handle and wear properties.

3,887,418

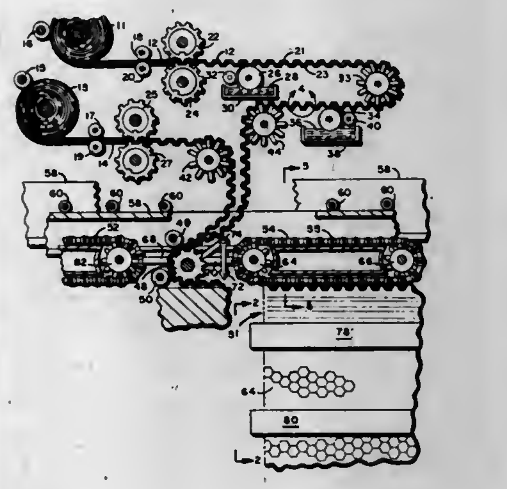
HONEYCOMB PRODUCT AND PROCESS FOR MANUFACTURE

Peter J. Jurisich, 4731 Royce Rd., Irvine, Calif. 92664

Filed May 14, 1973, Ser. No. 360,106

Int. Cl. B31d *3/02*

U.S. Cl. 156—197 **8 Claims**



1. A process for the manufacture of honeycomb comprising: corrugating a web material to form alternating crest and trough areas;

applying adhesive coatings to the corrugated webs and forming a stack of said adhesive coated webs so that said crest and trough areas are in substantial nesting alignment;

applying said adhesive coatings only to the extreme outer surfaces of the crests and to the extreme outer surface of the troughs of alternate layers of the corrugated web materials; said stack being formed by alternating layers of adhesive coated and uncoated corrugated webs;

allowing the adhesive coatings to cure and bond the stacked webs together; and,

expanding said bonded webs to form an open celled honeycomb structure.

7. A process for the manufacture of honeycomb comprising: corrugating a web material to form alternating crest and trough areas; applying adhesive coatings to the corrugated webs and forming a stack of said adhesive coated webs so that said crest and trough areas are in substantial nesting alignment;

said adhesive coatings are applied only to the extreme inner surface of the crests and to the extreme inner surface of the troughs of alternate layers of corrugated web material;

said stack is formed by alternating layers of adhesive coated and uncoated webs; and,

further comprising applying pressure to the stacked webs while allowing the adhesive coating to cure, expanding said bonded webs to form an open celled honeycomb structure.

8. A process for the manufacture of honeycomb comprising: corrugating a web material to form alternating crest and trough areas, applying adhesive coatings to the corrugated webs and forming a stack of said adhesive coated webs so that said crest and trough areas are in substantial nesting alignment;

said adhesive is applied only to the extreme outer surface of the crests of one layer of corrugated web and said adhesive is applied only to the extreme inner surfaces of the troughs of another layer of corrugated web; and,

wherein the layers of web are stacked together by alternating an outer crest coated web with an inner trough coated web, so that the adhesive coatings all face in the same direction; and,

applying pressure to the stacked webs while allowing the adhesive coatings to cure, expanding said bonded webs to form an open celled honeycomb structure.

3,887,419

APPARATUS AND METHOD FOR CONTINUOUSLY FORMING HONEYCOMB MATERIAL

Robert C. Geschwender, Lincoln, Nebr., assignor to Lancaster Research and Development Corporation, Lincoln, Nebr.

Filed July 16, 1973, Ser. No. 379,451

Int. Cl. B31d *3/02*

U.S. Cl. 156—197 **38 Claims**

1. Apparatus for continuously forming honeycomb material of a predetermined width dimension comprising:

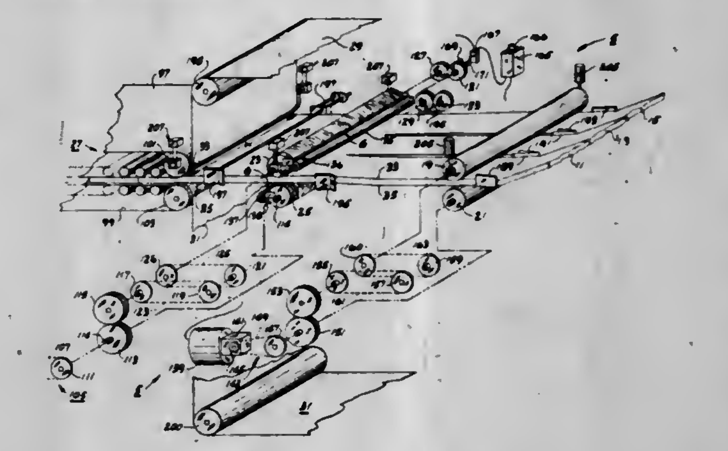
means for continuously feeding open cell honeycomb material with its cells expanded to a preselected degree so that the honeycomb material has said predetermined width;

a source of less completely expanded honeycomb material; and

means intermittently operable in response to the feeding of a preselected length of open cell honeycomb material by the feeding means for supplying to the feeding means from the source a length of less completely expanded honeycomb material which when expanded to the preselected degree will have a length equal to said preselected length thereby to insure that the feeding means continuously forms honeycomb material having the preselected degree of expansion and the predetermined width.

24. A method of forming honeycomb material of a predetermined width dimension comprising the steps of:

continuously feeding from feed rolls open cell honeycomb material having its cells expanded to a preselected degree so that the honeycomb material has said predetermined width dimension; and



intermittently feeding to said feed rolls lengths of less completely expanded honeycomb material each of which when expanded to the preselected degree has a length equal to said preselected length.

3,887,420

OFFSET TRANSFER OF DECALCOMANIAS

Saul W. Weingrad, Hillsdale, N.J., assignor to Pictorial Productions, Inc., Mount Vernon, N.Y.

Continuation of Ser. No. 139,044, April 30, 1971, abandoned. This application Mar. 29, 1973, Ser. No. 345,970

Int. Cl. B44c *1/16;* **B32b** *1/00;* **C09j** *5/06*

U.S. Cl. 156—235 **5 Claims**

1. A process for the transfer of a printed design comprising a first film layer, a design layer and a second film layer from a substrate therefor to a ware by means of a compressible transfer surface provided on a transfer head, said first film layer having a greater coefficient of adhesion to said transfer surface than said second film layer to said substrate but a lesser coefficient of adhesion to said transfer surface than said second film layer to said ware; said process comprising the steps of:

compressing said transfer surface against said printed design;

transferring said printed design from said substrate to said transfer surface;

compressing said transfer surface with said design thereon against said ware; and

transferring said printed design from said transfer surface to said ware.

3,887,421

METHOD OF MASKING SEMICONDUCTOR WAFERS USING A SELF-ALIGNING MASK

James L. Hudson, and Larry L. Jordan, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 325,227, Jan. 22, 1973, Pat. No. 3,841,261. This application June 5, 1974, Ser. No. 476,411

Int. Cl. B44d *1/20;* **B05c** *11/00*

U.S. Cl. 156—280 **1 Claim**

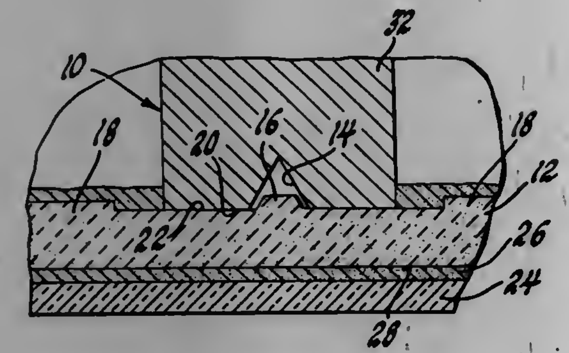
1. A process for applying a wax maskant to selected portions of a semiconductor wafer face prior to chemical etching of said wafer face, said process comprising:

forming a pattern of ridges on a face of a wafer of semiconductive material having a plurality of regions containing active semiconductor devices;

affixing an opposite face of said wafer to a support;

placing a face of a spray mask on said wafer, said spray mask being a grid of a magnetic metal, said grid having a plurality of intersecting portions surrounding apertures corresponding to said regions in said wafer, and having a pattern of grooves on said face corresponding to said pattern of ridges on said wafer face;

nesting said ridges in said grooves and abutting said spray mask face with said wafer face to interlock said mask with said wafer and align said grid apertures with said wafer regions;



magnetically holding said mask against said wafer face;

spraying wax onto said wafer regions through said apertures in said mask; and

removing said mask from said wafer face.

3,887,422
ADHESIVE COMPOSITION AND METHODS

David S. Bosniack, Baytown, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 245,389, April 19, 1972, abandoned. This application Aug. 15, 1973, Ser. No. 388,707

Int. Cl. C09j *3/14*

U.S. Cl. 156—334 **10 Claims**

1. A method for bonding two substances together which comprises in combination the steps of:

a. wetting at least a portion of the surface of each of said substances with an adhesive composition comprising (i) from about 20 to about 80 weight percent of a reject polypropylene containing, on a dry basis, from about 5 to about 95 weight percent of atactic polypropylene, from about 95 to about 5 weight percent isotactic polypropylene, and from about 1 to about 20 weight percent inorganic salts and (ii) from about 80 to about 20 weight percent asphalt; and

b. contacting said wetted surfaces with one another under sufficient pressure to create a strong bond between said substances.

3,887,423
TIRE BUILDING MACHINE

Georges Gazuit, Montlucon, France, assignor to NRM Corporation, Akron, Ohio

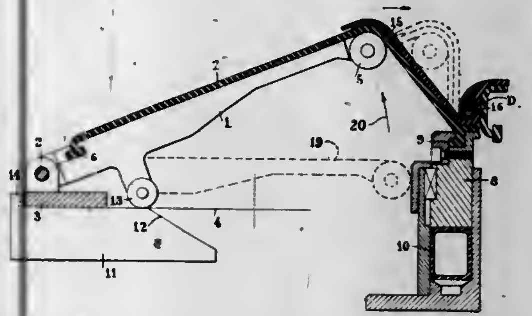
Filed Nov. 17, 1969, Ser. No. 877,399

Claims priority, application France, Nov. 27, 1968, 68.175507

Int. Cl. B29h *17/22*

U.S. Cl. 156—402 **16 Claims**

1. In a tire building machine, a rotatable drum adapted to receive ply stock thereon, the edges of such stock extending beyond such drum and adjacent a tire bead at the end of such drum, a plurality of pivotally mounted fingers at each end of said drum, the distal ends of said fingers being axially coextensive with such stock edges, means to pivot said fingers to cause the distal ends thereof to turn such stock edges, means then axially to move said fingers to cause such stock edges to wrap around such bead, a radially movable bead clamp operative to clamp said ply against such bead, and an elastic annular bladder extending from such bead clamp about said fingers.



3,887,424
MACHINE FOR PRODUCING NON-WOVEN FLOOR COVERINGS

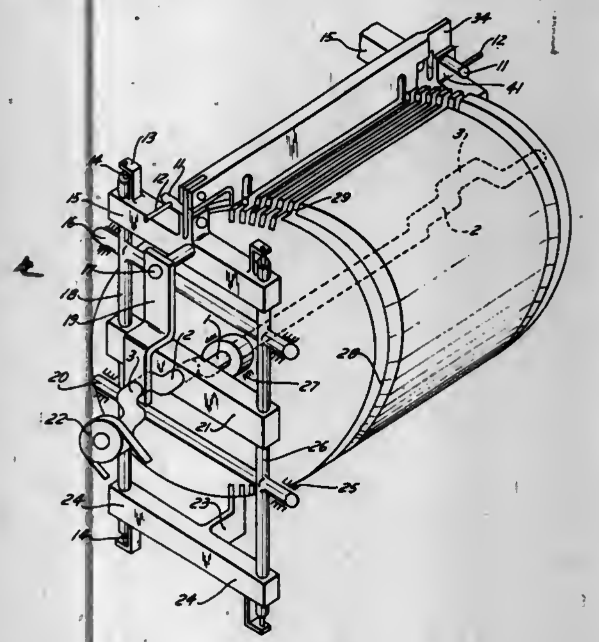
Stoyan Iliev Julev; Mihail Yordanov Milkov; Lyubomir Petrov Dachev; Rossen Petrov Vassilev, and Simeon Alexandrov Grigorov, all of Sofia, Bulgaria, assignors to ZNIRD pri DSO "TEXTIL", Sofia, Bulgaria

Filed Apr. 16, 1974, Ser. No. 461,414

Claims priority, application Bulgaria, Apr. 16, 1973, 23328

Int. Cl. D04h *11/08;* **B31f** *1/20*

U.S. Cl. 156—435 **17 Claims**



1. A machine for producing non-woven floor coverings, said machine comprising a horizontal drum having a plurality of longitudinally extending equally spaced grooves therein extending completely about its periphery, a drum supporting shaft mounted therewithin coaxial thereof, two parallel frames, one disposed at each end of the drum in a respective plane transverse to the axis of the drum, each frame having two spaced vertical guide members, the frame being mounted for movement in a transverse horizontal direction, means for rotatably driving the shaft, means for reciprocating the frame in a horizontal direction comprising an intermediate traverse slidable along the vertical guide members of the frame and first, smaller eccentrics mounted on the drum supporting shaft adjacent the respective ends of the drum, means on the intermediate traverse constituting first eccentric follower means, upper and lower traverses mounted above and below, respectively, the intermediate traverse, means connecting the upper and lower traverses to move in unison, said last named means comprising a second eccentric having an eccentricity markedly greater than that of the first eccentric, integrally attached to said drum supporting shaft, and second eccentric follower means connected to the connected upper and lower traverses, discs on the ends of the drum having grooves therein aligned

with respect to the grooves in the drum proper, drum indexing fingers connected to the respective upper and lower traverses for alternate engagement with the grooves in the grooved discs affixed to the drum, a beating blade extending longitudinally of the drum, and means connecting the ends of the beating blades to the upper traverses at the opposite ends of the drum, the drum indexing fingers and the beating blade describing a substantially elliptical path having a vertical axis which markedly exceeds in length the length of the horizontal axis.

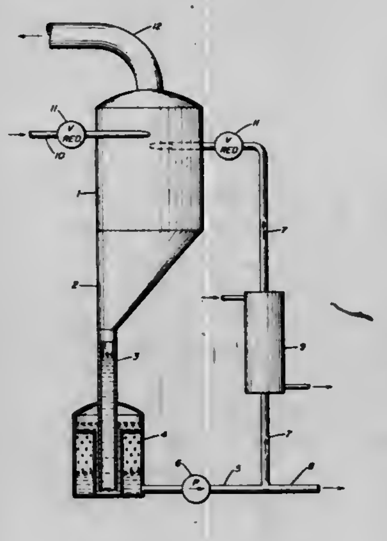
3,887,425
CONCENTRATING ACRYLAMIDE SOLUTIONS

Robert James Munch, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 1, 1973, Ser. No. 402,654

Int. Cl. C07c *103/00;* **B01d** *1/00, 1/16*

U.S. Cl. 159—48 L **4 Claims**



1. A process of concentrating aqueous acrylamide solution by flash evaporation of water therefrom while inhibiting polymerization of acrylamide, comprising the steps of

a. flash-evaporating water from aqueous acrylamide feed solution having more than 50 percent by weight water in the total feed, by constantly introducing said feed solution into an evaporation chamber in which pressure has been reduced to a selected pressure in the range from about 60 to about 450 mm Hg and with at least a portion of said feed entering said chamber at temperature higher than the boiling point of said feed at the defined reduced pressure in said chamber, and

b. constantly removing from said chamber to atmospheric pressure the liquid residue from said flash-evaporation at a rate sufficient to avoid accumulation of acrylamide solution in said chamber, and

c. during said flash-evaporation in said chamber constantly washing the surfaces that contact acrylamide in said evaporation chamber, and

d. as soon as said liquid residue from evaporation is removed to atmospheric pressure, restoring absorbed oxygen to saturation in said residue and,

e. recycling part of said residue with oxygen restored to saturation therein to said evaporation chamber with the temperature of said recycled liquid below its atmospheric boiling point but above the existing boiling point of said liquid inside said chamber at the reduced pressure therein.

3,887,426
PROCESS FOR PRODUCING CELLULOSE PULP BY DIGESTION WITH A DIOL OR TRIOL SOLVENT AND AN ANILINE OR PHENOL SALT

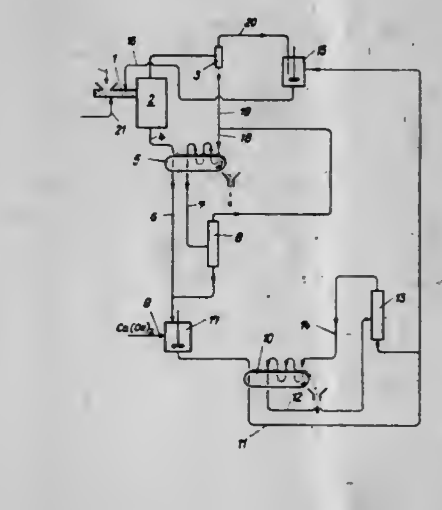
Andre Fogarassy, Paris, France, assignor to Societe Generale de Brevets Industriels et Chimiques, Switzerland

Continuation of Ser. No. 74,671, Sept. 23, 1970, abandoned. This application Mar. 15, 1973, Ser. No. 341,508

Claims priority, application Switzerland, Sept. 26, 1969, 14522/69

Int. Cl. D21c *3/20*

U.S. Cl. 162—29 **21 Claims**



1. A process for producing cellulose pulp comprising contacting wood chips containing lignin with a solution of a solvent selected from the group consisting of at least one saturated aliphatic diol or triol and a sufficient amount of a compound selected from the group consisting of an alkali metal salt of aniline, an alkaline earth metal salt of aniline and sodium phenate to dissolve the lignin in said wood chips;

digesting the solution contacted wood chips at a temperature higher than 100°C for about 30 minutes to 3 hours whereby said lignin is dissolved in the form of a soluble derivative;

separating the resultant cellulose pulp from said solution;

converting said lignin soluble derivative to an insoluble product;

separating said insoluble product from the solvent solution; and

recovering said solvent which is suitable for reuse.

3,887,427
PROCESS FOR SIZING CELLULOSE FIBERS

Karin Ulla Elisabet Helmer, Solna, and Alf Ragnar Reuterhall, Gustavsberg, both of Sweden, assignors to Kemanord AB, Stockholm, Sweden

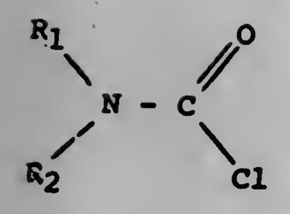
Filed July 14, 1972, Ser. No. 271,858

Claims priority, application Sweden, Nov. 16, 1971, 12622/71

Int. Cl. D21d *3/00*

U.S. Cl. 162—158 **14 Claims**

1. A process for sizing cellulose fibers or material containing cellulosic fibers wherein the cellulose fibers are brought into contact with at least 0.001% by weight based upon the weight of the dry cellulose fibers of a carbamoyl chloride having a general formula



wherein R_1 is an organic, hydrophobic hydrocarbon group containing 8–40 carbon atoms and R_2 is selected from the group consisting of hydrogen, lower alkyl and organic, hydrophobic hydrocarbon group containing 8–40 carbon atoms.

3,887,428

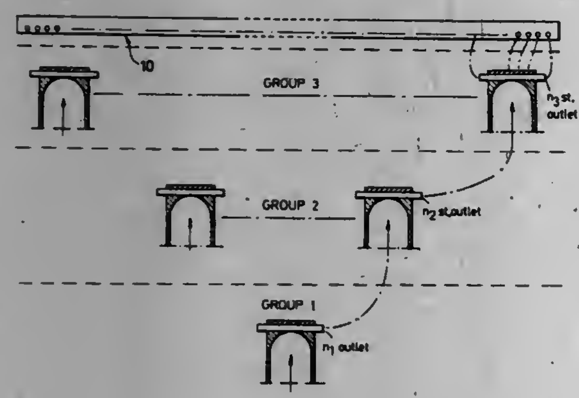
MANUFACTURE OF CONTINUOUS MATERIAL WEBS OF FIBROUS PARTICLES AT HIGH CONSISTENCIES BY PASSING PARTICLES THROUGH A SERIES OF CONSTRICTIONS

Douglas Wahren, Taby, and Lennart Reiner, Gustavsberg, both of Sweden, assignors to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Continuation-in-part of Ser. No. 157,120, June 28, 1971, abandoned. This application Dec. 20, 1973, Ser. No. 427,024

Int. Cl. D21f *1/06*

U.S. Cl. 162—216 **13 Claims**



1. An improved method of manufacturing a continuous material web of elongated fibrous particles including preparing a suspension of the particles in a liquid with the concentration of the fibrous particles in suspension being about 1.5 percent to 6.0 percent of the total weight of the liquid plus the fibrous particles; then forcing the suspension through a series of constrictions and deflecting the flow of the suspension after each constriction to create a turbulent flow ensuring uniform distribution over the web; and finally decaying the turbulent flow before deposition of the material and comprising the steps of:

gradually decreasing the scale and increasing the intensity of the turbulent flow in the series of constrictions by distributing the flow from one constriction over a plurality of subsequent constrictions of smaller diameter and said one constriction, the smallest constrictions of said series having a diameter not exceeding three times a mean particle length of said fibrous particles; and

eliminating all disrupting forces after the flow has passed through the smallest constrictions to transform the turbulent flow into a flow of a consolidated three-dimensional network structure of fibrous particles with entrained liquid before deposition thereof.

3,887,429

DEVICE FOR UNTANGLING AND DISPERSING FIBROUS MATERIALS

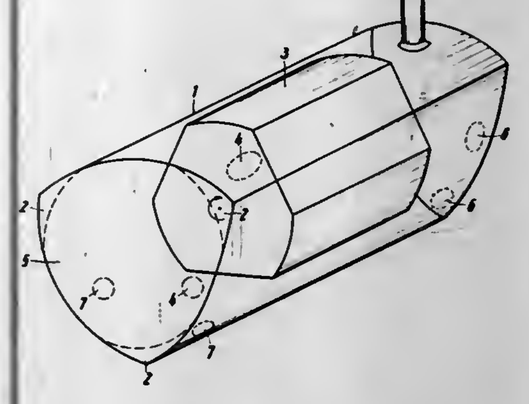
Eduard Schmid, Bonduz Gr; Reinold Nascher, Visp Vs; René Egli, Sins Ag, all of Switzerland; Noel James Parratt, Loughton, and Ronald William Gooding, Waltham Addey, both of England, assignors to Lonza, Ltd., Basle, Switzerland

Filed Mar. 7, 1973, Ser. No. 338,848

Claims priority, application Switzerland, Mar. 8, 1972, 3358/72

Int. Cl. D21j *3/00*

U.S. Cl. 162—261 **8 Claims**



1. Apparatus for treatment of a suspension of matted, tangled and interlocked fibrous materials suspended in a liquid to obtain a suspension in untangled form in said fluid which comprises:

a. a hollow stator casing closed at both ends and having

b. inlet means for feeding the suspension of said matted fibrous materials suspended in said fluid into one end of said hollow stator casing,

c. outlet means for withdrawing a suspension of said fibrous materials in untangled form suspended in the fluid from the other end of said hollow stator casing, and

d. a rotor body arranged for rotation about its longitudinal axis within said hollow stator casing, said hollow stator casing having an inner cross-section substantially in the form of a first regular polygon, said rotor body having an outer cross-section substantially in the form of a second regular polygon with rounded corners, the inscribed circle of said inner cross-section of said hollow stator casing and the circumscribed circle of said outer cross-section of said rotor body being concentric to each other, said longitudinal axis of said rotor body being arranged in the common center of said inscribed and said circumscribed circles, and the number of corner of said first polygon being equal to the number of corners of said second polygon.

3,887,430

CULTURE MEDIUM FOR TISSUE CULTURE TECHNIQUES

Harry L. Torney; Helen T. Torney, and Dale E. Bordt, all of Indianapolis, Ind., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 229,219, Feb. 24, 1972, abandoned, which is a continuation of Ser. No. 58,203, July 24, 1970, abandoned. This application July 9, 1973, Ser. No. 377,838

Int. Cl. C12k *9/00*

U.S. Cl. 195—1.7 **3 Claims**

1. In a tissue culture method comprising the steps of inoculating a protein-free, sterile tissue culture medium with living animal tissue cells and incubating said inoculated tissue culture medium under conditions conductive to cell propagation, the improvement which comprises the steps of mixing a growth-enhancing amount of a water-soluble lipid source selected from the group consisting of polysorbate 60 and polysorbate 80 with said medium, in an amount of from about 0.0010 to about 0.100 part by volume of lipid source per 100 parts by volume of medium, intimately contacting said medium with a growth-enhancing amount of a strongly basic anion-exhance resin obtained by reacting trimethylamine with a halomethylated polymer prepared by reacting chloromethyl methyl ether in the presence of a zinc chloride catalyst with beads of a copolymer of about 98 percent of styrene and 2 percent of divinylbenzene and thereafter incubating said tissue culture medium, cells and polysorbate lipid source in intimate contact with said strongly basic anion-exchange resin under conditions conducive to cell propagation for a time sufficient to obtain substantial propagation of said cells.

3,887,431

YEAST PROTEIN ISOLATE WITH REDUCED NUCLEIC ACID CONTENT AND PROCESS OF MAKING SAME

Ernest Aleck Robbins, High Ridge; Robert William Sucher; Erich Henry Schuldt, Jr., both of St. Louis County; Daniel Robert Sidoti, Ballwin; Robert Dudley Seeley, Crestwood, and Jon Albert Newell, Webster Groves, all of Mo., assignors to Anheuser-Busch Incorporated, St. Louis, Mo.

Filed Nov. 29, 1972, Ser. No. 310,469

Int. Cl. A23j *1/18*

U.S. Cl. 195—5 **25 Claims**

6. A process for producing a yeast protein product comprising the steps of:

a. rupturing yeast cells containing nuclease,

b. separating the soluble nucleic acid, nuclease, and protein from the insoluble cell wall debris,

c. hydrolyzing the nucleic acid with the nuclease,

d. insolubilizing the protein, and

e. separating the insoluble protein fraction from the remaining solubles fraction containing the hydrolyzed nucleic acid.

3,887,432

6-AMINOPENICILLANIC ACID PREPARATION

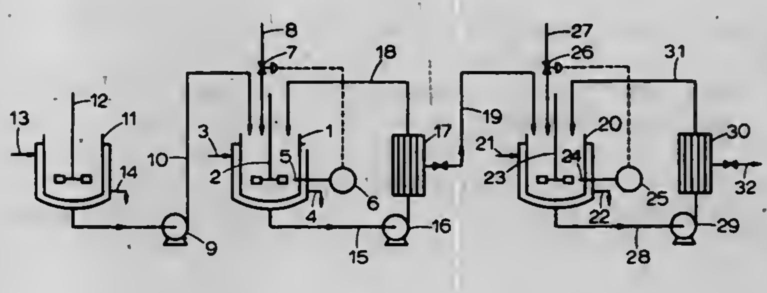
Michael Anthony Cawthorne, Horsham, England, assignor to Beecham Group Limited, England

Filed Nov. 14, 1973, Ser. No. 415,688

Claims priority, application United Kingdom, Nov. 21, 1972, 53822/72; Sept. 22, 1973, 44542/73

Int. Cl. C12d *1/02*

U.S. Cl. 195—36 P **5 Claims**



1. A process for the preparation of 6-aminopenicillanic acid which consists essentially in:

a. contacting, in aqueous solution at a pH within the range 6.0 to 9.0, benzylpenicillin or phenoxymethylpenicillin or a salt thereof with a water-soluble enzyme complex consisting of penicillin deacylase enzyme bonded to a sucrose-epichlorhydrin copolymer;

b. separating the said enzyme complex from the aqueous reaction mixture in an ultrafiltration unit;

c. recovering the formed 6-aminopenicillanic acid; and

d. re-using the separated aqueous solution of the said enzyme complex by contacting it with a further quantity of the penicillin.

3,887,433

PROCESS FOR PRODUCTION OF ANTIBIOTIC A-25822

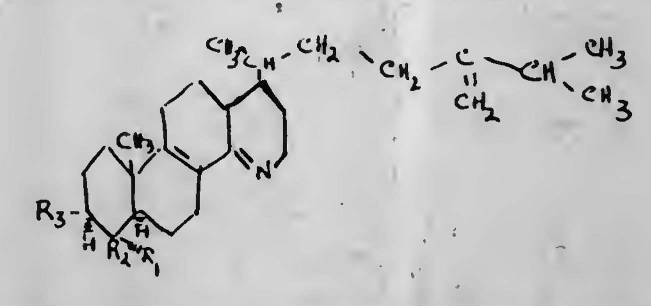
Robert H. Williams; Marvin M. Hoehn, and Karl-Heinz Michel, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 327,171, Feb. 2, 1973, Pat. No. 3,845,203. This application Mar. 21, 1974, Ser. No. 453,248

Int. Cl. C12d *7/00*

U.S. Cl. 195—81 **2 Claims**

1. The method for producing the antibiotic compound of



wherein R_1 and R_2 are both hydrogen or both methyl, and when R_1 and R_2 are both methyl R_3 is hydroxy; which comprises cultivating Geotrichum flavo-brunneum NRRL 3862 in a culture medium containing assimilable sources of carbon, nitrogen and inorganic salts under submerged aerobic fermentation conditions at a temperature of 25°–35°C and at a pH between 6 and 8 until a substantial amount of antibiotic activity is produced by said organism in said culture medium and recovering the antibiotic from said culture medium.

3,887,434

MICROBIOLOGICAL PRODUCTION OF INVERTASE

Werner Frommer, and Erich Rauenbusch, both of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 24, 1973, Ser. No. 363,640

Claims priority, application Germany, June 9, 1972, 2228112

Int. Cl. C12d *13/10*

U.S. Cl. 195—65 **10 Claims**

1. A process for the microbiological production of invertase which comprises culturing a strain of the microorganism *Saccharomyces carlsbergensis* Hansen CBS 268.72, 269.72 and 270.72 under aerobic conditions in an aqueous nutrient medium.

3,887,435

METHOD OF PRODUCING YEAST CELLS

Junji Nakamura; Shigeyoshi Miyashiro, and Hiroshi Okada, all of Tokyo, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Feb. 7, 1974, Ser. No. 440,291

Claims priority, application Japan, Feb. 14, 1973, 48-18004

Int. Cl. C12c *11/08*

U.S. Cl. 195—82 **6 Claims**

1. A method of producing yeast cells which comprises:

a. culturing a yeast strain capable of assimilating propionate ions and n-butyrate ions in an aqueous culture medium containing propionate ions, n-butyrate ions, or propionate and n-butyrate ions as the principal source of assimilable carbon, as assimilable source of nitrogen, inorganic salts, and minor organic nitrients until the cells of said strain multiply in said culture medium; and

b. recovering the multiplied cells from said medium.

3,887,436

CELL CULTURING SYSTEM

Ihsan A. Haddad, Bedford, and Alvin R. Arsenault, Burlington, both of Mass., assignors to Instrumentation Laboratory, Incorporated, Lexington, Mass.

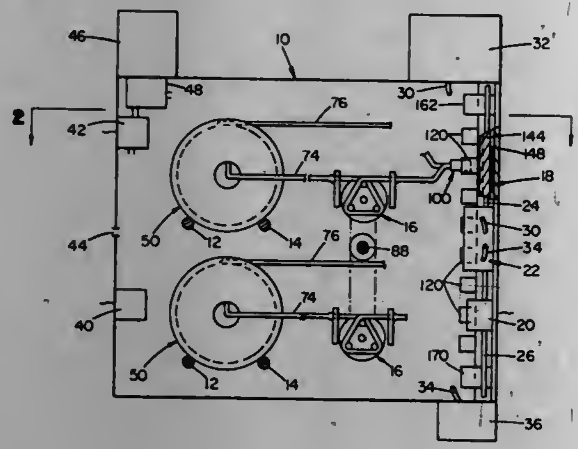
Filed May 31, 1973, Ser. No. 365,535

Int. Cl. C12b *1/00*

U.S. Cl. 195—142 **7 Claims**

1. A replaceable, sterilizable, cell growth assembly compris-

ing a chamber of gas permeable liquid impermeable material having an inner surface to which cells are attachable, and which defines an elongated flow path between inlet and outlet conduits, a coupling connected to said conduits, said coupling including a body member that supports two projecting rigid conduits, each said rigid conduit having an orifice and a puncturing tip adjacent said orifice, a seal member of elastomeric material, said puncturing tips being imbedded in said seal member, and a guide member secured to said seal member and extending parallel to said projecting rigid conduits for sliding movement relative to said body member so that said conduit orifices may be opened by sliding said seal member along said rigid conduits as guided by said guide member to expose the tips of said rigid conduits, said orifices being reclosed by sliding said seal member in the opposite direction away from said body member to reposition said orifices of said rigid conduits in said seal member.



3,887,437

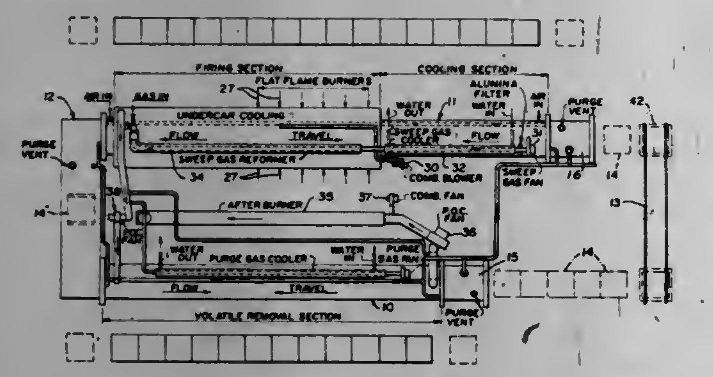
TUNNEL KILN FIRING OF CARBON PRODUCTS

Mohammed A. Osman, and Charles L. Kaib, both of Pittsburgh, Pa., assignors to Pullman Incorporated, Pittsburgh, Pa.

Filed Sept. 20, 1972, Ser. No. 290,576

Int. Cl. C10b *1/00, 7/00, 31/00*

U.S. Cl. 202—117 **12 Claims**



1. Tunnel kiln apparatus especially for firing carbon products, said apparatus comprising a volatiles removal section through which cars laden with "green" carbon ware are moved progressively from an entrance end to an exit end, and a section physically separated from said volatiles removal section and having a firing zone and a cooling zone through which cars transferred from the exit end of the volatiles removal section are successively and progressively moved from an entrance end of said firing zone to an exit end of said cooling zone.

3,887,438

PLANT FOR DISCHARGING COKE FROM HORIZONTAL-FLUE COKE OVEN

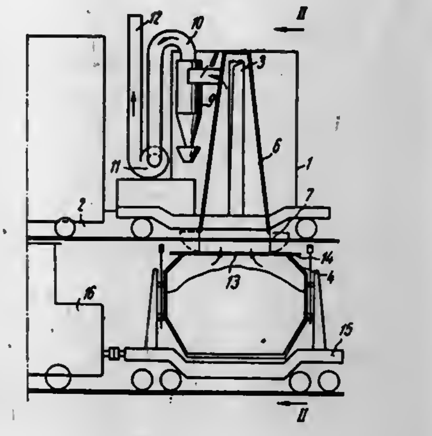
Nikolai Konstantinovich Kulakov, ulitsa Danilevskogo 14, kv. 21; Evgeny Petrovich Likhogub, ulitsa Kommunalnaya 43, kv. 97; Gersh Abramovich Dorfman, ulitsa Dmitrievskaya 20, kv. 10, and Alexandr Nikolaevich Suslov, ulitsa Karla Marxa, 38e, kv. 42, all of Kharkov, U.S.S.R.

Filed Nov. 16, 1973, Ser. No. 416,630

Claims priority, application U.S.S.R., Nov. 30, 1972, 1851900

Int. Cl. C10b *35/00*

U.S. Cl. 202—262 **2 Claims**



1. A plant for coke discharge from a horizontal-flue coke oven into a coke carrying car, comprising: a door extracting machine; a gas trap provided on the door extracting machine to prevent emission of dust and gas in to the atmosphere during coke discharge into the car; said gas trap having fixed skirt portions depending therefrom which extend below the top edges of the sides of the coke carrying car, said coke carrying car being movable between said skirt portions; pivotable fold plates mounted on the gas trap on either end thereof and extending transverse to said skirt portions, said fold plates adapted to be selectively raised and lowered so that when lowered during coke discharge from the oven these fold plates form together with the skirt portions a bell mouth facing with its wider portion the top of the car and forming an enclosed space together with the car.

3,887,439

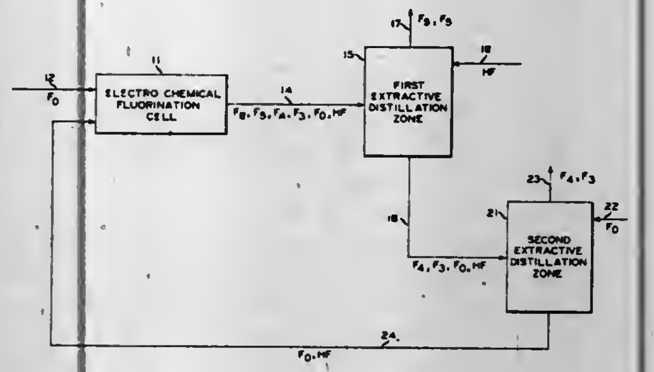
SEPARATION OF FLUORINATED DIMETHYL ETHERS BY EXTRACTIVE DISTILLATION

William M. Hutchinson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 25, 1972, Ser. No. 291,615

Int. Cl. B01d *9/00*

U.S. Cl. 203—63 **16 Claims**


12
F0
11
ELECTRO CHEMICAL FLUORINATION CELL
14
15
17
F5, F5
FIRST EXTRACTIVE DISTILLATION ZONE
18
HF
16
21
F4, F3
SECOND EXTRACTIVE DISTILLATION ZONE
22
F0
23
24
F0, HF

1. An extractive distillation process comprising:

- passing a first feedstock stream comprising trifluoromethyl difluoromethyl ether (F_5) and dimethyl ether (F_0) into a first extractive distillation zone;
- passing a first selective solvent stream comprising anhydrous hydrogen fluoride (HF) into said first extractive distillation zone;
- separating and withdrawing from said first extractive distillation zone a first overhead effluent stream comprising trifluoromethyl difluoromethyl ether (F_5); and
- separating and withdrawing from said first extractive distillation zone a first bottoms effluent stream comprising dimethyl ether (F_0) and anhydrous hydrogen fluoride (HF).

3,887,440

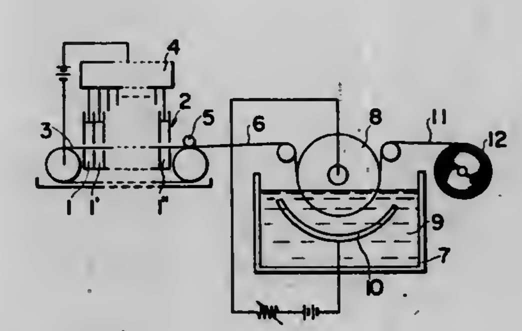
METHOD OF MANUFACTURING A CONTINUOUS MAGNETIC FOIL BY ELECTRODEPOSITION

Satoshi Ichioka, Toda, Japan, assignor to Mishima Kosan Co., Ltd., Kitakyushu, Fukuoka Prefecture, Japan

Filed Jan. 24, 1974, Ser. No. 436,376

Int. Cl. C23b *7/04;* **B23p** *1/00;* **C23b** *5/68*

U.S. Cl. 204—13 **4 Claims**



1. A method of manufacturing a continuous foil of magnetic material by electrodeposition, which comprises electrodepositing a desired magnetic alloy layer on a surface of an endless base conductor belt for electrodeposition in an electrodepositing bath composed of a plurality of electrodeposition chambers, peeling off the resulting deposited layer in a desired thickness, and then subjecting the deposited layer to a continuous electrolytic polishing so as to remove an initially deposited portion, whereby there remains a magnetic foil of uniform composition.

3,887,441

ELECTRO-CHEMICAL SYNTHESIS OF ORGANONICKEL COMPOUNDS

William B. Hughes, and Darryl R. Fahey, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 213,767, Dec. 29, 1971, abandoned, which is a continuation of Ser. No. 59,019, July 28, 1970, abandoned. This application May 25, 1973, Ser. No. 364,031

Int. Cl. C25b *3/00*

U.S. Cl. 204—59 QM **10 Claims**

1. A two-stage process for the synthesis of organonickel catalyst complexes comprising:

- subjecting a nickel(II)-phosphine ligand complex to a reducing voltage of from −1.7 to −3.6 volts in the presence of an electrolyte consisting of at least one of a tetraalkyl substituted ammonium halide, nitrate and perchlorate;
- contacting the reduced nickel(II)-phosphine ligand complex carried in an organic solvent selected from at least one of acetonitrile, propionitrile, N,N-dimethylformamide, bis(2-methoxyethyl)ether, sulfolane, 1,2-dimethoxyethane, and dioxane with a haloorganic compound selected from the group consisting of pentafluorobromobenzene, hexachlorobenzene, pentachloroiodobenzene, tetrabromomethylene, 2-chlorotoluene, chlorotrifluoroethylene, and pentafluoroiodoethane; and
- separating the resulting organonickel catalyst complex.

3,887,442

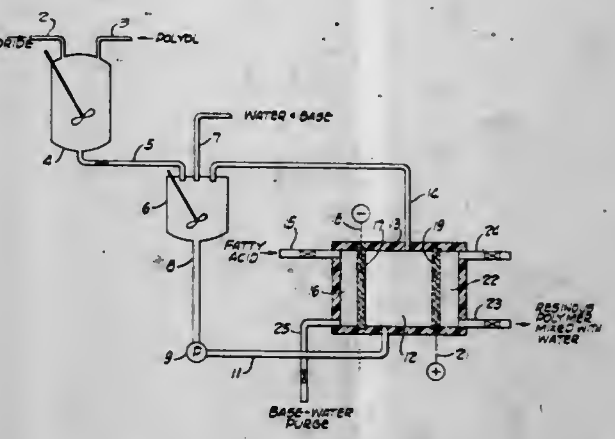
POLYMERIZATION PROCESS

Allan E. Gilchrist, Westlake, Ohio, assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 91,905, Nov. 23, 1970, abandoned. This application Mar. 8, 1971, Ser. No. 122,001

Int. Cl. C07c *29/06;* **C08g** *17/00*

U.S. Cl. 204—72 **2 Claims**



1. In a process for polymerizing resin-forming material that polymerizes into a fluent polymer in contact with a charged electrode surface, the improvement which comprises:

a. establishing and maintaining a reaction mixture in an electrical cell zone having as a boundary area a porous, electrically charged d.c. electrode at least about one thirty-second inch thick, the electroconductive portion of which is formed of a material selected from the group consisting of metals and electroconductive carbon,

said porous electrode having an absolute porosity within the range of about 600 millimicrons to about 200 microns and providing fluid communication between said cell zone and a collection zone,

said reaction mixture comprising said resin-forming material dispersed with electrolyte in an aqueous liquid bath;

b. concentrating, by electrodeposition at said porous electrode, said resin-forming material; and

c. establishing and maintaining a high-to-low pressure gradient between said cell zone and said collection zone, thereby forcing the resulting concentrate through said porous electrode into said collection zone, thus effecting a stage of separation between said concentrate of resin-forming material and the other components of said reaction mixture in said cell zone while electrically stressing said concentrate.

3,887,443

METHOD FOR FORMING A CARBIDE LAYER OF AN ELEMENT SELECTED FROM THE GROUP CONSISTING OF V, NB, TA AND MIXTURES THEREOF ON THE SURFACE OF AN IRON, FERROUS ALLOY OR CEMENTED CARBIDE ARTICLE

Noboru Komatsu, Toyoakeshi; Tohru Arai, and Yoshihiko Sugimoto, both of Nagoyashi, all of Japan, assignors to Kabishiki Kaisha Toyota Chuo Kenkyusho, Aichiken, Japan

Filed Apr. 27, 1973, Ser. No. 355,283

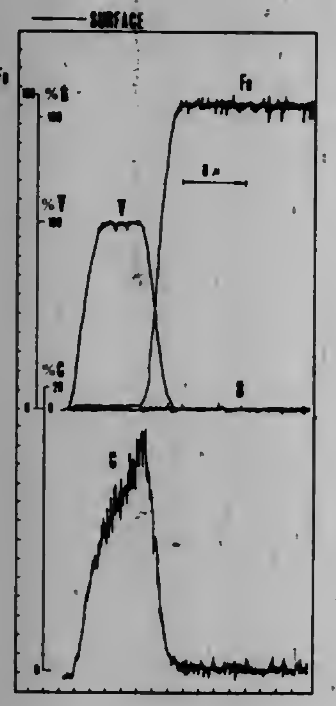
Claims priority, application Japan, May 4, 1972, 47-43729; May 9, 1972, 47-46080; June 8, 1972, 47-56493

Int. Cl. C23b *5/00*

U.S. Cl. 204—39 **14 Claims**

1. A method for forming a carbide layer of an element selected from the group consisting of V, Nb, Ta and mixtures thereof on the surface of an iron, ferrous alloy or cemented carbide article, said article containing at least 0.05 percent by weight of iron, comprising the steps of preparing a treating molten bath composed of molten boron oxide and a substance containing an element selected from the group consisting of V, Nb, Ta and mixtures thereof in a vessel, immersing said article into the treating molten bath, applying an electric current to the treating molten bath, through said article being

used as the cathode for depositing the element on the surface of the article and for forming the carbide layer of said element, with the carbon contained within said article, on the surface of said article, and removing the article from the treating molten bath.



3,887,444

BRIGHT TIN-NICKEL ALLOY PLATING ELECTROLYTE

Shimetomo Fueki; Kazumasa Abe, and Kenji Osawa, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan.

Filed Apr. 12, 1974, Ser. No. 460,527

Claims priority, application Japan, Apr. 19, 1973, 48-43776

Int. Cl. C23b *5/38, 5/46*

U.S. Cl. 204—43 S **14 Claims**

1. A bright tin-nickel alloy plating electrolyte having a pH in the range from 8 to 12 and consisting essentially of an aqueous main plating liquid containing:

a. a stannous salt selected from the group consisting of stannous pyrophosphate, stannous chloride and stannous sulfate, and which is present in said main plating liquid in an amount between 2 and 20 g/l. calculated as stannous ion;

b. a nickel salt selected from the group consisting of nickel pyrophosphate, nickel chloride and nickel sulfate, and which is present in said main plating liquid in an amount between 5 and 30 g/l. calculated as nickel ion;

c. an alkali-metal pyrophosphate selected from the group consisting of potassium pyrophosphate and sodium pyrophosphate, and which is present in said main plating liquid in an amount between 150 and 600 g/l;

d. at least one brightener additive in said plating liquid in an amount between 0.1 and 100 g/l. of said main plating liquid and being selected from the group consisting of ethylenediamine, 1,2-propanediamine, 1,3-propanediamine, 1,4-butanediamine, pentamethylenediamine, hexamethylenediamine, hydrazine, quanidine, urea and thiourea; and

e. a further additive selected from the group consisting of ammonia and ammonium salts, and in which said further additive is present in said main plating liquid in the amount between 5 and 100 g/l. in the case of ammonia calculated as a 28 percent aqueous ammonia solution, and between 1 and 150 g/l. in the case of ammonium salts.

3,887,445

METHOD FOR THE REDUCTION OF ZINC ION CONCENTRATION AND REMOVAL OF ORGANIC IMPURITIES IN A NEUTRAL OR ACIDIC, AQUEOUS ZINC PLATING BATH

Joseph L. Jackson, Westlake, Ohio, assignor to R. O. Hull & Company Incorporated, Cleveland, Ohio

Filed Apr. 26, 1974, Ser. No. 465,000

Int. Cl. C23b *5/10, 5/12;* **B01d** *9/00*

U.S. Cl. 204—55 R **5 Claims**

1. A method for the reduction of excess zinc ion concentration in an aqueous acid or neutral zinc electroplating bath comprising the steps of, adding to the bath a compound selected from the group consisting of ammonium oxalate, and the combination of oxalic acid and (an amount) about 2.0 equivalents of ammonium hydroxide based on said oxalic acid, to form a zinc precipitate.

3,887,446

ELECTROCHEMICAL PREPARATION OF METALLIC TELLURIDES

William S. McEwan, China Lake, Calif., and Melvin Miles, Murfreesboro, Tenn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 26, 1974, Ser. No. 492,110

Int. Cl. C01b *19/00;* **B01k** *3/06*

U.S. Cl. 204—86 **3 Claims**

1. A method for preparing a telluride comprising the steps of:

a. providing a tellurium cathode;

b. providing an anode of a material selected from the group consisting of cadmium, lead and tin;

c. placing said cathode and anode in an ammonium acetate-acetic acid buffer solution from which oxygen is removed and excluded; and

d. passing electrical current through said cathode and anode to generate positive ions at the anode and negative ions at the cathode which combine to form said telluride.

3,887,447

PROCESS OF ELECTROGRAINING ALUMINIUM

Peter Geoffrey Sheasby, and Alan Martin Smith, both of Banbury, England, assignors to Alcan Research and Development Limited, Montreal, Quebec, Canada

Filed Sept. 27, 1973, Ser. No. 401,257

Int. Cl. C23b *3/02*

U.S. Cl. 204—129.4 **2 Claims**

1. In the process of electrograining aluminum for the production of lithographic printing plates which comprises subjecting the aluminum to alternating current while immersed in an aqueous electrolyte containing 2 – 20 gms/liter hydrochloric acid the improvement which comprises the addition to the electrolyte of 1.5 – 15 gms/liter phosphoric acid whereby to maintain the pit size below about 10 microns in the presence of contaminant sulphate ion in the electrolyte.

3,887,448

METHOD OF PREVENTING SUPERSATURATION OF ELECTROLYTES WITH ARSENIC, ANTIMONY AND BISMUTH

Reinhold Schulze, Meckerfeld, Germany, assignor to Norddeutsche Affinerie, Hamburg, Germany

Filed Apr. 17, 1973, Ser. No. 352,079

Claims priority, application Germany, Apr. 19, 1972, 2218934. The portion of the term of this patent subsequent to Oct. 3, 1989, has been disclaimed.

Int. Cl. B01d *15/06*

U.S. Cl. 204—130 **4 Claims**

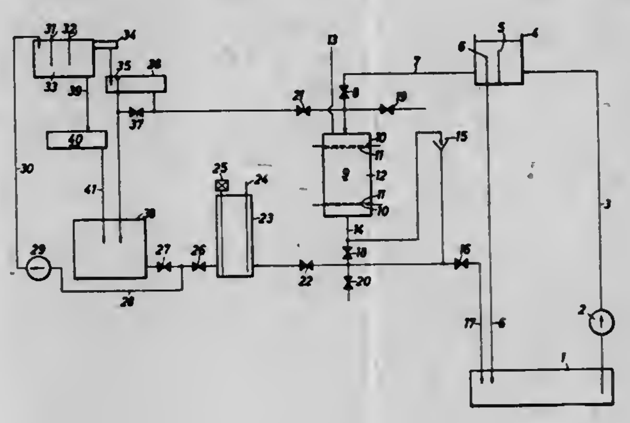
1. A process for preventing supersaturation of an electrolyte with an impurity selected from the group which consists of arsenic, antimony and bismuth which comprise the steps of:

a. treating said electrolyte with floating particles of a chemisorbent adapted to take up said impurity in an adsorber;

b. draining said electrolyte from said adsorber;

c. circulating a regenerating solution through said adsorber and into contact with said floating particles to strip said impurity therefrom; and

d. electrolytically regenerating said solution along the circulating path thereof; wherein said chemisorbent is stannic acid, said electrolyte is a sulfuric acid electrolyte for the electrolytically refining of copper and said regenerating solution is sulfuric acid more concentrated than said electrolyte.



3,887,449

COATING METHOD AND COMPOSITION FOR THE SACRIFICIAL PROTECTION OF METAL SUBSTRATES

Robert B. Baer, San Antonio, Tex., assignor to Chromalloy American Corporation, New York, N.Y.

Filed May 21, 1973, Ser. No. 362,062

Int. Cl. C23f *13/00;* **C23b** *9/06;* **C23f** *17/00*

U.S. Cl. 204—148 **10 Claims**

1. A method for the sacrificial protection of a metal substrate selected from the group consisting of magnesium and magnesium alloys which comprises,

anodizing said metal substrate to form an adherent oxide film thereon,

applying to said anodized film a first protective coating of a double salt selected from the group consisting of barium potassium chromate and calcium potassium chromate dispersed through a curable adhesive and bonding said coating to said anodized film by curing said adhesive,

providing a second protective coating material comprising a curable adhesive having dispersed therethrough a powdered alloy composition which is electropositive relative to said metal substrate,

said second coating material being electrically conductive relative to said metal substrate,

said powdered alloy composition comprising by weight about 5 to 60 percent of a calcium group metal selected from the group consisting of strontium, barium and calcium, 0 to about 20 percent aluminum and the balance substantially magnesium ranging from about 40 to 95 percent,

and applying and curing a layer of said second coating material to said first protective coating, said second protective coating being sacrificial relative to said metal substrate.

3,887,450

PHOTOPOLYMERIZABLE COMPOSITIONS CONTAINING POLYMERIC BINDING AGENTS

Michael N. Gilano, Fullerton, Calif.; Richard E. Beaupre, West Barrington, R.I., and Melvin A. Lipson, Fullerton, Calif., assignors to Dynachem Corporation, Santa Fe Springs, Calif.

Continuation of Ser. No. 112,797, Feb. 4, 1971, abandoned. This application Dec. 14, 1972, Ser. No. 315,153

Int. Cl. C08f *1/18, 15/16, 15/20; 15/26, 15/38, 19/10*

U.S. Cl. 204—159.15 **15 Claims**

1. A photopolymerizable composition comprising:

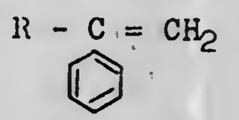
A. from 10 to 60 parts by weight of an addition polymerizable material consisting essentially of and being solely one or more non-gaseous compounds, containing at least two terminal ethylenic groups, having a boiling point above 100°C., and being selected from the group consisting of an unsaturated ester of a polyol, an unsaturated amide, and a vinyl ester;

B. from 0.001 to 10 parts by weight of a photo-initiated free-radical generating addition polymerizing initiating system;

C. from 0.001 to 5 parts by weight of a thermal-addition polymerization inhibitor; and

D. from 40 to 90 parts by weight of a preformed macromolecular polymeric binding agent which is a polymer of:

a first monomeric material which contains one or more non-acidic vinyl compounds selected from the group having the general formula:



wherein R is hydrogen, an alkyl group having from 1 to 6 carbon atoms or a halo group; and

a second monomeric material which consists essentially of one or more alpha,beta-unsaturated carboxyl-containing monomers having from 3 to 15 carbon atoms;

wherein the ratio of the first monomeric material to the second monomeric material is sufficient to render the binding agent soluble in a dilute aqueous solution containing from 0.01 to 10 percent of a water-soluble base.

3,887,451

METHOD FOR SPUTTERING GARNET COMPOUND LAYER

Jerome J. Cuomo, Bronx; Ashok F. Mayadas, Somers; Robert Rosenberg, Peekskill, and Varadachari Sadagopan, Scarborough, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,589

Int. Cl. C23c *15/00*

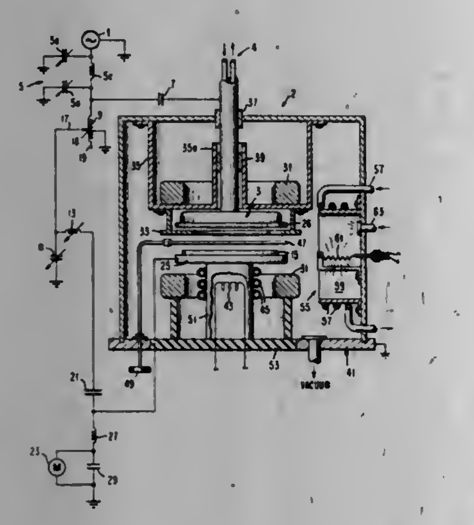
U.S. Cl. 204—192 **11 Claims**

9. Method for producing a layer with garnet stoichiometry comprising the steps of

establishing a target which has substantially a garnet stoichiometric composition which is substantially nongarnet structure and establishing a substrate with garnet composition,

radio-frequency sputtering said film onto said substrate from said target including,

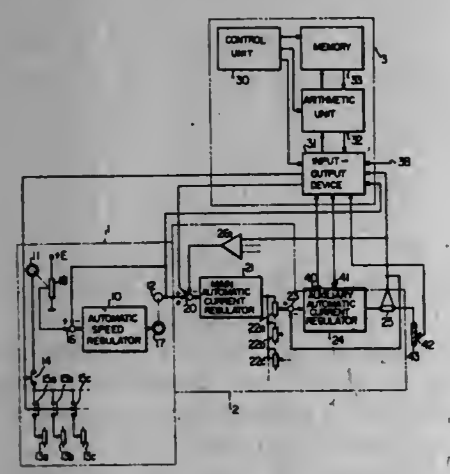
establishing operational parameters such that said substrate is at a given temperature approximately in the range of 650°C to 1,000°C, radio-frequency power to said target is at a given power density thereat approximately in the range of 35 watts/sq. in. to 60 watts/sq. in., and radio-frequency bias on said substrate is at a given d.c. level approximately in the range of 200 volts d.c. level to 25 volts d.c. level, and varying interdependently said operational parameters to deposit onto said substrate a layer having substantially said garnet stoichiometric composition and to establish a given accumulation rate of thick-



ness of said layer on said substrate approximately in the range of 1 Angstrom/sec. to 3 Angstroms/sec.

3,887,452
OPTIMUM ELECTROPLATING PLANT CONTROL DEVICE

Toshio Mannaka; Hidehiro Kitanosono, and Shigemichi Matsuka, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan
Filed Oct. 31, 1972, Ser. No. 302,402
Claims priority, application Japan, Nov. 4, 1971, 46-87194
Int. Cl. C23b *5/68;* **B01k** *3/00*
U.S. Cl. 204—211 **6 Claims**



1. An optimum control system for regulating the plating current in and speed of a plating line, said system comprising speed control means for controlling the speed of said plating line, said speed control means including speed detection means for detecting the speed of said plating line,

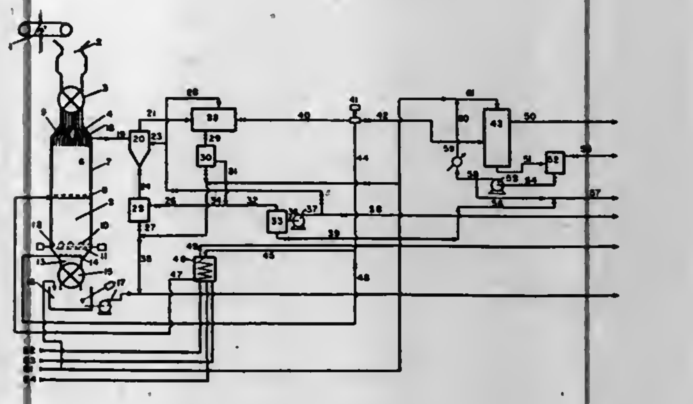
current control means for controlling the plating current of said plating line, said current control means including current detection means for detecting the plating current of said plating line,

temperature detection means for detecting the temperature of said current control means, and

system control means responsive to said detected speed, current and temperature for continuously regulating said speed control means and said current control means in accordance with a predetermined relationship based on the speed, current and temperature of said plating line, whereby the plating current of said plating line is continuously maintained at a level such that the temperature of said current control means is kept immediately below the critical breakdown temperature of said current control means.

3,887,453
PROCESS FOR OBTAINING OIL, GAS AND BYPRODUCTS FROM PYROBITUMINOUS SHALE OR OTHER SOLID MATERIALS IMPREGNATED WITH HYDROCARBONS

Seiki Ueta, Curitiba, Parana, and Osmar Chaves Ivo, Sao Mateus do Sul, Parana, both of Brazil, assignors to Petroleo Brasileiro S.A. -Petrobras, Rio de Janeiro, Brazil
Filed Sept. 1, 1972, Ser. No. 285,692
Claims priority, application Brazil, Sept. 6, 1971, 05857
Int. Cl. C10b *53/06*
U.S. Cl. 208—11 **8 Claims**



1. A non-combustion process for obtaining mineral oil and other derivatives from pyrobituminous shale or other solid materials impregnated with hydrocarbons, the said process being non-combustive and carried out in a vertical distillation retort, wherein the mined shale or other solid materials is continuously fed at the top of said retort through an inert gas sealed valve, wherefrom said mined shale or other solid materials are evenly distributed to the retorting zone and then descend to a cooling zone below the retorting zone, the retorting being carried out at super-atmospheric pressure by a mixture of substantially oxygen-free recycling gases previously and indirectly heated outside the retort, said heated recycling gases being introduced into the bottom of the retorting zone of said retort at a higher temperature than the retorting temperature, and of substantially oxygen-free recycling gases introduced cold at the bottom of said retort into the cooling zone which in upwardly flow through the cooling zone exchange sensible heat with said retorted shale or other solid materials that is continuously withdrawn from the bottom of said retort through an inert gas sealed valve, the liquid and gaseous retorting products being drawn from top of said retort.

3,887,454
LAYERED CLAY MINERALS AND PROCESSES FOR USING

Donald A. Hickson, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Division of Ser. No. 311,080, Dec. 1, 1972, Pat. No. 3,844,978. This application Mar. 18, 1974, Ser. No. 452,472
Int. Cl. C01b *33/28;* **C10g** *13/02, 11/18*
U.S. Cl. 208—111 **16 Claims**

1. A hydroconversion process comprising contacting a hydrocarbon feedstock at conventional hydroconversion conditions with a catalyst comprising: (1) a layer-type dioctahedral, clay-like mineral, and (2) at least one hydrogenation component, said mineral having prior to dehydrating and calcining of said catalyst, the empirical formula:

$$MgO : sSiO_2 : aAl_2O_3 : bAB : xH_2O$$

wherein the layer-lattice structure is composed of said silica, said alumina, said magnesia, said A and said B, and wherein
s is from 1.4 to 100,
a is from 0.1 to 100,
b is from 0.2 to 0.6,
A is one equivalent of an exchangeable cation having a valence of 3 or less and is external to the layers of the framework or at the edges or between successive layers of the structure,
B is chosen from the group of negative ions consisting of F^-, OH^-, $\frac{1}{2}O^{--}$ and mixtures thereof, and is internal or at the edges and surfaces of the layers of the framework structure, and
x is from 2 to 3.5 at 50% relative humidity,

said mineral being characterized by a d_{001} spacing at said humidity within the range which extends from a lower limit of about 10 Angstroms to an upper limit of 18 Angstroms when A is divalent or trivalent, with intermediate values possible when A is a mixture of monovalent, divalent and trivalent cations, and a d_{06} spacing at said humidity in the range of from 1.5176 to 1.4977 Angstroms by X-ray diffraction analysis.

3,887,455
EBULLATING BED PROCESS FOR HYDROTREATMENT OF HEAVY CRUDES AND RESIDUA

Glen P. Hamner, and Kenneth R. Clem, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.
Filed Mar. 25, 1974, Ser. No. 454,153
Int. Cl. C10g *13/02, 13/14;* **B03d** *3/00*
U.S. Cl. 208—112 **16 Claims**

1. In a process for the hydrotreatment of heavy crudes and residua which contain large quantities of 1050°F.+ hydrobon materials in an ebullating bed of catalyst operated at conditions wherein the catalyst particles are metallized or coked, or both, particles are added to the upper portion of the ebullating bed and catalyst withdrawn from the bottom of the bed, the improvement comprising:

establishing a bed of catalyst solids particles and ebullating said bed by upflow of a metals-containing liquid hydrocarbon feed introduced, with hydrogen, into the bed at velocity sufficient to expand the bed to a volume ranging from about 20 to about 70 percent, as contrasted with the volume of the bed of catalyst wherein the particles thereof are in quiescent state,

introducing a catalyst or precatalyst comprising at least about 50 percent of its total pore volume of absolute diameter within the range of from about 100A to about 300A, and less than about 20 percent of its total pore volume of absolute diameter within the range of 0 to about 100A, a surface area ranging at least about 200 m^2/g to about 600 m^2/g, a pore volume ranging from about 0.8 to about 3.0 cc/g, and a density ranging from about 0.25 to about 0.7 g/cc, into the top of the ebullating bed,

conducting the reaction at conditions characterized as follows,

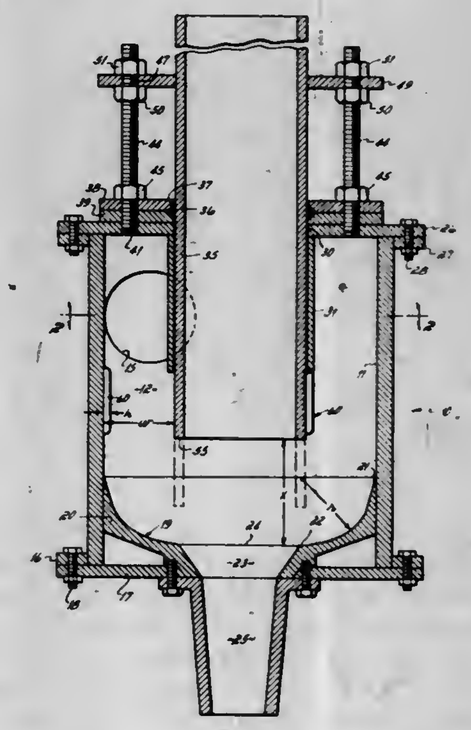
Temperature, °F. (E.I.T.)	
Start-of-Run	650
End-of-Run	850
Pressure, psi	500–10,000
Hydrogen Rate, SCF/B	3000–20,000
Space Velocity, LHSV	0.2–3.0

to produce stratification and grading of catalyst particles as a result of increased density caused by absorption of coke or metals, or both, in direct relation with catalyst age, the more aged catalyst particles settling to the bottom of the ebullating bed, and

removing stratified catalyst particles from the bottom of the ebullating bed characterized as containing a composite of from about 5 to about 50 percent of a Group VIB metal, or compound thereof, or from about 1 to about 12 percent of a Group VIII metal, or compound thereof, or admixture of both of said Group VIB and Group VIII metals, or compounds thereof, measured as oxides, a porous inorganic oxide support, and having a density at least about 0.1 g/cc greater than the density of the catalyst or precatalyst added to the top of the bed as a result of having absorbed metals or coke, or both, during the reaction.

3,887,456
CLASSIFIER WITH RIFFLERS AND VARIABLE THROAT

James W. Loughner, Rt. No. 1, Box 456 Litton Heights, Scott Depot, W. Va. 25560
Filed Oct. 1, 1973, Ser. No. 402,193
Int. Cl. B04c *5/103*
U.S. Cl. 209—211 **5 Claims**



1. A classifier for separating heavier and lighter fractions in a liquid-borne stream of mixed particles of different densities, said classifier comprising,

a hollow cylindrical body having a wall defining an annular internal chamber,

a bowl at a lower end of said chamber, said bowl curving downwardly and inwardly from the wall of said body to a conical central opening,

an inlet pipe leading to a substantially tangential inlet opening through said wall into said chamber adjacent an upper end of the chamber,

a top cover for said chamber,

an overflow pipe projecting downwardly through said cover and axially into said chamber toward said conical opening, said overflow pipe having an open lower end positioned above said conical opening and below said inlet opening, and a plurality of rifflers mounted to said wall at angularly spaced positions around said chamber below said inlet opening and above said bowl,

each said riffler being a projection on said wall extending into said chamber and having a generally semicircular cross-sectional shape with gradually inclined leading and trailing surfaces thereon,

each riffler extending angularly with respect to the direction of fluid flow over said wall between said inlet opening and said central opening,

the dimension of said rifflers in the direction across the radius of said chamber being no greater than about one-third the diameter of the largest particles to be separated, said rifflers in use of said classifier jigging liquid-borne material passing over them and thereby releasing lighter particles entrapped by heavier particles so that such lighter particles move inwardly with respect to the heavier particles while said heavier particles continue to move over said wall.

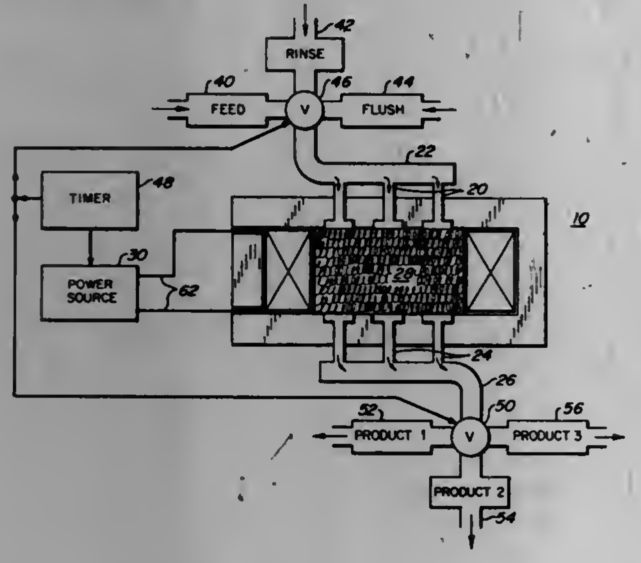
3,887,457
MAGNETIC SEPARATION METHOD

Peter G. Marston, Gloucester; Ionel Wechsler, Farmingham, and John J. Nolan, Randolph, all of Mass., assignors to Magnetic Engineering Associates Inc., Cambridge, Mass.

Filed May 21, 1973, Ser. No. 362,218

Int. Cl. B03c *1/24*

U.S. Cl. 209—214 **6 Claims**



1. An improved method of separating more-magnetic particles from less-magnetic particles contained in a fluid medium which reduces mechanical entrapment of less-magnetic particles by more-magnetic particles comprising:

submitting a fluid medium containing both more-magnetic particles and less-magnetic particles to a ferromagnetic matrix having a multiplicity of collection sites; and

simultaneously subjecting the more-magnetic particles and the less-magnetic particles, as they move through said matrix, to a time varying magnetic field whose intensity in said matrix varies, from a predetermined intensity sufficient to induce a high magnetic field gradients at said collection sites and to induce magnetic dipole moments in the more-magnetic particles to adhere the more-magnetic particles having induced magnetic dipole moments to said collection sites having high magnetic field gradients, some of the less-magnetic particles being entrapped between two or more more-magnetic particles or between one or more more-magnetic particles and a said collection site, to a lower intensity sufficient to reduce the high magnetic field gradients induced at said collection sites and reduce the induced magnetic dipole moment in said more-magnetic particles below the level required for said more-magnetic particles to adhere to each other and to said collection sites to free entrapped less-magnetic particles;

said time varying magnetic field reaching said predetermined intensity at a collection site more than once and decreasing below that predetermined intensity at least once during each matrix transit period during which more-magnetic and less-magnetic particles are simultaneously being fed to said matrix.

3,887,458
PERMANENT MAGNET STRONG FIELD SEPARATOR

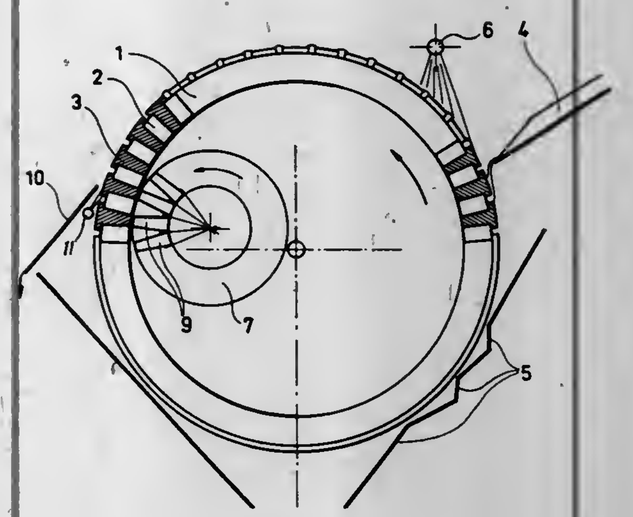
Erkki A. Laurila, Helsinki, Finland, assignor to Bermeco Oy, Helsinki, Finland

Filed May 21, 1973, Ser. No. 362,305

Claims priority, application Finland, May 26, 1972, 1486/72

Int. Cl. B03c *1/12*

U.S. Cl. 209—219 **10 Claims**



1. A permanent magnet separator particularly for separating weakly magnetic materials from non-magnetic materials, comprising:

a first hollow rotating cylinder, having inner and outer surfaces, composed of a plurality of substantially rectangular solid permanent magnets each arranged in a parallel relation to the side line of said cylinder and a plurality of pole pieces each substantially identically shaped and spaced intermediate said permanent magnets, thereby forming on said inner surface alternate substantially parallel sections consisting of said magnets and pole pieces, said permanent magnets being alternately reversely magnetized; and

shunting means, including a separate rotating multipole permanent magnet eccentrically mounted within said first cylinder, for shunting the magnetic field of said pole pieces of said first cylinder by cooperation between said shunting means and said pole pieces of said first cylinder as said pole pieces of said first cylinder come into a certain position in relation to said shunting means;

said separate permanent magnet comprising a second rotating cylinder with alternating reversely magnetized permanent magnets and pole pieces in which the distance between the magnetic pole pieces is the same as the distance between the magnetic pole pieces of said inner surface and wherein the remanent flux of said permanent magnets on said second cylinder is greater than the remanent flux of said permanent magnets on said first cylinder, said second cylinder being synchronized with said first cylinder so that said magnetic pole pieces thereof always face oppositely magnetized pole pieces on said first cylinder at said certain position.

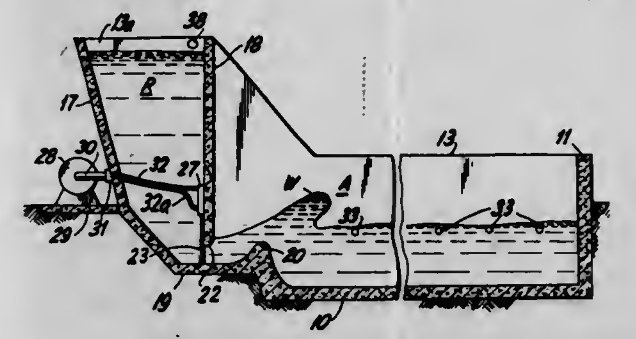
3,887,459
PROCESS FOR TREATING WATER

Minor E. McLaughlin, Newfane, Vt., assignor to Economic Development Corporation, Newfane, Vt.

Division of Ser. No. 230,424, Feb. 29, 1972, Pat. No. 3,823,767. This application Feb. 25, 1974, Ser. No. 445,230

Int. Cl.² C02C *1/02*

U.S. Cl. 210—8 **15 Claims**



2. The method of treating sewage in accordance with claim 1 including the step of agitating the sewage by means of a series of baffle-like projections to increase the amount of oxygen therein and to precipitate out the activated sludge.

3,887,460
SELECTIVE ION EXCHANGE RESINS

Christopher John Ward; Cyril Alfred Morgan, both of Chadwell Heath, and Richard Paul Allen, Surbiton, all of England, assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed June 1, 1973, Ser. No. 365,909

Int. Cl. C02b *1/56*

U.S. Cl. 210—37 **7 Claims**

1. The method of removing boron and arsenic anions from an aqueous solution having at least one of said anions dissolved therein which comprises contacting said aqueous solution with a cross-linked hydroxyaryl polymer having tetrahedral boron anion-receiving sites formed by polymerization of a pre-formed complex of a hydroxyaryl compound and boron anion with a formaldehyde source and leaching the formed polymer with an acid which is effective in removing said boron anion and providing said boron anion-receiving sites.

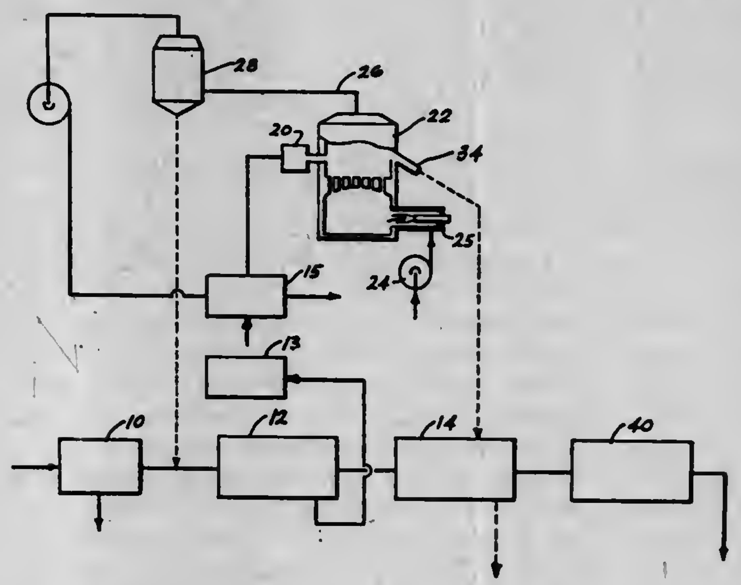
3,887,461
MAKING ACTIVE CARBON FROM SEWAGE SLUDGE

Robert D. Nickerson, Riverside, Conn., and Henry Cashel Messman, Larchmont, N.Y., assignors to Combustion Engineering, Inc., Windsor, Conn.

Continuation-in-part of Ser. No. 141,896, May 10, 1971, abandoned. This application Apr. 16, 1973, Ser. No. 351,685

Int. Cl. G02c *3/00*

U.S. Cl. 210—39 **4 Claims**



1. A method of treating sewage including the steps of subjecting the sewage to primary treatment which includes allowing solids to settle out in a settling tank, conveying the solids to a furnace, subjecting the solids to pyrolitic treatment in the furnace at temperatures within the range of 500°C–1000°C by passing a stream of hot gases therethrough, to form active carbon and char, separating the active carbon from the char by entraining it in the gases leaving the furnace, separating the active carbon from the gases, and introducing the active carbon into the settling tank to act as an adsorbent.

3,887,462
DISPOSAL OF WASTE STREAMS CONTAINING ASBESTOS

Thomas F. Lagess, and Valroy Henry Maudlin, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 7, 1974, Ser. No. 477,241

Int. Cl. C02b *1/20*

U.S. Cl. 210—53 **10 Claims**

1. A method of safe disposal of asbestos-containing aqueous waste material, which comprises admixing a finely divided, relatively dense, substantially insoluble settling agent to said asbestos-containing aqueous waste material, and conveying the mixture to an underground cavity.

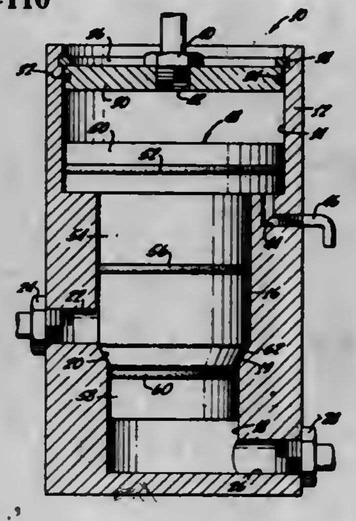
3,887,463
REVERSE OSMOSIS SYSTEM WITH AUTOMATIC VALVE FOR MODULE OPERATION CONTROL

Donald T. Bray, Escondido, Calif., assignor to Desalination Systems, Inc., Escondido, Calif.

Filed Feb. 6, 1974, Ser. No. 439,868

Int. Cl. B01d *31/00*

U.S. Cl. 210—110 **7 Claims**



1. A reverse osmosis water purification system comprising a module containing a semipermeable membrane and having an inlet for introduction of pressurized feed water thereinto, means for releasing concentrate from said module, means for transferring purified water produced by said module into a storage container and for maintaining said purified water in said storage container under elevated pressure, means for dispensing purified water from said container, and an automatic valve for controlling the introduction of pressurized feed water into said inlet of said module thereby to regulate the pressure of the purified water under elevated pressure in said storage container, in which the improvement comprises:

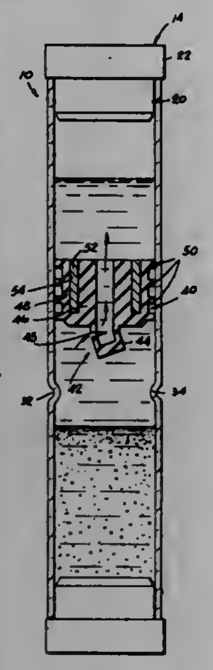
a. said automatic valve comprising a body having a first internal cavity having a movable seal spanning its effective cross sectional area and having a connection above said movable seal communicating with said storage container;

b. said body having a central internal cavity communicating with said inlet for introducing pressurized feed water into said module, and having a movable seal spanning its effective cross sectional area operatively connected to said movable seal spanning said first internal cavity, the effective cross sectional area of said central internal cavity being less than the effective cross sectional area of said first internal cavity;

c. said body having a third internal cavity connected to a supply of pressurized feed water for said module and having an opening leading to said central internal cavity, said opening being of area smaller than the effective cross sectional area of said central cavity, and a movable seal operatively connected to the movable seal in said central internal cavity and adapted to close the opening leading from said third internal cavity to said central internal cavity when the pressure above said movable seal in said first internal cavity is above a first predetermined pressure and adapted to open the opening leading from said third internal cavity to said central internal cavity when the pressure above said movable seal in said first cavity is below a second predetermined pressure which is below said first predetermined pressure.

3,887,464
SERUM/PLASMA SEPARATOR WITH CENTRIFUGAL VALVE SEAL

Waldemar A. Ayres, Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.
Filed Feb. 27, 1974, Ser. No. 446,359
Int. Cl. B01d *21/26*
U.S. Cl. 210—117 5 Claims



1. A self-contained fluid separator assembly, capable of separating blood into its component parts of light phase plasma or serum and heavy phase cellular portion, comprising:

a. a container having at least one open end which is adapted to receive blood for subsequent separation into a light phase and a heavy phase;

b. a closure sealing the open end of the container, the closure being formed of a self-sealing elastomeric material which is penetrable by a cannula through which blood to be separated is conducted into the container;

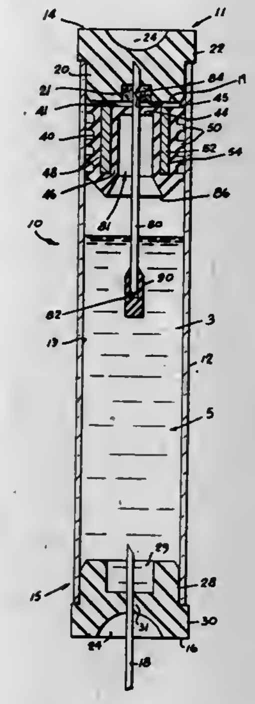
c. a piston having a specific gravity relatively greater than the cellular portion of the blood and slidably mounted in the container and having means on an outer surface in sealing engagement with an inner surface of the container;

d. centrifugally actuated valve means associated with said piston, said valve means being in the form of a downwardly projecting distortable closed end tube with a side slit and having a specific gravity greater than blood said slit openable when the valve means distorts due to substantial centrifugal force acting upon it, said valve means being normally closed when there is a minimum of centrifugal force acting on the valve means, so that when said container is subjected to moderate centrifugal force the blood separates into its light phase and heavy phase but the piston stays in the upper portion of the container, and subsequently when increased centrifugal force is used the valve means automatically opens with the light phase passing up through the valve means enabling the piston to move down through the light phase while retaining sealing engagement with the inner surface of the container; and

e. mechanical stop means on the container whereby the piston when moving through the light phase will stop a predetermined distance from one of the ends of the container followed by termination of substantial centrifugal force which permits the valve means to close to provide an impervious barrier between the separated light phase and heavy phase of the blood.

3,887,465
SERUM/PLASMA SEPARATOR — CANNULA FLUID BY-ASS TYPE

Waldemar A. Ayres, Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.
Filed Feb. 27, 1974, Ser. No. 446,384
Int. Cl. B01d *21/26*
U.S. Cl. 210—130 3 Claims



1. A self-contained fluid separator assembly capable of separating blood into its component parts of light phase plasma or serum, and heavy phase cellular material, comprising:

a container having a first open end which is adapted to receive blood for subsequent separation into a light phase and a heavy phase and a second open end for removing the separated light phase;

closures sealing the open ends of the container, the closures being formed of a self-sealing elastomeric material which is penetrable by a cannula;

a piston slidably mounted in said container having a specific gravity greater than the specific gravity of the blood and having means on an outer surface in sealing engagement with an inner surface of the container, said piston having a diaphragm portion forming partial upper and lower surfaces of said piston, said diaphragm portion being of a self-sealing elastomeric material penetrable by a cannula; said piston being disposed in said container so as to separate the chamber defined by said container with said closures, into upper and lower compartments;

said piston being initially mounted in said container at a position adjacent to said second end and being constructed and arranged to move at a predetermined centrifugal force to a second position within said container, whereby said upper compartment is expanded in volume and said lower compartment is reduced in volume;

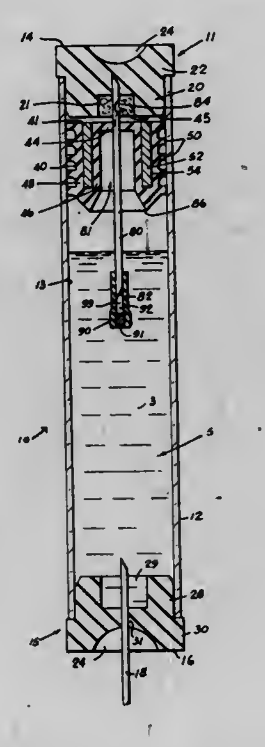
a tube of pre-determined length having one end fixed to the closure for said second end and one end free, terminating within said chamber, said tube having an opening into said chamber at the terminal free end and an opening into said upper compartment at the fixed end;

seal means closing said opening at the terminal, free end of said tube, said seal means being constructed and arranged to disengage from said tube at said predetermined centrifugal force;

said piston in its initial position cooperating with said tube, so that said tube pierces the diaphragm portion of said piston, whereby said tube together with said seal means forms a closed conduit through said piston, and whereby upon disengaging of said seal means by centrifugal force, communication between said upper and lower compartments is established, said piston in its second position being removed from cooperation with said tube, whereby said conduit is terminated and the diaphragm portion of said piston previously pierced by said tube is self-sealed.

3,887,466
SERUM/PLASMA SEPARATOR CANNULA FLUID BY-PASS TYPE CENTRIFUGAL VALVE CANNULA SEAL

Waldemar A. Ayres, Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.
Filed Feb. 27, 1974, Ser. No. 446,385
Int. Cl. B01d *21/26*
U.S. Cl. 210—131 4 Claims



1. A self-contained fluid separator assembly capable of separating blood into its component phases of plasma and serum, the light phase, and cellular material, the heavy phase, comprising:

a container having a first open end which is adapted to receive blood for subsequent separation into a light phase and a heavy phase and a second open end for removing the separated light phase;

closures sealing the open ends of the container, the closures being formed of a self-sealing elastomeric material which is penetrable by a cannula;

a piston slidably mounted in said container, having a specific gravity greater than the specific gravity of the blood and having means on an outer surface in sealing engagement with an inner surface of the container, said piston having a diaphragm portion forming partial upper and lower surfaces of said piston, said diaphragm portion being of a self-sealing elastomeric material penetrable by a cannula; said piston being disposed in said container so as to separate the chamber defined by said container with said closures, into upper and lower compartments;

said piston being initially mounted in said container at a position adjacent to said second end and being constructed and arranged to move at a predetermined centrifugal force to a second position within said container, whereby said upper compartment is expanded in volume and said lower compartment is reduced in volume;

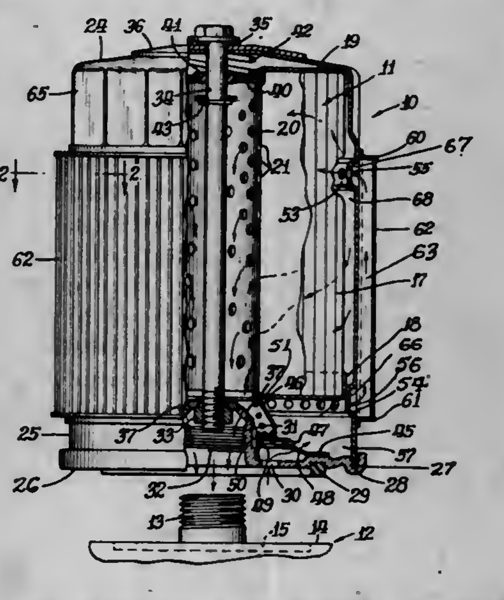
a tube of pre-determined length having one end fixed to the closure for said second end and one end free, terminating within said chamber, said tube having an opening into said chamber at the terminal free end and an opening into said upper compartment at the fixed end;

centrifugal valve means normally closing said opening at the terminal, free end of said tube and constructed and arranged to open under said predetermined centrifugal force; and

said piston in its initial position cooperating with said tube, so that said tube pierces the diaphragm portion of said piston, whereby said tube together with said valve means forms a closed conduit through said piston, and whereby upon opening of said valve means by centrifugal force, communication between said upper and lower compartments is established, said piston in its second position being removed from cooperation with said tube, whereby said conduit is terminated and the diaphragm portion of said piston previously pierced by said tube is self-sealed.

3,887,467
OIL COOLER AND FILTER CONTAINER FOR ENGINE

Andrew L. Johnson, 5346 Greenleaf, Skokie, Ill. 60076
Filed Oct. 1, 1973, Ser. No. 402,471
Int. Cl. B01d *35/18*
U.S. Cl. 210—186 8 Claims



1. In an oil filter apparatus for an internal combustion engine or the like, which apparatus includes a filter, a case about said filter, said case includes means whereby the oil is directed to flow in a path with the filter being transverse to a first part of said path so that the oil normally flows through the filter, the improvement comprising:

said means including a first wall about at least part of the periphery of the case and a second wall within said first wall, said walls defining a space therebetween which space is a second part of said path, said filter being within said second wall, said first wall including fin means to increase the heat transfer area of the wall, said fin means being in the form of corrugations in the first wall thereby increasing the surface area on both the interior and exterior of the wall,

said filter being a replaceable cartridge filter having two ends, said second wall having two inwardly extending annular bands with spaced openings through the bands, said first wall covering said bands, said case having means positioning said filter in a given location in said case such that said path and the openings in one band are beyond one end of the filter, said case being in separable parts with the line of separation extending other than through said first wall whereby access may be obtained to the interior of the case for replacement of the filter.

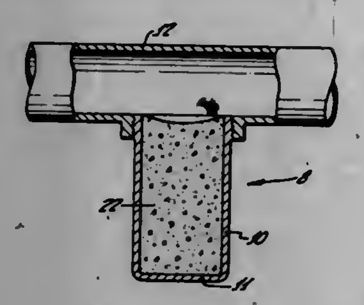
3,887,468
FEED WATER CHLORINATOR FOR A REVERSE OSMOSIS SYSTEM

Donald T. Bray, Escondido, Calif., assignor to Desalination Systems, Inc., Escondido, Calif.

Continuation-in-part of Ser. No. 352,506, April 19, 1973, abandoned. This application Aug. 16, 1974, Ser. No. 497,840

Int. Cl. C02b *3/06*

U.S. Cl. 210—206 **9 Claims**



1. In apparatus for treatment of a solution by a semipermeable membrane process and which comrises a module containing a semipermeable membrane, means for introducing feed water under pressure into said module, means for releasing purified water from said module, and means for releasing concentrate from said module; in which the improvement comprises:

a. said means for introducing said feed water into said module comprising a pipe;
b. a receptacle connected into and communicating with the interior of said pipe;
c. said receptacle enclosing a tube having at least one open end exposed to the feed water flowing through said pipe;
d. said tube containing a bactericide consisting essentially of a compacted mixture of more than 2 percent and up to 10 percent by weight of a fatty acid compound selected from the group consisting of ethylene glycol monostearate, diethylene glycol stearate, sorbitan monopalmitate, sorbitan monostearate, sorbitan tristearate and glyceryl monostearate, balance a chloroisocyanuric acid compound selected from the group consisting of sodium dichloroisocyanurate, potassium dichloroisocyanurate, dischlroisocyanuric acid and trichloroisocyanuric acid.

3,887,469
LUBRICATING OIL FILTERING DEVICE

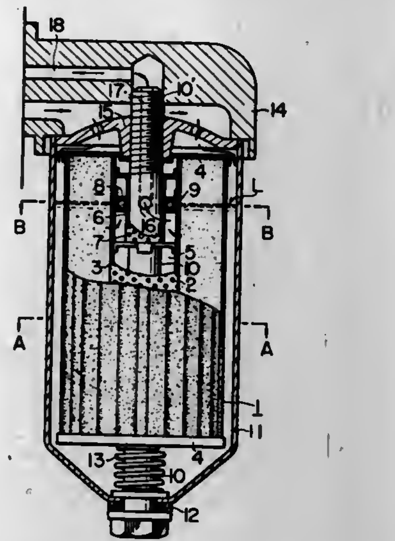
Masazi Hayashi, No. 23-9, 1-chome, Nishi-shinbashi, Minato-ku, Tokyo, Japan

Filed Aug. 9, 1973, Ser. No. 386,993

Int. Cl. B01d *35/06*

U.S. Cl. 210—223 **3 Claims**

1. In an oil filter, an outer casing formed with an inlet through which oil to be filtered enters said casing, a pair of concentric perforated cylinders in said casing, said cylinders having different diameters and defining between themselves an elongated annular space, filter means situated in said casing in the path of flow of oil from said inlet through one of said cylinders to said annular space for filtering the oil prior to the time when the oil reaches said annular space, said cylinders and the common axis thereof being upright during use of the filter, and outlet means for discharging oil from said casing, said outlet means communicating through the other of said perforated cylinders with said annular space at a predetermined elevation along the common axis of said cylinders, and ring-shaped magnet means situated in said annular space at said predetermined elevation therein for acting magnetically on particles in oil flowing to said outlet means through the other of said cylinders, whereby particles remaining in the oil in said annular space flowing toward said outlet means which respond to magnetism will be retained by said magnet means before reaching said outlet means, said cylinders including inner and outer cylinders respectively having outer and inner surfaces between which said annular space is defined, said filter means surrounding said outer cylinder and said outlet means communicating with the interior of said inner cylinder, said ring-shaped magnet means including an intermediate magnetic ring and a pair of magnetic end plates respectively engaging upper and lower end surfaces of said ring and projecting radially beyond the inner and outer peripheries of said ring to define a pair of circumferential channels respectively directed toward the inner and outer surfaces of said outer and inner cylinders.



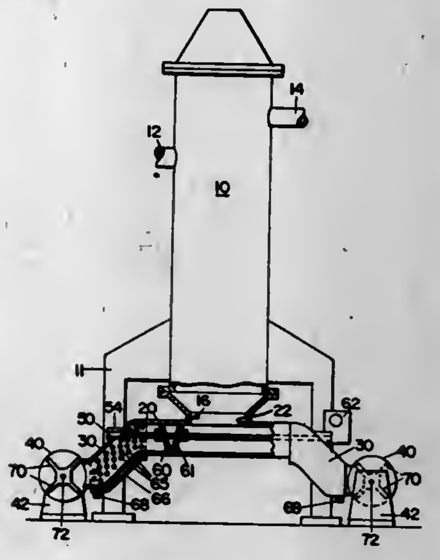
3,887,470
WASTE REMOVAL SYSTEM

Roland E. Weber, Holyoke, and Carl J. Zimmermann, Belchertown, both of Mass., assignors to Industrial Pollution Control Corp., Ware, Mass.

Filed Oct. 31, 1973, Ser. No. 411,247

Int. Cl. B01d *25/38*

U.S. Cl. 210—261 **1 Claim**



1. In anti-pollution apparatus incorporating a settling tank inclusive of an upper work area where a mainly liquid fraction is separated from a mainly heavier solid fraction with the liquid fraction being charged outwardly of the upper area and a lower work area where the solid fraction is charged downwardly thereinto from the upper work area and a lowermost discharge opening leading from the lower work area,

the improvement in means for the compacting of the solid fraction and the expression of fluent material therefrom comprising:

a horizontally-extending housing having a hollow interior of rectangular configuration in cross section and an uppermost central receiving opening in direct communication with the lowermost discharge opening of the settling tank and having an outlet at each opposite outboard extremity,

a pair of spaced parallel drive screws journalled at opposite ends of the housing and being extendable through and centrally of the housing interior,

a pair of angularly-and-oppositely-disposed compacting ram heads in threaded engagement with the drive screws for reciprocation in alternating in seriatim compacting strokes between the opposite outlets of the housing,

each compacting ram head having an outboard compacting face and an inboard non-compacting face and a plurality of tapered passages therethrough with each passage being smaller on the outboard compacting face than on the inboard non-compacting face,

drive means for unisonly driving the drive screws in a manner for effecting the in seriatim compacting movements of the compacting ram heads, an adjacently-disposed dehydrating chamber having upper open and lower open ends and being positioned at each end of the housing communicating at its upper open end with and inclining vertically below and away from the respective outlet for receiving a compacted charge of the solid fraction from within the housing during and upon the completion of each respective compacting stroke of the respective compacting ram head, inclined drum-shaped release means for the removal of fluent material expressed from each compacted charge of the solid fraction charged into each dehydrating chamber,

a horizontally-disposed drum-shaped residue receptacle communicating with the lower open end of each dehydrating chamber, means within said receptacle for the intermittent collection and removal of the charges of the solid fraction charged thereinto from the housing and respective dehydrating chamber and being rotated for the in-seriatim dumping of a compacted charge of the solid fraction from one compartment while a next-following compartment is being charged.

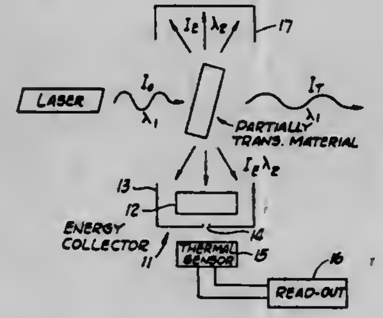
3,887,471
TRANSMITTING POWER METER FOR MEASUREMENT OF RADIATION

Suzanne C. Stotlar, Garretsville, Ohio, assignor to Kewanee Oil Company, Bryn Mawr, Pa.

Filed Feb. 19, 1974, Ser. No. 443,345

Int. Cl. G01t *1/16*

U.S. Cl. 250—338 **9 Claims**



1. A transmitting power meter for measuring the energy level of radiant energy comprising in combination, a partially transmitting crystalline mass of material having a preselected coefficient of absorption sufficient to generate a sensible thermal signal within said crystalline mass with the wavelength of radiation to be measured, and, responsively disposed in spaced apart relationship therewith, a thermal sensor for sensing and measuring said thermal signal generated within said crystalline mass when said radiant energy is intercepted by said crystalline mass.

3,887,472
CYCLIC OXIME DERIVATIVES

Peter Kirby, Maidstone; Eirlys R. Isaac, Stittingbourne, and Graham C. Smith, Ramsgate, all of England, assignors to Shell Oil Company, Houston, Tex.

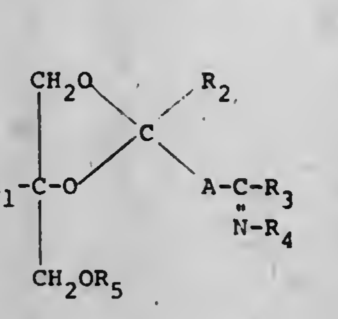
Filed Nov. 24, 1972, Ser. No. 309,566

Claims priority, application United Kingdom, Nov. 29, 1971, 55319/71

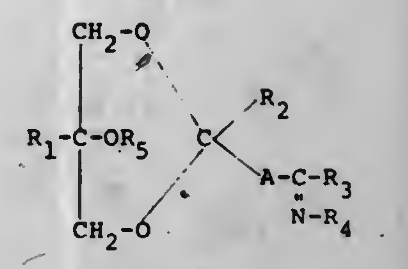
Int. Cl. C07d *15/04, 13/08, 13/02*

U.S. Cl. 260—340.7 **7 Claims**

1. An oxime of one of the following isomeric formulae:



I



II

wherein R_1 and R_2 each is alkyl of 1–6 carbon atoms; R_3 is a hydrogen atom or alkyl or alkoxycarbonyl each of up to 6 carbon atoms or phenyl, or R_2 and R_3 together represent polymethylene of up to 5 carbon atoms; R_4 is hydroxy or a sodium salt thereof, alkoxy of 1–6 carbon atoms optionally substituted by cyano, by alkoxy or alkoxycarbonyl each of up to 6 carbon atoms, or by N-phenylcarbamoyl, alkynyloxy or alkanoyloxy each of up to 6 carbon atoms, carbamoyloxy mono-N-substituted by alkyl or alkenyl each of up to 6 carbon atoms, or by dihalophenyl, benzyloxy, amino substituted by two alkyls each of 1–6 carbon atoms or by thiocarbamoyl, benzoyl or dinitrophenyl; R_5 is benzyl optionally substituted by two chlorine atoms or by alkyl of 1–6 carbon atoms; and A is a covalent bond or is methylene.

3,887,473
METHOD AND SYSTEM FOR THE INFRARED ANALYSIS OF GASES

Stanley P. Sternberg, Ypsilanti; James E. Young, Detroit, and John W. Lennington, Ypsilanti, all of Mich., assignors to Bergishagen & Associates, Mich.

Division of Ser. No. 281,958, Aug. 18, 1972, Pat. No. 3,790,798, which is a continuation-in-part of Ser. No. 178,260, Sept. 17, 1971, which is a continuation-in-part of Ser. No. 809,752, March 24, 1969, abandoned. This application Nov. 29, 1973, Ser. No. 420,305

Int. Cl. G01n *21/26*

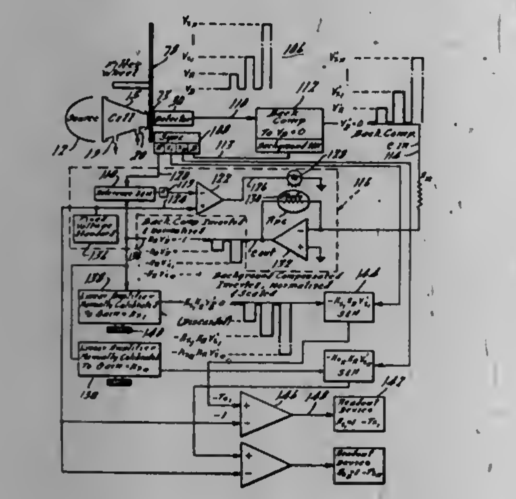
U.S. Cl. 250—345 **6 Claims**

1. A spectrophotometer for analyzing a fluid to determine the concentration of a component therein comprising:

means providing a component signal which is related to the concentration of a component of said fluid;

means providing a reference signal;

means for determining a ratio of said component signal with respect to said reference signal including amplifying means having an input terminal for sequentially receiving said component signal and said reference signal, and an output terminal providing a component ratio signal representative of said ratio of said component signal with respect to said reference signal, variable transfer means connected between said input terminal and said output terminal to provide a feedback signal at said input terminal, means for providing a standard signal means for determining the difference between said standard signal and said signal at said output terminal and for providing a difference signal representative thereof, and means for adjusting said variable transfer means in accordance with said difference signal when said reference signal is received at said input terminal so that said signal at said output terminal is adjusted by said feedback signal to approach said standard signal in value when said reference signal is received at said input terminal, said feedback signal remaining substantially constant when said component signal is received by said input terminal, whereby said component ratio signal is provided at said output terminal; and



means for subtracting said standard signal from said component ratio signal to provide a component concentration signal having a magnitude of zero when there is no concentration of said component and having a magnitude greater than zero representing the concentration of said component when there is a concentration of said component.

3,887,474

PROCESS FOR PRODUCING A FILLER FOR DRILLING MUD

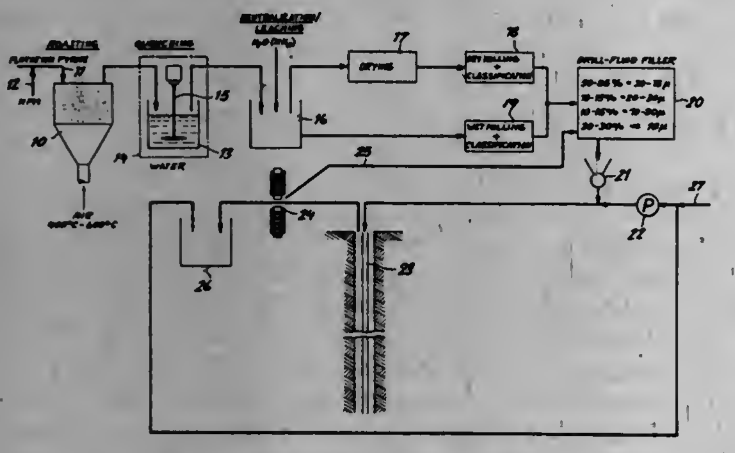
Heinz Senfe, Cologne-Stammheim; Artur Bergmann, Lennestadt; Gerhard Dam, Stommeln, and Dieter Menzel, Rheinkamp-Baerl, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 3, 1972, Ser. No. 277,659

Claims priority, application Germany, Aug. 10, 1971, 2139952; June 22, 1972, 2230510; June 23, 1972, 2230908; June 21, 1972, 2230272

Int. Cl. C09k *3/00*

U.S. Cl. 252—8.5 B **9 Claims**



1. A process for producing a filler for drilling fluids, comprising the steps of:

roasting an iron-and-sulphur-containing mineral mass to produce iron oxide solids containing less than 2 percent by weight sulphur;

quenching the roasted solids from a temperature above 200°C in water to a temperature below 100°C;

excluding any oxidizing atmosphere from the roasted solid during the quenching thereof;

leaching and washing the quenched solids with water to remove water soluble components therefrom; and

milling and classifying said solids to a particle size distribution below 75 microns, with no more than 50 percent of the particles thereof having a particle size below 10 microns to consititute said filler said solids are classified to a particle size distribution in the ranges of substantially:

50 to 55 percent = 30 to 75 microns
10 to 15 percent = 20 to 30 microns
10 to 15 percent = 10 to 20 microns
20 to 30 percent = up to 10 microns.

3,887,475

SOFTENING AGENT FOR TEXTILES HAVING A TETRAHYDROPYRIMIDINIUM SALT COMPONENT

Ulrich Cuntze, Hofheim, Taunus; Adolf May, Diedenbergen, Taunus, and Eckhard Milewski, Schwalbach, Taunus, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

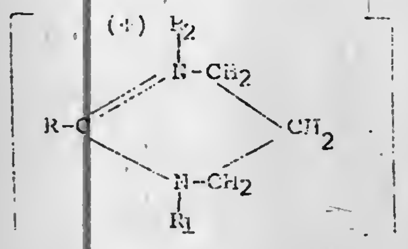
Filed Mar. 1, 1973, Ser. No. 337,195

Claims priority, application Germany, Mar. 2, 1972, 2210085

Int. Cl. D06m *13/36*

U.S. Cl. 252—8.8 **4 Claims**

1. Fluid concentrates of softeners for textiles, which contain as essential components about 50 to 80 percent by weight of tetrahydropyrimidinium salts of the formula I



$A^{(-)}$ (I),

in which R represents alkyl or alkenyl of 7 to 21 carbon atoms, R_1 represents alkyl or alkenyl of 8 to 22 carbon atoms or an N-acylaminopropyl radical of the formula (II)

$$-CH_2-CH_2-CH_2-NH-CO-R \qquad (II)$$

in which R has the meaning given above, R_2 represents a methyl or ethyl radical and $A^{(-)}$ represents $Cl^{(-)}$ or $R_2-O-SO_3^{(-)}$, which tetrahydropyrimidinium salts of the formula I contain at least one alkyl or alkenyl radical of more than 14 carbon atoms, and about 20 to 50 percent by weight of a lower aliphatic alcohol or a glycol.

3,887,476

QUATERNARY AMMONIUM DERIVATIVES OF BISIMIDAZOLINE COMPOUNDS FOR USE AS FABRIC SOFTENERS

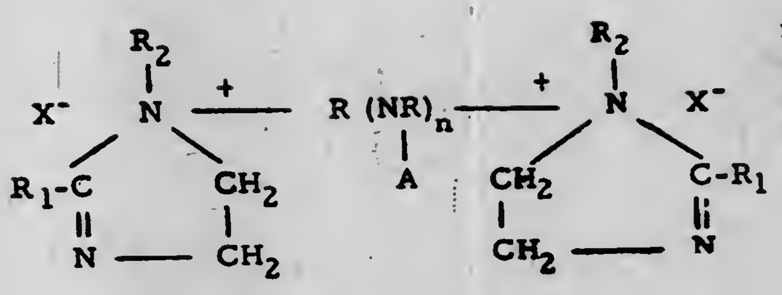
Robert B. McConnell, Janesville, Wis., assignor to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 379,574, July 16, 1973, Pat. No. 3,855,235. This application Sept. 16, 1974, Ser. No. 506,218

Int. Cl. D06m *13/46*

U.S. Cl. 252—8.75 **5 Claims**

1. A fabric softener concentrate in the form of a dispersion containing from 65–85 wt.% of a quaternary ammonium compound having the formula;



wherein R_1 is a $C_5 - C_{23}$ hydrocarbyl group; n is an integer of from 0 – 4; R_2 is lower alkyl; R is a $C_2 - C_4$ alkylene group; A represents hydrogen or an acyl group of the formula $R_1\,C(O)$ — in which R_1 has the meaning as aforesaid; and X represents a chloro or a lower alkyl sulfate anion and correspondingly from 35–15 wt. % of a lower alkanol.

3,887,477

ALKYL PHENOL-HYDRAZINE ANTIOXIDANTS

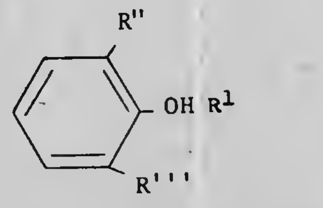
Armand Edward Brachman, Allentown, and Edward Michael McCarron, Easton, both of Pa., assignors to GAF Corporation, New York, N.Y.

Filed May 23, 1972, Ser. No. 282,910

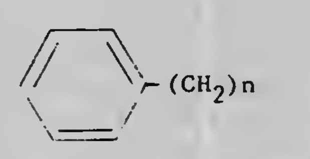
Int. Cl. C08f *45/58*

U.S. Cl. [illegible]—400 R **8 Claims**

1. A composition for stabilizing organic polymers against the deleterious effects of oxygen, heat and light comprising a substantially colorless mixture of hydrazine or hydrazine hydrate and a hindered alkyl phenol having the following formula:



wherein R′ is alkyl containing up to 24 carbon atoms or an aliphatic aryl group having the formula:



wherein *n* has a value of from 1 to 10; R″ is t-butyl t-amyl or isopropyl and R‴ is the same as R″ or ethyl, propyl, butyl, amyl or hydrogen.

3,887,478

PROCESS FOR PRODUCING ALKALINE EARTH FERRITES

Gordon Cunningham Eadie, Wentwood, England, assignor to British Steel Corporation, London, England

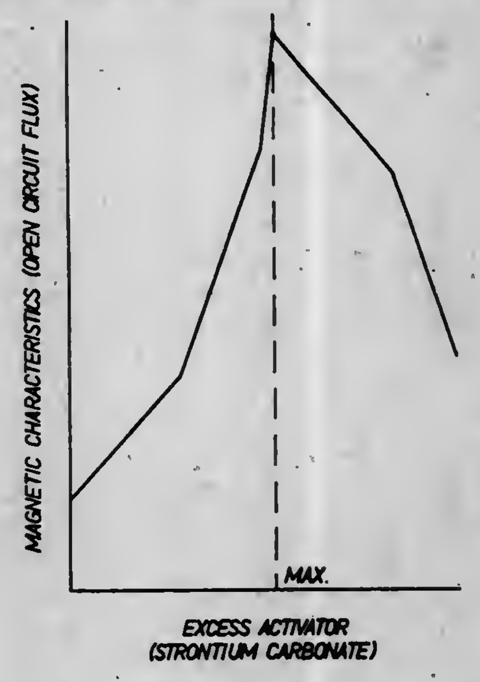
Filed Apr. 19, 1971, Ser. No. 135,031

Claims priority, application United Kingdom, Apr. 20, 1970, 18858/70

Int. Cl. C04b *35/26*

U.S. Cl. 252—62.63 **14 Claims**

1. A process for producing a ferrite magnetic material of the cubic, hexagonal magnetoplumbite or garnet type comprising mixing with solid, particulate, impure ferric oxide having an Fe_2O_3 content between 55 and 96% derived from a process involving iron or steel making or working, an activator in powder form capable of reacting with the ferric oxide to impart to it the required magnetic characteristics selected from the group consisting of compounds of barium, strontum and lead the amount of activator being in sufficient excess of that normally required to react with ferric oxide alone to neutralize or compensate for impurities whereby to render the impurity incapable of degrading the magnetic characteristics of the ferrite, sintering the mixture at a temperature effective to produce the ferrite material, and grinding the sintered material to the required particle size.



3,887,479

PROCESS FOR PREPARATION OF FERRITES

Joseph H. McLain, Chestertown, Md., assignor to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 30, 1973, Ser. No. 411,105

Int. Cl.² C04B *35/36, 35/26;* **C01G** *49/00*

U.S. Cl. 252—62.64 **12 Claims**

1. A process for forming a metallic ferrite comprising:

a. forming a solution of ferrous sulfate and a metallic sulfate in water acidified with sulfuric acid, wherein the mole ratio of ferrous sulfate to metallic sulfate varies from 1:1 to 4:1, and wherein the metallic sulfate is selected from the group consisting of nickel sulfate, manganese sulfate, copper sulfate, magnesium sulfate, zinc sulfate and a mixture of manganese sulfate and magnesium sulfate;

b. evaporating the solvent to form a mixed sulfate crystal;

c. recovering the mixed sulfate crystal;

d. heating the mixed sulfate crystal to form a metallic ferrite.

3,887,480

DETERGENT COMPOSITIONS AND METHODS OF MAKING AND USING THEM

Larry M. Rue, Inver Grove Heights; Richard E. Freis, and Oliver A. Ossanna, both of Bloomington, all of Minn., assignors to Economics, Laboratory, Inc., St. Paul, Minn.

Continuation of Ser. No. 287,479, Sept. 8, 1972, abandoned. This application June 24, 1974, Ser. No. 482,146

Int. Cl. C11d *3/04*

U.S. Cl. 252—135 **10 Claims**

1. A dishwashing detergent or laundry detergent composition comprising detergent ingredients and, in combination therewith, the following water conditioning agent for said detergent composition:

a polymer consisting essentially of: (a) 35 – 70 mole % maleic monomer; (b) 20 – 45 mole % vinyl acetate; and (c) 2 - 40 mole % acrylic acid, methacrylic acid, or an alkali metal salt thereof; said polymer having a number average molecular weight of at least 500 and being soluble in water at least to the extent of 30% by weight at 25°C.

3,887,481

BENZOTRIAZOLE AND TOLYLTRIAZOLE MIXTURE WITH TETRACHLOROETHYLENE

Charles J. Korpics, Toledo, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio

Continuation of Ser. No. 152,528, June 14, 1971, Pat. No. 3,803,049. This application Mar. 9, 1973, Ser. No. 339,527

Int. Cl. C11d *7/50;* **C23f** *11/14;* **C23g** *5/02*

U.S. Cl. 252—172 1 Claim

1. A solution of a triazole in tetrachloroethylene, consisting of a mixture of from 2 to 98 percent of benzotriazole and from 98 to 2 percent of tolyltriazole, where the total amount of triazole dissolved is a function of the proportion of benzotriazole and tolyltriazole present in the solution; and is represented by the shaded area between curve A and B of FIG. 6 of the attached drawing.

3,887,482

COMPOSITIONS FOR FLORIDATING DRINKING WATER

Carl-Johan Sigvard Hellestam; Karl-Axel Melkersson, both of Helsingborg, and Rolf Olof Nilsson, Viken, all of Sweden, assignors to Boliden Aktiebolag, Sweden

Continuation of Ser. No. 203,062, Nov. 29, 1971, abandoned. This application Oct. 9, 1973, Ser. No. 404,146

Claims priority, application Sweden, Nov. 30, 1970, 16214/70

Int. Cl. C02b *1/18, 9/00*

U.S. Cl. 252—175 11 Claims

1. A composition for use in adding fluorine to drinking water for the purpose of reducing dental caries when using said water, such addition of fluorine being carried out in connection with purification of crude water to form drinking water by flocculation with aluminium sulphate, sedimentation and filtration, comprising crystallized aluminium sulphate and homogeneously distributed therethrough, a fluorine compound selected from the group consisting of NaF, H_2SiF_6, Na_2SiF_6, $(NH_4)_2SiF_6$ and Na_3AlF_6 in an amount corresponding to 0.5 – 5 percent by weight of fluorine based on the weight of the composition.

3,887,483

PRECURSOR COMPOSITIONS FOR COLD CURE HIGH RESILIENCE FOAMS

Edward Lewis Morehouse, New City, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

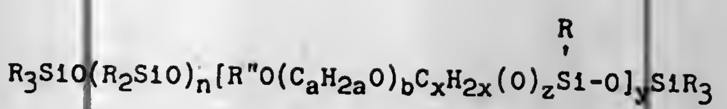
Division of Ser. No. 84,181, Oct. 26, 1970, Pat. No. 3,741,917. This application Apr. 17, 1973, Ser. No. 351,978

Int. Cl. C08g *22/46*

U.S. Cl. 252—182 11 Claims

1. A composition suitable for use in producing a cold cure high resilience polyether urethane foam selected from the class consisting of

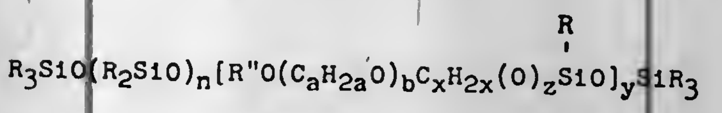
I. a composition consisting essentially of a major amount of an organic polyol selected from the group consisting of (A) a polyether triol containing at least 40 mole per cent primary hydroxyl groups and having a molecular weight from about 2,000 to about 8,000 and (B) a mixture of said polyether triol and another polyether having an average of at least two hydroxyl groups, said polyether triol of said mixture amounting to at least 40 weight per cent of the total polyol content, and a minor amount of a siloxane block copolymer having a molecular weight from about 500 to about 2,500, a siloxane content from about 40 to about 70 weight per cent based on the weight of the copolymer and an oxyethylene content of at least 35 per cent based on the total amount of any oxyalkylene groups present in said copolymer, said copolymer having the formula



$$R_3SiO(R_2SiO)_n[R''O(C_aH_{2a}O)_bC_xH_{2x}(O)_z\overset{R}{\overset{|}{Si}}\text{-}O]_ySiR_3$$

wherein z has a value of 0 or 1, *n* has a value from 2 to 7 inclusive, *y* has a value from 1 to 6 inclusive, *a* has a value from 2 to 4 inclusive, *x* has a value from 2 to 4 inclusive, *b* has a value of from 0 to 10 inclusive, R'' is a member selected from the class of an alkyl radical, an aryl radical, an aralkyl radical, an acyl radical, a carbamyl radical and a carbonate radical and R is a monovalent hydrocarbon radical, and

II. a composition consisting essentially of a major amount of water, a minor amount of an amine catalyst, a minor amount of an organic surfactant, and a minor amount of a siloxane block copolymer having a molecular weight from about 500 to about 2,500, a siloxane content from about 40 to about 70 weight per cent based on the weight of the copolymer and an oxyethylene content of at least 35 weight per cent based on the total amount of any oxyalkylene groups present in said copolymer, said copolymer having the formula



$$R_3SiO(R_2SiO)_n[R''O(C_aH_{2a}O)_bC_xH_{2x}(O)_z\overset{R}{\overset{|}{Si}}O]_ySiR_3$$

wherein z has a value of 0 or 1, *n* has a value of from 2 to 7 inclusive, *y* has a value from 1 to 6 inclusive, *a* has a value from 2 to 4 inclusive, *b* has a value of from 0 to 10 inclusive, R'' is a member selected from the class of an alkyl radical, an aryl radical, an aralkyl radical, an acyl radical, a carbamyl radical and a carbonate radical and R is a monovalent hydrocarbon radical.

3,887,484

HALOALKYLATION AGENT OF AROMATIC HYDROCARBONS

Amos Norwood, Philadelphia, Pa., assignor to Sybron Corporation, Rochester, N.Y.

Filed Nov. 16, 1972, Ser. No. 307,021

Int. Cl. C09k *3/00*

U.S. Cl. 252—188.3 R 8 Claims

1. A haloalkylating agent comprising the reaction product of a formaldehyde source, selected from a group consisting of formalin, paraformaldehyde, polyoxymethylene and methylal; a polar liquid selected from a group consisting of aldehydes, ketones, liquid organic acids, nitroparaffins and primary alcohols containing 1–4 carbon atoms; sulfuric acid and a halide source, selected from the group consisting of the tetrabromides and tetrachlorides of zirconium, titantium, hafnium and mixtures thereof.

3,887,485

SOLID OPTICAL FILTER HAVING SELECTIVE WAVELENGTH PERMEABILITY

Norbert Neuroth, Maniz-Mombach, Germany, assignor to Jenaer Glaswerk Schott & Gen., Germany

Continuation-in-part of Ser. No. 79,739, Oct. 12, 1970, abandoned. This application Sept. 1, 1972, Ser. No. 285,899

Claims priority, application Germany, Oct. 31, 1969, 1954802

Int. Cl. G02b *5/20;* **F21v** *9/02, 9/06*

U.S. Cl. 252—300 4 Claims

1. An optical filter comprising a compressed solid mass of light ray permeable embedding powder; and dispersed powder, said embedding powder having a refractive index in a short-wave spectral range smaller than that of the dispersed powder, said dispersed powder having a refraction index that changes in relation to the wave length of the light more greatly than the refractive index of the embedding powder so that in a specific wave length range the refractive indices of embedding powder and the dispersed powder are equal, said embedding powder being solid and capable of withstanding operational temperatures of the filter as high as between about 400° to 600°C, in which said embedding powder is selected from the group consisting of LiF, CaF_2, LaF_2, NaF, and BaF_2 and in which said dispersed powder consists of material selected from the group consisting of quartz glass, $NHCO_3$, boro silicate glass, boro silicate glass containing BaO and La_2O_3, quartz crystal, phosphate fluoride glass, GeO_2 powder, $baTio_3$, magnesium-aluminum-silicoborate glass, and barium borosilicate glass.

3,887,486

POROUS, MICROSPHEROIDAL, NUCLEAR FUELS HAVING INTERNAL POROSITY

John M. Googin, and Charles R. Schmitt, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Division of Ser. No. 48,579, May 25, 1970, abandoned. This application Oct. 16, 1972, Ser. No. 298,134

Int. Cl. G21c *3/02*

U.S. Cl. 252—301.1 R 13 Claims

1. A microspheroidal particle consisting essentially of a porous matrix of carbon or graphite, a substantial portion of the porosity of said matrix being of the closed-pore type, and an oxide or carbide of a metal selected from the group uranium, plutonium, and thorium within the internal volume and closed pores of said matrix.

6. Microspheres of uranium carbide produced by loading an ion exchange resin containing ion exchange sites for sorbing uranyl ions, drying the loaded resin and then heating said dried resin in an inert atmosphere at a temperature in the range 1,400°–2,200°C. to convert the resin to a porous carbon matrix containing closed pores and a homogeneously dispersed uranium carbide phase.

12. A microspheroidal particle 5 to 2,000 microns in diameter consisting essentially of a porous carbon matrix and a compound selected from the group consisting of an oxide and a carbide of at least one metal selected from the group consisting of uranium, plutonium, and thorium distributed within said matrix.

3,887,487

PROCESS FOR REMOVING BUBBLES OF GAS FROM LIQUIDS

Michel Camp, Lyon, and Paul Rostaing, Vienne, both of France, assignors to Rhone-Poulenc, S.A., Paris, France

Filed Jan. 31, 1973, Ser. No. 328,237

Claims priority, application France, Feb. 2, 1972, 72.03486

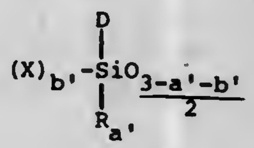
Int. Cl. B01d *19/04*

U.S. Cl. 252—321 7 Claims

1. A process for treating a liquid which is a hydraulic fluid, a heating fluid, a lubricating oil or a printing ink, to remove bubbles of gas dispersed therein or to inhibit formation of the dispersion of gas therein which comprises incorporating into the liquid in an amount of 0.0001% to 0.25% of the weight of the liquid an organosilicon compound containing at least one oxirane ring, which is bonded directly to a silicon atom or forms part of an organic radical bonded to a silicon atom by a Si-C bond, and selected from the group consisting of:

a. silanes of the general formula $(X)_{3-a}R_aSiD$ in which the symbol X represents a hydrolysable group, the symbol R a monovalent hydrocarbon group or a monovalent halogeno-hydrocarbon group, the symbol D an oxirane radical bonded directly to the silicon atom or a monovalent organic radical containing an oxirane ring and bonded to the silicon atom by a Si—C bond, and the symbol *a* represents 0, 1, 2 or 3,

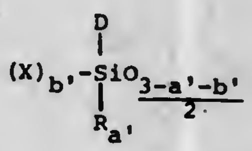
b. organopolysiloxane homopolymers consisting of units of the formula:



$$(X)_{b'}\text{-}\underset{R_{a'}}{\underset{|}{\overset{D}{\overset{|}{Si}}}}O_{\frac{3-a'-b'}{2}}$$

in which the symbols X, D and R are as defined above and each of *a'* and *b'*, which may be the same or different, represents zero, 1 or 2, the sum *a'* + *b '* being 0, 1 or 2, and

c. organopolysiloxane copolymers consisting of units of the formula



$$(X)_{b'}\text{-}\underset{R_{a'}}{\underset{|}{\overset{D}{\overset{|}{Si}}}}O_{\frac{3-a'-b'}{2}}$$

and

$$R_xSiO_{(4-x)/2}$$

the symbols X, D, R, *a'* and *b'* being as defined above and the symbol x representing 0, 1, 2 or 3.

3,887,488

INHIBITION OF CORROSION IN SULFURIC ACID SOLUTIONS

Robert H. Scott, Corpus Christi, and Dan L. Gaulding, Driscoll, both of Tex., assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 232,939, March 8, 1972, abandoned, which is a continuation-in-part of Ser. No. 825,070, May 15, 1969, abandoned. This application June 26, 1974, Ser. No. 483,167

Int. Cl. C23f *11/04;* **C23g** *1/04, 1/06*

U.S. Cl. 252—389 A 12 Claims

1. A method for inhibiting the corrosivity of aqueous sulfuric acid solutions towards metals, said method comprising incorporating into an aqueous sulfuric acid solution, which has a pH of between 0.01 to about 3.0, an amount ranging from 1 to 10,000 ppm of a corrosion inhibitor consisting essentially of a phosphorus compound having at least one phosphorus atom linked to an unshared oxygen atom and selected from the group consisting of oxy acids of phosphorus; salts of the oxy acids of phosphorus, esters of the oxy acids of phosphorus and oxides of phosphorus.

2. A method for inhibiting the corrosivity of aqueous sulfuric acid solutions toward metals, said method comprising incorporating into an aqueous sulfuric acid solution, which has a pH of between about 0.5 and 3.0, an amount ranging from 1 to 10,000 ppm of a corrosion inhibitor consisting essentially of a phosphorus compound having at least one phosphorus atom linked to an unshared oxygen atom and selected from the group consisting of oxy acids of phosphorus, salts of the oxy acids of phosphorus, esters of the oxy acids of phosphorus and oxides of phosphorus.

10. An aqueous sulfuric acid solution with a pH of between about 0.5 and 3.0 having incorporated therein a corrosion inhibitor consisting of orthophosphoric acid in a concentration of about 1 to 10,000 ppm.

3,887,489

RHODIUM CATALYST REGENERATION METHOD

Loyd W. Fannin, Dickinson, Tex.; Victor D. Phillips, Jr., Ballwin, Mo., and Thomas C. Singleton, Texas City, Tex., assignors to Monsanto Company, Texas City, Tex.

Filed Nov. 24, 1972, Ser. No. 309,560

Int. Cl. B01j *11/80;* **C07c** *31/14;* **C08h** *17/36*

U.S. Cl. 252—413 **6 Claims**

1. A process for the regeneration of a spent catalyst solution containing a soluble rhodium iodocarbonyl complex, hydrogen iodide, water, acetic acid and metallic corrosion products which comprises heating said spent catalyst solution with agitation at a temperature from about 100° to 190°C at a pressure sufficient to boil the solution for a period of time necessary to obtain a rhodium-containing precipitate from said solution and reduce the rhodium content of said solution to a predetermined level, separating the solid rhodium-containing precipitate from said liquid solution, adding a quantity of a solvent selected from the group consisting of water, acetic acid and mixtures thereof and an iodine-containing component selected from the group consisting of iodine, hydrogen iodide, alkyl iodides, aryl iodides and iodine salts to said rhodium-containing precipitate and heating the resulting mixture in contact with carbon monoxide while maintaining constant agitation until solution is effected.

3. The process of claim 1 wherein heating of said spent catalyst solution is effected at a temperature of at least 140° C and in the presence of an alkyl alcohol in which the alkyl group contains 1 to 5 carbon atoms, the amount of said alcohol being sufficient to provide a mole ratio of alcohol to hydrogen iodide in the spent catalyst solution of at least 1:1.

3,887,490

PROCESS FOR REGENERATING NOBLE METAL CATALYST FOR THE SYNTHESIS OF HYDROGEN PEROXIDE ACCORDING TO THE ANTHRAQUINONE PROCESS

Gerd Schreyer; Ferdinand Theissen, both of Grossauheim; Otto Weiberg, Neuisenburg, and Wolfgang Weigert, Offenbach, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Continuation of Ser. No. 174,234, Aug. 23, 1971, abandoned. This application Aug. 20, 1973, Ser. No. 389,543

Claims priority, application Germany, Aug. 27, 1970, 2042523

Int. Cl. B01j *11/18;* **C01b** *15/02*

U.S. Cl. 252—414 **7 Claims**

1. A process for the in situ regeneration of noble metal catalyst of the platinum group of the periodic system for the synthesis of hydrogen peroxide by the anthraquinone process, said catalyst being deposited on a catalyst consisting of silica, said process comprising introducing into the hydrogenation step of the anthraquinone process an anthraquinone working solution still containing 300 mg/liter up to 1,000 mg/liter of hydrogen peroxide to thereby completely regenerate the noble metal catalyst to full hydrogenation capacity.

6. A process according to claim 1 wherein the working solution introduced into the hydrogenation step to regenerate the catalyst directly in the hydrogenation step and the hydrogenated working solution is returned to the oxidation step to form further hydrogen peroxide, the thus formed oxidized working solution is extracted or desorbed to reduce the H_2O_2 content to 300—1,000 mg/liter and is then again reintroduced into the hydrogenation step.

3,887,491

METHOD OF PREPARING SILVER CATALYST

Enrique Garcia Ramirez, Bay City; Lowell Curtis Thomas, Lake Jackson, and William Earl Fry, Angleton, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 5, 1973, Ser. No. 413,002

Int. Cl. B01j *11/20*

U.S. Cl. 252—430 **4 Claims**

1. ~~In a~~ process for making a supported silver catalyst in which a soluble silver compound is impregnated onto a support from an aqueous solution thereof, subsequently dried and reduced to metallic silver, the improvement of adding to said aqueous solution a natural gum selected from the group consisting of karaya, ghatti, tragacanth, guar, saponin, locust bean, psyllium seed, quince seed, agar, algin, carrageenan, furcellaran, pectin, gelatin and casein in an amount of from about 0.5 to about 2.5 percent based on the total weight of said aqueous solution.

3,887,492

PREPARATION OF AMORPHOUS ALUMINA SPHERES

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed July 16, 1973, Ser. No. 379,680. The portion of the term of this patent subsequent to Apr. 7, 1992, has been disclaimed.

Int. Cl. B01j *11/44*

U.S. Cl. 252—448 **8 Claims**

1. A method of preparing amorphous, high surface area alumina spheres, which comprises:

a. commingling an ammonia precursor and an acidic alumina hydrosol at below gelation temperature, said ammonia precursor being decomposable to ammonia with increasing temperature;

b. dispersing the mixture as droplets in a hot oil bath effecting decomposition of said ammonia precursor and formation of hydrogel spheres therein;

c. separating and immersing the hydrogel particles in an aqueous ammonium chloride salt solution having a pH of at least about 5.5, and having a salt concentration substantially equivalent to the salt concentration of the internal aqueous phase of said hydrogel particles;

d. maintaining said particles in contact with said solution while reducing the salt concentration gradually at conditions to minimize the concentration gradient between said solution and the internal aqueous phase of said particles, until said solution is substantially salt-free;

e. separating, and drying and calcining the resulting salt-free hydrogel particles.

3,887,493

METHOD OF PREPARING SPHEROIDAL ETA-ALUMINA PARTICLES

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed July 16, 1973, Ser. No. 379,678

Int. Cl. B01j *11/44*

U.S. Cl. 252—448 **7 Claims**

1. A method of preparing spheroidal alumina particles which comprises:

a. commingling an ammonia precursor and an acidic alumina hydrosol at below gelation temperature, said ammonia precursor being decomposable to ammonia with increasing temperature;

b. dispersing the mixture as droplets in a hot oil bath effecting decomposition of said ammonia precursor and formation of hydrogel spheres therein;

c. immersing the hydrogel spheres in an aqueous ammonium chloride salt solution at a temperature of from about 25° to about 60° C., and at a pH of at least about 5.5, said aqueous salt solution having a salt concentration substantially equivalent to the salt concentration of the internal aqueous phase of said hydrogel spheres;

d. maintaining said hydrogel spheres in contact with said solution at said temperature while gradually reducing the salt concentration at conditions to minimize the concentration gradient between said solution and the internal aqueous phase of said hydrogel particles until said solution is substantially salt-free, and adjusting the pH of said solution to at least about 9;

e. aging the spheres at said pH of at least about 9 and forming crystalline bayerite alumina spheres.

3,887,494

OLEFIN POLYMERIZATION CATALYST

Richard E. Dietz, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 89,047, Nov. 12, 1970. This application May 24, 1973, Ser. No. 363,483

Int. Cl. B01j *11/32, 11/06*

U.S. Cl. 252—452 **12 Claims**

1. A method of preparing a silica-containing composition catalytically active for olefin polymerization comprising:

a. adding a titanium compound to a mineral acid;

b. introducing an alkali metal silicate into the acid containing said titanium compound to form a hydrogel;

c. aging the hydrogel for a time of greater than one hour;

d. washing the thus aged hydrogel to produce a substantially alkali metal-free hydrogel;

e. forming a mixture comprising the thus washed hydrogel and a normally liquid oxygen-containing, water soluble organic compound;

f. separating said organic compound and water from said mixture to form a xerogel; and,

g. heating said xerogel also containing chromium at a temperature of 900° to 1800° F to produce a composition catalytically active for olefin polymerization.

3,887,495

CATALYST PARTICULARLY USEFUL FOR DEHYDROGENATING SATURATED HYDROCARBONS

Bernard Juguin, and Jean-Francois Le Page, both of Rueil-Malmaison, France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

Filed Nov. 7, 1972, Ser. No. 304,543

Claims priority, application France, Nov. 19, 1971, 71.41426

Int. Cl. B01f *11/06, 11/08*

U.S. Cl. 252—464 **20 Claims**

1. A catalyst consisting essentially of (a) alumina, (b) rhenium and (c) at least one metal from groups III A, IV A and V A of the periodic classification of the elements, selected from the group consisting of gallium, indium, thallium, germanium, tin, lead, antimony and bismuth, said catalyst having a specific surface of about 20 to 80 m^2/g and a neutralization heat by ammonia adsorption lower than about 10 calories per gram of catalyst at 320°C and under a pressure of 300 mm of mercury, the total content by weight of rhenium being from 0.01 to 1% and the total content by weight of metals from groups III A, IV A and V A being from 0.01 to 0.5%, said catalyst being essentially free of group VIII metals.

3,887,496

QUATERNARY AMMONIUM ELECTROCONDUCTIVE RESIN COATING COMPOSITIONS

Sally P. Cornier, Sanford; Ben A. Tefertiller, and Richard J. Dolinski, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 2, 1972, Ser. No. 277,319

Int. Cl. H01b *1/00*

U.S. Cl. 252—500 **10 Claims**

1. An improved aqueous electroconductive resin coating composition containing as essential elements:

A. A water-soluble quaternary ammonium electroconductive resin, and

B. About 0.05–0.50 parts, based on the weight of the electroconductive resin, of a water-dispersible, substantially nonionic acrylamide polymer containing at least 20 wt. % polymerized acrylamide and having a 0.5 wt. % aqueous solution viscosity of less than about 5.0 cps at pH 5–6 and 25°C.

3,887,497

LIQUID CLEANSING COMPOSITION AND METHOD OF PRODUCING

George B. Ulvild, 1210 Dona Dr., Corpus Christi, Tex. 78407

Filed Mar. 15, 1973, Ser. No. 341,383

Int. Cl. C11d *3/065, 3/08*

U.S. Cl. 252—526 **22 Claims**

1. A one phase cleansing composition comprising (a) an anionic detergent surfactant which is an alkylamine salt or an alkylolamine salt of an alkylbenzene sulfonic acid, (b) a normally liquid organic solvent, (c) water and (d) an alkaline builder material or a builder material which is a mineral acid or a neutral or acidic inorganic salt thereof, wherein in said composition the molar ratio of said builder material to said detergent surfactant is within the range of 0.01:1 to 3:1, wherein the weight ratio of said solvent to said detergent surfactant is within the range of 1:1 to 5:1, wherein said water is present in amounts of from about 4.0 to 80 weight per cent, and wherein the alkyl portion of said alkylbenzene sulfonic acid contains substantially from 11 to 13 carbon atoms.

3,887,498

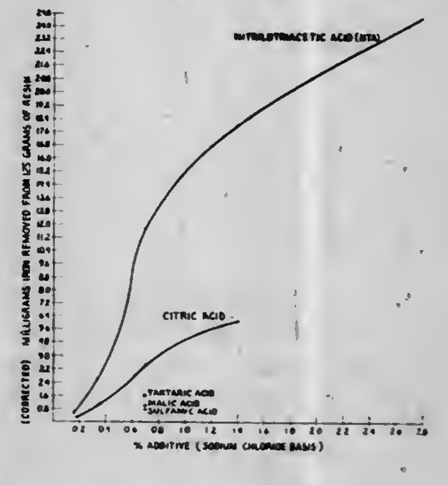
METHOD FOR REGENERATION OF CATION EXCHANGE RESINS AND FOR REMOVAL OF IRON DEPOSITS THEREFROM

Eugene J. Kuhajek, Crystal Lake; Howard W. Fiedelman, and Gordon H. Tibbitts, both of Woodstock, all of Ill., assignors to Morton-Norwich Products, Inc., Chicago, Ill.

Filed Mar. 12, 1973, Ser. No. 339,611

Int. Cl. B01d *15/06*

U.S. Cl. 260—2.2 R **4 Claims**



1. A method of regenerating a cation exchange resin which has been used for softening hard water and which has become iron-fouled and substantially exhausted by reason thereof, which method comprises contacting said resin with an aqueous solution containing about 10% by weight of sodium chloride and based on said sodium chloride at least about 0.175% by weight of nitrilotriacetic acid, the pH of said aqueous solution containing said sodium chloride and said nitrilotriacetic acid being less than about 3 pH units.

3,887,499

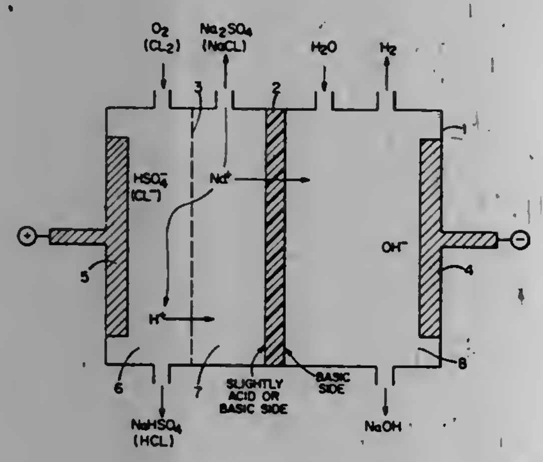
CATION EXCHANGE MEMBRANES HAVING CARBOXYLIC AND SULFONIC ACID FUNCTIONALITY

Russell B. Hodgdon, Jr., Sudbury, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Continuation of Ser. No. 205,056, Dec. 6, 1971, abandoned. This application Aug. 23, 1973, Ser. No. 394,212

Int. Cl. C08f *19/20*

U.S. Cl. 260—2.2 R **1 Claim**



1. A solid bifunctional cation selective membrane having at least two dimensions in excess of one cm. comprising a cross-linked polymer matrix bonded to both carboxylic acid and sulfonic acid functional groups, said matrix being a polymerized product of a solution mixture of at least one monvinyl aromatic monomer, at least one polyvinyl aromatic monomer, at least one olefinic carboxylic monomer and a non-polymerizable organic hydrocarbon solvent, said mixture containing said polyvinyl monomer between 40–50 mole % of the total polymerizable monomers and between 20–50% by volume of said non-polymerizable solvent, the said sulfonic acid groups being chemically bonded to the vinyl aromatic nuclei of said polymer matrix in an amount averaging 0.65 to 1.2 groups for every carboxylic acid group containing therein and wherein the mole ratio of the monovinyl monomer to carboxylic monomer is 1:3 to 3:1, the said membrane having a capacity of between about 4 to 11 meg./dry gm. of polymerized product, and being substantially dimensionally stable and ionically conductive substantially over the entire pH range.

3,887,500

ORGANOSILICONE POLYMERS

Bela Prokai, Mahopac, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

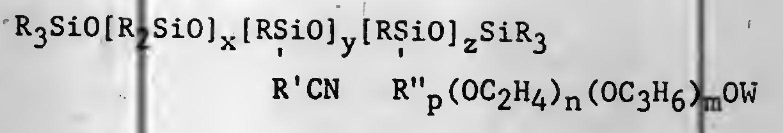
Division of Ser. No. 279,882, Aug. 11, 1972, Pat. No. 3,846,403. This application Nov. 29, 1973, Ser. No. 420,233

Int. Cl. C08g *22/44*

U.S. Cl. 260—2.5 AH **9 Claims**

1. A process for producing flexible polyurethane foam which comprises reacting and foaming a reaction mixture comprising:

a. a polyether polyol reactant containing an average of at least two hydroxyl groups per molecule,
b. a polyisocyanate reactant containing at least two isocyanato groups per molecule,
c. a blowing agent,
d. a catalyst comprising an amine, and
e. a foam stabilizer comprising a polysiloxanepolyoxyalkylene block copolymer having the average composition,



$$R_3SiO[R_2SiO]_x[\underset{R'CN}{RSiO}]_y[\underset{R''_p(OC_2H_4)_n(OC_3H_6)_mOW}{RSiO}]_zSiR_3$$

where
- R is an alkyl group having from 1 to 10 carbon atoms,
- R′ has from 2 to 12 carbon atoms and is a bivalent alkylene or a bivalent oxyalkylene group the oxygen atom of which is bonded to silicon,
- R″ is an organic radical comprising a bivalent alkylene group a carbon atom of which is bonded to silicon,
- W comprises a monovalent hydrocarbyl group having from 1 to 12 carbon atoms,
- *p* has a value of zero or one,
- *x* has an average value from about 10 to about 200,
- *y* has an average value from 3 to about 100,
- *z* has an average value from about 2 to about 30,
- and the average values of *m* and *n* are such that the average molecular weight of the chain, $—(C_3H_6O)_m(C_2H_4O)_n—$, is from about 1000 to about 6000 and from about 20 to about 65 weight percent of the chain is constituted of oxyethylene units;

said reaction mixture containing from 0.8 to 1.5 equivalents of —NCO per equivalent of total active hydrogen contained in said mixture, and from about 0.1 to about 5 parts by weight of said block copolymer per one hundred parts by weight of said polyether polyol reactant (a).

3,887,501

PROCESS FOR THE PREPARATION OF CARBODIIMIDE-ISOCYANURATE FOAMS

Thirumurti L. Narayan, Riverview, and Moses Cenker, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 21, 1973, Ser. No. 427,122

Int. Cl. C08g *22/44, 33/04*

U.S. Cl. 260—2.5 BF **8 Claims**

1. A process for the preparation of a cellular foam characterized by carbodiimide and isocyanurate linkages which comprises condensing an organic polyisocyanate in the presence of a catalytically sufficient amount of a catalyst system consisting essentially of methanol and a tertiary amine trimerization catalyst selected from the group consisting of 1,3,5-tris(N,N-dialkylaminoalkyl)-s- hexahydrotriazines, the alkylene oxide and water adducts thereof, and 2,4,6-tris(dimethylaminomethyl)phenol.

3,887,502

PREPARATION OF RIGID POLYURETHANE FOAM HAVING IMPROVED AGING PROPERTIES

Pierrepont Adams, Darien, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 252,613, May 12, 1972, Pat. No. 3,799,963. This application Jan. 16, 1974, Ser. No. 433,969. The portion of the term of this patent subsequent to Mar. 26, 1991, has been disclaimed.

Int. Cl. C08g *22/44, 22/26*

U.S. Cl. 260—2.5 AT **13 Claims**

1. In a process for preparing a rigid polyurethane foam from a reaction mixture comprised of a polyol, a foaming agent, a reaction catalyst and a crude product of the phosgenation of toluene diamine, the improvement which comprises heating said crude product, before it is used in making said foam, to a temperature of about 120°–250°C in the presence of about 0.05–8 percent by weight, based on the weight of said crude product, of formic acid.

3,887,503

3-(HYDROXYHYDROCARBYLSECONDARYAMINO)THIOPHENE 1,1-DIOXIDES AND POLYURETHANES CHAIN EXTENDED THEREWITH

Chung-Ling Mao, Sandy Hook, Conn., assignor to Uniroyal, Inc., New York, N.Y.

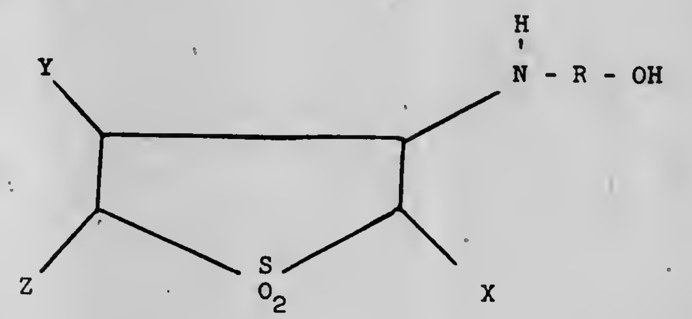
Filed Jan. 18, 1974, Ser. No. 434,470

Int. Cl. C08g *22/02, 22/16, 22/44*

U.S. Cl. 260—2.5 AM **35 Claims**

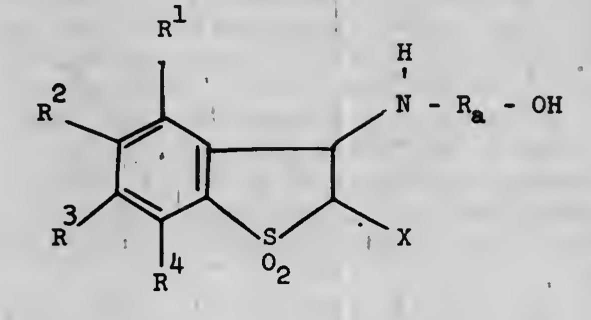
1. In a method of making polyurethanes which comprises reacting a long chain polyol selected from the group consisting of polyesters, polyethers and polyhydrocarbons with a chain extender and with a polyisocyanate, the improvement which comprises using as chain extender a 3-(hydroxyhydrocarbylsecondaryamino)thiophene 1,1-dioxide of one of the following formulas I or II:

Formula I:



wherein
- X may be hydrogen, an alkyl group having 1 to 5 carbon atoms or a halogen atom,
- Y may be hydrogen, an alkyl group having 1 to 5 carbon atoms, or a phenyl group,
- Z may be hydrogen, an alkyl group having 1 to 5 carbon atoms a phenyl group, or a halogen atom,
- R may be (1) an open chain alkylene group having 2 to 10 carbon atoms, (2) an open chain alkylene group having 2 to 10 carbon atoms in the alkylene portion substituted with one or more phenyl groups, or (3) a cycloalkylene group having 4 to 8 carbon atoms,
- the hydroxyl group being attached to a carbon atom of R that is separated from the secondary amino nitrogen by at least one carbon atom;

Formula II:



wherein
- X may be as defined in Formula I,
- R_a may be (1) an open chain alkyene group having 2 to 10 carbon atoms, (2) an open chain alkylene group having 2 to 10 carbon atoms in the alkylene portion substituted with at least one or more phenyl groups, and (3) a cycloalkylene group having 4 to 8 carbon atoms,
- the hydroxyl group being attached to a carbon atom of R_a that is separated from the secondary amino nitrogen atom by at least one carbon atom, and
- R^1, R^2, R^3 and R^4 are the same or different and are hydrogen, an alkyl group having 1 to 5 carbon atoms, or halogen.

2. A method as in claim 1 in which water is added as an additional reactant, and the resulting polyurethane is a foam.

3,887,504

PROCESS OF MAKING A SULFUR CONTAINING FOAM AND PRODUCT OBTAINED THEREFROM

Gar Lok Woo, Tiburon, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 344,694, March 26, 1973, which is a continuation-in-part of Ser. No. 253,144, May 15, 1972, abandoned. This application Jan. 31, 1974, Ser. No. 438,508

Int. Cl. C08g *22/44*

U.S. Cl. 260—2.5 AM **33 Claims**

1. A process for producing sulfur foam containing at least 50 weight percent sulfur, which comprises contacting and reacting molten sulfur with .001 to 1.0 g. mole acid equivalents of an organic protonic acid per 100 grams of sulfur wherein the organic protonic acid is reactive with molten sulfur so as to incorporate the organic acid with sulfur to form a sulfur-organic acid adduct containing protonic acid groups, and then contacting and reacting the protonic acid groups of the adduct with an organic polyisocyanate to obtain sulfur foam and wherein said contacting and reacting are carried out in the liquid phase.

3,887,505

PREPARATION OF LOW DENSITY FLEXIBLE URETHANE FOAMS WITH ENHANCED LOAD-BEARING PROPERTIES

John G. Demou, Lincoln Park, and Moses Cenker, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 3, 1973, Ser. No. 421,088

Int. Cl. C08g *22/40, 22/46, 22/14*

U.S. Cl. 260—2.5 AB **7 Claims**

1. In the preparation of low-density flexible polyurethane foams having improved load-bearing properties by a process which comprises reacting:

a. a polyoxyalkylene ether polyol or polyol blend which was prepared by condensing monomeric units such as ethylene oxide, propylene oxide, butylene oxide and mixtures thereof with active hydrogen compounds selected from the group consisting of 1,2-propylene glycol, 1,3-propylene glycol, 1,2-butanediol, 1,4-butanediol, 1,3-butanediol, hexanetriol, glycerol, trimethylolpropane, hydroquinone, pentaerythritol, alpha-methyl glucoside, sorbitol, and sucrose, having an equivalent weight of at least 100 and a primary hydroxyl content of at least 17 percent,
b. an organic polyisocyanate,
c. water, and 1 – polyoxyalkylene
d. a surfactant,

the improvement comprising catalyzing the reaction in the presence of an organic stannous compound selected from the group consisting of stannous acetate, stannous butyrate, stannous laurate, stannous octoate, stannous stearate, stannous oleate and stannous linoleate, as the sole catalyst.

3,887,506

PROCESS OF STABILIZING SOIL AND SOIL ADDITIVE PRODUCT

Robert L. Hewitt, Atlanta, Ga., assignor to Terra Perma, Inc., Atlanta, Ga.

Filed Oct. 11, 1973, Ser. No. 405,484
Int. Cl. C08f *45/52*

U.S. Cl. 260—17 A **1 Claim**

1. An additive for stabilizing in situ water permeable soil comprising from 80 – 90% by weight of a composition comprising vinyl acetate homopolymer, hydroxethyl cellulose, a non-ionic ethoxylated surfactant, potassium persulfate, sodium bicarbonate and water; from 5 – 10% by weight of a polyvinyl alcohol mixture comprising water, hydrogen peroxide, glycerin and polyvinyl alcohol; and from .5 – 10% by weight of a water repellent emulsion comprising wax, an ethoxylated surfactant, diglycol stearate, stearic acid, zirconium acetate, ethylene urea resin and water.

3,887,507

PROCESS FOR PREPARING TRIKETOIMIDAZOLIDINES AND PRODUCT

Johannes Reese, Wiesbaden-Biebrich, and Kurt Kraft, Auringen, both of Germany, assignors to Reichhold-Albert-Chemie-Aktiengesellschaft, Hamburg, Germany

Continuation-in-part of Ser. No. 154,634, June 18, 1971. This application Jan. 18, 1972, Ser. No. 218,691

Claims priority, application Germany, Aug. 4, 1971, 2139005

Int. Cl. C08g *33/02, 33/10*

U.S. Cl. 260—37 N **17 Claims**

1. A process for the manufacture of modified N,N′-substituted 2,4,5-triketoimidazolidines which comprises reacting

(a) at least one oxamidic ester of Formula VII

$$R-(NH-CO-CO-OR^{V})_r \qquad \text{(VII)}$$

wherein:

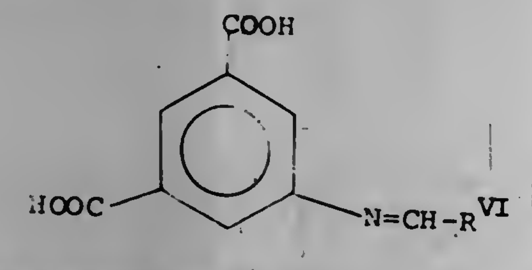
R is a mono- or polynuclear, mono to hexavalent carbocyclic or heterocyclic aromatic including quinone group and having up to 20 carbon atoms being unsubstituted or substituted by at least one substituent having up to 18 carbon atoms selected from the group consisting of halogen, nitro, dialkylamino, diarylamino, alkylarylamino and halogenated or unhalogenated alkyl, alkoxy, carboxyalkyl, carboxyaryl and acyl groups,

r is an integer of from 1 to 6, and wherein

R^{V} is individually selected from the group consisting of an aliphatic hydrocarbon group having up to 18 carbon atoms, a cycloaliphatic hydrocarbon group with up to 8 carbon atoms, a mononuclear aromatic hydrocarbon group being unsubstituted or substituted by at least one hydrocarbon group and having a total of up to 14 carbon atoms

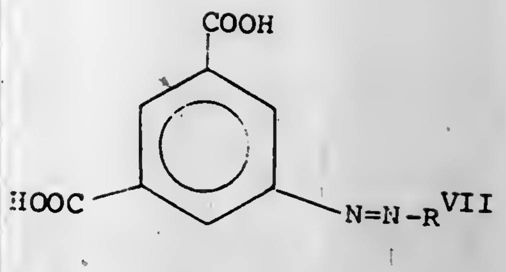
(b) at least one organic isocyanate, and (D) at least one compound selected from the group consisting of

(d) an azomethine of Formula (37)



(e) a metal chelate of component (d),

(f) an azo compound of Formula (38),



(g) a metal chelate of component (f),

wherein

R^{VI} is an aromatic group having at least one aromatic nucleus and having from 6 to 14 carbon atoms and containing a hydroxy group ortho to the azomethine group, a substituted product thereof having from 6 to 22 carbon atoms and having at least one substituent selected from the group consisting of alkyl, cycloalkyl, benzyl, hydroxy, methoxy, aryl, aryloxy, carboxyl, acyl, nitro, and halogen, each substituent containing up to 6 carbon atoms,

R^{VII} is an aromatic group having 6 to 14 carbon atoms and containing a hydroxy group ortho to the azo group, a substituted product thereof having up to 22 carbon atoms and having at least one substituent selected from the group consisting of alkyl, cyclohexyl, alkoxy, acyl, carboxyalkyl, a fluorcarbon group or halogen, each substituent containing up to 6 carbon atoms

so as to obtain a reaction product of modified N,N′-substituted 2,4,5-triketoimidazalidine.

3,887,508

VINYL HALIDE STABILIZER COMPOSITIONS OF ANTIMONY ORGANIC SULFUR-CONTAINING COMPOUNDS AND METAL CARBOXYLATES

Dale J. Dieckmann, Euclid, Ohio, assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Nov. 20, 1973, Ser. No. 417,634
Int. Cl. C08f *45/62*

U.S. Cl. 260—23 XA **16 Claims**

1. A vinyl halide resin heat stabilizer composition which consists essentially of,

an antimony organic sulfur-containing compound having the formula

$$R_nSbX_{3-n}$$

where R of the formula is selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, cycloalkyl, cycloalkenyl, mixed aryl-alkyl, and substituted groups thereof, where X of the formula is selected from the group consisting of sulfur, SR and SRCOOR′, where R of the group SR is selected from alkyl, aryl, mixed aryl-alkyl, and substituted groups thereof, where R of the group SRCOOR′ is selected from alkylene, arylene, aralkylene, and substituted groups thereof, wherein R′ of the group SRCOOR′ is selected from alkyl, aryl, mixed aryl-alkyl, and substituted groups thereof, where *n* is an integer of 0 to 2, and

a metal carboxylate selected from the group consisting of an alkali or alkaline earth metal salt of a carboxylic or thiocarboxylic acid, and mixtures thereof, said antimony compound and metal carboxylate components in relative amounts which together provide a synergistic heat stabilizing effectiveness upon said resin.

3,887,509

AMMONIUM SALTS OF RESINOUS POLYCARBOXYLIC ACIDS

Richard Bolstad, Bronx, N.Y., and Anna F. Melchoni, West Paterson, N.J., assignors to Inmont Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 409,482, Oct. 25, 1973, abandoned. This application Jan. 28, 1974, Ser. No. 437,356
Int. Cl. C08f *45/26*

U.S. Cl. 260—29.1 R **10 Claims**

1. A method of preparing ammonium salts of resinous polycarboxylic acids which comprises reacting the said polycarboxylic acid, in particulate form, with nascent ammonium generated in situ from particles of an ammonium coumpound of the group consisting of ammonium carbonate and ammonium bicarbonate, said reaction being carried out under substantially anhydrous conditions in an inert organic liquid between said particles of polycarboxylic acid and said particles of ammonium compound of such size that at least 95% by weight pass through a 60 mesh screen.

3,887,510

PROCESS FOR LOW TEMPERATURE PREPARATION OF AQUEOUS SOLUTION OF POLYALKYLENE AMINE-POLYAMIDE RESINS

Lock-Lim Chan, and John Edward Amy, both of Scarborough, Ontario, Canada, assignors to Borden, Inc., Columbus, Ohio

Division of Ser. No. 164,826, July 21, 1971, abandoned. This application Jan. 24, 1973, Ser. No. 326,503
Int. Cl. C08g *20/38*

U.S. Cl. 260—29.2 N **3 Claims**

1. In a process of preparing an aqueous solution of cationic thermosetting resin by (a) forming a long-chain water-soluble polyamide from a diester of a C_3 to C_6 saturated aliphatic dicarboxylic acid with a C_1 to C_3 saturated aliphatic alcohol and a polyalkylene polyamine having two primary amine groups and at least one secondary amine group the mol ratio of said polyamine to said diester being from about 0.8/1 to 1.4/1, and (b) then reacting said polyamide in aqueous solution with epichlorohydrin in amount such that the mol ratio of epichlorohydrin to the sum of secondary and tertiary amine groups in the polyamide is from about 0.5/1 to about 1.8/1, the improvement which comprises forming the polyamide by reacting the polyalkylene polyamine under substantially anhydrous conditions at from about 80° to about 95°C., from about 1.5 to 3 hours, at atmospheric pressure with the diester and removing the alcohol formed at a temperature no higher than about 105°C. to produce a polyamide having an intrinsic viscosity of from about 0.08 to 0.12 dl/gram in 1 n aqueous ammonium chloride at 25°C.

3,887,511

UREA-HCHO-DICYNDIAMIDE-OXY ACID OF PHOSPHORUS FIRE-RETARDANT FORMULATION AND PRODUCTS

Subhash C. Juneja, Ottawa, Ontario, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Nov. 30, 1972, Ser. No. 310,958
Claims priority, application Canada, Feb. 2, 1972, 133797
Int. Cl. C08g *37/28, 51/24, 9/14*

U.S. Cl. 260—29.4 R **12 Claims**

1. An aqueous liquid composition comprising an intermediate-stage resin solution formed by reacting:

a. a urea
b. dicyandiamide
c. formaldehyde and
d. oxy-acid of phosphorus;

in the following relative amounts:

a. about 1–10 moles
b. about 1–11 moles
c. about 1.2–3 moles per mole of (a) plus (b) and
d. about 0.5–2 moles per mole of (a) plus (b);

which reaction comprises dissolving (a) and (b) in an aqueous solution of (c) having a pH of about 7.5 to 9 and temperature of about 60° to 90°C, cooling to below about 50°C, and slowly adding (d), the solution having present excess or unreacted formaldehyde, acid in amounts sufficient to give an initial pH not significantly above about 3 and having a pot-life of at least about 1 month.

3,887,512

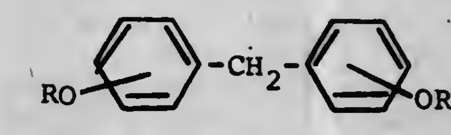
PLASTICIZED VINYL CHLORIDE POLYMERS

David A. Nelson, Littleton, Colo., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 7, 1974, Ser. No. 449,145
Int. Cl. C08f *45/34*

U.S. Cl. 260—33.2 R **5 Claims**

1. A plasticized vinyl chloride polymer containing a major proportion of polymerized vinyl chloride and as a plasticizing agent therefore from between about 40 to about 60 parts per hundred parts of polymer of a compound of the formula:



wherein R is selected from the group consisting of phenyl and alkyl containing from 1 to 4 carbon atoms.

3,887,513

NON-AQUEOUS PRINTING INK

Helmut Fritze, Wiesbaden; Kurt Hultzsch, Wiesbaden-Biebrich, and Hans-Jürgen Tietz, Langenhain, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Mar. 26, 1973, Ser. No. 345,117
Claims priority, application Germany, Mar. 29, 1972, 2215234; Mar. 29, 1972, 2215267
Int. Cl. C08f *45/28*

U.S. Cl. 260—33.6 UA **15 Claims**

1. A non-aqueous ink comprising a binder, at least one pigment and a non-aqueous volatile solvent in which the binding agent contains as an essential ingredient a compound selected from the group consisting of

a. a salt of a polymerization resin having units of carboxylic groups comprising a1) olefinically unsaturated monomers occurring in petroleum fractions boiling within the range from −20° to +280°C and a2) olefinically unsaturated at least monocarboxylic acid units having 3 to 8 carbon atoms, in a molar ratio of a1) : a2) = (2 to 20): 1, said salt having an average molecular weight in the range of 500 to 5000 and a saponification number in the range from 10 to 370 and

b. a combination of such salt with a reaction product of colophony with at most dibasic olefinically unsaturated carboxylic acids, 2 to 60% of the units of carboxylic groups of the polymerixation resin being bound to a cation of group I of the Periodic Table or an ammonium ion in which 0 to 4 hydrogen atoms are bound to the nitrogen atom or to a combination thereof and the units of carboxylic groups which are not present as a salt being free or at least in part esterified by an alcohol.

3,887,514

BODIED ORGANOPOLYSILOXANES AND PROCESS THEREFOR

Duane F. Merrill, Ballston Spa, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jan. 2, 1974, Ser. No. 429,525

Int. Cl. C08g *51/28*

U.S. Cl. 260—33.6 SB **16 Claims**

1. A process for effecting the controlled condensation of silanol radicals in a silanol-containing organopolysiloxane, which comprises:

1. heating at a temperature between 200°C and 250°C a mixture comprising said silanol-containing organopolysiloxane, substantially free of any acidity in excess of about 5 parts per million by weight, and unactivated diatomaceous earth in an amount of from 0.75 to 20% by weight of said silanol-containing organopolysiloxane; and
2. recovering an organopolysiloxane from the resulting mixture of (1), having a viscosity higher than said silanol-containing organopolysiloxane which has an average ratio of from 1 to 1.8 organo radicals per silicon atom, selected from the group consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals.

3,887,515

PROCESS FOR MAKING LOW PROFILE MOLDING COMPOUNDS

Donald W. Pennington, Lake Jackson, and James H. Enos, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 329,703, Feb. 5, 1973, abandoned. This application Apr. 26, 1974, Ser. No. 464,378

Int. Cl. C08g *51/04*

U.S. Cl. 260—40 R **27 Claims**

1. An improved process for making low profile molding compounds from a mixture of a thermosettable resin and a copolymerizable monomer wherein said resin is an unsaturated polyester resin, a terminally unsaturated vinyl ester resin or mixtures thereof, said process comprises combining with 100 parts of said resin-monomer mixture at least about 0.1 part of a block copolymer viscosity reducing agent in combination with about 5 to 20 parts of a polymeric low profile additive, about 10 to 150 parts of $CaCO_3$ and up to 150 parts of a fibrous reinforcing material, wherein said block copolymer has the formula

$$B_x—CH_2CH_2(OCH_2CH_2)_yOH, \text{ or} \qquad (I)$$

$$HO(CH_2CH_2O)_yCH_2CH_2—B_x—CH_2CH_2(OCH_2CH_2)_yOH \qquad (II)$$

where B is a monoalkenyl aromatic monomer, a conjugated diene monomer or mixtures thereof polymerized into a block segment and where *x* and *y*, each, have a value of at least about 25.

3,887,516

HINDERED TRIS (META-HYDROXYBENZYLTHIO)-S-TRIAZINE ANTIOXIDANTS

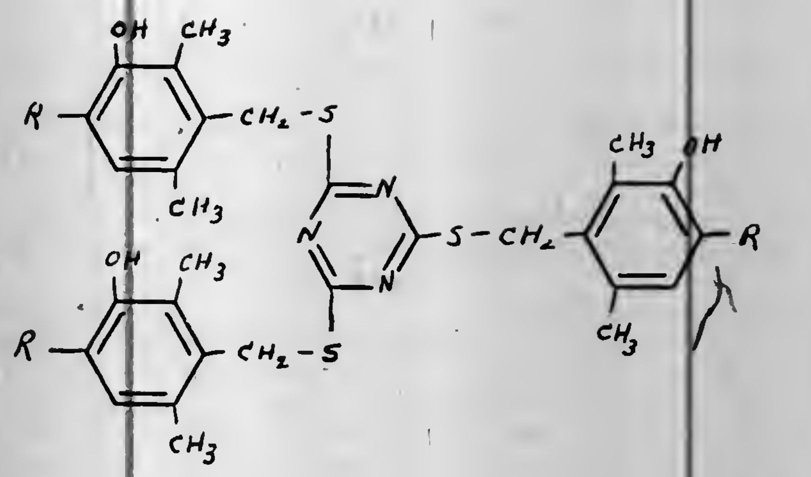
John Song, Bound Brook, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 199,341, Nov. 16, 1971, Pat. No. 3,723,428. This application Oct. 20, 1972, Ser. No. 299,566

Int. Cl. C08f *45/58*

U.S. Cl. 260—45.8 N **5 Claims**

1. A composition comprising an organic material which tends to deteriorate upon exposure to oxygen containing, in an amount effective to inhibit oxidative degradation thereof, a compound of the formula:



wherein R is a branched chain alkyl containing three to about 12 carbon atoms.

3,887,517

PIPERIDINE DERIVATIVES AND THEIR USE AS STABILIZERS

Keisuke Murayama; Katsuaki Matsui, and Tomoyuki Kurumada, all of Tokyo, Japan, assignors to Sankyo Co., Ltd., Japan

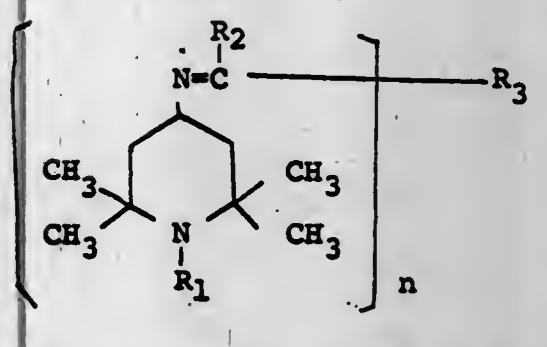
Filed Oct. 9, 1973, Ser. No. 404,147

Claims priority, application Japan, Oct. 25, 1972, 47-106796

Int. Cl. C08f *45/58*

U.S. Cl. 260—45.8 N **17 Claims**

1. A synthetic polymer composition stabilized against photo- and thermal-deterioration wherein there is incorporated, in a sufficient amount to prevent said deterioration, a compound having the formula



wherein R_1 represents hydrogen atom; and alkyl group having 1–4 carbon atoms which may be optionally substituted with hydroxy, alkoxy having 1–4 carbon atoms, phenoxy, aliphatic acyloxy having 2–18 carbon atoms, aromatic acyloxy having 7–11 carbon atoms, halogen, cyano, epoxy, alkoxycarbonyl having 1–4 carbon atoms in the alkoxy moiety or phenoxycarbonyl; an alkenyl group having 3–4 carbon atoms; an alkynyl group having 3–4 carbon atoms; benzyl group; an aliphatic acyl group having 2–4 carbon atoms; an alkoxycarbonyl gorup having 2–9 carbon atoms or a phenylalkoxycarbonyl group having 1–4 carbon atoms in the alkoxy moiety; *n* is 1 or 2 and, when *n* is 1, R_2 represents hydrogen atom; an alkyl group having 1–4 carbon atoms; a phenylalkyl group having 1–4 carbon atoms in the alkyl moiety; or an aryl group which may be optionally substituted with halogen, hydroxy, nitro, alkyl having 1–4 carbon atoms, alkoxy having 1–4 carbon atoms or alkali metal sulfo; and R_3 represents an alkyl group having 1–18 carbon atoms; a halogenoalkyl group having 1–4 carbon atoms; an alkenyl group having 2–4 carbon atoms; an alkynyl group having 2–4 carbon atoms; a phenylalkyl group having 1–4 carbon atoms in the alkyl moiety; styryl group; an aryl group which may be optionally substituted with halogen, hydroxy, nitro, alkyl having 1–4 carbon atoms, alkoxy having 1–4 carbon atoms, alkali metal sulfo; a heterocyclic group; or

R_3 and R_2, together with the carbon atom to which they are attached, represent a cycloalkylidene group having 4–6 carbon atoms and, when *n* is 2, R_2 represents hydrogen atom and R_3 represents an alkylene group having 2–6 carbon atoms; or phenylene; or the carbon atoms, each of which is linked to R_3, are directly bonded.

3,887,518

SALICYLOYL-ACYL-HYDRAZINES

Siegfried Rosenberger, Riehen, and Kurt Schwarzenbach, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

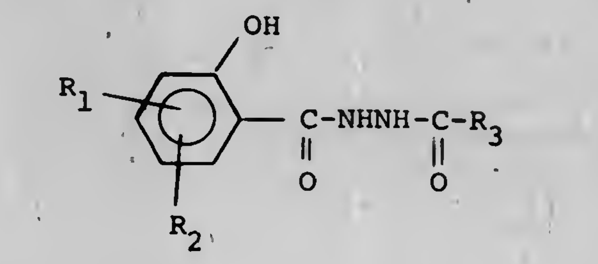
Division of Ser. No. 256,969, May 25, 1972, abandoned. This application Jan. 9, 1974, Ser. No. 431,996

Claims priority, application Switzerland, June 29, 1971, 9529/71

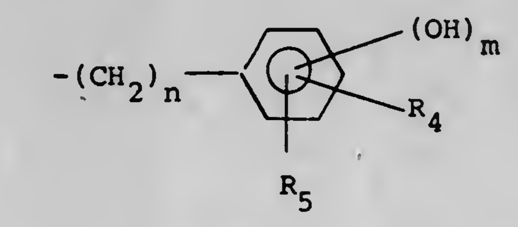
Int. Cl. C08f *45/60*

U.S. Cl. 260—45.9 NC **13 Claims**

1. A stabilized polyolefin containing a polyolefin and 0.01 to 5% of a stabilizer of the formula



in which R_1 denotes hydrogen, alkyl with 1 to 8 carbon atoms, alkenyl with 3 or 4 carbon atoms, cycloalkyl with 6 to 8 carbon atoms, aralkyl with 7 to 9 carbon atoms, phenyl, chlorine, hydroxyl, alkoxy with 1 to 18 carbon atoms, acyloxy with 2 to 18 carbon atoms or acylamino with 2 to 18 carbon atoms, R_2 denotes hydrogen, alkyl with 1 to 5 carbon atoms, alkenyl with 3 to 4 carbon atoms cyclohexyl, aralkyl with 7 to 9 carbon atoms, chlorine or hydroxyl, R_3 denotes alkyl with 2 to 21 carbon atoms, cyclohexyl or the radical



wherein *m* denotes 0 or 1 and *n* denotes 0 to 2, the difference *n-m* being not less than 0 if the OH group is in the o-position to the $—(CH_2)_n$ group, and wherein R_4 denotes hydrogen, alkyl with 1 to 8 carbon atoms, alkenyl with 3 or 4 carbon atoms, cycloalkyl with 6 to 8 carbon atoms, aralkyl with 7 to 9 carbon atoms, phenyl, chlorine, hydroxyl, alkoxy with 1 to 18 carbon atoms, acyloxy with 2 to 18 carbon atoms, or acylamino with 2 to 18 carbon atoms and R_5, if *m* is 1, denotes hydrogen, alkyl with 1 to 5 carbon atoms, alkenyl with 3 or 4 carbon atoms, cyclohexyl, aralkyl with 7 to 9 carbon atoms, chlorine or hydroxyl, or R_5, if *m* is 0, denotes hydrogen, alkyl with 1 to 8 carbon atoms, alkenyl with 3 or 4 carbon atoms, cycloalkyl with 6 to 8 carbon atoms, aralkyl with 7 to 9 carbon atoms, phenyl, chlorine, hydroxyl, alkoxy with 1 to 18 carbon atoms, acyloxy with 2 to 18 carbon atoms, or acylamino with 2 to 18 carbon atoms.

3,887,519

DIMETHYLTIN ESTER STABILIZERS FOR VINYL-HALIDE POLYMERS

Lewis B. Weisfeld, Princeton, N.J., and Robert C. Witman, Cincinnati, Ohio, assignors to Cincinnati Milacron Chemicals, Inc., Reading, Ohio

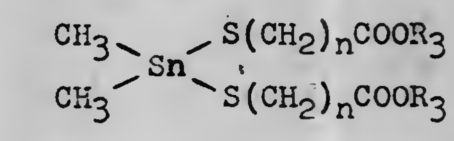
Continuation-in-part of Ser. Nos. 177,516, Sept. 2, 1971, and Ser. No. 317,228, Dec. 21, 1972, Pat. No. 3,810,868. This application Jan. 21, 1974, Ser. No. 435,264

Claims priority, application Germany, June 7, 1973, 2329039The portion of the term of this patent subsequent to May 14, 1991, has been disclaimed.

Int. Cl. C08f *45/62*

U.S. Cl. 260—45.75 K **30 Claims**

1. A composition comprising a halogen containing resin selected from the group consisting of chlorinated polyethylene a vinyl halide resin and a vinylidene halide resin with a stabilizingly effective amount of a mixture of (1) 60 to 96% of a compound having the formula

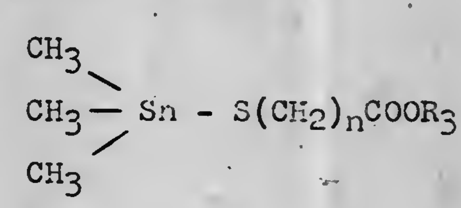


$$(CH_3)_2Sn[S(CH_2)_nCOOR_3]_2$$

and (2) 4 to 40% of a compound having the formula

$$CH_3 — Sn —S(CH_2)_nCOOR_3)_3$$

and having not over 0.6% of



$$(CH_3)_3Sn - S(CH_2)_nCOOR_3$$

as an impurity in the stabilizer and where R_3 is hydrocarbon of up to 20 carbon atoms and *n* is an integer of 1 to 3.

3,887,520

STABILIZED POLYAMIDE COMPOSITION

Kiyoaki Nishijima, and Atsuo Tanaka, both of Mihara, Japan, assignors to Allied Chemical Corporation, Petersburg, Va.

Filed Jan. 30, 1974, Ser. No. 438,131

Int. Cl. C08g *51/62*

U.S. Cl. 260—45.75 C **3 Claims**

1. In a composition consisting essentially of a polyamide, containing, based on the weight of said polyamide,

- a. from about 0.01 weight percent to about 5 weight percent 2-mercaptobenzimidazol, and
- b. from about 10 parts per million to about 500 parts per million, analyzed as copper metal, of a compound selected from the group consisting of the copper salt of 2-mercaptobenzimidazol and an organic acid copper salt,

the improvement comprising said polyamide also containing

- c. from about 5 parts per million to about 150 parts per million, analyzed as magnesium metal, of a compound selected from the group consisting of the magnesium salt of 2-mercaptobenzimidazol, and 8-hydroxyquinoline magnesium salt.

3,887,521
LIGHT-STABILIZED SYNTHETIC LINEAR POLYESTERS AND SHAPED STRUCTURES MADE THEREFROM

Erich Blöcker, Weilbach; Walter Rupp, Schneidhain, Taunus, and Franz Jakob, Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, (Main) Germany

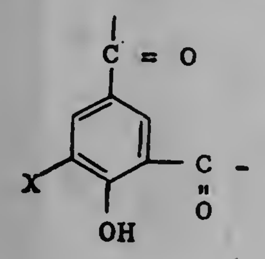
Filed May 10, 1974, Ser. No. 469,032

Claims priority, application Germany, May 14, 1973, 2324349

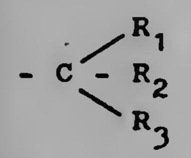
Int. Cl. C08g *17/14*

U.S. Cl. 260—47 C **8 Claims**

1. Synthetic linear, fiber- and film-forming polyester the macromolecules of which are composed of dicarboxylic acid and diol moieties, wherein about 0.1 to 5 mole % of the dicarboxylic acid moieties are structural units of the formula



in which X stands for the group



wherein R_1, R_2 and R_3 each are hydrogen or an alkyl of from 1 to 4 carbon atoms.

3,887,522
SELF-EXTINGUISHING, FILM-FORMING, LINEAR POLYARYLATES

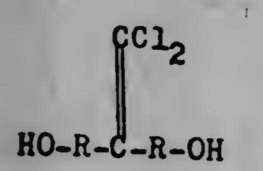
Zbigniew Brzozowski; Stanislaw Porejko; Jedrzej Kielkiewicz, and Janusz Kaczorowski, all of Warsaw, Poland, assignors to Politechnika Warszawska, Warsaw, Poland

Continuation-in-part of Ser. No. 331,247, Feb. 9, 1973, abandoned. This application May 24, 1974, Ser. No. 473,322

Int. Cl. C08g *17/08*

U.S. Cl. 260—47 C **14 Claims**

1. A high molecular weight self-extinguishing, linear polyarylate of a dicarboxylic acid and a bisphenol said dicarboxylic acid consisting essentially of at least one phthalic acid and said bisphenol comprising at least one chlorobisphenol of the formula:



$$HO-R-\overset{\overset{\displaystyle CCl_2}{\|}}{C}-R-OH$$

wherein each R is selected from the group consisting of phenyl and naphthyl and which may contain substituents selected from halogen and lower alkyl, said polyarylate being capable of forming a self-sustaining film.

3,887,523
FIBER-FORMING COPOLYESTER COMPOSITIONS FROM BROMINATED ETHOXYLATED HYDROQUINONE

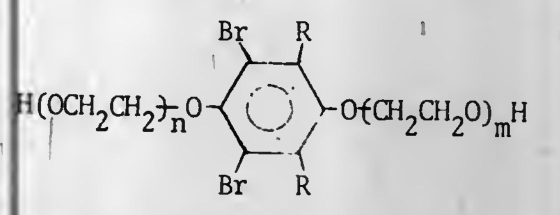
Chiou C. Yau; Irwin S. Schlossman, and Herman F. Oehlschlaeger, all of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed June 24, 1974, Ser. No. 482,198

Int. Cl. C08g *17/14*

U.S. Cl. 260—47 C **8 Claims**

1. A flame retardant, thermally stable, fiber-forming copolyester comprising the condensation product of (a) a diol, (b) a dicarboxylic acid or a lower alkyl ester thereof and (c) a brominated ethoxylated hydroquinone of the formula



wherein R is hydrogen or bromine and n and m are integers from 1 to 4, said brominated ethoxylated hydroquinone comprising about 1 to 25% by weight of the copolyester composition.

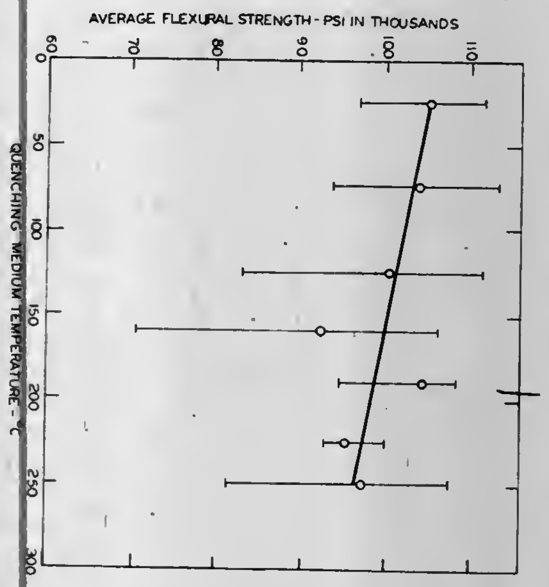
3,887,524
METHOD OF STRENGTHENING ALUMINA CERAMIC BY QUENCHING WITH LIQUID MEDIUM

Henry P. Kirchner, 700 S. Sparks St., State College, Pa. 16801, and Ralph E. Walker, Beaver Rd., Julian, Pa. 16844

Continuation-in-part of Ser. No. 131,595, April 6, 1971, abandoned. This application Dec. 20, 1972, Ser. No. 316,696

Int. Cl. B28b *11/00*

U.S. Cl. 264—66 **18 Claims**



1. A method of strengthening a polycrystalline alumina ceramic, comprising the steps of refiring an unglazed body consisting essentially of alumina ceramic having a grain size up to 50μm to a temperature of from 1400°C to between 1700° and 1750°C for a time sufficient to heat the body to be strengthened throughout, and quenching the body with a liquid medium which is at a temperature below about 250°C and no lower than room temperature and which is a medium taken from the group consisting of oils having a viscosity as low as 1.4 centistokes, said oils being mineral oil, petroleum oil, vegetable oil, and animal oil and emulsions of such oils in water with as little as 10% by weight of oil, whereby the flexural strength, tensile strength, impact resistance and thermal shock resistance is improved.

3,887,525
PROCESS FOR PREPARING SOLVENT-SOLUBLE POLYURETHANES

James Peter Brown; Edwin Gordon Jenner, and John Wilcock, all of Blackley, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 235,069, March 15, 1972, abandoned. This application Dec. 13, 1973, Ser. No. 424,424

Claims priority, application United Kingdom, Mar. 30, 1971, 8160/71

Int. Cl. C08g *22/14, 53/00, 53/20*

U.S. Cl. 260—77.5 AA **10 Claims**

1. A process for the manufacture of solvent-soluble polyurethane elastomers from polypropylene glycol having a molecular weight of 1,000–2,500, a diol having a molecular weight of at most 250 and an organic diisocyanate in amount at most equivalent to the polypropylene glycol and the diol together, which comprises (1) reacting together the organic diisocyanate and the polypropylene glycol in the absence of solvent to form an isocyanate-ended prepolymer, (2) further reacting the prepolymer with the diol in the absence of solvent to form a solvent-insoluble polyurethane product, (3) heating the solvent-insoluble polyurethane product in the absence of solvent until a product is obtained which is soluble in dimethyl formamide, dimethyl acetamide or dimethyl sulfoxide, (4) dissolving the solvent-soluble product in a solvent therefore and (5) removing the solvent to produce a solid polyurethane product.

3,887,526
PROCESS FOR THE HOMOPOLYMERIZATION OF MALEIC ANHYDRIDE

Charles J. Lancelot, Hightstown; John H. Blumbergs, Highland Park, both of N.J., and Donald G. MacKellar, Yardley, Pa., assignors to FMC Corporation, New York, N.Y.

Continuation of Ser. No. 248,880, May 1, 1972, Continuation-in-part of Ser. No. 51,730, July 1, 1970, abandoned. This application May 23, 1973, Ser. No. 363,015

Int. Cl. C08f *1/11, 3/48*

U.S. Cl. 260—78.4 R **8 Claims**

1. A process for the preparation of poly(maleic anhydride) which comprises,

adding at a controlled feed rate in the range from about 100 to 500 grams/liter/hour a feed mixture maintained at about 38°–50°C. which consists of maleic anhydride, an unsymmetrical acyl-maleyl peroxide initiator and a maleic anhydride solvent in which the maleic anhydride polymer product is insoluble,

to a polymerization reaction zone wherein is maintained a solvent system consisting essentially of a maleic anhydride solvent and about 0 to 25%, by weight, of maleic anhydride in solution,

said reaction zone being maintained at polymerization temperature,

precipitating poly(maleic anhydride) in the maleic anhydride solvent medium contained in said reaction zone, and

recovering and isolating the poly(maleic anhydride) product.

3,887,527
METHOD OF PRODUCING MALEIC ANHYDRIDE MODIFIED POLYISOPRENE RUBBER

Takayuki Okamura, and Shobu Minatono, both of Kashima, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed June 15, 1973, Ser. No. 370,380

Claims priority, application Japan, June 16, 1972, 47-60853

Int. Cl. C08f *27/00*

U.S. Cl. 260—78.4 D **6 Claims**

1. A method of producing modified polyisoprene rubber, comprising reacting maleic anhydride with a high cis-1,4-polyisoprene rubber having a cis-1,4 content of at least 95% by means of a radical-yielding catalyst, at a temperature of from about 0° to 150°C., in an inert solvent for said rubber as a reaction medium and under an atmosphere of an inert gas, characterized in that the maleic anhydride and the catalyst are respectively employed in amounts satisfying the conditions:

A. the amount of maleic anhydride is in the range of about 0.04 to 3 parts by weight per 100 parts by weight of the said rubber;

B. the value [amount of radical-yielding catalyst expressed in millimol per 100 g. of said rubber] × [initiator efficiency] is in the range of about 0.016 to 1.03; and

C. the value (A)/(B) is in the range of about 0.24 to 24.2 and conducting the reaction until a product having a bound maleic anhydride content of from about 0.03 to 0.9 mol per 100 recurring units of isoprene monomer in the polyisoprene polymer is obtained.

3,887,528
PRECIPITATION POLYMERIZATION OF 1:1 COPOLYMERIZATES OF MALEIC ACID ANHYDRIDE AND ALLYL ACETATE

Karlheinz Lottes, Munich, and Hans Katzer, Freising, both of Germany, assignors to Consortium fur Elektrochemische Industrie GmbH, Munich, Germany

Filed June 11, 1973, Ser. No. 369,075

Claims priority, application Germany, June 9, 1972, 2228107

Int. Cl. C08f *1/11, 15/36*

U.S. Cl. 260—78.5 R **14 Claims**

1. A method of precipitation polymerization of 1:1 copolymerizates of maleic acid anhydride and allyl acetate consisting of polymerizing a solution of a monomer mixture of maleic acid anhydride and allyl acetate in an organic diluent in which said monomer mixture is soluble but the copolymer produced is substantially insoluble in the presence of at least one suspension aid and a free-radical-former selected from the group consisting of dialkyl peroxydicarbonates, dicycloalkyl peroxydicarbonates and lower alkyl esters of peracids at a temperature and time sufficient to effect polymerization, and recovering a 1:1 copolymerizate of maleic acid anhydride and allyl acetate.

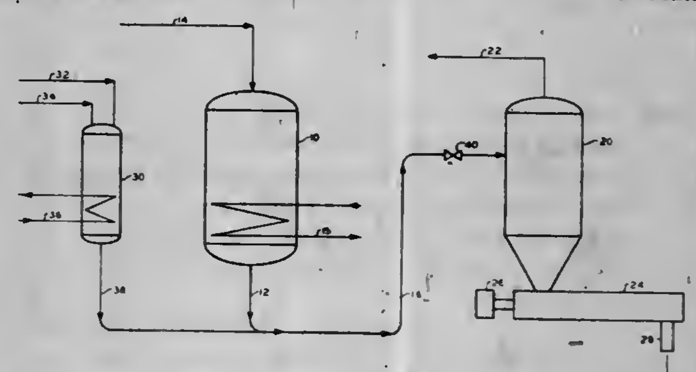
3,887,529
PREVENTING PLUGS IN TRANSFER CONDUITS

Raymond G. Rohlfing, Kapellen, Belgium, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 20, 1973, Ser. No. 426,699

Int. Cl. C08g *23/00*

U.S. Cl. 260—79 **9 Claims**



1. A method to prevent plugging of a transfer conduit through which a plug-forming material is passed when transferred from a first zone to a second zone, comprising: flushing said transfer conduit with a liquid which is a solvent for said plug-forming material wherein said solvent is at a temperature and pressure sufficient to maintain said solvent in the liquid phase in said transfer conduit but which causes at least a sufficient portion of said solvent to flash in said second zone to prevent said solvent from interfering with the processing of said plug-forming material in said second zone when said solvent is introduced into said second zone.

3,887,530
SEMI-CRYSTALLINE SULFONATED EDPM ELASTOMERIC IONOMERS

Charles P. O'Farrell, Clark, and Edward N. Kresge, Watchung, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Mar. 15, 1974, Ser. No. 451,384

Int. Cl. C08d *11/02, 13/30;* **C08f** *27/06*

U.S. Cl. 260—79.3 R **9 Claims**

1. A sulfonated composition comprising an elastomeric EPDM having a number average molecular weight of about 5,000 to about 250,000, a crystallinity of at least 2% to about 50% as determined by X-ray diffraction at 25°C. and sulfonated to about 4×10^{-3} moles SO_3H per gram of polymer to about 5×10^{-4} moles SO_3H per gram of polymer, said sulfonic acid groups being substantially neutralized.

3,887,531
INTERPOLYMERS OF 5,8-DIMETHYL-1,4,9-DECATRIENE AND/OR 4,8-DIMETHYL-1,4,9-DECATRIENE WITH AT LEAST ONE ALPHAOLEFIN CONTAINING 2 TO 6 CARBON ATOMS

Wolfgang Schneider, Brecksville, and Robert J. Minchak, Parma Hts., both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 491,027, Sept. 28, 1965, abandoned. This application Nov. 1, 1967, Ser. No. 679,620

Claims priority, application Canada, Sept. 20, 1966, 970861

Int. Cl. C08f *15/14*

U.S. Cl. 260—80.78 **6 Claims**

1. An amorphous, sulfur-vulcanizable, elastomeric interpolymer containing at least two alpha-olefins containing 2 to 6 carbon atoms, at least one of which is ethylene, and from about 0.1 to less than 20 mol percent of dimethyl-1,4,9-decatriene selected from the group consisting of 5,8-dimethyl-1,4,9-decatriene and 4,8-dimethyl-1,4,9-decatriene and having a dilute solution viscosity of 0.5 to 5 determined in 0.2% solutions of interpolymer in toluene at 25°C.

3,887,532
METHOD OF COAGULATING LATICES

Terry C. Neubert, Kent, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 15, 1973, Ser. No. 332,850

Int. Cl. C08d *5/02, 5/04*

U.S. Cl. 260—85.1 **9 Claims**

1. In a process for coagulating synthetic latices selected from the group consisting of homopolymers of butadiene and styrene, and copolymers of butadiene/styrene which have been prepared using as emulsifiers, alkali metal salts of fatty acids and/or alkali metal salts of disproportionated rosin acids and selecting a coagulating salt from the group consisting of ferric chloride, ferric nitrate, ferric sulphate, aluminum chloride, aluminum nitrate, and aluminum sulphate, the improvement comprising heating a coagulation solution at a temperature between about 45°C. and about 95°C. before introducing said latices to the coagulation solution and adjusting equivalents of metal ion of said coagulating salt between 0.16 and about 0.56 per equivalent of said emulsifier and adding enough acid to maintain a final pH of less than 6.

3,887,533
PROCESS FOR THE MANUFACTURE OF A LIGHT COLORED THERMOSTABLE CHLORINATED POLYOLEFIN

Ambar Nath Mukerjee, Gersthofen, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 12, 1973, Ser. No. 424,201

Claims priority, application Germany, Dec. 21, 1972, 2262535

Int. Cl. C08f *27/03*

U.S. Cl. 260—88.2 **5 Claims**

1. In a process for the manufacture of a light colored thermostable chloropolyolefin by chlorinating pulverulent polyethylene, polypropylene or a copolymer of ethylene with a straight chain or branched α-olefin having 3 to 6 carbon atoms, the molecular weight of the polymer being in the range of from about 20,000 to 2,000,000, with gaseous chlorine in the fluidized or moving bed, possibly after a thermal treatment of the polymer, the improvement of carrying out the chlorination in the presence of 0.01 to 3.0% by weight, calculated on the amount of polymer to be chlorinated and uniformly dispersed therein, of a compound selected from the group consisting of

a. a saturated aliphatic mono- or dicarboxylic acid having 4 to 50 carbon atoms,
b. a mononuclear aromatic, possibly alkyl-substituted, monocarboxylic acid having 7 to 23 carbon atoms,
c. an aliphatic hydroxi-monocarboxylic acid having 2 to 18 carbon atoms in the molecule,
d. an aliphatic hydroxi-dicarboxylic acid having 4 to 10 carbon atoms,
e. an aromatic, possibly alkyl-substituted, hydroxicarboxylic acid having 7 to 11 carbon atoms,
f. an alkali metal or alkaline earth metal salt of any one of the acids named sub (a) to (e),
g. an anhydride of an aliphatic monocarboxylic acid having 4 to 50 carbon atoms,
h. an anhydride of an aliphatic dicarboxylic acid having 4 to 50 carbon atoms,
i. an anhydride of an aromatic monocarboxylic acid having 7 to 23 carbon atoms, and
j. an anhydride of an aromatic dicarboxylic acid having 8 to 23 carbon atoms.

3,887,534
METHOD FOR PRODUCING A MODIFIED CRYSTALLINE PROPYLENE POLYMER

Kazuo Baba; Toshiaki Shiota; Kikuo Murakami, all of Niihama, and Kazuo Ono, Ehime-ken, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka-fu, Japan

Filed Mar. 9, 1973, Ser. No. 339,927

Claims priority, application Japan, Mar. 11, 1972, 47-24933

Int. Cl. C08f *27/22, 27/00, 3/10*

U.S. Cl. 260—93.7 **15 Claims**

1. A method for the modification of crystalline propylene polymer which comprises heating a mixture comprising 100 parts by weight of said polymer and 0.001 to 0.5 part by weight of an aliphatic peroxide at a temperature of from 170 to 280°C, said peroxide having a half life time of from 2.0 to 10.0 hours at 130°C and a vapor pressure of not more than 760 mmHg at 230°C.

3,887,535
PROCESS FOR PRODUCING RUBBERY CONJUGATED DIOLEFIN POLYMERS HAVING BRANCHED STRUCTURES

Saburo Minekawa; Sigeru Yonekawa; Haruro Tabata, all of Yokohama; Takashi Ishida, Kamakura; Satoshi Tsuchida, Yokohama, and Kiyoshi Yamada, Kawasaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 12,657, Feb. 19, 1970, abandoned, and a continuation-in-part of Ser. No. 688,788, Dec. 7, 1967, abandoned. This application May 8, 1972, Ser. No. 251,110

Claims priority, application Japan, Dec. 16, 1966, 41-82029

Int. Cl. C08d *3/04;* **C08f** *3/16*

U.S. Cl. 260—94.2 M **5 Claims**

1. Process for producing a rubbery polymer having a branched structure, which comprises

bringing continuously into a polymerization zone a mixture consisting of a conjugated diolefin having from 4 to 5 carbon atoms per molecule and selected from the group consisting of 1,3-butadiene, 2-methyl-1,3-butadiene and 1,3-pentadiene, a hydrocarbon diluent selected from the group consisting of a paraffinic, cycloparaffinic and aromatic hydrocarbon having from 5 to 12 carbon atoms per molecule and a C_2–C_8 alkyllithium catalyst and at a predetermined temperature of from about 90° to about 235°C. to initiate polymerization of said diolefin therein, and

continuing the polymerization of said conjugated diolefin while maintaining the polymerization themperature within said specified range of from about 90° to about 235°C. with a continuous addition of said conjugated diolefin, said hydrocarbon diluent and said catalyst to form said rubbery polymer,

the initiation and continuation of said polymerization being carried out under polymerization conditions in which k_I is greater than k_P.

3,887,536
PROCESS FOR PREPARING POLY-1,4-TRANS BUTADIENE

Masaru Ichikawa, and Tamio Noguchi, Sagamihara, both of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Filed June 1, 1973, Ser. No. 365,826

Claims priority, application Japan, June 9, 1972, 47-56892; Aug. 24, 1972, 47-84095

Int. Cl. C08d *3/08*

U.S. Cl. 260—94.2 **2 Claims**

1. A process for preparing polybutadiene of predominantly trans 1,4 structure which comprises:

polymerizing butadiene in the presence of a catalyst consisting of:
1. a metal selected from the group consisting of sodium, potassium, rubidium and cesium, and
2. an alkylamine or an alkenylamine

in an atmosphere at a temperature of from −20°C to 70°C at the weight ratio of metal to alkylamine or alkenylamine being about 1:10–10:1.

3,887,537
PROCESS FOR RECOVERING FATTY ACIDS AND/OR ROSIN ACIDS

Tetsuya Harada, Tokyo, and Tsunemasa Yumoto, Yokohama, both of Japan, assignors to Japan Synthetic Rubber Company Limited, Japan

Filed Sept. 6, 1974, Ser. No. 503,873

Claims priority, application Japan, Sept. 18, 1973, 48-105258

Int. Cl. C09f *8/07*

U.S. Cl. 260—97.6 **4 Claims**

1. A process for recovering fatty acids and/or rosin acids which comprises the steps of saponifying a tall oil head and/or pitch, introducing the saponified material into a thin film evaporator equipped with a rake and having a clearance of not more than one millimeter between the blade tips and the surrounding tube wall, evaporating and removing the low-boiling matter including unsaponifiables by a treatment at a temperature not lower than the melting point of the resulting soaps, and thereafter decomposing the saponification products.

3,887,538
PROCESS FOR SELECTIVELY CLEAVING CARBOXYL PROTECTING GROUPS FROM MULTI-CARBOXYL PEPTIDES OR AMINO ACIDS AND COMPOUNDS USEFUL THEREIN

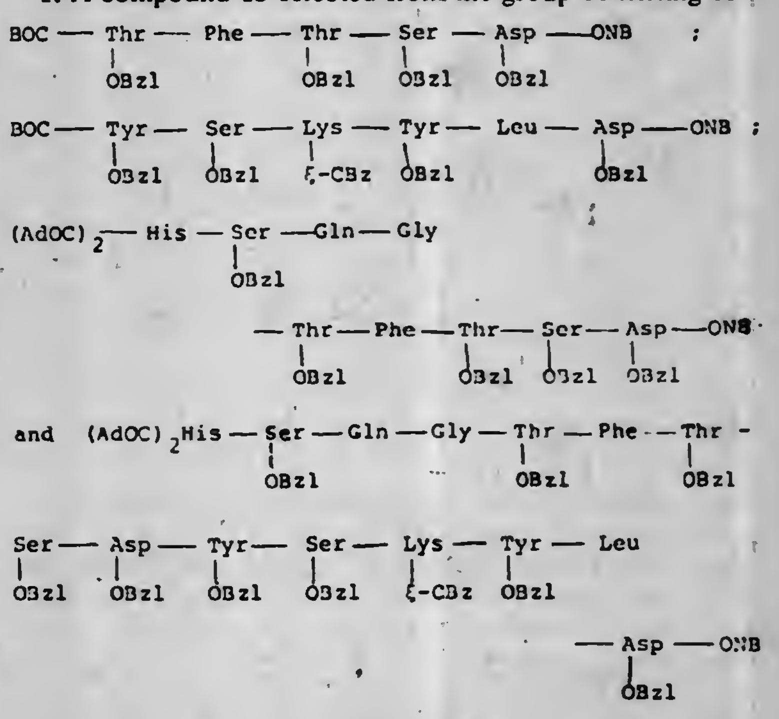
James E. Shields, and Edward L. Smithwick, Jr., both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 19, 1971, Ser. No. 200,607

Int. Cl. C07c *103/52, 101/00;* **C07d** *27/00*

U.S. Cl. 260—112.5 **4 Claims**

1. A compound 13 selected from the group consisting of



$$\mathrm{BOC}—\underset{\mathrm{OBzl}}{\mathrm{Thr}}—\mathrm{Phe}—\underset{\mathrm{OBzl}}{\mathrm{Thr}}—\underset{\mathrm{OBzl}}{\mathrm{Ser}}—\underset{\mathrm{OBzl}}{\mathrm{Asp}}—\mathrm{ONB}\ ;$$

$$\mathrm{BOC}—\underset{\mathrm{OBzl}}{\mathrm{Tyr}}—\underset{\mathrm{OBzl}}{\mathrm{Ser}}—\underset{\xi\text{-}\mathrm{CBz}}{\mathrm{Lys}}—\underset{\mathrm{OBzl}}{\mathrm{Tyr}}—\mathrm{Leu}—\underset{\mathrm{OBzl}}{\mathrm{Asp}}—\mathrm{ONB}\ ;$$

$$(\mathrm{AdOC})_2—\mathrm{His}—\underset{\mathrm{OBzl}}{\mathrm{Ser}}—\mathrm{Gln}—\mathrm{Gly}—\underset{\mathrm{OBzl}}{\mathrm{Thr}}—\mathrm{Phe}—\underset{\mathrm{OBzl}}{\mathrm{Thr}}—\underset{\mathrm{OBzl}}{\mathrm{Ser}}—\underset{\mathrm{OBzl}}{\mathrm{Asp}}—\mathrm{ONB}$$

and

$$(\mathrm{AdOC})_2\mathrm{His}—\underset{\mathrm{OBzl}}{\mathrm{Ser}}—\mathrm{Gln}—\mathrm{Gly}—\underset{\mathrm{OBzl}}{\mathrm{Thr}}—\mathrm{Phe}—\underset{\mathrm{OBzl}}{\mathrm{Thr}}—\underset{\mathrm{OBzl}}{\mathrm{Ser}}—\underset{\mathrm{OBzl}}{\mathrm{Asp}}—\underset{\mathrm{OBzl}}{\mathrm{Tyr}}—\underset{\mathrm{OBzl}}{\mathrm{Ser}}—\underset{\xi\text{-}\mathrm{CBz}}{\mathrm{Lys}}—\underset{\mathrm{OBzl}}{\mathrm{Tyr}}—\mathrm{Leu}—\underset{\mathrm{OBzl}}{\mathrm{Asp}}—\mathrm{ONB}$$

3,887,539
ADHESIVE COMPOSITIONS

Bruce P. Barth, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 30, 1973, Ser. No. 355,677

Int. Cl. C08g *5/20*

U.S. Cl. 260—19 UA **3 Claims**

1. An adhesive composition comprising a mixture of an aqueous dispersion of an alkaline catalyzed para-substituted phenol-formaldehyde resin having a labile formaldehyde content of about 0 weight percent to about 12 weight percent, based on the weight of the resin and a polychloroprene latex, in which there is present about 0.05 part by weight to about 2 parts by weight of the resin for each part of the polychloroprene.

3,887,540
COUPLING PROCESS FOR SUBSTITUTED AMINOAZOBENZENESULFONIC ACIDS

Arturo Gabriel Bellettini, Newark, and Richard Crawford Franklin, Wilmington, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 23, 1971, Ser. No. 201,567

Int. Cl. C07c *107/06;* **C09b** *29/08, 29/26*

U.S. Cl. 260—205 **2 Claims**

1. In the process of coupling metanilic acid diazonium salt or sulfanilic acid diazonium salt directly to the ring of a pripmary aryl amine under acidic conditions, the improvement

insisting essentially of coupling to a primary aryl amine selected from the group consisting of ortho-anisidine; ortho-toluidine, and aniline, at a pH between 0.2 to 1.5 and at a temperature from about 5°C. to 30°C., wherein the initial pH is about 0.2 to 0.5 and is raised as reaction progresses by adding mild alkali and the initial temperature is about 5°C. to 15°C. and is gradually raised to about 20°C. to 30°C.

3,887,541
1,4-BENZODIAZEPINE DERIVATIVES

Hiroyuki Tawada, Kyoto; Kanji Meguro, and Yutaka Kuwada, both of Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

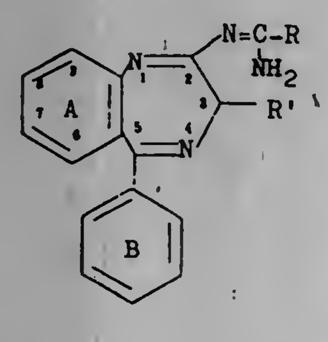
Division of Ser. No. 90,139, Nov. 16, 1970, Pat. No. 3,703,525. This application Sept. 13, 1972, Ser. No. 288,544

Claims priority, application Japan, Nov. 15, 1969, 44-91720

Int. Cl. C07d *53/06*

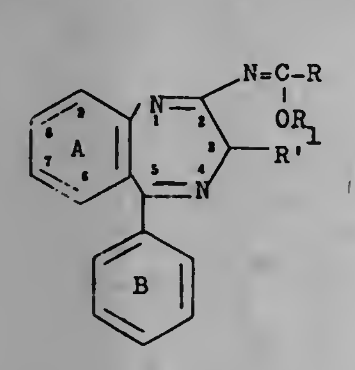
U.S. Cl. 260—239 BD **8 Claims**

1. A member selected from the group consisting of a compound of the formula



wherein R is alkyl of up to 8 carbon atoms, cyclohexyl, phenyl, naphthyl or phenyl lower alkyl, the phenyl and naphthyl rings being unsubstituted or substituted by lower alkyl, lower alkenyl, lower alkoxy, lower alkanoylamino, benzoylamino, halogen or nitro, R′ is hydrogen or lower alkyl, and rings A and B independently are unsubstituted or substituted by one or more members of the group consisting of halogen, nitro, trifluoromethyl, alkyl of up to 6 carbon atoms, cyclohexyl and alkoxy of up to 4 carbon atoms, a corresponding 4N-oxide thereof and a pharmaceutically acceptable acid salt thereof.

7. A member selected from the group consisting of a compound of the formula



wherein R is alkyl of up to 8 carbon atoms, cyclohexyl, phenyl; naphthyl or phenyl lower alkyl, the phenyl and naphthyl rings being unsubstituted or substituted by lower alkyl, lower alkenyl, lower alkoxy, lower alkanoylamino, benzoylamino, halogen or nitro, R′ is hydrogen or lower alkyl, R_1 is lower alkyl, and rings A and B independently are unsubstituted or substituted by one or more members of the group consisting of halogen, nitro, trifluoromethyl, alkyl of up to 6 carbon atoms, cyclohexyl and alkoxy of up to 4 carbon atoms, a corresponding 4N-oxide thereof and a pharmaceutically acceptable acid salt thereof.

3,887,542
POLYISOCYANATE AND POLYISOTHIOCYANATE DERIVATIVES OF 6-AMINOPENICILLANIC ACID

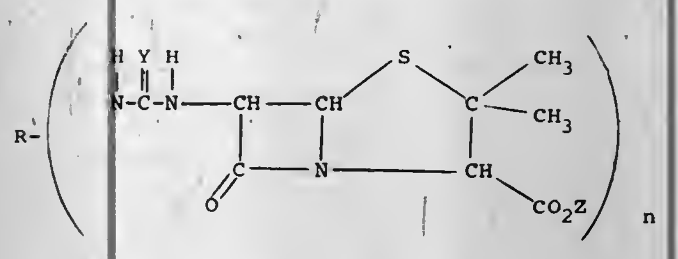
Donald J. Perrella, Princeton Junction, and Joseph E. Dolfini, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sept. 22, 1972, Ser. No. 291,439

Int. Cl. C07d *99/22*

U.S. Cl. 260—239.1 **8 Claims**

1. A compound of the formula



wherein Y is oxygen or sulfur, Z is hydrogen, a physiologically acceptable metal, NH_4, triethylamine, procaine, dibenzylamine, N-benzyl-β-phenethylamine, N,N′-dibenzylethylenediamine, N-ethyl-piperidine, or an alkyl group of from 1 to 7 carbon atoms, and R is an alkyl group of from 1 to 10 carbon atoms, a monocyclic alicyclic group of 5 or 6 carbon atoms in the ring; an aromatic carbocyclic 6-membered ring which may be joined to a second aromatic carbocyclic 6-membered ring directly or through a methylene group, or an aromatic carbocyclic 6-membered ring which may be substituted by one or two divalent alkyl groups of 1 or 2 carbon atoms; or a 5- or 6-membered monoheterocyclic group wherein the heteroatom is N, O or S, or a 5- or 6-membered diheterocyclic group wherein each heteroatom is N and n is 2 or 3.

3,887,543
THIENO(2,3-E)(1,4)DIAZEPINE DERIVATIVES

Michio Nakanishi, Oita; Masami Shiroki; Tetsuya Tahara, both of Fukuoka, and Kazuhiko Araki, Fukuoka, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

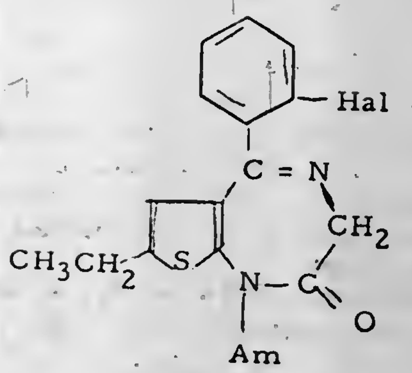
Continuation-in-part of Ser. No. 205,765, Dec. 7, 1971, abandoned. This application Jan. 29, 1974, Ser. No. 437,590

Claims priority, application Japan, Dec. 7, 1970, 45-108818; Dec. 19, 1970, 45-114680

Int. Cl. C07d *99/06*

U.S. Cl. 260—239.3 B **3 Claims**

1. A thieno[2,3-3][1,4]diazepine compound of the formula:



wherein Hal is a halogen atom, and Am is an $—NH_2$ or $—CONHCH_3$ group; and a pharmaceutically acceptable acid addition salt thereof.

3,887,544
CYCLOBUTABISBENZAZEPINETETRONE COMPOUNDS

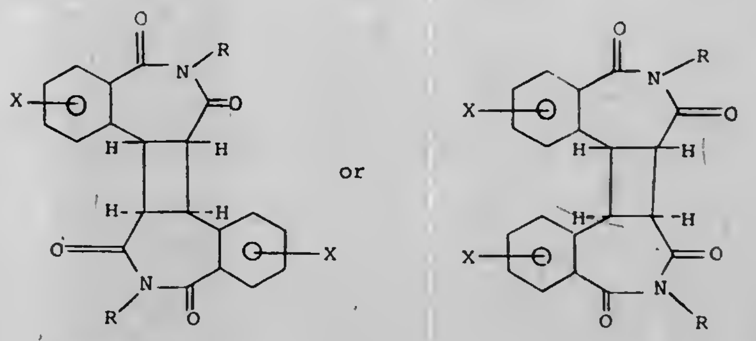
Berthold Richard Vogt, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed July 1, 1974, Ser. No. 484,908

Int. Cl. C07d *41/00, 41/08*

U.S. Cl. 260—239.3 P **3 Claims**

1. A compound of the formula



wherein X is hydrogen, alkyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons, halogen, CF_3, NO_2, wherein R is H, alkyl of from 1 to 4 carbons, allyl or dialkylaminoalkyl wherein each alkyl group may have from 1 to 3 carbon atoms, and pharmaceutically acceptable acid addition salts thereof when R is dialkylamino alkyl as previously defined.

3,887,545
SYNTHESIS OF 1α-HYDROXYLATED CHOLESTEROL DERIVATIVES

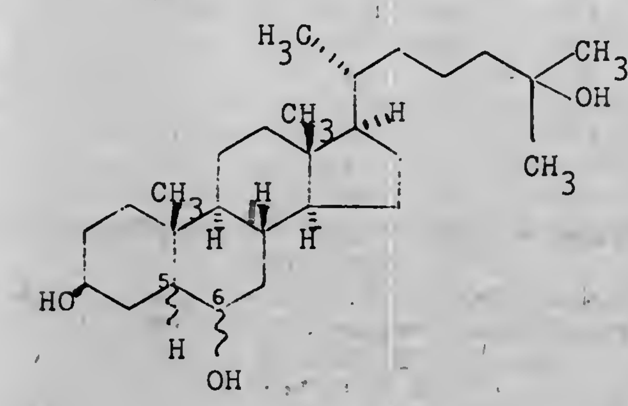
Jerome Anthony Iacobelli, Woodside; Thomas Albert Narwid, Pompton Plains, and Milan Radoje Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 12, 1973, Ser. No. 415,186

Int. Cl.² C07C *173/00*

U.S. Cl. 260—239.55 R **28 Claims**

1. A compound of the formula



with the proviso that the hydrogen atom in the 5-position and the hydroxyl group in the 6-position are cis to each other.

3,887,546
1-AMINO SUBSTITUTED 1-CYCLOALKANE DERIVATIVES OF 7-AMINOCEPHALOSPORANIC ACID AND 7-AMINODESACETOXY CEPHALOSPORANIC ACID

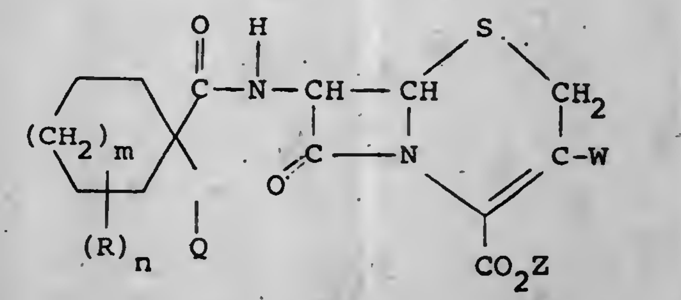
Bong Kuk Lee, Old Bridge; Saul Lewis Neidleman, Trenton, both of N.J., and Dewey D. Y. Ryu, Holliston, Mass., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 21, 1972, Ser. No. 282,097

Int. Cl. C07d *99/24*.

U.S. Cl. 260—240 G **8 Claims**

1. A compound of the formula



wherein *m* is 0, 1 or 2; R is alkyl of from 1 to 7 carbon atoms, hydroxy or halogen; *n* is 0, 1, 2, or 3; Q is $—N=CH-R^1—NHCH_2R^1$ wherein R^1 is phenyl, naphthyl, or substituted phenyl or naphthyl wherein the substituent is halogen, hydroxy, alkyl of from 1 to 4 carbon atoms, alkoxy of from 1 to 4 carbon atoms, or acyl of from 1 to 4 carbon atoms, or amido; W is $—CH_3$ or $—CH_2OCOCH_3$; and Z is hydrogen, alkyl of from 1 to 7 carbon atoms, a physiologically acceptable alkali metal or alkaline earth metal, or a physiologically acceptable organic base.

3,887,547
PROCESS FOR PREPARING dl-STRIGOL

Charles J. Sih, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Mar. 13, 1974, Ser. No. 450,950

Int. Cl. C07d *5/14*; **C07c** *61/00*

U.S. Cl. 260—240 R **2 Claims**

1. The process for preparing dl-strigol which comprises:

brominating 3-oxo-2,6,6-trimethylcycohex-1-en-1-carboxylic acid and separating the corresponding 2-bromomethyl-substituted carboxylic acid

methylating the said 2-bromomethyl-substituted carboxylic acid to obtain the corresponding methyl ester

contacting the said ester with dimethyl malonate and sodium methoxide in solvent solution and recovering methyl 1,4-diketo-7,7-dimethyl-2,3,5,6-tetrahydroindane-2-carboxylate in admixture with its enol form from the reaction mixture

subjecting the said keto and enol esters to alkylation and subsequent hydrolysis with spontaneous decarboxylation to obtain methyl 1,4-diketo-7,7-dimethyl-2,3,5,6-tetrahydroindane-2-carboxylic acid

subjecting the aforesaid diketo carboxylic acid to a hydride reducing agent and recoverying the resulting 1α,4α-dihydroxy-7,7-dimethyl-2,3,5,6-tetrahydroindane-2α-acetic acid α and β lactones in admixture from the reaction mixture

separating the said α-lactone from the said β-lactone formylating the said α-lactone and recovering the corresponding hydroxy methylene lactone alkylating the said hydroxy methylene lactone with bromobutenolide and recovering dl-strigol and dl-4′-epi strigol from the reaction mixture.

3,887,548
PYRAZOLE DERIVATIVES

Hans Bruderer, Benken; Rolf Richle, Mohlin, and Rudolf Ruegg, Bottmingen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

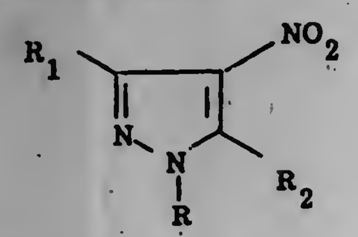
Division of Ser. No. 296,691, Oct. 11, 1972, Pat. No. 3,822,283. This application Apr. 8, 1974, Ser. No. 459,149

Claims priority, application Switzerland, Oct. 22, 1971, 15404/71; Sept. 12, 1972, 13327/72

Int. Cl. C07d *85/52, 49/18*

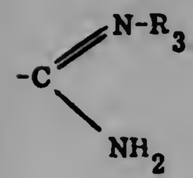
U.S. Cl. 260—240 A **42 Claims**

1. A compound of the formula

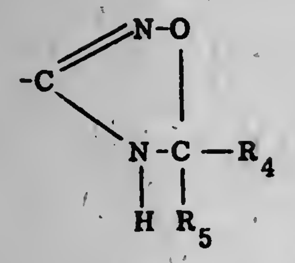


wherein

R is lower alkyl, halo-lower alkyl, hydroxy-lower alkyl, lower alkoxy-lower alkyl, lower alkoxycarbonyl-lower alkyl, carboxy-lower alkyl or lower alkenyl; R_1 is hydrogen, halogen, lower alkyl or lower alkoxy and R_2 is a radical of the formula



or



wherein

R_3 is lower alkanoyloxy, lower alkoxycarbonyloxy, phenylcarbonyloxy, lower alkyl-phenylcarbonyloxy, lower alkoxy-phenylcarbonyloxy, halo-phenylcarbonyloxy, phenyl-(lower alkylcarbonyloxy), lower alkyl-phenyl-(lower alkyl-carbonyloxy), lower alkoxy-phenyl-(lower alkylcarbonyloxy), halo-phenyl-(lower alkylcarbonyloxy), phenyl-(lower alkenyl-carbonyloxy), lower alkyl-phenyl-(lower alkenylcarbonyloxy), lower alkoxy-phenyl-(lower alkenylcarbonyloxy), halo-phenyl- (lower alkenylcarbonyloxy), pyridyl-(lower alkylcarbonyloxy), lower alkyl-pyridyl-(lower alkylcarbonyloxy), lower alkoxy-pyridyl-(lower alkylcarbonyloxy), halo-pyridyl-(lower alkylcarbonyloxy), pyridylcarbonyloxy, lower alkyl-pyridylcarbonyloxy, lower alkoxy-pyridylcarbonyloxy or halo-pyridylcarbonyloxy; R_4 is lower alkyl or phenyl; and R_5 is hydrogen or lower alkyl or R_4 and R_5, taken together with the carbon to which they are attached, are a 5-, 6- or 7-membered alicyclic ring,

or a pharmaceutically acceptable acid addition salt thereof.

3,887,549
PROCESS FOR PREPARING 7-ACYLAMIDO-7-METHOXY-3-CEPHEM-4-CARBOXYLIC ACID, ESTERS AND SALTS

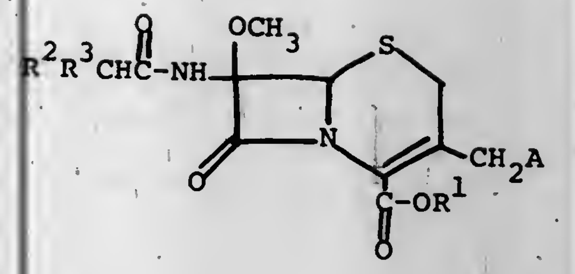
Burton G. Christensen, Scotch Plains, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 200,587, Nov. 19, 1971, abandoned. This application Apr. 12, 1972, Ser. No. 243,438

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **13 Claims**

1. The process for preparing a compound of the formula:



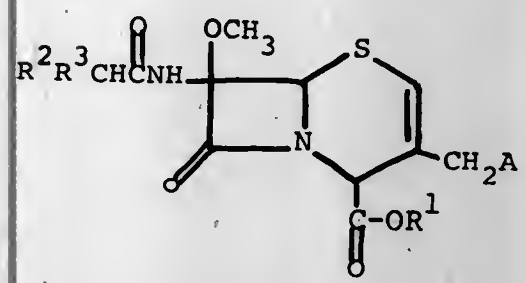
wherein

A is hydrogen, hydroxy, azido, halo, carbamoyloxy, N-lower alkyl carbamoyloxy; N,N-di-lower alkyl carbamoyloxy, pyridyl, lower alkoxy, lower alkanoyloxy benzoyloxy or 5-membered heterocyclic thio;

R^1 is hydrogen, trichloroethyl, tert-butyl, benzoylmethyl, p-methoxybenzyl, benzyl, benzhydryl, trimethylsilyl or methoxymethyl;

R^2 is hydrogen, halo, amino, guanidino, phosphono, hydroxy, tetrazolyl, carboxy or sulfamino; and

R^3 is phenyl, phenyl substituted on the phenyl carbon atoms by halogen, hydroxy, aminomethyl, carboxymethyl; carboxamidomethyl; a 5- or 6-membered monocyclic heterocycle containing one or more oxygen, sulfur or nitrogen atoms in the ring, substituted heterocycles wherein the substituent is halo, carboxymethyl, guanidino, guanidinomethyl, carboxamidomethyl, aminomethyl, nitro, methoxy or methyl; phenylthio, pyridylthio and substituted pyridylthio wherein the substituents are halo, carboxymethyl, guanidino, guanidinomethyl, carboxamidomethyl, aminomethyl, nitro, methoxy, methyl or cyano, which comprises dissolving a compound of the formula:



wherein A, R^1, R^2 and R^3 are as defined above in an inert solvent and treating said solution for 5 hours to 3 days or until isomerization is complete with an isomerizing agent selected from the group of inorganic bases consisting of alkali metal carbonates and hydroxides, alkaline earth metal carbonates and hydroxides, alumina and silica gel, wherein said inert solvent is water with a water miscible organic solvent.

3,887,550
METHOD FOR PRODUCING HETEROCYCLIC ACID ANHYDRIDES

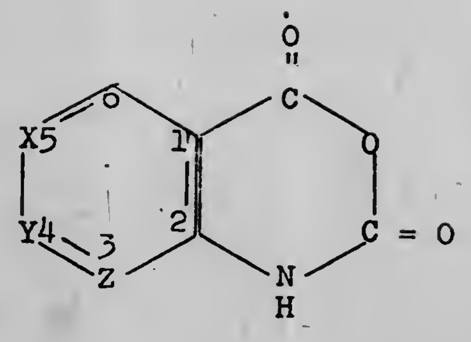
Athelstan L. J. Beckwith, Adelaide, Australia, assignor to The Sherwin-Williams Company, Cleveland, Okla.

Filed Nov. 20, 1969, Ser. No. 878,552

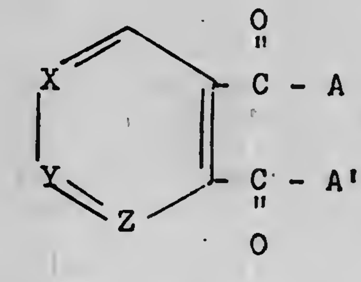
Int. Cl. C07d *87/10*

U.S. Cl. 260—244 R **3 Claims**

1. A method for producing heterocyclic acid anhydrides having the formula,



wherein each of X, Y and Z is N or CH and, not more than one of X, Y and Z is N, said method comprising dissolving in an inert anhydrous solvent substantially equivalent amounts of lead tetraacetate and a compound having the formula



wherein one of A and A′ is OH and the other is NH_2 and not more than one of X, Y and Z is N, with the proviso that when Z is nitrogen A is OH and A′ is NH_2, agitating the reaction mixture at a temperature sufficiently high that reaction occurs and recovering the acid anhydride.

3,887,551
CRYSTALLINE FORMS OF CEPHALORIDINE

Harold Alfred Crisp, Harrow Weald; John Francis Oughton, Gerrards Cross; Christopher John Sharp, Northolt, and Peter Alfred Wilkinson, South Croydon, all of England, assignors to Glaxo Laboratories Limited, Greenford, Middlesex, England

Continuation of Ser. No. 862,790, Oct. 1, 1969, abandoned, which is a division of Ser. No. 627,933, April 3, 1967, Pat. No. 3,498,979, which is a continuation-in-part of Ser. No. 605,474, Dec. 28, 1966, abandoned, which is a continuation-in-part of Ser. No. 408,919, Nov. 4, 1964, abandoned. This application Jan. 24, 1972, Ser. No. 220,537

Claims priority, application United Kingdom, Nov. 4, 1964, 29857/64; Apr. 7, 1966, 15719/66

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **2 Claims**

1. The crystalline form of N-(7-2′-thienylacetamidoceph-3-em-3-ylmethyl) pyridinium-4-carboxylate characterized by the following X-ray diffraction data:

Interplanar Spacing A	2Θ (CuKα), degrees
14.6	6.05
7.38	11.97
6.82	12.97
6.39	13.85
5.68	15.57
5.57	15.90
5.29	16.75
4.92	18.02
4.80	18.47
4.49	19.77
4.22	21.05
4.08	21.77
3.89	22.85
3.82	23.27
3.74	23.77
3.69	24.07
3.66	24.27
3.55	25.00
3.47	25.62
3.38	26.30
3.35	26.57
3.29	27.05
3.20	27.82
3.14	28.40
3.08	28.97
3.00	29.75
2.96	30.20
2.82	31.67
2.77	32.30
2.73	32.80
2.67	33.50
2.65	33.77
2.58	34.70
2.55	35.12
2.54	35.25
2.51	35.72
2.47	36.35
2.43	36.90
2.41	37.27
2.37	37.90
2.35	38.30
2.32	38.80
2.24	40.15
2.18	41.35
2.14	42.25.

2. The crystalline form of N-(7-2′-thienylacetamidoceph-3-em-3-ylmethyl) pyridinium-4-carboxylate characterized by the following X-ray diffraction data:

Interplanar Spacing A	2Θ (CuKα), degrees
14.48	6.10
8.32	10.62
7.43	11.90
6.79	13.02
6.46	13.70
6.01	14.72
5.77	15.35
5.65	15.67
5.56	15.92
5.35	16.55
5.29	16.75
4.94	17.92
4.82	18.40
4.62	19.20
4.51	19.67
4.33	20.47
4.30	20.62
4.22	21.02
4.09	21.70
3.97	22.37
3.86	23.05
3.79	23.42
3.70	24.02
3.65	24.40
3.63	24.52
3.58	24.85
3.53	25.20
3.50	25.42
3.42	26.00
3.41	26.15
3.35	26.62
3.31	26.90
3.24	27.55
3.17	28.10
3.07	29.10
3.01	29.67
2.98	29.95

2.87	31.10
2.82	31.67
2.79	32.10
2.77	32.32
2.70	33.10
2.68	33.40
2.62	34.20
2.59	34.65
2.562	35.00
2.558	35.05
2.48	36.12
2.46	36.45
2.43	36.97
2.39	37.62
2.37	37.97
2.35	38.30
2.32	38.82
2.30	39.27
2.26	39.92
2.24	40.30
2.23	40.42
2.21	40.77
2.18	41.47
2.15	42.00
2.12	42.67.

3,887,552

5-OXO-2,3-DIHYDRO-IMIDAZO(1,2-A)-S-TRIAZINES

Helmut Stähle; Herbert Köppe; Werner Kummer, all of Ingelheim am Rhein, and Wolfgang Hoefke, Budenheim, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

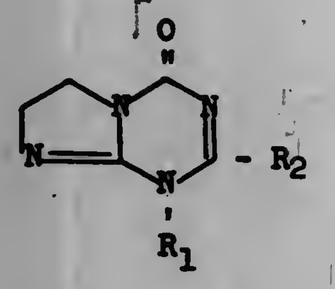
Filed Mar. 12, 1974, Ser. No. 450,289

Claims priority, application Germany, Mar. 23, 1973, 2314488

Int. Cl. C07d *57/34*

U.S. Cl. 260—249.5 **14 Claims**

1. A compound of the formula



wherein R_1 is phenyl or mono-, di- or tri-substituted phenyl, the substituents being each selected from the group consisting of halogen, methyl, methoxy and trifluoromethyl, and R_2 is hydrogen, phenyl or halo-phenyl.

3,887,553

PROCESS FOR THE MANUFACTURE OF PHOSPHORUS-CONTAINING CONDENSATION PRODUCTS

Hermann Nachbur, Dornach, and Arthur Maeder, Therwil, both of Switzerland, assignors to Ciba-Geigy AG, Basle, Switzerland

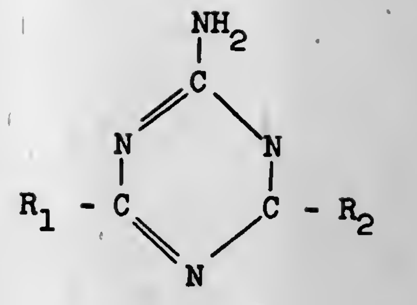
Filed Aug. 31, 1972, Ser. No. 285,383

Claims priority, application Switzerland, Jan. 14, 1972, 521/72

Int. Cl. C07d *55/24*

U.S. Cl. 260—249.6 **10 Claims**

1. A process for the manufacture of a water-soluble condensation product of a tetrakis-(hydroxymethyl)-phosphonium compound and a 1,3,5-triazine, consisting essentially of the step of condensing in the melt or in an aqueous medium 1 mol of a tetrakis-(hydroxymethyl)-phosphonium salt or hydroxide at 40° to 120°C with 0.02 to 0.1 mol of a 1,3,5-triazine of the formula



wherein

R_1 is amino, hydroxyl or hydrogen,

R_2 is amino, hydroxyl, hydrogen, methyl, phenyl or 1-dialkylphosphono-(alkyl)$_{n-1}$ wherein the moieties have 1 to 6 carbon atoms, and

n is 1 or 2,

or with a methylolated 1,3,5-triazine of the above formula.

3,887,554

2(4)-ANILINO-4(2)-HYDROXY-6 H-s-TRIAZINO (2,1-b)-QUINAZOLINE-6-ONE

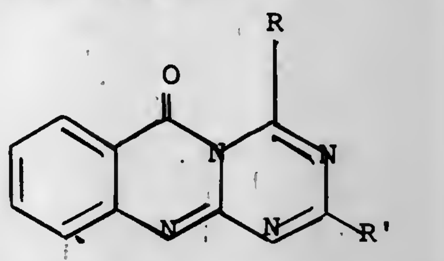
Roland A. E. Winter, Armonk, N.Y., and Thomas J. Villani, Danbury, Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 129,128, March 29, 1971, abandoned. This application Apr. 13, 1973, Ser. No. 351,127

Int. Cl. C07d *57/34*

U.S. Cl. 260—249.8 **4 Claims**

1. A compound having the formula:



wherein R and R′ are hydroxy or anilino groups provided that said R and R′ are different.

3,887,555

TETRATOSYLATE OR TETRAAMINO PHENYLATED QUINOXALINE MONOMERS AND METHOD OF SYNTHESIS

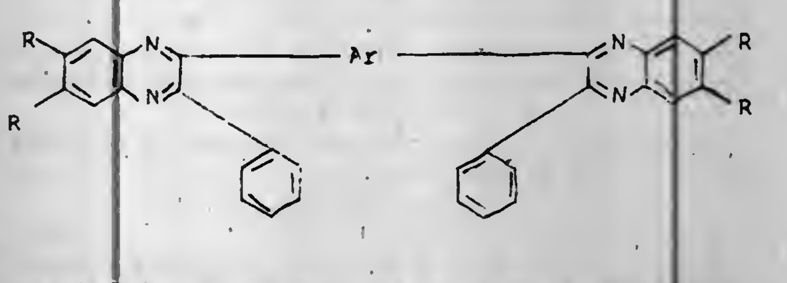
Fred R. Arnold, Centerville, and Robert F. Kovar, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 292,368, Sept. 26, 1972, Pat. No. 3,740,374. This application Mar. 26, 1973, Ser. No. 344,787

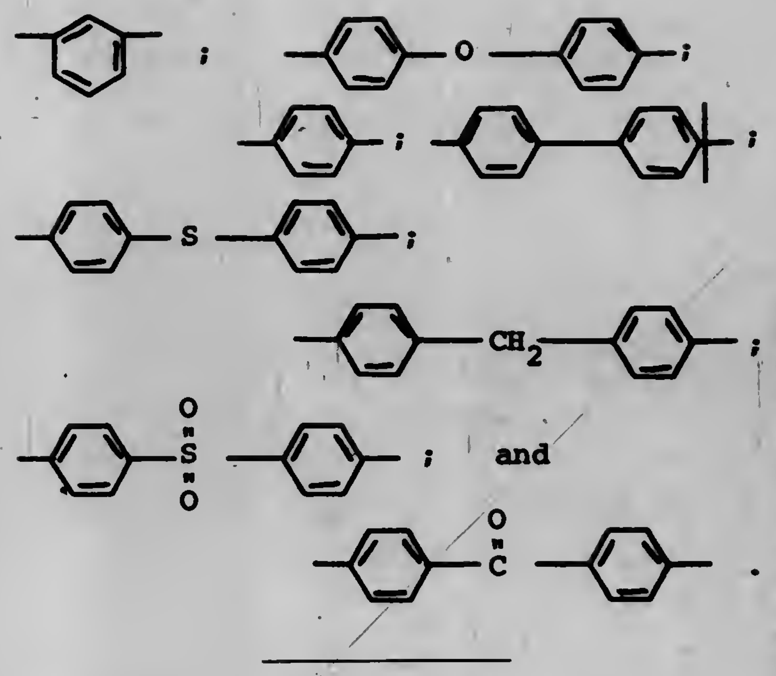
Int. Cl. C07d *51/78*

U.S. Cl. 260—250 Q **4 Claims**

1. A compound having the following formula:



wherein R is NH_2 or TosNH and Ar is one of the following radicals:



3,887,556

ANTIMYCOTIC DIPHENYL-IMIDAZOLYL-PYRIMIDYL METHANES

Wilfried Draber; Karl Heinz Büchel; Erik Regel, and Manfred Plempel, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

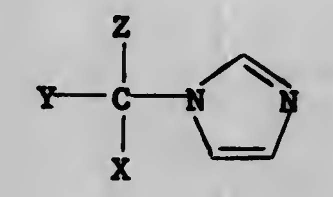
Division of Ser. No. 120,333, March 2, 1971, Pat. No. 3,787,415. This application Nov. 29, 1972, Ser. No. 310,423

Claims priority, application Germany, Mar. 23, 1970, 2013793

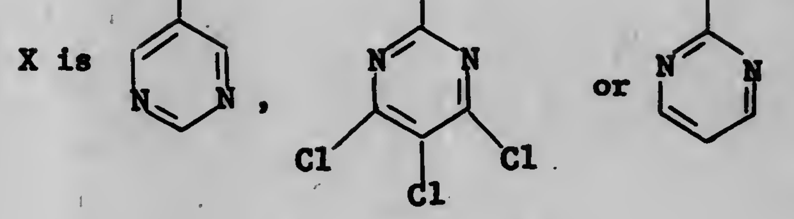
Int. Cl. C07d *51/36*

U.S. Cl. 260—256.4 R **7 Claims**

1. A compound of the formula:



wherein



Y is phenyl or p-fluorophenyl, and

Z is phenyl.

3,887,557

PIPERAZINE DERIVATIVES AND PROCESSES FOR PREPARATION THEREOF

Shinsaku Minami, Yamato-Kouriyama; Jun-Ichi Matsumoto, Takatsuki; Kazuyo Kawaguchi, Nara; Shinsaku Mishio, Osaka; Masanao Shimizu, Kobe; Yoshiyuki Takase, Amagasaki, and Shinichi Nakamura, Takatsuki, all of Japan, assignors to Dainippon Pharmaceutical Co. Ltd., Osaka, Japan

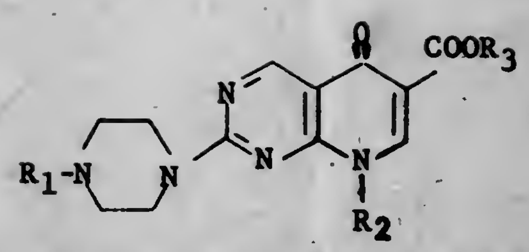
Filed Aug. 8, 1973, Ser. No. 386,626

Claims priority, application Japan, Aug. 14, 1972, 47-81288

Int. Cl. C07d *51/42*

U.S. Cl. 260—256.4 F **12 Claims**

1. Compounds of the formula



[I]

wherein R_1 is a moiety selected from one of the group consisting cf hydrogen, alkyl having 1 to 4 carbon atoms, hydroxyalkyl having 2 to 4 carbon atoms, benzyl, benzyl substituted by methoxy, phenyl, propargyl, or acyl selected from the group consisting of lower alkanoyl, trifluoroacetyl lower alkoxycarbonyl and phenyl-substituted lower alkoxycarbonyl, R_2 is a moiety selected from one of the group consisting of hydrogen, alkyl having 1 to 4 carbon atoms, alkyl having 2 to 4 carbon atoms substituted by hydroxy or halogen, vinyl, allyl or benzyl, and R_3 is a moiety selected from one of the group consisting of hydrogen or alkyl having 1 to 6 carbon atoms; and pharmaceutically effective organic and inorganic salts thereof.

3,887,558

PROCESS FOR PRODUCING 2,6-DIAMINO -1,4-DIHYDRO-3,5-PYRIDINE-DICARBOXYLATES AND DERIVATIVES THEREOF

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

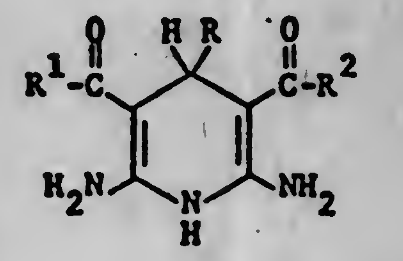
Filed Mar. 27, 1974, Ser. No. 454,997

Claims priority, application Germany, Mar. 6, 1972, 2210687

Int. Cl.² C07D *51/36, 31/36*

U.S. Cl. 260—256.4 C **33 Claims**

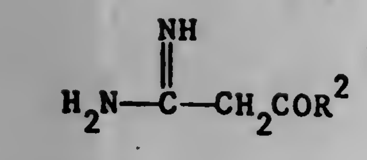
1. A process for the production of a compound of the formula



wherein

R is hydrogen; lower alkyl; alkenyl of 2 to 4 carbon atoms; alkynyl of 2 to 4 carbon atoms, phenyl; substituted phenyl in which the substituents are one to three members selected from the group consisting of lower alkyl, lower alkoxy, halogeno, nitro, cyano, trifluoromethyl, azido, carbo(lower alkoxy), lower alkylsulfonyl, lower alkylsulfinyl, and lower alkylthio; bi-phenyl; naphthyl; or a heterocyclic ring selected from the group consisting of quinolyl, isoquinolyl, pyridyl, pyrimidyl, thenyl, furyl and pyrryl, said heterocyclic ring being unsubstituted or substituted by one or two members selected from the group consisting of lower alkyl, lower alkoxy and halogeno; and each of R^1 and R^2, taken independently of the other, is lower alkoxy, lower alkoxy(lower alkoxy), alkenyloxy of 2 to 4 carbon atoms, alkynyloxy of 2 to 4 carbon atoms, amino, lower alkylamino or di(lower alkyl)amino;

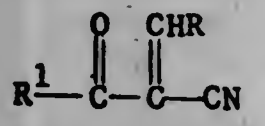
which comprises reacting an amidine of the formula



$$H_2N-\overset{\overset{NH}{\|}}{C}-CH_2COR^2$$

or a salt thereof, wherein
R^2 is as above defined;
with

a. an aldehyde of the formula RCHO, wherein R is as above defined, in an inert organis colvent to produce a compound as above defined wherein R^1 is the same as R^2; or
b. an ylidene cyanoacetic acid of the formula



$$R^1-\overset{\overset{O}{\|}}{C}-\overset{\overset{CHR}{\|}}{C}-CN$$

wherein R and R^1 are as above defined; in an inert solvent and in the presence of an alkali metal alkoxide, the reaction temperature being from 20° to 200°C, and recovering the compound produced.

3,887,559
PHARMACOLOGICALLY ACTIVE TRICYCLIC QUINAZOLINONES

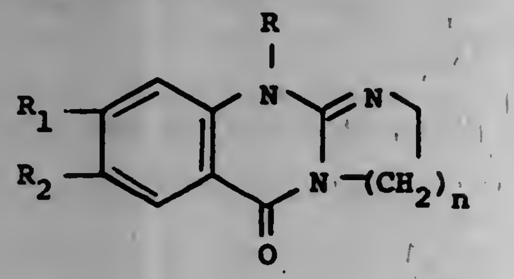
Guetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz, Inc., East Hanover, N.J.

Continuation-in-part of Ser. No. 163,105, July 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 87,016, Nov. 4, 1970, abandoned, which is a continuation-in-part of Ser. No. 828,757, May 28, 1969, Pat. No. 3,598,823. This application Jan. 19, 1973, Ser. No. 324,996

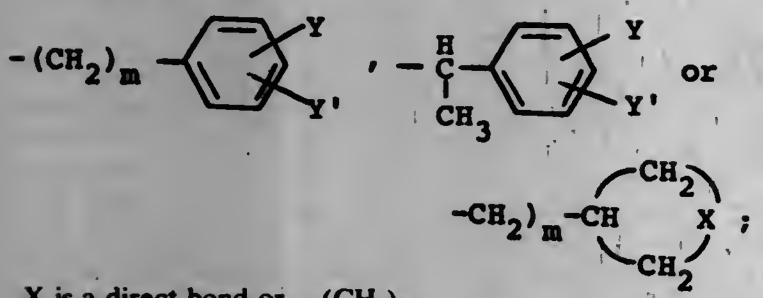
Int. Cl. C07d *51/42*

U.S. Cl. 260—256.4 F **52 Claims**

1. A compound of the formula:



wherein
each of R_1 and R_2 is, independently, hydrogen, fluoro, chloro or alkyl of 1 to 3 carbon atoms, or are either both hydroxy or both an alkoxy of 1 to 3 carbon atoms; or one is hydrogen and the other bromo, hydroxy or alkoxy of 1 to 2 carbon atoms,
n is 1 to 3
R is alkyl of 1 to 5 carbon atoms,



X is a direct bond or $-(CH_2)_y-$
Y is 1 to 3;
m is 0 to 2,
each of Y and Y40 is, independently, hydrogen, fluoro, chloro or alkyl or 1 to 3 carbon atoms, or either both are hydroxy or both alkoxy of 1 or 2 carbon atoms; or one is hydrogen and the other bromo, hydroxy or alkoxy of 1 to 2 carbon atoms, provided that no more than two of R_1, R_2, Y and Y' are hydroxy, further provided that neither of R_1 and R_2 is hydroxy with either of Y and Y' is alkoxy and further provided that neither of Y and Y' is hydroxy when either of R_1 and R_2 is alkoxy, and still further provided that one or both of R_1 and R_2 is fluoro or chloro or one is bromo or both are alkoxy or both hydroxy when R is alkyl and n is 1,
or a pharmaceutically acceptable acid addition salt thereof.

3,887,560
TONERS

Shinichiro Nagashima, and Terukuni Tuneda, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

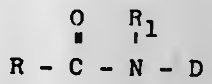
Continuation of Ser. No. 722,274, April 18, 1968, abandoned. This application Dec. 30, 1971, Ser. No. 214,458

Claims priority, application Japan, Apr. 22, 1967, 42-25512

Int. Cl. C07d *51/80*

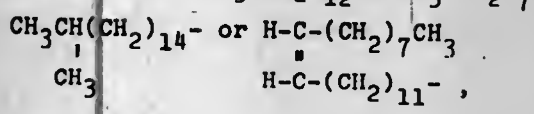
U.S. Cl. 260—267 **1 Claim**

1. An acid amido compound having the formula



$$R-\overset{\overset{O}{\|}}{C}-\overset{\overset{R_1}{|}}{N}-D$$

wherein R is $CH_3(CH_2)_{12}-$, $CH_3(CH_2)_7CH{=}CH(CH_2)_7-$,



$\underset{\underset{CH_3}{|}}{CH_3CH}(CH_2)_{14}-$ or $\begin{matrix}H-C-(CH_2)_7CH_3\\ \|\\ H-C-(CH_2)_{11}-\end{matrix}$,

R_1 is phenyl
and D is the non-amino portion of dye selected from the group consisting of nigrosine C.I. 50420.

3,887,561
PIPERIDINESULFONYLUREA DERIVATIVES

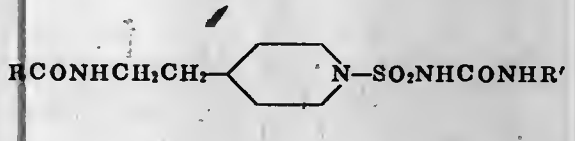
George R. Evanega, Ledyard; Donald E. Kuhla, Gales Ferry, and Reinhard Sarges, Mystic, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 305,594, Nov. 10, 1972, Pat. No. 3,829,434. This application Apr. 26, 1974, Ser. No. 464,332

Int. Cl. C07d *33/60*

U.S. Cl. 260—283 SA **8 Claims**

1. A sulfamylurea compound selected from the group consisting of 1-piperidinesulfonylureas of the formula:



and the base salts thereof with pharmacologically acceptable cations, wherein R is 8-quinolinyl, and R' is a member selected from the group consisting of bicyclo[2.2.1]hept-5-en-2-yl-endo-methyl, bicyclo[2.2.1]hept-2-yl-endo-methyl, 7-oxabicyclo[2.2.1]hept-2-ylmethyl, 1-adamantyl and cycloalkyl having from five to eight carbon atoms.

3,887,562
SALT OF POLYMANNURONIC ACID AND DIHYDROQUINIDINE

Gonzalo Cobo Barrachina, Madrid, Spain, assignor to Laboratorios Berenguer Beneyto S.A., Madrid, Spain

Division of Ser. No. 144,044, May 17, 1971, abandoned. This application May 7, 1973, Ser. No. 357,702

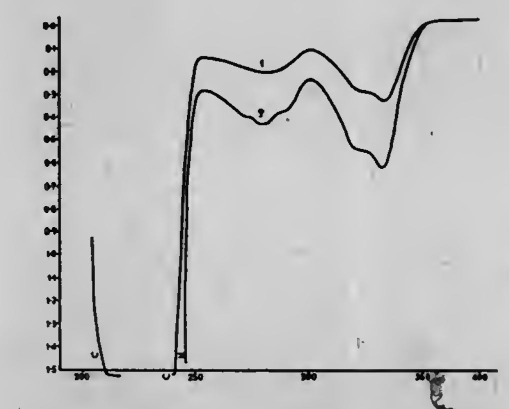
Claims priority, application Germany, May 21, 1970, 2024847

Int. Cl. C07d *43/24*

U.S. Cl. 260—284 **1 Claim**

1. A dihydroquinidine salt of polymanuronic acid having the following properties:

a. a fine odorless powder of yellowish color and bitter taste,
b. stable in air at from ambient temperature to about 150°C,
c. empirical formula $(C_{26}H_{34}O_8N_2)_x$, wherein x is the number of monomer units of manuronic acid,
d. dihydroquinidine content of 60.46%,
e. infrared spectrum indicating a peak at 1,615 cm^{-1}, with a broad band at 1,710 cm^{-1},



f. insoluble in methanol, 96% ethanol, chloroform, cold propylene glycol and acetone, and soluble in 50% methanol, 50% ethanol and hot propylene glycol,
g. total decomposition at 190°C,
h. rotation of +77.3° (propylene glycol, $c = 0.5$),
i. ultraviolet spectrum indicating a maxima absorption at 280 and 333 nm and a minima absorption at 253 and 301 nm, and
j. carbon content of 58.18%, hydrogen content of 6.76% and nitrogen content of 5.22%.

3,887,563
NOVEL COMPOUNDS, SYNTHESES AND THE USES THEREOF

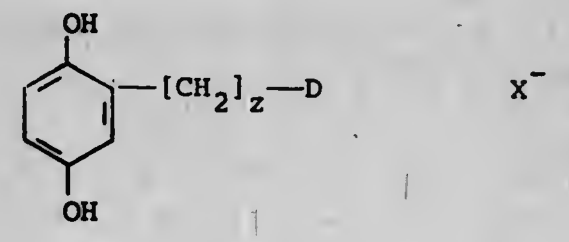
Stanley M. Bloom, Waban, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 102,931, Dec. 30, 1970, Pat. No. 3,797,937, which is a division of Ser. No. 741,293, July 1, 1968, Pat. No. 3,590,692. This application Oct. 31, 1973, Ser. No. 411,258

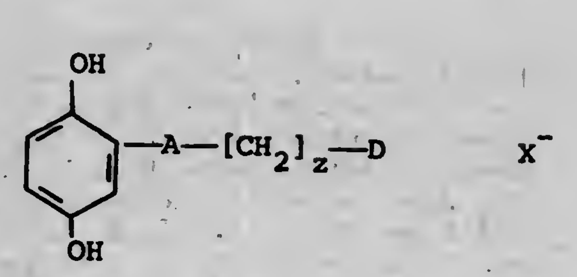
Int. Cl. C07d *33/32*

U.S. Cl. 260—286 R **7 Claims**

1. A compound selected from this represented by the formulae:



and



wherein z is an integer of from 2 to 10 inclusive, A is sulfur or oxygen, D is quinolinium or isoquinolinium and X is the anion of a salt.

3,887,564
ANTIBIOTIC A-25822 AND PROCESS FOR PRODUCTION THEROF

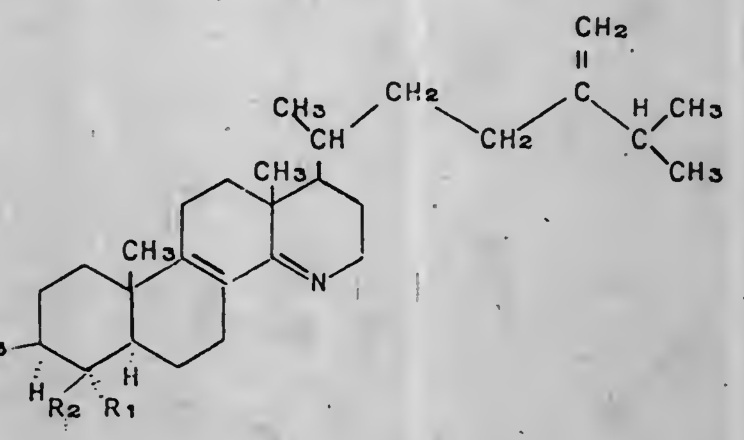
Robert H. Williams; Marvin M. Hoehn, and Karl-Heinz Michel, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 327,171, Feb. 2, 1973, Pat. No. 3,845,203, which is a continuation-in-part of Ser. No. 230,399, Feb. 29, 1972, abandoned. This application Mar. 21, 1974, Ser. No. 453,247

Int. Cl. C07d *33/48*

U.S. Cl. 260—287 R **6 Claims**

1. The antibiotic compound of the formula



wherein
R_1 and R_2 are both hydrogen or both methyl,
R_3 is hydroxy or acetoxy; or the non-toxic pharmaceutically acceptable acid addition salts thereof.

3,887,565
VINCADIOLINE

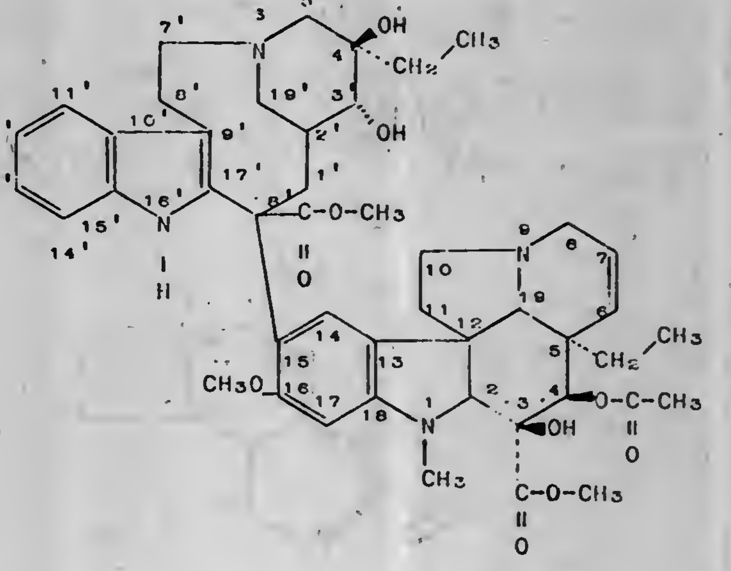
William E. Jones, Indianapolis, and George J. Cullinan, Trafalgar, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 6, 1974, Ser. No. 466,939

Int. Cl. C07d *33/50*

U.S. Cl. 260—287 R **3 Claims**

1. Vincadioline having the formula



and a pharmaceutically-acceptable acid addition salt, formed with a non-toxic acid.

3,887,566

2,3-DIHYDROIMIDAZO-ISOQUINOLINES

Ronald Ernest Rodway, Bourne End, and Ronald Frederick Cookson, Reading, both of England, assignors to Aspro Nicholas Ltd., Slough, England

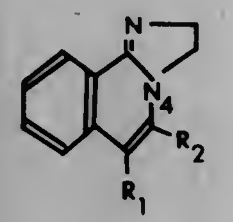
Filed Feb. 29, 1972, Ser. No. 230,464

Claims priority, application United Kingdom, Feb. 11, 1971, 4457/71

Int. Cl.² C07D *237/26*

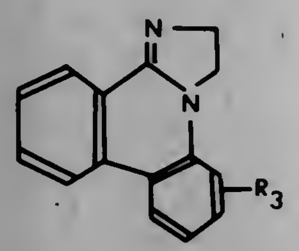
U.S. Cl. 260—288 R **6 Claims**

1. A 2,3-dihydroimidazo isoquinoline of formula VIa or a pharmaceutically acceptable acid addition salt thereof:



VIa

wherein R_1 and R_2 independently represent a phenyl, hydroxyphenyl, alkylthiophenyl, or alkoxyphenyl group in which the alkoxy or alkyothio group has 1 to 4 carbon atoms or, in the case of R_1 only, hydrogen except that R_1 is other than phenyl when R_2 is hydrogen or R_1 and R_2 together represent a divalent radical joined to the isoquinoline nucleus to form a 2,3-dihydroimidazo phenanthridine of formula:



wherein R_3 represents a halogen or hydrogen.

3,887,567

3-ALKOXY-2-AZAESTRATRIENES

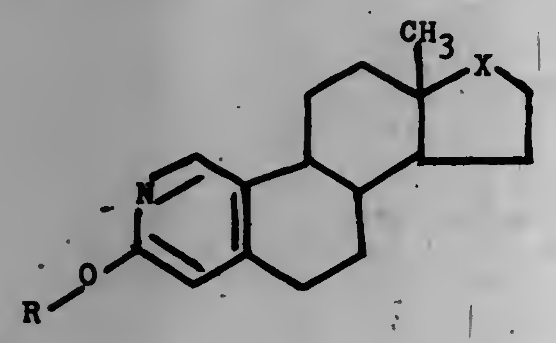
Robert J. Chorvat, Arlington Heights, and Pappo, Raphael, Skokie, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 100,419, Dec. 21, 1970, abandoned. This application Aug. 10, 1973, Ser. No. 387,389

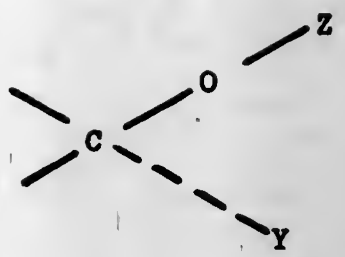
Int. Cl. C07d *101/00*

U.S. Cl. 260—289 AZ **11 Claims**

1. A compound of the formula



wherein R is a lower alkyl group having 1 to 7 carbon atoms inclusive or a cycloalkyl group having 4–8 carbon atoms inclusive, and X is a carbonyl group or a group of the formula



wherein Y is hydrogen, a lower alkyl group having 1 to 7 carbon atoms inclusive, a lower 1-alkynyl group having 2 to 7 carbon atoms inclusive or a propadienyl group and Z is hydrogen or a lower alkanoyl group having 1 to 7 carbon atoms inclusive.

3,887,568

PROCESS FOR PIPERIDINE DERIVATIVES

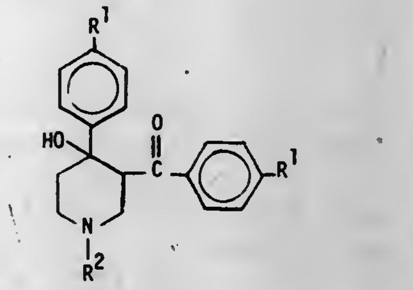
Charles M. Leir, Woodbury, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Filed July 12, 1973, Ser. No. 378,525

Int. Cl. C07d *29/20*

U.S. Cl. 260—293.8 **4 Claims**

1. A process for the preparation of compounds of the formula:



wherein R^1 is selected from fluorine, chlorine and hydrogen and R^2 is lower alkyl, and their pharmaceutically acceptable salts comprising

1. reacting benzene, chlorobenzene or fluorobenzene with a 3-halopropionyl halide in the presence of a Lewis acid and
2. treating the resulting product with excess aqueous lower alkylamine.

3,887,569

2-IMINO-PIPERIDINES

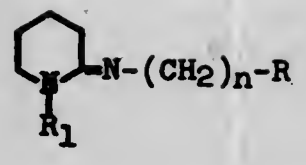
George Ireland Poos, Ambler, Pa., assignor to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Continuation-in-part of Ser. No. 85,734, Oct. 30, 1970, abandoned, which is a division of Ser. No. 738,379, June 17, 1968, abandoned, which is a continuation-in-part of Ser. No. 649,812, June 29, 1967, abandoned, which is a continuation-n-part of Ser. No. 409,563, Nov. 6, 1964, abandoned. This application July 13, 1973, Ser. No. 379,030

Int. Cl. C07d *29/28*

U.S. Cl. 260—293.78 **3 Claims**

1. A chemical compound selected from the group consisting of a 2-aralkylimino-1-R_1-piperidine having the formula:



and the therapeutically active acid addition salts thereof, wherein n is the integer 1 or 2; R_1 is a member selected from the group consisting of loweralkyl and benzyl; and R is a member selected from the group consisting of phenyl, mono- and di-substituted phenyl and methylenedioxyphenyl, each substituent of said substituted phenyls being a member selected from the group consisting of halo, loweralkyl, loweralkoxy and hydroxy.

3,887,570

DERIVATIVES OF PYRAZOLO(3,4-B)THIENO(2,3-D)PYRIDINE-2-CARBOXYLIC ACIDS

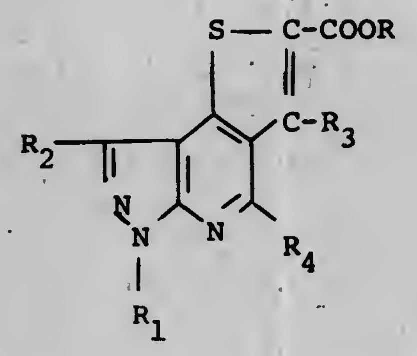
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sept. 28, 1973, Ser. No. 401,798

Int. Cl. C07d *31/50*

U.S. Cl. 260—294.8 B **10 Claims**

1. A compound of the formula



wherein R and R_2 each is hydrogen or lower alkyl;
R_1 is hydrogen, lower alkyl, phenyl, benzyl or phenethyl;
R_3 is lower alkyl, phenyl or substituted phenyl, wherein the phenyl substituent is lower alkyl, halo, trifluoromethyl, amino or carboxy; hydroxy or lower alkoxy; and
R_4 is hydrogen, lower alkyl or phenyl.

3,887,571

PREPARATION OF ARYL SUBSTITUTED SULFENAMIDES

Marion J. Gattuso, Hoffman Estates, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

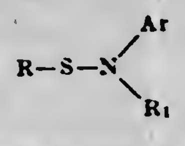
Continuation-in-part of Ser. No. 100,508, Dec. 21, 1970, abandoned, and Ser. No. 139,145, April 30, 1971, abandoned. This application Apr. 20, 1972, Ser. No. 246,043

Int. Cl. C07d *91/48*

U.S. Cl. 260—306.5 **2 Claims**

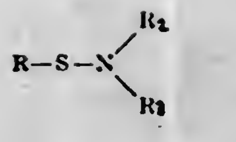
1. A process for preparing a compound of the formula

(I)

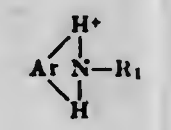


which comprises the step of reacting a compound of the formula:

(II)



with an arylamine acid addition salt in which the cation has the formula



Ar being phenyl, p-methoxyphenyl, alkylphenyl in which the alkyl has from 1 to 6 carbon atoms, dialkylphenyl in which the alkyl has from 1 to 6 carbon atoms, or aminophenyl, R, being Hydrogen, phenyl or C_1-C_2alkyl; R being 2-benzothiazolyl or 2-thiobenzothiazolyl; and R_2 and R_3 being hydrogen, C_1 to C_{10} alkyl and C_3 to C_{12} cycloalkyl or together with the nitrogen atom form morpholino.

3,887,572

PREPARATION OF 2-AMINO-5-ALKYL-1,3,4-THIADIAZOLES

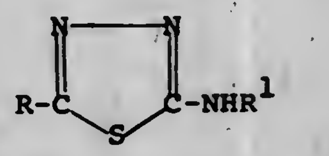
Eddie Vi Ping Tao, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Sept. 21, 1973, Ser. No. 399,672

Int. Cl. C07d *91/62*

U.S. Cl. 260—306.8 D **8 Claims**

1. In a process for preparing an aminothiadiazole compound of the formula



wherein R is C_1–C_7 alkyl and R^1 is hydrogen or C_1–C_6 alkyl, by reacting molar equivalents of an aliphatic acid and a 4-alkyl-3-thiosemicarbazide in a mineral acid medium, the improvement which comprises employing a mineral acid medium comprising 15 to 35 percent sulfuric acid and 65 to 85 percent polyphosphoric acid.

3,887,573

5-MERCAPTOALKYL-1,2,4-OXADIAZOLE DERIVATIVES

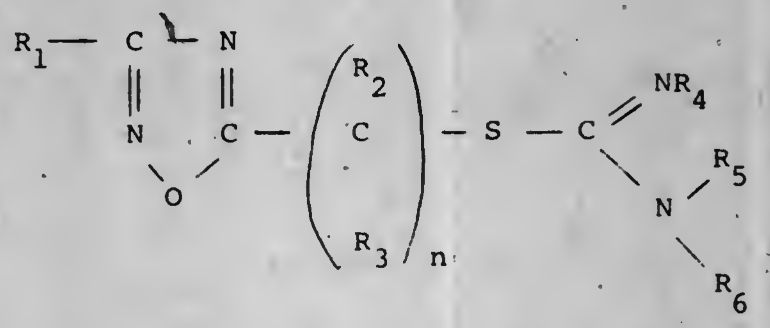
Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 5, 1973, Ser. No. 321,419

Int. Cl. C07d *85/52*

U.S. Cl. 260—307 G **9 Claims**

1. A compound of the formula



wherein R_1 is lower alkyl, phenyl, p-chlorophenyl, p-methoxyphenyl or phenyl-lower alkyl, R_2, R_3, R_4, R_5 and R_6 each is hydrogen or lower alkyl, and n is 1 or 2, said lower alkyl groups having less than four carbon atoms.

3,887,574
CARBOXAMIDO TETRAZOLO CHROMONES

Gwynn Pennant Ellis, Cardiff, and Mervyn Evan Peel, London, both of England, assignors to Allen & Hanburys Limited, London, England

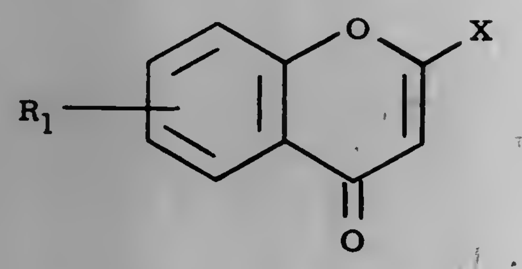
Filed Sept. 29, 1972, Ser. No. 293,578

Claims priority, application United Kingdom, Oct. 8, 1971, 46937/71

Int. Cl. C07d *55/56*

U.S. Cl. 260—308 D **12 Claims**

1. A compound having the formula



Wherein R_1 represents hydrogen, lower alky, lower alkoxy, hydroxy, cyano, nitro, carboxamidotetrazolyl, or tetrazolyl; and X is carboxamidotetrazolyl, or when R^1 is carboxamidotetrazolyl, X is tetrazolyl.

3,887,575
9H-DIBENZO[C, F]-S-TRIAZOLO[4,3-A]AZEPINES

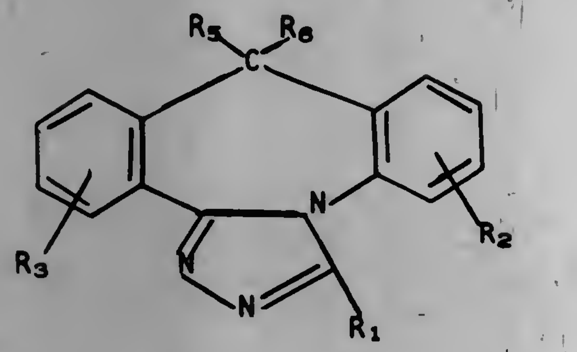
Jackson B. Hester, Jr., Galesburg, and Jacob Szmuszkovicz, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 313,208, Dec. 8, 1972, Pat. No. 3,850,942, which is a continuation-in-part of Ser. No. 227,916, Feb. 22, 1972, abandoned. This application Jan. 30, 1974, Ser. No. 437,818

Int. Cl. C07d *57/02, 57/04, 99/02*

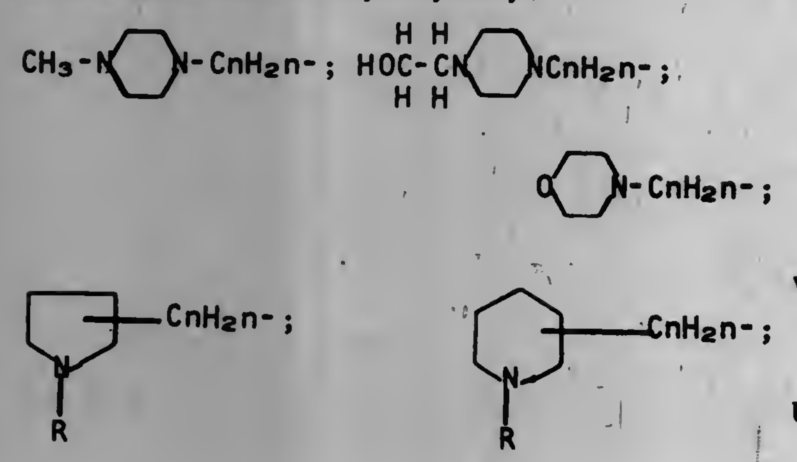
U.S. Cl. 260—308 R **16 Claims**

1. A compound selected from the group consisting of compounds of the formula III

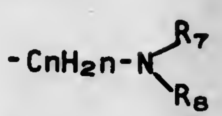


III

wherein R_5 and R_6 are each selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms, inclusive; wherein R_1 is selected from the group consisting of hydrogen, alkyl as defined as above, hydroxymethyl,

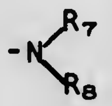


in which *n* is 1 to 4, inclusive, and R is hydrogen or alkyl defined as above, or R_1 is



$$-C_nH_{2n}-N\begin{matrix}R_7\\R_8\end{matrix}$$

in which *n* is defined as above, and R_7 and R_8 are each selected from the group consisting of hydrogen and alkyl as defined above, or



$$-N\begin{matrix}R_7\\R_8\end{matrix}$$

together is pyrrolidino or piperidino; wherein R_2 and R_3 are selected from the group consisting of hydrogen, fluoro, chloro, bromo, nitro, alkyl defined as above, trifluoromethyl, and alkoxy, in which the carbon moiety is of 1 to 3 carbon atoms, inclusive, and the pharmacologically acceptable acid addition salts.

3,887,576
SUBSTITUTED PHENYL-CARBAMOYL-ALKYL CARBONYLAMINO-BENZIMIDAZOLES

Gunther Dransch, Eschborn/Taunus; Kurt Hartel, Hofheim/-Taunus; Gerhard Horlein, Frankfurt am Main; Hubert Schonowsky, Neu-Isenburg, and Adolf Studeneer, Kelkheim/Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

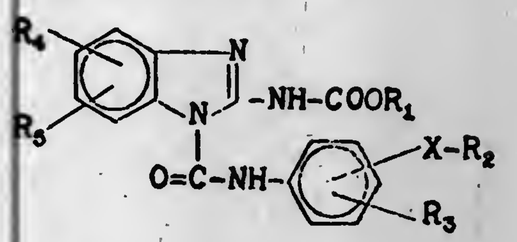
Filed Mar. 15, 1973, Ser. No. 341,760

Claims priority, application Germany, Mar. 21, 1972, 2213553

Int. Cl. C07d *49/38*

U.S. Cl. 260—309.2 **9 Claims**

1. A benzimidazole of the formula



I

in which

R_1 is alkyl of 1 to 4 carbon atoms,

X is oxygen or sulfur,

R_2 is alkyl or alkenyl each of 1 to 4 carbon atoms, substituted by fluorine, chlorine or bromine, and each of R_3, R_4, R_5 represent hydrogen, fluorine, chlorine, bromine, or alkyl of 1 to 4 carbon atoms, and if R_4 and R_5 are different, mixtures thereof.

3,887,577
PROCESS FOR THE PREPARATION OF 2-IMINO DERIVATIVES OF SUBSTITUTED IMIDAZOLES

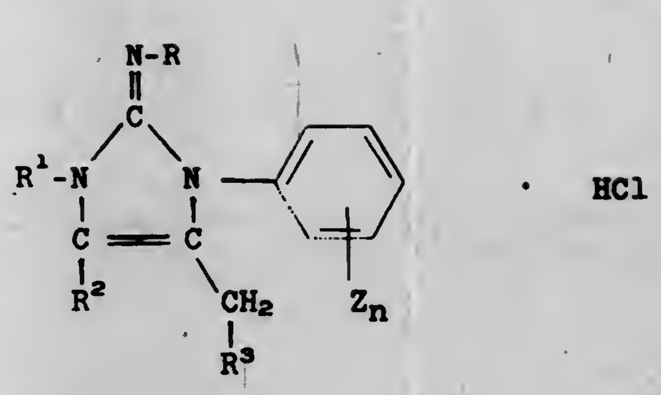
William D. Dixon, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed July 5, 1973, Ser. No. 376,493

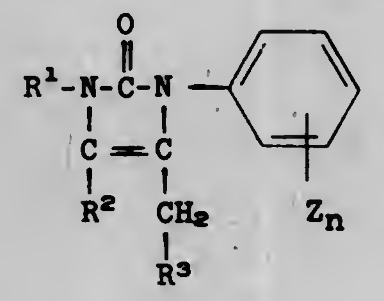
Int. Cl. C07d *49/36*

U.S. Cl. 260—309.6 **11 Claims**

1. A process for preparing a compound of the formula



wherein: R is lower alkyl or lower alkoxy lower alkyl, R^1 is lower alkyl; R^2 is lower alkyl or hydrogen; R^3 is lower alkyl or hydrogen; Z is fluoro, chloro, bromo, lower alkyl, halo lower alkyl, or lower alkoxy and n is an integer zero through 2, which comprises reacting at temperatures from about 40°C. up to the reflux temperature of the system a 4-imidazolin-2-one of the formula



wherein R^1, R^2, R^3, Z and n are as defined above, with phosphorus oxychloride and a primary amine of the formula H_2N—R wherein R is as defined above.

3,887,578
1-AMINO-PYRAZOLIC DERIVATIVES

Giorgio Adembri; Piero Tedeschi; Fabio Ponticelli, and Maresco Marini, all of Florence, Italy, assignors to Establissements Nativelle S.A., Paris, France

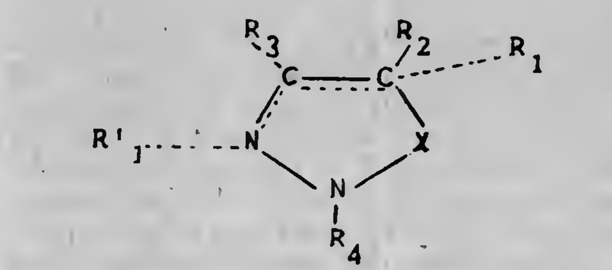
Filed Jan. 15, 1973, Ser. No. 323,605

Claims priority, application United Kingdom, Jan. 14, 1972, 1864/72; Jan. 14, 1972, 1866/72

Int. Cl. C07d *49/04*

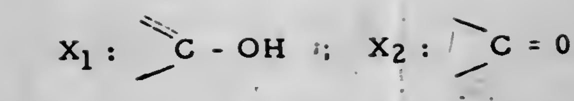
U.S. Cl. 260—310 A **5 Claims**

1. A 1-amino-pyrazole compound of the formula:



(I)

which X represents one of the two following forms:



wherein R_1 and R'_1, which cannot exist at the same time, represent a hydrogen atom or a lower alkyl group having 1 to 4 carbon atoms; R_2 and R_3, which may be identical or different represent a hydrogen atom, a lower alkyl group, a phenyl group, a phenyl group substituted by one or more groups selected from lower alkyl, halogen, nitro and lower alkoxy; R_4 represents an amino group, a mono-lower alkyl amino group or a di-lower alkyl amino group; or a pharmaceutically acceptable salt thereof with a mineral or organic acid.

3,887,579
METHOD OF MOLDING USING A POLYETHYLENE TEREPHTHALATE RELEASE FILM COATED WITH POLYETHYLENE SEBACATE

Jacques Brunet, Offranville, and Jean-Claude Rigaux, Rillieux, both of France, assignors to La Cellophane, Paris, France

Filed Apr. 9, 1973, Ser. No. 349,615

Claims priority, application France, Apr. 21, 1972, 72.14106

Int. Cl. B29c *1/04*

U.S. Cl. 264—316 **8 Claims**

1. The method of removing molded polymerized synthetic resin articles from a mold by placing at least one polyethylene terephthalate release film in the mold between the mold elements and at least one synthetic resin article to be polymerized in said mold, comprising:

a. coating said polyethylene terephthalate release film on at least one face thereof with a uniformly distributed coating of polyethylene sebacate having a density within the range of about 0.05 grams per square meter to about 5 grams per square meter;

b. placing at least one coated release film in the mold between the mold elements and at least one synthetic resin article prior to polymerization of such synthetic resin article in said mold, such that each synthetic resin article is only in contact with said polyethylene sebacate coating;

c. polymerizing each synthetic resin article in said mold;

d. cooling each molded polymerized synthetic resin article; and

e. removing each molded polymerized synthetic resin article from said mold and separating each release film from each molded polymerized synthetic resin article, said polyethylene sebacate coating being inert to said synthetic resin, and said polymerization step being carried out at a tempmerature which is lower than the melting point of said polyethylene terephthalate release film and said polyethylene sebacate coating.

3,887,580
METHOD OF CRYSTALLIZATION OF WATER IN SUPERCOOLED CLOUDS AND FOGS AND REAGENT USEFUL IN SAID METHOD

Veniamin Vasilievich Patrikeev, ulitsa Dmitria Ulyanova, 4, korpus 2, kv. 195; Anna Davydovna Malkina, Leningradskoe Shosse, 112, korpus 3, kv. 691, both of Moscow, and Amiran Ilich Kartsivadze, ulitsa Barnova, 64, Tbilisi, all of U.S.S.R.

Filed Sept. 8, 1972, Ser. No. 287,361

Int. Cl. B01d *17/00*

U.S. Cl. 252—319 **6 Claims**

1. A method for crystallizing or condensing water in supercooled clouds or fogs comprising the steps of subliming a crystallizing agent to form an aerosol of said crystallizing agent and introducing said aerosol into said supercooled clouds or fogs wherein the crystallizing agent is a sublimable metal chelate of acetoacetic ester or a β-diketone selected from the group consisting of acetylacetone, 3-chloroacetylacetone and acetoacetanilide with a metal se-

lected from the group consisting of copper, vanadium molybdenum and cobalt, said chelate being taken alone or in combination.

6. A reagent for use in crystallizing or condensing water in supercooled clouds and fogs, said reagent consisting of a mixture having the following composition in parts by weight:

copper acetylacetonate	25 – 50
copper chelate of acetoacetic ester	75 – 50.

3,887,581
PROCESS FOR PRODUCING IMINOISOINDOLINONE

Shoichi Kinoshita, Omiya; Masaji Oyama, Ogose, and Shunjiro Takijiri, Tokyo, all of Japan, assignors to Dainippon Ink & Chemicals Inc., Tokyo and Dainippon Ink Institute of Chemical Research, Saltama-ken, both of, Japan

Filed Oct. 17, 1972, Ser. No. 298,392

Claims priority, application Japan, Oct. 19, 1971, 46-82131

Int. Cl. C07d *27/50*

U.S. Cl. 260—325 Ph **10 Claims**

1. A process for producing 3-imino-, di-, tri-, or tetrahaloisoindoline-1-one metal salts which comprises reacting a di-, tri-, or tetra-halophthalonitrile in the presence of an alkali metal hydroxide, an alkaline earth metal hydroxide, or a compound forming such hydroxides by reaction with water, at a temperature of from 10 to 100°C for a time of from 0.5 to 40 hours.

3,887,582
BIS-IMIDE COMPOSITIONS

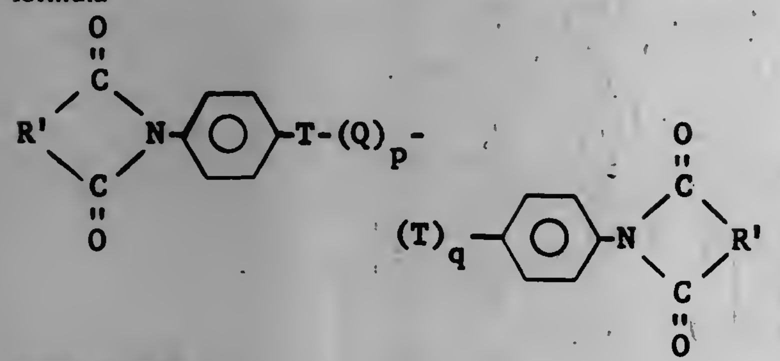
Fred F. Holub, Schenectady, N.Y., and Carl M. Emerick, New Brighton, Pa., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 149,805, June 3, 1971, abandoned, which is a division of Ser. No. 819,430, April 25, 1969, Pat. No. 3,651,012. This application Sept. 20, 1973, Ser. No. 398,929

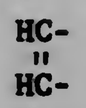
Int. Cl. C07d *27/18*

U.S. Cl. 260—326.26 **4 Claims**

1. A composition of matter corresponding to the general formula

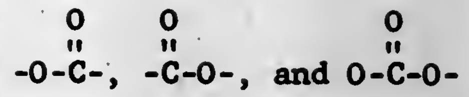


where R′ is the



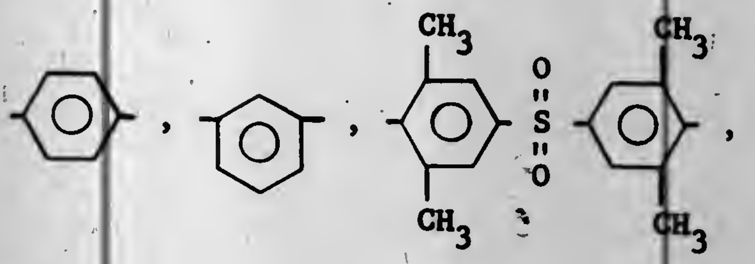
$$\begin{matrix}\text{HC-}\\ \|\\ \text{HC-}\end{matrix}$$

grouping, T is a member of the class consisting of

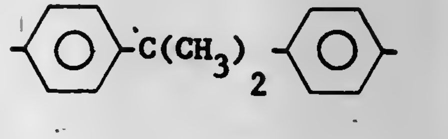


$\text{-O-}\overset{\text{O}}{\overset{\|}{\text{C}}}\text{-}$, $\text{-}\overset{\text{O}}{\overset{\|}{\text{C}}}\text{-O-}$, and $\text{O-}\overset{\text{O}}{\overset{\|}{\text{C}}}\text{-O-}$

radicals, and Q is a divalent organic radical selected from the class consisting of



and



radicals, and *p* and *q* are 0 or 1.

3,887,583
PRODUCTS AND PROCESS

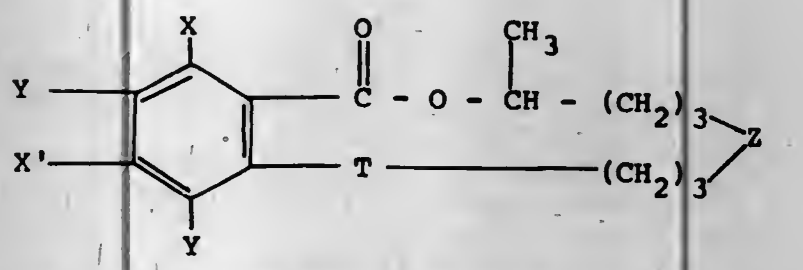
Herbert L. Wehrmeister, Terre Haute, Ind.; David B. R. Johnston, Warren, and Thomas B. Windholz, Westfield, both of N.J., assignors to Commercial Solvents Corp., Terre Haute, Ind., by said Herbert L. Wehrmeister and Merck & Co., Inc., Rahway, N.J., by said David B. R. Johnston and Thomas B. Windholz

Continuation of Ser. No. 729,392, May 15, 1968, abandoned. This application Oct. 31, 1972, Ser. No. 302,414

Int. Cl. C07d *9/00*

U.S. Cl. 260—343.2 F **40 Claims**

1. A compound having the formula:



wherein T is a radical selected from the group consisting of —CH=CH— and $—CH_2CH_2—$; Z is > CH_2; R is selected from the group consisting of hydrogen, lower alkyl, lower acyclic carboxylic acid acyl radicals, and monocyclic carbocyclic aralkyl radicals containing up to about 10 carbon atoms; X is selected from the group consisting of hydrogen, —OR and —OR′; R′ is selected from the group consisting of benzoxazolyl, benzothiazolyl and phenyltetrazolyl; X′ is selected from the group consisting of X and tetrahydropyranyloxy; Y is selected from the group consisting of hydrogen, amino, nitro and hydroxyl, and provided that unless at least one of X and X′ is selected from the group consisting of tetrahydropyranyloxy, benzoxazolyloxy, benzothiazolyloxy, and phenyltetrazolyloxy, then at least one of X and X′ is hydrogen.

3,887,584
3-(HYDROXYMETHYL)CHROMONES

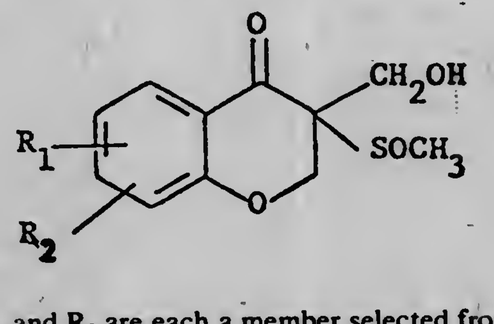
Maximilian Von Strandtmann, Rockaway; John Shavel, Jr., Mendham; Sylvester Klutchko, Hackettstown, and Marvin Cohen, New Milford, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 309,329, Nov. 30, 1972, Pat. No. 3,798,240, which is a continuation-in-part of Ser. No. 112,765, Feb. 4, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 428,290

Int. Cl. C07d *7/34*

U.S. Cl. 260—345.2 **10 Claims**

1. A compound of the formula:



wherein R_1 and R_2 are each a member selected from a group consisting of hydrogen, lower alkyl of 1 to 6 carbon atoms, halogen, carbocylic aryl of 6 to 8 carbon atoms, aryl lower alkyl in which aryl and lower alkyl are as defined, alkoxy of 1 to 6 carbon atoms, hydroxy, acylamino in which acyl is alkanoyl of less than 12 carbon atoms, and R_1 and R_2, when attached to adjacent carbon atoms, together form an orthofused arylene ring in which aryl is as defined.

3,887,585
POLYCYCLIC GAMMA-PYRONE-3-CARBOXALDEHYDE DERIVATIVES

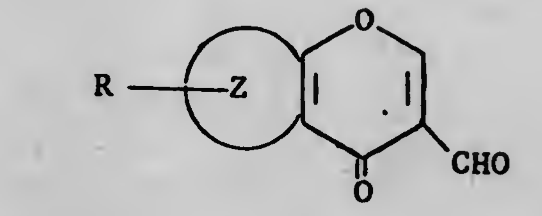
Daniel Kaminsky, deceased, late of Parsippany, N.J. (by Bernice R. Kaminsky, administratrix); Sylvester Klutchko, Hackettstown, and Maximilian Von Strandtmann, Rockaway, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 352,135, April 18, 1973, abandoned. This application June 19, 1974, Ser. No. 480,647

Int. Cl. C07d *7/32*

U.S. Cl. 260—345.2 **13 Claims**

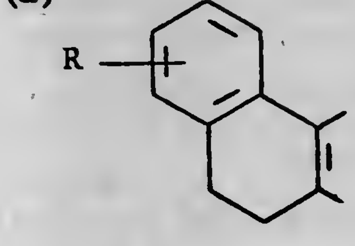
1. A compound of the formula I:



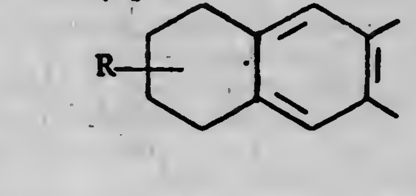
I

wherein R represents hydrogen, hydroxy, lower alkyl, or lower alkoxy and the Z ring has one of the following structures:

(a)

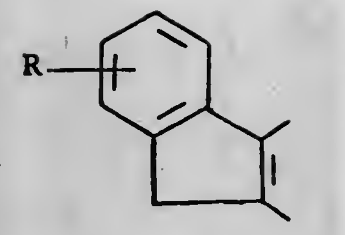


(d)

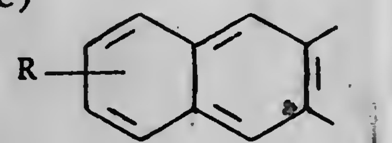


or

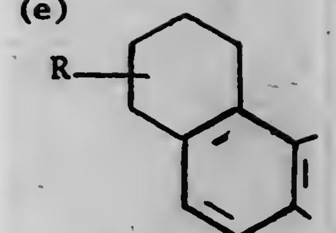
(b)



(c)



(e)



and the corresponding N-substituted, 3-formimide derivatives thereof.

3,887,586
ALLYL ETHERS

Madhukar Subraya Chodnekar, Basel; Albert Pfiffner, Pfaffhausen; Norbert Rigassi, Arlesheim; Ulrich Schwieter, Reinach, and Milos Suchy, Pfaffhausen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 108,599, Jan. 21, 1971, Pat. No. 3,781,309. This application Aug. 23, 1973, Ser. No. 390,962

Claims priority, application Switzerland, Jan. 27, 1970, 1104/70

Int. Cl. C07d *1/18*

U.S. Cl. 260—348 R **1 Claim**

1. 1-(Allyloxy)-4,5-epoxy-1,5-dimethylhexane.

3,887,587
SYNTHESIS OF PROSTAGLANDINS OF THE ONE-SERIES

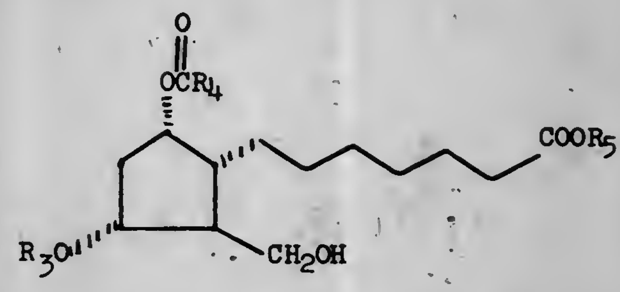
Thomas K. Schaaf, Old Lyme, Conn., and Elias J. Corey, Cambridge, Mass., assignors to Pfizer Inc., New York, N.Y.

Filed Apr. 17, 1972, Ser. No. 244,882

Int. Cl. C07d *5/32, 7/18;* **C07f** *7/18*

U.S. Cl. 260—345.8 **2 Claims**

1. A compound of the formula:



wherein

R_3 is tetrahydropyranyl, tetrahydrofuranyl, or dimethylisopropylsilyl; and

R_4 and R_5 are each alkyl of from 1 to 8 carbon atoms, phenylalkyl having up to three carbon atoms in the alkyl moiety, phenyl, tolyl, biphenyl, or fluorenyl.

3,887,588
PROCESS FOR MAKING NITROPHTHALIC ANHYDRIDES

Newell C. Cook, Schenectady, N.Y., and John M. Gasaway, Pittsfield, Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed May 8, 1974, Ser. No. 468,011

Int. Cl. C07c *63/14*

U.S. Cl. 260—346.3 **6 Claims**

1. In the process for isolating a mixture of 3-nitrophthalic anhydride and 4-nitrophthalic anhydride from a solution of

the two anhydrides in concentrated sulfuric acid, the improvement which comprises extracting the aforesaid two nitrophthalic anhydrides using methylene chloride as the extractant.

2. The process for obtaining nitrated derivatives of phthalic anhydride which comprises forming a solution of phthalic anhydride in a solvent composed of 98–100% concentrated sulfuric acid, contacting the said solution with 98–100% concentrated nitric acid in temperature range from 85° to 110°C., and thereafter extracting the nitrated products with methylene chloride to obtain a mixture composed essentially of 3-nitrophthalic anhydride and 4-nitrophthalic anhydride.

3,887,589

2,5-DIETHYL-4-HYDROXY-2,3,-DIHYDROFURAN-3-ONE

Adolf Jan Eykelboom, Zevenaar, Netherlands, and Christiaan Herman Theodoor Tonsbeek, Orpington, England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 811,218, March 27, 1969, abandoned. This application May 23, 1972, Ser. No. 256,196

Claims priority, application Netherlands, Mar. 28, 1968, 6804336

Int. Cl. C07d *5/10*

U.S. Cl. 260—347.8 **1 Claim**

1. A compound having a flavor of caramel with the structure 2,5-diethyl-4-hydroxy-2,3-dihydrofuran-3-one.

3,887,590

AZIDO CYCLOHEXANEPENTOL DERIVATIVE

Andre Cier, Lyon; Stephan Gero, Ablon, and Alain Olesker, Marcoussis, all of France, assignors to Labaz, Paris, France

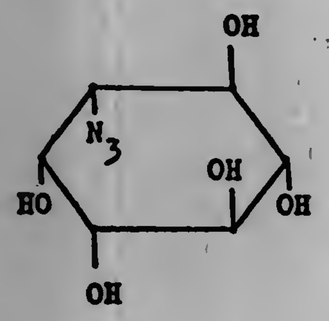
Filed July 30, 1973, Ser. No. 383,665

Claims priority, application United Kingdom, Aug. 16, 1972, 38300/72

Int. Cl. C07c *117/00*

U.S. Cl. 260—349 **1 Claim**

1. 1L-1-azido-1-deoxy-myo-inositol of the formula:



I

3,887,591

PROCESS FOR THE PRODUCTION OF 1-AMINO-4-NITROANTHRAQUINONE-2-CARBOXYLIC ESTERS

Wolfgang Elser, Frankenthal, and Gerd Schwantje, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen/Rhine, Germany

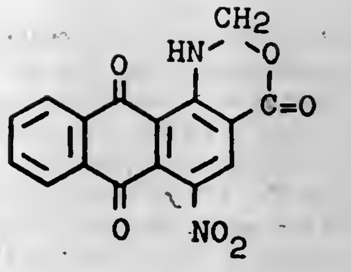
Filed Nov. 2, 1973, Ser. No. 412,421

Claims priority, application Germany, Nov. 9, 1972, 2254813

Int. Cl. C09b *1/22*

U.S. Cl. 260—376 **8 Claims**

1. A process for the production of esters of 1-amino-4-nitroanthraquinone-2-carboxylic acid which comprises reacting a compound of the formula



(I)

in the presence of a catalytic amount of an acid catalyst selected from the group consisting of sulfuric acid, hydrochloric acid, hydrobromic acid, dichloroacetic acid, trichloroacetic acid, benzenesulfonic acid, toluenesulfonic acid, naphthalene sulfonic acid and trifluoroacetic acid, with a cycloaliphatic alcohol of five to ten carbon atoms, a linear or branched saturated aliphatic alcohol of one to ten carbon atoms, or said saturated aliphatic alcohol in which one or two hydrogen atoms is replaced by hydroxyl, chlorine, bromine, alkoxy of one to four carbon atoms, phenyl, phenoxy or phenyl bearing chlorine, bromine, alkyl or alkoxy of one to four carbon atoms as a substituent at a temperature of from 100° to 180°C in excess of said alcohol or in an inert solvent.

3,887,592

2-HYDROXY OR ACETOXY SUBSTITUTED ESTERS USEFUL FOR THE CONTROL OF INSECTS

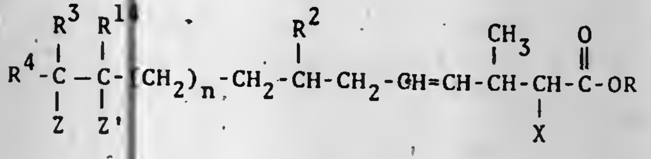
Clive A. Henrick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 205,344, Dec. 6, 1971, Pat. No. 3,803,187. This application Jan. 14, 1974, Ser. No. 433,410

Int. Cl. C07c *69/62;* **A01n** *9/24*

U.S. Cl. 260—399 **8 Claims**

1. A compound selected from those of formula (A):



$$R^4\text{-}\underset{Z}{\overset{R^3}{C}}\text{-}\underset{Z'}{\overset{R^{14}}{C}}\text{-}(CH_2)_n\text{-}CH_2\text{-}\overset{R^2}{CH}\text{-}CH_2\text{-}CH{=}CH\text{-}\overset{CH_3}{CH}\text{-}\underset{X}{CH}\text{-}\overset{O}{\overset{\|}{C}}\text{-}OR \qquad (A)$$

wherein,

n is zero or the positive integer one;
each of R^2, R^3 and R^4 is methyl or ethyl;
R^{14} is hydrogen or methyl;
R is lower alkyl;
X is hydroxy or acetoxy;
Z is hydrogen, lower alkyl, lower alkoxy or lower alkylthio; and
Z′ is hydrogen, or taken with Z, a carbon-carbon bond.

3,887,593

PREPARATION OF NITROKETONIZED AMIDES

Donald R. Lachowicz; George S. Saines, both of Fishkill, and George W. Eckert, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

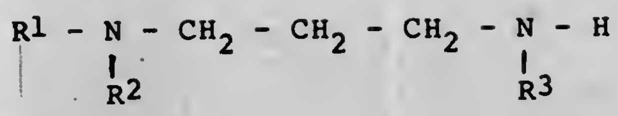
Division of Ser. No. 101,408, Dec. 24, 1970, Pat. No. 3,711,255. This application July 10, 1972, Ser. No. 270,362

Int. Cl. C07c *103/30*

U.S. Cl. 260—404.5 **8 Claims**

1. A method of preparing a nitroketonized amide which consists essentially of

contacting an acid amide of the formula:



$$R^1 - \underset{R^2}{N} - CH_2 - CH_2 - CH_2 - \underset{R^3}{N} - H$$

where R^1 is an alkenyl group having from 4 to 40 carbon atoms, where R^2 and R^3 alternately represent hydrogen and an alkenoyl group having from 4 to 40 carbon atoms with dinitrogen tetroxide and oxygen at a temperature of from about −35° to 45°C., wherein the mole ratio of said acid amide to dinitrogen tetroxide to oxygen is from 1:2:2 to 1:4:60.

3,887,594

2-CHLORO AND ALKOXY OR ALKYLTHIO SUBSTITUTED ESTERS USEFUL FOR THE CONTROL OF INSECTS

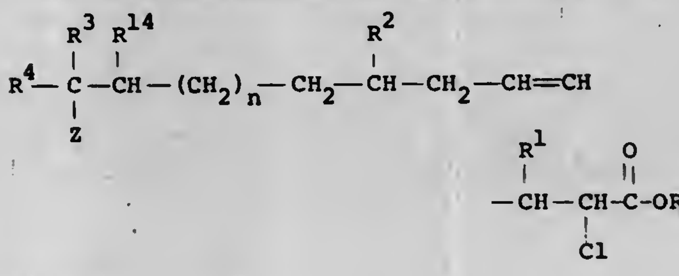
Clive A. Henrick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 205,344, Dec. 6, 1971, Pat. No. 3,803,187. This application Jan. 14, 1974, Ser. No. 433,411

Int. Cl. C07c *69/62;* **A01n** *9/24*

U.S. Cl. 260—408 **6 Claims**

1. A compound selected from those of formula (A):



$$R^4-\underset{Z}{\overset{R^3}{C}}-\overset{R^{14}}{CH}-(CH_2)_n-CH_2-\overset{R^2}{CH}-CH_2-CH{=}CH-\overset{R^1}{CH}-\underset{Cl}{CH}-\overset{O}{\overset{\|}{C}}\text{-}OR \qquad (A)$$

wherein,

n is zero or the positive integer one;
R^1 is methyl;
each of R^2, R^3 and R^4 is methyl or ethyl;
R^{14} is hydrogen or methyl;
R is lower alkyl; and
Z is lower alkoxy or lower alkylthio.

3,887,595

CARBONYLATION PROCESS

Kenzie Nozaki, St. Louis, Mo., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 5, 1973, Ser. No. 338,112

Int. Cl. C07c *51/14, 67/00*

U.S. Cl. 260—410.6 **8 Claims**

1. In the process of carbonylating olefinically unsaturated hydrocarbons of from 2 to 30 carbon atoms free from acetylenic unsaturation and conjugated olefinic unsaturation with carbon monoxide and with at least one hydroxylic compound selected from the group consisting of water, alkanol of from 1 to 20 carbon atoms, carboxylic acid of from 2–20 carbon atoms and mixtures thereof in the presence of a catalyst, the improvement which comprises producing predominately straight chain products by employing as said catalyst a composition consisting essentially of

a. a zerovalent noble metal phosphine complex of the general formula

$$(R_3P)_nM$$

wherein M is palladium or platinum, n is a whole number from 1 to 4 inclusive and R independently is a monovalent hydrocarbyl or substituted hydrocarbyl moiety of from 1 to 20 carbon atoms inclusive of substituents, is free from aliphatic carbon-carbon unsaturation and is selected from the group consisting of unsubstituted alkyl, unsubstituted phenyl, monosubstituted alkyl and monosubstituted phenyl wherein said substitutent is selected from the group consisting of alkoxy, carbalkoxy, trihalomethyl, halo, dialkylamino, alkanoyloxy and phenyl, in an amount of from about 0.0001 to about 0.1 mole percent of noble metal phosphine complex per mole of olefinic double bond present, and

b. from about 10 moles to about 150 moles of R_3P per mole of said noble metal-phosphine complex.

3,887,596

2-OXO SUBSTITUTED UNSATURATED ESTERS USEFUL FOR THE CONTROL OF INSECTS

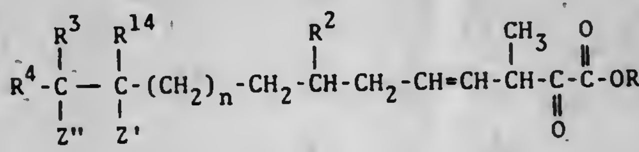
Clive A. Henrick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 205,344, Dec. 6, 1971, Pat. No. 3,803,187. This application Jan. 14, 1974, Ser. No. 433,412

Int. Cl. C07c *69/62;* **A01n** *9/24*

U.S. Cl. 260—410.9 R **7 Claims**

1. A compound of the formula (IV):



$$R^4\text{-}\underset{Z''}{\overset{R^3}{C}}-\underset{Z'}{\overset{R^{14}}{C}}\text{-}(CH_2)_n\text{-}CH_2\text{-}\overset{R^2}{CH}\text{-}CH_2\text{-}CH{=}CH\text{-}\overset{CH_3}{CH}\text{-}\underset{O}{\underset{\|}{C}}\text{-}\overset{O}{\overset{\|}{C}}\text{-}OR \qquad (IV)$$

wherein,

n is zero or the positive integer one;
R is methyl, ethyl or isopropyl;
each of R^2, R^3 and R^4 is methyl or ethyl;
R^{14} is hydrogen or methyl;
Z″ is hydrogen, lower alkyl, lower alkoxy or lower alkylsulfonyl; and
Z′ is hydrogen or, taken with Z″ a carbon-carbon bond.

3,887,597

PROCESS FOR PRODUCING AN ORGANIC SILVER CARBOXYLATE

Kinji Ohkubo, and Takao Masuda, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 2, 1973, Ser. No. 356,560

Claims priority, application Japan, May 2, 1972, 47-43867; May 16, 1972, 47-48453

Int. Cl.² C08H *17/36*

U.S. Cl. 260—414 **18 Claims**

1. In a process of producing silver salt of a long chain aliphatic carboxylic acid which comprises mixing an aqueous silver nitrate solution or an aqueous silver complex solution with a solution of a carboxylic acid in a solvent in which said carboxylic acid is soluble, both said silver salt of the carboxylic acid and silver nitrate are almost insoluble and with which water is sparingly miscible, to react said carboxylic acid with silver ions, the improvement which comprises conducting said reaction of the carboxylic acid with silver ions in the presence of a mercury compound and/or lead compound.

3,887,598

PROCESS FOR THE MANUFACTURE OF METAL COMPLEXES IN A PURE FORM

Hans Eicke, Reinach; Vladimir Arnold, Basel, and Francois L'Eplattenier, Therwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

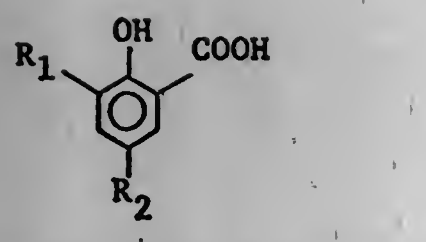
Filed Nov. 8, 1973, Ser. No. 413,994

Claims priority, application Switzerland, Nov. 22, 1972, 17009/72

Int. Cl. C07f *5/00, 5/06*

U.S. Cl. 260—429 R **4 Claims**

1. Process for the manufacture of metal complexes of trivalent or tetravalent metals with acids of the formula I



(I)

in which R_1 and R_2 independently of one another denote hydrogen, bromine, chlorine, alkyl, cycloalkyl or aralkyl, which is characterised in that a successive reaction is carried out, in a solvent, of

a. an acid of the formula I with

b. a salt of the formula II

$$M_pX_{(n.p)}/m \qquad (II)$$

in which M denotes the cation of a trivalent or tetravalent metal, X denotes an anion which forms with M a salt which is soluble in the solvent of the process and *p* denotes 1, 2 or 3 and *m* corresponds to the valency of the anion X and *n* to the valency of the metal M and

c. an alcoholate of the formula III

$$M'OR \qquad (III)$$

in which M′ denotes the cation of an alkali metal and R denotes lower alkyl, the methoxyethyl group or the ethoxyethyl group, *a*, *b* and *c* are employed in the molar ratio of (n-i):l/p:*n*, and *i* denotes 1 or 0 and, in the case that *i* is 1; the reaction mixture is reacted with water, the molar ratio of water to the acid of the formula I being at least 1:(n-1).

3,887,599
COMPLEXES CONTAINING SULPHUR

Grish Chandra, Penarth, Wales, assignor to Dow Corning Limited, Barry Glamorgan, Wales

Filed Oct. 29, 1973, Ser. No. 410,943

Int. Cl. C07f *15/00*

Claims priority, application United Kingdom, Nov. 11, 1972, 52202/72

U.S. Cl. 260—429 R **7 Claims**

1. Platinum (II) complexes represented by the formula

$$PtX_2(SR'R'')_2$$

in which X represents Cl, Br or I, R′ represents the R_3SiQ— group in which R represents an alkyl, aryl, aralkyl or alkaryl radical having from 1 to 18 inclusive carbon atoms and Q represents a divalent aliphatic hydrocarbon radical having from 1 to 6 carbon atoms inclusive and R″ represents an alkyl, aryl, aralkyl or alkaryl radical having from 1 to 18 inclusive carbon atoms or the R_3SiQ— group in which R and Q are as hereinabove defined.

3,887,600
BIMETALLIC SALTS AND DERIVATIVES THEREOF, THEIR PREPARATION AND USE IN THE COMPLEXING OF LIGANDS

Robert B. Long, Atlantic Highlands; Fred A. Caruso, Elizabeth, both of N.J.; Richard J. DeFeo, Baton Rouge, La., and David G. Walker, Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 805,912, Sept. 3, 1968, Pat. No. 3,651,159. This application May 17, 1971, Ser. No. 144,302

Int. Cl. C07f *1/08*

U.S. Cl. 260—438.1 **10 Claims**

1. A complex bimetallic salt having the generic formula $CuAlX_4L_m$ wherein X is selected from the group consisting of chlorine, bromine and flourine atoms, L is a complexible ligand [, said ligand selected from the group consisting of carbon monoxide, C_2-C_6 acetylenes,] C_2-C_{20} mono-olefins [,C_4-C_{10} conjugated diolefins, C_6-C_{16} polyolefins, C_5-C_{10} cyclic olefins and C_3-C_6 diolefins] and m is equal to the complexing stoichiometry of L and is an integer ranging from 1 to 4.

3,887,601
ORGANOSILICONE POLYMERS

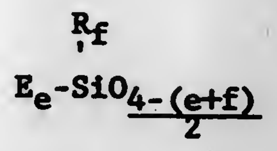
Bernard Kanner, Nyack; Bela Prokai, Mahopac, both of N.Y., and Walter R. Rosemund, Englewood, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 293,415, Sept. 29, 1972, Pat. No. 3,796,676. This application July 26, 1973, Ser. No. 382,863

Int. Cl. C07f *7/08, 7/10, 7/18*

U.S. Cl. 260—448.2 B **26 Claims**

1. An organosilicone polymer which consists essentially of monomeric units (A), (B) and (C) wherein: (A) is $SiO_{4/2}$; (B) is a monofunctional siloxy unit having the unit formula,



$$E_e\text{-}\overset{R_f}{Si}O_{\frac{4-(e+f)}{2}}$$

wherein E is a poly(oxyalkylene) chain an oxygen atom of which is linked to silicon through a bivalent hydrocarbon radical, said chain being terminated at its other end by a monovalent organic radical selected from the group consisting of $R^{\circ\circ}O$—, $R^{\circ\circ}NHC(O)O$— and $R^{\circ\circ}C(O)O$— where $R^{\circ\circ}$ is a monovalent hydrocarbon group having from 1 to 12 carbon atoms, R is a monovalent hydrocarbon group, *e* is an integer having a value of from 1 to 3, *f* has a value of zero to 2, and the sum *e*+*f* has a value of 3; and (C) is a monofunctional trihydrocarbylsiloxy unit; and wherein the mole ratio of the aforesaid (A) units to said (B) units is from about 0.75:1 to about 2:1, and the mole ratio of the aforesaid (C) units to said (B) units is from about 0.1:1 to about 1:1.

3,887,602
PREPARATION OF NEW ORGANOSILANES

Friedrich Martin Thurn, Bruhl; Eugen Meyer-Simon, Frankfurt; Werner Will, Wolfgang; Franz Schmidt, Mannheim; Wolfgang Schenk, Schwetzingen, and Rolf Wurmb, Heidelberg, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Dec. 19, 1973, Ser. No. 426,028

Int. Cl. C07f *7/08, 7/18*

Claims priority, application Germany, Dec. 22, 1972, 2262909

U.S. Cl. 260—448.2 B **3 Claims**

1. Organosilanes of the formula

$$X_3Si—R—[(OCH_2)_n—O—R']_m—O—R—SiX_3 \qquad (I)$$

wherein the X groups may be the same or different and X is selected from the group consisting of halogen, hydrocarbonoxy of one to seven carbon atoms, acyloxy of one to seven carbon atoms and hydroxyl; the R groups may be the same or different and R is a straight chain or branched bivalent hydrocarbon fragment of two to 10 carbon atoms which is connected to the silicon atom by a silicon-carbon bond and may be interrupted one or more times by an oxygen atom; R′ is an alkylene group of two to six carbon atoms which may contain one or two oxygen bridges; *n* is a number from 1.0 to 5.0; and *m* is a number from about 10 to 200.

3,887,603
MENTHOL-RELEASE COMPOUNDS

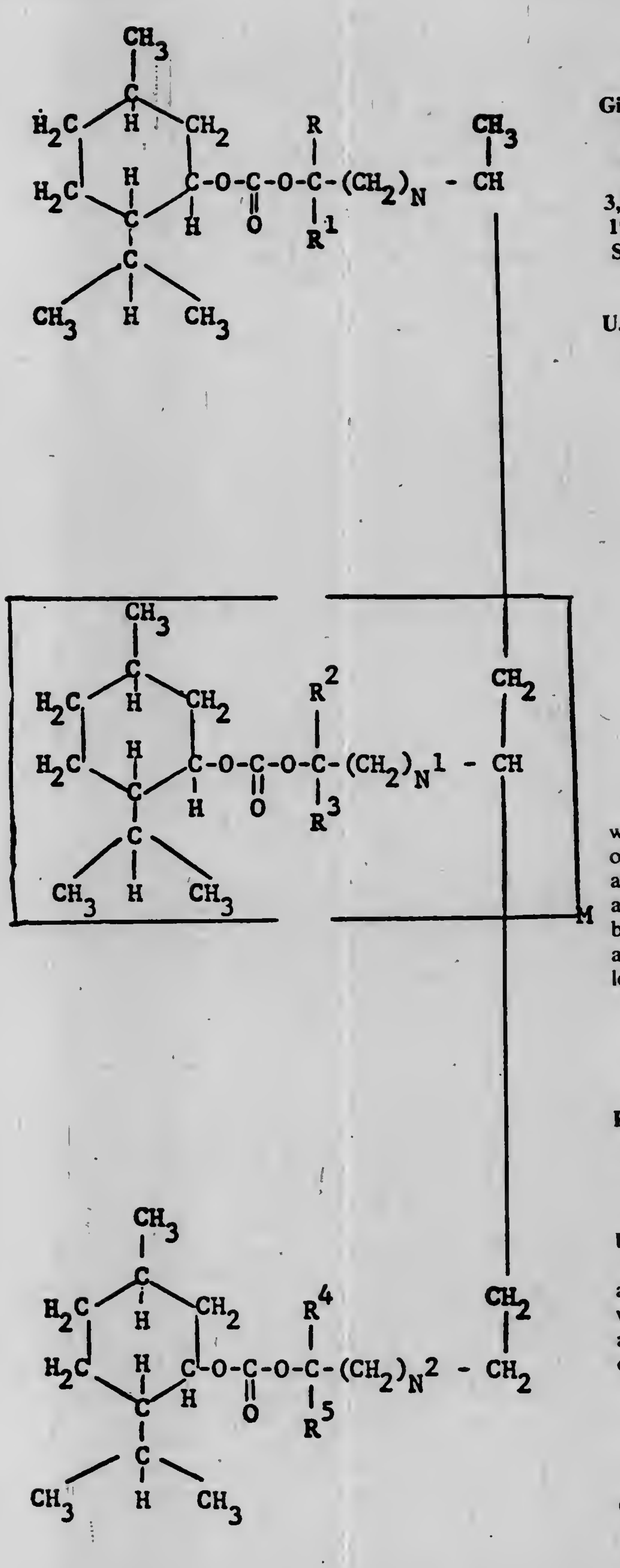
Eric G. S. Rundberg, Jr.; William R. Johnson, Jr., and Harvey J. Grubbs, all of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed July 30, 1973, Ser. No. 384,048

Int. Cl. C08g *17/13;* **A24b** *3/12, 13/00*

U.S. Cl. 260—463 **9 Claims**

1. A compound having the chemical formula:



wherein:

N, N^2 and each N^1 have values of from 0 to 8; R, R^1, R^4, R^5 and each R^2 and R^3 are each selected from the group consisting of alkyl having from 1 to 6 carbons, cycloalkyl having from 5 to 10 carbons and aromatic carbocyclic having from 6 to 10 carbons; and M has a value of from 0 to 98.

3,887,604
2-(2-HYDROXYETHYLAMINO)BENZOPHENONE OXIMES

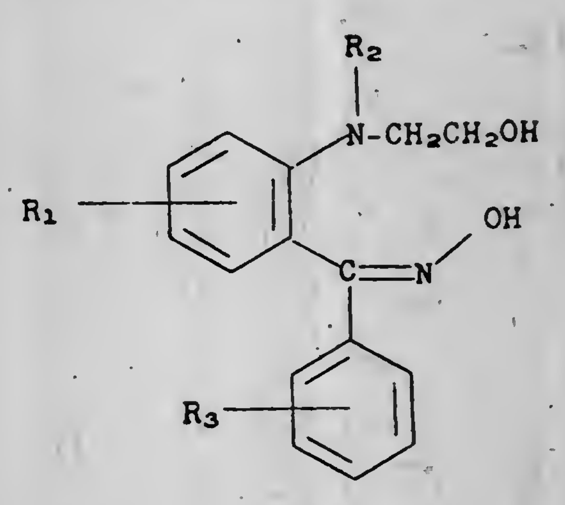
Giles Allen Archer, Montclair, and Leo Henryk Sternbach, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 175,738, Aug. 27, 1971, Pat. No. 3,803,233, which is a division of Ser. No. 819,410, April 25, 1968, Pat. No. 3,646,011, which is a continuation-in-part of Ser. No. 763,004, Sept. 26, 1968, Pat. No. 3,583,978. This application Dec. 19, 1973, Ser. No. 426,421

Int. Cl. C07c *131/00*

U.S. Cl. 260—465 D **1 Claim**

1. Compounds of the formula



wherein R_1 and R_3 each are selected from the group consisting of hydrogen, halogen, trifluoromethyl, nitro, amino, lower alkanoyl-amino, lower alkylthio, lower alkyl sulfonyl, lower alkylsulfinyl, lower alkoxy, hydroxy, lower alkyl, cyano, carboxy, carbo-lower alkoxy, carbamyl, and di-lower alkylamine; and R_2 is selected from the group consisting of hydrogen, lower alkyl, lower alkenyl and lower alkanoyl.

3,887,605
PROCESS FOR RECOVERY OF 2,6-DICYANONAPHTHALENE

Richard V. Norton, Wilmington, Del., and Howard P. Angstadt, Media, Pa., assignors to Sun Ventures, Inc., St. Davids, Pa.

Filed Jan. 10, 1974, Ser. No. 432,369

Int. Cl. C07c *121/62*

U.S. Cl. 260—465 C **2 Claims**

1. In the process of separating 2,6-dicyanonaphthalene from a gaseous ammoxidation product stream, the improvement which comprises cooling said hot product stream to a temperature above 240°C. and below about 300°C. and separating condensed solid crystals of 2,6-dicyanonaphthalene.

3,887,606
PROCESS FOR THE PREPARATION OF DL-PHENYLGLYCINE ESTERS

Gordon Hanley Phillipps, Wembley; Leslie Stephenson, Hanwell; Albert Roy Cooksey, Torver, and John Colin Clark, Gerrards Cross, all of England, assignors to Glaxo Laboratories Limited, Greenford, Middlesex, England

Filed June 2, 1972, Ser. No. 259,298

Claims priority, application United Kingdom, June 2, 1971, 18675/71

Int. Cl. C07c *101/06*

U.S. Cl. 260—471 A **18 Claims**

1. A process for the resolution of a DL-phenylglycine ester of the formula:

$$C_6H_5CH{\cdot}NH_2{\cdot}CO_2R$$

where R represents an alkyl group with 1 to 6 carbon atoms or a cycloalkyl group withh 5 or 6 carbon atoms, which comprises treating said DL-phenylglycine ester with (+)-tartaric acid at a temperature of from 15° to 60°C in the presence of a mixture of solvents of different polarities one of which is an alkanol having 1–4 carbon atoms, the said (+)-tartaric acid being used in a stoichiometric amount or in an excess up to 100 percent, and selectively crystallising the (+)-hemitartrate of the D-phenylglycine ester therefrom at a temperature of from −20° to +60°C.

3,887,607

A TETRA-ALLYL TERMINATED CARBAMATE

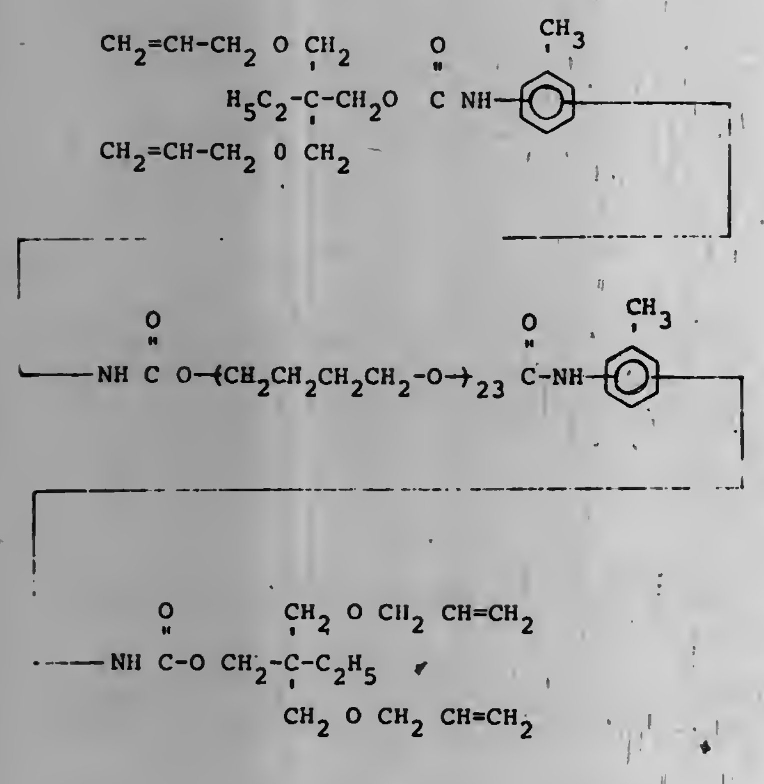
Clifton L. Kehr, Silver Spring, and Walter R. Wszolek, Sykesville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 617,801, Feb. 23, 1967, abandoned, which is a continuation-in-part of Ser. No. 567,841, July 26, 1966, abandoned. This application May 26, 1970, Ser. No. 40,738

Int. Cl. C07c ***125/06***

U.S. Cl. 260—471 C **1 Claim**

1. A terminally unsaturated polyene component having the formula:



3,887,608

PROCESS FOR PREPARING PHENYL ACETATE AND RELATED PRODUCTS

Naoya Kominami, Tokyo; Nobuhiro Tamura, Saitama, and Etsuo Yamamoto, Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 42,903, June 2, 1970, abandoned, and Ser. No. 98,889, Dec. 16, 1970, abandoned. This application Nov. 30, 1972, Ser. No. 310,894

Claims priority, application Japan, June 9, 1969, 44-44644; June 9, 1969, 44-44645; Nov. 5, 1969, 44-88113; Feb. 4, 1970, 45-9304; Nov. 17, 1969, 44-91460; Dec. 27, 1969, 44-104827; Aug. 13, 1970, 45-70419

Int. Cl. C07c ***69/14***

U.S. Cl. 260—479 R **25 Claims**

1. A process for preparing acetates of hydrocarbon aromatic compounds which comprises reacting at least one hydrocarbon aromatic compound with acetic acid and a molecular oxygen-containing gas, at a temperature between 30° and 300°C in the presence of a catalyst consisting of palladium or a compound thereof and XNO_3 in which X is hydrogen or alkali metal.

3,887,609

PROCESS FOR THE PRODUCTION OF HIGHER ALKYLACRYLATES AND METHACRYLATES

Gunter Strehlke, Rheinkamp; Wilhelm Franz, Rheinhausen, and Gunter Osterburg, Homberg, all of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed Apr. 1, 1974, Ser. No. 456,584

Claims priority, application Germany, Apr. 6, 1973, 2317226

Int. Cl. C07c ***69/54***

U.S. Cl. 260—486 R **7 Claims**

1. In a transesterification process for the production of a higher ester member selected from the group consisting of alkyl acrylate or alkyl methacrylate of low color numbers and low impurity content wherein said alkyl is of 3 to 24 carbons, wherein a lower ester selected from the group consisting of methyl acrylate and methyl methacrylate is contacted with an alkanol of from 3 to 24 carbons in the presence of a titanium alcoholate as catalyst, a polymerization inhibitor and an entraining agent for the methyl alcohol by-product, the improvement which comprises:

a contacting said lower ester with said alkanol in the presence of said titanium alcoholate represented by the formula $Ti(OR)_4$ where R is an alkyl of from 2 to 24 carbons and a polymerization inhibitor combination of 2,6-di-tert.-butyl-para-cresol and adsorptive carbon,

b. carrying out said esterification at a temperature of between 100° and 150°C. while bubbling through an oxygen-containing gas,

c. recovering said higher ester member, in said contacting step the initial mole ratio of said lower ester to said alkanol of between about 2 : 1 and 1.1 : 1, the titanium alcoholate content of between about 0.1 and 1.0 wt. percent based on 100 percent yield, the 2,6-di-tert.-butyl-para-cresol content of between 60 and 200 ppm, and the adsorptive carbon content of between about 0.1 and 0.2 wt. percent based on 100 percent yield.

3,887,610

EMULSION POLYMERIZATION OF ETHYLENE WITH CHAIN TRANSFER AGENTS TO FORM COPOLYMERS

Alfred E. Kober, Daytona Beach, Fla., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 9, 1971, Ser. No. 206,505

Int. Cl. C07c ***69/12***

U.S. Cl. 260—491 **5 Claim**

1. An emulsion polymerization process for preparing an oi soluble copolymer useful for improving the flow properties o petroleum fuel oils, said copolymer consisting essentially o about 4 to 15 molar proportions of ethylene per molar propor

tion of vinyl acetate, said copolymer having a number average molecular weight of about 3500 to 15,000, which process comprises forming an aqueous emulsified system comprising water, vinyl acetate, a water soluble free radical initiator, an emulsifier and a chain transfer agent, introducing ethylene and copolymerizing said ethylene and said vinyl acetate for about 6 to 600 minutes under ethylene pressure of 50 to 500 atomospheres, at a temperature in the range of about 60° to 120°C., and recovering said copolymer, wherein said chain transfer agent is selected from the group consisting of C_1 to C_{18} alkyl mercaptan and C_1 to C_4 chloroalkanes containing up to 4 chlorine atoms per molecule, wherein said initiator is present in an amount of 0.001 to 0.05 mole per mole of said vinyl acetate, wherein said chain transfer agent is present in the amount of 0.005 to 0.25 mole per mole of said vinyl acetate, wherein the aqueous phase is continuous, and wherein said vinyl acetate and said chain transfer agents are in the dispersed phase.

3,887,611

PROCESS FOR CONVERTING ALKYL SULTONES TO ALKENE SULFONIC ACIDS

William A. Sweeney, Larkspur, and Ralph House, San Pablo, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 215,191, Jan. 3, 1972, Pat. No. 3,845,114, which is a continuation-in-part of Ser. No. 33,948, May 1, 1970, abandoned. This application Aug. 2, 1973, Ser. No. 384,862

Int. Cl. C07c ***143/16***

U.S. Cl. 260—513 R **7 Claims**

1. A process for maximizing the alkene sulfonic acid content of a straight chain 10 to 24 carbon sulfonated olefin which comprises the steps of

a. hydrolyzing the alkyl sultone present in the sulfonated olefin to alkenesulfonic acid and hydroxyalkanesulfonic acid by contacting the sulfonated olefin with from 5 to 25 percent of water relative to the weight of the alkyl sultone at a temperature of from 100° to 200°C for a period of from about one-half hour to about 20 hours, and

b. dehydrating the product of (a) to convert the hydroxyalkanesulfonic acid produced in (a) by heating the product and distilling off the water produced by the resulting dehydration of the hydroxyalkyl sulfonic acid to alkyl sultone, and

c. hydrolyzing again as in (a).

3,887,612

PROCESS FOR PREPARING HIGH PURITY TEREPHTHALIC ACID

Motoo Shigeyasu, and Kenzo Kuihara, Ehime, both of Japan, assignors to Maruzen Oil Co., Ltd. and Matsuyama Petrochemicals Inc., Osaka, both of, Japan

Filed Apr. 26, 1972, Ser. No. 247,711

Claims priority, application Japan, Apr. 26, 1971, 46-27359

Int. Cl. C07c ***63/26***

U.S. Cl. 260—524 R **25 Claims**

1. A process for producing terephthalic acid of high purity which comprises the steps of:

a. oxidizing para-xylene in the liquid phase with molecular oxygen or a gas containing molecular oxygen in the presence of a lower aliphatic carboxylic acid as a solvent and an oxidation catalyst, and subjecting the resulting product which comprises crude terephthalic acid particles in a mother liquor comprising unreacted components and reaction by-products of the reaction to a solid-liquid separation, thereby separating crude terephthalic acid particles from said mother liquor;

b. feeding the crude terephthalic acid particles into a slurrying tank and slurrying it by addition of fresh solvent;

c. stirring the resulting slurry by continuously withdrawing a part of it from the slurrying tank and returning it into the slurry portion in said slurrying tank through a circulating pump located outside the slurrying tank to thereby reduce the average particle size of the terephthalic acid by crystal/crystal contact during said stirring; and

d. subsequently feeding the slurry into an immersion tank, immersing the slurry therein at an elevated temperature while maintaining the solvent in the liquid state, and thereafter subjecting it to solid-liquid separation to form purified terephthalic acid.

3,887,613

THERMAL PURIFICATION OF TEREPHTHALIC ACID USING GROUP I-B, II-B, VIII CATALYSTS

Jorge A. Blay, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 705,616, Feb. 15, 1968, abandoned. This application July 30, 1971, Ser. No. 167,857

Int. Cl. C07c ***63/26, 51/42***

U.S. Cl. 260—525 **3 Claims**

1. A method for improving the purity of a crude terephthalic acid containing 4-carboxybenzaldehyde as an impurity, which process consists essentially of

1. heating said crude terephthalic acid and an inert liquid medium consisting essentially of from about 0 – 75% by weight of water and from about 25 – 100% by weight of an inert organic compound selected from the group consisting of C_5 + hydrocarbons, C_2 + halohydrocarbons, carboxylic acids, hydrocarbon ethers, halohydrocarbon ethers, and mixtures thereof, and a soluble catalyst which will provide a metal selected from Group I-B, or II-B of Mendelyeev's Periodic Table to a temperature of at least 325°C, said temperature being one at which no more than about 50% of the terephthalic acid remains as a solid, the pressure being sufficient to maintain a liquid phase at temperatures below the critical temperature, said catalyst being present in an amount sufficient to provide from about 100 ppm to 6% by weight of terephthalic acid and liquid medium,

2. cooling the terephthalic acid and liquid medium so as to crystallize terephthalic acid and

3. recovering the thus crystallized, purified terephthalic acid.

3,887,614

DETERGENT COMPOSED OF HOLLOW SPHERICAL PELLETS, AND PROCESS FOR MANUFACTURING THE SAME

Rinnosuke Susuki, Tokyo; Hiroshi Hoshi, Chiba-ken; Minoru Yoshida, Tokyo; Toshisaburo Toyoda, Chiba-ken; Masayoshi Nakamura, Tokyo, and Susumu Ando, Chiba-ken, all of Japan, assignors to Raion Yush Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 94,420, Dec. 2, 1970, abandoned. This application June 21, 1973, Ser. No. 371,987

Claims priority, application Japan, Dec. 3, 1969, 44-97293

Int. Cl. C11d ***3/08, 11/00, 13/20***

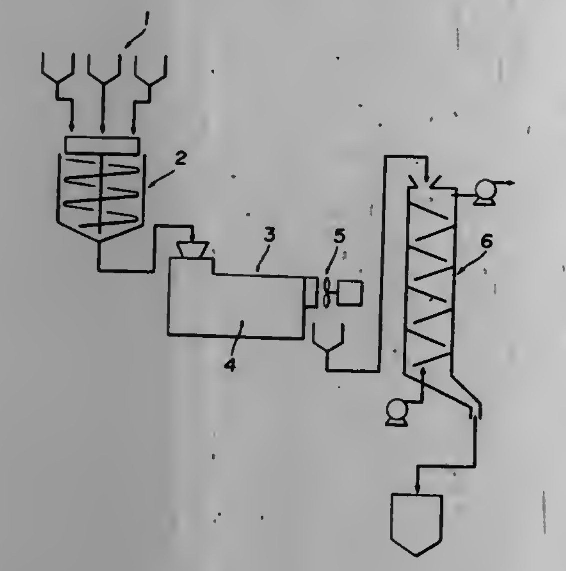
U.S. Cl. 252—531 **7 Claims**

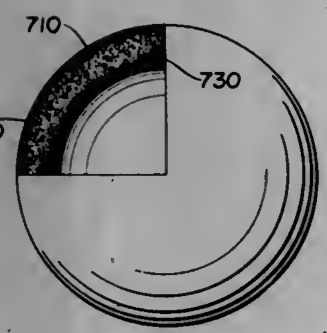
1. A process for manufacturing a detergent composed of hollow spherical pellets comprising the steps of mixing and kneading

a. 40 – 75 percent by weight of a matrix consisting of 30 – 50 percent by weight of sodium silicate ($Na_2O : SiO_2 = 1 : 2.1 – 3.1$), 15 – 30 percent by weight of a surface active agent selected from the group of organic sulfate esters and organic sulfonates, and 30 – 50 percent by weight of water, with

b. 25 – 60 percent by weight of a dispersoid material consisting substantially of inorganic builders into the form of a detergent composition having plasticity;

extruding said kneaded plastic composition through bores at a temperature of 40° to 80°C. and cutting into damp pellets having a diameter from 0.6 to 3.0 mm, and thermally drying and foaming said pellets to form said hollow spherical pellets, said drying and foaming being carried out by subjecting the pellets to a hot blast having a temperature up to 400°C. to heat said pellets to between 150° and 300°C. while rolling said pellets downward for a period of time sufficient to produce





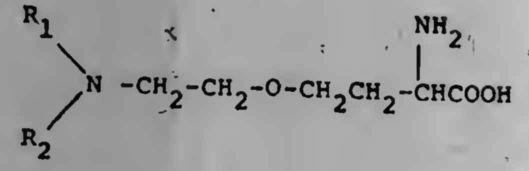
hollow spherical pellets 1 to 5 mm in diameter with a shell thickness 2 to 50 percent of the radius thereof and having an apparent specific gravity between 0.1 and 0.4.

3,887,615
NOVEL BUTANOIC ACID DERIVATIVES

Dennis Keith, Montclair, and Manfred Weigele, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 3, 1974, Ser. No. 457,340
Int. Cl. C07c *101/12*
U.S. Cl. 260—534 M **3 Claims**

1. A compound of the formula



wherein R_1 and R_2 each independently represent hydrogen or lower alkyl, or R_1 and R_2 taken together with their attached nitrogen atom form a 5- or 6-membered saturated heterocyclic ring wherein said 6-membered ring may contain an additional nitrogen atom or an oxygen atom; provided that one of R_1 or R_2 is other than hydrogen

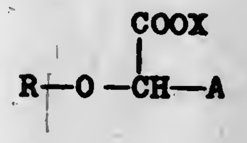
the pharmaceutically acceptable addition salts thereof, and the optical antipodes thereof.

3,887,616
HYDROXY ETHER CARBOXYLATES

Kent P. Lannert, Freeburg, Ill., assignor to Monsanto Company, St. Louis, Mo.

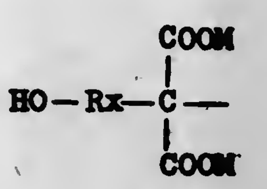
Filed Dec. 19, 1973, Ser. No. 426,158
Int. Cl. C07c *59/12*
U.S. Cl. 260—535 P **5 Claims**

1. Compounds represented by the formula



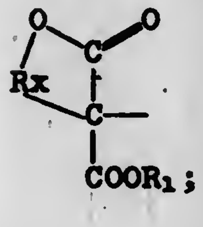
$$R-O-\overset{COOX}{\overset{|}{CH}}-A$$

wherein R is selected from the group consisting of

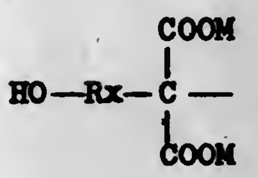


$$HO-Rx-\underset{COOM}{\underset{|}{\overset{COOM}{\overset{|}{C}}}}-$$

and

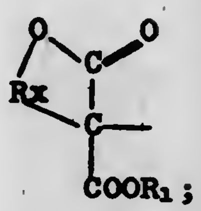


A is selected from the group consisting of hydrogen, methyl and ethyl; M is selected from the group consisting of alkali metal, ammonium, alkyl ammonium containing one to four carbon atoms and alkanol ammonium containing one to four carbon atoms; X is M when R is

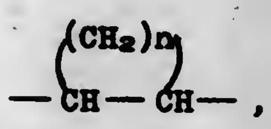


$$HO-Rx-\underset{COOM}{\underset{|}{\overset{COOM}{\overset{|}{C}}}}-$$

and X is hydrogen or an alkyl group containing from one to 20 carbon atoms when R is

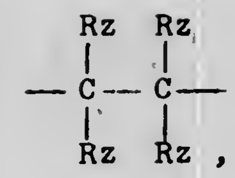


R_1 is selected from the group consisting of hydrogen and alkyl groups containing from one to 20 carbon atoms; and Rx is selected from the group consisting of



$$-\overset{(CH_2)_n}{\overbrace{CH-CH}}- ,$$

n being an integer from 4 to 10, and



$$-\underset{Rz}{\underset{|}{\overset{Rz}{\overset{|}{C}}}}-\underset{Rz}{\underset{|}{\overset{Rz}{\overset{|}{C}}}}- ,$$

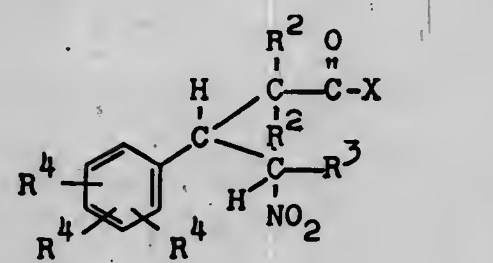
Rz being selected from the group consisting of hydrogen, alkyl, phenyl, phenyl alkyl, alkoxy alkyl, alkoxy phenyl, alkoxy phenyl alkyl and COOX, the total number of carbon atoms in Rx being from two to 22.

3,887,617
PRODUCTION OF 2-PHENYL-3-NITROBUTYRIC ACID COMPOUNDS

Dieter Seebach, Lich, and Herbert Leitz, Karlsruhe, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

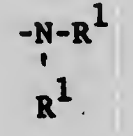
Filed June 26, 1972, Ser. No. 266,432
Claims priority, application Germany, July 9, 1971, 2134419
Int. Cl. C07c *103/02*, *67/04*
U.S. Cl. 260—559 R **9 Claims**

1. A process for the production of a 2-phenyl-3-nitrobutyric acid compound of the formula:



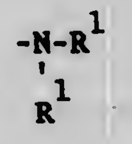
(I)

in which X is the radical



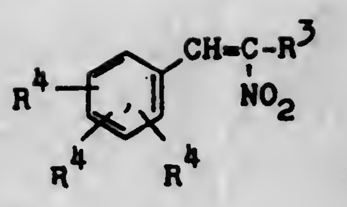
$$-\underset{R^1}{\underset{|}{N}}-R^1$$

or the radical —OR^1, the individual radicals R^1, R^2 and R^4 may be identical or different and each may be an aliphatic, araliphatic, cycloaliphatic or aromatic radical, R^3 is hydrogen or an aliphatic radical, and each of the radicals R^4 may also be hydrogen, halogen, nitro, or —OR^1 in which R^1 has the meanings given above, each of the radicals R^2 may also be hydrogen, and the two radicals R^1 in the radical



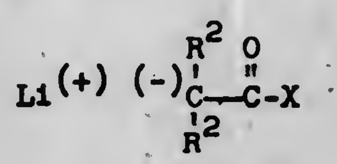
$$-\underset{R^1}{\underset{|}{N}}-R^1$$

may also form together with the adjacent nitrogen atom a heterocyclic ring, wherein a 1-phenyl-2-nitroethene of the formula:



(II)

in which R^3 and R^4 have the meanings given above is reacted at a temperature within the range from −120° to +25°C with a lithium compound of the formula:



$$Li^{(+)}\ {}^{(-)}\underset{R^2}{\underset{|}{\overset{R^2}{\overset{|}{C}}}}-\overset{O}{\overset{\|}{C}}-X \qquad (III)$$

in which X and R^2 have the meanings given above, an acid or a proton-donating acid salt is added to the reaction mixture in an amount sufficient to convert the end product (I) in the form of its lithium compound to said end product (I), and the end product (I) is isolated from the reaction mixture.

3,887,618
USE OF WEAK BASE RESINS AS CATALYSTS FOR THE METHYLOLATION OF ACRYLAMIDE

Delton William Hein, Darien, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 28, 1974, Ser. No. 446,980
Int. Cl. C07c *103/60*
U.S. Cl. 260—561 N **10 Claims**

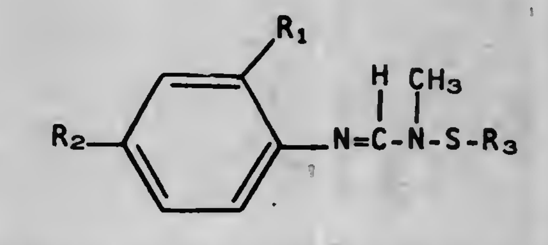
1. A continuous process for preparing a methylolacrylamide which comprises: admixing a solution of an acrylamide dissolved in an aqueous formaldehyde menstruum at a pH ranging from 6.5 – 7.5, preheating said solution at a temperatute ranging from 40°C. to 75°C., passing said preheated solution through a column packed with a weakly basic, ion-exchange resin maintained at a temperature between 40°C. and 75°C., said solution being passed through at a residence time of from one to five minutes, and recovering a N-methlolacrylamide in good yield and purity.

3,887,619
N-HYDROCARBYLSULFENYL-N-ALKYL-N'-ARYLFORMAMIDINES

Victor L. Rizzo, Almena, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed June 1, 1973, Ser. No. 366,999
Int. Cl. C07c *123/00*
U.S. Cl. 260—564 RF **17 Claims**

1. A compound selected from those of the formula:



or a salt thereof with an acid selected from the group consisting of hydrobromic acid, sulfuric acid, phosphoric acid, acetic acid, lactic acid, citric acid, succinic acid, benzoic acid and salicylic acid wherein R_1 is lower alkyl, R_2 is selected from hydrogen, halogen and lower alkyl and R_3 is selected from lower alkyl, phenyl, halogensubstituted phenyl, lower alkyl-substituted phenyl, lower alkoxy-substituted phenyl and halogen-substituted lower alkyl.

3,887,620

N-DIALKYLPHOSPHINYLALKYL PHENOXYANILINES

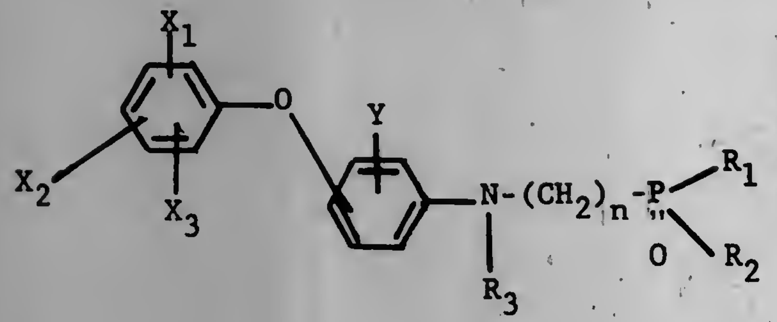
Edward J. Glamkowski, Warren; Joseph T. Strupczewski, Piscataway, both of N.J., and Erhard H. Wolf, Hofheim/-Taunus, Germany, assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed June 5, 1973, Ser. No. 367,108

Int. Cl. C07c *93/14, 103/10, 103/30*

U.S. Cl. 260—571 **8 Claims**

1. A compound of the formula



wherein

R_1 and R_2 are alkyl of 1 to 4 carbon atoms,
n is an integer from 1 to 4,
R_3 is hydrogen, or aralkyl of 7 or 8 carbon atoms,
X_1, X_2 and X_3 are hydrogen, halogen, trifluoromethyl, phenyl, alkyl of 1 to 4 carbon atoms, cyclohexyl, alkoxy of 1 to 4 carbon atoms, or dialkylamino of 1 to 4 carbon atoms in each alkyl group, and Y is hydrogen, methyl or chloro, and the pharmaceutically acceptable salts thereof.

3,887,621

MODIFIED POLYMERS AS PETROLEUM ADDITIVES

Perry Polss, Wilmington, Del., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

Filed Apr. 9, 1973, Ser. No. 349,304

Int. Cl. C07c *87/04*

U.S. Cl. 260—583 R **10 Claims**

1. A hydrocarbon fuel-~~soluble~~ reaction product prepared by the process of

- i. reacting an olefin polymer, selected from C_3, C_4 and C_3/C_4 olefin polymers having a molecular weight in the range of about 500 to 2,500, and containing at least one ethylenic unsaturation, with at least one mole of nitrosyl chloride per mole of the ethylenic unsaturation, at a temperature of from about −25°C. to 50°C., and introducing into the polymer from 75 to 100 percent of the theoretical amount of one chemically bound nitrogen per ethylenic unsaturation;
- ii. heating the product of (i) at about 60°C. to 100°C. until it is free of substantially all unreacted nitrosyl chloride; and
- iii. reacting the product of (ii) with an aliphatic hydrocarbon primary or secondary amine having about 4 to 20 carbon atoms, at a temperature of about 60°C. to 100°C., the amine being used at about the molar equivalent of ethylenic unsaturation in the olefin polymer reactant of (i), until cessation of water evolution.

3,887,622

PROCESS FOR THE PREPARATION OF SESQUITERPENE KETONES

Harmannus Boelens, Huizen, and Petrus C. Traas, Naarden, both of Netherlands, assignors to Naarden International NV, Naarden-Bussum, Netherlands

Filed July 17, 1973, Ser. No. 380,054

Claims priority, application United Kingdom, July 20, 1972, 33960/72

Int. Cl. C07c *45/04*

U.S. Cl. 260—586 P **3 Claims**

1. A process for the preparation of sesquiterpene ketones comprising reacting at a temperature of 40° to 100°C. for a period of 6 to 12 hours 1 mol of sesquiterpene hydrocarbon having one olefinic linkage in an endocyclic position selected from the group consisting cedrene, isolongifolene and thuyopsene with 1.3 – 1.5 mols of hydrogen peroxide, having a concentration of from 20 –50% by weight in the presence of from 120 –200 mol % of a lower alkyl formate.

3,887,623

METHOD FOR PREPARING DIVINYL SULPHIDE

Boris Alexandrovich Trofimov, ulitsa Lermontova, 321a, kv. 32, and Svetlana Viktorovna Amosova, ulitsa Dekabrskikh sobyty, 105 "B", kv. 43, both of Irkutsk, U.S.S.R.

Filed Jan. 2, 1973, Ser. No. 321,055

Int. Cl. C07c *149/10*

U.S. Cl. 260—609 B **9 Claims**

1. A method for preparing divinyl sulphide, consisting essentially in reacting, in stoichiometric amounts, an alkali metal sulphide and acetylene in a suitable solvent medium comprising an aqueous polar aprotic solvent, at a temperature of from room temperature to 170°C.

3,887,624

VINYLIDENE ALCOHOL COMPOSITIONS

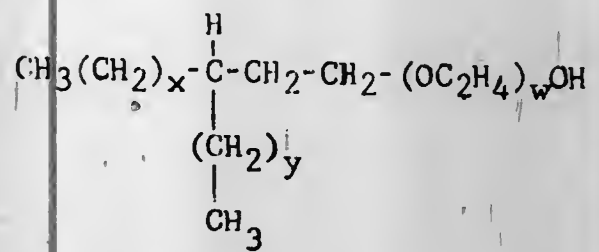
Robert M. Gipson; Floyd E. Bentley, and John G. Milligan, all of Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

Filed June 7, 1972, Ser. No. 260,545

Int. Cl. C07c *43/00, 43/04*

U.S. Cl. 260—615 B **4 Claims**

1. A vinylidene alcohol ethoxylate composition represented by the formula:



$$CH_3(CH_2)_x-\overset{H}{\underset{\substack{(CH_2)_y\\ CH_3}}{C}}-CH_2-CH_2-(OC_2H_4)_wOH$$

wherein, individually, *x* and *y* are numbers from 1 to 15 and the sum of *x* and *y* is a number in the range of 6 to 16 and wherein *w* is a number in the range of 7 to 15.

3,887,625

CYCLIC UNSATURATED ALCOHOLS

Karl-Heinrich Schulte-Elte, Onex, Geneva, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

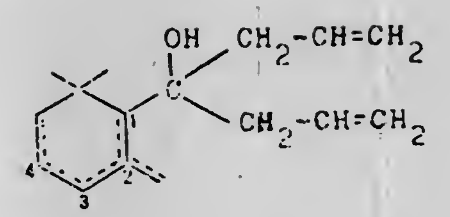
Filed Jan. 29, 1973, Ser. No. 327,842

Claims priority, application Switzerland, Feb. 3, 1972, 1618/72

Int. Cl. C07c *33/02*

U.S. Cl. 260—617 R **6 Claims**

1. Compounds having the formula



IIa

containing either a double bond in the 1-, (exo- or endocyclic) 2-, 3- or 4-position, or two conjugated double bonds in the 1- and 3- or (exocyclic) 2- and 3-positions, or two non-conjugated double bonds in the 1- and 4-positions of the ring.

3,887,626

OXIDATION OF 2-CHLOROBUTENE TO CHLOROPRENE

Abraham Nathan Kurtz, Charleston, W. Va., and Melvin Lee Farmer, Bangkok, Thailand, assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 6, 1973, Ser. No. 413,316

Int. Cl. C07c *17/00, 21/20*

U.S. Cl. 260—655 **6 Claims**

1. A process for the production of chloroprene which comprises introducing a feed mixture consisting essentially of oxygen and at least one of 2-chloro-2-butene and 2-chloro-1-butene, said feed mixture being free of hydrogen chloride, into a reaction zone containing a catalyst selected from the group consisting of magnesium chloride, rare earth metal chloride, and vanadium pentoxide, and maintaining said feed mixture in said reaction zone for a period of time and at an elevated temperature sufficient to produce chloroprene, said temperature being within the range of from about 450° to about 600°C.

3,887,627

PREPARATION OF UNSATURATED ALCOHOLS AND ETHERS

Michael G. Romanelli, New York, N.Y., assignor to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 113,591, Feb. 8, 1971, Pat. No. 3,769,352, which is a continuation-in-part of Ser. No. 808,673, March 19, 1969, Pat. No. 3,670,032. This application June 18, 1973, Ser. No. 370,722

Int. Cl. C07c *29/00*

U.S. Cl. 260—632 R **5 Claims**

1. A process for the formation of unsaturated alcohols which comprises contacting in the liquid phase a solution of a C_4 to C_8 acyclic aliphatic conjugated diolefin and water, said solution being free of dissolved oxygen, together with a solvent for said conjugated diolefin and water, said solvent to be selected from the group consisting of isopropanol, t-butanol and tetrahydrofuran, in the presence of a catalyst system comprised of a zero valent palladium material, selected from the group consisting of tetrakis (triphenylphosphine) palladium, tetrakis (tribenzylphosphine) palladium, tetrakis (diphenylalkylphosphine) palladium, tetrakis (phenyldialkylphosphine) palladium, tetrakis (trialkylphosphine) palladium, and a basic cocatalyst selected from the group consisting of tetralkyl and trialkylaralkyl ammonium hydroxides and alkoxides having from 4 to 20 carbon atoms at a temperature ranging from 0° to 160°C.

3,887,628

METHYLENE CHLORIDE STABILIZED WITH ORGANIC EPOXIDES

Norman L. Beckers, Chardon, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Feb. 23, 1973, Ser. No. 335,363

Int. Cl. C07c *17/40, 17/42*

U.S. Cl. 260—652.5 R **2 Claims**

1. A stabilized methylene chloride composition consisting essentially of methylene chloride and stabilizing amounts of from about 0.05 to about 2.0 percent by weight of the methylene chloride of each of butylene oxide and propylene oxide.

3,887,629

PURIFICATION OF FLUOROCARBONS

George B. Fozzard, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 1, 1973, Ser. No. 402,407

Int. Cl. C07c *17/38*

U.S. Cl. 260—653 **6 Claims**

1. A process for obtaining a high purity perfluoroalkane containing from 3 to 10 carbon atoms from a mixture thereof with a corresponding alkane which comprises extracting the mixture in a liquid phase at a temperature below about +20° C with toluene or xylene and subjecting the resulting raffinate to distillation and recovering from said distillation a perfluoroalkane of high purity.

3,887,630

ISOMERIZATION OF ALKYL AROMATIC HYDROCARBONS

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Feb. 4, 1974, Ser. No. 439,578

Int. Cl. C07c *15/02*

U.S. Cl. 260—668 A **10 Claims**

1. A process for the isomerization of alkyl aromatic hydrocarbons which comprises subjecting such hydrocarbon, or non-equilibrium mixtures thereof, to isomerization conditions in contact with a catalyst comprising as its essential active ingredient a hydrothermally stable Y zeolite prepared by the steps of:

1. subjecting an ammonium-sodium Y zeolite containing between about 1–5 weight-percent Na_2O to calcination in the presence of steam at temperatures above about 900°F but below the temperature at which appreciable thermal destruction of crystallinity occurs;
2. subjecting the resulting product to further ammonium ion exchange to replace at least about 25 percent of the zeolitic sodium ions with ammonium ions; and
3. calcining the resulting product at a temperature between about 700° and 1,200°F for a time sufficient to effect deammoniation without substantial dehydroxylation.

3,887,631

OXIDATIVE DEHYDROGENATION OF HYDROCARBONS

Roberta Yaffe, Fishkill, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed May 14, 1973, Ser. No. 359,953

Int. Cl. C07c *5/18*

U.S. Cl. 260—680 E **6 Claims**

1. The method of preparing butadiene from butene which comprises

contacting said butene in vapor phase in the presence of oxygen with a catalyst consisting essentially of

$$a\,CoO.\,b\,MoO_3\,.\,c\,B_2O_3$$

wherein *a* is 0.75–1.25, *b* is 0.75–1.25, and *c* is 0.8–2;

maintaining said butene in contact with said catalyst for 0.5–7 seconds at 440°C–510°C thereby forming effluent gas containing butadiene; and

recovering said effluent gas containing said butadiene.

3,887,632

PROCESS FOR PURIFYING DIENE HYDROCARBONS FROM ACETYLENE HYDROCARBON CONTAMINANTS

Alexandr Grigorievich Liakumovich, Prospekt Lenina, 23, kv. 4; Nina Vasilievna Zakharova, ulitsa Khudaiberdina, 97, kv. 16; Rashid Idrisovich Khamidullin, Prospekt Lenina, 23, kv. 4, all of Sterlitamak Bashkirskoi, and Vladimir Mikhailovich Zakrevsky, ulitsa Ushakova, 40a, kv. 53, Tolyatti Kuibyshevskoi oblasti, all of U.S.S.R.

Filed Oct. 11, 1972, Ser. No. 296,648
Int. Cl. C07c *5/16, 7/00*
U.S. Cl. 260—681.5 R **4 Claims**

1. In a process for purifying diene hydrocarbons from acetylenic hydrocarbons contaminants comprising hydrogenating said acetylenic hydrocarbons with hydrogen over a catalyst which has been pre-activated with hydrogen, the improvement comprising washing said pre-activated catalyst with a saturated liquid hydrocarbon after the preactivation with hydrogen and prior to its use in hydrogenation of the acetylenic hydrocarbons.

3,887,633

POLYMER OILS AND PROCESS FOR PREPARING SAME

Tadahiro Go, and Motoyuki Yamato, both of Kawasaki, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Aug. 6, 1973, Ser. No. 385,897
Claims priority, application Japan, Aug. 16, 1972, 47-81952
Int. Cl.² C07C *5/02*
U.S. Cl. 260—683.9 **10 Claims**

1. A process for preparing a polymer oil of pour point of not higher than −30°C, a flash point of not lower than 180°C, a specific gravity of 0.92 – 0.94, an acid value of not more than 0.02mgKOH/g, a saponification value of not more than 0.02mgKOH/g, a Hazen number of not more than 50, a number average molecular weight of 300 – 1,000, and an iodine number of not more than 60 comprising the steps of:

polymerizing a monomer containing at least 80 percent of 1,3-pentadiene at temperatures of from −30°C to 100°C in the presence of a homogenizable Friedel-Crafts type catalyst to produce a liquid polymer having a number average molecular weight of 300 – 1,000 and an iodine number of not less than 250 wherein at least 70 percent of the pentadiene units is of trans structure, and then hydrogenating the thus-produced liquid polymer to the extent that its iodine number is decreased to not more than 60 as determined by Wijs method, thereby obtaining said polymer oil.

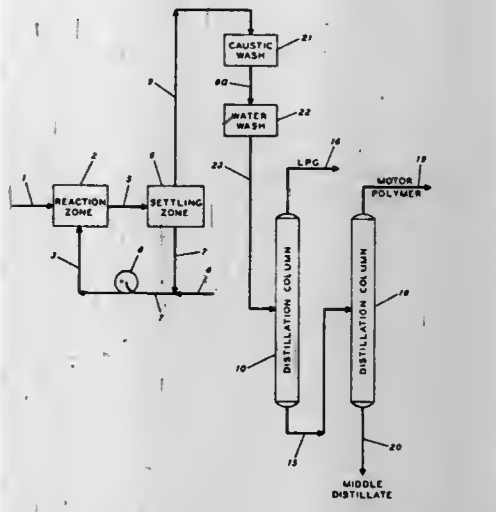
3,887,634

LIQUID PHOSPHORIC ACID CATALYZED POLYMERIZATION PROCESS

Mack F. Hughes, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 23, 1973, Ser. No. 418,631
Int. Cl. C07c *3/16*
U.S. Cl. 260—683.15 C **3 Claims**

1. In the startup of a process for polymerizing a feed of propylene, butylene, or mixtures thereof, by contacting the feed with a liquid phosphoric acid catalyst in a reaction zone at a temperature between about 200° and 350° F. and a pressure sufficient to maintain liquid phase, thereby obtaining a reaction zone effluent comprising hydrocarbons within the range of C_6 to C_{20} and phosphoric acid; removing the acid from the hydrocarbons in a settling zone; and returning the acid to the reaction zone, the improvement which comprises maintaining the reaction zone at a temperature of about 20° to 125° F. higher, during the first 10 to 100 hours of startup with fresh acid catalyst, than is maintained in steady-state operation after the catalyst has attained full activity.

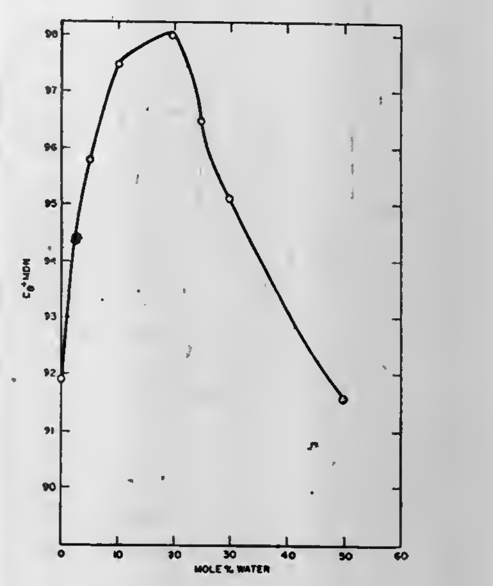


3,887,635

ALKYLATION PROCESS UTILIZING HALOSULFURIC OR TRIHALOMETHYLSULFONIC ACID WITH A CATALYST MODERATOR

Paul T. Parker, Baton Rouge, La., and Ivan Mayer, Summit, N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 201,389, Nov. 23, 1971, abandoned. This application Aug. 27, 1973, Ser. No. 391,864
Int. Cl. C07c *3/54*
U.S. Cl. 260—683.47 **33 Claims**



1. An alkylation process comprising introducing a paraffin feed and an olefin feed into an alkylation zone and contacting said feeds therein, at alkylation conditions, with a catalyst formed from a strong acid selected from the group consisting of halosulfuric acid, trihalomethanesulfonic acid and mixtures thereof, and the addition of about 5 to 100 mole %, based on acid, of (1) water, (2) a C_1—C_7 saturated aliphatic monohydroxy alcohol or (3) a mixture of water and said alcohol.

3,887,636

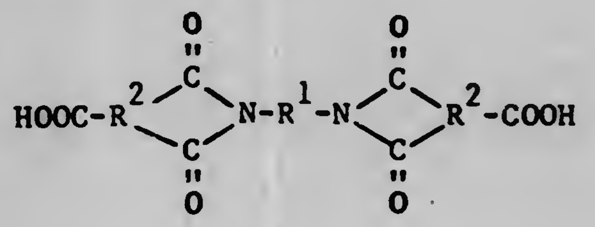
ORGANO(BLOCK-AMIDE-SILOXANE)-(BLOCK-AMIDE-IMIDE) POLYMERS

Peter C. Juliano, Scotia; Tyrone D. Mitchell, Troy, both of N.Y., and Simon W. Kantor, Ridgewood, N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 5, 1973, Ser. No. 422,024
Int. Cl. C08g *41/04, 47/10*
U.S. Cl. 260—824 R **19 Claims**

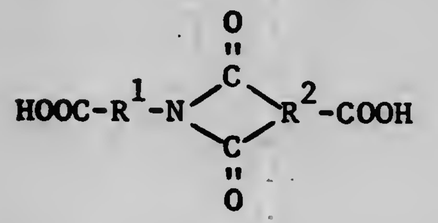
1. A process which comprises effecting a reaction between:
1. an organodicarboxyterminated imide of the formula selected from the group consisting of

A.



and

B.



or mixtures thereof, wherein R^1 is selected from the group consisting of substituted and unsubstituted divalent hydrocarbon radicals, and combinations thereof, and each R^2 is a trivalent aromatic hydrocarbon radical;

2. an organodicarboxyterminated polysiloxane of the formula

$$(HOOCR^3)_d(R^4)_e(R^5)_fSiO_{[4-(d+e+f)]/2}$$

wherein each R^3 is an alkylene radical of from about 2 to about 12 carbon atoms, R^4 and R^5 are monovalent hydrocarbon radicals, d is equal to from 0.001 to 1, inclusive, e is equal to from 0 to 2, inclusive, f is equal to from 0 to 3, inclusive, and the sum of d, e and f is equal to from 1.5 to 3, inclusive and;

3. an organodiisocyanate of the formula

$$O=C=N—R^6—N=C=O$$

wherein R^6 is selected from the group consisting of divalent hydrocarbon radicals which contain at least 3 carbon atoms and which are free from aliphatic unsaturation.

3,887,637

AMINOTRIAZINE-ALDEHYDE RESINS AND PROCESS FOR PREPARATION

Phillip A. Waitkus, Sheboygan, Wis., assignor to Plastics Engineering Company, Sheboygan, Wis.

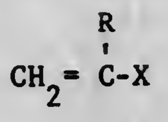
Continuation-in-part of Ser. No. 232,964, March 18, 1972, Pat. No. 3,839,289. This application Apr. 8, 1974, Ser. No. 458,835
Int. Cl. C08g *9/24, 9/30, 9/32*
U.S. Cl. 260—828 **21 Claims**

1. A process for producing and curing a molding resin composition of improved curing and electrical resistance characteristics comprising the steps of reacting in a liquid medium:

a. a triazine compound selected from the class consisting of melamine and benzoguanamine;

b. an aldehyde selected from the class consisting of formaldehyde, acetaldehyde, chloracetaldehyde and furfuraldehyde;

c. a vinyl compound having the formula

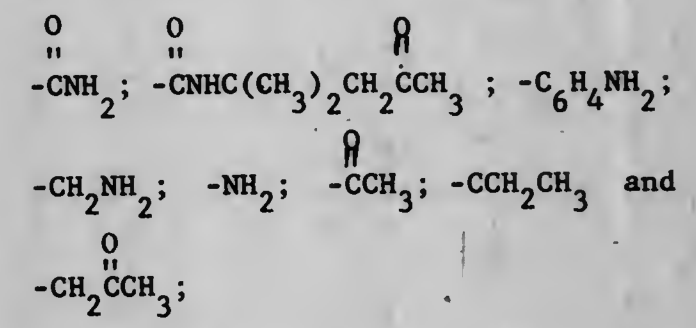


$$CH_2=\overset{\overset{R}{|}}{C}-X$$

wherein

R is selected from the class consisting of hydrogen and an alkyl group of 1–4 carbon atoms, and

X is a radical selected from the class consisting of:



$$-\overset{\overset{O}{\|}}{C}NH_2;\ -\overset{\overset{O}{\|}}{C}NHC(CH_3)_2CH_2\overset{\overset{O}{\|}}{C}CH_3\ ;\ -C_6H_4NH_2;$$
$$-CH_2NH_2;\ \ -NH_2;\ \ -\overset{\overset{O}{\|}}{C}CH_3;\ -CCH_2CH_3\ \text{ and }$$
$$-CH_2\overset{\overset{O}{\|}}{C}CH_3;$$

the proportion of said vinyl compound being 0.05–100 moles per mole of said triazine compound, and the proportion of said aldehyde being 0.5–6 moles per mole of said triazine compound with an additional 0.5–5 moles of aldehyde per mole of said vinyl compound;

said reaction being conducted at a temperature of 60°–100°C. and a pH in the range of 7–12 and the water being eventually removed from the reaction mass by heating under reduced pressure until the resin product forms a brittle solid mass upon cooling; admixing said resin product with 5–99 percent by weight of an unsaturated polyester prepared by the condensation of a glycol with a dibasic carboxylic acid, at least 25% of the dibasic acid component being an unsaturated aliphatic dibasic acid; and thereafter curing the resultant resin mixture at a temperature of 25°–400°F. in intimate mixture with 0.05–10 percent by weight of a peroxy or azo free-radical generating catalyst.

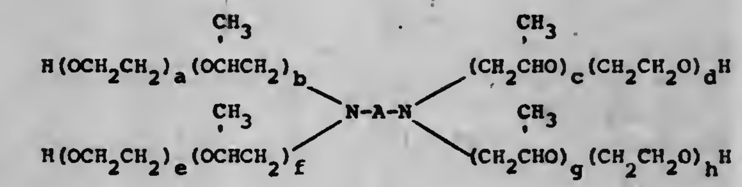
3,887,638

ANTISTATIC FIBER CONTAINING CHAIN-EXTENDED TETROLS BASED ON DIAMINES

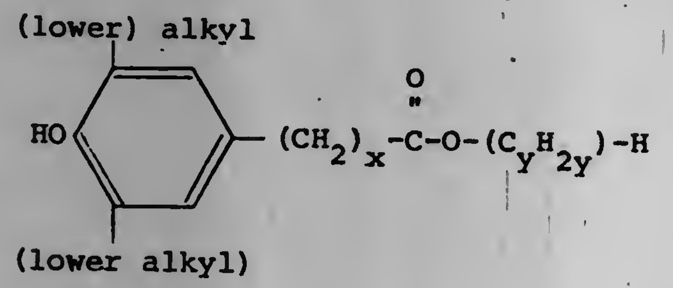
Lamberto Crescentini, and Rodney Lee Wells, both of Chester, Va., assignors to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 271,316, July 12, 1972. This application Aug. 5, 1974, Ser. No. 494,421
Int. Cl.² C08G *41/04*
U.S. Cl. 260—830 P **10 Claims**

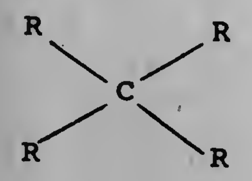
1. In a process for the formation of an antistatic polyamide fiber from a fiber-forming polyamide polymer containing about 1 to 12% by weight of an antistatic compound which is a chainextended reaction product of a tetrol compound represented by the formula:



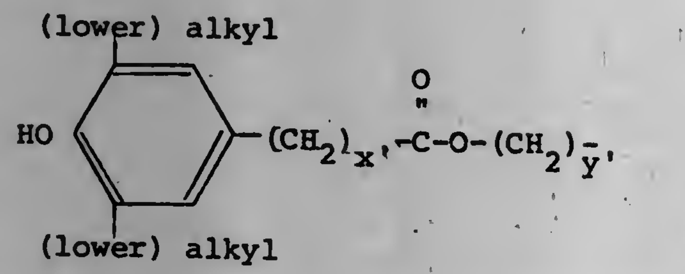
where *a*, *b*, *c*, *d*, *e*, *f*, *g*, and *h* are each a whole number and A is a difunctional radical from a hydrocarbon containing 1 to 13 carbon atoms, said tetrol compound having a molecular weight between about 4,000 and about 50,000 and at least one compound selected from the group consisting of diepoxides, by extruding the molten polymer through an orifice into a quenching medium and thereafter stretching the resulting filaments, the improvement comprising dissolving in the extrudate prior to extrusion at least 0.1% by weight, based on the weight of the antistatic compound, of a phenol compound selected from the group consisting of:



in which x has a value of from 1 to 6 and y has a value of from 6 to 30; and



in which R is



wherein x' has a value from 1 to 6 and y' has a value of 1 to 6.

3,887,639
THERMOPLASTIC POLYBLENDS COMPRISING PVC-ACRYLATE AND POLYACRYLATE-VC COPOLYMERS AND BLENDS THEREOF WITH S-A PLASTICS

Adam F. Kopacki, Westwood, N.J.; John H. Deatcher, Lake Peekskill; Kenneth L. Eilers, Irvington, N.Y., assignor to Stauffer Chemical Co., Dobbs Ferry, N.Y. 10522

Filed Aug. 5, 1974, Ser. No. 494,643

Int. Cl. C08f ***41/12*****, C08f** ***29/24***

U.S. Cl. 260—876 R **29 Claims**

1. A thermoplastic polyblend having improved impact resistance comprising:
- (a) about 20 to 90% by weight of a rigid styrene acrylonitrile plastic;
- (b) about 10 to 60% by weight of a vinyl chloride-alkyl acrylate copolymer prepared by suspension polymerizing vinyl chloride in the presence of an alkyl acrylate polymer;
- (c) about 1 to 30% of an alkyl methacrylate-vinyl chloride interpolymer prepared by polymerizing an alkyl methacrylate in the presence of a polyvinyl chloride suspension polymer, and
- (d) about 0 to 40% by weight of polyvinyl chloride.

3,887,640
EXTRUSION COATING COMPOSITION CONTAINING ETHYLENEPROPYLENE BLOCK COPOLYMER AND POLYETHYLENE HAVING A MIR OF AT LEAST 50

Juan C. Diaz, and Ray Edwards, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 15, 1972, Ser. No. 280,934

Int. Cl.² C08F ***15/00, 19/00***

U.S. Cl. 260—876 B **10 Claims**

1. An extrusion coating composition capable of providing extrusion coatings of less than 0.6 mil thickness characterized by good hardness, scuff resistance, impact strength, pinhole resistance and heat sealing properties consisting of a polymer blend consisting essentially of 40 to 99 percent, by weight, of an ethylene/propylene block copolymer containing at least 80 weight percent polymerized propylene having a flow rate of about 15 dg/minute to 100 dg/minute as determined by ASTM D-1238-62T and 1 to 60 percent, by weight, of polyethylene having a MIR of at least 50 and a density greater than 0.912.

3,887,641
METHOD FOR PRODUCING RESIN FOR PRINTING INK

Shozo Tsuchiya; Hideo Hayashi, and Hisatake Sato, all of Yokohama, Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Dec. 3, 1973, Ser. No. 421,040

Claims priority, application Japan, Dec. 9, 1972, 47-123034

Int. Cl. C08g ***37/20***

U.S. Cl. 260—845 **4 Claims**

1. A method for producing a resin for printing ink, which comprises reacting a cyclopentadiene resin obtained by heat-polymerizing at a temperature of 250°–350°C cyclopentadiene, dicyclopentadiene or an alkyl-substituted derivative thereof in the absence of a catalyst with an unsaturated carboxylic acid or its anhydride to form an acid-modified resin wherein the amount of the unsaturated carboxylic acid or its anhydride is 0.01 to 0.5 mol per 100 g of the cyclopentadiene resin, and reacting the acid-modified resin with a resol-type phenol-formaldehyde resin at a temperature of 100° to 250°C., the amount of the phenol-formaldehyde resin being at least 5 g per 100 g of the acid-modified resin, thereby to form a resin having a softening point of at least 100°C.

3,887,642
POWDERED THERMOSETTING COMPOSITIONS

André Vandersmissen, Brussels, Belgium, assignor to UCB, Brussels, Belgium

Filed Oct. 19, 1973, Ser. No. 407,985

Claims priority, application United Kingdom, Oct. 20, 1972, 48337/72

Int. Cl. C08g ***37/34, 37/32***

U.S. Cl. 260—850 **23 Claims**

1. A powdered thermosetting composition comprising

I. 50.01 to 149.99 parts by weight of a resinous constituent selected from the group consisting of
  1. a mixture of a linear or branched chain saturated resin (A) containing free hydroxyl and/or carboxyl groups and an aminoplast resin (B) selected from the group consisting of polyamine-aldehyde resins, polyamide-aldehyde resins, etherified polyamine-aldehyde resins and etherified polyamide-aldehyde resins, and
  2. a copolymer of a vinyl and/or an acrylic compound with a copolymerizable compound having free or alkoxylated methylolamide groups,

II. 0.01 to 10 parts by weight of a polycondensation catalyst (C) consisting of at least one monoester of a halogenated aromatic polycarboxylic acid derived from a monohydric alcohol selected from the group consisting of aliphatic alcohols having 1 to 18 carbon atoms, cycloaliphatic alcohols having 5 to 7 carbon atoms, araliphatic alcohols having 6 to 8 carbon atoms, aromatic alcohols having 6 to 9 carbon atoms and heterocyclic alcohols having 5 to 8 carbon atoms and from a halogenated aromatic polycarboxylic acid containing at least one halogen selected from the group consisting of fluorine, chlorine and bromine and

III. 0.01 to 90 parts by weight of auxiliary agents (D) for coating compositions.

3,887,643
DIENE-LACTAM BLOCK COPOLYMERS

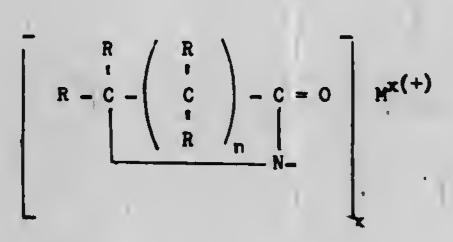
Charles M. Selman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 150,816, June 7, 1971, abandoned. This application Apr. 27, 1973, Ser. No. 355,002

Int. Cl. C08g ***41/04***

U.S. Cl. 260—857 D **7 Claims**

1. A method of producing a diene-lactam copolymer which comprises:
- a. reacting a metal salt of a lactam with a halogen-substituted isocyanate to produce a first reaction product, said metal salt having the formula



wherein R is selected from the group consisting of hydrogen, alkyl, cycloalkyl and aryl radicals or combinations thereof having from 1 to 10 carbon atoms and in which the total number of carbon atoms in such substituent groups is not greater than about 12; M is a metal selected from Group IA or IIA of the Periodic Table; and x is an integer equal to the valence of M; and in which said halogen-substituted isocyanate has the general formula X — R' — NCO wherein X is chlorine, bromine or iodine; and R' is a divalent hydrocarbon radical having from 4 to 12 carbon atoms; and n is an integer having a value of 1, 2, 4, 5 and 6;
- b. reacting said first reaction product with a lithium-containing polymer to produce a second reaction product, said lithium-containing polymer comprising a lithium-containing polymer of a conjugated diene having 4 to 12 carbon atoms, or a polymer of a conjugated diene and a vinyl-substituted aromatic compound having 8 to 20 carbon atoms; and
- c. reacting said second reaction product with a lactam monomer to produce a diene-lactam copolymer.

3,887,644
ANTISTATIC POLYAMIDE FIBER

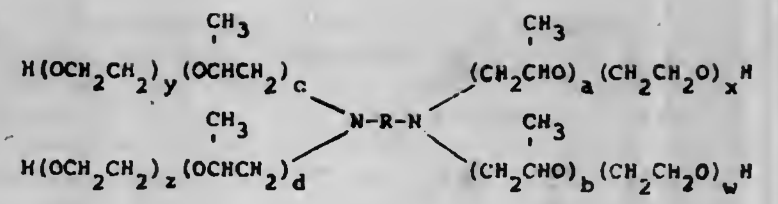
Rodney Lee Wells, Chester, Va., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Oct. 18, 1973, Ser. No. 407,680. The portion of the term of this patent subsequent to Nov. 13, 1990, has been disclaimed.

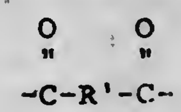
Int. Cl. C08G ***41/04***

U.S. Cl. 260—857 PG **10 Claims**

1. In a process for the formation of an antistatic polyamide fiber from a fiber-forming polyamide polymer containing about 1% to 12% by weight of an antistatic compound which is a chain-extended reaction product of a tetrol compound represented by the formula:

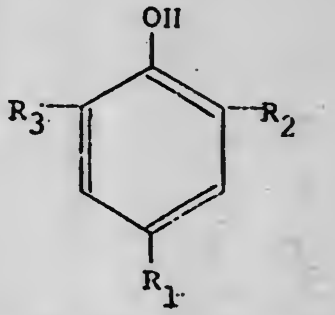


where a, b, c, d, w, x, y and z are each a whole number and R is a difunctional radical from a hydrocarbon containing 1 to 13 carbon atoms, said tetrol compound having a molecular weight between about 4,000 and about 50,000, and at least one compound selected from the group consisting of compounds which yield the following divalent radical:



$$-\overset{O}{\overset{\parallel}{C}}-R'-\overset{O}{\overset{\parallel}{C}}-$$

where R' is a difunctional radical from a hydrocarbon containing 1 to 30 carbon atoms, by extruding the molten polymer through an orifice into a quenching medium and thereafter stretching the resulting filaments, the improvement comprising dissolving in the extrudate prior to extrusion at least 0.5% by weight, based on the weight of the antistatic compound, of a phenol compound of the formula:



where R_1 is hydrogen or an alkyl radical containing 1 to 12 carbon atoms, R_2 is an alkyl radical containing 4 to 18 carbon atoms, and R_3 is an alkyl radical containing 4 to 18 carbon atoms.

3,887,645
COPOLYMERIZATE OF UNSATURATED POLYESTER, UNSATURATED MONOMER AND CARBOXY CONTAINING MONOMER

Jose Schwarcz, Vicente Lopez, Argentina, assignor to S. A. Alba, Buenos Aires, Argentina

Filed Jan. 2, 1974, Ser. No. 429,797

Claims priority, application Argentina, Jan. 4, 1973, 245991

Int. Cl. C08f ***21/00, 21/02***

U.S. Cl. 260—861 **4 Claims**

1. A water-dilutable film-forming material that is a copolymer formed by the addition polymerization of (*a*) at least one neutral vinyl monomer of the formula $CH_2{=}CR_1R_2$, where R_1 is hydrogen or a methyl group and R_2 is a phenyl or a $COOR_3$ residue, where R_3 is a straight or branched chain alkyl group with 1 to 8 carbon atoms; (*b*) at least one acidic vinyl monomer of formula $R_4CH{=}CR_1COOH$, where R_1 is hydrogen or a methyl group and R_4 is hydrogen or a carboxyl group (or its internal anhydride) and (*c*) an unsaturated alicyclic dibasic acid (or its anhydride) of the class of the partially hydrogenated phthalic acids, and α,β-unsaturated acyclic dibasic acid (or its anhydride) and at least one alcohol with one or more esterifiable hydroxyl groups and in which the alicylic unsaturated acid comprises from 80 to 100% by weight, and the acyclic α,β-unsaturated acid from 0 to 20% by weight of the total dibasic acids and the molar ratio of the hydroxyl groups

provided by the alcohols to the carboxyl groups provided by the dibasic acids (or their anhydrides) has a value between 1.05 and 1.4, the copolymer containing between 30 and 80% by weight of a), between 3 and 20% by weight of (*b*) and between 10 and 67% by weight of (*c*), the copolymerization of (*a*), (*b*) and (*c*) being effected by free radicals and the copolymer being solubilized in water through partial neutralization of its free carboxyl groups with a base dissolved in water up to a pH value between about 7.5 and 10.

3,887,646

RESINOUS COMPOSITIONS CONTAINING POLYPHENYLENE ETHER, STYRENE RUBBER AND RUBBER-MODIFIED CHLOROSTYRENE POLYMER

Eiichi Yonemitsu, Kashiwa; Akitoshi Sugio, Tokyo; Masanobu Masu, Tokyo; Masaharu Kimura, Tokyo, and Seiichi Kamiyama, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 30, 1972, Ser. No. 301,729

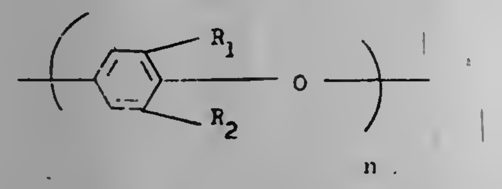
Claims priority, application Japan, Nov. 5, 1971, 46-87588

Int. Cl. C08f *15/00, 19/00*

U.S. Cl. 260—876 R **6 Claims**

1. A thermoplastic blended composition comprising

a. a polyphenylene ether having recurring units of the formula



wherein R_1 and R_2, which may be the same or different, are each selected from the group consisting of methyl and ethyl and *n* is an integer representing the degree of polymerization,

b. high styrene rubber composed of units derived from styrene and units derived from at least one conjugated diene monomer selected from the group consisting of butadiene, isoprene and chloroprene, obtained by copolymerization of styrene and the conjugated diene monomer, and in which the units derived from styrene amount to 40 to 60 percent by weight, and

c. a rubber-modified chlorostyrene polymer composed of units derived from at least one conjugated diene monomer selected from the group consisting of butadiene, isoprene and chloroprene and units derived from chlorostyrene, obtained by polymerization of a chlorostyrene monomer in the presence of a rubber component, and in which the units derived from the conjugated diene monomer amount to 2 15 percent by weight,

the proportions of components (*a*), (*b*) and (*c*) being in the ranges of 40 to 60 percent, 5 to 30 percent and 20 to 50 percent, by weight, respectively.

3,887,647

THERMOPLASTIC BLENDED RESINOUS COMPOSITION CONTAINING POLYPHENYLENE ETHER

Eiichi Yonemitsu, Kashiwa; Akitoshi Sugio; Seiichi Kamiyama; Masanobu Masu, and Masaharu Kimura, all of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 2, 1973, Ser. No. 402,820

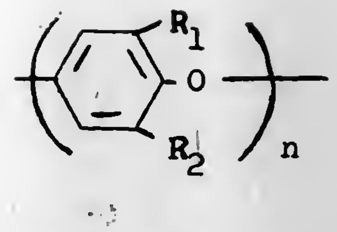
Claims priority, application Japan, Oct. 4, 1972, 47-98982

Int. Cl. C08f *15/00, 19/00*

U.S. Cl. 260—876 B **6 Claims**

1. A thermoplastic blended resinous composition comprising

a. 10 to 40 percent by weight of a polyphenylene ether having recurring units of the formula



wherein R_1 and R_2 are the same or different, and each represents a methyl or ethyl group, and *n* is a positive integer of at least 85 and represents the degree of polymerization,

b. 10 to 30 percent by weight of a block copolymer of a conjugated diene compound and styrene composed of units derived from styrene and units derived from a conjugated diene compound, in which the content of the units derived from styrene is 40 to 60 percent by weight, and

c. 50 to 75 percent by weight of a graft copolymer of chlorostyrene on a diene rubber substrate composed of units derived from a conjugated diene compound and units derived from chlorostyrene, in which the content of the units derived from the conjugated diene compound is 2 to 15 percent by weight,

the total of the proportions of these components being 100 percent by weight.

3,887,648

METHOD OF PRODUCING POLYMER COMPOSITIONS BASED ON CHLORINATED POLYETHYLENE

Akira Takahashi; Hiroo Kojima; Masao Ogawa, all of Tokyo; Hiroshi Osuka, Yokohama, and Shoichi Kobayashi, Tokyo, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 784,517, Nov. 22, 1968, Pat. No. 3,673,279, which is a continuation-in-part of Ser. No. 339,899, Jan. 24, 1964, Pat. No. 3,496,251. This application Apr. 16, 1971, Ser. No. 134,826

Int. Cl. C08f *15/00, 1/11*

U.S. Cl. 260—878 R **6 Claims**

1. In a method for producing a thermoplastic resin composition by contacting

A. a polymer component selected from the group consisting of chlorinated polyethylene of a degree of chlorination of 10–50% and a mixture consisting of 50–90% by weight of said chlorinated polyethylene and 10–50% by weight of copolymer selected from an ethylene-propylene copolymer rubber, an ethylene-propylene-nonconjugated diene terpolymer rubber and an ethylene-vinylacetate copolymer rubber, with

B. a monomer mixture comprising

- b_1. at least one monomer selected from styrene, alpha-methyl styrene, tertiary butyl styrene and chlorostyrene, and
- b_2. at least one monomer selected from acrylonitrile and methacrylonitrile

under polymerization conditions in the presence of a polymerization initiator to form an interpolymer of components (A) and (B), the improvement which comprises suspending said polymer component (A) and monomer component (B) in the form of fine particles in a state of separation from each other in an aqueous medium, said component (A) having a particle size of 5–150 Tyler mesh, the weight ratio of said component (A) to component (B) ranging from about 10:90 to about 65:35, said polymerization initiator being mixed in said component (B) prior to its suspension in the aqueous medium.

3,887,649

MOLDINGS MADE OF HYDROLYZED ETHYLENE-VINYL ACETATE COPOLYMER

Hiroshi Takida, Osaka, and Yoshimi Akamatu, Amagasaki, both of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki, Osaka, Japan

Filed July 18, 1974, Ser. No. 489,511

Int. Cl. C08g *39/10*

U.S. Cl. 260—873 **5 Claims**

1. A molding having an improved impact-resistance which comprises a hydrolyzed ethylene-vinyl acetate copolymer and 2 to 100 parts by weight of a block-copolymerized polyester-polyether elastomer per 100 parts by weight of said copolymer; said hydrolyzed ethylene-vinyl acetate copolymer having an ethylene content of 20 to 50% by mole, a vinyl acetate content of 80 to 50% by mole and a degree of hydrolysis in vinyl acetate component of not less than 90% by mole, and said block-copolymerized polyester-polyether elastomer having a melting point of crystalline region of 150° to 230°C. and an impact resilience of not less than 50%.

3,887,650

PROCESS FOR PREPARING BLOCK COPOLYMERS OF OLEFINS AND VINYLIC MONOMERS

Elias Agouri; Robert Laputte; Yves Philardeau, and Jacques Rideau, all of Pau, France, assignors to Aquitaine Total Organico, 92400 Courbevoie, France

Filed Aug. 1, 1973, Ser. No. 384,586

Claims priority, application France, Aug. 4, 1972, 72.28205

Int. Cl. C08f *15/00, 27/22*

U.S. Cl. 260—878 B **42 Claims**

1. A process for synthesizing block copolymers of olefins and vinylic monomers, comprising the steps of modifying in the absence of Ziegler-type catalysts, an olefinic polymer or copolymer containing terminal double bonds by the reaction with a compound of an element selected from boron and the metals in Columns II, III, IVA and VA of the periodic table of elements, in which at least one of the valencies of the element is saturated by a hydrogen atom or monovalent hydrocarbyl or hydrocarbyloxy radical, placing the resulting modified polymer in contact with an oxygenated free-radical-producing initiator and at least one vinylic monomer, and allowing polymerization of the monomer or monomers to take place within the resulting mixture.

3,887,651

PROCESS FOR PREPARING COPOLYMER

Jihei Inomata, Tokyo; Masahiro Hayashi, Yokohama; Seiichi Nozawa, Tokyo; Takayuki Ota, Yokohama; Kazuo Endo, Yokohama, and Yukio Yamaguchi, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Japan

Filed Aug. 17, 1973, Ser. No. 389,132

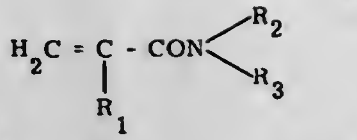
Claims priority, application Japan, Aug. 17, 1972, 47-82272; Sept. 20, 1972, 47-94416

Int. Cl. C08f *15/40;* **C08d** *9/08*

U.S. Cl. 260—879 **14 Claims**

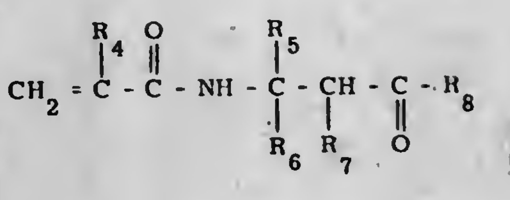
1. A graft copolymer prepared by a process, which comprises:

copolymerizing 60 – 90% by weight of acrylonitrile, of methacrylonitrile or mixtures thereof, 0.5 – 39.5% by weight of an alkylvinyl ether containing C_{1-4} alkyl groups and 0.5 – 20% by weight of an N-substituted acrylamide having a formula of



$$H_2C=\underset{\displaystyle R_1}{\underset{|}{C}}-CON{<}\begin{matrix}R_2\\R_3\end{matrix} \qquad \cdots\cdots\cdots\cdots \text{(I)}$$

or



$$CH_2=\overset{\displaystyle R_4}{\overset{|}{C}}-\overset{\displaystyle O}{\overset{\|}{C}}-NH-\overset{\displaystyle R_5}{\underset{\displaystyle R_6}{\overset{|}{\underset{|}{C}}}}-\underset{\displaystyle R_7}{\underset{|}{CH}}-\underset{\displaystyle O}{\underset{\|}{C}}-R_8 \qquad \cdots\cdots\cdots\cdots \text{(II)}$$

wherein

R_1represents hydrogen or methyl; R_2 and R_3 represent hydrogen or a C_{1-8} alkyl group and at least one of R_2 and R_3 is an alkyl; R_4 represents hydrogen or methyl and R_5, R_6, R_7 and R_8 represent hydrogen or C_{1-4} alkyl groups, with a homopolymer of a conjugated diene or a copolymer containing at least 50 weight % of said conjugated diene and a vinyl monomer, wherein the total weight of the mixture of said nitrile, said vinyl ether and said N-substituted acrylamide is 3 – 50 times the weight of said homopolymer or copolymer, at 0°– 100°C.

3,887,652

PROCESS FOR PRODUCING TRANSPARENT GRAFT POLYMER COMPOSITIONS

Frederick E. Carrock, Paramus, and Frank K. Y. Chu, Ramsey, both of N.J., assignors to Dart Industries Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 88,216, Nov. 9, 1970, abandoned. This application May 10, 1973, Ser. No. 359,175

Int. Cl. C08f *19/08*

U.S. Cl. 260—880 R **10 Claims**

1. A process for preparing a transparent graft polymer composition comprising:

a. preparing a pregraft reaction product in emulsion and in the absence of added suspending agent by reacting a butadiene based rubber latex containing from 0 to 40% by weight of bound styrene (S_b) and having an average rubber particle size in the range of 0.01 to 0.8 micron with a first monomer mixture of styrene and methyl methacrylate having a weight ratio in the range of 5/95 to 80/20, the weight ratio of total monomers to total rubber solids being in the range of 5/95 to 60/40 under conditions such that essentially all of the monomer mixture is reacted, employing solely a water soluble emulsion polymerization catalyst in said preparation;

b. forming an aqueous suspension of a second monomer mixture of styrene and methyl methacrylate, the emulsion of pregraft reaction product from step (a) and an oil soluble initiator, the amount of emulsion being sufficient to provide a total rubber content in the final graft polymer composition in the range of 3 to 60 percent by weight and the weight ratio of styrene to methyl methacrylate in the second monomer mixture being such that the concentration of total styrene (Sa) basis the total amount of styrene and methyl methacrylate in the first and second monomer mixture is within the limits defined by the relationship $wt\%Sa = 23.4 + 0.766\,(Sb) \pm 10$.

c. increasing the temperature of the suspension containing the emulsion of pregraft reaction product to an initial polymerization temperature in the range of 80°C to 150°C during which time the emulsion is substantially converted to a suspension;

d. polymerizing the monomers in the presence of the pregraft reaction product in suspension at temperatures in the range of 80°C to 150°C; and

e. recovering the graft polymer composition product in bead form directly from suspension.

3,887,653

PROCESS FOR PRODUCTION OF GRAFT COPOLYMERS, THE SUBSTRATES OF WHICH CONTAIN ALLYL DERIVATIVES OF MALEIC ACID AND MALEIC ACID ANHYDRIDE

Kunio Konishi, Takatsuki; Tsuneo Tsubakimoto, Toyonaka, and Masao Nikki, Ibaragi, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Ltd., Osaka, Japan

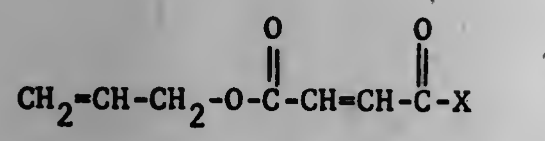
Filed Nov. 28, 1972, Ser. No. 310,012

Claims priority, application Japan, Dec. 1, 1971, 46-096290

Int. Cl. C08f *15/00, 19/00*

U.S. Cl. 260—885 **5 Claims**

1. A process for the preparation of graft copolymers which comprises graft-copolymerizing styrene to substratum polymer (AB) having pendent double bonds, said substratum polymer (AB) being prepared from 0.1 to 20.0% by weight of at least one comonomer (A) expressed by the following general formula



$$CH_2{=}CH{-}CH_2{-}O{-}\overset{\overset{O}{\|}}{C}{-}CH{=}CH{-}\overset{\overset{O}{\|}}{C}{-}X$$

wherein X is —OH, —O—CH_2—CH_2—OH, —O—CH_2—$CH(CH_3)$—OH, —O—$CH(CH_3)$—CH_2—OH, —O—CH_2—CH_2—NH_2 or —NH_2,
and 80.0 to 99.9% by weight of at least one ethylenically unsaturated monomer (B) selected from the group consisting of alkyl acrylates and alkyl methacrylates having 1 to 18 carbon atoms in the alkyl portion.

3,887,654

PHOSPHORUS CONTAINING REACTION PRODUCTS

Peter Hofmann, and Peter Rohringer, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 266,194, June 26, 1972, abandoned. This application Dec. 1, 1972, Ser. No. 311,052

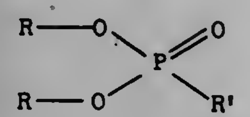
Claims priority, application Switzerland, July 5, 1971, 9829/71

Int. Cl. C07f *9/40*

U.S. Cl. 260—928 **9 Claims**

1. Reaction product of

1. a phosphonic acid ester of the formula



wherein R and R′ each denotes alkyl with 1 to 4 carbon atoms,
2. an alcohol of the formula

X—OH

wherein X denotes monohydroxyalkyl or dihydroxyalkyl with 2 to 6 carbon atoms, with the boiling point of the alcohol of the formula

R—OH

wherein R has the indicated meaning, which is liberated during the reaction, being at least 30°C below the boiling point of the alcohol X—OH and

3. an epoxide with 2 to 4 carbon atoms in the presence of an alkali metal oxide, alkaline earth metal oxide or alkaline earth metal hydroxide.

3,887,655

PHOSPHORAMIDATE ESTERS OF DIBROMONEOPENTYLGLYCOL

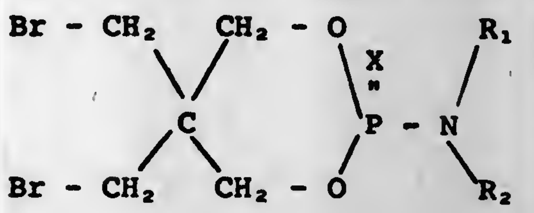
Kyung S. Shim, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 252,680, May 12, 1972, abandoned, which is a continuation of Ser. No. 35,269, May 6, 1970, abandoned. This application Aug. 20, 1973, Ser. No. 389,829

Int. Cl. C07f *9/24*

U.S. Cl. 260—937 **3 Claims**

1. Compositions of matter in accordance with the formula:



wherein X is oxygen or sulfur, R_1 and R_2 are the same or different and are selected from the group consisting of alkyl containing from 1 to 10 carbon atoms, hydrogen, and phenyl.

3,887,656

VINYL PHOSPHONATE ESTERS AND METHOD FOR THEIR PREPARATION

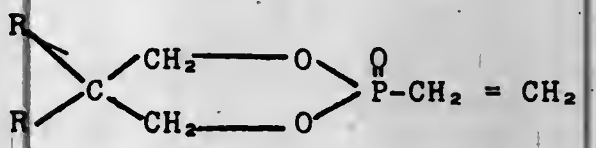
Kyung S. Shim, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 12, 1974, Ser. No. 460,399

Int. Cl. C07f *9/40*

U.S. Cl. 260—937 **10 Claims**

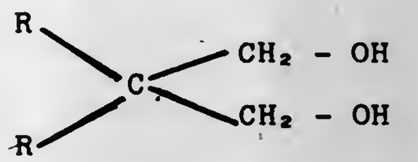
1. Compounds of the formula



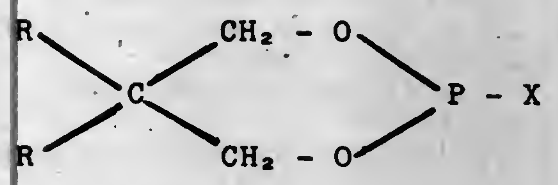
wherein R is selected from the group consisting of the straight and branched C_1-C_{12} alkyl groups, the phenyl group, the bromo and chloro substituted C_1-C_{12} alkyl groups, and the bromo and chloro substituted phenyl groups.

4. A process for forming compounds as set forth in claim 1 which comprises:

a. reacting a compound of the formula

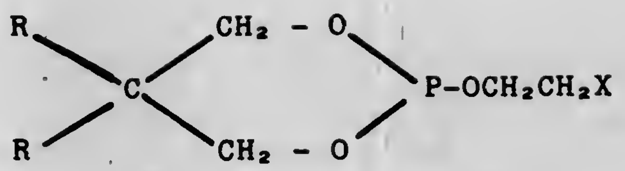


with a compound selected from the group consisting of phosphorus trichloride and phosphorus tribromide to form a compound having the formula:



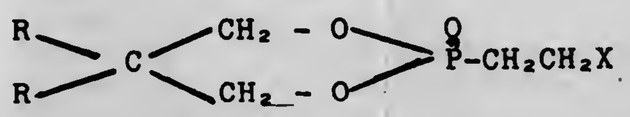
where X is selected from the group consisting of chlorine and bromine and R is as defined in claim 1;

b. reacting the product formed in step (a) with ethylene oxide to form a compound having the formula:



where R and X are as defined above;

c. reacting the product of step (b) with an Arbuzov rearrangement catalyst to form an Arbuzov rearrangement product having the formula:



where R and X are as defined above; and

d. dehydrohalogenating the product of step (c) with a base to form the compounds claimed in claim 1.

3,887,657

PHOSPHORAMIDOTHIOATE ESTERS

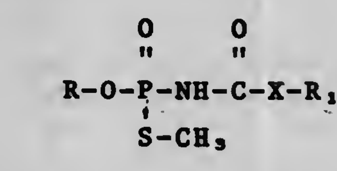
Robert D. Battershell; Russell M. Bimber, both of Painesville, and Janis A. Bungs, Willoughbby, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Jan. 14, 1974, Ser. No. 433,219

Int. Cl. A01n *9/36;* **C07f** *9/16, 9/24*

U.S. Cl. 260—938 **3 Claims**

1. A compound of the formula



$$R{-}O{-}\underset{\underset{S-CH_3}{|}}{\overset{\overset{O}{\|}}{P}}{-}NH{-}\overset{\overset{O}{\|}}{C}{-}X{-}R_1$$

where R is alkyl of 1 to 5 carbon atoms;
X is oxygen; and
R_1 is phenyl or substituted phenyl wherein the substituents are selected from alkyl of 1 to 5 atoms, alkoxy of 1 to 5 carbon atoms, halogen, phenyl, napthyl, phenoxy, alkylthio of 1 to 5 carbon atoms, nitro, cyano, phenylthio, dialkylamino of 1 to 5 carbon atoms in each alkyl, carboxyl, carbalkoxy of 1 to 5 carbon atoms, sulfonic, and sulfonamido.

3,887,658

O-ALKYL-S-ALKYL-S-[1,2-BIS(ALKOXYCARBONYL)ETHYL]DITHIOPHOSPHATES

Alexis A. Oswald, Mountainside, and Paul L. Valint, Woodbridge, both of N.J., assignors to Ciba-Geigy AG, Basel, Switzerland

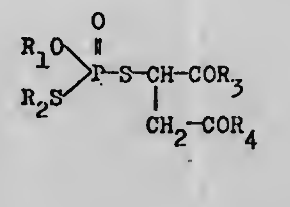
Filed Apr. 25, 1973, Ser. No. 354,404

Claims priority, application Switzerland, Apr. 27, 1972, 6265/72

Int. Cl. C07f *9/16;* **A01n** *9/36*

U.S. Cl. 260—942 **8 Claims**

1. A thiol phosphoric acid ester of the formula



wherein
R_1 represents methyl or ethyl, R_2 represents n-propyl, n-butyl, i-butyl, sec.butyl and R_3 and R_4 each represents straight or branched alkoxy containing 1 to 6 carbon atoms.

3,887,659

PROCESS FOR PRODUCING DIALKYL PHOSPHOROCHLORIDOTHIOATE

Hiroyuki Matsubara; Kennosuke Imamura; Yuhei Sogabe, and Toshio Aso, all of Tokyo, Japan, assignors to Nippon Chemical Industrial Co., Ltd., Tokyo, Japan

Filed Oct. 31, 1973, Ser. No. 411,571

Int. Cl. C07f *9/20*

U.S. Cl. 260—986 **6 Claims**

1. A process for producing dialkyl phosphorochloridothioate, which comprises chlorinating a dialkyl dithiophosphoric acid, and continuously mixing at a pH of 6 to 9 the reaction product obtained with a metal sulfide solution wherein said metal sulfide is an alkali metal sulfide, a water-soluble alkaline earth metal sulfide, the hydrosulfides thereof or the polysulfides thereof.

3,887,660

DEVICE FOR DISSOLVING A POORLY SOLUBLE GAS IN A LIQUID

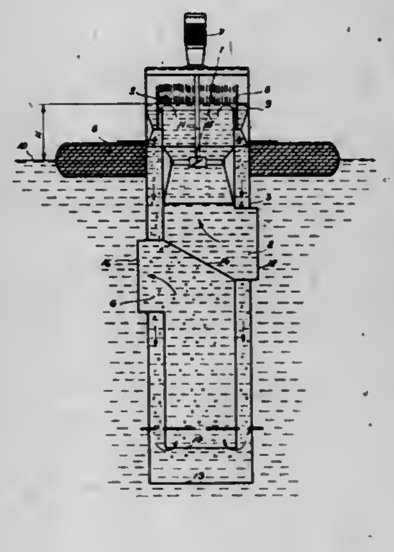
Hakan Wilhelm Romantschuk, and Pauli Unto Juhani Nyberg, both of Tampere, Finland, assignors to OY Tampella AB, Tampere, Finland

Filed Sept. 21, 1973, Ser. No. 399,492

Claims priority, application Finland, Sept. 25, 1972, 2625/72

Int. Cl. B01f *3/04*

U.S. Cl. 261—91 **4 Claims**



1. A device for dissolving poorly soluble gas in a liquid in which the device is partially immersed comprising:

an inner pipe having an upper portion with a first inlet located below the surface of the liquid for conducting liquid into said pipe and a first outlet located above the surface of the liquid forming an upper through-flow channel extending between said first inlet and said first outlet; an outer pipe coaxial with and substantially surrounding said inner pipe and having a closed lower end below the lower end of said inner pipe,

said outer pipe being spaced from said inner pipe and defining therewith an annular throttling zone below said first outlet and above said first inlet;

said inner pipe having a lower portion with a second outlet communicating with the liquid below the surface of the liquid and a second inlet communicating with the interior of said outer pipe forming a lower through-flow channel extending between said second inlet and second outlet;

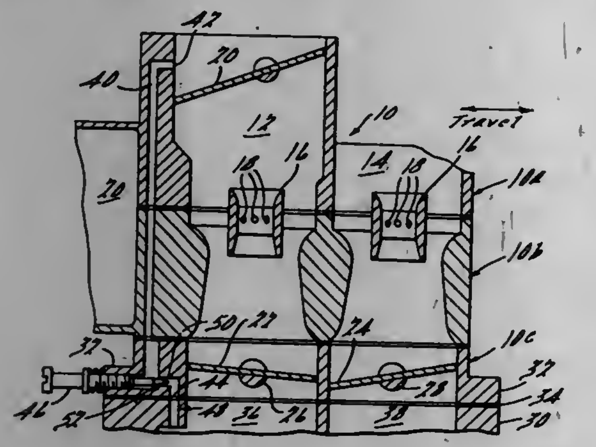
pumping means in said upper through-flow channel for drawing the liquid into said first inlet, out of said first outlet and into said throttling zone;

means, located in said throttling zone, for feeding a gas into the liquid in said zone; and
a partition wall separating said upper portion of said inner pipe from said lower portion thereof,
whereby the liquid flows downwardly through said outer pipe from said first outlet, through said throttling zone and into said second inlet.

3,887,661
TWO-STAGE CARBURETOR WITH IMPROVED IDLE AIR FUEL MIXTURE DISTRIBUTION

William K. Ojala, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed June 29, 1973, Ser. No. 375,215
Int. Cl. F02m *7/10*
U.S. Cl. 261—23 A **6 Claims**



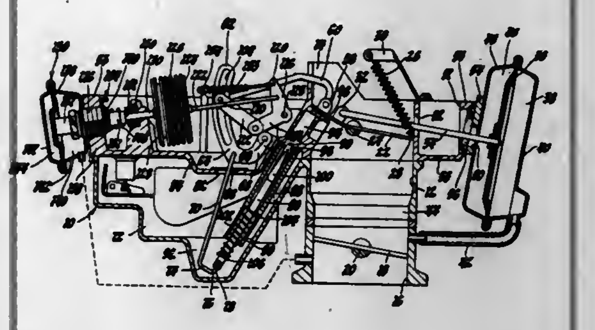
1. A two-stage carburetor for an internal combustion engine comprising in combination:
a housing;
at least one primary bore passage extending through said housing;
at least one secondary bore passage extending through said housing;
throttle valve means in each of said passages for controlling fluid flow through said passages;
linkage means connected to said throttle valve means for controlling the position of said throttle valve means in said passages whereby the rate of fluid flow may be controlled;
said linkage means including biasing means for biasing the secondary bore passage throttle means to a closed position and idle stop means defining at least one position of maximum closure of said primary bore passage whereby idle air/fuel mixture may be provided to the engine; and means forming a bleed air passage through said housing in parallel with said primary and secondary passages and arranged to be spatially separated from the secondary passage by the primary passage whereby leakage air flowing past the secondary bore passage throttle means may be compensated and the idle air/fuel mixture distribution may be balanced.

3,887,662
CARBURETOR

John A. Gural, Pittsford, and John W. Moulds, Penfield, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 4, 1974, Ser. No. 447,586
Int. Cl. F02m *7/22*
U.S. Cl. 261—39 A **2 Claims**

1. A carburetor comprising a mixture conduit having an air inlet and a mixture outlet, a throttle disposed in said mixture outlet for controlling flow therethrough, an air valve disposed in said air inlet for measuring air flow therethrough, a fuel passage entending to said mixture conduit for supplying fuel thereto, a metering orifice disposed in said fuel passage, a metering rod disposed in said metering orifice for controlling fuel flow therethrough, a lever positioning said metering rod, a link extending from said air valve to said lever for moving said lever and said metering rod to control fuel flow through said metering orifice in accordance with air flow through said air inlet, said lever having a slot receiving said link, and means for varying the position of said link in said slot to vary the travel of said metering rod in said orifice for selected movement of said air valve, said means including a reciprocable plunger connected to said link, a ferrule surrounding said plunger, said plunger having an adjusting screw received in one end of said ferrule for varying the relative positions of said plunger and said ferrule, a wall, an adjustable stop supported in said wall and surrounding said ferrule, said ferrule having a head engageable with one end of said adjustable stop, spring means biasing said head into engagement with said end of said adjustable stop, stop means engageable with the opposite end of said ferrule for limiting travel of said ferrule away from said adjustable stop against the bias of said spring means, a diaphragm engaging said one end of said ferrule and cover means surrounding said one end of said ferrule and the opposite end of said ferrule for limiting travel of said ferrule away from said adjustable stop against the bias of said spring means, a diaphragm engaging said one end of said ferrule and cover means surrounding said one end of said ferrule and the opposite end of adjustable stop and defining a chamber enclosed by said diaphragm and subjected to the pressure in said mixture conduit downstream of said throttle, whereby when said pressure is below a selected level said diaphragm may displace said ferrule and said plunger against the bias of said spring means to engage said ferrule with said stop means and to move said link in said slot to provide an enriched air-fuel mixture, whereby when said pressure is above said selected level said spring means may displace said ferrule, said diaphragm and said plunger to engage said ferrule head with said adjustable stop and to move said link in said slot to provide a lean air-fuel mixture, and whereby said air-fuel mixtures may be adjusted by removing said cover means and said diaphragm to expose said one end of said ferrule and said opposite end of said adjustable stop, by adjusting the position of said adjusting screw relative to said ferrule, and by adjusting the position of said adjustable stop relative to said wall.

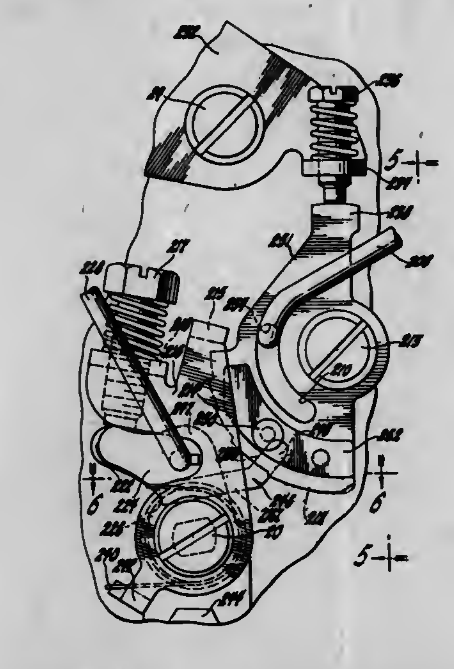


3,887,663
AIR VALVE CARBURETOR

John A. Gural, Pittsford, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 4, 1974, Ser. No. 439,286
Int. Cl. F02m *1/02*
U.S. Cl. 261—50 A **3 Claims**

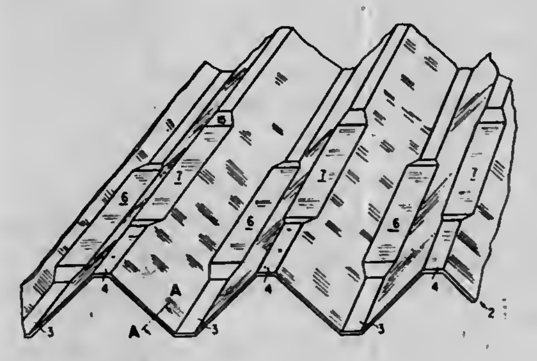
1. An internal combustion engine carburetor comprising a passage for air flow to the engine, a throttle disposed in said passage and rotatable between closed and open positions for controlling air flow therethrough, an air valve disposed in said passage upstream of said throttle and defining a controlled pressure region in said passage intermediate said air valve and said throttle, said air valve being rotatable between idle and open positions, means controlling said air valve to maintain a substantially constant pressure in said region whereby its rotative position is a measure of the rate of air flow through said passage, means connected to said air valve for supplying fuel to the engine at a rate proportional to the rotative displacement of said air valve from said idle position and inversely proportional to the pressure in said region, a lever secured to said air valve for rotation therewith through a predetermined path, a stop member disposed in said path for limiting closing movement of said air valve to establish said idle position, and means connected to said throttle and engageable with said stop member during movement of said throttle from said closed position for moving said stop member out of said air valve lever path whereby said air valve may be closed beyond said idle position to a closed position to decrease the pressure in said region and thereby increase the rate of fuel flow through said fuel supplying means.



3,887,664
CONTACT BODY FOR THE TRANSFER OF HEAT AND/OR SUBSTANCES

Ulrich Regehr, Susterfeld 65, D-51 Aachen, Germany

Filed Apr. 18, 1973, Ser. No. 352,467
Int. Cl. F28c *1/00*
U.S. Cl. 261—112 **8 Claims**

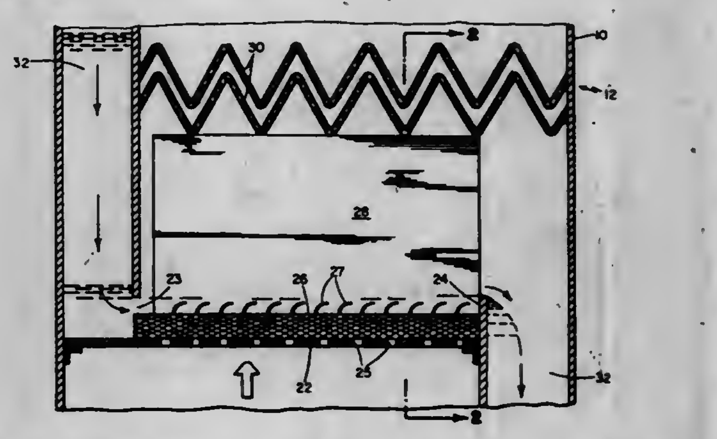


1. A contact body for the direct transfer of heat and/or substances between a liquid medium and a gaseous medium comprising in combination:
at least one first vertical flow sheet-panel having a plurality of equidistantly spaced regular undulations in its profile, defining parallel troughs with the undulations inclined to the vertical axis at an angle of less than ninety degrees;
at least one second vertical flow panel with similar undulations in its sheet profile, its undulations being oppositely inclined to the vertical axis at an angle likewise less than ninety degrees;
the first and second flow panels being contiguously joined together at the prominent areas of their undulations,
each said trough comprising: a plurality of first truncations at a first level adjacent to the imaginary tips of the said trough equidistantly spaced from each other;
said first level truncations defining ridges and bottoms;
a plurality of second truncations at a second level spaced from the said first level at a second level and equidistantly spaced from each other in the spaces between the said first truncations;
the latter being a series of contact areas where the bottoms of one flow panel meet the ridges of the adjoining flow panel;
the truncations of the first and second flow panels being of limited length in the undulation and being so arranged that a portion of the contact points between adjoining flow panels is eliminated;
the adjoining flow panels thus being arranged for a top-to-bottom flow of a liquid medium and a transverse flow of a gaseous medium, the latter flow being facilitated by the elimination of some of the contact points.

3,887,665
VAPOR-LIQUID CONTACTING

Thomas William Mix, 24 Atwood St., Wellesley, Mass. 02181, and Alve John Erickson, 425 N. W. 3rd St., Chisholm, Minn. 55719

Filed Apr. 20, 1973, Ser. No. 352,927
Int. Cl. B01f *3/09*
U.S. Cl. 261—114 R **20 Claims**



1. In vapor-liquid contacting apparatus of the cross-flow type having a column housing and at least one contact stage in said housing, said apparatus including liquid and vapor inlets to said stage, and a liquid outlet from said stage, that improvement comprising
an orificed tray mounted in said housing at said stage, between said inlets,
said tray having free area comprising 15–55 percent of the total active area of the tray and being mounted with said free area in effective communication with both said inlets to permit vapor to rise through said tray to contact liquid thereabove and produce a two phase dispersion of vapor and liquid supported on said tray, and
means disposed adjacent a surface of said tray at said free area, in effective communication with said vapor inlet and said liquid inlet, for damping fluid oscillations impinging upon said free area of said tray and for thereby reducing the vapor velocity through said free area required to prevent dumping.

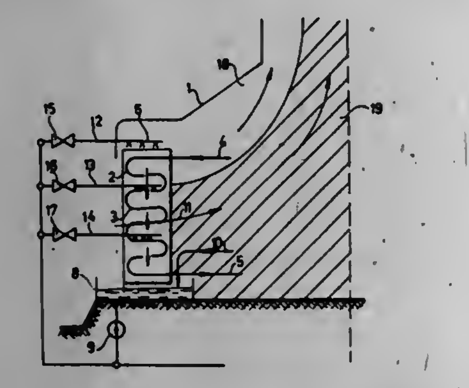
3,887,666
COOLING SYSTEM

Laszlo Heller; Laszlo Forgo; Janos Bodas; Istvan Papp, all of Budapest, Hungary; G. Sz. Agejev, and I. A. Alekszejev, both of Moscow, U.S.S.R., assignors to Transelektro Magyar Villamossagi Kulkereskedelmi Vallalat, Budapest, Hungary

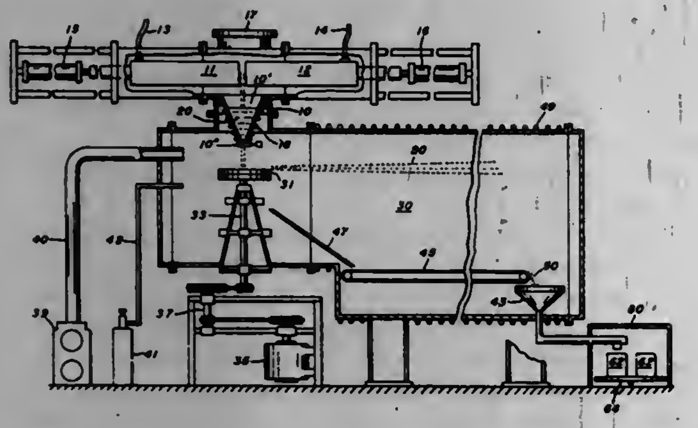
Filed June 29, 1973, Ser. No. 375,281
Claims priority, application Hungary, July 3, 1972, EE2041
Int. Cl. F28c *1/00*
U.S. Cl. 261—130 **9 Claims**

1. A cooling system for cooling a flow medium, comprising an essentially vertical heat-transfer means adapted for flow of said flow medium therethrough, means for transporting an air current past said heat transfer means, spray nozzles disposed at a plurality of levels and arranged for spraying water onto said heat transfer means, a plurality of valve means, the spray

nozzles at each of said levels being associated with one of said valve means for permitting and preventing flow of cooling water therethrough, and a plurality of pumps for pumping the cooling water to the nozzles, the hydraulic capacities of said pumps being such that when all the pumps are operative the resultant water pressure is sufficiently high so that all of the nozzles are supplied with cooling water under pressure whereas when one or more of said pumps is inoperative the water pressure is lowered so that a number of the nozzles proportional to the number of operative pumps are supplied with cooling water under pressure.

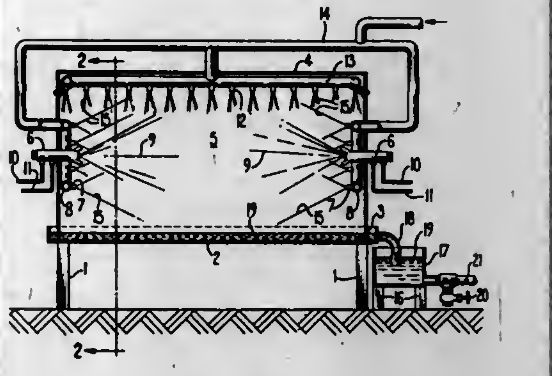


3,887,667
METHOD FOR POWDER METAL PRODUCTION
Irvin Dwight Clark, New Hartford, N.Y., assignor to Special Metals Corporation, New Hartford, N.Y.
Continuation of Ser. No. 55,123, July 15, 1970, abandoned. This application Aug. 6, 1973, Ser. No. 386,127
Int. Cl. B22f *9/00*
U.S. Cl. 264—8 **5 Claims**



1. A method of producing metallic powder of a superalloy wherein each element in the alloy is present in each particle of powder in substantially equal amounts, which comprises the steps of: arranging a statically cast superalloy consumable electrode having a heterogeneous make-up in a substantially horizontal position; arranging a second electrode in a substantially horizontal position; melting said consumable electrode by striking an electric arc between it and said second electrode; collecting molten metal droplets from said consumable electrode in a heated reservoir, said droplets having varying compositions; holding said molten metal in said reservoir for a period of time sufficient to homogenize it; passing said homogenized molten metal from said reservoir; atomizing said homogenized molten metal and cooling it to a temperature below its melting point as it passes from said reservoir, thereby forming metallic superalloy powder, each particle of powder containing each element in said alloy in substantially equal amounts; and collecting said powder, said powder being processable into parts having excellent high temperature strength.

3,887,668
METHOD OF PRODUCING POWDER COMPOSED OF PRECISELY SPHERICAL PARTICLES
Kazuo Honjo, Nishinomiya, Hyogo, Japan, assignor to Ideki Co., Ltd., Japan
Continuation-in-part of Ser. No. 95,403, Dec. 4, 1970, Pat. No. 3,739,049. This application May 3, 1973, Ser. No. 356,951 The portion of the term of this patent subsequent to June 12, 1990, has been disclaimed.
Int. Cl. B01j *2/06*
U.S. Cl. 264—14 **8 Claims**



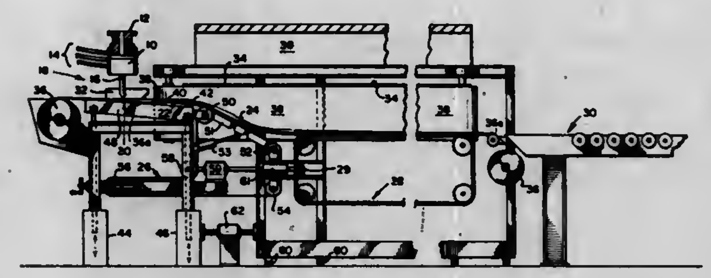
1. A method for producing a powder of spherical particles of a synthetic resin, comprising:

a. dissolving a synthetic resin in a volatile organic solvent to form a solution having a viscosity of about 5 to about 200 centistokes;
b. directing a spray of said solution under a pressure of at least 6.5 kg/cm² into a chamber to form spherical particles thereof;
c. directing into said chamber a spray of a liquid as a separation agent and intersecting said spray of solution, said resin being insoluble in said liquid separation agent, and the spraying force of said liquid separation agent being about 3 kg/cm² and less than that of said sprayed solution;
d. volatilizing the solvent from the particles of said sprayed solution to form spherical particles of resin powder falling in said chamber, said particles of liquid separation agent serving to separate said powder particles rendered sticky by said volatilization; and,
e. collecting said spherical powder particles in a tank containing said separation agent liquid, from which said powder particles are recovered and dried.

3,887,669
METHOD FOR FORMING A COMPOSITE OBJECT OF ACRYLIC RESIN AND SILICONE ELASTOMER
Jean Pillet, Paris, France, assignor to Rhone-Poulenc, S.A., Paris, France
Filed Mar. 26, 1973, Ser. No. 345,066
Claims priority, application France, Mar. 28, 1972, 72.10821
Int. Cl. A61c *13/00*
U.S. Cl. 264—16 **5 Claims**

1. In a process of producing a solid composite object comprising an acrylic resin portion adhering to a silicone elastomer portion, the improvement comprising bringing into direct contact with one another and without an intervening priming layer a first mixture comprising a peroxide catalyst and a methyl methacrylate composition which can be hot cured in the presence of a peroxide catalyst and a second mixture comprising a peroxide catalyst and vulcanisable polydiorganosiloxane rubber with a chain which consists of 85 to 99.95% of $(CH_3)_2SiO$ units, 0 to 10% of $(C_6H_5)_2SiO$ units and 5 to 0.05% of $CH_3(CH_2{=}CH)SiO$ units and is blocked at each end by a $(CH_3)_3SiO_{0.5}$ or $(CH_3)_2(CH_2{=}CH)SiO_{0.5}$ unit and then heating the first mixture and second mixture in direct contact with one another until a solid object is produced.

3,887,670
APPARATUS FOR AND METHOD OF PRODUCING CONTINUOUS FOAMED PLASTIC BUNSTOCK
Lawrence C. Porter, Palos Verdes Penninsula, Calif., assignor to The Upjohn Company, Kalamazoo, Mich.
Filed July 23, 1973, Ser. No. 381,923
Int. Cl. B29d *27/04*
U.S. Cl. 264—41 **14 Claims**

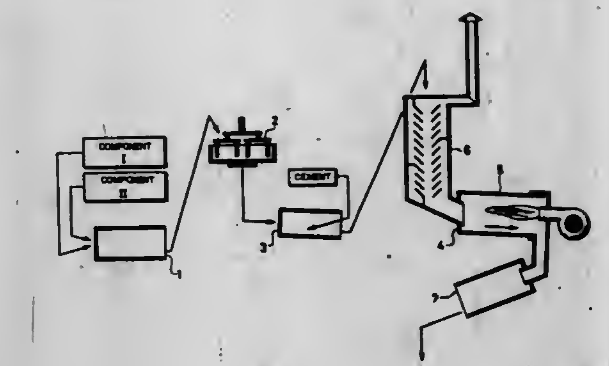


1. A method of producing longitudinally continuous foamed bunstock from a reactive liquid polymeric mix to provide a continuous length expanded cellular product of substantially rectangular cross section, uniform density and cell isotropicity, which comprises the steps of

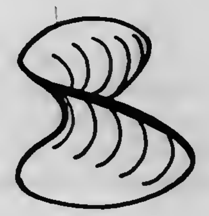
- advancing a continuous conveyor surface along a predetermined path of travel, said conveyor surface comprising a lower supporting portion and separate upstanding portions on laterally opposite sides of said lower portion and defining together a generally trough-like moving mold for the developing foam product;
- depositing reactive liquid polymer mix on said conveyor surface at a first point in its path of travel;
- advancing said conveyor surface in a generally horizontal plane with reacting liquid mix thereon to a second point along its path of travel;
- adjusting flow-impeding means disposed across said conveyor path intermediate said first and second points to produce a continuous pooling of said liquid mix therebetween to establish a stable cream line in the pooled liquid transversely of the path of travel and immediately ahead of said second point;
- adjusting the path travelled by the lower portion of said conveyor between said second point and a third point downstream thereof to conform said path approximately to the mirror image of the characteristic rise profile of the particular polymer mix developed in the time interval of conveyor travel between said second and third points, wherein said third point is adjustably positioned to substantially coincide with the point of maximum rise of the polymer foam; and
- thereafter continuing said conveyor surface travel from said third point through a curing zone to a point of discharge for the finished expanded cellular product.

3,887,671
PROCESS FOR PRODUCING GRANULAR, EXPANDED CERAMIC MATERIALS
Emil Metzger, 8240 Thayngen, Zieglerweg 54, Switzerland
Filed Mar. 1, 1972, Ser. No. 230,660
Claims priority, application Germany, Mar. 5, 1971, 2110498
Int. Cl. B28b *5/00;* **B29d** *27/04*
U.S. Cl. 264—43 **12 Claims**

1. A process for manufacturing granular expanded ceramic materials comprising forming a prime material consisting of at least 25% of gas forming mineral substances, selected from the group consisting of distensible clay, argillite or a volcanic earth and the balance of mineral substances with a SiO_2 content exceeding 65% after grinding, selected from the group consisting of sea sand and sandstone, mixing and homogenizing the material into pellets by the addition of water containing NaOH; completely surrounding said pellets, while in the moist condition, by a layer of cement applied in a rolling or tumbling operation, drying and preheating said pellets in a drying kiln for a period of about 20 minutes at temperatures up to approximately 700°C. maximum, heating said pellets with a very quick rise in temperature in a firing kiln for a period of not less than 3–5 minutes up to 1,000° to 1,200°C., and finally slowly cooling down said pellets to below 550°C. to form grains.



3,887,672
MANUFACTURE OF SADDLE-SHAPED DISCS FROM EXPANDABLE STYRENE POLYMERS
Erhard Stahnecker, Ziegelhausen; Georg Ruppert, Ludwigshafen; Rolf Moeller, Ludwigshafen; Rupert Schick, Ludwigshafen, and Ludwig Zuern, Bad Duerkheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
Filed Nov. 2, 1972, Ser. No. 303,138
Claims priority, application Germany, Nov. 4, 1971, 2154754
Int. Cl. B29d *27/00*
U.S. Cl. 264—51 **1 Claim**



1. A process for the manufacture of saddle-shaped discs from styrene polymers which process comprises: passing molten styrene polymers containing at least 50% by weight of polymerized styrene units through an extruder at melt temperatures of from 90° to 150°C to form cyclindrical extrudates containing an expanding agent; passing said extrudates through a coolant at such a rate that no expansion takes place, the residence time in the cooling bath being such that the extrudate remains internally plastic; shaping said extrudates by passing the extrudates at temperatures of from 70° to 90°C between rollers to form strands having an oval cross-section; slicing said shaped strands in the direction of the short axis of said oval cross-section to form discs of which the ratio of thickness to short axis is from 1:5 to 1:10, the thickness being measured in the machine direction of the extrudate; and thereafter foaming said discs to form particles having a bulk density of from 4 to 15 g/l.

3,887,673
APPARATUS AND METHOD FOR MANUFACTURING TUBULAR FILM OF THERMOPLASTIC RESIN

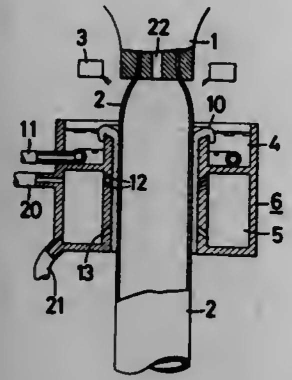
Wasuke Sato, and Osamu Uemura, both of Tokyo, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 164,599, July 21, 1971, abandoned. This application July 13, 1973, Ser. No. 378,950

Claims priority, application Japan, July 24, 1970, 45-64331; Dec. 8, 1970, 45-108080

Int. Cl. B29d *23/04*

U.S. Cl. 264—89 **11 Claims**



1. An apparatus for production of a tubular film of crystallized thermoplastic resin which comprises in combination, a thermoplastic resin extruding ring for extruding a tubular film of crystallizable thermoplastic film, an inflation means for inflating said tubular film, and a water-cooling tank, said water-cooling tank having an inner cylindrical wall defining a cooling zone, a sizing zone and a draining zone, a pliable cooling element having high water retention disposed over the inner cylindrical wall, a water supply chamber, one end of said pliable cooling element being immersed in water in said water supply chamber, suction orifices disposed through the cylindrical wall at the sizing zone and passing to a vacuum chamber, water draining orifices disposed through the cylindrical wall at the draining zone and passing to a water drain chamber, and means for passing the extruded film of thermoplastic film from the extruding ring into the water-cooling tank wherein the film is cooled to a temperature below the crystallization point at the sizing zone while under influence of internal pressure and external suction.

3,887,674
PIPE PART WITH A WIDENED END

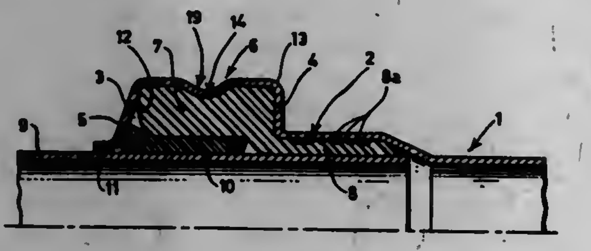
Albertus Anthony Oostenbrink, Hardenberg, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Filed June 29, 1973, Ser. No. 375,154

Claims priority, application Netherlands, June 30, 1972, 7209102

Int. Cl. B29c *17/04*

U.S. Cl. 264—94 **1 Claim**



1. A method for manufacturing a plastic pipe part with widened end, in which is provided a circular groove-shaped chamber, comprising deforming a pipe part by introducing internal overpressure and surrounding the pipe part to be deformed by a die with at least one recess, forming the groove-shaped chamber deformed with a substantially rectangular cross-section, defining a recess in said pipe part, the bottom of which is provided with a circular raised part extending all round, and forming an all round extending raised part merging by rounded sides with the bottom of the recess.

3,887,675
METHOD FOR MAKING SLIDELESS FASTENER

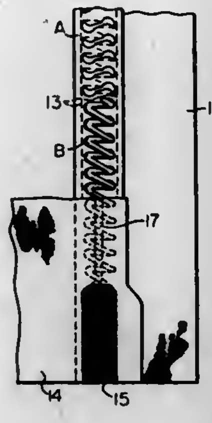
Toshiaki Takagi, Osaka, Japan, assignor to Yoshiaki Takagi, Osaka, Japan

Filed July 13, 1973, Ser. No. 378,897

Claims priority, application Japan, July 27, 1972, 47-76148

Int. Cl. A44b *19/42;* **B29c** *17/02, 17/14*

U.S. Cl. 264—156 **2 Claims**



1. In a method for making a slideless fastener which includes a tape-like fastening element adapted to be mounted on one part to be fastened and cooperable with a spiral fastening element adapted to be mounted on the other part to be fastened, the steps of making said tape-like fastening element comprising:

forming first and second rows of cuts longitudinally arranged at predetermined intervals along a resilient tape of thermally settable material, the cuts in each row being substantially semi-circular in shape and the cuts in one row being paired with and oriented in the reverse direction with respect to those in the other;

forming a series of tongues on one face of said tape by bending the semi-circular cut-out portions in said tape out of the plane of said tape with the bent out portions lying at at least a slight angle to the longitudinal direction of said tape;

forming a third row of cuts between said first and second row of cuts on the tape with the cuts in the third row joining the cuts of the first and second rows;

exerting a force on said tongues laterally of said tape to urge said tongues to positions which are twisted away from their initial positions toward positions more nearly parallel with the longitudinal direction of said tape for distorting the edges of the tape material along said cuts of said third row of cuts into the corresponding openings left by the bending of the tongues out of the first and second rows of cuts, and then folding the side edge portions of said tape against said tongues, and then releasing said lateral force, whereby the resiliency of the tape material causes said side edges to return to their original position and said tongues to twist at least partially back toward their original positions and leave openings between the edges of said cuts in said third row for receiving the spires of the spiral fastening element; and

inserting the spires of the spiral fastening element into the thus formed openings and thermally setting said tape material.

3,887,676
POLYVINYLCHLORIDE GRAFT VINYL CHLORIDE ONTO AMIDO BACKBONE AND POLYVINYL ALCOHOL AS FILM OR FIBER

Seizo Okamura; Tomoaki Tagawa; Kazuo Yagami; Kazuto Matsuo; Mitsuo Sakabe; Tsutomu Sogo, all of Kyato, Japan; Mikio Korematsu, deceased, late of Fukuoka, Japan, and by Etsuko Korematsu, widow and legal successor, Fukuoka, Japan, assignors to Kohjin Co. Ltd., Japan

Continuation-in-part of Ser. No. 230,478, Feb. 29, 1972, abandoned, which is a continuation of Ser. No. 821,066, May 1, 1969, abandoned. This application Apr. 5, 1973, Ser. No. 348,069

Claims priority, application Japan, May 7, 1968, 43-30471; May 7, 1968, 43-30472; Sept. 16, 1968, 43-66794; Apr. 15, 1969, 44-29264

Int. Cl. C08f *15/06;* **D01f** *7/04*

U.S. Cl. 264—184 **3 Claims**

1. A method for producing a fiber or film which comprises emulsion polymerizing vinyl chloride in an aqueous solution of a water-soluble amido-terpolymer consisting of acrylamide, diacetone acrylamide and sodium methallylsulfonate, said amido-terpolymer containing at least 80 mole percent amido-groups, in the presence of a catalyst and an emulsifying agent whereby an aqueous emulsion of polyvinyl chloride containing a graft polymer, in which a part of the vinyl chloride is grafted onto the water-soluble amido-terpolymer, is obtained wherein the amount of said amido-terpolymer is less than 20 percent by weight based on the total weight of the grafted and ungrafted polyvinyl chloride and then adding to the aqueous emulsion thus obtained, 40 to 150 percent by weight of polyvinyl alcohol based on the total weight of the grafted and ungrafted polyvinyl chloride in the emulsion to form a spinning dope, and then coagulating the spinning dope into a fiber or film.

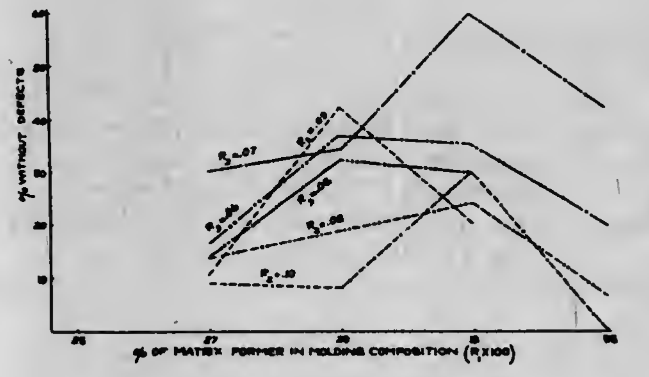
3,887,677
PROCESS OF MAKING A DYNAMOELECTRIC MACHINE STRUCTURE BY PRESSURE MOLDING

Thomas F. Deuter, Jonesboro, Ark., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 180,770, Sept. 15, 1971, Pat. No. 3,763,080. This application Sept. 20, 1973, Ser. No. 399,110

Int. Cl. B29f *1/10;* **C08g** *51/04*

U.S. Cl. 264—272 **11 Claims**



1. A method of manufacturing a dynamoelectric machine structure including a winding support, windings supported on the winding support, and a protective structure surrounding at least a portion of the windings, the method comprising the steps of:

positioning at least a portion of the windings in a mold cavity defining structure;

injecting a pressure molding composition under a pressure differential of at least about 40 psi into said cavity in intimate engagement with at least a portion of the windings;

said pressure molding composition comprising a blended, stable mixture of a liquid thermosetting synthetic resinous matrix forming material, an inorganic particulate material having a particle size distribution such that about 95 to 100 percent passes a 30 mesh sieve, at least about 50 percent passes a 40 mesh sieve and is retained on a 100 mesh sieve, and no more than a minor amount passes a 200 mesh sieve, and a finely divided solid particulate separation inhibitor selected from the group consisting of colloidal silica, powdered asbestos, powdered silica, and mixtures thereof, said particulate separation inhibitor having a particle size smaller than 325 mesh and at least one dimension smaller than one micron; said separation inhibitor being in an amount sufficient to prevent separation of the filler from the matrix forming material when said molding composition is injected under pressure into the mold cavity, the weight ratio of matrix forming material to the total weight of the composition being between about 0.27 and about 0.33; the weight ratio of inhibitor to matrix material being between about 0.05 and about 0.10; and the weight ratio of particulate material to the total weight of the composition being between about 0.65 and about 0.75;

at least partially curing said molding composition so injected to form a rigid, nonporous, dimensionally stable, protective structure at least partially surrounding said windings and winding support; and

removing the winding support, windings and protective structure from the mold cavity.

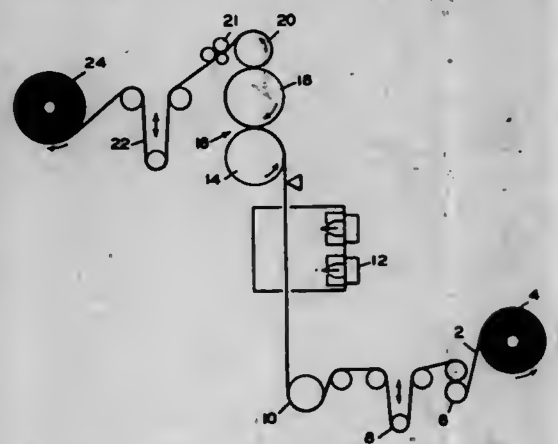
3,887,678
MECHANICALLY EMBOSSED RESILIENT LAMINAR FLOOR MATERIAL

Walter J. Lewicki, Jr., Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Continuation-in-part of Ser. No. 315,522, Dec. 15, 1972, abandoned. This application Feb. 15, 1974, Ser. No. 442,770

Int. Cl. B29c *15/00*

U.S. Cl. 264—284 **2 Claims**



1. A process for mechanically embossing a floor covering material consisting of the steps of:

a. passing a flexible sheet material having a printed pattern thereon by a heater structure which applies heat to only the upper side of the flexible sheet material, said sheet material being formed of a backing layer, an intermediate layer of a flexible foamed material and an upper thinner embossable layer of a wear resistant material,

b. heating the sheet material for a short time to a very high temperature on its upper layer, while maintaining approximately a 100°–200° F temperature differential at the point of embossing between the upper layer heated side of the sheet material which faces the heater structure and the flexible foamed side of the sheet material facing away from the heaters,

c. immediately feeding the heated sheet material into an embossing structure having a back-up roll and an embossing roll in engagement with the upper layer surface of the sheet material which had faced the heater, and completely bottoming out the embossing roll against the sheet material without the collapse of all or part of the foam structure intermediate layer underlying the embossed heated upper layer, and

d. providing the embossing roll with cooling means and wrapping the sheet material around approximately one-half of the circumference of the embossing roll to cool the sheet material after the embossed pattern has been placed thereon to provide a product having a substantially undamaged foam cell structure in the intermediate layer under the embossed areas which is capable, upon reheating of the sheet material, of exerting sufficient stress upon the upper layer to restore the upper layer to its unembossed state, the sheet material being guided in a direction transverse of its direction of movement and the peripheral speed of the embossing roll being controlled so that the embossed pattern is placed on the sheet material in registry with the printed pattern thereon.

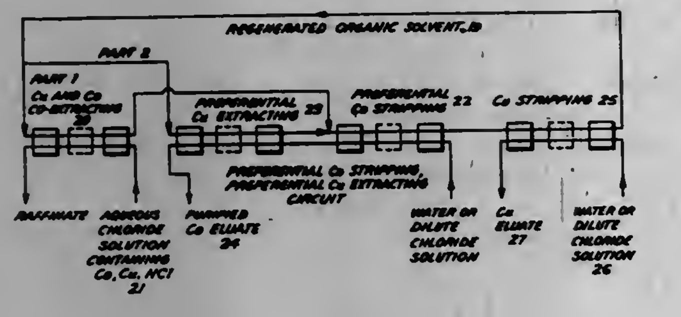
3,887,679
SEPARATION OF COPPER FROM COBALT

Eivind Wigstol, and Kjell Einar Froyland, both of Kristiansand-S, Norway, assignors to Falconbridge Nickel Mines Limited, Toronto, Ontario, Canada

Filed May 31, 1972, Ser. No. 258,396

Int. Cl. C01g *3/00, 51/00*

U.S. Cl. 423—24 **8 Claims**


REGENERATED ORGANIC SOLVENT 30
PART 2
PART 1
Cu AND Co CO-EXTRACTING 20
PREFERENTIAL Cu EXTRACTING 23
PREFERENTIAL Co STRIPPING 22
Cu STRIPPING 25
PREFERENTIAL Co STRIPPING, PREFERENTIAL Cu EXTRACTING CIRCUIT
RAFFINATE
AQUEOUS CHLORIDE SOLUTION CONTAINING Co, Cu, HCl 21
PURIFIED Co ELUATE 24
WATER OR DILUTE CHLORIDE SOLUTION
Cu ELUATE 27
WATER OR DILUTE CHLORIDE SOLUTION 26

1. In a method for recovering cobalt and copper from an aqueous chloride solution having a minimum total chloride concentration of about 7N, and containing cobalt, copper and hydrochloric acid in which cobalt and copper are co-extracted by contacting said solution with a substantially water-immiscible organic solution containing a tertiary amine solvent which will extract anionic chloride complexes of cobalt and copper and cobalt is preferentially stripped from the so produced cobalt and copper-bearing organic solution by water or dilute chloride solution having a maximum total chloride concentration of 5N, thereby forming a cobalt eluate containing copper, the improvement for separating copper from cobalt comprising,

- i. dividing the water-immiscible organic solution into a first part and a second part,
- ii. co-extracting cobalt and copper into the first part thereby forming a first cobalt and copper-bearing organic solution,
- iii. preferentially extracting copper from the cobalt eluate containing copper into the second part, thereby forming a purified cobalt eluate and a second cobalt and copper-bearing organic solution, said cobalt eluate containing copper having a maximum chloride concentration of 5N,
- iv. combining the first and second cobalt and copper-bearing organic solutions thereby forming a combined loaded organic solution,
- v. preferentially stripping cobalt from the combined organic solution with an aqueous solution having a maximum chloride concentration of 4N, thereby forming the cobalt eluate containing copper and a cobalt-depleted organic solution,
- vi. stripping copper from the cobalt-depleted organic solution thereby forming a copper eluate and a stripped organic solution, and,
- vii. recycling the stripped organic solution.

3,887,680
PROCESS FOR RECOVERING TUNGSTEN FROM TUNGSTEN CARBIDES CONTAINING AN IRON GROUP OF METALS

Martin B. MacInnis; Clarence D. Vanderpool, both of Towanda, and Carl W. Boyer, Wysox, all of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 23, 1973, Ser. No. 408,494

Int. Cl. C01g *41/00*

U.S. Cl. 423—55 **5 Claims**

1. In a process wherein a composition comprising tungsten carbide particles cemented with cobalt as a binder is oxidized to a friable oxidation product, the product is thereafter formed into discrete particles and the particles are treated to recover the tungsten values, the improvement comprising:

- a. oxidizing said composition in air at a temperature between about 800°C and 900°C for a time sufficient to form a friable oxidation product and
- b. recovering tungsten valves by digesting the particles of oxidation product in an aqueous alkali metal hydroxide solution at a temperature of from about 140°C to 195°C and under pressure of from about 50 to 200 pounds per square inch for about 6 to 10 hours to form watersoluble alkali metal tungstate and a sludge containing cobalt values

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3,887,681
SEPARATION OF GALLIUM FROM ALKALINE LIQUORS USING ACETYLACETONE

Pierre De La Breteque, Marseille-St. Louis, and Marc Beerli, Paris, both of France, assignors to Swiss Aluminum Ltd., Switzerland

Filed Oct. 5, 1972, Ser. No. 295,277

Claims priority, application Switzerland, Oct. 6, 1971, 14556/71

Int. Cl. B01d *11/00;* **B01j** *1/04;* **C01f** *1/00, 3/00, 7/00;* **C01g** *15/00;* **C22b** *21/00, 35/00, 61/00*

U.S. Cl. 423—112 **4 Claims**

1. A process for separating gallium from solution which comprises adding to an aqueous solution of aluminate in which gallium is dissolved, and containing between about 100 grams per liter and about 180 grams per liter of Na_2O, acetylacetone as a complexing agent, and extracting the complex by means of an organic solvent which is substantially immiscible with water.

3,887,682
PROCESS FOR PURIFYING A GAS CONTAINING HYDROGEN SULFIDE AND HYDROGEN CYANIDE

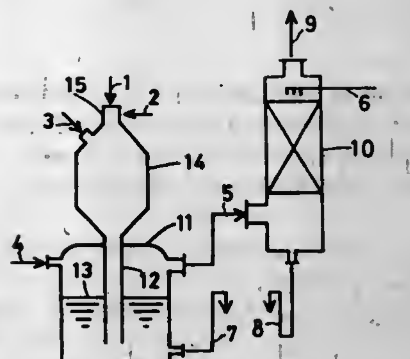
Seiji Kumata; Youichi Shimoi; Terubika Hirabayashi, and Yukinori Hiwatashi, all of Tokyo, Japan, assignors to Nittetu Chemical Engineering Limited, Tokyo, Japan

Filed Nov. 2, 1972, Ser. No. 303,078

Claims priority, application Japan, Nov. 2, 1971, 46-86765

Int. Cl. C01b *17/24;* **C01c** *3/04*

U.S. Cl. 423—232 **2 Claims**



1. In a process for purifying a gas containing hydrogen sulfide and hydrogen cyanide in which said gas is washed with an aqueous alkaline solution to dissolve the hydrogen sulfide as hydrosulfide and the hydrogen cyanide as cyanide, the aqueous solution containing hydrosulfide and cyanide being oxidized to form thiocyanates, sulfur oxide salts and a precipitate of free sulfur which precipitate is then removed from the aqueous alkaline solution; the improvement which comprises: reductively roasting the aqueous alkaline solution containing thiocyanates and sulfur oxide salts in a combustion zone at 650°–1100°C and with an air ratio of less than 0.95 to convert at least a portion of said thiocyanates and sulfur oxide salts to sulfides; dissolving said sulfides to form a thiocyanate and sulfur oxide salt depleted alkaline solution; and recycling said depleted solution to the alkline aqueous wash solution.

3,887,683
METHOD FOR REMOVING NITROGEN OXIDES FROM WASTE GASES

Yasuhiko Abe, and Hisayoshi Yamaguchi, both of Annaka, Japan, assignors to Shin-Etsu Handotai Co., Ltd., Japan

Filed Aug. 23, 1973, Ser. No. 391,021

Claims priority, application Japan, Aug. 23, 1972, 47-84325; Sept. 6, 1972, 47-89283

Int. Cl. B01d *53/34*

U.S. Cl. 423—235 **5 Claims**

1. A method for removing nitrogen oxide from waste gases which comprises:

- a. washing the waste gas with water or alkaline solution;
- b. adding ammonia to the washed waste gas;
- c. passing the ammonia-washed waste gas mixture in contact with a catalyst selected from the group consisting of activated charcoal and vanadium trioxide supported on activated charcoal at a temperature between room temperature and 150°C with a space velocity of from 1,000 to 50,000 parts by volume at standard temperature and pressure of the gas mixture per hour per part by volume of the catalyst; and
- d. subjecting the thus-treated gaseous mixture to a dust collection treatment.

3,887,684
REMOVAL OF SULFUR DIOXIDE FROM WASTE GASES

Frank S. Griffith, Palmerton, Pa., assignor to The New Jersey Zinc Company, Palmerton, Pa.

Filed Sept. 28, 1973, Ser. No. 401,747

Int. Cl. C01b *17/00*

U.S. Cl. 423—242 **10 Claims**

1. A process for recovering sulfur dioxide from dilute sulfur dioxide gases, comprising:

- a. contacting said gases with an aqueous solution of zinc sulfate in which the concentration of zinc in and the pH of, the aqueous solution of zinc sulfate is maintained, by the addition of a zinc oxide containing material, at levels sufficient to produce a zinc sulfite-zinc sulfate precipitate, and
- b. absorbing sulfur dioxide from said gases in said aqueous solution of zinc sulfate,
- c. removing said precipitate from said aqueous solution of zinc sulfate.

3,887,685
AUTOMATIC FEED BLOCK MOLDING PRESS FOR GRANULAR MATERIALS

Franz Stelzmuller, Oensingen, Switzerland, assignor to Von Roll A.G., Gerlafingen, Switzerland

Filed July 31, 1973, Ser. No. 384,390

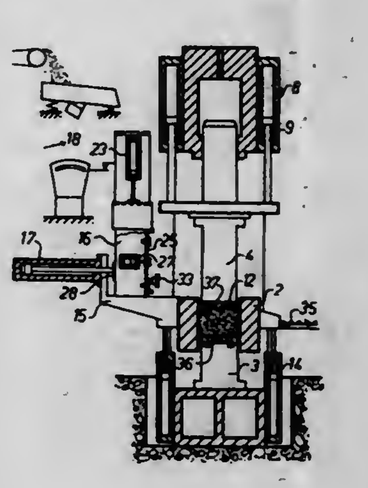
Claims priority, application Switzerland, Aug. 3, 1972, 11488/72

Int. Cl. B30b *11/02, 15/30*

U.S. Cl. 425—260 **7 Claims**

1. A block molding press particularly suited for forming block electrodes by compression of granulated material mixed with a binder comprising, in combination with a press frame: mold means open above and below;

- an upper and a lower compression means fitting into said mold means respectively from above and below;
- actuating means for moving said mold means and at least one of said compression means vertically with respect to said press frame;
- a dosage device (18) for said granular material;
- a laterally movable charging container (16) movable between a position below the discharge of said dosage device and a position above the upper opening of said mold means (2) and having an openable wall (25), said charging container means (16) also being open above and below and being slidably supported on a surface flush with the top of said mold means (2) provided by bracket means (15) affixed to said mold means (2);



- lateral drive means (17) for laterally moving said charging container (16) for charging said mold means (2) and expelling a previously pressed block in synchronism with operation of said actuating means; and
- operating means (27) connected to said openable wall (25) for opening and closing said wall and for maintaining said wall in open or closed position as required in synchronism with the operation of said actuating means and said lateral drive means,
- said actuating means and said lateral drive means being so synchronized that one of said compression means protrudes at least part way into said charging container (16) before said charging container is moved away from its said position above the upper opening of said mold means.

3,887,686
PHARMACEUTICAL COMPOSITIONS CONTAINING A 2-(FURYL-METHYL)-6,7-BENZOMORPHAN AND METHOD OF USE

Herbert Merz; Adolf Langbein; Helmut Wick, and Klaus Stockhaus, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Division of Ser. No. 222,669, Feb. 1, 1972, Pat. No. 3,823,150.

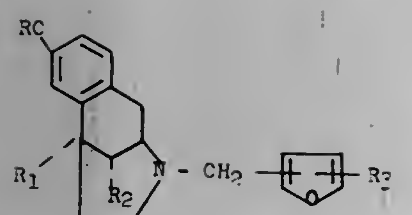
This application Jan. 24, 1974, Ser. No. 436,168

Claims priority, application Germany, Feb. 8, 1971, 2105743; Feb. 25, 1971, 2108954

Int. Cl. A61k *27/00*

U.S. Cl. 424—267 **13 Claims**

1. A pharmaceutical dosage unit composition having analgesic and antitussive activity consisting essentially of an inert pharmaceutical carrier and an effective analgesic or antitussive amount of a racemic mixture of a compound of the formula



wherein

R is hydrogen, methyl or acetyl,

R_1 is hydrogen, methyl, ethyl, n-propyl, isopropyl or butyl, and

R_2 and R_3 are each hydrogen, methyl or ethyl;

or an optically active isomer component thereof; or a nontoxic, pharmacologically acceptable acid addition salt of said racemic mixture or optically active isomer.

3,887,687

RECOVERY OF BORON FROM A POLYMER MATRIX

John T. Buford, Joplin, Mo., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 14, 1973, Ser. No. 397,463

Int. Cl. C01b *9/00, 35/00*

U.S. Cl. 423—292 **6 Claims**

1. A method for recovering boron dissolved or dispersed in a polymeric or elastomeric matrix which comprises heating the matrix to a temperature in the range 500° to 800° C. in an inert atmosphere for a time sufficient to effect thermal dissociation of the polymer, reacting the thermally dissociated residue with a halogenating reagent selected from the group consisting of Cl_2 or Br_2 at a temperature in the range 500° to 800° C., and then distilling the halogenation reaction product to obtain a purified BCl_3 or BBr_3 fraction.

3,887,688

PROCESS FOR REFINING AQUEOUS SOLUTION OF THIOCYANATE CONTAINING IMPURITIES

Yukio Shimosaka; Masahiko Ozaki, and Jiro Negi, all of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Jan. 31, 1974, Ser. No. 438,350

Claims priority, application Japan, Feb. 15, 1973, 48-18619

Int. Cl. C01c *3/20*

U.S. Cl. 423—366 **7 Claims**

1. A process for refining an aqueous solution of a thiocyanate containing impurities which comprises (a) feeding an aqueous solution of a thiocyanate containing impurities to a cross-linked dextran layer so that the impurities and thiocyanate may be caught in said cross-linked dextran layer, (b) then passing an eluent in an amount necessary to flow away the impurities through said cross-linked dextran layer so that the impurities may be flowed away together with the eluent, and (c) then further passing an eluent through said cross-linked dextran layer so that the effluent eluent containing the thiocyanate may be separated.

3,887,689

CARBONATION OF AMMONIACAL SODIUM CHLORIDE BRINE

John Raymond Carding, and Cyril Peover, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 26, 1973, Ser. No. 344,599

Claims priority, application United Kingdom, Mar. 27, 1972, 14250/72

Int. Cl. C01d *7/1*

U.S. Cl. 423—423 **8 Claims**

1. In a method of carbonating ammoniacal sodium chloride brine in an ammonia soda-Solvay process wherein a phenol-free or phenol-deficient ammonia is used and the phenolic compound content of the brine is below 10 milligrams per litre of ammoniacal sodium chloride brine and the carbon dioxide content of waste gas is above 12% by volume, the improvement comprising adding a sufficient amount of one or more phenolic compounds to the process to increase the phenolic compounds content of the brine to between 10 and 250 milligrams per litre and to reduce the carbon dioxide content of the waste gas to less than 12% by volume.

3,887,690

PROCESS FOR PRODUCING CARBON BLACK

Jesse R. West, Houston, Tex.; Ollie Middlebrooks, West Monroe, La., and William B. Crull, Dumas, Tex., assignors to Continental Carbon Company, Houston, Tex.

Continuation-in-part of Ser. No. 776,038, Nov. 15, 1968, abandoned. This application Mar. 11, 1971, Ser. No. 123,453

Int. Cl. C09c *1/48, 1/50*

U.S. Cl. 423—456 **3 Claims**

1. In a process for the production of carcass grades of oil furnace carbon black in which a carbon black feedstock is introduced axially into one end of an elongate, substantially cylindrical, refractory lined reactor of substantially uniform diameter into a primary reaction zone heated by primary hot combustion gases from the burning of a hydrocarbon gas or other fuel with air, said combustion gases flowing in longitudinal downstream flow, the improvement which comprises:

a. supplying said primary hot combustion gases in an amount of about 3500–5200 BTU per pound of said feedstock;

b. supplying secondary heat to said reactor as a stream or streams of secondary combustion gases introduced in tangential flow at a point or points located at distances downstream of the point of introduction of said primary heat equal to about 6–14 times the inside diameter of said refractory lining, the amount of said secondary heat being about 1000-2500 BTU per pound of said feedstock;

c. the ratio of the quantity of said primary heat to said secondary heat being from about 2 to about 4.

3,887,691

CHEMICAL PROCESS

Paul Kobetz, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed July 17, 1972, Ser. No. 272,314

Int. Cl. C01b *7/00;* C01f *7/02*

U.S. Cl. 423—462 **13 Claims**

1. A process for hydrolyzing aluminum alkoxides to produce alcohol and a hydroxy chloroaluminum compound which comprises:

reacting an aluminum alkoxide having from about 6 to about 30 carbon atoms per alkoxide group and hydrochloric acid in molar proportions of from about ½ to about 1 mol of hydrochloric acid per mol of aluminum alkoxide in an aqueous system to form a two phase reaction product system, one of said phases being an organic phase, the other of said phases being an aqueous solution of $AlCl_{0.5-1.0}(OH)_{2.5-2.0}$, and separating the phases.

8. An improved method for producing aluminum oxide or aluminum hydroxide which comprises:

reacting an aluminum alkoxide having from about 6 to about 30 carbon atoms per alkoxide group and hydrochloric acid in molar proportions of from about ½ to about 1 mol of hydrochloric acid per mol of aluminum alkoxide in an aqueous system to form a two phase reaction product system, one of said phases being an organic phase, the other of said phases being an aqueous solution of $AlCl_{0.5-1.0}(OH)_{2.5-2.0}$, separating the phases and vaporizing water and hydrochloric acid from the $AlCl_{0.5-1.0}OH_{2.5-2.0}$ to produce a residue of aluminum hydroxide or aluminum oxide.

3,887,692

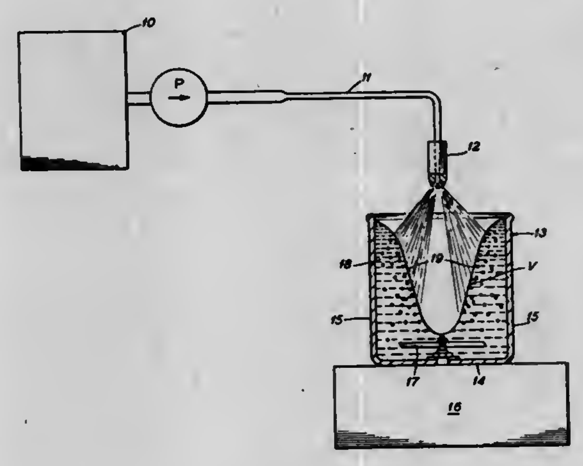
MICROSPHERICAL BASIC ALUMINUM HALIDES AND METHOD OF MAKING SAME

William S. Gilman, South Plainfield, N.J., assignor to Armour Pharmaceutical Company, Phoenix, Ariz.

Filed July 10, 1972, Ser. No. 269,991

Int. Cl. C01d *7/00, 7/02, 7/56*

U.S. Cl. 423—462 **20 Claims**



1. A basic aluminum halide in solid microspherical form in which the solid spherical particles have a diameter of 2 to 500 microns prepared by a process comprising the steps of discharging an aqueous solution of a halide having the formula $Al_n(OH)_xQ_y.XH_2O$ wherein $x + y = 3n$, x is 2 or more, X is 2 to 4 and Q is chlorine or bromine or mixtures thereof, in finely divided form, into the cavity in a whirling vortex of an organic alcohol having 4 or 5 carbon atoms and a branched methyl group, and separaring the resulting aluminum halide microspheres from said alcohol.

3,887,693

CONTINUOUS PROCESS FOR OBTAINING ALUMINIUM FLUORIDE BY REACTING FLUOSILICIC ACID WITH AN ALUMINOUS MATERIAL

Antonio Escribano Nevado, Bilbao/Vizcaya; Eduardo Chapela Lago, Castro Urdiales/Santander, and Jesus Gutierrez Hernandez, Algorta/Vizcaya, all of Spain, assignors to Derivados del Fluor, S.A., Spain

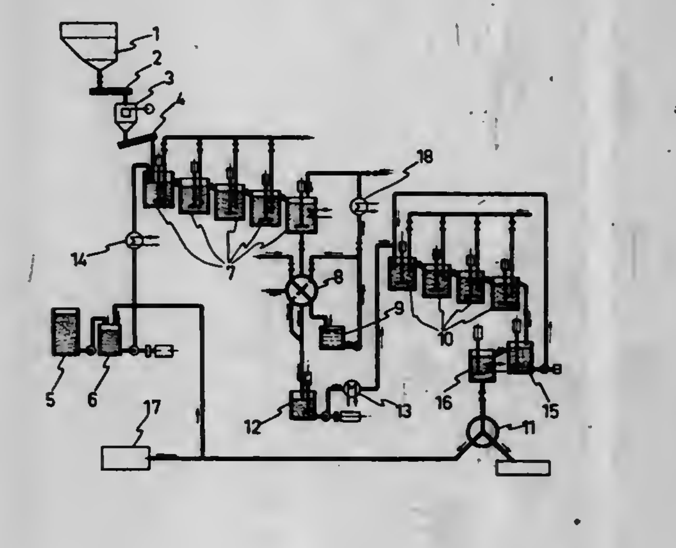
Filed May 25, 1973, Ser. No. 363,872

Claims priority, application Spain, May 26, 1972, 403234; May 8, 1973, 414546

Int. Cl. C01f *7/50;* C01b *33/12*

U.S. Cl. 423—489 **12 Claims**

1. Continuous process for obtaining aluminum fluoride by reacting fluosilicic acid with an aluminous material, forming a suspension of insoluble silica hydrate and a supersaturated solution of α-allotropic aluminum fluoride, which reaction is carried out by using fluosilicic acid having a concentration of 5 to 25%, previously heated to approximately 60° to 95°C, and finely pulverized alumina or bauxite hydrate high in silica; the reaction mixture being maintained at a temperature above 90°C, for a reaction time from 5 to 60 minutes, the process being carried out continuously in a battery of reactors arranged in cascade, the reaction being effected progressively from the first to the last reactor; the reaction flow being uniform; and the reactants being continuously introduced through the first reactor uniformly and continuously in such amount that the suspension emerging from the last reactor is maintained at a pH between 1 and 3, the insoluble silica hydrate being separated from said suspension which emerges from the last reactor, while said supersaturated α-allotropic aluminum fluoride solution obtained is lead to a battery of crystallizers, arranged in cascade, where the α-aluminum fluoride is continuously converted to its insoluble β-allotropic state.



3,887,694

PRODUCTION OF CHLORINE

Wendell E. Dunn, Jr., Sydney, Australia, assignor to Titanium Technology N.V., Curacao, Netherlands Antilles

Continuation-in-part of Ser. No. 108,571, Jan. 21, 1971, abandoned. This application Dec. 22, 1972, Ser. No. 317,744

Int. Cl. C01b *7/00*

U.S. Cl. 423—500 **11 Claims**

1. A process for producing chlorine comprising the steps of:

a. heating a mixture comprising:
   1. a hydrated ferric chloride of the formula $FeCl_3.nH_2O$ wherein n is a number in the range of 0 to 6 or an aqueous solution of ferric chloride and an alkali-metal chloride wherein the mole ratio of alkali-metal chloride to ferric chloride is in the range of 0.75:1 to 4:1;
   2. ferric oxide wherein the mole ratio of ferric oxide to ferric chloride is 0.2 to 1.0;
   3. water; and
   4. at least a sufficient amount of hydrogen chloride or hydrochloric acid to react with iron oxides a

   at a temperature in the range of 180° to 310°C. and distilling all of the water as water or hydrochloric acid to produce a dehydrated product; and

b. reacting the dehyrated product of (a) with at least a stoichiometric amount of an oxygen containing gas, at a temperature in the range of 400° to 1,200°C., to produce chlorine, iron oxide and unreacted chlorides.

3,887,695

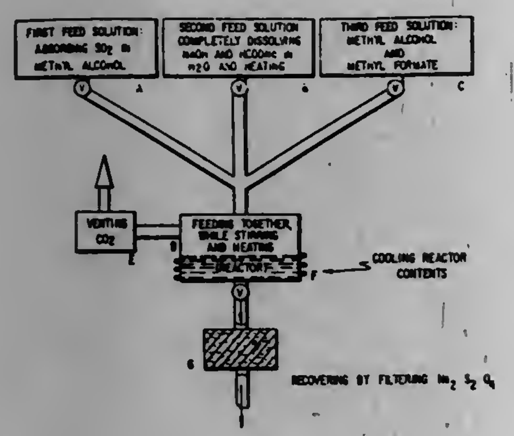
PRODUCTION OF SODIUM HYDROSULFITE FROM FORMATES

Jack Plentovich, Nansemond County; Charles Ellis Winslow, Jr., Norfolk, and Mearl A. Kise, Portsmouth, all of Va., assignors to Virginia Chemicals Inc., Portsmouth, Va.

Continuation-in-part of Ser. No. 9,078, Feb. 5, 1970, Pat. No. 3,576,598. This application Nov. 16, 1970, Ser. No. 89,720The portion of the term of this patent subsequent to Apr. 27, 1988, has been disclaimed.

Int. Cl. C01b *17/98*

U.S. Cl. 423—515 **6 Claims**


FIRST FEED SOLUTION: ABSORBING SO2 IN METHYL ALCOHOL
SECOND FEED SOLUTION COMPLETELY DISSOLVING NaOH AND HCOONa IN H2O AND HEATING
THIRD FEED SOLUTION: METHYL ALCOHOL AND METHYL FORMATE
A
B
C
VENTING CO2
E
D
FEEDING TOGETHER WHILE STIRRING AND HEATING
REACTOR
F
COOLING REACTOR CONTENTS
G
RECOVERING BY FILTERING Na2 S2 O4

1. Method of preparing sodium hydrosulfite ($Na_2S_2O_4$) from formates comprising:

A. absorbing sulfur dioxide (SO_2) in methyl alcohol (CH_3OH) as a first feed solution;

B. dissolving sodium hydroxide (NaOH) and sodium formate (HCOONa) in water (H_2O) and heating to effect complete solution of all solids, as a second feed solution;

C. feeding a small amount of methyl alcohol (CH_3OH) and methyl formate ($HCOOCH_3$) to a reactor, as a third feed solution, while heating in the range 60° to 90° C. and stirring under superatmospheric pressure within said reactor;

D. sequentially feeding together under pressure said first and second feed solutions as a reaction liquid into said reactor while stirring and heating in the range 60° to 90° C. under a superatmospheric pressure;

E. venting carbon dioxide (CO_2) from said reaction liquid within said reactor;

F. cooling said reactor and contents;

G. recovering by filtering sodium hydrosulfite ($Na_2S_2O_4$) solids from said reaction liquid; and

H. recovering methyl formate ($HCOOCH_3$) together with methyl alcohol (CH_2OH), sequentially of filtering said hydrosulfite from said reaction liquid, and recycling both said methyl formate ($HCOOCH_3$) and said methyl alcohol (CH_3OH) into said third feed solution.

3,887,696

PROCESS AND APPARATUS FOR HETEROGENEOUS CATALYSIS OF A CHEMICAL REACTION, PARTICULARLY CATALYTIC DECOMPOSITION OF HYDROGEN PEROXIDE

Michel Louis Bernard, Poitiers, and Gerard Coudrin, Nantes, both of France, assignors to Republic of France, Paris, France

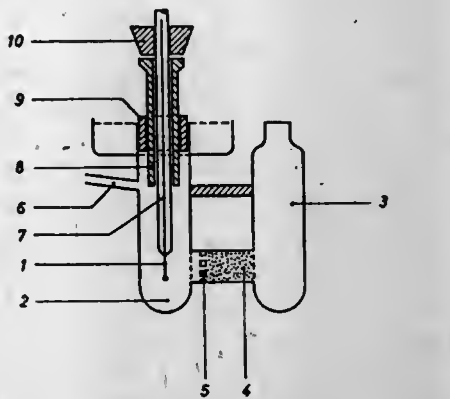
Filed Dec. 26, 1972, Ser. No. 318,655

Claims priority, application France, Dec. 23, 1971, 71.46266

Int. Cl. C01b *13/02*

U.S. Cl. 423—579 **9 Claims**

1. In a process of heterogeneous catalysis of a chemical reaction comprising catalytic decomposition of aqueous solutions of hydrogen peroxide, the catalyst utilized being metallic and belonging to the class constituted by transition elements of groups I, VI, VII and VIII, the improvement comprising subjecting the said catalyst to a cathode or alternating voltage which has the effect of electrochemically polarizing it and increasing the catalytic reaction at said catalyst cathode, the nature of the catalyst and the level of the applied voltage being such as to effect release of oxygen primarily at the catalyst cathode.



3,887,697

HEMAGGLUTINATION METHOD FOR AUSTRALIA ANTIGEN AND ANTIBODY THERETO

Girish N. Vyas, San Francisco, Calif., and Nahum Raphael Shulman, Kensington, Md., assignors to The United States of America as represented by the Secretary of the Department of Health, Education & Welfare, Washington, D.C.

Filed Aug. 9, 1971, Ser. No. 170,292

Int. Cl. C12k *1/00;* **G01n** *31/00, 33/16*

U.S. Cl. 424—12 **8 Claims**

1. A method for measuring Australia antigen in serum or other biological material comprising coating inert indicator human red blood cells with purified Australia antigen using chromic chloride as a coupling agent, suspending said coated cells in phosphate buffered saline solution containing bovine serum albumin, polyvinyl pyrrolidone, and polyoxyethylene sorbitan monooleate, adding an aliquot of a predetermined dilution of antibody to said antigen to each of serial two-fold dilutions of said serum or other material, and adding said suspension of coated cells to said serum-antibody mixture, whereby inhibition of hemagglutination in 1:2 dilution and higher dilutions indicates the presence of said antigen in said serum.

3,887,698

SACS WITH EPITOPIC SITES ON WALLS ENCLOSING STABLE FREE RADICALS

Harden M. McConnell, Palo Alto, and Gillian K. Humphries, Los Altos, both of Calif., assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 339,775, March 12, 1973, abandoned. This application Feb. 25, 1974, Ser. No. 445,392

Int. Cl. G01n *27/00, 31/02, 33/16*

U.S. Cl. 424—12 **12 Claims**

1. A composition useful in immunoassay comprising vesicles or liposomes having at least one epitopic site on the external walls thereof, said walls enclosing an aqueous medium including stable free radicals comprising electron spin resonance labels, said free radicals being in sufficient concentration to provide an electron paramagnetic resonance spectrum of at least about 3 gauss in half width, peak to peak, at a resonance frequency of about 9.2 gigahertz.

8. A composition useful in immunoassay comprising erythrocyte ghosts having at least one epitopic site on the external walls thereof, said walls enclosing an aqueous medium including stable free radicals comprising electron spin resonance labels, said free radicals being in sufficient concentration to provide an electron paramagnetic resonance spectrum of at least about 3 gauss in half width, peak to peak, at a resonance frequency of about 9.2 gigahertz.

3,887,699

BIODEGRADABLE POLYMERIC ARTICLE FOR DISPENSING DRUGS

Seymour Yolles, 404 Stamford Dr., Newark, Del. 19711

Continuation-in-part of Ser. No. 809,946, March 24, 1969, abandoned. This application Dec. 29, 1970, Ser. No. 102,431

Int. Cl. A61k *27/12*

U.S. Cl. 424—19 **9 Claims**

1. An article for controllably dispensing drugs comprising:
a. a plurality of spheroidal shaped, homopolymers and copolymers of lactic acid, said polymers being prepared from cyclic esters of optically active or inactive lactic acids, or mixtures thereof, having a sufficiently high molecular weight to retain structural integrity of said spheroids for an effective period of time upon implantation, with the proviso that crystalline spheroids having relatively long duration upon implantation are formed from pure optically active lactic acids and spheroids having rapid release upon implantation are formed from lactic acid polymers having a lower degree of crystallinity with
b. an effective amount of a solution of a drug said solution of drug substantially at the center of said spheroids exuding or migrating, upon implantation, from the interior to the surface of the spheroid until said surface is coated with a drug and an equilibrium is established between the surface layer and the drug at the interior of the polymeric material such that if the surface layer is partially or totally removed the equilibrium is destroyed and further amounts of the drug migrate to the surface until equilibrium is reestablished so that this cycle repeats itself until the supply of drug is exhausted.

3,887,700

ANALGESIC FORMULATIONS

Graham Arthur Boncey, Cowley; Maurice John Hedge, Windsor, and James Rae Henderson, High Wycombe, all of England, assignors to Aspro Nicholas Ltd., Stough, England

Division of Ser. No. 92,284, Nov. 23, 1970. This application Nov. 12, 1973, Ser. No. 415,247

Claims priority, application United Kingdom, Nov. 28, 1969, 58203/69

Int. Cl. A61k *11/02*

U.S. Cl. 424—44 **5 Claims**

1. An effervescent composition comprising one part of free flowing readily wetable coated aspirin particles, of which at least 95 percent by weight are not more than 150 microns, comprising: one part of aspirin to one to one ninth part of a coating agent comprising at least one ingredient selected from glycine, methionine, sucrose, lactose, arabino galactan sugar products, manitol, inositol, and sorbitol; said coating agent also comprising up to 5 percent by weight of a wetting agent; and up to 10 percent by weight of a film forming agent selected from hydroxyethyl cellulose, hydroxy propyl methyl cellulose, sodium carboxymethyl cellulose, starches, dextrin, dextran, gun acacia, gum tragicanth and polyvinyl pyrrolidone: and three to six parts of an effervescent couple constituted by a mixture of a pharmaceutically acceptable acid and alkalai which in contact with water will react to liberate carbon dioxide, the ratio be weight of the aspirin to the total weight of the composition being greater than 1:8.

3,887,701

ANTIBACTERIAL ORAL COMPOSITIONS CONTAINING PRESERVATIVE-ANTIOXIDANTS

Julius Harvey Nachtigal, Colonia, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 1, 1974, Ser. No. 411,726

Int. Cl. A61k *7/16*

U.S. Cl. 424—54 **24 Claims**

1. An oral preparation comprising a non-toxic bisbiguanido hexane compound as antibacterial agent in amount of from about 0.01% to about 5% by weight based on the free base thereof, a vehicle for said agent compatible therewith and as a stabilizing agent from about 0.01% to about 5% by weight of hydrogenated coumarin reducing agent.

3,887,702

COMPOSITION AND METHOD FOR TREATING FINGERNAILS AND TOENAILS

Mildred Baldwin, 1545 Archer Rd., Bronx, N.Y. 10462

Filed Aug. 30, 1973, Ser. No. 392,970

Int. Cl. A61k *7/04*

U.S. Cl. 424—61 **6 Claims**

1. A composition for improving the quality of fingernails and toenails consisting essentially of an effective amount of an oil chosen from the group consisting of soybean oil, sunflower oil, and combinations thereof comprising from 1 to 19 parts soybean oil and from 19 to 1 parts sunflower oil, and from 200 to 2800 international units of vitamin E per fluid ounce of oil.

3,887,703

MUCOPOLYSACCHARIDES, THEIR PREPARATION AND USE IN COSMETIC AND PHARMACEUTICAL COMPOSITIONS

Georges Manoussos, and Claudine Berrebi, both of Paris, France, assignors to Societe Anonyne dite: L'Oreal, Paris, France

Continuation-in-part of Ser. No. 132,182, April 7, 1971, abandoned, which is a continuation of Ser. No. 714,770, March 21, 1968, abandoned, and a continuation of Ser. No. 860,044, Sept. 22, 1969, abandoned. This application Feb. 26, 1973, Ser. No. 335,728

Claims priority, application Luxembourg, Sept. 28, 1968, 56945

Int. Cl.^{2} A61K *27/00*

U.S. Cl. 424—95 **38 Claims**

1. A method for producing mucopolysaccharides from a material selected from the group consisting of cutaneous teguments, umbilical cords and mixtures thereof from the foetus of an animal selected from the group consisting of a cow and a sheep comprising under aseptic conditions:

a. grinding said material,

b. extracting said ground material with an ionic extraction solution having a pH between 1.5 and 9 and present in amounts of about 1–20 ml/g of said ground material, said ionic extraction solution being selected from the group consisting of

  i. a 0.1–2.5 M solution of a neutral salt selected from the group consisting of sodium chloride and potassium chloride,

  ii. a 0.1 M solution of an acid salt selected from the group consisting of sodium acid phosphate, potassium acid phosphate, disodium citrate, dipotassium citrate and mixtures thereof,

  iii. a solution of hydrochloric acid having a pH of about 1.5 and

  iv. a 1N solution of sodium hydroxide,

c. digesting said extracted, ground material in the presence of a proteolytic enzyme selected from the group consisting of trypsin, ficin, pepsin, pronase, papain and pancreatin, said enzyme being present in amounts effective to digest said material, said digesting being continued until said material becomes fluid, thereby forming a broth,

d. adding to said broth a solvent selected from the group consisting of acetone, methanol, ethanol and isopropanol in amounts effective to precipitate said mucopolysaccharides therefrom,

e. separating said precipitated mucopolysaccharides by filtration, decantation or centrifugation,

f. washing said separated mucopolysaccharides, and

g. drying said mucopolysaccharides thereby providing mucopolysaccharides in the form of a white solid, soluble in water and physiological serum solution and having a molecular weight ranging between about 5,000–2,500,000.

3,887,704

AQUEOUS ZINC SOLUTIONS FOR PHYSIOLOGICAL USE

Joseph Lichtenstein, 101 Devon Rd., Colonia, N.J. 07067
Filed Mar. 12, 1974, Ser. No. 450,390
Int. Cl.² A61K *27/00*
U.S. Cl. 424—145 **11 Claims**

1. A composition for use in physiological administration comprising an aqueous solution having a pH within the range of from 5.0 to 8.5 of a water-soluble zinc salt in a proportion sufficient to provide a physiologically active zinc ion concentration, at least one other physiologically active ingredient selected from the group consisting of water-soluble phosphates, soaps, fatty acids, proteins and protein hydrolysates in a proportion normally tending to insolubilize said zinc ions, and a neutralized salt which is water-soluble at a pH within the range of from 5.0 to 8.5 selected from the group consisting of water-soluble alkali metal, alkaline earth metal, alkanolamine, amine, and quaternary ammonium salts of an acid whose zinc salt is water-soluble at a pH within the range of from 5.0 to 8.5, the weight ratio of said neutralized salt to said zinc salt being within the range of from about 0.1 to about 40, whereby the insolubilization of said zinc ions by said other physiologically active ingredient is inhibited by said neutralized salt.

3,887,705

MEDICAMENTS INTENDED FOR THE PREVENTION AND TREATMENT OF CAPILLARY-VENOUS DEFICIENCIES

Hubert Serre, Mazamet, and Jean Rey, Castres, both of France, assignors to Pierre Fabre S.A., Paris, France
Filed May 17, 1973, Ser. No. 361,020
Claims priority, application France, May 17, 1972, 72.17754
Int. Cl.² A61K *27/00*
U.S. Cl. 424—180 **12 Claims**

1. Pharmaceutical composition useful in the prevention and treatment of circulatory disturbances comprising in effective amounts

a. dihydroergotamine or a pharmaceutically acceptable salt thereof,
b. at least one vitamin P compound, and
c. ascorbic acid (vitamin C) in a form useful in medicaments,

wherein said components (a), (b) and (c) are present in amounts so as to provide the components in a proportion by weight of about 2 parts of (a), 10–150 parts of (b), and 30–350 parts of (c).

3,887,706

N6-(3-CHLOROBUTEN-2-YL)-ADENOSINES AS ANTI-INFLAMMATORY AGENTS

Helmut Vorbrüggen, Berlin, Germany, assignor to Schering Aktiengesellschaft, Berlin, Germany
Division of Ser. No. 94,624, Dec. 2, 1970, Pat. No. 3,766,168.
This application July 23, 1973, Ser. No. 381,600
Claims priority, application Germany, Dec. 12, 1969, 1962387
Int. Cl. A61k *27/00*
U.S. Cl. 424—180 **2 Claims**

1. A process for the treatment of inflammatory conditions which comprises administering to a patient an effective anti-inflammatory amount of a pharmaceutical anti-inflammatory preparation of a compound selected from the group consisting of N^6-(3-chloro-cis-buten-2-yl)-adenosine and N^6-(3-chloro-trans-buten-2-yl)-adenosine and admixed with a pharmaceutically acceptable carrier.

3,887,707

ANTI-ARTHRITIC COMPOSITIONS COMPRISING AN S-HOSPHINE OR PHOSPHITE GOLD THIO-CYANATE AND METHODS OF PRODUCING ANTI-ARTHRITIC ACTIVITY

Blaine M. Sutton, Hatboro; Donald T. Walz, Drexel Hill, and Joseph Weinstock, Phoenixville, all of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.
Filed July 23, 1973, Ser. No. 381,831
Int. Cl. A61k *27/00*
U.S. Cl. 424—210 **8 Claims**

5. The method of producing anti-arthritic activity which comprises administering orally to an animal in need of said activity in an amount sufficient to produce said activity an S-phosphine or phosphite gold thiocyanate of the formula:

$$(R)_3P \rightarrow AuSCN$$

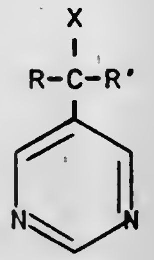
in which R is lower alkyl, lower alkoxy, phenyl or phenoxy, each alkyl or alkoxy having from 1 to 3 carbon atoms.

3,887,708

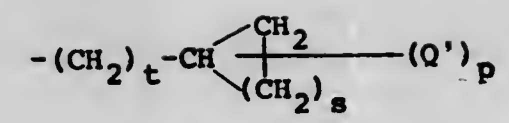
ALPHA, ALPHA-DISUBSTITUTED-5-PYRIMIDINEMETHANES USED AS FUNGICIDES

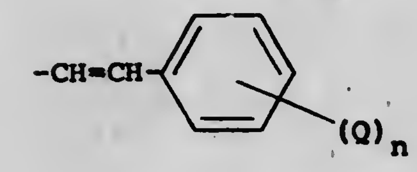
Harold M. Taylor; James D. Davenport, and Ronald E. Hackler, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.
Continuation-in-part of Ser. No. 234,339, March 13, 1972, Pat. No. 3,818,009, which is a continuation-in-part of Ser. No. 888,949, Dec. 29, 1969, abandoned, which is a continuation-n-part of Ser. No. 829,844, May 7, 1969, abandoned, which is a continuation-in-part of Ser. No. 685,315, Nov. 24, 1967, abandoned, which is a continuation-in-part of Ser. No. 634,074, April 27, 1967, abandoned. This application Dec. 20, 1972, Ser. No. 316,967
Int. Cl. A01n *9/12, 9/20*
U.S. Cl. 424—251 **12 Claims**

1. A method of controlling phytopathogenic fungi of plants which comprises contacting the fungi with a fungicidally-effective but non-phytotoxic amount of one or more compounds of the formula



wherein
X is
  hydrogen,
  hydroxy,
  C_1–C_4 alkanoyloxy,
  $N(R'')_2$,
  C_1–C_3 alkyl,
  C_1–C_3 alkoxy,
  C_1–C_3 alkylthio,
  halo,
  cyano,
  anilino,
  hydroxylamino,
  imidazolylthio,
  furylthio, or
  thienylthio;
R is
  C_1–C_{13} alkyl,
  C_2–C_{12} alkenyl,





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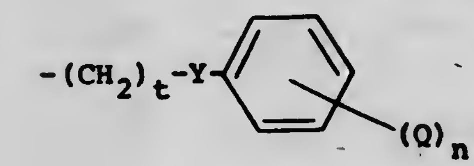
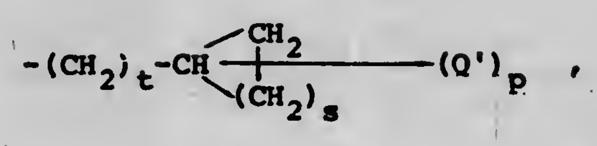


R′ is
  C_2–C_{13} alkyl,
  C_2–C_{12} alkenyl,
  norbornen-2-yl,
  2-norbornyl,
  adamantyl,



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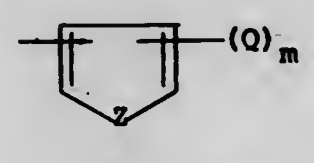

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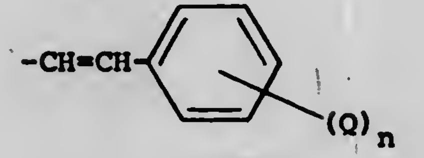

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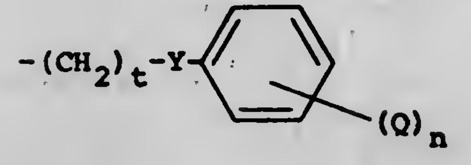
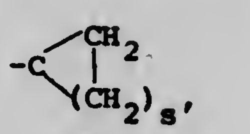
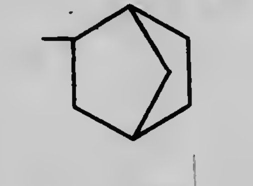
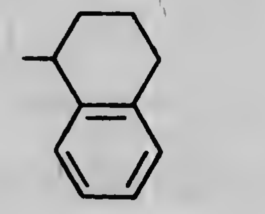


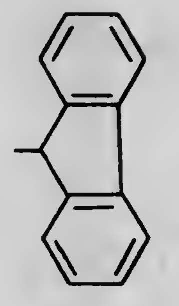
; or

when X is hydrogen or hydroxy, R and R′ taken together with the carbon atom to which they are attached form a ring of the formula









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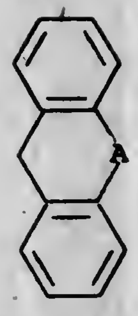


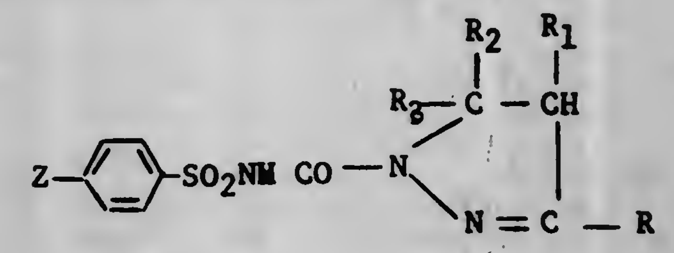
Q is C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, halo, hydroxy, trifluoromethyl, C_1–C_4 alkylsulfonyl, nitro, or di(C_1–C_4 alkyl)amino, or two Q's attached to adjacent carbon atoms of a benzene ring form a methylenedioxy group;
Q′ is C_1–C_4 alkyl or methoxy;
Y is oxygen, sulfur, or a carbon-to-carbon bond;
Z is oxygen or sulfur;
A is oxygen, sulfur, Ch_2, Ch_2—CH_2, or CH=CH;
R″ is hydrogen, C_1–C_4 alkyl, or C_1–C_4 alkanoyl;
n is 0 to 5;
m is 0 to 2;
p is 0 to 3;
s is 1 to 6; and
t is 0 to 5,
or the nonphytotoxic acid addition salts thereof.

3,887,709

2-PYRAZOLINE-1-CARBOXAMIDE SULFONAMIDE DERIVATIVES USEFUL AS HYPOGLYCEMIC AGENTS

Zdzislaw Brzozowski, 9 m 1 Sniadeckich Str., Gdansk-Wrzeszcz; Stefan Angielski, 10 m 1 Hoene-Wronskiego Str., Gdansk-Wrzeszcz, and Czeslaw Wójcikowski, 86 c m 95 Pomorska Str., Gdansk-Oliwa, all of Poland
Division of Ser. No. 181,009, Sept. 16, 1971, Pat. No. 3,780,058. This application Nov. 30, 1972, Ser. No. 310,916
Int. Cl. A61b *27/00*
U.S. Cl. 424—273 **2 Claims**

1. A method of treating a patient to produce hypoglycemic action, said method comprising administering to a patient an effective amount for producing hypoglycemic action of a compound having the formula:



in which Z is hydrogen, halogen or lower alkyl, and R, R_1, R_2, and R_3 each is hydrogen or lower alkyl.

3,887,710

SYNERGIZED CARBAMATE INSECTICIDE

Henry W. Shaver, New York; William Schmidt, Sea Cliff, and Murray W. Winicov, Flushing, all of N.Y., assignors to West Laboratories, Inc., Long Island City, N.Y.
Filed Apr. 19, 1972, Ser. No. 245,624
Int. Cl. A01n *9/20*
U.S. Cl. 424—300 **2 Claims**

1. An insecticidal composition for use against non-flying insect pests comprising the carbamate insecticide o-

isopropoxyphenyl methylcarbamate and a synergist which is a glycerol ester of C_8 to C_{22} fatty acids, the proportions of said synergist to said carbamate insecticide being within the range of about 0.5:1 to 2.5:1 on a weight basis.

3,887,711

FUNGICIDAL CARBAMALDOXIMES

Jacques Perronnet, and Pierre Girault, both of Paris, France, assignors to Roussel Uclaf, Paris, France

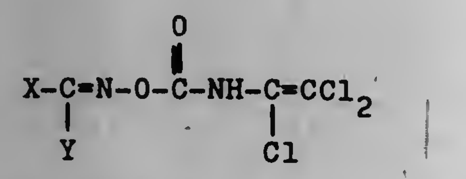
Division of Ser. No. 408,744, Oct. 23, 1973, Pat. No. 3,836,582. This application June 26, 1974, Ser. No. 483,290

Claims priority, application France, Nov. 6, 1972, 72.39141

Int. Cl. A01n *9/20*

U.S. Cl. 424—300 **3 Claims**

1. A fungicidal composition comprising an effective amount of a compound of the formula



$$X-\underset{\displaystyle Y}{\underset{|}{C}}=N-O-\overset{\displaystyle O}{\overset{\|}{C}}-NH-\underset{\displaystyle Cl}{\underset{|}{C}}=CCl_2$$

wherein Y is selected from the group consisting of hydrogen, chlorine and bromine and X is selected from the group consisting of phenyl optionally substituted with at least one member selected from the group consisting of halogen, cyano, —NO_2, alkyl of 1 to 6 carbon atoms and alkoxy of 1 to 6 carbon atoms; and a carrier.

3,887,712

ORAL HYGIENE PRODUCTS

Myron J. Lover, Mountainside, and Joseph P. Speranza, Clark, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed June 15, 1973, Ser. No. 370,481

Int. Cl. A61k *7/16*

U.S. Cl. 424—326 **1 Claim**

1. A liquid oral hygiene composition for use in diluted form in an oral irrigation device for the prevention of dental plaque, calculus, gingivitis, caries and related periodontal disease comprising as active ingredient, alexidine dihydrofluoride in concentration 1 percent by weight.

3,887,713

METHOD FOR PRODUCING FLEXIBLE CASINGS AND THE CASINGS OBTAINED THEREFROM

Jerome Jordan Michael Rasmussen, South Stickney Township, and David Voo, Park Forest, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. Nos. 789,350, Jan. 6, 1969, abandoned, and Ser. No. 839,651, July 7, 1969, abandoned. This application Aug. 19, 1971, Ser. No. 173,250

Int. Cl. A22c *13/00*

U.S. Cl. 426—135 **17 Claims**

1. A method for producing a regenerated cellulosic casing containing a moistureproof-gas barrier coating, said casing exhibiting improved flexibility and antiblock characteristics, the method including the steps of:

a. incorporating into a viscose solution a softening-antiblock additive in an amount of from about 2.5 to 14 percent by weight based upon the dry weight of the cellulose in the viscose solution, said softening-antiblock additive being a fully esterified fatty acid ester of a polyhydric alcohol added to said viscose solution in an aqueous emulsion thereof;

b. extruding the viscose solution containing said softening-antiblock additive to form a tubular configuration;

c. coagulating and regenerating the cellulose in the tubular configuration until a tubular cellulosic casing is obtained having the softening-antiblock additive incorporated in the wall thereof; and,

d. applying a moistureproof-gas barrier coating to the tubular casing containing said softening-antiblock additive.

3,887,714

PROCESS FOR PREPARING INSTANT CEREALS AND THE RESULTING PRODUCT

Vincent J. Kelly, and Wayne Smalligan, both of Fremont, Mich., assignors to Gerber Products Company, Fremont, Mich.

Filed Dec. 6, 1973, Ser. No. 422,481

Int. Cl. A23l *1/18*

U.S. Cl. 426—72 **7 Claims**

1. An instant grain cereal selected from at least one of oats or wheat, comprising pregelatinized base flakes and quick cooking cereal flakes in a weight ratio of 1:1–5 as a dry mixture, said flakes being in a size of about 0.05 to about 0.25 inch cross section,

wherein said pregelatinized base flakes are prepared by drying and flaking a slurry comprised of 80 to 95 weight percent of cereal flour and 2 to 10 weight percent mineral supplementation, with from 2.5 to 10.0 times by weight of water, said slurry being heated to a temperature in the range of 140° to 230° F.

3,887,715

EDIBLE POLYUNSATURATED EMULSIONS

Charles John Cante, Ossining, N.Y., and Victor Moreno, Montreal, Canada, assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 310,283, Nov. 29, 1972, abandoned. This application June 13, 1974, Ser. No. 479,022

Int. Cl. A23l *1/14*

U.S. Cl. 426—570 **6 Claims**

1. An edible whippable emulsion comprising on a volume basis one to four parts oil, four parts water and a proteinaceous emulsifier consisting essentially of proteose peptone, the proteose peptone being present at a level of from 0.01 to 2.0 percent by weight, based on the weight of water contained in the oil-water emulsion.

3,887,716

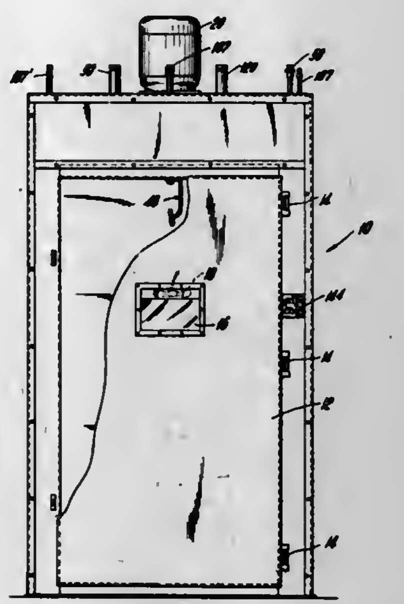
METHOD AND APPARATUS FOR PROCESSING FOODSTUFFS

Bernard H. Seelbach, Staatsburg, N.Y., assignor to K. C. Seelbach Co. Inc., Rhinebeck, N.Y.

Division of Ser. No. 231,566, March 3, 1972, Pat. No. 3,747,513. This application Apr. 23, 1973, Ser. No. 353,816

Int. Cl. A23b *1/04*

U.S. Cl. 426—231 **7 Claims**



1. A method of processing foodstuffs in an apparatus including a processing chamber in communication with an air distribution chamber, comrising the steps of:

placing the foodstuffs in the processing chamber;

heating the air within the processing chamber and recirculating said air from said processing chamber to the distribution chamber and back to the processing chamber;

introducing outside dry air into the processing chamber and recirculating the air at a high rate of speed to dehumidify the foodstuffs in order to accelerate the setting of the color of the foodstuffs;

smoking the foodstuffs by introducing smoke into the processing chamber and recirculating the air at a slow rate of speed;

cooking the foodstuffs to the desired temperature to inhibit bacterial growth; and

removing said foodstuffs from the processing chamber.

3,887,717

PROCESS FOR THE EXTRACTION OF PROTEINS, OTHER NITROGENOUS SUBSTANCES AND LIPIDS FROM BONES

Gottfried Pfeiffer, Eching; Robert Wellhauser, Dachau, and Hartmut Gehra, Furstenfeldbruck, all of Germany, assignors to Herta KG Karl Schweisfurth, Germany

Filed Nov. 21, 1972, Ser. No. 308,439

Claims priority, application Germany, Nov. 22, 1971, 2157850

Int. Cl. A23j *1/10*

U.S. Cl. 426—264 **11 Claims**

1. In a process for extracting proteins, other nitrogenous substances and lipids from bones, including bones with adherent flesh, of warm and cold blooded animals, by comminuting the bones with cooling, supplying water and/or ice to the bones before, during or after communition and centrifuging the resulting aqueous mixture, the improvement in which comprises comminuting the bones so finely that the proteins and other nitrogenous substances, other than the remaining connective tissue, are dissolved and disposed in the aqueous mixture and in which the bones are mixed with a total quantity of at least 60 percent of water and/or ice based of the weight of the bones with adhering flesh.

3,887,718

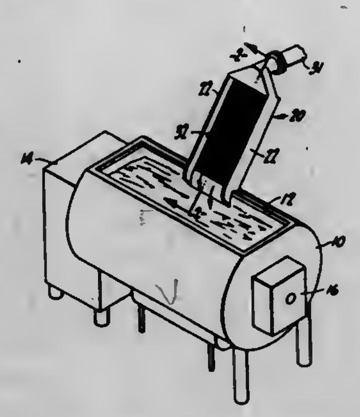
METHOD AND APPARATUS FOR PROCESSING COTTAGE CHEESE CURD AND LIKE FOODS

Horace Hinds, Jr., Mountain View, Calif., assignor to Grace Machinery Company Incorporated, Santa Rosa, Calif.

Filed Aug. 19, 1972, Ser. No. 173,022

Int. Cl. A23c *21/00*

U.S. Cl. 426—491 **20 Claims**



1. In an improved method for rapidly and efficiently separating intermixed liquids and soft particulate foods, with minimum alteration in the characteristics of the separated components, the steps of providing an inclined separation zone in the form of a plurality of spaced apart transverse rods having substantially planar conveyance surfaces, arranging said conveyance surfaces in substantially coplanar relation wherein each individual conveyance surface is inclined at a slight angle with respect to a direction of conveyance across said separation zone, each of said conveyance surfaces being at a shallow obtuse angle with respect to said direction of conveyance so as to arrest the movement of materials flowing thereover, introducing a feed of intermixed liquid and soft particulate food to said separation zone along said direction of conveyance to thereby cause the soft food praticles to move in gently cascading, arrested fashion along said conveyance surfaces and the liquid to pass through and between said conveyance surfaces, whereby the liquid and soft particulate food materials are rapidly and substantially separated, and independently collecting the separated liquid and soft food particles for further processing.

3,887,719

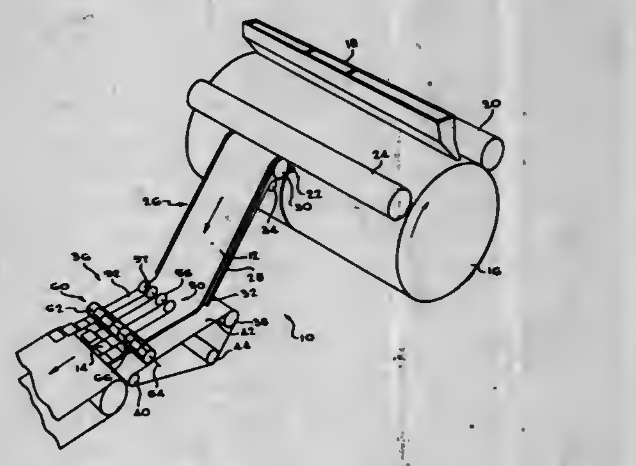
METHOD AND APPARATUS FOR HANDLING PROCESS CHEESE SPREAD

Roland E. Miller, Orangeville, Ill., assignor to Kraftco Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 96,766, Dec. 10, 1970, abandoned. This application Apr. 23, 1973, Ser. No. 353,789

Int. Cl. A23c *19/02*

U.S. Cl. 426—517 **6 Claims**



1. A method of handling a process cheese spread containing from about 44% to about 60% moisture, which when formed into a sheet has low tensile strength, for division thereof into slices, comprising the steps of forming the process cheese spread into a sheet by distributing the cheese spread in a flowable state onto a top portion of a rotating chill roll, separating a sheet of the cheese spread from the chill roll at another top portion thereof after it has remained on the chill roll for a period of time less than the period for one revolution but more than the period of three-quarters of one revolution of the roll, guiding said sheet upwardly between a guide roll and a first conveyor means, substantially reversing the direction of travel of said sheet, conveying said sheet of cheese spread downwardly and away from the chill roll on said first conveying means, supporting the cheese spread across its width and along its length substantially from beneath while it is being conveyed on said first conveyor means, transferring the cheese spread from said first conveying means to a second substantially horizontal conveying means disposed below said first conveying means, supporting the cheese spread substantially across its width and along its length during transfer from said first conveying means to said second conveying means, said substantial support during transfer being effected by tapered bar means located at the terminus of said first conveyor means adjacent said second conveyor means, conveying the cheese spread while supporting it across its width and along its length substantially from beneath in a direction away from the chill roll on said second conveying means, slitting the cheese spread into a plurality of adjacent longitudinal strips while the cheese spread is supported across its width and along its length after removal from said chill roll, and cutting the longitudinal cheese spread strips tranversely so as to provide slices of desired length and width, said cutting occurring while

the cheese spread is conveyed on said second conveying means.

4. Apparatus for handling a process cheese spread containing from about 44% to about 60% moisture, which when formed into a sheet has low tensile strength, for division thereof into slices, comprising a chill roll adapted to receive the process cheese spread in a flowable state and to rotate with the cheese spread thereupon until the cheese spread has set into a sheet, means for separating the cheese spread sheet from near the top of the chill roll, said separating means comprising a doctor blade disposed adjacent the chill roll along the length thereof and adapted to remove the cheese spread sheet from the chill roll and a rotating member positioned adjacent thereto and having its axis parallel to the axis of the chill roll and being above and adjacent a first conveyor means and adapted to guide the cheese spread sheet from the chill roll onto said first conveying means, first conveying means adjacent the roll for conveying the cheese spread in a direction downwardly and away from the separating means, second substantially horizontal conveying means disposed below said first conveying means for conveying the cheese spread in a direction away from the chill roll, both conveying means supporting the cheese spread across its width and along its length substantially throughout the conveying, said first conveying means including tapered bar means at the lower end thereof for effecting a transfer of the cheese spread to said second conveying means without separation or tearing thereof, slitting means adjacent either of said conveyor means at a point where the cheese spread is in the form of the sheet for dividing the cheese spread into a plurality of adjacent longitudinal strips while it is supported across its width and along its length, and cutting means adjacent the second conveying means for transversely dividing the longitudinal strips carried thereon so as to provide slices of desired length and width.

3,887,720

METHOD AND APPARATUS FOR COATING A METALLIC STRIP

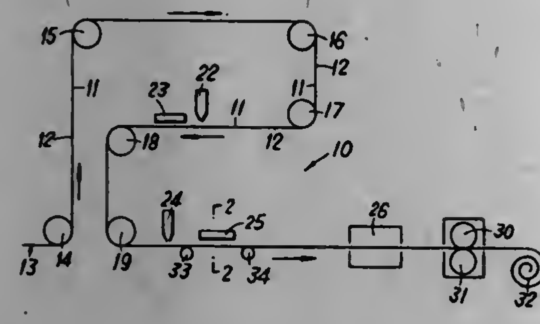
Albert Edward Jackson, Mold, Wales, assignor to British Steel Corporation, London, England

Continuation of Ser. No. 263,617, June 16, 1972, abandoned. This application Feb. 1, 1974, Ser. No. 438,631

Claims priority, application United Kingdom, June 29, 1971, 30433/71

Int. Cl. B05b *5/02;* **B44d** *1/092, 1/44*

U.S. Cl. 427—32 **11 Claims**



1. In a method of coating a metallic strip comprising:
- wetting a first surface of the strip, passing the wetted first surface adjacent to and at a predetermined constant spacing, throughout its width, from a first electrostatically charged grid supplying a metallic powder to the wetted first surface and applying the metallic powder electrostatically to said first surface to provide said surface with a coating of the metallic powder;
- wetting a second surface of the strip which is opposite to the said first portion thereof, passing the wetted second surface adjacent to a second electrostatically charged grid, supplying a metallic powder to the wetted second surface and applying the metallic powder electrostatically to said second surface to provide said surface with a coating of the metallic powder; and
- drying the wetted coatings on the first and second surfaces and effecting firm adherence of dry coatings to both said surfaces;
- the improvement comprising at least one smooth surfaced cylindrical support roll disposed adjacent to and below the second grid to maintain a predetermined constant spacing between the metallic strip and the grid, throughout its width, from said second grid while passing the wetted coating on the first surface of the strip in direct contact with said support roll, the strip being a relatively wide strip of at least about 48 inches, and each of said grids being disposed parallel to and spaced from the respective surface throughout the whole width of the strip by a constant distance in the range of 1.0 to 1.5 inches.

8. In an apparatus for coating a relatively wide metallic strip of at least about 48 inches comprising first and second wetting means for respectively wetting first and second opposite surfaces of the strip, first and second electrostatically charged grids by means of which the first and second wetted surfaces may be respectively electrostatically coated with metallic powder, each grid being disposed parallel to and spaced from the respective surface throughout the whole width of the strip by a constant distance in the range of 1.0 to 1.5 inches, means for moving the strip sequentially past the first and second grids so that each of the first and second surfaces of the strip passes adjacent to and at a predetermined constant spacing, throughout its width, from the respective grid, means for drying the wetted coatings on the first and second surfaces and effecting firm adherence of the coatings to said surface,
- the improvement comprising including at least one smooth surfaced cylindrical support roll disposed adjacent to and beneath the second grid and over which, in operation, the wetted coating on the first surface passes.

3,887,721

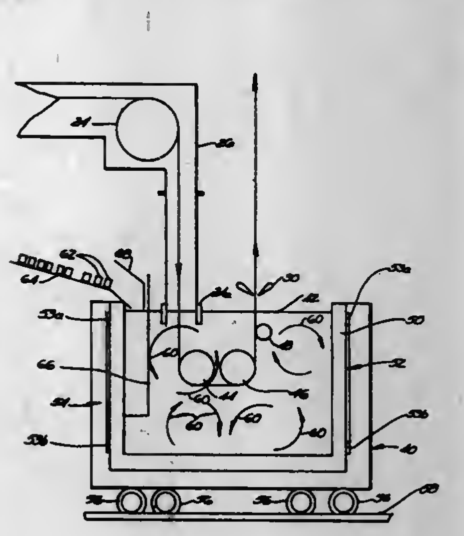
METALLIC COATING METHOD

Roman A. Schwieterman, Middletown, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed Dec. 20, 1972, Ser. No. 316,826

Int. Cl. B05c *3/0;* **B44d** *1/20*

U.S. Cl. 427—45 **5 Claims**



1. In a hot dip metallic coating method including the steps of thoroughly cleaning the surface of a ferrous base metal strand to prepare said surface to be wet by the coating metal, passing said cleaned base metal strand into a bath of molten coating metal, withdrawing said strand from said bath in an upward path of travel whereby a quantity of said molten coating metal will be carried from said bath by said strand, finishing said molten metal adhering to said strand, and solidifying said molten coating; the improved steps of:

- a. providing a nonconductive coreless induction coating pot for containing said bath of molten coating metal;
- b. providing a primary coil within the side walls of said pot; and
- c. supplying power to the primary coil of said coreless induction pot whereby to induce heavy secondary currents in the coating metal in said pot which are converted into heat by the resistance of said coating metal, said induced secondary currents serving to continuously agitate the molten coating metal whereby to help provide a bright bath surface where said strand exists from said bath and to substantially eliminate the accumulation of oxides and dross :on the bottom of said pot and to minimize the accumulation of oxides and dross on the walls of said pot.

3,887,722

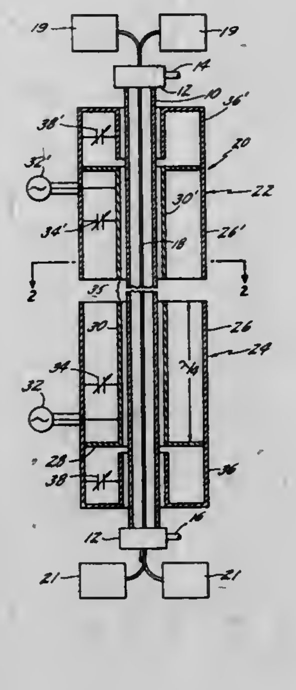
METHOD FOR PRODUCING A PLURALITY OF FILAMENTS IN A RADIO FREQUENCY REACTOR

Frank C. Douglas, Granby; Francis S. Galasso, Manchester, and James Y. Whittier, South Glastonbury, all of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Aug. 31, 1973, Ser. No. 393,697

Int. Cl. C23c *11/00*

U.S. Cl. 427—46 **10 Claims**



1. A process for simultaneously producing a plurality of filaments using a single electrical heating unit by vapor depositing material from a material containing decomposable gas onto a plurality of moving wires heated by electrical power dissipation therein wherein the impedance of the wire changes during deposition, comprising the steps of:
- passing said wires through a single coaxial cavity coupler means to electromagnetically couple said wires to radio frequency source means thereby exposing said wires to an axially oscillating electric field having a density sufficiently high to heat the wires and cause deposition of said material thereon, said coupler means including wall means forming a channel aligned with the axis of said wires;
- positioning each of said wires within said channel at the same nominal distance from adjacent affecting walls of said channel, and;
- maintaining the position of each wire within 2 percent of said nominal distance from said affecting walls.

3,887,723

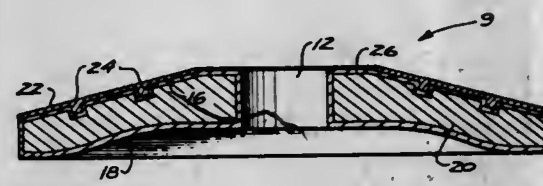
METHOD OF FABRICATION OF COMPOSITE ANODE FOR ROTATING-ANODE X-RAY TUBES

Richard B. Kaplan, 4151 Dundee Dr., Los Angeles, Calif. 90027; Sebastian Gonnella, 13688 Chase St., Pacoima, Calif. 91331, and Walter M. Abrams, 17333 Victory Blvd., Van Nuys, Calif. 91406

Filed Mar. 22, 1972, Ser. No. 236,898

Int. Cl. B44d *1/18'*

U.S. Cl. 427—58 **18 Claims**



4. The method of fabricating a composite anode for a rotating-anode x-ray tube, comprising the steps of:
- providing a substrate disk of a first refractory material, said disk having an axis, a substantially frusto-conical upper surface and a lower surface; said upper and lower surface, each being substantially symmetric about said axis;
- scoring at least a portion of the sloped region of said upper surface; and
- applying to at least a part of said scored, sloped region, a coating comprising a second material differing from said first material, said second material having the ability to emit x-rays in response to electron bombardment, at least a portion of said coating caused to extend into said scoring.

3,887,724

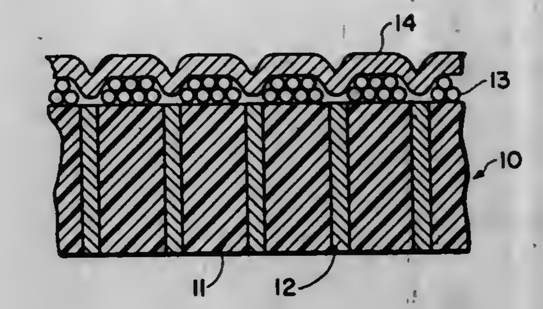
METHOD OF MAKING HIGH CONTRAST FIBER OPTIC PHOSPHOR SCREEN

Nicholas A. Diakides, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 308,886, Nov. 22, 1972, abandoned. This application Dec. 6, 1973, Ser. No. 422,457

Int. Cl. B44d *1/16*

U.S. Cl. 427—64 **2 Claims**



1. A method of producing a high contrast fiber optic arrayed phosphor screen comprising the steps of:
- immersing in a photosensitive solution a fiber optic substrate composed of a plurality of fiber optic core elements surrounded by cladding material;
- adding phosphor to said solution and allowing the phosphor to settle onto the surface of said substrate to a desired thickness;
- directing ultraviolet radiation from the side opposite the phosphor coated surface of the substrate, said radiation passing through said fiber optic core elements to the phosphor layer; and
- removing the soft phosphor which was not exposed to the ultraviolet radiation and which remains over the cladding thereby forming said arrayed phosphor screen.

3,887,725

PROCESS FOR IMPROVING LUMEN MAINTENANCE OF CALCIUM HALOPHOSPHATE PHOSPHORS USED IN A FLUORESCENT LAMP

Albert O. Halstead, Jr., Waverly, and Donald A. Hebbard, Genoa, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 4, 1972, Ser. No. 311,665
Int. Cl. H01j *61/35, 61/42*
U.S. Cl. 427—67 **2 Claims**

1. In a process of fabricating a fluorescent lamp in which a slurry of a calcium halophosphate phosphor having the general formula $Ca_{10}(F,Cl)_2(PO_4)_6$:Mn,Sb and a suitable lacquer is applied to the interior surface of said lamp and baked, the improvement wherein prior to the application of said slurry to said surface, an amount of zinc orthophosphate sufficient to increase lumen maintenance of said phosphor is added to said slurry and the resultant slurry is blended to form a substantially homogenous mixture.

3,887,726

METHOD OF CHEMICAL VAPOR DEPOSITION TO PROVIDE SILICON DIOXIDE FILMS WITH REDUCED SURFACE STATE CHARGE ON SEMICONDUCTOR SUBSTRATES

Robert L. Bratter, Wappinger Falls, and Arun K. Gaind, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 29, 1973, Ser. No. 375,297
Int. Cl. B44d *1/18*
U.S. Cl. 427—95 **9 Claims**

1. In the method of forming silicon dioxide films on silicon substrates by a chemical-vapor deposition reaction of a mixture of an oxidizing agent and $SiH_nCl_{(4-n)}$, where *n* is an integer of from 0 to 4, to deposit silicon dioxide films displaying a maximum increase of 1×10^{11} charges/cm^2 in surface charge when subjected to bias-temperature test conditions of applied field of 2×10^6 V/cm for 30 minutes at 250°C, the improvement of

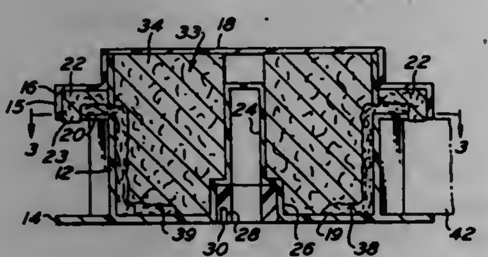
adding HCl from an external source to said reactants.

3,887,727

METHOD OF MAKING PRINTING RIBBON SPOOL

Walter Ploeger, Jr., North Bellmore, N.Y., and John W. H. Bishop, Montreal, Quebec, Canada, assignors to Controlled Printout Devices, Inc., New York, N.Y.

Division of Ser. No. 195,710, Nov. 4, 1971, Pat. No. 3,819,026. This application Nov. 14, 1973, Ser. No. 415,579
Int. Cl. B41j *31/14*
U.S. Cl. 427—177 **5 Claims**



1. A method of replenishing ink in a printing ribbon comprising withdrawing ink from a sealed reservoir by capillary action using a wick of compressible material having one end communicating with said reservoir by way of an opening smaller in dimensions than the transverse dimensions of said wick in its uncompressed state, compressing said wick at said opening, transferring the ink from said reservoir by said wick to a deformable pad, transferring ink from the pad to a printing ribbon by contact between the pad and a side edge of the ribbon, and initiating said transfer of ink from said reservoir to said pad by flexing an exposed portion of said pad.

3,887,728

VINYLCHLORIDE-ALKYLENE COPOLYMER AND USES THEREFOR

Wolfgang Looman; Wolfgang Pungs, both of Troisdore; Egon Bierwirth, Porz-Urbach, and Robert Buning, Oftroisdorf Sieglar, all of Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

Continuation of Ser. No. 117,690, Nov. 18, 1970, abandoned. This application Feb. 9, 1973, Ser. No. 330,920
Claims priority, application Germany, Nov. 18, 1969, 1946612; Nov. 18, 1969, 1957824
Int. Cl. B44d *1/094*
U.S. Cl. 427—185 **5 Claims**

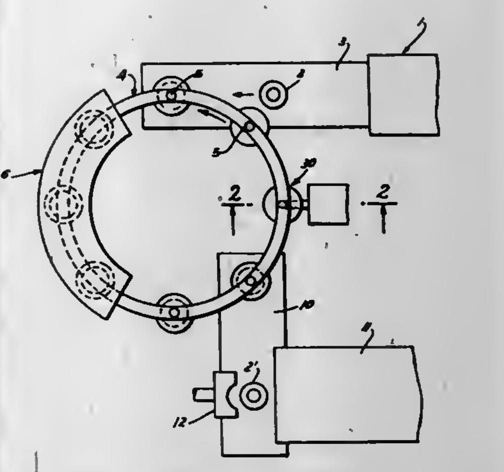
1. In the process of coating a substrate with a plasticizer-free vinyl chloride polymer coating by the use of a fluidized-bed of sinterable polymer particles; the improvement with comprises utilizing as coating composition a molding composition consisting essentially of 90 to 99.5 weight percent vinyl chloride and 0.5 to 10 weight percent ethylene or propylene having a K-value of 45 to 65 and having a grain size of about 0.04 to 0.5 mm.

3,887,729

METHOD FOR COATING GLASS CONTAINERS

Joseph C. Cavanagh, Bay Shores, N.Y., assignor to Midland Glass Company, Cliffwood, N.J.

Filed Nov. 15, 1973, Ser. No. 415,972
Int. Cl. B05b *5/02;* **B44d** *1/094*
U.S. Cl. 427—195 **11 Claims**



1. A method for applying a powdered synthetic resin coating to a glass container comprising:

a. attaching a first work holder to said container;
b. conducting said work holder, with said attached container, through a coating zone, so as to coat said container with said powdered synthetic resin;
c. removing said coated container from said first work holder;
d. attaching a second work holder to said coated container; and
e. conveying said second work holder with said attached, coated container through a curing zone to fuse said coating.

3,887,730

MICROPOROUS STYRENE POLYMERS AND METHOD OF MAKING SAME

Norman B. Rainer, and Peter Allen Wilson, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 21, 1972, Ser. No. 282,481
Int. Cl. B44d *1/09;* **A24d** *1/00*
U.S. Cl. 427—244 **12 Claims**

1. A process for preparing a microporous product which process comprises:

a. diluting a styrene polymer latex, said styrene polymer being non-film forming and comprising at least 80 percent styrene, with a water-soluble ether compatible with said polymer and having a boiling point above about 85°C, said ether being employed in an amount sufficient to form a dispersion containing from about 5 to about 30 weight percent of said polymer,
b. impregnating said dispersion into a fibrous material, and
c. heating the impregnated fibrous material to a temperature of from about 80°C to about 120°C, said temperature being lower than the boiling point of said ether, for about 1 minute to about 60 minutes.

3,887,731

CORROSION RESISTANT COATING SYSTEM FOR FERROUS METAL ARTICLES HAVING BRAZED JOINTS

Michael F. Dean; Hossein Borougerdi, and John A. Puchot, all of San Antonio, Tex., assignors to Chromalloy American Corporation, New York, N.Y.

Filed Apr. 23, 1973, Ser. No. 353,677
Int. Cl. C23c *9/00*
U.S. Cl. 427—258 **15 Claims**

1. A method of aluminizing a brazed stainless steel article characterized by at least one brazed joint, the braze of said joint being formed of a non-ferrous brazing alloy of melting point ranging from about 1125°F to 1925°F which comprises: selectively coating the non-ferrous braze of said stainless steel article with an adherent layer of nickel of at least about 0.0002 inch thick,

and thermally diffusing aluminum into the entire surface of said article including the selectively coated braze,

whereby a sacrificial coating comprising said aluminum is produced, the aluminum coating on the stainless steel surface being characterized by the presence of iron aluminide and the aluminum coating on said nickel-coated braze being chacterized by the presence of nickel aluminide.

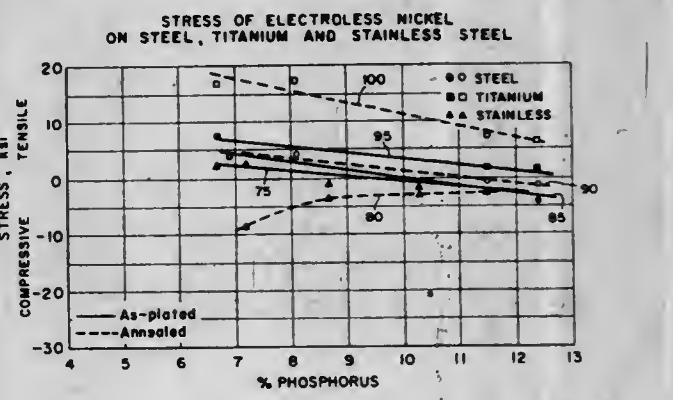
3,887,732

STRESS CONTROLLED ELECTROLESS NICKEL DEPOSITS

Konrad Parker, Park Ridge, and Hasmukhlal M. Shah, Chicago, both of Ill., assignors to General American Transportation Corporation, Chicago, Ill.

Filed Oct. 1, 1970, Ser. No. 77,063
Int. Cl. C23c *1/10*
U.S. Cl. 427—380 **6 Claims**

1. A method of producing a nickel-phosphorus alloy coating having a predetermined and controlled residual stress in the range of from about +15 ksi tensile stress to about −17 ksi compressive stress therein and chemically deposited on a metal substrate selected from the group consisting of beryllium, aluminum, titanium, iron, nickel, copper and their alloys, said method comprising introducing the metal substrate into an aqueous bath of the nickel cation-hypophosphite anion type, the bath having a hypophosphite ion concentration expressed in moles per liter of from about 0.1 to about 0.5, maintaining the pH of the bath at a predetermined value in the range from about 3.5 to about 7 and the temperature of the bath at a predetermined value in the range from about 70°C. to about 95°C. to deposit on the metal substrate a nickel-phosphorus coating having a phosphorus content of a predetermined value in the range of between about 13 percent and about 3 percent, maintenance of the pH of the bath at the upper end of the pH range coupled with maintenance of the temperature of the bath at the lower end of the temperature range producing a coating having a phosphorus content at the lower end of the phosphorus range and maintenance of the pH of the bath at the lower end of the pH range coupled with maintenance of the temperature of the bath near the upper end of the temperature range producing a coating having a phosphorus content at the upper end of the phosphorus range, a coating having a phosphorus content near the lower end of the phosphorus range tending to be in tensile stress and a coating having a phosphorus content near the upper end of the phosphorus range tending to be in compressive stress, contacting the metal substrate with the bath for a time period sufficient to deposit on the metal substrate a coating having a predetermined thickness of at least about one-tenth mil, removing the coated metal substrate from the bath and cooling the coated metal substrate to ambient temperatures, whereby to produce a metal substrate having chemically deposited thereon a nickel-phosphorus coating having a predetermined and controlled residual stress therein.

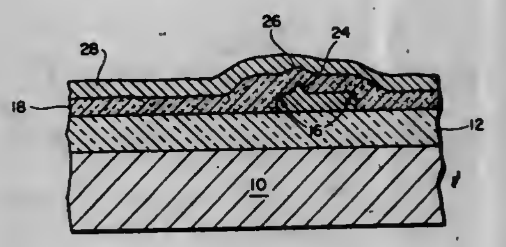


3,887,733

DOPED OXIDE REFLOW PROCESS

Donald L. Tolliver, Phoenix, and William E. Armstrong, Tempe, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Apr. 24, 1974, Ser. No. 463,631
Int. Cl. B44d *1/16*
U.S. Cl. 427—444 **7 Claims**



1. A process for altering the shape of a doped oxide layer on a substrate, which comprises:

contacting said doped oxide with a source of hydroxyl ions, and heating said doped oxide at least to its softening temperature while in contact with said source of hydroxyl ions, and allowing said doped oxide to reflow until the desired alteration of the layer has taken place.

3,887,734

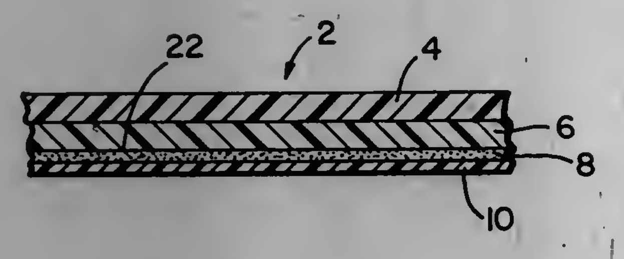
EMBOSSING TAPE

David J. Chazan, Berkeley, Calif., assignor to Dymo Industries, Inc., San Francisco, Calif.

Filed Oct. 29, 1973, Ser. No. 410,724

Int. Cl. B32b *27/08, 27/18, 27/30*

U.S. Cl. 428—40 **16 Claims**



1. An embossable sheet material comprising a rigid non-stress whitening plastic backing film and a base sheet of at least about 2mils in thickness of a stress-whitening elastomer modified poly(methyl methacrylate), having a tensile elongation of from about 25 to 80 percent of elongation at break and wherein said elastomeric modifier is bonded or mixed with said poly(methyl methacrylate) and said elastomeric modifier is an acrylate polymer having at least about 50 monomer percent of an alkyl acrylate, and said alkyl group is of from about 1 to 6 carbon atoms.

6. An embossing tape for use in machines of the type impressing onto the tape alpha-numeric symbols comprising:

a transparent stress-whitening elastomer modified poly(-methyl methacrylate) film of from about 2 to 6 mils thickness, having a tensile elongation at break of from about 25 to 80 percent said elastomeric modifier is an acrylate polymer having at least about 50 monomer percent of an alkyl acrylate, and said alkyl group is of from 1 to 6 carbon atoms, a rigid non-stress whitening plastic film affixed to said base;

an adhesive coating affixed to the exposed side of said rigid plastic film; and

a protective film adhered to said adhesive coating.

3,887,735

UPHOLSTERY ARTICLES AND PROCESS FOR THEIR MANUFACTURE

Cesare Laberinti, Milan, Italy, assignor to Industrie Pirelli, S.p.A., Milan, Italy

Filed Jan. 11, 1973, Ser. No. 322,844

Claims priority, application Italy, Jan. 11, 1972, 19202/72

Int. Cl. B32b *3/26*

U.S. Cl. 428—71 **7 Claims**

1. In an article of upholstery molded in expanded polyurethane comprising an inner core of expanded polyurethane and a cover comprising a microporous polyurethane skin chemically bonded to said inner core,

the improvement which comprises at least part of the surface of the microporous skin being covered by a very thin top coat of pigmented compact polyurethane, less than 0.05 mm thick, joined directly to the skin by a strong chemical bond, and having a slip coefficient of at least 20° (UNI 4818 Standard).

3,887,736

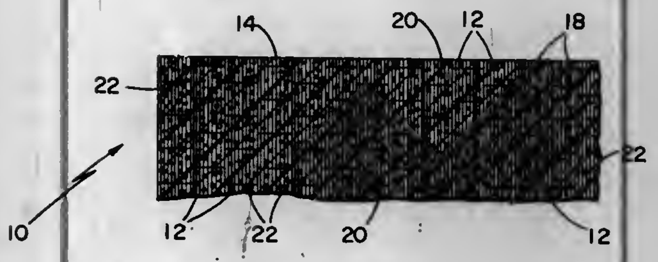
SYNTHETIC END GRAIN BLOCK DEFINING A WEAR SURFACE

Ernest R. Kaswell, Newton, Mass., assignor to Fabric Research Laboratories, Dedham, Mass.

Filed Sept. 7, 1973, Ser. No. 395,352

Int. Cl. B32b *5/02;* **E04f** *13/18, 15/10*

U.S. Cl. 428—87 **13 Claims**



1. A synthetic end grain block of the type adapted to be abutted with similar blocks to define a working surface and having a top surface adapted to define a portion of said working surface; a bottom surface parallel to and spaced from said top surface; a plurality of wear fibers extending within said block substantially perpendicular to said top and bottom surfaces; a plurality of other fibres extending other than generally perpendicular to said top surface and said bottom surface and interconnecting said wear fibres; and an organic plastic material extending substantially throughout said block and bonding said wear fibres together, ends of said wear fibres defining at least a part of said top surface, said wear fibres being at least 40 weight percent of said block, and at least 80% of all fibres within said block extending generally parallel to each other and perpendicular to said top surface and said bottom surface.

3,887,737

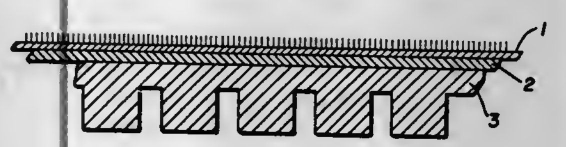
LAMINATE WITH FLOCKED FIBER PILE

Samuel Paul Baxter, London, England, and Keith Marchant, Newport, Wales, assignors to Monsanto Chemicals Limited, London, England

Filed June 27, 1972, Ser. No. 266,844

Int. Cl. D04h *11/00*

U.S. Cl. 428—90 **5 Claims**



1. A laminar structure for use as a surface covering comprising: a non-woven fabric sheet of continuous filaments wherein said sheet has a thickness of from 0.1 to 0.4 mm and a weight of 0.5 to 4 ounces per square yard, a pile of flocked fibers secured to one face of said fabric sheet by an adhesive, a foamed sheet of polyolefin resin selected from the group consisting of polyethylene and polypropylene resins bonded to the face of said fabric sheet opposite to that on which said flocked fibers are secured.

3,887,738

CARPET BACKSIZED WITH HOT MELT ADHESIVE AND METHOD

David D. Taft, Minneapolis, and Terry H. Shepler, St. Paul, both of Minn., assignors to Ashland Oil, Inc., Ashland, Ky. Division of Ser. No. 149,843, June 3, 1971, Pat. No. 3,758,431, which is a continuation-in-part of Ser. No. 121,150, March 4, 1971, abandoned. This application May 15, 1973, Ser. No. 360,616The portion of the term of this patent subsequent to Sept. 11, 1990, has been disclaimed.

Int. Cl. D03d *27/00;* **D04h** *11/00*

U.S. Cl. 428—95 **6 Claims**

1. A process for backsizing a tufted carpet having a primary textile backing and non-woven tufts of synthetic fibers protruding therefrom which comprises:

a. heating to about 160° F. to about 375° F. a hot melt coating composition consisting essentially of:
   1. copolymer of ethylene and unsaturated ester monomer selected from the group consisting of vinyl acetate, alkyl arcylate wherein the alkyl group contains 1 – 18 carbon atoms, and mixtures thereof, containing from 40 – 85% by weight of ethylene and from 15 – 60% by weight of said unsaturated ester monomer;
   2. ester of rosin and polyhydric alcohol wherein the ester has an acid value between about 5 and about 40, and melting point range between 75° and 140° C.; and
   3. ester of polyhydric alcohol and dimer and/or trimer or mixture thereof, of ethylenically unsaturated monocarboxylic fatty acid having 16 – 22 carbon atoms, wherein said ester has an acid value of 6 to 40;

b. applying a uniform coating in an amount from about 6 to 40 ounces per square yard of said composition in a molten state to the back side of said carpet at a coating station while moving said carpet past said coating station at a speed of from about 15to 80 feet per minute; and

c. thereafter solidifying said coating by cooling it below its melting point.

3,887,739

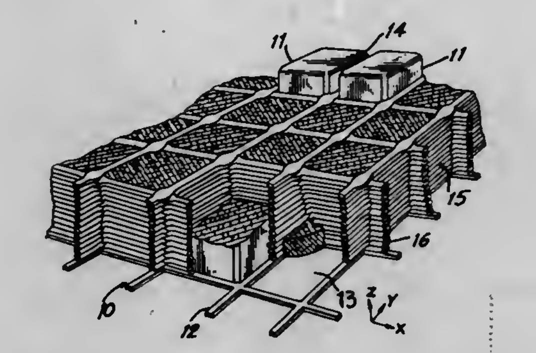
HONEYCOMB STRUCTURES

Robert V. Kromrey, Fair Oaks, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Division of Ser. No. 875,433, Nov. 10, 1969, Pat. No. 3,694,284, which is a continuation-in-part of Ser. No. 648,447, June 23, 1967, Pat. No. 3,617,416. This application June 21, 1971, Ser. No. 155,215

Int. Cl. B32b *3/12*

U.S. Cl. 428—112 **8 Claims**



1. A honeycomb structure comprising: a body having a plurality of open cells and means defining a number of walls surrounding said cells to provide a honeycomb configuration therefor, said means including a plurality of rovings high modulus fibrous arranged in stacked, intersecting relationship to each other, the portion of each roving at its intersections with adjacent rovings being flattened into chamfered areas so as to have a greater area then the portions of the roving between the intersections; and resin impregnated in said rovings throughout their lengths for bonding the overlapped rovings together.

3,887,740

PROCESS FOR DEPOSITING OXIDE COATINGS

Gordon F. Foster, Campbell; Helmuth E. Meissner, and Janice L. Stiles, both of Painted Post, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 1, 1972, Ser. No. 249,353

Int. Cl. B44d *1/44*

U.S. Cl. 428—116 **6 Claims**

1. A process for providing a catalyst on a uniform, tightly-adherent, high-surface-area oxide catalyst support coating deposited on the porous interior channel walls of a refractory monolithic support structure of the honeycomb type which comprises:

a. impregnating the porous interior channel walls of the support structure with an aqueous ionic solution of at least one metal selected from the group consisting of aluminum, titanium, tin, zirconium, thorium, chromium, manganese, iron, gallium, niobium, magnesium, tantalum, and hafnium;

b. contacting the thus-impregnated porous support structure with ammonia or an aqueous ammonia alkaline solution to cause the in situ precipitation on the suppo structure of a uniform, tightly-adherent, high-surfa area coating consisting essentially of the hydrated oxi of the selected metals; and

c. depositing a noble metal catalyst on the high-surface-a coating.

3,887,741

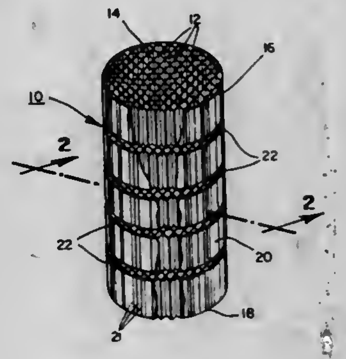
THIN-WALLED HONEYCOMBED SUBSTRATE WITH AXIAL DISCONTINUITIES IN THE PERIPHERY

Thomas J. Dwyer, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Aug. 13, 1973, Ser. No. 387,774

Int. Cl. B01j *9/00;* **B29f** *27/00;* **B32b** *3/12*

U.S. Cl. 428—188 **24 Claims**



1. A thermally shock resistant honeycombed structure prising a plurality of thin walls forming open-ended cells of substantially polygonal, straight-sided cross-section and having axes extending from one end of said structure to the other end, said thin walls of at least 70% of said cells in a layer adjacent the periphery having an axial discontinuity in at least one location between said one end and said other end, said cells located centrally of said layer having substantially axially continuous cell walls.

-3,887,742

COPY RESISTANT DOCUMENTS

Richard E. Reinnagel, 60 East Jerge Dr., Elma, N.Y. 14059

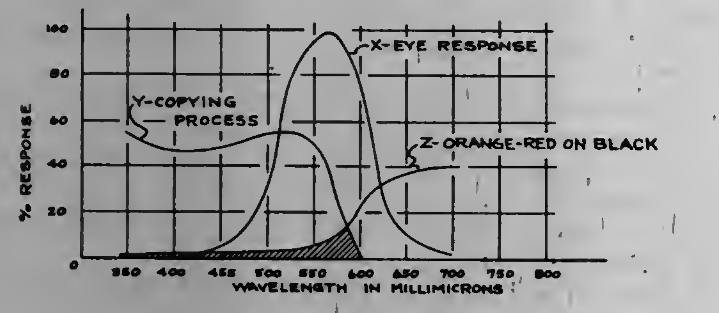
Filed Apr. 13, 1972, Ser. No. 243,743

Int. Cl. B42d *15/00;* **B44d** *1/44;* **D21h** *5/10*

U.S. Cl. 428—211 **6 Claims**

1. A sheet of material adapted to have graphical info tion applied thereto which can be detected by the retin human eyes having typical spectral responses in the range substantially 425 to 675 millimicrons, but which cannot be detected by the detectors of copying machines having spectral responses typically in the range of substantially 350 to 600

millimicrons, comprising; a sheet of material at least a portion of which have a reflectance of substantially 4% over the wavelength of substantially 325 millimicrons to substantially 525 millimicrons, and a reflectance which increases from substantially 4% at substantially 525 millimicrons to substantially 7% at 550 and which then increases to substantially 13% at substantially 575 millimicrons, whereby insufficient reflected energy is available from said sheet of material and graphical information thereon to be distinguished by the detectors of typical copying machines at wavelengths to which they are most sensitive whereas sufficient reflected energy is available from said sheet of material and graphical information thereon to be distinguished by the retinas of human eyes at wavelengths to which they are most sensitive.



3,887,743

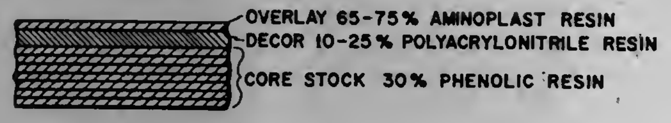
UNITARY PLASTIC LAMINATE

William C. Lane, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 9, 1972, Ser. No. 305,170

Int. Cl. B44f *1/00*

U.S. Cl. 428—206 **5 Claims**



OVERLAY 65-75% AMINOPLAST RESIN
DECOR 10-25% POLYACRYLONITRILE RESIN
CORE STOCK 30% PHENOLIC RESIN

1. A unitary plastic laminate consisting essentially of a core impregnated with a phenolic resin, a decor sheet and an overlay impregnated with an aminoplast, said decor sheet having from 10 to 25% by weight of particulate polyacrylonitrile resin uniformly dispersed therein during manufacture thereof, said polyacrylonitrile resin being a copolymer of 85 to 98% by weight of acrylonitrile and 15 to 2% by weight of an ethylenically unsaturated monomer copolymerizable therewith, said polyacrylonitrile having a molecular weight ranging from 60,000 to 90,000.

3,887,744

COATED TRANSPARENT SHEETS

Nobuyuki Tomita, and Ken Yoshiki, both of Tokyo, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Oct. 13, 1969, Ser. No. 866,032

Claims priority, application Japan, Oct. 18, 1968, 43-76382

Int. Cl. B29d *11/00;* **B44d** *5/06;* **C03c** *17/00*

U.S. Cl. 428—208 **10 Claims**

1. A transparent structure comprising a transparent sheet having a non-continuous coating of aluminum distributed over at least one surface of the sheet in a regular pattern, in the form of closely spaced parallel lines, there being from 10 to 50 lines of coating per inch, to provide a means of controlling the percentage transmission of visible light and infra-red radiation.

3,887,745

FINGER-TEARABLE ADHESIVE TAPE

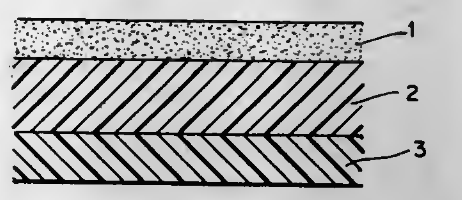
Toshiya Yoshii, Kyoto, and Masaru Suzuki, Otsu, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Aug. 9, 1973, Ser. No. 387,023

Claims priority, application Japan, Sept. 8, 1972, 47-89511; Oct. 16, 1972, 47-118570

Int. Cl. B32b *7/00*

U.S. Cl. 428—213 **8 Claims**



1. A finger-tearable adhesive tape having longitudinal and transverse dimensions and having an adhesive layer applied to a laminated film base, said base comprising a layer of propylene polymer film which is biaxially oriented and at least one other layer of a propylene polymer film which is uniaxially oriented in a transverse direction, the melting point of said uniaxially oriented film being 0.5° – 10° C higher than the melting point of said biaxially oriented film, and the total thickness of said uniaxially oriented film being 1.2 – 5.0 times greater than the total thickness of said biaxially oriented film.

3,887,746

LACQUERED ARTICLES OF COLD ROLLED ABS RESIN

Michael R. Grancio, Hampden, and George E. Walker, Longmeadow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 26, 1972, Ser. No. 317,967

Int. Cl. B44d *1/14*

U.S. Cl. 428—215 **7 Claims**

1. An article of manufacture comprising an impact resistant ductile composite of a cold rolled rubber reinforced resin specimen of 10–250 mil thickness having a normally embrittling coating of 0.1 to 10 mil thickness; wherein the minimum elongation beyond the yield point of the composite is at least 5 percent of the original length; wherein the rubber reinforced resin comprises a dispersion of a rubber graft copolymer in a matrix interpolymer; wherein the rubber graft copolymer comprises a superstrate of a graft copolymer of 5-95 parts by weight of a vinylidene aromatic hydrocarbon monomer and 95-5 parts by weight of a unsaturated nitrile monomer on a rubber substrate; wherein the weight ratio of superstrate to substrate is in the range of 10:100 to 250:100; wherein the matrix interpolymer is of about the same composition as the superstrate; wherein the rubber substrate comprises between 3 and 30 weight percent of the total resin; and wherein the average particle size of the rubber substrate is in the range of 0.01 to 1.5 micron.

3,887,747

NEW HOLLOW FILAMENTARY STRUCTURES

Yoshio Tamura, and Koichiro Ohtomo, both of Takatsuki, Japan, assignors to Kanebo Ltd., Tokyo and Nippon Kynol Inc., Osaka, both of, Japan

Filed Feb. 21, 1973, Ser. No. 334,203

Claims priority, application Japan, Feb. 24, 1972, 47-19458

Int. Cl. B28b *3/20;* **D02g** *3/00*

U.S. Cl. 428—229 **10 Claims**

1. A hollow ion-exchange novolak resin filament consisting essentially of from 50 to 100% by weight of a flame-resistant and anti-fusing cured novolak resin having an ion-exchange moiety and from 0 to 50% by weight of a fiber-forming thermoplastic synthetic resin selected from at least one of the group consisting of polyamide, polyester, polyolefin and polyurethane, with the provisos that the hollow structure continuously extends in the axial direction of the filament, and the rate of hollowness is from 10 to 80%.

3,887,748

METHOD AND COMPOSITION FOR APPLYING A COVERING TO A WALL OR LIKE SUBSTRATE

Clyde J. Swedenberg, 3706 E. North St. Ext., Greenville, S.C. 29607; Charles C. Fain, Bayphone Estates, Clemson, S.C. 29631, and William W. Rutledge, 33 W. Tallulah Ave., Greenville, S.C. 29601

Filed Aug. 26, 1971, Ser. No. 175,388

Int. Cl. B32b *13/00*

U.S. Cl. 428—247 **11 Claims**

1. A decorative wall covering for installation upon a rigid wall for imparting a finished surface to the wall consisting essentially of:

a. a flexible lath of mesh material,
b. a substantially dry semi-hydrated flexible gypsum layer bonded on said material substantially covering one side of said lath,
c. a substantially uniform aqueous latex adhesive coating across an exposed side of said gypsum layer for securing said wall covering to said rigid wall and hydrating said gypsum,
d. said ratio of aqueous latex adhesive to gypsum is such that said aqueous latex adhesive supplies about three parts by weight of water for about ten parts of weight of gypsum, and
e. said semi-hydrated flexible gypsum being of sufficient thickness that said aqueous latex adhesive affords a sufficiently controlled amount of water to hydrate said gypsum and for inverting said latex adhesive,

whereby the wall covering may be shipped and stored in rolls preparatory to installation utilizing said application of aqueous latex adhesive.

3,887,749

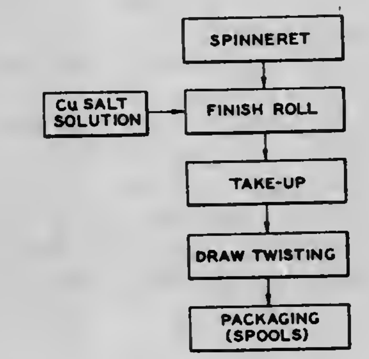
STABILIZATION OF POLYESTER FILAMENTARY MATERIAL

Donald G. Pullum, Chesterfield; Eugene J. Corrigan, Village of Chester; Bernard H. Howard, Petersburg, and Bernard D. Stabley, Village of Chester, all of Va., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 21, 1972, Ser. No. 282,878

Int. Cl. C09k *3/28*

U.S. Cl. 428—284 **3 Claims**



1. A rubber product containing filamentary material consisting essentially of polyester in contact with the rubber thereof, one million parts of the filamentary material containing a stabilizer consisting essentially of 20 to 1,000 parts of copper as a water solution or oil emulsion of a cupric salt of the class consisting of cupric citrate, sulfate, acetate, salicylate, formate, oleoate, linoleate, octoate, decanoate, and butyrate, which salt is surface applied, the concentration of the salt being greater adjacent the surface of the filaments in the material than farther from the surface.

3,887,750

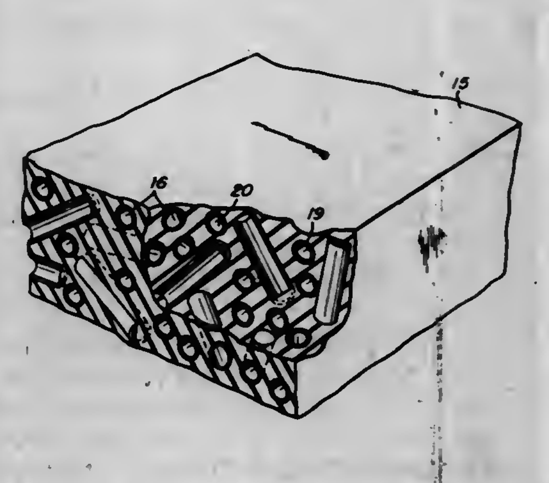
COMPRESSIBLE PRINTING BLANKET

John C. Duckett, Clyde; Wayne W. Easley, and William T. Wickham, both of Waynesville, all of N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed Jan. 8, 1973, Ser. No. 321,901

Int. Cl.² B41N *9/00*

U.S. Cl. 428—297 **7 Claims**



1. A laminated printing blanket comprising at least one fabric base ply, a surface layer, and a compressible intermediate layer, said intermediate layer comprising an elastomeric matrix having unconnected voids uniformly distributed therethrough, said voids defined by discrete hollow fibers having thin elastic walls made of vinylidene chloride-acrylonitrile copolymer which is compatible with said matrix material and capable of being bonded thereto upon curing.

3,887,751

ELECTROCONDUCTIVE SHEET MATERIAL AND PROCESS OF PREPARATION

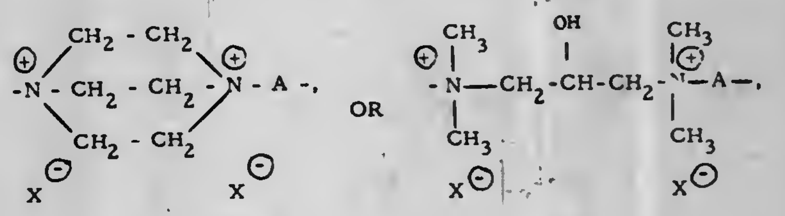
Albert H. Markhart, Wilbraham, and James O. Santer, East Longmeadow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed May 12, 1972, Ser. No. 252,560

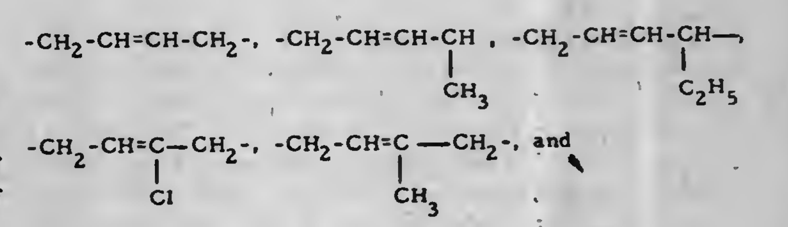
Int. Cl. D21h *1/38*

U.S. Cl. 428—342 **11 Claims**

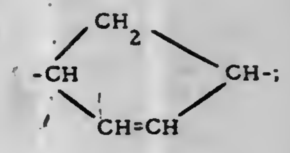
1. An electroconductive sheet material comprising a base sheet and an electroconductive quaternary ammonium resin having recurring units of the general formula:



wherein X is bromine or chlorine,
wherein A is a divalent radical selected from the group consisting of



$-CH_2-CH{=}CH-CH_2-$, $-CH_2-CH{=}CH-\underset{CH_3}{CH}$, $-CH_2-CH{=}CH-\underset{C_2H_5}{CH}-$, $-CH_2-CH{=}\underset{Cl}{C}-CH_2-$, $-CH_2-CH{=}\underset{CH_3}{C}-CH_2-$, and



wherein the quaternary ammonium resin has an intrinsic viscosity of at least 0.05 in 2 percent aqueous sodium cloride at 25°C., wherein the weight ratio of base sheet to electroconductive resin is in the range of 1:1 and 500:1 and the electroconductive resin is present at a coating on at least one surface of the base sheet in an amount ranging from 0.5 to 15 pounds per 3000 sq. ft. of base sheet.

3,887,752

TEXTILE TREATMENT WITH AMPHOTERIC STARCH ESTERS

Lee H. Elizer, Keokuk, Iowa, assignor to The Hubinger Company, Keokuk, Iowa

Division of Ser. No. 308,963, Nov. 24, 1972, Pat. No. 3,793,310. This application June 21, 1973, Ser. No. 372,057The portion of the term of this patent subsequent to Feb. 19, 1991, has been disclaimed.

Int. Cl. D06m *11/00;* **C03c** *25/02*

U.S. Cl. 428—378 **14 Claims**

1. A process of sizing textile fibers which comprises coating such fibers with a gelatinized aqueous dispersion of an acylated amphoteric starch, said acylated amphoteric starch containing cationic, anionic and acyl groups connected to the starch molecules through carbon and oxygen, the cationic and anionic groups each constituting 0.5 to 6 groups per 100 anhydroglucose units, and the acyl groups constituting 2.5 to 7% by weight, calculated as acetyl groups, on a dry basis, said cationic groups being from the class consisting of tertiary amino, tertiary amine salt, quaternary amino, quaternary amine salt and cyanamide and said anionic groups being from the class consisting of sulfonic, sulfonate, carboxylic, carboxylate, phosphate and phosphonate, said cationic groups and said anionic groups being connected to oxygen of the starch molecule.

3,887,753

FLUORESCENT FILM FOR COLOR PICTURE TUBE AND PROCESS OF PREPARING SAME

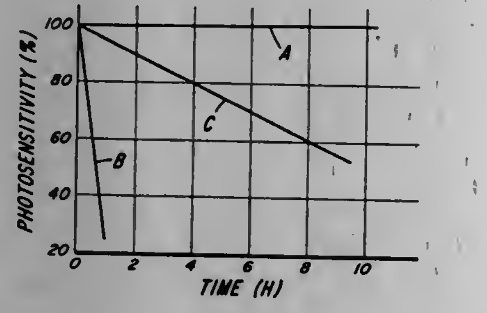
Chikayoshi Ninagawa, Takatsuki; Osamu Yoshida, Kyoto, and Shigeya Ashizaki, Hirakata, all of Japan, assignors to Matsushita Electronics Corporation, Kadoma-shi, Osaka, Japan

Continuation-in-part of Ser. No. 62,150, Aug. 7, 1970, abandoned, which is a continuation of Ser. No. 650,827, July 3, 1967, abandoned. This application June 27, 1973, Ser. No. 374,099

Claims priority, application Japan, July 22, 1966, 41-48443

Int. Cl. B44d *5/00;* **G03c** *5/02*

U.S. Cl. 428—328 **6 Claims**



1. A cathode ray tube comprising

a face plate having a fluorescent film on one surface comprising phosphor particles coated with a member selected from the group consisting of a mixture of GeO_2 and SiO_2 and a mixture of WO_3 and SiO_2 wherein the amount of said member constitutes from 0.5 to 5.0% of the weight of said phosphor particles and in the first instance the amount of the GeO_2 constitutes 0.3 to 4.9% of the weight of said particles while in the second instance the amount of WO_3 constitutes 0.3 to 4.9% of the weight of said particles.

3,887,754

PARTICULATE EXPANDABLE STYRENE POLYMERS HAVING DESIRABLE PROCESSING PROPERTIES

Manfred Walter, Speyer, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany and Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

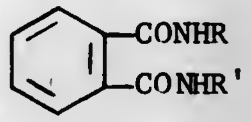
Filed May 30, 1973, Ser. No. 365,217

Int. Cl. C09k *3/00*

Claims priority, application Germany, May 30, 1972, 22 26168

U.S. Cl. 428—407 **4 Claims**

1. Particulate expandable styrene polymers having short minimum residence times in the mold and having a coating of from 0.05 to 2% by weight of a carboxamide melting between 50° and 110°C and having the formula



wherein the acid component is selected from the group consisting of dihydrophthalic acid, tetrahydrophthalic acid and phthalic acid and wherein R and R' are alkyl groups of from eight to 22 carbon atoms.

3,887,755

LAMINATING ADHESIVES

Joseph Zamer, Paramus, N.J., assignor to Inmont Corporation, New York, N.Y.

Filed Sept. 11, 1973, Ser. No. 396,237

Int. Cl. B32b *27/40*

U.S. Cl. 428—424 **6 Claims**

1. A laminate of the group consisting of saran adhesively bonded to saran, saran adhered to treated polyethylene or treated polypropylene, and treated polyethylene adhered to treated polyethylene wherein the adhesive is a mixture of a minor amount of a terpene urethane resin which is the reaction product of a terpene alcohol with a polyisocyanate, and a major amount of a water soluble salt of a substantially linear thermoplastic polyurethane containing 0.5 to 2.5% by weight of nitrogen derived from tertiary amine groups and from 2 to 8% of nitrogen derived from isocyanate groups, said polyurethane being prepared by (a) reacting an excess of an isocyanate with a mixture of diols consisting of polyether diols having a molecular weight of from 425 to 4,000 and tertiary amine diols selected from the group consisting of N-phenyl dialkanol amine and N-lower alkyl dialkanol amines to obtain a reaction product having free isocyanate groups greater than 0.1 milliequivalents of NCO per gram of solution at 50% solids, (b) chain extending the reaction product with a chain extender selected from the group consisting of alkanol amines and alkylene diamines to obtain a chain extended polyurethane polymer containing from 0.07 to 0.1 milliequivalents of NCO per gram of 50% solution, (c) reacting the free isocyanate groups with a material selected from the group consisting of water miscible alcohols, water miscible acids and water, an amount of a water miscible acid being added sufficient to form the acid salts of the tertiary amine groups present on the polyurethane.

3,887,756

POLYMER-BASE PAINTED RESIN CURED UNSATURATED ELASTOMERIC SUBSTRATES

Jeffrey M. Gerstin, East Brunswick, and Lawrence Spenadel, Westfield, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 26, 1972, Ser. No. 318,020

Int. Cl. B32b *25/08;* **B44d** *1/22*

U.S. Cl. 428—425 **14 Claims**

1. A polymer base painted resin cured elastomer composition comprising:

A. at least one elastomer selected from the group consisting of butyl rubber and an EPDM rubber wherein the diene termonomer component is an alkylidene norbornene, and the chloro and bromo-derivatives thereof;

B. a heat reactive phenol-aldehyde resin;

C. a metal oxide or halide wherein the metal is selected from the group consisting of metals of Groups IIB, IIIB, IVB and VIII;

wherein the composition contains at least one of the foregoing components selected from the group consisting of (A) and (C) which serves as a halogen donor, by containing chemically combined halogen selected from the group consisting of chlorine and bromine; and

D. a polyurethane base paint coated on said cured elastomer.

3,887,757

LAMINATES HAVING A POLYURETHANE ADHESIVE

Edward Stone, Morris Plains; Joseph Zamer, Paramus; Matthew Guagliardo, Bloomfield, and Kenneth F. Wieland, Pompton Plains, all of N.J., assignors to Inmont Corporation, New York, N.Y.

Filed May 29, 1973, Ser. No. 364,817

Int. Cl. B32b *27/40*

U.S. Cl. 428—425 **6 Claims**

1. A laminate of the group consisting of saran adhesively bonded to saran, saran adhered to treated polyethylene and treated polyethylene adhered to treated polyethylene wherein the adhesive is a water soluble salt of a substantially linear thermoplastic polyurethane containing 0.5 to 2.5% by weight of nitrogen derived from tertiary amine groups and from 2 to 8% of nitrogen derived from isocyanate groups, said polyurethane being prepared by (a) reacting an excess of an isocyanate with a mixture of diols consisting of polyether diols having a molecular weight of from 425 to 4,000 and tertiary amine diols selected from the group consisting of N-phenyl dialkanol amine and N-lower alkyl dialkanol amines to obtain a reaction product having free isocyanate groups greater than 0.1 milliequivalents of NCO per gram of solution at 50% solids, (b) chain extending the reaction product with a chain extender selected from the group consisting of alkanol amines and alkylene diamines to obtain a chain extended polyurethane polymer containing from 0.07 to 0.1 milliequivalents of NCO per gram of solution at 50% solids, (c) reacting the free isocyanate groups with a material selected from the group consisting of water miscible alcohols, acids and water, and adding an amount of a water miscible acid being added sufficient to form the acid salts with the tertiary amine groups present on the polyurethane.

3,887,758

OIL RESISTANT LEATHER

Anthony J. Butler, and Daniel R. Pail, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Apr. 19, 1974, Ser. No. 462,274

Int. Cl. B44d *1/32*

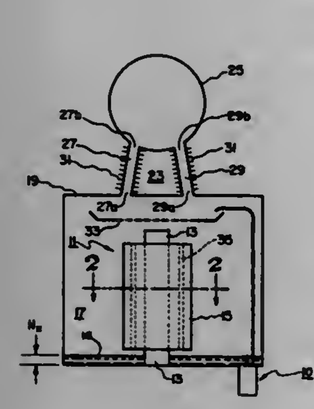
U.S. Cl. 428—540 **5 Claims**

1. A method of preparing an oil resistant leather which comprises impregnating the leather with an organosilicon resin curable at room temperature, said resin having been prepared by mixing

1. from 1 to 65 percent by weight of a dimethylpolysiloxane containing silicon-bonded hydroxyl groups having on the average from 5 to 50 siloxane units per molecule which can contain up to 10 mol percent monomethylsiloxane units,
2. from 15 to 70 percent by weight of a siloxane resin containing silicon-bonded hydroxyl groups having a phenyl-to-silicon ratio of at least 0.3, a hydrocarbon radical to silicon ratio of 1 to 1.5 in which the hydrocarbon radicals are of the group consisting of phenyl and methyl, and
3. from 5 to 65 percent by weight of a silane of the formula $RSiX_3$ in which X is acetoxy, lower alkoxy, $—ON{=}CR'_2$, $—NR'_2$, $—ONR'_2$ or $—NR'(O{=}CR')$ in which R is an aliphatic hydrocarbon radical of 1 to 2 carbon atoms and R' is a lower alkyl radical and thereafter allowing the resin to cure.

3,887,759
EVAPORATIVE COOLING SYSTEM EMPLOYING LIQUID FILM EVAPORATION FROM GROOVED EVAPORATOR SURFACE AND VAPOR PUSH PUMP FOR CIRCULATING LIQUID

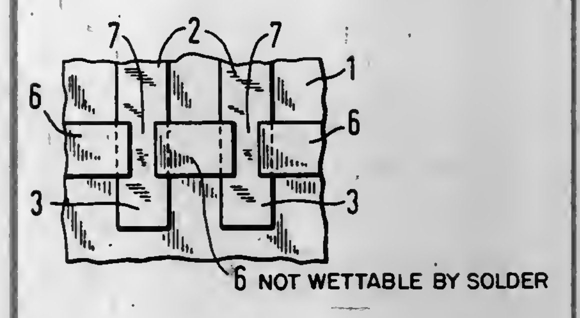
Fred W. Staub, and Philip G. Kosky, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.
Continuation of Ser. No. 310,323, Nov. 29, 1972, abandoned. This application Mar. 20, 1974, Ser. No. 452,945
Int. Cl. H01f *27/18*
U.S. Cl. 174—15 R **3 Claims**



1. In combination: a vaporization chamber containing heat producing electrical apparatus to be cooled while dielectrically protected and a two phase dielectric fluid comprising a liquid and a vapor, said apparatus including at least one cooling duct extending vertically therethrough, said duct having a plurality of longitudinal extending vertical grooves in its side wall, said liquid residing at a bottom portion of the chamber and having a liquid level above the bottom of the chamber, said liquid also being distributed as a film which coats said apparatus and coats the vertical grooves of said duct, said vapor being produced by vaporization of said liquid by said heat produced by said apparatus, said vapor occupying space in said chamber above said liquid level, a condenser having one end thereof connected to and communicating with an upper portion of said vaporization chamber occupied by said vapor, a reservoir containing a predetermined mass of non-condensable dielectric gas positioned above said condenser, said condenser having another end connected to and communicating with said reservoir and said gas therein, said gas forming an interfacial contact with said vapor in said condenser at a region therein between said ends of said condenser, said vapor condensing to form liquid condensate in the condenser on one side of said interfacial contact so that the effective condensation area of said condenser lies between said one end of said condenser and said interfacial contact; distribution means in said chamber positioned above said electrical apparatus for receiving liquid condensate from said condenser and distributing the liquid condensate as a film coating said apparatus and coating the vertical grooves of said duct, and a condensate make-up pump for pumping liquid from the bottom portion of the chamber to said distribution means.

3,887,760
LAYER CIRCUIT WITH AT LEAST ONE SOLDER PLATFORM FOR THE SOLDERING ON OF SEMICONDUCTOR MODULES

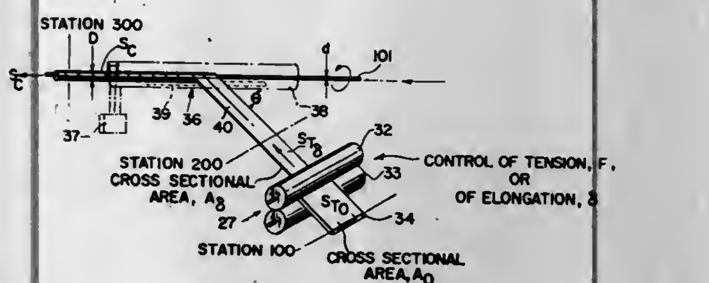
Friedrich Krieger, Gilching, and Christian Stein, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Feb. 4, 1974, Ser. No. 439,116
Claims priority, application Germany, Feb. 14, 1973, 2307325
Int. Cl. H05k *1/18*
U.S. Cl. 174—68.5 **3 Claims**



1. A layer circuit having at least one conductor path extending therealong, a platform of solder on one end of said conductor path, and a layer extending across part of said conductor path beyond said solder platform, said layer being not wettable by solder, thereby separating said solder platform from the remainder of said conductor path by a narrow constriction.

3,887,761
TAPE WRAPPED CONDUCTOR

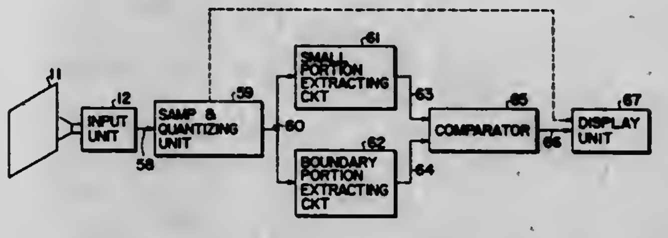
Wilbert L. Gore, Newark, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.
Division of Ser. No. 666,007, Sept. 7, 1967, abandoned. This application Feb. 20, 1973, Ser. No. 333,470
Int. Cl. H01b *7/02*
U.S. Cl. 174—110 R **10 Claims**



1. An insulated electrical conductor of continuous length having exceptionally uniform outside diameter, said insulated conductor comprising:
- a. a conductor of continuous length;
- b. a synthetic polymeric tape spirally wrapped about said conductor;
- c. said tape having the physical property that at strains above about 5% the tape exhibits a small slope in its characteristic stress-strain curve;
- d. said tape having been constantly elongated during the wrapping process; and
- e. said tape having a substantially constant width along the length of said conductor
- f. said insulated conductor having a uniform outside diameter.

3,887,762
INSPECTION EQUIPMENT FOR DETECTING AND EXTRACTING SMALL PORTION INCLUDED IN PATTERN

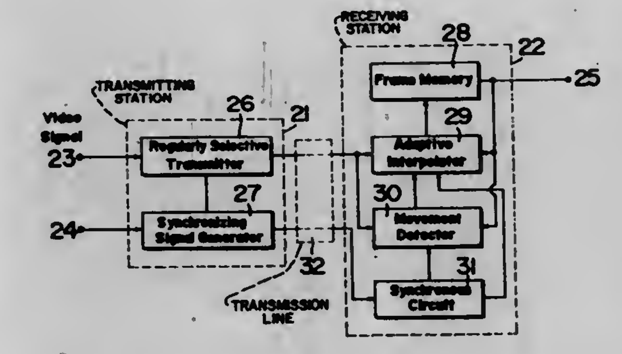
Takeshi Uno, Sayama; Haruo Yoda, Hachioji; Masakazu Ejiri, Tokorosawa; Michihiro Mese, Kokubunji, and Sadahiro Ikeda, Tachikawa, all of Japan, assignors to Hitachi, Ltd., Japan
Filed Nov. 20, 1972, Ser. No. 307,870
Claims priority, application Japan, July 8, 1972, 47-75069
Int. Cl. H04n *1/38*
U.S. Cl. 178—6 **18 Claims**



1. Inspection equipment for detecting and extracting small portions in a pattern comprising:
- a. input means for sequentially scanning a pattern to be inspected and converting said pattern into an electrical video signal;
- b. means for sampling said video signal at a predetermined sampling time interval corresponding to one picture element of said pattern to be inspected and converting said video signal into a binary coded video signal;
- c. a two-dimension image extracting means for rearranging the one-dimensionally arranged output from said sampling and binary coding means into a two-dimensionally arranged signal; and
- d. small portion processing means for extracting a desired video signal from said video signal stored in said two-dimensional image extracting means, thereby extracting a small portion from said pattern.

3,887,763
VIDEO SIGNAL TRANSMISSION SYSTEM

Shigehiko Hinoshita, Yokohama; Yukihiko Minejima, Kawasaki, and Takao Moriya, Yamato, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed July 17, 1973, Ser. No. 380,117
Claims priority, application Japan, July 19, 1972, 47-71596
Int. Cl. H04n *1/00*
U.S. Cl. 178—6 **6 Claims**



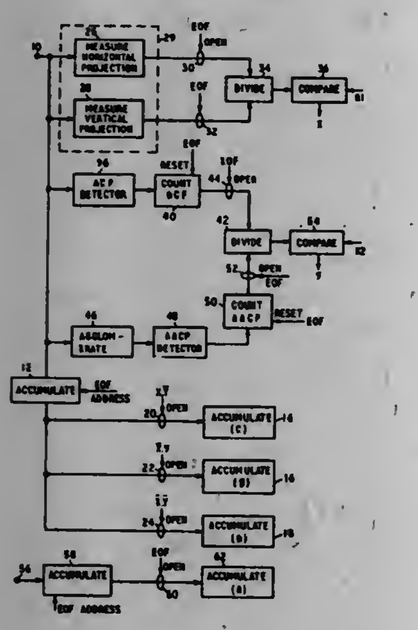
1. A video signal transmission system for transmitting a video signal of compressed bandwidth over a transmission medium, wherein the video signal to be transmitted defines successive picture frames, each of plural picture elements, said system comprising:
- A. a transmission station including:
  - 1. a synchronizing signal generator for producing a first clock signal synchronized with the video signal; and
  - 2. a regularly selective transmitter responsive to the first clock signal for removing from the video signal to be transmitted, selected ones of the picture elements of each picture frame, thereby forming and transmitting a video signal sequence corresponding to said selected picture elements, in succession, and
- B. a receiving station including:
  - 1. a synchronizing signal generator for producing a second clock signal synchronized with the first clock signal of said transmission station;
  - 2. a frame memory for storing the transmitted video signal sequence corresponding to the selected picture elements of one frame;
  - 3. a movement detector for comparing the video signal sequence transmitted from said transmission station for a given frame, as received, with the video signal sequence of a previous picture frame, as previously received and stored in said frame memory, for judging whether the video signal sequence of the said given frame belongs to a moving picture or to a stationary picture and for producing a movement detecting signal in accordance therewith; and
  - 4. an adaptive interpolator responsive to successive, received video signal sequences, for replacing the video signal sequence of a given frame stored in same frame memory with the next successive, received video signal sequence for the successive frame, and selectively operable in response to the movement detecting signal for a stationary picture, to interpolate and produce from the said stored, second video signal sequence a corresponding, successive second video signal sequence and replace the said stored second sequence of said frame memory with the said successive video sequence interpolated therefrom, and, for a moving picture, to interpolate and produce from the said next successive received video sequence a corresponding, succesive second video signal sequence and replace the said stored second sequence with said second video signal sequence interpolated from the said received, next successive video signal sequence, thereby to store in said memory a video signal sequence for the plural picture elements of one frame.

3,887,764
FEATURE CLASSIFICATION IN IMAGE ANALYSIS

John Michael Gibbons, and William Ralph Knowles, both of Royston, England, assignors to Image Analysing Computers Limited, Melbourn, Royston, Hertfordshire, England
Filed May 5, 1972, Ser. No. 250,501
Claims priority, application United Kingdom, May 6, 1971, 13591/71
Int. Cl. H04n *7/00*
U.S. Cl. 178—6.8 **17 Claims**

1. A method of classifying a region of a polished steel surface containing non-metallic inclusions which appear darker than the remainder of the steel surface, comprising the steps of scanning an image of the region in a series of parallel lines forming a raster, generating an amplitude varying video signal from the scanning, in which the amplitude has a first value corresponding to the steel, a second value corresponding to sulphide inclusions and a third value corresponding to oxide inclusions, comparing the video signal with a first reference voltage between the said first and second values and with a second reference voltage between the said second and third values, generating a first detected signal of pulses generated whenever the video signal amplitude has a value between the first and second reference voltages and a second detected signal of pulses generated whenever the video signal amplitude has a value below the second reference voltage, performing measurements on the pulses forming the second detected signal arising from scanning the whole region to produce at

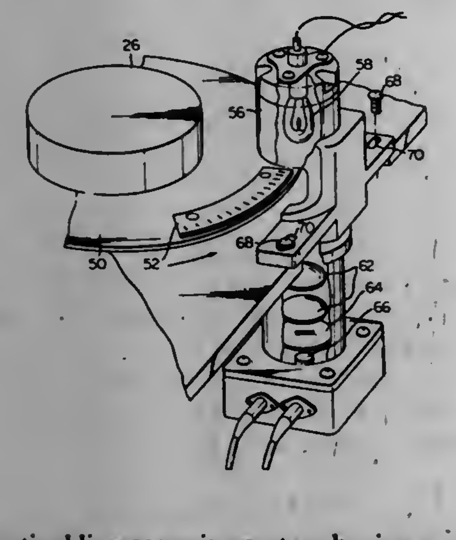
least first and second output signals, comparing the relative magnitudes of said output signals and generating a classifying signal for the region in response to the comparison of the output signals.



3,887,765
OPTICAL LINE SCANNING SYSTEM

Katsuo Murahse, and Kazuyuki Hara, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Mar. 21, 1974, Ser. No. 453,382
Claims priority, application Japan, Apr. 22, 1973, 48-45467
Int. Cl. H04n *1/10*
U.S. Cl. 178—7.6 **19 Claims**



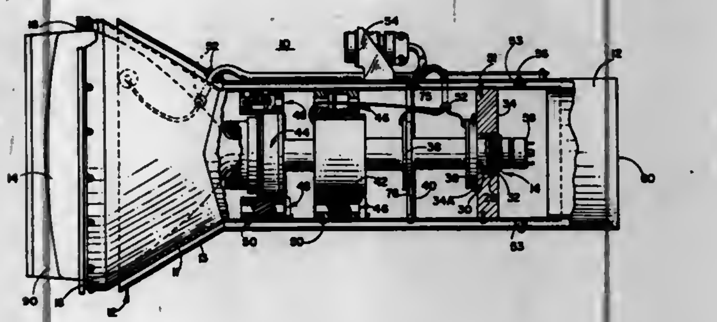
1. In an optical line scanning system having a rotary scanner body carrying a plurality of scanning elements thereon which are equiangularly spaced about the axis of the scanner body, and an optical system to focus an image of the line on the rotary scanner body so that the image of the line will be swept by the scanning elements upon rotation of the scanner body, the improvement comprising:

- a timing member rotatable with the scanner body and having one set of timing marks thereon indicating the angular position of the scanner body relative to the position of the line being scanned by the scanning elements; and
- a plurality of sensing heads arranged adjacent to said timing member to sense said timing marks and produce electrical signals in response thereto;
- the sensing heads being substantially equiangularly spaced about the circumference of the timing member and the number of said sensing heads being equal to the number of said scanning elements, each of said sensing heads being associated with a respective scanning element.

3,887,766
CRT ASSEMBLY

Robert L. Caswell, Placentia, Calif., assignor to Rockwell International Corporation, El Sequndo, Calif.

Filed Dec. 6, 1973, Ser. No. 422,444
Int. Cl. H01j *29/06*; **H04n** *5/645*
U.S. Cl. 178—7.82 **8 Claims**



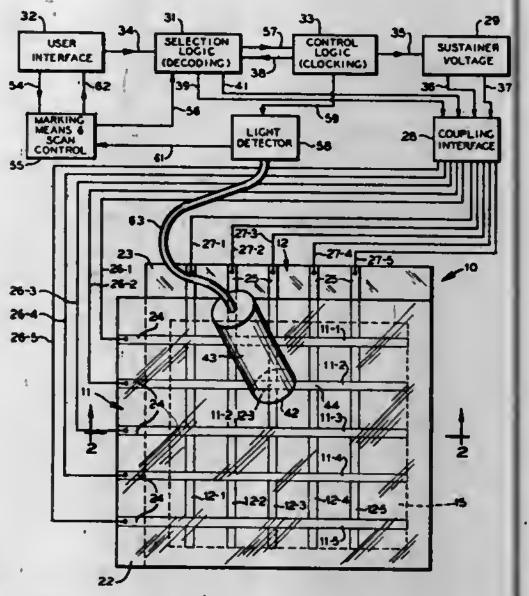
1. A cathode ray tube assembly for housing a CRT comprising:

- at least one precision positioner means having an aperture to accommodate said CRT;
- front plate means for securing the face end portion of said CRT;
- at least one coil holder means having an aperture to accommodate another portion of said CRT;
- clamp means for securing still another portion of said CRT; said clamp means comprising a housing having a threaded aperture therein through which said CRT extends, a retainer ring having a threaded outer surface, and a pliable spacer, which expands into said aperture when said retainer ring is threaded into said threaded aperture of the clamp housing and compresses said spacer thereby forcing said pliable spacer to grip said CRT; and
- magnetic shield means connected to said front plate means, said precision positioner, said coil holder and said clamp housing to provide a support structure therefor.

3,887,767
METHOD OF AND SYSTEM FOR LIGHT PEN READ-OUT MULTICELLED GASEOUS DISCHARGE DISPLAY/MEMORY DEVICE

John W. V. Miller, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 1, 1973, Ser. No. 401,971
Int. Cl. G08b *5/22*; **G11c** *7/00*; **H05b** *41/00*
U.S. Cl. 178—18 **33 Claims**



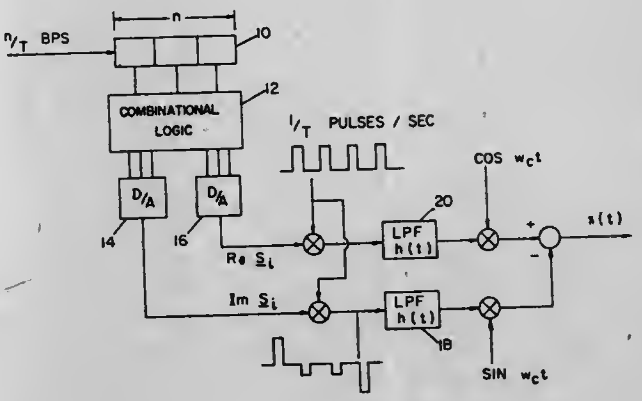
1. The method of ascertaining the location of one or more selected cells in a multicelled gas discharge display/memory device, each said cells comprising an electrode in a first array common to a plurality of cells, an electrode in a second array spaced from the electrode of the first array, a volume of ionizable gas in the vicinity of the electrodes of the first and second arrays, and at least one dielectric layer separating one of the electrodes from the gas volume, the cells having the characteristics that individual cells are sustained in their "on state" or "off state" of discharge when subjected to a sustainer voltage between respective electrodes of the first and second array which is periodically alternating between sustainer voltage magnitudes on opposite sides of a neutral voltage including:

- positioning a pickup for discharge radiation in registry with the selected cells;
- interrupting the application of the sustainer voltage alternations between the electrodes of the first and second array; transferring in succession each of a plurality of cells in an "off state" of discharge between an "off state" of discharge and an "on interrogation state" of discharge to cause said cells to issue discharge radiation at unique moments during the interruption of the sustainer alterations;
- sensing the discharge radiation of the selected cell by said pickup means when that cell is transferred between the "off state" and an "on interrogation state;" and
- correlating the sensing of the discharge with the transfer of the selected cells discharge state.

3,887,768
SIGNAL STRUCTURES FOR DOUBLE SIDE BAND-QUADRATURE CARRIER MODULATION

George David Forney, Jr., and Robert G. Gallager, both of Lexington, Mass., assignors to Codex Corporation, Newton, Mass.

Filed Sept. 14, 1971, Ser. No. 180,289
Int. Cl. H04l *27/18*
U.S. Cl. 178—67 **8 Claims**



1. A double side band-quadrature carrier modulation system comprising

- input means for receiving a sequence of symbols a_k at a rate 1/*T* per second.
- coding means connected to said input means for providing from said symbbols a sequence of complex valued signal points d_k drawn from an alphabet comprising M points arranged in a multiplicity of concentric rings in the complex plane including an innermost ring having four equally spaced points and a plurality of additional rings each having four equally spaced points, each said ring being rotated by 45° with respect to adjacent said rings, and
- modulating means connected to said coding means for providing from said signal points a signal in the form

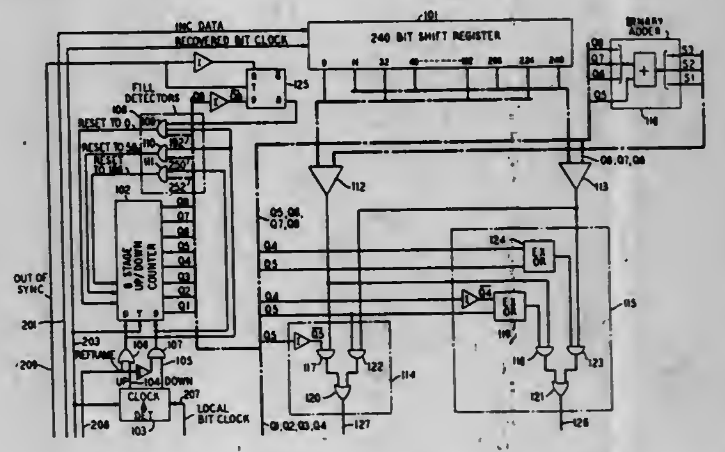
$$x(t) = \mathrm{Re}\sum_{k} \underline{d}_k\, h(t-kT)\, e^{jw_c t},$$

where $h(t-kT)$ represents an impulse response, *w* represents a carrier frequency, *t* represents time, *j* equals −1, and *k* is the index of d_k and a_k.

3,887,769
FRAME SYNCRHONIZATION OF ELASTIC DATA BIT STORES

Michael Peter Cichetti, Jr., Staten Island, N.Y., and Robert Jeffrey Fretz, Red Bank, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 4, 1973, Ser. No. 347,851
Int. Cl. H04l *7/00*
U.S. Cl. 178—69.5 R **8 Claims**



1. An elastic store for receiving incoming frames of serial data, each frame having a fixed number of bits and including at least one framing bit for defining the demarcation between successive incoming frames, comprising,

- variable delay means for delaying the bits and thereby producing bits delayed a predetermined interval of time;
- a local clock for generating framing pulses;
- means for detecting the misalignment in time of the delayed framing bit and the generated framing pulse; and
- means operated in response to the detecting means for cumulatively increasing the delay of the delay means by an interval of time equal to the interval that the increasing means is operating, said increasing means commencing operation at the time that the delayed framing bit is produced and concluding operation at the time that the framing pulse is generated.

3,887,770
DECODER APPARATUS ADAPTED FOR DIFFERENT 4-HANNEL MATRIX SYSTEMS

Susumu Takahashi, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1973, Ser. No. 419,527
Claims priority, application Japan, Nov. 30, 1972, 47-120032
Int. Cl. H04r *5/00*
U.S. Cl. 179—1 GQ **8 Claims**

1. A decoder apparatus for decoding two-channel composite signals obtained by different four-channel matrix systems into four-channel signals in the form well matching any of said matrix systems comprising:

- first means connected to receive the two-channel composite signals for producing a sum signal;
- second means connected to receive the two-channel composite signals for producing a difference signal;
- third means connected to receive the sum and difference signals for additively combining the sum and difference signals to produce a first reproduced signal associated with one of front channels;

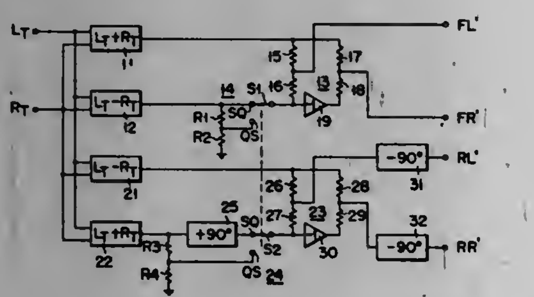
fourth means connected to receive the sum and difference signals for subtractively combining the sum and difference signals to produce a second reproduced signal associated with the other of the front channels;

fifth means for selectively varying an amplitude level ratio between the sum and difference signals supplied to said third and fourth means in accordance with the type of the two-channel composite signals being decoded;

sixth means connected to receive the two-channel composite signals for generating a difference signal;

seventh means connected to receive the two-channel composite signals for generating a sum signal;

eighth means connected to receive the difference signal from said sixth means and the sum signal from said seventh means for additively combining the sum and difference signals to obtain a third reproduced signal associated with one of rear channels;



ninth means connected to receive the difference signal from said sixth means and the sum signal from said seventh means for subtractively combining the sum and difference signals to obtain a fourth reproduced signal associated with the other of the rear channels;

tenth means for varying an amplitude level ratio between the sum and difference signals supplied to said eighth and ninth means simultaneously with the ratio varying operation of said fifth means; and

at least one first phase shifting means selectively connected in circuit or out of circuit with respect to the inputs to said eighth and ninth means simultaneously with the ratio varying operation of said fifth and tenth means such that when said first phase shifting means is in circuit one input to said eighth and ninth means is phase shifted with respect to the other input thereto and when said first phase shifting means is out of circuit it produces no relative phase shift of the input signals to said eighth and ninth means.

3,887,771
TELEPHONE ADAPTER
Abram N. Spanel, 344 Stockton St., Princeton, N.J. 08540
Filed Mar. 4, 1974, Ser. No. 447,690
Int. Cl. H04m *1/21*
U.S. Cl. 179—1 C **15 Claims**

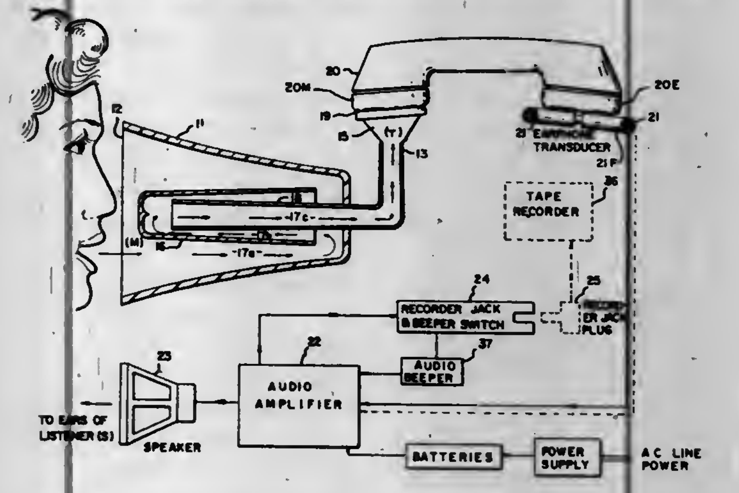
1. An adapter for a telephone permitting its hands-free use, comprising:

an exponential re-entrant horn having walls forming sound passages, said horn decreasing in acoustical cross-section from its mouth towards its tail portion;

a coupling end connecting with said tail portion to provide acoustic coupling with the telephone microphone;

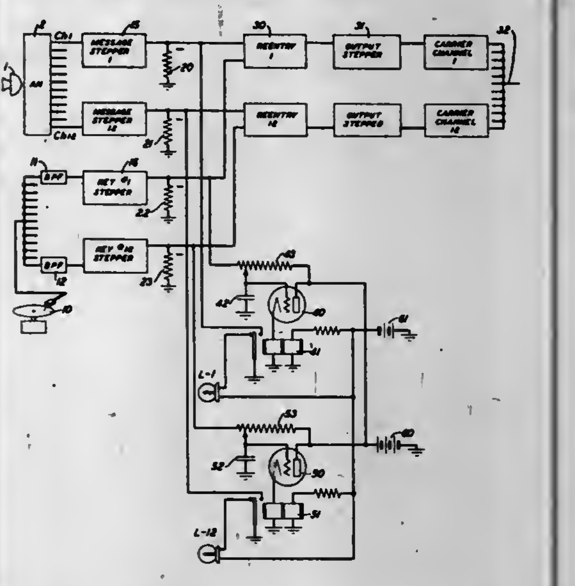
a housing within which said horn is mounted, said mouth of said horn opening through a first part of said housing, and said coupling end opening through a second part of said housing substantially removed from said first part and outside the perimeter of said horn mouth, the area of said mouth being larger than the area of said coupling end, producing acoustic amplification between said mouth and said coupling end; and

means for making audible communications received by the



telephone earphone including speaker means external of said housing.

3,887,772
SIGNAL PRIVACY WITH SAFETY FEATURE
Ralph L. Miller, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed June 30, 1944, Ser. No. 542,976
Int. Cl. H04m *1/68*; H04k *1/02*
U.S. Cl. 179—1.5 M **2 Claims**



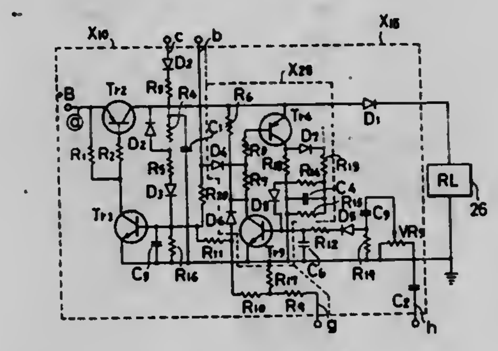
1. In a signal privacy system, a signal current input circuit, a privacy equipment including a source for supplying masking currents thereto, means for combining said masking currents with said signal current for disguising the identity of the signals, a circuit controller having a normal condition and an operated condition, means to impress a portion of said masking currents from said source on said circuit controller, said portion normally having a critical value such as to hold said controller in its normal condition, said circuit controller in its operated condition disabling said signal current input circuit for supplying signal current to said combining means.

3,887,773
AUTOMATIC TELEPHONE ANSWERING APPARATUS
Yuji Urayama, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan
Filed May 14, 1974, Ser. No. 469,872
Claims priority, application Japan, May 17, 1973, 48-57221
Int. Cl. H04m *1/64*
U.S. Cl. 179—6 R **8 Claims**

1. In an automatic telephone answering apparatus of the type operating in response to an incoming call arriving through a telephone line from a caller to reproduce an answering message previously recorded on a recording medium and to send out the reproduced signal to a telephone line, the combination of:

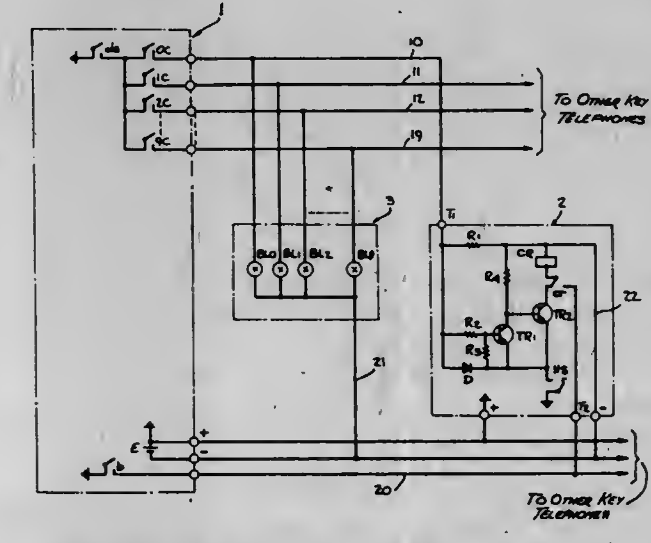
telephone line connecting means operating in response to the incoming call to connect the apparatus to the telephone line;

detection and storing means for detecting and storing an indication that the caller has replaced his telephone receiver on its cradle to cut off the telephone line connection of the caller side; and



control means for holding the telephone line connecting means in its operative state of connecting the apparatus to the telephone line until the apparatus places the recording medium in a state wherein the answering message can be reproduced from the starting point thereof even when the detection and storing means operates when the apparatus is in an intermediate point in its answering operation and for releasing thereafter the telephone line connecting means from its operative state.

3,887,774
TRANSISTOR SWITCHING CIRCUIT FOR USE IN A TELEPHONE SYSTEM
Hachiroh Takubo; Kengo Sudoh, both of Kawasaki, Japan, and Stephen Kerman, Merrick, N.Y., assignors to Nippon Tsu Shin Kogyo K.K., Kanagawa, Japan and TIE/Communications, Inc., Stamford, Conn.
Filed Mar. 14, 1973, Ser. No. 341,201
Int. Cl. H04m *3/22*
U.S. Cl. 179—99 **5 Claims**



1. A switching circuit comprising

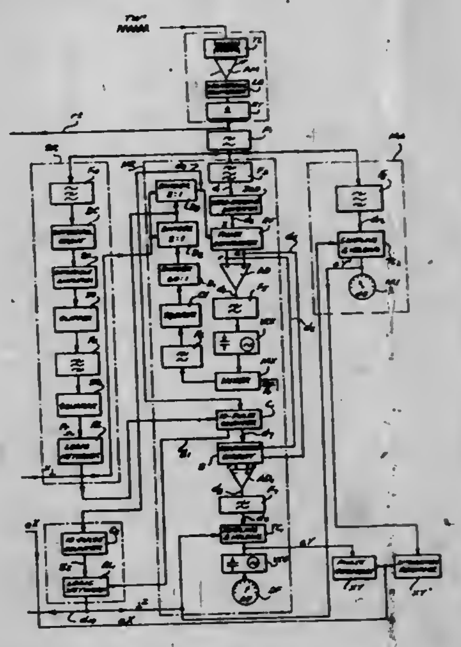
a semiconductor switching circuit means having a first input terminal, a second input terminal and an output terminal, a first signalling means for producing a first signal output, said output connected by a single conductor to the first input terminal of the semiconductor switching means,

a second signalling means for producing a second signal output, said output connected to the second input of the semiconductor switching means, and

a first responsive means connected to the output terminal of the switching means and a second responsive means connected to the single conductor of said first signalling means,

the semiconductor switching circuit means producing a first output signal at its output terminal for operating the first responsive means, said first switching output signal being produced in response to the first output signal from the first signalling means, independent of the signal from said second signalling means, and the switching means also producing a second output signal at its first input terminal in response to the second output signal from the second signalling means, for operating the second responsive means.

3,887,775
SYSTEM FOR MEASURING GROUP DELAY IN SIGNAL TRANSMISSION
Nicola Montefusco, and Alfredo Barlucchi, both of Milan, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy
Filed Oct. 31, 1973, Ser. No. 411,237
Claims priority, application Italy, Oct. 31, 1972, 31144/72
Int. Cl. H04b *3/46*
U.S. Cl. 179—175.3 R **22 Claims**



1. A system for measuring the relative phase shift between a selected carrier frequency f_M and a standard carrier frequency f_R on passing through a test object, said carrier frequencies being amplitude-modulated by a common modulating frequency f_m and being alternately transmitted through said test object under the control of a switching signal with a commutation frequency f_c, comprising:

a receiver for said carrier frequencies provided with an amplitude demodulator for detecting a carrier envelope with a frequency component of said modulating frequency f_m undergoing two opposite phase shifts during a switching cycle $1/f_c$;

a phase discriminator connected to the output of said amplitude demodulator and including zero-crossing detector for deriving from said envelope a measuring square wave in phase with said frequency component thereof;

a phase-locking loop in said phase discriminator including a tunable oscillation generator, wave-shaping means for deriving a reference square wave of frequency f_m from the output of said oscillation generator, and a phase comparator receiving said measuring and reference square waves for producing a control signal proportional to the mean phase difference between said square waves to tune said oscillation generator with stabilization of the phase of said reference square wave at the mean phase of said measuring square wave; and

output means in said phase discriminator for deriving from said phase comparator a voltage proportional to the absolute phase difference between said square waves as a measure of said relative phase shift.

3,887,776
CONDUCTOR ROLL

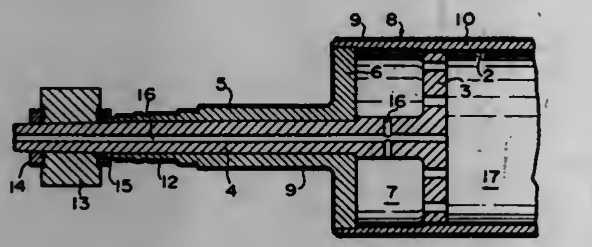
Masahiko Kanbayashi, Tokyo, Japan, assignor to Yamato Kogyo Kabushiki Kaisha, Japan

Filed Jan. 3, 1974, Ser. No. 430,522

Claims priority, application Japan, July 27, 1973, 48-84669

Int. Cl. B01k *3/00*

U.S. Cl. 191—1 A **5 Claims**



1. A conductor roll for conducting electrical plating current, comprising:
  a hollow steel roll body having an inner surface and an outer surface;
  a hard metallic layer covering said outer surface; a copper layer plated on said inner surface;
  a copper shaft having a copper flange integrally connected thereto, which flange includes a silver layer in contact with the copper layer of said roll body to mount the flange of the shaft in said hollow body with firm electric contact between said copper and silver layers and said copper flange; and
  an electric conductor ring affixed to said shaft externally of said roll body.

3,887,777
REFRIGERATOR DOOR SWITCH HAVING VERTICAL DRAIN PASSAGE

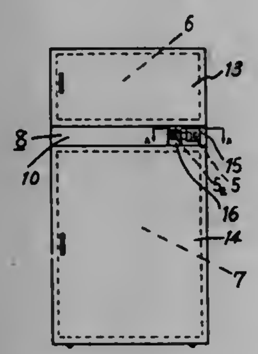
Shiro Nishino, No. 462 Nakakosaka, Higashiosaka-shi, Osaka, Japan

Filed Aug. 22, 1973, Ser. No. 390,612

Claims priority, application Japan, Aug. 31, 1972, 47-102315

Int. Cl. H01h *3/16*

U.S. Cl. 200—61.69 **1 Claim**



1. In combination with a refrigerator having a refrigerator door and a freezing chamber door, a door switch comprising the combination of:
  a. a casing having a main body portion, a flange portion and at least two laterally spaced members interconnecting said main body portion and said flange portion, said laterally spaced members forming at least one vertical water-draining passage between said flange portion and said main body portion of said casing for draining water running out of said freezing chamber downwardly through said casing, and
  b. at least two push buttons mounted on the opposite side of said flange portion from said main body portion and extending into said laterally spaced members for operating switches within said casing, one of said push buttons engaging the refrigerator door and the another of said push buttons engaging the freezing chamber door.

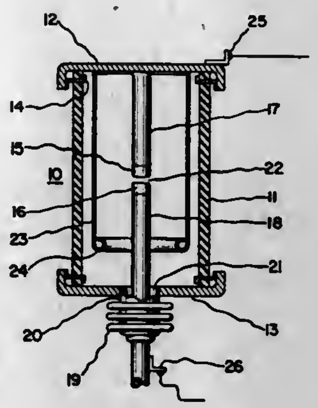
3,887,778
VACUUM ARC DEVICE WITH IMPROVED ARC-RESISTANT ELECTRODES

George A. Farrall, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 305,649, Nov. 10, 1972, which is a continuation of Ser. No. 117,924, Feb. 24, 1971, abandoned. This application Sept. 13, 1973, Ser. No. 396,817

Int. Cl. H01h *33/66*

U.S. Cl. 200—144 B **3 Claims**



1. A vacuum arc device comprising:
  a. an hermetically sealed envelope evacuated to a pressure of 10^{-5} torr or less;
  b. at least a pair of arc-electrodes within said envelope adapted to form an inter-electrode gap;
  c. at least a surface portion of each of said arc-electrodes being capable of sustaining a high current vacuum arc,
    c_1. at least one of said surface portions comprising an alloy of titanium and approximately 1–5 weight percent of beryllium,
    c_2. said alloy having less than 10^{-6} atomic parts of sorbed gases and containing no constituents thereof which exhibit a vapor pressure higher than 10^{-3} torr at 500°C.
    d. said device operating to conduct high current between said arc electrodes through an arc consisting essentially of electrons and ionized metallic specie evolved from said electrodes.

3,887,779
SWITCH

Heiroku Tanaka, and Yoshinobu Nakagawa, both of Neyagawa, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

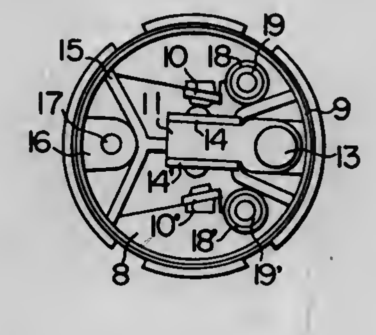
Filed Aug. 27, 1973, Ser. No. 391,871

Claims priority, application Japan, Aug. 29, 1972, 47-101102

Int. Cl. H01h *3/42*

U.S. Cl. 200—153 L **3 Claims**

1. A switch comprising a switch casing made of an insulating material, at least two fixed contacts arranged on said switch casing, a movable contact piece pivotably mounted on a supporting post on said switch casing to engage and disengage with said fixed contacts, at least two mounting projections disposed on said switch casing in the vicinity of said fixed contacts, each of said mounting projections being formed with a first groove for preventing the deterioration of voltage proof, a driving plate mounted on a step projection formed on said switch casing and an engaging projection formed on the lower surface of said driving plate, said engaging projection being connected to change the position of said movable contact piece, and a spring provided between a cam member for effecting a switching operation of said driving plate and said driving plate to separate said cam member and said driving plate from each other.



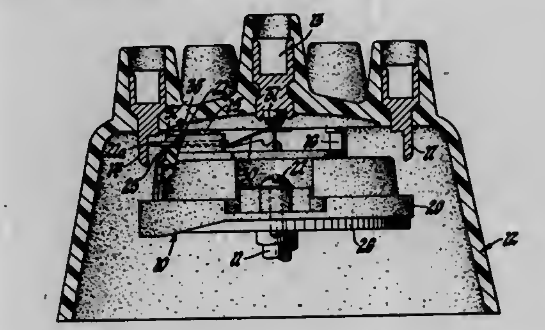
3,887,780
IGNITION DISTRIBUTOR ROTOR

Dwight O. Crim, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 377,646, July 9, 1973. This application Sept. 18, 1973, Ser. No. 398,564

Int. Cl. H01h *3/00*

U.S. Cl. 200—19 DR **5 Claims**



1. An ignition distributor rotor of the type which is rotated by a driving shaft within a distributor cap having a center input terminal and a plurality of output terminals circumferentially arranged about the input terminal comprising: a body member of an electrically nonconductive material adapted to be rotated by said driving shaft, a spark gap electrode of an electrically conductive material supported by and having a tip portion extending beyond an edge of said body member which is passed in spark gap relationship with successive ones of said output terminals as said body member is rotated by said shaft, and an auxiliary electrode of an electrically conductive material in electrical contact with said spark gap electrode and positioned in register with said spark gap electrode along a common radius and extending beyond the edge of said body member in the direction of said tip portion of said spark gap electrode.

3,887,781
METAL BASE COOKWARE INDUCTION HEATING APPARATUS HAVING IMPROVED CONTROL CIRCUIT USING INFRA-RED TEMPERATURE SENSOR

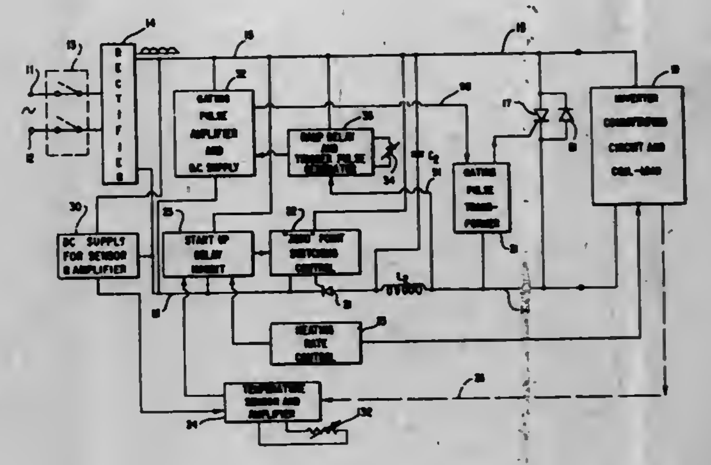
Philip H. Peters, Jr., Greenwich, N.Y., assignor to Environment/One Corp., Schenectady, N.Y.

Division of Ser. No. 131,648, April 6, 1971, Pat. No. 3,710,062. This application June 9, 1972, Ser. No. 261,227

Int. Cl. H05b *5/04*

U.S. Cl. 219—10.49 **13 Claims**

1. A temperature set and control circuit including an infra-red heat sensor device arranged to view an object whose temperature is to be controlled, a constant current amplifier connected in series circuit relationship with the infra-red heat sensor device across a source of low voltage direct current excitation potential, means for periodically interrupting the view of the infra-red heat sensor device to produce an output alternating current signal component whose amplitude is indicative of the temperature of the object, an alternating current amplifier, an adjustable temperature set impedance coupled to and controlling the gain of said alternating current amplifier, the setting of said adjustable temperature set impedance serving to establish the temperature level at which the output from the alternating current amplifier attains an operative level of magnitude, output on-off control amplifier means coupled to and controlled by the output from said alternating current amplifier for producing an amplified output on-off control signal representative of the temperature of the object whose temperature is being controlled in accordance with the temperature setting of the adjustable temperature set impedance, and means for supplying operating bias potentials from a common reference point on the source of low voltage excitation potential supplying the alternating current amplifier and the on-off control amplifier means whereby the effect of variations in the excitation potential is minimized.



11. A stabilized sensor circuit comprising a sensor device for sensing changes in a physical phenomenon being monitored and a constant current amplifier connected in series circuit relationship with the sensor device across a source of excitation potential, said constant current amplifier comprising a field effect transistor having drain, source and gate electrodes and a series connected feedback resistor connected in series circuit relationship with the drain-source electrodes, the feedback resistor being connected through a feedback connection back to the gate of the field effect transistor for maintaining constant current through the field effect transistor and the series connected feedback resistor, the series circuit comprised by the series connected feedback resistor and drain-source electrodes being connected in series circuit relationship with the sensor device.

3,887,782
EDM ELECTRODE VIBRATION CONTROL SYSTEM

Leonard M. Wohlabaugh, Miller Place, N.Y., assignor to Eltee Pulsitron (Entire), West Caldwell, N.J.

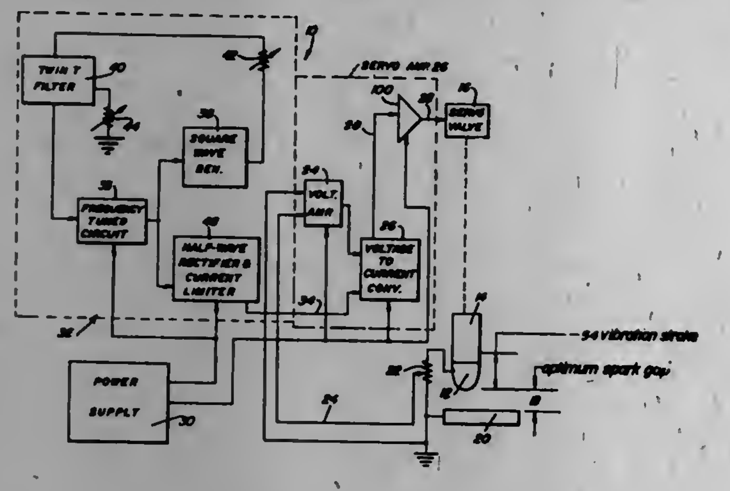
Filed Oct. 12, 1973, Ser. No. 406,091

Int. Cl. B23p *1/08*

U.S. Cl. 219—69 V **6 Claims**

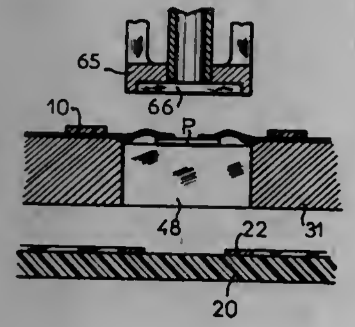
5. In combination with a servo control system for effecting relative displacement between a workpiece and an electrode as a function of the spacing therebetween to maintain an optimum spark gap; a source of electrical oscillating signals, vibration generating means connecting said source to the servo control system for modulating said relative displacement between the electrode and workpiece with a vibratory motion of preselected frequency and amplitude, and stroke control means connected to the vibration generating means for substantially preventing any reduction in the spacing between the

workpiece and the electrode from a distance equal to that of the optimum spark gap, said stroke control means including



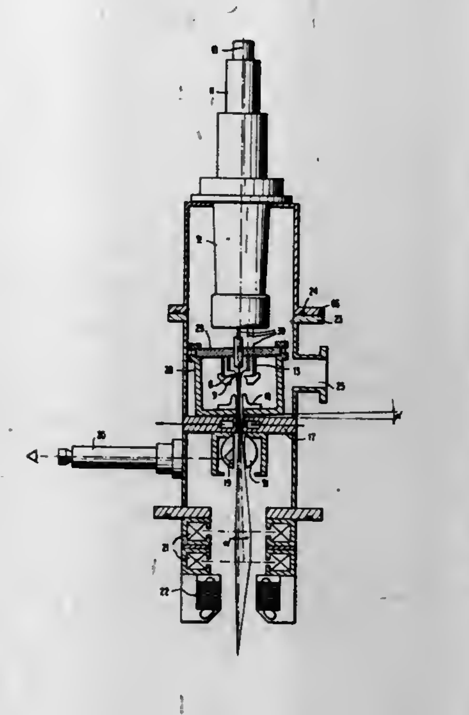
current limiting means connecting the source to the servo control system for rectifying the oscillating signal.

3,887,783
DEVICES FOR WELDING OF INTEGRATED-CIRCUIT WAFERS
Robert Comette, Rosny/Bois, France, assignor to Societe Honeywell Bull (Societe Anonyme), Paris, France
Filed June 12, 1973, Ser. No. 369,234
Claims priority, application France, Nov. 9, 1972, 72.39749.
Int. Cl. B23k *1/02*
U.S. Cl. 219—85 **5 Claims**



1. A device for soldering to a substrate integrated circuit chips mounted previously on a carrier film, said film comprising a series of openings and a conductive sheet hot-rolled on one surface of said film, said sheet forming at each opening a plurality of flexible leads extending towards the center of said opening and bonded to a chip located in said center, said device comprising:
- a first support plate for supporting said substrate,
- a bonding head movable in a direction perpendicular to said plate,
- means for displacing said head between a first position in which it is at a distance from said substrate and a second position in which it is in contact with said substrate,
- a second support plate, disposed between the first support plate and the bonding head when this latter is in its first position, for supporting the film having chips mounted thereon, said second support plate being provided with a die opening positioned on the bonding axis of the head, and means for adjusting successively each chip of the film on the bonding axis of the head, each adjusted chip overlying said die opening, said bonding head comprising a peen shaped to be engaged in said die opening for cutting the leads of the adjusted chip, when the bonding head is displaced from its first position to its second position for soldering to said substrate the remaining portions of the leads of said chip which, after this cutting-off has been completed, is carried by said peen to said substrate.

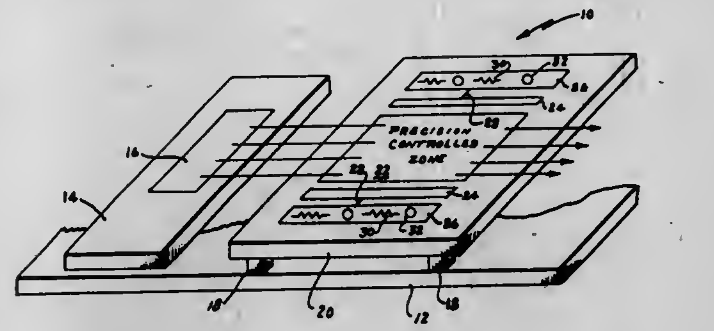
3,887,784
WELDING GUNS
Michel Alais, Orsay; Robert Caillot, Ezanville, and Francois Corcelle, Montlhery, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France
Division of Ser. No. 212,274, Dec. 27, 1971, abandoned. This application Feb. 6, 1973, Ser. No. 330,067
Int. Cl. B23k *15/00*
U.S. Cl. 219—121 EM **5 Claims**



1. In a method for welding a workpiece by electron bombardment of an operating plane of said workpiece, comprising generating by an electron gun having at least one electron beam geometry-influencing system an electron beam having a crossover point and having an elongated cross section, and impacting said operating plane by said electron beam; the improvement comprising inclining at an acute angle the geometrical axis of said beam relative to the axis of said influencing system before the beam is influenced by said system while keeping the crossover point of the beam approximately on the axis of said influencing system first acting upon the beam, said electron gun comprising two portions through which successively passes the electron beam before it is influenced by said influencing system, said two portions contacting each other along a curved sliding seat, and effecting said inclination of the geometrical axis of the beam by rotating one said portion relative to the other portion about an axis making a substantial angle with the direction of the electron beam between a Wehnelt cylinder and said beam geometry-influencing system, said rotation being effected by sliding one said portion along said sliding seat.

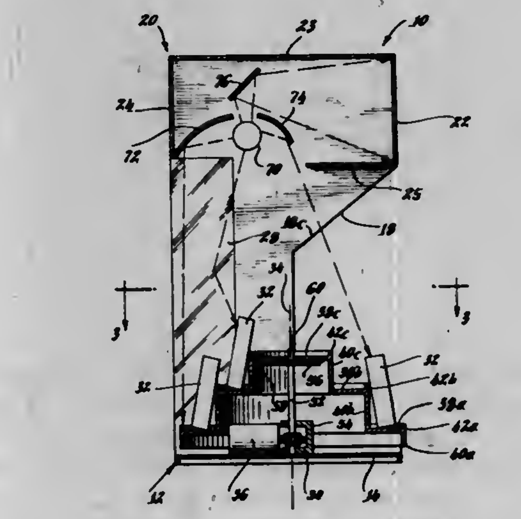
3,887,785
TEMPERATURE CONTROLLED HYBRID OVEN
Boyce T. Ahlport, Rolling Hills Estates, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Aug. 29, 1974, Ser. No. 501,724
Int. Cl. H05b *1/00*
U.S. Cl. 219—209 **1 Claim**

1. A temperature controlled hybrid oven for microcircuits comprising: a base; a plurality of thermally insulating glass piers positioned symmetrically on said base; a beryllia substrate mounted on said piers; a microcircuit mounted on the substrate; a pair of thin gold films deposited on said substrate adjacent to and opposite sides of said microcircuit for sensing substrate temperature, and means for heating the microcircuit mounted on the substrate, connected to the said films whereby



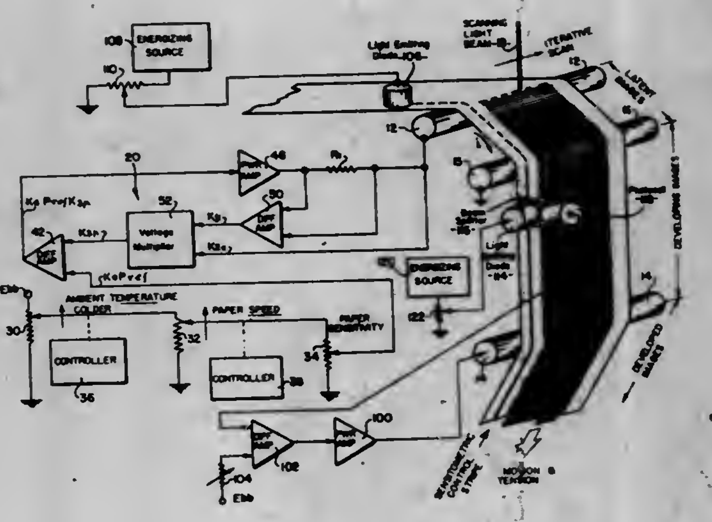
temperature changes in said substrate and microcircuit will be sensed and acted upon by the heating means.

3,887,786
MERCHANDISING DEVICE FOR MAINTAINING FOOD PRODUCT UNITS IN A UNIFORMLY HEATED CONDITION
Allan E. Witt, and Bernard G. Koether, both of Westport, Conn., assignors to Food Automation Service Techniques Inc., Stratford, Conn.
Filed Oct. 26, 1973, Ser. No. 409,797
Int. Cl. H05b *1/00*
U.S. Cl. 219—214 **7 Claims**



1. A merchandiser of the type arranged to store and display a group of food product units and to maintain the food product units in a heated condition during such storage and display, comprising:
- a housing with an open front and means forming an upper housing portion,
- carousel means visible through the open front of the housing and mounted within the housing for rotation about a vertical axis and having upper food supporting surfaces arranged to carry said group of food product units thereon,
- the food supporting surfaces forming centrally elevated tiers for carrying food product units thereon for increased visibility and easier grasping thereof,
- motor means for rotating said carousel means and the food product units on the upper food supporting surfaces thereof,
- frictionally engaging slip clutch means for transmitting rotation from the motor means to the carousel means and for permitting the carousel means to be temporarily stopped from rotating without stopping the motor means, the slip clutch means having vertically separable elements removably mounting the carousel means within the housing for separation of the carousel means from the remainder of the merchandiser for cleaning, and
- radiant heat lamp means mounted to the upper housing portion above the carousel means and being arranged to emit heat and light downwardly upon the food product units carried by the upper food supporting surfaces of the carousel means for illuminating the food product units for display and for maintaining the rotating food product units in a uniformly heated condition,
- said radiant heat lamp means having a field of view substantially encompassing the food supporting surfaces of said carousel means, whereby each rotating food product unit thereon substantially continuously receives radiant heat, thereby increasing the uniformity of temperature of the food product units on the carousel means.

3,887,787
DRY PROCESS PHOTOGRAPHIC PAPER RECORDING APPARATUS
David Paul Gregg, Culver City, Calif., assignor to Del Mar Engineering Laboratories, Los Angeles, Calif.
Filed Oct. 3, 1974, Ser. No. 511,791
Int. Cl. H05b *1/00*
U.S. Cl. 219—216 **9 Claims**

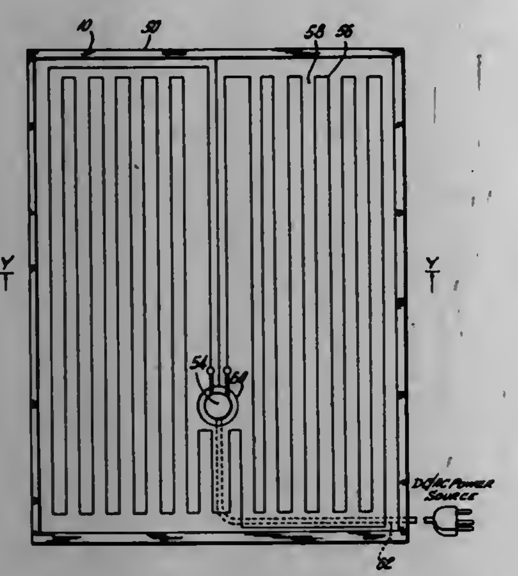


1. Apparatus for developing a dry process photographic web, said web comprising a base of electrically conductive material and a light sensitive photographic emulsion on the base formed of materials capable of being developed by heat, said apparatus including: electrode means across which the web is drawn, and electrical circuit means connected to said electrode means for producing an electric power dissipation within the base of the web to cause internal developing heat to be generated thereby for the emulsion.

3,887,788
CONDENSATION FREE MIRROR
Richard Roy Seibel, Morganville, and Robert Rhea, Matawan, both of N.J., assignors to Seibel & Seibel Enterprises, Wickatunk, N.J.
Continuation-in-part of Ser. No. 297,286, Oct. 13, 1972. This application June 26, 1973, Ser. No. 373,770
Int. Cl. H05b *1/00*
U.S. Cl. 219—219 **5 Claims**

1. A condensation free mirror assembly comprising a transparent plate, a light reflective coating on one side of said plate, an electrically energizeable heating element consisting of a printed circuit board containing a ground path surrounding the perimeter of said board, a single continuous etched path of uniform thickness of a conductor material selected from the group consisting of copper, aluminum and Nichrome, a means for mounting said heating element to said transparent plate, a

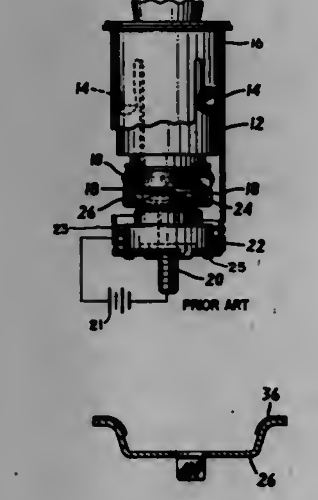
means for supplying electrical power to said heating element whereby electrical power can be transmitted to said heating element from said electrical power means thereby energizing said heating element whereby said plate is heated.



3,887,789
NO-RELIGHT CIGAR LIGHTER SOCKET

Walter Pecota, Mountain Lakes, N.J., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Apr. 1, 1974, Ser. No. 456,625
Int. Cl. F23q *7/24*
U.S. Cl. 219—265 **7 Claims**

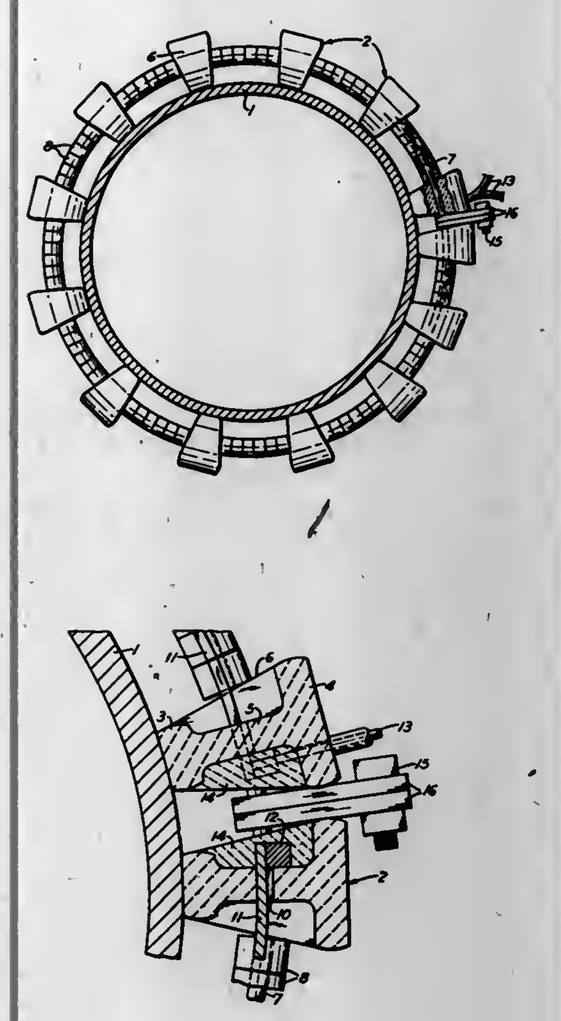


1. A no-relight cigar lighter socket comprising:
a. a metal socket housing;
b. an electrical stud secured to and electrically insulated from the socket housing;
c. a bimetallic thermostat affixed to said stud, said bimetallic thermostat being capable of retaining an electrical burner cup of a cigar lighter plug when the same is inserted therein;
d. a metal stop member affixed to said stud for limiting the maximum insertion of the burner cup of the cigar lighter plug;
e. said stop member being coated with an insulating material which electrically insulates the stop member from the burner cup when the burner cup is in its maximum inserted position thereby preventing the flow of electricity from the stop member to the burner cup when the burner cup is in contact with the stop member; and
f. said insulating material maintaining its electrical insulating properties at temperatures up to the maximum design operating temperature of the cigar lighter socket.

3,887,790
WRAP-AROUND ELECTRIC RESISTANCE HEATER

Vernon H. Ferguson, 3233 Kennebec Rd., Pittsburgh, Pa. 15241

Filed Oct. 7, 1974, Ser. No. 512,238
Int. Cl. H05b *3/58*
U.S. Cl. 219—535 **11 Claims**



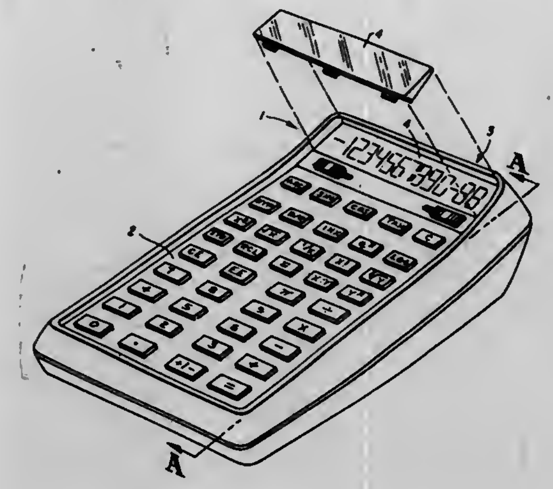
1. A wrap-around electric resistance heater for heating an object surrounded by it, comprising a plurality of spaced parallel insulating rigid bars, each bar having a row of laterally spaced slots extending transversely therethrough, the slots in each row being disposed edge to edge, each end of each bar having a transverse passage therethrough, a tie wire extending through all of the passages at each end of the bars and provided with spacing means holding the bars spaced apart, laterally spaced flexible electric resistance ribbons extending through said slots in parallel relation, low resistance metal jumper means electrically connecting one end of each ribbon to the adjacent end of the next succeeding ribbon to form a zig zag electrical resistance element, electrical connections at the opposite ends of said element, and fastening means secured to the opposite ends of each tie wire for fastening those ends together after the heater has been wrapped around an object, whereby to hold the heater in place with said bars engaging said object.

3,887,791
PRISMATIC DISPLAY WINDOW FOR A CALCULATOR

Lee Glen Kitchens, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 8, 1973, Ser. No. 414,004
Int. Cl. G06c *5/02;* **G06m** *1/22*
U.S. Cl. 235—1 D **6 Claims**

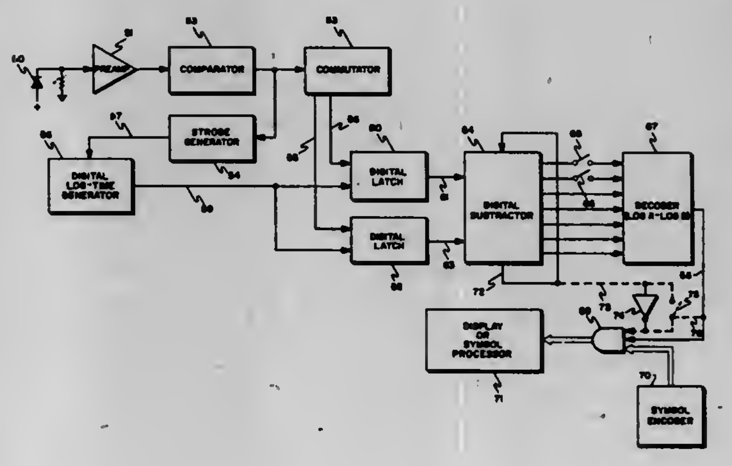
1. In a calculator system having a keyboard and having a visible output display contained in a casing for displaying visual data representations, the improvement comprising:
a. a display source, disposed substantially in the same plane as the keyboard; and
b. a prism attached to the casing for altering the angle of transmission of the visual data representations the transmission angle being acute with respect to the vertical plane.



3,887,792
METHOD AND DEVICE FOR READING AND DECODING A DELTA-DISTANCE CODE

Richard E. Williams, Reston, Va., assignor to Scope Incorporated, Reston, Va.

Filed Dec. 4, 1973, Ser. No. 421,580
Int. Cl.^{2} G06K *7/10;* **G08C** *9/06*
U.S. Cl. 235—61.11 E **13 Claims**

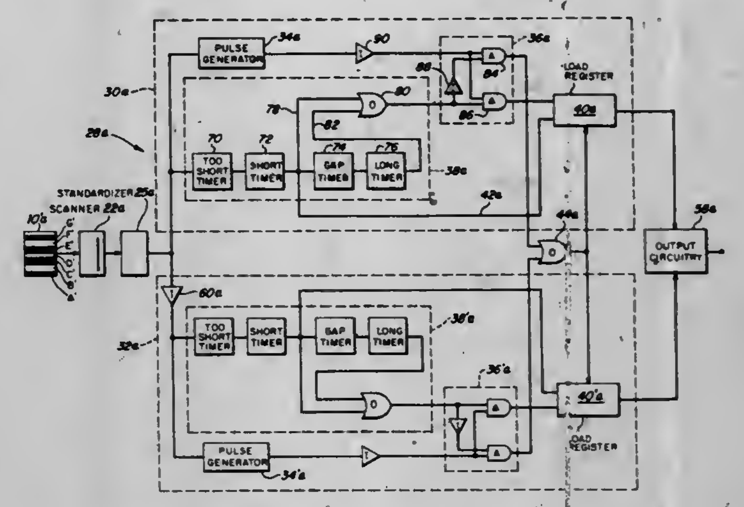


9. A device for scanning and decoding a multiple zone coded representation which includes two or more zonal dimensions bounded by three or more detectable transitions and in which a ratio of dimensions comprises coded data, comprising:
first means for scanning the representation and generating electrical signals which are an analog of the representation;
second means responsive to said first means for generating a plurality of signals substantially coincident in time with the scan of said detectable transitions;
third means responsive to said second means for generating and storing a plurality of signals respectively indicative of the logarithms of the times required to scan the representation between said detectable transitions;
fourth means responsive to said third means for generating a unique signal corresponding to a categorization of a difference between predetermined members of said stored signals whereby the categorization defines a zone coded representation in terms of a dimensional ratio.

3,887,793
INTERSTITIAL CONTRASTING CODED MARK LABEL READING SYSTEM

Frank Carl Goodfinger, Randolph, and Richard H. Tuhro, Norwood, both of Mass., assignors to Computer Identics Corporation, Westwood, Mass.

Filed Jan. 11, 1974, Ser. No. 432,641
Int. Cl. G06k *7/10, 19/06;* **G08c** *9/06*
U.S. Cl. 235—61.11 E **9 Claims**



1. In a label reading system having means for scanning a label and providing signals representative of information borne by the label, a system for decoding signals derived from a label having a first set of information bearing segments having a first characteristic and at least a second set of information bearing segments disposed interstitially of said first set of segments and having a second characteristic contrasting with said first characteristic, each of said segments in each of said sets representing one of a predetermined number of different states, said decoding system comprising:
a first decoder channel responsive to a first set of segments and a second decoder channel responsive to a second set of segments, each of said channels including:
a load register for accumulating signals representative of a set of information bearing signals;
a timing circuit for establishing a recognition period for each of the predetermined number of different states and providing to said load register a data signal representative of that state during that period; and
a steering circuit, responsive to said timing circuit, for enabling a clock pulse to said load register to enter said data signal in response to a signal representative of a segment occurring during that period.

3,887,794
DOPPLER SHIFT COMPUTER

Louis Katz, Anaheim, and Lawrence Wells, Placentia, both of Calif., assignors to Electrac, Inc., Anaheim, Calif.

Filed Oct. 29, 1973, Ser. No. 408,201
Int. Cl. G06f *15/50;* **G01s** *9/42*
U.S. Cl. 235—151.3 **6 Claims**

1. A computer for calculating the amount the frequency in first and second RF channels has shifted while being transmitted from a first point to a second point wherein each received frequency at the second point is the sum of the transmitted frequency plus the doppler shift frequency plus the error shift frequency and the two transmitted frequencies are at a fixed ratio to each other, said computer comprising:
a first and a second adder for adding at least two frequencies inputted therein and outputting the sum,
first means for coupling the received frequency of said first channel to said first adder,
second means including a first voltage controlled oscillator and a first divider circuit for producing a first frequency that includes a reference frequency plus at least the transmitted and doppler frequencies of said one channel and

for coupling said first frequency to said first adder so that at least the reference frequency is outputted therefrom,

thrid means of producing a second frequency that is substantially equal to the outputted frequency from said first adder

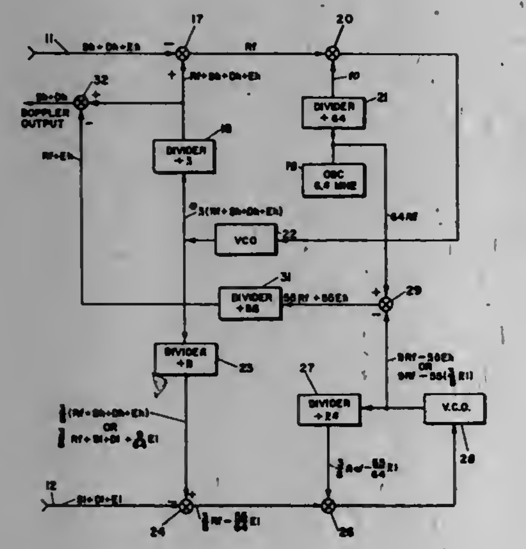
fourth means for comparing said second frequency and the outputted frequency from said first adder to produce a first voltage that is related to the phase difference between the frequencies,

said first voltage controlled oscillator being responsive to said first voltage to control its output frequency to maintain said second frequency and said first adder outputted frequency equal to each other and its output frequency being a multiple of said first frequency,

said first divider circuit being disposed between said first voltage controlled oscillator and said first adder,

fifth means for coupling the frequency of the second channel to said second adder,

a second divider for dividing the output frequency of said first voltage controlled oscillator and producing a third frequency wherein the ratio of said first frequency to said third frequency is the same as the ratio of said transmitted frequencies and for coupling said third frequency to said second adder,



said second adder outputting a fourth frequency that includes the reference frequency multiplied by said ratio and a fraction of the value of the error frequency of said second channel,

sixth means including a second voltage controlled oscillator and a third divider having its input coupled to the output of said second oscillator for producing a fifth frequency that is substantially equal to said fourth frequency,

seventh means for comparing said fourth and fifth frequencies to produce a second voltage that is related to the phase difference of the frequencies and is coupled to the input of said second oscillator,

said second voltage controlled oscillator being responsive to said second voltage to control its output frequency to maintain said fifth frequency equal to said fourth frequency and the output frequency of said second oscillator being a fixed multiple of said fourth frequency, and

eighth means for coupling the output frequency of said second oscillator to the output frequency of said first oscillator so that the error frequency shift is removed from the outputted frequency of said first divider.

3,887,795

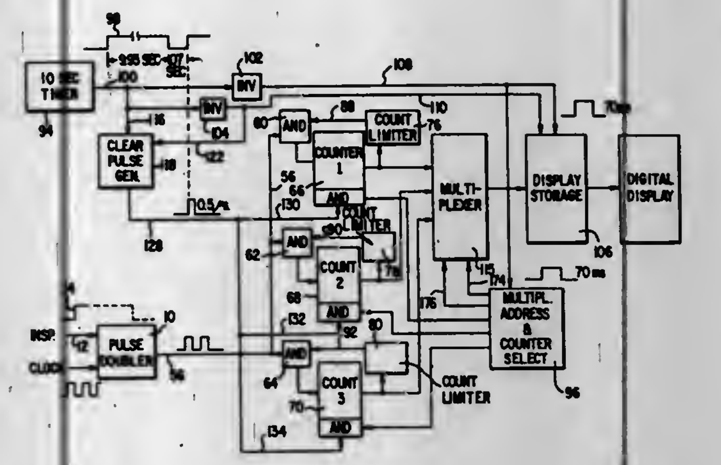
RESPIRATION RATEMETER

Theodore B. Eyrick, Reading, and Neil R. Hattes, Danvers, both of Mass., assignors to Chemetron Corporation, Chicago, Ill.

Filed Oct. 2, 1973, Ser. No. 402,678

Int. Cl. H03k *21/18*

U.S. Cl. 235—92 EA **12 Claims**



1. In a meter for counting pulses representing the rate of occurrence of an event to be monitored and displaying a periodically updated accumulated count representing said rate of occurrence,

at least two counters each receiving and accumulating all of said pulses representing said event,

timer means generating a train of periodic timing pulses;

selector means responsive to said timing pulses for sequentially selecting said counters;

indicator means;

means responsive to said timing pulses for transferring the accumulated count in a selected counter to said indicator means; and

means for clearing said selected counter after transfer of the accumulated count, whereby the output of each counter in turn is periodically selected and displayed to provide a periodic update in the display representing said rate.

3,887,796

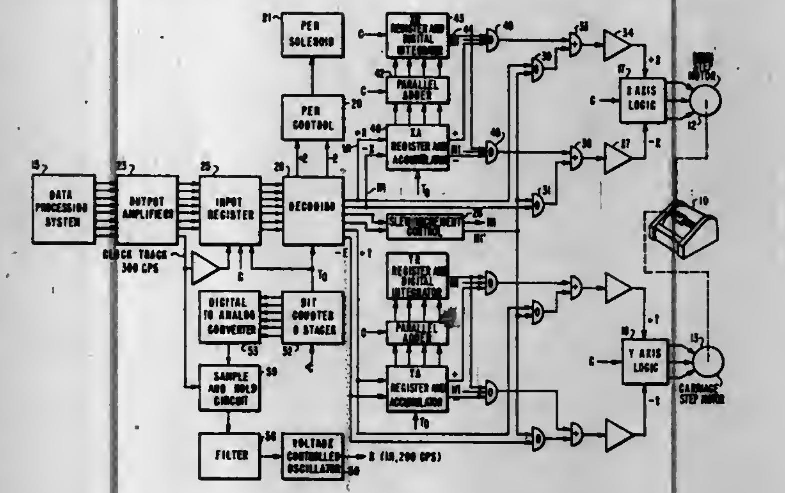
DIGITAL INCREMENTAL CONTROL SYSTEM

Robert B. Trousdale, Santa Ana; Eugene Seid, Los Angeles, and William E. Smith, Anaheim, all of Calif., assignors to California Computer Products, Inc., Anaheim, Calif.

Filed Oct. 26, 1964, Ser. No. 406,523

Int. Cl. G06k *15/22, 17/00*

U.S. Cl. 235—151 **29 Claims**



1. The method of providing digital incremental graphical plots from a data processor which includes the steps of providing distance increment and velocity increment commands in separate series from the data processor, operating a plotter at rates synchronized with distance increment commands as they are provided in one series, and operating the plotter at rates which vary with time in accordance with the velocity increment commands as they are provided in the other series.

3,887,797

DEVICE FOR AUTOMATICALLY ADJUSTING FAULT NULL POINT INDICATION OF DIGITAL SCALE

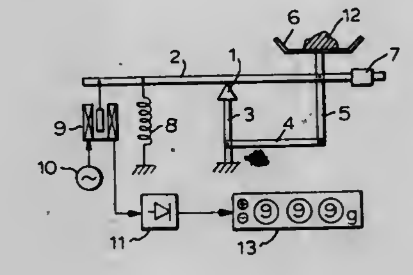
Yuzuru Nishiguchi, Tokyo, Japan, assignor to Shinko Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 26, 1973, Ser. No. 400,816

Claims priority, application Japan, Oct. 14, 1972, 47-102944

Int. Cl. G01g *19/00*

U.S. Cl. 235—151.33 **3 Claims**



1. In a digital scale system of the type having a digital voltmeter to which an input voltage proportional to a measured weight of an object is provided from an electric transducer consisting of a weighing system, and a device for automatically adjusting a faulty numeral indication at the null point to the exact 0, said device comprising:

a calculator operatively coupled to and receiving two kinds of electric signals from said digital voltmeter, one being a signal for distinguishing whether the polarity of the indication on the digital voltmeter is (+) or (−), and the other being for distinguishing whether said indication is within or without the preset slight numeral range, a positive (+) output signal being produced by said calculator where the indication of (+) polarity falls within the preset numeral range, a negative output signal being produced by said calculator when the indication of (−) polarity falls within the preset slight range, and an output of 0 being produced independent of said distinguished polarity when the indication falls without the preset slight range; and

an integrator coupled to said calculator for receiving the output signal thereof and coupled to said transducer for feeding back its output to one of a mechanical and electric means in said electric transducer until the indication of said digital voltmeter becomes correct 0 at the null point.

3,887,798

GENERATOR OF PULSE TRAINS CORRESPONDING TO WALSH FUNCTIONS

Girolamo DeVincentiis, San Mauro Torinese, and Angelo Luvison, all of Turin, Italy, assignors to CSELT-Centro Studi E Laboratori Telecomunicazioni s.p.a., Torino, Italy

Filed Dec. 17, 1973, Ser. No. 425,132

Int. Cl. H03k *13/24*

U.S. Cl. 235—152 **8 Claims**

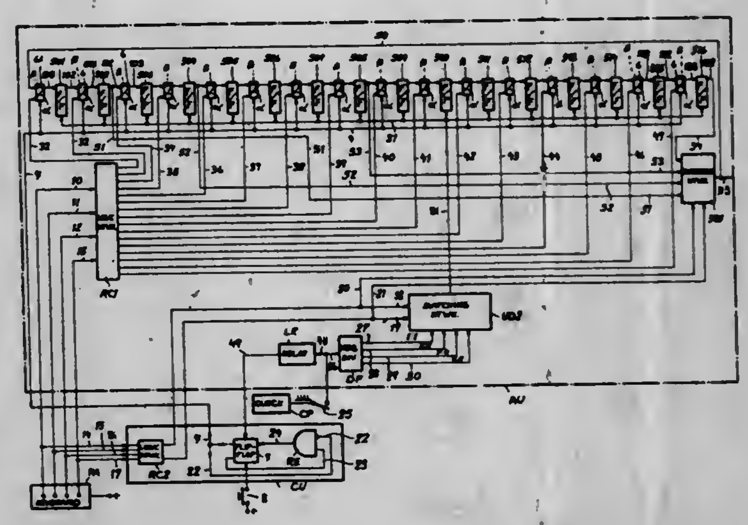
1. A system for generating, on an outgoing line, binary pulse trains with assigned numerical values ranging from 1 through $m-1$ with $m=2^{k+1}$, k being an integer greater than 1, comprising:

logical circuitry with k+1 input leads and with at least $m-2$ output leads for converting a chosen binary number, represented by selective energization of said input leads, into an equivalent Walsh function represented by energization of certain of said output leads;

memory means with m stages, at least $m-2$ of said stages being provided with loading connections to respective output leads of said circuitry;

a source of $k+1$ pulse sequences with repetition frequencies subharmonically related to a basic pulse frequency f;

first switching means connected to said input leads for determining from the energization pattern thereof the rank p of the highest-ranking finite bit of the chosen binary number and for completing an output connection to said outgoing line for the serial read-out of a group of 2^p consecutive stages of said memory means; and



second switching means connected to said source for applying a pulse sequence of repetition frequency $f/2^{k+1-p}$ to respective stepping inputs of said group of 2^p stages.

3,887,799

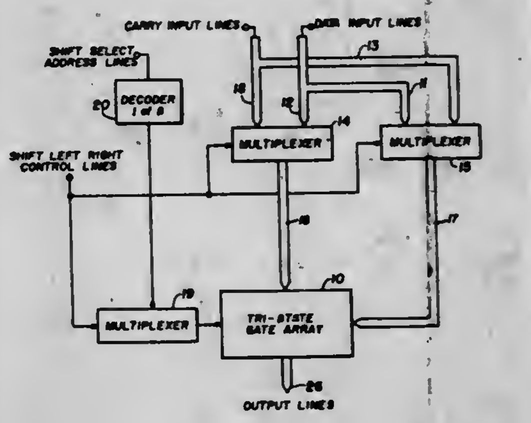
ASYNCHRONOUS N BIT POSITION DATA SHIFTER

Theodore P. Lindgren, 4653 Lisann, San Diego, Calif. 92117

Filed Dec. 3, 1973, Ser. No. 421,366

Int. Cl. G06f *7/00*

U.S. Cl. 235—164 **4 Claims**



1. An asynchronous data bit shifter for shifting a data word to the left or right depending on the value of the shift select word said shifter comprising:

a. a first input means for receiving a carry signal input,

b. a second input means for receiving a data signal input,

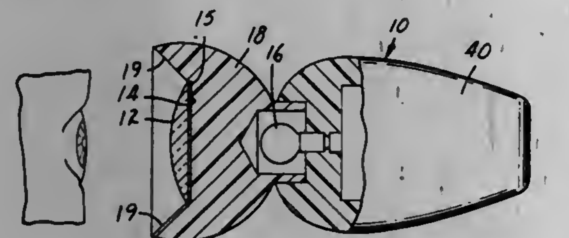
c. a third input means for receiving a control signal input,

d. a matrix of tri-state gates, one-half of said gates having their inputs connected to said second input means and the other half of said gates having their inputs connected to said first input means, the control elements of said gates being coupled to said third input means so that input data coupled to said first and second input means can be asynchronously shifted right and left in response to a command signal applied to said third input means.

3,887,800
PERSONAL CARE VIEWER

Dee Lynn Johnson, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 19, 1973, Ser. No. 426,119
Int. Cl. F21
U.S. Cl. 240—1 EL **13 Claims**

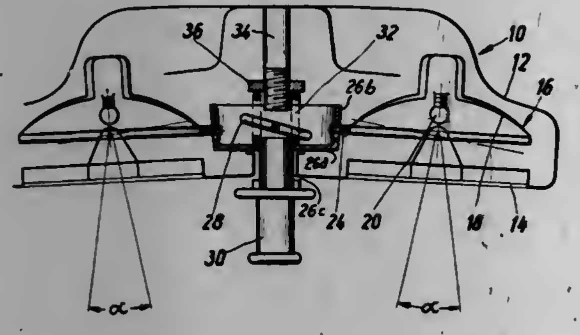


1. A personal care viewing device comprising:
- a. a positive catadioptric element having front and back reflecting surfaces, said catadioptric element having an unfolded focal length of 50 to 500 mm;
- b. a light source positioned behind said back reflecting surface of said catadioptric element; and
- c. a light guide surrounding said catadioptric element adapted to direct light from said light source beyond the periphery of said catadioptric element and from said back reflecting surface in a diffuse pattern into the space adjacent to said front surface of said catadioptric element.

3,887,801
SURGICAL OPERATING LAMP WITH INDIVIDUAL SPOT-LIGHTS

Karl F. Ilzig, Hanau; Klaus M. Junginger, Rodenbach, and Alois Rieth, Offenbach-Bieber, all of Germany, assignors to Original Hanau Quarzlampen GmbH, D-6450 Hanau, Germany

Filed Jan. 24, 1974, Ser. No. 436,256
Claims priority, application Germany, Feb. 6, 1973, 2305666
Int. Cl. A61g *13/00;* **F21v** *33/00*
U.S. Cl. 240—1.4 **7 Claims**

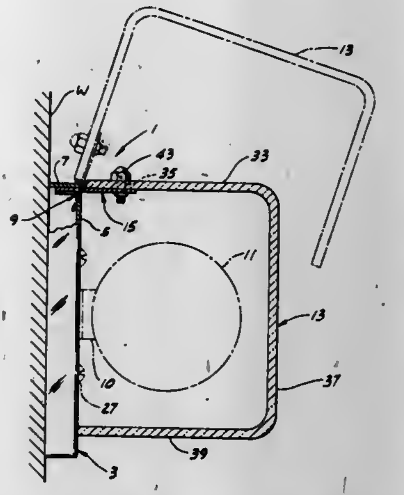


1. In a surgical operating lamp having a housing with at least one hole therethrough and a plurality of individual lights pivotally mounted within said housing and disposed about a central axis of the lamp such that the rays of each individual light meet on the central axis at a desired distance from the lamp, the improved lamp pivoting means comprising
- a. cam means within the housing having an annular intermediate wall oriented perpendicular to the central axis of the lamp, an upper wall attached to the outer periphery of said annular intermediate wall and extending in a first direction, said upper wall having a plurality of slots therethrough defining a plurality of cam surfaces, the longitudinal axes of said slots inclined with respect to the central axis of said lamp, and a lower wall attached to the inner periphery of said annular intermediate wall and extending in a direction opposite that of said upper wall, said lower wall pivotally extending through the hole in said lamp housing;
- b. a handle attached to said lower wall and extending exteriorly of said lamp housing; and
- c. pins affixed to each individual light and bearing on one of the cam surface of said cam means, such that rotation of said handle produces a corresponding rotation of said cam means which thereby causes said lights to pivot about an axis tangent to a common circle drawn about the central axis of the surgical operating lamp.

3,887,802
WALL-MOUNTED LIGHTING FIXTURE

Charles D. Goralnik, 200 Brynwyck Pl., St. Louis County, Mo. 63141

Filed May 20, 1974, Ser. No. 471,788
Int. Cl. F21s *1/02, 3/02, 5/00*
U.S. Cl. 240—73 LD **27 Claims**



1. A wall-mounted lighting fixture comprising a mounting base adapted to be secured to a wall, said mounting base having a generally vertical front wall, an adjoining generally horizontal top wall and at least one generally horizontal slot in the front wall adjacent said top wall, said fixture further comprising lighting means carried by the front wall of said mounting base, a light transmitting shade, and at least one hinge means mounting said shade on said mounting base for movement between a lowered operating position in which said shade effectively shades said lighting means and a raised position in which said lighting means is readily accessible, said hinge means comprising a hinge member having a generally flat leg portion insertable into said slot from the back side of said mounting base, a head portion engageable with the inner face of said front wall to prevent said hinge from passing through said slot, and retaining means for holding the hinge captive relative to the mounting base, said hinge member being swingable between a first position in which the lower surface of said leg portion is in engagement with an edge of said front wall, said edge constituting at least a portion of the lower surface of said slot, for supporting said shade in its operating position and a second position in which said shade is supported in its raised position, at least a portion of said retaining means being on the opposite side of said front wall of said base from said head portion.

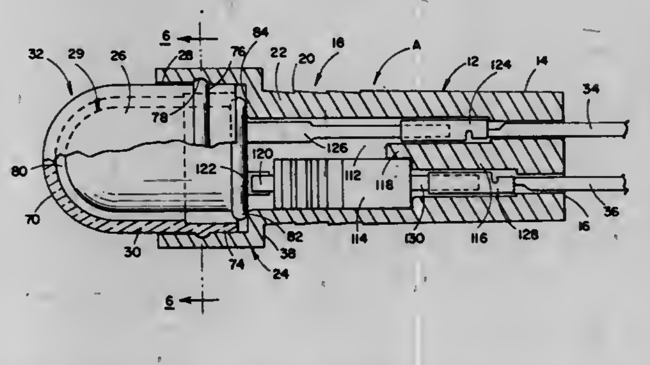
3,887,803
LIGHT EMITTING DIODE DEVICE

John M. Savage, Jr., Los Angeles, Calif.

Filed May 28, 1974, Ser. No. 474,094
Int. Cl.^{2} F21V *17/00;* **G09F** *9/14*
U.S. Cl. 240—151 **17 Claims**

1. A light emitting diode device comprising an outer housing, said housing having a longitudinally elongated body and an enlarged head connected to said body, said head having an interiorly presented wall forming a socket therein, a lens having an outer section and an annular skirt section projecting from said outer section, said skirt section removably extending within said socket, recess means formed in said interiorly presented wall, and somewhat resilient projecting locking means on said skirt section sized and fitting within said recess means when said skirt section is introduced into said socket for removably retaining said lens on said outer housing, a light emitting diode received within said lens and extending radially inwardly of said recess means, the diode having a longitudinally elongated terminal and a relatively short terminal, both said terminals projecting within a hollow formed by said housing elongated body, a resistor positioned in said hollow by said body and in endwise alignment with said diode relatively short terminal, said resistor having a conductive tab and a terminal at longitudinally opposite ends thereof, said tab integrally connected to the diode relatively short terminal whereby the diode is positioned relative to the housing and lens by the resistor, there being electrically conductive clips in the housing removably longitudinally receiving and engaging the diode elongated terminal and the resistor terminal, whereby the diode and resistor may be longitudinally removed as a unit from the housing or returned as a unit into the housing via said socket after prior removal of the lens therefrom.

15. A light emitting diode device comprising an outer housing, said housing having a longitudinally elongated body and an enlarged head connected to said body, said head having an interiorly presented wall forming a socket therein, a lens having an outer section and an annular skirt section projecting from said outer section, said skirt section removably extending within said socket, recess means formed in said interiorly presented wall, and somewhat resilient projecting locking means on said skirt section sized and fitting within said recess means when said skirt section is introduced into said socket for removable retaining said lens on said outer housing, a light emitting diode received within said lens and extending radially inwardly of said recess means, there being longitudinally elongated terminals of different lengths connected with the diode, there also being electrically conductive clips in the housing removably longitudinally receiving and engaging said terminals, one of said clips being located sufficiently closer to said socket than the other clip that the terminal normally received by said other clip cannot be sufficiently longitudinally received by said one clip to allow reception of the remaining terminal by said other clip.

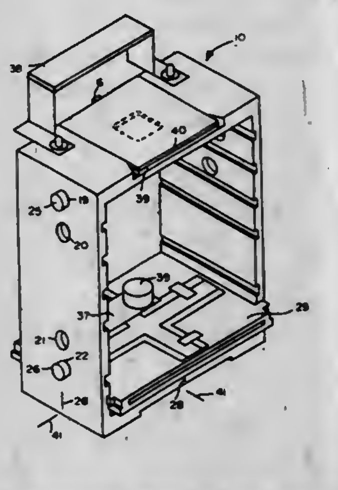


3,887,804
RADIOGRAPHIC TEST STAND

Tommie J. Morgan; George I. Coats; Richard W. Kisielewski, and Charles K. Showalter, all of Rockville, Md., assignors to The United States of America as represented by the Secretary of the Department of Health, Education & Welfare, Washington, D.C.

Filed Dec. 3, 1973, Ser. No. 420,977
Int. Cl. G03b *41/16*
U.S. Cl. 250—252 **13 Claims**

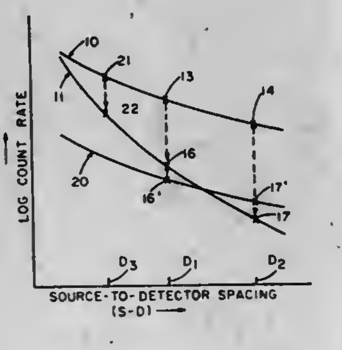
1. A test stand for maintaining fixed geometry during X-ray imaging, comprising:
- a substantially rectangular frame open at the front and back having substantially aligned first and second apertures in two opposing sides, first slide receiving means associated with each of said apertures for receiving and positioning a slide assembly over said apertures, and a plurality of second slide receiving means in two opposing sides of said frame other than those sides having said apertures for receiving and positioning a slide assembly parallel to and between said apertures at various predetermined positions between said apertures.



3,887,805
MEASURING APPARATUS

Nick A. Schuster, Darien, Conn., assignor to Schlumberger Limited, New York, N.Y.

Continuation of Ser. No. 64,846, July 29, 1970, abandoned, which is a division of Ser. No. 686,404, Nov. 29, 1967, Pat. No. 3,546,454. This application Apr. 16, 1973, Ser. No. 351,230
Int. Cl. G01t *1/16*
U.S. Cl. 250—264 **20 Claims**



1. A borehole logging system for measuring the porosity of an earth formation comprising a housing, a first neutron source within said housing for establishing a neutron distribution in which the neutron intensity decreases with increasing separation from said source at rates that correspond to the formation and borehole conditions, a short-spaced neutron detector within said housing spaced from said source a sufficient distance to produce signals related to the earth formation porosity, a second neutron detector within said housing positioned beyond said first neutron source and said short-spaced detector to produce signals related to the earth formation porosity, a second neutron source within said housing for establishing an individual neutron distribution that characterizes the formation and borehole conditions, said second neutron source positioned within said housing adjacent to said second neutron detector a sufficiently short distance to at least a portion of said neutron detector to compensate said detector for the borehole conditions.

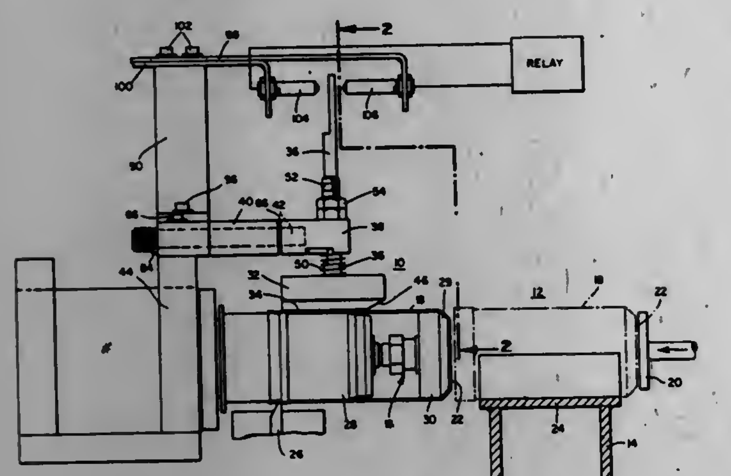
3,887,806
FAULTY CAN DETECTOR

John J. Rodak, Southampton, and Robert L. Macheski, Warminster, both of Pa., assignors to Crown Cork & Seal Co., Inc., Philadelphia, Pa.

Filed Oct. 9, 1973, Ser. No. 404,784
Int. Cl. H01j *39/12*
U.S. Cl. 250—223 B **7 Claims**

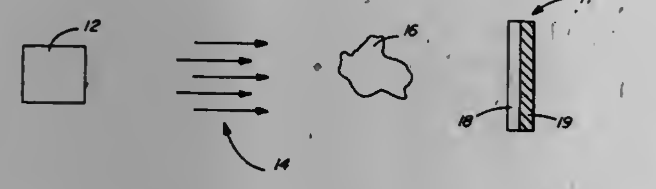
1. Faulty can detector apparatus for detecting roll back and other defective can conditions comprising:

means for rotating the can about the longitudinal axis thereof;
a detector shoe having a surface positioned in close proximity to the rotating can;
a pivot flag member extending from said detector shoe;
support means to pivotally secure said pivot flag at an intermediate pivot point along its length so as to permit said



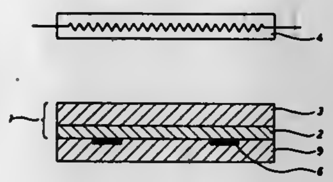
detector shoe to be deflected through an arc substantially tangent to the surface of the can when the detector shoe is deflected by a defect in the can; and
a sensing means for detecting defective can conditions actuatable by said pivot flag member when the defective portion of the can impacts the detector shoe thus causing the pivot flag member to pivot about said intermediate pivot point.

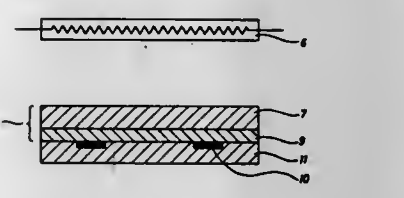
3,887,807
ELEMENTS AND PROCESS FOR RECORDING DIRECT IMAGE NEUTRON RADIOGRAPHS
Robert V. Poignant, Jr., and Edwin P. Przybylowicz, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed July 20, 1973, Ser. No. 381,106
Int. Cl. G01z *3/00*
U.S. Cl. 250—315 22 Claims



1. An element for reducing a direct image neutron radiograph, said element being capable of holding an electrostatic charge and comprising means for absorbing neutrons and generating a current by dissipation of said electrostatic charge in proportion to the number of neutrons absorbed, said neutron absorbing means comprising an insulative layer comprising a neutron absorbing agent in a concentration of at least 10^{17} atoms per cubic centimeter.

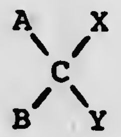
3,887,808
THERMOIMAGING PROCESS UTILIZING A PHOTOCHROMIC MATERIAL CONTAINING A SPIROPYRAN, A POLYHALOGENATED HYDROCARBON, A THIOL COMPOUND AND A POLYVINYLCARBAZOLE
Jozef Willy Van den Houte, Berchem; Freddy Ghisleen Van Royen, Wommelgem; Hugo Vital Van Goethem, Edegem, and Edwin Hendrik Hazenbosch, Mechelen, all of Belgium, assignors to Agfa-Gevaert, Mortsel, Belgium
Filed June 25, 1973, Ser. No. 372,938
Claims priority, application United Kingdom, June 26, 1972, 29915/72
Int. Cl. G03c *5/04, 1/52*
U.S. Cl. 250—316 15 Claims





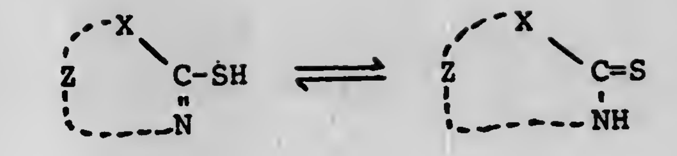
1. A process for forming a dye image comprising applying a heat pattern having a temperature of at least 90°C of the image in the presence of minor amounts of about up to 20% of visible light to a recording material including a recording layer containing an intimate mixture comprising:

1. at least one spiropyran compound of the group consisting of a spirodibenzopyran, a spirodinaphthopyran, a spirobenzonaphthopyran, a 1,3,3-trimethylindolinobenzospiropyran, a 1,3,3-trimethylindoline-naphthospiropyran, or a spiropyran that contains a condensed aromatic nucleus of anthracene or phenanthrene, and
2. at least one ultra-violet radiation-sensitive polyhalogen compound capable of producing on exposure with ultraviolet radiation with the spiropyran compound a dye salt and having the general formula:



wherein:
each of A, B, X and Y is a chlorine, bromine or iodine atom, or
one of said groups A, B, X or Y is an alkyl group, an aryl group or an aroyl group and the other groups are each chlorine, bromine, or iodine, or two of said groups A, B, X or Y each is an aromatic acyl group and the other groups chlorine, bromine, or iodine,
and in working relation with said mixture at least one of the following compounds,

a. a tautomeric organic nitrogen containing compound corresponding to the following general formula:



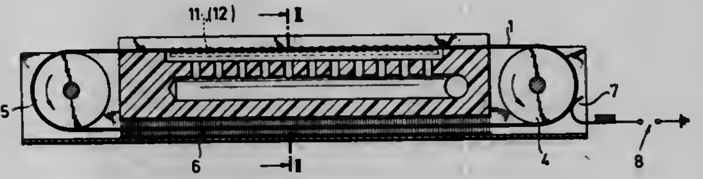
in which:
X represents oxygen, sulphur, selenium or the group

$$-\dot{N}R$$

in which R is hydrogen, or an alkyl, allyl, or phenyl group, and
Z represent the necessary atoms to close a 5- or 6-membered heterocyclic nitrogen-containing ring system, and

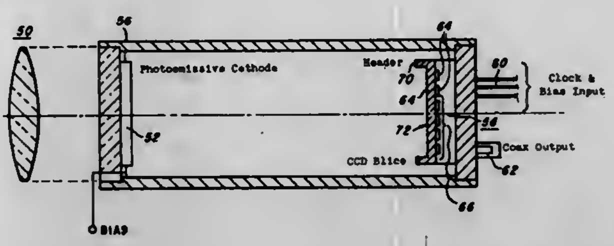
b. a polymer containing N-vinylcarbazole units.

3,887,809
CORONA DISCHARGE DEVICE
Gerhard Marx, Hahn/Taunus, and Hermann Frank, Sulzbach, both of Germany, assignors to Hoechst Aktiengesellschaft, Wiesbaden-Biebrich, Germany
Filed Nov. 14, 1974, Ser. No. 523,751
Claims priority, application Germany, June 22, 1972, 2230483
Int. Cl. G03g *15/00*
U.S. Cl. 250—324 25 Claims



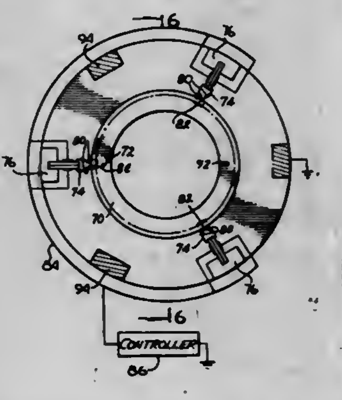
1. A corona discharge device comprising an endless movable belt as at least one corona discharge element, said belt having at least one conductive layer at two discharge edges of the belt, a row of supported electrodes facing each discharge edge a uniform distance therefrom for a portion of said belt which with said portion form a discharge zone and a cleaning device through which said belt moves positioned outside of the discharge zone and extending along said belt.

3,887,810
PHOTON-MULTIPLIER IMAGING SYSTEM
Frank Lee Skaggs, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Jan. 2, 1973, Ser. No. 320,392
Int. Cl. H01j *31/50;* **G01t** *1/16*
U.S. Cl. 250—333 10 Claims



1. A high gain semiconductor charge transfer device imager comprising a proximity tube including a substantially planar photo-emissive cathode for emitting a number of electrons corresponding to the intensity of visible radiation from an image focused thereon, the density pattern of emitted electrons substantially corresponding to the light intensity pattern of said image; an array of semiconductor charge transfer device storage elements defined on a first planar surface of a semiconductor anode spaced from said cathode, said anode defining a second planar impact ionization surface facing said cathode, said second surface defining a recess in registry with the region on said first planar surface wherein said array is defined, said recessed region defining a thickness of said semiconductor anode effective to minimize lateral spread of charge; means for biasing said anode and cathode to accelerate said emitted electrons to a higher energy and for impacting said accelerated electrons on said anode in substantially the same density pattern as said emitted electrons, said accelerated electrons respectively generating a plurality of hole-electron pairs in said semiconductor anode thereby providing substantial gain, said electron-hole pairs effectively modifying the charge of respective corresponding storage elements of said array, the pattern of said modified charge in said array substantially conforming to said density pattern of emitted electrons; and output means for addressing said array and selectively detecting the charge stored in each of said storage elements to provide an amplified output signal corresponding to said image.

3,887,811
ELECTRO MECHANICAL ALIGNMENT APPARATUS FOR ELECTRON IMAGE PROJECTION SYSTEMS
William R. Livesay, Camarillo, Calif., assignor to Radiant Energy Systems, Inc., Newbury Park, Calif.
Continuation of Ser. No. 187,799, Oct. 8, 1971, abandoned. This application Nov. 8, 1973, Ser. No. 413,815
Int. Cl. H01j *37/20*
U.S. Cl. 250—442 12 Claims

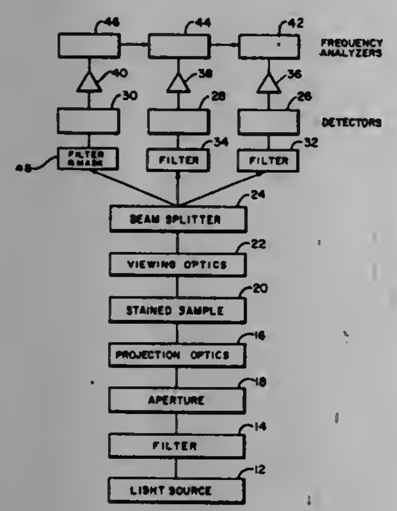


1. An angular alignment system for electron image projection systems comprising:
first means for supporting a photocathode;
second means for supporting an article to receive an electron image emitted from the photocathode; and
a plurality of piezoelectric means disposed between and attached to said first and second means, for inducing relative rotation between said first and second means according to the magnitude and polarity of a control voltage applied to said piezoelectric means to cause dimensional distortion thereof, and for providing the sole support for the weight of one of said first and second means with respect to the other, thereby allowing substantially friction-free and hysteresis-free relative rotation.

3,887,812
METHOD AND APPARATUS FOR DETECTING AND CLASSIFYING NUCLEIC ACID PARTICLES
Tomas Hirschfeld, Framingham, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.
Continuation-in-part of Ser. No. 375,807, July 2, 1973. This application July 29, 1974, Ser. No. 492,501
Int. Cl. G01t *1/16*
U.S. Cl. 250—458 4 Claims

1. Apparatus for detecting and classifying, in a fluid specimen, submicron-dimensioned particles containing a nucleic acid and stained with a fluorescent dye specific to said nucleic acid, said apparatus comprising,

- a radiation source for providing illumination within an excitation band of said dye,
- means for directing said illumination into said specimen,
- means for viewing fluorescence emission produced from said dye responsively to said illumination, and



- means for spatially filtering at least one of said illumination and said fluorescence emission, said means for spatially filtering comprising aperture means providing, in conjunction with said means for viewing, a ratio of viewed volume of said specimen to the root mean square distance across said aperture means of greater than 1000/1.

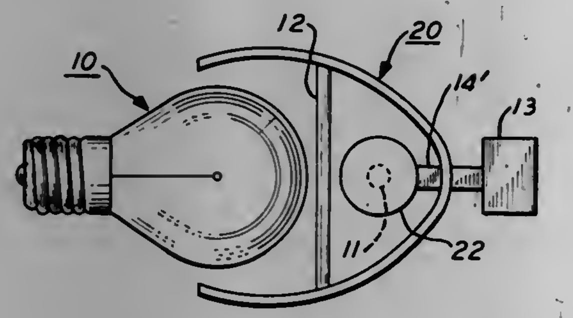
3,887,813
SHORT WAVELENGTH FLUORESCENT LIGHT SOURCE

Robert W. Allington, Lincoln, Nebr., assignor to Instrumentation Specialties Company, Lincoln, Nebr.

Division of Ser. No. 654,303, June 26, 1967, abandoned, which is a continuation-in-part of Ser. No. 590,071, Oct. 27, 1966, abandoned. This application July 24, 1970, Ser. No. 64,863

Int. Cl.^{2} G01N *21/38*

U.S. Cl. 250—461 **14 Claims**



1. A source of ultraviolet illumination for use in photometric apparatus, comprising:

- primary source means for radiating ultraviolet light in at least one direction;
- fluorescent means, positioned in said one direction from said primary source means, for emitting light along at least one path having at least some wavelengths substantially within the range of about 270 to 320 millimicrons upon receiving said ultraviolet light from said primary source means;
- said fluorescent means including an article of thallium-activated alkali halide;
- said photometric apparatus including a flow cell positioned in said one path, whereby light from said fluorescent means is directed into said flow cell.

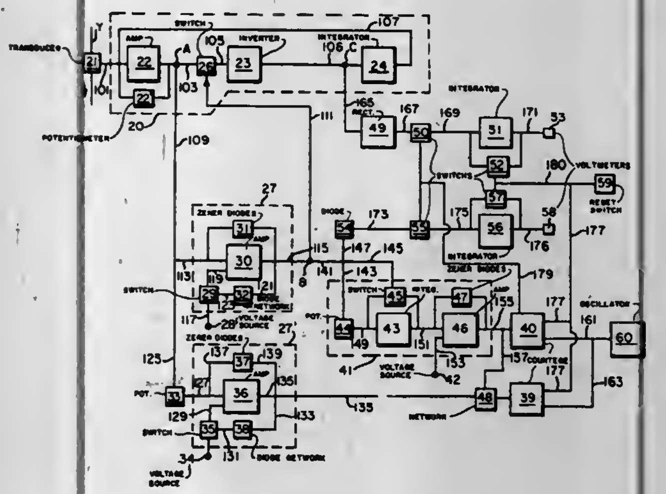
3,887,814
YARN SLUB ANALYZER

Mark Edwin Faulhaber, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Nov. 1, 1973, Ser. No. 412,040

Int. Cl.^{2} G01N *21/32*

U.S. Cl. 250—562 **7 Claims**



5. In a yarn inspection system wherein yarn moves at a uniform rate past a photoelectric means for generating an electric signal output corresponding to instantaneous variations in yarn diameter and including electronic means responsive to said photoelectric means for processing said electric signal output, said electronic means comprising: an amplifier having input and output terminals, said input terminal being connected to said photoelectric means, said amplifier producing a voltage output signal from said electric output signal; an electrical circuit coupled to the amplifier input and output terminals for producing a time-averaged signal from said voltage output signal and for feeding said time-averaged signal back to the input terminal; means for maintaining said time-averaged signal constant and for providing an indication signal when said voltage output signal exceeds a predetermined minimum threshold value; means for establishing said minimum threshold value; and means for measuring the duration of said indication signal and signaling each instance said duration exceeds a predetermined minimum time during a preselected period of time.

3,887,815
PHOTOELECTRIC SMOKE DETECTOR

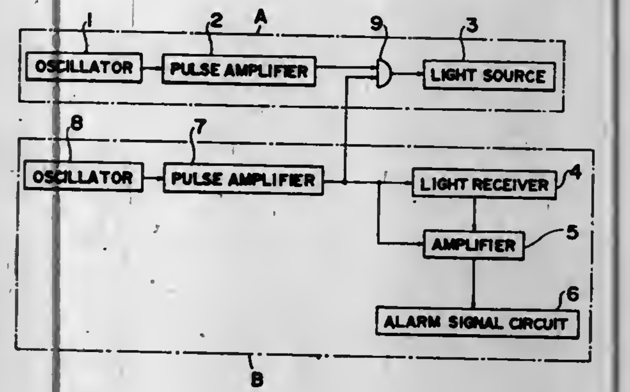
Mamoru Kawakami, Takatsuki, Japan, assignor to Hochiki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1973, Ser. No. 423,530

Claims priority, application Japan, Dec. 14, 1972, 47-142726

Int. Cl. H01j *39/12*

U.S. Cl. 250—564 **3 Claims**



1. A photoelectric smoke detector comprising a source of light, a first oscillator connected to said source, said source

being adapted for being intermittently energized by the output of said first oscillator, a second oscillator, a light receiving circuit including a photoelectric means adapted for being energized by the output of a second oscillator thereby to come into operation intermittently for receiving light scattered by smoke generated by the source of light, the first and second oscillators having different oscillation periods, and an AND gate circuit controlled by the outputs of the first and second oscillators being connected between the first oscillator and the source of light.

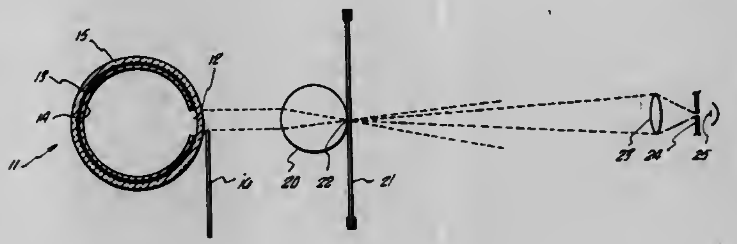
3,887,816
OPTICAL SYSTEM FOR X-RAY SCANNING EQUIPMENT

Austin G. Cooley, Reno, Nev., assignor to Litton Medical Products, Inc., Elk Grove, Ill.

Filed Apr. 26, 1973, Ser. No. 354,671

Int. Cl. G01n *21/06, 21/22*

U.S. Cl. 250—571 **7 Claims**



1. In combination:

- an x-ray film station having a plane for receiving a frame of x-ray film;
- an exciter lamp positioned on one side of said x-ray film station for illuminating a thin line of illumination across the x-ray film;
- an aperture plate positioned on the opposite side of said film station;
- an objective lens positioned between said film station and aperture plate for focusing the scanned image from said film station onto said aperture plate;
- photosensitive means positioned behind said aperture plate for receiving the light signals passing through said aperture plate and generating electrical signals in response thereto;
- lens means positioned between said exciter lamp and said film station for diverging the spectral light passing therethrough and increasing the luminance of the illuminated line passing therethrough, said lens means including a cylindrical lens longitudinally positioned adjacent said film station; and
- means for attenuating portions of the illuminated line exiting said exciter lamp.

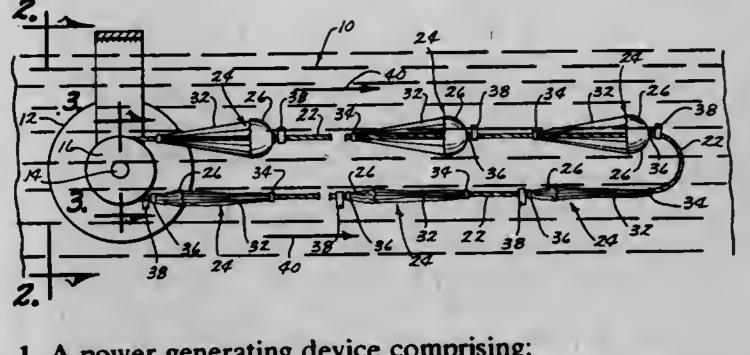
3,887,817
POWER GENERATING DEVICE

Gerald E. Steelman, R.R. 3, Adel, Iowa 50003

Filed Dec. 20, 1973, Ser. No. 426,804

Int. Cl. F03b *13/10*

U.S. Cl. 290—43 **11 Claims**



1. A power generating device comprising:

- a frame;
- a continuous elongated flexible loop member adapted to be suspended in a current of moving fluid, said loop member having opposite end loop portions and including a plurality of flexible and collapsible containers;
- each of said containers being comprised of a flexible material which is free to collapse radially inwardly towards the longitudinal axis of said loop member;
- each of said flexible containers having an open end and a closed end, each of said containers being adapted to open and to capture and hold a quantity of fluid when said open end extends towards an oncoming current of fluid, and being adapted to collapse and empty said quantity of fluid when said closed end extends towards an oncoming current,
- a rotatable member rotatably mounted to said frame;
- and one end loop portion of said loop member embracing said rotatable member, whereupon movement of said loop member by a moving current of fluid will impart rotational movement to said rotatable member.

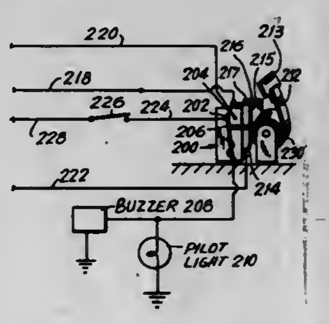
3,887,818
MOTOR VEHICLE EQUIPMENT

Jesse R. Hollins, 40 Stoner Ave., Great Neck, N.Y. 11021

Filed Dec. 26, 1972, Ser. No. 318,377

Int. Cl. B60r *25/10*

U.S. Cl. 307—10 SB **4 Claims**



1. Motor vehicle equipment comprising an ignition key receiving lock cylinder, a conducting arm, a conducting arm mover element, a switch first contact, a switch second contact, said conducting arm biased to touch said switch second contact, means for moving said conducting arm mover element so that said conducting arm is in circuit with said switch first contact when an ignition key is in said ignition key receiving lock cylinder, an ignition ON contact, a source of electrical power, said source of electrical power connected to said conducting arm, means for selectively connecting said source of electrical power to said ignition ON contact, a seat belt assembly including a retractable belt, a warning device and means for activating said warning device when said source of power is electrically coupled via said conducting arm to said switch second contact and said belt is unretracted and for deactivating said warning device when said belt is retracted.

3,887,819
SAFETY DEVICE ACTUATING ARRANGEMENT

Yoshiya Kurasawa, Yokohama, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Sept. 25, 1973, Ser. No. 400,615

Claims priority, application Japan, Sept. 26, 1972, 47-112123

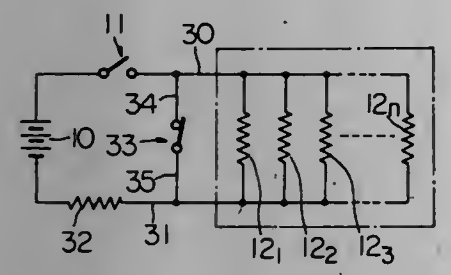
Int. Cl. B60q *1/52*

U.S. Cl. 307—10 R **1 Claim**

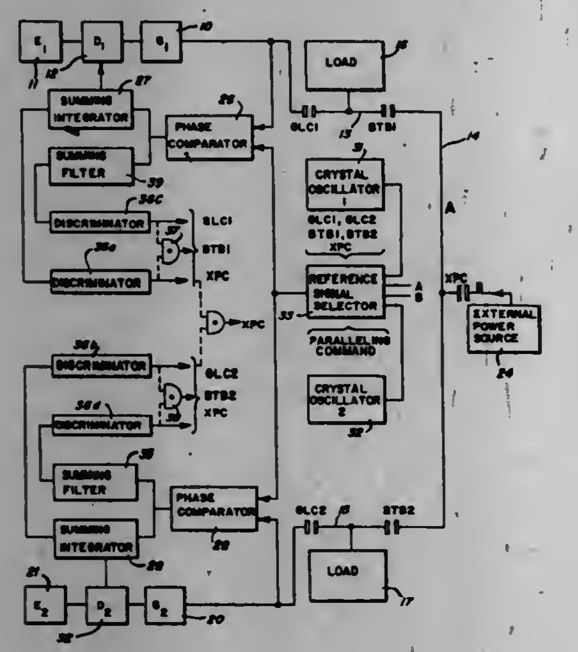
1. A safety device actuating arrangement for actuating a safety device of a motor vehicle, which comprises:

- at least one actuator for the safety device when energized;
  - a normally-open deceleration rate detecting switch for connecting said actuator to a power source so as to energize said at least one actuator when it is subjected to a deceleration rate greater than a predetermined magnitude; and
- a normally-closed mechanical pressure detecting switch connected in parallel with said at least one actuator and

in series, through a resistor, with said deceleration rate detecting switch, said mechanical pressure detecting switch being opened when a mechanical pressure is applied thereto.



3,887,820
PARALLELING CONTROL FOR PHASE SYNCHRONIZED GENERATORS
Timothy F. Glennon, Rockford, Ill., assignor to Sunstrand Corporation, Rockford, Ill.
Filed Mar. 29, 1974, Ser. No. 456,310
Int. Cl. H03k *5/20*
U.S. Cl. 307—87 12 Claims

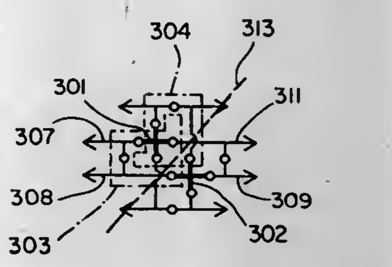


1. In an electrical power generation and distribution system having a first electrical power source including a generator having an alternating current output, the generator being powered by a variable speed engine through a constant speed drive, a second electrical power source having an alternating current output and switch means for connecting the outputs of the two sources in parallel, a paralleling control comprising: means providing an alternating current phase reference signal, the phase of which corresponds with that of said second alternating current source;

means for comparing the phase of the output of said first source generator with the phase of said reference signal;
means responsive to the phase comparator for developing a cumulative phase difference signal which is connected with said constant speed drive to phase synchronize the first source generator with the reference signal; and

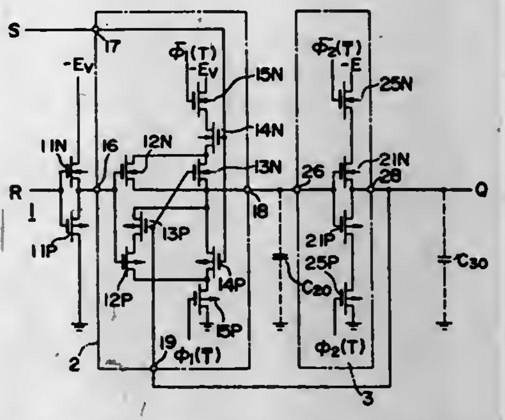
means responsive to the phase comparator for actuating said switch means to connect the electrical source outputs in parallel, when the phase difference between the first source generator and the reference signal is within selected limits.

3,887,821
POWER TRANSMISSION SUBSTATION ARRANGEMENT
John M. Stipcevich, 114 Hampton Rd., Collingswood, N.J. 08108
Filed May 20, 1974, Ser. No. 471,597
Int. Cl. H02b *1/20*
U.S. Cl. 307—112 10 Claims



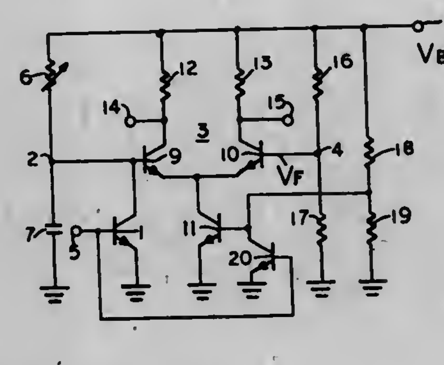
1. Electrical power substation apparatus comprising:
a. first and second bus means separated by an axis therebetween, each bus means having a central conductive portion and appendages extending therefrom, each of said bus means being identified with a zone defined by said appendages;
b. a plurality of circuit breaker means, each having three circuit breaker means, first and second ones of which are connected respectively to appendages of said first and second bus means; and
c. a plurality of electrical lines, each being connected to a third breaker switch of one of said breaker means and to one other breaker switch of the same one of said breaker means, each of said lines being located exclusively of the zones identified with said first and second bus means.

3,887,822
FLIP-FLOP CIRCUITS UTILIZING INSULATED GATE FIELD EFFECT TRANSISTORS
Yasoji Suzuki, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed Aug. 3, 1973, Ser. No. 385,247
Claims priority, application Japan, Aug. 31, 1972, 47-87457
Int. Cl. H03k *3/286, 3/33, 19/08*
U.S. Cl. 307—279 24 Claims



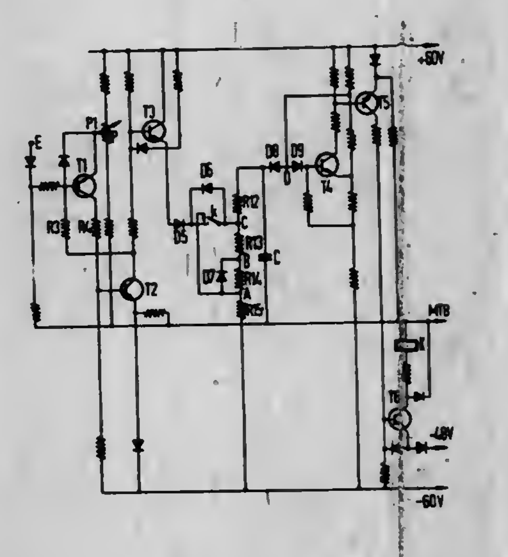
1. A flip-flop circuit utilizing insulated gate field effect transistors, comprising:
a source of first and second logical inputs;
a source of operating voltage;
a source of first complementary clock signals;
first inverter means including a complementary pair of field effect transistors for receiving and reversing the polarity of said first logical input;
delayed logic circuit means comprising first to fourth transistors of one channel type each including source and drain regions defining therebetween a conduction path and a gate electrode, and fifth to eighth transistors of the other channel type each including source and drain regions defining therebetween a conduction path and a gate electrode, the conduction paths of said first and second transistors being coupled in parallel, the conduction path of said third transistor being connected in series with that of said first transistor, the conduction paths of said fifth and sixth transistors being connected in series, the conduction path of said seventh transistor being connected in parallel with serially connected conduction paths of said fifth and sixth transistors, the conduction path of said second transistor being connected in series with that of said seventh transistor, the conduction path of said fourth transistor being connected between the conduction path of said third transistor and one terminal of said source of operating voltage, the conduction path of said eighth transistor being connected between the conduction path of said fifth transistor and the other terminal of said source of operating voltage, the gate electrodes of said first and fifth transistors being connected in common to receive the output of said first inverter means, the gate electrodes of said second and sixth transistors being connected in common to receive an output of said flip-flop circuit, the gate electrodes of said third and seventh transistors being connected in common to receive said second logical input, the gate electrodes of said fourth and eighth transistors being connected to said clock signal source to receive respectively complementary clock signals, and the junction between the conduction paths of said second and seventh transistors comprising an output of said delayed logic circuit means; and
second inverter means coupled to the output of said delayed logic circuit means, and including a complementary pair of field effect transistors for receiving and reversing the polarity of the outputs of said delayed logic circuit means to provide the output of said flip-flop circuit;
whereby when the states of first and second logical inputs are in a predetermined combination, the output state of the flip-flop circuit is held, and when the states of said first and second logical inputs are in other combinations, either one of said first and second logical inputs is dominantly derived out on the output side in response to said clock signals.

3,887,823
DIFFERENTIAL AMPLIFIER PULSE DELAY CIRCUIT
Akira Nikami, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Dec. 18, 1973, Ser. No. 425,839
Claims priority, application Japan, Jan. 19, 1973, 48-8444; Dec. 21, 1972, 47-14689; May 4, 1973, 48-50018
Int. Cl. H03k *17/26*
U.S. Cl. 307—293 11 Claims



1. A delay circuit comprising:
A. first and second power supply terminals;
B. a differential amplifier comprising:
  1. first and second differentially connected transistors having their emitters connected together,
  2. first and second input terminals connected, respectively, to the bases of said first and second transistors,
  3. an output terminal,
  4. means connecting said output terminal to the collector of one of said differentially connected transistors, and
  5. means connecting said connected together emitters and the collectors of said differentially connected transistors to said first and second power supply terminals, respectively;
C. a time constant circuit connected to said first input terminal;
D. a first clamping circuit connected to said first input terminal to control the conductivity of said first transistor;
E. a second clamping circuit connected to said differential amplifier to control the conductivity of said second transistor;
F. pulse input means to apply pulses to be delayed to said first and second clamping circuits for activating the latter; and
G. a reference voltage circuit connected to said second input terminal, whereby said second transistor is normally conductive when said first transistor is nonconductive and said second clamping circuit is not activated.

3,887,824
COMMUNICATION MONITORING CIRCUIT
Hans Joachim Blauert; Filip Jejina, and Hans Reisch, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Jan. 5, 1973, Ser. No. 321,272
Claims priority, application Germany, Jan. 24, 1972, 2203180
Int. Cl. H03k *17/26;* **H04l** *25/02*
U.S. Cl. 307—294 3 Claims

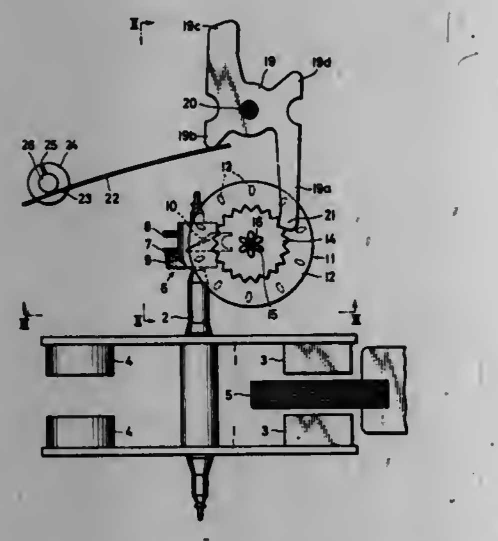


1. A transmission line monitoring circuit for a telecommunication network for operating a time-dependent switching element upon the occurrence of predetermined conditions, comprising:
input circuit means for coupling the current from a transmission line in said network to said monitoring circuit including a bistable circuit connected to said transmission line and adjustable to operate at a predetermined threshold value of current on said transmission line and switching means controlled by said bistable circuit,
timing circuit means comprising parallel combination of a series connection of resistances and capacitance and a switching stage for determining the state of charge of said capacitance and
means coupling said switching element to said switching stage so as to be energized by said switching stage,
said switching element including contact means, said contact means being arranged between said switching means and said timing circuit means for controlling the charging and discharging times of said capacitance through said series connection of resistances in dependence on the operating state of said switching element by connecting said switching means during a first operating state of said contact means to a first junction point in said series connection of resistances and during a second

operating state of said contact means to a second junction point in said series connection of resistances.

3,887,825
CONTROL APPARATUS FOR AN INTERMITTENTLY ROTATED INDEXED WHEEL

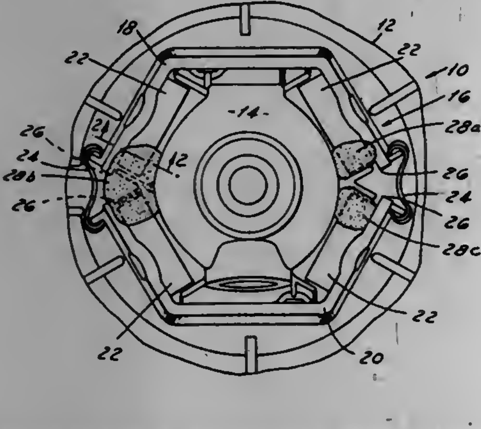
Shoichiro Kumazawa, Kamagaya, Japan, assignor to Kabushiki Kaisha Seikosha, Japan
Filed Feb. 22, 1974, Ser. No. 444,793
Claims priority, application Japan, Mar. 6, 1973, 48-27252
Int. Cl. H02k *33/00*
U.S. Cl. 310—37 **2 Claims**



1. In combination, a driven wheel driven stepwise, means to insure said wheel is driven precise angular increments comprising a toothed lock wheel having peripheral teeth and driven synchronously with said driven wheel and fixed thereto, a lock lever rockably supported on its center of gravity and having a pawl engaging the teeth of said lock wheel to control the incremental rotation of said lock wheel and said wheel driven stepwise, said lock lever having plurality of balancing arms insuring its balance on its center of gravity means supporting said lock lever at its center of gravity, a lever spring having a free end applying a rotational force to said lock lever to resiliently apply said pawl into engagement with said teeth of the lock wheel , and a turnable collet holding another end portion of said lever spring for variably controlling the pressure said lever spring applies against said lock lever.

3,887,826
METHOD AND MEANS FOR REDUCING AUDIBLE NOISE IN A DYNAMOELECTRIC MACHINE

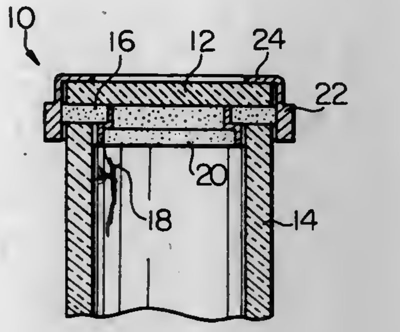
Theodore G. Apostoleris, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Oct. 1, 1973, Ser. No. 402,528
Int. Cl. H02k *15/12*
U.S. Cl. 310—43 **1 Claim**



1. In combination with a permanent magnet dynamoelectric machine of the type having a stator flux producing structure comprising a plurality of permanent magnets and ferromagnetic flux path means engaging pairs of the permanent magnets, the flux path members having intersecting edge surfaces forming flux path member tips, each of the permanent magnets being located in proximity to at lease one flux path member tip, the stator flux producing structure being held in cooperative association with means forming a housing to electromagnetically coact with a rotary armature, the improvement comprising means forming a semi-rigid bonding agent interposed between the housing and the flux path member tips in contact with the associated permanent magnets to bond the flux path member to the housing.

3,887,827
TARGET ASSEMBLY OF IMAGE PICK-UP TUBE

Mitsumasa Katayama, Kadoma, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan
Continuation-in-part of Ser. No. 181,310, Sept. 17, 1971, abandoned. This application Oct. 23, 1973, Ser. No. 408,531
Claims priority, application Japan, Sept. 19, 1970, 45-93354
Int. Cl. H01j *29/02, 31/38*
U.S. Cl. 313—390 **3 Claims**

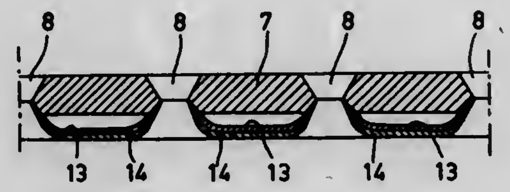


1. A target assembly of an image pick-up tube including a tubular envelope, comprising:

- a transparent face plate having the diameter of said tubular envelope;
- an annular, stepped metallic support member comprising an inwardly offset portion adjacent said face plate, an outwardly offset portion, and a step portion therebetween, said offset portions being parallel to said tubular envelope and said step portion being perpendicular thereto;
- an annular, electrically conductive signal ring of cylindrical shape which is disposed along the rim of said face plate; an annular binding and sealing ring of soft metal which is sealingly and bindingly interposed between and welded to said face plate and said tubular envelope, has an outer diameter which is greater than the outer diameter of said tubular envelope, and has an inner diameter which is less than the inner diameter of said tubular envelope minus the radially measured width of said step portion, said binding and sealing ring being additionally welded to said inwardly offset portion along said inner diameter, whereby said binding and sealing ring has sufficient annular width to extend from said inwardly offset portion to said signal ring, said signal ring is annularly spaced from the exterior of said tubular envelope, and said outwardly offset portion is annularly spaced from the interior of said tubular envelope so that damage from mechanical shock while said image pick-up tube is in use is minimized.

3,887,828
SHADOW MASK HAVING CONDUCTIVE LAYER IN POOR THERMAL CONTACT WITH MASK

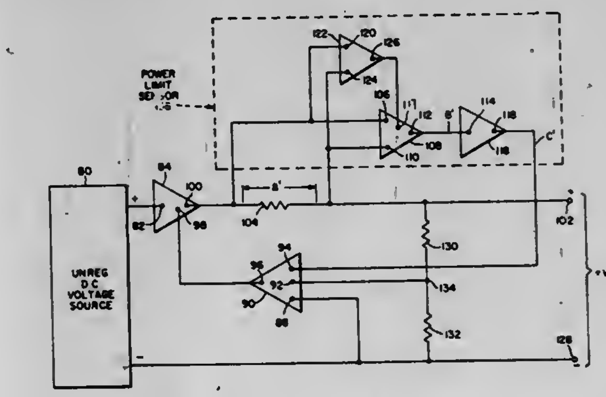
Robert Richard Bathelt, and Roelof Egbert Schuil, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed July 3, 1974, Ser. No. 485,370
Claims priority, application Netherlands, July 26, 1973, 7310372
Int. Cl. H01j *29/06, 29/08*
U.S. Cl. 313—402 **5 Claims**



1. A cathode ray tube for displaying coloured pictures comprising, in an evacuated envelope, means for generating a number of electron beams, a display screen comprising a large number of regions luminescing in different colours, and a colour selection electrode having a plurality of apertures, said electron beams being each assigned to luminescent regions of one colour by means of the colour selection electrode which colour selection electrode is provided with a layer for reducing the temperature of the colour selection electrode, characterized in that on the side facing the means for generating the electron beams, the colour selection electrode is provided with an electrically conductive, electron-absorbing layer whose thermal contact with the colour selection electrode is minimal said electron-absorbing layer consisting of a thin metal layer contacting and bonded to the colour selection electrode only along the edges of said apertures.

3,887,829
ELECTROMAGNETIC DEFLECTION DISPLAY SYSTEM INCLUDING DUAL MODE DEFLECTION AMPLIFIERS AND OUTPUT POWER LIMITED SUPPLIES

Abner Owens, Jr., Pompton Lakes, N.J., assignor to The Bendix Corporation, Teterboro, N.J.
Filed June 28, 1973, Ser. No. 374,735
Int. Cl. H01j *29/70*
U.S. Cl. 315—411 **6 Claims**

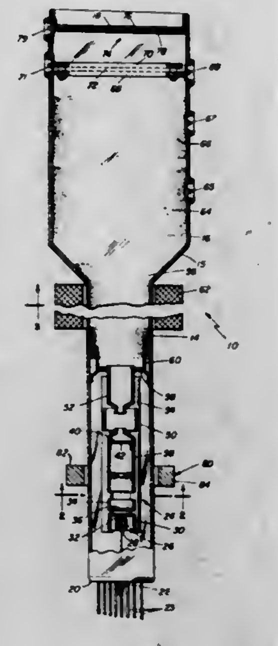


1. For use in an electromagnetic display system of the type including deflection display means and power supply means providing power for powering the deflection display means, the power supply means comprising:

- a voltage source for providing an unregulated voltage;
- power supply output and return terminals connected across the voltage source;
- amplifier means connected intermediate the voltage source and the terminals;
- means connected to the amplifier means for sampling the output therefrom;
- sensor means for sensing the sampled output and for providing an output when the sensed output is commensurate with a display means deflection time in excess of a predetermined maximum deflection time; and
- the amplifier means connected to the sensor means and responsive to the output therefrom for rendering the power supply in an off condition, and said power supply operating at predetermined duty cycle with the output power at a predetermined average value.

3,887,830
CATHODE RAY TUBE WITH MAGNETIC BEAM ALIGNMENT MEANS

Gordon R. Spencer, Westwood, Mass., assignor to Raytheon Company, Lexington, Mass.
Filed Sept. 7, 1973, Ser. No. 395,103
Int. Cl. H01j *29/46*
U.S. Cl. 313—443 **12 Claims**



1. An electron gun comprising:

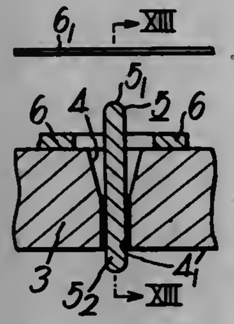
- electron beam generating means including an electron emitting cathode and an axially disposed series of electrodes, at least one of which comprises a hollow cylindrical electrode having a substantially electrostatic field-free space therein
- beam limiting means including an electrode wall element disposed transversely with respect to the cylindrical electrode and having a beam restricting aperture therein; and beam aligning magnetic means including a continuous annular magnetic member coaxially disposed in the substantially electrostatic field-free space within the cylindrical electrode for providing a transverse magnetic field between selected opposing portions of the annular magnetic member and deflecting the beam into alignment with the aperture.

3,887,831
INDICATOR DISCHARGE TUBE

Tokuo Matsushita, and Satoshi Watanabe, both of Tokyo, Japan, assignors to Okaya Denki Sangyo Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 212,779, Dec. 27, 1971, Pat. No. 3,798,480, which is a continuation of Ser. No. 849,949, Aug. 14, 1969, abandoned. This application Feb. 7, 1974, Ser. No. 440,494
Int. Cl. H01j *1/02*
U.S. Cl. 313—516 **5 Claims**

5. An indicator discharge tube comprising an insulating base plate having a plurality of grooves of predetermined

shapes formed at predetermined locations, an anode electrode disposed opposite said insulating base plate, a plurality of cathode electrodes respectively disposed in the plurality of grooves of the insulating base plate, said anode electrode having an anode portion lying between adjacent cathode



electrodes, each of said cathode electrodes having a portion jutting beyond the anode electrode in spaced relation thereto, and a tube having enclosed therein the insulating base plate, the cathode electrodes and the anode electrode in an airtight manner.

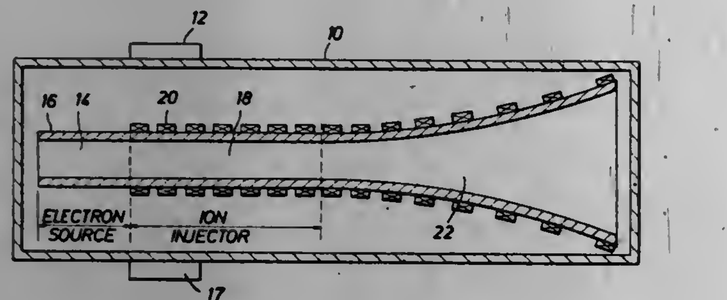
3,887,832
AUTO-RESONANT ACCELERATION OF IONS

William E. Drummond, and Millard L. Sloan, both of Austin, Tex., assignors to Aralco, Austin, Tex.

Filed June 25, 1973, Ser. No. 373,089

Int. Cl. H01j *25/10*

U.S. Cl. 315—5.41 **19 Claims**



1. A linear accelerator for accelerating injected ions, comprising
- a longitudinal waveguide creating a conductive boundary,
- a vacuum chamber enclosing said waveguide,
- means for establishing a longitudinal static magnetic field in said waveguide,
  - said magnetic field being large at the entrance of said waveguide and decreasing to a small valve at the exit of said waveguide,
- means for injecting ions into said waveguide,
- means for establishing an intense beam of electrons immersed in said magnetic field,
  - said electron beam and magnetic field sustaining a traveling wave that is the lower branch of the upper hybrid resonant cyclotron eigenmode of said beam, the phase velocity of said wave increasing in such a manner as to accelerate the injected ions trapped in said wave.

3,887,833
COLOR PURITY ADJUSTING DEVICE FOR A COLOR PICTURE TUBE

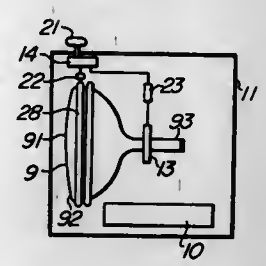
Eiichi Yamazaki, Ichihara, Japan, assignor to Hitachi, Ltd., Japan

Filed May 27, 1970, Ser. No. 40,827

Claims priority, application Japan, June 16, 1969, 44-46870

Int. Cl. H01j *29/70*

U.S. Cl. 315—13 C **7 Claims**



1. A color purity adjusting device for a color picture tube having a phosphor screen, comprising a first coil formed of component magnetic coils connected to form magnetic poles in the vicinity of the four corners of the phosphor screen of said color picture tube to provide a quadripole magnetic pole arrangement, each of said component magnetic coils being disposed to produce a magnetic field in a plane perpendicular to the axis of said color picture tube.

3,887,834
CATHODE-RAY TUBE HAVING AN ELECTRIC CYLINDER LENS FOR THE DYNAMIC CORRECTION OF ELECTROSTATIC DEFLECTION DEFOCUSING

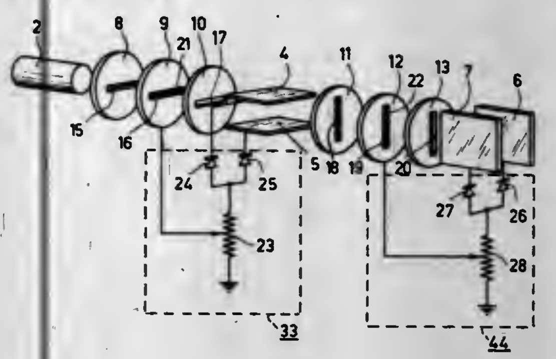
Erich Eduard Himmelbauer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 31, 1969, Ser. No. 872,864

Claims priority, application Netherlands, Nov. 9, 1968, 6816003

Int. Cl. H01j *29/02, 29/56*

U.S. Cl. 315—31 R **1 Claim**



1. A cathode-ray tube having means for the dynamic correction of defocussing caused by electrostatic deflection, comprising a hermetically sealed envelope, an electron gun within said envelope for producing an electron beam along the longitudinal axis of the electron gun, a target within said envelope for receiving said electron beam, at least one pair of deflection plates on opposite sides of a plane along which said axis lies within said envelope between said electron gun and said target for electrostatically deflecting said electron beam, means for applying deflection voltage signals to said deflection plates, and an electric cylinder lens surrounding said axis within said envelope for providing corrective deflection of said electron beam to compensate for defocussing of said electron beam resulting from the electrostatic deflection of said beam by said deflection plates, said electric cylinder lens comprising two electrodes positioned substantially orthogonal to said axis, each electrode having a slot-like aperture centered relative to the axis, the longer sides of said apertures being substantially

orthogonal to the direction of deflection of said electron beam, a flat grid-like electrode positioned between said electrodes substantially orthogonal to the axis, and means including two parallel rectifier elements and a grounded potentiometer, the anodes of said rectifier elements having a common connection in series with said potentiometer, the cathode of each rectifier element being connected to each deflection plate for deriving from said deflection signals a negative voltage having a value as determined by departures of the amplitude of said deflection signals from the average value thereof, and the tap of said potentiometer being connected to said grid-shaped electrode thereby to provide dynamic correction of defocussing of said beam by said deflection signals.

3,887,835
FIELD EMISSION ELECTRON GUN

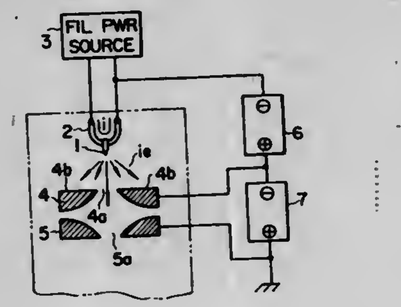
Setsuo Nomura, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed June 11, 1973, Ser. No. 368,520

Claims priority, application Japan, June 6, 1972, 47-56910

Int. Cl. H05b *39/00*

U.S. Cl. 315—94 **5 Claims**



1. A field-emission electron gun comprising a cathode, a first anode, a second anode, a source of a first electric potential connected between said cathode and said first anode to form an electric field for drawing out electrons from said cathode, a source of a second electric potential connected between said first anode and said second anode to form an accelerating electric field for accelerating the electrons drawn out from said cathode, and power supply means for continuously heating said cathode to a fixed temperature within a range of from 100℃. to 500℃. during a state under which said electrons are being emitted from said cathode.

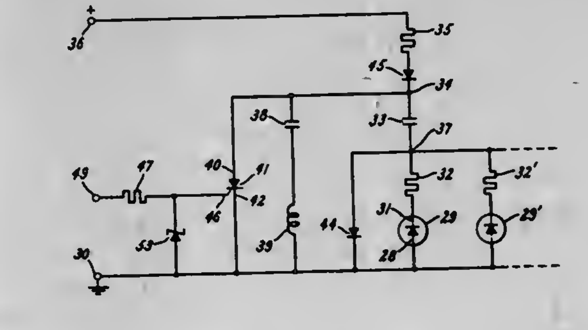
3,887,836
OPTICAL DRIVER CIRCUIT

Bernard D. Leete, Newtown Square, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Sept. 20, 1973, Ser. No. 399,254

Int. Cl. H05b *37/00*

U.S. Cl. 315—207 **9 Claims**



1. In combination:
- a. a source of light comprising at least one element which when energized by an appropriate electrical input signal causes said source to issue an optical output signal;
- b. a first capacitor;
- c. means for coupling said capacitor in series circuit relationship with said element to a d-c power supply from which said capacitor accumulates a charge;
- d. controllable switching means connected in parallel with said element and said first capacitor;
- e. means responsive to a control signal for turning on said switching means, whereupon said capacitor discharges through both said switching means and said element, the capacitor discharge current serving as said input signal for said element;
- f. a series combination of an inductor and a second capacitor connected in parallel with said first capacitor, said series combination introducing a ringing action in response to turnon of said switching means so as to turn off said switching means after a predetermined time delay, whereupon said d-c power supply recharges said capacitor; and
- g. a diode connected across said element and poled to conduct capacitor charging current.

3,887,837
CATHODE RAY TUBE

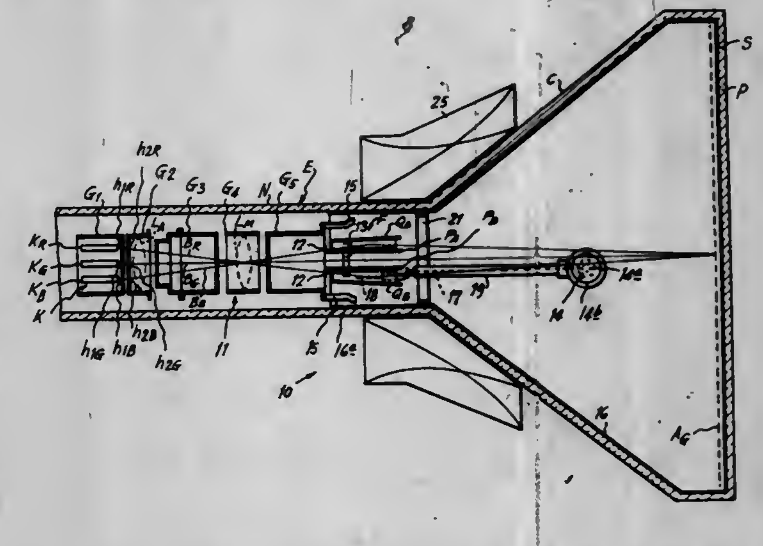
Akira Nakayama, Tokyo; Senri Miyaoka, Fujisawa, and Akio Ohkoshi, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 23, 1973, Ser. No. 353,637

Claims priority, application Japan, Apr. 25, 1972, 47-42000

Int. Cl. H01j *29/70*

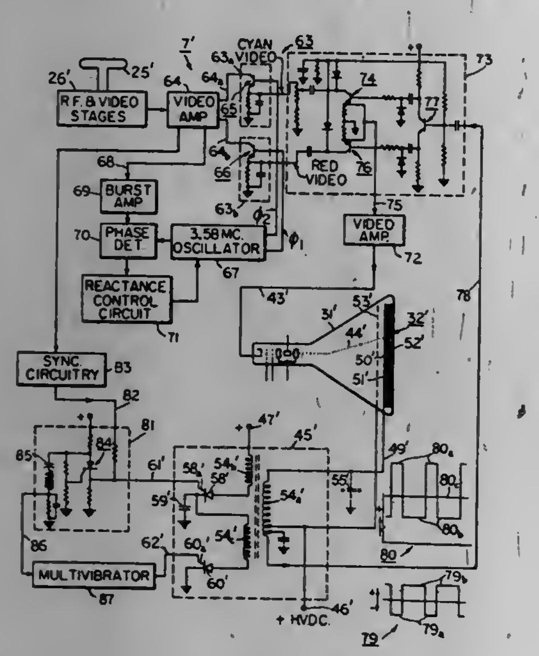
U.S. Cl. 315—368 **12 Claims**



1. In a color picture tube including an envelope having a neck portion and a conical portion extending from said neck portion to a face plate having a screen thereon, and electron gun means disposed in said neck portion for directing and focusing a plurality of electron beams at said screen and requiring first and second high voltages of different values for the operation of said gun means; means for supplying said first and second high voltages to said gun means from within said conical portion of the envelope, comprising a conductive layer on the inner surface of said conical portion and at least the adjacent part of said neck portion and having said first high voltage applied thereto, at least one first contact member extending from said gun means and engageable with said conductive layer within said neck portion for receiving said first high voltage, a lead wire extending from within said conical portion toward said neck portion and receiving said second high voltage at the end of said lead wire remote from said neck portion, a second contact member connected with the other end of said lead wire and extending into said neck portion and being engageable with said gun means for applying said second high voltage thereto, a non-magnetic, conductive tubular member extending around and being insulated from said lead wire within said conical portion, and means electrically connecting said tubular member to said conductive layer for applying said first high voltage to said tubular member and thereby avoiding disturbance to magnetic fields within said

conical portion by said second high voltage applied to said lead wire.

3,887,838
GENERATION OF STEPPED VOLTAGES FOR COLOR TELEVISION AND THE LIKE
Richard P. Thurston, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Continuation of Ser. No. 573,907, Aug. 22, 1966, abandoned. This application Mar. 4, 1969, Ser. No. 805,113
Int. Cl. H01j *29/80*
U.S. Cl. 315—376 **2 Claims**



2. A color display system comprising:

a screen including phosphors which emit light of different colors when struck by electrons of different energies said screen forming a capacitive electrical load;

an electron gun for emitting a beam of electrons toward said screen;

field generating means for deflecting said beam of electrons in a scanning raster;

means for applying a DC bias voltage to said screen to accelerate electrons emitted from said gun toward said screen;

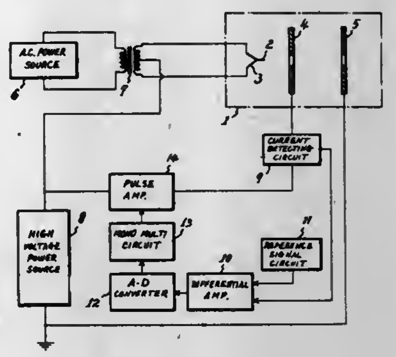
a transformer having a primary winding and a secondary winding, said secondary winding being adapted to be connected to said screen for applying a time-varying voltage thereto;

a first switching circuit for connecting said primary winding across a voltage source, said first switching circuit including a first electronic switching means and a capacitor in series with each other and with said primary winding, said first switching means having a gate terminal;

a second switching circuit including a second electronic switching means which is connected across said primary winding and said capacitor from a first junction between said first switching means and said primary winding to a second junction on the side of said capacitor and primary winding opposite said first switching means, said second electronic switching means having a gate terminal; and

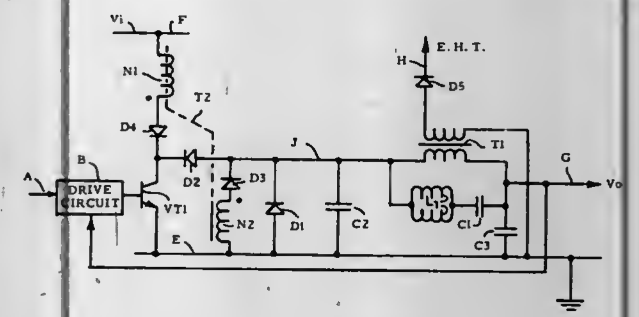
means for applying signals to the gate terminals of said first and second switching means for triggering said first and second switching means into conduction alternately, said transformer having leakage reactance which, upon triggering of either of said first and second switching means, causes said capacitive load to be charged to a respective voltage which then reverse-biases the triggered switching means, whereby said screen is switched repetitively between at least two different voltage levels each of which persists until the next switching means is triggered and whereby said electrons are accelerated to at least two different energies for energizing said screen to produce multiple-color images.

3,887,839
PULSED FIELD EMISSION TYPE ELECTRON GUN
Susumu Ota, and Ryuzo Aihara, both of Tokyo, Japan, assignors to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan
Filed July 10, 1973, Ser. No. 377,932
Claims priority, application Japan, July 17, 1972, 47-71489
Int. Cl. H01j *29/52*
U.S. Cl. 315—383 **4 Claims**



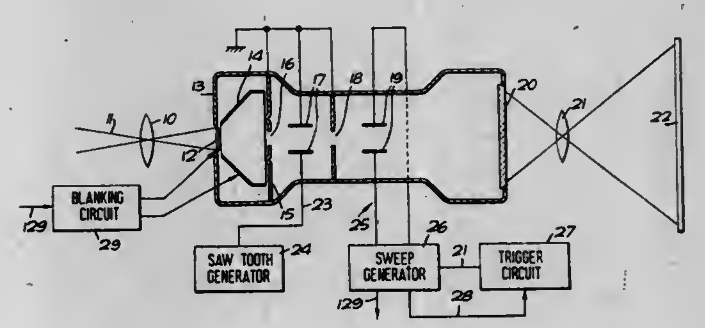
1. A field emission type electron gun comprising:
a. an emitter having a tip,
b. a control electrode,
c. a power supply for supplying a pulse voltage having a constant peak value between said emitter and control electrode such that during the pulse an intense electric field in the vicinity of the emitter tip causes field emission therefrom and for supplying a bias voltage between pulses,
d. means for heating said emitter,
e. means for detecting the emitter current and
f. means responsive to the emitter current for adjusting one of the heating means and/or power supply to maintain the current substantially constant whereby the radius of curvature of the emitter tip remains substantially constant.

3,887,840
SELF-REGULATING LINE OUTPUT STAGE
Michael John Maytum, Buckden, England, assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Nov. 12, 1973, Ser. No. 415,085
Claims priority, application United Kingdom, Nov. 24, 1972, 54384/72
Int. Cl. H01j *29/70*
U.S. Cl. 315—389 **6 Claims**



1. A television combination circuit for generating a stabilized voltage for the operation of other circuits and line scan deflection signals for the deflection coils of a cathode ray tube, including a transistor, the collector of which is connected to a voltage supply through the primary winding of a transformer, and the emitter of which is connected to a reference potential, means for applying a rectangular waveform to the base of the transistor to render it alternately conducting and nonconducting, a conductor connected to the collector of the transistor through a first diode poled to pass current through the transistor when it is conducting, the conductor being connected separately through a resonant circuit and a second diode to the reference potential, the resonant circuit having inductive means including the deflection coils connecting the conductor to a storage capacitor connected to the reference potential and another capacitor connected from the conductor to the reference potential, and the second diode being poled so that current through it will also pass through the first diode; wherein the secondary winding of the transformer is connected in series with a third diode in a path from the reference potential to the storage capacitor to transfer to that capacitor the energy stored in the transformer while the transistor is conducting, and a fourth diode is connected between the primary winding of the first transformer and the collector electrode of the transistor to block connection of the primary and secondary windings of the transformer together through the first and third diodes.

3,887,841
HIGH SPEED CAMERA
Alexander Edward Huston, Reading, England, assignor to John Hadland Photographic Instrumentation Ltd., Herts, England
Continuation-in-part of Ser. No. 133,677, April 13, 1971, abandoned. This application June 14, 1973, Ser. No. 370,032
Claims priority, application United Kingdom, Apr. 20, 1970, 18700/70
Int. Cl. H01j *29/72*
U.S. Cl. 315—391 **2 Claims**



1. In an electron image tube camera of the type wherein an electron beam is formed in accordance with an optical image and is directed at a screen for the production of an image which is reproduced photographically and wherein the image tube includes first and second deflector means for deflecting the beam transversely in the same plane in response to electrical signals, the improvement which comprises, in combination with the deflector means:

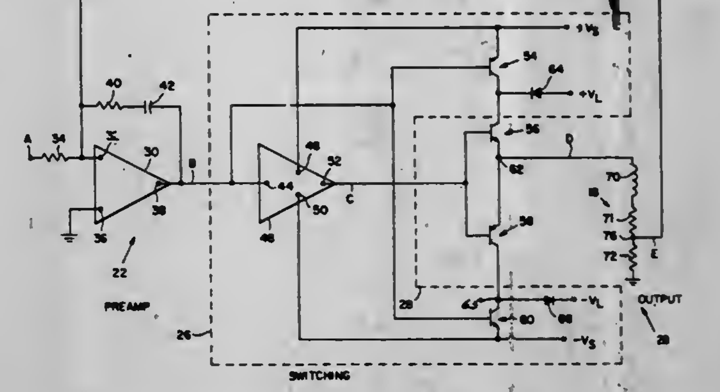
means for generating a linear ramp signal;

means for applying said ramp signal to the first deflector means so as to produce deflection of said beam across said screen;

means for generating a repetitive signal of frequency greater than 100 MHz. and having portions capable of producing deflection of said beam at the same rate as said ramp signal; and

means for applying said repetitive signal to the second deflector means so that said portions produce deflection of said beam in cancellation of deflection produced by said ramp signal, and the deflection of the beam across the screen produced by the said signals alternates between substantially zero and a rapid value.

3,887,842
ELECTRONMAGNETIC DEFLECTION DISPLAY SYSTEM INCLUDING DUAL MODE DEFLECTION AMPLIFIERS AND OUTPUT POWER LIMITED POWER SUPPLIES
Abner Owens, Jr., Pompton, and Donald Weinstein, Fair Lawn, both of N.J., assignors to The Bendix Corporation, Teterboro, N.J.
Filed June 28, 1973, Ser. No. 374,730
Int. Cl. H01j *29/70, 29/76*
U.S. Cl. 315—397 **8 Claims**



1. For use with an electromagnetic deflection display system of the type including means for providing deflection signals, deflection display means and power supply means providing linear mode output power and slew mode output power for powering the deflection display means, deflection amplifier means comprising:

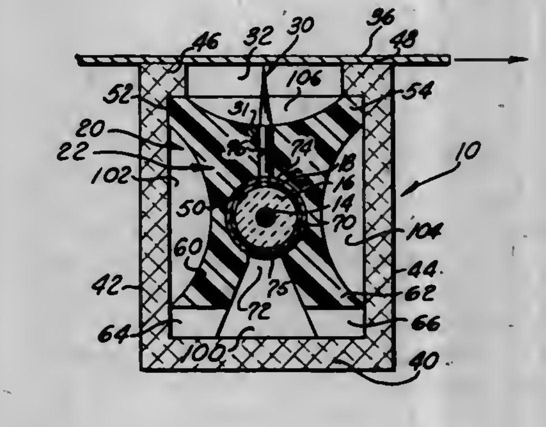
preamp means for receiving the deflection signals;

output means for applying output power to the deflection display means; and

switching means connected to the preamp means, to the power supply means and to the output means, and initially operative in a linear mode for applying the linear mode output power to the output means and responsive to a rate of change of the deflection signals above a predetermined rate for switching to a slew mode of operation to apply the slew mode output power to the output mean; and

the linear and slew mode of operation being independent of each other for reducing slew time without increasing power consumption.

3,887,843
STATIC ELIMINATOR
Robert Harold Richardson, Melbourne, and Edward Richard Vokoun, Melbourne Beach, both of Fla., assignors to Harris-Intertype Corporation, Cleveland, Ohio
Filed May 10, 1974, Ser. No. 468,930
Int. Cl. H01t *19/04*
U.S. Cl. 317—2 F **12 Claims**



1. A static eliminator comprising an elongated hollow metal housing having walls defining internally facing bottom and side walls and a continuous longitudinally extending slot dis-

posed opposite said bottom wall for defining a channel opening, an elongated cable having a portion of its length located within and extending longitudinally of said housing, said cable having an inner conductive core surrounded by a dielectric layer with said core adapted to be connected to a high voltage AC source; an array of longitudinally spaced electrically conductive needles, each having a sharp projection at one end facing in a direction away from said cable; said means for mounting said cable and said needles within said housing comprising a longitudinally extending insulator member mounted within said housing, said insulator member having a body portion and mounting means extending from said body portion for engaging said housing to hold said member in place, said member having an inverted U-shaped groove therein extending longitudinally of said housing, said cable having a portion of its length within said housing received in said groove, said needles extending through said member in the direction away from said groove so as to extend beyond said member in a direction toward said slotted opening.

3,887,844

OVERCURRENT PROTECTION CIRCUIT FOR A BRUSHLESS DIRECT CURRENT MOTOR

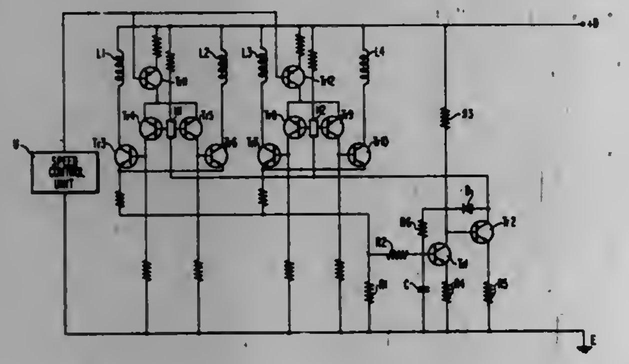
Masayuki Yoshida, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 12, 1973, Ser. No. 424,026

Claims priority, application Japan, Dec. 12, 1972, 47-142587

Int. Cl. H02h *7/085*

U.S. Cl. 317—13 R **3 Claims**



1. An overcurrent protection circuit for a brushless direct current motor including a rotor having at least one pair of magnetic poles and a stator including at least a pair of driving coils for rotating the rotor, said protection circuit comprising:

a. driving circuit means for alternately supplying current to said driving coils;

b. magneto-electric converting means for controlling said driving circuit by means of its output voltage, said output voltage varying in accordance with the variation of the magnetic field generated by said magnetic poles of said rotor;

c. a resistor connected in series with said driving coils and developing a voltage proportional to the current flowing through said coils;

d. delay circuit means for delaying the voltage developed by said resistor; and

e. switching circuit means, switched and latched when the output of said delay circuit increases to a predetermined level, for directly interrupting the operating control current of said magneto-electric converting means and for continuing the interruption even when the output of said delay circuit falls below said predetermined level, thereby turning OFF said converting means and interrupting the current flowing through said driving coils, said switching means being connected in series with the operating control current path for said magneto-electric converting means.

3,887,845

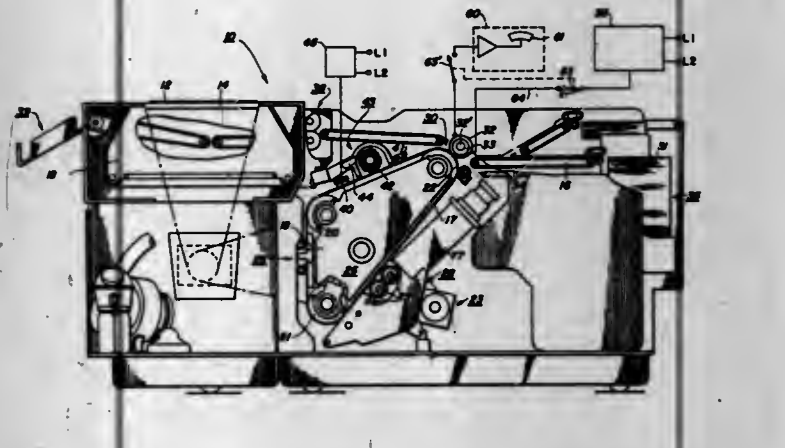
COPIER PHOTORECEPTOR CHARGE CONTROL

Robert J. Michatek, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 26, 1973, Ser. No. 400,776

Int. Cl. G03g *15/02*

U.S. Cl. 317—262 A **10 Claims**



1. The method of controlling the charge level on the photoreceptor of an electrostatic reproduction machine of the type having corona charging means for placing a charge on the photoreceptor in preparation for imaging together with means including a biased transfer roller to transfer images developed on said photoreceptor to copying material, the steps consisting of:

interrupting bias to the transfer roller while
measuring the transfer roller electrical output; and
adjusting said corona charging means to provide a predetermined transfer roller output repreesenting optimum charge on said photoreceptor.

3,887,846

ELECTRODES FOR AIR CONDITIONING APPARATUS

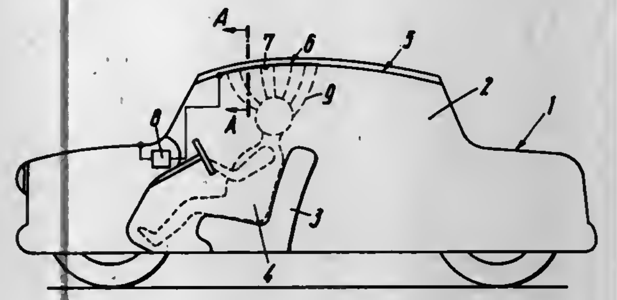
Constantin Graf von Berckheim, Friedrichstrasse 9, 6940 Weinheim (Bergstrasse), Germany

Filed Feb. 15, 1974, Ser. No. 443,012

Claims priority, application Germany, May 2, 1973, 2322022

Int. Cl. H01g ; H02b ; H02h ; H05f

U.S. Cl. 317—262 AE **6 Claims**



1. In a substantially enclosed habitable compartment an air conditioning apparatus comprising, in combination, first and second electrode means; a high-voltage D.C. voltage source having terminals of opposite polarity respectively connected to said first and second electrode means for establishing therebetween a steady electrostatic field in the interior of said substantially enclosed habitable compartment, at least one of said electrode means comprising a carrier of electrically insulating material, a protective cover layer of insulating material facing the interior of said substantially enclosed habitable compartment, and a layer of electrically conductive adhesive material intermediate said cover layer and said carrier holding said cover in place on said carrier by adhesive force and being electrically connected to one of said terminals to serve as the electrode for said one of said electrode means.

3,887,847

GLOW DISCHARGE STARTER SWITCH

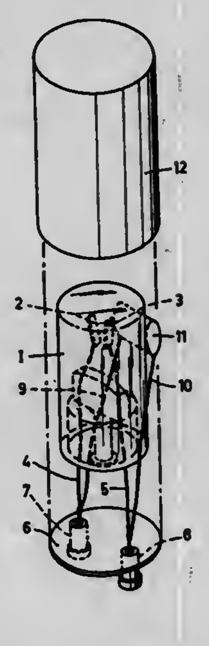
Wilhelmus Polycarpus de Graaf; Jan Man In'T Veld, and Adrianus Petrus Vervaart, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 237,177, March 22, 1972, abandoned. This application July 11, 1973, Ser. No. 378,244

Claims priority, application Netherlands, Apr. 14, 1971, 7104999

Int. Cl. H02h *7/04*

U.S. Cl. 317—15 **6 Claims**



1. A glow discharge starter which comprising a discharge tube including a bimetal electrode and a second electrode cooperating therewith and a safety device being in close thermal relationship with the glow discharge-heated discharge path between the electrodes and responsive to heat generated in the discharge tube of said starter switch, said bimetal electrode being configured to bend toward said second electrode responsive to heat in said discharge tube to allow arcing between said electrodes, said safety device produces a short circuit of the power supply to said starter switch when a maximum temperature limit is reached, said safety device being outside of the discharge tube and including a first and second conductor element connected to respective electrodes of said discharge tube, said first conductor having insulative material being disposed over a portion of its length as a sleeve, said insulative sleeve adapted to undergo a permanent distortion at a predetermined maximum temperature limit, and a metallic spring element mechanically and electrically coupled to said second conductor, said spring having a portion pressing under tension against said insulative sleeve, whereby said spring element cuts through said insulative sleeve to establish electrical contact between said conductors when said predetermined maximum temperature is reached, said temperature of said insulative sleeve being raised by arcing of said electrodes.

3,887,848

APPARATUS AND MATERIAL FOR PROTECTING MICROELECTRONICS FROM HIGH POTENTIAL ELECTRICITY

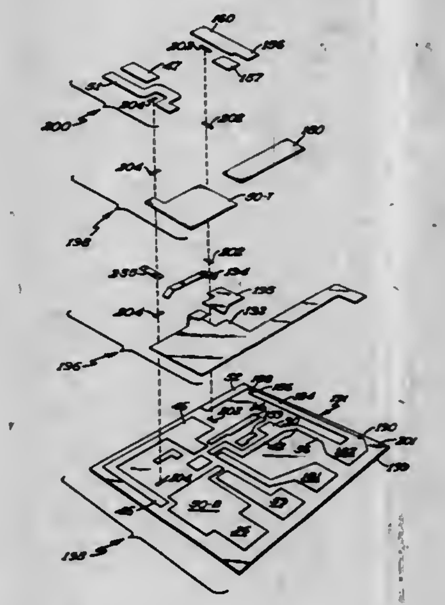
Willis A. Larson, Mequon, Wis., and David E. Colglazier, Minneapolis, Minn., assignors to Magic Dot, Inc., Minneapolis, Minn.

Filed Aug. 14, 1972, Ser. No. 280,258

Int. Cl. H02h *1/04*

U.S. Cl. 317—33 R **79 Claims**

1. In a touch actuated electronic switch including microelectronic circuitry and including a touch portion, accessible to the touch of a human, coupled to an input conductor to the microelectronic circuitry, means for protecting the microelectronic circuitry from damage due to the application of high potential electricity to the touch portion, comprising in combination: a coating of electrically resistive material disposed upon the touch portion and forming an electrically unitary resistive film upon the touch portion, the resistive material including a top surface accessible to the touch of a human operator and a bottom surface secured to the touch portion, the coating presenting a distributed resistance through the resistive material from any point on the top surface to any point on the bottom surface of a value sufficient to define a current of an amount less damaging to the microelectronic circuitry associated with the touch actuated electronic switch upon the application of high potential voltage to the top surface of the coating accessible to the touch of a human, the coating further presenting a resistance between any point on the top surface accessible to the touch of a human and the input conductor to the microelectronic circuitry associated with the touch actuated electronic switch of a value sufficient to define a current of an amount less damaging to the microelectronic circuitry upon the application of a high potential voltage to the top surface of the coating accessible to the touch of a human, the material being of a hardness providing durability to withstand continual touching by humans; means for providing a connection to a reference for the microelectronic circuitry; electrical resistance means arranged between the input conductor and the remainder of the microelectronic circuitry; protective conductor means having one end thereof arranged at a distance from the input conductor to the microelectronic circuitry to define a protective spark gap between the one end and the input conductor of a breakdown voltage less than the breakdown voltage across the electrical resistance means and of a breakdown voltage less than the breakdown voltage from the input conductor to any remaining conductive portion within the microelectronic circuitry, the protective conductor electrically connected directly to the means for providing a connection to a reference for the microelectronic circuitry, the entire protective conductor means spaced from any remaining conductive portion within the microelectronic circuitry by a distance providing a breakdown voltage exceeding the breakdown voltage of the protective spark gap to provide a favored and preferred path for any high potential electricity applied to the input conductor such that the applied electricity arcs across the protective spark gap and is conducted by the protective conductor means to the means for providing a connection to a reference for the microelectronic circuitry to thus provide a conductive path for any current created by the electricity to the reference for the microelectronic circuitry without passing in any harmful way through the microelectronic circuitry.



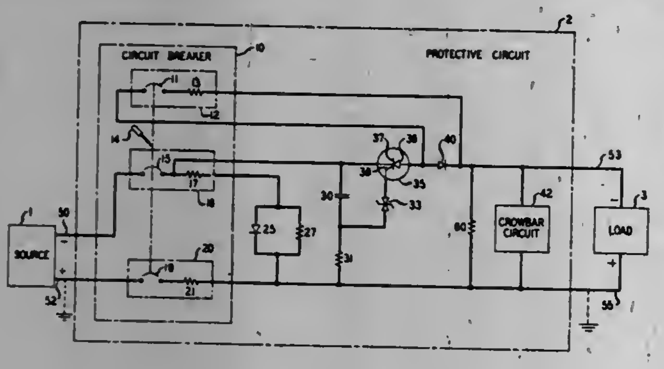
3,887,849
PROTECTIVE CIRCUIT

Harry Henry Nagel, Westwood, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 2, 1973, Ser. No. 412,295

Int. Cl. H02h *3/18, 3/38, 11/00*

U.S. Cl. 317—36 TD **10 Claims**



9. A protective circuit for connecting an electrical source to a load device comprising first switching means connected to said source, turnon means for rendering said first switching means conductive, turnoff means for rendering said first switching means nonconductive within a first time interval, means for detecting a predetermined condition of said source, said turnoff means being responsive to the operation of said detecting means for rendering said first switching means nonconductive within said first time interval, means responsive to said turnon means for connecting said first switching means to said load after a predetermined time greater than said first time interval comprising a semiconductive switch having a conductive state and a nonconductive state and means responsive to the operation of said turnon means for placing said semiconductive switch in its conductive state after said predetermined time, whereby said source is tested for said predetermined condition prior to connection of said source to said load.

3,887,850
DELAY CIRCUIT FOR A RELAY

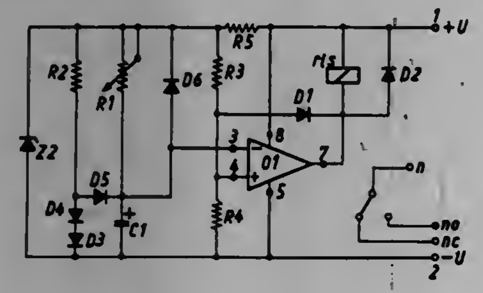
Wilhelm Sterff, Schliersee, Germany, assignor to Matsushita Electric Works, Ltd., Kadoma City, Osaka, Japan and SDS-Electro GmbH, Munich, Germany

Filed Nov. 14, 1973, Ser. No. 415,651

Claims priority, application Germany, Nov. 23, 1972, 2257373

Int. Cl. H01h *47/18, 47/32*

U.S. Cl. 317—141 S **4 Claims**



1. A circuit to delay for a predetermined time interval the response of a relay having an operating winding with one side conneted to one side of a voltage supply and comprising a differential amplifier having an output connected to the other side of the winding and non-inverting input and an inverting input, a potential divider connected across said voltage supply and having a center tap connected to said non-inverting amplifier input, a first resistor and a capacitor in series therewith both connected across said voltage supply, said amplifier inverting input connected between said first resistor and said capacitor, a diode which is blocking when the relay is not energized connected between said amplifier output and said amplifier non-inverting input, a reference voltage source comprising one of fourth and fifth diodes conducting in the direction of said voltage supply or a diode conducting in the direction of said voltage supply and a resistor in series with said diode, a second resistor in series with said reference voltage source and in parallel with said first resistor and said capacitor, said second resistor having a higher ohmic value with respect to said first resistor, a second diode conducting in the direction of the voltage supply connected to those terminals of said first resistor and said capacitor which are not connected to said voltage supply, and a third diode shunting said first resistor and blocking in the direction of said supply voltage, the reference voltage being at least twice the threshold voltage of a diode, said first resistor comprising an adjustable potentiometer having an electrical resistance of about 100-1000 times that of said second resistor.

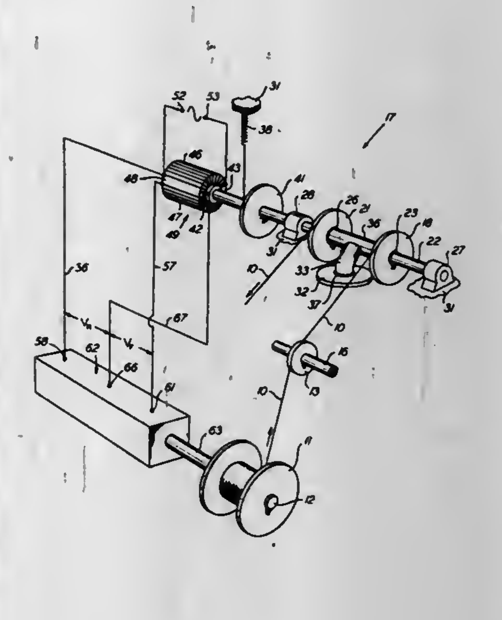
3,887,851
TENSION SPEED CONTROL FOR A ROTATABLE STRAND SUPPLY UTILIZING A TRANSFORMER HAVING VARIABLE PRIMARY AND SECONDARY WINDINGS

Robert Phillip Loesch, Tonawanda, N.Y., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Dec. 19, 1973, Ser. No. 426,179

Int. Cl. H02p *1/56*

U.S. Cl. 318—6 **6 Claims**



1. A system for controlling the paying out of a strand from a rotatable supply thereof which comprises:

a transformer having a primary winding and a secondary winding;

a moveable contactor positionable on said transformer windings;

means for connecting said primary winding to an excitation source;

means responsible to variations in tension in said strand for moving said transformer contactor; and

driving means connected to one side of said primary winding, one side of said secondary winding and said moveable contactor for imparting a torque in a first direction to said rotatable supply when said contactor is positioned on said primary winding and for imparting a torque in a second opposite direction to said rotatable supply when said contactor is positioned on said secondary winding.

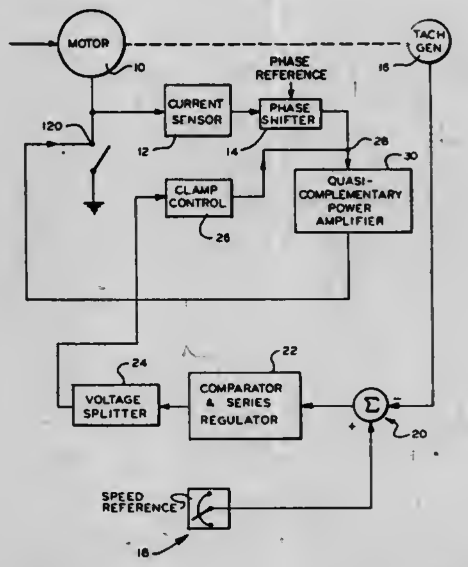
3,887,852
CONTROL SYSTEM FOR ROTATING ELECTRICAL MACHINERY USING ELECTRONICALLY DERIVED INJECTED ROTOR EMF'S

Roosevelt A. Fernandes, 5607 Bear Rd., Apt. K-12, North Syracuse, N.Y. 13212, and Harry R. Sanders, 3709 Trimble Rd., Nashville, Tenn. 37215

Continuation-in-part of Ser. No. 308,701, Nov. 22, 1972, abandoned. This application Dec. 13, 1973, Ser. No. 424,416

Int. Cl. H02p *7/36*

U.S. Cl. 318—197 **10 Claims**



1. A control system for AC machinery comprising:

a. a source of three-phase power providing a controlled reference signal;

b. means for sensing the frequency of the currents in each of the three rotor phases;

c. means for generating square wave signals of the respective frequencies and phases of each rotor phase in response to signals received from said sensing means;

d. means for generating a signal commensurate with actual rotational speed of the machine;

e. means for selectively varying said reference signal;

f. means for comparing said signal commensurate with actual rotational speed and said varied reference signal and providing an amplified difference signal output;

g. means for dividing said signal output into equal positive and negative signal levels;

h. means for clamping said signal levels at predetermined amplitude levels; and

i. means for applying said clamped signal levels to the respective rotor windings at the required current level.

3,887,853
STABILIZING SYSTEM FOR AN INVERTER-DRIVEN INDUCTION MOTOR

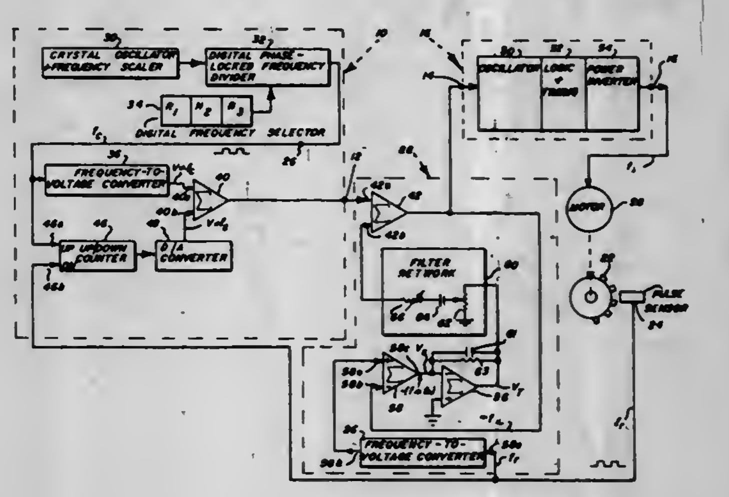
Frank N. Klein, and Gerald F. O'Callaghan, both of Kenosha, Wis., assignors to Eaton Corp., Cleveland, Ohio

Filed Dec. 14, 1973, Ser. No. 424,725

Int. Cl. A02p *7/42*

U.S. Cl. 318—230 **15 Claims**

1. Stabilizing apparatus for use with an inverter-driven induction motor system having an inverter responsive to a principal control signal to produce ac excitation for the stator of the motor comprising sensor means for sensing the speed of the rotor of the motor and for producing a first signal dependent thereon, circuit means for producing a second signal in accordance with the frequency of power with which the stator of said motor is excited by said inverter, algebraic combining means for combining said first and second signals to produce a third signal representative of the slip frequency of said motor, frequency-dependent filter means receiving said third signal for producing a filtered fourth signal in response to said third signal at least at times when said third signal is substantially below a pull-out level, and means for controlling said inverter in accordance with both said fourth signal and said principal control signal.


CRYSTAL OSCILLATOR FREQUENCY SCALER
DIGITAL PHASE-LOCKED FREQUENCY DIVIDER
DIGITAL FREQUENCY SELECTOR
FREQUENCY-TO-VOLTAGE CONVERTER
UP UPDOWN COUNTER
D/A CONVERTER
OSCILLATOR
LOGIC + TIMING
POWER INVERTER
MOTOR
FILTER NETWORK
PULSE SENSOR
FREQUENCY-TO-VOLTAGE CONVERTER

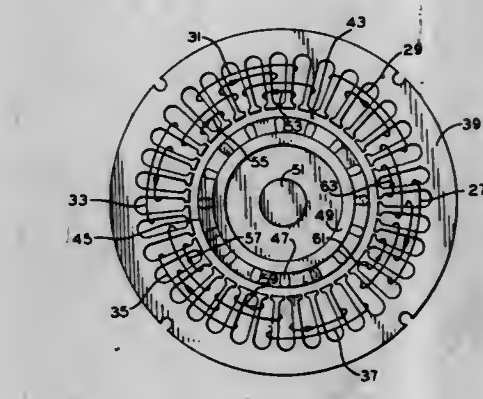
3,887,854
MULTI-SPEED MOTOR

Walter K. Parks, Springfield, Mo., assignor to General Electric Company, Fort Wayne, Ind.

Filed Dec. 3, 1973, Ser. No. 420,981

Int. Cl. H02k *17/08*

U.S. Cl. 318—224 A **10 Claims**



1. An electric motor for operation selectively at at least two different speeds, a magnetic core having a plurality of winding accepting slots;

first winding means disposed in at least some of the core slots;

means for selectively connecting the main winding means, in one of at least two different pole number configurations to a source of excitation voltage to thereby provide for more than one operating speed;

auxiliary winding means disposed in at least some of the core slots and energizable in conjunction with the main winding means to provide a starting torque for the motor regardless of the particular pole number configuration of the main winding means, the auxiliary winding means comprising a number of coil groups defining the same number of salient polar axes, the auxiliary winding means being arranged on the core so that a first half of the coil groups are uniformly distributed on the core and a second half of the coil groups are uniformly distributed on the core, with at least two mechanically adjacent ones of the coil groups establishing instantaneous poles of opposite polarity and being separated by an arcuate distance greater than the separation between other salient polar axes of the auxiliary winding means.

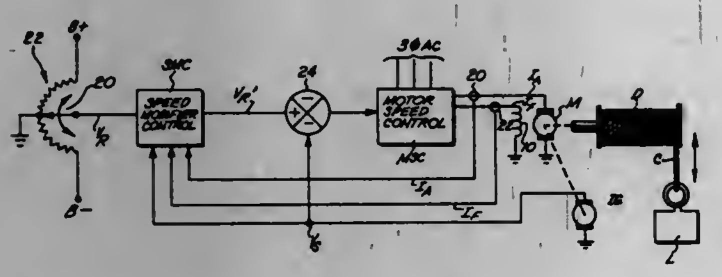
3,887,855
MOTOR SPEED MODIFIER CONTROL

Robert G. Klimo, Parma, Ohio, assignor to Cleveland Machine Controls, Inc., Cleveland, Ohio

Filed Nov. 28, 1973, Ser. No. 419,718

Int. Cl. H07p *5/16*

U.S. Cl. 318—332 **13 Claims**



1. A motor control system for a D.C. motor having a field and armature and exhibiting available torque over a motor speed range within a desired speed-torque relationship and comprising:

- means for providing a motor speed signal representative of actual motor speed,
- means for providing a speed reference signal representative of a desired motor speed,
- motor speed control means for controlling energization of said motor to operate at a motor speed dependent upon a given relationship of said motor speed signal and said reference speed signal, and
- speed modifier control means including means for providing a torque signal representative of the available motor torque, and means for effectively varying said reference speed signal to reduce said motor speed only when said motor operates in a field weakened speed range and the available torque is less than that required for the motor speed to be within said desired speed-torque relationship.

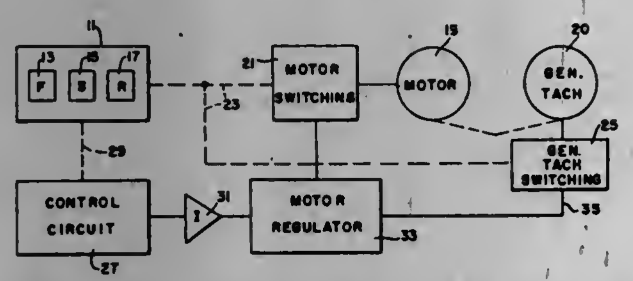
3,887,856
PUSH-BUTTON-OPERATED MOTOR SPEED CONTROL CIRCUIT

Frank N. Cicchiello, Norristown, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 256,670, May 25, 1972, which is a division of Ser. No. 116,395, Feb. 18, 1971. This application Oct. 2, 1973, Ser. No. 402,706

Int. Cl. H02p *5/12*

U.S. Cl. 318—345 **9 Claims**



1. A motor speed control system for controlling current flow to a motor comprising:

- current-control means including two current-carrying electrodes, and a control electrode having substantially complete current flow isolation with respect to said current-carrying electrodes, said current-control means being coupleable to the motor for controlling current flow to the motor as the function of a voltage level upon said control electrode;
- means coupleable to the motor for providing a settable minimum current flow level to the motor;
- a capacitor connected to said control electrode for controlling the voltage level on said control electrode in proportion to the charge on said capacitor;
- first manually operable means having a controllable duration of actuation for charging said capacitor, the charging of said capacitor being directly proportional to the duration of actuation of said first manually operable means; and
- second manually operable means having a controllable duration of actuation for discharging said capacitor, the discharging of said capacitor being directly proportional to the duration of actuation of said second manually operable means.

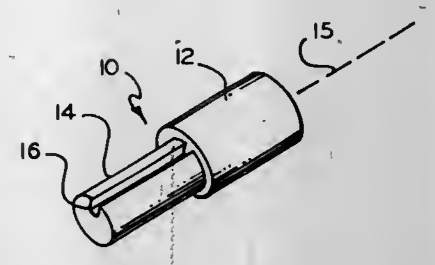
3,887,857
MEASURING APPARATUS FOR MACHINE TOOL SYSTEMS

Joseph Elbling, Armonk, N.Y., assignor to Inductosyn Corporation, Valhalla, N.Y.

Filed Nov. 19, 1973, Ser. No. 416,892

Int. Cl. G05b *19/24*

U.S. Cl. 318—572 **7 Claims**



1. In the method of providing a signal representation of an unknown dimension of a portion of a workpiece unsuited for direct gage measurement mounted within a machine tool, the steps of:

- generating dimension signals representative of a gaged dimension of said workpiece in response to a signal provided by a gage which senses said gaged dimension;
- generating machine slide signals which change in response to a movement of a machine slide of said machine tool;
- altering said machine slide signals to conform to said dimension signals when said machine slide is connected to a portion of said workpiece having said gaged dimension; and
- positioning said machine slide for connection with said portion of said workpiece having said unknown dimension.

3,887,858
BATTERY CHARGING

Wilford B. Burkett, Pacific Palisades, and George D. Carlsen, II, Venice, both of Calif., assignors to McCulloch Corporation, Los Angeles, Calif.

Continuation of Ser. No. 240,137, March 31, 1972, abandoned. This application June 14, 1973, Ser. No. 370,007

Int. Cl. H02j *7/04*

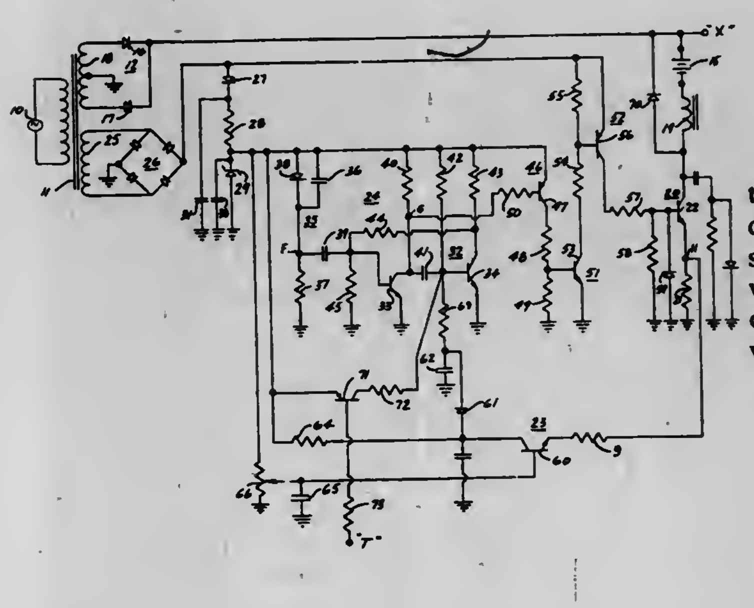
U.S. Cl. 320—31 **6 Claims**

1. A method of charging a lead acid battery comprising the steps of applying a charging current for a first interval of time at a rate sufficient to cause gassing as charge progresses and to reach the hard gassing point for the battery; monitoring the battery terminal voltage; and upon attaining the battery terminal voltage corresponding to the hard gassing point of the battery contuining the application of charging current for a second interval of time having a duration dependent upon the duration of the first interval of time at a rate sufficient to maintain the battery terminal voltage above the decomposition potential of the electrolyte.

5. A circuit for charging a battery comprising

- a constant current source,
- circuit means for connecting the source to a battery to be charged,

- circuit means for monitoring the terminal voltage of the battery under charge during a first interval of charge,
- means responsive to the attainment of a preselected terminal voltage for starting a second interval of charge,
- means for determining the duration of the first interval and for limiting the duration of the second interval to a preselected percentage of the duration of the first interval,
- the monitoring means comprises a voltage divider network connected across the battery, the network comprising at least one Zener diode in series with a potentiometer; the responsive means comprises a first silicon controlled rectifier having its gate connected to the movable arm of the potentiometer; its cathode connected to the negative terminal of the battery and its anode connected to the positive terminal of the battery through a current limiting resistor, and a NPN transistor switch for connecting the determining and limiting means to the battery under charge during the first interval, the base of the transistor being connected to the anode of the first silicon controlled rectifier, the emitter being connected to the determining and limiting means through a second current limiting resistor and the collector being connected to the positive terminal of the battery; and the determining and limiting means comprises one or more electrochemical cells charged during the first interval through the NPN transistor and discharged during the second interval through a diode and the base-emitter junction of a second NPN transistor switch, the base of the second transistor being connected to the positive terminal of the cell through a diode, the emitter of the second transistor being connected to the negative terminal of the cell and the battery under charge in common, a second silicon controlled rectifier controlled by the conduction state of the second transistor and the conduction state of a PNP transistor switch, the base of the PNP transistor being connected to the anode of the first silicon controlled rectifier, the collector of the PNP transistor being connected through a current limiting resistor to the gate of the second silicon controlled rectifier, the emitter of the PNP transistor being connected to the positive terminal of the battery under charge, the anode of the second silicon controlled rectifier being connected to the positive terminal of the battery through a current limiting resistor, the cathode of the second silicon controlled rectifier being connected to the negative terminal of the battery, and circuit means connected between the anode of the second silicon controlled rectifier and the source for reducing the current to a trickle charge upon the firing of the second silicon controlled rectifier.



3,887,859
SELF-COMMUTATING FREQUENCY CONVERTER WITH ADDITIONAL CHARGING ARRANGEMENT

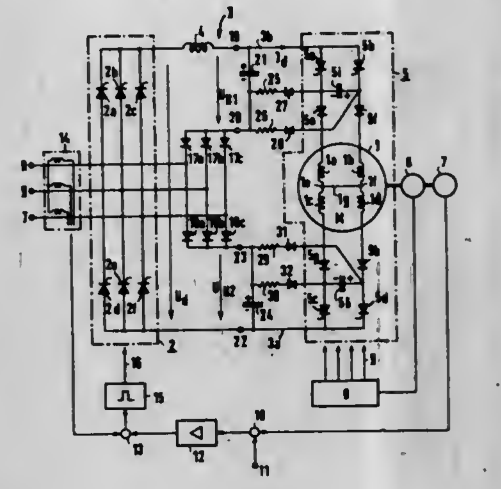
Klaus Hubner, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 25, 1974, Ser. No. 464,329

Claims priority, application Germany, Apr. 26, 1973, 2321199

Int. Cl. H02m *7/48, 5/44*

U.S. Cl. 321—5 **4 Claims**



1. In a static frequency changer comprising a line commutated controlled converter configured as a rectifier bridge, a d-c link circuit and a self-commutating converter, in which self-commutating converter all controlled rectifier valves which are tied to the same bus of the d-c link circuit are connected with each other through commutation capacitors, wherein the improvement comprises:

- a. a first set of supplementary uncontrolled rectifiers coupled to at least one half of the bridge of the line commutated converter so as to form a first semicontrolled rectifier bridge having as one terminal one bus of the d-c link circuit and as another terminal, the output of said uncontrolled rectifiers;
- b. a smoothing capacitor shunted across said one and another terminals;
- c. first series circuits each comprising a resistor and a decoupling diode coupling said another terminal to one side of each said commutation capacitor associated with controlled rectifiers in the self-commutating converter which are coupled to the bus of said d-c link forming said one terminal; and
- d. second series circuits each comprising a resistor and a decoupling diode coupling said another terminal to the other side of each of said commutation capacitors.

3,887,860
FUSELESS INVERTER

Thomas Joseph Bernhardt, Racine, and Frank N. Klein, Kenosha, both of Wis., assignors to Eaton Corp., Cleveland, Ohio

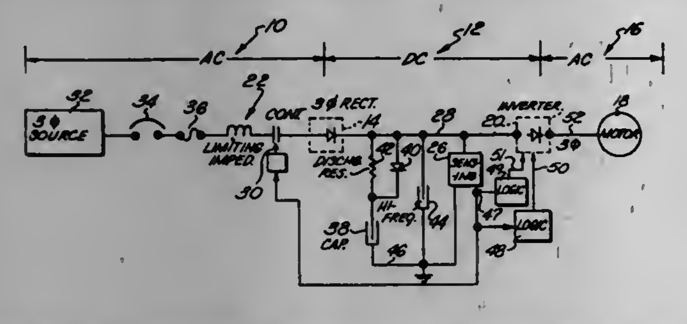
Filed Jan. 15, 1972, Ser. No. 306,521

Int. Cl. H02h *7/10*

U.S. Cl. 321—14 **27 Claims**

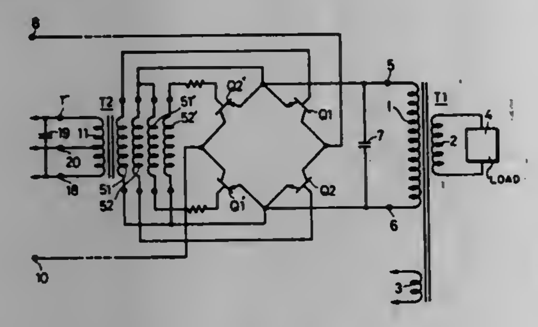
1. An electrical system for receiving power from a DC electrical source comprising a static inverter means including a plurality of main semiconductor means for inverting the power and auxiliary semiconductor means for commutating off said main semiconductor means upon conduction of said auxiliary semiconductor means, sensing means for detecting an abnormality indicative of a current overload fault and producing a signal thereupon, and control means responsive

to said signal for initiating current conduction upon occurrence of the fault in at least one of said auxiliary semiconductor means to complete an additional shunt current path to share current flowing to said static inverter means.



3,887,861
TRANSISTOR INVERTER

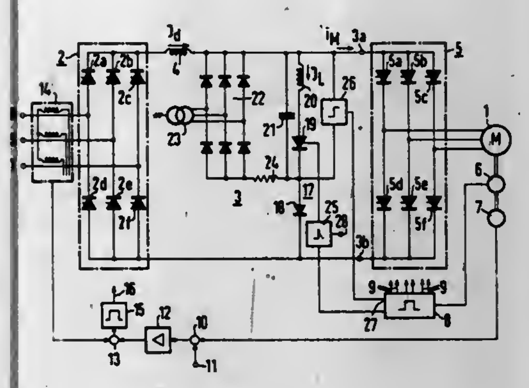
Hiroshi Anzai, and Hiroyuki Miura, both of Tokyo, Japan, assignors to Kabushikikaisha Tokyo Keiki, Tokyo, Japan
Continuation of Ser. No. 289,170, Sept. 14, 1972, abandoned. This application Feb. 22, 1974, Ser. No. 444,842
Int. Cl. H02m *7/52*
U.S. Cl. 321—18 **3 Claims**



1. A transistor inverter comprising:
a DC power source;
an output transformer having primary, secondary and tertiary windings;
a load connected to the secondary winding of the output transformer;
a first transistor having its collector connected to one end of the DC power source and its emitter connected to one end of the primary winding of the output transformer;
a second transistor having its collector connected to the one end of the DC power source and its emitter connected to the other end of the primary winding of the output transformer;
a third transistor having its collector connected to the other end of the DC power source and its emitter connected to the other end of the primary winding of the output transformer;
a fourth transistor having its collector connected to the other end of the DC power source and its emitter connected to the one end of the primary winding of the output transformer;
a drive control signal generator generating rectangular drive control signals of opposite polarities;
a control signal generator having a rectifier for rectifying an output derived from the tertiary winding of the output transformer, a constant voltage circuit for generating a constant voltage and a comparator for generating a control signal by comparing an output derived from the rectifier with the constant voltage derived from the constant voltage circuit;
a driving signal generator having a driving transformer with primary, secondary, tertiary, quarternary and quinary windings, a fifth transistor having its collector connected to the one end of the primary winding of the driving transformer and its emitter connected to the other end of the DC power source, a sixth transistor having its collector connected to the other end of the primary winding of the driving transformer and its emitter connected to the other end of the DC power source, a seventh transistor having its collector connected to the neutral point of the primary winding of the driving transformer and its emitter connected to the one end of the DC power source and a waveform adjusting capacitor connected between both ends of the primary winding of the driving transformer, the one and other ends of the secondary winding of the driving transformer being connected to the base of the first transistor and the emitters of the second and third transistors, respectively, the one and other ends of the tertiary winding of the driving transformer being connected to the emitters of the first and fourth transistors and the base of the second transistor, respectively, the one and other ends of the quarternary winding of the driving transformer being connected to the emitters of the first and fourth transistors and the base of the third transistor, respectively, and the one and other ends of the quinary winding of the driving transformer being connected to the base of the fourth transistor and the emitters of the second and third transistors, respectively;
means for supplying the rectangular drive control signals derived from the drive control signal generator to the bases of the fifth and sixth transistors of the driving signal generator, respectively; and
means for supplying the control signal derived from the comparator of the control signal generator to the base of the seventh transistor of the driving signal generator.

3,887,862
AUXILIARY EXTINGUISHING ARRANGEMENT FOR THE INVERTERS IN AN INTERMEDIATE LINK CONVERTER

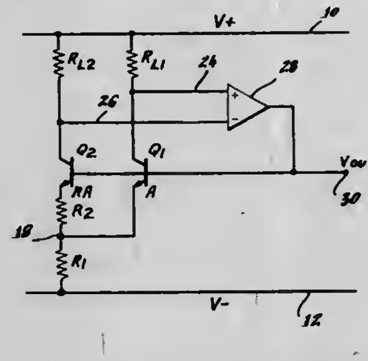
Klaus Hubner, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany
Filed Sept. 20, 1973, Ser. No. 399,348
Claims priority, application Germany, Sept. 22, 1972, 2246562
Int. Cl. H02m *5/44*
U.S. Cl. 321—45 C **4 Claims**



1. An auxiliary extinguishing arrangement for the rectifier devices of an intermediate link converter supplying an electric motor, said intermediate link converter including a logic circuit for controlling the firing of the rectifier devices, where the improvement comprises:
a. a series circuit including a reversing choke, a controlled rectifier and an un-controlled rectifier, placed across the output of the intermediate link;
b. a commutation capacitor shunted across the series combination of the reversing choke and controlled rectifier;
c. means for voltage detection having its input coupled to measure the voltage at said commutation capacitor and providing its output as a disabling input to the logic circuit, said voltage detection means providing a disabling output during each commutation when the voltage at said commutation capacitor falls below a predetermined limit.

3,887,863
SOLID-STATE REGULATED VOLTAGE SUPPLY

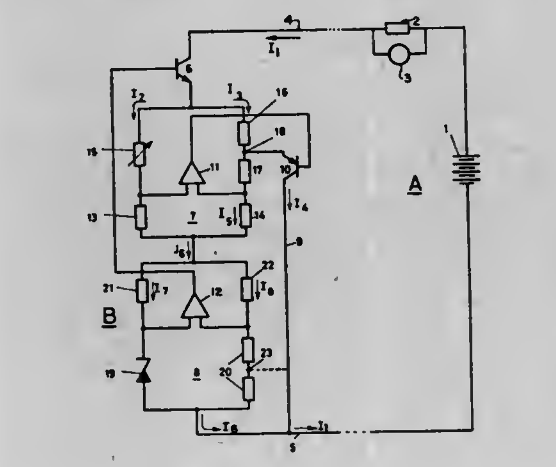
Adrian Paul Brokaw, Burlington, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.
Filed Nov. 28, 1973, Ser. No. 419,616
Int. Cl. G05f *1/48*
U.S. Cl. 323—19 **19 Claims**



17. A solid-state temperature-compensated voltage supply comprising:
first and second transistors arranged to conduct respective currents;
voltage means to provide base voltage to said transistor bases to produce current densities therein having a non-unity ratio;
circuit means including resistance means connected to the emitters of said two transistors to develop a first voltage proportional to the difference in base-to-emitter voltages of said transistors and to apply said first voltage to the emitter of said second transistor;
means coupling the bases of said two transistors together to provide for tracking of the base potentials;
an output terminal; and
means coupling said output terminal to the base of said second transistor to provide at said output terminal an output voltage proportional to said first voltage combined with the base-to-emitter voltage of said second transistor.

3,887,864
MEASURED-VALUE TRANSDUCER WITH A COMPENSATING BRIDGE CIRCUIT

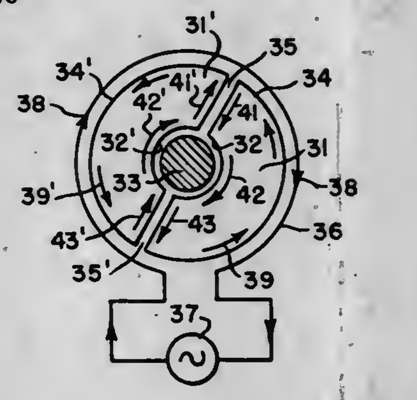
Ole Friis Knudsen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark
Filed Nov. 14, 1973, Ser. No. 415,568
Claims priority, application Germany, Nov. 16, 1972, 2256196
Int. Cl. G05f *1/58*
U.S. Cl. 323—40 **13 Claims**



1. A measuring-transducer circuit arrangement suitable for a two-line telemetering system, the circuit arrangement comprising: a first bridge circuit including a compensating resistor and having two bridge diagonals; a current regulator; a comparator circuit comprising a Zener diode forming a reference element for establishing a constant reference voltage and a reference-voltage resistor for developing a voltage used for controlling said current regulator; and a measuring amplifier connected to one of said bridge diagonals, said measuring amplifier controlling a compensating current which in use flows in said compensating resistor; said current regulator and said Zener diode being connected in a series path which also includes the other of said bridge diagonals said series path having two ends respectively for connection to said two lines of said telemetering system.

3,887,865
EDDY CURRENT TESTING APPARATUS USING SEGMENTED MONOTURN CONDUCTIVE MEMBERS

Robert A. Brooks, Rye, N.Y., assignor to Magnetic Analysis Corporation, Mount Vernon, N.Y.
Filed Feb. 15, 1974, Ser. No. 442,847
Int. Cl. G01r *33/12*
U.S. Cl. 324—40 **7 Claims**



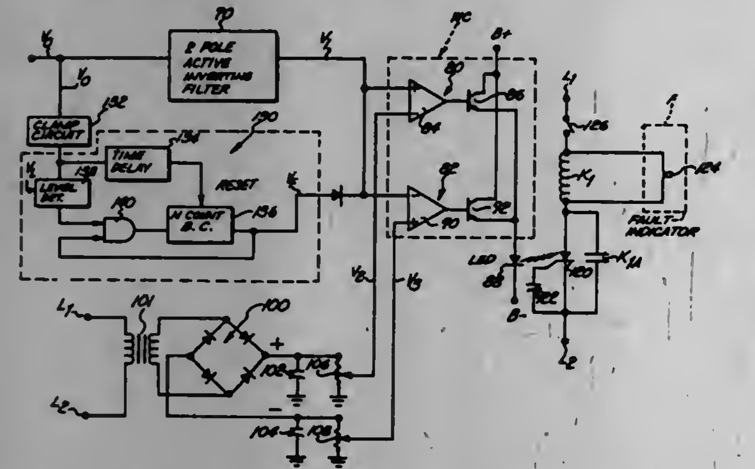
1. Eddy current testing apparatus for the non-destructive testing of objects which comprises
a. a body section having an opening therethrough,
b. a coil supported by said body section and encircling said opening,
c. a segmented monoturn conductive member for said opening formed of a plurality of separate segments which when assembled in the opening provide a segmented inner aperture for an object to be tested and a segmented surface encircling the aperture and spaced therefrom,
d. said segments when in assembled relationship being insulated from each other,
e. mounting means for securing said segments in said opening with said coil encircling said segmented encircling surface of the assembled monoturn member,
f. means for supplying alternating or pulsed current to said coil for inducing current flow in said segmented encircling surface,
g. said assembled monoturn conductive member being designed and adapted for producing current flow around the surface segments of said aperture in like direction opposite to the direction of current flow in said encircling surface in response to said current in said coil and thereby produce a magnetic field to induce eddy currents in an object located in the aperture,
h. and detecting and indicating means responsive to variations in said eddy currents for indicating variations in said object.

3,887,866
SURGE TESTER FOR TESTING AN ELECTRICAL WINDING AND INCLUDING VOLTAGE COMPARISON MEANS

Michael B. Safer, Shaker Heights, and Andrew J. Menegos, Copley, both of Ohio, assignors to Avtron Manufacturing, Inc., Cleveland, Ohio
Division of Ser. No. 368,306, June 8, 1973. This application Sept. 20, 1974, Ser. No. 567,675
Int. Cl. G01r *31/02, 31/06*
U.S. Cl. 324—51 **6 Claims**

1. A surge tester for testing an electrical winding comprising:

means for respectively applying first and second surge voltage pulses to a test winding and a standard winding,
surge voltage generating means for developing said surge voltage pulses from an AC voltage source such that the magnitude of a said voltage pulse is proportional to the magnitude of said AC voltage source, said AC voltage source being an AC line voltage source and said surge voltage generating means including means for developing said surge voltage pulses from said AC line voltage source so that the magnitude of a said surge voltage pulse is proportional to the peak value of said AC line voltage source;



output circuit means connected to said test and standard windings for providing a difference voltage exhibiting a magnitude representative of any difference in the voltages developed across said windings in response to application of the first and second surge voltage pulses thereto;
fault detector means including means for comparing any said difference voltage with a reference voltage and providing an output signal in dependence upon said comparison; and,
circuit means for providing a said reference voltage derived from a said AC voltage source with said reference voltage having a magnitude which varies in proportion to variations in the magnitude of said AC voltage source.

3,887,867

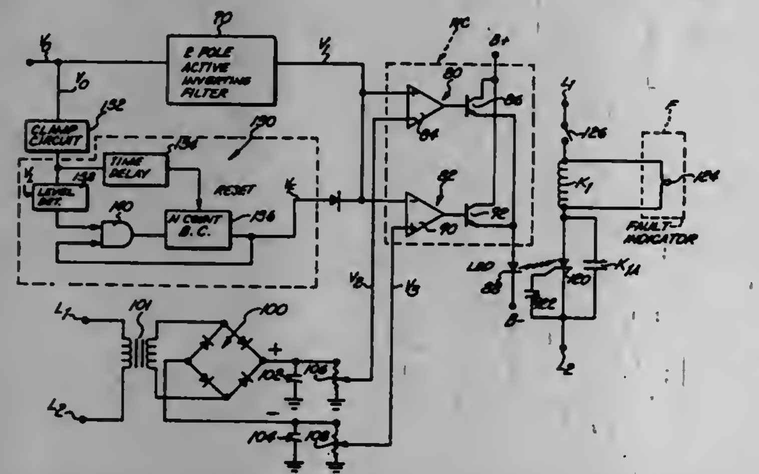
SURGE TESTER FOR DETECTING A GROUND FAULT IN AN ELECTRICAL WINDING

Michael B. Safer, Shaker Heights, and Andrew J. Menegos, Copley, both of Ohio, assignors to Avtron Manufacturing, Inc., Cleveland, Ohio

Division of Ser. No. 368,306, June 8, 1973. This application Sept. 20, 1974, Ser. No. 507,784

Int. Cl. G01r *31/02, 31/06*

U.S. Cl. 324—51 **3 Claims**



1. Apparatus for surge testing a winding to determine the presence of a ground fault by virtue of an electrical connection, at least when a surge voltage pulse is applied to said winding, between said winding and an associated electrically conductive core member comprising:
capacitor means connected between said winding and said core member;
means for applying a surge voltage pulse to said winding so that if a said ground fault exists, a damped oscillatory output voltage is provided across said capacitor means; and
ground fault detector means for receiving a said oscillatory output voltage and providing an output indication representative of a said ground fault as a function of the number of pulsations of said oscillatory voltage during a given period of time.

3,887,868

MEASURING DEVICE FOR DETERMINING THE CONCENTRATION AND THE MEAN PARTICLE SIZE OF PARTICLES SUSPENDED IN AN ELECTROLYTICALLY CONDUCTIVE LIQUID

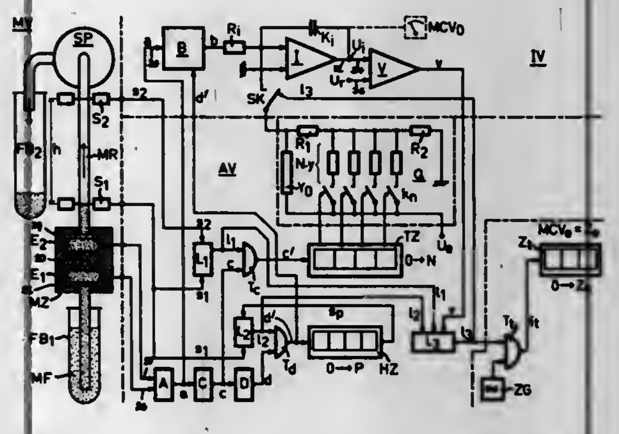
Walter Guggenbuhl, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed Sept. 4, 1973, Ser. No. 394,125

Claims priority, application Switzerland, Sept. 14, 1972, 13434/72

Int. Cl. G01n *27/00*

U.S. Cl. 324—71 CP **1 Claim**



1. An apparatus for measuring the mean volume of a multiplicity of particles contained in an electrolytically conductive suspension liquid, comprising, in combination:

a. means defining a capillary restricted measurement path arranged between two electrodes;
b. a particle detector device incorporating means for propelling the suspension liquid through the capillary restricted measurement path;
c. pulse generator means for generating for each particle which passes through the measurement path a particle pulse with a peak amplitude proportional to the particle volume;
d. a particle pulse counting mechanism for indicating the sum of the particles contained in a predetermined volume of suspension liquid;
e. pulse counting and selection means for converting only such particle pulses which, with regard to a preceding particle pulse possess a minimum spacing in time, into square wave pulses of appropriate peak amplitude and predetermined non-variable duration;
f. a square wave pulse integration mechanism for the integrating charging of a capacitance to a final voltage which is proportional to the peak amplitude summation of all integrated square wave pulses;
g. an auxiliary counting mechanism for counting all integrated square wave pulses until reaching a predetermined final numerical value;
h. means for the automatic placing into standstill the integration operation of the integration mechanism upon reaching a predetermined final counter state of the auxiliary counter mechanism and for connecting the capacitance to a discharge current circuit upon termination of the counting function of the particle pulse counting mechanism;

i. means for the automatic parallel circuit connection of additional conductance values at a basic conductance value of a discharge current circuit in functional dependency of the attained counter state of the particle pulse counter mechanism; and
j. means for measuring the discharge time of the capacitance as an actual time value which is proportional to the mean particle volume.

3,887,869

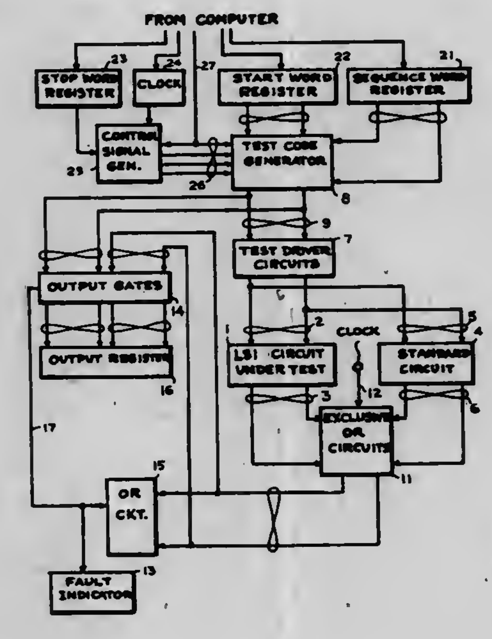
METHOD AND APPARATUS FOR HIGH SPEED DIGITAL CIRCUIT TESTING

John B. Connolly, Nabnasset, and Yohan Cho, Carlisle, both of Mass., assignors to Tau-tron, Inc., North Billerica, Mass.

Continuation of Ser. No. 21,657, March 27, 1970, abandoned. This application July 25, 1972, Ser. No. 275,021

Int. Cl. G01r *15/12*

U.S. Cl. 324—73 R **4 Claims**



1. A system for testing a complex electronic circuit where the same set of input signals are simultaneously applied to a test circuit and a standard circuit and output signals from the test and standard circuits are simultaneously compared to detect a fault in the test circuit comprising,
a random number generator for generating random parallel binary numbers of up to N bits each at a rate in the dynamic operating range of the test circuit, each random number being represented as a set of N generator output signals,
means applying said N output signals to inputs of both the test and standard circuits which produces in response thereto, test and standard sets of M output signals,
a set of M coincidence comparing circuits, each responsive to corresponding output signals from the test and standard circuits, said M comparing circuits producing a set of M fault signals,
an N stage register for storing a random number,
an M stage register for storing M fault output signals,
means responsive to the M fault output signals for feeding the particular random number applied to the test and standard circuits, which results in at least one fault output signal from the comparing circuits, to the N stage register, and
means responsive to the M fault output signals for feeding the fault output signals to the M stage register at the same time the said particular random number is fed to the N stage register,
whereby said registers store information indicative of inputs and outputs of the test circuit when a fault occurs.

3,887,870

PULSE REPETITION RATE METERS

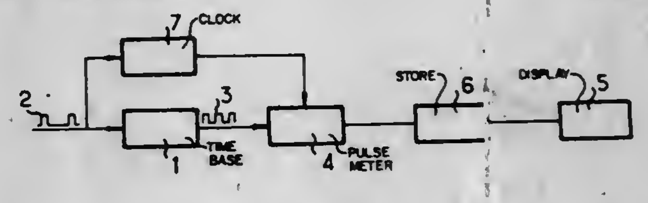
Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Sept. 28, 1972, Ser. No. 293,023

Claims priority, application France, Sept. 30, 1971, 71.35897

Int. Cl. G01h *23/02*

U.S. Cl. 324—78 D **7 Claims**



1. A pulse-repetition rate meter, comprising
time base means having an input to receive pulses whose repetition rate is to be measured and an output, the time base means being operative upon receipt of each pulse at its input to generate a predetermined plurality of auxiliary pulses at a frequency such that the said plurality is completed before the next following pulse to be measured occurs,
counting means having an input connected to the output of the time base means and a gate input, and
control means for supplying a control signal to the gate input of the counting means to render the counting means operative to count said auxiliary pulses for a predetermined duration only, whereby the count registered by the counting means is representative of the repetition rate of the pulses applied to the input of the time base means.

3,887,871

VARIABLE QUANTITY MEASURING DEVICES

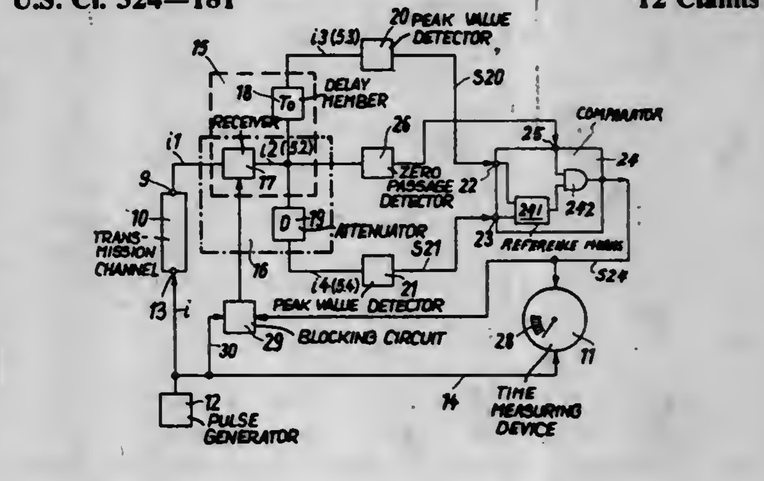
Burckhard Aechter, Achim, and Manfred Gerlach, Bremen-Mahndorf, both of Germany, assignors to Fried Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Oct. 31, 1973, Ser. No. 411,319

Claims priority, application Germany, Nov. 4, 1972, 2254019

Int. Cl. G04f *9/00*

U.S. Cl. 324—181 **12 Claims**



3. Circuit arrangement as defined in claim 1 wherein said measuring means comprises: a measurement receiver; shifting means connected to said receiver for shifting the output therefrom relative to the independent variable by an amount equal to the selected number of oscillation periods; attenuation means connected to said receiver for attenuating the dependent variable values of the receiver output by an amount related to the given ratio; and peak value detector means connected between the outputs of said shifting means and said attenuating means and inputs of said comparator means for causing such comparison signal to be emitted at the output of said comparator means when the values of the signals from said detector means indicate that the given ratio is present between the dependent variable values of such a pair of peaks.

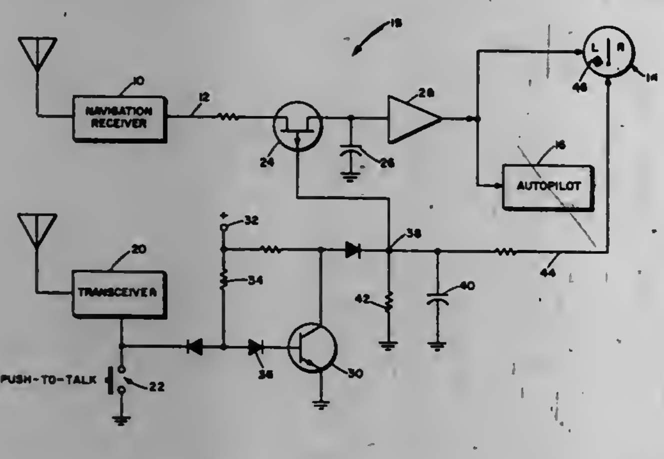
3,887,872
FREEZE CIRCUIT FOR AIRCRAFT RADIO NAVIGATION SYSTEMS

Claude A. Sharpe, Ft. Lauderdale, Fla., assignor to The Bendix Corporation, Southfield, Del.

Filed Dec. 5, 1973, Ser. No. 421,881

Int. Cl. H04b *1/40, 1/44*

U.S. Cl. 325—21 **4 Claims**



1. In a radio navigation system, means for eliminating adverse effects of false guidance signals caused by intermittent transmissions from a nearby communications transmitter, said navigation system including a receiver tuned to a frequency within a band of frequencies assigned for navigation use and providing guidance signal output, and means utilizing said guidance signal output, said communications transmitter operating in a communications band of frequencies adjacent said navigation band of frequencies and being active to transmit or inactive depending upon the operation of a first switch means; comprising,

- second switch means interposed between said navigation receiver and said utilizing means, a first condition of said second switch means permitting application of guidance signal from said receiver to said utilizing means, a second condition of said second switch means interrupting application of said guidance signal to said utilizing means;
- means for storing said guidance signal during the time said second switch means is in said first condition and for applying said stored guidance signal to said utilizing means as a substitute for said guidance signal during the time said second switch means is in said second condition; and
- means controlled by said first switch means and controlling said second switch means to cause said second switch means to change from said first condition to said second condition whenever said transmitter is active and to revert said second switch means to said first condition whenever said transmitter is inactive.

3,887,873
PULSE AMPLITUDE MODULATION, FREQUENCY MODULATION TELEMETRIC DATA TRANSMITTER

Jerry E. Duncan, and Lance E. Riggin, both of Indianapolis, Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

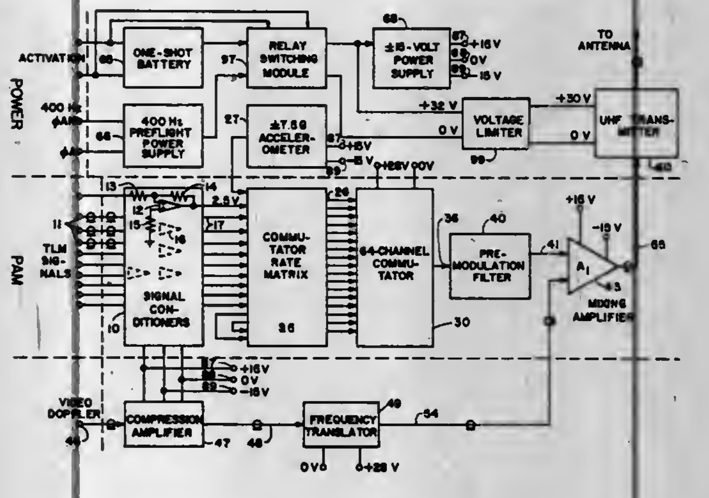
Filed July 8, 1971, Ser. No. 163,531

Int. Cl. H04b *1/04*

U.S. Cl. 325—113 **8 Claims**

1. A pulse amplitude modulation, frequency modulation telemetric data transmission system comprising:

- a pulse amplitude modulation telemetry signal subsection having signal conditioners to receive channeled telemetry signals and unify the amplitudes thereof, a commutation rate matrix coupled to said signal conditioners to receive said uniform signals and matrix them to appear on an appropriate number of channel outputs, a channel commutator of gates driven in sequence by a counter circuit that is driven by a clock pulse source with each gate coupled to a channel output of said matrix through said gate to a common output, and a premodulation filter coupled in said common output;
- a video doppler subsection having a compression amplifier to receive video doppler frequency signals of random amplitude to compress said signals to a uniform amplitude on an output thereof, and a frequency translator coupled to the compression amplifier output to translate said frequency signals to corresponding levels different from the frequency levels of said telemetry signals on an output thereof;
- a transmitter for transmitting radio frequency signals;



- a summing amplifier coupled to said common output of said premodulation filter and the output of said frequency translator and having an output coupled to said transmitter to sum said telemetry signals and said video doppler signals into composite signals for transmission; and
- a power supply subsection having batteries therein coupled through switches and conductors to said telemetry channel, said video doppler channel, said summing amplifier, and said transmitter to switch said conductors to external taps for external power supply under one condition and to switch said conductors to said batteries under another condition whereby telemetry signals of missile operation and video signals of a target object with respect to said missile are transmitted over a single radio channel.

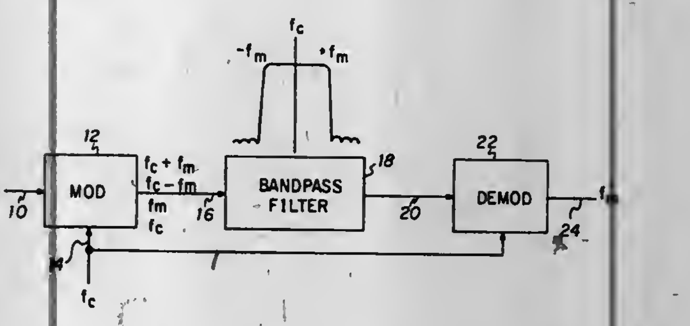
3,887,874
LOW PASS FILTER APPARATUS

Thomas D. Reed, Plano, and Wayne A. Winget, Richardson, both of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 10, 1974, Ser. No. 468,777

Int. Cl.^{2} H03B *1/04*

U.S. Cl. 328—167 **1 Claim**



1. A lowpass filter apparatus comprising, in combination:

- input means for supplying a signal to be lowpass filtered;
- apparatus output means for supplying lowpass frequency filtered signals;
- bandpass transversal filter means having a frequency bandwidth of approximately twice the range of the range of frequencies to be lowpass filtered the phase shift through said filter means being substantially constant throughout the lowpass frequency design range; and
- double balanced modulator-demodulator means directly connecting said bandpass filter between said input means and said output means, said modulator means increasing the average frequency of signals to be filtered before being applied to said filter means and said demodulator means decreasing the average frequency before applying the signal received from the filter means to said apparatus output means.

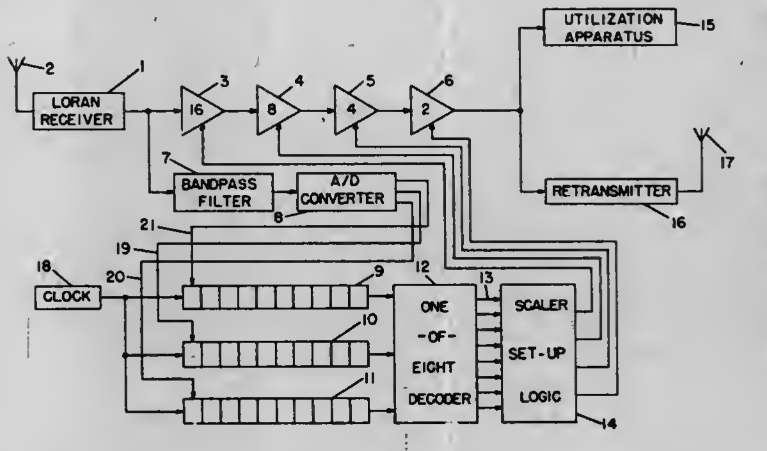
3,887,875
DIGITAL SIGNAL LEVELING DEVICE

Harry D. Shearer, St. Petersburg, and Eli J. Dalabakis, Seminole, both of Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Sept. 7, 1973, Ser. No. 395,022

Int. Cl. H03b *3/02;* **H03k** *5/02*

U.S. Cl. 328—168 **7 Claims**



1. Automatic gain control apparatus for leveling the amplitude of pulses received at a predetermined repetition rate, said automatic gain control apparatus having an input terminal and an output terminal, said automatic gain control apparatus comprising:

- A. an analog-to-digital converter coupled to said input terminal for converting the amplitude of pulses appearing thereat into a plural bit digital representation, each of said bits issuing from separate outputs from said analog-to-digital converter:
- B. a plurality of pulse delay means corresponding in number to the number of bits in said plural bit representation;
- C. means coupling each output from said analog-to-digital converter to the input of a separate one of said plurality of pulse delay means;
- D. scaler means connected between the input and output terminals of said automatic gain control apparatus for selectively attenuating a pulse passing therethrough in accordance with level control signals applied to said scaler; and
- E. means for receiving the digital representation from said delay means and developing level control signals in accordance with the bit configuration of the plurality of pulse delay means for application to said scaler.

3,887,876
OPTICAL INTERMEDIATE AMPLIFIER FOR A COMMUNICATION SYSTEM

Gunter Zeidler, Unterpfaffenhofen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

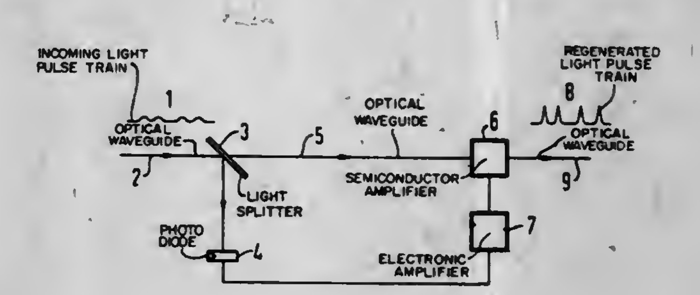
Filed Sept. 21, 1973, Ser. No. 399,635

Claims priority, application Germany, Oct. 3, 1972, 2248372

Int. Cl. H01s *3/10*

U.S. Cl. 330—4.3 **1 Claim**

1. An intermediate amplifier for a communications transmission system for transmitting communications by way of light waves in optical wave guides, said intermediate amplifier comprising an optical amplifier for amplifying the light waves according to the laser principle, means for electrically pulse pumping said optical amplifier upon receipt of light pulses at said optical amplifier, said pumping means including an electronic amplifier, a photo diode connected to said electronic amplifier and receiving a portion of the incoming light power of the light pulses, said optical amplifier operable in response to said light pulses to provide said optical amplifier with pumping pulses at those times at which subsequent light pulses pass through said optical amplifier.



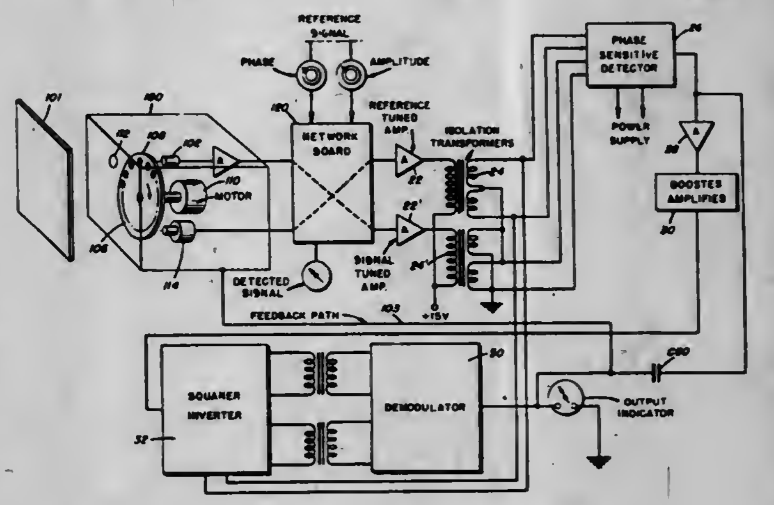
3,887,877
FEEDBACK ELECTROSTATIC VOLTMETER

Robert E. Vosteen, 15 W. Center St., Medina, N.Y.

Continuation of Ser. No. 66,444, Aug. 24, 1970, abandoned, which is a division of Ser. No. 567,973, July 26, 1966, Pat. No. 3,525,936. This application Mar. 26, 1973, Ser. No. 344,511

Int. Cl.^{2} H03F *3/38*

U.S. Cl. 330—10 **4 Claims**



1. A high gain amplifier system comprising:

- an operational amplifier having an input and an output,
- a square wave drive source of predetermined frequency,
- a first inverter means having first and second transistors, each having a base, an emitter and a collector electrode, the source of square waves being connected across the base electrodes of the first and second transistors to alternately drive them into conduction at the predetermined frequency.
- a first step-up transformer having a center-tapped primary winding and a secondary winding, the primary winding being connected across corresponding electrodes of the first and second transistors other than the base electrodes, the remaining corresponding electrodes of the first and second transistors other than the base electrodes being connected to form a first common connection,
- a second inverter means having third and fourth transistors, each having a base, an emitter and collector electrode, the source of square waves being connected across the base electrodes of the third and fourth transistors to alternately drive them into conduction at the predetermined frequency,
- a second step-up transformer having a center-tapped primary winding and a secondary winding, the primary winding being connected across corresponding electrodes of

the third and fourth transistors other than the base electrodes, the remaining corresponding electrodes of the third and fourth transistors other than the base electrodes being connected to form a second common connection,
a power supply having positive and negative supply terminals, one of the supply terminals being connected to the center tap of the primary winding of the first step-up transformer, the other supply terminal being connected to the second common connection,
means connecting the output of the operational amplifier to feed the first common connection and the center-tap of the primary winding of the second step-up transformer, the first and second inverters thereby providing output signals to the first and second step-up transformers respectively dependent upon the magnitude and polarity of the output of the operational amplifier and modulated at the predetermined frequency,
first and second demodulators connected to the secondary windings of the first and second step-up transformers respectively to demodulate the outputs thereof to produce high gain output signals.

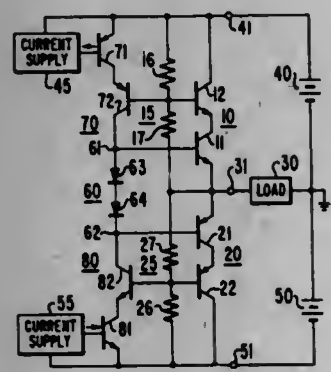
3,887,878
TRANSISTOR SERIES AMPLIFIER

Otto Heinrich Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 4, 1974, Ser. No. 447,934

Int. Cl. H03f *3/18*

U.S. Cl. 330—13 **18 Claims**



12. In combination:
a series amplifier comprising a first cascade of transistors, the principal conduction paths of which are connected in a first serial connection for direct current, and a potential divider for apportioning the potential appearing across said first serial connection to the control electrodes of all but the first transistors in said first cascade to cause the transistors in said first cascade to have substantially equal potentials across their principal conduction paths; and
a second cascade of transistors, the principal conduction paths of which are in a second serial connection for direct current, and sharing said potential divider with said first series amplifier for apportioning the potential appearing across said first serial connection to the control electrodes of all but the first transistor in said second cascade to cause the transistors in said second cascade to have substantially equal potentials across their principal conduction paths, said second serial connection being connected to the control electrode of the first transistor of said first cascade thereby to cascade said first cascade after said second cascade.

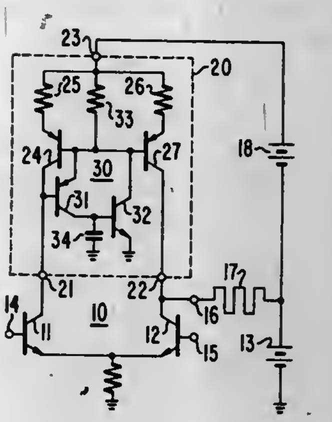
3,887,879
CURRENT MIRROR

Jonathan Samuel Radovsky, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 11, 1974, Ser. No. 459,952

Int. Cl. H03f *3/42*

U.S. Cl. 330—19 **7 Claims**



1. A current amplifier comprising:
an input terminal, an output terminal and a common terminal;
first and second and third transistors of a first conductivity type and a fourth transistor of a second conductivity type complementary to said first conductivity type, each transistor having base and emitter and collector electrodes, the emitter electrodes of said first and said second transistors being direct current conductively coupled to said common terminal, the collector electrodes of said first and said second transistors being direct current conductively coupled respectively to said input terminal and to said output terminal, the base electrode of said third transistor having said input terminal direct coupled thereto, the emitter electrode of said third transistor having the base electrodes of said first and said second transistors coupled thereto; the collector electrode of said third transistor being direct coupled to the base electrode of said fourth transistor, the collector electrode of said fourth transistor being direct coupled to said first transistor base electrode and to said second transistor base electrode; and
means connected to the emitter electrode of said fourth transistor for biasing said fourth transistor for common-emitter amplification.

3,887,880
BIAS CIRCUITRY FOR STACKED TRANSISTOR POWER AMPLIFIER STAGES

Arthur John Leidich, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

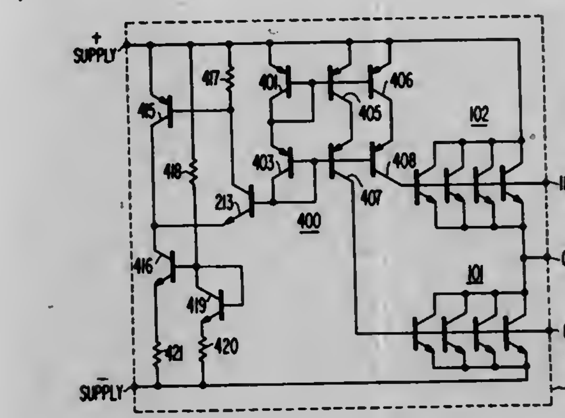
Filed May 24, 1973, Ser. No. 363,563

Int. Cl. H03f *3/04*

U.S. Cl. 330—22 **9 Claims**

1. An amplifier comprising, in combination:
first and second transistors of the same conductivity type, each having emitter, base and collector electrodes, each having the same common-emitter forward current gain denominated beta;
first and second terminals for the application of an energizing potential therebetween and a third terminal, said first transistor emitter electrode being connected to said first terminal, said first transistor collector electrode and said second transistor emitter electrode each being connected to said third terminal, said second transistor collector electrode being connected to said second terminal;
auxiliary transistor means, including emitter electrode means and collector electrode means and base electrode means, and being thermally coupled to said first and second transistors;

means connected between the emitter electrode means and collector electrode means of said auxiliary transistor means for causing a constant current flow therebetween within said auxiliary transistor means; and
first and second current amplifier means, each having a constant and temperature-independent current gain of substantially equal value to the current gain of the other,



each having an input circuit connected to the base electrode means of said auxiliary transistor means to receive an input current therefrom, and each having an output circuit for responding to its input current to provide an oppositely directed output current, the output currents being respectively applied to separate ones of the base electrodes of said first and said second transistors.

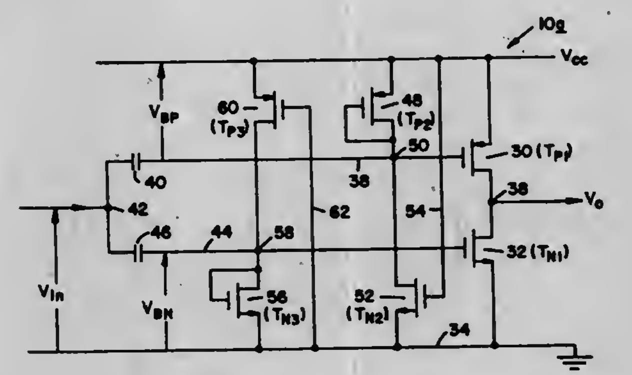
3,887,881
LOW VOLTAGE CMOS AMPLIFIER

Kurt Hoffmann, Sunnyvale, Calif., assignor to American Micro-Systems, Inc., Santa Clara, Calif.

Filed Jan. 24, 1974, Ser. No. 436,151

Int. Cl. H03f *3/16*

U.S. Cl. 330—35 **5 Claims**



1. An amplifier comprising:
a pair of amplifying transistors connected to a common output junction, including a first transistor connected to a voltage supply line and a second transistor connected to a ground-line;
a first lead extending from an input junction to the gate of said first amplifying transistor and a second lead extending from said input junction to the gate of said second amplifying transistor, each of said leads being connected through a capacitor means for preventing the flow of direct current; and
a pair of divider networks connected to said voltage supply line and said ground-line, each said network comprising a pair of biasing transistors connected in series and with a junction between them connected to at least one of said leads for the gates of said amplifying transistors.

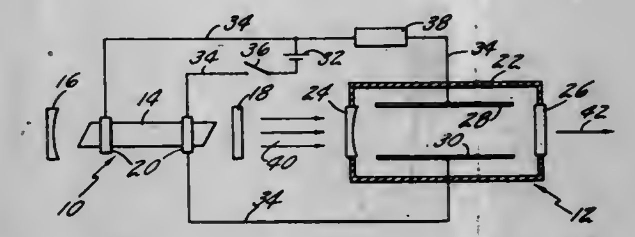
3,887,882
ELECTRIC DISCHARGE LASER WITH ELECTROMAGNETIC RADIATION INDUCED CONDUCTIVITY ENHANCEMENT OF THE GAIN MEDIUM

David C. Smith, Glastonbury, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Aug. 1, 1972, Ser. No. 277,023

Int. Cl. H01s *3/09*

U.S. Cl. 331—94.5 P **12 Claims**



3. A gas laser for producing energy in the form of coherent electromagnetic radiation comprising:
an optical resonator for producing laser radiation oscillations with a gain medium;
means for producing radiation which is injected into the resonator and absorbed by the gain medium thereby enhancing the electrical conductivity of the gain medium; and
means for passing a nonarcing electric current through the conductivity enhanced gain medium to produce a population inversion in the energy levels of the gain medium.

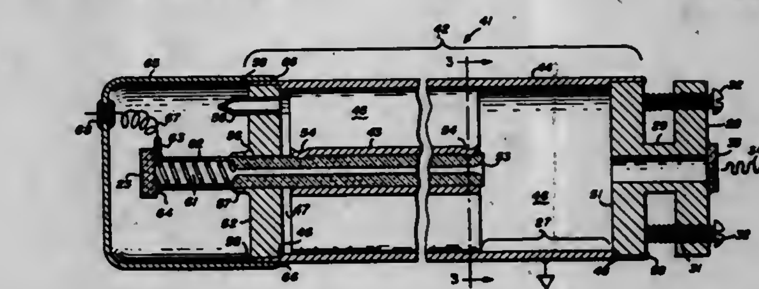
3,887,883
GAS LASER TUBE AND METHOD OF FABRICATING SAME

Lewayne E. Garman, 938 Iris, Sunnyvale, Calif. 94086

Filed Oct. 29, 1973, Ser. No. 410,608

Int. Cl. H01s *3/22*

U.S. Cl. 331—94.5 PE **7 Claims**



1. In a gas laser tube:
a hollow elongated unipotential metallic envelope means;
metallic wall means extending transversely of said envelope means in axially spaced relation as unipotential portions of said envelope means;
means for defining at least a portion of a gas tight enclosure within said envelope means between said metallic transverse wall means;
an elongated electrically insulative glow discharge tube disposed within said elongated metallic envelope means in axial alignment therewith;
support means disposed (within said envelope means) intermediate said transverse wall means for supporting said glow discharge tube from that portion of said hollow metallic envelope means intervening between said transverse wall means;
means defining an optical resonator disposed in axial alignment with said glow discharge tube;
means filling said glow discharge tube with a fluid laser gain medium; and
means for establishing an electrical discharge within said gain medium within said discharge tube for supporting

sustained stimulated coherent emission of optical radiation within said optical resonator of the laser.

3,887,884
RELAXATION OSCILLATOR

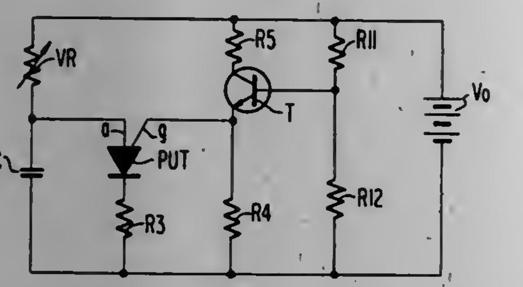
Takeshi Suzuki, Okazaki, Japan, assignor to Minolta Camera Kabushiki Kaisha, Japan

Filed Mar. 19, 1973, Ser. No. 342,390

Claims priority, application Japan, Mar. 17, 1972, 47-32865

Int. Cl. H03k *4/48*

U.S. Cl. 331—111 **2 Claims**



1. A relaxation oscillator comprising a D.C. power source, a programmable unijunction transistor having an N-shaped anode-voltage-current characteristic, a timer circuit including a variable resistor and a capacitor connected in series across said power source, said capacitor being connected between the anode and cathode of said programmable unijunction transistor, a second transistor having its emitter connected to the gate of said programmable unijunction transistor, the collector of said second transistor being connected through a resistance to one end of said power source, a fixed resistor connecting the emitter of said second transistor to the other end of said power source, and a voltage divider having its respective ends connected across said power source and a central point providing a divided output connected to the base of said second transistor.

3,887,885
ELECTROOPTIC MODULATOR

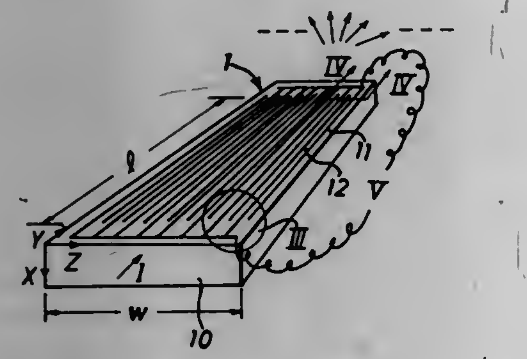
Shuzo Hattori, and Tadao Hiramatsu, both of Nagoya, Japan, assignors to Hagiwara Denki Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 28, 1973, Ser. No. 419,869

Claims priority, application Japan, Dec. 4, 1972, 47-121353

Int. Cl. H01s *3/10*

U.S. Cl. 332—7.51 **8 Claims**



1. An electrooptic modulator comprising:

an electrooptic crystalline medium having a front side and rear side and a surface therebetween of a plane defined by rectangular coordinate first and second axes;

electrodes provided on said surface to cause in said medium and subjacent said surface an electrostatic field which is spatially periodic in a direction of said first axis and uniform in a direction of said second axis;

a first means to apply to said electrodes a voltage variable in accordance with a modulating signal; and

a second means to couple onto the front side of said medium an incident beam of electromagnetic energy with flat-aligned planes toward a direction of said second axis and in such an angle range that said beam propagates in said medium to be totally reflected at an inside of said surface, said medium delivering modulated output beams from the rear side thereof.

3,887,886
BALANCED MODULATOR CIRCUIT

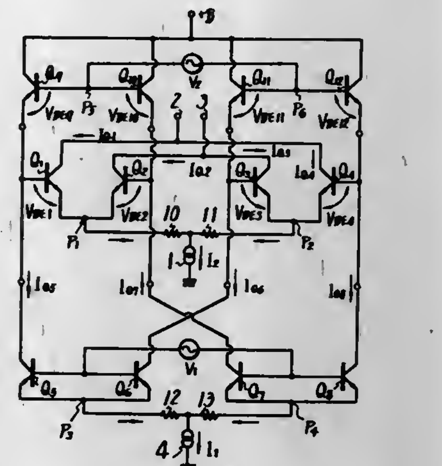
Takashi Okada, and Takao Tsuchiya, both of Kanagawa-ken, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 428,136

Claims priority, application Japan, Dec. 29, 1972, 48-548

Int. Cl. H03c *1/54;* **H03f** *3/26*

U.S. Cl. 332—43 B **15 Claims**



1. A balanced modulator circuit comprising:

A. a first differential amplifier comprising:
  1. first and second input terminals, and
  2. first and second output terminals;

B. a second differential amplifier comprising:
  1. third and fourth input terminals, and
  2. third and fourth output terminals connected respectively, to said second and first output terminals of said first differential amplifier;

C. means for supplying a first input signal differentially to each of said first and second differential amplifier;

D. means for supplying a second input signal to said first and second input terminals in one condition and for supplying said second input signal to said third and fourth input terminals differentially with respect to said one condition such that said first and second differential amplifier comprise a composite differential amplifier.

3,887,887
ACOUSTIC BULK MODE SUPPRESSOR

Rogert S. Wagers, Richardson, Tex.; Michael J. Birch, Rothersthorpe, England; Clinton S. Hartmann, and Donald F. Weirauch, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 28, 1973, Ser. No. 429,476

Int. Cl. H03h *9/30, 9/32, 9/26*

U.S. Cl. 333—30 R **4 Claims**

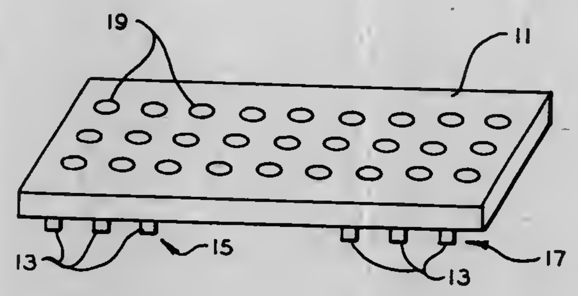
1. An acoustic surface wave device comprising:

a substrate of piezoelectric material having a parallelepiped configuration,

said substrate having a pair of major surface areas in spaced parallel relationship with respect to each other and defining top and bottom surfaces respectively thereof,

at least one acoustic surface wave transducer disposed on said top surface of said substrate for generating acoustic surface waves propagating along said top surface of said substrate, and

means defining a multiplicity of topographic deformations on the bottom surface of said substrate, said multiplicity of topographic deformations being spaced apart in a random pattern and having respective width dimensions on the order of magnitude of one-half acoustic wavelength of the acoustic surface waves to be generated by said at least one acoustic surface wave transducer disposed on the top surface of said substrate, and the spacing between adjacent ones of said topographic deformations being of the order of magnitude of the acoustic wavelength along the direction of propagation of acoustic surface waves to be generated by said at least one acoustic surface wave transducer disposed on the top surface of said substrate.



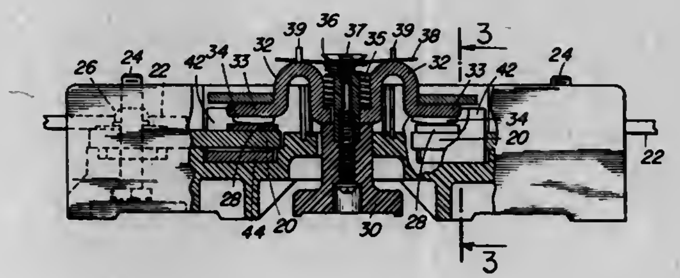
3,887,888
HIGH CURRENT SWITCH

John Bayles, East Dover, Vt.; Randall C. Bremer, East Granby, Conn.; George E. Gauthier, Farmington, Conn.; Frank J. Nascimbeni, Avon, Conn., and Robert J. Petitjean, Simsbury, Conn., assignors to Arrow-Hart, Inc., Hartford, Conn.

Filed Apr. 4, 1973, Ser. No. 347,460

Int. Cl. H01h *77/08*

U.S. Cl. 335—195 **5 Claims**



1. An electric switch comprising a pair of fixed contact members and a bridging contact member movable into and out of engagement with said fixed contact members, a pair of members of ferro-magnetic material for each pair of fixed and movable contact members forming a loop through which extends at least one contact supporting member of each pair thereof, one magnetic member of each pair thereof being secured to said bridging contact member, said magnetic members providing a flux concentrating path for electro-magnetic flux around said loop-penetrating current-conducting members whereby on occurrence of a short circuit in the electric circuit including said contacts, said one magnetic member is attracted toward the other magnetic member and said contacts are held in engagement by a force proportional to the current flow through said contact members, and operating means carrying said bridging contact member, and anti-rocking means carried by said operating means acting on said bridging contact member in switch-closed position to prevent rocking of the contacting surfaces of said bridging member on the contacting surfaces of said fixed contact members in switch-closed position on a short circuit condition.

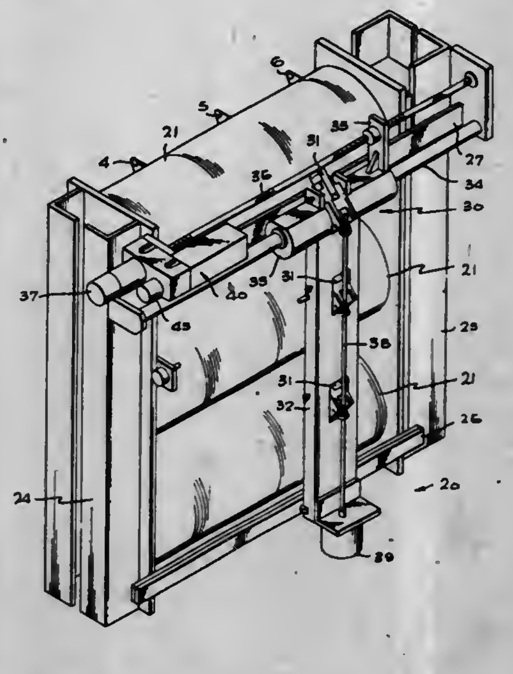
3,887,889
HIGH POWER VARIABLE AUTOTRANSFORMER

Frank J. Karlov, Park Ridge; Leonidas Sidorewicz, Chicago; Charles L. Redfield, Woodridge, and Robert Evans, Evanston, all of Ill., assignors to Litton Medical Products, Inc., Elk Grove, Ill.

Filed Nov. 28, 1973, Ser. No. 419,694

Int. Cl. H01f *21/00, 29/00*

U.S. Cl. 336—146 **13 Claims**



1. A transformer comprising:

a first continuous winding forming a plurality of turns;

means for contacting individual turns of said winding, said means comprising a metal contact movably mounted on a carriage, said contact having a bearing surface for engaging said turns;

means for axially moving said metal contact along the length of said winding and positioning said metal contact approximately over any desired turn of said winding; and indexing means for automatically centering said metal contact exactly over the midpoint of any selected turn, said indexing means including means for sensing the position of said metal contact with said selected turn and moving said metal contact, in response to the sensed information, to the midpoint of said selected turn.

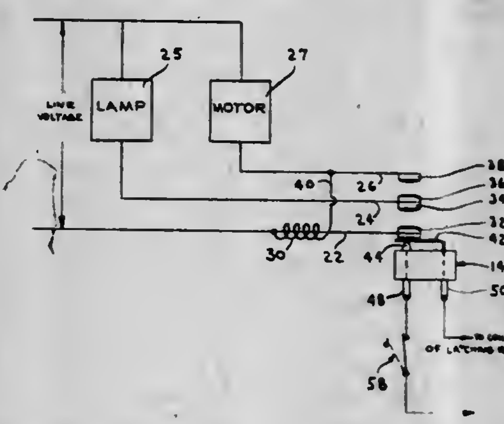
3,887,890
SWITCH MECHANISM ENSURING THE AUTOMATIC CLOSING OF A MOTOR-OPERATED GARAGE DOOR

Florian Lafontaine, 10747 Hotel de Ville, Montreal Nord, Quebec, Canada

Filed Mar. 8, 1974, Ser. No. 449,269

Int. Cl. H01h *71/16*

U.S. Cl. 337—103 **4 Claims**



1. A switch mechanism for ensuring the automatic closing of a motor-operating garage door after said door has reached a fully opened position, comprising, in combination:

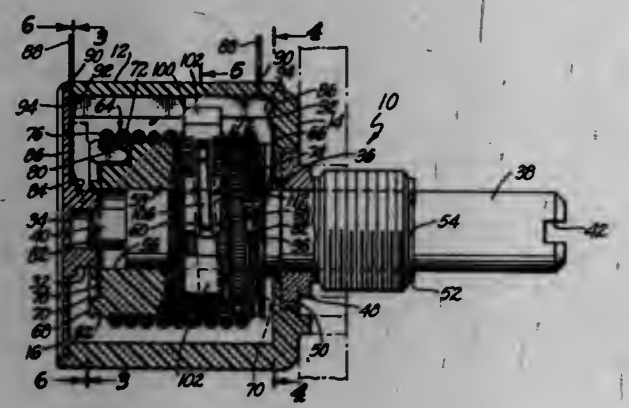
a. a thermostatic switch for providing delayed switch action including:
  i. a first bi-metallic blade having an electric heating element mounted longitudinally thereon; said heating element operating on said blade when energized by a motor-operating current;
  ii. a second blade adjacently spaced from said first blade for turning on an electric lamp when contacted by said first blade when temperature raises in said heating element;
  iii. a third blade adjacently spaced from said second blade for short-circuiting said heating element when energized for an excessively long period of time;
b. a second switch having contacts normally closed by said first blade of said thermostatic switch when the garage door is in a fully closed position; said second switch being connected to a latching relay coil adapted to operate the garage door motor; said contacts opening when said motor-operating current passes through said heating element and said first blade moves to contact said second blade; said contacts being subsequently closed by said first blade when, after the garage door has reached a fully opened position, said first blade returns to itis initial contact closing position.

3,887,891
ROTARY POTENTIOMETER

Billy Harold Tice, Carlsbad, Calif., assignor to Polaris Industrial Enterprises, Oceanside, Calif.

Filed Sept. 28, 1973, Ser. No. 401,687
Int. Cl. H01c *5/02*

U.S. Cl. 338—145 **4 Claims**



1. A potentiometer having a cylindrical housing, a rotor rotatably mounted in said housing, means for rotating said rotor, a resistance element coiled around said rotor, slider means extending between the interior of said housing and said resistance element for establishing electrical contact with said resistance element as said rotor is turned and two terminal means, each of said terminal means establishing electrical contact between an end of said resistance element and the exterior of said housing in which the improvement comprises: each of said terminal means having two parts, the first of said parts comprising a ring located concentrically about the axis of rotation of said rotor, the first of said parts of both of said terminal means being located on said rotor, the second of said parts comprising brush means resiliently engaging the associated ring, the second of said parts of both of said terminal means being located within the interior of said housing and including yokes straddling said shaft, the ends of said yokes comprising said brush means, said rings on both of said terminal means being mounted on the ends of said rotor and include resilient tabs extending underneath said resistance element, said tabs being located adjacent to the ends of said resistance element and resiliently engaging said resistance element so as to serve as end terminals therefor,

said slider means including a slider body positioned within said housing between the exterior of said rotor and the interior of said housing, an electrical conductor mounted on the interior of said housing so as to extend parallel to the axis of said rotor, rail means engaging said slider body and extending parallel to the axis of rotation of said rotor located on the interior of said housing, said rail means being engaged by said slider body so that rotation of said slider body is prevented, guide means located on said slider body for engaging said rotor for moving said slider body along said rail means as said rotor is rotated, and spring contact means located on said slider body for resiliently engaging said resistance element and said contact strip in all positions of said slider body,

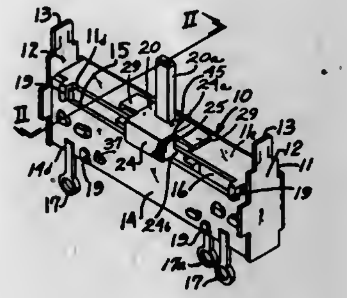
said rings on both of said terminal means including extensions extending therefrom beyond the periphery of said rotor, said extensions serving as stops to limit movement of said slider body and said rotor as said shaft is rotated, tab means for making an electric connection integrally formed with the second of said parts of both of said terminal means, said tab means extending from the interior of said housing to the exterior of the periphery of said housing.

3,887,892
VARIABLE RESISTANCE SLIDE CONTROL

Arthur L. Rozema; John D. Saik, and Mervin B. Arisman, all of Elkhart, Ind., assignors to CTS Corporation, Elkhart, Ind.

Filed July 16, 1973, Ser. No. 379,719
Int. Cl. H01c *9/02*

U.S. Cl. 338—183 **18 Claims**



1. A variable resistance slide control comprising an elongated housing having a front wall and a side wall extending normal to the front wall, a dielectric base mounted to the housing in spaced parallel relationship to the side wall, the dielectric base having a top edge abutting against the edge of the front wall and having a bottom edge, the dielectric base being provided with notches communicating with the bottom edge, a resistance element and a collector element supported on the base, a plurality of terminals connected to the resistance element and to the collector element for connecting the control to an external electrical circuit, the terminals being partially received in the notches provided in the base, control operating means supported for movement relative to the housing, a contactor constrained to move with the control operating means, the contactor wipably engaging said resistance element and the collector element, the edge of the front wall of the housing and the top edge of the dielectric base being spaced from each other and defining an elongated slot, the control operating means having a portion extending through the slot and bearing against the front wall.

3,887,893
FUSIBLE RESISTOR

Ivan L. Brandt, Fox Point, and Theodor von Alten, Grafton, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Sept. 24, 1973, Ser. No. 400,236
Int. Cl. H01c *1/00*

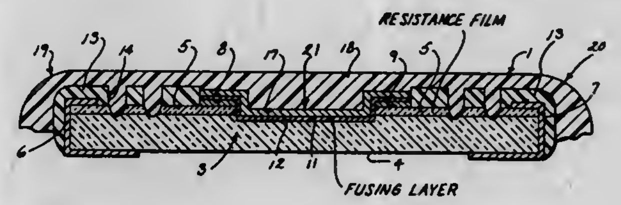
U.S. Cl. 338—262 **16 Claims**

1. A fusible resistor, the combination comprising:

a cylindrical substrate made of an electrically insulating material and having ohmic contacts disposed at its ends;

a pair of lead wires fastened to the ends of said cylindrical substrate and in electrical contact with said ohmic contacts;

a resistive film deposited on the surface of said cylindrical substrate between said ohmic contacts, said resistive film being divided into two resistor sections by a gap which interrupts electrical continuity between said lead wires; and



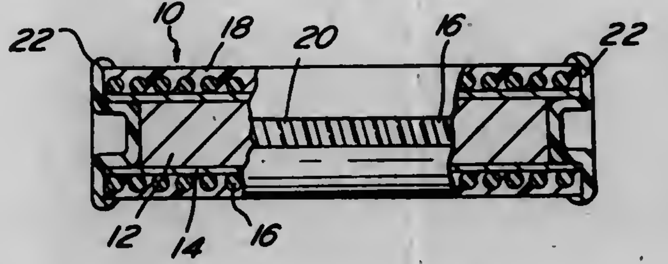
a fusible link deposited on said substrate and within said gap to provide electrical continuity between said resistor sections at normal operating temperatures, said fusible link including a fusing layer which melts at a preselected temperature to open circuit.

3,887,894
HELICAL RESISTOR

Floyd R. Rudd, North Wales, and George D. MacKenzie, Maple Glen, both of Pa., assignors to TRW Inc., Cleveland, Ohio

Division of Ser. No. 311,355, Dec. 4, 1972, Pat. No. 3,849,878. This application Dec. 26, 1973, Ser. No. 428,041
Int. Cl. H01c *1/02*

U.S. Cl. 338—264 **4 Claims**



1. A resistance element comprising

a wire core having ends and a cylindrical outer surface,

a cylindrical insulating layer on the outer surface of the core with said layer having ends extending beyond the ends of the core which are recessed therefrom,

a resistance wire helically wound around the insulating layer along the length of the insulating layer and about the extending ends of the insulating layer, and

a protection layer around the resistance wire winding.

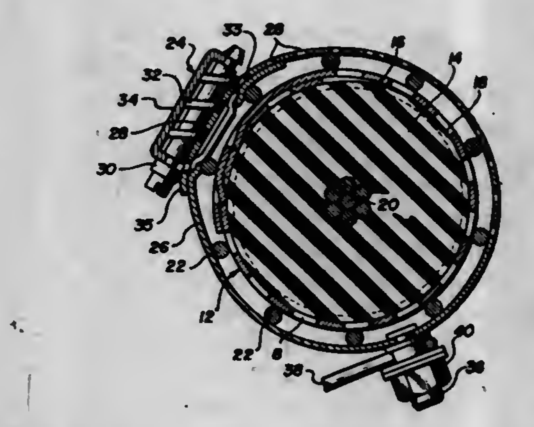
3,887,895
CLAMPING ARRANGEMENT AND METHOD

Chester E. Pierzchala, Wheaton, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed Jan. 7, 1974, Ser. No. 431,473
Int. Cl. H01r *3/06*

U.S. Cl. 339—14 R **6 Claims**

1. A ground clamping arrangement for forming a conductive connection with an electrical cable having a conductive core, a surrounding jacket of insulating material, and a series of grounding wires helically disposed over said insulating jacket in substantially concentric relation therewith and with the wires being circumferentially spaced apart, said arrangement being remote from a cable splice or termination and comprising a member deformable into a collar radially interposed between the jacket and the grounding wires, and a clamp having an electrically conductive ring for enveloping said wires in the region of said collar and including means for constricting said ring to apply radially inward pressure against said wires and cause said wires to impinge snugly upon said collar, and means preventing constriction of said collar under pressure from said ring, thereby to prevent diametral reduction of said jacket, said grounding wires being continuous and maintaining their helical lay across the width of said collar and for substantial distances on opposite sides of said arrangement.

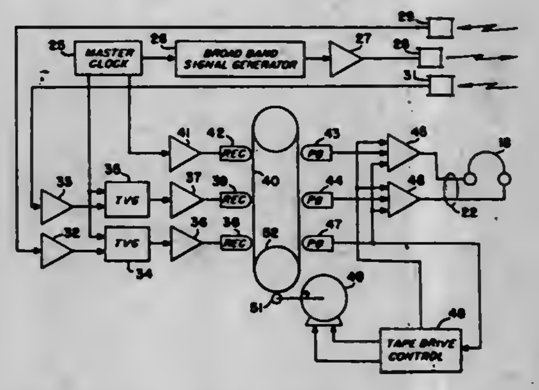


3,887,896
ACTIVE SONAR IMAGE PERCEPTION

Clarence F. Ramstedt, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 18, 1974, Ser. No. 461,840
Int. Cl. G01s *9/66, 7/54*

U.S. Cl. 340—3 R **12 Claims**



1. A swimmer carrier active sonar system comprising;

ensonifying means for projecting acoustic energy into a volume of water adjacent the swimmer;

two spaced hydrophone means held in spaced relation to said ensonifying means for receiving echo returns from the acoustic energy in a stereo information pattern and converting them to electrical signals;

master clock means connected to said ensonifying means for production of clock signals having a predetermined frequency;

stereo information processing circuitry connected to said two spaced hydrophones for processing the electrical signals;

first magnetic recording head means connected to said stereo information processing circuitry for making a recording field adjacent thereto;

second magnetic recording head means effectively connected to said master clock means for producing a recording field adjacent thereto in response to the clock signals;

a magnetic tape positioned adjacent said first and second magnetic recording head means in the associated recording fields to record the magnetic fields adjacent thereto;

two speed tape transport means operatively engaging said magnetic tape for movement past said magnetic recording head means;

first magnetic playback head means positioned adjacent said magnetic tape to respond to signals recorded thereon by said first magnetic recording head means;

second magnetic playback head means positioned adjacent said magnetic tape to respond to signals recorded thereon by said second magnetic recording head means;

stereo signal replay circuit means connected to said first magnetic playback head means for amplifying the recorded signals to which said first magnetic playback head means responds;

tape drive control circuit means connected to said second magnetic playback head means and to said two speed tape transport means for altering the speed thereof in accordance with the response of said second magnetic playback head to signals recorded on said magnetic tape by said second magnetic recording head;

binaural electroacoustic transducers physically positioned adjacent the ears of the swimmer and electrically connected to said stero playback means for providing a spatial, aural reconstruction of echo return impinging said two spaced hydrophone means, whereby the diver may aurally locate the object producing the echo return during periods of replay at the lower of the two speeds of said tape transport due to heightened stereophonic illusion.

3,887,897

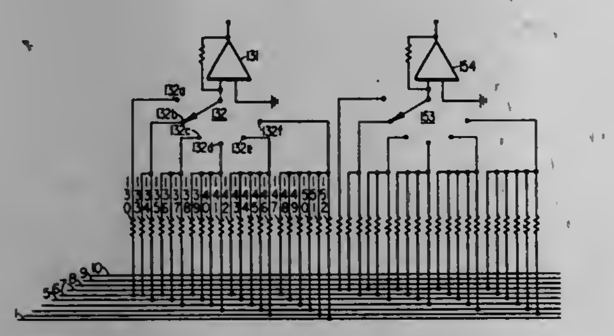
SYSTEM FOR CHANGING SEISMIC DETECTION ARRAY LENGTHS

Edwin B. Neitzel, Dallas, and Marvin D. Gontarek, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed July 23, 1973, Ser. No. 381,812

Int. Cl. G01v *1/16*

U.S. Cl. 340—7 R **10 Claims**



1. Means for varying the effective seismic detector array length while maintaining constant the effective detector array spacing in a seismic surveying system where an array channel from each detector array in a seismic spread leads to a multichannel recorder, comprising:

a. a plurality of multi-state input/output channel selectors, each connected at one input thereof to one of said array channels by means of first weighting means leading to first input terminals of said selectors,

b. connections between pairs of said array channels from adjacent detector arrays each by means of pairs of second weighting means leading to second input terminals of said selectors, and

c. means for selectively connecting inputs of said recorder to said first or said second output terminals of said selectors.

3,887,898

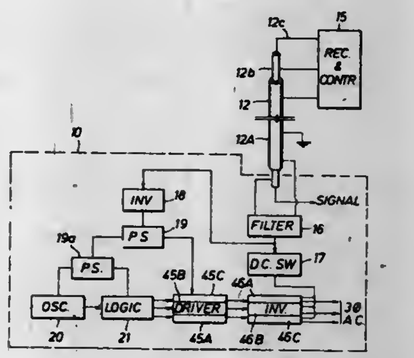
WELL LOGGING SYSTEM USING 3 PHASE AC POWER SUPPLY

John M. Jones, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Aug. 20, 1973, Ser. No. 389,857

Int. Cl. G01v *1/40*

U.S. Cl. 340—18 R **7 Claims**



1. A logging tool for use in a well bore where an electrical direct current is supplied via an armored logging cable to such tool,

said logging tool including a fluid tight housing for containing a system for converting such electrical direct current into three phase alternating current, said system comprising

plural inverter means including plural transformer means for receiving direct current and conductor paths for providing current flow paths in opposite directions through primary windings of said transformer means, said current flow conductor paths being adapted for receiving such direct current, means in said current flow conductor paths for alternating the application of such direct current to said transformer means,

means for generating clocking pulses and means for converting said clocking pulses into at least three phase related control signals, and

means responsive to said control signals for electrically operating said alternating means in a timed relationship for producing at least three, phase related alternating current outputs for input to said primary windings of said transformer means.

3,887,899

DUAL BRAKE SYSTEM FAULT DETECTION DEVICE

Hiroshi Kawaguchi, and Kiyoshi Nishiwaki, both of Shizuoka-ken, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Apr. 24, 1974, Ser. No. 463,689

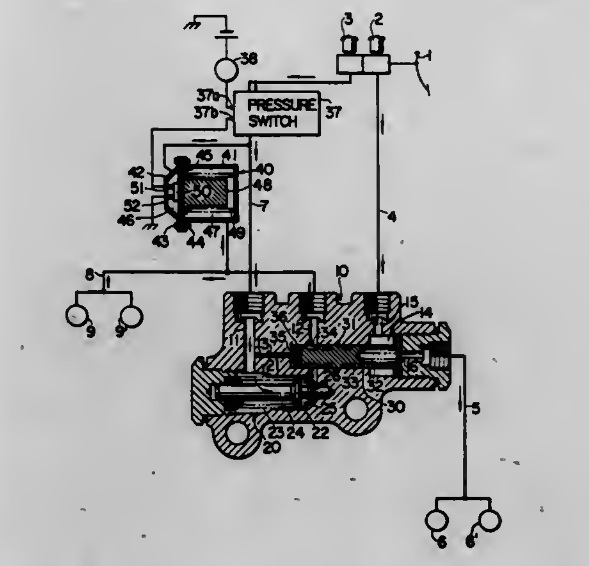
Claims priority, application Japan, June 21, 1973, 48-69178

Int. Cl. B60t *8/26, 17/22*

U.S. Cl. 340—52 C **4 Claims**

1. A fault detecting device for a vehicle dual brake system having brake actuating means, a front brake system including a front master cylinder and front wheel cylinders, a rear brake system including a rear master cylinder and rear wheel cylinders, conduit means operatively connecting said master cylinders to apply braking fluid pressure to said wheel cylinders to brake said vehicle in response to operation of said actuating means, and regulating valve means provided in said rear brake system for regulating the braking fluid pressure applied in said rear wheel cylinders, said fault detection device comprising an alarm circuit including signal means for providing an indication of a fault in said system upon actuation of said circuit, first and second pressure-sensitive switches each operatively associated with said alarm circuit and adapted to be switched between a circuit activating condition and a circuit deactivating condition in response to pressure applied thereto, said first pressure-sensitive switch being connected to sense pressure in said rear master cylinder and to switch to said circuit-

activating condition when said rear master cylinder pressure reaches a predetermined level, said second pressure-sensitive switch being connected to sense a difference between master cylinder pressure and wheel cylinder pressure and switch to said circuit deactivating condition when the sensed difference reaches a predetermined level, said alarm circuit being operative to generate a fault-indicating signal when both said switches are in the circuit-activating condition.



3,887,900

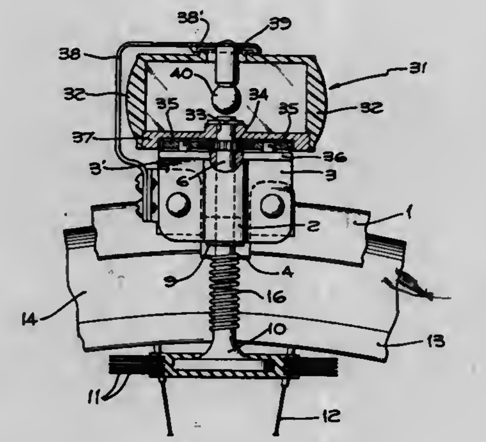
ROTATING BICYCLE SIGNAL AND DRIVE THEREFOR

Gerald Lawrence Goedert, 1907 E. Rowland Ave., Camarillo, Calif. 93010

Filed July 1, 1974, Ser. No. 484,680

Int. Cl. B62j *3/00, 5/00;* B60q *1/26*

U.S. Cl. 340—134 **6 Claims**



1. A rotatable signaling device for a bicycle or the like, comprising:

resilient means for translating and transmitting rotation of a bicycle wheel about a horizontal axis into rotation of a shaft about a virtually vertical axis;

journal means for supporting a shaft for rotation about a virtually vertical axis, said journal means including means for connecting the journal means to a bicycle frame;

a shaft in said journal means;

a light-transmitting and reflecting signal mounted for rotation by said shaft about a vertical axis;

and a resilient, shock-absorbing torsion-transmitting coupling between the signal and said shaft.

3,887,901

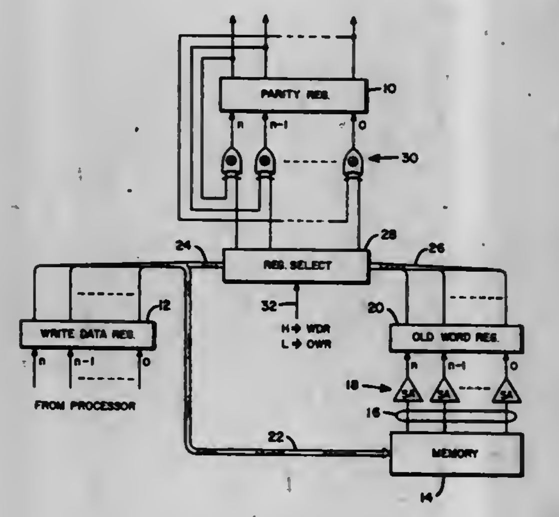
LONGITUDINAL PARITY GENERATOR FOR MAINFRAME MEMORIES

Harry Winthrop Moore, III, Lakeland, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 29, 1974, Ser. No. 465,014

Int. Cl. G06f *11/10*

U.S. Cl. 340—146.1 AG **3 Claims**



1. A circuit for continuously generating a longitudinal parity word each time a new item of data is entered into a computer memory device comprising in combination:

a. a memory for storing digital information at addressable locations therein;

b. A first multistage register connected to said memory for at least temporarily storing a data word to be entered into said memory at a predetermined address;

c. a second multistage register connected to the output of said memory adapted to at least temporarily hold the data word stored in said memory at said predetermined address which is to be replaced with the data word in said first register;

d. a longitudinal parity word register having a number of individual stages equal in number to the size of said data word for storing a binary number representative of the parity word which when added to the words stored in said memory will cause the total number of bits occupying a given bit position in all of said words in said memory to be odd or even;

e. a plurality of Exclusive OR logic circuits equal in number to the number of bits in said data words having first and second input terminals and an output terminal, said output terminal of each of said logic circuits being connected individually to an input of a separate one of said stages of said parity word register;

f. means connecting the output of each of said stages in said parity word register individually to the first of said input terminals of said logic circuit associated with that stage; and

g. means for alternately connecting the outputs from the individual stages of said first and second registers to said second terminal of said logic circuit associated with the corresponding stage of said parity word register.

3,887,902

METHOD AND APPARATUS FOR PROCESSING CALLS DISTRIBUTED RANDOMLY IN TIME AND REQUIRING RESPONSE DELAYS OF ANY DURATION, BUT SPECIFIED FOR EACH CALL

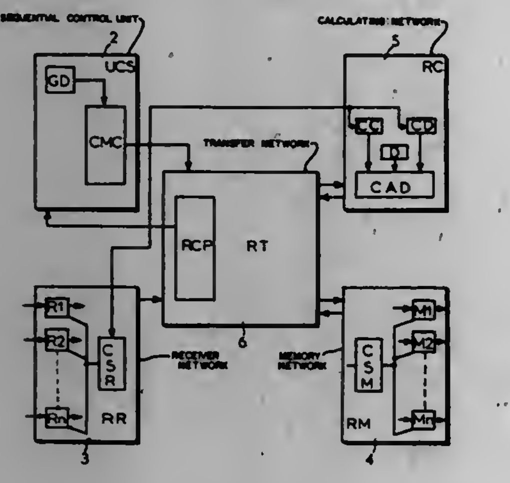
Pierre Labalme, Paris, France, assignor to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Filed Sept. 25, 1973, Ser. No. 400,578

Claims priority, application France, Sept. 29, 1972, 72.34508

Int. Cl. G06f *9/16, 9/19*; **G04c** *23/38*

U.S. Cl. 340—172.5 15 Claims



1. A circuit for processing calls distributed randomly in time and generated by a plurality of devices, each call being accompanied by a delay data item which represents the response delay required by the calling device in terms of a multiplier to be assigned to a predetermined minimum time interval *d*, comprising:

- a sequential control unit for controlling the operation of said circuit in cycles and for providing a succession of control order signals during each cycle;
- a plurality of call receivers, one receiver for each device;
- a sequential selection circuit for sequentially selecting said call receivers in response to said control order signals;
- a plurality of alterable memories, one alterable memory for each device, each of said memories comprising means for chaining into a circular waiting queue a memory assigned to calling devices;
- a calculating network responsive to said control order signals for generating a first representation of the number of said cycles of operation of said circuit, a second representation of the number of said calling devices for which memories are chained into said queue, and a sum representation of the quantities represented by said first and second representations; and
- a transfer network responsive to said control order signals and coupled sequentially to said memories, to the ones of said call receivers selected by said selection circuit, and to said calculating network, for transferring to one of said memories the delay item provided by a calling device and the current sum representation generated by said calculating network.

3,887,903

INTERACTIVE MAN-MACHINE METHOD AND SYSTEM FOR GRADING PATTERN PIECES AND FOR PRODUCING AN APPAREL MARKER

Charles Ronald Martell, Dallas, Tex., assignor to Camsco, Inc., Richardson, Tex.

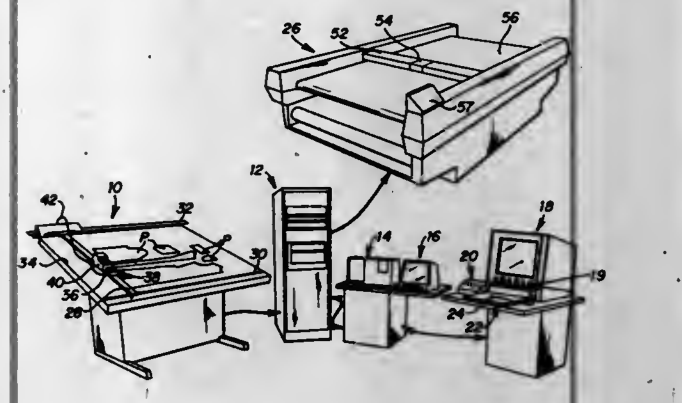
Filed Aug. 29, 1973, Ser. No. 392,651

Int. Cl. G06f *3/14*

U.S. Cl. 340—172.5 30 Claims

1. A system for laying out an apparel pattern marker wherein a plurality of apparel pattern pieces are arranged within a predetermined marker area comprising:

- screen means for displaying to an operator scaled miniature representations of said pattern pieces adjacent a scaled miniature representation of said marker area;
- positioning means movable by the operator to selectively move said representations of said pattern pieces one at a time on said screen means to within said representation of said marker area, wherein said representations of said pattern pieces may be efficiently arranged within said representation of said marker area to form a simulated marker; and
- means responsive to the orientation of said representations of said pattern pieces forming said simulated marker on said screen for plotting the full size marker layout of said pattern pieces in the predetermined full size marker area.



3,887,904

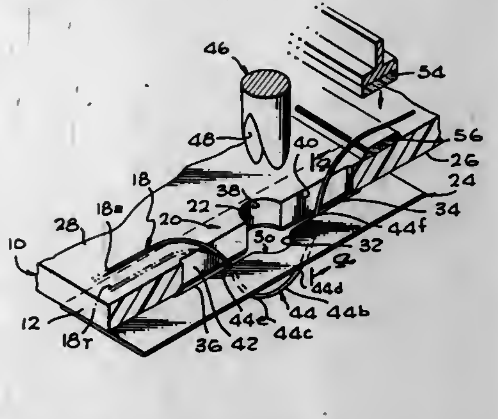
WIRE MASS TERMINATION

Niels Krag, Pacific Palisades, Calif., assignor to Electronic Memories & Magnetics Corp., Hawthorne, Calif.

Filed Aug. 22, 1973, Ser. No. 390,357

Int. Cl. G11c *5/08*; **H01f** *41/10*

U.S. Cl. 340—174 MA 11 Claims



1. A circuit assembly comprising:

- an insulating board having a plurality of holes;
- a pad of conductive material surrounding each of said holes in the board, each pad having a slit with a portion lying within the boundary of a corresponding hole;
- a plurality of electrical devices mounted on said board;
- a plurality of wires coupled to said electrical devices and extending over a face of the board and through said holes and slits.

3,887,905

MAGNETIC DOMAIN SHIFTING ARRANGEMENT EMPLOYING MOVABLE STRIP DOMAIN

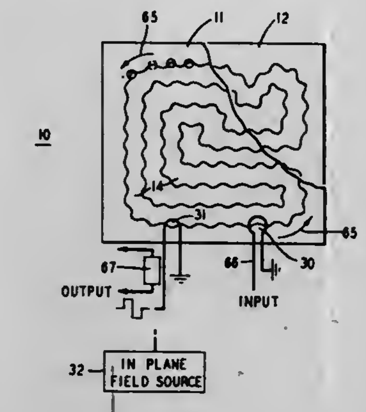
Andrew Henry Bobeck, Chatham, and Henry Evelyn Derrick Scovil, Gladstone, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 29, 1973, Ser. No. 327,625

Int. Cl. G11c *11/14, 19/00*

U.S. Cl. 340—174 TF 16 Claims

1. Magnetic apparatus comprising a first layer of magnetic material having properties such as to be capable of having a domain wall formed therein in response to the presence of a magnetic field in a first range, said wall extending between first and second positions in a manner to form an information channel therebetween in the absence of propagation-assisting physical structures, first means coupled to said layer for introducing a magnetic indication of information to said channel at said first position, and second means also coupled to said layer for detecting said magnetic indication of information at said second position, said magnetic indication being moveable from said first to said second position in the presence of a magnetic field in said first range, said wall having properties such as to be operative in the presence of a magnetic drive field to move said indication therealong.



3,887,906

OPTICAL ASSOCIATIVE MEMORY USING COMPLEMENTARY MAGNETIC BUBBLE SHIFT REGISTERS

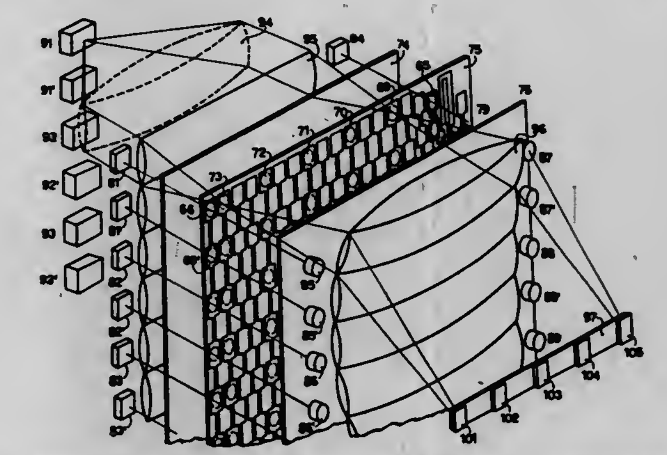
Nicola Minnaja, Milan, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

Filed June 28, 1973, Ser. No. 374,624

Claims priority, application Italy, June 28, 1972, 26323/72

Int. Cl. G11c *11/16, 11/42, 15/00*

U.S. Cl. 340—174 GA 3 Claims



1. An optical associative memory system, comprising an optical support for recording information by means of a variable optical response to illumination of elementary areas in dependence on the recorded information, the optical response of each elementary area of the support being dependent on the transparency of said elementary area in the presence of polarized incident the transmitted light, said recorded information comprising a plurality of words formed each by an ordered set of an equal number of bits, illuminating means for illuminating said support, and an array of electro-optical detector elements for generating electrical signals in response to the illumination of said detectors, said system being characterized in that:

- each bit is recorded both in a first direct form and in a second inverse form, complementary to the first direct form;
- said support comprises a plurality of bit regions, each one recording in the same form the bits of equal order of all the recorded words;
- said illuminating means selectively illuminates at least one of said regions with polarized light;
- said array of detector elements comprises a number of detectors equal to the number of words which may be recorded on the support;
- the optical response of each bit region to the illumination is concentrated on said array of detector elements, each detector being responsive to the illumination resulting from the cumulative optical response of all the illuminated bits of a single word;
- said recording support includes a plate of crystal of rare-earth orthoferrite subject to a magnetic field and provided on at least a face with a suitable pattern of electrical conductors for generating local variation in said magnetic field in response to electrical current flowing therethrough, for generating duplicating, displacing or cancelling magnetic bubbles, said conductors forming magnetic bubble shift registers for recording the information by means of the presence or absence in predetermined time intervals of magnetic bubbles in prearranged memory locations, the presence of said bubbles being detected as a variation of the optical response of said incident polarized light emerging from an analyzing device;
- said shift registers are grouped in pairs of registers, each pair being assigned to the bits of equal order of all recorded words, homologous memory locations in each register of each pair being assigned for recording respectively in direct and inverse form the bits of the same word; said illuminating means selectively illuminates at least one of said registers; and
- said system comprises in addition a "fly-eye" optical device for focusing and superimposing the images of the iluminated register on said array of detector elements.

3,887,907

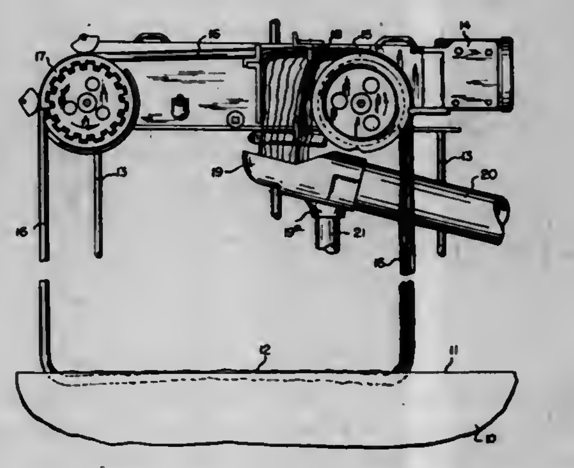
OIL DETECTOR

Eugene L. Brill, 1803 W. Royalton Rd., Cleveland, Ohio 44147

Filed Nov. 12, 1973, Ser. No. 414,996

Int. Cl. G08b *21/00*

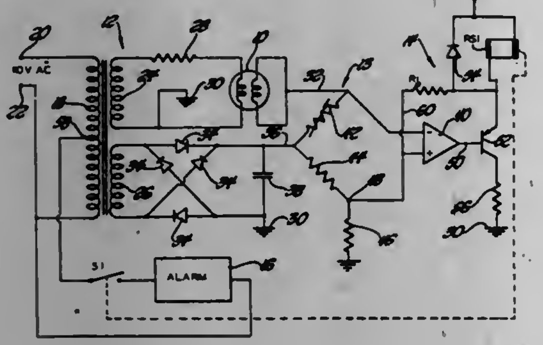
U.S. Cl. 340—236 9 Claims



1. The method of detecting the presence of oil floating on water, comprising taking and collecting all of a continuous liquid sample from the surface of said water at a substantially steady rate using a hydrophobic collector having a greater affinity for oil than for water, collecting a continuous series of samples, each sample of predetermined parameter in a predetermined time constituting a cycle, dumping each sample at the end of each cycle, and providing a signal when a sample reaches said predetermined parameter in less than said predetermined time due to the presence of oil in said sample.

3,887,908
TOXIC GAS INDICATOR

David L. Swigert, Ypsilanti, Mich., assignor to Environmental Metrology Corp., Ann Arbor, Mich.
Filed May 7, 1973, Ser. No. 357,631
Int. Cl. G08b *17/10*
U.S. Cl. 340—237 R **7 Claims**

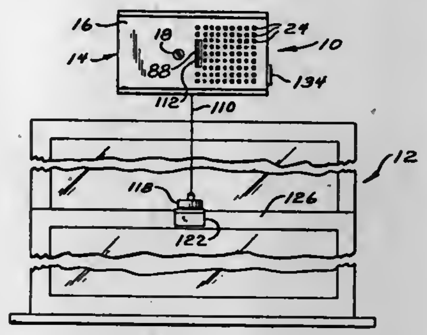


1. Apparatus for indicating the presence of a toxic gas comprising, a solid state sensor having a relatively large nominal resistance but being responsive to the presence of said toxic gas to present a substantially reduced electrical resistance characteristic, bridge circuit comprising as a first leg the series combination of said sensor and a variable resistor and as a second leg the series combination of two reference resistors, the first and second legs being connected in parallel, input circuit means including first means connected directly to said sensor for energizing said sensor with electrical energy of a predetermined magnitude for producing an electrical signal quantity related to the resistance characteristic of said sensor, said input circuit means further including second means connected across both of the first and second legs for energizing the bridge circuit and for producing a reference quantity, control circuit means including comparator means having separate inputs connected to the mid-points of said first and second legs for comparing said electrical signal quantity to said reference quantity and for producing an output signal quantity when said electrical signal quantity bears a predetermined relationship to said reference quantity, and indicator means for indicating an alarm condition connected to be controlled by said output signal quantity for indicating the presence of said gas, said input circuit means including a transformer having a tapped primary winding and first and second secondary windings, said tapped primary winding being connected to said indicator means for energizing said indicator means under the control of said output signal quantity, said first secondary winding being connected to energize said sensor, and said second secondary winding being connected by circuit means to said reference resistor to produce said reference quantity, whereby the relative energization of said first and second legs is constant irrespective of variations in the voltage applied to said primary winding.

3,887,909
ALARM DEVICE

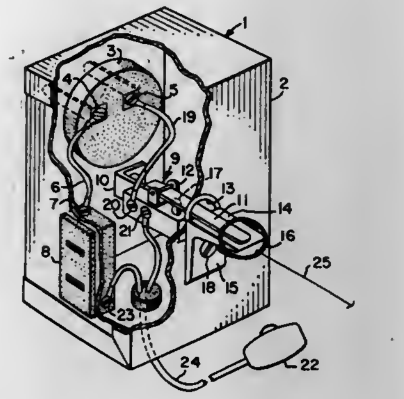
John L. Beiswenger, Pacific Palisades, and Leland DeVon Jorgensen, Chippewa Falls, both of Wis., assignors to National Presto Industries, Inc., Eau Claire, Wis.
Filed Apr. 27, 1972, Ser. No. 248,050
Int. Cl. G08b *13/00, 13/08*
U.S. Cl. 340—274 **11 Claims**

1. An alarm device for use in detecting movement of an object, comprising, in combination, housing means, electrically operated alarm generating means supported by said housing means, a source of electrical energy supported by said housing means, circuit means selectively electrically connecting said alarm generating means to said source of electrical energy, said circuit means including switch means having a pair of spaced fixed contacts and a movable contact arm therebetween and biasing means urging the movable contact arm to one and away from the other of said fixed contacts, said movable contact arm and fixed contacts being connected in said circuit such that said circuit means is closed when said contact arm is contacting either of said fixed contacts and open when said contact arm is disposed intermediate said fixed contacts, a rotatable reel member, means including a length of cord wound about said rotatable reel member, and releasable clutch means for resisting rotation of said reel member, said cord means acting directly on said movable contact arm and having its free end adapted to be secured to the object, said clutch means being releasable to permit unwinding of said cord means from said reel member to facilitate attachment of said cord means to the object and to take up slack in said cord means to place said cord means under tension of an amount sufficient to resist the force of the biasing means and hold said contact arm intermediate and out of engagement with said fixed contacts, whereby when said cord means is pulled, broken or otherwise disturbed said contact arm will be caused to contact one of said fixed contacts and to energize said alarm generating means.



3,887,910
BURGLAR ALARM

Vernon H. Jones, 2553 Falmouth Rd., Akron, Ohio 44313
Continuation-in-part of Ser. No. 306,709, Nov. 15, 1972, abandoned. This application Jan. 22, 1973, Ser. No. 325,741
Int. Cl. G08b *13/00*
U.S. Cl. 340—276 **14 Claims**



1. A burglar alarm for use with an existing power circuit having a plurality of power outlet receptacles at various remote locations from each other the alarm comprising:

a. a trigger operated switch assembly connected between a power input and power output for turning off or on power from the input to the output, the power input of the switch assembly being plugged into one of the power outlet receptacles in an existing power circuit, said trigger operated switch assembly having a trigger operated switch and a trigger mechanism comprising:

1. a fixed trigger arm positioning member attached to the housing and extending outwardly therefrom,
2. a trigger arm operatively associated with the trigger operated switch and extending through an opening in the housing to a position adjacent the positioning member, an outwardly extending flange which is tapered from a larger

thickness at the inner end to a smaller thickness at the outer end to provide greater ease of removal of the retaining member, said trigger arm movable to and from the positioning member,
3. a spring clip retaining means simultaneously engaging the positioning member and the trigger arm to resiliently position the trigger arm with respect to the positioning member, thereby causing the switch to be in an open position, and
4. a release line having one end attached to the retaining member and the opposite end anchored at a remote location from the trigger mechanism,
5. whereby any tension exerted on the line will pull the retaining member out of engagement with the positioning member and the trigger arm and release the trigger arm thereby permitting the switch to close, and

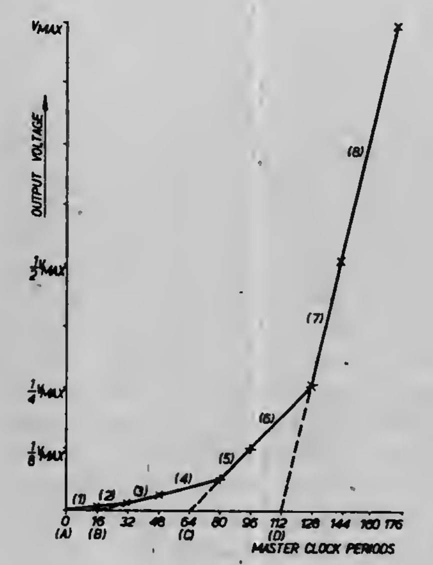
a. a high frequency signal transmitter connected to the power output of the trigger operated switch assembly to send a high frequency signal through the power circuit when the trigger operated switch is closed;

b. a high frequency signal receiver connected to a predetermined location on the power circuit said receiver being responsive to signals transmitted by the signal transmitter over the power circuit to close a switch connected between an input and and output of the receiver; and

c. an electrically operated warning signal device connected to the output of the receiver to produce a warning signal when the trigger operated switch is closed and a high frequency signal from the transmitter causes the switch in the receiver to close thereby causing electrical current to flow to the warning signal device.

3,887,911
DIGITAL-TO-ANALOGUE CONVERTER FOR RAPIDLY CONVERTING DIFFERENT CODES

Philip Richard Bell, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, Essex, England
Filed Feb. 15, 1973, Ser. No. 332,548
Claims priority, application United Kingdom, Feb. 24, 1972, 8562/72
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 DA **3 Claims**



1. A digital-to analogue converter comprising, in combination:

storage means for storing successive digital codes during conversion thereof to corresponding analogue signals, each of said codes including certain bits identifying a straight line segment of a conversion law obeyed by the converter and other bits providing a digital number identifying whereabouts on said segment the corresponding analogue signal lies, at least two of said segments defining a straight line section having a predetermined positive slope starting from a finite minimum value of said corresponding analogue signal and which defines the beginning point of one line segment;

means responsive to said certain bits identifying either said two segments for producing a linearly increasing signal whose rate of increase corresponds to said predetermined slope whereby said signal reaches the level of said beginning point of said one line segment after a predetermined period of time;

counter means for counting clock signals to produce an increasing digital output number;

first clock signal means for producing a first clock signal of a frequency corresponding to m clock pulses during said predetermined period of time;

said one line segment having an end point which is reached by said linearly increasing signal after $m = k$ of said first clock pulses where k is the number of said first clock pulses required for said linearly increasing signal to increase from said minimum value to said end point;

second clock signal means for producing a second clock signal of a frequency corresponding to m second clock pulses during the time taken for said linearly increasing signal to reach said end point of said one line segment;

delay means for driving said counter means after m pulse inputs thereto;

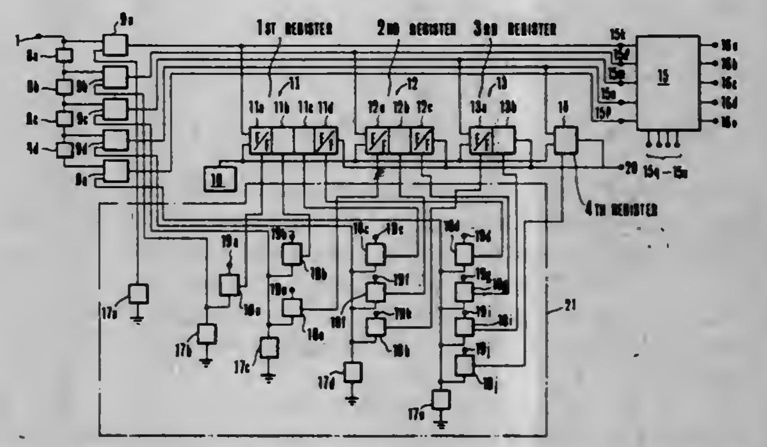
comparator means for comparing the output of said counter means with the number represented by said other bits of a stored code;

switch means responsive to said certain bits of a stored code for connecting one of said clock signals to said counter means through said delay means; and

means for taking off the value of said linearly increasing signal when equality between the count of said counter means and that number represented by said other bits is reached.

3,887,912
ANALOGUE-DIGITAL CONVERTER APPARATUS

Mitomu Kuwamura, Tokyo, Japan, assignor to Iwatsu Electric Company, Japan
Filed Oct. 15, 1973, Ser. No. 406,462
Claims priority, application Japan, Oct. 20, 1972, 47-10563
Int. Cl. H03k *13/17*
U.S. Cl. 340—347 **3 Claims**



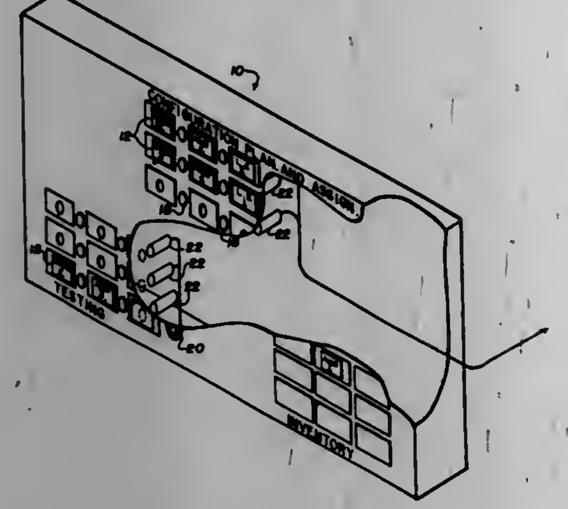
1. An analogue-digital converter apparatus comprising a plurality of analogue-digital converters of the same number as the number of bits (m) of the digital output, each of said analogue-digital converters acting to convert an analogue input into a digital output, a plurality of delay elements coupled to respective converters to successively apply said analogue input to said analogue-digital converters starting from the converter corresponding to the most significant digit toward the converter corresponding to the least significant digit with a predetermined time delay between the inputs to adjacent converters, a plurality of shift registers connected to receive and set respective outputs from said plurality of analogue-digital converters and to receive a shift pulse having a period equal to said predetermined delay time for successively shifting said outputs set in said shift registers, weight circuit

means connected to be controlled in accordance with the contents of said shift registers for supplying reference outputs successively to said analogue-digital converters starting from the converter corresponding to the most significant digit toward the converter corresponding to the least significant digit, said reference outputs being the combinations of $2^{m-1}, 2^{m-2} \ldots 2^0$ where m has the same meaning as above defined, and memory means for storing the outputs from said analogue-digital converters and for producing a digital output corresponding to said analogue input.

3,887,913

ELECTRONIC STATUS AND CONTROL BOARD

Edwin W. Smith, 13073 Via Latina, Del Mar, Calif. 92014
Filed Apr. 15, 1974, Ser. No. 460,853
Int. Cl. G09f *9/14*
U.S. Cl. 340—381 **5 Claims**

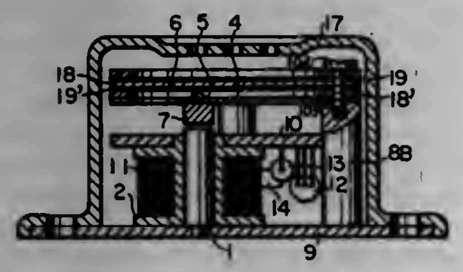


1. An electronic status and control board comprising:
a. a configuration area where coded tabs representing equipments to be configured into a system are positioned to display a desired system configuration,
b. sensing means for sensing the code of said coded tabs to provide selective switching signals,
c. actuating means positioned on the control board to activate said sensing means to generate selective switching signals to implement the assigned equipments in the desired configuration.

3,887,914

CONTACTLESS BUZZER

Yukio Sato; Youjiro Shigemori; Yoshio Mitumori, and Tadashi Suzuki, all of Shizuoka, Japan, assignors to Star Seimitsu Kabushiki Kaisha (Star Mfg. Co., Ltd.), Shizuoka, Japan
Filed Jan. 8, 1974, Ser. No. 431,811
Claims priority, application Japan, Jan. 9, 1973, 48-5954[U]; Mar. 22, 1973, 48-35310[U]; **Mar. 22, 1973, 48-35309[U]**
Int. Cl. G08b *3/00*
U.S. Cl. 340—384 R **5 Claims**

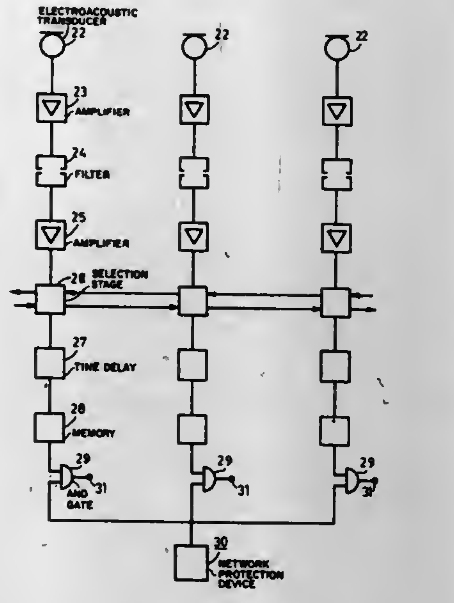


1. A contactless buzzer comprising a base, a plurality of spaced apart pillars secured to said based perpendicular thereto, vibrator arm means having a free end extending in parallel spaced relation to said base and including supporting means mounted on the tops of said pillars, resonator means disposed parallel to said base in contiguous relation to the upper surface of said supporting means and including a resonator disc and a pair of annular supporting rings disposed on opposite sides of said disc adjacent the circumference thereof and electro magnet means mounted on said base and including a coil and a core with said core being disposed perpendicular to said base in alignment with the free end of said vibrator arm means.

3,887,915

ARRANGEMENT FOR DETECTING DIELECTRIC BREAKDOWNS IN METAL-CLAD HIGH-VOLTAGE SWITCHING AND TRANSMISSION INSTALLATIONS

Willi Olsen; Manfred Lieske; Wolfgang Ehmann, and Gerhard Perst, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed Mar. 18, 1974, Ser. No. 452,261
Claims priority, application Germany, Mar. 23, 1973, 2315323
Int. Cl. H02b *13/02*
U.S. Cl. 340—415 **9 Claims**

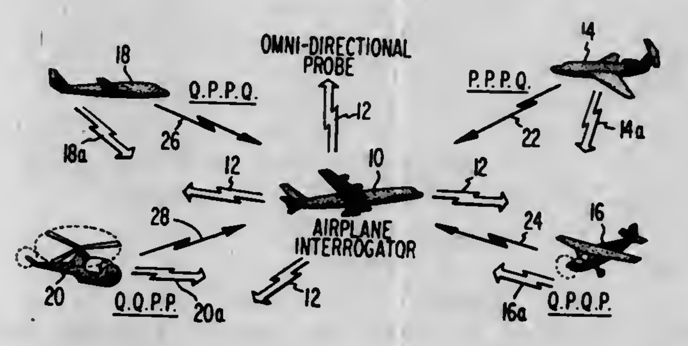


1. An arrangement for detecting dielectric breakdowns in a metal-encapsulated, high-voltage installation such as an equipment suitable for switching and transmitting high-voltages made up of a plurality of component sections sealed gastight one with respect to the other wherein breakers open and close causing an interrupting arc of known duration to be drawn during a breaker opening operation and wherein a dielectric breakdown is accompanied by a fault arc having noise frequency approximately the same as that of the interrupting arc, the arrangement operating in combination with a network protection device for issuing a signal in response to the presence of a fault in the installation, the arrangement comprising: electroacoustic transducer means disposed at a component section for detecting the sound waves generated by the fault arc and transmitted by the encapsulation; filter means for blocking signals from said transducer means having a frequency other than that of the fault arc; amplitude means for passing only said signals from said transducer means having a minimum amplitude whereby signals below said amplitude are not transmitted; time delay means for passing said signals from said transducer means having a duration greater than the duration of the interrupting arc; and, evaluation control means for issuing a signal indicative of a fault in response to the presence simultaneously of a signal from said time delay means and a signal from the network protection device.

3,887,916

CORRELATOR AND CONTROL SYSTEM FOR VEHICULAR COLLISION AVOIDANCE

Ronald Bruce Goyer, North Hollywood, Calif., assignor to RCA Corporation, New York, N.Y.
Filed Apr. 30, 1973, Ser. No. 355,448
Claims priority, application United Kingdom, June 27, 1972, 30036/72; Jan. 18, 1973, 2634/73; June 27, 1972, 30039/72; Apr. 13, 1973, 30036/73
Int. Cl. G01s *9/56*
U.S. Cl. 343—6.5 LC **10 Claims**



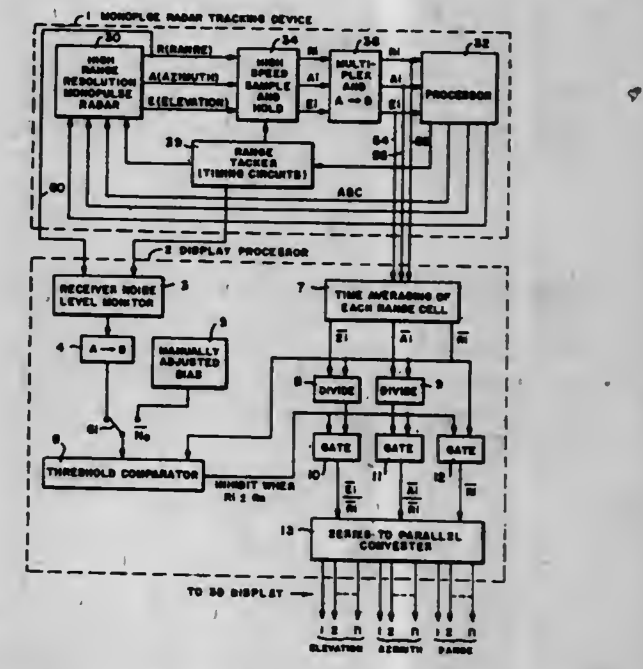
1. A digital correlator comprising:
a. a source of random digital signals of varying pulse width,
b. means for periodically sampling said random signals to generate any one of two interrogation signals each having a distinguishing indicia from the other,
b1. said interrogation signals adapted for transmission to the environment once each period for interrogating the presence of remote stations,
b2. said remote stations having means responsive to said interrogation signals to generate and transmit to the environment a reply signal corresponding to the respective interrogation signals received by them,
b3. said remote stations further having means for periodically transmitting any one of two interrogation signals, corresponding to said first mentioned interrogation signals, generated in response to a random source different from said first mentioned random source,
c. means for receiving signals comprising said reply signals and interrogation signals from said remote stations,
d. means for discriminating said received signals into signals corresponding to either one of said two interrogation signals,
e. digital circuit means in synchronism with said periodic sampling means for comparing the transmitted and replied interrogation signals during each sampling period for providing any one of said two signals corresponding, respectively, to like and unlike correlations of the sampled and received signals, and
f. digital circuit means responsive to said comparison means for integrating the like and unlike signals.

3,887,917

DIGITAL RADAR TARGET IMAGING WITH HIGH RADAR RESOLUTION MONOPULSE RADAR

Dean D. Howard, and David C. Cross, both of Oxon Hill, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Oct. 4, 1972, Ser. No. 294,033
Int. Cl. G01s *7/20*
U.S. Cl. 343—7.9 **8 Claims**

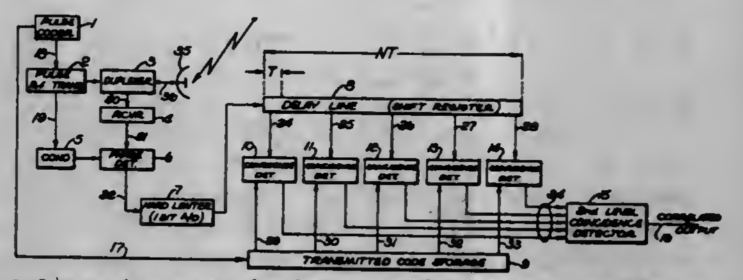
1. In a three dimensional monopulse radar system:
display processor means adapted to receive elevation, azimuth and range amplitude signals from a monopulse radar tracking system using small aperture antennas and process said signals for display;
said display means comprised of a stacked series of display planes in a first dimension, each plane of which is capable of displaying data in two spacial dimensions different from said first dimension;
said three dimensional display means connected to receive said processed signals and to gate said signals to a particular location in the display in accordance with magnitude and occurrence of said signals in time.


MONOPULSE RADAR TRACKING DEVICE
HIGH RANGE RESOLUTION MONOPULSE RADAR
Σ(RANGE)
Δ(AZIMUTH)
Δ(ELEVATION)
HIGH SPEED SAMPLE AND HOLD
MULTIPLEX A/D
PROCESSOR
RANGE TACKER (TIMING CIRCUITS)
DISPLAY PROCESSOR
RECEIVER NOISE LEVEL MONITOR
TIME AVERAGING OF EACH RANGE CELL
MANUALLY ADJUSTED BIAS
DIVIDE
DIVIDE
GATE
GATE
GATE
THRESHOLD COMPARATOR
SERIES-TO-PARALLEL CONVERTER
TO 3D DISPLAY
ELEVATION
AZIMUTH
RANGE

3,887,918

MULTI-LEVEL DIGITAL COINCIDENCE DETECTION

John S. Bailey, Woodland Hills, and David E. Hammers, Los Angeles, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.
Filed May 9, 1973, Ser. No. 358,617
Int. Cl. G01s *7/30*
U.S. Cl. 343—17.2 R **6 Claims**



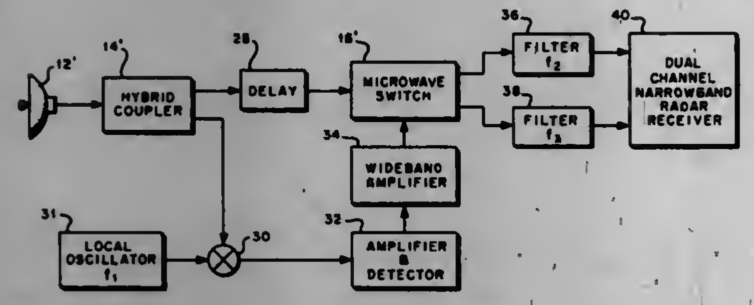
1. In a radar system having means for transmitting relatively long pulses each subdivided into a plurality of N substantially equal duration successive subpulses each coded in first or second radio frequency phase condition according to a predetermined program, and pulse echo receiving means, pulse compression means comprising: means responsive to said transmitting means for storing the code of said transmitted pulses as a series of one-bit digital codes corresponding discretely to said subpulses; phase detection means responsive to said receiving means for producing a sequence of bi-polar video pulses the polarities of which correspond discretely to said first and second radio frequency phase conditions; means responsive to said phase detection means for converting said video polarities to a one-bit digital code corresponding to each of said subpulses at the output thereof; delay means responsive to said one-bit code, said delay means having a transmission time at least as long as said relatively long transmitted pulses, said delay means having a number of taps corresponding to the number of said successive subpulses, said taps being spaced by a time substantially equal to the duration of one of said increments; a first level correlator comprising a first bank of G coincidence detectors, said coincidence detectors each connected to correlate a different predetermined fraction of the plurality of N subpulses of said transmitted pulse against the corresponding fraction of said subpulses in said means for storing the code of said transmitted pulses, said coincidence

detectors connecting between corresponding groups of taps on said delay means and said means for storing the code of said transmitted pulses, said coincidence detectors each producing a single output providing a one bit code representing correlation success, or the lack of it, within the corresponding detector; and a second level correlator comprising a second bank of coincidence detectors responsive to the outputs of said first level correlator for producing a one bit output representative of at least two successes in the outputs of said G coincidence detectors.

3,887,919
HIGH SPEED MICROWAVE SWITCHING LOGIC FOR ECCM

James L. Christensen, Beverly, and Thomas B. Howard, Moorestown, both of N.J., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 30, 1966, Ser. No. 598,114
Int. Cl. G01s *7/36*
U.S. Cl. 343—18 E **6 Claims**

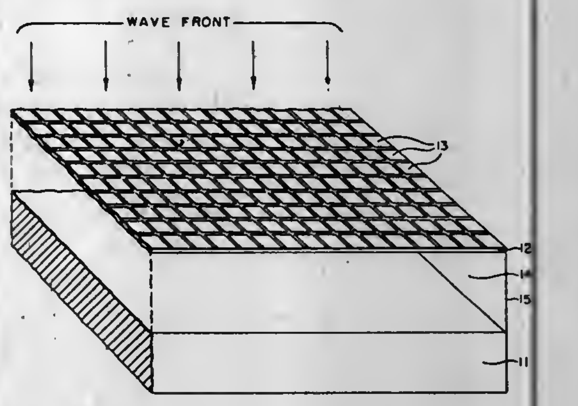


1. In a receiving system, an electronic counter countermeasures device for preventing a jamming signal from rendering a receiver inoperative, the device comprising:
   means providing a pair of signal paths for signals received by said system;
   means connected to a first of said paths for detecting the presence of a jamming signal therein and providing a control signal in response thereto;
   a delay device for delaying the signals received by said system;
   means connected to the second of said paths, said means being responsive to said control signal and including a microwave switch having an input and first and second outputs, said input for receiving the delayed signals from said delay device;
   first and second filters connected to said first and second outputs for preventing jamming signals from passing therethrough; and
   said microwave switch passing the delayed signals to said second filter only in the presence of said control signal.

3,887,920
THIN, LIGHTWEIGHT ELECTROMAGNETIC WAVE ABSORBER

Rufus W. Wright, Alexandria, Va., and John W. Wright, Accokeek, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C. Continuation-in-part of Ser. No. 96,335, March 16, 1961, abandoned. This application Mar. 12, 1963, Ser. No. 265,590
Int. Cl. H01q *17/00*
U.S. Cl. 343—18 A **14 Claims**

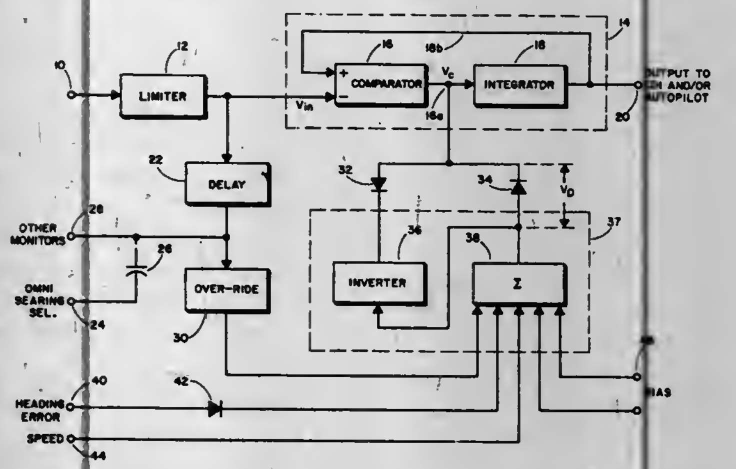
1. Means for absorbing microwave radiation incident on the surface of an object comprising, in combination;
   an insulating sheet,
   a thin film array of uniform geometric figures on a surface of said sheet,
   said film being composed of a material whose electrical conductivity is greater than 0.1 mho per meter,
   said sheet being positioned at a distance from the surface of said object substantially less than a quarter wavelength of said incident radiation as measured in free space and absorbing said incident microwave radiation.



3,887,921
ADAPTIVE RATE LIMITER

Brendan J. Spratt, Boca Raton, and James C. Lunsden, Plantation, both of Fla., assignors to The Bendix Corporation, Southfield, Mich.

Filed Mar. 25, 1974, Ser. No. 454,508
Int. Cl. G01s *1/46*
U.S. Cl. 343—106 R **15 Claims**



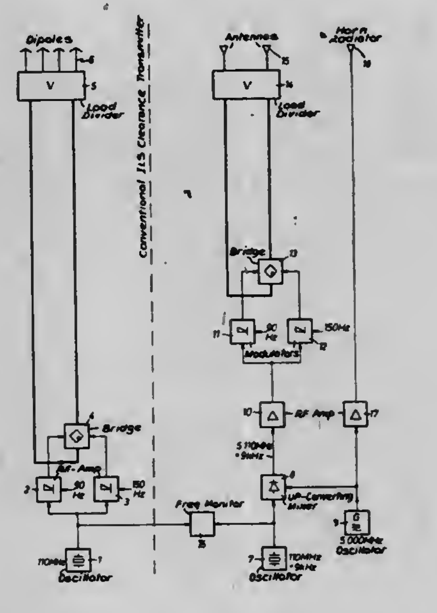
1. An adaptive rate filter for use in an aircraft navigation system installed in an aircraft which includes receiver means for generating a navigation signal in response to a signal received from a remote station wherein said navigation signal includes at least a component related to the bearing of the receiver means from the remote station and including means for generating at least one voltage signal related to a predetermined aircraft parameter, said adaptive rate filter comprising: means for generating a second voltage signal related to the difference of said component and a feedback signal;
   means for limiting said second voltage signal at least in accordance with said one voltage signal; and,
   means for integrating the limited second voltage signal, the absolute value of the results of the integration comprising the absolute value of said feedback signal.

3,887,922
INSTRUMENT LANDING SYSTEM WITH MICROWAVE COURSE PATTERN TRANSMISSION

Günter Hofgen, and Werner Poschadel, both of Kornwestheim, Germany, assignors to International Standard Electric Corp., New York, N.Y.

Filed Jan. 23, 1974, Ser. No. 435,654
Int. Cl. G01s *1/16*
U.S. Cl. 343—108 R **3 Claims**

1. An instrument landing system of the two-carrier type including ground based localizer and glide-slope signal transmitting means, each generating a clearance radiation pattern and a course radiation pattern, the carrier frequencies for said localizer and glide-slope clearance patterns being in the VHF and UHF regions, respectively; said system including an airborne receiver for determining deviations from a desired landing path by comparison of relative amplitudes of **90Hz** and **150Hz** modulation on a carrier, comprising the combination of:
   ground means for generating and radiating a course radiation pattern for at least one of said localizer and glide-slope functions in the microwave frequency region;

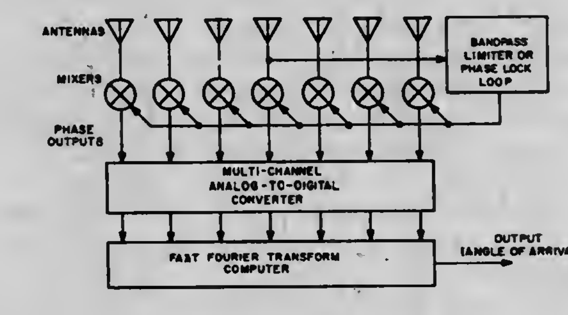


   and airborne means including a microwave receiving antenna and a converter responsive thereto for converting said microwave radiation into the frequency domain of the corresponding clearance channel, and also including means for mixing said converted microwave radiation with corresponding lower carrier frequency received clearance radiation, thereby to provide for a capture effect such that said airborne means will automatically respond to ground radiations with or without said microwave radiation.

3,887,923
RADIO-FREQUENCY HOLOGRAPHY

Charles E. Hendrix, Pacific Palisades, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 26, 1973, Ser. No. 372,431
Int. Cl. G01s *7/04, 5/02*
U.S. Cl. 343—113 R **1 Claim**

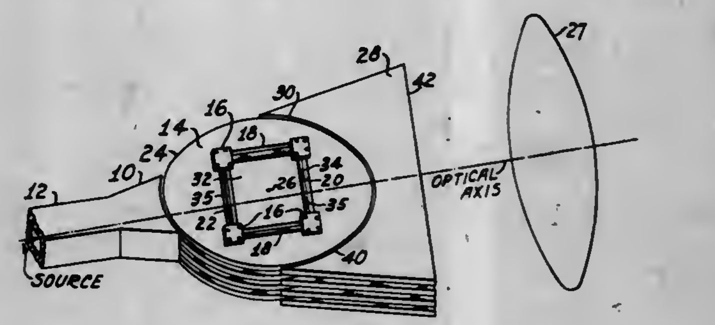

ANTENNAS
MIXERS
PHASE OUTPUTS
BANDPASS LIMITER OR PHASE LOCK LOOP
MULTI-CHANNEL ANALOG-TO-DIGITAL CONVERTER
FAST FOURIER TRANSFORM COMPUTER
OUTPUT (ANGLE OF ARRIVAL)

1. Passive radio direction finder for producing a radio frequency hologram and numerically reconstructing the hologram said finder comprising;
   a plurality of fixed antenna elements closely spaced to form a linear array having a predetermined receiving aperture for individually sampling the phase of an incoming wave front at discrete points across the receiving aperture;
   a plurality of mixer elements each separately electrically coupled to each of said antenna elements for receiving individual electrical signals;
   self contained reference signal means electrically coupled to receive a signal from one of said antenna elements and electrically coupled to each of said mixer elements for providing a signal output that is the same frequency as the signal received by each of said antenna elements;
   a multi-channel analog-to-digital converter electrically coupled to each of said mixer elements for receiving direct current signal voltages from said mixer elements that are proportional to the relative phase of an incoming wave front as it impinges each of said antenna elements and to provide an output that is a digital representative of each direct current voltage; and
   a fast Fourier transform digital computer coupled to said converter for transforming each signal received by each of said antenna elements into a signal representative of the angles of arrival as an incoming wave front impinges said antenna elements;
   whereby a radio-frequency hologram is constructed that is indicative of the direction of the target from said direction-finder.

3,887,924
SCANNING ANTENNA

William C. Wilkinson, Jr., Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 30, 1950, Ser. No. 171,448
Int. Cl. H01q *19/06*
U.S. Cl. 343—754 **10 Claims**



8. The combination of a lens system having an optical axis and a field of focus, an antenna for the radiation or reception of energy, a dielectric block between said lens and said antenna having opposed parallel plane surfaces and rotatable about an axis normal to said optical axis and parallel to said surfaces, the index of refraction of said block with respect to the surrounding medium having a value to bring the apparent position of said antenna as a source viewed from said lens system substantially into coincidence with said field, as said block rotates.

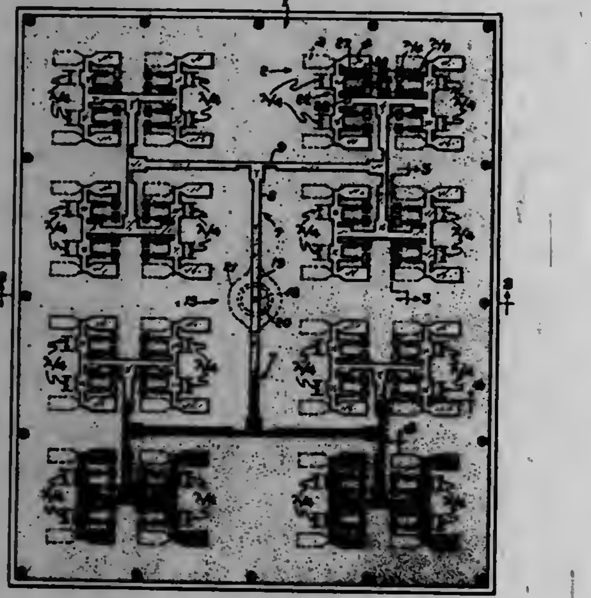
3,887,925
LINEARLY POLARIZED PHASED ANTENNA ARRAY

Joseph C. Ranghelli, Brooklyn, N.Y., and Emmanuel J. Perrotti, Ramsey, N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed July 31, 1973, Ser. No. 384,188
Int. Cl. H01q *9/28*
U.S. Cl. 343—795 **27 Claims**

1. An antenna array comprising:
   N linearly polarized mat-strip center fed dipole elements indicidually disposed on opposite sides of a printed circuit board, each of said N elements having a given orientation; a ground plane superimposed relative to and associated with said N elements;
   a mat-strip power distribution network disposed on said board coupled to said N elements;
   said N elements, said ground plane and said distribution network cooperating to produce a linearly polarized antenna beam; and
   a mat-strip phase shifting arrangement selectively coupled

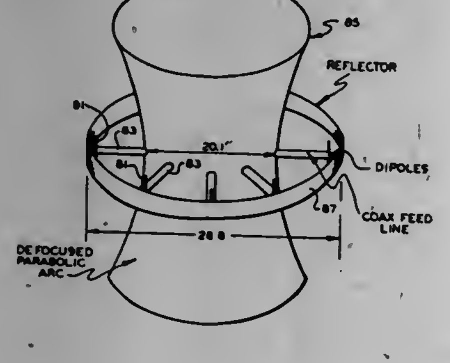
to said distribution network to control said antenna beam to have different selected angular directions, identical portions of said phase shifting arrangement being carried on both surfaces of said board.



3,887,926
PHASED ARRAY SCANNING ANTENNA

Leonard Schwartz, Scarsdale, and Edward G. H. Chin, Rego Park, both of N.Y., assignors to The Singer Company, Little Falls, N.J.

Filed Nov. 14, 1973, Ser. No. 415,523
Int. Cl. H01q *3/26*
U.S. Cl. 343—816 **7 Claims**

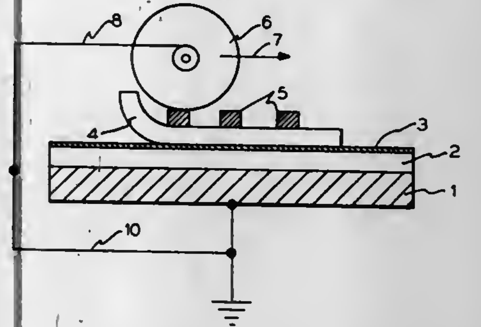


1. A microwave landing system scanning beam antenna which provides a planar fan beam comprising:
- a. a set of equally spaced radiating elements arranged to form one of a portion of a circle and a portion of a cylinder;
- b. a source of microwave energy;
- c. a plurality of phase shifters each coupling said source to one of said plurality of radiating elements;
- d. a plurality of digital amplitude controllers one being interposed between the source and each phase shifter;
- e. means to store digital data comprising:
  - 1. a plurality of representations of radial lines equally spaced each representing an angular deviation from radial line through the center of an arc formed by said set of radiating elements, said plurality of representations dividing the angle equivalent to the spacing between two of said radiating elements into a plurality of small increments;
  - 2. a digital representation of the phase shift required for each of said phase shifters to present a uniform phase front perpendicular to each of said radial lines; and
  - 3. a digital representation of the amplitude of each of said radial lines; and
- f. means to sequentially provide as outputs to said phase shifters digital representations of phase shift associated with each of said radial lines, and to sequentially provide as outputs to said digital amplitude controllers and digital representation of amplitude associated with said radial lines, whereby the antenna beam will be scanned in small increments through an angle between two elements with minimum side lobes in the radiated beam.

3,887,927
APPARATUS AND PROCESS FOR PRODUCING LATENT ELECTROSTATIC IMAGES

Garbor Forgo, Zurich, Switzerland, assignor to Turlabor, A.G., Zumikon, Switzerland

Filed May 11, 1973, Ser. No. 359,593
Claims priority, application Switzerland, May 23, 1972, 007588/72
Int. Cl. G03g *13/22*; G01d *6/11*
U.S. Cl. 346—74 ES **35 Claims**



1. A one-step process for producing in the absence of intermediate masters a latent electrostatic charge image corresponding to selected areas on one of two surfaces of an uncoated original document having non-electrostatically produced indicia on said one surface thereof, said selected areas on said document being more conductive than other areas, comprising the steps of positioning a dielectric carrier member in contact with the other of the two surfaces of said original document, providing an electrically conductive element on the free surface of said carrier member, applying an electric field potential above at least 200 volts between the free surface of said original document and said conductive element, thereafter removing said field potential and separating said original document and said carrier member whereby a latent electrostatic image is retained on said carrier member.

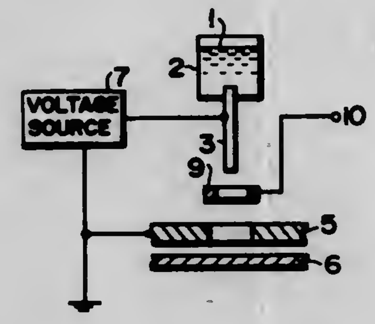
3,887,928
INK JET RECORDING UNIT

Genji Ohno, Yokohama; Tadamitsu Uchiyama, Tokyo; Seisaku Ohki, Tokyo, and Hishao Morohashi, Tokyo, all of Japan, assignors to Research and Development Laboratories of Ohno Company Limited, Yokohama-shi, Japan

Filed Nov. 23, 1973, Ser. No. 418,283
Claims priority, application Japan, Nov. 24, 1972, 47-117737; Nov. 24, 1972, 47-117738; Nov. 24, 1972, 47-135075[U]
Int. Cl. G01d *15/18*
U.S. Cl. 346—140 **18 Claims**

1. A recording unit comprising:
- a. a hollow nozzle having an open end defining a tip for directing a jet of liquid imaging material from said nozzle;
- b. means for supplying a liquid imaging material to said nozzle;
- c. an electrode plate having a through hole and disposed opposite to said nozzle with said through hole being coaxial with said nozzle;
- d. means for disposing a recording member adjacent said electric plate on the opposite side from said nozzle;

- e. a ring having an inner diameter greater than the outer diameter of said nozzle disposed in close proximity to said nozzle tip and in coaxial relationship therewith;
- f. means for applying a voltage between said nozzle and electrode plate to create a first electric field therebetween having a high intensity, non-uniform component in the vicinity of said nozzle tip to form the liquid imaging material in said nozzle into a jet and to direct said jet through said through hole of said electrode plate to said recording member; and

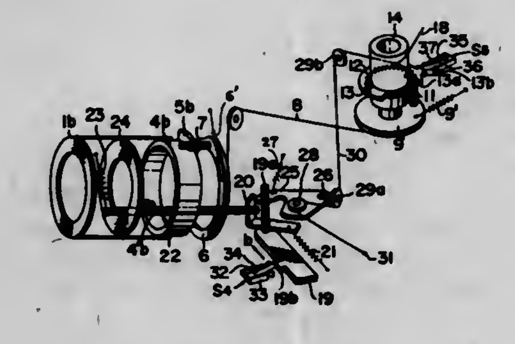


- g. means for applying a voltage to said ring to generate a second electric field of the same polarity as the high intensity component of said first electric field in the vicinity of said nozzle tip to reduce the level of said high intensity component field and to impart uniformity to said high intensity component field thereby raising the voltage level at which jetting of said liquid imaging material from said nozzle tip occurs to interrupt said jet for recording an image on said recording member.

3,887,929
SINGLE LENS REFLEX CAMERA LIGHT MEASURING SYSTEM

Toshinori Imura, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 27, 1973, Ser. No. 345,353
Claims priority, application Japan, Mar. 31, 1972, 47-31634
Int. Cl. G03b *7/20*
U.S. Cl. 354—46 **9 Claims**

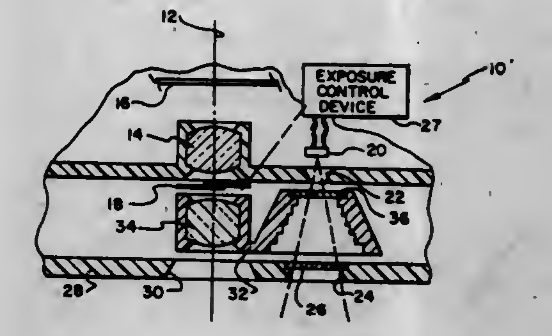


1. A single lens reflex camera comprising:
a camera body;
an objective lens detachably mounted on said camera body, and including a diaphragm aperture means, a manually operable aperture setting means and diaphragm adjusting means adaptable to follow the movement of said aperture setting means;
light measuring means for measuring field light rays passed through said objective lens;
first changing means movable between a first position for maintaining said diaphragm aperture means fully opened and a second position for setting said diaphragm adjusting means to the preset value of said aperture setting means, said first changing means being biased in said first position;
first interlocking means movable with the operation of said aperture setting means;
second interlocking means for interlocking with said first interlocking means and for transmitting the setting of said aperture setting means to said light measuring means;
second changing means movable between a first position for enabling said second interlocking means to follow said first interlocking means and a second position for releasing said second interlocking means from following said first interlocking means, said second changing means being biased into said first position; and
manually operable means to move said first changing means and said second changing means from said first to said second position.

3,887,930
LIGHT COMPENSATION FOR EXPOSURE CONTROL CAMERAS

Richard J. Bresson, Hamlin, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 12, 1974, Ser. No. 488,613
Int. Cl. G01j *1/22*
U.S. Cl. 354—59 **6 Claims**



1. In a camera having a primary lens; a converter lens having a predetermined light loss factor and a predetermined color contribution factor, said converter lens being movable between a taking position in optical alignment with said primary lens and a stored position out of optical alignment with said primary lens; and a photocell which is part of an exposure control device; the improvement comprising:
optical means having a light loss factor of approximately one-half that of said converter lens and a color contribution factor substantially the same as that of said converter lens;
means for mounting said optical means for movement between a first position affecting light directed toward said primary lens and a second position affecting light directed toward said photocell; and
means for moving said optical means to its first position when said converter lens is in its stored position and for moving said optical means to its second position when said converter lens is in its taking position.

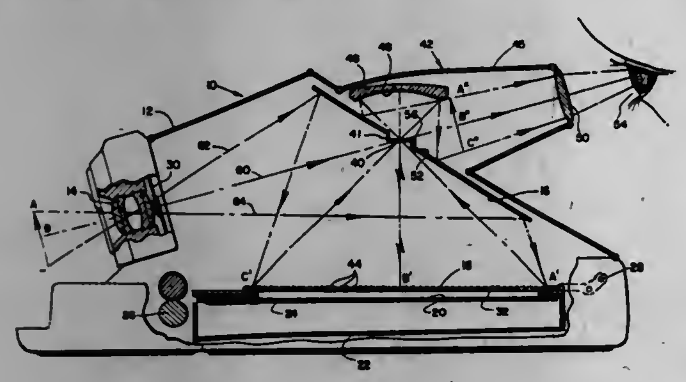
3,887,931
PARALLAX FREE VIEWER

James G. Baker, Winchester, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 16, 1973, Ser. No. 406,893
Int. Cl. G03b *13/08*
U.S. Cl. 354—155 **17 Claims**

1. A reflex camera comprising:
an objective lens for forming a real image of a subject;
a film plane;
a reflective focusing screen;
means for positioning said reflective forcusing screen proximate said film plane;
a first plane mirror for reflecting said real image onto said reflective focusing screen;
a window, opposite the geometric center of said reflective focusing screen, in said first plane mirror for transmitting light reflected from said reflective focusing screen;

said reflective focusing screen having a plurality of reflective circular echelons situate on said reflective focusing screen and concentric with said geometric center, configured for forming an image of said objective lens's exit pupil at said window, said echelons having an optic axis normal to said reflective focusing screen and passing through its geometric center; and



means, including a concave mirror, situate on the side of said first plane mirror opposite said reflective focusing screen to receive said light transmitted through said window from said reflective focusing screen, for forming an aerial image of the real image focused on said reflective focusing screen.

3,887,932
MEMORY SWITCH CONTROLS FOR CAMERAS

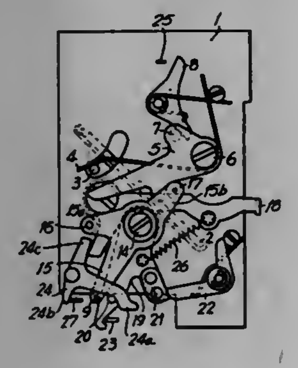
Naoyuki Uno, and Katsuhiko Nomura, both of Kawagoe, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Sept. 19, 1973, Ser. No. 398,806

Claims priority, application Japan, Sept. 21, 1972, 47-108966

Int. Cl. G03b *19/12*

U.S. Cl. 354—156 **10 Claims**



1. In a single lens reflex camera which measures light internally and which has a swingable mirror normally occupying a lower viewing position where said mirror reflects light which has travelled through the objective to a light-measuring structure and being swingable from said lower position to an upper exposure position where light travelling through the objective no longer reaches the light-measuring structure, memory switch means movable between a normal inactive position and an operative position enabling a memory structure to retain information received by the light-measuring structure, said memory switch means having an inherent force which acts to maintain said memory switch means in said inactive position, mirror-drive means cooperating with the mirror to drive the latter upwardly from said lower viewing position to said upper exposure position, switch-operating means cooperating with said memory switch means for displacing the latter in opposition to said inherent force from said normal inactive position to said operative position, said switch-operating means having a rest position cooperating with said mirror-drive means to prevent operation thereof, said switch-operating means being movable from said rest position thereof for placing said memory switch means in said operative position thereof, while said switch-operating means also releases said mirror-drive means for operation to drive said mirror to said exposure position thereof, and manually operable release means to be set into motion by the operator of the camera for carrying out operations in connection with shutter release, said manually operable release means cooperating with said switch-operating means for moving the latter to place said memory switch means in said operative position thereof, whereby said mirror-drive means will not be released to drive the mirror upwardly to its exposure position until after said memory switch means has been placed by said switchoperating means in said operative position thereof.

3,887,933
LENS BARREL FOR AUTOMATICALLY CONTROLLED ELECTRONIC FLASH UNIT

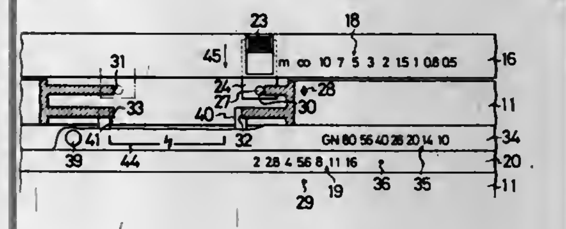
Kenichi Miyake, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

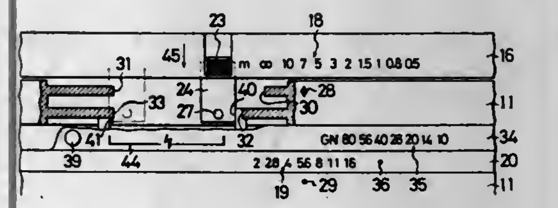
Filed Jan. 9, 1974, Ser. No. 432,123

Claims priority, application Japan, Jan. 23, 1973, 48-11022

Int. Cl. G03b *3/00*

U.S. Cl. 354—195 **5 Claims**





1. A lens barrel for use with a camera adapted to be mounted with an automatically light controlled electronic flash unit and further adapted for both ordinary and flash photography, comprising:
- a stationary tube;
- a diaphragm aperture setting ring rotatably provided on said stationary tube and having a calibrated diaphragm scale; a lens focussing ring rotatably provided on said stationary tube about an axis and bearing a distance scale thereon and rotatable from an infinity focusing position to a closest focusing position through an angle corresponding to the angle of rotation of said diaphragm aperture setting ring;
- a changing member movable with said focussing ring in the direction of its rotation and movable in the axial direction of said focussing ring from a first position for ordinary photography to a second position for flash photography; a pair of first limiting elements on said stationary tube and engageable with said changing member for limiting the range of rotation of said focussing ring between the infinity focusing position and the closest focussing position when said changing member is at said first position;
- a pair of second limiting elements on said stationary tube and engageable with said changing member for limiting the range of rotation of said focussing ring between a maximum focussing position for flash photography and the closest focussing position when said changing member is moved from said first position to said second position;
- a guide number ring having a guide number scale and being rotatably provided on said stationary tube and retainable at desired set positions indicated by the number scale; and
- a third limiting element on said guide number ring and engageable with said changing member for limiting the range of rotation of said focussing ring in one direction to a position determined by the set position of the guide number ring.

3,887,934
PHOTOGRAPHIC SHUTTER

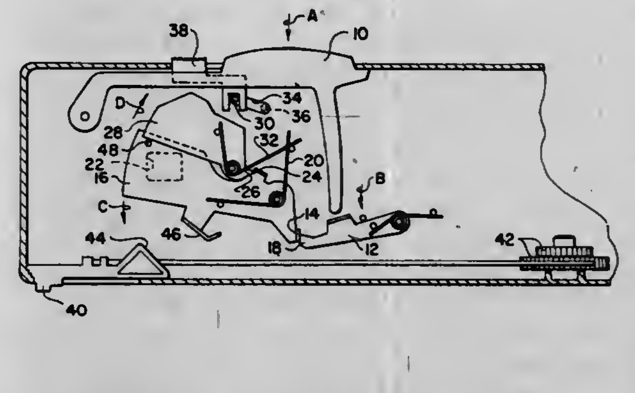
Helmut Ettischer, Ruit, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 16, 1974, Ser. No. 433,627

Claims priority, application Germany, Feb. 8, 1973, 2306056

Int. Cl. G03b *9/14*

U.S. Cl. 354—251 **4 Claims**



1. In a camera having an exposure aperture, a shutter mechanism comprising:
- an opening blade movable relative to the exposure aperture between a closed position wherein said opening blade covers the aperture and an open position wherein said opening blade uncovers the exposure aperture;
- a first spring coupled with said opening blade urging said opening blade toward its open position;
- a closing blade movable relative to the exposure aperture between an open position wherein said closing blade uncovers the exposure aperture and a closed position wherein said closing blade covers the exposure aperture, a portion of said closing blade defining an impact receiving member;
- means responsive to movement of said opening blade from its closed position toward its open position for striking said impact receiving member of said closing blade to effect movement of said closing blade in a first direction away from its closed position; and
- a second spring coupled with said closing blade for urging said closing blade in a second direction toward its closed position, said second spring being weaker than said first spring.

3,887,935
INTEGRATED SEMICONDUCTOR ARRANGEMENT INCLUDING SOLAR CELL AND A SCHOTTKY DIODE

Horst Fischer, Heilbronn, and Willi Pschunder, Flein, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

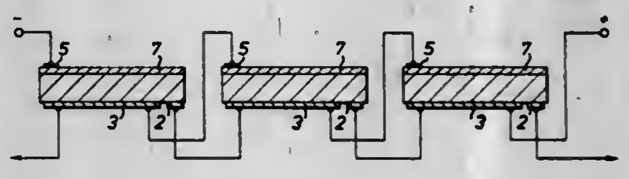
Filed Nov. 2, 1973, Ser. No. 412,105

Claims priority, application Germany, Nov. 3, 1972, 2253831

Int. Cl. H01l *11/00, 15/00*

U.S. Cl. 357—15 **10 Claims**

1. An integrated semiconductor arrangement comprising in combination: a solar cell including a semiconductor body of a first conductivity type having a region of the opposite conductivity type adjacent one major surface thereof and forming the pn-junction of the solar cell, an ohmic front side contact for said region of opposite conductivity type and an ohmic rear side contact covering substantially the entire rear surface of said semiconductor body; and a metal coating on said rear surface of said semiconductor body and forming a rectifying



metal semiconductor contact with said semiconductor body, said metal coating having at least one narrow strip-shaped portion which is substantially surrounded by but separated from said ohmic rear side contact of said solar cell.

3,887,936
RADIATION SENSITIVE SOLID STATE DEVICES

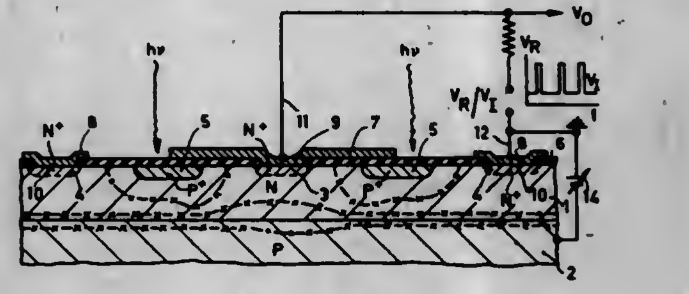
John Martin Shannon, and John Ernest Ralph, both of Salfords, near Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 18, 1973, Ser. No. 398,491

Claims priority, application United Kingdom, Sept. 22, 1972, 43956/72

Int. Cl. H01l *17/00*

U.S. Cl. 357—30 **26 Claims**

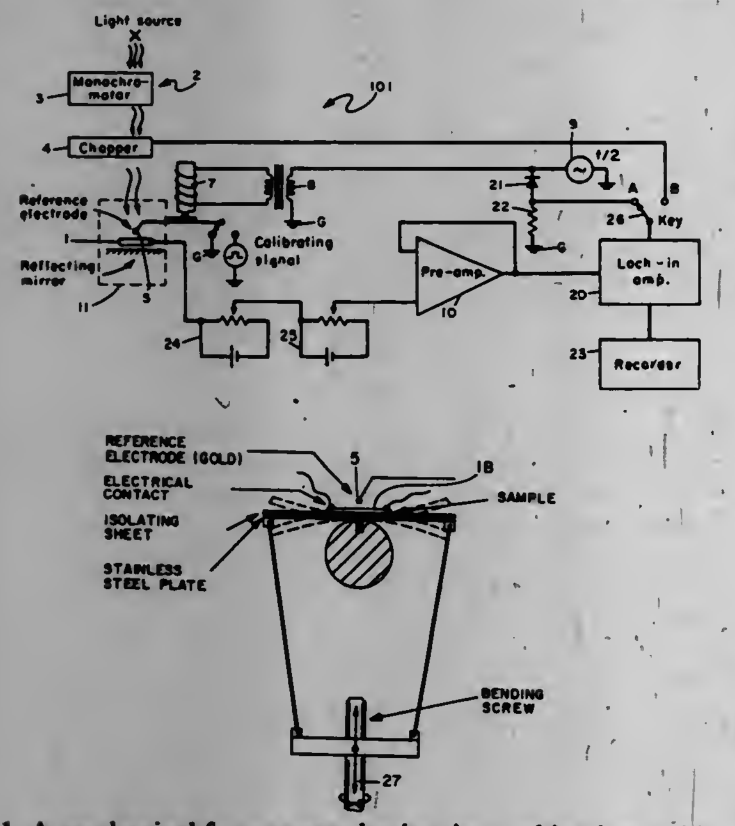


1. A radiation sensitive solid state device comprising a semiconductor body having a semiconductor layer of one conductivity type, at least one radiation sensitive element being present in the semiconductor layer and comprising a junction field effect transistor structure, said junction field effect transistor structure comprising source and drain connections at positions spaced apart laterally of the semiconductor layer whereby in the layer portion situated intermediate said connections a substantially lateral flow of charge carriers characteristic of said one conductivity type can occur in a channel region, at least one of said source and drain connections being present at a first surface of the semiconductor layer, a gate electrode situated at or adjacent said first surface in the proximity of the channel region and forming a rectifying junction with the semiconductor layer material of the one conductivity type whereby said lateral current flow in the channel region is determined in accordance with the extent of a depletion region associated with and extending into the layer from said rectifying junction, said gate electrode being connected via a storage capacitor present at or adjacent to said first surface to the said one of the source and drain connections, a first terminal connection forming a common connection to said one of the source and drain connections and to the side of the capacitor remote from the gate electrode, and a second terminal connection to the other of said source and drain connections, means being present to permit incident radiation to be absorbed in the semiconductor layer in the vicinity of the channel region for generation of free charge carriers in order to influence the extent of a depletion region associated with the gate electrode rectifying junction.

3,887,937
SEMICONDUCTOR SENSOR

Harry C. Gatos, Weston, Mass., and Jacek Lagowski, Warsaw, Poland, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sept. 21, 1972, Ser. No. 290,666
Int. Cl. H01l *15/00*
U.S. Cl. 357—26 **6 Claims**

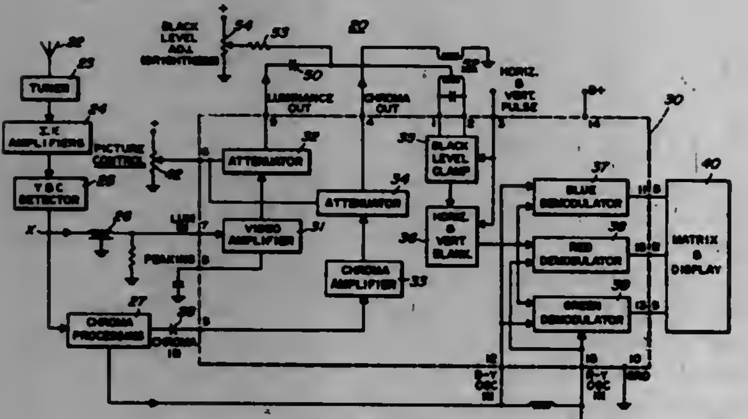


1. A mechanical force sensor having, in combination, a thin non-centrosymmetric semiconductor wafer comprising a material having a high energy gap wherein the surface states are not in good communication with the bulk; means for applying the force to the wafer as a mechanical bending stress upon the wafer to effect changes in the population of the surface states of the semiconductor to effect changes in the surface barrier without appreciably affecting the electrical carrier concentration in the bulk material; and means for detecting the changes in the surface states as a consequence of said changes in population and for relating the same to the force to-be-sensed.

3,887,938
IC COLOR DEMODULATOR WITH SINGLE EXTERNAL PICTURE CONTROL

Gildo Cecchin, Niles, Ill., assignor to Motorola, Inc., Chicago, Ill.

Filed Mar. 18, 1974, Ser. No. 452,240
Int. Cl. H04n *9/535*
U.S. Cl. 358—27 **15 Claims**



9. In a color television receiver having a source of composite video signal information and also a source of chroma signal information, an improved color demodulator arrangement, including in combination:

a plurality of demodulators for deriving respective color signals;

first amplifiers means for amplifying the composite video signal and applying the same to first attenuator means for controlling the level of luminance signal as translated thereby;

second amplifier means for amplifying the chroma signal and applying the same to second attenuator means for controlling the level of chrominance signal as translated thereby;

manually adjustable resistance means for connection to said first and second attenuators in common so as to selectively and simultaneously control the level of luminance and chrominance signals as translated thereby;

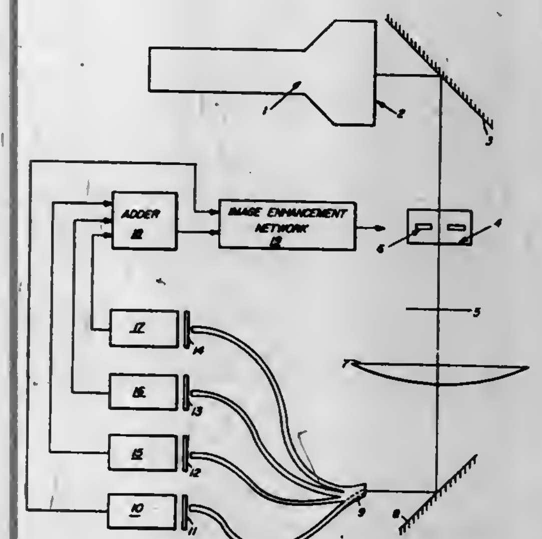
light dependent resistance means for connection to said first and second attenuators in common so as to control automatically the luminance and chrominance signal levels as translated thereby in accordance with and in response to ambient light level; and

black level clamping means for effecting a fixed bias to said demodulators in response to the blanking level of the composite video signal and regardless of the magnitude of the d-c component in said luminance signal as translated by said first attenuator means.

3,887,939
SCANNING APPARATUS AND METHOD USING SHARP AND UNSHARP SPOTS

Robert W. G. Hunt, North Harrow, England, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 23, 1973, Ser. No. 353,834
Claims priority, application United Kingdom, Apr. 27, 1972, 19691/72
Int. Cl. H04n *3/28, 9/08*
U.S. Cl. 358—75 **9 Claims**



1. Apparatus for producing electrical signals corresponding to information from a color object, said apparatus comprising:
a. means for scanning a color object with two spots of light, the first of said spots being small and sharp, and the second of said spots being large and unsharp,

b. first means utilizing substantially all of and only the light passing from the first spot scan of such object, for producing a high definition luminance signal, and

c. second means, utilizing substantially all of the light passing from the second spot scan of such object, for producing low definition color signals.

3,887,940
LIQUID FABRIC WALL COVER

Donald J. Mangold, Moraga, and John E. Vetterli, Albany, both of Calif., assignors to The Flecto Company, Inc., Oakland, Calif.

Continuation of Ser. No. 172,353, Aug. 12, 1971, abandoned. This application May 10, 1973, Ser. No. 359,043
Int. Cl. C08d *7/08;* **C08f** *45/16*
U.S. Cl. 260—8 **9 Claims**

1. A composition for application to a surface with a roller to produce a fabric-like surface coating, said composition consisting essentially of the following components blended together in relative amounts effective to permit substantially even spreading thereof over the surface by a hand-operated paint roller, relative amounts of said components being selected from the following relative proportions:

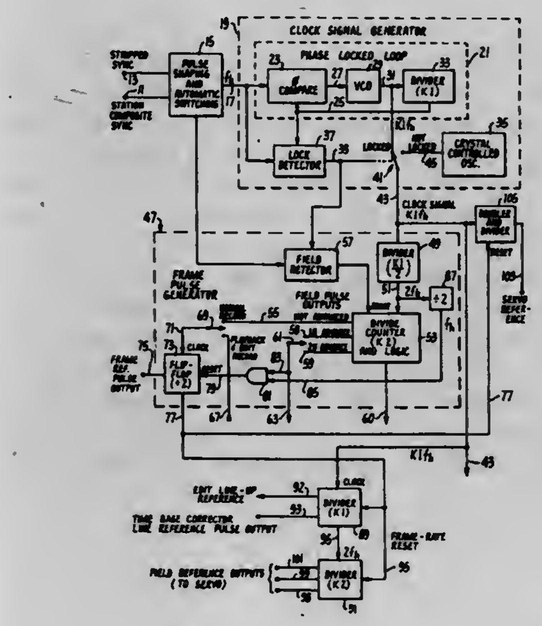
Fibrous Textile Mass	1–2 lbs. having a volume of .075–0.24 cubic feet, said thickening
Water Soluble or Swellable Thickening Agent	agent being 5–20% by weight thereof
Latex Adhesive	50–400 grams (100% solids basis)
Water	3.7–4.7 quarts

wherein the majority of the fibers in said textile mass are about 1–3 mm. in length and have a flocculent appearance, and a minority of the fibers in said textile mass are one-fourth to three-fourths inches in length, further provided that all fibers in said mass are not more than three-fourths inches in length, said thickening agent being selected from water soluble, hydrophilic, colloidal cellulose and natural gums, albumin and colloidal silica and said latex adhesive being selected from styrene-butadiene, polystyrene, polyvinyl chloride, polyvinylidene chloride, polyvinyl alcohol, polyvinyl urethane, copolymers of methylmethacrylate and ethylmethacrylate latexes.

3,887,941
SYNCHRONIZING PULSE PROCESSOR FOR A VIDEO TAPE RECORDER

Bert H. Dann, Mountain View, and Nikola Vidovic, Sunnyvale, both of Calif., assignors to International Video Corporation, Sunnyvale, Calif.

Filed Sept. 1, 1972, Ser. No. 285,919
Int. Cl. H04l *7/00;* **H04n** *5/04*
U.S. Cl. 360—36 **18 Claims**



1. A synchronizing pulse processor for a video tape recorder wherein synchronizing pulses at the television field rate, frame rate and horizontal line rate are processed, said synchronizing pulse processor normally receiving reference horizontal pulses and reference field pulses normally related to said reference horizontal pulses, the combination comprising

means receiving said reference horizontal pulses for generating clock pulses having a frequency at a multiple of the reference horizontal pulse frequency,

means receiving said reference field pulses and said clock pulses for generating at least two field rate pulse outputs, said field rate pulse outputs spaced in time by an integral number of clock pulse intervals, one of said field rate pulse outputs synchronized to said clock pulses and said reference field pulses as a reference synchronous field output, the other of said field rate pulse outputs occurring before said reference field pulses as an advanced field pulse output,

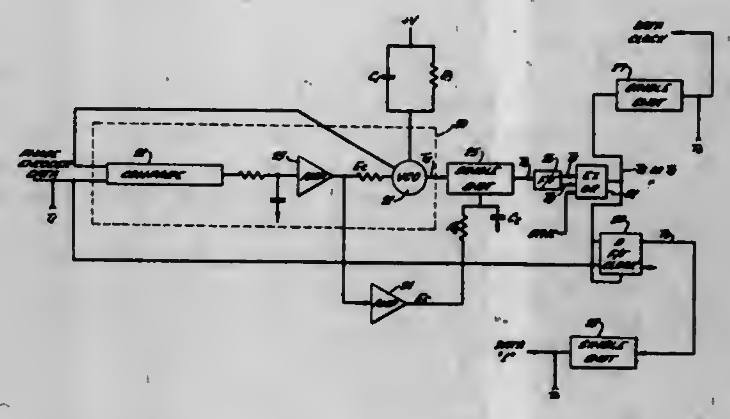
stable self-contained oscillator means for generating said clock pulses, and

means for detecting the presence of said reference horizontal pulses to apply the multiple of said reference horizontal pulses as said clock pulses when said reference horizontal pulses are present and for simultaneously applying the pulses from said oscillator as said clock pulses to said field rate pulse generating means and removing said reference field pulses from said means for generating field rate pulses when said reference horizontal pulses are absent, whereby the change of clock pulse sources has substantially no effect on the substantially lower frequency field pulse rate.

3,887,942
TAPE SPEED COMPENSATION SYSTEM

Noah Horowitz, Los Angeles, Calif., assignor to Century Data Systems, Inc., A Division of California Computer Products, Inc., Anaheim, Calif.

Filed Apr. 13, 1972, Ser. No. 243,625
Int. Cl. G11b *5/09*
U.S. Cl. 360—51 **5 Claims**



1. An apparatus for compensating for variations in the speed of a moving medium upon which digital data is recorded comprising:

means for varying the time position of the opening of a sample window as a function of the recording medium variations comprising a phased locked oscillator which generates a feedback voltage proportional to the instantaneous phase difference between the input frequency and the phase locked oscilator frequency;

means for varying the time position of the closing of the sample window as a function of recording medium speed variations comprising a one shot multivibrator having a width which is controlled by the feedback voltage generated by said phase locked oscillator;

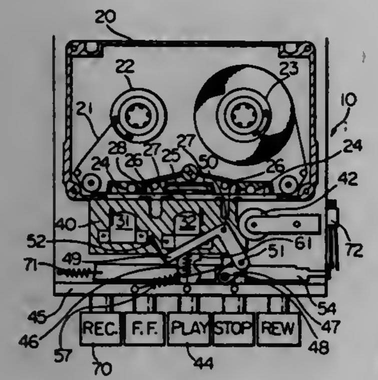
means for centering the time position of the data edge between said opening and closing of the sample window and

means for adjusting the opening and closing of the sample window so as to maintain the data edge centered with respect to the opening and closing of the sample window as the speed of the recording medium varies.

3,887,943

AUTOMATIC STOP APPARATUS FOR TAPE RECORDER

Hiromasa Katsurayama, Nagoya, Japan, assignor to Shin-Shirasuna Electric Corporation, Nagoya-shi, Japan
Filed Mar. 22, 1973, Ser. No. 343,662
Int. Cl. G11b *23/04, 15/43, 15/00*
U.S. Cl. 360—96 **6 Claims**



1. A tape recorder and automatic stop means which comprises in combination a set of reels to which tape ends are secured and between which tape is driven, a sub-chassie having heads disposed to move toward tape passage and away from tape passage, the sub-chassie being spring biased away from tape passage, a first L-shaped arm having a first supporting point on the sub-chassie at the arm joinder and a sensing lever provided at an end thereof, a second arm having a second supporting point at a fixed position on a frame and pivotally connected to said first arm at an end opposite the sensing lever, means for locking the position of the sub-classis when said sub-chassis is moved so that said head is urged against the tape and the connecting point of said first and second arms comes on the straight line connecting said first and second supporting points, a set of spaced guide posts on the side opposite to said heads along the tape passage, said sensing lever of said first arm being pressure engaged with the tape portion stretching between said guide posts, said first and second arms being displaced by the sensing lever pushing force accompanied by increase of the tape tension at the terminal end of the tape, said sub-chassis being moved away from the tape passage and simultaneously therewith the mechanism interlocked with said sub-chassis being mechanically stopped.

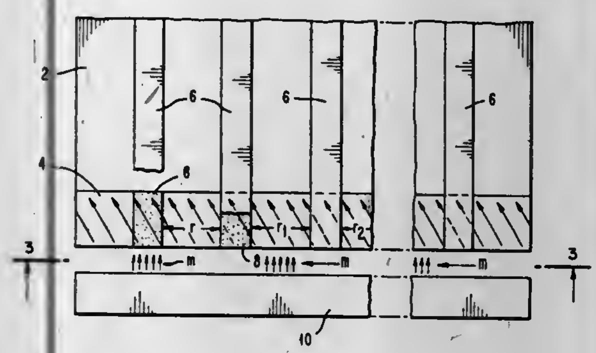
3,887,944

METHOD FOR ELIMINATING PART OF MAGNETIC CROSSTALK IN MAGNETORESISTIVE SENSORS

Christopher H. Bajorek, Lewisboro, and David A. Thompson, Somers, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed June 29, 1973, Ser. No. 375,286
Int. Cl. G11b *5/12*
U.S. Cl. 360—113 **16 Claims**

1. An integrated array of magnetic recording elements comprising a substrate,

- a thin film of magnetoresistive material on said substrate,
- a plurality of spaced electrical conductors each of which overlaps a separate region of said magnetoresistive material, and

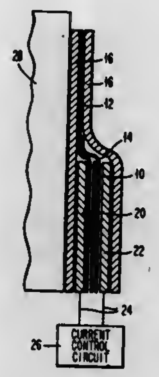


- a high coercivity material interposed between said magnetoresistive material and its corresponding overlapped conductors.

3,887,945

HEAD ASSEMBLY FOR RECORDING AND READING, EMPLOYING INDUCTIVE AND MAGNETORESISTIVE ELEMENTS

Daniel A. Nepela, Saratoga, and Robert I. Potter, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 12, 1973, Ser. No. 424,242
Int. Cl. G11b *5/30, 5/12*
U.S. Cl. 360—113 **13 Claims**



10. A multilayer head assembly for reading and recording magnetically recorded information on a medium comprising: a layer of a magnetoresistive material for sensing magnetically recorded information while transversing the medium,

- a pair of layers of electrically conductive film material, one planar surface of each layer disposed adjacent to opposite planar surfaces of said magnetoresistive layer; and
- a pair of highly permeable magnetic members, one disposed adjacent to each planar surface of said pair of conductive film layers opposite said magnetoresistive layer;
- selectively controllable means connected to said conductive film material to provide a bias field for said magnetoresistive element and to provide a periodically reversible magnetic field to record magnetic transitions in the medium.

DESIGN PATENTS

GRANTED JUNE 3, 1975

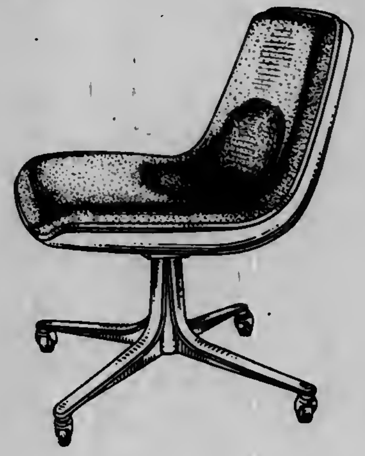
ERRATA

For CLASS	See PATENT NO.
023-090.1	235,273

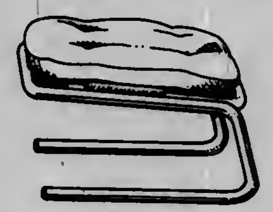
DESIGNS

JUNE 3, 1975

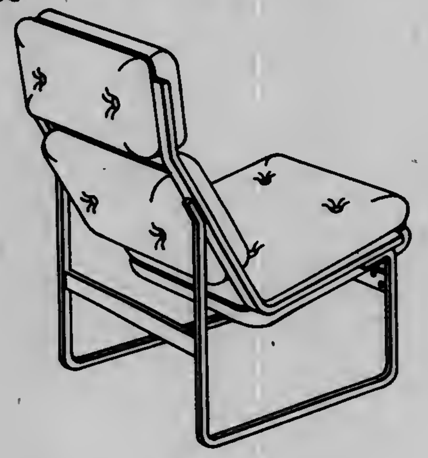
235,233
CHAIR
Alfred J. Prizlow, Bloomfield Hills, Mich., assignor to GF Business Equipment, Inc., Youngstown, Ohio
Filed Aug. 25, 1971, Ser. No. 175,033
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—30



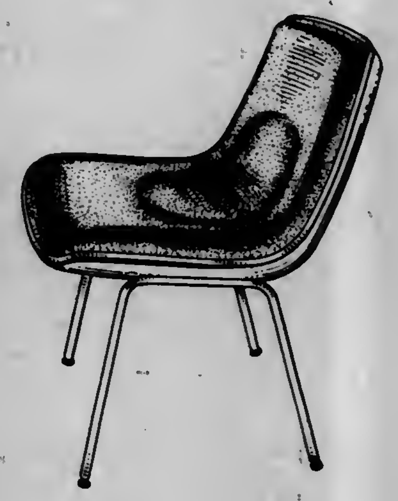
235,234
OTTOMAN
Jerry Johnson, Rancho Cuerdo, Box 50, Portrero, Calif. 92063
Original design application May 10, 1973, Ser. No. 359,007. Divided and this application July 17, 1974, Ser. No. 489,079
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—36



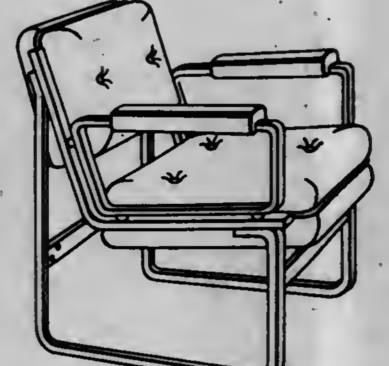
235,235
LOUNGE CHAIR
Leif Blodee, Holland, Mich., assignor to American Seating Company, Grand Rapids, Mich.
Filed June 22, 1973, Ser. No. 372,854
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—38



235,236
CHAIR
Alfred J. Prizlow, Bloomfield Hills, Mich., assignor to GF Business Equipment, Inc., Youngstown, Ohio
Filed Aug. 25, 1971, Ser. No. 175,032
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—66



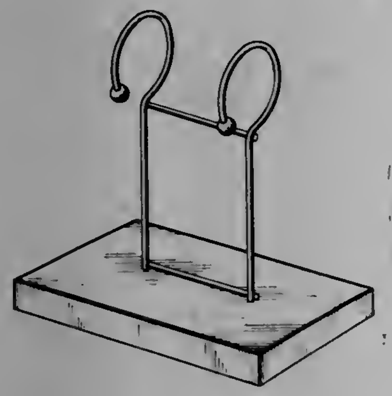
235,237
LOUNGE CHAIR WITH LOW BACK
Leif Blodee, Holland, Mich., assignor to American Seating Company, Grand Rapids, Mich.
Filed June 22, 1973, Ser. No. 372,808
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67



235,238

DISPLAY STAND OR SIMILAR ARTICLE

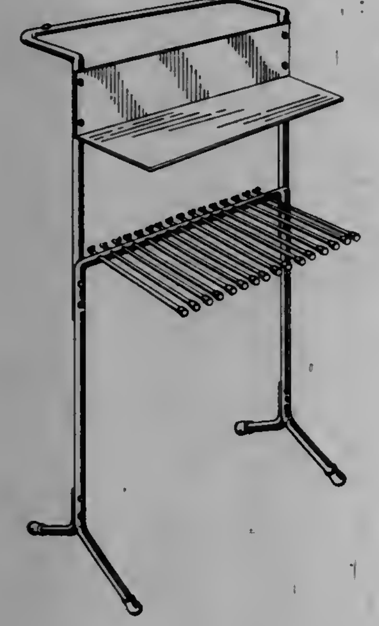
Melvin Braverman, Glen Cove, N.Y., assignor to A&M Leatherlines, Inc., New York, N.Y.
Filed June 25, 1973, Ser. No. 373,571
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—85



235,239

CLOTHES DRYING RACK

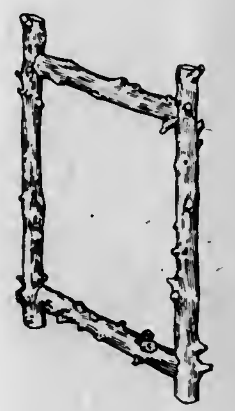
Earl H. Cartwright, 967 N. Iowa, Olathe, Kans. 66061
Filed Sept. 4, 1973, Ser. No. 393,735
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—181



235,240

PICTURE FRAME

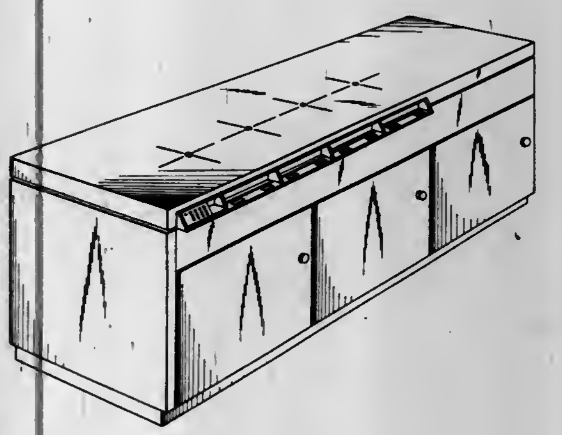
Wayne K. Bessinger, Rte. 1, Box 198, Bourbon, Ind. 46504
Filed May 25, 1973, Ser. No. 363,864
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—239



235,241

ELECTRIC COUNTER TOP COOKING RANGE

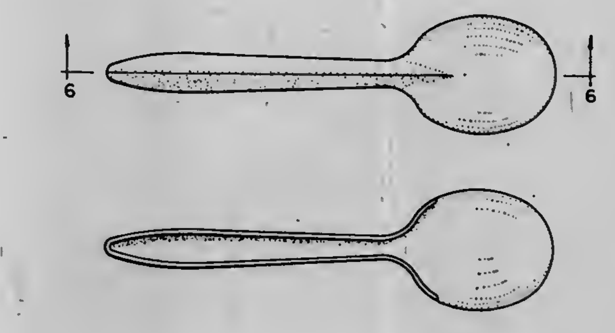
Philip H. Peters, Jr., Washington County, and John L. Matrone, Albany County, N.Y., assignors to Environment/One Corporation, Schenectady, N.Y.
Filed Sept. 23, 1971, Ser. No. 183,288
Term of patent 14 years
Int. Cls. D7—*02;* D6—*04*
U.S. Cl. D7—111



235,242

SOUP SPOON

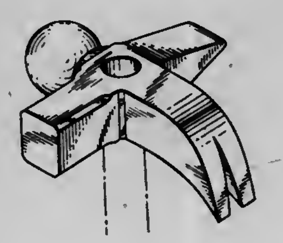
William A. Dart, and Laurence T. Uridge, Mason, Mich., assignors to Dart Container Corporation, Mason, Mich.
Filed June 21, 1973, Ser. No. 372,080
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—138



235,243

HAMMERHEAD

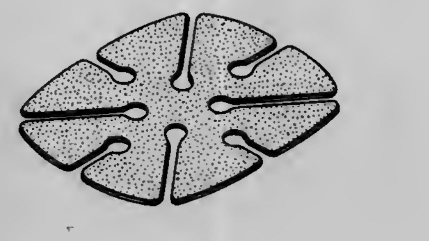
Josef Pecenka, Pretoria, Hotel Fiesta, 580 Church St., Transvaal, Republic of South Africa
Filed Nov. 13, 1973, Ser. No. 415,373
Claims priority, application Republic of South Africa June 26, 1973
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—79



235,244

ABRASIVE PAD FOR GRINDING LENSES

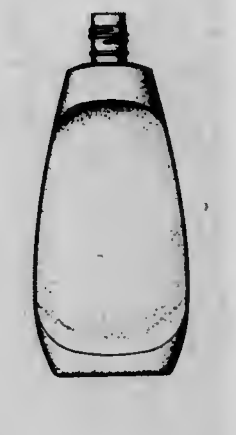
Waldemar Stoppacher, White Plains, N.Y., assignor to Interoptic Laboratories, Inc., Elmsford, N.Y.
Filed Dec. 10, 1973, Ser. No. 423,174
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—90



235,245

BOTTLE OR SIMILAR ARTICLE

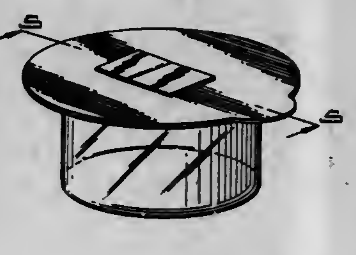
John Wesley McDonald, Kansas City, Mo., assignor to Ethyl Development Corporation, Kansas City, Mo.
Filed June 20, 1973, Ser. No. 371,865
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—143



235,246

PACKAGING CONTAINER

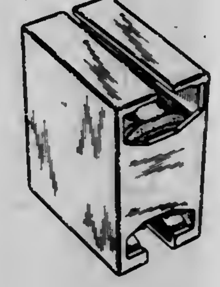
David E. Evans, Jr., Bexley, and James W. Murray, Columbus, Ohio, assignors to The Columbus Dental Manufacturing Company, Columbus, Ohio
Filed Mar. 21, 1973, Ser. No. 343,449
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—222



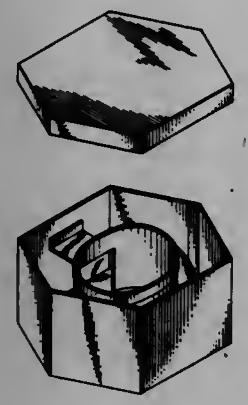
235,247

RAZOR BLADE DISPENSER

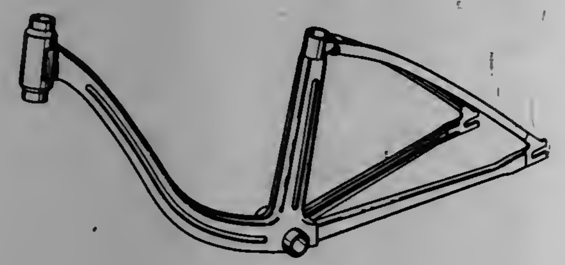
Paul A. Braginetz, Staunton, Va., assignor to Philip Morris Incorporated, New York, N.Y.
Filed May 8, 1973, Ser. No. 358,405
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D9—224



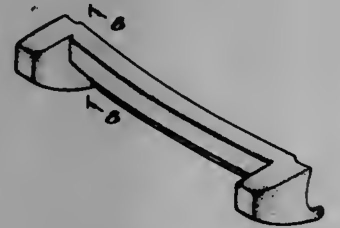
235,248
HAT BOX
David Bennett, Rockville Centre, N.Y., assignor to The Modern Box Corporation, Brooklyn, N.Y.
Filed June 4, 1973, Ser. No. 366,626
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—240



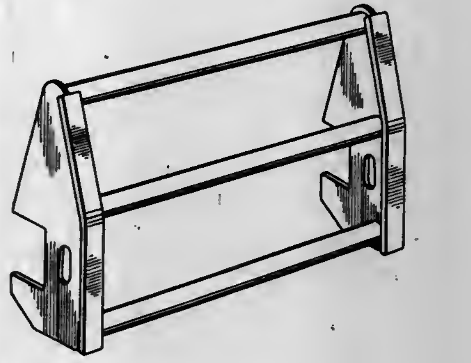
235,249
BICYCLE FRAME
Kaname Kitsuda, 115 Shinshuku, Hiratsuka-shi, Kanagawa-ken, Japan
Filed Apr. 9, 1974, Ser. No. 459,352
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—111



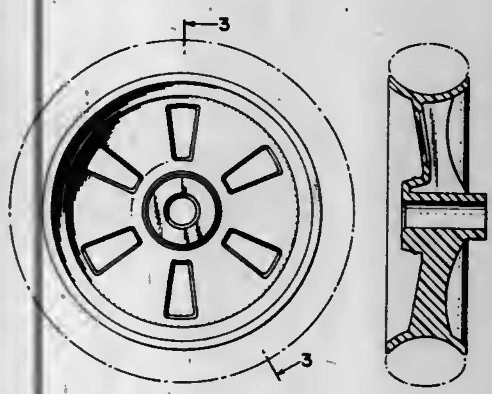
235,250
VEHICLE BUMPER PANEL
Alan J. Mittelman, 5160 Venice Blvd., Los Angeles, Calif. 90019, and Wilbert H. Phillips, 7520 Valjean St., Van Nuys, Calif. 91406
Filed Apr. 23, 1974, Ser. No. 463,298
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—169



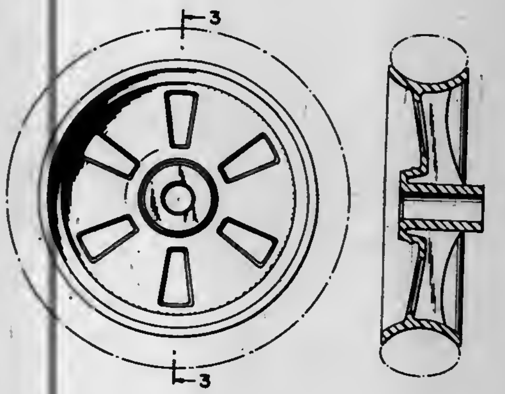
235,251
VEHICLE GRILLE GUARD
Dennis Gary Asbury, Spring Valley, Calif., assignor to House of Steel, Spring Valley, Calif.
Filed Feb. 22, 1974, Ser. No. 444,737
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—169



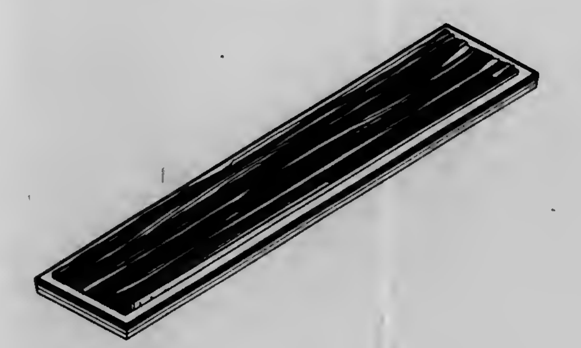
235,252
WHEEL CENTER
Joseph R. May, Chatham, and Donald F. Morgan, Bloomingdale, N.J., assignors to Amerace Corporation, New York, N.Y.
Filed Feb. 14, 1974, Ser. No. 442,660
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



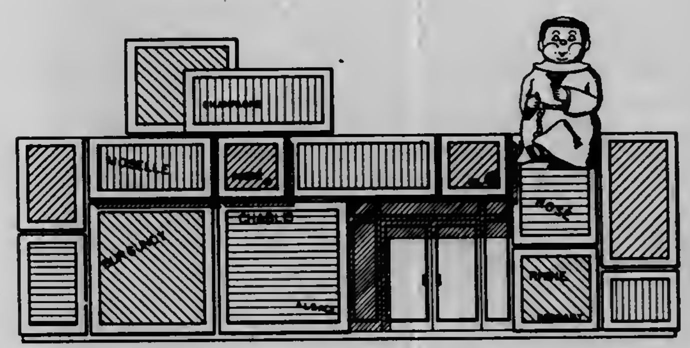
235,253
WHEEL CENTER
Joseph R. May, Chatham, and Donald F. Morgan, Bloomingdale, N.J., assignors to Amerace Corporation, New York, N.Y.
Filed Feb. 14, 1974, Ser. No. 442,661
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



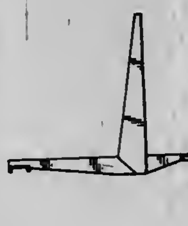
235,254
TILE SHAKE
Merle A. Luther, P.O. Box 347, Cascade, Idaho 83611
Filed June 23, 1972, Ser. No. 265,858
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 J



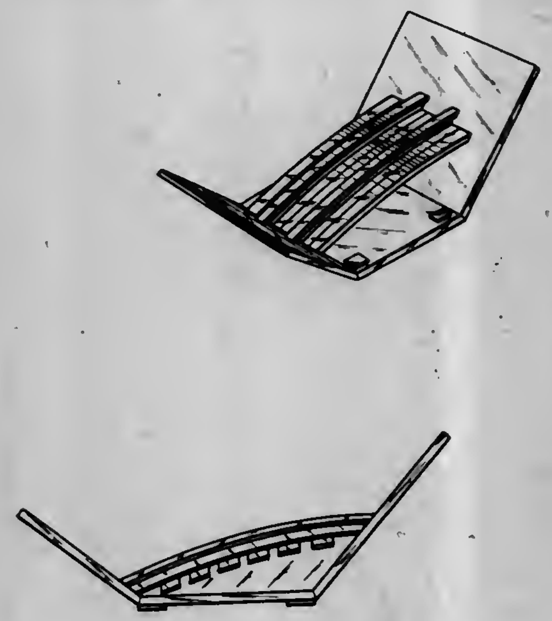
235,255
BUILDING
Francis H. Neverett, Landing Road, Chazy, N.Y. 12921
Filed Nov. 12, 1973, Ser. No. 414,762
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 B



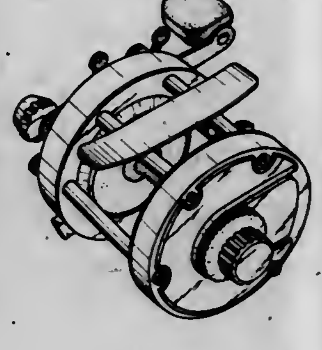
235,256
SUPPORT UNIT FOR ABOVE-GROUND SWIMMING POOLS OR THE LIKE
William A. Oden, Upland, Calif., assignor to Domain Industries, Inc., New Richmond, Wis.
Filed June 21, 1973, Ser. No. 372,284
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D13—1 G



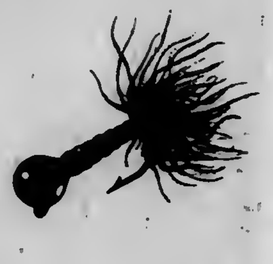
235,257
CARD FILE OR SIMILAR ARTICLE
Gordon Perry, Bayside, N.Y., assignor to Oxford Pendaflex Corporation, Garden City, N.Y.
Filed July 25, 1973, Ser. No. 382,484
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76



235,258
FISHING REEL
Tatsuo Sugimoto, Tokyo, Japan, assignor to Daiwa Seiko Incorporated, Tokyo, Japan
Filed Jan. 18, 1974, Ser. No. 434,801
Claims priority, application Japan July 27, 1973
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



235,259
FISH LURE
Glen R. Welle, Ric-Jig Tackle, Inc., Island View Route, International Falls, Minn. 56649
Filed Jan. 25, 1974, Ser. No. 436,531
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

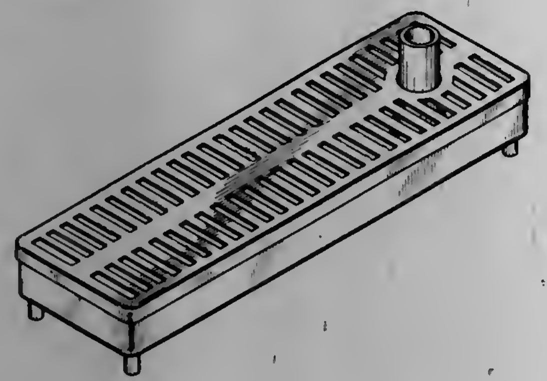


235,260

WATER CONDITIONER RETAINER FOR AN AQUARIUM

Eugene G. Danner, 9122 71st Road,
Forest Hills, N.Y. 11375
Filed Oct. 27, 1972, Ser. No. 301,667
Term of patent 14 years
Int. Cl. D23—*01*

U.S. Cl. D23—3

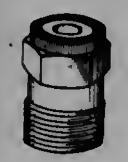


235,261

COLOR CODED NOZZLE

William J. Wichman, Glendora, and Dennis L. Hart, Hacienda Heights, Calif., assignors to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.
Filed May 1, 1972, Ser. No. 249,477
Term of patent 14 years
Int. Cl. D23—*01*

U.S. Cl. D23—34

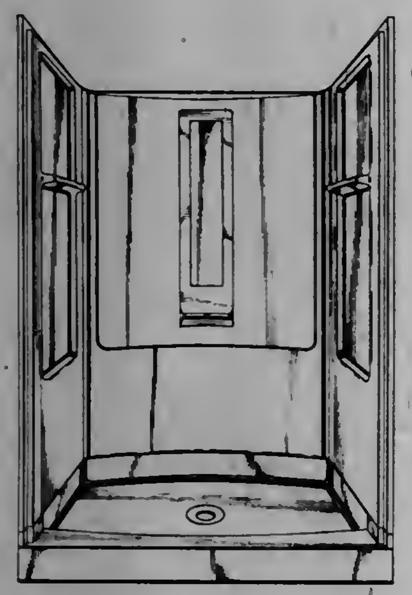


235,262

SHOWER STALL

Merritt W. Seymour, Sylvania, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Continuation-in-part of abandoned design application Ser. No. 308,357, Nov. 21, 1972. This application July 20, 1973, Ser. No. 381,194
Term of patent 14 years
Int. Cl. D23—*02*

U.S. Cl. D23—57

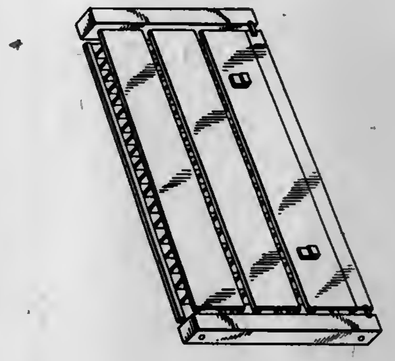


235,263

HEAT CONVECTOR

Gunnar Olaf Vestergaard Rasmussen, % Hudevad Radiatorfabrik Aktieselskab, Aarslev, Denmark
Filed June 19, 1972, Ser. No. 264,289
Claims priority, application Denmark Dec. 20, 1971
Term of patent 14 years
Int. Cl. D23—*03*

U.S. Cl. D23—127

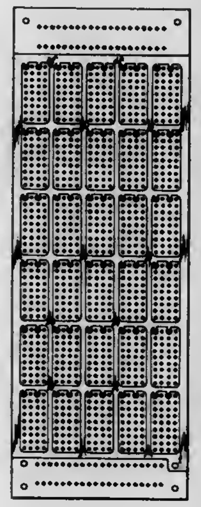


235,264

PANEL BOARD FOR INTEGRATED CIRCUIT PACKAGES

James V. Murphy, 28 Ladderlook Road,
Warwick, R.I. 02886
Filed June 18, 1973, Ser. No. 371,232
Term of patent 14 years
Int. Cl. D13—*03*

U.S. Cl. D26—1 A

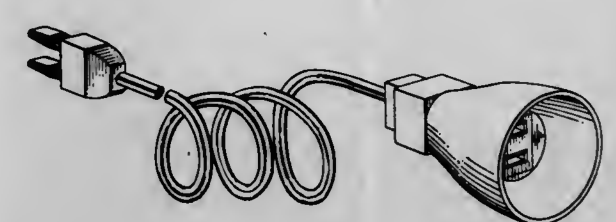


235,265

COMBINED EXTENSION CORD AND SAFETY SOCKET THEREFOR

Howard Perry Michener, 44 Plainfield Road,
Stirling, N.J. 07980
Filed Mar. 21, 1972, Ser. No. 236,801
Term of patent 14 years
Int. Cl. D13—*03*

U.S. Cl. D26—1 B

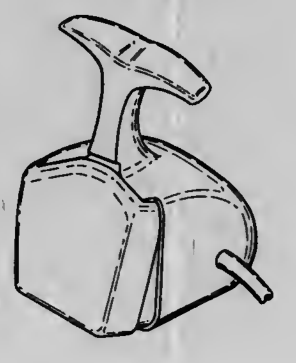


235,266

PALM SUPPORTED FINGER OPERATED SWITCH

Chester B. Rackson, 22 Orchard Drive,
Woodbury, N.Y. 11797
Filed Mar. 13, 1974, Ser. No. 450,849
Term of patent 14 years
Int. Cl. D13—*03*

U.S. Cl. D26—13 R

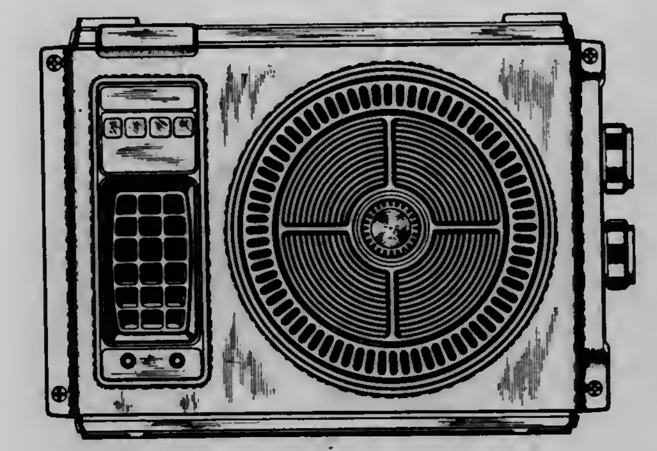


235,267

EIGHT-TRACK PORTABLE TAPE PLAYER

Richard Culbertson, Manlius, and Cornelius W. Christie, Jr., Fulton, N.Y., assignors to General Electric Company
Filed July 11, 1974, Ser. No. 487,567
Term of patent 14 years
Int. Cl. D14—*01*

U.S. Cl. D26—14 B

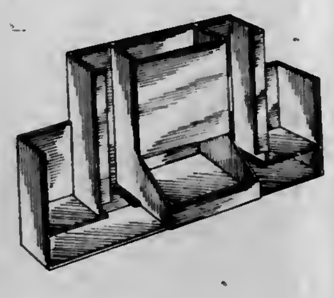


235,268

MATCH DISPENSER WITH SHELF OR SIMILAR ARTICLE

Francis R. McNine, 340 Success Ave.,
Bridgeport, Conn. 06604
Filed Mar. 26, 1973, Ser. No. 344,728
Term of patent 14 years
Int. Cl. D27—*99*

U.S. Cl. D27—32

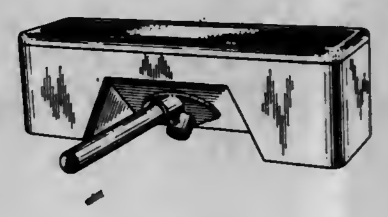


235,269

TURNSTILE

Theodore Nica, New York, N.Y., assignor to Perey Manufacturing Co., Inc., New York, N.Y.
Filed July 13, 1973, Ser. No. 379,126
Term of patent 14 years
Int. Cl. D25—*02*

U.S. Cl. D28—1 B

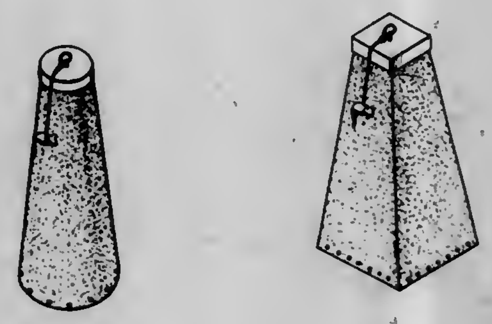


235,270

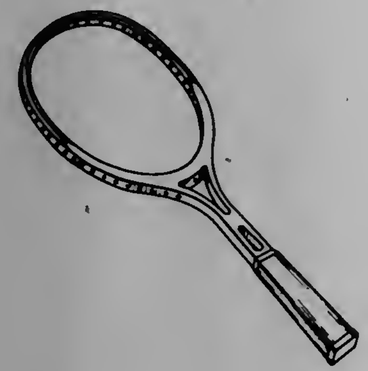
SCRATCHING POST FOR CATS

Paul A. Borak, 600 Shepley Drive,
Glasgow Village, Mo. 65254
Filed June 15, 1973, Ser. No. 370,429
Term of patent 14 years
Int. Cl. D30—*99*

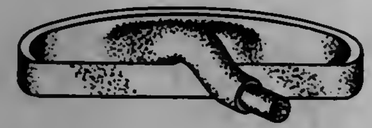
U.S. Cl. D30—42



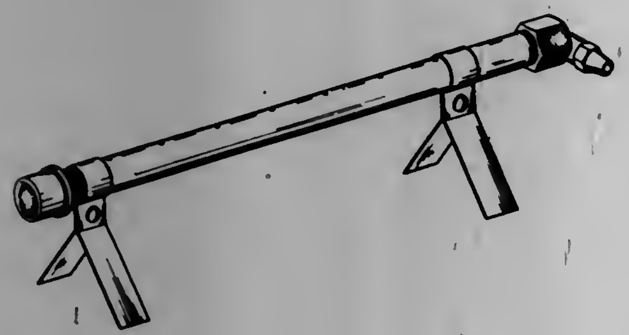
235,271
TENNIS RACKET FRAME
Mitsuji Kameoka, 1–8–24, Jingumae Shibuya-ku, Tokyo, Japan
Filed Oct. 17, 1973, Ser. No. 407,302
Claims priority, application Japan, May 31, 1973
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST



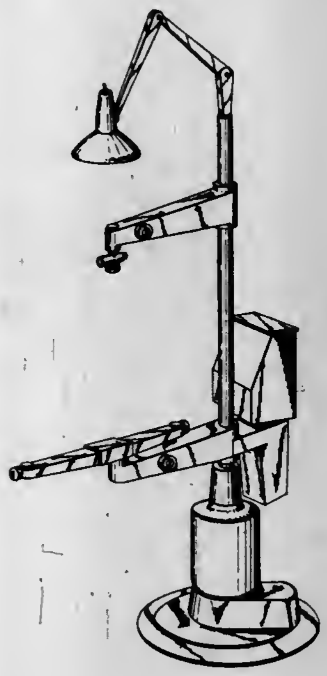
235,272
GOLF CLUB HEAD
Martin E. Quast, 8013 Washburn Circle, Bloomington, Minn. 55431
Filed April 19, 1973, Ser. No. 352,621
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

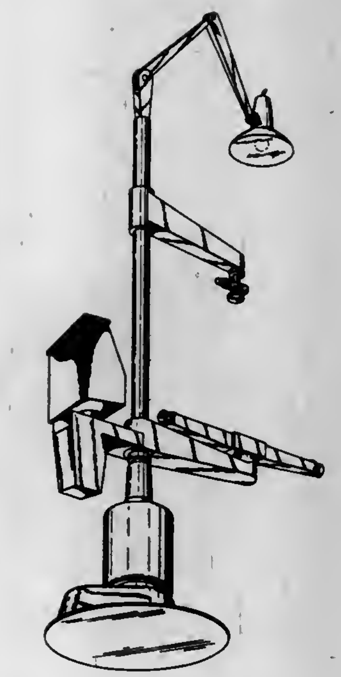


235,273
FIRE STARTER NOZZLE
Leslie G. Boyd, Dallas, Tex., assignor of fractional part interest to Daniel B. Jackson, Seymour, Tex.
Filed Aug. 21, 1973, Ser. No. 390,326
Term of patent 14 years
Int. Cl. D23—*05*
U.S. Cl. D23—90.1

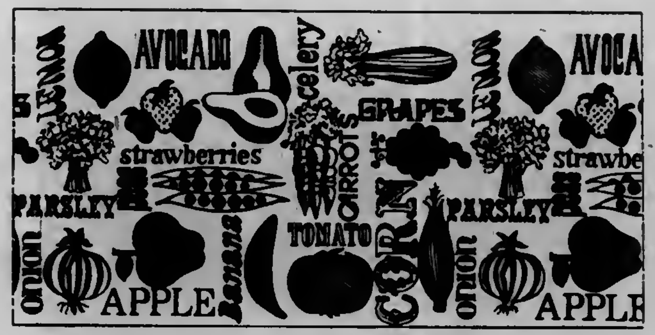


235,274
OPHTHALMIC STAND
John T. Armbruster, Niagara Falls, N.Y., assignor to American Optical Corporation, Southbridge, Mass.
Filed Feb. 23, 1973, Ser. No. 335,188
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D57—1 E

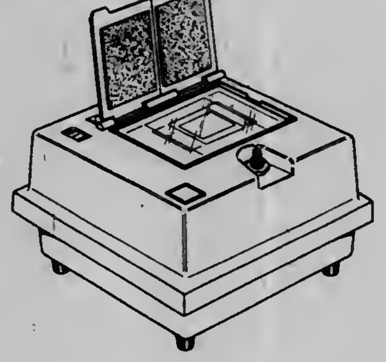




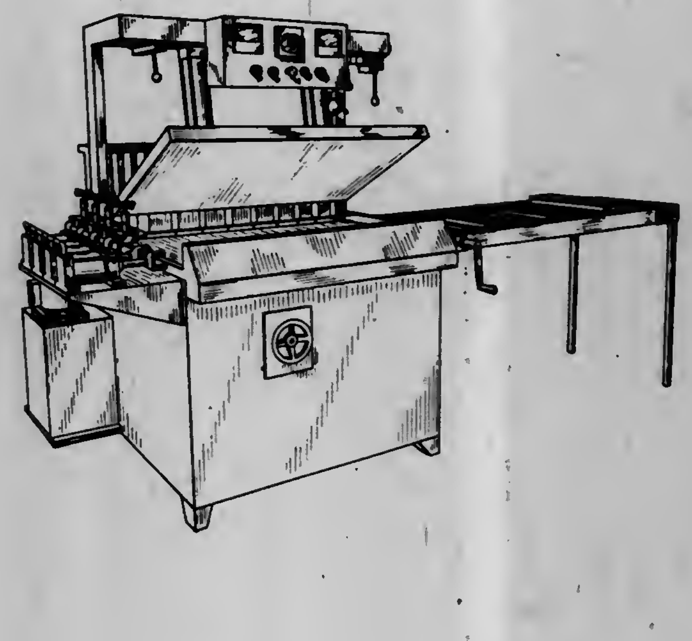
235,275
PAPER TOWELING
Bridget Austin, Green Bay, Wis., assignor to Fort Howard Paper Company, Green Bay, Wis.
Filed July 2, 1973, Ser. No. 375,907
Term of patent 14 years
Int. Cl. D5—*03*
U.S. Cl. D59—2 A



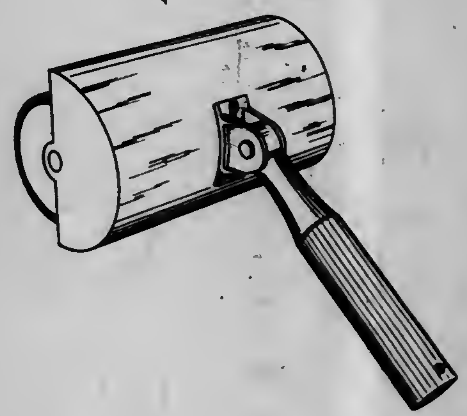
235,276
CONTACT PRINTER
Ronald Keith Dodson, Portland, and Donald H. McCauley, Beaverton, Oreg., assignors to GAF Corporation, New York, N.Y.
Filed July 23, 1973, Ser. No. 382,001
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D61—1 Q



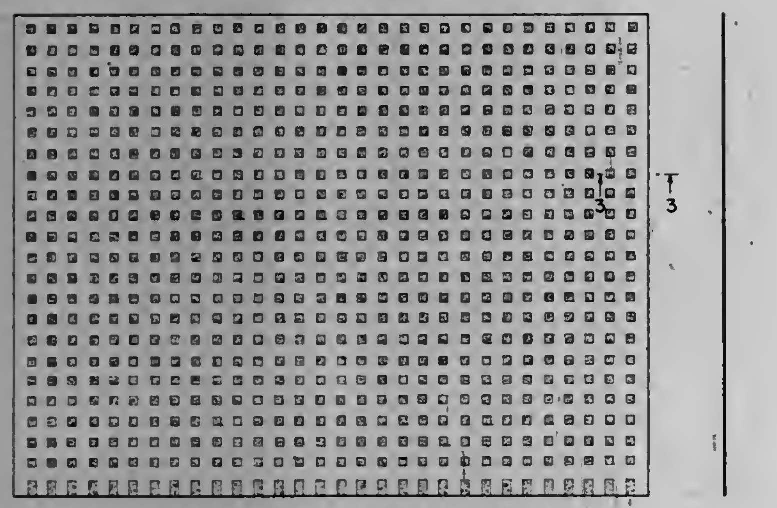
235,277
HIGH FREQUENCY PRESS FOR GLUEING SECTIONS OF WOOD TO PRODUCE PANELS, FRAMES AND OTHER TYPES OF GLUED WOOD STRUCTURES
Ernest E. Rosenquist, North Wilkesboro, N.C., assignor to L&L Machine Division, Modern Globe, Inc.
Filed Feb. 12, 1973, Ser. No. 331,958
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D63—1



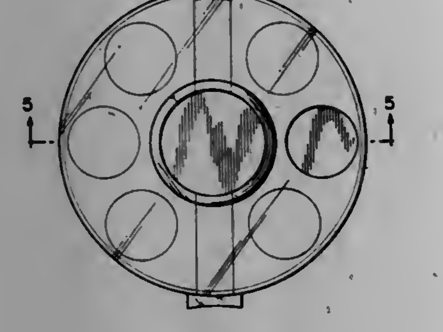
235,278
COMBINED PAINT APPLICATOR AND ROLLER THEREFOR
Robert I. Janssen, 1160 Sibley Memorial Highway, St. Paul, Minn. 55118
Filed Oct. 10, 1972, Ser. No. 296,234
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D64—18



235,279
STERILIZER CONTROL INDICATOR
Seymour Schuman, and Arthur W. Kelson, New York, N.Y., assignors to Propper Manufacturing Co., Inc., Long Island City, N.Y.
Filed June 28, 1973, Ser. No. 374,358
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1 W



235,280
COSMETIC CONTAINER
Henry G. Glass, Roanoke, Va., assignor to Eli Lilly and Company, Indianapolis, Ind.
Filed May 1, 1973, Ser. No. 356,272
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D86—10 N



235,281
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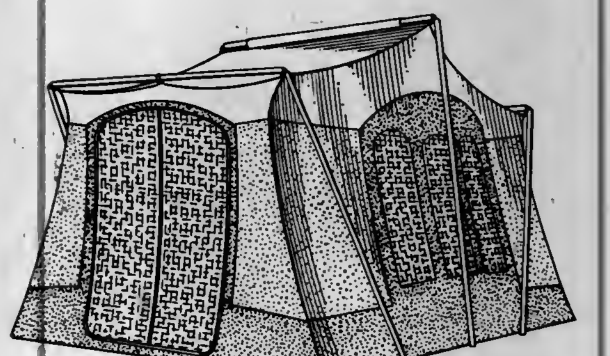
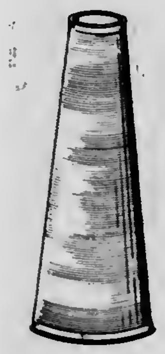
Filed May 24, 1973, Ser. No. 363,395
Term of patent 14 years
Int. Cl. D21—*04*
U.S. Cl. D88—3 B



235,282
YARN CONE
Charles Robert Langston, Jr., Seneca, S.C., assignor to Coats & Clark, Inc., New York, N.Y.
Filed Sept. 4, 1973, Ser. No. 393,968
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D92—15



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF JUNE, 1975

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Abney, David Lewis; and Williams, Robert Carl, to Dresser Industries, Inc. Well packer zone activated valve. 3,887,007, Cl. 166-224.00A.
Abrahams, Jacobus Hubertus, to U.S. Philips Corporation. Hot-gas reciprocating engine and control device. 3,886,743, Cl. 60-521.000.
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Adachi, Hisao, to Pioneer Electronic Corporation. Speaker box cabinet and method of manufacturing the same. 3,887,101, Cl. 220-4.00F.
Adams, Pierrepont, to Olin Corporation. Preparation of rigid polyurethane foam having improved aging properties. 3;887,502, Cl. 260-2.5AT.
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Adembri, Giorgio; Tedeschi, Piero; Ponticelli, Fabio; and Marini, Maresco, to Establissements Nativelle S.A. 1-Amino-pyrazolic derivatives. 3,887,578, Cl. 260-310.00A.
Aechter, Burckhard; and Gerlach, Manfred, to Fried Krupp Gesellschaft mit beschrankter Haftung. Variable quantity measuring devices. 3,887,871, Cl. 324-181.000.
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Ahlport, Boyce T., to United States of America, Air Force. Temperature controlled hybrid oven. 3,887,785, Cl. 219-209.000.
Ahrns, Daniel C.; and Morrison, Robert W., Jr., to Ford Motor Company. Lubricant metering system. 3,886,914, Cl. 123-73.0AD.
Aihara, Ryuzo: *See*—
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Akaishi, Hachiro; Busuzima, Shigeo; Katayama, Morio; and Kan, Akinori, to Kabuishi Kaisha Gunpo. Universal lockseamer mechanism. 3,886,877, Cl. 112-121.150.
Akamatu, Yoshimi: *See*—
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Akashi, Naotomo; and Fujimoto, Katsuji, to Nippon Sheet Glass Co., Ltd. Apparatus for manufacturing ribbon glass having a metal oxide coating. 3,887,349, Cl. 65-161.000.
Akatsu, Toshio; and Fujiyoshi, Toshimitsu, to Hitachi, Ltd. Method of and apparatus for measuring physical quantities of a rotating body. 3,886,787, Cl. 73-88.50R.
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Alais, Michel; Caillot, Robert; and Corcelle, Francois, to Commissariat a l'Energie Atomique. Welding guns. 3,887,784, Cl. 219-121.0EM.
Albrecht, Wilhelm; Patzelt, Helmut; and Hoheisel, Peter-Matthias, to Daimler-Benz Aktiengesellschaft. Safety steering for motor vehicles. 3,887,215, Cl. 280-150.0AB.
Alcan Research and Development Limited: *See*—
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Alekszejev, I. A.: *See*—
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Alexander, John A., to TRW Inc. Method of making erosion resistant articles. 3,886,647, Cl. 228-175.000.
Alfonso, Louis. Sign facing assembly. 3,886,676, Cl. 40-125.00F.
Allam, Rodney John; and Bligh, Bernard Ramsay, to Air Products and Chemicals, Inc. Separation of gases. 3,886,756, Cl. 62-13.000.
Allen-Bradley Company: *See*—
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Allington, Robert W., to Instrumentation Specialties Company. Short wavelength fluorescent light source. 3,887,813, Cl. 250-461.000.
Allis-Chalmers Corporation: *See*—
  Rouch, Keith E., 3,887,245.
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Allison, William D., to Ford Motor Company. Motor vehicle power steering device. 3,887,026, Cl. 180-79.200.
Allison, William D., to Ford Motor Company. Steering mechanism with lateral force correction. 3,887,027, Cl. 180-79.200.
Allmanna Svenska Elektriska Aktiebolaget: *See*—
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Amann, Charles A.; and Sheridan, David C., to General Motors Corporation. Gas turbine with throttle responsive hydrokinetic torque converter and throttle responsive hydrokinetic torque converter. 3,886,729, Cl. 60-39.240.
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- Anders, Edward Olen, to Global Marine Inc. Passive ship motion stabilization system with active assist for high amplitude motions. 3,886,886, Cl. 114-125.000.
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- Andresen, Egon; Reiners, Wolfgang; and Klassen, Alfons, to G. Siempelkamp & Co. System for the production of pressed board. 3,887,314, Cl. 425-135.000.
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- Antoni, Heinz; and Leichsenring, Carl Hans, to Gesellschaft fur Kernforschung mbH. Glandless solenoid valve for corrosive media. 3,887,162, Cl. 251-129.000.
- Anzai, Hiroshi; and Miura, Hiroyuki, to Kabushikikaisha Tokyo Keiki. Transistor inverter. 3,887,861, Cl. 321-18.000.
- Apatoczky, Charles J., to Teledyne, Inc. Crystallizer mold. 3,887,157, Cl. 249-79.000.
- Apostoleris, Theodore G., to Ford Motor Company. Method and means for reducing audible noise in a dynamoelectric machine. 3,887,826, Cl. 310-43.000.
- Appel, Wilhelm, to G. L. Rexroth GmbH. Torque responsive regulating apparatus for a pump. 3,887,302, Cl. 417-212.000.
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- Archer, Giles Allen; and Sternbach, Leo Henryk, to Hoffmann-La Roche Inc. 2-(2-Hydroxyethylamino)benzophenone oximes. 3,887,604, Cl. 260-465.00D.
- Archer, Milton C., to Monsanto Company. Method for facilitating the harvest of fruit. 3,887,354, Cl. 71-90.000.
- Archer, Milton C.; and Franz, John E., to Monsanto Company. Method for facilitating the harvest of fruit. 3,887,357, Cl. 71-95.000.
- Archer, Milton C., to Monsanto Company. Method for facilitating the harvest of fruit. 3,887,358, Cl. 71-104.000.
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- Arnold, Richard B., to General Electric Company. Method and apparatus for developing and placing electrical coils. 3,886,653, Cl. 29-596.000.
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- Ayer, George E., to Bunker Ramo Corporation. Connector retaining adapter. 3,887,259, Cl. 339-119.00R.
- Ayers, Ray R.; and Seymour, Errol V., to Shell Oil Company. Oil containment apparatus. 3,886,750, Cl. 61-1.00F.
- Ayres, Waldemar A., to Becton, Dickinson and Company. Serum/-plasma separator with centrifugal valve seal. 3,887,464, Cl. 210-117.000.
- Ayres, Waldemar A., to Becton, Dickinson and Company. Serum/-plasma separator — cannula fluid by-pass type. 3,887,465, Cl. 210-130.000.
- Ayres, Waldemar A., to Becton, Dickinson and Company. Serum/-plasma separator cannula fluid by-pass type centrifugal valve cannula seal. 3,887,466, Cl. 210-131.000.
- B. F. Goodrich Company, The: *See—*
  - Schneider, Wolfgang; and Minchak, Robert J., 3,887,531.
- B.V.S.: *See—*
  - Denoor, Gaston, 3,886,752.
- Baba, Kazuo; Shiota, Toshiaki; Murakami, Kikuo; and Ono, Kazuo, to Sumitomo Chemical Co., Ltd. Method for producing a modified crystalline propylene polymer. 3,887,534, Cl. 260-93.700.

- Babcock-Atlantique Societe Anonyme: *See—*
  - Pacault, Pierre Henri, 3,886,749.
- Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
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  - Stahnecker, Erhard; Ruppert, Georg; Moeller, Rolf; Schick, Rupert; and Zuern, Ludwig, 3,887,672.
  - Walter, Manfred, 3,887,754.
- Baer, Robert B., to Chromalloy American Corporation. Coating method and composition for the sacrificial protection of metal substrates. 3,887,449, Cl. 204-148.000.
- Bago, Julius. Oxygen meter. 3,887,334, Cl. 23-232.00E.
- Bailey, David S., to Eastman Kodak Company. Photographic elements and processes for producing formazan dye images of enhanced stability. 3,887,372, Cl. 96-48.00R.
- Bailey, John M.; and Cobb, Delwin E., to Caterpillar Tractor Co. Ripper with repetitive explosive device for rock breaking. 3,887,237, Cl. 299-13.000.
- Bailey, John S.; and Hammers, David E., to International Telephone and Telegraph Corporation. Multi-level digital coincidence detection. 3,887,918, Cl. 343-17.20R.
- Bajorek, Christopher H.; and Thompson, David A., to International Business Machines Corporation. Method for eliminating part of magnetic crosstalk in magnetoresistive sensors. 3,887,944, Cl. 360-113.000.
- Baker Hydro, Inc.: *See—*
  - Stanwood, David A., 3,886,602.
- Baker, James G., to Polaroid Corporation. Parallax free viewer. 3,887,931, Cl. 354-155.000.
- Baker, Ratib Sofar, to RCA Corporation. Photographic method for printing viewing-screen structure including treatment of exposed coating with ammonium compound. 3,887,371, Cl. 96-36.100.
- Baker, William H. Building sandwich panels. 3,886,706, Cl. 52-615.000.
- Bakke Industries Limited: *See—*
  - Hattingh, Pieter Anthon, 3,887,123.
- Bako, Lazlo, to Presto Lock Company, Division of Walter Kidde & Company, Inc. Buckle. 3,886,632, Cl. 24-167.000.
- Baldwin, Bernard A., to Phillips Petroleum Company. Method for evaluating petroleum reservoirs. 3,887,331, Cl. 23-230.0EP.
- Baldwin, Mildred. Composition and method for treating fingernails and toenails. 3,887,702, Cl. 424-61.000.
- Bally Manufacturing Corporation: *See—*
  - Lally, Joseph Edward, 3,887,192.
- Balmford, David Ernest Hall: *See—*
  - Mills, Noel; Balmford, David Ernest Hall; and Saunders, James Edwin, 3,887,296.
- Balsbaugh, Vernon L. Rotary internal combustion engine. 3,886,909, Cl. 123-8.450.
- Banner Metals Division Intercole Automation, Inc.: *See—*
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  - Wilson, James D., 3,887,219.
- Banner Metals, Inc.: *See—*
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- Baremor, Jerry F., to Eaton Corp. Differential. 3,886,813, Cl. 74-710.500.
- Barlow, Percy; and Barlow, Roderick Bruce. Fluid pressure connector and break-away unit. 3,886,970, Cl. 137-561.00R.
- Barlow, Roderick Bruce: *See—*
  - Barlow, Percy; and Barlow, Roderick Bruce, 3,886,970.
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- Barry-Wehmiller Company: *See—*
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- Barth, Bruce P., to Union Carbide Corporation. Adhesive compositions. 3,887,539, Cl. 260-19.0UA.
- Barthel, Horst K. F.: *See—*
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- BASF Aktiengesellschaft: *See—*
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- BASF Wyandotte Corporation: *See—*
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  - Narayan, Thirumurti L.; and Cenker, Moses, 3,887,501.
- Bassan, Eraclio. Link hinge. 3,886,627, Cl. 16-163.000.
- Bathelt, Robert Richard; and Schuil, Roelof Egbert, to U.S. Philips Corporation. Shadow mask having conductive layer in poor thermal contact with mask. 3,887,828, Cl. 313-402.000.
- Batt, John A.: *See—*
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- Battelle Memorial Institute S.A. Automobiles Citroen: *See—*
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- Battershell, Robert D.; Bimber, Russell M.; and Bungs, Janis A., to Diamond Shamrock Corporation. Phosphoramidothioate esters. 3,887,657, Cl. 260-938.000.
- Bauer, Hans. Device for measuring the humidity of gases. 3,886,797, Cl. 73-335.000.
- Baughan, Harry O., III: *See—*
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- Bausier, Andre Henri, to Raffinerie Tirlemontoise. Apparatus for continuously separating and discharging heavy foreign matters from beets. 3,887,074, Cl. 209-158.000.
- Baxter, Bobby G., to Binkley Company, The. System for moving and aligning modular house units onto a foundation. 3,887,083, Cl. 214-1.00H.
- Baxter, Bobby G., to Binkley Company, The. Prefabricated house module moving system. 3,887,085, Cl. 214-1.00H.
- Baxter Laboratories, Inc.: *See—*
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- Baxter, Samuel Paul; and Marchant, Keith, to Monsanto Chemicals Limited. Laminate with flocked fiber pile. 3,887,737, Cl. 428-90.000.
- Bayer Aktiengesellschaft: *See—*
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- Bayles, John; Bremer, Randall C.; Gauthier, George E.; Nascimbeni, Frank J.; and Petitjean, Robert J., to Arrow-Hart, Inc. High current switch. 3,887,888, Cl. 335-195.000.
- Beatrice Foods Company: *See—*
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- Beauchamp, Gerald J.; and Kelly, Thomas A., to Beaukel, Ltd. Practice hockey puck of felt material. 3,887,188, Cl. 273-128.00R.
- Beaukel, Ltd.: *See—*
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  - Doniat, Denis; Beccu, Klaus; and Porta, Augusto, 3,887,400.
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- Bechtel International Corporation: *See—*
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- Beck, Theodore A., to Hayden Trans-Cooler, Inc. Heat exchange apparatus. 3,887,004, Cl. 165-179.000.
- Becker, Rudolf; and Becker, Wolfgang, to Linde Aktiengesellschaft. Container system for the storage and/or transportation of liquefied gas. 3,886,885, Cl. 114-74.00A.
- Becker, Wolfgang: *See—*
  - Becker, Rudolf; and Becker, Wolfgang, 3,886,885.
- Beckers, Norman L., to Diamond Shamrock Corporation. Methylene chloride stabilized with organic epoxides. 3,887,628, Cl. 260-652.50R.
- Beckwith, Athelstan L. J., to Sherwin-Williams Company, The. Method for producing heterocyclic acid anhydrides. 3,887,550, Cl. 260-244.00R.
- Beckwith, Merton M.: *See—*
  - Fong, Jaan-Jiue; and Beckwith, Merton M., 3,887,405.
- Becton, Dickinson and Company: *See—*
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  - Ayres, Waldemar A., 3,887,465.
  - Ayres, Waldemar A., 3,887,466.
- Beecham Group Limited: *See—*
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- Beerli, Marc: *See—*
  - De La Breteque, Pierre; and Beerli, Marc, 3,887,681.
- Behring, Harry L.; and Spector, George. Border frame for pictures. 3,886,677, Cl. 40-152.000.
- Beiswenger, John L.; and Jorgensen, Leland DeVon, to National Presto Industries, Inc. Alarm device. 3,887,909, Cl. 340-274.000.
- Bell & Howell Company: *See—*
  - La Rue, Mervin W., Jr., 3,887,393.
- Bell, Philip Richard, to Marconi Company Limited, The. Digital-to-analogue converter for rapidly converting different codes. 3,887,911, Cl. 340-347.0DA.
- Bell Telephone Laboratories, Incorporated: *See—*
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  - Cichetti, Michael Peter, Jr.; and Fretz, Robert Jeffrey, 3,887,769.
  - Kompfner, Rudolf, 3,887,264.
  - Miller, Ralph L., 3,887,772.
  - Nagel, Harry Henry, 3,887,849.
- Bellettini, Arturo Gabriel; and Franklin, Richard Crawford, to du Pont de Nemours, E. I., and Company. Coupling process for substituted aminoazobenzenesulfonic acids. 3,887,540, Cl. 260-205.000.
- Belousov, Alexeevich Vladimir: *See—*
  - Tseitlin, Aron Yakovlevich; Martynov, Oleg Viktorovich; Ordinartsev, Jury Nikolaevich; Ordinartsev, Vladimir Nikolaevich; Tishkin, Evgeny Pavlovich; Tikhonov, Sergel Sergeevich; and Belousov, Alexeevich Vladimir, 3,886,996.
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  - Owens, Abner, Jr.; and Weinstein, Donald, 3,887,842.
  - Sharpe, Claude A., 3,887,872.
  - Spratt, Brendan J.; and Lunsden, James C., 3,887,921.
  - Taplin, Lael B., 3,886,915.
- Benjamin, Milton L.; and Miles, Wilbur N., to Erickson Tool Company. Quick change chuck. 3,887,203, Cl. 279-50.000.

- Bennett, Ronald W., to General Motors Corporation. Tractor-trailer braking system with variable motor speed control device. 3,887,238, Cl. 303-7.000.
- Bentley, Floyd E.: *See—*
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- Berg Manufacturing Company, The: *See—*
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- Bergmann, Paul F., Jr. Portable building structure. 3,886,699, Cl. 52-90.000.
- Berman, Bernard H. Exercise apparatus for bedridden patients. 3,887,180, Cl. 272-58.000.
- Bermeco Oy: *See—*
  - Laurila, Erkki A., 3,887,458.
- Bernard, Michel Louis; and Coudrin, Gerard, to Republic of France. Process and apparatus for heterogeneous catalysis of a chemical reaction, particularly catalytic decomposition of hydrogen peroxide. 3,887,696, Cl. 423-579.000.
- Bernardin, Leo J., to Kimberly-Clark Corporation. Sanitary napkin. 3,886,942, Cl. 128-290.000.
- Berner, Erling. Air curtain device. 3,886,851, Cl. 98-36.000.
- Bernhardt, Thomas Joseph; and Klein, Frank N., to Eaton Corp. Fuseless inverter. 3,887,860, Cl. 321-14.000.
- Berrebi, Claudine: *See—*
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- Berry, Robert J., to Maher, Lawrence J., a part interest. Oyster shucker and method. 3,886,628, Cl. 17-76.000.
- Bertalot, Silvio, to U.S. Philips Corporation. Telescoping support mechanism. 3,887,155, Cl. 248-333.000.
- Betz Laboratories, Inc.: *See—*
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  - Porter, Joe A.; and Dageforde, Allen F., 3,887,194.
- Bez, Ulrich, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Collision energy dissipation apparatus for a passenger motor vehicle. 3,887,223, Cl. 293-70.000.
- Bickerdike, Robert Lewis; Mair, William Norman; and Thomas, Evan Samuel, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State of Defence in Her Majesty's Government of the. Temperature control. 3,887,001, Cl. 165-81.000.
- Bierwirth, Egon: *See—*
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- Bignell, Fred A., to Emporium Specialties Co., Inc. Fluid-operated clutch with wear limiting stop. 3,887,051, Cl. 192-85.0AA.
- Billette, Richard J.; and Vennard, John, to National Semiconductor Corporation. Semiconductor pressure transducer employing temperature compensation circuits and novel heater circuitry. 3,886,799, Cl. 73-398.0AR.
- Bimber, Russell M.: *See—*
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- Binkley Company, The: *See—*
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  - Baxter, Bobby G., 3,887,085.
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- Birdy, Jal Nariman; and Stubbs, Shirley Bowers. Submersible structures. 3,886,753, Cl. 61-46.500.
- Bishop, John W. H.: *See—*
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- Bison-werke Bahre & Greten GmbH & Co. Kg: *See—*
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- Bjorklund, Curt Arnold. Valve. 3,886,974, Cl. 137-613.000.
- Blanc, Henri. Load-handling appliance. 3,887,209, Cl. 280-43.210.
- Blanchard, James G. Rotary-piston internal combustion engine. 3,886,913, Cl. 123-44.00D.
- Blau, Henry H., Jr.; and Kebabian, Paul L., to Environmental Research & Technology, Inc. Light equalizer and method of making same. 3,887,262, Cl. 350-1.000.
- Blauert, Hans Joachim; Jejina, Filip; and Reisch, Hans, to Siemens Aktiengesellschaft. Communication monitoring circuit. 3,887,824, Cl. 307-294.000.
- Blay, Jorge A., to Celanese Corporation. Thermal purification of terephthalic acid using group I-B, II-B; VIII catalysts. 3,887,613, Cl. 260-525.000.
- Bligh, Bernard Ramsay: *See—*
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- Block, Charles, to Joseph Galkin Corporation. Automatic fabric handling apparatus. 3,886,878, Cl. 112-121.270.
- Block Engineering, Inc.: *See—*
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- Blocker, Erich; Rupp, Walter; and Jakob, Franz, to Hoechst Aktiengesellschaft. Light-stabilized synthetic linear polyesters and shaped structures made therefrom. 3,887,521, Cl. 260-47.00C.
- Bloom, Stanley M., to Polaroid Corporation. Novel compounds, syntheses and the uses thereof. 3,887,563, Cl. 260-286.00R.
- Blumbergs, John H.: *See—*
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- Bobeck, Andrew Henry; and Scovil, Henry Evelyn Derrick, to Bell Telephone Laboratories, Incorporated. Magnetic domain shifting arrangement employing movable strip domain. 3,887,905, Cl. 340-174.0TF.
- Bobo, Donald E.; and McPhee, Charles J., to American Hospital Supply Corporation. Medical administration set for dispensing plural medical liquids. 3,886,937, Cl. 128-214.00R.
- Bochynsky, Frank J., to Byke Co., The. Backrest for wheeled vehicles. 3,887,231, Cl. 297-366.000.
- Bock, Ronald E.: *See—*
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  - Heller, Laszlo; Forgo, Laszlo; Bodas, Janos; Papp, Istvan; Agejev, G. Sz.; and Alekszejev, I. A., 3,887,666.
- Bodine, Roger E. Method for testing accuracy of machine tool control programs. 3,886,846, Cl. 90-11.00C.
- Boehringer Ingelheim GmbH: *See—*
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  - Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Hoefke, Wolfgang, 3,887,552.
- Boehringer, John R. Gas sampling device. 3,886,800, Cl. 73-421.50R.
- Boeing Company, The: *See—*
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- Boelens, Harmannus; and Traas, Petrus C., to Naarden International NV. Process for the preparation of sesquiterpene ketones. 3,887,622, Cl. 260-586.00P.
- Bogaert, Pierre Emmanuel Eugene Jean. Top for a skylight side member. 3,886,701, Cl. 52-200.000.
- Bolduc, Lee R.; and Dickhudt, Eugene A., to Population Research Incorporated. Apparatus for puncturing and collapsing a container. 3,887,112, Cl. 222-85.000.
- Boliden Aktiebolag: *See—*
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- Bollig, George; Brock, Klaus; and Niendorf, Alfred, to Schloemann-Siemag Aktiengesellschaft. Continuous casting installation equipped with mold support pivotable out of a casting position. 3,886,995, Cl. 164-260.000.
- Bolstad, Richard; and Melchoni, Anna F., to Inmont Corporation. Ammonium salts of resinous polycarboxylic acids. 3,887,509, Cl. 260-29.10R.
- Bomanite Corporation: *See—*
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- Boncey, Graham Arthur; Hedge, Maurice John; and Henderson, James Rae, to Aspro Nicholas Ltd. Analgesic formulations. 3,887,700, Cl. 424-44.000.
- Boniek, Klaus, to Inventio Aktiengesellschaft. Device for controlling a lift or the like. 3,887,039, Cl. 187-29.00R.
- Borden, Inc.: *See—*
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- Bordt, Dale E.: *See—*
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- Borenstein, David E.; and Newton, Richard C., to Phillips Petroleum Company. Yarn processing. 3,886,636, Cl. 28-72.110.
- Borg-Warner Corporation: *See—*
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  - Hoppesch, Joseph P.; Ward, Donald H.; and Tomashek, James R., 3,886,929.
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  - Taylor, Charles F., 3,887,290.
- Borougerdi, Hossein: *See—*
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- Bosniack, David S., to Exxon Research and Engineering Company. Adhesive composition and methods. 3,887,422, Cl. 156-334.000.
- Bossert, Friedrich: *See—*
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- Bossler, Robert B., to Kaman Aerospace Corporation. Bolt head which measures and maintains preload. 3,886,840, Cl. 85-62.000.
- Bourg, Christian Pierre: *See—*
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- Bourne, Joseph R., to Carrier Corporation. Fluid distributor. 3,887,131, Cl. 239-110.000.
- Boutonnat, Maurice, to Charbonnages de France; and MSA de France. Electrical measuring and monitoring apparatus utilising a remote detector. 3,887,335, Cl. 23-254.00E.
- Bower, Richard. Expandable belt. 3,886,727, Cl. 59-79.00B.
- Bowman, Bradshaw, to Bomanite Corporation. Method for imprinting non-repeating stone patterns in fresh concrete. 3,887,293, Cl. 404-72.000.
- Boxer, Steve. Device for alleviating muscular discomfort. 3,886,939, Cl. 128-268.000.
- Boyer, Carl W.: *See—*
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- Boyles, Robert L., to General Electric Company. Alarm clock timer. 3,886,723, Cl. 58-21.150.

- BPB Industries Limited: *See—*
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- Brachman, Armand Edward; and McCarron, Edward Michael, to GAF Corporation. Alkyl phenol-hydrazine antioxidants. 3,887,477, Cl. 252-400.00R.
- Bradford, John Guythar. Foldable casualty carrier. 3,886,606, Cl. 5-82.000.
- Brandt, Ivan L.; and von Alten, Theodor, to Allen-Bradley Company. Fusible resistor. 3,887,893, Cl. 338-262.000.
- Bratten, William Richard, to Baxter Laboratories, Inc. Die assembly for heat-sealing tubing ends to sheeting in transverse relationship. 3,887,323, Cl. 425-521.000.
- Bratter, Robert L.; and Gaind, Arun K., to International Business Machines Corporation. Method of chemical vapor deposition to provide silicon dioxide films with reduced surface state charge on semiconductor substrates. 3,887,726, Cl. 427-95.000.
- Brawn, Darrell S., to Eaton Corp. Inflatable vehicle occupant restraint system and means for supporting same. 3,887,214, Cl. 280-150.0AB.
- Bray, Donald T., to Desalination Systems, Inc. Reverse osmosis system with automatic valve for module operation control. 3,887,463, Cl. 210-110.000.
- Bray, Donald T., to Desalination Systems, Inc. Feed water chlorinator for a reverse osmosis system. 3,887,468, Cl. 210-206.000.
- Breinig, Harry V. Fire escape. 3,887,033, Cl. 182-78.000.
- Brekle, Oliver R., to M & B Metal Products Company. Apparatus for cleaning and coating wire. 3,886,894, Cl. 118-6.000.
- Bremer, Randall C.: *See—*
  - Bayles, John; Bremer, Randall C.; Gauthier, George E.; Nascimbeni, Frank J.; and Petitjean, Robert J., 3,887,888.
- Breslow, Jeffrey D., to Marvin Glass & Associates. Fluid stream game apparatus. 3,887,182, Cl. 273-1.00E.
- Bresson, Richard J., to Eastman Kodak Company. Light compensation for exposure control cameras. 3,887,930, Cl. 354-59.000.
- Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc. 5-Mercaptoalkyl-1,2,4-oxadiazole derivatives. 3,887,573, Cl. 260-307.00G.
- Bridges, John A.; and Wyatt, W. Burk, to Aladdin Industries, Incorporated. Food service cart. 3,887,253, Cl. 312-250.000.
- Bright, Cooper B., to Rutgers University. Aircraft with combination stored energy and engine compressor power source for augmentation of lift, stability, control and propulsion. 3,887,146, Cl. 244-12.00R.
- Brill, Eugene L. Oil detector. 3,887,907, Cl. 340-236.000.
- British Insulated Callender's Cables Limited: *See—*
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- British Steel Corporation: *See—*
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- Brobu Industrie-Ofenbau GmbH & Co. KG: *See—*
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  - Bollig, George; Brock, Klaus; and Niendorf, Alfred, 3,886,995.
- Brockmann, Heinz, to Brobu Industrie-Ofenbau GmbH & Co. KG. Walking beam conveyor in a furnace. 3,887,064, Cl. 198-219.000.
- Broderson, John C. Method for constructing an awning. 3,886,646, Cl. 228-182.000.
- Brokaw, Adrian Paul, to Analog Devices, Incorporated. Solid-state regulated voltage supply. 3,887,863, Cl. 323-19.000.
- Brongo, Ralph T.; Fleming, James C.; and Manthey, Joseph W., to Eastman Kodak Company. Tetrazolium alt photoreductive imaging. 3,887,374, Cl. 96-48.00R.
- Bronicki, Lucien Yehuda, to Ormat Turbines (1965) Ltd. Closed rankine cycle power plant and condenser therefor. 3,886,748, Cl. 60-651.000.
- Brookfield, Donald W. Viscometer. 3,886,789, Cl. 73-59.000.
- Brooks, Frank, to Foscolor Limited. Mixing apparatus. 3,887,168, Cl. 259-16.000.
- Brooks, Robert A., to Magnetic Analysis Corporation. Eddy current testing apparatus using segmented monoturn conductive members. 3,887,865, Cl. 324-40.000.
- Brooks, Robert H.: *See—*
  - Hutchinson, Bruce R.; Hunter, Bruce H.; and Brooks, Robert H., 3,887,336.
- Brothers, Don R.; and Stewart, Edwin D., to Century Industries Corporation. Method for forming caulking tube cartridges. 3,886,711, Cl. 53-14.000.
- Brown Boveri-Sulzer Turbomaschinen Aktiengesellschaft: *See—*
  - Uhlig, Klaus, 3,886,964.
- Brown, Harold F. Accessory attachment for a vehicle used for fluid spraying of vegetation. 3,887,129, Cl. 239-119.000.
- Brown International Corporation: *See—*
  - Bushman, Ronald C., 3,887,062.
- Brown, James Peter; Jenner, Edwin Gordon; and Wilcock, John, to Imperial Chemical Industries Limited. Process for preparing solvent-soluble polyurethanes. 3,887,525, Cl. 260-77.5AA.
- Brown, Robert L. Surveying apparatus stake cutter. 3,886,826, Cl. 83-13.000.
- Browne, Frank H., to General Motors Corporation. Impact energy absorber with radially adjustable flow metering. 3,887,224, Cl. 293-85.000.
- Bruck, Erhard, to Wilhelm Loh Kommanditgesellschaft. Mounting device for optical lenses. 3,886,696, Cl. 51-216.0LP.
- Bruderer, Hans; Richle, Rolf; and Ruegg, Rudolf, to Hoffmann-La Roche Inc. Pyrazole derivatives. 3,887,548, Cl. 260-240.00A.
- Bruderer, Werner: *See—*
  - Meier, Walter; and Bruderer, Werner, 3,886,991.
- Brundige, Clayton L.; and Bechman, William H., to Eaton Corp. Material handling apparatus. 3,887,098, Cl. 214-762.000.
- Brunet, Jacques; and Rigaux, Jean-Claude, to La Cellophane. Method of molding using a polyethylene terephthalate release film coated with polyethylene sebacate. 3,887,579, Cl. 264-316.000.
- Brunnthaler, Erich: *See—*
  - Stahl, Horst; Vorbach, Guenther; Brunnthaler, Erich; Hezel, Wolfgang; and Flath, Wolfgang, 3,887,057.
- Brunswick Corporation: *See—*
  - Crossman, Phillip E.; Kenrick, Robert C.; and Le Mieux, Robert W., 3,887,187.
  - Matlock, Oscar N., Jr., 3,887,186.
- Brzozowski, Zbigniew; Porejko, Stanislaw; Kielkiewicz, Jedrzej; and Kaczorowski, Janusz, to Politechnika Warszawska. Self-extinguishing, film-forming, linear polyarylates. 3,887,522, Cl. 260-47.00C.
- Brzozowski, Zdzislaw; Angielski, Stefan; and Wojcikowski, Czeslaw. 2-Pyrazoline-1-carboxamide sulfonamide derivatives useful as hypoglycemic agents. 3,887,709, Cl. 424-273.000.
- Bucey, Jackson P. Finger-tip writing instrument. 3,887,286, Cl. 401-7.000.
- Buchel, Karl Heinz: *See—*
  - Draber, Wilfried; Buchel, Karl Heinz; Regel, Erik; and Plempel, Manfred, 3,887,556.
- Buck, Charles Herbert, to Liberty Winery, Inc. Transfer apparatus for bulk grapes. 3,887,091, Cl. 214-38.00R.
- Budecker, Ludwig; and Von Grunberg, Hubertus, to ITT Industries, Inc. Pressure operated directional control valve. 3,886,848, Cl. 91-412.000.
- Bueler, Richard C., to Wagner Electric Corporation. Quick installation vehicle wheel sensor. 3,887,046, Cl. 188-181.00A.
- Buford, John T., to United States of America, Energy Research and Development Administration. Recovery of boron from a polymer matrix. 3,887,687, Cl. 423-292.000.
- Bullard, David E.; and Allen, Jan K., to Caterpillar Tractor Co. Cooling circuit for a vehicle transmission. 3,886,814, Cl. 74-730.000.
- Bullivant, Kenneth W., to K-Tron Corporation. Density control feeder system. 3,887,111, Cl. 222-57.000.
- Bungs, Janis A.: *See—*
  - Battershell, Robert D.; Bimber, Russell M.; and Bungs, Janis A., 3,887,657.
- Buning, Robert: *See—*
  - Looman, Wolfgang; Pungs, Wolfgang; Bierwirth, Egon; and Buning, Robert, 3,887,728.
- Bunker Ramo Corporation: *See—*
  - Ayer, George E., 3,887,259.
- Bunnelle, Philip R., to FMC Corporation. Liquid-gas separator unit. 3,887,342, Cl. 55-203.000.
- Burgdorf, Jochen; and Eikenberg, Dieter, to ITT Industries, Inc. Spot-type disc brake. 3,887,044, Cl. 188-73.500.
- Burger, Anthony John. Portable cleaning device for outboard motors. 3,886,889, Cl. 115-.50R.
- Burgess, George A.: *See—*
  - Reckseit, Bernard S.; and Burgess, George A., 3,887,090.
- Burkett, Wilford B.; and Carlsen, George D., II, to McCulloch Corporation. Battery charging. 3,887,858, Cl. 320-31.000.
- Burroughs Corporation: *See—*
  - Cicchiello, Frank N., 3,887,856.
  - Colegrove, James Anthony; and Seeley, Dunham Briggs, 3,886,898.
  - Lehmann, Jerry Hans, 3,887,056.
- Busch, Johannes; Roser, Herbert; and Sedlacek, Hugo, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Hinge support, especially for a bridge. 3,886,613, Cl. 14-14.000.
- Buschbom, Floyd E.; Hansen, Glen Dale; and Wolfe, Walter W., to Veda, Inc. Lift apparatus. 3,887,038, Cl. 187-27.000.
- Bushman, Ronald C., to Brown International Corporation. Side entry hopper for rotary fruit feeder. 3,887,062, Cl. 198-52.000.
- Busuzima, Shigeo: *See—*
  - Akaishi, Hachiro; Busuzima, Shigeo; Katayama, Morio; and Kan, Akinori, 3,886,877.
- Butler, Anthony J.; and Pail, Daniel R., to Dow Corning Corporation. Oil resistant leather. 3,887,758, Cl. 428-540.000.
- Byke Co., The: *See—*
  - Bochynsky, Frank J., 3,887,231.
- Bystrom, Sven Borje: *See—*
  - Stromstedt, Sven Sixten; and Bystrom, Sven Borje, 3,886,774.
- C. Keller u. Co.: *See—*
  - Kamhues, Hermann, 3,887,060.
- C. P. Bourg: *See—*
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- C. Reichert Optische Werke, AG: *See—*
  - Merstallinger, Kurt; and Schindl, Klaus P., 3,887,283.
- Caccamo, Samuel E. Camouflage remover on duck blind. 3,886,678, Cl. 43-1.000.
- Caillot, Robert: *See—*
  - Alais, Michel; Caillot, Robert; and Corcelle, Francois, 3,887,784.
- Cairns, Elton J.: *See—*
  - Walsh, William J.; Chilenskas, Albert A.; Cairns, Elton J.; and Nelson, Paul A., 3,887,396.
- California Computer Products, Inc.: *See—*
  - Trousdale, Robert B.; Seid, Eugene; and Smith, William E., 3,887,796.
- Calpha, Arthur J., Jr.: *See—*
  - Erlewine, Richard H.; Richter, Charles W., III; and Calpha, Arthur J., Jr., 3,887,320.

Camp, Michel; and Rostaing, Paul, to Rhone-Poulenc, S.A. Process for removing bubbles of gas from liquids. 3,887,487, Cl. 252-321.000.

Campbell, Roger G.; Goff, Richard E., Jr.; and Guay, Normand D., to Johnson & Johnson. Narrow elastic fabric for apparel waistbands. 3,886,598, Cl. 2-237.000.

Campione, Joseph C. Integral universal stretcher bar. 3,886,990, Cl. 160-374.100.

Camsco, Inc.: *See—*
Martell, Charles Ronald, 3,887,903.

Canadian Occidental Petroleum, Ltd.: *See—*
Chalmers, William W., 3,887,130.

Canadian Patents and Development Limited: *See—*
Juneja, Subhash C., 3,887,511.

Canfield, Charles L. Downhole gas compression technique. 3,887,008, Cl. 166-267.000.

Canon Kabushiki Kaisha: *See—*
Matsuno, Hiroshi; and Endo, Ichiro, 3,887,369.
Nagashima, Shinichiro; and Tuneda, Terukuni, 3,887,560.

Canron Inc.: *See—*
Maisonneuve, Hubert; and von Beckmann, Helmut, 3,886,675.

Cante, Charles John; and Moreno, Victor, to General Foods Corporation. Edible polyunsaturated emulsions. 3,887,715, Cl. 426-570.000.

Canter, Lawrence E.: *See—*
Lammy, James E.; Francis, Thomas; and Canter, Lawrence E., 3,886,611.

Carabott, Carmel John Angelo; and Ross, Jaffray Stuart, to Stenprint Limited. Stencil stamp with air valve and protective stencil. 3,886,863, Cl. 101-125.000.

Caradot, Patrice, to Milbras. Self-clamping grip for a free cable winch. 3,886,631, Cl. 24-134.00N.

Carding, John Raymond; and Peover, Cyril, to Imperial Chemical Industries Limited. Carbonation of ammoniacal sodium chloride brine. 3,887,689, Cl. 423-423.000.

Carlsen, George D., II: *See—*
Burkett, Wilford B.; and Carlsen, George D., II, 3,887,858.

Carrier Corporation: *See—*
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Carrock, Frederick E.; and Chu, Frank K. Y., to Dart Industries Inc. Process for producing transparent graft polymer compositions. 3,887,652, Cl. 260-880.00R.

Caruso, Fred A.: *See—*
Long, Robert B.; Caruso, Fred A.; DeFeo, Richard J.; and Walker, David G., 3,887,600.

Casella, Michael D. Rocking chair or cradle with rocking mechanism. 3,886,608, Cl. 5-109.000.

Cash, Walter A. Dental floss holder. 3,886,956, Cl. 132-91.000.

Caswell, Robert L., to Rockwell International Corporation. CRT assembly. 3,887,766, Cl. 178-7.820.

Caterpillar Tractor Co.: *See—*
Bailey, John M.; and Cobb, Delwin E., 3,887,237.
Bullard, David E.; and Allen, Jan K., 3,886,814.
Engel, Henry L., 3,886,984.
Engelking, Frederick S.; and Durham, Donald F., 3,887,200.
Haslett, Glenn M.; and Reinsma, Harold L., 3,887,244.
Jeter, Harold W., Jr., 3,886,788.
Johnson, Gordon W., 3,886,742.
McClure, William M.; and Klintworth, Keith K., 3,887,198.
Scholl, Rolland Dale; Coleman, Donald Frederick; Johnson, Edward Lawrence; and Streight, William Edward, 3,887,012.
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Cav, Inc.: *See—*
Franklin, Charlotte S.; and Franklin, Burton P., 3,886,596.

Cavaliere, Joseph. Hand-held and manipulated catch ball game. 3,887,184, Cl. 273-96.00R.

Cavanagh, Joseph C., to Midland Glass Company. Method for coating glass containers. 3,887,729, Cl. 427-195.000.

Cawthorne, Michael Anthony, to Beecham Group Limited. 6-Aminopenicillanic acid preparation. 3,887,432, Cl. 195-36.00P.

CBS Inc.: *See—*
Meshulam, Avram; and Rebold, Jerome, 3,886,656.

Cecchin, Gildo, to Motorola, Inc. IC color demodulator with single external picture control. 3,887,938, Cl. 358-27.000.

Celanese Corporation: *See—*
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Scott, Robert H.; and Gaulding, Dan L., 3,887,488.

Cenker, Moses: *See—*
Demou, John G.; and Cenker, Moses, 3,887,505.
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Century Data Systems, Inc., A Division of California Computer Products, Inc.: *See—*
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Century Industries Corporation: *See—*
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Chabrak, Thomas A.: *See—*
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Chaffin, John D. Apparatus for geological drilling and coring. 3,887,020, Cl. 175-206.000.

Chalmers, William W., to Canadian Occidental Petroleum, Ltd. Sulfur pelletizing. 3,887,130, Cl. 239-132.500.

Champ, Robert Bruce; and Shattuck, Meredith David, to International Business Machines Corporation. Cyanine pigments in electrophotographic processes. 3,887,366, Cl. 96-1.0PC.

Champion International Corporation: *See—*
Cohn, Robert, 3,887,414.

Chan, Lock-Lim; and Amy, John Edward, to Borden, Inc. Process for low temperature preparation of aqueous solution of polyalkylene amine-polyamide resins. 3,887,510, Cl. 260-29.20N.

Chandor Limited: *See—*
Unwin, Derek Keith, 3,886,897.

Chandra, Grish, to Dow Corning Limited. Complexes containing sulphur. 3,887,599, Cl. 260-429.00R.

Chane, Jean-Paul, to U.S. Philips Corporation. Method of manufacturing semiconductor devices. 3,887,404, Cl. 156-8.000.

Change, Nicholas D.; and Riggs, Michael T., to PCB Piezotronics, Inc. Conformal pressure transducer for ammunition testing. 3,886,792, Cl. 73-167.000.

Chapela Lago, Eduardo: *See—*
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Charbonnages de France: *See—*
Boutonnat, Maurice, 3,887,335.

Charlson, Paul Marlin; Green, Charles Donald; Harris, William John; and Inman, Keith Erwin, to International Business Machines Corporation. Ticket cartridge and hopper and stacker therefor. 3,887,106, Cl. 221-197.000.

Chase Brass and Copper Co.: *See—*
Law, Anthony G.; and Johnson, James E. (said Anthony G. Law assors. to), 3,886,831.

Chattin, John Henry. Stone cutter. 3,886,927, Cl. 125-23.00C.

Chaumont, Guy Noel, to Dayco Corporation. Endless track. 3,887,243, Cl. 305-24.000.

Chavez, Victor J.: *See—*
Scott, Paul R.; Chavez, Victor J.; and Kruka, Vitold R., 3,886,972.

Chazan, David J., to Dymo Industries, Inc. Embossing tape. 3,887,734, Cl. 428-40.000.

Check, Donald R.; and Kilbourn, Lawrence L., to Olin Corporation. Ski boot with forward lean wedge. 3,886,673, Cl. 36-2.5AL.

Chemetron Corporation: *See—*
Eyrick, Theodore B.; and Hattes, Neil R., 3,887,795.

Chesnick, John C. Archery bow with nocking point on the bowstring. 3,886,924, Cl. 124-23.00R.

Chevron Research Company: *See—*
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Hughes, Mack F., 3,887,634.
Sweeney, William A.; and House, Ralph, 3,887,611.
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Chiappe, Wayne T., to Continental Can Company, Inc. Non-detachable tear flap and tab for containers. 3,887,105, Cl. 220-277.000.

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Walsh, William J.; Chilenskas, Albert A.; Cairns, Elton J.; and Nelson, Paul A., 3,887,396.

Chin, Edward G. H.: *See—*
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Cho, Yohan: *See—*
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Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, to Hoffmann-La Roche Inc. Allyl ethers. 3,887,586, Cl. 260-348.00R.

Chorvat, Robert J.; and Pappo, Raphael, to G. D. Searle & Co. 3-Alkoxy-2-azaestratrienes. 3,887,567, Cl. 260-289.0AZ.

Christensen, Burton G., to Merck & Co., Inc. Process for preparing 7-acylamido-7-methoxy-3-cephem-4-carboxylic acid, esters and salts. 3,887,549, Cl. 260-243.00C.

Christensen, Charles M.: *See—*
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Christensen, James L.; and Howard, Thomas B., to United States of America, Navy. High speed microwave switching logic for eccm. 3,887,919, Cl. 343-18.00E.

Christiansen, Soren Bent, to F. L. Smidth & Co. Cement manufacture. 3,887,388, Cl. 106-100.000.

Chromalloy American Corporation: *See—*
Baer, Robert B., 3,887,449.
Dean, Michael F.; Borougerdi, Hossein; and Puchot, John A., 3,887,731.
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Chrysler Corporation: *See—*
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Chryst, Anton W.: *See—*
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Chu, Frank K. Y.: *See—*
Carrock, Frederick E.; and Chu, Frank K. Y., 3,887,652.

Chupp, John P.; and Tung, Ching C., to Monsanto Company. Herbicidal composition and methods employing n-(1-alken-1-yl)-amino-S-triazine compounds. 3,887,355, Cl. 71-93.000.

Chupp, John P., to Monsanto Company. Herbicidal compositions and methods employing N-(1-cycloalken-1-yl)-amino-S-triazine. 3,887,356, Cl. 71-93.000.

Ciba-Geigy AG: *See—*
Deiner, Hans, 3,887,390.
Hegar, Gert; Angliker, Hans-Joerg; Lang, Walter; Liechti, Hans Wilhelm; and Milicevic, Branimir, 3,887,329.
Nachbur, Hermann; and Maeder, Arthur, 3,887,553.
Oswald, Alexis A.; and Valint, Paul L., 3,887,658.

Ciba-Geigy Corporation: *See—*
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Hofmann, Peter; and Rohringer, Peter, 3,887,654.
Rosenberger, Siegfried; and Schwarzenbach, Kurt, 3,887,518.

Winter, Roland A. E.; and Villani, Thomas J., 3,887,554.

Cicchiello, Frank N., to Burroughs Corporation. Push-button-operated motor speed control circuit. 3,887,856, Cl. 318-345.000.

Cichetti, Michael Peter, Jr.; and Fretz, Robert Jeffrey, to Bell Telephone Laboratories, Incorporated. Frame syncrhonization of elastic data bit stores. 3,887,769, Cl. 178-69.50R.

Cier, Andre; Gero, Stephan; and Olesker, Alain, to Labaz. Azido cyclohexanepentol derivative. 3,887,590, Cl. 260-349.000.

Cincinnati Milacron Chemicals, Inc.: *See—*
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Cities Service Oil Company: *See—*
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Clark Equipment Company: *See—*
Haluda, Raymond P.; and Nelson, Kenneth W., 3,887,037.
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Clark, Irvin Dwight, to Special Metals Corporation. Method for powder metal production. 3,887,667, Cl. 264-8.000.

Clark, John Colin: *See—*
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Clark, Merlin O.: *See—*
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Classic Games Company, Inc.: *See—*
Krause, Franz; and Shulberg, Austin T., 3,886,710.

Clay, Burton Ross; and Gore, Douglas Alan, to United States of America, Navy. Rapidly accessible optically stored information. 3,887,276, Cl. 353-26.000.

Clecak, Nicholas J.; and Cox, Robert J., to International Business Machines Corporation. Photoresist azide sensitizer composition. 3,887,379, Cl. 96-115.00R.

Clem, Kenneth R.: *See—*
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Clendenen, Harold K.: *See—*
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Cleveland Machine Controls, Inc.: *See—*
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Coats, George I.: *See—*
Morgan, Tommie J.; Coats, George I.; Kisielewski, Richard W.; and Showalter, Charles K., 3,887,804.

Cobaugh, Robert Franklin; and Coller, James Ray, to AMP Incorporated. Method and apparatus for precrimping solder rings on electrical terminal posts. 3,886,650, Cl. 228-136.000.

Cobb, Delwin E.: *See—*
Bailey, John M.; and Cobb, Delwin E., 3,887,237.

Cobo Barrachina, Gonzalo, to Laboratorios Berenguer Beneyto S.A. Salt of polymannuronic acid and dihydroquinidine. 3,887,562, Cl. 260-284.000.

Cochard, Pierre E.; and Vandecauter, Roger, to Laboratoires G.-A. Cochard. Quinidine alginate and process of preparation thereof. 3,887,175, Cl. 260-209.600.

Codex Corporation: *See—*
Forney, George David, Jr.; and Gallager, Robert G., 3,887,768.

Codrino, Giuseppe. Multiple coupling connector for electrical connection. 3,887,255, Cl. 339-17.00L.

Codrino, Guiseppe. Multiple coupling connector for electrical connection between flexible ribbon-like conductors and circular cross-section cables. 3,887,260, Cl. 339-176.0MF.

Coggins, Dolphus L., to McDonnell Douglas Corporation. Process and solution for removing titanium and refractory metals and their alloys from tools. 3,887,403, Cl. 156-7.000.

Cohen, Marvin: *See—*
Von Strandtmann, Maximilian; Shavel, John, Jr.; Klutchko, Sylvester; and Cohen, Marvin, 3,887,584.

Cohen, Robert A.: *See—*
Natman, Solomon; and Cohen, Robert A., 3,886,619.

Cohn, Robert, to Champion International Corporation. Envelope window patching. 3,887,414, Cl. 156-108.000.

Coil, Frederick J. Extensible beam compass. 3,886,664, Cl. 33-27.00C.

Cole, David F. Sealed gas tank. 3,887,104, Cl. 220-85.00B.

Cole, Edward N., to General Motors Corporation. Heated manifold. 3,886,918, Cl. 123-122.0AC.

Cole, John B., to Midland-Ross Corporation. Method of forming flat bottoms on bags of creasable material. 3,886,850, Cl. 93-35.0SB.

Colegrove, James Anthony; and Seeley, Dunham Briggs, to Burroughs Corporation. Multiple, contiguous stripe, extrusion coating apparatus. 3,886,898, Cl. 118-411.000.

Coleman, Donald Frederick: *See—*
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Colgate-Palmolive Company: *See—*
Nachtigal, Julius Harvey, 3,887,701.

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Coller, James Ray: *See—*
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Collura, Peter C.; and Kipp, Michael A., to Container Corporation of America. Package. 3,887,067, Cl. 206-45.140.

Colorant Schmuckstein GmbH: *See—*
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Colt Industries Operating Corp.: *See—*
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Combustion Engineering, Inc.: *See—*
Nickerson, Robert D.; and Messman, Henry Cashel, 3,887,461.

Comette, Robert, to Societe Honeywell Bull (Societe Anonyme). Devices for welding of integrated-circuit wafers. 3,887,783, Cl. 219-85.000.

Commercial Solvents Corp.: *See—*
Wehrmeister, Herbert L.; Johnston, David B. R.; and Windholz, Thomas B. (said Herbert L. Wehrmeister assors. to), 3,887,583.

Commissariat a l'Energie Atomique: *See—*
Alais, Michel; Caillot, Robert; and Corcelle, Francois, 3,887,784.

Compagnie Honeywell Bull (Societe Anonyme): *See—*
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Compagnie Industrielle des Tellecommunications CIT-Alcatel: *See—*
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Computer Identics Corporation: *See—*
Goodfinger, Frank Carl; and Tuhro, Richard H., 3,887,793.

Concast AG: *See—*
Meier, Walter; and Bruderer, Werner, 3,886,991.

Connell, Joseph A., to NRG Incorporated. Pneumatic energy source utilizing liquid oxygen. 3,886,733, Cl. 60-39.480.

Connolly, John B.; and Cho, Yohan, to Tau-tron, Inc. Method and apparatus for high speed digital circuit testing. 3,887,869, Cl. 324-73.00R.

Consortium fur Elektrochemische Industrie GmbH: *See—*
Lottes, Karlheinz; and Katzer, Hans, 3,887,528.

Container Corporation of America: *See—*
Collura, Peter C.; and Kipp, Michael A., 3,887,067.

Conti, Fulvio. Width washing plant, particularly for delicate fabrics. 3,886,769, Cl. 68-15.000.

Continental Can Company, Inc.: *See—*
Chiappe, Wayne T., 3,887,105.

Continental Carbon Company: *See—*
West, Jesse R.; Middlebrooks, Ollie; and Crull, William B., 3,887,690.

Continental Gummi-Werke Aktiengesellschaft: *See—*
Jaedicke, Roland; and Schmidt, Ulfert, 3,887,313.

Continental Oil Company: *See—*
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Contraves AG: *See—*
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Control Data Canada, Ltd.: *See—*
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Controlled Printout Devices, Inc.: *See—*
Ploeger, Walter, Jr.; and Bishop, John W. H., 3,887,727.

Cook, Newell C.; and Gasaway, John M., to General Electric Company. Process for making nitrophthalic anhydrides. 3,887,588, Cl. 260-346.300.

Cooksey, Albert Roy: *See—*
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Cookson, Ronald Frederick: *See—*
Rodway, Ronald Ernest; and Cookson, Ronald Frederick, 3,887,566.

Cooley, Austin G., to Litton Medical Products, Inc. Optical system for x-ray scanning equipment. 3,887,816, Cl. 250-571.000.

Coombs, William Charles. Winch. 3,887,164, Cl. 254-175.500.

Coors Container Company: *See—*
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Corble, John C.: *See—*
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Corcelle, Francois: *See—*
Alais, Michel; Caillot, Robert; and Corcelle, Francois, 3,887,784.

Corey, Elias J.: *See—*
Schaaf, Thomas K.; and Corey, Elias J., 3,887,587.

Cornett, John W. Support. 3,887,154, Cl. 248-156.000.

Cornier, Sally P.; Tefertiller, Ben A.; and Dolinski, Richard J., to Dow Chemical Company, The. Quaternary ammonium electroconductive resin coating compositions. 3,887,496, Cl. 252-500.000.

Corning Glass Works: *See—*
Dahlman, Frederick A.; Mras, Raymond J., deceased; and Mras, Carl A., executor, 3,887,351.
Dwyer, Thomas J., 3,887,741.
Foster, Gordon F.; Meissner, Helmuth E.; and Stiles, Janice L., 3,887,740.

Cornland, Georg Valentin, to Hoganas AB. Hollow structural panel of extruded plastics material and a composite panel structure formed thereof. 3,886,705, Cl. 52-586.000.

Corrigan, Eugene J.: *See—*
Pullum, Donald G.; Corrigan, Eugene J.; Howard, Bernard H.; and Stabley, Bernard D., 3,887,749.

Cottingham, Robert A., to Polymer Corporation, The. Apparatus for the extrusion of ultra high molecular weight polymeric resins. 3,887,319, Cl. 425-379.00R.

Coudrin, Gerard: *See—*
Bernard, Michel Louis; and Coudrin, Gerard, 3,887,696.

Coven, Monroe J.; and Moss, Chester C., to Monarch Wine Co., Inc. Anti strip overcap for metal screw caps for bottles or containers. 3,887,100, Cl. 215-256.000.

Cox, Robert J.: *See—*
Clecak, Nicholas J.; and Cox, Robert J., 3,887,379.

Cramer, Henry E.; Gerkin, James M.; Groh, Dale L.; and Groh, Gale A., to United States of America, Navy. Projectile body testing machine. 3,886,793, Cl. 73-167.000.

Crescentini, Lamberto; and Wells, Rodney Lee, to Allied Chemical Corporation. Antistatic fiber containing chain-extended tetrols based on diamines. 3,887,638, Cl. 260-830.00P.

Crew, Beatrice L. Multi-purpose clothes hanger combination. 3,887,079, Cl. 211-118.000.

Criblez, Roger, to Hatebur Umformmaschinen AG. Device for shearing rod sections in an automatic multi-stage cross-fed press. 3,886,829, Cl. 83-198.000.

Crim, Dwight O., to General Motors Corporation. Ignition distributor rotor. 3,887,780, Cl. 200-19.0DR.

Crisp, Harold Alfred; Oughton, John Francis; Sharp, Christopher John; and Wilkinson, Peter Alfred, to Glaxo Laboratories Limited. Crystalline forms of cephaloridine. 3,887,551, Cl. 260-243.00C.

Cross, David C.: *See—*

Howard, Dean D.; and Cross, David C., 3,887,917.

Crossman, Phillip E.; Kenrick, Robert C.; and Le Mieux, Robert W., to Brunswick Corporation. Air cushion table game. 3,887,187, Cl. 273-126.00A.

Crown Cork & Seal Co., Inc.: *See—*

Rodak, John J.; and Macheski, Robert L., 3,887,806.

Crull, William B.: *See—*

West, Jesse R.; Middlebrooks, Ollie; and Crull, William B., 3,887,690.

CSELT-Centro Studi E Laboratori Telecomunicazioni s.p.a.: *See—*

DeVincentiis, Girolamo; and Luvison, Angelo, 3,887,798.

CTS Corporation: *See—*

Rozema, Arthur L.; Saik, John D.; and Arisman, Mervin B., 3,887,892.

Cullinan, George J.: *See—*

Jones, William E.; and Cullinan, George J., 3,887,565.

Culpepper, Clifford, Jr., to Aero-Dyne Manufacturing, Inc. Apparatus for disposing of airborne particulate matter and cooking means. 3,886,854, Cl. 98-115.00K.

Cunningham, Alton J.; Wendt, David W.; and Weber, Bernard R., to Wesbar Corporation. Wire connector means for vehicle lamp. 3,887,258, Cl. 339-95.00D.

Cunningham, Sinclair Upton; and Jackson, Douglas, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. System for controlling the position of a floating vessel. 3,886,887, Cl. 114-230.000.

Cuntze, Ulrich; May, Adolf; and Milewski, Eckhard, to Hoechst Aktiengesellschaft. Softening agent for textiles having a tetrahydropyrimidinium salt component. 3,887,475, Cl. 252-8.800.

Cuomo, Jerome J.; Mayadas, Ashok F.; Rosenberg, Robert; and Sadagopan, Varadachari, to International Business Machines Corporation. Method for sputtering garnet compound layer. 3,887,451, Cl. 204-192.000.

Curtis, William R.; and Trimble, David C., to Hercules Incorporated. Furniture subframe. 3,887,234, Cl. 297-440.000.

Curtiss-Wright Corporation: *See—*

De Feo, Angelo; and Price, Harry N., 3,886,816.

Loyd, Robert W., Jr., 3,886,907.

Pratt, Winthrop B., 3,887,307.

Cusveller, John, to Sperry Rand Australia Limited. Fluid operated actuator for movable members. 3,887,160, Cl. 251-31.000.

Cutter Laboratories, Inc.: *See—*

Kahn, Paul; and Stubstad, James A., 3,886,600.

Dachev, Lyubomir Petrov: *See—*

Julev, Stoyan Iliev; Milkov, Mihail Yordanov; Dachev, Lyubomir Petrov; Vassilev, Rossen Petrov; and Grigorov, Simeon Alexandrov, 3,887,424.

Dageforde, Allen F.: *See—*

Porter, Joe A.; and Dageforde, Allen F., 3,887,194.

Dahlman, Frederick A.; Mras, Raymond J., deceased; and by Mras, Carl A., executor, to Corning Glass Works. Combined turret positioner and clamp assembly for glass pressing machine. 3,887,351, Cl. 65-305.000.

Dai Nippon Printing Co., Ltd.: *See—*

Ohto, Michihiro; Noshiro, Atsumi; Takamizawa, Minoru; and Inoue, Yoshio, 3;886,865.

Daigne, Bernard; and Girard, Francois, to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.). Device for making a casting of a directionally solidified alloy. 3,886,994, Cl. 164-250.000.

Daimler-Benz Aktiengesellschaft: *See—*

Albrecht, Wilhelm; Patzelt, Helmut; and Hoheisel, Peter-Matthias, 3,887,215.

Deckert, Franz, 3,887,227.

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Dainippon Ink & Chemicals Inc.: *See—*

Kinoshita, Shoichi; Oyama, Masaji; and Takijiri, Shunjiro, 3,887,581.

Dainippon Ink Institute of Chemical Research: *See—*

Kinoshita, Shoichi; Oyama, Masaji; and Takijiri, Shunjiro, 3,887,581.

Dainippon Pharmaceutical Co. Ltd.: *See—*

Minami, Shinsaku; Matsumoto, Jun-Ichi; Kawaguchi, Kazuyo; Mishio, Shinsaku; Shimizu, Masanao; Takase, Yoshiyuki; and Nakamura, Shinichi, 3,887,557.

Dalabakis, Eli J.: *See—*

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Dam, Gerhard: *See—*

Senfe, Heinz; Bergmann, Artur; Dam, Gerhard; and Menzel, Dieter, 3,887,474.

Danfoss A/S: *See—*

Knudsen, Ole Friis, 3,887,864.

Dann, Bert H.; and Vidovic, Nikola, to International Video Corporation. Synchronizing pulse processor for a video tape recorder. 3,887,941, Cl. 360-36.000.

Dargie, Philip A., to Malden Mills, Inc. Method of modifying a pile fabric machine. 3,886,767, Cl. 66-9.00B.

Dart Industries Inc.: *See—*

Carrock, Frederick E.; and Chu, Frank K. Y., 3,887,652.

Dieckmann, Dale J., 3,887,508.

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Davenport, James D.: *See—*

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Davenport, Joseph A.: *See—*

Raith, Richard L.; and Davenport, Joseph A., 3,886,698.

David Brown Tractors Limited: *See—*

Eastwood, Thomas, 3,886,815.

Davies, Barrie Linton, to Imperial Chemical Industries Limited. Nonwoven fabrics. 3,887,417, Cl. 156-181.000.

Davis, John Douglas, to AMP Incorporated. Apparatus for inserting wires into terminals in an electrical connector. 3,886,641, Cl. 29-203.0MW.

Dawes, Milton. Word board game. 3,887,189, Cl. 273-130.0AB.

Dayco Corporation: *See—*

Chaumont, Guy Noel, 3,887,243.

Duckett, John C.; Easley, Wayne W.; and Wickham, William T., 3,887,750.

De La Breteque, Pierre; and Beerli, Marc, to Swiss Aluminum Ltd. Separation of gallium from alkaline liquors using acetylacetone. 3,887,681, Cl. 423-112.000.

de la Poype, Roland, to Prepac (S.A.R.L.). Machine for making and filling sachets. 3,886,714, Cl. 53-180.000.

Dean, Michael F.; Borougerdi, Hossein; and Puchot, John A., to Chromalloy American Corporation. Corrosion resistant coating system for ferrous metal articles having brazed joints. 3,887,731, Cl. 427-258.000.

Deckert, Franz, to Daimler-Benz Aktiengesellschaft. Installation for the protection of motor vehicle bodies against lateral impacts. 3,887,227, Cl. 296-28.00R.

Deeks, Ronald G., to Procor Limited. Gas vent. 3,886,978, Cl. 138-103.000.

De Feo, Angelo; and Price, Harry N., to Curtiss-Wright Corporation. Bidirectional planetary gear transmission. 3,886,816, Cl. 74-764.000.

DeFeo, Richard J.: *See—*

Long, Robert B.; Caruso, Fred A.; DeFeo, Richard J.; and Walker, David G., 3,887,600.

Degn, Hans Peter: *See—*

Lundsgaard, Jorgen Schjerning; and Degn, Hans Peter, 3,886,971.

de Graaf, Wilhelmus Polycarpus; In'T Veld, Jan Man; and Vervaart, Adrianus Petrus, to U.S. Philips Corporation. Glow discharge starter switch. 3,887,847, Cl. 317-15.000.

DeHoff, Edward J.; and Flory, Donald M., to General Motors Corporation. Disc brake caliper assembly and method. 3,887,045, Cl. 188-73.300.

Deiner, Hans, to Ciba-Geigy AG. Concentrated stable aqueous emulsions of water-repellent agents and process for making them. 3,887,390, Cl. 106-271.000.

Del Mar Engineering Laboratories: *See—*

Gregg, David Paul, 3,887,787.

del Castillo, Juan M. Optical metronome. 3,886,839, Cl. 84-484.000.

Del Faro, Gordon P.; and Valentine, Eugene E. Machine tool monitoring unit. 3,887,052, Cl. 192-127.000.

Del Guercio, Louis R. M.: *See—*

Szabo, Anthony W.; and Del Guercio, Louis R. M., 3,886,938.

Deman, Albert: *See—*

Diebel, Howard; and Deman, Albert, 3,886,958.

DeMets, Albert, to Bison-werke Bahre & Greten GmbH & Co. Kg. Continuously operating press. 3,887,318, Cl. 425-371.000.

Demou, John G.; and Cenker, Moses, to BASF Wyandotte Corporation. Preparation of low density flexible urethane foams with enhanced load-bearing properties. 3,887,505, Cl. 260-2.5AB.

Denoor, Gaston, to B.V.S. Prefabricated element for wall construction. 3,886,752, Cl. 61-45.00R.

Dentsply Research & Development Corp.: *See—*

Thornton, Henry M., Jr.; and Plowman, Richard E., 3,886,660.

Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Derivatives of pyrazolo(3,4-b)thieno(2,3-d)pyridine-2-carboxylic acids. 3,887,570, Cl. 260-294.80B.

Derivados del Fluor, S.A.: *See—*

Escribano Nevado, Antonio; Chapela Lago, Eduardo; and Gutierrez Hernandez, Jesus, 3,887,693.

Desalination Systems, Inc.: *See—*

Bray, Donald T., 3,887,463.

Bray, Donald T., 3,887,468.

Descamps, Freddy Francois Eugene; Dumont, Georges Luciaan; and Goossens, Walter Remi Adele, to Studiecentrum Voor Kernenergie SCK. Fluidization column. 3,887,337, Cl. 23-284.000.

Deshayes, Phillippe M.; and Weber, Guy Paul, to La Cellophane. Apparatus for developing a latent charged image. 3,886,900, Cl. 118-637.000.

Deuter, Thomas F., to General Electric Company. Process of making a dynamoelectric machine structure by pressure molding. 3,887,677, Cl. 264-272.000.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*

Schreyer, Gerd; Theissen, Ferdinand; Weiberg, Otto; and Weigert, Wolfgang, 3,887,490.

Thurn, Friedrich Martin; Meyer-Simon, Eugen; Will, Werner; Schmidt, Franz; Schenk, Wolfgang; and Wurmb, Rolf, 3,887,602.

Deutsche Texaco Aktiengesellschaft: *See—*

Strehlke, Gunter; Franz, Wilhelm; and Osterburg, Gunter, 3,887,609.

DeVincentiis, Girolamo; and Luvison, Angelo, to CSELT-Centro Studi E Laboratori Telecomunicazioni s.p.a. Generator of pulse trains corresponding to walsh functions. 3,887,798, Cl. 235-152.000.

Devlin, Bernard T., to Sperry Rand Corporation. Aircraft glide slope coupler and landing system. 3,887,148, Cl. 244-77.00A.

Diakides, Nicholas A., to United States of America, Army. Method of making high contrast fiber optic phosphor screen. 3,887,724, Cl. 427-64.000.

Diamond Shamrock Corporation: *See—*

Battershell, Robert D.; Bimber, Russell M.; and Bungs, Janis A., 3,887,657.

Beckers, Norman L., 3,887,628.

Diamontis, Damon. Folding crutch. 3,886,962, Cl. 135-49.000.

Diaz, Juan C.; and Edwards, Ray, to Eastman Kodak Company. Extrusion coating composition containing ethylenepropylene block copolymer and polyethylene having a MIR of at least 50. 3,887,640, Cl. 260-876.00B.

Di Blasi, Rosario. Collapsible vehicle. 3,887,218, Cl. 280-278.000.

Dickhudt, Eugene A.: *See—*

Bolduc, Lee R.; and Dickhudt, Eugene A., 3,887,112.

Didier-Werke AG: *See—*

Fehling, Hans Reinhard, 3,887,117.

Diebel, Howard; and Deman, Albert, to Moyer Diebel Limited. Apparatus for washing articles. 3,886,958, Cl. 134-80.000.

Dieckmann, Dale J., to Dart Industries Inc. Vinyl halide stabilizer compositions of antimony organic sulfur-containing compounds and metal carboxylates. 3,887,508, Cl. 260-23.0XA.

Dietz, Richard E., to Phillips Petroleum Company. Olefin polymerization catalyst. 3,887,494, Cl. 252-452.000.

DiGuilio, Guy, to Sperry Rand Corporation. Plated wire memory. 3,887,338, Cl. 29-191.600.

Dinkel, Emil, to Metallwerk Max Brose & Co. Hinge arrangement for a folding car seat. 3,887,232, Cl. 297-367.000.

Ditlinger, Richard J.; Kerr, Richard W.; and Massing, Lyle E., to Bendix Corporation, The. Piston and extensible cylinder therefor. 3,887,042, Cl. 188-71.800.

Diwo, Manfred. Double flask for the reception of two liquids. 3,887,069, Cl. 206-229.000.

Dixon, William D., to Monsanto Company. Process for the preparation of 2-imino derivatives of substituted imidazoles. 3,887,577, Cl. 260-309.600.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See—*

Bez, Ulrich, 3,887,223.

Dokes, Samuel; and Isaiah, Alvin K., to Plotkin, Steven R.; and Gertler, David, part interest to each. Fire extinguisher. 3,887,011, Cl. 169-69.000.

Dolfini, Joseph E.: *See—*

Perrella, Donald J.; and Dolfini, Joseph E., 3,887,542.

Dolinski, Richard J.: *See—*

Cornier, Sally P.; Tefertiller, Ben A.; and Dolinski, Richard J., 3,887,496.

Donaldson, Ralph W., Jr.: *See—*

Pollock, Glenn E.; Henderson, Milton E.; and Donaldson, Ralph W., Jr., 3,887,345.

Doniat, Denis; Beccu, Klaus; and Porta, Augusto, to Battelle Memorial Institute S.A. Automobiles Citroen. Method and apparatus for electrochemically producing an electric current. 3,887,400, Cl. 136-86.00A.

Dorer, Wilfried, to Addressograph-Multigraph Corporation. Envelope stuffing machine. 3,886,715, Cl. 53-384.000.

Dorfman, Gersh Abramovich: *See—*

Kulakov, Nikolai Konstantinovich; Likhogub, Evgeny Petrovich; Dorfman, Gersh Abramovich; and Suslov, Alexandr Nikolaevich, 3,887,438.

Dorgebray, Gerard. Plug for pipes under pressure. 3,886,977, Cl. 138-89.000.

Doty, Bruce Ivan. Heat-massage device for physical therapy. 3,886,934, Cl. 128-24.100.

Douglas, Frank C.; Galasso, Francis S.; and Whittier, James Y., to United Aircraft Corporation. Method for producing a plurality of filaments in a radio frequency reactor. 3,887,722, Cl. 427-46.000.

Douros, John D., Jr.: *See—*

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Dow Chemical Company, The: *See—*

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Jones, Elvis E.; Mays, William A.; and Smith, William F., 3,886,963.

Lagess, Thomas F.; and Maudlin, Valroy Henry, 3,887,462.

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Ramirez, Enrique Garcia; Thomas, Lowell Curtis; and Fry, William Earl, 3,887,491.

Torney, Harry L.; Torney, Helen T.; and Bordt, Dale E., 3,887,430.

Dow Corning Corporation: *See—*

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Dow Corning Limited: *See—*

Chandra, Grish, 3,887,599.

Draber, Wilfried; Buchel, Karl Heinz; Regel, Erik; and Plempel, Manfred, to Bayer Aktiengesellschaft. Antimycotic diphenyl-imidazolyl-pyrimidyl methanes. 3,887,556, Cl. 260-256.40R.

Dransch, Gunther; Hartel, Kurt; Horlein, Gerhard; Schonowsky, Hubert; and Studeneer, Adolf, to Hoechst Aktiengesellschaft. Substituted phenyl-carbamoyl-alkyl carbonylamino-benzimidazoles. 3,887,576, Cl. 260-309.200.

Dresser Industries, Inc.: *See—*

Abney, David Lewis; and Williams, Robert Carl, 3,887,007.

Wishon, Berhl E., 3,887,173.

Drummond, William E.; and Sloan, Millard L., to Aralco. Autoresonant acceleration of ions. 3,887,832, Cl. 315-5.410.

DSO "Bulgarski Darjavni Jeleznitzi": *See—*

Stanev, Tzvyatko Penchev, 3,887,022.

Duane, John J.; and Lindner, Charles B., to Union Carbide Corporation. Diaper insert. 3,886,941, Cl. 128-287.000.

Duckett, John C.; Easley, Wayne W.; and Wickham, William T., to Dayco Corporation. Compressible printing blanket. 3,887,750, Cl. 428-297.000.

Duikers, Marcel: *See—*

Michel, Edmond; and Duikers, Marcel, 3,886,824.

Dumont, Georges Luciaan: *See—*

Descamps, Freddy Francois Eugene; Dumont, Georges Luciaan; and Goossens, Walter Remi Adele, 3,887,337.

Duncan, Jerry E.; and Riggin, Lance E., to United States of America, Navy. Pulse amplitude modulation, frequency modulation telemetric data transmitter. 3,887,873, Cl. 325-113.000.

Dunlop Limited: *See—*

Malone, Denis Frederick, 3,887,041.

Dunn, Troy. Play crib. 3,886,607, Cl. 5-104.000.

Dunn, Wendell E., Jr., to Titanium Technology N.V. Production of chlorine. 3,887,694, Cl. 423-500.000.

Duo-Fast Corporation: *See—*

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du Pont de Nemours, E. I., and Company: *See—*

Bellettini, Arturo Gabriel; and Franklin, Richard Crawford, 3,887,540.

Faulhaber, Mark Edwin, 3,887,814.

Irwin, Carl F., 3,887,167.

Polss, Perry, 3,887,621.

Dupre, Jacques-Philippe. Face mask and process for making face masks. 3,886,597, Cl. 2-206.000.

Durham, Donald F.: *See—*

Engelking, Frederick S.; and Durham, Donald F., 3,887,200.

Dwyer, Thomas J., to Corning Glass Works. Thin-walled honeycombed substrate with axial discontinuities in the periphery. 3,887,741, Cl. 428-188.000.

Dymo Industries, Inc.: *See—*

Chazan, David J., 3,887,734.

Dynachem Corporation: *See—*

Gilano, Michael N.; Beaupre, Richard E.; and Lipson, Melvin A., 3,887,450.

Dynamit Nobel AG: *See—*

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Dynamit Nobel Aktiengesellschaft: *See—*

Krah, Robert; and Gehrke, Alfons, 3,886,709.

E. R. Squibb & Sons, Inc.: *See—*

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Lee, Bong Kuk; Neidleman, Saul Lewis; and Ryu, Dewey D. Y., 3,887,546.

Perrella, Donald J.; and Dolfini, Joseph E., 3,887,542.

Vogt, Berthold Richard, 3,887,544.

Eadie, Gordon Cunningham, to British Steel Corporation. Process for producing alkaline earth ferrites. 3,887,478, Cl. 252-62.630.

Eagle-Picher Industries, Inc.: *See—*

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Earley, Donald C. Ventilated, adjustable size, open top receptacle. 3,887,102, Cl. 220-8.000.

Easley, Wayne W.: *See—*

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Eastman Kodak Company: *See—*

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Bresson, Richard J., 3,887,930.

Brongo, Ralph T.; Fleming, James C.; and Manthey, Joseph W., 3,887,374.

Diaz, Juan C.; and Edwards, Ray, 3,887,640.

Ettischer, Helmut, 3,887,934.

Hunt, Robert W. G., 3,887,939.

Poignant, Robert V., Jr.; and Przybylowicz, Edwin P., 3,887,807.

Tepper, Charles William, 3,887,277.

Wilson, Burton D.; Woodgate, Paul E.; and Henn, Richard W., 3,887,376.

Easton, Wayne B. High pressure expansible chamber device. 3,887,309, Cl. 418-61.00B.

Eastwood, Thomas, to David Brown Tractors Limited. Multi-speed reversible gearing. 3,886,815, Cl. 74-745.000.

Eaton Corp.: *See—*

Baremor, Jerry F., 3,886,813.

Bernhardt, Thomas Joseph; and Klein, Frank N., 3,887,860.

Brawn, Darrell S., 3,887,214.

Brundige, Clayton L.; and Bechman, William H., 3,887,098.

Goetz, George W., 3,887,213.

Klein, Frank N.; and O'Callaghan, Gerald F., 3,887,853.

Obermaier, Frank E.; and Scott, Arthur A., 3,887,159.

Ward, Harold R., 3,886,741.

Eblovi, Roger, to General Signal Corporation. Automatic vehicle protection system. 3,887,152, Cl. 246-37.000.

Eckert, George W.: *See—*

Lachowicz, Donald R.; Saines, George S.; and Eckert, George W., 3,887,593.

Economic Development Corporation: *See—*

McLaughlin, Minor E., 3,887,459.

Economics, Laboratory, Inc.: *See—*

Rue, Larry M.; Freis, Richard E.; and Ossanna, Oliver A., 3,887,480.

Edmund, James Mitchell. Safety ski binding. 3,887,205, Cl. 280-11.35K.

Edwards, Ray: *See—*

Diaz, Juan C.; and Edwards, Ray, 3,887,640.

Edwards, Thomas C., to Rovac Corporation, The. Self-driven refrigerator. 3,886,763, Cl. 62-402.000.

Edwards, Thomas C., to Rovac Corporation, The. Compressor-expander having tilting vanes for use in air conditioning. 3,886,764, Cl. 62-402.000.

Edwards, Thomas C., to Rovac Corporation, The. Compressor-expander having thermal isolation and adjustment features. 3,886,765, Cl. 62-402.000.

Egli, Rene: *See—*

Schmid, Eduard; Nascher, Reinold; Egli, Rene; Parratt, Noel James; and Gooding, Ronald William, 3,887,429.

Egyptien, Josef; and Henning, Walter, to Messrs. Jos. Zimmermann. Textile treatment tube. 3,887,145, Cl. 242-125.100.

Ehmann, Wolfgang: *See—*

Olsen, Willi; Lieske, Manfred; Ehmann, Wolfgang; and Perst, Gerhard, 3,887,915.

Eicke, Hans; Arnold, Vladimir; and L'Eplattenier, Francois, to Ciba-Geigy Corporation. Process for the manufacture of metal complexes in a pure form. 3,887,598, Cl. 260-429.00R.

Eiken Chemical Co., Ltd.: *See—*

Takase, Kazuei; and Morikawa, Junji, 3,887,332.

Eikenberg, Dieter: *See—*

Burgdorf, Jochen; and Eikenberg, Dieter, 3,887,044.

Ejiri, Masakazu: *See—*

Uno, Takeshi; Yoda, Haruo; Ejiri, Masakazu; Mese, Michihiro; and Ikeda, Sadahiro, 3,887,762.

Elbe, Maximo, to Colorant Schmuckstein GmbH. Method for grinding a gem stone. 3,886,695, Cl. 51-283.000.

Elbert, Ketil E. Method and apparatus for boring drain holes in ground. 3,887,021, Cl. 175-422.000.

Elbling, Joseph, to Inductosyn Corporation. Measuring apparatus for machine tool systems. 3,887,857, Cl. 318-572.000.

Eldre Components, Inc.: *See—*

Erdle, Harvey B., 3,886,654.

Electrac, Inc.: *See—*

Katz, Louis; and Wells, Lawrence, 3,887,794.

Electronic Memories & Magnetics Corp.: *See—*

Krag, Niels, 3,887,904.

Elgin Sweeper Company: *See—*

Landesman, Eric; and Palmiter, Donald R., 3,886,623.

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Tao, Eddie Vi Ping, 3,887,572.

Taylor, Harold M.; Davenport, James D.; and Hackler, Ronald E., 3,887,708.

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Williams, Robert H.; Hoehn, Marvin M.; and Michel, Karl-Heinz, 3,887,564.

Eliason, Kay E., to Atlantic Richfield Company. Pipeline insulation means. 3,886,981, Cl. 138-149.000.

Elizer, Lee H., to Hubinger Company, The. Textile treatment with amphoteric starch esters. 3,887,752, Cl. 428-378.000.

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Ellis, Gwynn Pennant; and Peel, Mervyn Evan, to Allen & Hanburys Limited. Carboxamido tetrazolo chromones. 3,887,574, Cl. 260-308.00D.

Ellis, John L.; Mal, M. Kumar; and Tarkan, Stuart E., to Chromalloy American Corporation. Method of producing heat treatable titanium carbide tool steel coatings on cylinders of internal combustion engines. 3,886,637, Cl. 29-156.4WL.

Ellis, Robert P. Bicycle operating means. 3,886,807, Cl. 74-521.000.

Elmendorf, Armin; and Etzold, Roland, to Elmendorf Research, Inc. Panel with decorative bark surface and method of making the same. 3,887,415, Cl. 156-154.000.

Elmendorf Research, Inc.: *See—*

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Kachi, Kenjiro; Takeichi, Morio; Nakamura, Yasumasa; Inomata, Yoichi; and Nakano, Mitsuru, 3,887,274.

Elser, Wolfgang; and Schwantje, Gerd, to BASF Aktiengesellschaft. Process for the production of 1-amino-4-nitroanthraquinone-2-carboxylic esters. 3,887,591, Cl. 260-376.000.

Elson, Arthur M., to Acme-Hamilton Manufacturing Corporation. Steam hose design. 3,886,980, Cl. 138-127.000.

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Emery, Edgar Frank, to Manx Mail Order Limited. Cable tie clips. 3,886,630, Cl. 24-16.0PB.

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Engel, Henry L., to Caterpillar Tractor Co. Tree harvester shear assembly with fixed and movable blades. 3,886,984, Cl. 144-3.00D.

Engel Industries, Inc.: *See—*

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Nesteruk, Edward P., 3,887,383.

Engelking, Frederick S.; and Durham, Donald F., to Caterpillar Tractor Co. Rotary seal assembly. 3,887,200, Cl. 277-88.000.

Enger, Rolf; Piene, Kristian; Skreien, Nils; Saethre, Audun; and Thorslund, Jan-Erik, to Elkem-Spigerverket A/S. Reduction of silicon dioxide by means of carbon in electric furnace. 3,887,359, Cl. 75-11.000.

Engle, Thomas H., to General Signal Corporation. Method and apparatus for controlling the speed of a vehicle. 3,887,239, Cl. 303-21.00B.

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Erdle, Harvey B., to Eldre Components, Inc. Method of manufacturing laminated bus bars. 3,886,654, Cl. 29-624.000.

Erdman, Lynn Ellynn. Chemical thermal package with three separate chambers. 3,887,346, Cl. 62-4.000.

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Erickson Tool Company: *See—*

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Erlewine, Richard H.; Richter, Charles W., III; and Calpha, Arthur J., Jr., to General Plastics Corporation. Apparatus for continuously forming plastic sheet and corrugating with vacuum pressure. 3,887,320, Cl. 425-384.000.

Ernst, Arnold E. Planter apparatus. 3,886,875, Cl. 111-85.000.

Escribano Nevado, Antonio; Chapela Lago, Eduardo; and Gutierrez Hernandez, Jesus, to Derivados del Fluor, S.A. Continuous process for obtaining aluminium fluoride by reacting fluosilicic acid with an aluminous material. 3,887,693, Cl. 423-489.000.

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Evanega, George R.; Kuhla, Donald E.; and Sarges, Reinhard, to Pfizer Inc. Piperidinesulfonylurea derivatives. 3,887,561, Cl. 260-283.0SA.

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Evans, Robert: *See—*

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Ewing, Tom. Bunk bed construction. 3,886,604, Cl. 5-8.000.

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Gerstin, Jeffrey M.; and Spenadel, Lawrence, 3,887,756.

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Eyrick, Theodore B.; and Hattes, Neil R., to Chemetron Corporation. Respiration ratemeter. 3,887,795, Cl. 235-92.0EA.

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Fabian, Ralf. Windshield wiper sharpener. 3,886,657, Cl. 30-294.000.

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Fannin, Loyd W.; Phillips, Victor D., Jr.; and Singleton, Thomas C., to Monsanto Company. Rhodium catalyst regeneration method. 3,887,489, Cl. 252-413.000.

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Farrall, George A., to General Electric Company. Vacuum arc device with improved arc-resistant electrodes. 3,887,778, Cl. 200-144.00B.

Faulhaber, Mark Edwin, to du Pont de Nemours, E. I., and Company. Yarn slub analyzer. 3,887,814, Cl. 250-562.000.

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Feldcamp, Edward George.. Methods for finishing an aperture. 3,886,697, Cl. 51-317.000.

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Ferguson, Vernon H. Wrap-around electric resistance heater. 3,887,790, Cl. 219-535.000.

Fernandes, Roosevelt A.; and Sanders, Harry R. Control system for rotating electrical machinery using electronically derived injected rotor EMF's. 3,887,852, Cl. 318-197.000.

Fernandez-Rana, Victoriano; and Hageman, Carlton V., to Harris-Intertype Corporation. Method and apparatus for forming a vertical stack of signatures. 3,887,088, Cl. 214-6.00C.

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Findlay, Eric George. Prosthetic knee joint assembly. 3,886,601, Cl. 3-1.000.

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Fischer, Horst; and Pschunder, Willi, to Licentia Patent-Verwaltungs-G.m.b.H. Integrated semiconductor arrangement including solar cell and a Schottky diode. 3,887,935, Cl. 357-15.000.

Fitzgerald, Christopher John; and Wilson, Robert Keith. Duct systems for air cushion vehicles. 3,887,030, Cl. 180-121.000.

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Fogle, Stephen G., to Q.V.S., Inc. Hinge mechanism. 3,886,626, Cl. 16-184.000.

Fohrmann, Ernest F., to United States of America, Navy. Capacitor - contact fuze system. 3,886,866, Cl. 102-70.20R.

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Forney, George David, Jr.; and Gallager, Robert G., to Codex Corporation. Signal structures for double side band-quadrature carrier modulation. 3,887,768, Cl. 178-67.000.

Forssen, Zeth; and Lindius, Gosta, to Aktiebolaget Cementa. Sack-filling device. 3,886,983, Cl. 141-68.000.

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Francis, Geoffrey. Parking device. 3,887,089, Cl. 214-16.10B.

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Freund, Franz, to Mora Fabrik fuer Mebgeraete H. Freund. Marking apparatus including a vertical column serving for guiding and holding a marking arm. 3,886,812, Cl. 74-813.00L.

Frey, Martin Oscar. Containers or racks for sheet material. 3,887,077, Cl. 211-45.000.

Frick, Charles H., to General Motors Corporation. Engine speed governor with peak load control. 3,886,922, Cl. 123-140.00R.

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Frommer, Werner; and Rauenbusch, Erich, to Bayer Aktiengesellschaft. Microbiological production of invertase. 3,887,434, Cl. 195-65.000.
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Garavaglia, Albert P.; and Matsuhiro, Dennis S., to United States of America, General Counsel-Code GP. Shoulder harness and lap belt restraint system. 3,887,233, Cl. 297-389.000.
Garman, Lewayne E. Gas laser tube and method of fabricating same. 3,887,883, Cl. 331-94.5PE.
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Giebel, Joseph L.; and Temple, Ernest E., to Mine Safety Appliances Company. Self-cocking explosively actuated cable cutter with shock absorber. 3,886,842, Cl. 89-1.00B.
Gilano, Michael N.; Beaupre, Richard E.; and Lipson, Melvin A., to Dynachem Corporation. Photopolymerizable compositions containing polymeric binding agents. 3,887,450, Cl. 204-159.150.
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Godot, Jean-Marie, to Essilor International (Compagnie Generale d'Optique). Machines for trimming and bevelling ophtalmic lenses. 3,886,692, Cl. 51-101.0LG.
Goedert, Gerald Lawrence. Rotating bicycle signal and drive therefor. 3,887,900, Cl. 340-134.000.
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Greune, Christian; and Hackl, Friedrich, to Motoren-und Turbinen-Union Munchen GmbH. Governing device for a gas turbine system. 3,886,731, Cl. 60-39.28T.
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- Grosseau, Albert, to Societe Anonyme Automobiles Citroen. Pulse repetition rate meters. 3,887,870, Cl. 324-78.00D.
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- Gunn, John Wolferston; and Murphy, Leonard Adolphus, to Elworthy and Company Ltd; and MacMillan Bloedel Limited. Apparatus to effect remote automatic positioning of web slitter. 3,886,833, Cl. 83-499.000.
- Gural, John A.; and Moulds, John W., to General Motors Corporation. Carburetor. 3,887,662, Cl. 261-39.00A.
- Gural, John A., to General Motors Corporation. Air valve carburetor. 3,887,663, Cl. 261-50.00A.
- Guse, Otto, to Robert Bosch Verpackungsmaschinen G.m.b.H. Apparatus for sealing containers. 3,886,708, Cl. 53-329.000.
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- Hakim, Salomon, to Hakim Company Limited. Ventricular shunt having a variable pressure valve. 3,886,948, Cl. 128-350.00V.
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- Haluda, Raymond P.; and Nelson, Kenneth W., to Clark Equipment Company. Lubrication system for differentials. 3,887,037, Cl. 184-6.120.
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- Hardy, Donald F., to Dart Industries Inc. Work holder with fluid purge means. 3,886,891, Cl. 118-1.000.
- Harless, Charles E.; and Taylor, Ward G., to United States of America, Energy Research and Development Administration. Bellows-forming apparatus. 3,886,777, Cl. 72-84.000.
- Harnish, Eugene E.; and Horner, Richard F., to Bendix Corporation, The. Automatic brake adjuster and reset having extensionable feature. 3,887,047, Cl. 188-196.00R.
- Harrill, John D., to Marvel Specialty Company, Inc. Hosiery handling method and apparatus. 3,887,120, Cl. 223-43.000.
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- Harwick, Duane H.; and McDaniel, Dwight W., to General Motors Corporation. Master cylinder assembly and reservoir for same. 3,886,747, Cl. 60-585.000.
- Haslett, Glenn M.; and Reinsma, Harold L., to Caterpillar Tractor Co. Resilient mid-pitch lug for an endless track. 3,887,244, Cl. 305-57.000.
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- Hattori, Shuzo; and Hiramatsu, Tadao, to Hagiwara Denki Kabushiki Kaisha. Electrooptic modulator. 3,887,885, Cl. 332-7.510.
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- Hayes, Fay A. Hand propelled swimming pool cleaner. 3,886,616, Cl. 15-1.700.
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- Hayes, John C., to Universal Oil Products Company. Method of preparing spheroidal eta-alumina particles. 3,887,493, Cl. 252-448.000.
- Hayman, Dennis J.; and Stultz, Robert George, to Hydrometals, Inc. Multi-way valve porting block. 3,886,638, Cl. 29-157.10R.
- Haynes, Robert C. Recirculating fish raising tank system with cleanable filter. 3,886,902, Cl. 119-3.000.
- Hays, Robert G.; Hughes, Henry G.; and Hunter, William L., to Motorola, Inc. Non-polluting photoresist developing process. 3,887,373, Cl. 96-36.000.
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- Hein, Delton William, to American Cyanamid Company. Use of weak base resins as catalysts for the methylolation of acrylamide. 3,887,618, Cl. 260-561.00N.
- Heindl, Friedrich, to Ludwig Engel KG. Injection unit for an injection moulding machine. 3,887,170, Cl. 259-191.000.
- Heist, Kenneth D. Automatic slide music stand. 3,887,275, Cl. 353-74.000.
- Helberg, Wilbur, to Tri-County Machine Products, Inc. Sod cutting and stacking machine. 3,887,013, Cl. 172-20.000.
- Heldt, Karl Helge Konstantin, to SKF Industrial Trading & Development Company. Device for achieving an axially pre-stressed joint. 3,886,707, Cl. 52-758.00F.
- Helistrand, Inc.: *See—*
  - Smith, Gordon F., 3,886,770.
- Heller, Laszlo; Forgo, Laszlo; Bodas, Janos; Papp, Istvan; Agejev, G. Sz.; and Alekszejev, I. A., to Transelektro Magyar Villamossagi Kulkereskedelmi Vallalat. Cooling system. 3,887,666, Cl. 261-130.000.
- Heller, Rudolf, to Contraves AG. Apparatus for adjusting an optical observation device. 3,887,267, Cl. 350-85.000.
- Hellestam, Carl-Johan Sigvard; Melkersson, Karl-Axel; and Nilsson, Rolf Olof, to Boliden Aktiebolag. Compositions for floridating drinking water. 3,887,482, Cl. 252-175.000.
- Helmer, Karin Ulla Elisabet; and Reuterhall, Alf Ragnar, to Kemanord AB. Process for sizing cellulose fibers. 3,887,427, Cl. 162-158.000.
- Helmich, Paul Otto Gunther: *See—*
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  - Shira, Michael L.; and Henderson, Robert H., 3,886,969.
- Henderson, Robert McDougall, to Colt Industries Operating Corp. Timing mechanism for breakerless ignition systems. 3,886,916, Cl. 123-117.00R.
- Hendrix, Charles E., to United States of America, Navy. Radiofrequency holography. 3,887,923, Cl. 343-113.00R.
- Henkel, Harry D., to General Motors Corporation. Radial compressor having improved press-fit pistons. 3,887,301, Cl. 417-53.000.
- Henn, Richard W.: *See—*
  - Wilson, Burton D.; Woodgate, Paul E.; and Henn, Richard W., 3,887,376.
- Henning, Carl P. Snowmobile rear drive construction. 3,887,023, Cl. 180-5.00R.
- Henning, Walter: *See—*
  - Egyptien, Josef; and Henning, Walter, 3,887,145.
- Henrick, Clive A., to Zoecon Corporation. 2-Hydroxy or acetoxy substituted esters useful for the control of insects. 3,887,592, Cl. 260-399.000.
- Henrick, Clive A., to Zoecon Corporation. 2-Chloro and alkoxy or alkylthio substituted esters useful for the control of insects. 3,887,594, Cl. 260-408.000.
- Henrick, Clive A., to Zoecon Corporation. 2-Oxo substituted unsaturated esters useful for the control of insects. 3,887,596, Cl. 260-410.90R.
- Hercules Incorporated: *See—*
  - Curtis, William R.; and Trimble, David C., 3,887,234.
- Herding, Walter: *See—*
  - Ach, Ernst; and Herding, Walter, 3,887,097.
- Hernick, Jack F., to Royal Industries, Inc. Replacement pads for brake assemblies. 3,887,043, Cl. 188-73.100.
- Herrmann, Thomas R.: *See—*
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- Herta KG Karl Schweisfurth: *See—*
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- Hesch, Harold E.; and Hutchison, John W., to Pullman Incorporated. Railroad car door construction. 3,886,687, Cl. 49-503.000.
- Hesener, Walter. Apparatus for playing an educational game including code orienting means. 3,886,672, Cl. 35-48.00R.
- Hess, John R.; and Kozlin, Joseph R., to United Aircraft Corporation. Apparatus for sealing turbine blade damper cavities. 3,887,298, Cl. 416-220.000.
- Hesston Corporation: *See—*
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- Hestehave, Borge. Apparatus for injection-blow-molding hollow articles. 3,887,316, Cl. 425-242.00B.
- Hester, Jackson B., Jr.; and Szmuszkovicz, Jacob, to Upjohn Company, The. 9H-Dibenzo[c, f]-s-triazolo[4,3-a]azepines. 3,887,575, Cl. 260-308.00R.
- Hetzel, Max, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Magnetic parts and method of manufacturing same. 3,887,401, Cl. 148-121.000.
- Hewitt, Robert L., to Terra Perma, Inc. Process of stabilizing soil and soil additive product. 3,887,506, Cl. 260-17.00A.
- Hezel, Wolfgang: *See—*
  - Stahl, Horst; Vorbach, Guenther; Brunnthaler, Erich; Hezel, Wolfgang; and Flath, Wolfgang, 3,887,057.
- Hickson, Donald A., to Chevron Research Company. Layered clay minerals and processes for using. 3,887,454, Cl. 208-111.000.
- Hidasi, Karoly: *See—*
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- Hijikata, Itsuo; Kasazaki, Masayoshi; and Terada, Hideto, to Sintokogio Ltd. Vacuum sealed molding apparatus. 3,887,321, Cl. 425-388.000.
- Hills, Brian Andrew, to National Research Development Corporation. Decompression meter. 3,886,801, Cl. 73-432.00R.
- Hillyer, Anthony William, to Raleigh Industries Limited. Epicyclic change speed hubs. 3,886,811, Cl. 74-750.00B.
- Himmelbauer, Erich Eduard, to U.S. Philips Corporation. Cathode-ray tube having an electric cylinder lens for the dynamic correction of electrostatic deflection defocusing. 3,887,834, Cl. 315-31.00R.
- Hinata, Masanao: *See—*
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- Hinds, Horace, Jr., to Grace Machinery Company Incorporated. Method and apparatus for processing cottage cheese curd and like foods. 3,887,718, Cl. 426-491.000.
- Hinoshita, Shigehiko; Minejima, Yukihiko; and Moriya, Takao, to Fujitsu Limited. Video signal transmission system. 3,887,763, Cl. 178-6.000.
- Hirabayashi, Terubika: *See—*
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- Hirsch, Richard F. Automatic loading blind riveter. 3,886,783, Cl. 72-391.000.
- Hirschfeld, Tomas, to Block Engineering, Inc. Method and apparatus for detecting and classifying nucleic acid particles. 3,887,812, Cl. 250-458.000.
- Hitachi, Ltd.: *See—*
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- Hiyoshi, Teruo, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument capable of generating tone signals having the pitch frequency, tone color and volume envelope varied with time. 3,886,836, Cl. 84-1.260.
- Hochiki Kabushiki Kaisha: *See—*
  - Kawakami, Mamoru, 3,887,815.
- Hocq, Robert, to Societe Franco-Hispano-Americaine (FRANCIS-PAM. Key holder. 3,886,772, Cl. 70-456.00R.
- Hodgdon, Russell B., Jr., to Ionics, Incorporated. Cation exchange membranes having carboxylic and sulfonic acid functionality. 3,887,499, Cl. 260-2.20R.
- Hodgson, Brian, to Machine Tool Divisional Services Limited. Gear finishing machines. 3,886,845, Cl. 90-1.600.
- Hoechst Aktiengesellschaft: *See—*
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  - Cuntze, Ulrich; May, Adolf; and Milewski, Eckhard, 3,887,475.
  - Dransch, Gunther; Hartel, Kurt; Horlein, Gerhard; Schonowsky, Hubert; and Studeneer, Adolf, 3,887,576.
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  - Williams, Robert H.; Hoehn, Marvin M.; and Michel, Karl-Heinz, 3,887,564.
- Hoey, Charles E., to Rohm and Haas Company. Method of forming permeable polymeric liner on absorbent diapers, wound dressings, catamenial pads and the like. 3,887,408, Cl. 156-78.000.
- Hoffmann, Gunter Wilhelm; and Magnollay, Gilbert, to Werkzeugmaschinenfabrik Oerlikon-Buhrle. Pneumatic apparatus for firing an automatic firing weapon. 3,886,843, Cl. 89-136.000.
- Hoffmann, Kurt, to American Micro-Systems, Inc. Low voltage CMOS amplifier. 3,887,881, Cl. 330-35.000.
- Hoffmann-La Roche Inc.: *See—*
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  - Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,887,586.
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  - Keith, Dennis; and Weigele, Manfred, 3,887,615.
- Hofgen, Gunter; and Poschadel, Werner, to International Standard Electric Corp. Instrument landing system with microwave course pattern transmission. 3,887,922, Cl. 343-108.00R.
- Hofmann, Karl, to Robert Bosch G.m.b.H. Fuel injection arrangement. 3,887,140, Cl. 239-600.000.
- Hofmann, Peter; and Rohringer, Peter, to Ciba-Geigy Corporation. Phosphorus containing reaction products. 3,887,654, Cl. 260-928.000.
- Hoganas AB: *See—*
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- Hoheisel, Peter-Matthias: *See—*
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- Hollins, Jesse R. Motor vehicle equipment. 3,887,818, Cl. 307-10.0SB.
- Holthoff, Helmut; and Pazderka, Cyril, to Friedrich Kocks, Firma. Cutting devices for subdividing moving elongated stocks. 3,886,830, Cl. 83-285.000.
- Holub, Fred F.; and Emerick, Carl M., to General Electric Company. Bis-imide compositions. 3,887,582, Cl. 260-326.260.
- Honeywell Inc.: *See—*
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  - Smart, David C., 3,887,289.
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- Honjo, Kazuo, to Ideki Co., Ltd. Method of producing powder composed of precisely spherical particles. 3,887,668, Cl. 264-14.000.
- Honshu Paper Company, Ltd.: *See—*
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- Hooper, Clive William: *See—*
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- Hopkins, Henry R. Portable modular materials distribution system. 3,887,061, Cl. 198-36.000.
- Hoppesch, Joseph P.; Ward, Donald H.; and Tomashek, James R., to Borg-Warner Corporation. Null memory system for a gas analysis system. 3,886,786, Cl. 73-27.00R.
- Hoppesch, Joseph P.; Ward, Donald H.; and Tomashek, James R., to Borg-Warner Corporation. Breath tester null memory system. 3,886,929, Cl. 128-2.00C.
- Hori, Kikuo; Okada, Hidehiko; and Fujita, Masakazu, to Teijin Limited. Process for producing polyester textured yarn. 3,886,722, Cl. 57-157.0TS.
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- Horning, Robert J., to Honeywell Inc. Highly conductive stable electrolyte for lithium batteries. 3,887,397, Cl. 136-6.0LN.
- Horowitz, Noah, to Century Data Systems, Inc., A Division of California Computer Products, Inc. Tape speed compensation system. 3,887,942, Cl. 360-51.000.
- Horst, Thomas A., to Western Sales and Supply Co. Tubular buffer element. 3,886,622, Cl. 15-230.130.
- Horvath, Richard J., to Shell Oil Company. Sulfur-hydrocarbon slurry pipeline transportation containing an inorganic corrosion inhibitor. 3,887,330, Cl. 21-2.50R.
- Hoshi, Hiroshi: *See—*
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- Houtsager, Hendrik, to Moore Dry Kiln Company of Oregon. Automatic board turner. 3,887,066, Cl. 198-285.000.
- Howard, Bernard H.: *See—*
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- Howard, Dean D.; and Cross, David C., to United States of America, Navy. Digital radar target imaging with high radar resolution monopulse radar. 3,887,917, Cl. 343-7.900.
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- Howell, Gerald D. Boat trailer. 3,887,093, Cl. 214-84.000.
- Hsu, Yuan Tsun; and Lange, K. Robert, to Betz Laboratories, Inc. Method for scrubbing gases derived from basic oxygen furnaces. 3,887,340, Cl. 55-72.000.
- Hubinger Company, The: *See—*
  - Elizer, Lee H., 3,887,752.
- Hubner, Klaus, to Siemens Aktiengesellschaft. Self-commutating frequency converter with additional charging arrangement. 3,887,859, Cl. 321-5.000.
- Hubner, Klaus, to Siemens Aktiengesellschaft. Auxiliary extinguishing arrangement for the inverters in an intermediate link converter. 3,887,862, Cl. 321-45.00C.
- Hudgin, Donald E.; and Reich, Murray, to Princeton Chemical Research, Inc. Degradable plastic. 3,886,683, Cl. 47-9.000.
- Hudson, David Ian, to Raleigh Industries Limited. End stop for a forming machine. 3,886,776, Cl. 72-71.000.
- Hudson, James L.; and Jordan, Larry L., to General Motors Corporation. Method of masking semiconductor wafers using a self-aligning mask. 3,887,421, Cl. 156-280.000.
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- Hughes, Mack F., to Chevron Research Company. Liquid phosphoric acid catalyzed polymerization process. 3,887,634, Cl. 260-683.15C.
- Hughes, William B.; and Fahey, Darryl R., to Phillips Petroleum Company. Electro-chemical synthesis of organonickel compounds. 3,887,441, Cl. 204-59.0QM.
- Hugonnier, Charles. Exterior driving mirror for an automobile vehicle. 3,887,156, Cl. 248-475.00A.
- Hulse, Charles O.; and Batt, John A., to United Aircraft Corporation. Tough refractory oxide eutectic article. 3,887,384, Cl. 106-57.000.
- Hultzsch, Kurt: *See—*
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- Hunt, Robert W. G., to Eastman Kodak Company. Scanning apparatus and method using sharp and unsharp spots. 3,887,939, Cl. 358-75.000.
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- Hurst, Eric Kenneth; and Moore, Ronald Keith, to Lewis Woolf Griptight Limited. Baby soother. 3,886,949, Cl. 128-360.000.
- Huston, Alexander Edward, to John Hadland Photographic Instrumentation Ltd. High speed camera. 3,887,841, Cl. 315-391.000.
- Hutchinson, Bruce R.; Hunter, Bruce H.; and Brooks, Robert H. Incineration systems and methods. 3,887,336, Cl. 23-277.00C.
- Hutchinson, William M., to Phillips Petroleum Company. Separation of fluorinated dimethyl ethers by extractive distillation. 3,887,439, Cl. 203-63.000.
- Hutchison, John W.: *See—*
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- Huttermann, Bernhard: *See—*
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- Hyde, Vernon E. Trachea instrument. 3,886,946, Cl. 128-305.000.
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- Iacobelli, Jerome Anthony; Narwid, Thomas Albert; and Uskokovic, Milan Radoje, to Hoffmann-La Roche Inc. Synthesis of 1α-hydroxylated cholesterol derivatives. 3,887,545, Cl. 260-239.55R.

- Iarocci, Anthony; and Willows, William John, to Koehring Canada Limited. Multiple tree harvester and method for harvesting trees. 3,886,985, Cl. 144-309.0AC.
- Ichikawa, Masaru; and Noguchi, Tamio, to Sagami Chemical Research Center. Process for preparing poly-1,4-trans butadiene. 3,887,536, Cl. 260-94.200.
- Ichioka, Satoshi, to Mishima Kosan Co., Ltd. Method of manufacturing a continuous magnetic foil by electrodeposition. 3,887,440, Cl. 204-13.000.
- Ideal Toy Corporation: *See—*
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- Ideki Co., Ltd.: *See—*
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- Ieda, Michael; and Ventura, Frank, to Ideal Toy Corporation. Toy vehicle and launcher. 3,886,682, Cl. 46-202.000.
- Ihlingen, Horb: *See—*
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- Ikeda, Hiroshi; Matsubara, Yukio; and Yamaguchi, Ginichi, to Onahama Seiren Kabushiki Kaisha. Conveyance of electrodes for electrolytic cells in electrorefining. 3,887,094, Cl. 214-89.000.
- Ikeda, Sadahiro: *See—*
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- Illinois Tool Works Limited: *See—*
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- Ilzig, Karl F.; Junginger, Klaus M.; and Rieth, Alois, to Original Hanau Quarzlampen GmbH. Surgical operating lamp with individual spotlights. 3,887,801, Cl. 240-1.400.
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  - Key, Kenneth Andrew; and Hooper, Clive William, 3,886,721.
  - McLean, William Ronald, 3,887,280.
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- Imura, Toshinori, to Minolta Camera Kabushiki Kaisha. Single lens reflex camera light measuring system. 3,887,929, Cl. 354-46.000.
- Inayama, Takayuki: *See—*
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- Ingerson, Philip E. Foldable wheelchair and kit therefor. 3,887,228, Cl. 297-39.000.
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- Inomata, Jihei; Hayashi, Masahiro; Nozawa, Seiichi; Ota, Takayuki; Endo, Kazuo; and Yamaguchi, Yukio, to Mitsubishi Chemical Industries, Ltd. Process for preparing copolymer. 3,887,651, Cl. 260-879.000.
- Inomata, Yoichi: *See—*
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- Institute of Gas Technology: *See—*
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  - Bratter, Robert L.; and Gaind, Arun K., 3,887,726.
  - Champ, Robert Bruce; and Shattuck, Meredith David, 3,887,366.
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  - Cuomo, Jerome J.; Mayadas, Ashok F.; Rosenberg, Robert; and Sadagopan, Varadachari, 3,887,451.
  - Nepela, Daniel A.; and Potter, Robert I., 3,887,945.
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- Inventio Aktiengesellschaft: *See—*
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- Irwin, Carl F., to du Pont de Nemours, E. I., and Company. Apparatus for manufacture of organic isocyanates. 3,887,167, Cl. 259-9.000.
- Irwin, John A., to General Motors Corporation. Ceramic combustion liner. 3,886,735, Cl. 60-39.650.
- Isaac, Eirlys R.: *See—*
  - Kirby, Peter; Isaac, Eirlys R.; and Smith, Graham C., 3,887,472.
- Isaiah, Alvin K.: *See—*
  - Dokes, Samuel; and Isaiah, Alvin K., 3,887,011.
- Ishibashi, Masato: *See—*
  - Kawabe, Ushio; Kudo, Mitsuhiro; Fukase, Shigeo; and Ishibashi, Masato, 3,887,364.
- Ishida, Takashi: *See—*
  - Minekawa, Saburo; Yonekawa, Sigeru; Tabata, Haruro; Ishida, Takashi; Tsuchida, Satoshi; and Yamada, Kiyoshi, 3,887,535.
- Ishikawa, Seiichi; Miya, Yooichi; Odate, Ryoji; and Kumai, Yasui, to Shiseido Co., Ltd. Receptacle for liquid material. 3,887,116, Cl. 222-520.000.
- ISPOW AG: *See—*
  - Funke, Peter, 3,887,210.
- Itimura, Takeo: *See—*
  - Yamaguchi, Kazunori; Itimura, Takeo; Kaneko, Teruo; and Yamamoto, Hiroshi, 3,887,271.
- Ito, Kazuichi. Reciprocating pump. 3,887,305, Cl. 417-439.000.
- Ito, Shin; and Kawaguchi, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic controls for transmission and brake systems with pressure booster. 3,887,049, Cl. 192-4.00A.
- ITT Industries, Inc.: *See—*
  - Budecker, Ludwig; and Von Grunberg, Hubertus, 3,886,848.
  - Burgdorf, Jochen; and Eikenberg, Dieter, 3,887,044.
- Ivashuk, Michael: *See—*
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- Ivo, Osmar Chaves: *See—*
  - Ueta, Seiki; and Ivo, Osmar Chaves, 3,887,453.
- Iwatsu Electric Company: *See—*
  - Kuwamura, Mitomu, 3,887,912.
- Izawa, Masao; Ohlawa, Kiyoto; and Yuasa, Yookichi, to Agatsuma Seiki K. K. Digital timepiece. 3,886,725, Cl. 58-50.00R.
- Jackson, Albert Edward, to British Steel Corporation. Method and apparatus for coating a metallic strip. 3,887,720, Cl. 427-32.000.
- Jackson, Douglas: *See—*
  - Cunningham, Sinclair Upton; and Jackson, Douglas, 3,886,887.
- Jackson, George W.: *See—*
  - Whelan, James E.; and Jackson, George W., 3,887,174.
- Jackson, Joseph L., to R. O. Hull & Company Incorporated. Method for the reduction of zinc ion concentration and removal of organic impurities in a neutral or acidic, aqueous zinc plating bath. 3,887,445, Cl. 204-55.00R.
- Jacobson, Peter E.; Lane, Arthur W.; and Ashley, Paul E., to Sperry Rand Corporation. Fluid bearing gyroscope. 3,886,803, Cl. 74-5.60D.
- Jaedicke, Roland; and Schmidt, Ulfert, to Continental Gummi-Werke Aktiengesellschaft. Vulcanizing device for open hollow bodies, especially toroidal raw pneumatic tires. 3,887,313, Cl. 425-42.000.
- Jahnel, Ernst; John, Erich; and Sinclair, Harold, to Messrs. Zahnraderfabrik Renk Aktiengesellschaft, DT. Ship's propulsion plant. 3,887,048, Cl. 192-3.280.
- Jakob, Franz: *See—*
  - Blocker, Erich; Rupp, Walter; and Jakob, Franz, 3,887,521.
- Jakubowski, Thaddeus, Jr., to McDonnell Douglas Corporation. Internal ejector mechanism. 3,887,150, Cl. 244-137.00R.
- James Daivd, Inc.: *See—*
  - Glaser, Harold, 3,887,288.
- James, David Richard: *See—*
  - Reynolds, Lionel Arthur; and James, David Richard, 3,887,019.
- Jamrog, Aloysius R.: *See—*
  - Graae, Johan E. A.; Jamrog, Aloysius R.; Kelecius, Anthony S.; and Mingesz, Donald P., 3,887,247.
- Jamshidi, Khosrow. Microcautery device. 3,886,944, Cl. 128-303.100.
- Japan Exlan Company Limited: *See—*
  - Shimosaka, Yukio; Ozaki, Masahiko; and Negi, Jiro, 3,887,688.
- Japan Synthetic Rubber Company Limited: *See—*
  - Harada, Tetsuya; and Yumoto, Tsunemasa, 3,887,537.
- Jarke Corporation: *See—*
  - Jay, Richard S., 3,887,078.

Jaspers, Hendrik A., to North American Philips Corporation. Power-control system for stirling engines. 3,886,744, Cl. 60-521.000.

Jauss, Fritz, to Zentra Albert Burkle Kommanditgesellschaft. Method of and control circuit for admixing air. 3,887,127, Cl. 236-91.000.

Jay, Richard S., to Jarke Corporation. Unitized modular rack for vertical storage of flat sheet materials. 3,887,078, Cl. 211-50.000.

Jayne, Murray L. Fluid driven hammers. 3,887,018, Cl. 173-120.000.

Jefferson Chemical Company, Inc.: *See—*
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Jejina, Filip: *See—*
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Jenkins, Cecil: *See—*
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Jenkins, Charles W., to Owens-Illinois, Inc. Fluid cooling of glass molds. 3,887,350, Cl. 65-267.000.

Jenner, Edwin Gordon: *See—*
Brown, James Peter; Jenner, Edwin Gordon; and Wilcock, John, 3,887,525.

Jeter, Harold W., Jr., to Caterpillar Tractor Co. Tractor test cell. 3,886,788, Cl. 73-117.000.

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John Laing & Son Limited: *See—*
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John Mohr & Sons: *See—*
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John Zink Company: *See—*
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Johnson, Andrew L. Oil cooler and filter container for engine. 3,887,467, Cl. 210-186.000.

Johnson, Dee Lynn, to Minnesota Mining and Manufacturing Company. Personal care viewer. 3,887,800, Cl. 240-1.0EL.

Johnson, Edward Lawrence: *See—*
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Johnson, Gordon W., to Caterpillar Tractor Co. Single pump hydrostatic transmission control and supply system. 3,886,742, Cl. 60-488.000.

Johnson, James E.: *See—*
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Johnson, James W.; and Knapp, Gladys Janet. Cigarette and the like filter and method for producing same. 3,886,955, Cl. 131-261.00R.

Johnson, John R., to Owens-Illinois, Inc. Moving mask for shielding articles. 3,886,899, Cl. 118-504.000.

Johnson & Johnson: *See—*
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Johnson, Keith G.; and Limbach, Anthony Paul, to Arco Polymers, Inc. Extruder die for multiple stream extrusion. 3,887,322, Cl. 425-466.000.

Johnson, Richard G. Continuous combustion engine. 3,886,734, Cl. 60-39.610.

Johnson, William R., Jr.: *See—*
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Jones, Elvis E.; Mays, William A.; and Smith, William F., to Dow Chemical Company, The. Valve. 3,886,963, Cl. 137-334.000.

Jones, Fred W.: *See—*
Thompson, Charles H.; and Jones, Fred W., 3,886,666.

Jones, John M., to Texaco Inc. Well logging system using 3 phase AC power supply. 3,887,898, Cl. 340-18.00R.

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Jones, Vernon H. Burglar alarm. 3,887,910, Cl. 340-276.000.

Jones, William E.; and Cullinan, George J., to Eli Lilly and Company. Vincadioline. 3,887,565, Cl. 260-287.00R.

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Juguin, Bernard; and Le Page, Jean-Francois, to Institut Francais du Petrole, des Carburants et Lubrifiants. Catalyst particularly useful for dehydrogenating saturated hydrocarbons. 3,887,495, Cl. 252-464.000.

Julev, Stoyan Iliev; Milkov, Mihail Yordanov; Dachev, Lyubomir Petrov; Vassilev, Rossen Petrov; and Grigorov, Simeon Alexandrov, to ZNIRD pri DSO "TEXTIL". Machine for producing non-woven floor coverings. 3,887,424, Cl. 156-435.000.

Juliano, Peter C.; Mitchell, Tyrone D.; and Kantor, Simon W., to General Electric Company. Organo(block- amide-siloxane)-(block-amide-imide) polymers. 3,887,636, Cl. 260-824.00R.

Juneja, Subhash C., to Canadian Patents and Development Limited. Urea-HCHO-dicyndiamide-oxy acid of phosphorus fire-retardant formulation and products. 3,887,511, Cl. 260-29.40R.

Junginger, Klaus M.: *See—*
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Jurid Werke GmbH: *See—*
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Jurisich, Peter J. Honeycomb product and process for manufacture. 3,887,418, Cl. 156-197.000.

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K-Tron Corporation: *See—*
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Kabishiki Kaisha Toyota Chuo Kenkyusho: *See—*
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Kabushikikaisha Tokyo Keiki: *See—*
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Kachi, Kenjiro; Takeichi, Morio; Nakamura, Yasumasa; Inomata, Yoichi; and Nakano, Mitsuru, to Elmo Company, Limited. Film frame selecting apparatus for a projector. 3,887,274, Cl. 353-26.000.

Kaczorowski, Janusz: *See—*
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Kahn, Burton M. Method of manufacturing reinforced concrete panels. 3,886,648, Cl. 29-452.000.

Kahn, Paul; and Stubstad, James A., to Cutter Laboratories, Inc. Joint prosthesis. 3,886,600, Cl. 3-1.000.

Kaib, Charles L.: *See—*
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Kaida, Fukumi; Nonaka, Risaburo; Sugii, Takeo; and Haraikawa, Tetsuo, to Tokico Ltd.; and Nippon Oils and Fats Co. Ltd. Hydraulic actuating device. 3,886,745, Cl. 60-533.000.

Kakei, Jun: *See—*
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Kalinushkin, Pavel Nikitovich: *See—*
Vernik, Alexandr Borisovich; Listkov, Viktor Fedorovich; Skorupsky, Boris Pavlovich; Grinshpun, Mark Izrailevich; Tetelbaum, Petr Iosifovich; Tyrtov, Anatoly Sergeevich; Konyaev, Vladimir Petrovich; Afanasiev, Ivan Petrovich; Kazakevich, Igor Illarionovich; Kalinushkin, Pavel Nikitovich; Andreev, Ivan Ivanovich; and Sukhanov, Alexandr Alexandrovich, 3,886,651.

Kaltwasser, Helmut, to General Motors Corporation. Rigid rear axle suspension systems. 3,887,025, Cl. 180-73.0TL.

Kaman Aerospace Corporation: *See—*
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Kamhues, Hermann, to C. Keller u. Co. Apparatus and methods for forming rows of selectively spaced articles. 3,887,060, Cl. 198-30.000.

Kaminsky, Bernice R., administratrix: *See—*
Kaminsky, Daniel, deceased; Klutchko, Sylvester; and Von Strandtmann, Maximilian, 3,887,585.

Kaminsky, Daniel, deceased (by Kaminsky, Bernice R., administratrix); Klutchko, Sylvester; and Von Strandtmann, Maximilian, to Warner-Lambert Company. Polycyclic gamma-pyrone-3-carboxaldehyde derivatives. 3,887,585, Cl. 260-345.200.

Kamiya, Masaaki, to Kabushiki Kaisha Diani Seikosha. Liquid crystal display watch. 3,886,724, Cl. 58-23.0BA.

Kamiyama, Seiichi: *See—*
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Kanebo Ltd.: *See—*
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Kaneko, Teruo: *See—*
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Kanner, Bernard; Prokai, Bela; and Rosemund, Walter R., to Union Carbide Corporation. Organosilicone polymers. 3,887,601, Cl. 260-448.20B.

Kanner, Bernard: *See—*
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Kantor, Simon W.: *See—*
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Kapich, Davorin D.; and Thurston, Glenn C., to General Atomic Company. Seal system. 3,887,197, Cl. 277-15.000.

Kaplan, Richard B.; Gonnella, Sebastian; and Abrams, Walter M. Method of fabrication of composite anode for rotating-anode x-ray tubes. 3,887,723, Cl. 427-58.000.

Kardas, Alan; Larson, Dennis H.; and Nesbitt, John D., to Institute of Gas Technology. Recuperator having a reradiant insert. 3,886,976, Cl. 138-38.000.

Karlov, Frank J.; Sidorewicz, Leonidas; Redfield, Charles L.; and Evans, Robert, to Litton Medical Products, Inc. High power variable autotransformer. 3,887,889, Cl. 336-146.000.

Kartsivadze, Amiran Ilich: *See—*
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Kastner, Arnold. Cigarette making machine. 3,886,952, Cl. 131-70.000.

Kaswell, Ernest R., to Fabric Research Laboratories. Synthetic end grain block defining a wear surface. 3,887,736, Cl. 428-87.000.

Katayama, Mitsumasa, to Matsushita Electronics Corporation. Target assembly of image pick-up tube. 3,887,827, Cl. 313-390.000.

Katayama, Morio: *See—*
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Kato, Hisatoyo: *See—*
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Katsurayama, Hiromasa, to Shin-Shirasuna Electric Corporation. Automatic stop apparatus for tape recorder. 3,887,943, Cl. 360-96.000.

Katz, Louis; and Wells, Lawrence, to Electrac, Inc. Doppler shift computer. 3,887,794, Cl. 235-151.300.

Katzer, Hans: *See—*
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Kawabe, Ushio; Kudo, Mitsuhiro; Fukase, Shigeo; and Ishibashi, Masato, to Hitachi, Ltd. Superconducting materials. 3,887,364, Cl. 75-174.000.

Kawaguchi, Hiroshi; and Nishiwaki, Kiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Dual brake system fault detection device. 3,887,899, Cl. 340-52.00C.

Kawaguchi, Hiroshi: *See—*
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Kawaguchi, Katsuyuki, to Westinghouse Electric Corporation. Combustion apparatus for gas turbine. 3,886,736, Cl. 60-39.74R.

Kawaguchi, Kazuyo: *See—*
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Kawakami, Mamoru, to Hochiki Kabushiki Kaisha. Photoelectric smoke detector. 3,887,815, Cl. 250-564.000.

Kaye, Gordon E., to P. R. Mallory & Co. Incorporated. Battery cartridge with hollow case of minimum weight and dimensions. 3,887,394, Cl. 136-173.000.

Kazakevich, Igor Illarionovich: *See—*
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Kehr, Clifton L.; and Wszolek, Walter R., to W. R. Grace & Co. A tetra-allyl terminated carbamate. 3,887,607, Cl. 260-471.00C.

Keith, Dennis; and Weigele, Manfred, to Hoffmann-La Roche Inc. Novel butanoic acid derivatives. 3,887,615, Cl. 260-534.00M.

Kelecius, Anthony S.: *See—*
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Kelley Company, Inc.: *See—*
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Kelley, Leon O. Convertible ripper and gouger and toe trimmer. 3,887,015, Cl. 172-254.000.

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Kemanord AB: *See—*
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Key, Kenneth Andrew; and Hooper, Clive William, to Imperial Chemical Industries Limited. Method for over-end winding of yarns. 3,886,721, Cl. 57-156.000.

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King, John M., to Aquarium Systems, Inc. Artificial sea water solution and composition for making the same. 3,886,904, Cl. 119-3.000.

Kinney, Alfred W., to Phillips Petroleum Company. Production of a variegated product. 3,886,973, Cl. 137-604.000.

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Kinoshita, Shoichi; Oyama, Masaji; and Takijiri, Shunjiro, to Dainippon Ink & Chemicals Inc.; and Dainippon Ink Institute of Chemical Research. Process for producing iminoisoindolinone. 3,887,581, Cl. 260-325.0Ph.

Kipp, Michael A.: *See—*
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Kirby, Peter; Isaac, Eirlys R.; and Smith, Graham C., to Shell Oil Company. Cyclic oxime derivatives. 3,887,472, Cl. 260-340.700.

Kirchner, Henry P.; and Walker, Ralph E. Method of strengthening alumina ceramic by quenching with liquid medium. 3,887,524, Cl. 264-66.000.

Kise, Mearl A.: *See—*
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Kisielewski, Richard W.: *See—*
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Kiss, Laszlo J. Positive drive continuous gear mesh shifting transmissions. 3,886,809, Cl. 74-681.000.

Kitanosono, Hidehiro: *See—*
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Kitchens, Lee Glen, to Texas Instruments Incorporated. Prismatic display window for a calculator. 3,887,791, Cl. 235-1.00D.

Klassen, Alfons: *See—*
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Klein, Alfons; Konig, Anita Von; Poot, Albert Lucien; and Wedemeyer, Karlfried, to Agfa-Gevaert. Image recording and receiving materials. 3,887,378, Cl. 96-114.100.

Klein, Frank N.; and O'Callaghan, Gerald F., to Eaton Corp. Stabilizing system for an inverter-driven induction motor. 3,887,853, Cl. 318-230.000.

Klein, Frank N.: *See—*
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Klenz, Karl A.; and Velarde, Clyde R., to Rheem Manufacturing Company. Clipping apparatus and clips therefor. 3,886,643, Cl. 29-243.570.

Klepper, John T.; and Morse, George. Log rolling apparatus with adjustable friction structure. 3,887,179, Cl. 272-1.00E.

Klimek, Boleslaw; and Mastis, Victor, to Berg Manufacturing Company, The. Tractor-trailer electrical connector. 3,887,256, Cl. 339-44.00M.

Klimo, Robert G., to Cleveland Machine Controls, Inc. Motor speed modifier control. 3,887,855, Cl. 318-332.000.

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Kobayashi, Shoichi: *See—*
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Kober, Alfred E., to Exxon Research and Engineering Company. Emulsion polymerization of ethylene with chain transfer agents to form copolymers. 3,887,610, Cl. 260-491.000.

Kobetz, Paul, to Ethyl Corporation. Chemical process. 3,887,691, Cl. 423-462.000.

Koch, Julius F., Jr., to General Motors Corporation. Upper main bearing removal tool. 3,886,644, Cl. 29-270.000.

Koderman, Ivan. Crank gear for the conversion of a translational motion into rotation. 3,886,805, Cl. 74-52.000.

Koehne, Anthony J.: *See—*
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Kolibas, James Andrew, to Addressograph-Multigraph Corporation. Multi-section drum assembly. 3,887,278, Cl. 355-16.000.

Komatsu, Noboru; Arai, Tohru; and Sugimoto, Yoshihiko, to Kabishiki Kaisha Toyota Chuo Kenkyusho. Method for forming a carbide layer of an element selected from the group consisting of V, Nb, Ta and mixtures thereof on the surface of an iron, ferrous alloy or cemented carbide article. 3,887,443, Cl. 204-39.000.

Kominami, Naoya; Tamura, Nobuhiro; and Yamamoto, Etsuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for preparing phenyl acetate and related products. 3,887,608, Cl. 260-479.00R.

Komiyama, Kazuya: *See—*
Matsuzaka, Takashi; Koga, Tsuneo; and Komiyama, Kazuya, 3,887,303.

Kompfner, Rudolf, to Bell Telephone Laboratories, Incorporated. Optical fiber with asymmetric index profile. 3,887,264, Cl. 350-96.0WG.

Kondo, Tokiharu, deceased: *See—*
Shiba, Keisuke; Hinata, Masanao; Ohi, Reiichi; Sato, Arkira; Yamasue, Koutarou; and Kondo, Tokiharu, deceased, 3,887,380.

Kondo, Yoshiharu, legal representative: *See—*
Shiba, Keisuke; Hinata, Masanao; Ohi, Reiichi; Sato, Arkira; Yamasue, Koutarou; and Kondo, Tokiharu, deceased, 3,887,380.

Kondo, Yoshikazu; and Ohhori, Mitsuo, to Kozo Yoshizaki. Method for producing high density steel powders. 3,887,402, Cl. 148-126.000.

Konig, Anita Von: *See—*
Klein, Alfons; Konig, Anita Von; Poot, Albert Lucien; and Wedemeyer, Karlfried, 3,887,378.

Konishi, Kunio; Tsubakimoto, Tsuneo; and Nikki, Masao, to Nippon Shokubai Kagaku Kogyo Ltd. Process for production of graft copolymers, the substrates of which contain allyl derivatives of maleic acid and maleic acid anhydride. 3,887,653, Cl. 260-885.000.

Konyaev, Vladimir Petrovich: *See—*
Vernik, Alexandr Borisovich; Listkov, Viktor Fedorovich; Skorupsky, Boris Pavlovich; Grinshpun, Mark Izrailevich; Tetelbaum, Petr Iosifovich; Tyrtov, Anatoly Sergeevich; Konyaev, Vladimir Petrovich; Afanasiev, Ivan Petrovich; Kazakevich, Igor Illarionovich; Kalinushkin, Pavel Nikitovich; Andreev, Ivan Ivanovich; and Sukhanov, Alexandr Alexandrovich, 3,886,651.

Koons, Harold F.: *See—*
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Koppe, Herbert: *See—*
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Koppers, Manfred, to Rheinstahl AG. Assembly for hydraulic extraction of sheet-like mineral deposits sectioned into panels by a system of passageways. 3,887,235, Cl. 299-1.000.

Korasiak, Wolfgang: *See—*
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Korber-AG, Firma: *See—*
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Korematsu, Etsuko, widow and legal successor: *See—*
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Koremura, Norio, to Jintan Terumo Co., Ltd. Package. 3,887,072, Cl. 206-484.000.

Korpics, Charles J., to Sherwin-Williams Company, The. Benzotriazole and tolyltriazole mixture with tetrachloroethylene. 3,887,481, Cl. 252-172.000.

Korsell, Torsten; Larker, Hans; Lundblad, Erik; and Nilsson, Jan, to Allmanna Svenska Elektriska Aktiebolaget. Die for manufacturing rods or wire of compounds material with non-round cross-section. 3,886,775, Cl. 72-60.000.

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Kraftwerk Union Aktiengesellschaft: *See—*
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Krag, Niels, to Electronic Memories & Magnetics Corp. Wire mass termination. 3,887,904, Cl. 340-174.0MA.

Krah, Robert; and Gehrke, Alfons, to Dynamit Nobel Aktiengesellschaft. Wall facing arrangement. 3,886,709, Cl. 52-460.000.

Krause, Franz; and Shulberg, Austin T., to Classic Games Company, Inc. Table construction. 3,886,710, Cl. 52-758.00H.

Kresge, Edward N.: *See—*
O'Farrell, Charles P.; and Kresge, Edward N., 3,887,530.

Krieger, Friedrich; and Stein, Christian, to Siemens Aktiengesellschaft. Layer circuit with at least one solder platform for the soldering on of semiconductor modules. 3,887,760, Cl. 174-68.500.

Kristof, John J.; and Thiry, Geza A., to Sycon Corporation. Valve assembly. 3,886,975, Cl. 137-625.420.

Krok, Frank S., to General Motors Corporation. Hydrodynamic torque converter with hydraulically energized one-way roller clutch. 3,886,740, Cl. 60-341.000.

Kronirey, Robert V., to Aerojet-General Corporation. Honeycomb structures. 3,887,739, Cl. 428-112.000.

Krueger, Ralph A. Paint roller cleaning apparatus. 3,886,960, Cl. 134-138.000.

Kruka, Vitold R.: *See—*
Scott, Paul R.; Chavez, Victor J.; and Kruka, Vitold R., 3,886,972.

Krupen, Philip, to United States of America, Army. Contact fuze. 3,886,867, Cl. 102-70.20R.

Kubelka, Joseph R., Jr. Arrangement for closing a kelly-cock supported on a rotary swivel with a stem therefrom. 3,887,161, Cl. 251-58.000.

Kudo, Mitsuhiro: *See—*
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Kuhajek, Eugene J.; Fiedelman, Howard W.; and Tibbitts, Gordon H., to Morton-Norwich Products, Inc. Method for regeneration of cation exchange resins and for removal of iron deposits therefrom. 3,887,498, Cl. 260-2.20R.

Kuhl, Franz: *See—*
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Kuhla, Donald E.: *See—*
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Kuhlmann, Franz, to Franz Kuhlmann KG, Prazisionsmechanik und Maschinebau. Pantograph copy milling machine with drawing tracing device. 3,886,847, Cl. 90-13.800.

Kuihara, Kenzo: *See—*
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Kulakov, Nikolai Konstantinovich; Likhogub, Evgeny Petrovich; Dorfman, Gersh Abramovich; and Suslov, Alexandr Nikolaevich. Plant for discharging coke from horizontal-flue coke oven. 3,887,438, Cl. 202-262.000.

Kumai, Yasui: *See—*
Ishikawa, Seiichi; Miya, Yooichi; Odate, Ryoji; and Kumai, Yasui, 3,887,116.

Kumata, Seiji; Shimoi, Youichi; Hirabayashi, Terubika; and Hiwatashi, Yukinori, to Nittetu Chemical Engineering Limited. Process for purifying a gas containing hydrogen sulfide and hydrogen cyanide. 3,887,682, Cl. 423-232.000.

Kumazawa, Shoichiro, to Kabushiki Kaisha Seikosha. Control apparatus for an intermittently rotated indexed wheel. 3,887,825, Cl. 310-37.000.

Kume, Takeo: *See—*
Tokunaga, Takeshi; Maekawa, Toshiaki; Uno, Takeshi; Akagi, Tadashi; Abe, Nobuyuki; Kume, Takeo; Ohnishi, Yukio; and Shimomura, Yasumi, 3,886,821.

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Kurasawa, Yoshiya, to Nissan Motor Company Limited. Safety device actuating arrangement. 3,887,819, Cl. 307-10.00R.

Kurita, Takashi; Yamamoto, Hiroshi; and Makabe, Hideki, to Shimadzu Seisakusho Ltd. Spectrophotometric measurement system. 3,887,281, Cl. 356-96.000.

Kurtz, Abraham Nathan; and Farmer, Melvin Lee, to Union Carbide Corporation. Oxidation of 2-chlorobutene to chloroprene. 3,887,626, Cl. 260-655.000.

Kurumada, Tomoyuki: *See—*
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Kuwada, Yutaka: *See—*
Tawada, Hiroyuki; Meguro, Kanji; and Kuwada, Yutaka, 3,887,541.

Kuwamura, Mitomu, to Iwatsu Electric Company. Analogue-digital converter apparatus. 3,887,912, Cl. 340-347.000.

La Cellophane: *See—*
Brunet, Jacques; and Rigaux, Jean-Claude, 3,887,579.
Deshayes, Phillippe M.; and Weber, Guy Paul, 3,886,900.

Labalme, Pierre, to Compagnie Honeywell Bull (Societe Anonyme). Method and apparatus for processing calls distributed randomly in time and requiring response delays of any duration, but specified for each call. 3,887,902, Cl. 340-172.500.

Labaz: *See—*
Cier, Andre; Gero, Stephan; and Olesker, Alain, 3,887,590.

Laberinti, Cesare, to Industrie Pirelli, S.p.A. Upholstery articles and process for their manufacture. 3,887,735, Cl. 428-71.000.

Laboratoires G.-A. Cochard: *See—*
Cochard, Pierre E.; and Vandecauter, Roger, 3,887,175.

Laboratorios Berenguer Beneyto S.A.: *See—*
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Labran, Garrie; and Chabrak, Thomas A. Self cleanable hair brush. 3,886,617, Cl. 15-169.000.

Lachowicz, Donald R.; Saines, George S.; and Eckert, George W., to Texaco Inc. Preparation of nitroketonized amides. 3,887,593, Cl. 260-404.500.

Lafontaine, Florian. Switch mechanism ensuring the automatic closing of a motor-operated garage door. 3,887,890, Cl. 337-103.000.

Lagess, Thomas F.; and Maudlin, Valroy Henry, to Dow Chemical Company, The. Disposal of waste streams containing asbestos. 3,887,462, Cl. 210-53.000.

Lagowski, Jacek: *See—*
Gatos, Harry C.; and Lagowski, Jacek, 3,887,937.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des procedes Georges Claude: *See—*
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Lally, Joseph Edward, to Bally Manufacturing Corporation. Random selective switching apparatus. 3,887,192, Cl. 273-138.00A.

Lambert, William M. Collapsible structural member. 3,886,700, Cl. 52-108.000.

Lammy, James E.; Francis, Thomas; and Canter, Lawrence E., to Scott Port-A-Fold, Inc. Pivotable arm rest for boat seat. 3,886,611, Cl. 9-7.000.

Lancaster Research and Development Corporation: *See—*
Geschwender, Robert C., 3,887,419.

Lancelot, Charles J.; Blumbergs, John H.; and MacKellar, Donald G., to FMC Corporation. Process for the homopolymerization of maleic anhydride. 3,887,526, Cl. 260-78.40R.

Landesman, Eric; and Palmiter, Donald R., to Elgin Sweeper Company. Vacuum type sweeper. 3,886,623, Cl. 15-319.000.

Landesman, Eric; and Palmiter, Donald R., to Elgin Sweeper Company. Vacuum type sweeper. 3,886,624, Cl. 15-340.000.

Landis, Alfred R.; and Torrence, Sammie B., to Kearney-National Inc. Electric grounding apparatus. 3,887,254, Cl. 339-5.00R.

Landreville, Patrick M. Tilting tube with rolling member game. 3,887,185, Cl. 273-109.000.

Lane, Arthur W.: *See—*
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Lane, William C., to Mead Corporation, The. Unitary plastic laminate. 3,887,743, Cl. 428-206.000.

Lang, Walter: *See—*
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Langren, Robert J., to Hosmer/Dorrance Corporation. Clamp joint for separated members. 3,887,291, Cl. 403-391.000.

Lannert, Kent P., to Monsanto Company. Hydroxy ether carboxylates. 3,887,616, Cl. 260-535.00P.

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Larker, Hans: *See—*
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Larkin, Sam. Sand molding apparatus. 3,886,993, Cl. 164-211.000.

Larsen, Mogens Drost. Document filing rack. 3,887,076, Cl. 211-10.000.

Larson, Dennis H.: *See—*
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Larson, Willis A.; and Colglazier, David E., to Magic Dot, Inc. Apparatus and material for protecting microelectronics from high potential electricity. 3,887,848, Cl. 317-33.00R.

Larsson, Ivar F. Triangular drive for screen printer. 3,886,864, Cl. 101-126.000.

La Rue, Mervin W., Jr., to Bell & Howell Company. Battery holder assembly. 3,887,393, Cl. 136-173.000.

Laurila, Erkki A., to Bermeco Oy. Permanent magnet strong field separator. 3,887,458, Cl. 209-219.000.

Law, Andrew B.: *See—*
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Law, Anthony G.; and Johnson, James E., to Chase Brass and Copper Co., by said Anthony G. Law. Electrohydraulically controlled cut off saw. 3,886,831, Cl. 83-294.000.

Lawson, Lewis E.: *See—*
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Lazarus, Alfred; and Lazarus, Jean-Jaques. Stylus device for the vision of image sequences. 3,887,270, Cl. 350-241.000.

Lazarus, Jean-Jaques: *See—*
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Lee, Bong Kuk; Neidleman, Saul Lewis; and Ryu, Dewey D. Y., to E. R. Squibb & Sons, Inc. 1-Amino substituted 1-cycloalkane derivatives of 7-aminocephalosporanic acid and 7-aminodesacetoxy cephalosporanic acid. 3,887,546, Cl. 260-240.00G.

Lee C. Moore Corporation: *See—*
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Lee, Richard K., to Universal Oil Products Company. Heating of catalytic converter casing. 3,886,739, Cl. 60-286.000.

Leet, Richard A. Tail gate lift mechanism. 3,887,092, Cl. 214-75.00T.

Leete, Bernard D., to General Electric Company. Optical driver circuit. 3,887,836, Cl. 315-207.000.

LeHenaff, Madame Maryvonne: *See—*
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Lehmann, Jerry Hans, to Burroughs Corporation. Demountable-pluggable tensioning and re-inking ribbon cartridge. 3,887,056, Cl. 197-168.000.

Leiber, Heinz; Gerstenmeier, Jurgen; and Korasiak, Wolfgang, to Teldix GmbH. Antilock control system for vehicles. 3,887,240, Cl. 303-21.00P.

Leichsenring, Carl Hans: *See—*
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Leidich, Arthur John, to RCA Corporation. Bias circuitry for stacked transistor power amplifier stages. 3,887,880, Cl. 330-22.000.

Leir, Charles M., to Riker Laboratories, Inc. Process for piperidine derivatives. 3,887,568, Cl. 260-293.800.

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Lemke, Hans, to Produits Chimiques Ugine Kuhlmann. Treatment of organic effluents from the halcon process to precipitate the metal used as catalyst. 3,887,361, Cl. 75-108.000.

Lennington, John W.: *See—*
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Lentz, Carl A., to General Motors Corporation. Transmission shift control. 3,886,819, Cl. 74-868.000.

Lentz, Carl A., to General Motors Corporation. Transmission and control. 3,886,820, Cl. 74-869.000.

Leon, John E. Concrete imprinting apparatus and method. 3,887,294, Cl. 404-89.000.

Le Page, Jean-Francois: *See—*
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Lever Brothers Company: *See—*
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Lew, Hyok Sang. Lettering set. 3,886,663, Cl. 33-23.00D.

Lewals, Inc.: *See—*
Walls, Leroy C., 3,886,892.

Lewicki, Walter J., Jr., to Armstrong Cork Company. Mechanically embossed resilient laminar floor material. 3,887,678, Cl. 264-284.000.

Lewis, Sheldon N.; Miller, George A.; and Law, Andrew B., to Rohm and Haas Company. Control of microorganisms with 3-hydroxyisothiazoles. 3,887,352, Cl. 71-67.000.

Lewis Woolf Griptight Limited: *See—*
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Liakumovich, Alexandr Grigorievich; Zakharova, Nina Vasilievna; Khamidullin, Rashid Idrisovich; and Zakrevsky, Vladimir Mikhailovich. Process for purifying diene hydrocarbons from acetylene hydrocarbon contaminants. 3,887,632, Cl. 260-681.50R.

Liberty Winery, Inc.: *See—*
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- Libkie, Herbert A., to General Motors Corporation. Valve arrangement for a vehicular inflatable cushion. 3,887,109, Cl. 222-3.000.
- Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
  - Fischer, Horst; and Pschunder, Willi, 3,887,935.
- Lichtenstein, Joseph. Aqueous zinc solutions for physiological use. 3,887,704, Cl. 424-145.000.
- Liebert, Karl-Heinz, to Zahnradfabrik Friedrichshafen AG. Valve porting arrangement for a gerotor. 3,887,308, Cl. 418-61.00B.
- Liechti, Hans Wilhelm: *See—*
  - Hegar, Gert; Angliker, Hans-Joerg; Lang, Walter; Liechti, Hans Wilhelm; and Milicevic, Branimir, 3,887,329.
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  - Olsen, Willi; Lieske, Manfred; Ehmann, Wolfgang; and Perst, Gerhard, 3,887,915.
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- Linde Aktiengesellschaft: *See—*
  - Becker, Rudolf; and Becker, Wolfgang, 3,886,885.
- Lindgren, Theodore P. Asynchronous n bit position data shifter. 3,887,799, Cl. 235-164.000.
- Lindius, Gosta: *See—*
  - Forssen, Zeth; and Lindius, Gosta, 3,886,983.
- Lindner, Charles B.: *See—*
  - Duane, John J.; and Lindner, Charles B., 3,886,941.
- Lindner, Robert G., to H. H. Robertson Company. Method for fabricating double-skin foam core construction panels. 3,887,410, Cl. 156-79.000.
- Lion Fat & Oil Co., Ltd.: *See—*
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- Lipschutz, Paul; and Leroy, Jean, to Societe d'Exploitation des Brevets Neiman. Anti-theft devices. 3,887,029, Cl. 180-114.000.
- Lipson, Melvin A.: *See—*
  - Gilano, Michael N.; Beaupre, Richard E.; and Lipson, Melvin A., 3,887,450.
- Listkov, Viktor Fedorovich: *See—*
  - Vernik, Alexandr Borisovich; Listkov, Viktor Fedorovich; Skorupsky, Boris Pavlovich; Grinshpun, Mark Izrailevich; Tetelbaum, Petr Iosifovich; Tyrtov, Anatoly Sergeevich; Konyaev, Vladimir Petrovich; Afanasiev, Ivan Petrovich; Kazakevich, Igor Illarionovich; Kalinushkin, Pavel Nikitovich; Andreev, Ivan Ivanovich; and Sukhanov, Alexandr Alexandrovich, 3,886,651.
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  - Karlov, Frank J.; Sidorewicz, Leonidas; Redfield, Charles L.; and Evans, Robert, 3,887,889.
- Liu, Hsing-Ching, to Liu, Hsing-Ching; and Wei, Ching Huei. Linguistic self learning device. 3,886,671, Cl. 35-35.00C.
- Livesay, William R., to Radiant Energy Systems, Inc. Electro mechanical alignment apparatus for electron image projection systems. 3,887,811, Cl. 250-442.000.
- Lockhead Aircraft Corporation: *See—*
  - Wirt, Leslie S., 3,887,031.
- Loesch, Robert Phillip, to Western Electric Company, Incorporated. Tension speed control for a rotatable strand supply utilizing a transformer having variable primary and secondary windings. 3,887,851, Cl. 318-6.000.
- Lohr, Ernest F., to SCM Corporation. Dual tone margin signal for typewriters. 3,887,058, Cl. 197-192.000.
- Long, Robert B.; Caruso, Fred A.; DeFeo, Richard J.; and Walker, David G., to Exxon Research and Engineering Company. Bimetallic salts and derivatives thereof, their preparation and use in the complexing of ligands. 3,887,600, Cl. 260-438.100.
- Lonza, Ltd.: *See—*
  - Schmid, Eduard; Nascher, Reinold; Egli, Rene; Parratt, Noel James; and Gooding, Ronald William, 3,887,429.
- Looman, Wolfgang; Pungs, Wolfgang; Bierwirth, Egon; and Buning, Robert, to Dynamit Nobel AG. Vinylchloride-alkylene copolymer and uses therefor. 3,887,728, Cl. 427-185.000.
- Loop-A-Line, Inc.: *See—*
  - McGahee, Welbourne D., 3,886,773.
- Loftes, Karlheinz; and Katzer, Hans, to Consortium fur Elektrochemische Industrie GmbH. Precipitation polymerization of 1:1 copolymerizates of maleic acid anhydride and allyl acetate. 3,887,528, Cl. 260-78.50R.
- Loughner, James W. Classifier with rifflers and variable throat. 3,887,456, Cl. 209-211.000.
- Louzecky, Paul J., to General Motors Corporation. Rotary machine apex seal. 3,887,311, Cl. 418-113.000.
- Lover, Myron J.; and Speranza, Joseph P., to Merck & Co., Inc. Oral hygiene products. 3,887,712, Cl. 424-326.000.
- Lowen, Michael David, to John Laing & Son Limited. Monitoring apparatus. 3,886,665, Cl. 33-174.00R.
- Lowe's, Inc.: *See—*
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- Loyd, Robert W., Jr., to Curtiss-Wright Corporation. Gas fueled rotary engine. 3,886,907, Cl. 123-8.130.
- Lucas, Charles H., to Raymond Lee Organization, Inc., The. Football board game apparatus. 3,887,191, Cl. 273-134.0DB.
- Lucien, Rene; and LeHenaff, Madame Maryvonne. Audio-visual educational apparatus. 3,886,670, Cl. 35-9.00A.
- Ludwig Engel KG: *See—*
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- Lundin, Holger Alexander, to Telefonaktiebolaget L M Ericsson. Method for locating an underground cable. 3,886,755, Cl. 61-72.600.
- Lundsgaard, Jorgen Schjerning; and Degn, Hans Peter. Apparatus for regulating the ratio of mixing of two fluid flows. 3,886,971, Cl. 137-599.000.
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- Maas, Hermann; Abratis, Horst; and Raeune, Claus, to Rheinstahl Huettenwerke AG. Method of treating metal melts with a purging gas during the process of continuous casting. 3,886,992, Cl. 164-56.000.
- Macheski, Robert L.: *See—*
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- MacKellar, Donald G.: *See—*
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- Majumdar, Amalendu Jyoti, to National Research and Development Corporation. Glass fibres and compositions containing glass fibres. 3,887,386, Cl. 106-99.000.
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- Malone, Denis Frederick, to Dunlop Limited. Disc brakes. 3,887,041, Cl. 188-71.500.
- Mangold, Donald J.; and Vetterli, John E., to Flecto Company, Inc., The. Liquid fabric wall cover. 3,887,940, Cl. 260-8.000.
- Mannaka, Toshio; Kitanosono, Hidehiro; and Matsuka, Shigemichi, to Hitachi, Ltd. Optimum electroplating plant control device. 3,887,452, Cl. 204-211.000.
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- Markhart, Albert H.; and Santer, James O., to Monsanto Company. Electroconductive sheet material and process of preparation. 3,887,751, Cl. 428-342.000.
- Marston, Peter G.; Wechsler, Ionel; and Nolan, John J., to Magnetic Engineering Associates Inc. Magnetic separation method. 3,887,457, Cl. 209-214.000.
- Martell, Charles Ronald, to Camsco, Inc. Interactive man-machine method and system for grading pattern pieces and for producing an apparel marker. 3,887,903, Cl. 340-172.500.
- Martin, Donald L., to General Electric Company. Cobalt-rare earth magnets comprising sintered products bonded with cobalt-rare earth bonding agents. 3,887,395, Cl. 148-31.570.
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- Matsuo, Kazuto: *See—*
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- McCloskey, Albert R., to Rockwell International Corporation. Antifriction ball bearing assembly. 3,887,246, Cl. 308-6.00C.
- McClure, William M.; and Klintworth, Keith K., to Caterpillar Tractor Co. Pressure balanced ring seal. 3,887,198, Cl. 277-27.000.
- McConnell, Harden M.; and Humphries, Gillian K., to Leland Stanford Junior University, The Board of Trustees of. Sacs with epitopic sites on walls enclosing stable free radicals. 3,887,698, Cl. 424-12.000.
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- McEwan, William S.; and Miles, Melvin, to United States of America, Navy. Electrochemical preparation of metallic tellurides. 3,887,446, Cl. 204-86.000.
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- McNamee, Gerald P. Method for recovery of hydrocarbon vapors. 3,886,759, Cl. 62-54.000.
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- Merstallinger, Kurt; and Schindl, Klaus P., to C. Reichert Optische Werke, AG. Optical system for a microscope photometry attachment. 3,887,283, Cl. 356-219.000.
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- Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. Process for producing 2,6-diamino -1,4-dihydro-3,5-pyridine-dicarboxylates and derivatives thereof. 3,887,558, Cl. 260-256.40C.
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- Michatek, Robert J., to Xerox Corporation. Copier photoreceptor charge control. 3,887,845, Cl. 317-262.00A.
- Michel, Edmond; and Duikers, Marcel, to Solvay & Cie. Method and apparatus for deflashing hollow plastic articles. 3,886,824, Cl. 82-47.000.
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- Miller, Roland E., to Kraftco Corporation. Method and apparatus for handling process cheese spread. 3,887,719, Cl. 426-517.000.
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  - Gipson, Robert M.; Bentley, Floyd E.; and Milligan, John G., 3,887,624.
- Mills, Noel; Balmford, David Ernest Hall; and Saunders, James Edwin, to Westland Aircraft Limited. Vibration absorbing systems. 3,887,296, Cl. 416-145.000.
- Mimura, Norihisa; Uehaka, Takao; and Kato, Hisatoyo. Liquid sensitometry process for photographic emulsions. 3,887,383, Cl. 23-230.00R.
- Minami, Shinsaku; Matsumoto, Jun-Ichi; Kawaguchi, Kazuyo; Mishio, Shinsaku; Shimizu, Masanao; Takase, Yoshiyuki; and Nakamura, Shinichi, to Dainippon Pharmaceutical Co. Ltd. Piperazine derivatives and processes for preparation thereof. 3,887,557, Cl. 260-256.40F.
- Minatono, Shobu: *See—*
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- Minekawa, Saburo; Yonekawa, Sigeru; Tabata, Haruro; Ishida, Takashi; Tsuchida, Satoshi; and Yamada, Kiyoshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing rubbery conjugated diolefin polymers having branched structures. 3,887,535, Cl. 260-94.20M.
- Mingesz, Donald P.: *See—*
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- Minnaja, Nicola, to Honeywell Information Systems Italia. Optical associative memory using complementary magnetic bubble shift registers. 3,887,906, Cl. 340-174.0GA.

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- Mitsubishi Chemical Industries, Ltd.: *See—*
  - Inomata, Jihei; Hayashi, Masahiro; Nozawa, Seiichi; Ota, Takayuki; Endo, Kazuo; and Yamaguchi, Yukio, 3,887,651.
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  - Yonemitsu, Eiichi; Sugio, Akitoshi; Kamiyama, Seiichi; Masu, Masanobu; and Kimura, Masaharu, 3,887,647.
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- Mix, Thomas William; and Erickson, Alve John. Vapor-liquid contacting. 3,887,665, Cl. 261-114.00R.
- Miya, Yooichi: *See—*
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- Miyake, Kenichi, to Minolta Camera Kabushiki Kaisha. Lens barrel for automatically controlled electronic flash unit. 3,887,933, Cl. 354-195.000.
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- Montefusco, Nicola; and Barlucchi, Alfredo, to Societa Italiana Telecomunicazioni Siemens S.p.A. System for measuring group delay in signal transmission. 3,887,775, Cl. 179-175.30R.
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- Mori, Toshiyuki; and Kinoshita, Kunio, to Olympus Optical Co., Ltd. Ureteral catheter device. 3,886,933, Cl. 128-7.000.
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- Munch, Robert James, to American Cyanamid Company. Concentrating acrylamide solutions. 3,887,425, Cl. 159-48.00L.
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- Neuroth, Norbert, to Jenaer Glaswerk Schott & Gen. Solid optical filter having selective wavelength permeability. 3,887,485, Cl. 252-300.000.
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- Nishijima, Kiyoaki; and Tanaka, Atsuo, to Allied Chemical Corporation. Stabilized polyamide composition. 3,887,520, Cl. 260-45.75C.
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- Nyberg, Pauli Unto Juhani: *See—*
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- Obergfell, Allen R., to Duo-Fast Corporation. Apparatus for fastening articles. 3,887,113, Cl. 222-146.0HE.
- Obermaier, Frank E.; and Scott, Arthur A., to Eaton Corp. Ported valve and sealing means therefor. 3,887,159, Cl. 251-11.000.
- O'Callaghan, Gerald F.: *See—*
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- Odaka, Minoru, to Mitsui Shipbuilding and Engineering Co. Ltd. Apparatus for disposing longitudinals for constructing hull blocks. 3,886,883, Cl. 114-65.00R.
- Odate, Ryoji: *See—*
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  - Yau, Chiou C.; Schlossman, Irwin S.; and Oehlschlaeger, Herman F., 3,887,523.
- O'Farrell, Charles P.; and Kresge, Edward N., to Exxon Research and Engineering Company. Semi-crystalline sulfonated EDPM elastomeric ionomers. 3,887,530, Cl. 260-79.30R.
- Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.): *See—*
  - Daigne, Bernard; and Girard, Francois, 3,886,994.
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- Ohkubo, Kinji; and Masuda, Takao, to Fuji Photo Film Co., Ltd. Process for producing an organic silver carboxylate. 3,887,597, Cl. 260-414.000.
- Ohlawa, Kiyoto: *See—*
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- Ohnishi, Yukio: *See—*
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- Ohno, Genji; Uchiyama, Tadamitsu; Ohki, Seisaku; and Morohashi, Hishao, to Research and Development Laboratories of Ohno Company Limited. Ink jet recording unit. 3,887,928, Cl. 346-140.000.
- Ohto, Michihiro; Noshiro, Atsumi; Takamizawa, Minoru; and Inoue, Yoshio, to Dai Nippon Printing Co., Ltd. Planographic printing plates comprising organic polysiloxanes. 3,886,865, Cl. 101-456.000.
- Ohtomo, Koichiro: *See—*
  - Tamura, Yoshio; and Ohtomo, Koichiro, 3,887,747.
- Ohyama, Yasushi; and Sumitani, Hideo, to Mitsubishi Paper Mills, Ltd. Dye transfer acceleration with polyamine compounds. 3,887,370, Cl. 96-29.00D.
- Oil Base Germany, G.m.b.H.: *See—*
  - Miller, Geo. L.; and Barthel, Horst K. F. (said Barthel assors. to), 3,887,009.
- Oil Base, Inc.: *See—*
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- Oil-Rite Corporation: *See—*
  - Gruett, Donald G., 3,886,796.
- Ojala, William K., to Ford Motor Company. Two-stage carburetor with improved idle air fuel mixture distribution. 3,887,661, Cl. 261-23.00A.
- Okada, Hidehiko: *See—*
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- Okada, Hiroshi: *See—*
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- Okada, Takashi; and Tsuchiya, Takao, to Sony Corporation. Balanced modulator circuit. 3,887,886, Cl. 332-43.00B.
- Okamoto, Eisaku, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument capable of modulation controlling a second keyboard section tone signal in accordance with a first keyboard section tone signal. 3,886,834, Cl. 84-1.170.
- Okamura, Seizo; Tagawa, Tomoaki; Yagami, Kazuo; Matsuo, Kazuto; Sakabe, Mitsuo; Sogo, Tsutomu; Korematsu, Mikio, deceased; and by Korematsu, Etsuko, widow and legal successor, to Kohjin Co. Ltd. Polyvinylchloride graft vinyl chloride onto amido backbone and polyvinyl alcohol as film or fiber. 3,887,676, Cl. 264-184.000.
- Okamura, Takayuki; and Minatono, Shobu, to Kuraray Co., Ltd. Method of producing maleic anhydride modified polyisoprene rubber. 3,887,527, Cl. 260-78.40D.
- Okaya Denki Sangyo Kabushiki Kaisha: *See—*
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- Olsen, Willi; Lieske, Manfred; Ehmann, Wolfgang; and Perst, Gerhard, to Siemens Aktiengesellschaft. Arrangement for detecting dielectric breakdowns in metal-clad high-voltage switching and transmission installations. 3,887,915, Cl. 340-415.000.
- Olympus Opitcal Co., Ltd.: *See—*
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- Olympus Optical Co., Ltd.: *See—*
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- Onesta, Roberto Carlo. Device to facilitate the clearance of a blocked drain. 3,886,603, Cl. 4-255.000.
- Ono, Kazuo: *See—*
  - Baba, Kazuo; Shiota, Toshiaki; Murakami, Kikuo; and Ono, Kazuo, 3,887,534.
- Ono, Minoru; and Momoi, Toshimitu, to Hitachi, Ltd. Method of manufacturing semiconductor device with nitride oxide double layer film. 3,887,407, Cl. 156-11.000.
- Oostenbrink, Albertus Anthony, to Wavin B.V. Pipe part with a widened end. 3,887,674, Cl. 264-94.000.
- Ordinartsev, Jury Nikolaevich: *See—*
  - Tseitlin, Aron Yakovlevich; Martynov, Oleg Viktorovich; Ordinartsev, Jury Nikolaevich; Ordinartsev, Vladimir Nikolaevich; Tishkin, Evgeny Pavlovich; Tikhonov, Sergel Sergeevich; and Belousov, Alexeevich Vladimir, 3,886,996.
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  - Tseitlin, Aron Yakovlevich; Martynov, Oleg Viktorovich; Ordinartsev, Jury Nikolaevich; Ordinartsev, Vladimir Nikolaevich; Tishkin, Evgeny Pavlovich; Tikhonov, Sergel Sergeevich; and Belousov, Alexeevich Vladimir, 3,886,996.
- O'Reilly, Daniel W.; and O'Reilly, Joseph D. Attachments for unloading devices. 3,887,153, Cl. 239-676.000.
- O'Reilly, Joseph D.: *See—*
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- Osman, Mohammed A.; and Kaib, Charles L., to Pullman Incorporated. Tunnel kiln firing of carbon products. 3,887,437, Cl. 202-117.000.
- Ossanna, Oliver A.: *See—*
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- Osterburg, Gunter: *See—*
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- Ostermann, Max, to W. & M. Ostermann. Device for applying filamentary material about a workpiece. 3,886,720, Cl. 57-13.000.
- Osuka, Hiroshi: *See—*
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- Oswald, Alexis A.; and Valint, Paul L., to Ciba-Geigy AG. O-Alkyl-S-alkyl-S-[1,2-bis(alkoxycarbonyl)ethyl]dithiophosphates. 3,887,658, Cl. 260-942.000.
- Ota, Susumu; and Aihara, Ryuzo, to Nihon Denshi Kabushiki Kaisha. Pulsed field emission type electron gun. 3,887,839, Cl. 315-383.000.
- Ota, Takayuki: *See*—
  - Inomata, Jihei; Hayashi, Masahiro; Nozawa, Seiichi; Ota, Takayuki; Endo, Kazuo; and Yamaguchi, Yukio, 3,887,651.
- Otaki, Takashi; and Aihara, Yoshiaki, to Mitsubishi Jukogyo Kabushiki Kaisha. Compressor construction. 3,887,304, Cl. 417-363.000.
- Otis Engineering Corporation: *See*—
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- Oughton, John Francis: *See*—
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- Owens, Abner, Jr., to Bendix Corporation, The. Electromagnetic deflection display system including dual mode deflection amplifiers and output power limited supplies. 3,887,829, Cl. 315-411.000.
- Owens, Abner, Jr.; and Weinstein, Donald, to Bendix Corporation, The. Electronmagnetic deflection display system including dual mode deflection amplifiers and output power limited power supplies. 3,887,842, Cl. 315-397.000.
- Owens-Illinois, Inc.: *See*—
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- Pacault, Pierre Henri, to Babcock-Atlantique Societe Anonyme. Steam power stations. 3,886,749, Cl. 60-652.000.
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  - Landesman, Eric; and Palmiter, Donald R., 3,886,624.
- Panek, George J.; and McCrea, Michael E., to International Telephone and Telegraph Corporation. Electrical connector. 3,887,257, Cl. 339-45.00M.
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- Papp, Istvan: *See*—
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- Pappo, Raphael: *See*—
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- Paramonoff, Elpidifor; and Main, Ralph M., to Standun, Inc. Force equalized external stripper for metalworking machines and the like. 3,886,781, Cl. 72-344.000.
- Parker, Delmer Gene, to Xerox Corporation. Method for temperature stabilizing photoreceptors. 3,887,367, Cl. 96-1.00R.
- Parker, Konrad; and Shah, Hasmukhlal M., to General American Transportation Corporation. Stress controlled electroless nickel deposits. 3,887,732, Cl. 427-380.000.
- Parker, Paul T.; and Mayer, Ivan, to Exxon Research and Engineering Company. Alkylation process utilizing halosulfuric or trihalomethylsulfonic acid with a catalyst moderator. 3,887,635, Cl. 260-683.470.
- Parks, Walter K., to General Electric Company. Multi-speed motor. 3,887,854, Cl. 318-224.00A.
- Parratt, Noel James: *See*—
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- Parsons, Charles O. Ski rope retrieving device. 3,886,888, Cl. 114-235.0WS.
- Pasternak, Stephen F., to Peerless of America, Incorporated. Method of making a finned heat exchanger. 3,886,639, Cl. 29-157.30A.
- Pastrick, Benjamin George, to International Business Machines Corporation. Card holder. 3,887,055, Cl. 197-135.00R.
- Patrick, James G., to Bechtel International Corporation. Apparatus and method for cutting and breaking rock. 3,887,236, Cl. 299-10.000.
- Patrikeev, Veniamin Vasilievich; Malkina, Anna Davydovna; and Kartsivadze, Amiran Ilich. Method of crystallization of water in supercooled clouds and fogs and reagent useful in said method. 3,887,580, Cl. 252-319.000.
- Patzelt, Helmut: *See*—
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- Paul, Howard C.; and Tuzson, John J., to Borg-Warner Corporation. Engine torque sensor device. 3,886,817, Cl. 74-861.000.
- Pauley, Reginald W., to Ingersoll-Rand Company. Power wrench with rotatively mounted motor. 3,886,822, Cl. 81-52.40R.
- Paulus, Jean; and Bourg, Christian Pierre, to C. P. Bourg. Sheet collator. 3,887,176, Cl. 270-58.000.
- Pavia, Rafael Saurina. Article of footwear. 3,886,674, Cl. 36-38.000.
- Pazderka, Cyril: *See*—
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- Pearce, Denis N., to Illinois Tool Works Limited. Trickle irrigation emitter. 3,887,139, Cl. 239-542.000.
- Pearce, Ronald A.; and Herrmann, Thomas R., to Coors Container Company. Method of making a press tab container end from a metallic shell. 3,886,881, Cl. 113-121.00C.
- Pecota, Walter, to Wagner Electric Corporation. No-relight cigar lighter socket. 3,887,789, Cl. 219-265.000.
- Peel, Mervyn Evan: *See*—
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- Pelabon, Andre E., to ANF Frangeco S.A. Gas turbine and electric drive locomotive. 3,886,870, Cl. 105-61.500.
- Pelsue, Thurman A. Air dryer jacket for underground electrical cables. 3,886,669, Cl. 34-107.000.
- Pennington, Donald W.; and Enos, James H., to Dow Chemical Company, The. Process for making low profile molding compounds. 3,887,515, Cl. 260-40.00R.
- Pennington, James R.: *See*—
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- Peover, Cyril: *See*—
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- Perrella, Donald J.; and Dolfini, Joseph E., to E. R. Squibb & Sons, Inc. Polyisocyanate and polyisothiocyanate derivatives of 6-aminopenicillanic acid. 3,887,542, Cl. 260-239.100.
- Perronnet, Jacques; and Girault, Pierre, to Roussel Uclaf. Fungicidal carbamaldoximes. 3,887,711, Cl. 424-300.000.
- Perrotin, Guy; and Anselmini, Jean-Pierre, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des procedes Georges Claude. Processes for the production of nitrogen and oxygen. 3,886,758, Cl. 62-30.000.
- Perrotti, Emmanuel J.: *See*—
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- Perry, Gary D., to Eagle-Picher Industries, Inc. Vehicle step assembly. 3,887,216, Cl. 280-163.000.
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- Peters, Philip H., Jr., to Environment/One Corp. Metal base cookware induction heating apparatus having improved control circuit using infra-red temperature sensor. 3,887,781, Cl. 219-10.490.
- Peterson, Richard H. Tremulant and chorus generating system for electrical musical instruments. 3,886,835, Cl. 84-1.240.
- Petitjean, Robert J.: *See*—
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- Pfeiffer, Gottfried; Wellhauser, Robert; and Gehra, Hartmut, to Herta KG Karl Schweisfurth. Process for the extraction of proteins, other nitrogenous substances and lipids from bones. 3,887,717, Cl. 426-264.000.
- Pfiffner, Albert: *See*—
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- Phillips, Malcolm E., Jr., to AMF Incorporated. Apparatus for metering and shaping materials. 3,887,315, Cl. 425-209.000.
- Phillips Petroleum Company: *See*—
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- Pierzchala, Chester E., to Reliable Electric Company. Clamping arrangement and method. 3,887,895, Cl. 339-14.00R.
- Pillet, Jean, to Rhone-Poulenc, S.A. Method for forming a composite object of acrylic resin and silicone elastomer. 3,887,669, Cl. 264-16.000.
- Pinckaers, B. Hubert, to Honeywell Inc. Control system comprising differential amplifier with dual current comparator having two outputs separated by a deadband. 3,887,000, Cl. 165-26.000.
- Pioneer Electronic Corporation: *See*—
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- Pitts, Charles A., to Dow Chemical Company, The. Fluid retainer setting tool. 3,887,006, Cl. 166-124.000.
- Plantevin, Bruno; and Touchard, Jacques, to Regie Nationale des Usines Renault. Installation for automatic polishing. 3,886,690, Cl. 51-80.00A.
- Plass, Ludolf, to Metallgesellschaft Aktiengesellschaft. Method of operating a heat exchanger. 3,886,997, Cl. 165-1.000.
- Plastic Forming Company, Inc., The: *See*—
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- Plastics Engineering Company: *See*—
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- Platz, Edward A. Sub-surface root fertilizer and probe. 3,886,874, Cl. 111-7.400.
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- Plentovich, Jack; Winslow, Charles Ellis, Jr.; and Kise, Mearl A., to Virginia Chemicals Inc. Production of sodium hydrosulfite from formates. 3,887,695, Cl. 423-515.000.
- Plett, Edelbert G., to Control Data Canada, Ltd. Apparatus for determining the gross thrust of a jet engine. 3,886,790, Cl. 73-117.400.
- Plocher, Werner; Ihlingen, Horb; Kuhl, Franz; and Huttermann, Bernhard, to Jurid Werke GmbH; and Maschinenfabrik Lauffer & Butscher. Pressing apparatus. 3,887,317, Cl. 425-257.000.
- Ploeger, Walter, Jr.; and Bishop, John W. H., to Controlled Printout Devices, Inc. Method of making printing ribbon spool. 3,887,727, Cl. 427-177.000.
- Plotkin, Steven R.: *See*—
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- Plowman, Richard E.: *See*—
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- Plumat, Emile; Schottey, Jean; and Toussaint, Francois, to Glaverbel S.A. Glass coloring process. 3,887,348, Cl. 65-30.000.
- Plume, Robert W., to Travel Products, Inc. Convertible seat. 3,887,229, Cl. 297-65.000.
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  - Thurston, Richard P., 3,887,838.
  - Weed, Lucretia J., 3,887,272.
- Polcer, John; and Barratt, Robert O., to Foster Wheeler Corporation. Bayonet tube heat exchanger. 3,887,003, Cl. 165-142.000.
- Politechnika Warszawska: *See*—
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- Polk, Jodie E., to Otis Engineering Corporation. Blow out preventers. 3,887,158, Cl. 251-1.000.
- Pollock, Glenn E.; Henderson, Milton E.; and Donaldson, Ralph W., Jr., to United States of America, National Aeronautics and Space Administration. Gas chromatograph injection system. 3,887,345, Cl. 55-386.000.
- Polss, Perry, to du Pont de Nemours, E. I., and Company. Modified polymers as petroleum additives. 3,887,621, Cl. 260-583.00R.
- Poly-Seal Corporation: *See*—
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  - Adembri, Giorgio; Tedeschi, Piero; Ponticelli, Fabio; and Marini, Maresco, 3,887,578.
- Poos, George Ireland, to McNeil Laboratories, Incorporated. 2-Iminopiperidines. 3,887,569, Cl. 260-293.780.
- Poot, Albert Lucien: *See*—
  - Klein, Alfons; Konig, Anita Von; Poot, Albert Lucien; and Wedemeyer, Karlfried, 3,887,378.
- Pope, John W. Electronic smoking inhibiting device. 3,886,953, Cl. 131-170.00A.
- Population Research Incorporated: *See*—
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- Porraz Jimenez Labora, Mauricio. Aquatic construction module and method of forming thereof. 3,886,751, Cl. 61-3.000.
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  - Ruble, Emerson J., 3,887,128.
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- Porter, Lawrence C., to Upjohn Company, The. Dispensing methods and apparatus. 3,887,110, Cl. 222-16.000.
- Porter, Lawrence C., to Upjohn Company, The. Apparatus for and method of producing continuous foamed plastic bunstock. 3,887,670, Cl. 264-41.000.
- Poschadel, Werner: *See*—
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  - Reese, Walter J., 3,887,347.
  - Thomaswick, Ronald J., 3,887,071.
- Prange, Charles J., to Rockwell International Corporation. Apparatus for inserting cable or the like in conduits. 3,887,163, Cl. 254-134.3FT.
- Pratt, Winthrop B., to Curtiss-Wright Corporation. Rotary mechanism with die-cast trochoidal housing. 3,887,307, Cl. 418-61.00A.
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- Profant, Daniel, to United States of America, Air Force. Non-abradable turbine seal. 3,887,299, Cl. 415-174.000.
- Prokai, Bela; and Kanner, Bernard, to Union Carbide Corporation. Organosilicone polymers. 3,887,500, Cl. 260-2.5AH.
- Prokai, Bela: *See*—
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- Questor Corporation: *See—*
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- Quist, Bernardus B.; and Zuiderwijk, Jacobus J. M., to Shell Oil Company. Dry light-weight cement composition. 3,887,385, Cl. 106-96.000.
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- Rao, V. Durga Nageswar, to Ford Motor Company. Rubbing seal material for ceramic heat exchanger. 3,887,201, Cl. 277-96.00R.
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Schmidt, William: *See—*
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Schmitt, Charles R.: *See—*
Googin, John M.; and Schmitt, Charles R., 3,887,486.

Schneider, Wolfgang; and Minchak, Robert J., to B. F. Goodrich Company, The. Interpolymers of 5,8-dimethyl-1,4,9-decatriene and/or 4,8-dimethyl-1,4,9-decatriene with at least one alphaolefin containing 2 to 6 carbon atoms. 3,887,531, Cl. 260-80.780.

Schnirel, David R.; Zimmerman, William T.; Barsell, Birger E.; and Christensen, Charles M., to United States of America, Navy. Man overboard package. 3,886,612, Cl. 9-14.000.

Schnurr, Robert H.: *See—*
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Schoenrock, Karlheinz W. R.; Richey, Preston; and Rounds, Hugh G., to Amalgamated Sugar Company, The. Process for the decalcification sugar beet juice. 3,887,391, Cl. 127-46.00A.

Scholl, Rolland Dale; Coleman, Donald Frederick; Johnson, Edward Lawrence; and Streight, William Edward, to Caterpillar Tractor Co. Automatic levelling system for earth working blades and the like. 3,887,012, Cl. 172-4.500.

Schonowsky, Hubert: *See—*
Dransch, Gunther; Hartel, Kurt; Horlein, Gerhard; Schonowsky, Hubert; and Studeneer, Adolf, 3,887,576.

Schoonman, Willem, to Lummus Company, The. Air-cooled heat exchanger with after-condenser. 3,887,002, Cl. 165-113.000.

Schottey, Jean: *See—*
Plumat, Emile; Schottey, Jean; and Toussaint, Francois, 3,887,348.

Schottmiller, John C.; Ryan, Francis W.; and Wood, Charles, to Xerox Corporation. Composition. 3,887,368, Cl. 96-1.500.

Schreyer, Gerd; Theissen, Ferdinand; Weiberg, Otto; and Weigert, Wolfgang, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for regenerating noble metal catalyst for the synthesis of hydrogen peroxide according to the anthraquinone process. 3,887,490, Cl. 252-414.000.

Schuchman, Frederick E. Elastic surface exposure wrapper for soap cakes. 3,886,987, Cl. 150-52.000.

Schuil, Roelof Egbert: *See—*
Bathelt, Robert Richard; and Schuil, Roelof Egbert, 3,887,828.

Schuldt, Erich Henry, Jr.: *See—*
Robbins, Ernest Aleck; Sucher, Robert William; Schuldt, Erich Henry, Jr.; Sidoti, Daniel Robert; Seeley, Robert Dudley; and Newell, Jon Albert, 3,887,431.

Schulte-Elte, Karl-Heinrich, to Firmenich S.A. Cyclic unsaturated alcohols. 3,887,625, Cl. 260-617.00R.

Schulze, Reinhold, to Norddeutsche Affinerie. Method of preventing supersaturation of electrolytes with arsenic, antimony and bismuth. 3,887,448, Cl. 204-130.000.

Schummer, Arthur: *See—*
Funck, Alfred; and Schummer, Arthur, 3,887,172.

Schurman, Peter T., to Plastic Forming Company, Inc., The. Method of molding and assembling a hinged plastic container. 3,886,645, Cl. 29-434.000.

Schuster, Nick A., to Schlumberger Limited. Measuring apparatus. 3,887,805, Cl. 250-264.000.

Schwantje, Gerd: *See—*
Elser, Wolfgang; and Schwantje, Gerd, 3,887,591.

Schwarcz, Jose, to S. A. Alba. Copolymerizate of unsaturated polyester, unsaturated monomer and carboxy containing monomer. 3,887,645, Cl. 260-861.000.

Schwartz, Leonard; and Chin, Edward G. H., to Singer Company, The. Phased array scanning antenna. 3,887,926, Cl. 343-816.000.

Schwartz, Robert F.: *See—*
Reed, Robert D.; Zink, John Smith; Schwartz, Robert F.; Glomm, Horst; Corble, John C.; and Koons, Harold F., 3,887,324.

Schwarzenbach, Kurt: *See—*
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Schwieter, Ulrich: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,887,586.

Schwieterman, Roman A., to Armco Steel Corporation. Metallic coating method. 3,887,721, Cl. 427-45.000.

SCM Corporation: *See—*
Gilchrist, Allan E., 3,887,442.
Lohr, Ernest F., 3,887,058.

Scope Incorporated: *See—*
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Scott, Arthur A.: *See—*
Obermaier, Frank E.; and Scott, Arthur A., 3,887,159.

Scott, Paul R.; Chavez, Victor J.; and Kruka, Vitold R., to Shell Oil Company. Core flow nozzle. 3,886,972, Cl. 137-602.000.

Scott Port-A-Fold, Inc.: *See—*
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Scott, Robert H.; and Gaulding, Dan L., to Celanese Corporation. Inhibition of corrosion in sulfuric acid solutions. 3,887,488, Cl. 252-389.00A.

Scovil, Henry Evelyn Derrick: *See—*
Bobeck, Andrew Henry; and Scovil, Henry Evelyn Derrick, 3,887,905.

SDS-Electro GmbH: *See—*
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Seary, Eugene G. Injection molding apparatus. 3,887,312, Cl. 425-3.000.

Sedlacek, Hugo: *See—*
Busch, Johannes; Roser, Herbert; and Sedlacek, Hugo, 3,886,613.

Seebach, Dieter; and Leitz, Herbert, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of 2-phenyl-3-nitrobutyric acid compounds. 3,887,617, Cl. 260-559.00R.

Seelbach, Bernard H., to K. C. Seelbach Co. Inc. Method and apparatus for processing foodstuffs. 3,887,716, Cl. 426-231.000.

Seeley, Dunham Briggs: *See—*
Colegrove, James Anthony; and Seeley, Dunham Briggs, 3,886,898.

Seeley, Robert Dudley: *See—*
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Seibel, Richard Roy; and Rhea, Robert, to Seibel & Seibel Enterprises. Condensation free mirror. 3,887,788, Cl. 219-219.000.

Seibel & Seibel Enterprises: *See—*
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Seid, Eugene: *See—*
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Seiger, Harvey N., to Textron Inc. Method for producing electrical energy with consumable aluminum anode. 3,887,399, Cl. 136-86.00A.

Seitz-Werke G.m.b.H.: *See—*
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Sellers, Jerry W., to Rockwell International Corporation. Electrically powered grass trimmer. 3,886,716, Cl. 56-17.400.

Selman, Charles M., to Phillips Petroleum Company. Diene-lactam block copolymers. 3,887,643, Cl. 260-857.00D.

Selmek, Emil C., to Ford Motor Company. Universal joint. 3,886,766, Cl. 64-17.00R.

Senfe, Heinz; Bergmann, Artur; Dam, Gerhard; and Menzel, Dieter, to Metallgesellschaft Aktiengesellschaft. Process for producing a filler for drilling mud. 3,887,474, Cl. 252-8.50B.

Serre, Hubert; and Rey, Jean, to Pierre Fabre S.A. Medicaments intended for the prevention and treatment of capillary-venous deficiencies. 3,887,705, Cl. 424-180.000.

Seymour, Errol V.: *See—*
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Shah, Hasmukhlal M.: *See—*
Parker, Konrad; and Shah, Hasmukhlal M., 3,887,732.

Shannon, John Martin; and Ralph, John Ernest, to U.S. Philips Corporation. Radiation sensitive solid state devices. 3,887,936, Cl. 357-30.000.

Sharp, Christopher John: *See—*
Crisp, Harold Alfred; Oughton, John Francis; Sharp, Christopher John; and Wilkinson, Peter Alfred, 3,887,551.

Sharpe, Claude A., to Bendix Corporation, The. Freeze circuit for aircraft radio navigation systems. 3,887,872, Cl. 325-21.000.

Shattuck, Meredith David: *See—*
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Shavel, John, Jr.: *See—*
Von Strandtmann, Maximilian; Shavel, John, Jr.; Klutchko, Sylvester; and Cohen, Marvin, 3,887,584.

Shaver, Henry W.; Schmidt, William; and Winicov, Murray W., to West Laboratories, Inc. Synergized carbamate insecticide. 3,887,710, Cl. 424-300.000.

Shearer, Harry D.; and Dalabakis, Eli J., to NCR Corporation. Digital signal leveling device. 3,887,875, Cl. 328-168.000.

Sheasby, Peter Geoffrey; and Smith, Alan Martin, to Alcan Research and Development Limited. Process of electrograining aluminium. 3,887,447, Cl. 204-129.400.

Sheckells, Amuel E., to International Steel Company. Revolving door hanger assembly. 3,886,684, Cl. 49-44.000.

Sheckells, Amuel E., to International Steel Company. Gearing with centrifugal brake for revolving door. 3,887,050, Cl. 192-4.00R.

Shelden, Charles Hunter, to Huntington Institute of Applied Medical Research. Hospital bed. 3,886,610, Cl. 5-81.00R.

Sheldon, Robert S., to Air-Dry Corp. High pressure dew and frost point indicator. 3,886,784, Cl. 73-17.00A.

Shell Oil Company: *See—*
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Shepler, Terry H.: *See—*
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Sherfey, Joseph M., to United States of America, General Counsel-Code GP. Process for making sheets with parallel pores of uniform size. 3,887,365, Cl. 75-214.000.

Sheridan, David C.: *See—*
Amann, Charles A.; and Sheridan, David C., 3,886,729.

Sherwin-Williams Company, The: *See—*
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Shiba, Keisuke; Hinata, Masanao; Ohi, Reiichi; Sato, Arkira; Yamasue, Koutarou; and Kondo, Tokiharu, deceased (by Kondo, Yoshiharu, legal representative), to Fuji Photo Film Co., Ltd. Direct positive silver halide photographic emulsion. 3,887,380, Cl. 96-126.000.

Shiba, Keisuke; and Tsubota, Hotohiko, to Fuji Photo Film Co., Ltd. Spectral sensitization of photographic light-sensitive emulsion. 3,887,381, Cl. 96-127.000.

Shields, James E.; and Smithwick, Edward L., Jr., to Eli Lilly and Company. Process for selectively cleaving carboxyl protecting groups from multi-carboxyl peptides or amino acids and compounds useful therein. 3,887,538, Cl. 260-112.500.

Shigemori, Youjiro: *See—*
Sato, Yukio; Shigemori, Youjiro; Mitumori, Yoshio; and Suzuki, Tadashi, 3,887,914.

Shigeyasu, Motoo; and Kuihara, Kenzo, to Maruzen Oil Co., Ltd.; and Matsuyama Petrochemicals Inc. Process for preparing high purity terephthalic acid. 3,887,612, Cl. 260-524.00R.

Shim, Kyung S., to Stauffer Chemical Company. Phosphoramidate esters of dibromoneopentylglycol. 3,887,655, Cl. 260-937.000.

Shim, Kyung S., to Stauffer Chemical Company. Vinyl phosphonate esters and method for their preparation. 3,887,656, Cl. 260-937.000.

Shimadzu Seisakusho Ltd.: *See—*
Kurita, Takashi; Yamamoto, Hiroshi; and Makabe, Hideki, 3,887,281.

Shimaro Industrial Co., Ltd.: *See—*
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Shimizu, Masanao: *See—*
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Shimosaka, Yukio; Ozaki, Masahiko; and Negi, Jiro, to Japan Exlan Company Limited. Process for refining aqueous solution of thiocyanate containing impurities. 3,887,688, Cl. 423-366.000.

Shin-Etsu Handotai Co., Ltd.: *See—*
Abe, Yasuhiko; and Yamaguchi, Hisayoshi, 3,887,683.

Shin-Shirasuna Electric Corporation: *See—*
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Shinko Denshi Kabushiki Kaisha: *See—*
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Shira, Michael L.; and Henderson, Robert H., to United States of America, Energy Research and Development Administration. Time delay vent valve. 3,886,969, Cl. 137-509.000.

Shiroki, Masami: *See—*
Nakanishi, Michio; Shiroki, Masami; Tahara, Tetsuya; and Araki, Kazuhiko, 3,887,543.

Shiseido Co., Ltd.: *See—*
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Showa Denko Kabushiki Kaisha: *See—*
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Robbins, Ernest Aleck; Sucher, Robert William; Schuldt, Erich Henry, Jr.; Sidoti, Daniel Robert; Seeley, Robert Dudley; and Newell, Jon Albert, 3,887,431.

Siegal, Burton L.: *See—*
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Sien Equipment Company: *See—*
Sien, Gerald Bruce, 3,886,738.

Sien, Gerald Bruce, to Sien Equipment Company. Diesel engine for use in mines. 3,886,738, Cl. 60-277.000.

Sigmatex AG Basel: *See—*
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Sih, Charles J., to Wisconsin Alumni Research Foundation. Process for preparing dl-strigol. 3,887,547, Cl. 260-240.00R.

Simon, Ernst-Ulrich; and Ullrich, Horst, to VDO Adolf Schindling AG. Brake lining thickness monitoring device. 3,887,040, Cl. 188-1.00A.

Simon, Joseph A. Process for cold forming a metal tube with an inwardly thickened end. 3,886,649, Cl. 228-112.000.

Sinclair, Harold: *See—*
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Singer Company, The: *See—*
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Singleton, Thomas C.: *See—*
Fannin, Loyd W.; Phillips, Victor D., Jr.; and Singleton, Thomas C., 3,887,489.

Singman, David, to United States of America, Army. Prevention of deterioration of lead dioxide. 3,887,398, Cl. 136-26.000.

Sintokogio Ltd.: *See—*

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Sioux Steam Cleaner Corporation: *See—*

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Sizer, Phillip S.; and Grimmer, George G., to Otis Engineering Corporation. Well flow control method. 3,887,010, Cl. 166-314.000.

Skaggs, Frank Lee, to Texas Instruments Incorporated. Photonmultiplier imaging system. 3,887,810, Cl. 250-333.000.

Skau, John E. Container box closure. 3,887,124, Cl. 229-7.0SC.

SKF Industrial Trading & Development Company: *See—*

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SKF Industrial Trading and Development Company B.V.: *See—*

Sundqvist, Yngve Bertil, 3,887,199.

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Smashey, Russell W.; and Wukusick, Carl S., to General Electric Company. Nickel-base superalloy cast article. 3,887,363, Cl. 75-171.000.

Smith, Alan Martin: *See—*

Sheasby, Peter Geoffrey; and Smith, Alan Martin, 3,887,447.

Smith, David C., to United Aircraft Corporation. Electric discharge laser with electromagnetic radiation induced conductivity enhancement of the gain medium. 3,887,882, Cl. 331-94.50P.

Smith, Edwin W. Electronic status and control board. 3,887,913, Cl. 340-381.000.

Smith, Gordon F., to Helistrand, Inc. Double locking security apparatus. 3,886,770, Cl. 70-18.000.

Smith, Graham C.: *See—*

Kirby, Peter; Isaac, Eirlys R.; and Smith, Graham C., 3,887,472.

Smith, Matthew S.; and Filippi, Ernest A. Rocket powered round. 3,886,841, Cl. 89-1.00F.

Smith, Randall E. Self-cleaning filter. 3,887,344, Cl. 55-294.000.

Smith, William E.: *See—*

Trousdale, Robert B.; Seid, Eugene; and Smith, William E., 3,887,796.

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SmithKline Corporation: *See—*

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Societe Anonyme Automobiles Citroen: *See—*

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Societe Anonyne dite: L'Oreal: *See—*

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Societe d'Exploitation des Brevets Neiman: *See—*

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Societe Franco-Hispano-Americaine (FRANCISPAM: *See—*

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Societe Generale de Brevets Industriels et Chimiques: *See—*

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Solomon, Paul. Disposable pattern, composition for investment casting. 3,887,382, Cl. 106-38.800.

Solvay & Cie: *See—*

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Sommeria, Marcel R., to Hyper-Loop, Inc. Press feeder control apparatus. 3,887,122, Cl. 226-136.000.

Song, John, to American Cyanamid Company. Hindered tris (metahydroxybenzylthio)-s-triazine antioxidants. 3,887,516, Cl. 260-45.80N.

Sony Corporation: *See—*

Fueki, Shimetomo; Abe, Kazumasa; and Osawa, Kenji, 3,887,444.

Nakayama, Akira; Miyaoka, Senri; and Ohkoshi, Akio, 3,887,837.

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Spacelabs, Inc.: *See—*

Ukkestad, Donald C.; Hancock, Donald C.; and Valiquette, Donley J., 3,886,950.

Spanel, Abram N. Telephone adapter. 3,887,771, Cl. 179-1.00C.

Sparso, Viggo, to Andersen, Hans Christian. Apparatus for the closing of the toe of a circularly knit stocking. 3,886,876, Cl. 112-27.000.

Special Metals Corporation: *See—*

Clark, Irvin Dwight, 3,887,667.

Spector, George: *See—*

Behring, Harry L.; and Spector, George, 3,886,677.

Speer, Lawrence, to Vinyltron Corporation. Method for repairing plastic materials. 3,887,413, Cl. 156-94.000.

Spenadel, Lawrence: *See—*

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Spencer, Gordon R., to Raytheon Company. Cathode ray tube with magnetic beam alignment means. 3,887,830, Cl. 313-443.000.

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Sperry Rand Australia Limited: *See—*

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Sperry Rand Corporation: *See—*

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Moore, Harry Winthrop, III, 3,887,901.

Spiller, Eberhard A., to International Business Machines Corporation. Low-loss reflection coatings using absorbing materials. 3,887,261, Cl. 350-1.000.

Spooner, Edward. Swimming pool equipment carrying case. 3,887,103, Cl. 220-20.000.

Sprague, Mary. Neckband applicator. 3,886,935, Cl. 128-57.000.

Spratt, Brendan J.; and Lunsden, James C., to Bendix Corporation, The. Adaptive rate limiter. 3,887,921, Cl. 343-106.00R.

Stabley, Bernard D.: *See—*

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Stadler, Henry L.; Tien, Tseng-ying; Esper, Michael J.; and Romine, Donald J., to Ford Motor Company. Gas sensor and method of manufacture. 3,886,785, Cl. 73-23.000.

Stahl, Horst; Vorbach, Guenther; Brunnthaler, Erich; Hezel, Wolfgang; and Flath, Wolfgang, to Siemens Aktiengesellschaft. Housing for electrically operated typewriters and similar machines. 3,887,057, Cl. 197-186.00B.

Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Hoefke, Wolfgang, to Boehringer Ingelheim GmbH. 5-Oxo-2,3-dihydroimidazo(1,2-a)-s-triazines. 3,887,552, Cl. 260-249.500.

Stahnecker, Erhard; Ruppert, Georg; Moeller, Rolf; Schick, Rupert; and Zuern, Ludwig, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of saddle-shaped discs from expandable styrene polymers. 3,887,672, Cl. 264-51.000.

Stance Industries Inc.: *See—*

Natman, Solomon; and Cohen, Robert A., 3,886,619.

Standun, Inc.: *See—*

Paramonoff, Elpidifor; and Main, Ralph M., 3,886,781.

Stanev, Tzvyatko Penchev, to DSO "Bulgarski Darjavni Jeleznitzi". Railway vehicle-load measuring method and device. 3,887,022, Cl. 177-146.000.

Stanley, Carlyle Eugene. Golf practice device. 3,887,193, Cl. 273-186.00R.

Stanwood, David A., to Baker Hydro, Inc. Wave quenching device. 3,886,602, Cl. 4-172.000.

Star Seimitsu Kabushiki Kaisha (Star Mfg. Co., Ltd.): *See—*

Sato, Yukio; Shigemori, Youjiro; Mitumori, Yoshio; and Suzuki, Tadashi, 3,887,914.

Stark, Donald R.; and Hirsch, Irving A., to Boeing Company, The. Control system for hydrofoil. 3,886,884, Cl. 114-66.50H.

Staub, Fred W.; and Kosky, Philip G., to General Electric Company. Evaporative cooling system employing liquid film evaporation from grooved evaporator surface and vapor push pump for circulating liquid. 3,887,759, Cl. 174-15.00R.

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Shim, Kyung S., 3,887,656.

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Sterff, Wilhelm, to Matsushita Electric Works, Ltd.; and SDS-Electro GmbH. Delay circuit for a relay. 3,887,850, Cl. 317-141.00S.

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Stipcevich, John M. Power transmission substation arrangement. 3,887,821, Cl. 307-112.000.

Stockhaus, Klaus: *See—*

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Stoepel, Kurt: *See—*

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Stone, Edward; Zamer, Joseph; Guagliardo. Matthew; and Wieland, Kenneth F., to Inmont Corporation. Laminates having a polyurethane adhesive. 3,887,757, Cl. 428-425.000.

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Stotlar, Suzanne C., to Kewanee Oil Company. Transmitting power meter for measurement of radiation. 3,887.471, Cl. 250-338.000.

Stott, Reginald W. Glass washing machine. 3,886,959, Cl. 134-134.000.

Straarup, Orla; and Helmich, Paul Otto Gunther, to Aktieselskabet Nro Atomizer. Atomizer wheel for the atomization of slurries. 3,887,133, Cl. 239-224.000.

Strange, John, to Firth Cleveland Fastenings Ltd. Self-threading nut. 3,886,989, Cl. 151-7.000.

Strehlke, Gunter; Franz, Wilhelm; and Osterburg, Gunter, to Deutsche Texaco Aktiengesellschaft. Process for the production of higher alkylacrylates and methacrylates. 3,887,609, Cl. 260-486.00R.

Streight, William Edward: *See—*

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Stumpf, Joseph G.; and Andera, Joseph F., to Frigitronics of Conn., Inc. Cryosurgical apparatus. 3,886,945, Cl. 128-303.100.

Sturhahn, Hans, to Feldmuhle Anlagen- und Produktions- Gesellschaft mit beschrankter Haftung. Shaped zirconium oxide bodies of high strength. 3,887,387, Cl. 106-57.000.

Styhr, Karsten H.; Ezis, Andre; and Goodyear, Michael U., to Ford Motor Company. Method of making a triple density silicon nitride article. 3,887,412, Cl. 156-89.000.

Styhr, Karsten H.: *See—*

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Sundqvist, Yngve Bertil, to SKF Industrial Trading and Development Company B.V. Pressure medium operated frictionless seal assembly. 3,887,199, Cl. 277-74.000.

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Sutter, Hanspeter, to Luwa AG. Method of and apparatus for automatic cleaning of an air filter. 3,887,341, Cl. 55-96.000.

Sutton, Blaine M.; Walz, Donald T.; and Weinstock, Joseph, to SmithKline Corporation. Anti-arthritic compositions comprising an S-phosphine or phosphite gold thio-cyanate and methods of producing anti-arthritic activity. 3,887,707, Cl. 424-210.000.

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Swedenberg, Clyde J.; Fain, Charles C.; and Rutledge, William W. Method and composition for applying a covering to a wall or like substrate. 3,887,748, Cl. 428-247.000.

Sweeney, William A.; and House, Ralph, to Chevron Research Company. Process for converting alkyl sultones to alkene sulfonic acids. 3,887,611, Cl. 260-513.00R.

Swigert, David L., to Environmental Metrology Corp. Toxic gas indicator. 3,887,908, Cl. 340-237.00R.

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Tajnafoi, Jozsef; Gellert, Karoly; Hidasi, Karoly; Gribovszki; and Vekony, Sandor, to Nehezipari Muszaki Egyetem. Grinding machine for machining polygonal workpieces. 3,886,693, Cl. 51-105.0EC.

Takagi, Toshiaki, to Yoshiaki Takagi. Method for making slideless fastener. 3,887,675, Cl. 264-156.000.

Takahashi, Akira; Kojima, Hiroo; Ogawa, Masao; Osuka, Hiroshi; and Kobayashi, Shoichi, to Showa Denko Kabushiki Kaisha. Method of producing polymer compositions based on chlorinated polyethylene. 3,887,648, Cl. 260-878.00R.

Takahashi, Koichi; and Abe, Eiichi, to Nissan Motor Company Limited. Motor vehicle drive lines. 3,887,024, Cl. 180-70.00P.

Takahashi, Susumu, to Sansui Electric Co., Ltd. Decoder apparatus adapted for different 4-channel matrix systems. 3,887,770, Cl. 179-1.0GQ.

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Takeuchi, Shigeo. Apparatus for applying wax to the side surfaces of vehicles. 3,886,893, Cl. 118-2.000.

Takida, Hiroshi; and Akamatu, Yoshimi, to Nippon Gohsei Kagaku Kogyo Kabushiki. Moldings made of hydrolyzed ethylene-vinyl acetate copolymer. 3,887,649, Cl. 260-873.000.

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Takubo, Hachiroh; Sudoh, Kengo; and Kerman, Stephen, to Nippon Tsu Shin Kogyo K.K.; and TIE/Communications, Inc. Transistor switching circuit for use in a telephone system. 3,887,774, Cl. 179-99.000.

Talbot, John M. Automatic header height control system for combines and the like. 3,886,718, Cl. 56-208.000.

Tamai, Shigetake. Gas-atomizing nozzle by spirally rotating gas stream. 3,887,135, Cl. 239-406.000.

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Tanaka, Ichiro. Method for mechanically cutting flanges from preshaped steel construction members. 3,886,825, Cl. 83-13.000.

Tang, Arthur Y. C., to General Diode Corporation. Material treatment method. 3,887,392, Cl. 134-1.000.

Tantlinger. Keith W., to Rohr Industries Inc. Thrust responsive pinch wheel drive mechanism. 3,886,869, Cl. 104-147.00R.

Tao, Eddie Vi Ping, to Eli Lilly and Company. Preparation of 2-amino-5-alkyl-1,3,4-thiadiazoles. 3,887,572, Cl. 260-306.80D.

Taplin, Lael B., to Bendix Corporation, The. Passive adaptive engine control system for improved vehicle driveability. 3,886,915, Cl. 123-102.000.

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Taylor, Charles F., to Borg-Warner Corporation. Shaft connecting apparatus. 3,887,290, Cl. 403-370.000.

Taylor, Harold M.; Davenport, James D.; and Hackler, Ronald E., to Eli Lilly and Company. Alpha, alpha-disubstituted-5-pyrimidinemethanes used as fungicides. 3,887,708. Cl. 424-251.000.

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Thomas, Walter W. Retractable step for vehicles. 3,887,217, Cl. 280-166.000.

Thomaswick, Ronald J., to PPG Industries, Inc. Article transporting rack. 3,887,071, Cl. 206-454.000.

Thompson, Charles H.; and Jones, Fred W., to United States of America, Energy Research and Development Administration. Apparatus for measuring tool path accuracy. 3,886,666, Cl. 33-174.00P.

Thompson, David A.: *See—*
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Thompson, Earl Clayton. Watering valve for animals. 3,887,165, Cl. 251-339.000.

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Thompson, William S., III, to Texas Instruments Incorporated. High resolution wide field scan system. 3,887,263, Cl. 350-7.000.

Thornburg, Russell B.; and Jones, Klemme M., to Global Marine Inc. Mooring apparatus for ice-breaking drill ship. 3,886,882, Cl. 114-40.000.

Thornton, Henry M., Jr.; and Plowman, Richard E., to Dentsply Research & Development Corp. Control unit for dental equipment. 3,886,660, Cl. 32-22.000.

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Tice, Billy Harold, to Polaris Industrial Enterprises. Rotary potentiometer. 3,887,891, Cl. 338-145.000.

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Uhlig, Klaus, to Brown Boveri-Sulzer Turbomaschinen Aktiengesellschaft. Shutoff apparatus. 3,886,964, Cl. 137-340.000.

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- Uno, Takeshi; Yoda, Haruo; Ejiri, Masakazu; Mese, Michihiro; and Ikeda, Sadahiro, to Hitachi, Ltd. Inspection equipment for detecting and extracting small portion included in pattern. 3,887,762, Cl. 178-6.000.
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- Verjux, Jean, to Usines Decoufle. Cigarette setting device. 3,887,065, Cl. 198-280.000.
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- Vosteen, Robert E. Feedback electrostatic voltmeter. 3,887,877, Cl. 330-10.000.
- Vrooman, Richard Arnold. Rotary, multi-chambered, internal combustion engine. 3,886,910, Cl. 123-8.450.
- Vyas, Girish N.; and Shulman, Nahum Raphael, to United States of America, Health, Education & Welfare. Hemagglutination method for australia antigen and antibody thereto. 3,887,697, Cl. 424-12.000.
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- Walker, Ralph E.: *See—*
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- Walls, Leroy C., to Lewals, Inc. Disc advancing and processing apparatus. 3,886,892, Cl. 118-2.000.
- Walsh, William J.; Chilenskas, Albert A.; Cairns, Elton J.; and Nelson, Paul A., to United States of America, Energy Research and Development Administration. Modular electrochemical cell. 3,887,396, Cl. 136-6.00L.
- Walter, Manfred, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft; and Soda-Fabrik Aktiengesellschaft. Particulate expandable styrene polymers having desirable processing properties. 3,887,754, Cl. 428-407.000.
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  - Hoppesch, Joseph P.; Ward, Donald H.; and Tomashek, James R., 3,886,929.
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- Waxman, Jay S.; and Siegal, Burton L., to G. D. Searle & Co. Housing for the controlled exposure of film cassette. 3,886,640, Cl. 29-200.00P.
- Webb, George, to Avco Corporation. Spinning bomblet fuze. 3,886,868, Cl. 102-79.000.
- Weber, Bernard R.: *See—*
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- Weber, Robert L., to Caterpillar Tractor Co. Engine valve lifter guide. 3,886,808, Cl. 74-569.000.
- Weber, Roland E.; and Zimmermann, Carl J., to Industrial Pollution Control Corp. Waste removal system. 3,887,470, Cl. 210-261.000.
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- Wehrmeister, Herbert L.; Johnston, David B. R.; and Windholz, Thomas B., to Commercial Solvents Corp., by said Herbert L. Wehrmeister; and Merck & Co., Inc., by said David B. R. Johnston and Thomas B. Windholz. Products and process. 3,887,583, Cl. 260-343.20F.
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- Welchek, Michael John, to United Aircraft Corporation. Variable leading edge stator vane assembly. 3,887,297, Cl. 415-161.000.

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Appel, Arthur, and A. J. Stein. Process for the interactive design of polyhedra. T935,004, 6–3–75, Cl. 444—1.

Baker, Melvin C. Method for treating polyglycol-water emulsions to remove solids. T935,006, 6–3–75, Cl. 210—45.

Bennett, Brian T., and A. C. McKellar. Process for the sequential recovery of the records of a file. T935,005, 6–3–75, Cl. 340—172.5.

Chapman, Aurelius F. Soft adhesive for two-adhesive polyester bags. T935,001, 6–3–75, Cl. 229—53.

Linville, Thomas P., E. Schischa, and G. R. Thompson. Process for selecting circuits with optimum power and area requirements. T935,003, 6–3–75, Cl. 444—1.

McKellar, Archie C.: *See*—
Bennett, Brian T., and McKellar. T935,005.

Schischa, Erwin: *See*—
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Seiber, Joseph. Liquefied natural gas oxygen separation water desalination and electrical generation system. T935,002, 6–3–75, Cl. 203—10.

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LIST OF REISSUE PATENTEES

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Shepherd, Charles J., to Container Corp. of America. Heavy duty container. Re. 28,439, 6–3–75, Cl. 229—23.

Vitter, Albert L., Jr., and H. G. McDonald, to Chevron Research Co. Method of determining downhole occurrences in well drilling using rotary torque oscillation measurements. Re. 28,436, 6–3–75, Cl. 73—151.

Williams, Edwin B.: *See*—
Mowry, James B., Dayton, Hough, Bailey, Williams, Janick, Shay, and Emerson. Re. 28,435.

Wolf, Robert L., to Mount Sinai School of Medicine of the City-University of New York. Radioimmunossay of angiotensin and renin activity. Re. 28,442, 6–3–75, Cl. 424—1.

LIST OF PLANT PATENTEES

Jackson & Perkins Co.: *See*—
Kordes, Reimer. 3,724.
Kuramoto, Hideharu H. 3,725.
Kordes, Reimer. 3,726.

Kordes, Reimer, to Jackson & Perkins Co. Rose plant. 3.724, 6–3–75, Cl. 28.

Kordes, Reimer, to Jackson & Perkins Co. Rose plant. 3,726, 6–3–75 Cl. 15.

Kuramoto, Hideharu H., to Jackson & Perkins Co. Rose. 3,725, 6–3–75, Cl. 22.

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May, Joseph R., and Morgan. 235,252.

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American Seating Co.: *See*—
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Blodee, Leif. 235,237.

Armbruster, John T., to American Optical Corp. Ophthalmic stand. 235,274, 6–3–75, Cl. D57—1.

Asbury, Dennis G., to House of Steel. Vehicle grille guard. 235,251, 6–3–75, Cl. D12—169.

Austin, Bridget, to Fort Howard Paper Co. Paper toweling. 235,275, 6–3–75, Cl. D59—2.

Baugh, Benjamin C.: *See*—
Lundblade, Eugene D., Madison, Thornton, Baugh, and Worley. 235,281.

Bennett, David, to The Modern Box Corp. Hat box. 235,248, 6–3–75, Cl. D9—240.

Bessinger, Wayne K. Picture frame. 235,240, 6–3–75, Cl. D6—239.

Blodee, Leif, to American Seating Co. Lounge chair. 235,235, 6–3–75, Cl. D6—38.

Blodee, Leif, to American Seating Co. Lounge chair with low back. 235,237, 6–3–75, Cl. D6—67.

Borak, Paul A. Scratching post for cats. 235,270, 6–3–75, Cl. D30—42.

Boyd, Leslie G., ½ interest to Daniel B. Jackson. Fire starter nozzle. 235,273, 6–3–75, Cl. D23—90.1.

Braginetz, Paul A., to Philip Morris Inc. Razor blade dispenser. 235,247, 6–3–75, Cl. D9—224.

Braverman, Melvin, to A & M Leatherlines, Inc. Display stand or similar article. 235,238, 6–3–75, Cl. D6—85.

Cartwright, Earl H. Clothes drying rack. 235,239, 6–3–75, Cl. D6—181.

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Daiwa Seiko Inc.: *See*—
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Danner, Eugene G. Water conditioner retainer for an aquarium. 235,260, 6–3–75, Cl. D23—3.

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Dart, William A., and L. T. Uridge, to Dart Container Corp. Soup spoon. 235,242, 6–3–75, Cl. D7—138.

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Ethyl Development Corp.: *See*—
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Evans, David E., Jr., and J. W. Murray, to The Columbus Dental Mfg. Co. (Ohio Corp.). Packaging container. 235,246, 6–3–75, Cl. D9—222.

Fort Howard Paper Co.: *See*
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GAF Corp.: *See*—
Dodson, Ronald K., and McCauley. 235,276.

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Johnson, Jerry. Ottoman. 235,234, 6–3–75, Cl. D6—36.

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L & L Machine Division, Modern Globe, Inc.: *See*—
Rosenquist, Ernest E. 235,277.

Langston, Charles R., Jr., to Coats & Clark, Inc. Yarn cone. 235,282, 6–3–75. Cl. D92—15.

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Madison, George B., E. D. Lundblade, L. S. Thornton, B. C. Baugh, and L. D. Worley, to Coleman Co., Inc. Tent. 235,281, 6–3–75. Cl. D88—3.

Matrone, John L.: *See*—
Peters, Philip H., Jr., and Matrone. 235,241.

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May, Joseph R., and D. F. Morgan, to Amerace Corp. Wheel center. 235,253, 6–3–75, Cl. D12—211.

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McNine, Francis R. Match dispenser with shelf. 235,268, 6–3–75, Cl. D27—32.

Michener, Howard P. Combined extension cord and safety socket therefor. 235,265, 6–3–75, Cl. D26—1.

Mittelman, Alan J., and W. H. Phillips. Vehicle bumper panel. 235,250, 6–3–75, Cl. D12—169.

Modern Box Corp., The: *See*—
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Murphy, James V. Panel board for integrated circuit packages. 235,264, 6–3–75, Cl. D26—1.

Murray, James W.: *See*—
Evans, David E., Jr., and Murray. 235,246.

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Oden, William A., to Domain Industries, Inc. Support unit for above-ground swimming pools or the like. 235,256, 6–3–75, Cl. D13—1.

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Rain Bird Sprinkler Mfg. Corp.: *See*—
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Rosenquist, Ernest E., to L & L Machine Division, Modern Globe, Inc. High frequency press for glueing sections of wood to produce panels, frames and other types of glued wood structures. 235,277, 6–3–75, Cl. D63—1.

Schuman, Seymour, and A. W. Kelson, to Propper Mfg. Co. Inc. Sterlizer control indicator. 235,279, 6–3–75, Cl. D83—1.

Seymour, Merritt W., to Owens-Corning Fiberglass Corp. Shower stall. 235,262, 6–3–75, Cl. D23—57.

Stoppacher, Waldermar, to Interoptic Laboratories, Inc. Abrasive pad for grinding lenses. 235,244, 6–3–75, Cl. D8—90.

Sugimoto, Tatsuo, to Daiwa Seiko Inc. Fishing reel. 235,258, 6–3–75, Cl. D22—25.

Thornton, Larry S.: *See*—
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Wichman, William J., and D. L. Hart, to Rain Bird Sprinkler Mfg. Corp. Color coded nozzle. 235,261, 6–3–75, Cl. D23—34.

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CLASSIFICATION OF PATENTS

ISSUED JUNE 3, 1975

NOTE.—First number, class; second number, subclass; third number, patent number

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334 3,887,422
402 3,887,423
435 3,887,424
CLASS 159
48L 3,887,425
CLASS 160
374.1 3,886,990
CLASS 162
29 3,887,426
158 3,887,427
216 3,887,428
261 3,887,429
CLASS 164
4 3,886,991
56 3,886,992
211 3,886,993
250 3,886,994
260 3,886,995
283M 3,886,996
CLASS 165
1 3,886,997
2 3,886,998
26 3,887,000
81 3,887,001
113 3,887,002
142 3,887,003
179 3,887,004

CLASS 166
72 3,887,005
124 3,887,006
224A 3,887,007
267 3,887,008
292 3,887,009
314 3,887,010
CLASS 169
69 3,887,011
CLASS 172
4.5 3,887,012
20 3,887,013
54 3,887,014
254 3,887,015
311 3,887,016
CLASS 173
46 3,887,017
120 3,887,018
134 3,887,019
159 3,886,999
CLASS 174
15R 3,887,759
68.5 3,887,760
110R 3,887,761
CLASS 175
206 3,887,020
422 3,887,021
CLASS 177
146 3,887,022
CLASS 178
6 3,887,762
3,887,763
6.8 3,887,764
7.6 3,887,765
7.82 3,887,766
18 3,887,767
67 3,887,768
69.5R 3,887,769
CLASS 179
1GQ 3,887,770
1C 3,887,771
1.5M 3,887,772
6R 3,887,773
99 3,887,774
175.3R 3,887,775
CLASS 180
5R 3,887,023
70P 3,887,024
73TL 3,887,025
79.2R 3,887,028
79.2 3,887,026
3,887,027
114 3,887,029
121 3,887,030
CLASS 181
33G 3,887,031
59 3,887,032
CLASS 182
78 3,887,033
129 3,887,034
186 3,887,035
CLASS 184
6.12 3,887,037
6.16 3,887,036
CLASS 187
27 3,887,038
29R 3,887,039
CLASS 188
1A 3,887,040
71.5 3,887,041
71.8 3,887,042
73.1 3,887,043
73.3 3,887,045
73.5 3,887,044
181A 3,887,046
196R 3,887,047
CLASS 191
1A 3,887,776
CLASS 192
3.28 3,887,048
4A 3,887,049
4R 3,887,050
85AA 3,887,051
127 3,887,052
CLASS 193
34 3,887,053
CLASS 194
92 3,887,054
CLASS 195
1.7 3,887,430
5 3,887,431
36P 3,887,432
65 3,887,434
81 3,887,433
82 3,887,435
142 3,887,436
CLASS 197
135R 3,887,055
168 3,887,056

186B 3,887,057
192 3,887,058
CLASS 198
20C 3,887,059
30 3,887,060
34 Re.28,437
36 3,887,061
52 3,887,062
165 3,887,063
219 3,887,064
280 3,887,065
285 3,887,066
CLASS 200
19DR 3,887,780
61.69 3,887,777
144B 3,887,778
153L 3,887,779
CLASS 202
117 3,887,437
262 3,887,438
CLASS 203
63 3,887,439
CLASS 204
13 3,887,440
39 3,887,443
43S 3,887,444
55R 3,887,445
59QM 3,887,441
72 3,887,442
86 3,887,446
129.4 3,887,447
130 3,887,448
148 3,887,449
159.15 3,887,450
192 3,887,451
211 3,887,452
CLASS 206
45.14 3,887,067
223 3,887,068
229 3,887,069
392 3,887,070
454 3,887,071
455 Re.28,438
484 3,887,072
507 3,887,073
CLASS 208
11 3,887,453
111 3,887,454
112 3,887,455
CLASS 209
158 3,887,074
211 3,887,456
214 3,887,457
219 3,887,458
CLASS 210
8 3,887,459
37 3,887,460
39 3,887,461
53 3,887,462
110 3,887,463
117 3,887,464
130 3,887,465
131 3,887,466
186 3,887,467
206 3,887,468
223 3,887,469
261 3,887,470
CLASS 211
5 3,887,075
10 3,887,076
45 3,887,077
50 3,887,078
118 3,887,079
CLASS 212
11 3,887,080
128 3,887,081
CLASS 214
1BB 3,887,082
3,887,084
1H 3,887,083
3,887,085
2.5 3,887,086
6DK 3,887,087
6C 3,887,088
16.1B 3,887,089
17C 3,887,090
38R 3,887,091
75T 3,887,092
84 3,887,093
89 3,887,094
130R 3,887,095
145 3,887,096
730 3,887,097
762 3,887,098
CLASS 215
220 3,887,099
256 3,887,100
CLASS 219
10.49 3,887,781
69V 3,887,782
85 3,887,783
121EM 3,887,784

209 3,887,785
214 3,887,786
216 3,887,787
219 3,887,788
265 3,887,789
535 3,887,790
CLASS 220
4F 3,887,101
8 3,887,102
20 3,887,103
85B 3,887,104
277 3,887,105
CLASS 221
197 3,887,106
241 3,887,107
CLASS 222
1 3,887,108
3 3,887,109
16 3,887,110
57 3,887,111
85 3,887,112
146HE 3,887,113
176 3,887,114
247 3,887,119
402.13 3,887,115
520 3,887,116
542 3,887,117
CLASS 223
28 3,887,118
43 3,887,120
CLASS 226
53 3,887,121
136 3,887,122
CLASS 228
103 3,886,651
112 3,886,649
136 3,886,650
175 3,886,647
182 3,886,646
CLASS 229
2.5 3,887,123
7SC 3,887,124
7R 3,887,125
23R Re.28,439
34R 3,887,126
CLASS 235
1D 3,887,791
61.11E 3,887,792
3,887,793
92EA 3,887,795
151 3,887,796
151.3 3,887,794
151.33 3,887,797
152 3,887,798
164 3,887,799
CLASS 236
91 3,887,127
CLASS 238
349 3,887,128
CLASS 239
110 3,887,131
119 3,887,129
132.5 3,887,130
166 3,887,132
224 3,887,133
404 3,887,134
406 3,887,135
460 3,887,136
468 3,887,137
542 3,887,138
3,887,139
600 3,887,140
676 3,887,153
CLASS 240
1EL 3,887,800
1.4 3,887,801
73LD 3,887,802
151 3,887,803
CLASS 241
52 3,887,141
79 3,887,142
215 3,887,143
301 3,887,144
CLASS 242
125.1 3,887,145
CLASS 244
12R 3,887,146
42CC 3,887,147
77A 3,887,148
110C 3,887,149
137R 3,887,150
152 3,887,151
CLASS 246
37 3,887,152
CLASS 248
156 3,887,154
333 3,887,155
475A 3,887,156
CLASS 249
79 3,887,157

CLASS 250
223B 3,887,806
252 3,887,804
264 3,887,805
315 3,887,807
316 3,887,808
324 3,887,809
333 3,887,810
338 3,887,471
345 3,887,473
442 3,887,811
458 3,887,271
3,887,812
461 3,887,813
562 3,887,814
564 3,887,815
571 3,887,816
CLASS 251
1 3,887,158
11 3,887,159
31 3,887,160
58 3,887,161
129 3,887,162
339 3,887,165
CLASS 252
8.5B 3,887,474
8.75 3,887,476
8.8 3,887,475
62.63 3,887,478
62.64 3,887,479
135 3,887,480
172 3,887,481
175 3,887,482
182 3,887,483
188.3R 3,887,484
300 3,887,485
301.1R 3,887,486
319 3,887,580
321 3,887,487
389A 3,887,488
400R 3,887,477
413 3,887,489
414 3,887,490
430 3,887,491
448 3,887,492
3,887,493
452 3,887,494
464 3,887,495
500 3,887,496
526 3,887,497
531 3,887,614
CLASS 254
134.3FT 3,887,163
175.5 3,887,164
CLASS 259
2 3,887,166
9 3,887,167
16 3,887,168
109 3,887,169
191 3,887,170
CLASS 260
2.2R 3,887,498
3,887,499
2.5AB 3,887,505
2.5AH 3,887,500
2.5AM 3,887,503
3,887,504
2.5AT 3,887,502
2.5BF 3,887,501
8 3,887,940
17A 3,887,506
19UA 3,887,539
23XA 3,887,508
29.1R 3,887,509
29.2N 3,887,510
29.4R 3,887,511
33.2R 3,887,512
33.6SB 3,887,514
33.6UA 3,887,513
37N 3,887,507
40R 3,887,515
45.75C 3,887,520
45.75K 3,887,519
45.8N 3,887,516
3,887,517
45.9NC 3,887,518
47C 3,887,521
3,887,522
3,887,523
77.5AA 3,887,525
78.4D 3,887,527
78.4R 3,887,526
78.5R 3,887,528
79 3,887,529
79.3R 3,887,530
80.78 3,887,531
85.1 3,887,532
88.2 3,887,533
93.7 3,887,534
94.2M 3,887,535
94.2 3,887,536
97.6 3,887,537
112.5 3,887,538
205 3,887,540
209.6 3,887,175

239BD 3,887,541
239.1 3,887,542
239.3B 3,887,543
239.3P 3,887,544
239.55R 3,887,545
240A 3,887,548
240G 3,887,546
240R 3,887,547
243C 3,887,549
3,887,551
244R 3,887,550
249.5 3,887,552
249.6 3,887,553
249.8 3,887,554
250Q 3,887,555
256.4C 3,887,558
256.4F 3,887,557
3,887,559
256.4R 3,887,556
267 3,887,560
283SA 3,887,561
284 3,887,562
286R 3,887,563
287R 3,887,564
3,887,565
288R 3,887,566
289AZ 3,887,567
293.78 3,887,569
293.8 3,887,568
294.8B 3,887,570
306.5 3,887,571
306.8D 3,887,572
307G 3,887,573
308D 3,887,574
308R 3,887,575
309.2 3,887,576
309.6 3,887,577
310A 3,887,578
325PH 3,887,581
326.26 3,887,582
340.7 3,887,472
343.2F 3,887,583
345.2 3,887,584
3,887,585
345.8 3,887,587
346.3 3,887,588
347.8 3,887,589
348R 3,887,586
349 3,887,590
376 3,887,591
399 3,887,592
404.5 3,887,593
408 3,887,594
410.6 3,887,595
410.9R 3,887,596
414 3,887,597
429R 3,887,598
3,887,599
438.1 3,887,600
448.2B 3,887,601
3,887,602
463 3,887,603
465C 3,887,605
465D 3,887,604
471A 3,887,606
471C 3,887,607
479R 3,887,608
486R 3,887,609
491 3,887,610
513R 3,887,611
524R 3,887,612
525 3,887,613
534M 3,887,615
535P 3,887,616
559R 3,887,617
561N 3,887,618
564RF 3,887,619
571 3,887,620
583R 3,887,621
586P 3,887,622
609B 3,887,623
615B 3,887,624
617R 3,887,625
632R 3,887,627
652.5R 3,887,628
653 3,887,629
655 3,887,626
668A 3,887,630
680E 3,887,631
681.5R 3,887,632
683.15C 3,887,634
683.47 3,887,635
683.9 3,887,633
824R 3,887,636
828 3,887,637
830P 3,887,638
836 3,887,639
845 3,887,641
850 3,887,642
857PG 3,887,644
857D 3,887,643
861 3,887,645
873 3,887,649
876B 3,887,640
3,887,647
876R 3,887,646

878B 3,887,650
878R 3,887,648
879 3,887,651
880R 3,887,652
885 3,887,653
928 3,887,654
937 3,887,655
3,887,656
938 3,887,657
942 3,887,658
986 3,887,659
CLASS 261
23A 3,887,661
39A 3,887,662
50A 3,887,663
91 3,887,660
112 3,887,664
114R 3,887,665
130 3,887,666
CLASS 264
8 3,887,667
14 3,887,668
16 3,887,669
41 3,887,670
43 3,887,671
51 3,887,672
66 3,887,524
89 3,887,673
94 3,887,674
156 3,887,675
184 3,887,676
272 3,887,677
284 3,887,678
316 3,887,579
CLASS 266
34A 3,887,172
34R 3,887,171
43 3,887,173
CLASS 267
64R 3,887,174
CLASS 270
58 3,887,176
CLASS 271
12 3,887,177
30R 3,887,178
CLASS 272
1E 3,887,179
58 3,887,180
CLASS 273
1B 3,887,181
1E 3,887,182
41 3,887,183
96R 3,887,184
106.5B 3,887,186
109 3,887,185
126A 3,887,187
128R 3,887,188
130AB 3,887,189
131L 3,887,190
134DB 3,887,191
138A 3,887,192
186R 3,887,193
CLASS 277
1 3,887,194
2 3,887,195
3,887,196
15 3,887,197
27 3,887,198
74 3,887,199
88 3,887,200
96R 3,887,201
CLASS 279
5 3,887,202
50 3,887,203
CLASS 280
3 3,887,204
11.35K 3,887,205
11.35N 3,887,206

33.99T 3,887,207
36C 3,887,208
43.21 3,887,209
87.01 3,887,210
95R 3,887,211
150AB 3,887,213
3,887,214
3,887,215
150SB 3,887,212
163 3,887,216
166 3,887,217
278 3,887,218
408 3,887,219
423R 3,887,220
CLASS 285
236 3,887,221
307 3,887,222
CLASS 290
43 3,887,817
CLASS 293
70 3,887,223
85 3,887,224
CLASS 294
19A 3,887,225
CLASS 296
26 3,887,226
28R 3,887,227
CLASS 297
39 3,887,228
65 3,887,229
232 3,887,230
366 3,887,231
367 3,887,232
389 3,887,233
440 3,887,234
CLASS 299
1 3,887,235
10 3,887,236
13 3,887,237
CLASS 303
7 3,887,238
21B 3,887,239
21P 3,887,240
68 3,887,241
CLASS 305
24 3,887,242
3,887,243
57 3,887,244
CLASS 307
10SB 3,887,818
10R 3,887,819
87 3,887,820
112 3,887,821
279 3,887,822
293 3,887,823
294 3,887,824
CLASS 308
1R 3,887,245
6B 3,887,247
6C 3,887,246
15 3,887,248
73 3,887,249
76 3,887,250
136 3,887,251
CLASS 310
37 3,887,825
43 3,887,826
CLASS 312
223 3,887,252
250 3,887,253
CLASS 313
390 3,887,827
402 3,887,828
443 3,887,830
516 3,887,831

CLASS 315
5.41 3,887,832
13C 3,887,833
31R 3,887,834
94 3,887,835
207 3,887,836
368 3,887,837
376 3,887,838
383 3,887,839
389 3,887,840
391 3,887,841
397 3,887,842
411 3,887,829
CLASS 317
2F 3,887,843
13R 3,887,844
15 3,887,847
33R 3,887,848
36TD 3,887,849
141S 3,887,850
262AE 3,887,846
262A 3,887,845
CLASS 318
6 3,887,851
197 3,887,852
224A 3,887,854
230 3,887,853
332 3,887,855
345 3,887,856
572 3,887,857
CLASS 320
31 3,887,858
CLASS 321
5 3,887,859
14 3,887,860
18 3,887,861
45C 3,887,862
CLASS 323
19 3,887,863
40 3,887,864
CLASS 324
3,887,865
51 3,887,866
3,887,867
71CP 3,887,868
73R 3,887,869
78D 3,887,870
181 3,887,871
CLASS 325
21 3,887,872
113 3,887,873
CLASS 328
167 3,887,874
168 3,887,875
CLASS 330
4.3 3,887,876
10 3,887,877
13 3,887,878
19 3,887,879
22 3,887,880
35 3,887,881
CLASS 331
94.5PE 3,887,882
3,887,883
111 3,887,884
CLASS 332
7.51 3,887,885
43B 3,887,886
CLASS 333
30R 3,887,887
CLASS 335
195 3,887,888
CLASS 336
146 3,887,889
CLASS 337
103 3,887,890

CLASS 338
145 3,887,891
183 3,887,892
262 3,887,893
264 3,887,894
CLASS 339
5R 3,887,254
14R 3,887,895
17L 3,887,255
44M 3,887,256
45M 3,887,257
95D 3,887,258
119R 3,887,259
176MF 3,887,260
CLASS 340
3R 3,887,896
7R 3,887,897
18R 3,887,898
52C 3,887,899
134 3,887,900
146.1AG 3,887,901
172.5 3,887,902
3,887,903
174GA 3,887,906
174MA 3,887,904
174TF 3,887,905
174YC Re.28,440
236 3,887,907
237R 3,887,908
274 3,887,909
276 3,887,910
347DA 3,887,911
347 3,887,912
381 3,887,913
384R 3,887,914
415 3,887,915
CLASS 343
6.5LC 3,887,916
7.9 3,887,917
17.2R 3,887,918
18A 3,887,920
18E 3,887,919
106R 3,887,921
108R 3,887,922
113R 3,887,923
754 3,887,924
795 3,887,925
816 3,887,926
CLASS 346
74ES 3,887,927
140 3,887,928
CLASS 350
1 3,887,261
3,887,262
7 3,887,263
85 3,887,267
96WG 3,887,264
96B 3,887,265
99 3,887,268
216 3,887,269
241 3,887,270
CLASS 352
130 3,887,272
CLASS 353
14 3,887,273
26 3,887,274
3,887,276
74 3,887,275
103 3,887,277
CLASS 354
46 3,887,929
59 3,887,930
155 3,887,931
156 3,887,932
195 3,887,933
251 3,887,934
CLASS 355
16 3,887,278
38 3,887,279

CLASS 356
85 3,887,280
96 3,887,281
138 3,887,282
219 3,887,283
240 3,887,284
3,887,285
CLASS 357
15 3,887,935
26 3,887,937
30 3,887,936
CLASS 358
27 3,887,938
75 3,887,939
CLASS 360
36 3,887,941
51 3,887,942
96 3,887,943
113 3,887,944
3,887,945
CLASS 401
7 3,887,286
35 3,887,287
CLASS 403
219 3,887,288
315 3,887,289
370 3,887,290
391 3,887,291
CLASS 404
69 3,887,292
72 3,887,293
89 3,887,294
CLASS 415
116 3,887,295
161 3,887,297
174 3,887,299
CLASS 416
145 3,887,296
210 3,887,300
220 3,887,298
CLASS 417
53 3,887,301
212 3,887,302
363 3,887,303
3,887,304
439 3,887,305
477 3,887,306
CLASS 418
61A 3,887,307
61B 3,887,308
3,887,309
72 3,887,310
113 3,887,311
270 Re.28,441
CLASS 423
24 3,887,679
55 3,887,680
112 3,887,681
232 3,887,682
235 3,887,683
242 3,887,684
292 3,887,687
366 3,887,688
423 3,887,689
456 3,887,690
462 3,887,691
3,887,692
489 3,887,693
500 3,887,694
515 3,887,695
579 3,887,696
CLASS 424
1 Re.28,442
12 3,887,697
3,887,698
19 3,887,699
44 3,887,700
54 3,887,701
61 3,887,702

95 3,887,703
145 3,887,704
180 3,887,705
3,887,706
210 3,887,707
251 3,887,708
267 3,887,686
273 3,887,709
300 3,887,710
3,887,711
326 3,887,712
CLASS 425
3 3,887,312
42 3,887,313
135 3,887,314
209 3,887,315
242B 3,887,316
257 3,887,317
260 3,887,685
371 3,887,318
379R 3,887,319
384 3,887,320
388 3,887,321
466 3,887,322
521 3,887,323
CLASS 426
72 3,887,714
135 3,887,713
231 3,887,716
264 3,887,717
491 3,887,718
517 3,887,719
570 3,887,715
CLASS 427
32 3,887,720
45 3,887,721
46 3,887,722
58 3,887,723
64 3,887,724
67 3,887,725
95 3,887,726
177 3,887,727
185 3,887,728
195 3,887,729
244 3,887,730
258 3,887,731
380 3,887,732
444 3,887,733
CLASS 428
40 3,887,734
71 3,887,735
87 3,887,736
90 3,887,737
95 3,887,738
112 3,887,739
116 3,887,740
188 3,887,741
206 3,887,743
208 3,887,744
211 3,887,742
213 3,887,745
215 3,887,746
229 3,887,747
247 3,887,748
284 3,887,749
297 3,887,750
328 3,887,753
342 3,887,751
378 3,887,752
407 3,887,754
424 3,887,755
425 3,887,756
3,887,757
540 3,887,758
CLASS 431
5 3,887,324
6 3,887,325
CLASS 432
14 3,887,326
124 3,887,327
152 3,887,266
224 3,887,328

CLASSIFICATION OF DESIGNS

D6—	30	235,233		138	235,242			235,251		27	235,259		13R	235,266	D59—	2A	235,275
	36	235,234	D8—	79	235,243		211	235,252	D23—	3	235,260		14B	235,267	D61—	1Q	235,276
	38	235,235		90	235,244			235,253		34	235,261	D27—	32	235,268	D63—		235,277
	66	235,236	D9—	143	235,245	D13—	1B	235,255		57	235,262	D28—	1B	235,269	D64—	18	235,278
	67	235,237		222	235,246		G	235,256		90.1	235,273	D30—	42	235,270	D83—	1W	235,279
	85	235,238		224	235,247		J	235,254		127	235,263	D34—	5GH	235,272	D86—	10N	235,280
	181	235,239		240	235,248	D19—	76	235,257	D26—	1A	235,264		ST	235,271	D88—	3B	235,281
	239	235,240	D12—	111	235,249	D22—	25	235,258		B	235,265	D57—	1E	235,274	D92—	15	235,282
D7—	111	235,241		169	235,250												

CLASSIFICATION OF PLANTS

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DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

203—	11	T935,002	210—	45	T935,004	229—	53	T935,001	340—	172.5	T935,006	444—	1	T935,003			T935,005

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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1 :	3,886,894		3,886,910		3,887,399		3,887,124		3,887,129		3,887,256
	3,887,770		3,886,919		3,887,414		3,887,205		3,887,610		3,887,268
2 :	3,886,905		3,886,923		3,887,415		3,887,242		3,887,843		3,887,323
4 :	3,886,604		3,886,925		3,887,416		3,887,289		3,887,872		3,887,382
	3,886,609		3,886,937		3,887,418		3,887,290		3,887,875		3,887,393
	3,886,646		3,886,939		3,887,446		3,887,512		3,887,921		3,887,396
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	3,886,803		3,886,950		3,887,454		3,886,599		3,886,879		3,887,492
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5 :	3,886,987		3,886,990		3,887,596		3,886,673		3,886,623		3,887,616
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6 :	Re.28,438		3,887,033		3,887,670		3,887,298		3,886,644		3,887,820
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6 : 3,725
18 : Re.28,435

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36 : T935,003
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PATENT OFFICE NOTICES

INTERNATIONAL INDUSTRIAL PROPERTY PROTECTION DEVELOPMENTS REPORTS ON CONFERENCES ATTENDED BY OFFICIALS OF U.S. PATENT AND TRADEMARK OFFICE

Representatives of the U.S. Patent and Trademark Office are frequent participants at international intergovernmental meetings where matters relating to industrial property protection are discussed. These include meetings on patent and trademark classification, mechanized information retrieval, assistance programs for developing countries, and periodic conferences pursuant to international treaties to which we are a party.

When the results of these deliberations have been of particular significance, for example, texts of new treaties such as the Patent Cooperation Treaty and the Trademark Registration Treaty, they have been made available to readers of the OFFICIAL GAZETTE *by publication of the relevant documents.*

To keep readers current on relevant international activities as they occur, even in their evolving state, more frequent status reports seem desirable.

We have in the past solicited views from the private sector on important issues by way of circular letters and questionnaires addressed to heads of organizations, industrial groups and patent law associations. We plan to continue using this method of communication.

In order that the entire readership of the OFFICIAL GAZETTE *be kept advised, however, we intend to publish from time to time summary reports of the more significant international meetings that we attend. The first such report follows.*

I am hopeful that this series will be helpful. Please do not hesitate to give us your views on the matters presented or your suggestions on how to improve the presentations of this series.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

REPORT ON THE MEETING OF THE AD HOC GROUP OF GOVERNMENTAL EXPERTS ON THE REVISION OF THE PARIS CONVENTION, FEBRUARY 11 TO 17, 1975

This Ad Hoc Group of Governmental Experts was convened pursuant to a resolution of the Coordination Committee of WIPO adopted in September 1974, as follows:

> "The Director General will create and convene an Ad Hoc Group of Governmental Experts coming from states both members and non-members of the Paris Union to study all aspects to the question of revising the Paris Convention including, inter alia, additional provisions of special benefit to the developing countries."

The meeting was well attended; almost fifty countries were represented. Also represented were five intergovernmental organizations and nine international nongovernmental organizations.

The developing countries expressed concern that the systems of patent protection as currently practiced were hampering rather than facilitating the transfer of technology to them. Algeria, Cuba and the Ivory Coast were principal spokesmen. They pointed out that developing countries hold a very small percentage share of the total pool of patents and voiced the view that in too many instances enterprises of developed market economy countries were protecting their exports through the use of patents, to the detriment of industrialization objectives of developing countries.

Accordingly, their major attention was focussed on ways to avoid the utilization of patents in a manner considered by them "abusive" to interests of developing countries. In this regard, they identified a few areas which they thought possibly susceptible to correction by amendment of the Paris Convention.

A change in the national treatment clause of article 2 of the Paris Convention was suggested, based on the contention that the equality principle leads to unequal benefits. Support was expressed for "preferential treatment" for their nationals "without reciprocity." Developing countries urged that compulsory licensing be made available for use by developing countries at an earlier date than is now permitted under the Paris Convention. It was also suggested that a greater transfer of know-how associated with patented technology was needed to accomplish domestic working. Additionally, suggestions were made to exclude certain technological subject matter from the scope of coverage of patent grants and to reduce in certain instances the term of the patent grant.

The Socialist countries, with the Soviet Union as their chief spokesman, expressed a favorable disposition to a "modernization" of the Paris Convention which supported the aspirations of developing countries. They asserted the desirability of incorporating into the Paris Convention provisions for giving greater recognition to inventors' certificates, the principal incentive to inventors in Socialist countries. Another theme repeated by these countries was the desirability of extending industrial property protection provisions of the Convention to include scientific discoveries.

The developed market economy countries also expressed support for promoting the transfer of technology to the developing countries, but pointed out that careful analysis is needed to determine the best ways to accomplish this. In their view, the Paris Convention has been very successful since its inception in promoting international trade in industrial property and the Convention may well be sufficiently flexible to permit tackling the problems experienced by developing countries without amendment. In any event, the practical problems which are being experienced should be identified with greater precision and clarity so that the approaches developed would be suitable to meet the realities of the current situation.

Several developed market economy countries pointed out the practical reality that the technology which developing countries need is owned privately in industrialized countries. Therefore, the transfer of that technology can only be achieved when the owners of that technology are encouraged to transfer it to the recipient country in a commercial arrangement on mutually acceptable terms based on a comfortable working relationship between the parties.

Attention was also called to the fact that there are several alternative ways of assisting developing countries within the framework of the World Intellectual Property Organization. In particular, mention was made of the preparation of a new Model Law on Inventions, the technical assistance and technical information programs under Chapter 4 of the Patent Cooperation Treaty, and the activities of the Permanent Program for the Acquisition by Developing Countries of Technology Related to Industrial Property. It was also pointed out that some of the desires of the developing countries could be achieved by changes in their national laws, without change in the Paris Convention.

The group of experts after a full discussion adopted the following recommendation:

"*The Ad Hoc Group of Governmental Experts on the Revision of the Paris Convention for the Protection of Industrial Property,* convened in accordance with the decisions taken at the September 1974 sessions of the Coordination Committee of the World Intellectual Property Organization (WIPO) and the Executive Committee of the Paris Union for the Protection of Industrial Property,

"*Meeting* at Geneva from February 11 to 17, 1975,

"*Noting* the interest that developing countries have manifested in the revision of the Paris Convention,

"1. *Agrees* that, at this stage of the work, the following questions be considered:

(i) National Treatment
(ii) Independence of Patents

(iii) to (v) Non-Working and Delays in Working of the Patented Invention; Compulsory Licenses; Licenses of Right
(vi) Preferential Treatment Without Reciprocity
(vii) Technical Assistance
(viii) Types of Protection other than Patents (Inventors' Certificates, etc.)
(ix) Marks; Industrial Designs; Appellations of Origin
(x) Reservations
(xi) Deletion of Article 24
(xii) Scope of Protection of Process Patents
(xiii) Right of Priority
(xiv) Unanimity Rule

"2. *Recommends:*

(*a*) that the Director General, taking into account the need to respect the basic principles of the Paris Convention and to take into consideration the concerns of the developing countries, prepare a study containing an analysis of the issues and outlining possible alternative solutions in respect of the said points and any connected questions,

(*b*) that the report containing the said study be communicated to the Governments of all countries members of the United Nations system of organizations for their comments,

(*c*) that, as a continuation of the work towards the revision of the Paris Convention, the Ad Hoc Group of Governmental Experts be convened, as soon as possible, in a second session,

(*d*) that the competent organs of WIPO and the Paris Union and all other interested organizations, in particular the United Nations Conference on Trade and Development (UNCTAD) and the United Nations Industrial Development Organization (UNIDO), be informed of the results of the first (present) session of the Ad Hoc Group of Governmental Experts,

(*e*) that other United Nations bodies, particularly the United Nations Conference on Trade and Development and the United Nations Industrial Development Organization, interested in the transfer of technology be consulted as to the contribution they could make to the further work of the Ad Hoc Group of Governmental Experts."

The issues forming the basis of the fourteen questions, thirteen of substantive law and one of procedure mentioned in paragraph 1 of the resolution, were developed to some degree by the members of the Committee of Experts as follows:

"A. *Questions of Substantive Law*

"*Question No. 1: National Treatment.* It was generally understood that the principle of national treatment should remain unaffected in the relations between developed countries,* this term covering both market economy and Socialist countries which are not developing countries. The question here is rather whether, in the relations of developing countries to developed countries, national treatment should not, on certain points—yet to be identified—suffer exceptions totally or within certain limits also to be defined. The total exception to national treatment on certain points may require the definition of minimum standards of protection to be respected in any case. Whether such derogations from national treatment would apply also in the relations between developing countries would also have to be considered.

"The examples of possible cases where certain derogations from the national treatment principle were mentioned concerned smaller fees for nationals than foreigners, the requirements of working the patented invention on the territory of the developing country and the duration of the patent.

"Moreover, the question should be examined whether, in a case where an invention was made by a resident of the country or where an invention was worked in the country, national treatment should not apply unconditionally, irrespective of the nationality of the patentee of other person working the invention.

"*Question No. 2: Independence of Patents.* The question here is whether the principle of full independence embodied in Article 4*bis* of the Paris Convention should be maintained, or whether exceptions to it should be allowed, particularly where the foreign applicant in the developing country claims priority of an earlier foreign application on which no patent was issued because of lack of patentability or where the patent so granted was later invalidated for that reason. Furthermore, the question should be studied how decisions taken in respect of an invention in any foreign country could be made available to the national office of any developing country in which an application for that invention had been filed.

"*Questions Nos. 3 to 5: Non-Working and Delays in Working of the Patented Invention; Compulsory Licenses; Licenses of Right.* The questions here are whether any developing country should not be permitted to impose requirements for working the patented invention which are more stringent for foreigners than nationals, whether the time limits in Article 5A of the Paris Convention should not be shortened, whether licenses of right—whose concept still required precise definition—should not be allowed by the Paris Convention, and whether it should not be specified that importation did not satisfy the requirement of working in the country.

"*Question No. 6: Preferential Treatment Without Reciprocity.* The question here is whether in certain respects nationals of developing countries should not receive more favorable treatment in developed countries than nationals of the developed countries. One example was mentioned, that is, the fees to be paid: whether the amount of the fees charged for the application for, and maintenance of, a patent in a developed country should not be less than the fees to be paid by the nationals of countries which are not developing countries.

"*Question No. 7: Technical Assistance.* The question here is whether the Paris Convention should not contain provisions—similar, for example, to those contained in the Patent Cooperation Treaty—concerning technical assistance to developing countries. It was noted that under Article 7 of the Convention Establishing the World Intellectual Property Organization the institutional framework for such technical assistance existed but that budgetary considerations might miliate in favor of including provisions on technical assistance also in the Paris Convention. It was suggested that Article 19 could be made use of in order to establish special unions devoted to technical assistance.

"*Question No. 8: Types of Protection Other than Patents (Inventors' Certificates, etc.).* The most important question here is whether inventors' certificates should not, as far as their legal nature so permits, be treated in the Paris Convention on an equal footing with patents and, consequently, expressly referred to in Article 1 and all other relevant provisions of that Convention. It was mentioned in this connection that the free choice, for foreigners on the same terms as for nationals, between patents and inventors' certificates would have to be consequently generalized. A further question here is whether inventors' certificates granted for industrial designs rather than technical inventions should also be expressly mentioned. Finally, the question of the inclusion in the text of the Paris Convention of references to special types of patents should be examined.

"*Question No. 9: Marks; Industrial Designs; Appellations of Origin.* Examples mentioned of questions to be considered here were: whether a more precise definition of the time limit mentioned in Article 5C(1) of the Paris Convention was not required in order to ensure early enforcement of any use requirements; whether the prohibition of the use of geographical designations as trademarks should not be established or, to the extent that it existed, reinforced; whether the protection of appellations of origin should not be reinforced and, in cases of conflict between an appellation of origin and a trademark, the former should not prevail; whether the protection against false indications of source and unfair competition in general should not be strengthened to allow for swifter action against abuses; whether the obligation to protect any well-known mark (*marque notoirement connue*) was always compatible with the interests of developing countries in which similar national marks were registered before the registration of the well-known mark; whether the possibility of providing for compulsory licenses for trademarks and industrial designs, in certain well-defined cases, should not be provided for; whether Article 6 of the Paris Convention concerning the independence of trademarks need not be revised; finally, whether the possibility of pronouncing the lapse of industrial designs, in certain well-defined cases, should not be provided for.

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*The Delegation of Canada reserved its position as to this conclusion, and generally as to the possibilities of enlarging any proposed amendments which were appropriate for both developed and developing countries, so as to make them of universal application. The Director General indicated that amendments of benefit to all members States could be so enlarged.

"*Question 10: Reservations.* The question here is whether any exception from the obligations of the Paris Convention allowed for developing countries should not be exercisable by way of a reservation to the relevant provision of that Convention. This could allow of a more flexible system, tailor-made for the needs of the country making reservations.

"*Question No. 11: Deletion of Article 24.* The question here is whether Article 24 of the Paris Convention has not become anachronistic and should not be deleted.

"*Question No. 12: Scope of Protection of Process Patents.* The question here is whether developing countries should not be exempted from the rule embodied in Article 5*quater* of the Paris Convention according to which the patentee has, with regard to imported products, all the rights which the process patent grants to him with respect to products manufactured in the country.

"*Question No. 13: Right of Priority.* All aspects of Article 4 of the Paris Convention should be examined, including the question whether the duration of the right of priority should not be longer for applicants who are nationals of developing countries when they apply for patents in developed countries.

"B. *Question of Procedure*

"*Question No. 14: Unanimity Rule.* The question here is to weigh the relative advantages and disadvantages of amending the Paris Convention by unanimity or a qualified majority."

These narrative synopses will form the basis for the study which the Director General will undertake as specified in paragraph 2(*a*) of the resolution. Following completion of the Director General's study, the report he prepares will be circulated to all member countries of the UN system of organizations for their comments and following receipt of these a second meeting of the Ad Hoc Group of Governmental Experts Concerning the Revision of the Paris Convention will be called. This may take place in the Spring of 1976.

Disclaimers

3,319,872.—*Irving C. Beckman* and *Alex Morrell Beerbohm*, Huntington Woods, Mich. MAILER. Patent dated May 16, 1967. Disclaimer filed Dec. 23, 1974, by the assignee, *2B System Corporation.*

Hereby disclaims the term of this patent subsequent to Sept. 20, 1983.

3,615,710.—*Yoon Chai Lee* and *Quirino A. Trementozzi*, Springfield, Mass. Patent dated Oct. 26, 1971. PACKAGING MATERIALS FOR COMESTIBLES. Disclaimer filed Dec. 5, 1973, by the assignee, *Monsanto Company.*

Hereby disclaims the term of this patent subsequent to June 24, 1986.

3,642,768.—*Joachim Ribka,* Offenbach (Main), Germany. WATER-INSOLUBLE PHENYL-AZO-NAPHTHOL DYESTUFFS. Patent dated Feb. 15, 1972. Disclaimer filed Oct. 25, 1974, by the assignee, *Hoechst Aktiengesellschaft.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,644,137.—*Maurice Raynor Fox, Neil David Stewart,* and *Alfred Peter Lockett,* Manchester, England. METHOD OF APPLYING PROCESSING LIQUORS TO TEXTILE MATERIALS AND APPARATUS THEREFOR. Patent dated Feb. 22, 1972. Disclaimer filed Aug. 19, 1974, by the assignee, *Imperial Chemical Industries Limited.*

Hereby enters this disclaimer to all claims of said patent.

3,658,892.—*Henry Martin,* Basel, and *Jacques Rufener,* Stein, Aargau, Switzerland, and *Georg Pissiotas,* Lorrach, Germany. DERIVATIVES OF N-PHENYLTHALAMIDE ACID USEFUL FOR REGULATING PLANT DEVELOPMENT. Patent dated Apr. 25, 1972. Disclaimer filed Dec. 4, 1974, by the assignee, *Ciba-Geigy A.G.*

Hereby enters this disclaimer to claims 1 through 7, inclusive, of said patent.

3,662,745.—*Louis Ciro Cosentino,* West Paterson, N.J. METAL-METAL SALT ELECTRODE AND METHOD FOR MAKING THE SAME. Patent dated May 16, 1972. Disclaimer filed Jan. 27, 1975, by the assignee, *Medtronic, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

3,664,118.—*Richard S. Walton,* Lancaster, Pa. ELECTRONICALLY CONTROLLED TIMEPIECE USING LOW POWER MOS TRANSISTOR CIRCUITRY. Patent dated May 23, 1972. Disclaimer filed Oct. 16, 1973, by the assignee, *Hamilton Watch Company.*

Hereby enters this disclaimer to claim 20 of said patent.

3,669,532.—*Edwin E. Figge,* Des Plaines, Ill., *Joseph H. Lancor, Jr.,* Arcadia, Calif., and *Edward H. Lodge,* Wilmette, Ill. PROJECTOR CONTROL APPARATUS. Patent dated June 13, 1972. Disclaimer filed Oct. 25, 1972, by the assignee, *Bell & Howell Company.*

Hereby enters this disclaimer to claims 1, 2, 3 and 4 of said patent.

3,673,681.—*James J. Steranko,* Weston, Mass. ELECTRICAL CIRCUIT BOARD WIRING. Patent dated July 4, 1972. Disclaimer filed Aug. 3, 1973, by the assignee, *Inforex, Inc.*

Hereby enters this disclaimer to claims 1–4 of said patent.

3,684,720.—*Darwin W. Richardson,* Richardson, Tex. REMOVAL OF SCALE FROM SURFACES. Patent dated Aug. 15, 1972. Disclaimer filed Sept. 28, 1973, by the assignee, *The Western Company.*

Hereby enters this disclaimer to claims 1–23, all of the claims, of said patent.

3,700,541.—*Ronald Horace Shrimpton,* Lichfield, and *Keith William Dunkley,* Birmingham, England. PRINTERS BLANKETS. Patent dated Oct. 24, 1972. Disclaimer filed Sept. 16, 1974, by the assignee, *Dunlop Holdings Limited.*

Hereby disclaims the entire remaining term of said patent.

3,736,197.—*Harold J. Messerschmidt,* Stockholm, *Karl Heyman,* Montclair, and *Bernadou W. Johnsen II,* Paterson, N.J. POWDERLESS ETCHING BATH COMPOSITIONS AND ADDITIVES. Patent dated May 29, 1973. Disclaimer filed July 10, 1973, by the assignee, *Mona Industries, Inc.*

Hereby disclaims the term of this patent subsequent to Apr. 3, 1990.

3,748,601.—*Harold Seidel,* Warren, N.J. COUPLING NETWORKS HAVING BROADER BANDWIDTH THAN INCLUDED PHASE SHIFTERS. Patent dated July 24, 1973. Disclaimer filed Sept. 13, 1973, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby enters this disclaimer to claim 1 of said patent.

3,756,521.—*Franz Werner,* Vienna, Austria. WINDING DEVICE FOR RECORDING AND/OR PLAY-BACK APPARATUS. Patent dated Sept. 4, 1973. Disclaimer filed Nov. 26, 1974, by the assignee, *U.S. Philips Corporation.*

Hereby enters this disclaimer to claims 1, 7, 8, 9 and 10 of said patent.

3,767,410.—*David Philip Brust* and *Grace Eileen Kane,* Rochester, N.Y. PHOTOGRAPHIC HYDROPHILIC COLLOIDS AND METHOD OF COATING. Patent dated Oct. 23, 1973. Disclaimer filed July 11, 1974, by the assignee, *Eastman Kodak Company.*

Hereby enters this disclaimer to claims 1, 2, 3 and 4 of said patent.

3,769,557.—*John Paul Jones, Jr.,* Wayne, Pa. ELECTROLYTIC TIME DELAY CAPSULE WITH PLASTIC CUP ELECTRODE HOLDER. Patent dated Oct. 30, 1973. Disclaimer filed Mar. 22, 1974, by the assignee, *Compuline Corporation.*

Hereby enters this disclaimer to claims 1 and 10 of said patent.

Certificates of Correction for the Week of June 10, 1975

P.P. 3,690
Re. 28,245
3,523,779
3,706,773
3,730,887
3,750,616
3,758,463
3,763,977
3,784,115
3,785,010
3,789,000
3,794,407
3,794,558
3,796,648
3,799,650
3,799,839
3,803,178
3,803,405
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3,809,376
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3,817,607
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3,875,278
3,875,285
3,875,457
3,876,171
3,876,518
3,876,699
3,877,881
3,877,947

Dedication

3,624,968.—*Alec Leibowitz,* London, England. GEM STONE POLISHING MACHINES. Patent dated Dec. 7, 1971. Dedication filed Sept. 7, 1973, by the assignee, *Spectrum Diamonds (Proprietary) Ltd.*

Hereby dedicates the entire remaining term of said patent to the Public.

Disclaimers and Dedications

3,768,535.—*Ernest L. Holden,* Phoenix, Ariz. TIRE TREAD. Patent dated Oct. 30, 1973. Disclaimer and dedication filed Mar. 27, 1975, by the assignee, *The Goodyear Tire & Rubber Company.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

3,778,579.—*Eiichi Takarada,* Rockford, Ill. ARC CONTROL. Patent dated Dec. 11, 1973. Disclaimer filed Mar. 5, 1975, by the assignee, *Amsted Industries Incorporated.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

Erratum

All references to Patent Number 3,858,414 to Lester Mishcon for Circular Knitting Machine With Pattern Wheels, appearing in the OFFICIAL GAZETTE of January 7, 1975, should be deleted since the patent should not have been granted.

Patents Available for Licensing or Sale

D. 219,763. SAFETY ASHTRAY. S. Peter Sarris, Swampscott, Mass. Correspondence to: S. Steven Karalekas, 1735 New York Ave. NW., 6th Floor, Washington, D.C., 20006.

3,690,549. AUXILIARY HEATING SYSTEM FOR AUTOMOTIVE VEHICLES. Warren Frank Hardy, 9609 Dixie Hiway, Louisville, Ky., 40272.

3,743,297. GOLF SWING PRACTICE CLUB. Edward J. Dennis, 99 Teresa St., Dale City, Calif., 94014.

3,811,513. PORTABLE PNEUMATIC POWER TOOL. Schmid & Wezel, Germany. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,848,274. INFLATABLE BED PAN. Janet Oliver 428½ Kenwood, Glendale, Calif., 91206.

3,848,774. LIQUOR DISPENSING INSTRUMENT. Lloyd J. Schimke, Box 1272, 1112 2nd St. SE., Minot, N. Dak. 58701.

3,851,398. GEAR TEST APPARATUS. Metabowerke KG Closs, Germany. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,853,768. SKIMMING DEVICE. Luigi Bagnulo, Milan, Italy. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,861,136. RECEPTACLE MOUNTED ELECTRIC CLOCK. C. W. Blenkhorn, 3199–D Via Buena Vista, Laguna Hills, Calif., 92653.

3,865,366. VARIABLE MOTION PEDAL ASSEMBLY FOR A FOOTPOWERED VEHICLE. Charles T. Stantial Station Road, Campbell Hall, N.Y., 10916.

3,866,776. BOAT LOADER OF THE SIDE MOUNTING TYPE. Michael J. Partyka, 75–B Stenton Court, Lalor Gardens, Trenton, N.J., 08610.

3,867,948. INFRA RED RADIATION MEANS WITH FAN MEANS. Adolf Kallenborn, Germany. Correspondence to: Holman & Stern (Folio 42329) 2401 15th St. NW., Washington, D.C., 20009.

The following 2 patents are offered by: Mrs. Marie Gagnier, 19 Corte Mateo, Moraga, Calif., 94556.

3,134,174.	ADJUSTABLE MOUNT FOR A TELESCOPIC FIREARM SIGHT.
3,381,924.	TELESCOPIC GUN SIGHT MOUNT.

The following 13 patents are offered by: Peter T. Rado, Ide & Haigney, 41 E. 42nd St., New York, N.Y., 10017.

3,029,473.	VACUUM POST-CURING OF INFUSIBLE PLASTIC MATERIAL.
3,038,551.	SELF-DAMPING MATERIAL AND SONAR DOME FORMED THEREFROM.
3,095,336.	HIGH STRENGTH CERAMIC COMPOSITIONS AND METHODS FOR PREPARING THE SAME.
3,123,176.	SONAR DOME.
3,136,380.	SONAR DOME AND SELF-DAMPING COMPONENT THEREOF.
3,543,348.	INJECTION MOLD APPARATUS.
3,671,159.	EJECTING GIANT ARTICLES FROM INJECTION MOLD.

3,723,584. METHOD OF MAKING AN ELECTROFORMED MOLD HAVING HEAT TRANSFER CONDUITS AND FOAM POLYURETHANE FOUNDATION.

3,733,161. STRUCTURIZER MOLD.

3,734,985. GLASS FIBER REINFORCED THERMOPLASTIC CELLULAR PLASTICS.

3,744,775. MIXING OF MOLTEN PLASTIC AND GAS.

3,763,293. PROCESS OF MOLDING GIANT ARTICLES OF STRUCTURED PLASTIC.

3,796,779. MIXING OF MOLTEN PLASTIC AND GAS.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following 80 patents.

Inquiries respecting licenses under these patents should be addressed to: RCA Corporation, Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y., 10036.

3,869,677. MICROWAVE TRANSISTOR CARRIER FOR COMMON BASE CLASS A OPERATION.

3,869,678. MULTIPLE TRANSISTOR MICROWAVE AMPLIFIER.

3,869,705. ELECTRONIC TECHNIQUE FOR MAKING MULTICHANNEL, SPATIAL-CARRIER-ENCODED RECORDINGS.

3,869,721. RECOVERY OF NORMALLY ILLEGIBLE, MAGNETICALLY RECORDED INFORMATION.

3,870,320. PICKUP ARM CONTROL FOR VIDEO DISC PLAYER.

3,870,835. STYLUS CONTROL APPARATUS FOR A VIDEO DISC RECORD PLAYER.

3,870,954. STARTER SYSTEM FAULT DETECTOR.

3,870,958. CIRCUIT FOR APPLYING DATA SIGNALS ACROSS A MICROPHONE INPUT CIRCUIT.

3,870,966. COMPLEMENTARY FIELD EFFECT TRANSISTOR DIFFERENTIAL AMPLIFIER.

3,871,019. LINE SEQUENTIAL COLOR TELEVISION RECORDING SYSTEM.

3,871,020. CHROMINANCE SIGNAL CORRECTION.

3,871,663. RECORD CONTACT SPINDLE.

3,872,240. PICKUP APPARATUS FOR CAPACITIVE VIDEO DISC PLAYERS WITH TRANSMISSION LINE TUNED CIRCUIT.

3,872,265. VIDEO DISC TRANSMISSION LINE AND STYLUS RF RETURN SYSTEMS.

3,872,325. R-F SWITCHING CIRCUIT.

3,872,329. RADIATION SENSING CIRCUIT.

3,872,480. METHOD OF ELECTROSTATIC RECORDING ON ELECTRICALLY INSULATING FILMS BY NON-WETTING ELECTRICALLY CONDUCTIVE LIQUIDS.

3,872,497. SIGNAL TRANSLATING APPARATUS FOR COMPOSITE SIGNAL SUBJECT TO JITTER.

3,872,498. COLOR INFORMATION TRANSLATING SYSTEMS.

3,873,098. ROTARY STYLUS RESHAPER.

3,873,179. LITHIUM NIOBATE HOLOGRAM READOUT USING CONTINUOUS INCOHERENT NOISE ERASING LIGHT.

3,873,762. SPRING LOADED STYLUS ARM PIVOT.

3,873,764. SPEED CORRECTION SYSTEM FOR A VIDEO DISK PLAYBACK SYSTEM.

3,873,765. DISC PLAYBACK SYSTEM WITH SPEED CONTROL OF A BELT DRIVE.

3,873,782. CAPACITIVE PROTECTION COUPLING ELEMENT FOR STYLUS ELECTRODE DISCHARGE.

3,873,783. UNIVERSAL STYLUS AND PIVOT COUPLING.

3,873,851. CHARGE TRANSFER DECODERS.

3,873,853. COMPARATOR-KEYED OSCILLATOR.

3,873,867. SUPPORT AND FOCUS STRUCTURE FOR PHOTOMULTIPLIER.

3,873,873. DIGITAL STORAGE TUBE TARGET STRUCTURE.

3,873,879. IN-LINE ELECTRON GUN.

3,873,888. LIQUID CRYSTAL PROTECTION CIRCUIT.

3,873,906. SIGNAL CONVERSION CIRCUITS.

3,873,933. CIRCUIT WITH ADJUSTABLE GAIN CURRENT MIRROR AMPLIFIER.

3,873,990. CHROMINANCE SIGNAL CORRECTION.

Re. 28,385. METHOD OF TREATING SEMICONDUCTOR DEVICES.

Re. 28,386. METHOD OF TREATING SEMICONDUCTOR DEVICES TO IMPROVE LIFETIME.

3,875,026. METHOD FOR PRODUCING ALUMINUM HOLOGRAPHIC MASTERS.

3,875,328. APPARATUS AND METHOD FOR MEASURING THE SIGNAL TO NOISE RATIO FOR A PERIODIC SIGNAL.

3,875,441. ELECTRON DISCHARGE DEVICE INCLUDING AN ELECTRON EMISSIVE ELECTRODE HAVING AN UNDULATING CROSS-SECTIONAL CONTOUR.

3,875,450. CATHODE-RAY TUBE WITH RADIATION-EMITTING INDEX STRIP-LIKE AREAS.

3,875,535. ENHANCED EFFICIENCY DIODE CIRCUIT.

3,875,652. METHOD OF BONDING METALS TOGETHER.

3,876,472. METHOD OF ACHIEVING SEMICONDUCTOR SUBSTRATES HAVING SIMILAR SURFACE RESISTIVITY.

3,876,952. SIGNAL PROCESSING CIRCUITS FOR CHARGE-TRANSFER IMAGE-SENSING ARRAYS.

3,876,955. BIASING CIRCUIT FOR DIFFERENTIAL AMPLIFIER.

3,877,791. DEFORMABLE MIRROR LIGHT VALVE AND METHOD OF MAKING THE SAME.

3,877,810. METHOD FOR MAKING A PHOTOMASK.

3,877,883. METHOD OF GROWING SINGLE CRYSTALS OF COMPOUNDS.

3,877,981. METHOD OF ELECTROLESS PLATING.

3,878,007. METHOD OF DEPOSITING A PATTERN OF METAL PLATED AREAS ON AN INSULATING SUBSTRATE.

3,878,061. MASTER MATRIX FOR MAKING MULTIPLE COPIES.

3,878,326. VOLTAGE SUPPLY SYSTEM.

3,878,335. DIGITAL SYNCHRONIZATION SYSTEM.

3,878,336. DIGITAL SYNCHRONIZING SYSTEM.

3,878,427. APERTURED-MASK CATHODE-RAY TUBE HAVING HALF-TONE ARRAY OF HEAT-ABSORBING AREAS ON TARGET SURFACE.

3,878,428. CATHODE RAY TUBE HAVING SHADOW MASK AND SCREEN WITH TAILORED HEAT TRANSFER PROPERTIES.

3,878,470. FM DEMODULATOR.

3,878,471. STABILIZATION OF QUIESCENT COLLECTOR POTENTIAL OF CURRENT-MODE BIASED TRANSISTORS.

3,878,486. HIGH FREQUENCY DEVICE ASSEMBLY.

3,878,541. LIQUID LEVEL LIMIT INDICATOR.

3,878,556. MODULARIZED LASER DIODE ASSEMBLY.

3,879,183. CORONA DISCHARGE METHOD OF DEPLETING MOBILE IONS FROM A GLASS REGION.

3,879,582. DATA LOOP COMMUNICATION SYSTEM.

3,879,633. TELEVISION DEGAUSSING SYSTEM WITH SADDLE-TYPE COILS ADJACENT CRT CONE.

3,879,640. PROTECTIVE DIODE NETWORK FOR MOS DEVICES.

3,879,650. DC TO POLYPHASE INVERTER UTILIZING A PLURALITY OF SWITCHING DEVICE AND A TRANSFORMER HAVING A PLURALITY OF PRIMARY AND FEEDBACK WINDINGS CONNECTED IN CIRCUIT WITH THE SWITCHING DEVICE.

3,879,663. DELTA MODULATOR UTILIZING A DUTY CYCLE CIRCUIT.

3,879,683. SAWTOOTH WAVEFORM GENERATOR.

3,879,690. DISTRIBUTED TRANSMISSION LINE FILTER.

3,879,710. DATA PROCESSOR FOR A LOOP DATA COMMUNICATIONS SYSTEM.

3,879,720. ENERGY PEAK/TIME AVERAGING SEISMIC INTRUSION DETECTOR.

3,879,730. RANGE TRACKING CIRCUIT.

3,879,758. TAPE CARTRIDGE CHANGER WITH SELECTIVE CARTRIDGE AND TRACK PROGRAMMING CONTROLS.

3,880,676. METHOD OF MAKING A SEMICONDUCTOR DEVICE.

3,880,725. PREDETERMINED THICKNESS PROFILES THROUGH ELECTROPLATING.

3,881,134. RASTER CENTERING CIRCUIT.

3,881,135. BOOST REGULATOR WITH HIGH VOLTAGE PROTECTION.

3,881,181. SEMICONDUCTOR TEMPERATURE SENSOR.

3,881,183. READ/WRITE CIRCUITS FOR RELIABLE DIGITAL RECORDING.

General Electric Company is prepared to grant non-exclusive licenses under the following 82 patents on reasonable terms to domestic manufacturers.

Applications for licenses under the following 2 patents may be addressed to: Patent Counsel, Telecom, Products Dept., General Electric Co., Lynchburg, Va., 24502.

3,867,681. BATTERY CHARGING CIRCUIT.

3,873,776. ALARM ARRANGEMENT FOR A TIME DIVISION MULTIPLEX, PULSE-CODE MODULATION CARRIER SYSTEM.

Applications for license under the following 23 patents may be addressed to: Patent Counsel General Electric Co., Building 43, Room 529, 100 Woodlawn Ave., Pittsfield, Mass., 01201.

D. 226,326. LUMINAIRE.

3,058,951. COMPOSITION COMPRISING AN EPOXY RESIN, A POLYVINYL ACETAL RESIN, AND A POLYACRYLATE RESIN, AND AN ARTICLE COATED THEREWITH.

3,083,119. THERMALLY STABLE LAYER INSULATION.

3,113,172. PRESSURE RELIEF DEVICE.

3,150,243. THREE POSITION, SNAP ACTION ROTARY SWITCH.

3,365,540. CABLE HOLDER.

3,377,480. LUMINAIRE.

3,425,049. VOLTAGE TEST DEVICE.

3,430,394. FRAME DEVICE WITH A STRIP FOR REMOVING BROKEN GLASS FRAGMENTS AND SEALING MATERIAL.

3,430,996. ADJUSTING BOLT.

3,431,003. LATCH DEVICE.

3,435,290. VOLTAGE SURGE PROTECTOR FOR SUBMERGED DEEP WELL PUMP MOTORS.

3,440,519. CONSTANT CURRENT REGULATOR WITH MOVING COIL TRANSFORMER.

3,440,520. CONSTANT CURRENT REGULATOR WITH MOVING COIL TRANSFORMER.

3,513,425. MODULAR ELECTRICAL CONDUCTOR TERMINATION SYSTEM.

3,598,178. HEAT PIPE.

3,600,742. CONCEALED DOUBLE-PIVOT HINGE FOR HINGED ENCLOSURE.

3,643,088. LUMINAIRE SUPPORT.

3,646,503. HANDLING MEANS FOR A CABLE TERMINATION HOUSING HAVING STRESS ISOLATING MEANS BETWEEN THE HOUSING AND THE HANDLING MEANS.

3,678,432. VENTED FUSE MODULE FOR UNDERGROUND POWER CABLE SYSTEM.

3,727,104. PROTECTIVE CIRCUIT FOR LIGHTING SYSTEM.

3,801,899. MEANS FOR DETECTING THE INCEPTION OF CORONA DISCHARGES WITHIN INDUCTION APPARATUS.

3,862,092. POLYAMIDE-IMIDE COMPOSITIONS.

Applications for license under the following 26 patents may be addressed to: Group Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky., 40225.

D. 225,780. PORTABLE MICROWAVE OVEN OR SIMILAR ARTICLE.

3,422,994. ICE DISPENSER HAVING STAGES WITH DIFFERENT FEED RATES.

3,684,853. INDUCTION SURFACE HEATING UNIT SYSTEM.

3,781,522. THERMOCHROMIC SURFACE HEATING APPARATUS.

3,781,523. THERMOCHROMIC SURFACE HEATING APPARATUS.

3,814,888. SOLID STATE INDUCTION COOKING APPLIANCE.

3,816,704. SURFACE HEATING APPARATUS.

3,820,005. INVERTER WITH CONSTANT DUTY CYCLE CONTROL.

3,821,630. COMMUTATION FAILURE DETECTION AND CONTROL FOR SCR INVERTERS.

3,832,621. RELIABLE STATIC POWER CONVERTER WITH CONTROL LOGIC.

3,842,542. REMOVABLE OVEN DOOR HINGE SYSTEM.

3,843,862. MICROWAVE OVEN HAVING TM AND TE MODES.

3,843,863. IMPEDANCE VARYING DEVICE FOR MICROWAVE OVEN.

3,845,267. MICROWAVE OVEN WITH WAVE GUIDE FEED.

3,845,273. COMPOSITE METAL PLATE SURFACE HEATING UNIT.

3,847,135. HINGED ADAPTER DUCT FOR OVEN VENT.

3,855,440. MICROWAVE OVEN HAVING PREFERRED MODES.

3,856,058. LIQUID DISPENSER HAVING IMPROVED OVERFILL PROTECTOR.

3,858,270. REFRIGERATOR CABINET HAVING ADJUSTABLE WHEEL OR ROLLER.

3,859,901. RECIRCULATING VENTILATING HOOD.

3,862,609. INCINERATOR ASH REMOVAL APPARATUS.

3,862,720. WASTE DISPOSER INSTALLATION.

3,862,786. WASHER INSTALLATION.

3,863,391. REVERSIBLY MOUNTED CABINET DOOR.

3,863,619. COLLAPSIBLE HEAT SHIELD FOR WINDOW OF OVEN DOOR.

3,866,018. MOLDED PLASTIC COOKTOP WITH HEATED GLASS-CERAMIC PLATE INSERT.

Applications for license under the following 31 patents may be addressed to: Patent Counsel, General Electric Company, 1501 Roanoke Blvd., Salem, Va., 24153.

2,888,129. CONTROL SYSTEM FOR CONVEYING APPARATUS.

2,964,691. CONSTANT CURRENT MOTOR CONTROL.

2,982,907. CONTROL SYSTEM.

3,024,401. MOTOR CONTROL CIRCUIT.

3,024,405. HALF-WAVE MOTOR CONTROL CIRCUIT.

3,026,463. SPEED CONTROL SYSTEM FOR D.C. MOTORS.

3,064,174. MOTOR SPEED CONTROL CIRCUITS.

3,164,767. SYNCHRONIZATION AND LOCKOUT CONTROL SYSTEM FOR CONTROLLED RECTIFIERS.

3,187,243. MOTOR ACCELERATION CONTROL FOR A TENSIONING SYSTEM.

3,192,482. CIRCUIT FOR GENERATING AN INVERSE SIGNAL UTILIZING A MULTIPLIER CIRCUIT.

3,227,936. POLYPHASE MOTOR CONTROL ARRANGEMENT.

3,242,410. CIRCUIT FOR CONTROLLING ENERGIZATION OF A DIRECT CURRENT LOAD.

3,308,397. SATURABLE CURRENT TRANSFORMER-TRANSISTOR INVERTER CIRCUIT.

3,319,147. VARIABLE FREQUENCY, VARIABLE WAVE FORM INVERTER.

3,320,519. SILICON CONTROL SWITCH-SATURABLE TRANSFORMER CURRENT LIMIT PROTECTIVE CIRCUIT.

3,364,838. CABINET FOR MOUNTING, ENCLOSING AND COOLING ELECTRICAL APPARATUS.

3,414,797. POWER CONVERTER EMPLOYING INTEGRATED MAGNETICS.

3,418,550. BRUSHLESS ADJUSTABLE SPEED DRIVE.

3,426,262. SYSTEM FOR CONTROLLING INTERMITTENT AND BIDIRECTIONAL OPERATION OF MOTORS.

3,458,791. ADJUSTABLE SPEED DRIVE SYSTEM WITH FRICTION COMPENSATION.

3,465,228. PULSE WIDTH CONTROL FOR ADJUSTABLE SPEED DRIVE SYSTEM.

3,474,320. VARIABLE FREQUENCY AND VOLTAGE ELECTRIC POWER INVERTER UTILIZING AN AUXILIARY SOURCE OF FIXED-MAGNITUDE COMMUTATING VOLTAGE.

3,515,971. MOTOR CONTROL SYSTEM WITH FEEDBACK AND VARIABLE GAIN AMPLIFIER RESPONSIVE TO CURRENT.

3,536,984. POLYPHASE INVERTER WITH SELF-PROTECTION MEANS.

3,541,426. CROSSFIRE PROTECTION TECHNIQUE.

3,568,021. LOW COST VARIABLE INPUT VOLTAGE INVERTER WITH RELIABLE COMMUTATION.

3,596,158. STABILIZING PHASE CONTROLLED AC INDUCTION MOTORS.

3,614,571. LINEARIZATION OF A DIGITAL PHASE CONTROL POWER AMPLIFIER FOR DYNAMO ELECTRIC MACHINE.

3,671,836. POWER CONVERSION CONTROL SYSTEM.

3,678,358. BRUSHLESS DC ADJUSTABLE SPEED DRIVE WITH STATIC REGENERATIVE DC MOTOR CONTROL.

3,775,651. POWER SYSTEM OVERCURRENT PROTECTION MEANS UTILIZING VOLTAGE ADJUSTMENT.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 24, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-26-74
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-22-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-24-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-3-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-1-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	11-6-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-28-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-2-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-29-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-8-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	2-4-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-15-74
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-3-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-30-74
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	8-9-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-29-74

Expiration of patents: The patents within the range of numbers indicated below expire during June 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,836,826, to 2,840,820 inclusive
Plant Patents	Numbers 1,714, to 1,721 inclusive

REISSUES

JUNE`10, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

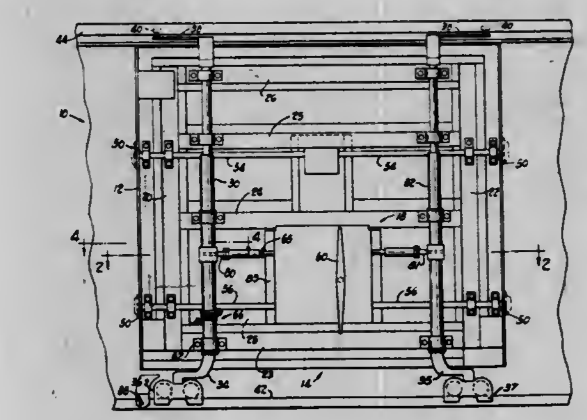
28,443
OVER-TRAVEL AND RETURN MECHANISM FOR DOOR

Irving D. Ross, Jr., Barrington, and Thorvald Madland, Arlington Heights, Ill., assignors to The Youngstown Steel Door Co., Cleveland, Ohio

Original No. 3,747,270, dated July 24, 1973, Ser. No. 113,143, Feb. 8, 1971. Application for reissue June 26, 1974, Ser. No. 483,111

Int. Cl. E05d *15/10*

U.S. Cl. 49—220 **4 Claims**



1. A plug-type rail car door assembly comprising:

a door member;

at least [a pair of] *first and second* shaft and crank assemblies supporting said door on *respective first and second* roller means for permitting said door assembly to be moved in a first direction longitudinally toward a door opening and in a second direction longitudinally away from a door opening,

said assemblies having cranks mounted to be rotated through an arc defined by a first door closed position and a second door open position wherein said cranks are substantially normal to said door and *at least said first shaft and crank assembly including one of said cranks mounted to be rotated to* a third position beyond said second position from said first position,

actuating means for rotating said shaft and crank assemblies to cause said door member to move out of and into said door opening as said cranks are moved respectively from said first position to said second position and from said second position to said first position,

said actuating means including means maintaining the cranks of said assemblies in said second position during longitudinal movement of said door on said roller means,

stop means for engaging *at least said first of* said roller means to stop *said first of* said roller means at a predetermined point relative to said opening during longitudinal movement of said door in said first direction;

cushion means adjacent said opening and inwardly of the edges of the door when said cranks are in said second position;

over-travel means including spring means connected between said door and *at least said first of said* crank [assembly] *assemblies,*

whereby upon engagement of *said first of* said roller means with said stop means the edge of the door in the direction of travel pivots inwardly, relative to its position during longitudinal movement, toward said cushion means to absorb the kinetic energy in the door as [the cranks move] *said first crank moves* from [their] *its* second position to [their]*its* third position and by action of the spring means back to the second position.

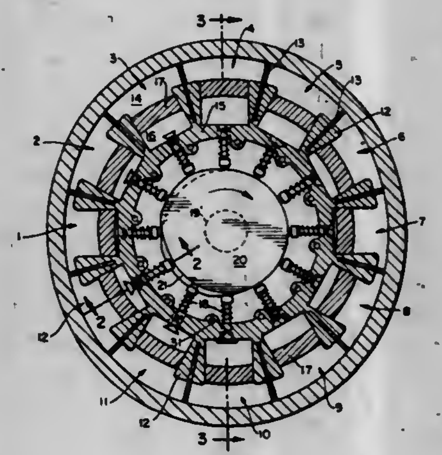
28,444
ROTARY APPARATUS

Edward T. Saylor, Jr., 789 E. Glen Ave.,
Ridgewood, N.J. 07450

Original No. 3,595,018, dated July 27, 1971, Ser. No. 886,421, Dec. 18, 1969, which is a continuation-in-part of application Ser. No. 687,947, Nov. 9, 1967, now Patent No. 3,485,174. Application f[illegible] reissue May 11, 1973, Ser. No. 359,237

Int. Cl. F01b *13/06;* **F02b** *57/08;* **F02g** *3/00*

U.S. Cl. 60—39.61 **11 Claims**



1. A rotary [fluid motor] *apparatus* comprising:

(a) a casing having an inner and outer wall, said inner wall being of an approximately [circular] *elliptical* shape defined by points at non-uniform radial distances from a center [point], said points being located at angular displacements defined with respect to said center [point] and measured from a reference point in a direction of rotation, said inner wall being at [minimum] *maximum* radial distances from said center [point] at [minimum] points located at angular displacements of about 90° and about 270° from said reference point, said inner wall *being* at [maximum] *minimum* radial distances from said center [point being at maximum points located] at angular displacements of about 0° and 180° from said reference point,

(b) a circular vaned wheel arranged within said casing for rotation about said center [point] in said direction of rotation and spaced from said inner wall, said wheel including a central hub and fixed vanes extending radially from said hub [at substantially uniform distances from said point], said fixed vanes forming channels adapted to accommodate a gas and a liquid in the form of a liquid cell adjacent to the inner wall and a gas cell adjacent to the central hub, a piston located in each channel slidably mounted therein to partition each channel into said gas and liquid cells, said fixed vanes and channels located at angular displacements defined with respect to said center [point] and measured from said reference point in said direction of rotation;

(c) movable vanes incorporated in said fixed vanes and extendable and retractable therefrom, means for urging said movable vanes into continuous contact with said inner wall to seal said channels,

[d. valve means for introducing a motive gas through gas port means within said central hub into said gas cells of said vaned wheel located at angular displacements of about 0° to about 90° from said reference point, said valve means further being adapted to close gas port means thereby sealing gas cells at angular displacements of about 90° to about 270° and said gas port means further adapted to allow the exhaust of said gas cells located at about angular displacements of about 270° to about 360°, end placed closing said casing and means for journaling said vaned wheel and central hub for rotation within said casing,]

(d) end plates closing said casing and means for journalling said vaned wheel and central hub for rotation within said end plates,

(e) means in conjunction with said casing and central hub for introducing a [motive] gas [through] *into* said central hub for passage into said cells located *at angular displacements of about 0° to 90°* [into each of said gas cells.]

(f) valve means for introducing said gas through gas port means within said central hub into said gas cells of said vaned wheel located at angular displacements of about 0° to about 90° from said reference point, said valve means further being adapted to close gas port means thereby sealing gas cells at angular displacements of about 90° to about 270° and said gas port means further adapted to allow the exhaust of said gas from said gas cells located at about angular displacement of about 270° to about 360°,

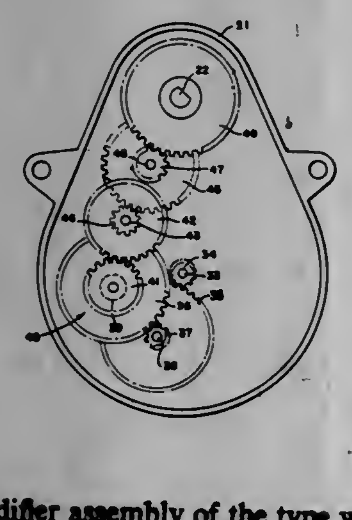
(g) and means in conjunction with said casing and central hub for exhausting said gas cells at angular displacements of about 270° to about 360°.

28,445
ROTARY HUMIDIFIER DRIVE
Walter R. Stiles, Milford, Mich., assignor to Skuttle Mfg. Co., Milford, Mich.

Original No. 3,408,880, dated Nov. 5, 1968, Ser. No. 638,235, May 15, 1967, which is a continuation-in-part of abandoned application Ser. No. 578,364, Sept. 9, 1966. Application for reissue Apr. 18, 1974, Ser. No. 462,028

Int. Cl. F16h *57/00;* **F24f** *3/14*

U.S. Cl. 74—405 **9 Claims**



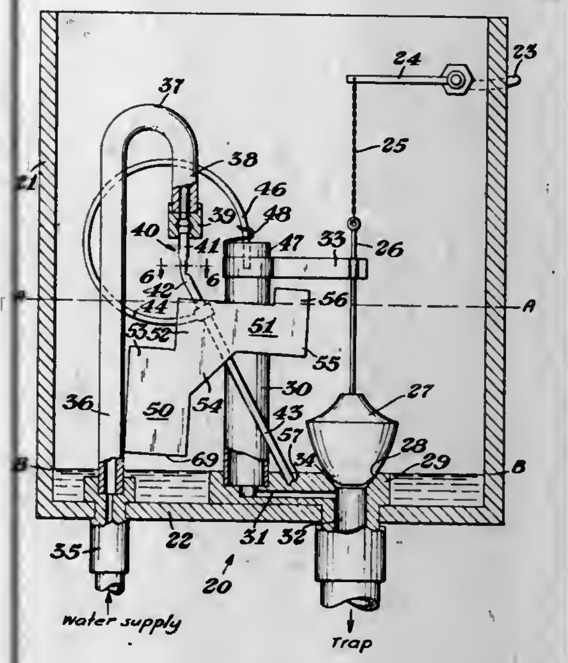
1. In a humidifier assembly of the type wherein a water pick-up rotor [having] *consisting essentially of skeleton frame means and an annular flexible sleeve or porous synthetic plastic material mounted on said frame means with its* lower portion extending into a body of water is driven from a motor through a drive line containing a train of speed reduction gearing *and said rotor is rotatably supported on coaxial shaft means projecting from opposite ends of said rotor* the improvement which comprises a normally engaged slip clutch unit in said drive line *connected between the output side of said train of gearing and one of said shaft means* adapted to slip and interrupt power transmission therethrough when subjected to torque in either direction of rotation in excess of a predetermined amount and to automatically resume power transmission when such excess torque condition does not prevail.

28,446
ECCENTRIC ACTING FLOAT-CONTROLLED PINCH-VALVE VESSEL FILLING ASSEMBLY
Wallace H. Buswell, Beaverton, Mich., assignor of fractional part interest to Clare C. Anderson, Midland, Mich.

Original No. 3,670,751, dated June 20, 1972, Ser. No. 117,301, Feb. 22, 1971. Application for reissue June 13, 1974, Ser. No. 478,950

Int. Cl. G05d *9/02*

U.S. Cl. 137—1 **31 Claims**



1. In combination with a vessel to be controllably filled with a liquid to a pre-determined filled level, said vessel having defining walls and controllable liquid emptying means, the float-controlled pinch-valve vessel filling device mounted therein, which comprises:

a liquid supply conduit positioned to deliver liquid inside the vessel, said supply conduit having a terminal portion positioned above the pre-determined filled level and extending approximately vertically downward towards said filled level;

delivery tube means having a first end portion coupled to the terminal end of said supply conduit and communicating therewith, and a second dependent portion terminating in a free distal end that is directed downwardly when the vessel is empty, and the delivery tube means having a third portion co-joining the first and second portions and being flexible and adapted to prevent liquid flow therethrough by its internal cross-section becoming substantially zero when flexed to form an included angle less than about 90° between the first and second portions;

buoyant float means associated with and attached to said delivery tube means between the point of flexing in

the third portion, and the mid-length of the second portion of the delivery tube means;

and stop means restricting the pivotal movement of the buoyant float means and associated delivery tube means about the point of flexing when the delivery tube means depends downwardly when the vessel is in a substantially empty condition prior to filling and the associated float and delivery tube means are in filling position;

said buoyant float means being buoyant in, substantially impervious to, and substantially unattacked by, said liquid;

said buoyant float means being shaped with first and second slightly elongated body portions each having a longitudinal axis and each having an end co-joined at an angle of about 90° between said axes with the end of the second body portion overlapping the end of the first body portion by about one-fourth to one-third the width of said first body portion, said second body portion having a side extension adjacent its free end, said side extension projecting from the side opposite the side to which the first body portion is joined, and said second body portion having a buoyancy at least about as great as said first body portion;

said delivery tube means being substantially coplanar therewith and attached to said buoyant float means and extending along a line between the body portions at an angle of between at least 15° to the longitudinal axis of the first body portion and at least 30° to the longitudinal axis of the second body portion and at a point along the delivery tube means whereby upon such tube means depending downwardly, the longitudinal axis of the second body portion is at approximately the height of the predetermined filled level;

and said stop means being positioned relative to the combination of factors (1) the position of the vertically downward portion of the supply conduit, (2) the dimensions of the first body portion of the buoyant float means, and (3) the angle between the second portion of the delivery tube means to the buoyant float means, whereby in the assembly, prior to filling the vessel when the second portion of the delivery tube means depends downwardly and the buoyant float means is pushed substantially horizontally against the stop means by initial flow of filling liquid and by buoyancy of the first body portion, the longitudinal axis of said first body portion extends, at the bottom end thereof, away from a line drawn vertically downward from said downwardly extending portion of the supply conduit and toward said stop means, the stop means being spaced a distance equal to from about 85 to 95 percent of the thickness of the first body portion from the line vertically drawn, while the second portion of the delivery tube means diverges away from said stop means and depends at an angle of from about 10° to about 55° with respect to said line drawn vertically.

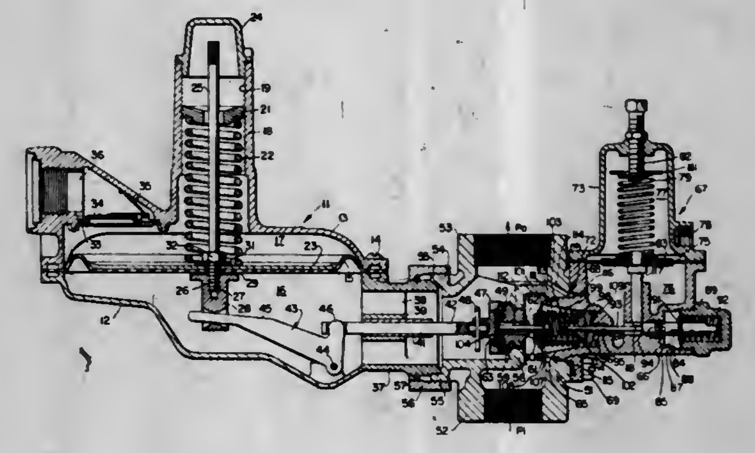
28,447
SERVICE REGULATOR WITH HIGH-LOW PRESSURE CUTOFF DEVICE
Joseph A. Bonner, Pittsburgh, and Howard J. Evans, New Kensington, Pa.; Eugenia Wilson Evans, independent executrix of said Howard J. Evans, deceased, assignors to Rockwell International Corporation, Pittsburgh, Pa.

Original No. 3,623,506, dated Nov. 30, 1971, Ser. No. 859,712, Sept. 22, 1969. Application for reissue Oct. 1, 1973, Ser. No. 402,091

Int. Cl. F16k *17/22*

U.S. Cl. 137—613 **15 Claims**

1. A gas pressure regulator comprising a main valve controlling flow of gas therethrough and means responsive to downstream gas pressure for actuating said main valve to regulate the downstream gas pressure, a cutoff valve adapted for controlling flow of gas through said regulator, and means in said regulator *including a positional control connection between said valves and* responsive respectively to downstream gas pressures below and



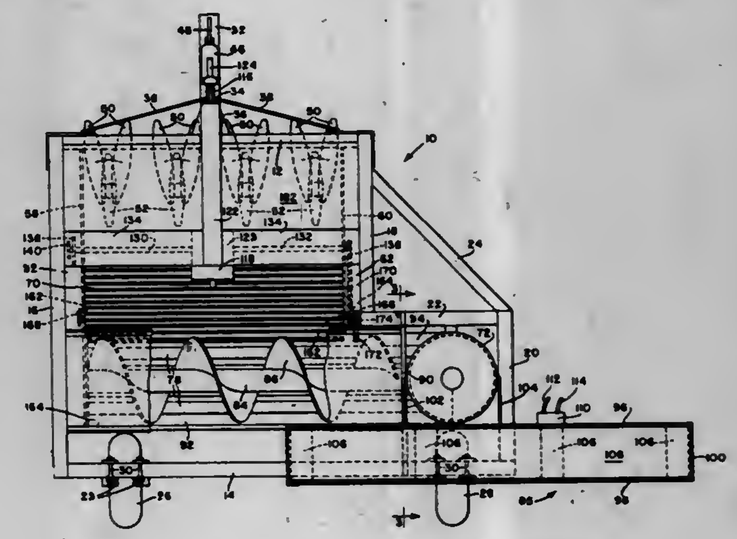
above predetermined limits for actuating said cutoff valve to arrest flow of gas through said regulator, *said cutoff valve being spring biased toward cutoff position and said control connection comprising a direct motion transmitting means extending between said main valve and said cutoff valve.*

28,448
ROOT CROP HARVESTING IMPLEMENT
Richard David Zaun, and Richard Wayne Hook, Des Moines, Iowa, assignors to Deere & Company, Moline, Ill.

Original No. 3,791,451, dated Feb. 12, 1974, Ser. No. 209,124, Dec. 17, 1971. Application for reissue July 26, 1974, Ser. No. 492,069

Int. Cl. A01d *17/00*

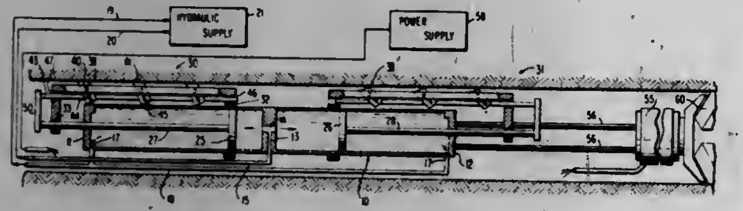
U.S. Cl. 171—58 **12 Claims**



1. A root crop harvester comprising: a main frame; root digging means secured across the forward end of the frame; elevator means including a substantially upright auger conveyor mounted on the frame, *transversely offset of the fore-and-aft center line,* for moving roots from the lower end thereof upwardly to a deposit area; and conveyor means supported on the main frame to receive roots from the digging means and moving the same upwardly and laterally from the root digging means to the lower end of the upright auger conveyor.

28,449
ANCHORING AND PRESSURING APPARATUS FOR A DRILL

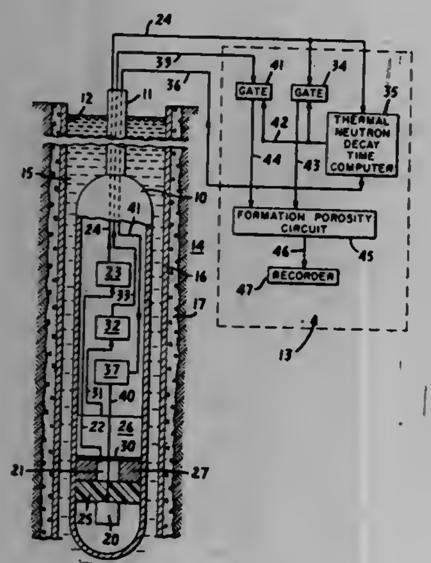
Tibor O. Edmond, Ponca City, Okla., by Continental Oil Company, Ponca City, Okla., assignee
Original No. 3,827,512, dated Aug. 6, 1974, Ser. No. 325,773, Jan. 22, 1973. Application for reissue Sept. 3, 1974, Ser. No. 502,581.
Int. Cl. E21b *3/12;* **E21c** *19/00*
U.S. Cl. 175—94 **13 Claims**



8. An apparatus for incrementally forcing a drill bit into the earth comprising a cylinder having first and second ends, first and second pistons in said cylinder with piston rods extending axially from each of said pistons through said first and second ends, respectively, an anchoring assembly for each piston including an anchor means, a sliding mount retaining said anchor means supported between said cylinder and said piston rod and means coupled to said piston rod and to said anchor means, a first hydraulic port mounted between said pistons, and a port mounted at each end of said cylinder.

28,450
TWO DETECTOR PULSE NEUTRON LOGGING POROSITY TECHNIQUE

Robert J. Schwartz, Houston, Tex., assignor to Schlumberger Technology Corp., New York, N.Y.
Original No. 3,621,255, dated Nov. 16, 1971, Ser. No. 863,771, Oct. 2, 1969, which is a continuation of application Ser. No. 705,154, Feb. 13, 1968. Application for reissue Sept. 13, 1973, Ser. No. 396,818
Int. Cl. G01t *3/00*
U.S. Cl. 250—264 **16 Claims**


GATE
GATE
THERMAL NEUTRON DECAY TIME COMPUTER
FORMATION POROSITY CIRCUIT
RECORDER

1. A system for [computing] *investigating* the porosity of an earth formation traversed by a borehole, comprising:

a source of neutrons for irradiating the formation with pulses of neutrons,

[a] means for producing [a signal] *signal* that [corresponds] *corresponds to at least* thermal neutron *population* [absorption time] within the borehole environment *between neutron pulses,*

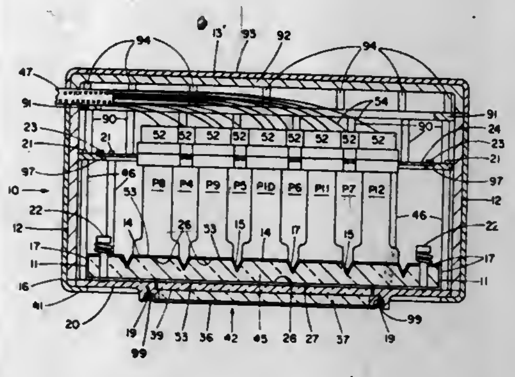
circuit means responsive to said [thermal] neutron [absorption signal means] *population signals* for producing a gating signal that is automatically related primarily to the thermal neutron [absorption time] *population variations* characterizing the earth formation, as the earth formation strata change along the length of the borehole, as distinguished from the thermal neutron [absorption time] *population variations* that [characterizes] *characterize* the borehole,

gate means responsive to said gating signal *from said* circuit means for passing [a portion] *portions* of said [thermal] neutron [absorption signal] *population signals* that [is] *correspond to the neutron population characterizing the earth formation, said gated signal portions being* related to the porosity of the earth formation as distinguished from a characteristic of the borehole, and

further circuit means responsive to said gated signal [portion] *portions* for producing another signal that corresponds to the earth formation porosity [measured only during said thermal neutron absorption time that characterizes the earth formation in response to said gating signal means].

28,451
RADIATION DETECTING APPARATUS

David J. Spleha, Franklin Park, and Marvin J. Kreuser, Schaumburg, Ill., assignors to G. D. Searle & Co., Skokie, Ill.
Original No. 3,723,735, dated Mar. 27, 1973, Ser. No. 111,409, Feb. 1, 1971. Application for reissue Dec. 13, 1973, Ser. No. 424,198
Int. Cl. G01t *1/20*
U.S. Cl. 250—366 **14 Claims**



11. A radiation detecting apparatus for locating a radiation source in two-dimensional coordinates and for indicating the intensity of radiation produced by said radiation source comprising:

a. a planar scintillating crystal assembly having opposite faces,

b. a plurality of photomultiplier tubes having light sensitive faces lying in a plane parallel to said scintillating crystal assembly and spaced therefrom,

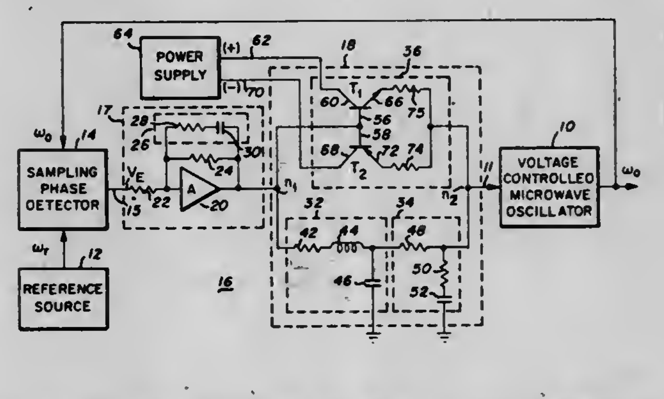
c. a light guide interposed between said scintillating crystal assembly and said photomultiplier tubes comprising an upstream surface having a highly transparent area in intimate contact with one of said faces of said scintillating crystal assembly, a downstream surface having highly transparent areas in intimate contact with said light sensitive faces of said photomultiplier tubes, a boundary surface joining said downstream and upstream surfaces and spanning the distance between said scintillating crystal assembly and said light sensitive faces of said photomultiplier tubes, and a coating of greater light absorbency than white paint on said light guide surrounding the aforesaid areas of intimate contact with said scintillating crystal assembly and said light sensitive faces of said photomultiplier tubes,

d. amplifying and computing circuitry means coupled to each of said photomultiplier tubes for computing the two-dimensional coordinates of a scintillation produced in said scintillating crystal assembly according to the quanta of radiation produced by said scintillation and sensed by each of said photomultiplier tubes, and

e. location registration means coupled to said amplifying and computing circuitry means for recording the coordinates of a scintillation.

28,452
DUAL BANDWIDTH PHASE LOCK LOOP

Drew R. Lance, Saratoga, Calif., assignor to California Microwave Incorporated, Sunnyvale, Calif.
Original No. 3,805,183, dated Apr. 16, 1974, Ser. No. 304,136, Nov. 6, 1972. Application for reissue Sept. 3, 1974, Ser. No. 502,747
Int. Cl. H03b *3/06*
U.S. Cl. 331—17 **8 Claims**



2. In a phase lock loop [as recited in claim 1 wherein said control network includes] *including a microwave oscillator responsive to a control signal and operative to develop a microwave output signal, a reference source for developing a fixed frequency reference signal, a phase detector responsive to said output signal and said reference signal and operative to develop an error signal commensurate with a difference in phase between said reference signal and said output signal, and signal translating means responsive to said error signal and operative to develop a control signal for controlling said oscillator, an improved signal translating means comprising:*

means for amplifying said error signal; and

an adaptive control network responsive to the amplified error signal and operative to develop said control signal for controlling the phase of said oscillator; said network including

a first terminal for receiving said error signal and a second terminal connected to the control signal input of said oscillator,

a low-pass filter circuit connected between said first terminal and said second terminal,

an out-of-band filter circuit coupled in series with said low pass filter circuit between said first and second terminals, *and*

voltage-follower means including a first transistor having a base electrode connected to said first terminal, a collector electrode for connection to a first source of potential, and an emitter electrode connected to said second terminal, and a second transistor having a base electrode connected to said first terminal, a collector electrode for connection to a second source of potential and an emitter electrode connected to said second terminal, said control network having a first bandwidth characteristic when said amplified error signal is less than a predetermined threshold value and having a second bandwidth characteristic when said amplified error signal is greater than said threshold value.

PLANT PATENTS

GRANTED JUNE 10, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,727

ROSE PLANT

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Mar. 21, 1974, Ser. No. 453,302

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct cultivar of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its vigorous, upright habit of growth, suitability as a greenhouse cut flower, its dark green, mildew resistant foliage, its lack of fragrance, its bud and flower color near Wilson's Current Red.

3,728

ROSE PLANT

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Mar. 15, 1974, Ser. No. 451,499

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—26 **1 Claim**

1. A new and distinct cultivar of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of vigorous habit of growth, high production of cut flowers throughout the year, strong stems suitable for cut flowers, all characteristics which are similar to the cultivar Bridal Pink. The bud and flower color are distinctive and novel in this new cultivar, being near Geranium Lake as the sepals unfold and Camellia Rose in the opening and full open flower.

3,729

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Apr. 24, 1974, Ser. No. 463,502

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct cultivar of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a vigorous habit of growth, relatively larger foliage than the cultivar Bridal Pink, relatively larger buds and blooms than the cultivar Bridal Pink, a high degree of resistance to powdery mildew, long stems suitable for use as cut flowers, a bud and flower color of Camellia Rose opening to French Rose.

PATENTS

GRANTED JUNE 10, 1975

ERRATA

For CLASS	See PATENT NO.
030–358	3,888,068
072–364	3,888,119
093–001c	3,888,160
106–015 AF	3,888,176
426–126	3,888,224
139–123	3,888,272
353–029	3,888,462
242–056	3,888,480
252–513	3,888,575
352–092	3,888,780
200–016	3,888,807
426–262	3,888,859
427–243	3,889,024
200–268	3,899,098

PATENTS

GRANTED JUNE 10, 1975

GENERAL AND MECHANICAL

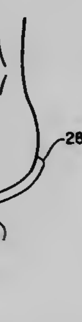
3,887,946
FOOT COVERING

Sondra Laskin, and Hyman Laskin, both of 1003 Gabel St., Silver Spring, Md.

Filed Oct. 3, 1973, Ser. No. 402,982

Int. Cl. A43b *17/00*

U.S. Cl. 2—239 **7 Claims**



5. A foot covering comprising a single sheet of material symmetrical about a vertical axis and having a toe, arch and heel portion, said toe being closed by means joining symmetrical segments of the periphery of said sheet from a point at which said periphery crosses said vertical axis in said toe portion to corresponding points which are the lower end points of two peripheral segments of said toe section which are parallel to said vertical axis before joining, said arch and heel portion being open and said heel portion terminating in a straight line substantially perpendicular to said vertical axis, and said corresponding points at which said joining means terminates being such that upon insertion of the toes of a foot into said closed toe portion, the peripheral edges of said arch portion curve up from said vertical axis to form lateral walls around the arch of said foot.

3,887,947
PIVOTABLE MODULAR HYGIENIC-SANITARY SYSTEM

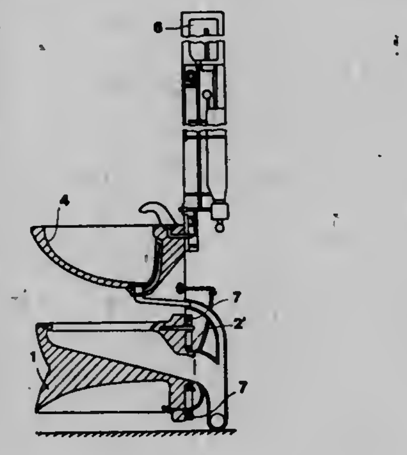
Alessandro Tosca, Via Bosco 53 Fontana Pradosa, Piacenza, Italy

Filed Nov. 5, 1973, Ser. No. 413,060

Claims priority, application Italy, Nov. 8, 1972, 31421/72

Int. Cl. A47k *4/00*

U.S. Cl. 4—2 **4 Claims**



1. A modular hygienicsanitary system for use in a bathroom facility, comprising a support structure having an upright wall; a sanitary fixture having a toilet bowl recess in a surface located at one side of a first horizontal axis and a bidet bowl recess in a surface located at the opposite side of said first horizontal axis; means mounting said fixture on said wall for turning movement about said first horizontal axis so that said recesses are selectively movable to an upwardly facing position by turning said fixture about said first horizontal axis; a wash basin; means mounting said wash basin on said wall so that said wash basin is pivotable about a vertical axis in a horizontal plane to and from a position in which it is located above said fixture; a shower base; and means mounting said base on said wall laterally spaced from said fixture and said basin so that said base is pivotable about a second horizontal axis located at a level lower than said first horizontal axis between one position in which said shower base projects horizontally from said wall and is ready for use and another position in which said shower base is upright and extends substantially parallel to said wall.

3,887,948
CONDITIONING DEVICE FOR DEODORISING AND/OR ODOURISING AIR

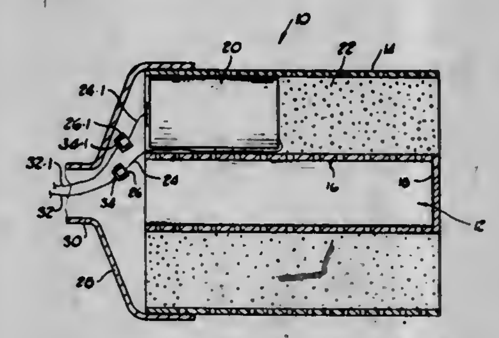
Robin Harry Stamper, 1891 Westbourne Rd., Bryanston, South Africa

Filed Oct. 5, 1973, Ser. No. 403,879

Claims priority, application South Africa, Oct. 6, 1972, 72/7169; Oct. 6, 1972, 72/7170; Oct. 6, 1972, 72/7171

Int. Cl. A47k *3/22;* **E03d** *9/04, 13/00*

U.S. Cl. 4—213 **1 Claim**



1. A disposable conditioning pack for use in a ventilating apparatus of a sanitary manufacture such as a toilet bowl or bedpan to condition air, said pack comprising an outer perforated casing, an inner perforated casing positioned wholly within the outer casing and forming an annular container surrounding a central air passage, a battery and an air-permeable substance that alters the odour of air passing therethrough positioned in the annular container formed between the two casings, leads extending from the battery out of one end of the casing to terminals positioned outside the casing for connection to an air displacement means for displacing air to be conditioned through the substance, the central air passage being open at the end from which the leads extend and closed at the other end, the amount of said air-permeable substance being such that, when the battery is exhausted, the odour-altering property of said substance is substantially exhausted as well.

3,887,949
VENTILATED SEATING FOR A WATER CLOSET

John S. Osmond, 2467 Louella Ave., Venice, Calif. 90291

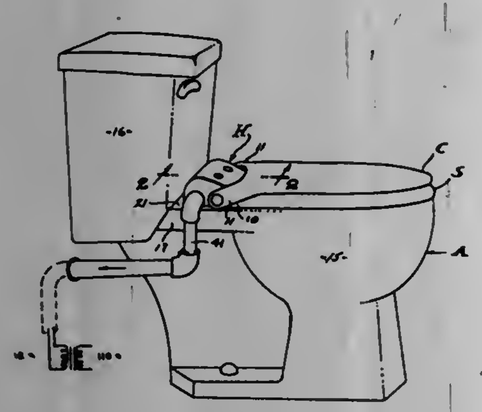
Filed Aug. 3, 1973, Ser. No. 385,406

Int. Cl. A47k *13/28, 13/30;* **E03d** *9/05*

U.S. Cl. 4—217 **6 Claims**

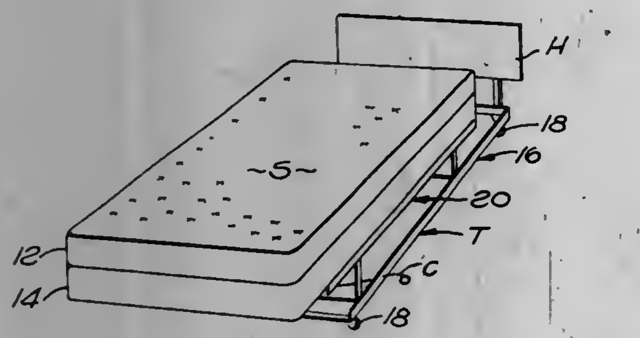
1. Seating for adaption to a water closet comprised of a bowl for receiving and disposing of excrement and the like, the bowl having a concavely curved inner rim and a flattened hinge area extending outwardly and rearward from said rim at each side of the water closet and including, an means to immovably fix an adapter housing to said hinge area and having walls forming a chamber with a lip to engage upon the hinge area and overhang the said concavely curved rim of the bowl

forming thereby a downwardly opening inlet from the bowl into said chamber and having hinge means disposed on a transverse axis, fan means within the said chamber exhausting air therefrom and through an exhaust opening and tube extending to a remote discharge point, there being a seat, and trunnions pivoting the seat to the adapter housing on said hinge means and wherein there is a bulkhead and means for selectively locating said bulkhead.



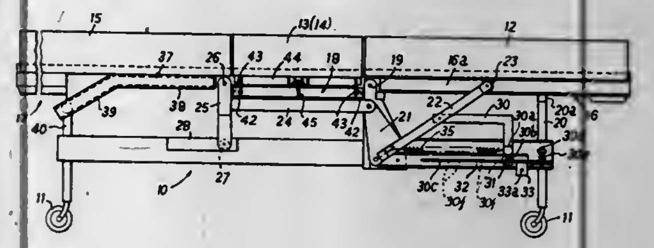
4. The seating for a water closet as set forth in claim 1, wherein there is means for selectively locating the bulkhead over the hinge area at either side of the water closet to thereby divide the adapter housing chamber into an enlarged inlet plenum and a diminished exhaust plenum, and there is means to reversibly insert the fan means into said bulkhead to draw the air therethrough into said exhaust plenum and through said exhaust opening.

3,887,950
BED STRUCTURE AFFORDING DISPLACEMENT FOR HOUSEKEEPING AND MAKING
William P. Wachsman, 10430 Wilshire Blvd., Los Angeles, Calif. 90024
Filed Aug. 28, 1973, Ser. No. 392,395
Int. Cl. A61g *7/10*
U.S. Cl. 5—11 **5 Claims**



1. A bed structure for supporting a sleeping platform alternately in a reclining position and in an elevated convenience position, comprising:
- a base support for receiving bed members;
- a holding member for said sleeping platform;
- a plurality of pivot link means affixed to extend between said base support and said holding member, said link means including pairs of said link means aligned on opposed sides of said holding member;
- elongated telescopically-related crank members extending between each of said pairs of link means for controlling the motion of said pivot link means in similar arcuate motion patterns to move said sleeping platform horizontally and vertically between said reclining position and said convenience position.

3,887,951
INVALID BED
Michael Joseph Yates, Margate, and Kenneth James Hurst, Folkestone, both of England, assignors to Pioneer Welding Company Limited, Kent, England
Filed Jan. 28, 1974, Ser. No. 437,220
Claims priority, application United Kingdom, Jan. 26, 1973, 4226/73
Int. Cl.² A61G *7/02*
U.S. Cl. 5—90 **5 Claims**

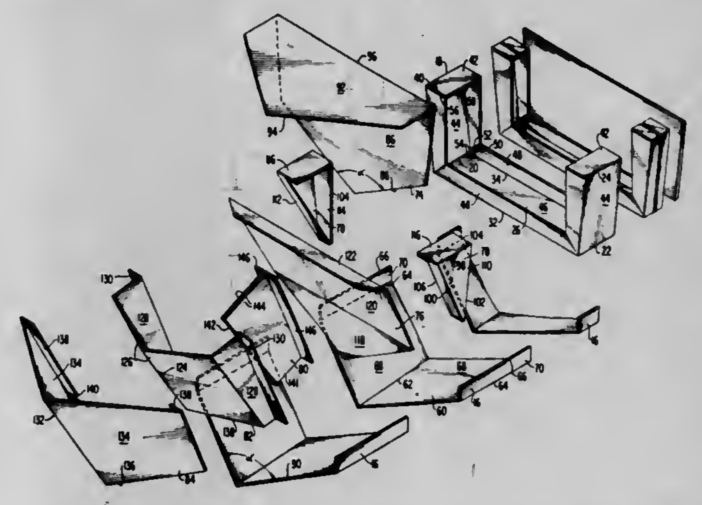


1. A bed comprising:
- a main frame;
- head-end, middle and foot-end mattress supports mounted end-to-end on said main frame;
- said head-end support having its end nearer the middle support pivotally mounted on said main frame for adjustment of the angle of inclination of said head-end support; a first guideway provided in said head-end support and extending lengthwise thereof;
- a second guideway provided in said main frame and disposed beneath said foot-end support, said second guideway extending lengthwise of said main frame;
- a guide element engaged in and movable along said second guideway;
- a first lever having three pivot points arranged in the form of a triangle, said first lever being pivotally mounted on said main frame by a first of said pivot points thereof and having at a second of said pivot points thereof a guide element engaged in the first said guideway;
- a second lever to which said middle support is secured and which has three pivot points arranged in the form of a triangle, which pivot points are respectively connected to a first end of said foot-end support nearer said middle support, to the third of the pivot points of said first lever at a location adjacent the said end of the head-end support nearer the middle support, and to said guide element which is engaged in said second guideway;
- whereby said middle and foot-end supports and said second lever are mounted for movement lengthwise of said main frame in dependence on the angle of inclination of said head-end support;
- a connection means between said main frame and a location on said foot-end support spaced away from said first end thereof, said connection means being operative for lowering the opposite end of said foot-end support on movement of said foot-end support lengthwise of the bed in a direction away from said middle support; and
- means for locating said head-end support in selected positions of inclination about its pivotal mounting on said main frame.

3,887,952
MODULAR CONSTRUCTED FIBERGLASS REINFORCED PAPERBOARD BOAT
Frank S. Nicoll, Jr., Dolfield Rd., Owings Mills, Md. 21117
Filed Dec. 3, 1973, Ser. No. 420,839
Int. Cl. B63b *5/00*
U.S. Cl. 9—6 **12 Claims**

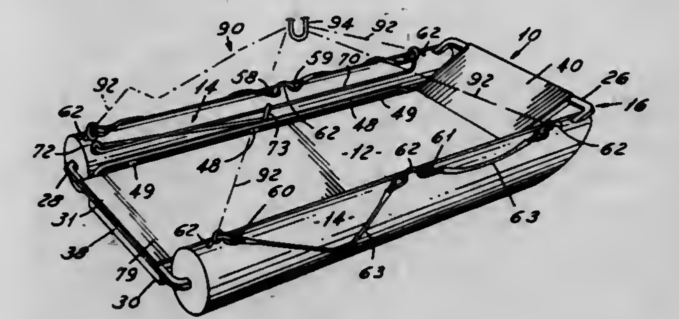
1. In a marine craft formed of a plurality of separate prefabricated modular units adhesively and sealably fastened together to form a complete hull, the improvement wherein:

each unit is formed of fiberglass reinforced, resin treated waterproof paperboard,
- and wherein said units include a number of end to end longitudinally joined unitary hull units, each hull unit being bent into U-shaped cross section including planar, generally vertical sidewalls joined by an integral horizontal planar base portion, a transom spanning the aftmost hull unit, at least one bottom panel commonly underlying said hull units and having its sides overlying and joined to respective planar sidewalls of the hull units and a bow unit including at least one V-shaped bow panel fixed at its rear end to the leading end of the foremost hull unit and at its bottom to the leading end of the foremost bottom panel,



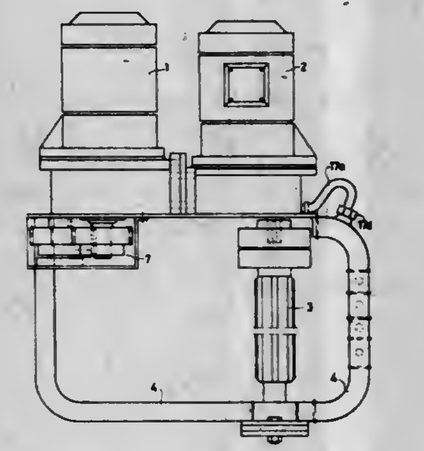
- and wherein, each of said longitudinally joined unitary hull units of U-shaped cross section include right angle, integral planar edge walls at longitudinally forward and rear ends of said units which extend at right angles to the sidewalls and horizontal base portion for each hull unit, and wherein said horizontal base portion forms a center wall between said edge walls, and means for mutually sealably coupling the planar edge walls of adjacent abutting units together,
- and wherein said bow unit panel includes sidewalls inclined outwardly with respect to the longitudinal center line of the craft, and said bow unit further includes an inverted L-shaped rear panel including vertical and horizontal panel portions terminating in a frontal V-shaped edge and said frontal V-shaped edge conforms to the V-shaped sidewalls of the bow panel, and means for adhesively fixing said panals together to form a watertight hull.

3,887,953
RAFT ADAPTED FOR USE AS A WATER RESCUE OR RECOVERY LITTER
Leigh E. Eisenhauer, 3 Warren Rd., Van Wert, Ohio 45891
Continuation-in-part of Ser. No. 320,103, Jan. 2, 1973 abandoned. This application Dec. 28, 1973, Ser. No. 429,179
Int. Cl. B63c *9/04*
U.S. Cl. 9—11 R **9 Claims**



1. A raft adapted for use as a rescue or recovery litter, comprising an elongated body section, elongated parallel floatable pontoons on opposite sides of said body section, a frame structure connecting said body section and pontoons together, said body section having a flat horizontal upper surface adapted to support a person thereon, said upper surface being disposed below the tops of said pontoons and when said raft is afloat unloaded being disposed near water level, said upper surface extending continuously to the rear end of said raft to provide an unobstructed loading deck portion by means of which a person may be floated onto said upper surface, the undersurfaces of said body section and pontoons having upwardly and forwardly inclined front end portions to facilitate forward movement through the water, said pontoons being spaced laterally outwardly from said body section, said body section having opposite sides extending downwardly beneath said upper surface thereof in opposed confronting relation to said pontoons and cooperating with said pontoons to provide longitudinally extending slots in the underside open at the front and rear for the free flow of water therethrough when said raft is pulled lengthwise through the water, thereby to reduce any tendency of the raft to fishtail, said body section being relatively hard, tough and shock resistant on its surfaces.

3,887,954
MOTOR-DRIVEN WASHING APPARATUS
Rolf Gottfrid Carlsson, Kullbackstorpsvagen 21, S-435 00 Molnlycke, Sweden
Continuation-in-part of Ser. No. 270,987, July 12, 1972, abandoned. This application Apr. 26, 1974, Ser. No. 464,635
Claims priority, application Sweden, June 1, 1972, 7168/72
Int. Cl. A47l *1/04*
U.S. Cl. 15—50 C **5 Claims**



1. An apparatus for cleaning vertical surfaces of a ship or building comprising
- a. a rail member disposed horizontally on said surface, said rail member having, in cross-section, a horizontal covering portion extending outwardly from said surface, a support portion extending downwardly from the outermost edge of said covering portion, and a horizontal track portion extending inwardly towards said surface from the bottommost edge of said support portion,
- b. at least one U-shaped channel disposed horizontally on said surface under said covering portion of said rail member, said channel being operable to receive a conduit, and
- c. a movable washing unit comprising
  - i. a frame;
  - ii. wheel means rotatably mounted on said frame for engagement with upper surface of said track portion of said rail and operable to support said washing unit during movement along said rail;
  - iii. means operable to move said washing unit along said rail;
  - iv. at least one vertical brush means rotatably mounted on said frame for washing engagement with said surface;
  - v. means operable to rotate said brush means;

vi. wash fluid spray means; and

vii. a hollow arm disposed on said frame so as to ride under said covering portion of said rail upon engagement of said wheel means with said track portion, said arm being operable to receive a conduit at one end from said channel and conduct said conduit through its hollow core to said washing unit.

3,887,955
HEADLIGHT WIPER

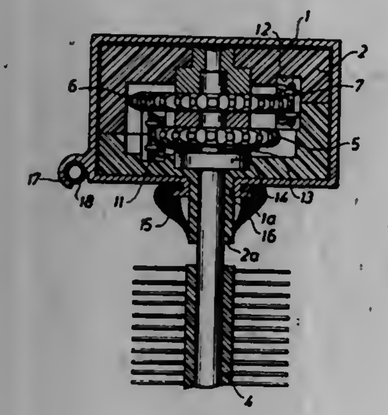
Uro Tapio Järvinen, Satunavagen 18, Marsta, Sweden (19500)

Filed Apr. 9, 1974, Ser. No. 459,306

Claims priority, application Sweden, Apr. 10, 1973, 73050346

Int. Cl. B60s *1/20, 1/44*

U.S. Cl. 15—250.22 **2 Claims**



1. A headlight wiper comprising a stationary body, a carriage mounted for reciprocating movement along a guide way formed in said body, a roatary member mounted in said carriage and serving to carry a generally cylindrical brush, which may be rotated about its longitudinal axis by said member, and a motor-operated drive mechanism for moving the carriage along the guide way and imparting a rotary movement to the rotary member, characterized in that said drive mechanism includes two concentric wheels of mutually different diameter, both connected to the rotary member, and an endless drive means, such as a chain, cable, rope or belt, having two substantially parallel parts extending each on one side of the common rotary axis of said wheels and arranged in engagement each with one of said wheels.

3,887,956
WINDSHIELD WIPER FLUID DISPENSER

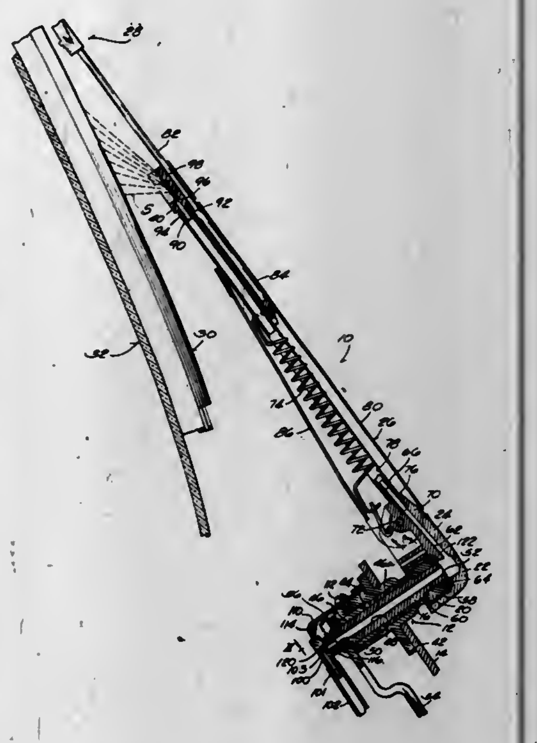
Harold Wind, Kentwood, Mich., assignor to Lescoa, Inc., Grand Rapids, Mich.

Filed Oct. 18, 1973, Ser. No. 407,527

Int. Cl. B60s *1/46, 1/48, 1/52*

U.S. Cl. 15—250.04 **10 Claims**

5. A windshield wiper assembly comprising, in combination: a base for anchoring to the cowling of a vehicle; and drive shaft rotatable in said base; a one-piece integrally formed head member removably anchored to said shaft and rotatable therewith, said head member having a shaft engaging portion and a portion extending radially relative said shaft; a wiper arm attached at one end to said radial portion of said head member; a wiper blade pivotally connected near its center to the other end of said wiper arm; a fluid dispersing nozzle anchored to the underside of said wiper arm near said other end; and condiut means for conveying cleaning fluid to said nozzle from a source comprising a first passageway formed centrally through said shaft, an enlarged central opening in said shaft engaging portion of said head member which communicates with said first passageway when said head member is positioned on said shaft, a second passageway formed centrally through said radial portion of said head member communicating directly with said enlarged opening, and a tubular hose means interconnected between said nozzle and said radial head portion anchored to the underside of said wiper arm.



3,887,957
HEADLIGHT WIPER

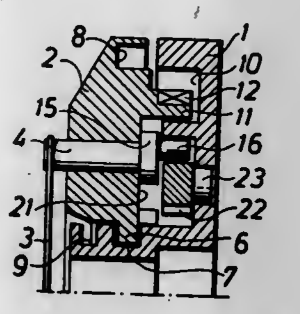
Uro Tapio Järvinen, Satunavagen 18, and Olli Olavi Salminen, Valstavage 58, both of Marsta, Sweden (19500)

Filed Apr. 24, 1974, Ser. No. 463,831

Claims priority, application Sweden, Apr. 27, 1973, 73060022

Int. Cl. B60s *1/20, 1/44*

U.S. Cl. 15—250.16 **8 Claims**



1. A headlight wiper comprising a support ring to be mounted in a stationary position on a headlight, a carrier ring rotatably mounted on the support ring and arranged to be driven from a driving motor, and a wiper arm which is pivotally mounted in the carrier ring and arranged, when the wiper is started, to be swung from an approximately tangential rest position to an approximately radial working position in which the wiper arm will move along the lens of the headlight through the rotary movement of the carrier ring, the wiper further comprising a resetting member carried by the support ring and arranged to cause the wiper arm to return to its rest position without any preceding reversal of the direction of movement of the carrier ring, characterized in that the resetting member is movable between an inoperative position, in which it leaves the wiper arm unaffected thereby, and an operative position, in which it brings the wiper arm to return to its rest position.

3,887,958
HEADLIGHT WIPER MECHANISM FOR A MOTOR VEHICLE

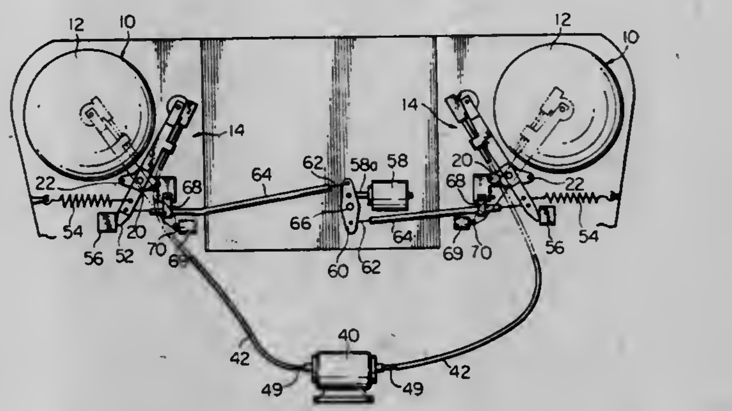
Noburu Fukasawa, Kamakura; Takanori Kitagawa, Yokosuka, and Naohiko Inoue, Yokohama, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed June 18, 1973, Ser. No. 370,605

Claims priority, application Japan, July 22, 1972, 47-86533

Int. Cl. B60s *1/44*

U.S. Cl. 15—250.17 **1 Claim**



1. A headlight wiper mechanism for two headlights of a motor vehicle spaced transversely apart from each other of the motor vehicle, comprising two pivot shafts rotatably supported by the vehicle and disposed radially outside of said headlights; two wiper arm and rotatable blade assemblies attached to said pivot shafts, respectively for unitary rotation with said pivot shafts: operating means for moving said wiper arm and rotatable blade assemblies between operating positions whereat said wiper arm and rotatable blade assemblies are maintained in engagement with the outer surfaces of said headlights and parked positions whereat said wiper arm and rotatable blade assemblies are disposed radially outside of said headlights; and drive means automatically actuated when said wiper arm and rotatable blade assemblies are in said operating positions for imparting rotation to said rotatable blades of said wiper arm and rotatable blade assemblies, wherein the improvement being in the operating means comprises: two arms connected to said two pivot shafts and extending radially therefrom, respectively; two sets of stoppers, each set of stoppers interposing therebetween one of said two arms, providing an arrangement whereby when each of said two wiper arm and rotatable blade assemblies is in its operating position, each of said two arms engages with a first stopper of each set of said two sets of stoppers, and when each of said two wiper arm and rotatable blade assemblies is in its parked position, each of said two arms engages with a second stopper of each set of said two sets of stoppers; two springs, each resiliently biasing each of said two arms to engage with the second stopper of each set of said two sets of stoppers; mechanical linkage means for oscillating said two arms to engage with said first stoppers of said two sets of stoppers, respectively, against the biasing forces of said two springs when actuated; and a solenoid operable to actuate said mechanical linkage means.

3,887,959
APPARATUS FOR SEPARATION OF AIR AND DUST

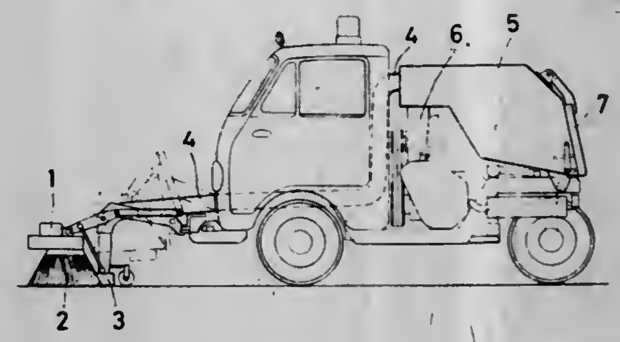
Susumu Matsuo, Minamitsushuki 196 Chasen Cho, Shizuoka, Japan

Filed May 14, 1974, Ser. No. 469,812

Int. Cl. A47l *9/10*

U.S. Cl. 15—347 **2 Claims**

1. An apparatus for separating air and dust comprising, in combination, a closed dust hopper disposed to receive and store dust separated from a mixture of air and dust, an air-discharge hole having a flange projecting into said hopper and disposed within a wall of the hopper, an air and dust injection nozzle positioned within said air-discharge hole in coaxial relationship and projecting into said hopper to a lesser extent than said flange, said dust injection nozzle having a cross section similar to that of the air discharge hole and having a cross-sectional area half the cross-sectional area of said air discharge hole, a tubular member coaxial with the dust injection nozzle and disposed within the hopper in front of the dust injection nozzle and spaced from said flange of said air discharge hole to enclose the air current projecting from said dust injection nozzle and to guide air and dust projecting from



the said injection nozzle to the hopper, a vacuum pump means joined to said air-discharge hole, and a dust collection means, a duct leading from said dust collection means to said dust injection nozzle, whereby dust-containing air passing into the duct is injected into the hopper and separated, the separated dust being collected within the hopper, with the air being removed between the air-discharge hole and said dust injection nozzle.

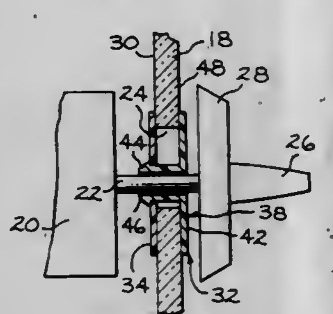
3,887,960
SHAFT BUSHING TO PREVENT SOIL MIGRATION

George R. Sherman, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Feb. 1, 1974, Ser. No. 438,758

Int. Cl. B65d *7/48;* **H01b** *17/26*

U.S. Cl. 16—2 **2 Claims**

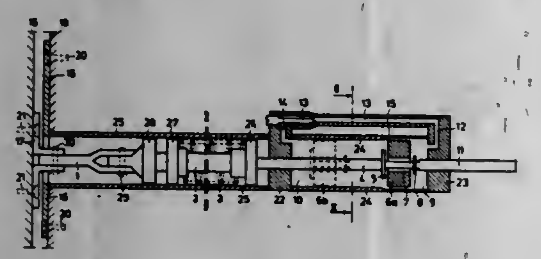


1. A rigid supporting panel having a shaft bushing adjustably mounted in an oversized opening in the panel, said bushing comprising a first member that is larger than the said opening and has an oversized central bore adapted to slip freely over a shaft, said shaft being adapted to be inserted through the said panel opening, and a second interlocking member also being larger than the said panel opening and having a central bore adapted to slip closely over the said shaft, said second member having fastening means engagable in the said oversized bore of the first member and held therewith so that the said opening in the supporting panel is substantially closed by the combined shaft and bushing which extend through the said opening, said bushing being loosely fitted within the said oversized panel opening so as to be capable of lateral adjustment within the plane of the said opening.

3,887,961

DAMPING ASSEMBLIES FOR DOORS OR THE LIKE

Jaakko Saajos, Virkkalantie 30 A, 08100 Lohja 10, Finland
Filed June 12, 1974, Ser. No. 478,708
Claims priority, application Finland, June 15, 1973, 1947/73
Int. Cl. E05f *3/12*
U.S. Cl. 16—56 **9 Claims**

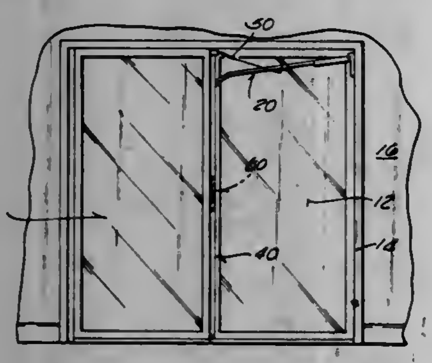


1. In a combination which includes a movable component whose movement must be at least partially damped, a damping assembly for at least partially damping the movement of said component, said damping assembly comprising a cylinder adapted to contain a damping fluid and having a pair of opposed end walls, a piston in said cylinder, said piston and cylinder forming a pair of members at least one of which is movable along the axis of said cylinder with respect to the other, said piston defining with said end walls a pair of interior cylinder chambers respectively situated on opposite sides of said piston, passage means operatively connected wtih said cylinder and providing communication between said chambers so that during movement of said one member along said axis with respect to the other the damping fluid can flow through said passage means between chambers, a piston rod operatively connected with said piston and extending slideably and fluid-tightly through one of said end walls, and an extension rod operatively connected to said piston and extending therefrom slideably and fluid-tightly through the other of said end walls, said extension rod having substantially the same cross section as said piston rod and said piston rod and extension rod forming a unit in which said piston rod and extension rod do not change their position relative to each other, said piston rod and extension rod respectively extending through said chambers and said extension rod rendering unnecessary any structure to compensate for the lack of a piston rod in that one of said chambers through which said extension rod passes.

3,887,962

SLIDING SASH CLOSER

Roy Mills, 1128 Karla Dr., Hurst, Tex. 76053
Filed Oct. 15, 1973, Ser. No. 406,523
Int. Cl. E05f *1/08*
U.S. Cl. 16—72 **9 Claims**



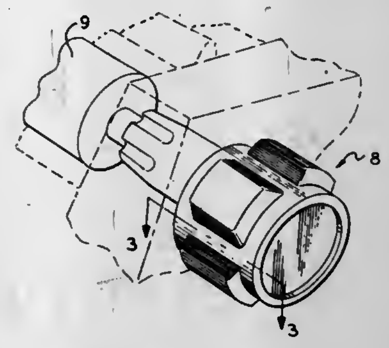
1. In a device for moving a sash which is slidable substantially in the plane of said sash and parallel to a sash guide between two extremes of movement defined by the ends of the sash guide; a plurality of relatively movable parts movable in closely spaced parallel planes and including at least one sash and a sash guide having two ends and extending substantially parallel to the sash, means for biasing a said sash toward one of two extreme positions of said sliding part with reference to another said part, said means comprising a roller, an arm having two ends and an axis extending between them, said arm carrying said roller at one said end, said arm having a pivot on its other end, said pivot being mounted on one of said sash and said sash guide, said pivot being oriented respecting the part on which it is mounted so that said arm is movable in a plane including the edge of another of said plurality of relatively movable parts whereby swinging of said arm causes movement of said roller along said edge,

the improvement comprising: biasing means including an anchor fixed substantially above said roller on the part on which the pivot is mounted, said arm being provided with an abutment extending away from the said axis and from said anchor in the plane in which said arm pivots, said abutment being adjustably fixed to said arm for adjustment along said axis, said biasing means including resilient tension means secured to said anchor and linear connecting means connected at one end to the resilient tension means crossing the axis of said arm and secured over said abutment to apply bias to said arm at a point spaced from said axis in a direction away from said abutment to bias said arm to move said roller along said edge toward said biasing means, said biasing means being strong enough to maintain movement of said sliding part to its extreme position after said movement is initiated.

3,887,963

CONTROL KNOB ASSEMBLY

James E. Harmon, Groton; Stephen R. Watrous, Cortland, and Herrick R. Diamond, Homer, all of N.Y., assignors to SCM Corporation, New York, N.Y.
Filed June 19, 1974, Ser. No. 480,649
Int. Cl. A47b *95/02;* **B25g** *1/00;* **E05b** *1/00*
U.S. Cl. 16—121 **17 Claims**



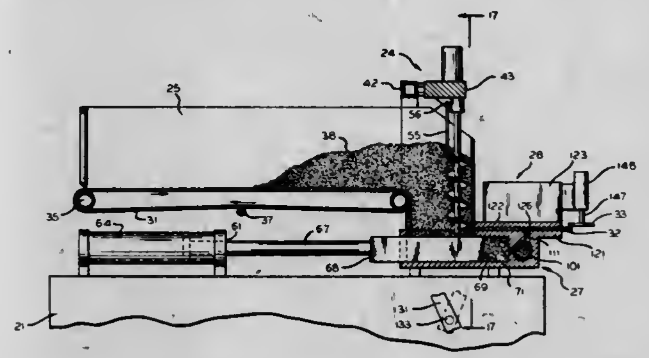
1. A control knob for business machines comprising:
a frame defining a plurality of apertures disposed along the periphery;
a member having a plurality of elevated segments disposed for positioning within said plurality of apertures in said frame and to project therefrom when said member is positioned within said frame;
means for retaining said elevated segments of said member in position within said plurality of apertures in said frame.

3,887,964

FOOD PATTY MOLDING MACHINE

Louis R. Richards, Mokena, Ill., assignor to Formax, Inc., Mokena, Ill.
Filed Jan. 24, 1972, Ser. No. 220,323
Int. Cl. A22c *7/00*
U.S. Cl. 17—32 **12 Claims**

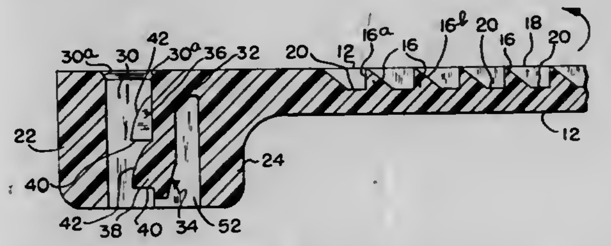
1. A high speed food patty molding machine comprising:
a multiple-cavity, cyclically operable molding mechanism having an inlet for supplying food material simultaneously to all of the cavities, the molding mechanism inlet being closed for a major portion of each molding cycle;
two food pumps, each pump comprising a fixed cavity having an intake opening at one end and an outlet opening at the other end, a plunger aligned with the intake end of the cavity, and drive means for moving the plunger between a retracted ready position clear of the intake opening in the cavity and a pressure position in which the piston is advanced inwardly of the cavity beyond the intake opening toward the outlet opening;
supply means for supplying moldable food material to the intake opening of each pump cavity whenever the plunger for that pump is in its retracted position;
a manifold connected to the outlet openings of the two pump cavities and having an outlet passageway connected to the molding mechanism inlet to supply a substantially unrestricted flow of food material thereto;
actuating means for actuating the pump drive means in overlapping alternation so that at least one pump cavity always contains moldable food material under a given mimimum mold-filling pressure and, when the material in one cavity reaches a given minimum volume, both pump cavities contain moldable food material under the aforesaid mold-filling pressure for a limited pump changeover interval;
and valve means for sealing off the outlet opening of each pump cavity from the manifold whenever the plunger for that pump is moved toward its retracted position, in an overlapping cycle such that both outlet openings communicate with the inlet to the molding mechanism during a part of said changeover interval, thereby affording a continuous supply of moldable food material, under continuous pressure, at the inlet of the molding mechanism.



3,887,965

BUNDLING TIE

Jerome T. Schuplin, Parma Heights, Ohio, assignor to Fastway Fasteners, Inc., Lorain, Ohio
Filed Sept. 4, 1973, Ser. No. 394,291
Int. Cl. B65d *63/100;* **F16l** *3/22*
U.S. Cl. 24—16 PB **17 Claims**

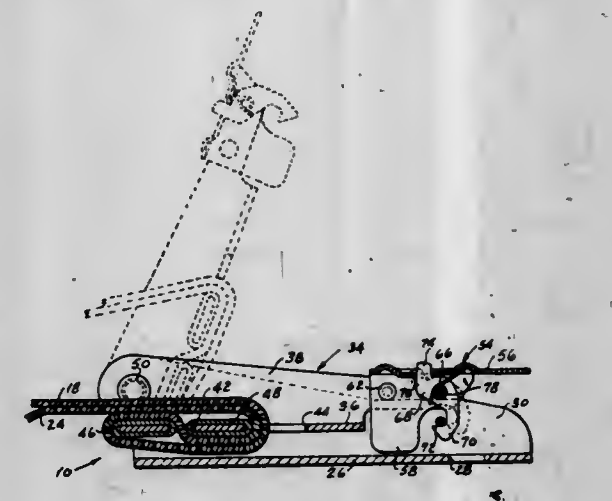


1. A flexible bundling tie including an elongated strap and a head attached to one end thereof adapted for locking coaction with the strap, said strap having teeth formed on one side thereof, said head having a generally vertically extending aperture therethrough adapted to receive the strap, a generally flexible vertically elongated pawl formed on said head and extending into said aperture in the same general direction of extension as the axis of said aperture, said pawl having a plurality of spaced teeth projecting therefrom in said aperture adapted for abutting engagement with respective of the strap teeth to hold the tie in encompassing relation to a bundle, at least certain of said pawl teeth in a direction transverse of said pawl extending laterally a lesser distance than the width of said pawl and being staggered with respect to one another in a direction transverse of said pawl.

3,887,966

HEAVY DUTY TENSION LATCH

Paul R. Gley, Hillsdale, N.J., assignor to Rexnord Inc., Milwaukee, Wis.
Filed July 30, 1973, Ser. No. 383,987
Int. Cl. A44b *21/00*
U.S. Cl. 24—68 CD **6 Claims**



1. A latch and belt assembly for tensioning a flexible belt length along a line of action including in combination, a length of flexible belt having a free end, a mounting bracket having a base, a handle having a bottom and sides extending upwardly from said bottom, said bottom being formed with spaced openings providing a first bottom portion extending between said sides at a location adjacent to one end of said handle and a second bottom portion extending between said sides at a location intermediate the ends of said handle, and means mounting said handle sides on said bracket at a location above said base for pivotal movement around an axis from an open position at which said second bottom portion is above said axis to a closed position at which said second bottom portion is between said axis and said base, said belt length base, the closed position of said handle extending from said free end thereof into said latch past said first and second handle bottom portions on one side of said bottom and around said second bottom portion and between said first and second bottom portions and around said first portion and past said first and second portions on the other side of said bottom and again around said second bottom portion and past said first and second portions on said one side of said bottom and outwardly and away from said latch along a line of action generally parallel to said base so that spaced portions of said belt adjacent to said free end are captured between said second bottom portion and the outwardly extending portion of said belt and between said first bottom portion and the outwardly extending portion of said belt.

3,887,967

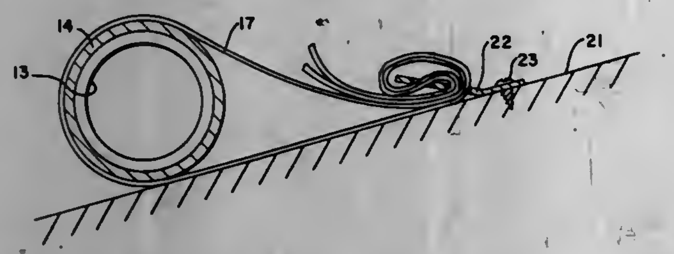
SOLAR HEATER PANEL ARRAY SECURING APPARATUS

Benjamin Edward Vandenbossche, Menlo Park, Calif., assignor to Fafco Incorporated, Menlo Park, Calif.
Filed Aug. 30, 1974, Ser. No. 501,895
Int. Cl. A44b *21/00*
U.S. Cl. 24—73 PB **10 Claims**

1. An apparatus for securing a solar heating panel array to a supporting structure using heating panels having a flat central portion presenting maximized area to the environment with a plurality of channels extending through the flat central portion for carrying a fluid for exchanging heat with the environment, and having headers on each end of the central portion in communication with the channels, and joints for at-

taching the headers to other headers on adjacent panels for side by side disposition thereby providing increased panel area for contact with the environment, comprising a plurality of first straps for surrounding the joints between the panels on one end thereof,

a plurality of second straps for surrounding the joints between the panels on the other end thereof,



means for receiving ones of said plurality of first and second straps for holding therein, said means for receiving being secured to the supporting structure,

said second straps having greater elasticity than said first straps, whereby when said first and second straps are placed in tension in opposing directions and the heating panels change dimensionally over a temperature range due to temperature coefficient of expansion of the panel material, said second straps yield thereby preventing leakage at the joints by relieving stress on the joints.

3,887,968
COMPOSITE ELASTIC BAND FOR USE WITH A GARMENT

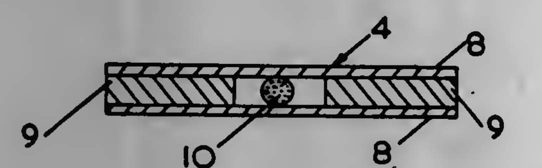
John Edward Lynam, Melton Mowbray, England, assignor to Automatic Braiding Co. (Nottingham) Ltd., Mowbray, England

Filed June 14, 1973, Ser. No. 369,962

Claims priority, application United Kingdom, June 21, 1972, 28932/72; Apr. 10, 1973, 17115/73

Int. Cl. B32b *3/04, 3/24;* **A41f** *9/00*

U.S. Cl. 24—266 **5 Claims**



1. A prefabricated composite elastic band for use in connection with a garment and capable of being stretched elastically from a relaxed condition and of recovery to said condition, comprising a core having two faces including two substantially co-planar elastic ribbons spaced apart from each other with a gap between adjacent edges, a cover composed of a flexible material connected to the core and extending over and covering both faces of the core and covering the gap, and a tie-cord extending freely, within the gap, lengthwise of the band, said tie-cord being puckered when said band is in said relaxed condition.

3,887,969
APPARATUS AND METHOD FOR COOLING A CRIMPED TOW

Wayne K. Erickson, and Albert F. Stegelman, both of Greenville, S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

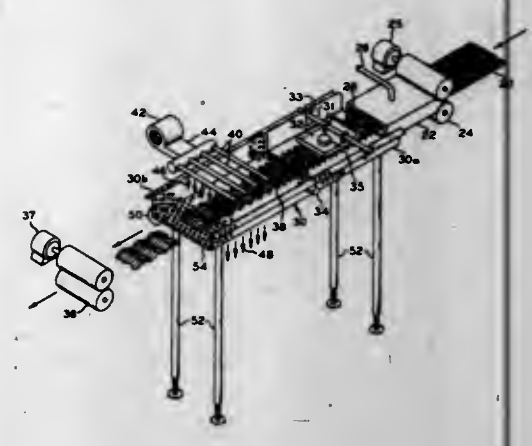
Filed Sept. 14, 1973, Ser. No. 397,259

Int. Cl. D02g *1/12*

U.S. Cl. 28—1.6 **12 Claims**

6. Apparatus for cooling a heated crimped tow of synthetic filaments comprising, in combination:

crimping means; first and second sections, said first section having a surface extending a distance from said crimping means and being positioned for receiving the tow and said second section having a surface which is an extension of, attached to, and extended a distance outwardly from the surface of said first section to receive said tow from said first section, said first section having a surface which is of sufficient length to cool the tow to a temperature such that moderate tension can be applied to the tow in said second section without impairing the crimp retention of the tow;



a weight means to force said tow against said first section, said weight means being fastened to said first section in a manner to prevent horizontal movement and allow vertical movement of said weight means;

a cooling means for contacting said tow with a cooling fluid in said second section; and

withdrawal means positioned subsequent to said second section to remove the tow therefrom.

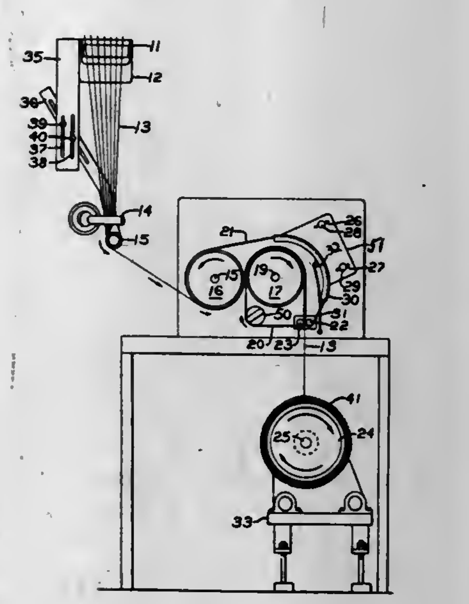
3,887,970
METHOD OF PRODUCING CRIMPED FIBER GLASS

Warren W. Drummond, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 363,912, May 25, 1973, which is a continuation-in-part of Ser. No. 274,951, July 25, 1972, abandoned. This application Dec. 18, 1973, Ser. No. 425,914

Int. Cl. D02g *1/00;* **C03b** *37/04*

U.S. Cl. 28—72.1 **12 Claims**



1. A method of producing crimped fiber glass mat comprising passing a plurality of fiber glass strands in an essentially parallel relationship with respect to each other through an attenuating device operating to produce a high rate of speed in the parallel strands, rapidly projecting the parallel strands being attenuated at a high rate of speed in a substantially straight line from the attenuator, interrupting the path of travel of the paralleled strands by imposing a collection surface for the strands in their path of travel and in close proximity thereto while they are being transmitted in a straight line and before any substantial wave motion is imparted to the paralleled strands and collecting an interlocked fiber glass product on said collection surface.

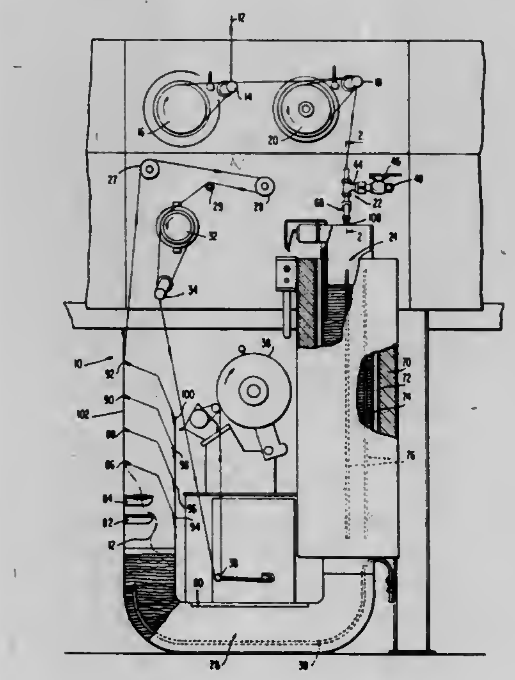
3,887,971
OUTLET MEANS IN A THERMOPLASTIC YARN REBOUND TEXTURIZING APPARATUS

Lloyd M. Guenther, Severna Park, Md., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 28, 1973, Ser. No. 429,058

Int. Cl. D02j *1/16*

U.S. Cl. 28—1.4 **3 Claims**



1. In bounce crimping apparatus for texturizing multifilament thermoplastic yarn including:

a yarn texturizing chamber having an inlet, a fluid outlet aligned longitudinally with said inlet, and a lateral yarn outlet,

means for introducing a heated fluid into said yarn texturizing chamber for drawing yarn into said chamber,

a foraminous surface positioned across said fluid outlet of said chamber, said heated fluid introduced into said chamber for drawing yarn into said chamber further serving to hurl the yarn against said foraminous surface to axially compress and crimp the yarn filaments and rebound the yarn through said lateral outlet, and

means for collecting the crimped yarn while maintaining the yarn substantially free from longitudinal tension,

the improvement comprising:

a tubular member connected to said lateral outlet in said chamber for conveying the crimped yarn from said chamber to said means for collecting the crimped yarn and for continuously axially compacting the yarn as the yarn is conveyed to said means for collection,

said tubular member having,

a first end connected to said lateral outlet of said chamber for receiving yarn rebounded from said foraminous surface, wherein a central longitudinal axis of said tubular member at said first end extends at right angles with respect to and intersects a central longitudinal axis of said chamber; and

a second end for directing the yarn from the tubular member into said means for collecting the crimped yarn,

said tubular member being curved such that said curve provides resistance to the passage of yarn therethrough for axially compacting the yarn within the tubular member, and

said tubular member being circular in cross section and having an inside diameter slightly greater than the largest dimension of said lateral outlet of said yarn texturizing chamber whereby yarn hurled against said foraminous surface to be axially compressed and crimped and rebound through said lateral outlet may readily enter said tubular member and conform to the shape thereof without substantial buckling of the yarn upon itself as said yarn exits said lateral outlet.

3,887,972
CRIMPING OF SYNTHETIC PLASTIC FILAMENTS

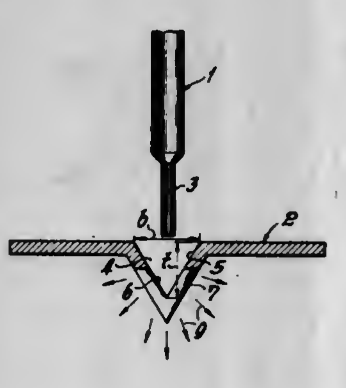
Ernst Bauch, Bordesholm, Germany, assignor to Neumunstersche Maschinen-und Apparatebau Ges. MbH, Neumunster, Germany

Filed July 23, 1973, Ser. No. 381,493

Claims priority, application Germany, July 22, 1972, 2236024

Int. Cl. D02g *1/16*

U.S. Cl. 28—1.4 **13 Claims**



1. In an apparatus for crimping synthetic plastic filaments, a combination comprising first means having a surface; second means for moving said first means so that said surface travels continuously; third means for directing a synthetic filament in plastic state in a path substantially normal to said surface, so as to become crimped by contact with said surface; and a groove formed in said surface into which said filament enters so as to be confined against lateral displacement upon contact with the travelling surface, said groove including a plurality of apertures extending from its interior through said first means.

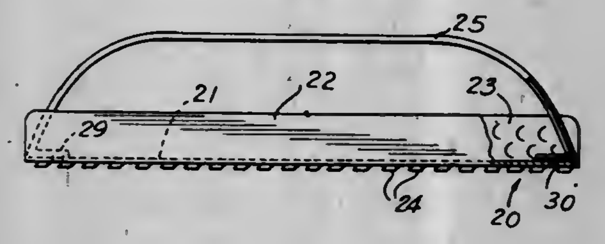
3,887,973
DISPOSABLE COMBINATION FILE AND HANDLE

James A. Coon, 929 Driver St., W. Sacramento, Calif. 95691

Filed Feb. 26, 1974, Ser. No. 445,954

Int. Cl. B23d *71/04*

U.S. Cl. 29—78 **3 Claims**



1. A disposable combined file and handle comprising a generally rectangular plate, a pair of upstanding side walls integrally secured to the opposite side edges of said plate and extending perpendicularly from said plate, a plurality of sharpened file teeth struck from said plate and one of said walls, a bow handle positioned over said plate and including an elongate strip of metal having the opposite side edges thereof

rolled under to provide stiffness of said handle, and a pair of tabs integrally formed on the opposite ends of said handle and bent to engage the upper surface of said plate and spot welded thereto.

3,887,974

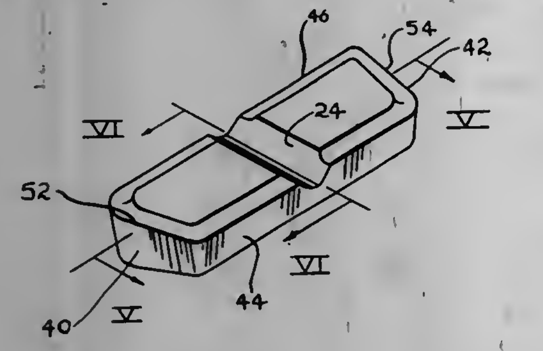
CUTTING INSERT AND HOLDER THEREFOR

Edward L. Sorice, Crabtree, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Aug. 1, 1974, Ser. No. 493,560

Int. Cl. B26d *1/00*

U.S. Cl. 29—95 R **9 Claims**



1. A cutting insert comprising: a body of hard wear resistant material having top and bottom and side and end walls, said side walls being parallel and longer than said end walls and said body being symmetrical about an axis perpendicular to said side walls when viewed in plan, one of the longer side walls being shorter than the other thereof whereby said end walls converge toward one side wall of said body, each end wall of the body forming a cutting edge at the junction thereof with the said top wall of the body, said top wall having a flat island area upstanding thereon which at the ends is spaced inwardly from said cutting edges, a land region in the plane of said top wall extending inwardly from each cutting edge, and a fillet at the inner edge of each land region leading upwardly to the plane of said island area.

3,887,975

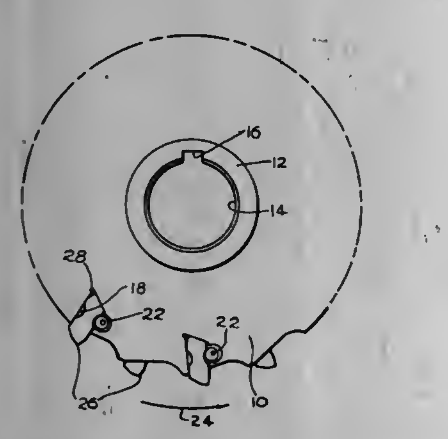
SLOTTING CUTTER AND CUTTING INSERT THEREFOR

Edward L. Sorice, Crabtree, and Ernest J. Friedline, Latrobe, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed May 13, 1974, Ser. No. 469,516

Int. Cl. B26d *1/12*

U.S. Cl. 29—105 R **7 Claims**



1. In a slotting cutter; a disc like body having parallel side walls and rotatable in a predetermined direction on a central axis perpendicular to the plane of the body, a plurality of pockets formed into each side wall of the body in circumferentially distributed relation with the pockets in one side of the body staggered relative to the pockets in the other side of the body when the body is viewed in the axial direction, each pocket having circumferentially spaced front and rear walls and an axially bottom wall and a radially inner wall and open on the other two sides, said axially bottom wall converging with the respective side wall of the rotatable disc body in the direction of rotation of said disc body and also inclining outwardly toward said disc wall from the radially inner end of said axially bottom wall toward the outer end thereof, a cutting insert in each pocket having parallel front and back walls and parallel side walls perpendicular to said front and back walls, each insert having an end portion protruding radially from said body and presenting a cutting edge, and clamping means for clamping each insert in the respective pocket while simultaneously urging the insert toward the said rear wall and the said radially inner wall of the pocket.

3,887,976

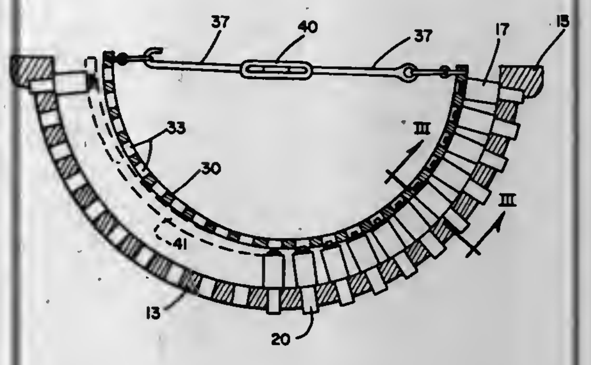
STATOR BLADE ASSEMBLY FOR TURBO MACHINES

J. Rodger Sheilds, 1601 Penn Ave., Pittsburgh, Pa. 15206, and Alexander A. Carroll, 3010 Court Pl., Greensburg, Pa. 15601

Division of Ser. No. 112,163, Feb. 3, 1971, abandoned. This application Feb. 26, 1973, Ser. No. 335,973

Int. Cl. B21k *3/00*

U.S. Cl. 29—156.8 R **3 Claims**



1. The method of assembling an arcuate shroud ring to the inner ends of an arcuate series of stator blades extending in a radial direction inwardly from a machine casing, the ring having apertures spaced apart circumferentially for receiving in registration therewith said blade ends, the method including contracting the shroud ring by applying a force thereto to reduce the diameter of the shroud ring to a diameter less than that described by the ends of the blades in the series whereby at least one blade receiving aperture in the ring is insertable into one of said blade ends,

inserting said one aperture into said one blade end, and

relieving said contracting force to permit the shroud ring to expand whereby the remaining apertures move into receiving registration with the remaining blade ends in said series.

3,887,977

METHOD OF PRODUCING AIR CONDITIONERS

Valerio Giordano Riello, Legnago, Italy, assignor to Riello Condizionatori S.A.S. di Giordano-Riello & Co, Bevilacqua, Verona, Italy

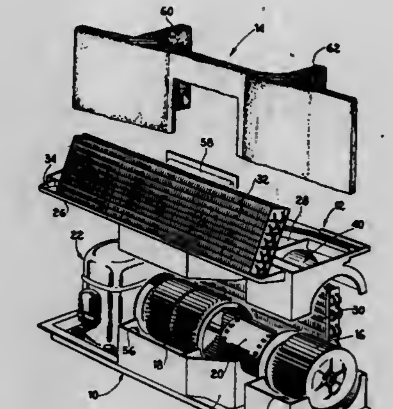
Division of Ser. No. 154,956, June 21, 1971, Pat. No. 3,756,039. This application June 8, 1973, Ser. No. 368,080

Claims priority, application Italy, June 20, 1970, 26327/70

Int. Cl. B25d *23/02, 23/08*

U.S. Cl. 29—157 R **9 Claims**

1. A method of producing an air conditioner having a compressor, a condenser, an evaporator connected to said compressor, and an electromechanical blower unit comprising an electric motor and a pair of blowing fans driven by said motor and arranged with the latter along a common axis, said method comprising the steps of molding a pair of three-dimensional structural components each having a wall of substantially rectangular outline; placing said motor and said fans on said wall of rectangular outline of one of said structural components; connecting said walls of rectangular outline by additional walls extending substantially normal thereto and defining between said walls of rectangular outline at least in part three recesses respectively housing said motor and said fans, with each of said walls of rectangular outline projecting with portions thereof beyond said additional walls; forming in said structural components air passages providing communication between said recesses and communication of said recesses with the surrounding atmosphere; mounting said compressor and said condenser on said portions of said wall of rectangular outline of said one component which projects beyond said additional walls; and mounting said evaporator on a portion of said wall of rectangular outline of said other component which projects laterally beyond said additional walls, said condenser being mounted on said one component to project in part upwardly beyond said other component and said evaporator being mounted on said other component to project upwardly therefrom.



3,887,978

MANUFACTURING OF BEVEL GEAR BY COLD FORMING OF BLANKS IN A PRESS DIE

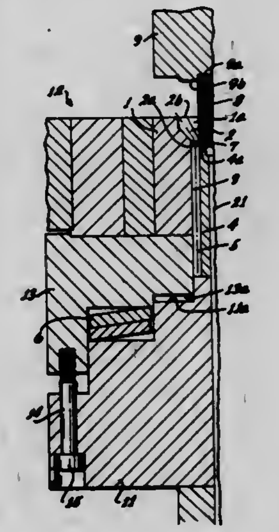
Fritz Dohmann, Furth, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte AG, Hannover, Germany

Filed Apr. 8, 1974, Ser. No. 459,161

Claims priority, application Germany, Apr. 21, 1973, 2320336

Int. Cl. B21j *5/12*

U.S. Cl. 29—159.2 **6 Claims**



1. In an apparatus for forming bevel gear, including a die with bevel gear forming die cavity, a punch acting from the side of largest diameter of the die cavity and a counter punch acting from the side of smallest diameter, the improvement, comprising:

- **a continuation portion of the die cavity having gear shaped cross-sectional contour corresponding to the smallest,** bevel-gear-defining cavity portion, and having longitudinally cylindrical configuration;
- the counter punch positioned in said continuation portion of the die cavity and having correspondingly gear like cross-section; and
- means for advancing the counter punch during the last phase of the relative advance of the punch.

3,887,979

MANUFACTURING PROCESS OF A ROLLED GEAR

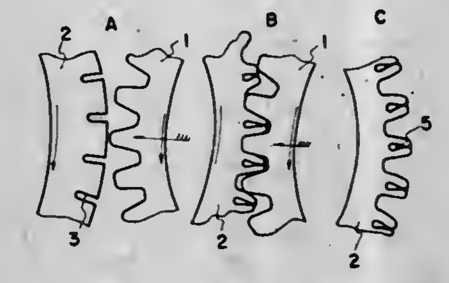
Minoru Kamiya, 2-46-3 Minami Otsuka, Tokyo, Japan

Filed July 1, 1974, Ser. No. 484,754

Claims priority, application Japan, Mar. 6, 1974, 49-025912

Int. Cl. B21h *5/00;* **B23p** *15/14;* **B29d** *15/00*

U.S. Cl. 29—159.2 **7 Claims**



6. A method of manufacturing a rolled gear having an elastic tooth profile comprising the steps of forming spaces on the periphery of the gear material at a pitch consistent with that of the gear to be produced, and forcing a rolling dye against said gear material with a force sufficient to deform the gear material and form a water drop-like gap in a portion of the tooth profile.

3,887,980

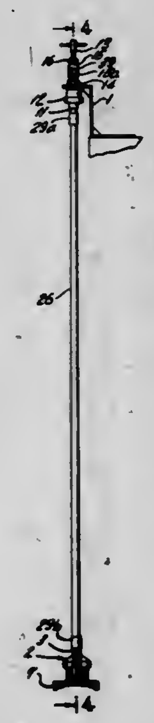
NUCLEAR FUEL BUNDLE DISASSEMBLY AND ASSEMBLY TOOL

Jack Yates, and John W. Long, both of Richland, Wash., assignors to Exxon Nuclear Company, Inc., Bellevue, Wash.

Filed Mar. 29, 1973, Ser. No. 345,831

Int. Cl. B23p *19/04*

U.S. Cl. 29—200 D **7 Claims**



1. A tool for assembling and disassembling a nuclear power reactor fuel bundle of the type having a plurality of tie rods in parallel array, each of said rods being secured at one end to a lower tie plate disposed normal to the axes of said tie rods

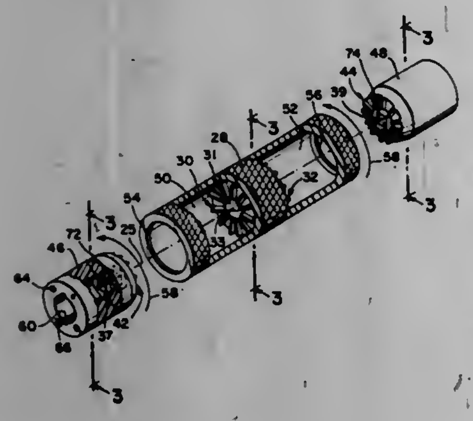
and the other end extending through openings in an upper tie plate, said tie plates having openings for accepting and positioning fuel rods in parallel array therebetween, and wherein each of said tie rods is provided with an elongated slot near the end extending through said upper tie plate for receiving the tines of a locking fork to secure said tie plates against separation by compressed springs mounted therebetween, said tool comprising in combination:

- (a) a means for depressing said upper tie plate relative to said tie rods and toward said lower tie plate against the pressure of said compressed springs by acting against a rigid support fixed in position relative to said lower tie plate and thereby exposing said tie rod slots;
- (b) locking fork carrier means for engaging and moving said locking forks in a direction substantially parallel to said upper tie plate after said upper tie plate has been depressed by said depressing means of (a), said carrier means mounted on said depressing means and capable of moving independently thereof, said fork carrier means being operated by a force directed normal to said upper tie plate and including a means for translating said normal force into a force parallel to said upper tie plate for moving said locking forks;
- c. means for engaging and disengaging said depressing means and said fork carrier means whereby said depressing means may be engaged with said fork carrier means when said upper tie plate is depressed and disengaged when said locking forks are moved by said carrier means.

3,887,981
INSTALLATION TOOL FOR WIRE CONNECTORS

Charles F. Mazzeo, Scotch Plains, and Anthony J. Santos, Edison, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Filed June 24, 1974, Ser. No. 482,239
Int. Cl. B25b *27/02;* **H05k** *13/00*
U.S. Cl. 29—203 H **11 Claims**

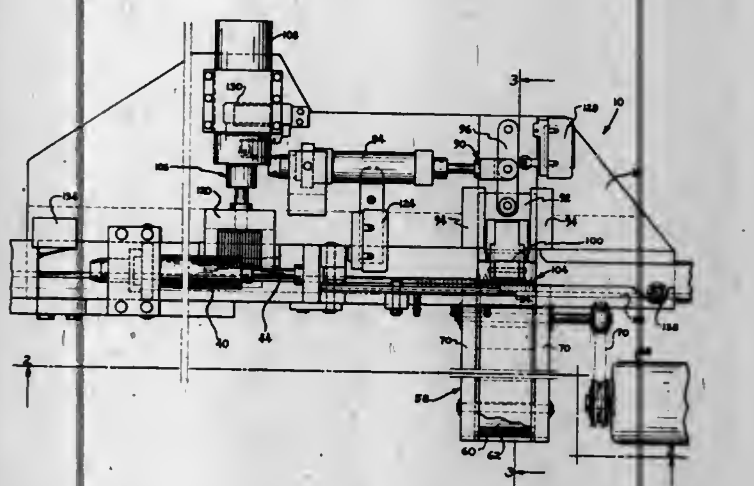


1. A hand operable installation tool comprising
- a. a substantially hollow elongated body member, said body member being provided with an internally extending annular flange at each end;
- b. two cylindrically-shaped wrench heads, one of said wrench heads being adapted to rotate within the hollow at each end of said body member and being adapted to be retained therein by said annular flanges, said wrench heads being provided with a receptacle on the outer end thereof complementary in shape to said wire connector for receiving the latter therein; and
- c. one-way clutch means engageable between each of said wrench heads and said body member, said one-way clutch means being adapted to transmit torque applied to said body member to said wrench heads for causing said wrench heads to rotate unidirectionally about the longitudinal axis of said body member.

3,887,982
SUBSTRATE LOADER

Robert W. Delisle, Dover, Pa., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 388,363, Aug. 15, 1973. This application July 31, 1974, Ser. No. 493,232
Int. Cl. H01r *43/00*
U.S. Cl. 29—203 DS **2 Claims**

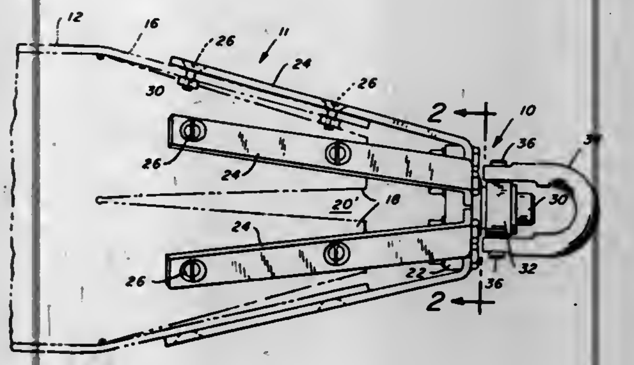


1. Substrate loading apparatus including a terminal feed path for a carrier strip having a number of clip-type terminals extending therefrom, means for loading successive substrates on terminals on the carrier strip located in a work zone, feed means for incrementally indexing the carrier strip along the feed path, and means located adjacent the feed path upstream from the first named means for blanking a selected number of terminals from the carrier strip.

3,887,983
PIPE PULLING TOOL

William F. Province, Bartlesville, Okla., assignor to The Ridge Tool Company, Bartlesville, Okla.

Continuation of Ser. No. 318,002, Dec. 26, 1972, abandoned. This application Aug. 5, 1974, Ser. No. 495,060
Int. Cl. B23p *19/04*
U.S. Cl. 29—234 **9 Claims**

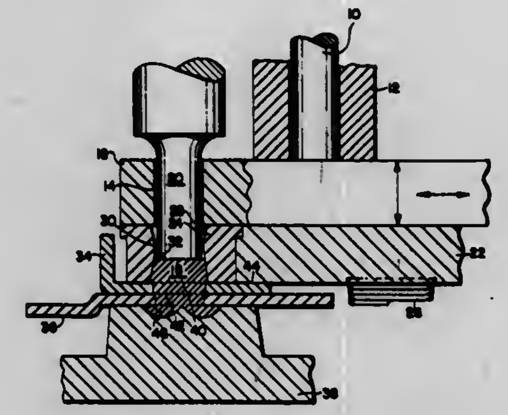


1. The combination of a liner pipe and a liner pipe pulling means, comprising:
- a. a liner pipe, one end of said liner pipe having a plurality of fingers extending from the end of the pipe and spaced circumferentially around said pipe, said fingers bent inwardly to form generally a truncated conical surface;
- b. said pulling means comprising: axial support means; a plurality of circumferentially spaced straps attached to said axial support means; said straps expanding outwardly from the axis to form generally a conical surface;
- c. means to removably attach each of said straps individually to one of said fingers; and
- d. means to attach a tensile means to said axial support means.

3,887,984
RIVETING APPARATUS AND METHOD

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 303,065, Nov. 2, 1972, Pat. No. 3,828,421. This application Mar. 15, 1974, Ser. No. 451,341
Int. Cl. B23p *11/00*
U.S. Cl. 29—243.53 **6 Claims**

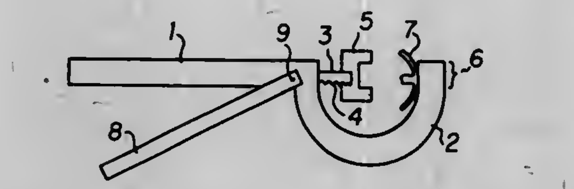


1. Riveting apparatus comprising a support, a guide and clamp member connected to said support for reciprocating movement relative to said support, means normally biasing said guide and clamp member to a first position, said guide and clamp member being provided with a passageway extending therethrough and including a restricted orifice, slug feed means for feeding a slug having a diameter slightly greater than the diameter of said orifice to a position contiguous to one end of said passageway and in alignment with said passageway, an anvil for supporting parts to be riveted with holes through the parts in substantial alignment with said passageway and adjacent the other end thereof, means to force said slug through said passageway so that the pressure generated as said slug passes through said orifice overcomes the action of said biasing means and moves said guide and clamp member into clamping engagement with said parts, said anvil being provided with recess means for reception of a portion of said slug to form cap means on one end of said slug.

3,887,985
DEVICE FOR MOUNTING AND DEMOUNTING GUIDES ON A CARRYING ROD

Raymond A. Zenon, Abbeville, La., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 20, 1974, Ser. No. 471,181
Int. Cl. B25b *27/02*
U.S. Cl. 29—267 **5 Claims**

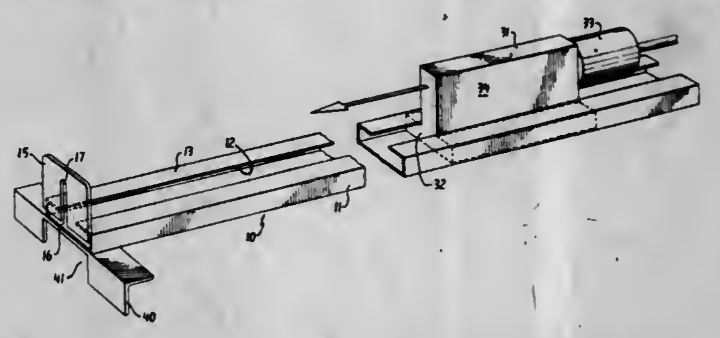


1. In a device for removing an object from a carrying rod, said object being adapted to be forcibly slide onto said carrying rod by way of a longitudinally extending groove therein, said device having means for forcing a first member thereof toward and away from a spaced apart opposing second member thereof, the improvement comprising a support means carried by one of said first and second members, said support means having spaced apart upstanding sections for supporting said carrying rod on opposite longitudinal ends of said object so that said object is spaced away from said support means, and a press means carried by the other of said first and second members opposite said support means, said press means for bearing against an object carried by said support means to press said object onto or off of its carrying rod, said press means having a longitudinally extending indentation therein for receiving said object, and shoulder means on both sides of said indentation for contacting said object on either side of said groove in said object.

3,887,986
DRIVE CAP GUIDE ASSEMBLY FOR INTERCONNECTING ADJOINING SHEET SECTIONS

Mace Edward Walton, 8008 Holly Ave., Waldorf, Md. 20601

Filed Mar. 5, 1974, Ser. No. 448,391
Int. Cl. B25b *27/16*
U.S. Cl. 29—271 **11 Claims**

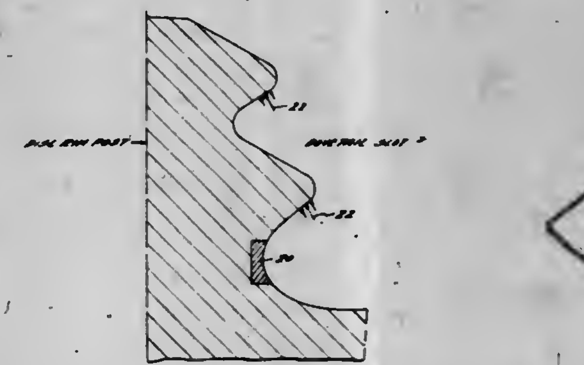


1. In a guide assembly for interconnecting adjoining sheet sections together with a drive cap, the adjoining edges of the sheet sections being shaped to mate with the drive cap to effect interconnection thereby, comprising:
- a. a first guide section comprising a long channel to receive the drive cap, having an entry end through which the drive cap enters and an exit end through which the drive cap exists, and further defining a slit at the top portion thereof to receive any vertical extension of the drive cap,
- b. a second guide section secured to the top portion at the exit end of the first guide section to guide said any vertical extension of the drive cap during the interconnection operation, the first and second guide sections being shaped to securely support the drive cap and prevent distortion thereof during the interconnection operation,
- c. drive means to drive the drive cap through the first and second guide sections, and
- d. an angle stop attached beneath the first guide section at the exit end of the first guide section and defining a notched section for receiving a bar slip.

3,887,987
METHOD OF MAKING, AND OF MEASURING ARTICLE FATIGUE LIFE

Trevor L. Salt, Beverly, Mass., assignor to General Electric Company, Lynn, Mass.

Division of Ser. No. 323,349, Jan. 15, 1973. This application July 29, 1974, Ser. No. 492,862
Int. Cl. B23q *17/00*
U.S. Cl. 29—407 **4 Claims**

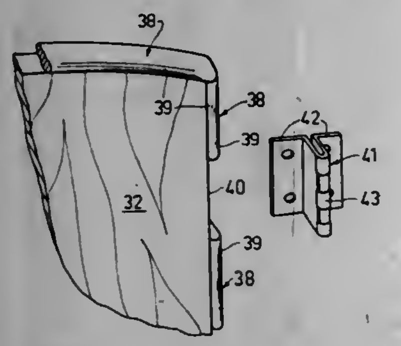


1. A method for making an article having at least a minimum selected useful fatigue life under certain operating conditions, the article being made of a selected material, comprising the steps of:

making an initial design for the article;
selecting from the design an area of relatively high stress;
obtaining stress/strain data for the selected material;
obtaining stress intensity/crack growth data and at least one fatigue characteristic for the selected material;
determining a characteristic material defect length (λ) for the selected material by:
a. selecting at random a first characteristic material defect length for the selected material; and then
b. comparing and modifying the length of the initial characteristic material defect length with the stress/strain data and stress intensity/crack growth data in an literative method until a characteristic material defect length (λ) matches the fatigue characteristic;
applying (λ) to the stress data to determine the useful fatigue life of the article in the relatively high stress area, and then making the article to the design if the useful fatigue life is at least the selected minimum or reshaping the design of the relatively high stress area until the useful fatigue life is attained and then making the article to the reshaped design.

3,887,988
METHOD OF PRODUCING FURNITURE

Walter John Mortlock, 46 Macarthur Rd., East Camden, New South Wales, Australia
Filed Aug. 29, 1973, Ser. No. 392,390
Int. Cl. B23p *17/00*
U.S. Cl. 29—416 **11 Claims**



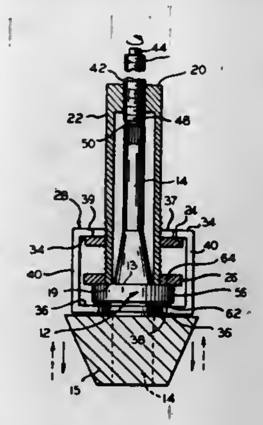
1. A method of producing for furniture a frontispiece of sheet material provided with at least one aperture for access therethrough and a displaceable panel to occupy the aperture, said method comprising cutting out said panel from said sheet material to leave an aperture in the latter, and securing edging strips in such respective positions that when the panel is returned to the aperture said strips are located to occupy at least some of the gap, of the cut, between the panel and the sheet.

6. A method of producing for furniture a frontispiece of sheet material provided with at least one aperture for access therethrough and a displaceable panel to occupy the aperture, said method comprising placing said sheet material on a worktable adjacent a rotatable routing tool, advancing the routing tool to cut into the sheet material, imparting predetermined relative movement between the sheet material and the routing tool whereby the latter progressively cuts out a panel from the former to leave a predetermined aperture, and subsequently securing edging strips in such respective positions that when the panel is returned to the aperture said strips are located to occupy at least some of the gap, represented by the cut of the routing tool, and located between the panel and the sheet.

3,887,989
BEARING PULLER DEVICE

Wade Maynard, 7009 S.W. 14th St., Des Moines, Iowa 50309
Filed Feb. 7, 1973, Ser. No. 330,211
Int. Cl. B23p *19/02*
U.S. Cl. 29—427 **17 Claims**

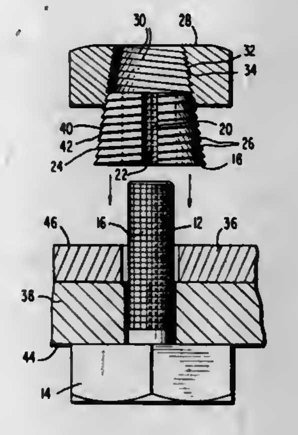
1. A bearing puller device to remove or position a bearing assembly from its seat on a shaft, said puller comprising:
a tubular member;
an upper collar and a lower collar associated with said tubular member, each of said collars being adjustable on said tubular member; and
clamp means for gripping said upper collar and said bearing assembly, said bearing assembly being operatively positioned between said lower collar and said clamp means, said bearing assembly being removed or positioned on said seat by the application of an external force to said shaft.



10. The method of claim 9, wherein said shaft extends outward from said bearing assembly and said method further comprises positioning said tubular member over said shaft.

3,887,990
METHOD OF SECURING TWO MEMBERS TOGETHER WITH A FASTENER

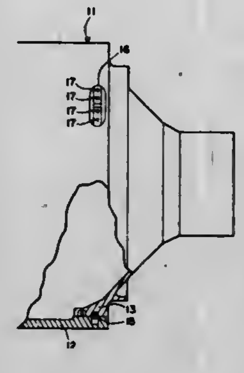
Floyd Leroy Wilson, P. O. Box 203, Manhattan, Kans. 66502
Filed Dec. 11, 1972, Ser. No. 313,619
Int. Cl. B23p *11/02, 19/00, 19/02*
U.S. Cl. 29—450 **5 Claims**



3. A method of releasably fastening two members together by providing a stud located to extend through the members and having an exposed serrated portion;
providing a nut and insert assembly, the insert having an interior opening sufficiently large to freely slide over the serrated portion of said stud and having an outer surface which is tapered relatively to the walls of the inner surface of said nut the surface of the interior opening of the nut being threaded;
slipping said insert-nut assembly over the serrated portion of said stud; and
applying an axially directed compressive impact between one end of the stud and the insert-nut assembly thereby to compress the interior surface of the insert into locking engagement with the serrated portion of the stud while advancing the nut along the outer surface of the insert with the nut being locked to the insert outer surface to prevent relative axial movement by coacting threads after application of the compressive force except through rotation of said nut relative to said insert.

3,887,991
METHOD OF ASSEMBLING A SAFETY DEVICE FOR ROCKETS

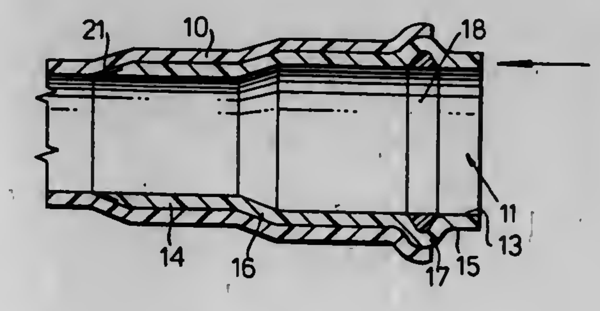
Edward A. Panella, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed May 17, 1974, Ser. No. 470,892
Int. Cl. B23p *11/02*
U.S. Cl. 29—450 **3 Claims**



1. A method for fastening closures and a rocket motor case together comprising the steps of:
a. providing an externally grooved closure;
b. providing an internally grooved cylindrical motor case;
c. aligning the grooves;
d. inserting a resilient wire having a cross section larger than the groove in the closure and smaller than the groove in the motor case in the aligned grooves;
e. resiliently drawing the ends of the wire together; to move the wire into the groove in said closure, and
f. fastening the ends of the wire together with a locking clip fabricated from a material which will retain its streenth at temperatures up to a predetermined temperature and then fail whereby the wire will spring out of the groove in the closure and into the groove in the motor case to release the closure from the motor case.

3,887,992
PROCESS OF PRODUCING A SOCKET JOINT BETWEEN A PAIR OF LENGTHS OF THERMO-PLASTIC PIPE

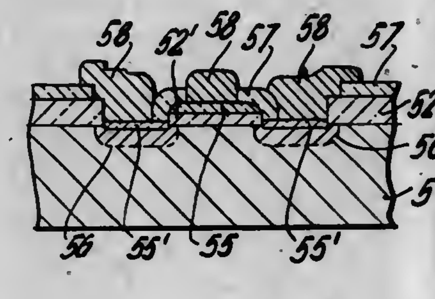
Gunnar Parmann, Mathopen, Norway, assignor to Rieber & Son Plastic-Industri A/S, Bergen, Norway
Continuation of Ser. No. 236,857, March 22, 1972. This application Mar. 4, 1974, Ser. No. 447,480
Claims priority, application Norway, Apr. 1, 1971, 1223/71
Int. Cl. B23p *11/02*
U.S. Cl. 29—450 **3 Claims**



1. A process for producing a socket joint between a pair of lengths of thermoplastic pipe, comprising providing an internally calibrated pipe end receptive socket in one end of one of said pipe lengths by telescopically pushing axially into the core of said pipe end while the latter is in a heated elastically-deformable condition a one-piece and annularly continuous sleeve mould having a through bore with an annular gasket ring-carrying groove therein and an outwardly tapered leading end insertable in said pipe bore and being of greater outer transverse dimensions than the diameter of said pipe bore receptively to expand and shape this pipe end progressively in conformity to the exterior contour of said sleeve mould, leaving said sleeve mould telescoped within said expanded pipe end to serve as a non-displaceable and permanent internal reinforcing member therefor with the bore of said sleeve mould having at least an annular section into which one end of the other of said pipe lengths can be snugly fitted, providing a gasket ring in said ring-carrying groove, and telescoping said end of the other of said pipe lengths into said annular section of said sleeve mould bore with a snug fit thereby providing said socket joint.

3,887,993
METHOD OF MAKING AN OHMIC CONTACT WITH A SEMICONDUCTOR SUBSTRATE

Takashi Okada; Sokichi Yamagishi; Mototaka Kamoshida; Tomomitsu Satake, and Sadayuki Kishi, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan
Filed Aug. 27, 1973, Ser. No. 391,820
Claims priority, application Japan, Aug. 28, 1972, 47-85288
Int. Cl. B01j *17/00*
U.S. Cl. 29—571 **5 Claims**



1. A method of producing an insulated-gate field effect transistor comprising the steps of forming a gate insulator film on a predetermined surface region of a semiconductor substrate of one conductivity type, forming first, second and third layers of a metal, each of said metal layers containing an impurity of the opposite conductivity type on first and second surface regions of said semiconductor substrate and on said gate insulator film respectively, said first and second surface regions being adjacent to said predetermined surface region and being separated from each other, and subjecting said semiconductor substrate with said gate insulator film and said first, second and third layers of metal deposited thereon to heat treatment, to thereby diffuse said impurity contained in said first and second layers of metal into said first and second surface regions of said semiconductor substrate and form a compound of said metal and said semiconductor at said first and second surface regions, whereby said first surface region, said gate insulator film and said second surface region serve as the source region, gate insulator and drain region, respectively, of the field effect transistor and said compound of said metal and said semiconductor at said first and second surface regions serves as ohmic contacts to the source and drain regions of the field effect transistor.

3,887,994
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

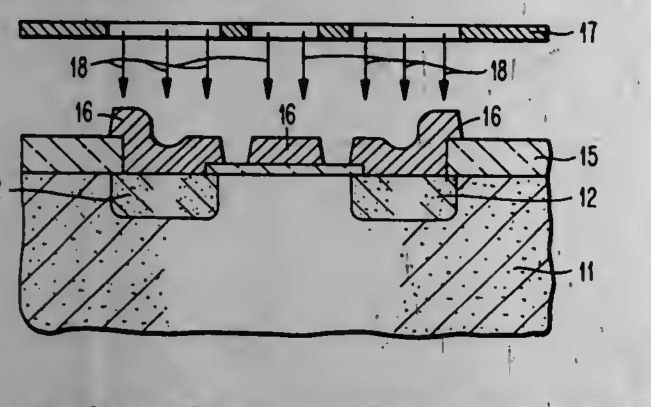
San-Mei Ku, Poughkeepsie, and Charles A. Pillius, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed June 29, 1973, Ser. No. 375,295
Int. Cl. B01j *17/00;* H01l *7/54, 11/14*
U.S. Cl. 29—571 **13 Claims**

1. A method of manufacturing a semiconductor device having a substrate of a semiconductor material with an insulating layer thereon and a metal film overlying the insulating

layer and in contact with at least one portion of the substrate to form an electrode layer including the steps of:

implanting ions into the metal film;

selecting the ions from the group consisting of hydrogen, helium, silicon, neon, argon, carbon, aluminum, nitrogen, oxygen, copper, gold, xenon, and krypton;



selecting the dosage of the ions to prevent an increase in the fast surface state density;

and controlling the energy level of the ions to position all of the implanted ions within the metal film.

3,887,995

PROCESS OF MANUFACTURE OF SOLAR CELLS

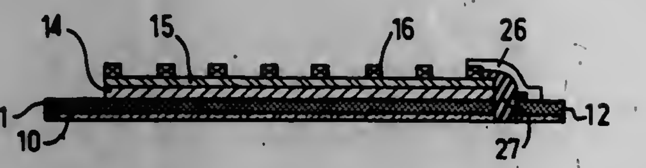
Andre Gauthier, Paris, France, assignor to Societe Anonyme de Telecommunications, France

Filed July 12, 1973, Ser. No. 378,521

Claims priority, application France, July 28, 1972, 72.27227

Int. Cl. H01l *15/02*

U.S. Cl. 29—572 **3 Claims**



1. A process for manufacturing a solar cell comprising two electrodes, a collector grid, a copper sulphide layer and a cadmium sulphide layer, said process comprising depositing on an insulating support a conductive layer or film in two distinct areas separated by a zone in which the insulating sheet remains bare, successively depositing on one of said areas a layer of CdS and a layer of Cu_2S, forming a mask on the layer of Cu_2S, electrolytically depositing a metal on said masked layer of Cu_2S by using said conductive layer deposited on said first area as a cathode for an electrolysis device and removing the mask on said layer of Cu_2S.

3,887,996

SEMICONDUCTOR LOADING APPARATUS FOR BONDING

Ronald J. Hartleroad, Twelve Mile, and James P. Grabowski, Carmel, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 1, 1974, Ser. No. 466,024

Int. Cl. B01j *17/00*

U.S. Cl. 29—583 **6 Claims**

1. An apparatus for transferring and positioning integrally leaded semiconductor chips onto a probe for bonding to lead frame structures, said apparatus comprising:

a base member having a flat major surface;

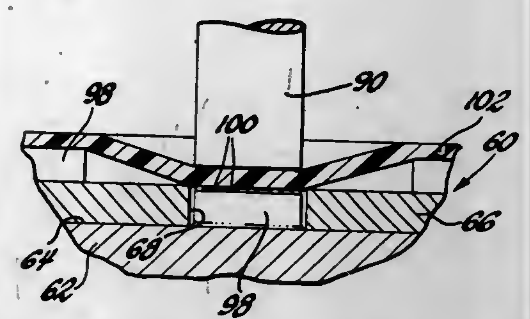
an elongated groove in said surface of the base member;

an elongated slide member slidably disposed in said groove, said slide member having at least one aperture therethrough providing a cavity into which a semiconductor chip can be inserted;

means on said base member surface for retaining said slide member in the groove;

a flexible carrier having at least one integrally leaded semiconductor chip affixed thereto wherein the integral chip leads are contiguous said carrier;

means for supporting said flexible carrier so that said chip is positioned over said aperture in the slide member, said carrier being responsive to a downward pressure so as to insert said chip into said aperture;



an opening in said groove extending orthogonally from the groove through the base member so that a bonding probe may extend therethrough; and

means for stopping translational movement of said slide member after it has stripped said chip from said carrier so that said chip is automatically positioned over said opening whereby said probe may engage the back side of the chip and raise it into aligned engagement with an overlying lead frame structure for bonding.

3,887,997

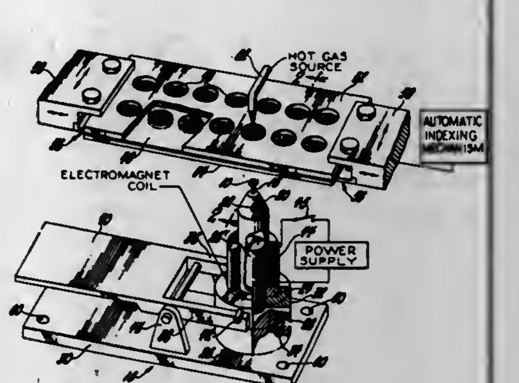
MAGNETIC ALIGNMENT FOR SEMICONDUCTOR DEVICE BONDING

Ronald J. Hartleroad, Twelve Mile; James C. Krajewski, and Ronald G. Rayon, both of Kokomo, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 9, 1973, Ser. No. 414,274

Int. Cl. B01j *17/00*

U.S. Cl. 29—589 **4 Claims**



1. A self-aligning method of automatically transferring integrally leaded semiconductor device chips to a conductive lead frame structure for permanently bonding thereto, said method comprising:

placing a semiconductor device chip having a face with a plurality of soft ferromagnetic integral leads thereon on a soft ferromagnetic support so that said chip face is oriented upwardly,

positioning the support so that said chip is in closely spaced relation under an overlying conductive lead frame having a soft ferromagnetic convergent cantilevered finger set that has free ends corresponding to said integral leads on said chip, with said integral leads being in close proximity with said corresponding finger free ends,

applying a magnetic field generally perpendicularly to said chip and said finger set to precisely align said integral chip leads with corresponding finger free ends and to concurrently magnetically raise said chip from said support up to said finger free ends to produce a uniform intimate engagement between all of said integral chip leads and their corresponding finger free ends, and

bonding said integral chip leads to said finger free ends.

3,887,998

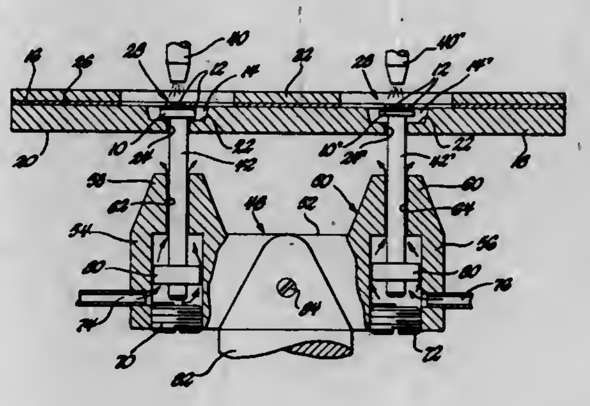
AIR-BIASED PROBE FOR SEMICONDUCTOR DEVICE BONDING

Ronald J. Hartleroad, Twelve Mile, and James P. Grabowski, Carmel, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 414,521, Nov. 9, 1973, abandoned. This application Apr. 4, 1974, Ser. No. 458,004

Int. Cl. B01j *17/00*

U.S. Cl. 29—589 **4 Claims**



1. A self-aligning method of automatically transferring integrally leaded semiconductor device chips to a conductive lead frame and for automatically consistently producing uniform low stress bonds therebetween, said method comprising: inserting a semiconductive device chip into each of a plurality of spaced recesses in an upper surface of a carrier template, each of said chips having a face with a plurality of soft ferromagnetic integral leads thereon, with each of said chip faces being oriented upwardly;

supporting on said template upper surface a conductive lead frame having a plurality of soft ferromagnetic finger sets in register over corresponding template recesses, with said fingers corresponding to said integral chip leads;

raising said chips on soft ferromagnetic supports into close proximity with the underside of their overlying finger sets; magnetically raising said chips up off their supports into engagement with their overlying finger sets and precisely aligning them therewith;

re-engaging the backside of the chips with their respective supports without further significantly elevating said chips and overstressing said lead frame fingers;

flowing a hot gas onto said finger sets and said chips while said chips are in re-engagement with their respective supports to bond said integral chip leads to their corresponding lead frame fingers without disturbing said precise alignment therebetween;

terminating said flow of hot gas; and

withdrawing the supports from said chips.

3,887,999

METHOD AND APPARATUS FOR VARYING THE RELATIVE LENGTH OF A PLURALITY OF LEADS AND FOR PERFORMING WORK OPERATIONS ON THE ENDS OF LEADS OF DIFFERING RELATIVE LENGTH

Milton Dean Ross; Kenneth Foster Folk, and Walter Clifton Shatto, Jr., all of Harrisburg, Pa., assignors to William J. Keating, Esq., Harrisburg, Pa.

Continuation-in-part of Ser. No. 389,924, Aug. 20, 1973. This application Dec. 12, 1973, Ser. No. 424,129

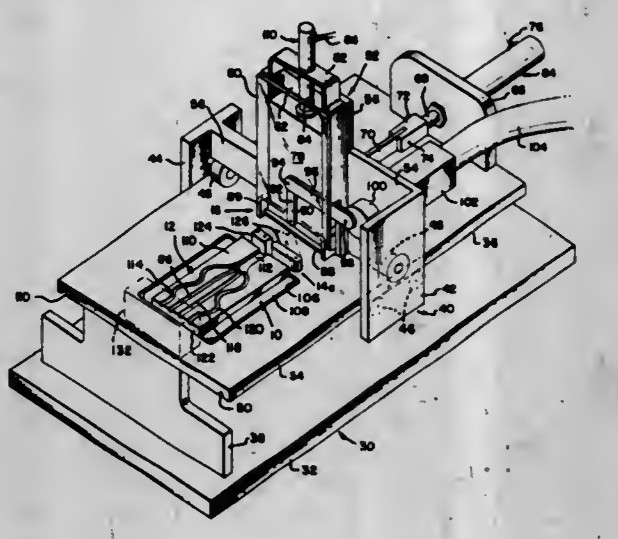
Int. Cl. H01r *43/00*

U.S. Cl. 29—628 **27 Claims**

1. A method of varying the relative length of a plurality of leads, comprising the steps of:

providing an apparatus including a template having a plurality of spaced apart grooves, each groove having spaced apart first and second portions;

holding portions of the plurality of leads in fixed relationship to each other adjacent the first portion of the grooves;



positioning portions of the leads which extend away from the held portions of the leads in said plurality of grooves with said positioned portions extending between said first and second portions of the grooves; and

varying the relative length of the leads which extend away from the held portions of said leads between the first and second portions of the grooves while holding the leads and maintaining portions of said plurality of leads in said second portions of said plurality of said grooves.

3,888,000

FRUIT AND VEGETABLE CUTTING DEVICES

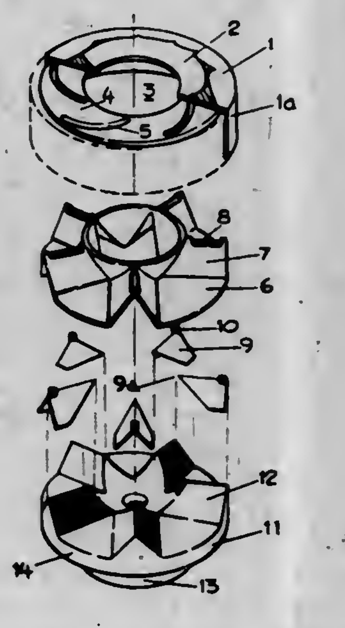
Frank Willows Ladlow, Sea Croft Lodge, 133 Drummond Rd., Skegness, England

Filed June 21, 1973, Ser. No. 372,403

Claims priority, application United Kingdom, June 23, 1972, 29422/72; Jan. 5, 1973, 505/73

Int. Cl. A21c *5/08;* **B26b** *27/00*

U.S. Cl. 30—114 **2 Claims**



1. A cutting device, adapted to bisect tomatoes, other eatable produce and the like into portions having castellated edges, comprising:

a base member having a plurality of angular upstanding portions, and having a tomato-receiving center space;

a plurality of angular blade members with upstanding spigot portions, said blade members adapted to rest freely upon the angular upstanding portions of said base member and to be reciprocably slidable thereupon;

a blade holder member, adapted to fit matingly over said base member and said blade members, having a tomato-receiving center space, having a plurality of angular upstanding portions corresponding to the angular upstanding portions of said base member, each blade holder member angular upstanding portion having a spigot slot through which the spigot portion of said blade members is adapted to project and in which the spigot portion of said blade members is adapted to be free to reciprocally slide;

an outer casing member, adapted to engagingly fit over said base member, said blade members, and said blade holder member, having a tomato-receiving center space, said outer casing member having a top under cam surface with a plurality of arcuate cam tracks adapted to engage the spigot portions of said blade members, said outer casing member being rotatable about said base member, said blade members, and said blade holder member; and

said cam tracks adapted to, during rotation of said outer casing member, reciprocally slide the spigot portions of said blade members radially inward toward the center of the tomato-receiving center space, thus reciprocally sliding simultaneously all of said blade members on the angular upstanding portions of said base member towards the center of the tomato-receiving center space.

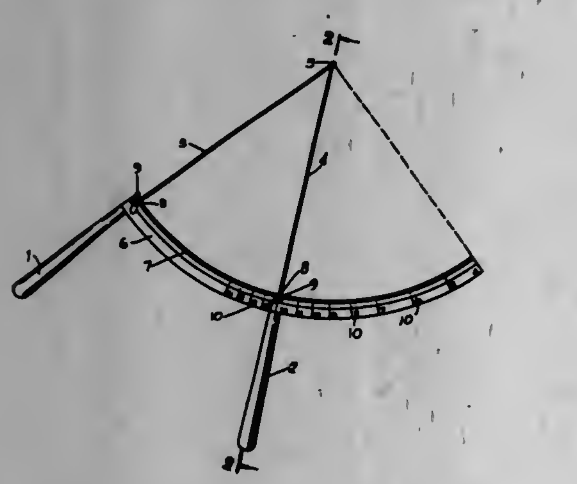
3,888,001
ADJUSTABLE CUTTER FOR CAKES AND PIES

David Mervyn Gilbart-Smith, 1651 Harwood St., Apt. 1105, Vancouver, Canada

Filed June 24, 1974, Ser. No. 482,016

Int. Cl. A21c *15/04*

U.S. Cl. 30—114 **1 Claim**



1. A device for cutting pies, cakes or the like into a predetermined number of slices and comprising:

first and second horizontally elongated cutting blades lying in vertical planes with bottom disposed horizontal cutting edges;

first and second horizontally elongated handles, each handle being secured to one end of a corresponding blade;

means pivotally securing the other ends of the blades together;

first and second vertical threaded bolts, each bolt being secured at its bottom end to the corresponding handle and extending upward from the one end of the corresponding blade;

a horizontal flat curved member defining a circular arc, said member having a curved slot also defining a circular arc, said slot and said member having the same center of curvature, the bottom of said member having spaced radially extending straight recesses, said bolts extending upwards through the curved slot whereby the blades can be rotated in the slot about the means and said one end of each blade can be disposed in any one of said recesses; and

first and second wing nuts, each nut being secured to the top end of a corresponding bolt and overlying said member.

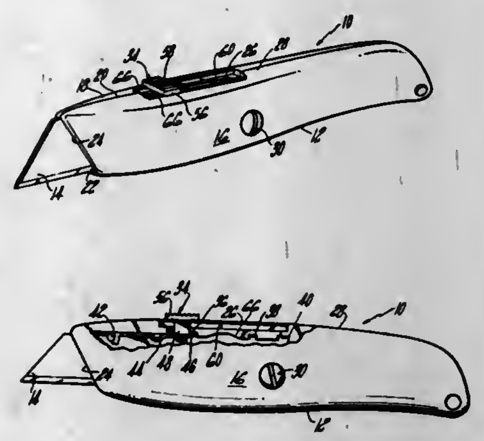
3,888,002
UTILITY KNIFE

James Joseph Graham, Wallingford, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed May 9, 1974, Ser. No. 468,461

Int. Cl. B26b *1/08*

U.S. Cl. 30—162 **3 Claims**



1. In a knife comprising a knife blade, an elongated handle having a blade position adjusting recess extending longitudinally along the handle and an interior latching surface adjacent the recess, a blade carrier mounting the blade for slideable movement relative to the handle, said carrier including a latching member cooperating with the latching surface for releasably latching the blade in one of a plurality of selected positions, and an operating member secured to said latching member and adapted for moving the latching member out of engagement with the latching surface and for moving the blade carrier along the handle, the combination wherein said operating member includes a stem portion and an enlarged head portion rotatably mounted on the stem portion, said stem portion having a top shoulder with an integral, inverted frustoconical spindle projecting upwardly therefrom and said head having a complementary frustoconical aperture of substantially the same size, said spindle being nonreleasably positioned within said aperture with said head engaging said spindle and said top shoulder to prevent axial displacement of said head from said spindle while permitting relative rotation therebetween, said head having a width less than the width of said recess to permit movement into and along said recess during movement of the blade between selected positions and a length greater than the width of said recess, said frustoconical spindle and aperture connection permitting rotation of said head into a recess-bridging locked position only when said latching member is positioned within one of said selected latching positions, said head in its recess-bridging locked position cooperating with said handle to prevent depression of said stem and inadvertent unlatching of the latching member for movement of the blade out of its selected position.

3,888,003
POWER HANDLE FOR PIVOTALLY INTERCONNECTED LEVER TOOLS

Frank R. Brown, Clinton St., Antrim, N.H. 03440

Filed July 12, 1974, Ser. No. 488,078

Int. Cl. B26b *17/00;* **B25b** *7/00*

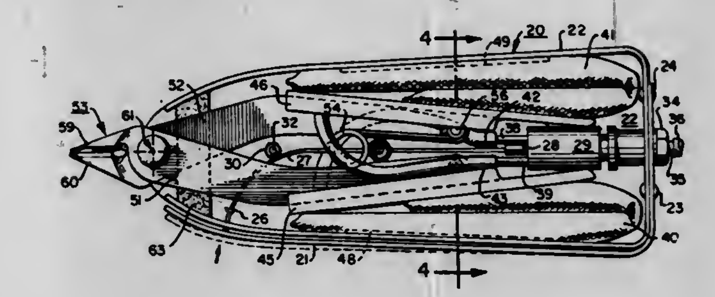
U.S. Cl. 30—180 **8 Claims**

1. A compressed gas operated power handle for use with tools having pivotally interconnected lever arms with forward extending distal jaw portions and proximal actuating portions comprising:

A. A pair of opposing sidewalls rigidly spaced apart;

B. A pair of inflatable bellows, each positioned between one of said sidewalls and the proximal portion of one lever arm of said tool;

C. A transversely expandable member attached to and between said lever arms; and



D. A manually operated inflation valve alternatively connecting said bellows to atmosphere when said valve is not actuated and connecting said bellows for inflation to a source of compressed gas when said valve is actuated, whereby the lever arms of said tool are pivotally juxtaposed when said bellows inflate and are pivotally separated when said bellows deflate.

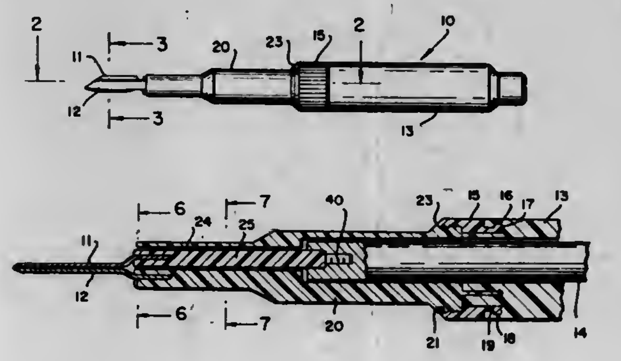
3,888,004
ULTRASONSICALLY VIBRATED SURGICAL CUTTING INSTRUMENT

Donald Jackson Coleman, 223 Maple St., Haworth, N.J. 07641

Continuation-in-part of Ser. No. 386,867, Aug. 9, 1973, abandoned. This application Sept. 20, 1974, Ser. No. 507,978

Int. Cl. B26b *7/00*

U.S. Cl. 30—272 A **4 Claims**



1. An improved ultrasonically vibrated surgical cutting instrument having an ultrasonic frequency generator, a transducer in communication with said ultrasonic frequency generator for converting ultrasonic energy to vibratory energy and a vibrating anvil in communication with said transducer for providing vibrations wherein the improvement comprises a fixed knife blade, a moveable knife blade in communication with said fixed knife blade and said vibrating anvil and means for preventing said moveable knife blade from separating from said fixed knife blade during the cutting operation so that said fixed knife blade prevents said moveable knife blade from deflecting during the cutting operation.

3,888,005
CUTTING TOOL

Dennis P. Bagwell, La Grange, Ill., assignor to Tomorrow Enterprises, Inc., La Grange, Ill.

Continuation-in-part of Ser. No. 443,603, Feb. 19, 1974, abandoned, which is a continuation of Ser. No. 274,642, July 24, 1972, abandoned. This application Sept. 3, 1974, Ser. No. 502,341

Int. Cl. B26b *9/02, 29/02*

U.S. Cl. 30—286 **6 Claims**

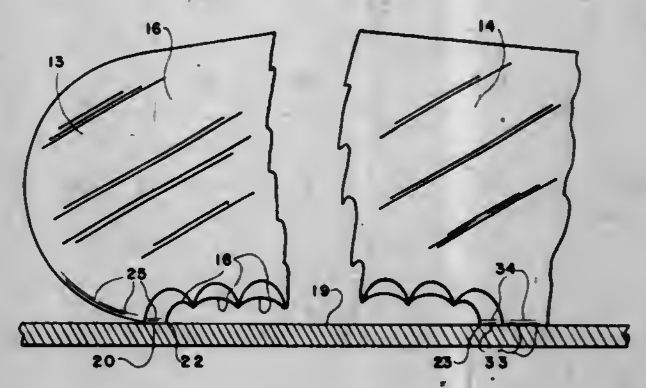
1. A knife comprising

a handle,

a blade attached to the handle and having a blunt top edge and opposite thereto a continuous cutting edge, and

damage preventing tips at both ends of the cutting edge which in normal use at a cutting angle of 0° contacts a flat support surface on which an article being cut rests, said cutting edge at 0° being essentially flush against the support surface so that the article being cut is severed clean through,

each of said tips including a smooth, wide-area contact surface which is essentially flush against the support surface at the cutting angle of 0°, and a junction point common to the cutting edge and the contact surface so that at said 0° cutting angle the junction point moves through the article, severing said article while remaining flush with the support surface but not striking into said support surface, thereby avoiding cutting or abrading said surface,



the contact surfaces of both said tips having smooth, rounded edge extremities such that a twisting motion about the longitudinal axis of the knife blade during cutting will bring the rounded edge extremities into contact with the support surface, whereby said rounded edges are adapted to avoid scratching, abrading or cutting of said support surface.

3,888,006
CLIPPING DEVICE FOR FRUIT STEMS AND THE LIKE

Allen C. Roberts, Rockledge, Indian Cave, Guilford, Conn. 06437

Filed Oct. 21, 1974, Ser. No. 516,423

Int. Cl. B26b *27/00*

U.S. Cl. 30—298 **6 Claims**

1. A device for clipping the stems of fruit and the like comprising:

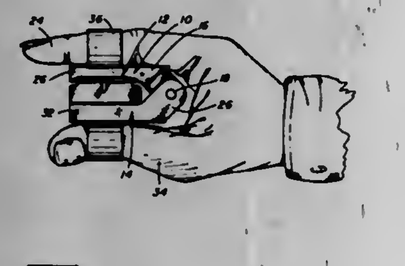
a. a pair of longitudinally extending arms pivotally connected together at one end portion for relative generally laterally swinging movement toward and away from each other, intermediate portions and end portions of said arms opposite said pivotal connection being spaced laterally from each other in all swinging positions thereof,

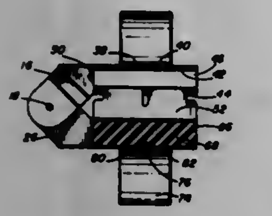
b. a laterally outwardly projecting member on each of said arms which members are at least partially circular viewed longitudinally and which are adapted respectively to receive a thumb and forefinger of an operator's hand for manual manipulation, the pivotally connected end portions of the arms being positioned between thumb and forefinger base portions,

c. a single edge razor blade,

d. one of said arms having a laterally inwardly open slot for receiving and frictionally holding a body portion of said single edge razor blade, the blade portion of the razor blade projecting laterally inwardly therefrom toward the other arm for manual clipping operation of a stem on inward swinging of the arms,

e. and an elongated resilient backup member removably mounted on and along an inner portion of said other arm for engaging and supporting a stem as the latter is severed by said razor blade on manual inward swinging movement of the arms.



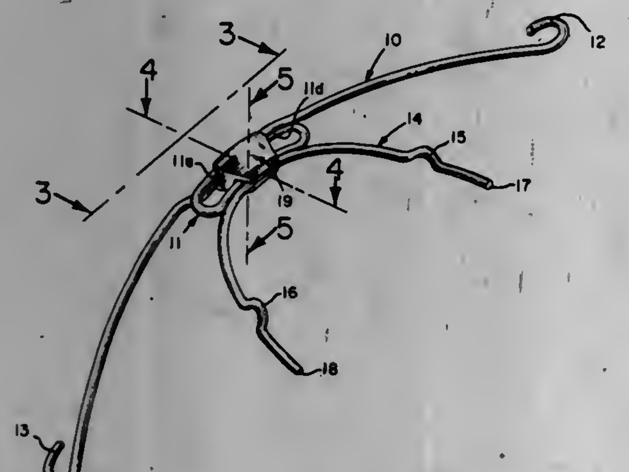


3,888,007
ORTHODONTIC FACE BOW

Donald F. Chittenden, 1365 N. Armel Dr., Covina, Calif. 91722

Filed Apr. 18, 1974, Ser. No. 461,855
Int. Cl. A61c *7/00*

U.S. Cl. 32—14 D **7 Claims**



1. An orthopedic face bow comprising, in combination:
a. an outer bow member defined forming an elongated loop at its central portion;
b. an inner bow having its central portion secured to a central underside portion of said elongated loop; and,
c. a rigid centerpiece having a lower channel with a floor portion passing through said elongated loop, the central portion of the inner bow and lower central portion of the loop lying in said channel so that the lower side walls eclipse the securement portion of the inner bow to the outer bow the upper surface of said center piece defining the opposite side of the floor of said lower channel, including portions servicing as fulcrum surfaces when the extending ends of the outer bow are flexed inwardly.

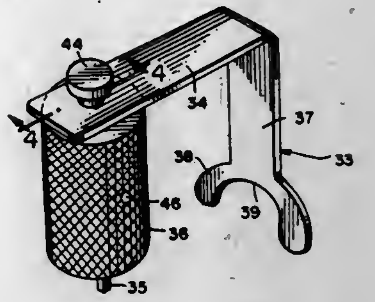
3,888,008
HANDPIECE AND CHUCK WRENCH THEREFOR

Charles C. Lake, Park Ridge, and Boubene M. Jaremus, Barrington, both of Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jan. 24, 1973, Ser. No. 326,569
Int. Cl. A61c *1/10*

U.S. Cl. 32—27 **46 Claims**

1. A dental handpiece combination comprising a rotor housing having a chamber and having upper and lower openings coaxial therewith, a rotor within said chamber having a bore aligned with said openings and being adapted to be driven in a clockwise direction when viewed from above during normal handpiece operation, said bore having outwardly flared surfaces at its lower end, a collet chuck received within said bore and having a plurality of spring jaws at its lower end for releasably holding a dental bur, said jaws being externally enlarged at their lower ends to provide bearing surfaces engageable with the flared surfaces of said bore, said chuck and said rotor being threadedly connected within said bore by right-hand threads which direct said chuck upwardly to force said jaws into camming engagement with said flared surfaces when said chuck is urged in a counterclockwise direction relative to said rotor, means provided at the upper end of said chuck and accessible through the upper opening of said housing for holding said chuck against rotation within said housing, and means provided at the upper end of said rotor and accessible through said upper opening for engaging said rotor and turning the same about its axis while said chuck is held against rotation within said housing, whereby, said chuck is self-tightening within said rotor in response to resistance exerted against a bur held by said chuck in normal operation of said handpiece and may be loosened and extracted from the lower end of said rotor by holding the upper end of said chuck against rotation relative to said housing and then turning the upper end of said rotor in a counterclockwise direction when viewed from above.



3,888,009
EQUIPMENT FOR DESIGNING AND MAKING COSTUMES

Berta A. I. White, Cambridge, and William G. Lines, Godstone, both of England, assignors to Kincob Limited, Cambridge, England

Filed July 11, 1973, Ser. No. 378,173

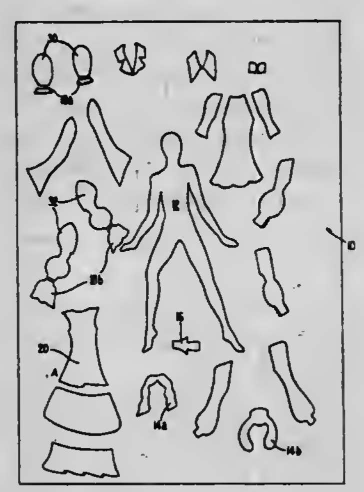
Claims priority, application United Kingdom, July 19, 1972, 33786/72

Int. Cl. A41h *43/00*

U.S. Cl. 33—12 **9 Claims**

1. A kit for use in designing and making costumes, comprising, in combination, a set of stencils with each stencil having a unique outline representing a particular costume part, at least one of said costume parts being represented by the outline of more than one shape of a particular style, at least one clothing pattern piece representing each stencil outline, with corresponding ones of the stencil outlines and pattern pieces having similar markings as an aid to matching, whereby a costume can be designed by selecting a particular combination of outlines and drawing through said outlines onto a writing sheet to form a two-dimensional representation of a design, and that particular costume design can be constructed

by using said similar markings to locate the pattern pieces which correspond to the outlines used in the costume design and then using those pattern pieces to cut the material and make the costume.

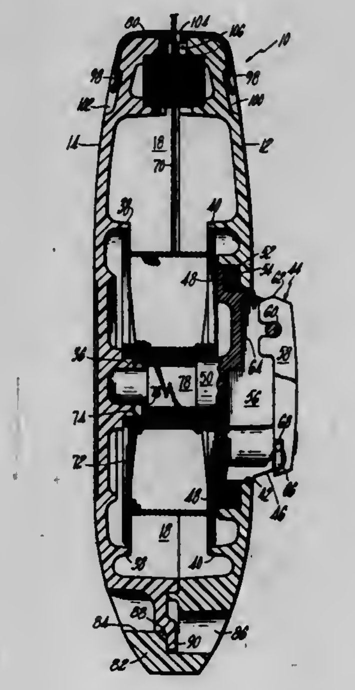


3,888,010
CHALK LINE DEVICE

Robert Steven Hyde, East Hartford, and Maarten Cornelis De Jong, Canton, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Dec. 10, 1973, Ser. No. 423,079
Int. Cl. B44d *3/38*

U.S. Cl. 33—87 **5 Claims**



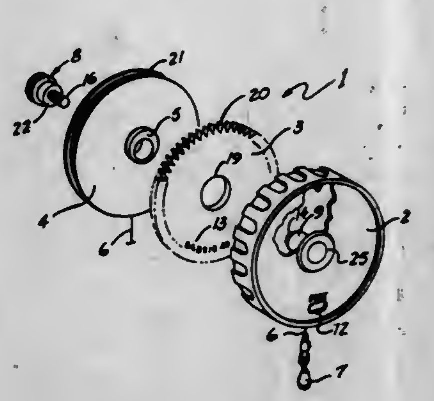
1. A chalk line dispensing and storage device comprising a casing of plumbbob configuration having an aperture in the top thereof, said casing including a pair of mating side members defining a chalk chamber and having longitudinally extending mating surfaces, a chalk line reel rotatably mounted in said chalk chamber, a chalk line mounted on the reel and extending from the chamber through said top aperture, said side members being interconnected by a releasable pivot including a shouldered recess in one of said members adjacent said mating surface and a depending flange in the other of said side members pivotably receivable within the recess for engagement with the shoulder, a mountable resilient clamp bridging said side members at a position remote from said releasable pivot and interconnected therewith to retain the mating surfaces in intimate engagement and prevent separation thereof, a compressible seal and a crank assembly mounted on one of said side members for engagement with said seal, said crank assembly including a drive shaft mounting the reel for rotation therewith, said casing side members axially biasing said crank assembly into frictional engagement with said seal to prevent free wheeling rotation of said reel while sealing the chalk chamber at said crank assembly.

3,888,011
MEASURING DEVICES AND METHODS OF MAKING AND USING THE SAME

Loran D. Hunt, Jr., 7493 Hazelcrest Dr., Hazelwood, Mo. 63043

Filed Oct. 12, 1973, Ser. No. 405,776
Int. Cl. G01b *3/00;* **G01f** *23/04;* **F16h** *1/28*

U.S. Cl. 33—126.5 **4 Claims**



1. A measuring device comprising,
housing means, said housing means provided with a chamber therein,
a pair of sprocket teeth operably mounted in said chamber, a first hub means operably mounted on said housing means, said first hub means disposed within said chamber, reel means rotatably mounted on said first hub means, measuring line means operably secured to said reel means, second hub means mounted on said reel means, said second hub means disposed eccentric to the axis of rotation of said reel means sprocket means rotatably mounted on said second hub means and communicating with said sprocket teeth,
securing means operably coupling said reel means to said housing means, sprocket means being provided with measuring indicia and said housing being provided with an indicia viewing port, through which said indicia are visible.

3,888,012
INSTRUMENT FOR THE SIMULTANEOUS TRANSMISSION OF THE MOVEMENTS OF A FEELER TO AT LEAST TWO READING MEANS

René Droz, Le Locle, Switzerland, assignor to Les Fabriques d'Assortiments Reunies, Le Locle, Switzerland

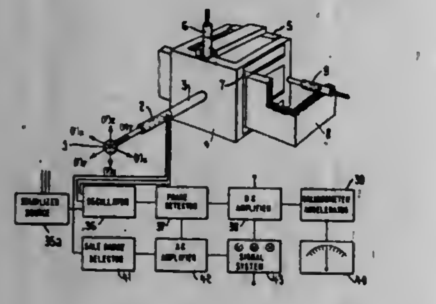
Filed Feb. 22, 1972, Ser. No. 228,215

Claims priority, application Switzerland, Mar. 1, 1971, 2976/71

Int. Cl. G01b *5/25*

U.S. Cl. 33—174 L **5 Claims**

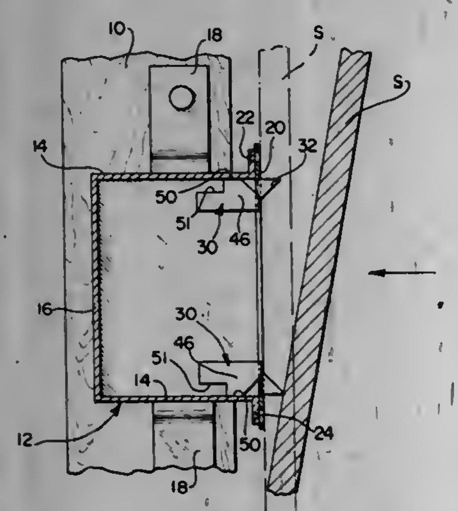
1. An instrument for the simultaneous transmission of the movements of a feeler with respect to at least two orthogonal coordinate axes to at least two reading means, each of them having a moveable portion and a sensor responding to displacements of the said moveable portion, said instrument comprising a frame, two parallelogram assemblies combined together between said frame and the feeler, each of said parallelogram assemblies having two elastically deformable sides parallel to each other and two other sides perpendicular to said deformable sides forming rigid bridges parallel to each other and interconnecting said deformable sides, said rigid bridges being maintained parallel by said deformable sides during deformation; one of said bridges of a first one of said



parallelogram assemblies being ridigly connected with said frame and the other bridge of said first parallelogram assembly being rigidly connected to one of the bridges of the second of said parallelogram assemblies with said second assembly disposed within the bounds of the four sides of said first assembly, the other bridge of said second parallelogram assembly being connected to the feeler whereby the same is moveable in at least two degrees of freedom characterized by the coordinate axes, said moveable portions of said two reading means being carried by said other bridges of said first and second parallelogram assemblies, respectively.

3,888,013
DEVICE FOR DETERMINING THE POSITION AND OUTLINE OF OPENINGS TO BE MADE IN SHEET MATERIALS

Lucien E. Benoit, R.F.D. 2, Woonsocket, R.I. 02864
Filed July 10, 1974, Ser. No. 487,229
Int. Cl. B25h *7/04;* G01b *3/14*
U.S. Cl. 33—174 G **5 Claims**



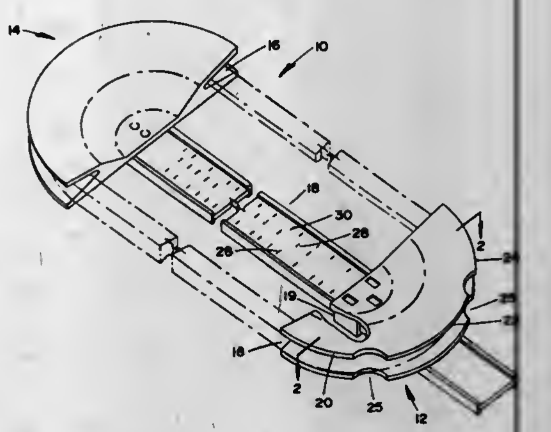
1. A template or the like for determining the position and outline of openings to be made in sheet material to receive wall boxes open on one side thereof such as electrical outlet boxes prior to the use of such sheet material in a subsequent finish wall construction comprising,

a generally flat frame member having a peripheral configuration corresponding to the particular opening desired in said sheet material, said frame member having portions thereof adapted for contact with the outer edges of said open one side of such wall box, said frame member further having a plurality of connected walls each having inner and outer sides thereof,

means for temporarily supporting said member in a generally superimposed position over said open one side of said wall box, said means comprising a plurality of legs downwardly dependent from said member, each of said legs being attached to an inner side portion of said walls, attachment means on the upper surface of said member for directly temporarily attaching said template to said sheet material in the position corresponding to that of the underlying wall box in said finish wall construction when said sheet material is forced thereagainst and subsequently removed therefrom, and wherein said frame member is of a plural angle geometric configuration, said wall box comprising a plurality of sidewalls disposed in angular relationship to each other and exhibiting a geometric configuration at its open end corresponding to that of said frame member, said legs having first and second bearing surfaces adapted for engaging contact with respective adjacent surfaces of said wall box sidewalls.

3,888,014
BELT MEASURING DEVICE

William L. Bixler, Littleton, Colo., assignor to The Gates Rubber Company, Denver, Colo.
Filed Mar. 25, 1974, Ser. No. 454,995
Int. Cl. G01b *3/00;* G01d *21/02*
U.S. Cl. 33—174 R **6 Claims**



1. A gauge for identifying V-belts of various top widths and lengths comprising:

a first generally semi-sheave member having a V-groove defined by two oppositely oriented faces;

a stick fixedly attached near one end to said first member, the stick having its length identifying characters;

a second generally semi-sheave member attached to said stick for reciprocal movement toward and away from the first semi-sheave member, the second semi-sheave member having a V-groove defined by two oppositely oriented faces, the first and second semi-sheave members arranged to have their V-grooves oppositely facing away from each other adapted for receiving a V-Belt and dividing it into two curved portions and two straight portions;

means for gauging the top width of a V-belt comprising at least one of said oppositely oriented faces with at least one variable arcuate outer peripheral portion defined by a generally constantly increasing face radius that effects generally a constantly increasing arcuate V-groove portion of increasing width juxtaposed thereto to define a variable gauging portion;

means in cooperation with the variable gauging portion for pointing to the belt identifying characters.

3,888,015
PRESETTING FIXTURE FOR CAM ACTUATED TURRET LATHES

Raymond H. Williams, P.O. Box 280, Chadwicks, N.Y. 13319
Filed Mar. 11, 1974, Ser. No. 449,858
Int. Cl. B27g *23/00*
U.S. Cl. 33—185 R **3 Claims**

1. A presetting fixture for a cam actuated turret lathe including:

a rigid base having a guideway;

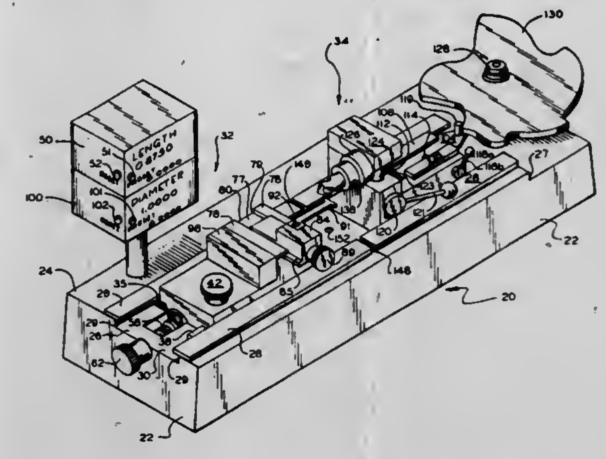
a support member on the base on which a turret cam, to be used for presetting, can be mounted;

a first and a second slide each independently movable in the guideway;

turret-collet simulating means including retaining means on the first slide in which a turret tool holder can be held and reference means on the second slide for representing axial positions on a workpiece held by a collet;

a cam follower on either of said slides to permit said slide to be positioned by the lobes of the turret cam mounted on the support member;

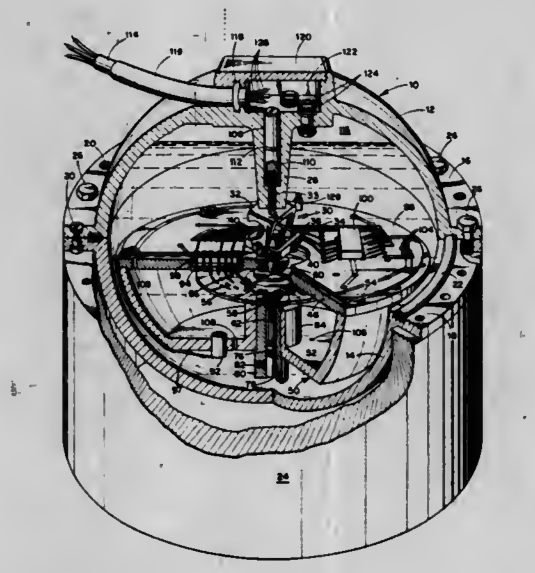
measuring means on the other slide for determining its position relative to the slide with the cam follower; and



diameter reference means operably connected to the second slide for positioning a tool off center within the turret tool holder, the diameter reference means including a diameter guideway in the second slide running perpendicular to the base guideway, a diameter slide movable in said diameter guideway, and diameter measuring means for determining the position of the diameter slide within its guideway.

3,888,016
DIGITAL COMPASS

John T. Fowler, Winthrop, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.
Filed Aug. 10, 1972, Ser. No. 279,723
Int. Cl. G01c *17/26*
U.S. Cl. 33—346 **15 Claims**



1. A digital compass comprising:

a housing containing a damping liquid therein and including:

first and second circumferentially flanged hemispherical portions secured together in sealing relationship; and

a support member depending internally from the first hemispherical portion, said member having a sealable liquid port therein through which damping liquid may be introduced to and sealed inside the housing;

a gimbal assembly supported within the housing by said support member and including:

a bracket affixed to said support member;

a first gimbal attached to the bracket for rotation about a first axis;

a second gimbal attached to the first gimbal for rotation about a second axis orthogonal to the first axis;

an enclosure filled with a damping liquid in fluid communication with the housing liquid and pendulously supported by the second gimbal for rotation about said first and second orthogonal axes;

a shaft disposed in said enclosure and rotatably mounted to the second gimbal and the enclosure for rotation about a third axis orthogonal to said first and second axes;

a compass rotor affixed to said shaft within said enclosure and having a sensible code thereon representative of compass headings;

a cylindrical magnet affixed within said enclosure to said shaft and compass rotor and rotatable therewith to align the compass rotor with respect to the earth's magnetic field; and

means in said enclosure for sensing the code on the compass rotor and to provide an output signal representative of compass heading.

3,888,017
METHOD FOR PREPARATION OF FINE PARTICLE SIZE INORGANIC OXIDIZERS

David A. McBride, Cumberland, Md., assignor to Hercules Incorporated, Wilmington, Del.
Filed Mar. 25, 1974, Ser. No. 454,625
Int. Cl. F26b *5/06, 5/08*
U.S. Cl. 34—5 **12 Claims**

1. A process for preparation of fine particle size inorganic oxidizers comprising:

a. forming an aqueous solution of an inorganic oxidizer selected from the group consisting of ammonium perchlorate, sodium perchlorate, potassium perchlorate, ammonium nitrate, sodium nitrate and potassium nitrate,

b. centrifugally dispersing said solution into a spray of fine droplets having a high radial velocity,

c. forming a film of quenching liquid, said quenching liquid being a nonsolvent for the inorganic oxidizer in solution, said quenching liquid being at a temperature at which crystallization of the fine droplets of inorganic oxidizer solution will occur substantially instantaneously upon penetration of said film by said droplets,

d. impinging the fine droplets of step (b) on the film of quenching liquid at a velocity sufficient for the droplets to penetrate the surface of the quenching liquid whereby the inorganic oxidizer crystallizes from said droplets forming fine inorganic oxidizer particles,

e. subliming water and quenching liquid from the crystallized inorganic oxidizer particles, and

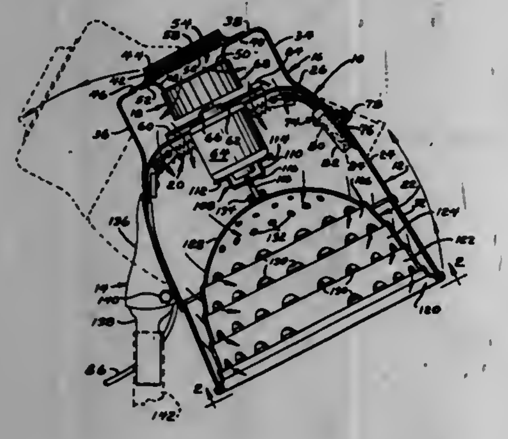
f. recovering inorganic oxidizers having a weight medium diameter of less than about one micron.

3,888,018
HAIR DRYER

John Wayne Gaski, Jr., River Grove, Ill., assignor to DeGraff Products Company, Chicago, Ill.
Filed May 10, 1974, Ser. No. 468,822
Int. Cl. A45d *20/25*
U.S. Cl. 34—99 **7 Claims**

1. In a hair dryer assembly having a support, the improvement being a hair dryer mounted on the support, said hair dryer comprising: a housing connected to said support, said housing having a hollow main body, a support collar formed integral with one end of the main body, said collar having a plurality of air ports extending therethrough, a dome-shaped hood diffuser releasably and sealingly connected to said main body, said diffuser being adapted to receive a person's head, said diffuser having a plurality of exit ports to allow air to flow

from the main body into the diffuser, an inlet housing mounted on the end of the main body adjacent to the collar, said inlet housing having an inlet aperture, a filter mounted in the inlet aperture to filter air entering the inlet housing, an air impeller rotatable about an axis positioned in the inlet housing

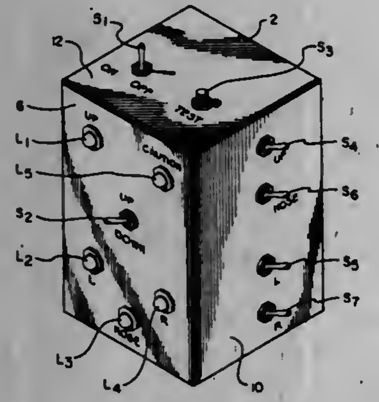


to draw air into the inlet housing through the inlet aperture, an electric motor driving the air impeller, a heating element mounted in said main body for heating air passing through the air ports in the collar, and means for controlling the heating element connected to the heating element.

3,888,019
LANDING GEAR POSITION SIMULATOR

Humberto Trabanino, 318 Vagabond Dr., Murray, Utah 84107

Filed Apr. 24, 1974, Ser. No. 463,434
Int. Cl. G09b *9/08*
U.S. Cl. 35—12 B **4 Claims**

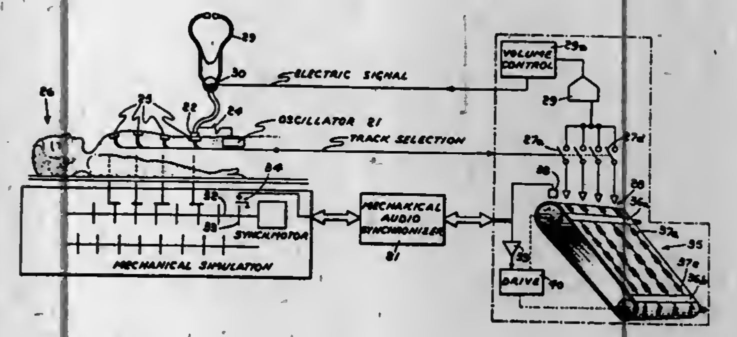


4. A landing gear position simulator for use in an aircraft capable of seating a student pilot and an instructor and including apparatus for generating an indication of the aircraft speed comprising
- first and second panels positioned in different planes, said simulator being positioned in the aircraft so that the student pilot may view the first panel and the instructor may view the second panel,
- first, said second and third indicators, when activated, representing that left and right landing gear respectively of the aircraft are in the extended position, and said first indicator, when activated, representing that the landing gear are in the retracted position,
- a manually operable landing gear control simulation switch mounted on said first panel, wherein movement of said switch to a first position simulates a control action to retract the landing gear and movement of said switch to a second position simulates a control action to extend the landing gear,
- first, second and third manually operable switches mounted on said second panel for selectively preventing the activation of said first, second and third visual indicators respectively, and
- a fourth visual indicator mounted on said first panel, and means responsive to an aircraft speed indication for activating said fourth visual indicator if said simulation switch is in the first position.

3,888,020
MANIKIN SYNCHRONIZATION SYSTEM

Irving A. Krause, Nutley, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Division of Ser. No. 221,902, Jan. 31, 1972, Pat. No. 3,769,526. This application Sept. 18, 1973, Ser. No. 398,357
Int. Cl. G09b *23/32*
U.S. Cl. 35—17 **2 Claims**



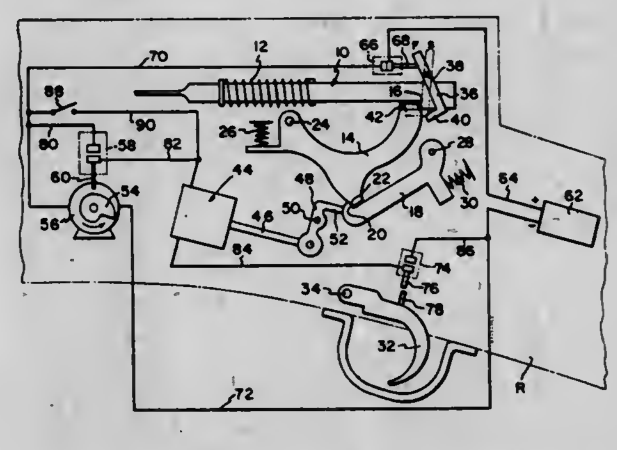
1. A manikin arrangement comprising:
- means for providing an indication of a mechanical motion cycle of said manikin;
- means for selectively producing one of a plurality of audio sounds;
- means for producing an indication of a selected audio cycle; and
- means for synchronizing the selected audio cycle with said mechanical motion cycle, further comprising
  - a. first means for producing a ramp function voltage representing said mechanical motion cycle including a relay having its contacts momentarily closed according to said cycle,
  - b. second means coupled to said first means for storing and sampling said ramp voltage in response to said audio cycle including a second relay having its contacts momentarily closed according to said cycle for sampling said ramp voltage,
  - c. third means coupled to said second means to provide a voltage output proportional to the stored voltage, and
  - d. Fourth means coupled to said third means to effect a synchronization between said mechanical and audio cycles.

3,888,021
FIRING CONTROL SYSTEM

James P. McCurdy, 1025 N. Miller Rd., Saginaw, Mich. 48603

Filed May 6, 1974, Ser. No. 466,991
Int. Cl. F41g *3/26*
U.S. Cl. 35—25 **4 Claims**

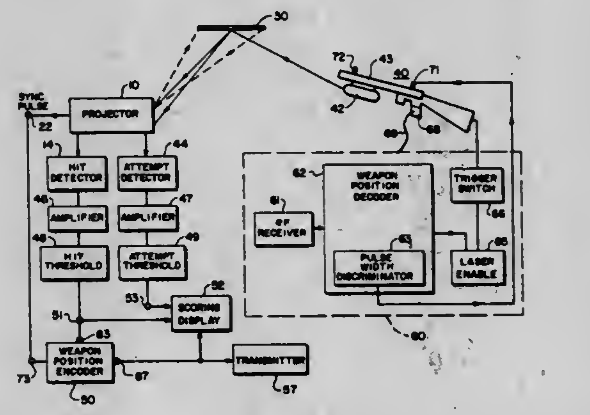
1. For use in combination with a firearm having a firing pin movable between a cocked and a fire position, a trigger movable between a ready and a fire position, and a safety movable between a safe and a fire position, the improvement comprising firing control means including latch means normally engaged with said firing pin when said pin is in said cocked position to latch said pin in said cocked position and operable when actuated to release said pin to permit said pin to move to said fire position; cyclically movable means operable at one point in its cycle to condition said latch means for actuation; drive means operable when actuated to drive said cyclically movable means in cyclic movement; first control means for actuating said drive means; and second control means operable when said trigger is in said fire position to actuate said latch means when said latch means is conditioned for actuation by said cyclically movable means.



3,888,022
MOVING TARGET SCREEN

Herman I. Pardes, Wanamassa; Joseph R. Schwartz, Neptune City, and Frederick B. Sherburne, Oceanport, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 4, 1974, Ser. No. 476,238
Int. Cl. F41g *11/00*
U.S. Cl. 35—25 **8 Claims**

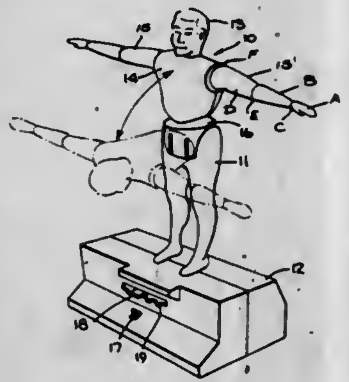


1. An electro-optical weapon firing training device comprising a film strip projector and viewing screen, at least one weapon on which is mounted a laser means to trigger a laser beam upon firing said weapon, a film strip, each frame of said film strip containing a first portion representing a scene including at least one target area at which the laser beam should be directed and a second portion which is substantially opaque to radiation from said laser except for at least one aperture region through which light from said projector can pass, the location of said aperture within said second portion being in the same relative position as the location of the target area in the first portion of said film strip, said projector including optical means for projecting each frame of said film strip onto said screen as two separate projected frame portions each having a scene portion and a bright spot whose location relative to the projected scene portion is the same as that of the aperture region relative to the first portion of said film frame, and including adjustable means for initially moving one projected frame portion on the screen relative to the other projected frame portion on the screen until the aperture region in the second projected frame portion is superimposed exactly on the corresponding target area in the scene portion of the other projected frame portion, and means responsive to correspondence between the position of the laser beam impingement upon said screen and said bright spot.

3,888,023
PHYSICAL TRAINING ROBOT

Robert Genin, Bay Harbor Islands, Fla., assignor to Jardine Industries, Inc., Hong Kong

Filed Aug. 21, 1974, Ser. No. 499,194
Int. Cl. G09b *19/00;* **A63h** *11/00*
U.S. Cl. 35—29 R **9 Claims**

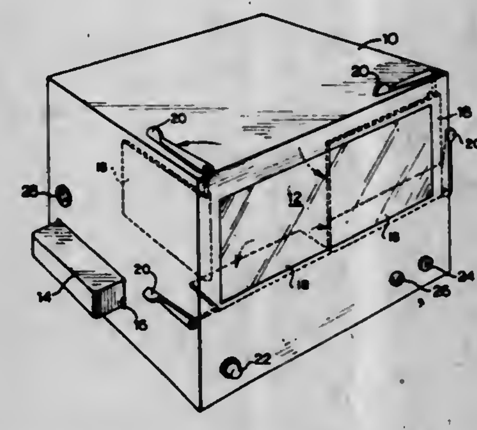


1. A physical training robot arrangement adapted to demonstrate any one of a series of calisthenic movements, said arrangement comprising:
- A. a robot having a humanoid form including a torso element having hand and arm assemblies attached to the shoulders thereof, said torso element being mounted above a pelvis element and being rockable from side to side and being oscillatable back and forth with respect to said torso element, said pelvis element being trunnioned on top of a pair of legs whereby the pelvis element may be caused to bend forwardly to execute a bowing movement of the robot; and
- B. a motorized mechanism operatively coupled to said torso and pelvis elements selectively to effect rocking, oscillating and bowing movements thereof.

3,888,024
AUDIO-VISUAL TEACHING APPARATUS

John Kenneth Elliott, 82 Baybrook Cres., Scarborough, Ontario, Canada

Filed Aug. 9, 1973, Ser. No. 386,981
Int. Cl. G09b *17/00*
U.S. Cl. 35—35 R **8 Claims**



1. An apparatus for teaching a person how to communicate with other persons comprising:
- means for simultaneously visually displaying at least four sequences of images which relate to communication among persons and which are different visual representations of identical subject matter, said display of sequences being uninterrupted and
- means selectively operable for optionally precluding visual display of at least one of said sequences of images to the person being taught;
- at least two of said sequences being a series of pictorial representations of the subject matter being taught and the

remaining sequences being word sequences representing the same subject matter, the presentation of said at least four sequences being the simultaneous display of a word or a group of words of said word sequences which corresponds with the pictorial representations being then displayed.

3,888,025

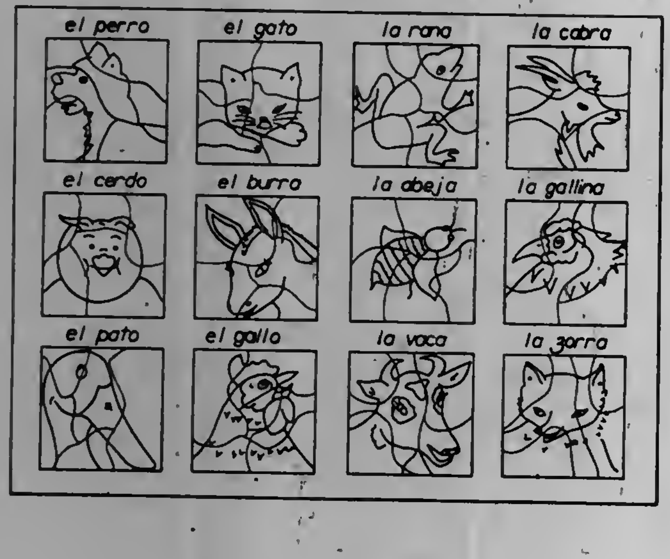
TEACHING GAME

Drucilla Schmieder, 4180 Pontatoc Rd., Tucson, Ariz. 85718

Filed Jan. 9, 1974, Ser. No. 431,956

Int. Cl. G09b *5/04;* **A63f** *9/10*

U.S. Cl. 35—35 H **7 Claims**



1. A teaching game method for learning Spanish by a student comprising the steps:

a. providing a tape recording in English stating the object of the game and the procedure to be followed by the student;

b. providing a series of whistle signals on the tape at spaced intervals;

c. providing a game board containing a plurality of recessed windows;

d. providing a plurality of picture puzzles, each puzzle comprising five pieces, each piece carrying a part of a picture of an animal;

e. starting the tape recording;

f. at the first whistle signal from the tape recording beginning the assembly of the first of said picture puzzles in the first window of said game board;

g. simultaneously at said whistle signal, the name, sound, and color of the animal is recited from said tape recording in Spanish such that the student identifies the pieces for each window in order and learns the lesson with the placement of each piece;

h. the tape renders a second whistle signal which terminates the time interval for the assembly of the five pieces in the first window;

i. said second whistle signal starting the time interval for the assembly of the five pieces in the second window while the name, color, and sound of the animal is recited in Spanish;

j. the tape renders a third whistle signal starting the assembly of a set of five pieces in the third window, the operation continuing in like manner until all of the windows have been worked in turn without stopping the tape, and;

k. the tape being rewound and replayed in its entirety until each set of five pieces can be assembled in each respective window in twenty-five seconds.

3,888,026

RUNNING SOLE FOR SPORTS SHOE

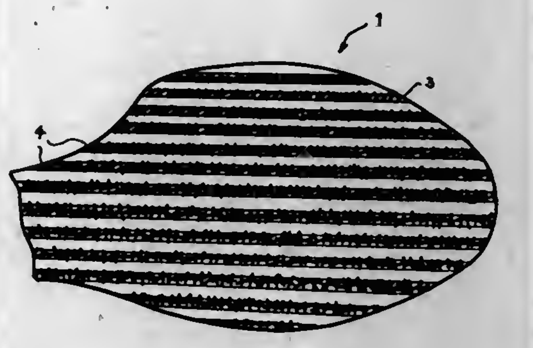
Adolf Dassler, D-8522 Herzogenaurach am Bahnhof, Germany

Filed Aug. 2, 1973, Ser. No. 384,813

Claims priority, application Germany, Aug. 12, 1972, 2239824

Int. Cl. D04h *11/00;* **B32b** *31/00*

U.S. Cl. 36—25 R **15 Claims**



1. A running sole for a sports shoe comprising a carrier, fiber bristles distributed at least over certain areas of said carrier and extending downwardly therefrom, and a synthetic resin impregnation stiffening and gluing said fiber bristles to one another.

3,888,027

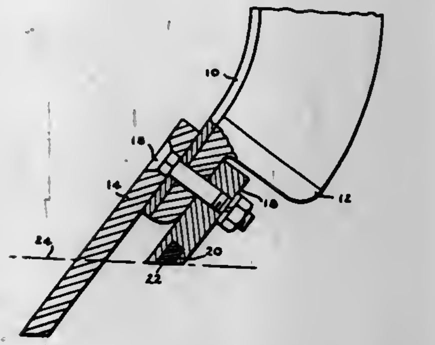
ARRANGEMENT FOR ENHANCING BLADE LIFE

Leonard F. Toews, Greensburg, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Continuation of Ser. No. 384,024, July 30, 1973. This application Sept. 12, 1974, Ser. No. 505,471

Int. Cl. E02f *9/28*

U.S. Cl. 37—141 R **10 Claims**



1. Wear resistant means for use in combination with an elongated steel blade for a grader or snow plow, the blade in unworn condition having parallel upper and lower edges and including means near the upper edge for fixedly supporting the blade with the lower edge exposed, said wear resistant means adapted to be disposed parallel to and rearwardly of the blade near at least one end thereof, said wear resistant means including at least one member having upper and lower edges and being substantially more narrow in the vertical direction than the blade, said member in length being a small fraction only of the total length of the blade, means near the upper edge of said member for fixedly supporting the member parallel to the blade near the end of the blade and rearwardly thereof and with the said lower edge of the member spaced upwardly from the lower edge of the blade and parallel thereto, the distance between the lower edge of the said member and the lower edge of the blade when the latter is not worn being about equal to maximum amount to be worn off the blade before replacement thereof, the lower edge of said member including wear and abrasion resistant means substantially more wear and abrasion resistant than the steel of the blade.

3,888,028

DIGGER TOOTH

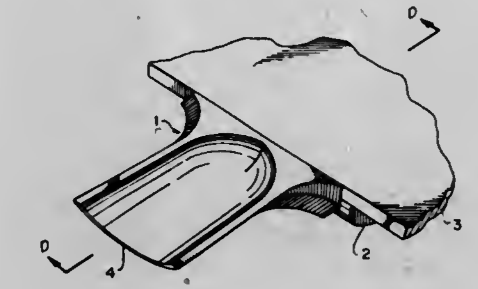
Kenneth M. White, Calgary, Alberta, Canada, assignor to Western Rock Bit Company Limited, Calgary, Alberta, Canada

Continuation of Ser. No. 373,939, June 27, 1973, abandoned. This application Sept. 10, 1974, Ser. No. 504,697

Claims priority, application Canada, May 29, 1973, 172630

Int. Cl. E02f *9/28*

U.S. Cl. 37—142 R **7 Claims**



1. A digger tooth for releasable attachment to an excavating machine, comprising a mounting portion and a cutting portion having a cutting edge, said cutting portion having an upper concave and a lower convex surface as viewed in transverse section, said surfaces varying in profile such that the outer edges of the cutting portion are thicker than its central part, whereby when said tooth is mounted and working said outer edges undercut a portion of material on each side of the material to be removed.

3,888,029

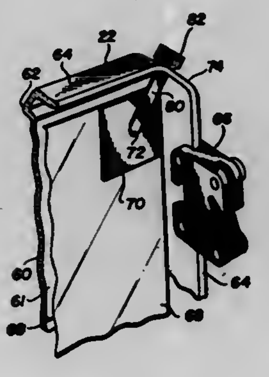
CHANGEABLE MULTIPLE IMAGE DISPLAY APPARATUS

Wilfried Schubert, Bensenville, Ill., assignor to National Advertising Company, Bedford Park, Ill.

Division of Ser. No. 294,791, Oct. 4, 1972, Pat. No. 3,824,726. This application Feb. 1, 1974, Ser. No. 438,742

Int. Cl. G09f *13/04*

U.S. Cl. 40—125 G **8 Claims**



1. A removable display film carrier for changeable copyboards comprising:

a carrier frame having a display face bounded by side flanges extending from said carrier frame transversely to said display face and including means for removably attaching said carrier frame to said copyboard;

said side flanges having mounting apertures therein;

a thin, flexible film sheet bearing a display image and including a plurality of apertures along the perimeter thereof; and

a plurality of tensioning members for suspendingly mounting said film sheet in substantially constant tension on said carrier frame with said display image viewable through said display face;

each of said tensioning members including;

an elongated, elastomeric middle portion,

a tail knob at one end of said middle portion, said tail knob having a slightly larger cross sectional portion than said middle portion;

a head knob at the other end of said middle portion, said head knob having a slightly larger cross sectional portion than said middle portion;

each of said tensioning members engageable between respective mounting apertures in said side flanges and said film sheet perimeter with said tail knob engaging said side flange, said head knob engaging said film sheet, and said middle portion in elastic tension therebetween for suspending said film sheet in substantially constant tension between said side flanges.

3,888,030

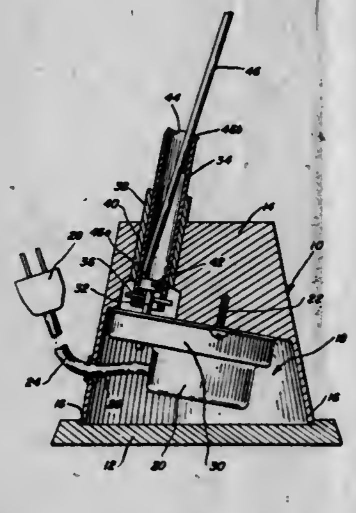
KINETIC SCULPTURE

Gordon E. Bradt, 828 Ashland Ave., Wilmette, Ill. 60091

Filed Jan. 21, 1974, Ser. No. 434,861

Int. Cl. G09f *19/02*

U.S. Cl. 40—126 R **14 Claims**



1. A kinetic sculpture, comprising:

a base structure adapted for positioning on a support structure such as a table top or the like;

motive means mounted on said base structure;

motion imparting means mounted on said base structure and operatively associated with said motive means to be driven thereby, said motion imparting means including means providing an elongated cavity having a substantially non-circular open top and a substantially closed bottom and being rotatable by said motive means about an axis extending generally longitudinally of said cavity; and

at least one elongated flexible rod-like member of a cross sectional size less than the inner cross dimensions of said cavity, said rod member being positioned at one end into said cavity so as to be freely movable therein whereby swinging, bobbing, swaying and other movements may be imparted to said rod member in response to rotation of said motion imparting means depending on the cross sectional shape of said cavity.

3,888,031

BALLISTIC SET INCLUDING A PROJECTILE AND ITS LAUNCHING DEVICE

Robert M. Bornand, Meyrin, Switzerland, assignor to Valinor Anstalt, Vaduz, Liechtenstein

Filed Oct. 16, 1973, Ser. No. 406,929

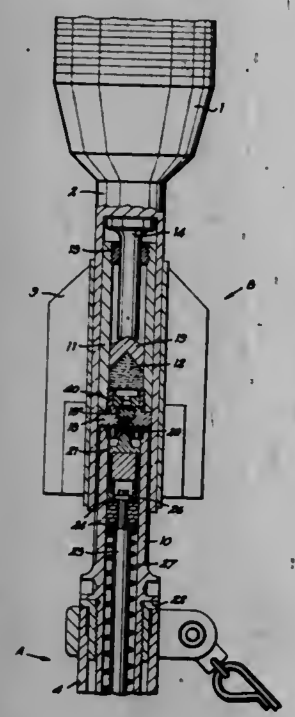
Claims priority, application Switzerland, Oct. 5, 1973, 14240/73

Int. Cl. F41c *27/06*

U.S. Cl. 42—1 F **4 Claims**

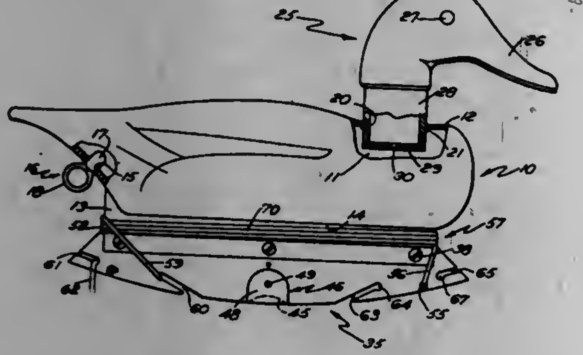
1. In a ballistic device comprising a projectile and a launcher for said projectile, the projectile comprising a rearwardly extending tube containing a combustion chamber which in turn contains a combustible launching charge sealed

in the chamber by means of a piston at the forward side of the charge, the launcher comprising a guiding tip that extends forwardly into the tube, the piston bearing at its forward side on a rod that propels the projectile, and ignition means for the launching charge; the improvement in which said ignition means comprises a floating lifter disposed in said guide tip and a floating striker disposed in said projectile at the rear of said combustion chamber, there being a firing primer between said striker and said combustion charge, a guide rod reciprocable in said guide tip, and spring means urging said guide rod toward said floating lifter whereby upon movement of said guide rod toward said floating lifter under the influence of said spring means, said floating lifter strikes said floating striker which in turn strikes said primer to ignite said combustion charge.



3,888,032
WATERFOWL DECOY

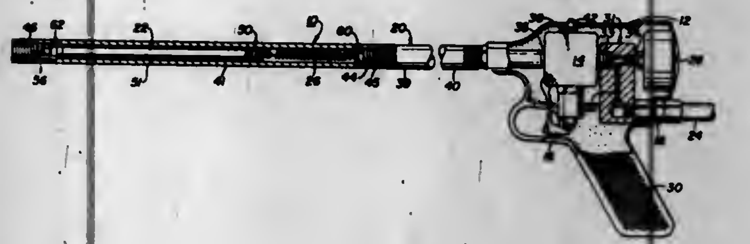
Kenneth M. Gagnon, 302 Reservoir Ave., Lincoln, R.I. 02865
Filed Apr. 12, 1974, Ser. No. 460,295
Int. Cl. A01m *31/06*
U.S. Cl. 43—3 **6 Claims**



1. A waterfowl decoy comprising
- a. a hollow body portion having an outer shell of resilient material with an opening in said shell,
- b. said body portion being provided with a fin integral therewith,
- c. a detachable keel having means to detachably secure said keel to said fin, said detachable keel having wedge-shape slots extending inwardly from the outer periphery thereof to wedge an anchoring cord therein, said slots being oppositely oriented to present a web portion about which the anchoring cord may be wound,
- d. a head portion having a neck extending downwardly therefrom, said neck being substantially cylindrical and of a size to have an interference fit throughout its length with said opening and with its outer surface smooth and parallel with its center axis whereby said neck may be axially adjusted through said opening to a number of positions,
- e. said hollow body portion being molded from a collapsible resilient material which permits the body to be collapsed and to return to its working position after the collapsing influence is removed.

3,888,033
UNDERWATER WEAPON

Raoul Fima, 655 W. Diversey, Addison, Ill. 60101
Continuation-in-part of Ser. No. 245,832, April 20, 1972, abandoned. This application May 17, 1974, Ser. No. 471,010
Int. Cl. A01k *81/04*
U.S. Cl. 43—6 **8 Claims**



1. An underwater weapon of the type including a hollow tip member connected to a piston which is forwardly driven from a retracted position in a cylinder by compressed gas to project the tip therefrom into a creature, said gas being injected into the creature through a passageway in said tip, the improvement comprising

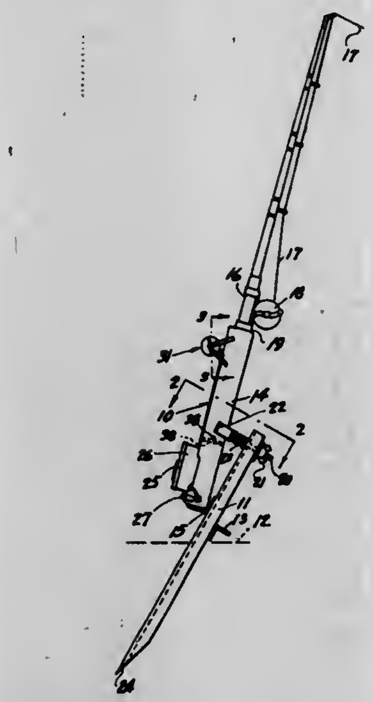
bypass means disposed in the forward portion of said cylinder for feeding compressed gas around said piston to the passageway in said hollow tip said bypass means operating only when said piston is in its most forward position.

3,888,034
ADJUSTABLE FISHING POLE HOLDER

Kenneth H. McGuire, 5010 Sorento Rd., Sacramento, Calif. 95835
Filed Nov. 20, 1973, Ser. No. 417,518
Int. Cl. A01k *97/12*
U.S. Cl. 43—17 **3 Claims**

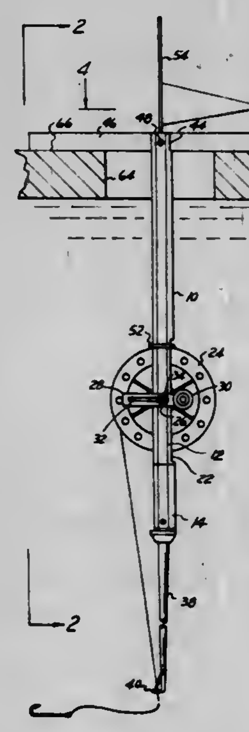
1. An adjustable fishing pole holder and signal comprising a stake for insertion in the earth, a tubular support hingedly secured to said stake and adapted to receive the lower end of a fishing pole, a securing element resiliently mounted on said stake and engaging said support for maintaining said support in a generally upright position, a control unit, means mounting said unit to said support for rotary adjustment about a generally horizontal axis transverse to said support, a pair of mercury switches mounted in said unit extending perpendicularly to the axis of said unit and spaced respectively above and

below the axis of said unit, signal means on said support and means connecting said mercury switches to said signal means for actuating said signal means on movement of said support and said switches.



3,888,035
ICE FISHING ROD

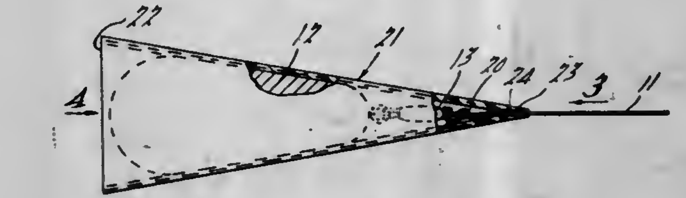
Ralph P. Totten, 7455 Parkstone Ln., Birmingham, Mich. 48010, and Gerald F. Lewis, 1850 Columbia, Berkley, Mich. 48072
Filed Mar. 18, 1974, Ser. No. 451,948
Int. Cl. A01k *97/12*
U.S. Cl. 43—17 **8 Claims**



1. An elongated ice fishing rod having a handle section at one end which is channel shaped in cross-section; a line guide section at the opposite end; a reel retaining section between the handle section and the line guide section; and an elongated support section having its midpoint pivotably supported to the free end of the handle section so that it may be disposed in a first position wherein it partially lies within said channel section and forms a coaxial extension of said handle or a second position wherein it projects normally relative to said handle section and is adapted to lie across a hole formed in ice so that the line guide section, the reel retaining section and the handle section project downwardly through the hole.

3,888,036
SINKER AND SWIVEL SHIELD

Maynard Wallace, 38172 Seaway Dr., Mt. Clemens, Mich. 48073
Filed Jan. 2, 1974, Ser. No. 430,253
Int. Cl. A01k *95/00*
U.S. Cl. 43—44.97 **5 Claims**



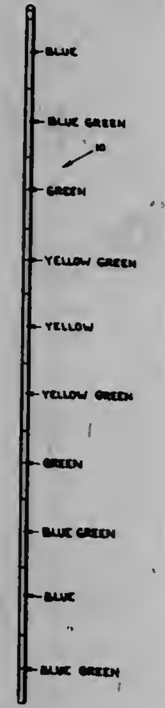
1. A shield for sinkers and swivels used on the ends of fishing lines, comprising a hollow thin-walled conical member fabricated of resilient material, the wall being conical, relatively thin and of constant thickness substantially throughout its entire length whereby its resilience will permit it to bounce off rocks, the member being provided with an open base and an apertured apex for receiving the end of the fishing line, whereby the fishing line may be drawn through the shield and attached by a knot to the swivel and sinker, the size of the aperture in said apex being sufficient to allow the fishing line to pass freely therethrough but substantially less than that of the swivel whereby the swivel and knot may not pass therethrough even when tensile force is applied to the line, the relative dimensions of the shield and sinker being such that when the fishing line is drawn back through the apertured apex, the sinker will engage internal surfaces of said shield when the sinker, swivel and knot are enclosed by the shield so as to prevent snagging on weeds or rocks, and the swivel will be held free of the inside surface of said member whereby it may effectively perform its swivelling function to permit said sinker and shield to rotate together as a unit.

3,888,037
POLYCHROIC FISHING LINE

Raymond L. Warthen, Spirit Lake, Iowa, assignor to Berkley & Company, Inc., Spirit Lake, Iowa
Filed Jan. 21, 1974, Ser. No. 435,288
Int. Cl. A01k *91/00*
U.S. Cl. 43—44.98 **14 Claims**

1. Polychroic fishing line comprising:
- a. a continuum of line consisting of a plurality of discretely colored segments including a first plurality of individual line segments being of a chroma having a basic foundation and a first primary color and a second plurality of individual line segments being of a chroma having a basic foundation in a second primary color, and connective segments within said continuum and extending between individual members of said first individual and said second individual segments;
- b. the arrangement being such that each individual segment

is arranged with each of its neighbors having a chroma spaced apart on the standard Chromaticity Chart by a difference in the sum of the coordinates being less than about 0.4.



3,888,038

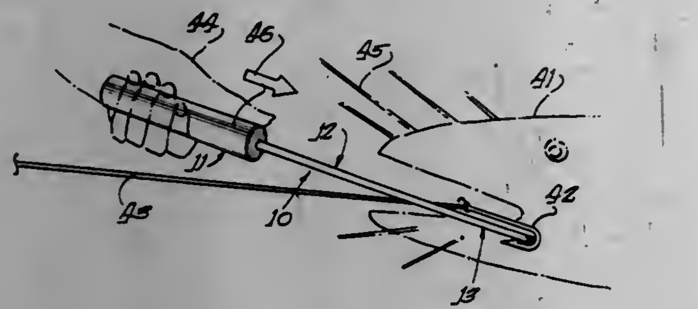
FISHING HOOK REMOVER

Barbara J. Howell, 14226 Julie Dale, Humble, Tex. 77338

Filed Apr. 29, 1974, Ser. No. 465,232

Int. Cl. A01k *97/00*

U.S. Cl. 43—53.5 **1 Claim**



1. A hook remover device intended for removing a fishing hook from the mouth of a fish in a manner avoiding any contact between the body of the fish and the body of the individual who caught the fish, the hook remover device comprising, in combination:

a handle member of an elongated hollow cylindrical configuration having cylindrical side walls, a flat front end, and an open back end;

a compartment of an elongated cylindrical configuration defined interiorly of said side walls and said closed front end with ingress and egress thereof being through said open back end;

a plurality of screw threads formed integrally with said housing side walls exterior thereof adjacent said open back end and extending about the circumference thereof; a cylindrically shaped cap member having a closed back end surface, an open front end surface, and cylindrical side walls formed integrally with the peripheral edges of said back surface and depending outwardly therefrom;

screw threads disposed about the interior circumference of said cap side wall surfaces from said open front end thereof to said closed back end thereof;

said cap member adapted to be threadedly engaged with said threads on said body member to close said handle member compartment in a watertight manner;

said handle member having a diameter of 1 inch and an overall length of about 4 inches;

a generally Z-shaped retaining clip having one end portion thereof permanently affixed to said handle side wall with said clip extending longitudinally along a tangential line disposed along said side wall and spaced therefrom a distance adapted to resiliently engage at its opposite end onto an individual's belt, pants top, and the like for temporarily hanging said handle member in a suspended manner therefrom;

an elongated solid cylindrical rod disposed concentric with said front end of said handle member and having one end affixed thereto with the opposite end projecting outwardly therefrom, said rod being of an even continuous diameter throughout its entire length;

a hook member formed integrally with the projecting free end of said rod, said hook member being formed by bending said free end of said rod back onto itself to point in the direction of said handle member with the bight portion of said hook member projecting outwardly of said handle member;

said rod having a length of about 7 inches;

said bent over portion defining said hook member having a length of about 1 inch;

said bent over portion being spaced from said rod a distance of about ⅛ inch;

said bent over portion extending parallel to said rod; and

said bent over portion being of the same cross-sectional diameter continuously therealong as said rod.

3,888,039

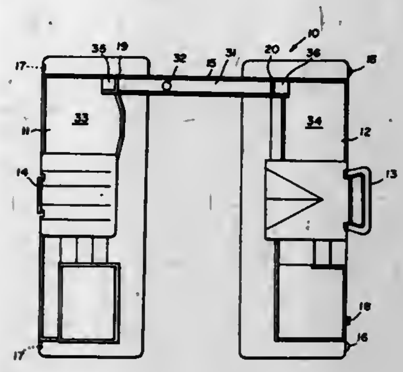
FOLDABLE TOY BUILDING

Paul D. Snyder, and Ralph W. Crawford, both of East Aurora, N.Y., assignors to The Quaker Oats Company, Chicago, Ill.

Continuation of Ser. No. 432,436, Jan. 11, 1974, abandoned. This application Sept. 26, 1974, Ser. No. 509,453

Int. Cl. A65h *33/04*

U.S. Cl. 46—12 **11 Claims**



1. A foldable toy building comprising:

a. a pair of disconnectable building portions orientable from a folded, back-to-back disposition to an openedup disposition with said building portions set at any desired angle relative to each other;

b. a separate archway removably joinable to one end of each of said building portions for releasably connecting said building portions;

c. said archway spanning the distance between front corners of said building portions with said building portions in said back-to-back orientation;

d. a vertically oriented resin hinge arranged on each of said building portions at each of said front corners;

e. each of said hinges having a base portion interlocked with one of said building portions in a fixed relation and a free end region extending outward from said building portions and flexibly pivotal relative to said base portion and said building portion;

f. each of said hinges having opposed vertical grooves inward from said free end regions of said hinges making said hinges relatively narrower in the region of said opposed grooves and relatively wider in said free end regions outward from said opposed grooves; and

g. each opposite end region of said archway having a vertical slot, each of said slots having a closed upper end, an open lower end, and opening into a recess in said archway, the sides of said slots being shaped to fit in said grooves on said hinges so said archway can be slid down over said hinges and slid back up from said hinges with said free end regions of said hinges being received in said recesses of said archway and said sides of said slots having a vertically slidable fit on said hinges, the pivotal portions of which allow free pivotal motion of said building portions relative to each other and relative to said archway with said archway in place on said hinges, said building portions and archway including means by which each may stand apart from connection with the others.

3,888,040

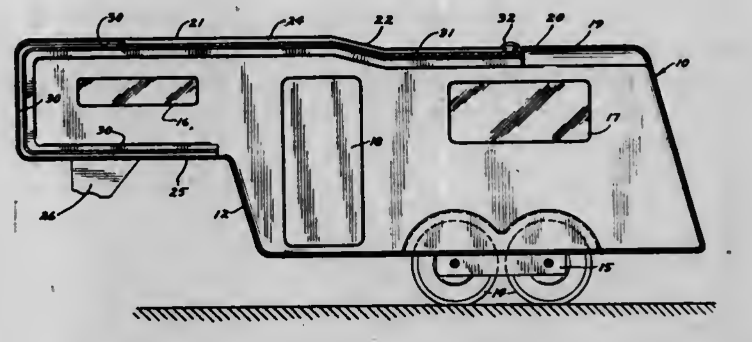
MINIATURE TOY CAMPER TRAILER

Harlan L. Waterhouse, Excelsior, Minn., assignor to Tonka Corporation, Hopkins, Minn.

Filed May 10, 1974, Ser. No. 468,920

Int. Cl. A63h *17/00*

U.S. Cl. 46—201 **3 Claims**



1. In a miniature toy trailer,

a. a trailer body carrying means for hitch connection to a draft vehicle and having side walls connected by a roof,

b. the roof having an opening therein centered between the side walls,

c. the side walls having opposing tracks extending in parallelism under and at each side of the roof opening and extending beyond the opening,

d. a sliding door having its side edges disposed in said tracks for sliding movement of the door between open and closed positions relative to the opening.

3,888,041

DEVICES, SYSTEMS AND METHODS EMPLOYING KNITTED FABRIC MULCH

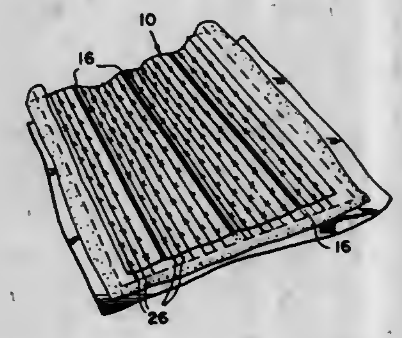
Robert T. Seith, Tuscaloosa, Ala., and Otto M. Bundy, Bradenton, Fla., assignors to Gulf States Paper Corporation, Tuscaloosa, Ala.

Division of Ser. No. 333,782, Feb. 20, 1973. This application Aug. 12, 1974, Ser. No. 496,625

Int. Cl. A01g *25/02*

U.S. Cl. 47—9 **7 Claims**

1. A mulch comprising an open-mesh knitted fabric constituted by a multiplicity of knittedly interconnected longitudinal and transverse yarn elements, said fabric having at least one irrigation tube and a multiplicity of parallel strips between longitudinal yarn elements and interleaved with transverse yarn elements of said fabric, said strips being substantially wider than said yarn elements and occupying a major portion of the area of the fabric.



3,888,042

ROOT-BALL WRAPPINGS FOR THE PLANTATION OF PLANTS AND METHODS FOR THEIR MANUFACTURE

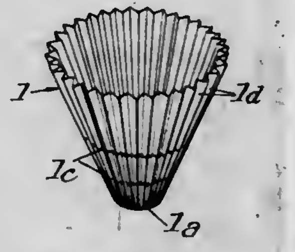
Henri Jacques Bourne, 38 Jarcieu, France

Filed May 24, 1973, Ser. No. 363,566

Claims priority, application France, June 23, 1972, 72.22771

Int. Cl. A01c *11/00*

U.S. Cl. 47—37 **8 Claims**



1. A method for wrapping the root-ball of a plant comprising placing a non-woven wrapping of a material comprising a plurality of randomly distributed fibers and having a substantially circular shape around the root-ball so that the wrapping conforms to the shape of the root-ball and the peripheral edges of the wrapping surround the stem-base of the plant and fixing the wrapping in place using a flexible tie to bind the wrapping together in an area adjacent the peripheral edges of the stem-base of the plant.

3,888,043

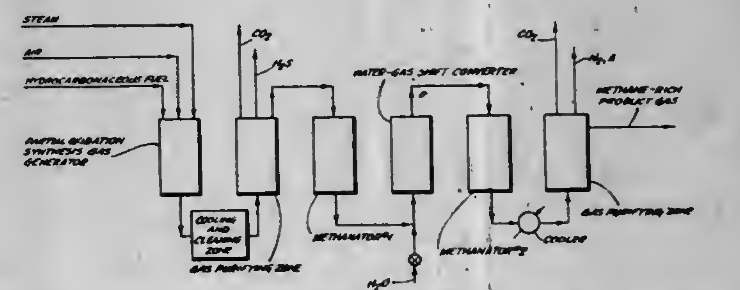
PRODUCTION OF METHANE

Edward T. Child, Hacienda Heights, and Allen M. Robin, Anaheim, both of Calif., assignors to Texaco Inc., New York, N.Y.

Filed June 25, 1973, Ser. No. 373,351

Int. Cl. C10j *3/00*

U.S. Cl. 48—197 R **17 Claims**



1. A process for producing a stream comprising methane comprising

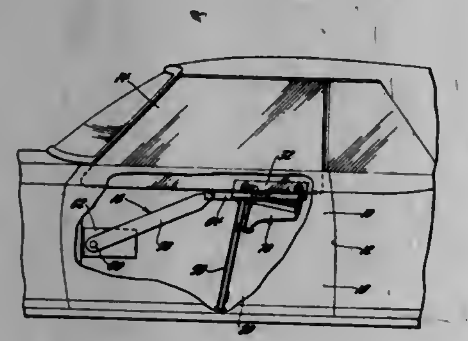
1. producing a raw process gas stream principally comprising CO, H_2, CO_2, H_2O with minor amounts of CH_4, A, H_2S, particulate carbon and containing from about 30 to 60 mole percent of N_2 dry basis by the noncatalytic par-

tial oxidation of a hydrocarbonaceous feedstock with air or oxygen-enriched air comprising about 21 to 50 mole % O_2 and from about 50 to 79 mole % N_2, and optionally with a temperature moderator, at an autogenous temperature in the range of about 1500° to 3500°F. and a pressure in the range of about 1 to 350 atm. abs. in a free-flow gas generator;

2. cooling, cleaning and purifying the effluent gas stream from 1 to produce a feed gas for catalytic methanation substantially comprising CO and H_2 and containing from about 32 to 62 mole % nitrogen.
3. reacting the feed gas stream from 2 in a first catalytic methanation zone at a temperature in the range of about 400° to 1500°F. and a pressure in the range of about 1 to 350 atm. abs. until substantially all of the H_2 is reacted with a portion of the CO to produce a process gas stream comprising CO, N_2, A, CH_4 and optionally CO_2 and H_2O;
4. introducing the effluent gas stream from 3 into a water-gas shift conversion zone at a suitable temperature along with supplemental H_2O, and reacting therein H_2O with a portion of the CO in said gas stream to produce a process gas stream comprising H_2, CO, CO_2, CH_4 and N_2, and removing any excess water therefrom;
5. adjusting the temperature of the effluent gas stream from 4 to a temperature in the range of about 400° to 1000°F., and reacting the H_2 and CO in said gas stream in a second catalytic methanation zone to produce a gas stream principally comprising CH_4, CO_2, H_2O, N_2 and optionally minor amounts of H_2, CO and A; and
6. cooling the effluent gas stream from 5 and separating impurities therefrom to produce said product stream principally comprising methane.

3,888,044
FOLDING STABILIZER LINKAGE FOR VEHICLE WINDOW

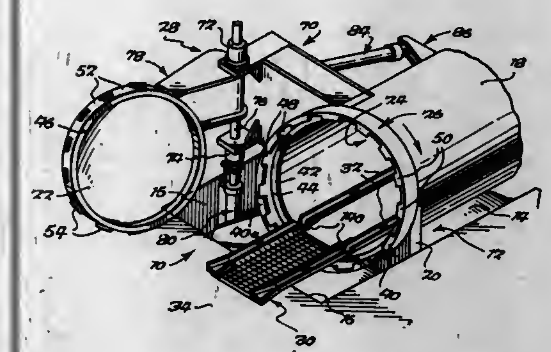
Leonard A. Lystad, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jan. 16, 1974, Ser. No. 433,752
Int. Cl. E05f *11/52*
U.S. Cl. 49—227 **3 Claims**



1. In a vehicle body having a window opening, a window movable between raised and lowered positions with respect to the opening, guide means connected to the window and movably mounting the window on the body and defining the path of window movement, and operating means for so moving the window along the path of movement, a stabilizer linkage comprising: track means mounted on the vehicle body within the storage cavity and extending generally vertically, means slidably interengaged with the track means, foldable linkage means having one end pivotally connected to the means slidably interengaged with the track means and the other end pivotally connected to the window at a point longitudinally spaced from the connection between the window and the guide means, means urging the foldable linkage to a normal unfolded position stabilizing the window, and means acting to fold the foldable linkage as the window is lowered to permit increased lowering of the window.

3,888,045
CONSTRUCTION FOR MOUNTING A DOOR OF A PIT MOUNTED PRESSURE VESSEL

Henry J. Piegza, Clarence, N.Y., assignor to WSF Industries Inc., Tonawanda, N.Y.
Filed May 30, 1974, Ser. No. 474,311
Int. Cl. E05f *7/02*
U.S. Cl. 49—255 **11 Claims**



1. A door mounting mechanism for use with a horizontally disposed pressure vessel of the type having a shell defining access opening closeable by said door and a rotatable locking ring mechanism for releasably locking said door in access opening closed position, said shell being mounted within a pit of a depth sufficient to permit a material carrier to be moved essentially horizontally into and out of said shell when said door is in an open position over a bridge removably positioned to bridge between said shell and a floor surface in front of said pit, said mounting mechanism serving to mount said door for both vertical reciprocating and horizontal swinging opening-closing movements between open and closed positions, whereby the "bridging" distance between said shell and said floor surface is less than that required to accommodate solely for horizontally directed swinging movements of said door between said positions, and said mounting mechanism comprising:

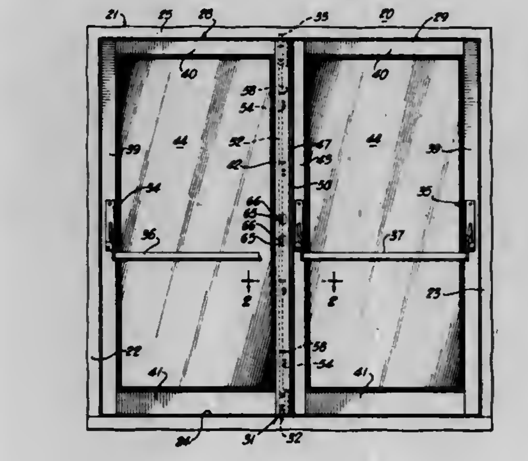
- a vertically extending bearing shaft;
- a first hinge part for mounting said bearing shaft for both horizontally directed rotary and vertically directed reciprocating movements;
- a second hinge part having one end thereof affixed to said bearing shaft for movement therewith and an opposite end thereof connected to said door;
- a lift control cylinder for imparting vertical reciprocating movements to said bearing shaft, whereby to effect vertical reciprocating movements of said door;
- a swing control cylinder for imparting rotary movements to said bearing shaft; whereby to effect horizontal swinging movements of said door; and
- circuit means for sequentially controlling operation of said lift and swing control cylinders, whereby in succession to swing said door horizontally from closed position sufficiently to clear said locking ring mechanism, to lift said door vertically sufficiently to clear said floor surface and to swing said door horizontally into said open position.

3,888,046
AUTOMATIC ASTRAGAL

Richard A. Meisterheim, Dowagiac, Mich., assignor to Kawneer Company, Inc., Niles, Mich.
Continuation-in-part of Ser. No. 272,387, July 17, 1972. This application Jan. 28, 1974, Ser. No. 436,952
Int. Cl.² E05C *9/14*
U.S. Cl. 49—319 **9 Claims**

1. An automatic astragal assembly for attachment to the edge of a door comprising:

- an elongated astragal housing member having a first edge slot;
- an elongated astragal retractable relative to said slot and of generally U-shape cross-section having a pair of spaced side members defining a second edge slot confronting the first edge slot;
- an elongated actuating member positioned at least in part within said second edge slot;
- motion translating means operatively connecting said actuating member and said astragal for projecting said withdrawing said astragal in response to vertical movement of said actuating member;
- projecting bolt means, said actuating member being operatively associated with said projecting bolt means;
- a panic bar, said panic bar being operatively associated with said actuating member;
- said motion translation means including a motion guiding mechanism guiding said astragal through projecting and retracting movement while preventing vertical movement thereof;

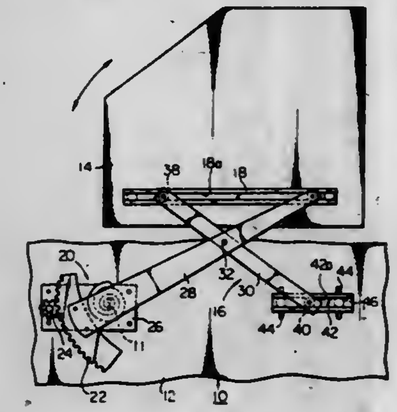


- said motion guiding mechanism comprising a guide pin fixed to the astragal and horizontally movable in guide slots in said astragal housing member, said actuating member having a clearance slot for said guide pin angled inwardly and downwardly;
- motion driving mechanism driving said astragal between its projected and retracted positions in response to vertical movement of said actuating member;
- said motion driving mechanism comprising a drive pin fixed to one of said members and guided for vertical movement in a slot in the other of said members; and
- said astragal being provided with a drive slot angled outwardly and upwardly at the same slope as said clearance slot and receiving said drive pin.

3,888,047
WINDOW REGULATOR FOR MOTOR VEHICLE

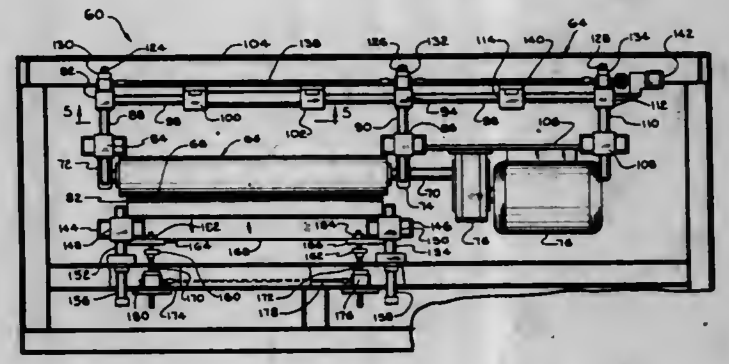
Takayo Chikaraishi, Tokyo, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan
Filed May 22, 1973, Ser. No. 362,844
Claims priority, application Japan, May 23, 1972, 47-60183
Int. Cl. E05f *11/44*
U.S. Cl. 49—351 **5 Claims**

1. A window regulator mechanism for raising and lowering a window pane in a motor vehicle door body having an inner panel, comprising a first arm secured at its one end to a gear segment meshing with a pinion gear mounted on said door inner panel and connected at its other end to said window pane, a second regulator arm pivotally connected to said first regulator arm by a pin at a point spaced apart from said gear segment and connected at its one end to said window pane, said second regulator arm being provided with a roller having an annular enlarged portion thereof at the other end of said regulator arm, said enlarged portion having an annular cylindrical surface thereon, and a guide rail being formed integrally with said door inner panel and including a pair of opposing stepped portions, said stepped portions having opposite parallelly extending plane surfaces thereof for rollably securely receiving therebetween the annular cylindrical surface of the enlarged portion of said roller to guide the other end of said second regulator arm.



3,888,048
METHOD AND APPARATUS FOR REMOVING SCALE FROM METAL SHEETS

Ford B. Cauffiel, 4940 Homerdale Ave., Toledo, Ohio 43623
Filed July 23, 1973, Ser. No. 381,879
Int. Cl. B24b *7/12*
U.S. Cl. 51—39 **4 Claims**



2. Apparatus for removing scale from a metal sheet, said apparatus comprising a hub, a multiplicity of flexible sheets extending generally radially from said hub, each of said flexible sheets having an abrasive surface facing in a common direction, means for rotating said hub at a high speed in the common direction, means for supporting the metal sheet in contact with outer edge portions of said flexible sheets, means for moving said metal sheet in a given direction between said flexible sheets and said supporting means, said supporting means comprising two back-up rolls having axes parallel to the axis of said hub and located symmetrically on opposite sides of a vertical plane extending through the axis of said hub, and positioned to engage the metal sheet at the same time and to support it in contact with the outer edge portions of said flexible sheets, an additional back-up roll, and means for mounting said additional back-up roll with its axis in the plane extending through the axis of said hub and spaced toward said hub from said two back-up rolls.

3. Apparatus for removing scale from a metal sheet, said apparatus comprising means for directing the metal sheet along a predetermined path, an upper abrasive roll located above said path and positioned to contact an upper surface of the metal sheet when moving along the path, at least one back-up roll positioned on the side of the path opposite said abrasive roll to support the sheet in contact with said upper abrasive roll, means for rotating said abrasive roll at high speed, a lower abrasive roll located below the path and posi-

tioned to contact a lower surface of the sheet when moving along the path, at least one additional back-up roll located on the side of the path opposite said lower abrasive roll to support the sheet in contact with the lower abrasive roll, means for rotating said lower abrasive roll at high speed, means for engaging said metal sheet on the same side thereof as said lower abrasive roll, and means for raising said engaging means when the metal sheet is stopped to separate the metal sheet from said lower abrasive roll.

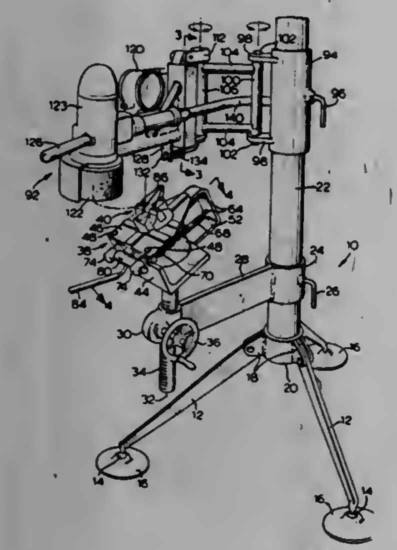
3,888,049
APPARATUS FOR GRINDING ROCK BIT INSERTS

George MacSween, 161 Bridgeland Ave., Toronto, 390 Ontario, Canada

Filed Sept. 28, 1973, Ser. No. 401,621

Int. Cl. B24b *3/33;* **B23q** *3/06*

U.S. Cl. 51—54 **5 Claims**



1. Apparatus for grinding the surface of an insert located at one end of a rock drill bit body comprising means for holding said body to locate said insert in a predetermined position, a driven cup shaped grinding wheel having a planar lip, moveable support means for said wheel comprising a first transversely rotatable arm and a second transversely rotatable arm rotatable with respect to said first arm, said grinding wheel being located on said second arm, whereby said planar lip of said grinding wheel is transversely moveable across said insert during grinding; and means acting between said support means providing limited movement of said planar lip into said insert, comprising a member pivoted on said first arm about a transverse axis and secured to said second arm, stop means on said first arm, and biasing means supported by said first arm urging said member away from said stop.

3,888,050
METHOD OF AND APPARATUS FOR RAPIDLY AND SIMULTANEOUSLY ABRADING METAL WORKPIECES IN PRESELECTED PLURAL NUMBERS

Donald C. Elm, St. Paul, Minn., assignor to Timesavers, Inc., Minneapolis, Minn.

Filed Feb. 19, 1974, Ser. No. 443,918

Int. Cl. B24b *21/00, 1/00*

U.S. Cl. 51—135 R **47 Claims**

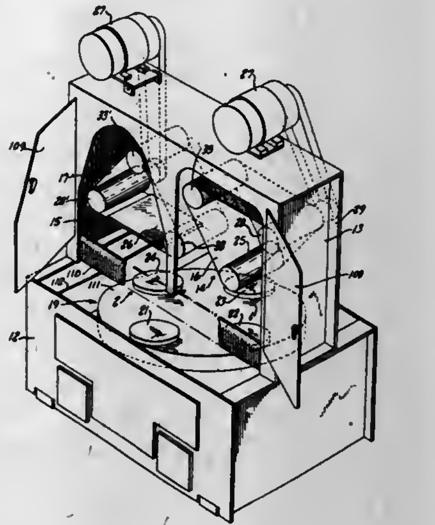
1. A grinding machine comprising the combination of:

A. a turntable having a plurality of work supports positioned to travel in a circular orbit upon rotation of the turntable, there being an even number of said work supports arranged in substantially diametrically opposite pairs with respect to the turntable axis;

B. a pair of abrading heads above the turntable at substantially diametrically opposite locations on the circular orbit of the work supports, so that said locations constitute work stations,

each of said abrading heads having a power driven endless abrasive belt and a backup member to hold a downwardly facing stretch of the belt against a workpiece on a work support therebeneath;

C. means to effect relative motion towards one another between the abrasive belts and the work supports then at the work stations, to thereby produce and maintain work performing engagement between both abrasive belts and the workpieces on said work supports; and



D. means for indexing the turntable in increments so related to the orbital distance between the work supports that with each index a pair of opposite work supports is brought to said work stations and another such pair is brought to intermediate stations on the circular orbit of the work supports,

so that during the intervals between indexing of the turntable, the two workpieces at the work stations can be ground while loading and unloading of workpieces can take place at at least one of said intermediate stations.

3,888,051
CONTROL OF THE MOTION OF A WORK TOOL CARRIAGE

Heinz Berthle, Aichelberg, Germany, assignor to Fortuna Werke Maschinenfabrik AG, Stuttgart, Germany

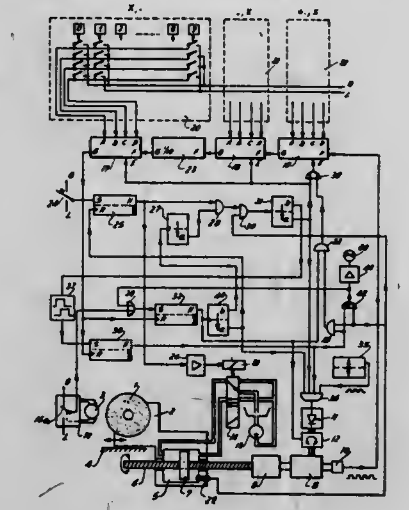
Filed Dec. 20, 1973, Ser. No. 426,938

Claims priority, application Germany, Dec. 27, 1972, 2263452

Int. Cl. B24b *49/04*

U.S. Cl. 51—165.77 **15 Claims**

1. In a machine tool in combination, a work tool carriage mounted for movement along a predetermined path towards and away from a workpiece; moving means for moving said carriage along said path and including rotatable means operative for causing said moving means to move said carriage along said path a distance proportional to the number of rotations performed by said rotatable means; selecting means for selecting a distance to be travelled by said carriage along said path; pulse-generating means operative for detecting rotation of said rotatable means and generating a pulse each time said rotatable means rotates through a predetermined angle; and control means receiving pulses generated by said pulse-generating means and operative for initiating operation of said rotatable means and for thereafter automatically terminating operation of said rotatable means in response to receipt of a sequence of pulses corresponding to the selected distance.



3,888,052
RELATING TO METHODS FOR GRINDING RAILS

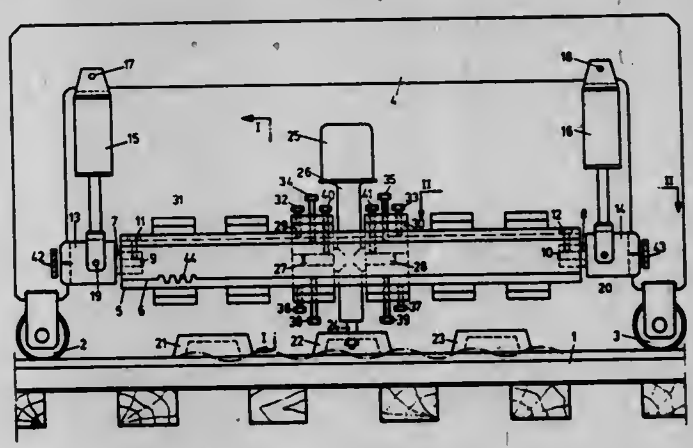
Romolo Panetti, Geneva, Switzerland, assignor to Speno International S.A., Geneva, Switzerland and Frank Speno Railroad Ballast Cleaning Co., Inc., Ithaca, N.Y.

Filed June 7, 1973, Ser. No. 367,875

Claims priority, application Switzerland, June 8, 1972, 08498/72

Int. Cl. B24b *1/00*

U.S. Cl. 51—281 R **8 Claims**



1. A method of truing a rail by grinding comprising mounting a reference base by two point contact with a rail to be ground, adjustably mounting a plurality of spaced grinders on the base to co-operate with the rail at respective grinding zones in line with said two points, and adjusting the longitudinal spacing between the grinders to shift said grinding zones longitudinally of the two point line to an optimum position dependent on the irregularities of the rail to be trued.

3,888,053
METHOD OF SHAPING SEMICONDUCTOR WORKPIECE

Joseph Paul White, and Paul Joseph Delpriore, both of Somerville, N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 29, 1973, Ser. No. 364,660

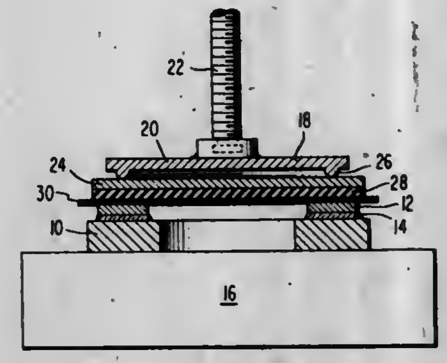
Int. Cl. B24b *1/00, 7/22*

U.S. Cl. 51—281 SF **3 Claims**

1. In a process for shaping semiconductor workpieces, the steps of:

providing a layer of wax adhesive on a surface of a mounting plate and disposing a number of workpieces on said layer, and

applying a uniform pressure to each of said workpieces for pressing them into said layer utilizing a compressible pressure applying means to accommodate thickness variations among said workpieces and a slip plate disposed between said compressible pressure applying means and said workpieces for preventing stressing of said workpieces in directions parallel to said layer.



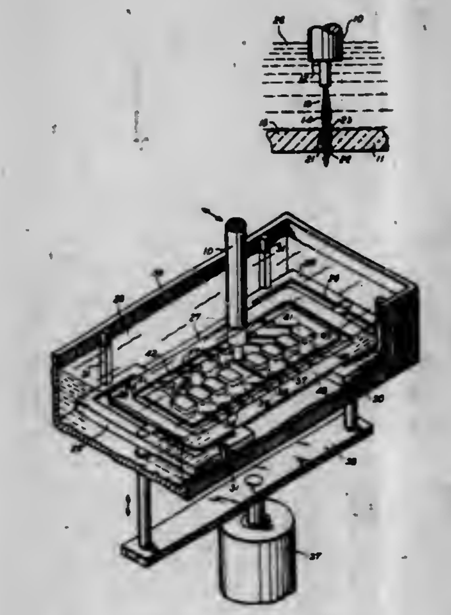
3,888,054
METHOD FOR ABRASIVE CUTTING IN A LIQUID

Nicholas F. Maselli, East Hampstead, N.H., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Nov. 16, 1973, Ser. No. 416,553

Int. Cl. B24c *1/00, 1/04*

U.S. Cl. 51—319 **9 Claims**



1. A method of forming an aperture in material, comprising the steps of:

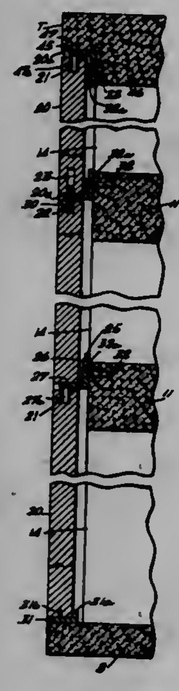
covering the surface of the material at a site at which the aperture is to be formed, with a liquid; and

propelling a stream of abrasive particles, carried in a fluid under pressure, against the covered surface of the material to form the aperture in the material.

3,888,055

CRYPT WALL CONSTRUCTION HAVING REMOVABLE FRONTS SECURED BY CONCEALED FASTENERS AND METHOD OF CONSTRUCTION

Roberto A. Gallo, 2468 Wiley St., Hollywood, Fla. 33020
Filed Sept. 25, 1973, Ser. No. 400,542
Int. Cl. E04h *13/00;* E04b *2/88*
U.S. Cl. 52—98 **6 Claims**

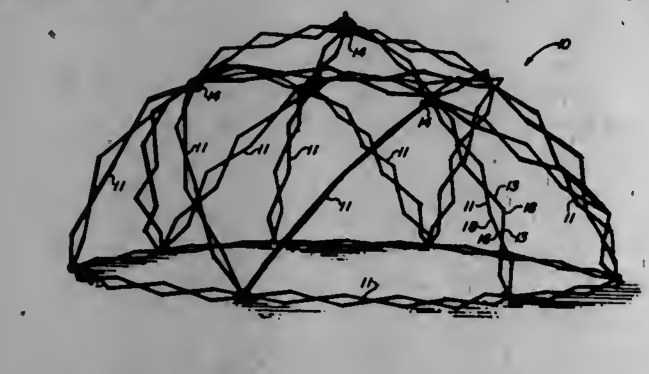


1. A method of constructing a wall of individually removable fronts for a burial crypt structure in vertical tiers comprising the steps of forming spaced seats and a center bore in the top edges and a center bore in the bottom edges of the fronts, the bores being in alignment and the bottom bore having a depth about twice that of the top bore, installing the fronts, tier by tier commencing at the bottom, said installation including the steps of locating adjacent fronts on previously installed brackets of a lower tier by means of pins extending between said center bores, positioning brackets having means for engaging seats of said adjacent fronts on the top edges thereof, drilling holes in the crypt structure to register with openings in said bracket for fastening the latter thereto, inserting expansion bolts through said bracket openings and into said holes, and expanding the bolts to secure the bracket to the crypt structure.

3,888,056

ERECTABLE BUILDING STRUCTURE JUNCTION ELEMENT

Vincent M. Kelly, 61 Hassayampa Country Club, Prescott, Ariz. 86301, and Henry H. Schrieber, 631 East Wesleyan, Tempe, Ariz. 85282
Filed Oct. 25, 1973, Ser. No. 409,436
Int. Cl. A45f *1/16;* E04h *12/18*
U.S. Cl. 52—109 **3 Claims**



1. A junction element for interconnecting a plurality of expandable trusses forming a portion of an erectable framework for a building structure, each expandable truss comprised of a scissor-type mechanical strut having at least one pair of linkages pivotally connected at a point between their ends, said junction element comprising:

a plurality of substantially axially aligned hubs positioned along a rod, the number of said hubs grouped into sets of three;

a plurality of lugs fastened around the periphery of each hub;

means for pivotally fastening the pivot point of the paired scissors-type linkage at the end of one expandable strut to one lug of the central hub of a group of hubs;

a first and second arm pivotally fastened respectively at one end to a lug of the first and third hub of the group, the other ends of the arms being each pivotally fastened to one linkage of the scissor-type mechanical truss at a position between the pivot point of the linkage and the pivot connection to the next linkage;

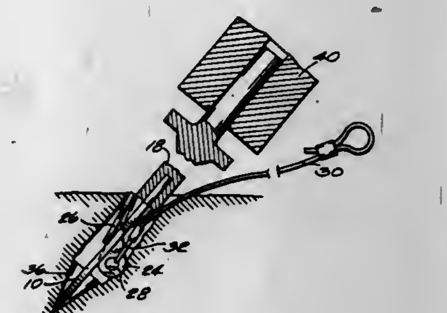
the relative position of the first and third hubs to the central hub of one junction element determining the distance between the common ends of the linkages of the scissors-type struts and thus determining the length of said expandable trusses,

said central hub of each group being fastened to said rod while the first and third hubs are slidably fastened thereto.

3,888,057

GROUND ANCHOR WITH PIVOTING FLUKE

Raymond H. Zubke, Route 1, 2625 Church Rd., Jackson, Wis. 53037
Filed Feb. 21, 1974, Ser. No. 444,453
Int. Cl. E02d *5/80*
U.S. Cl. 52—163 **10 Claims**



1. In a ground anchor having a fixed fluke adapted to be driven into the ground along a longitudinal axis, a driving tool having a releasable connection with the fixed fluke to leave the fixed fluke free to turn laterally to said axis when the driving tool is withdrawn, a movable fluke pivotally attached to said fixed fluke and movable between a first position in which said movable fluke is substantially parallel to said longitudinal axis and a second position in which said movable fluke is transverse to said longitudinal axis, a cable coupled to said movable fluke and operable to move said movable fluke from said first position thereof toward said second position thereof in response to a pull on said cable, abutment means on said fixed fluke engageable with said movable fluke to limit its movement in said second position thereof, means including said cable and said abutment means for exerting turning torque between the movable fluke and the fixed fluke when said movable fluke is in its second position and turn said fixed fluke transverse to said axis to set the anchor in the ground.

3,888,058

STAIR UNIT FOR A STAIRWAY

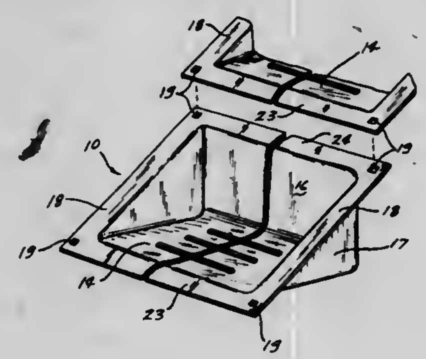
Claude W. Ahrens, Box 275, Grinnell, Iowa 50112
Filed Apr. 22, 1974, Ser. No. 463,065
Int. Cl. E04f *11/12*
U.S. Cl. 52—191 **2 Claims**

1. A stairway comprising:

a. a pair of transversely spaced side members,

b. a plurality of like one piece stair units, each of which includes a tread section, a riser section and end sections of a triangular shape connected to and extended between corresponding ends of said tread section and riser section,

c. a continuous flange extended laterally outwardly from the forward side of said tread section and the upper sides of said riser section and end sections, said flange lying in a plane normal to said side sections,



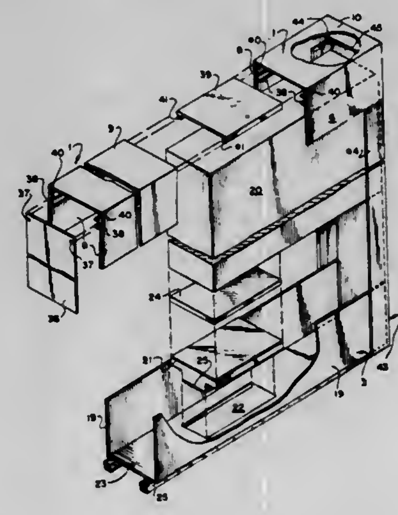
d. said stair units located between said side members with the flange portions corresponding to said side sections supported on the upper surfaces of said side members and the flange portion corresponding to a tread section on one stair unit arranged in a superposed relation with the flange portion corresponding to a riser section on a next adjacent stair unit, and

f. means for securing said side section flange portions to said side members.

3,888,059

PARTITION WALL CONSTRUCTION

Clayton MacLennan, 6814 Lowell Crescent St., and Orville W. Haagenson, 4212 Blow St, N.W., both of Calgary, Alberta, Canada
Division of Ser. No. 324,010, Jan. 16, 1973. This application Dec. 6, 1973, Ser. No. 422,109
Int. Cl. E04b *2/78*
U.S. Cl. 52—241 **5 Claims**



1. A removable partition wall construction adapted to be positioned between a floor and a ceiling, comprising:

a. an upper generally U-shaped channel member having a base portion attached to a ceiling and a pair of transversely spaced, longitudinally extending dependent leg portions;

b. a plurality of vertically extending stud members each having a generally I cross-sectional configuration, each stud comprising a pair of spaced side webs joined by a transverse cross web;

c. the side webs at the upper end of each stud being located within and parallel to the leg portions of said channel member;

d. each stud including guide means adjacent the upper end thereof;

e. a member vertically slidable in said guide means and fixedly secured to the base portion of said upper channel member;

f. said stud member being located with its lower end in abutment with the floor;

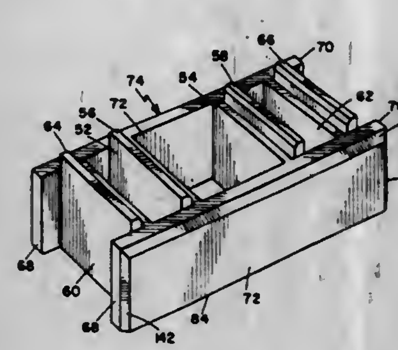
g. a plurality of lower, generally U-shaped channel members, each of said U-shaped channel members having a base portion and a pair of transversely spaced upstanding leg portions, the ends of the lower channel member extending between two adjacent studs between said side webs; and

h. at least one aperture in said base portion of each of the lower U-shaped channel members with a floor anchor member extending through such aperture for supporting the weight of panel web members of said wall.

3,888,060

CONSTRUCTION ASSEMBLY AND METHOD INCLUDING INTERLOCKING BLOCKS

Juan Haener, 8215 Harton Pl., San Diego, Calif. 92120
Filed Dec. 17, 1973, Ser. No. 425,299
Int. Cl. E04c *1/08, 1/10, 1/30*
U.S. Cl. 52—286 **38 Claims**



1. An interlocking block for use in wall construction assemblies, which assemblies involve the interlocking of a plurality of substantially identical blocks to create a substantially continuous planar wall surface, and wherein said wall construction assemblies have a plurality of linear courses of blocks, with each said linear course comprising a plurality of abutting blocks laid end to end, and wherein the blocks in the courses lying staggered and below any linear course are in stabgered relationship to the blocks in it's underlying or overlying linear course, said block comprising:

a pair of spaced parallel side walls having flat upper and lower faces,

means to maintain said side walls in a spaced relationship, a plurality of first locking means connected to said side walls, and disposed between the upper section of said side walls,

said first locking means including a plurality of projections extending above the upper face of said side walls,

cooperative locking means having cooperating portions connected to said side walls and disposed between the lower section of said side walls,

said cooperating locking means terminating at the plane of said lower face,

the thickness of said projections being less than the thickness of said cooperating portions,

whereby the projections above the upper face of the side walls on one block are adapted to cooperate in locking relationship with the lower cooperating portions of a block placed above said one block to prevent transverse or longitudinal displacement of the blocks relative to one another.

3,888,061

COMPONENT PART OF LAMINATED BOARD AND A PROCESS FOR MANUFACTURING SUCH COMPONENT PART

Olof Kahr, Transtorpsvägen 237, 382 00 Nybro, Sweden
Filed May 24, 1973, Ser. No. 363,497
Int. Cl. B32b *3/10*
U.S. Cl. 52—589 **13 Claims**

1. A core for floor boarding comprising:

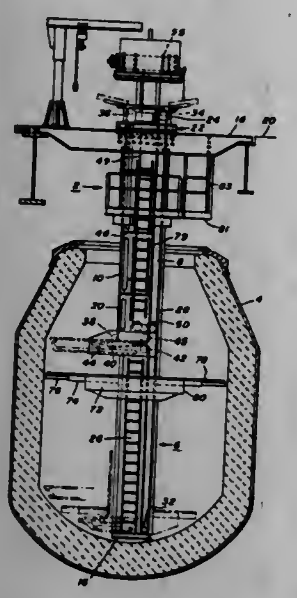
at least two oblong panels, each consisting of wood boards and each having its boards disposed in first patterns, recurrent longitudinally of the oblong panel, of first, mutually parallel boards having a first direction relative to the oblong panel, and in second patterns, between the first patterns, of second, mutually parallel boards having a second direction relative to the oblong panel, the panels being laminated together and having boards of each first pattern of one panel interlocked transversely with boards of a second pattern of another panel laminated with said one panel, and vice versa, and

at least two pairs of elongate edge fillets, each fillet extending longitudinally of one of the oblong panels and having a first edge secured to one side edge of the panel, such fillets of each pair thereof facing one another, being laminated together with one another and having substantially coincident, free, second edges to define fillet surfaces of different width, facing one another, whereby the core has, between its panels and edge fillets, substantially step-like joints reinforcing side edge portions of the core.

3,888,062

WORK TOWER FOR RELINING METALLURGICAL VESSELS

Thomas Gregord, Hudson, Ohio; Bernard Filipich, and William Jancosko, both of Pittsburgh, Pa., assignors to Vulcan Engineering Company, Pittsburgh, Pa.
Filed Feb. 14, 1974, Ser. No. 442,323
Int. Cl.² E04G *21/14*
U.S. Cl. 52—749 **16 Claims**



1. In an apparatus for lining the walls of a metallurgical vessel with refractory bricks which apparatus includes support means over the top opening of the vessel, elongated tower means suspended within the vessel from the support means and rotatably movable thereon, and first conveyor means, in the tower and rotatably movable therewith, for conveying bricks vertically within the vessel, the improvement comprising:

a second conveyor means having a laterally extending brick conveying upper surface of adjustable length vertically movable on the tower means for transporting bricks between the tower means and the walls of the vessel at variable heights and distances from the tower means; and wherein

said first conveyor means comprises:

a plurality of sprockets;

two pairs of endless chains traveling in the same direction on a path defined by the sprockets, which path has two vertical runs between upper and lower sprockets rotatably mounted at fixed positions on the tower, one said vertical run having a first portion in which one pair of chains travels in a plane parallel to, and laterally disposed from, the plane of travel of the other pair, and a second vertical portion in which the pairs of chains travel in the same plane, the other vertical run having the pairs of chains travel in the same plane throughout the run;

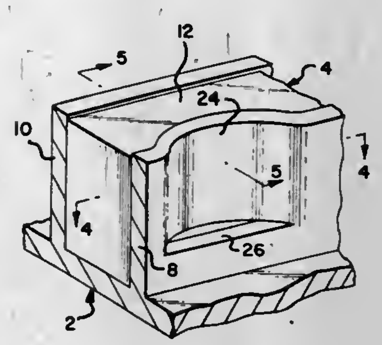
a plurality of foldable pallets each of which is connected to both pairs of chains at spaced intervals along the chains, which pallets are horizontally suspended between the chains during the first portion of said one vertical run, and are disposed in the same plane as the pairs of chains during the second portion of said one vertical run and throughout the second vertical run; and

a frame having a plurality of sprockets rotatably mounted and arranged thereon to guide one of said pairs of chains along a substantially horizontal path between the two laterally displaced planes of the first portion and the common plane of the second portion of said one vertical run which imparts substantial horizontal movement to the foldable pallets as they pass from said first to second portion of said one vertical run, said frame being vertically movable on the tower to vary the respective lengths of said first and second portions of said one run and to align the horizontally moving foldable pallets between said first and second portions in brick transferring relationship with the second conveyor whereby bricks are conveyed between the exterior of the metallurgical vessel and the interior walls thereof through vertical movement by said first conveyor and lateral movement by said second conveyor.

3,888,063

FASTENINGS AND CORNER JOINTS

Robert Houston Frantz, Carlisle, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Jan. 29, 1971, Ser. No. 110,908
Int. Cl. F16b *7/00*
U.S. Cl. 52—753 D **19 Claims**



1. A connecting device for forming a corner joint among three structural members, said device comprising:

first, second, and third arms said arms having rectangular cross sections,

said first and second arms being perpendicular to each other and defining a first plane, said first and second arms having sides which are substantially parallel to said first plane,

said third arm extending perpendicularly from said first arm at a location spaced from the juncture of said first and second arms, said first and third arms defining a second plane which extends normally of said first plane, said third arm having sides which are substantially perpendicular to said second plane,

recesses on at least one of said sides of each of said arms, said recesses extending partially across said sides and being adapted to receive portions of said structural members, and

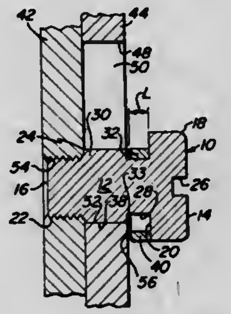
projections on said second arm on one side which is between said sides, said projections being adapted to be received in said structural members whereby,

said first and third arms can be located between parallel ribs on two structural members extending perpendicularly with respect to each other and abutting each other, and said second arm can be located against a rib on an additional structural member which abuts, and extends normally from, said first and second structural members, said structural members being securable to said device upon deformation of said ribs into said recesses.

3,888,064

MULTIPLE GRIP LENGTH MOUNTING BOLT

Peter A. Basile, Edison, N.J., assignor to Amerace Corporation, New York, N.Y.
Filed Nov. 16, 1973, Ser. No. 416,439
Int. Cl.² F16B *5/02, 35/00*
U.S. Cl. 52—758 F **10 Claims**



1. Apparatus for mounting an item upon either of at least two mounting boards of differing thicknesses, said apparatus comprising, in combination:

a. at least two mounting boards of differing thicknesses, each of said boards containing at least one laterally extending keyhole configured slot passing through the thickness thereof, each of said slots having a larger diametered portion interconnected with a smaller diametered portion;

b. an item adapted to be mounted in juxtaposition with at least one of said mounting boards, said item having a portion, including securing means, adapted to be positioned adjacent to either of said boards;

c. a mounting bolt adapted to mount said item on either of said boards, said bolt comprising:

  i. a shank extending longitudinally between opposite ends thereof, said shank being dimensioned to be positioned within the smaller diametered portion of said slot;

  ii. a head at one end of said shank, the diameter of said head being smaller than the diameter of the larger diametered portion of said slot and larger than the diameter of the smaller diametered portion of said slot, said head defining a primary gripping surface extending laterally relative to said shank, said primary gripping surface adapted to engage the thicker of said mounting boards adjacent said smaller diametered portion of said slot;

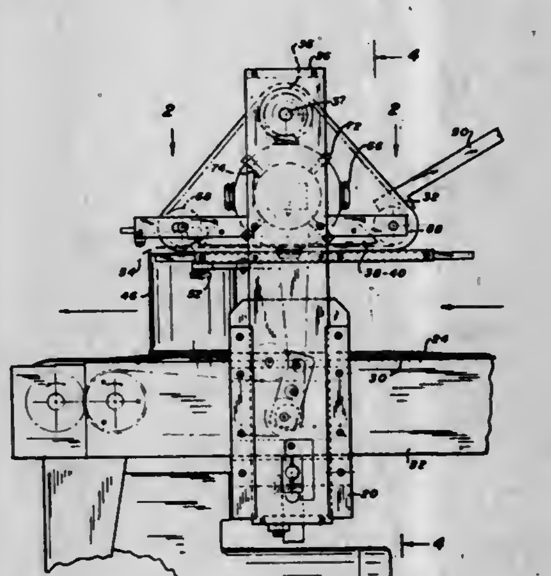
  iii. securing means at the other end of said shank adapted to engage the securing means of said portion of said item so as to secure said mounting bolt to said item with said item at a fixed position on said shank relative to the gripping surface; and

  iv. spacing means on said shank between said head and said fixed position, said spacing means including a collar having an auxiliary gripping surface thereon, said collar being captively contained within a recess on said shank and being movable laterally relative to the shank so as to be alternately placed and removed from between the primary gripping surface and said fixed position, said auxiliary gripping surface being adapted to engage the thinner of the said mounting boards adjacent the smaller diametered portion of said slot; the longitudinal distance between the primary gripping surface and the auxiliary gripping surface corresponding essentially to the incremental difference between said board thicknesses.

3,888,065

APPARATUS AND METHOD FOR AUTOMATICALLY POSITIONING AND INSERTING PLASTIC PLUGS IN A CONTAINER TOP

Raymond A. Heisler, 657 Dakota Trail, Franklin Lakes, N.J. 07417
Filed July 3, 1974, Ser. No. 485,501
Int. Cl. B65b *7/28;* **B67b** *1/04*
U.S. Cl. 53—43 **15 Claims**



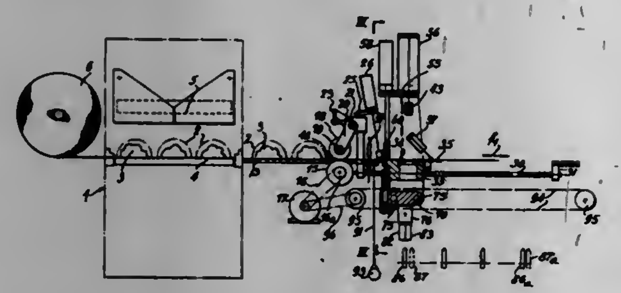
1. Apparatus for receiving, transporting and delivering containers to a plug inserting station whereat a plastic plug is positioned and inserted into an aperture in the cover of an advancing container, said inserting apparatus including: (a) a support means; (b) a lower conveyor carried by the support means and having means for receiving containers and with their bottoms resting on said conveyor advancing said containers in a single file array to and through a plug inserting station; (c) means for advancing said lower conveyor at a selected rate of travel; (d) a pair of upper transporting chains carried by the support means and having their lower extents parallel to and disposed at a distance above and in alignment with the lower conveyor which distance is slightly greater than the height of a container to be transported; (e) means for retaining the lower extents of the upper chains in a fixed plane parallel to the lower conveyor; (f) spring biasing means for elevating that intermediate portion of the lower conveyor that is in spaced alignment and parallel with the upper transporting chains, said spring biasing means locally elevating the lower conveyor so that a transported container is brought upwardly into engagement with the lower extents of the upper chains to cause the top surface of the container to be moved through the apparatus in an established plane; (g) chute means for feeding and delivering plastic plugs one at a time to a delivery station; (h) a rotatable wheel carried above the upper chains and having a plurality of plug pushers mounted thereon; (i) means for rotating said wheel in a timed relationship with the advancement of the container so that an associated plug pusher on the wheel first engages and then removes the lowermost plug in the chute means and then guides the plug into an aperture in the container cover, said rotatable wheel and plug pusher so spaced from the top of the advancing container that as the

aperture and plug is brought in way of the lowpoint of the circular travel of the plug pusher, the plug carried thereby is pushed into seated engagement in the aperture, and (j) means for the continuation of the rotation of the wheel so that the plug pusher is eventually lifted from inserted engagement with the plug, and the container is free for transport from the inserting station.

3,888,066
MACHINE FOR PERFORMING LONGITUDINAL AND TRANSVERSE CUTTINGS IN SHEETS, PLATES AND SIMILAR PRODUCTS

Marcel Tabur, Le Mans, France, assignor to G.M.T. S.A., Le Mans, France

Filed Oct. 29, 1973, Ser. No. 410,380
Int. Cl. B65b *61/08, 61/16*
U.S. Cl. 53—167 16 Claims

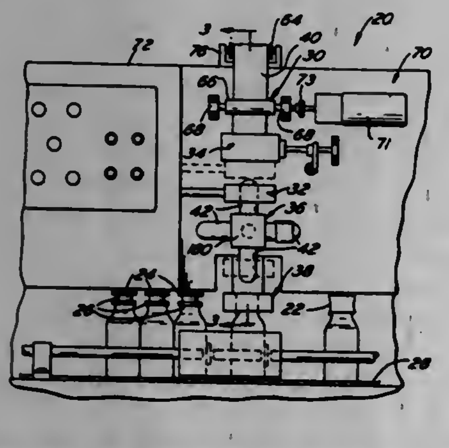


1. Packaging and cutting apparatus comprising a packaging unit for packaging a plurality of objects between a supporting sheet and a covering film bonded to said sheet, a table located near said packaging unit to support said sheet and film to be cut between said objects, a set of blades fixedly placed in an arrangement transverse to said table, a first carriage placed at end of said table on longitudinal guides, said first carriage supporting at least one small bar vertically mobile to press said sheet and film on top thereof, whereby advance of said first carriage causes advance of said sheet and film which are longitudinally cut by said blades, the first carriage further supporting a second carriage placed on guides extending angularly to the guides on which the first carriage is moved, and said second carriage supporting at least one blade protruding above said first carriage, whereby said blade ensures cutting of said sheet and film in transversal direction thereof during a step by step action cycle of said first carriage.

3,888,067
BANDING MACHINE

Radley Cross, Bala Cynwyd, and John Laessig, Newtown Square, both of Pa., assignors to Gilbreth Company, Cornwells Heights, Pa.

Filed Sept. 18, 1973, Ser. No. 398,514
Int. Cl. B67b *5/00*
U.S. Cl. 53—292 9 Claims

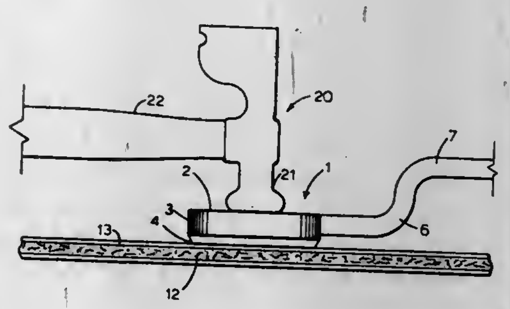


1. Apparatus for providing a band about an article moving along a horizontal path comprising means for supplying a band of a predetermined length, first vacuum means to grip the outer surface of the band to effect the partial opening of the band and to carry said partially opened band along a vertical path to mandrel means disposed therebelow, said mandrel means including a turret having a plurality of mandrels extending radially outward therefrom, said turret being rotatable about a horizontal axis to rotate said mandrels in a vertical plane whereupon one of said mandrels extends vertically upward towards said first vacuum means and one of said mandrels extends vertically downward towards second vacuum means disposed therebelow, each of said mandrels being cylindrical and including a tapered end, the diameter of said mandrels being slightly smaller than the inside diameter of the band when fully opened such that when said first vacuum means places said partially opened band on said mandrel said mandrel effects the more full opening of said band, said second vacuum means for gripping the outer surface of the band disposed on said downwardly extending mandrel to substantially fully open the band and completely remove it from said mandrel by thereafter carrying said band in a downward vertical direction off said mandrel to position it around said article disposed therebelow.

3,888,068
HOLE CUTTING APPARATUS

Damaso P. Zambrano, 3344A Hoolulu St., Honolulu, Hawaii 96815

Filed Aug. 23, 1973, Ser. No. 390,773
Int. Cl. B26f *1/32*
U.S. Cl. 30—358 5 Claims

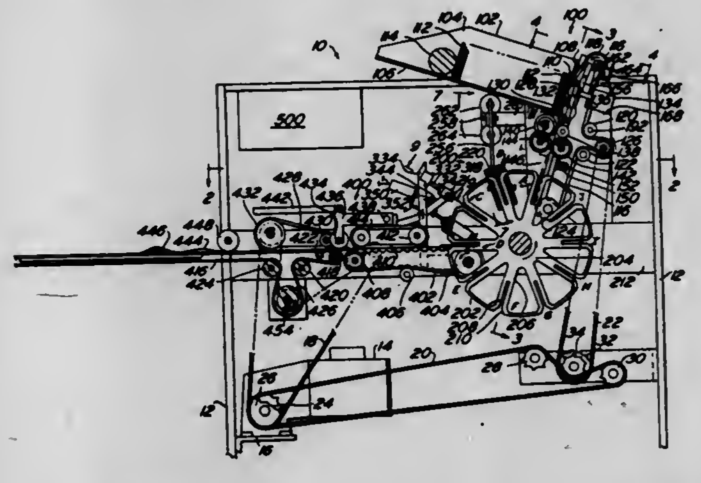


1. A wall board hole cutting apparatus comprising
an anvil plate,
an annular cutting rim, attached to a perimeter of the anvil plate extending perpendicularly downward from a principal plane of the anvil plate, where a lower edge of the annular cutting rim is a cutting edge,
an elongated handle member, with one end attached to the edge of the anvil plate, extending away from the anvil plate in a direction generally parallel to the plane of the anvil plate with a portion of the handle bent upward away from the plane of the anvil plate and with the handle bent a second time to return the configuration generally parallel with the plane of the anvil plate with a distal portion of the elongated handle member displaced upward from the plane of the anvil plate so that the handle may be encircled by a hand with backs of fingers resting on wall board while the annular cutting rim rests on a sheet of wall board, whereby the hole cutting apparatus is held in position on the wall board during a cutting process;
whereby holes are cut in wallboard by manually positioning the hole cutting apparatus with the elongated handle member and by driving the annular cutting rim through the wallboard by impacting an upper face of the anvil plate.

3,888,069
ENVELOPE OPENING MACHINE

Edwin F. Pierce, Bessemer; Larry W. Roberts, Fairfield, and Leland D. Maddox, Hueytown, all of Ala., assignors to Amer-O-Matic Corporation, Bessemer, Ala.

Filed July 1, 1974, Ser. No. 484,368
Int. Cl. B65b *61/00*
U.S. Cl. 53—381 R 15 Claims

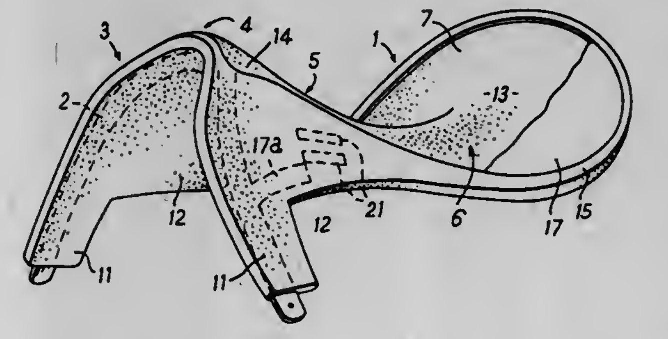


13. An envelope opening machine for automatically opening envelopes and exposing the contents thereof comprising a hopper, a pair of side edge destruction means, a top edge destruction means, means for transferring an envelope from the hopper into alignment with the pair of side edge destruction means for destroying the envelope side edges, means for transferring the envelope from the pair of side edge destruction means into alignment with said top edge destruction means for destroying the envelope top edge, a discharge conveyor for discharging envelopes with their contents exposed, and means between said discharge conveyor and said top edge destruction means for moving one panel of the envelope to a position wherein the contents of the envelope are exposed.

3,888,070
SADDLE TREES AND SADDLES

Robert Eric White, Hounslow, and Robert Oscar Lightfoot, Croydon, both of England, assignors to White Polytechniques Limited, London, England

Filed June 11, 1973, Ser. No. 368,529
Claims priority, application United Kingdom, June 9, 1972, 27029/72; Sept. 1, 1972, 40696/72; Sept. 4, 1972, 40982/72
Int. Cl. B68c *1/00*
U.S. Cl. 54—44 12 Claims

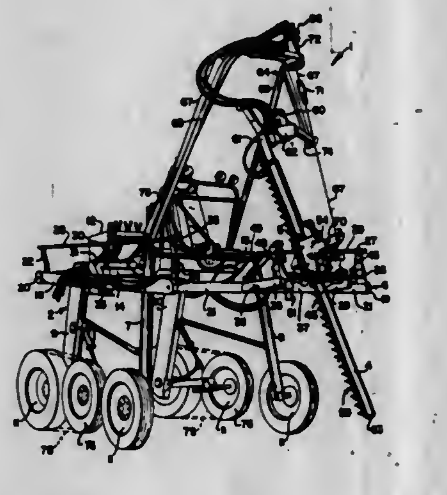


1. A method of making a saddle tree which comprises moulding in one operation a first substantially rigid part of the tree comprising a front neck portion, a mid-waist and seat portion, and a rear cantle portion from plastics material, thereafter while using the first part as a mould part, moulding a second resiliently compressible part of self-skinning foamed plastics material to provide a resilient cushion bonded to at least the majority of the upper surface of the seat and cantle portions of the first part and additionally moulding padding to bond to the rear and underside of the cantle portion.

3,888,071
TREE TRIMMING APPARATUS

Louie E. Wallace, Plainview, Tex., assignor to W. F. Larson, Inc., Plainview, Tex.

Filed Oct. 9, 1973, Ser. No. 404,767
Int. Cl. A01d *55/02*
U.S. Cl. 56—237 14 Claims

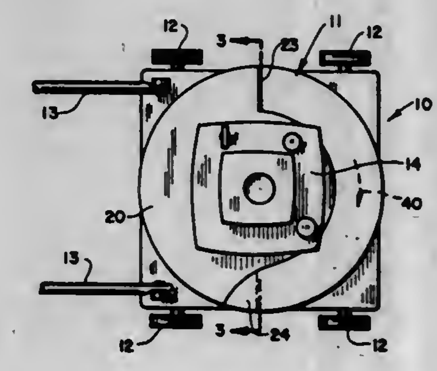


1. A tree trimming apparatus comprising:
a. a mobile support structure;
b. a platform adjustably mounted on said support structure;
c. means operatively connected to said platform and support structure for positioning said platform in a desired attitude relative to the ground;
d. an elongated trimming member having an upper end and a lower end and extending through said platform;
e. means mounted on said platform and engageable with said trimming member for positioning same at a selected angle relative to said platform;
f. means for selectively longitudinally positioning said trimming member relative to said platform; and
g. means operatively connected to said platform for rotating same relative to said support structure thereby moving said trimming member in a path defining a selected geometric surface of revolution.

3,888,072
ROTARY LAWN MOWER

William E. Templeton, 1807 W. Hanley Rd., Lakewood, Ohio 44904

Continuation-in-part of Ser. No. 247,664, April 26, 1972, abandoned. This application May 16, 1973, Ser. No. 360,920
Int. Cl. A01d *67/00, 55/18*
U.S. Cl. 56—320.2 13 Claims



1. A rotary lawn mower comprising:
a. a guard housing supported on ground engaging wheels and defining a downwardly opening chamber which is generally cylindrical about a vertical axis;

- b. power drive means carried by said guard housing and having a drive shaft positioned along said axis and depending into said chamber;
- c. blade means mounted on said drive shaft for rotation in a generally horizontal plane;
- d. said blade means having radially extending portions projecting outwardly from a central region and having an axis of symmetry coincident with the axis of said drive shaft;
- e. said radially extending portions each defining an end region including forward and trailing blade edge portions, said forward edge portions being sharpened to form shearing surfaces, and said trailing edge portions carrying forwardly opening generally U-shaped deflectors;
- f. said guard housing defining a peripheral discharge opening communicating with one side of said chamber and an inlet opening communicating with said chamber at a position spaced circumferentially from said discharge opening;
- g. said guard housing further defining a curved channel of increasing cross section extending in the direction of rotation of said blade means from said inlet opening to said discharge opening for permitting a stream of air to be drawn into said housing through said inlet opening and channeled smoothly through said housing along said channel to entrain grass clippings in the air stream and to discharge the entrained clippings through said discharge opening.

3,888,073
CONSTRUCTION TO FACILITATE ASSEMBLY OF A TIMEPIECE

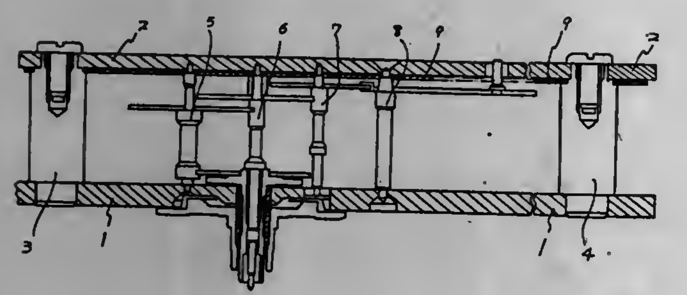
Masahiro Kurita, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Japan

Filed Dec. 27, 1971, Ser. No. 212,611

Claims priority, application Japan, Dec. 28, 1970, 45-132722

Int. Cl. G04b *13/02*

U.S. Cl. 58—7 **8 Claims**



1. In as assembly of a timepiece comprising a base plate and a bridge plate, pillars supporting said plates in fixed spaced relationship, a plurality of gear wheels having support shafts disposed between said plates, bearing means carried by said plates rotatably supporting said gear wheel shafts, the improvement which comprises a guide plate mounted on said pillars adjacent said bridge plate, said guide plate being of thin flexible sheet material having a thickness less than that of the bridge plate and having a plurality of openings through which end portions of the shafts of said gear wheels pass, said openings being large enough to receive the end portions of said shafts freely while small enough to guide and position said end portions of the gear wheel shafts to maintain the latter in alignment with the corresponding bearing means on the bridge plate as the latter is assembled into position on the pillars.

3,888,074
APPARATUS FOR CLOCK

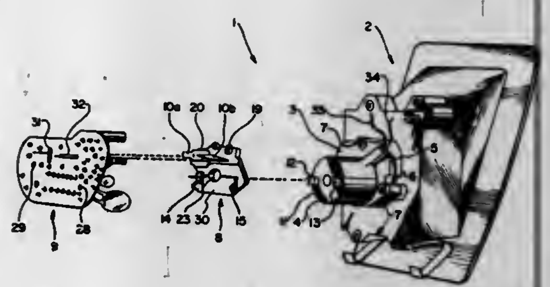
Benno August Wagenknecht, Pforzheim, and Horst Erich Breckle, Munich, both of Germany, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Aug. 16, 1974, Ser. No. 498,082

Claims priority, application Germany, Aug. 21, 1973, 2342250

Int. Cl. G04c *3/00;* **G04b** *37/00*

U.S. Cl. 58—23 R **15 Claims**



1. A mounting device for use with an electrical clock having an electrical motor and mounted in a housing, said mounting device comprising:

- a base plate having two sides;
- means on said base plate for mounting said base plate to the electrical motor, whereby said electrical motor projects outwardly from one side of said base plate;
- carrier means projecting from the otherside of said base plate for supporting an electrical circuit board; and
- electrical coupling means projecting from said base plate for electrically coupling the electrical motor to the circuit board and to an external power supply.

15. An apparatus for an electrical clock which is mounted in a housing, said mechanism comprising:

- an electrical motor for driving a time indicator of the electrical clock, said motor having a driving end for coupling to the drive train of a time indicator of the clock, and a support end with a rear wall;
- a base plate having an abutting side and a coupling side;
- mounting means on said motor and said base plate for mounting the abutting side of said base plate on said rear wall of said motor;
- carrier means for projecting from said coupling side of said base plate;
- an electrical circuit board fastened to said base plate by said carrier means; and
- a pair of plug contacts projecting outwardly from said coupling side of said base plate and extending through openings in said circuit board, said plug contacts having soldering pins for connecting them to the electrical circuit of said circuit board.

3,888,075
ELECTRONIC CLOCK

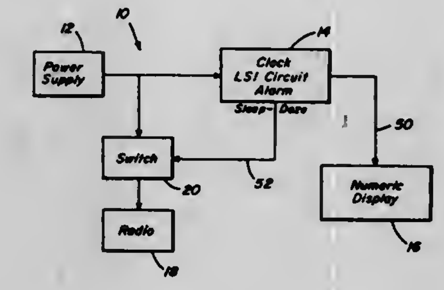
Leon S. Wecker, Hallandale, Fla., assignor to Topp Electronics, Inc., Miami, Fla.

Filed Jan. 25, 1974, Ser. No. 436,681

Int. Cl. G04c *3/00;* **G04b** *19/30*

U.S. Cl. 58—38 **10 Claims**

2. In combination with a source of AC voltage and a DC powered clock device having a plurality of outputs connected to a numeric display device, voltage rectifying means connected to said source for supplying DC energizing voltage to said clock device, and means connected to said source for transmitting a continuous, polarity changing excitation voltage to the numeric display device through the outputs of the clock device, said numeric display device including a plurality of light emitting diodes respectively connected to the outputs of the clock device and means connected to said source for biasing all of the light emitting diodes.



3,888,076
CALENDER-WATCH MOVEMENT

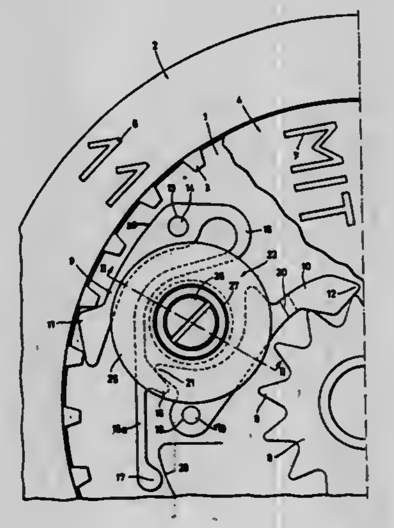
Roland Zaugg, and Josef Flück, both of Grenchen, Switzerland, assignors to A. Schild S.A., Grenchen, Switzerland

Filed Sept. 24, 1974, Ser. No. 508,900

Claims priority, application Switzerland, Oct. 10, 1973, 14431/73

Int. Cl. G04b *19/24*

U.S. Cl. 58—58 **9 Claims**



1. A calendar-watch movement comprising a base plate, at least one indicator member having a toothing and intermittently rotating about the center of said base plate, and means for immobilizing said indicator member or members during the periods between two rotating movements, wherein said means comprise a flat portion of said base plate, a circular retaining plate fastened to said base plate by its center portion and spaced a certain distance above said flat portion, a jumper having a rigid arm and a resilient arm, two catches projecting from said resilient arm at two separate locations along said resilient arm, means for pivoting said jumper on said flat portion, and a biasing element extending opposite one of said catches, both arms of said jumper being situated on the same side of the center of said retaining plate and being covered thereby, said resilient arm being kept biased by the pressure of one of said catches against said biasing element and the other of said catches being freely movable.

3,888,077
MECHANICAL WATCH MOVEMENT

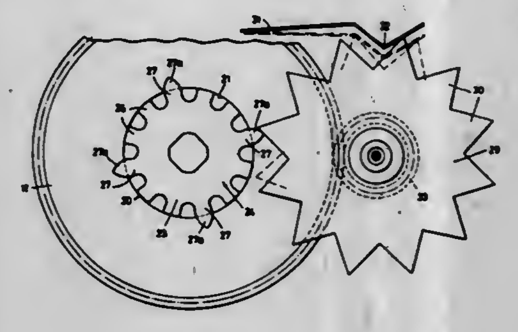
Peter Bachmann, Bettlach, Switzerland, assignor to Ebauches Bettlach S.A., Bettlach, Switzerland

Filed Apr. 29, 1974, Ser. No. 465,077

Claims priority, application Switzerland, May 11, 1973, 6732/73

Int. Cl. G04b *33/00, 13/02*

U.S. Cl. 58—59 **5 Claims**



1. A mechanical watch movement comprising:

- a minute-wheel pinion having a plurality of teeth each having a lateral face portion in the form of a cylinderical arc coaxial with said minute-wheel pinion, at least some of said teeth having a further substantially pointed portion which extends from and beyond said arcuate face portion; a toothed minute-wheel having a thickness which is less than the thickness of said minute-wheel pinion and fixed to said arcuate lateral face portions of said minute-wheel pinion;
- a cannon-pinion having teeth which mesh with said toothed minute-wheel; and
- a toothed hour-wheel coaxial with said cannon-pinion and having an outside diameter such that only said pointed portions of said minute-wheel pinion engage said toothed hour-wheel.

3,888,078
GOVERNING DEVICE FOR A GAS TURBINE SYSTEM EXEMPLIFIED BY A VEHICULAR OR AIRCRAFT ENGINE

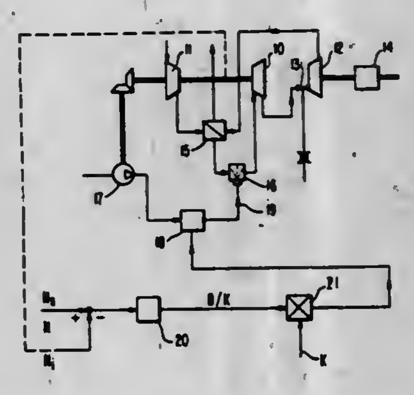
Christian Greune, Furstenfeldbruck, and Friedrich Hackl, Neu-Esting, both of Germany, assignors to Motoren-und Turbinen-Union Munchen GmbH, Germany

Filed Dec. 18, 1972, Ser. No. 316,059

Claims priority, application Germany, Dec. 17, 1971, 2162660

Int. Cl. F02c *9/08*

U.S. Cl. 60—39.28 R **7 Claims**



1. In a gas turbine system including a combustion chamber receiving combustion air from a turbine driven compressor and a fuel metering device for metering the flow of fuel to said combustion chamber, a governing device for controlling said fuel metering device comprising governor means responsive to

a selected engine characteristic to provide an output signal representing the ratio of fuel flow to at least the engine characteristic relating to the rotational speed of a turbomachine in the system and multiplier means connected between said governor means and said fuel metering device and responsive to a regulation signal representing at least the engine characteristic relating to rotational speed for multiplying said output signal of said governor means by said regulation signal, thereby providing a fuel control signal representing required fuel flow to control said fuel metering device.

3,888,079
SOLID PROPELLANT ROCKET MOTOR

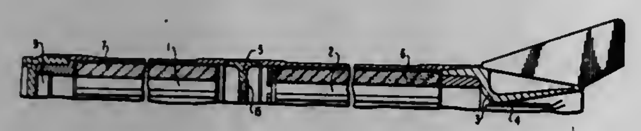
Walter Helmut Diesinger, Bergisch Gladbach, Germany, assignor to Dynamit Nobel AG, Germany

Filed Mar. 26, 1973, Ser. No. 344,631

Claims priority, application Germany, Mar. 25, 1972, 2214802

Int. Cl. F02k *9/04*, *9/06*

U.S. Cl. 60—245 **11 Claims**



1. In a solid propellant rocket motor with two or more coaxially arranged combustion chambers containing propellant charges of the same or of a different efficiency arranged in series one behind the other, which chambers cooperate with a common nozzle, are each equipped with one igniting device activatable in a predetermined time interval, and are secured with respect to each other against unintentional burning, the improvement which comprises partition means for separating the propellant charges from each other including closure means that open up, at least partially, to provide a throughflow cross-section due to the excess pressure caused by ignition of the subsequent propellent charge, said partition means including a perforated plate and said closure means including holes in said plate which are sealed by plugs, and means arranged on the side of the perforated plate opposite from said nozzle and attached to said plugs for securing said plugs to said plate.

3,888,080
AIR FLOW CONTROL VALVE

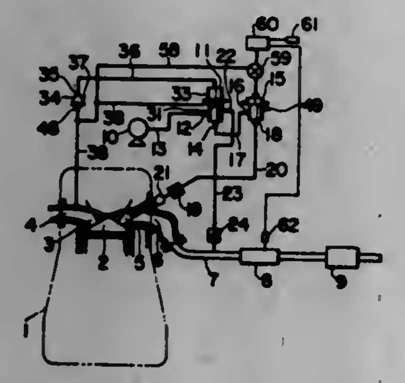
Hidetaka Nohira, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed June 17, 1974, Ser. No. 480,252

Claims priority, application Japan, June 20, 1973, 48-68691

Int. Cl. F02b *75/10*

U.S. Cl. 60—290 **2 Claims**



1. In an internal combustion engine system in which the unburned component in discharge gas is burned in a catalytic converter mounted downstream of an exhaust pipe and the resulting gas is discharged to the atmosphere and including an engine having an intake manifold and having an exhaust manifold connected to the exhaust pipe, means for controlling the flow of secondary air comprising, in combination:
- an air pump for supplying secondary air;
- first and second two-position changeover valves, said first two-position changeover valve being connected to provide secondary air from said air pump to a suction port of said second changeover valve in a first position and to provide secondary air to the exhaust pipe upstream of the catalytic converter in a second position, and said second two-position changeover valve coupling said suction port to an exhaust port of a combustion chamber of the engine in a first position and coupling said suction port to the atmosphere in a second position;
- first pressure responsive means responsively connected to the intake manifold of the engine connected for momentarily switching said first two-position changeover valve from its first position to its second position in response to a first level of vacuum pressure in the intake manifold;
- a first operating valve responsively connected to said intake manifold and connected for introducing atmospheric pressure acting on said first pressure responsive means in response to a predetermined level of vacuum pressure in said intake manifold, whereby said first two-position changeover valve is maintained in its first position when the vacuum pressure in the intake manifold exceeds the predetermined level;
- second pressure responsive means responsively coupled to the intake manifold connected for switching said second two-position changeover valve from its first position to its second position in response to a second level of vacuum pressure being lower than the first level;
- a second operating valve connected between said second pressure responsive means and the intake manifold for selectively coupling said second pressure responsive means to the intake manifold; and
- a controller connected to operate said second operating valve, said controller including means for sensing catalytic converter temperature and closing said second operating valve in response to the temperature of the catalytic converter being above a predetermined level, whereby said second two-position changeover valve is maintained in its first position, whereby the flow of secondary air is controlled in response to engine operating conditions.

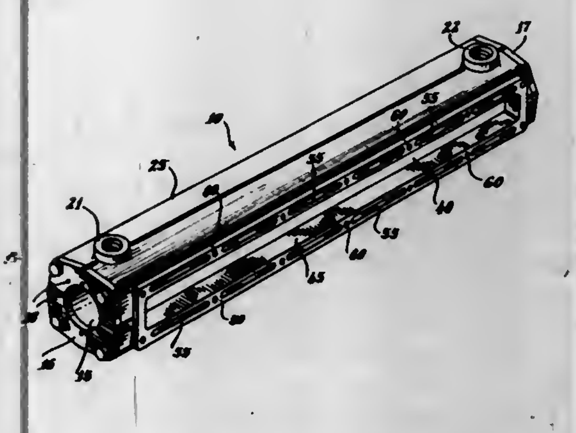
3,888,081
EXHAUST MANIFOLD ASSEMBLY

Robert A. Fitts, Stamford, Conn., assignor to Hekma Advanced Machine Company, Cos Cob, Conn.

Filed Apr. 19, 1973, Ser. No. 352,425

Int. Cl. F01n *7/06*

U.S. Cl. 60—321 **1 Claim**



1. A universal exhaust gas manifold assembly comprising:

A. an exhaust duct assembly comprising,
  1. a face plate having a joining surface,
  2. a plurality of gas ducts on the side opposite said face plate joining surface and

  3. means forming openings in said face plate from said gas ducts, and

B. an elongated cast metal gas receiver having
  1. an internal cavity extending lengthwise thereof for receiving exhaust gases,
  2. a joining surface extending along the side of said receiver and conforming to said face plate joining surface
     i. said surface having means forming at least one longitudinal opening therein which is in communication with said cavity, and
     ii. which is aligned to receive gas from two or more of said gas ducts,

  whereby said gas receiver may be connected to any one of a number of face plates having varying gas duct locations along the face plate for different internal combustion engine configurations; and
  3. means forming a cooling jacket cast around said gas receiver internal cavity, said cooling jacket having a plurality of openings on said gas receiver joining surface through which cooling fluid is brought in contact with said face plate joining surface when said face plate is joined to said gas receiver.

3,888,082
HYDRODYNAMIC TORQUE CONVERTER

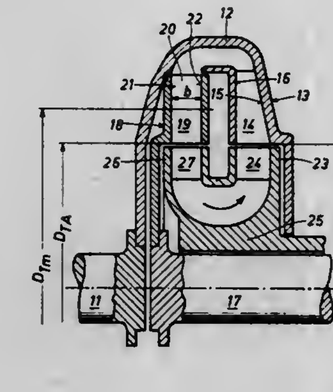
Karl Halde, Friedrichshafen, Germany, assignor to Motoren-und-Turbinen-Union Friedrichshafen GmbH, Germany

Filed Mar. 22, 1974, Ser. No. 453,808

Claims priority, application Germany, Mar. 23, 1973, 2314492

Int. Cl. F16h *41/00*

U.S. Cl. 60—361 **31 Claims**



1. A hydrodynamic torque converter including a pump wheel means centrifugally traversed and a turbine wheel means centripetally traversed, both the pump and turbine wheel means having blade means and wheel side walls, the turbine wheel outlet diameter being approximately equal to the pump wheel inlet diameter, and first guide wheel means arranged substantially directly upstream of the pump wheel means as viewed in the flow direction and a further guide wheel means arranged substantially directly downstream of the turbine wheel means, characterized in that
- a. the radial lenght (L_T) of the turbine blade means is larger than about 15 percent of the middle diameter (D_{TM}) of the turbine blade means;
- b. the blade spacing of the turbine wheel means at the middle diameter thereof amounts to about 30 percent to about 50 percent of the radial length of the turbine wheel blade means, and
- c. the interior width (lW_A) of each blade flow channel at the outlet of the turbine wheel means being smaller than about 35 percent of the blade spacing of the turbine wheel means.

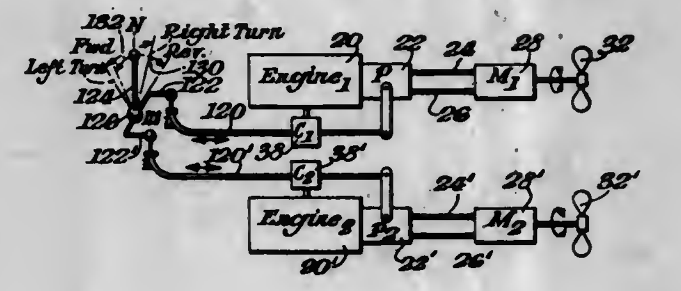
3,888,083
VARIABLE SPEED DUAL HYDROSTATIC DRIVE

John W. Tone, 2601 Foulke Rd., Wilmington, Del. 19810

Division of Ser. No. 308,567, Nov. 21, 1972, Pat. No. 3,826,097. This application June 19, 1974, Ser. No. 480,744

Int. Cl. F15b *11/16*; **F16h** *39/46*

U.S. Cl. 60—431 **8 Claims**



1. A hydrostatic drive system for a ship having a known power demand versus speed characteristic comprising:
- first and second prime movers each having first adjustable control means for varying the speed of a respective one of said prime movers,
- first and second reversible and adjustable fluid pumps adapted to be driven by corresponding ones of said prime movers, each having second adjustable control means for varying the fluid displacement of a respective one of said pumps,
- first and second hydraulic motors hydraulically connected to a different one of said pumps and adapted to drive said ship at speeds related to the speeds of said motors,
- first master control means connected to said first prime mover control means and said first pump second control means for adjusting the speed of said first prime mover and the displacement of said first pump,
- first manual means for setting said first master control means for a desired ship speed,
- second master control means connected to said second prime mover control means and to said second pump second control means for adjusting the speed of said second prime mover and the displacement of said second pump, and
- a second manual means for setting said second master control means for a desired ship speed, said first and second master control means operating to adjust the speeds of said first and second prime movers to the minimum required to meet the power demand of said ship at said desired speed, whereby said ship may be steered by manipulation of said first and second manual means.

3,888,084
THERMAL RECOVERY SYSTEM

Gilbert L. Hawkins, 305 Simmons Ave., Webster Groves, Mo. 63119

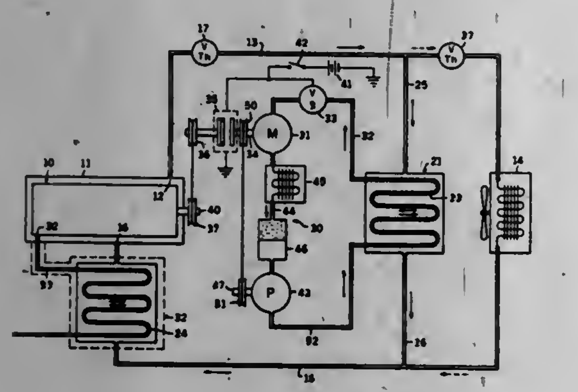
Filed May 20, 1974, Ser. No. 471,509

Int. Cl. F01k *23/06*

U.S. Cl. 60—614 **6 Claims**

1. In combination with an internal combustion engine of the type having a cooling and exhaust system in which coolant is circulated from an engine outlet port at relatively high temperature through an outflow conduit to a radiator and from the radiator through a return conduit to an engine inlet port at a relatively low temperature, and in which exhaust gases are passed from the engine through an exhaust port, a thermal recovery system comprising:
- a. a first heat exchanger means operatively connected between the outflow conduit and the return conduit in bypass relation to the radiator to receive coolant from the engine and discharge coolant into the return conduit, said first heat exchanger means including a first coil means containing refrigerant to absorb heat from the coolant,

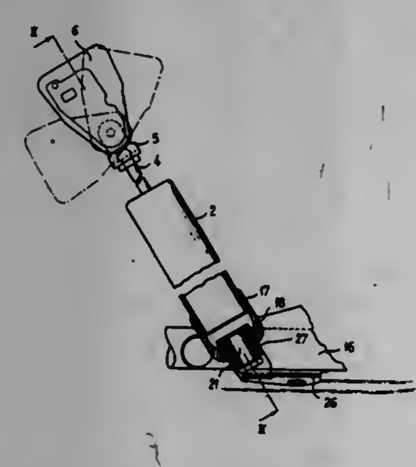
b. refrigerant operated motor means,
c. conduit means delivering refrigerant from the first coil means to the motor means to energize the motor means,
d. drive means operatively connecting the motor means and the engine crankshaft,
e. pump means between the motor means and the first coil means,
f. conduit means delivering refrigerant from the motor means to the pump means,
g. drive means operatively connecting the motor means and the pump means to energize the pump means,



h. conduit means delivering refrigerant from the pump means to the first coil means,
i. a second heat exchanger means disposed in the return conduit to receive coolant from the first heat exchanger means and discharge coolant into the inlet port, said second heat exchanger means including a second coil means operatively connected to the engine exhaust port to convey exhaust gases and impart heat to the coolant prior to entering the inlet port.

3,888,085
PYROTECHNICAL JACKS

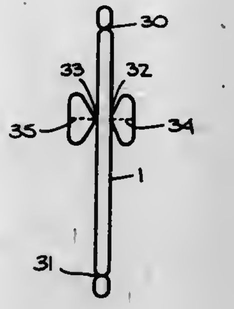
Jean-Francois Larsonneur, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of, France
Filed Oct. 30, 1973, Ser. No. 411,154
Claims priority, application France, Nov. 6, 1972, 72.39188
Int. Cl. F01b ***29/08;*** **F02n** ***13/00***
U.S. Cl. 60—635 **1 Claim**



1. A pyrotechnical jack for stretching the webbing of a safety belt or harness in a motor vehicle with one end of the jack being adapted to be anchored to an element of a motor vehicle, said jack comprising:
a cylinder,
a piston slidably fitted in said cylinder,
a hollow head connected to one end of said cylinder,
a traction rod rigidly connected to said piston,
an explosive charge,
an explosion chamber,
means defining a peripheral groove in said piston,
means for locking the piston at the end of its operative stroke, said locking means comprising:
an expansible split ring in said groove, and
a shoulder formed by the end of said cylinder projecting from the inner wall of said hollow head, said shoulder being adapted to retain the piston at the end of its operative stroke by the expansion of the then expanded split ring thereover,
means defining a part-spherical socket in the inner surface of the end of said hollow head most remote from said cylinder,
a ball joint positioned in said socket for the swivel mounting of the jack, said ball joint comprising a shock absorbing element adapted to co-act with the inoperative face of the piston at the end of the operative stroke thereof, and
an element rigidly connected to said ball joint for anchoring the jack to an element of a motor vehicle.

3,888,086
FLOATING BOOM

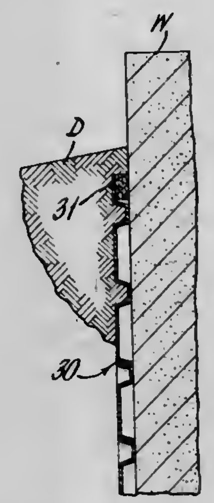
Gerald W. Robertson, Dumfries, and Terence Sturgeon, Locharbriggs, Dumfries, both of Scotland, assignors to Uniroyal Inc., Newbridge, Midlothian, Scotland
Filed Aug. 31, 1973, Ser. No. 393,359
Claims priority, application United Kingdom, Sept. 4, 1972, 40958/72
Int. Cl. E02b ***15/04***
U.S. Cl. 61—1 F **8 Claims**



1. A multi-compartmented floating boom comprising a one-piece flexible sheet means folded over upon itself along the length thereof, a plurality of compartments defined by said one-piece sheet means, each compartment being isolated from another compartment through the intermediary of a pinched portion of said sheet means, each of said pinched portions including a flexible neck portion which is defined by at least one pair of sheet means portions which converge toward one another to a position wherein their corresponding opposed surfaces are adjacent to one another, means for sealing said corresponding opposed surfaces to one another along the length of each of said pinched portions, said plurality of compartments including a pollutant-barrier compartment means containing a stiffening medium, said pollutant-barrier compartment means having upper and lower longitudinally extending end portions, a pair of buoyant compartment means each containing a buoyant-inducing medium and disposed opposite one another along respective opposite faces of said pollutant-barrier compartment means, each of said buoyant compartment means being disposed intermediately between said upper and lower longitudinally extending end portions of said pollutant-barrier compartment means and isolated from the latter through the intermediary of respective ones of said pinched portions, and a ballast-inducing medium secured to said boom along the lower longitudinally extending end portion of said pollutant-barrier compartment means; whereby when said boom floats in the water said upper longitudinally extending end portion is disposed above the water surface and said lower longitudinally extending end portion is disposed below the water surface to, thereby, contain floating debris.

3,888,087
FOUNDATION WALL PROTECTIVE SHEET

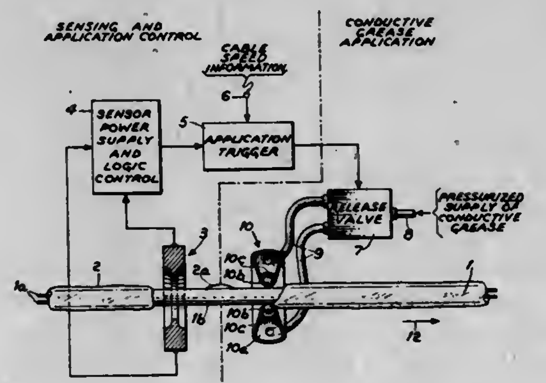
Jon Bergsland, Olso, Norway, assignor to Oivind Lorentzen Activities, Inc., New York, N.Y.
Filed Apr. 11, 1973, Ser. No. 350,280
Int. Cl. E02b ***11/00;*** **E02d** ***31/02, 27/48***
U.S. Cl. 61—11 **2 Claims**



2. An imperforate sheet made of relatively thin stiff material for protecting foundation walls and the like, and including embossed protrusions on a front side thereof and comprising means for forming air channels between the wall and the sheet, said sheet including embossed ribs formed therein and extending from an edge of said sheet across said sheet and forming on said sheet channels for bending said sheet along the lengths of said ribs, said ribs extending from a top edge of said sheet downwardly and comprising channel means formed on the back side of said sheet for receiving water externally of said sheet, said ribs protruding forwardly a lesser distance than said protrusions, and a strip of porous material adhering along the top edge of said sheet on the front side thereof.

3,888,088
STABILIZING ATTENUATION OF A SEA WATER WIRE LINK

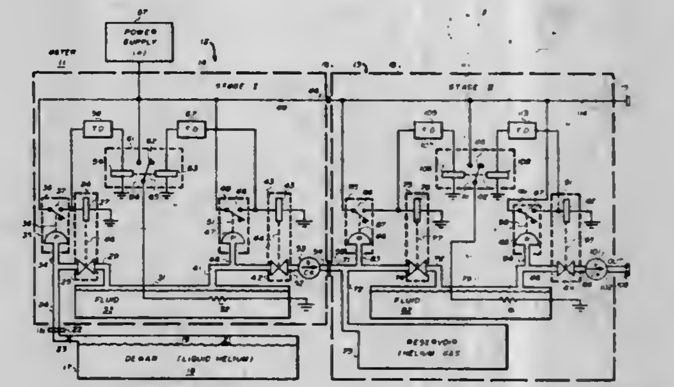
Harold F. Jarger, Rochelle Park, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.
Filed Sept. 11, 1972, Ser. No. 287,956
Int. Cl. B44d ***1/18***
U.S. Cl. 61—72.3 **2 Claims**


SENSING AND APPLICATION CONTROL
CONDUCTIVE GREASE APPLICATION
CABLE SPEED INFORMATION
6
4
SENSOR POWER SUPPLY AND LOGIC CONTROL
5
APPLICATION TRIGGER
RELEASE VALVE
PRESSURIZED SUPPLY OF CONDUCTIVE GREASE
8
7
3
10
9
10c
10b
2
2a
1a
1b
10b
10c
10a
1
12

1. A method for providing a communications cable having a constant attenuation characteristic in sea water comprising:
a. providing a length of insulated communications cable;
b. applying a conductive grease to the outer surface of said cable;
c. connecting said conductive grease to an electrical ground; and
d. submerging said cable into the sea water.

3,888,089
VAPOR PRESSURE REGULATOR

Michael T. Cooper, Panama City, Fla., assignor to The United States of Amercia as represented by the Secretary of the Navy, Washington, D.C.
Filed Feb. 11, 1974, Ser. No. 441,726
Int. Cl. F17c ***7/02***
U.S. Cl. 62—50 **16 Claims**

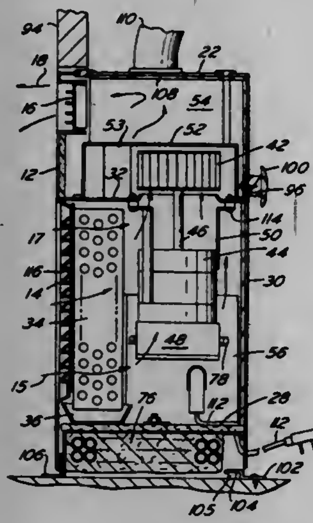


1. A vapor pressure regulator, comprising in combination: means adapted for being connected to a container for receiving the vapor of a predetermined substance contained therein; means, having an input and an output, adapted for containing a given liquid within a portion of the volume thereof;
a liquid, having a coefficient of expansion such that a volume thereof is increased with temperature and decreases with decreased temperature, disposed within said portion of the volume of the aforesaid containing means;
a first normally closed valve means, connected between the output of said receiving means and the input of said containing means, adapted for being opened in response to a first signal, so as to timely allow the aforesaid vapor to pass from said receiving means into that portion of said containing means not occupied by said given liquid and effectively in contact therewith;
a second normally closed valve means, having an input and an output, with the input thereof connected to the output of said containing means, adapted for being timely opened in response to a second signal, so as to timely allow the aforesaid vapor to pass out of said containing means;
means disposed in proximity with the aforesaid given liquid disposed within a portion of the volume of said containing means for the timely heating thereof in response to a third signal;
means connected to said receiving means and said first normally closed valve means for supplying said first signal thereto in response to a first vapor pressure within said receiving means and for removing said first signal therefrom in response to a second vapor pressure within said receiving means that is lower than said first vapor pressure;
means connected to the output of said containing means and said second normally closed valve means for supplying said second signal thereto in response to a third vapor pressure within said containing means and for removing said second signal therefrom in response to a fourth vapor pressure within said containing means that is lower than said third vapor pressure;
means connected to the output of said second normally closed valve means for exhausting the vapor from said container means whenever said second signal is supplied to said second normally closed valve means; and
means connected to said first and second signal supplying means and to said liquid heating means for supplying said third signal to said liquid heating means in accordance with a predetermined program and at such times that said first and second signals are not present at their respective first and second normally closed valve means.

3,888,090
AIR CONDITIONING APPARATUS

Eric A. Meyer, Furlong, Pa., assignor to Repco Products Corporation, Philadelphia, Pa.
Filed Dec. 26, 1973, Ser. No. 428,297
Int. Cl. B63b *25/26*

U.S. Cl. 62—240 **8 Claims**

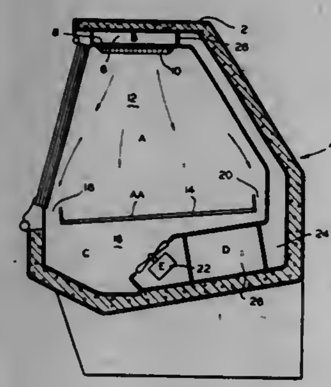


1. Compact air conditioning apparatus comprising a housing having an air inlet means and at least one air outlet means, an evaporator positioned in the housing adjacent the air inlet means for cooling air which enters the housing there through, an intermediate wall in said housing adjacent the upper end of said evaporator, said wall dividing the interior of said housing into an upper plenum discharge chamber and a lower cooling chamber containing said evaporator, said wall having an opening, air blower means in said plenum chamber with suction side adjacent to said opening so that the maximum air disturbances produced in the cooling chamber occur adjacent the top of said evaporator, motor means located in said cooling chamber adjacent said evaporator and below said opening for energizing said air blower, and said upper plenum chamber communicating with said outlet means.

3,888,091
AIR DISTRIBUTION MEANS FOR A REFRIGERATED MEAT CASE

Edward E. Butts, Niles, Mich., assignor to Clark Equipment Company, Buchanan, Mich.
Filed Apr. 4, 1974, Ser. No. 457,959
Int. Cl. A47f *3/04*

U.S. Cl. 62—256 **6 Claims**



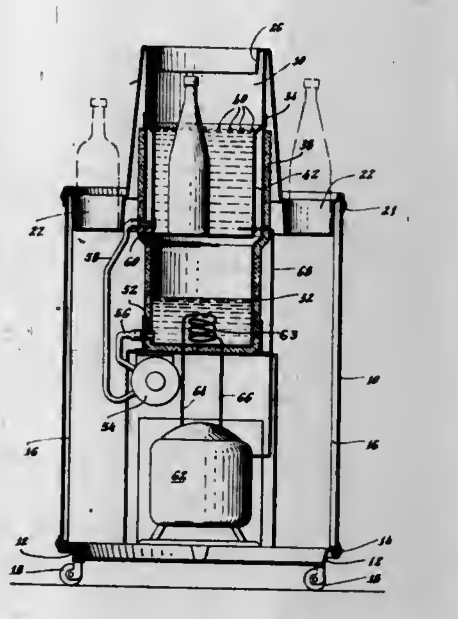
1. A refrigerated display case having a refrigerated space and including:

a support for articles to be stored in said refrigerated space,
a plenum chamber located above said support,
a second plenum chamber located below said support,
an air duct between said second plenum chamber and said first plenum chamber including therein,
means for maintaining the air in said second plenum chamber at less than atmospheric pressure and maintaining the air in said first plenum chamber at greater than atmospheric pressure,
cooling means located in said air duct capable of maintaining the temperature of said air in said first plenum chamber lower than the temperature of the air in said second plenum chamber,
porous conductive means located between said first plenum chamber and said refrigerated space capable of restricting the flow of air so as to diffuse the air as it passes from said first plenum chamber to said refrigerated space,
whereby air is exhausted from the lower portion of said space into said second plenum chamber and thereafter circulated by said cooling means through said air duct to said first plenum chamber and moved through said porous conductive material from said first plenum chamber into said space and by gravity through said space to said second plenum chamber, to thereby cause the circulation of cool air through said space and past said support in a manner substantially equal to gravity flow.

3,888,092
DEVICE FOR CHANGING THE TEMPERATURE OF CONTAINERS AND THEIR CONTENTS

James I. Fisher, 412 Longmeadow Rd., Orange, Conn. 06477
Filed Dec. 26, 1973, Ser. No. 427,680
Int. Cl. F83d *17/02*

U.S. Cl. 62—376 **8 Claims**



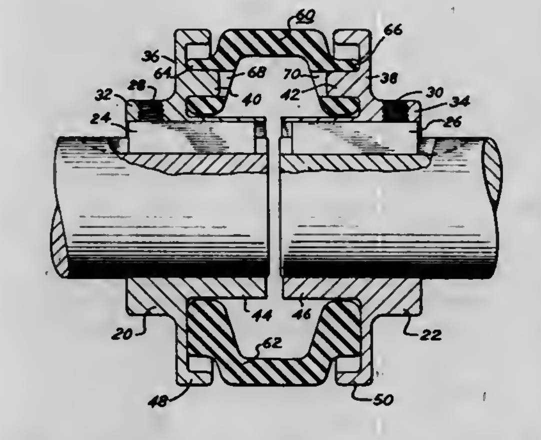
1. Apparatus for cooling containers of material comprising a cylindrical outer body,

a top with a central portion higher than the peripheral edge portion of said top, said central portion having an opening at the top,
a tank positioned within said body to which access may be gained via said opening,
receptacle means positioned around the lower portion of and below and spaced apart from said tank,
means positioned above the bottom of said tank at that level at which it is desired to have the surface of the liquid by which cooling of said containers is to be effected, whereby liquid in said tank above said means may flow from said tank into said receptacle means via a duct,
outlet means in the bottom region of said receptacle whereby water may flow from said receptacle means into a flow path including the inner path of flow of a pump by means of which liquid may be caused to travel to an inlet means positioned in that region of said tank which is below said egress means,
and means for causing the temperature of said liquid to be lowered, which means includes a refrigerator means and a heat exchanger means,
the liquid flow capacity of said egress means being greater than that of said flow path.

3,888,093
FLEXIBLE SHAFT COUPLING

Holmes A. Downey, Bremen, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.
Filed Feb. 21, 1974, Ser. No. 444,277
Int. Cl. F16d *3/78*

U.S. Cl. 64—13 **8 Claims**

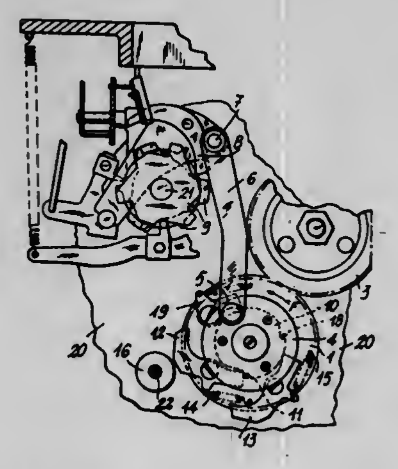


1. A flexible coupling for connecting two shafts in end-to-end relation, comprising a flange for each shaft, each flange having a hub for connection to a shaft, an annular radial portion connected to said hub and having an inner surface facing the opposite flange, a plurality of spaced pins projecting in an axial parallel direction from the inner surface of the radial portion, and a flexible torsional element of a generally U-shaped cross sectional configuration disposed between said flanges and having spaced, inwardly extending side walls, said side walls projecting laterally and having a plurality of holes in the laterally projecting portion for receiving the pins on the respective flange.

3,888,094
DRIVE UNIT FOR OPERATING AND CUTTING OUT THE ADDITIONAL THREAD SUPPLIES AND ASSOCIATED THREAD GUIDES ON DUAL CYLINDER CIRCULAR KNITTING MACHINES

Francesco Lonati, Brescia, Italy, assignor to Construzioni Meccaniche Lonati di Lonati Francesco & Figli (Ettore, Fausto, Tiberio)S.n.c., Brescia, Italy
Filed Jan. 7, 1974, Ser. No. 431,091
Claims priority, application Italy, Feb. 8, 1973, 5107/73
Int. Cl. D04b *15/54*

U.S. Cl. 66—138 **3 Claims**

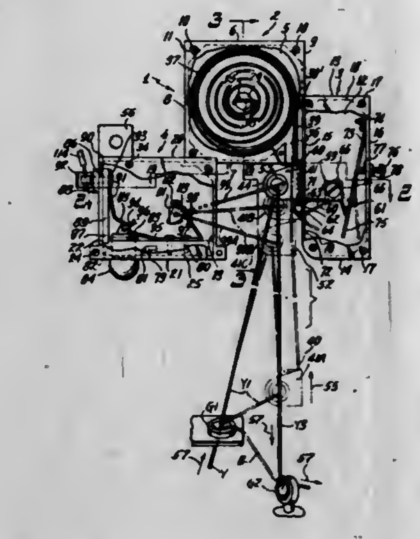


1. A drive unit for operating and cutting out the additional supplies and associated thread guides on dual cylinder, circular knitting machines, comprising a gear wheel rotably restrained to a wheelwork controlling said dual cylinder, and a disc idly carried on the shaft of said gear wheel, thereto being connected the small end of a connecting rod which in turn is restrained to a plurality of levers acting on a set of cam discs controlling the additional thread supplies and associated thread guides, wherein on said disc and connecting rod facing said gear wheel there is secured an annular element having at least one peripheral tooth, and on the face adjacent said gear wheel at least two driving rocking levers are pivoted, these levers being angularly spaced apart and selectively acting on said tooth of said annular element to restrain said annular element to said gear wheel, each of said levers being connected to a spring constantly retaining it adherent to the periphery of said annular element.

3,888,095
STOP MOTION ASSEMBLY AND METHOD

Morris Philip, 2519 Grand Ave., Bronx, N.Y. 10468
Continuation-in-part of Ser. No. 341,957, March 16, 1973, abandoned. This application Feb. 5, 1974, Ser. No. 440,138
Int. Cl. D04b *35/12*

U.S. Cl. 66—163 **41 Claims**



1. A method of controlling the stop motion control circuit of a knitting machine or the like when the normal yarn flow is undesirably impeded upstream of the vertex of a flexed reach of yarn traveling from an upstream yarn guide to an adjacent downstream guide by being drawn through the latter by said machine, said method comprising the steps of:

a. retaining and guiding said vertex with movable vertex guide means;
b. positioning said vertex guide means at a normal guiding position remote from the base line of said yarn guides so that drawing of the yarn against the drag of the yarn flowing upstream of said vertex guide means causes the vertex to exert an extending force acting on said vertex guide means urging said vertex guide means from said normal position toward said base line;
c. providing a retracting force generally opposed to said extending force continuously urging said vertex guide means, at least when said vertex guide means is away from said normal position, away from said base line toward said normal position, but preventing said retracting force from moving said vertex guide means past said normal position;
d. normally operating said machine to draw said yarn through said downstream guide and maintaining said vertex guide means in said normal position with normal yarn flow;
e. when said normal yarn flow is impeded upstream of said vertex guide means to a predetermined undesirable level, thereby increasing said extending force to an actuating level at least sufficiently high to exceed said retracting force, releasing said vertex guide means to permit said increased extending force to move said vertex guide means toward said base line;

f. actuating the stop motion control circuit of said machine at a time not prior to the time the extending force increases to said actuating level while permitting said extending force to continue moving said vertex guide means toward said base line, as said machine continues drawing said yarn because of machine inertia, until either said impediment self-eliminates or said machine stops drawing said yarn;

g. eliminating said impediment if it has not been self-eliminated, elimination of said impediment, by self-elimination or otherwise, reducing the extending force acting on said vertex guide means to a level below the level of said retracting force, to permit said retracting force to automatically return said vertex guide means to said normal position;

h. automatically deactuating said stop motion control circuit at a time subsequent to the time it was actuated;

i. continuously retaining and guiding said vertex with said vertex guide means throughout the foregoing steps to maintain said yarn reach taut;

j. maintaining a continuous connection between said vertex guide means and a reference connection location on a support throughout said vertex guide means movement, said connection being lengthened in the general direction of said extending force during movement of the vertex guide means in one of said vertex guide means movement directions and being shortened in the general direction of said retracting force during movement of the vertex guide means in the other of said vertex guide means movement directions;

k. and restarting said machine, to resume normal operation, after said vertex guide means has been returned to said normal position and said stop motion control circuit has been deactuated;

l. said normal position being sufficiently remote from said base line to provide adequate distance for said vertex guide means to continue moving toward said base line without reaching it until said machine stops drawing said yarn without self-elimination of the impediment after actuation of said stop motion control circuit.

15. A stop motion assembly for use with a stop motion control circuit of a knitting machine or the like for actuating said stop motion control circuit when the normal yarn flow is undesirably impeded upstream of the vertex of a flexed reach of yarn traveling from an upstream yarn guide to an adjacent downstream yarn guide by being drawn through the latter by said machine, said machine continuing to draw said yarn after actuation of the stop motion control circuit because of machine inertia, said assembly comprising:

a. a support;

b. movable vertex guide means for retaining and guiding the vertex of said reach of traveling yarn throughout the movement of said vertex guide means;

c. mounting means for mounting said vertex guide means on said support for longitudinal reciprocating movement between a normal guiding position and a terminal guiding position and for providing at least a portion of a continuous longitudinally lengthenable-shortenable connection between said vertex guide means and a reference location on said support throughout said vertex guide means movement;

d. means providing a retracting force continuously urging said vertex guide means, at least when said vertex guide means is away from said normal position, away from said terminal position toward said normal position;

e. said vertex guide means being movable from said normal position toward said terminal position by an extending force exerted by said vertex, generally opposed to said retracting force, when the level of said extending force reaches an actuating level at least sufficiently high to exceed said retracting force, said retracting force automatically returning said vertex guide means to said normal position when said retracting force exceeds said extending force and said vertex guide means is away from said normal position;

f. means preventing said retracting force from moving said vertex guide means past said normal position;

g. switch means for actuating said stop motion control circuit, said circuit being actuated when said switch means is closed and being non-actuated when said switch means is open, said switch means being normally open;

h. means for connecting said switch means to the stop motion control circuit of said machine;

i. and sensor means for closing said switch means at a time not prior to the time said extending force increases to said actuating level while permitting said extending force to continue moving said vertex guide means toward said terminal position, as long as said extending force exceeds said retracting force, and for automatically opening said switch means at a time subsequent to the time it was closed;

j. whereby when normal yarn flow is impeded upstream of said vertex guide means to increase the level of said extending force to said actuating level, said switch means is closed and said extending force moves said vertex guide means toward said terminal position, said extending force continuing to move said guide means toward said terminal position after said switch means closes as said machine continues drawing said yarn because of machine inertia until said impediment self-eliminates or said machine stops drawing said yarn, and when said impediment is eliminated, by self-elimination or otherwise, to reduce the extending force to a level below the level of said retracting force, said retracting force automatically returns said vertex guide means guiding said vertex to said normal position, said switch means automatically opening at a time subsequent to the time it was closed.

3,888,096

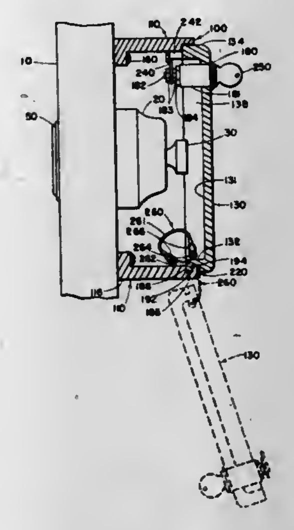
LOCK-UP HOUSING FOR DOOR LOCK

Steven J. Huss, 2311 S. 8th St., Omaha, Nebr. 68108

Filed June 4, 1973, Ser. No. 366,297

Int. Cl. E05b *13/00*

U.S. Cl. 70—209 **4 Claims**



1. A doorway locking assembly comprising a door jamb having a doorway opening therethrough, a door in said doorway opening, said door having an inner side disposed substantially in a vertical plane, a door locking device mounted on the inner side of said door, said door locking device having a manipulatable locking and unlocking control means thereon extending in a direction outwardly from one side of said door, a lock-up housing unit, said unit comprising: a base having an opening means therethrough receiving at least a portion of said locking device and said control means being inside of said housing unit and guarded by said housing unit, means securing said base to said door, a lid, a lid-lock in said housing, said lid-lock being operable to lock said lid to said base and to unlock said lid from said base, said lid-lock being controllable from the outside of said housing unit, said lid and said base and said lid-lock forming an enclosing assembly which latter sufficiently encloses said control means that a thief cannot manipulate said control means from the lid side of said unit without removing said lid, said lid being removably attached to said base for movement away from said base when said lid-lock is unlocked, said lid being sufficiently large that when said lid is removed from said base this will give an operator sufficient access to said control means to manually operate said control means, that side of said base which faces said door defining a forward side of said base, said lid extending across the rearward side of said base, said lid fitting inside of said base and lapping said base for making it difficult for a thief to insert a prying tool in the space between said lid and said base, said lid and base forming a pair of closure members, one side of at least one of said closure members having both a certain groove means therein and having a certain ridge means thereon, said certain ridge means being disposed exteriorly on its closure member of the groove means of its closure member, the other closure having a groove means removably receiving the ridge means of said one closure member, said one closure member having a wall thickness on an opposite side of its groove from its ridge which latter wall thickness is equal to the wall thickness at its said ridge.

3,888,097

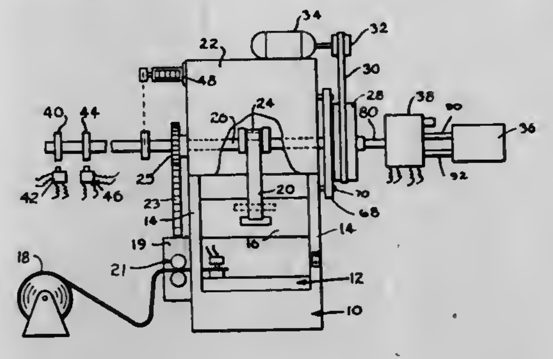
MACHINE HAVING A DRIVE SHAFT AND A METHOD OF OPERATION

Ronald F. Fortman, Fort Loramie, and John E. Voorhees, Sidney, both of Ohio, assignors to The Minster Machine Company, Minster, Ohio

Filed Apr. 11, 1974, Ser. No. 460,217

Int. Cl. B21j *9/20*

U.S. Cl. 72—26 **19 Claims**



1. The method of operating a machine having a frame with a shaft and a driving member rotatable therein so as to halt the shaft near a predetermined first rotated position when the shaft must be stopped from rotation at either high or low speed, said method comprising; clutching the shaft to the driving member to drive the shaft, applying a brake to the shaft at a predetermined second rotated position thereof with the clutch released to halt the shaft near said first rotated position, and when the shaft is rotating above a predetermined speed applying the brake while releasing the clutch to slow the shaft down to near said predetermined speed, and then releasing the brake to permit the shaft to coast to said second predetermined rotated position and then again applying said brake to the shaft.

3,888,098

LIQUID METAL CORE TRANSPACTOR ELEMENTS FOR ELECTROMAGNETIC FORMING TOOLS

Walter H. Larrimer, Jr., Bellevue, and Donald L. Duncan, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

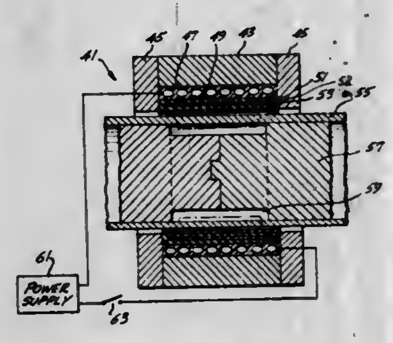
Filed Feb. 27, 1974, Ser. No. 446,491

Int. Cl. B21d *26/14*

U.S. Cl. 72—56 **22 Claims**

1. A transpactor element suitable for use in an electromagnetic forming tool of the type wherein an electromagnetic coil lies adjacent to the transpactor element and the transpactor element creates a deforming force in response to the interaction between an electrical current induced in the transpactor element by the electromagnetic coil and the magnetic field generated by the electromagnetic coil, said transpactor element comprising:

an elastomeric member formed of an elastomeric material, said elastomeric member including an entirely enclosed internal cavity defined by at least a pair of walls spaced relatively close to one another; and,



a liquid metal core located in said internal cavity in said elastomeric member, said liquid metal core formed of a solid body comprising a low melting point alloy having a melting point above room temperature and electrical characteristics such that electrical currents are induced therein when said liquid metal core is in the presence of an externally generated magnetic field, said low melting point alloy comprising at least two metals selected from the group consisting of cadmium, indium, bismuth, lead and tin.

3,888,099

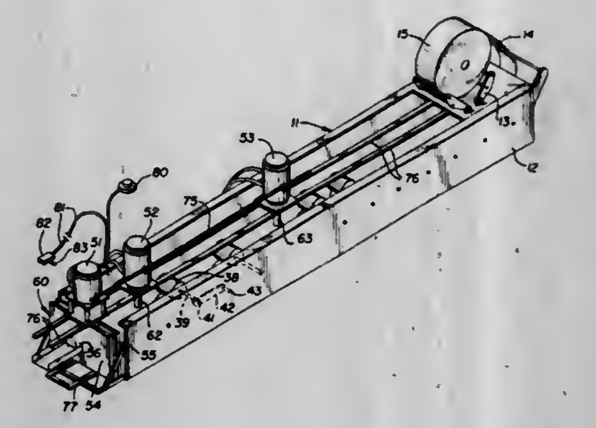
METAL STUD AND TRACK FORMER

Jeral D. Allen, Denver, Colo., assignor to Watertite Industries, Inc., Denver, Colo.

Filed Nov. 27, 1973, Ser. No. 419,308

Int. Cl. B21f *11/00*

U.S. Cl. 72—129 **9 Claims**

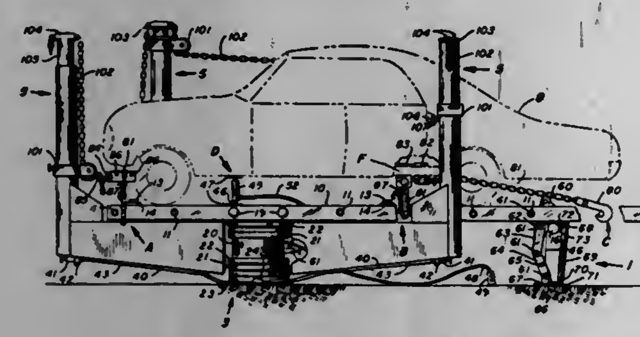


1. A portable roll forming machine for the fabrication of structural channel sections from coil strip materials wherein at least two of the channel sections formed by said machine are to be of different width comprising a plurality of pass roll stands in circuit arrangement one after another, an intermediate roll stand having mating top and bottom rolls adapted to provide flange related initial radius bends at laterally spaced bend lines whereby the flanges of either channel section are moved to a position that is normal with respect to the web of such section with the flanges of each section being disposed apart the same distance, and a following roll stand disposed in operative position after said intermediate stand having mating top and bottom rolls adapted to selectively reduce the radius of said initial flange related bends and to laterally move the flanges for channel sections worked by said following roll stand whereby the flanges of such worked channel sections are adapted for close interfitting engagement with the flanges of

channel sections passing only through said intermediate roll stand.

3,888,100
AUTO BODY AND FRAME STRAIGHTENING DEVICES

Finis L. Chisum, 1113 W. 16th, Claremore, Okla. 74107
Continuation-in-part of Ser. No. 810,940, March 27, 1969, Pat. No. 3,630,066. This application Dec. 23, 1971, Ser. No. 211,527
Int. Cl. B21d *1/12*
U.S. Cl. 72—305 **36 Claims**

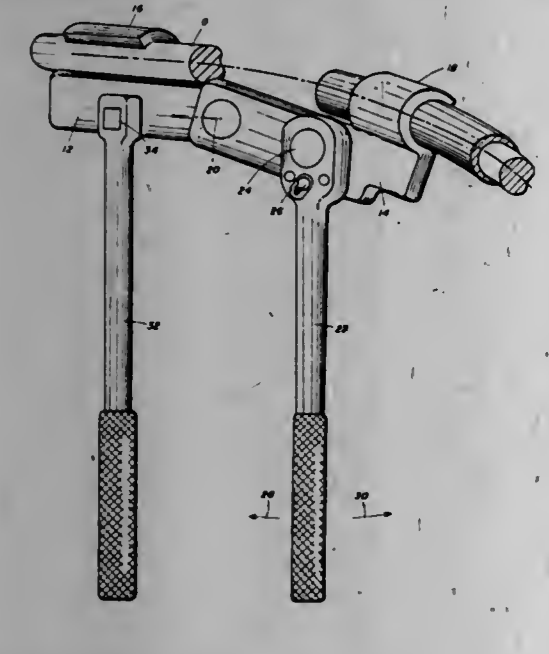


1. Apparatus for applying equal and opposite forces to a mechanical structure such as an automotive vehicle body or frame comprising:

a. a platform system;
b. means on said platform system for supporting said structure;
c. at least one vertical pull tower means pivotally connected about a vertical axis fixed to said platform system notatably movable to a desired position relative to said structure;
d. means to vertically elongate said tower;
e. means to connect a tension member between said vertically elongate means and a first portion of said structure to apply a first force to said structure; and
f. means to apply a second force between a second portion of said structure and said platform system.

3,888,101
CABLE BENDER

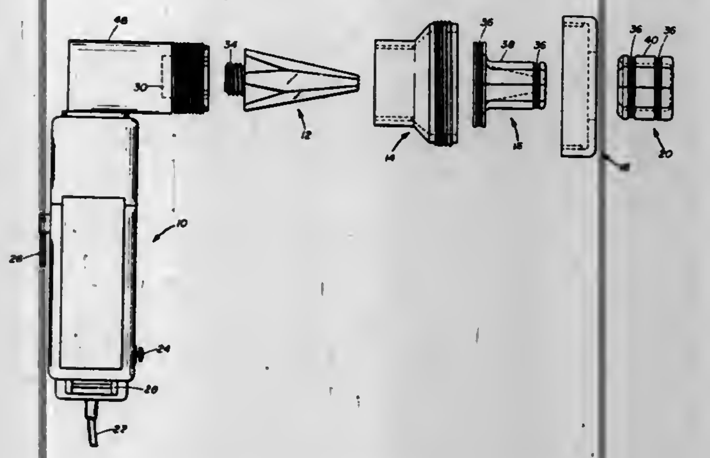
Silas Ray Crees, 1649 Avocado Ave., Eau Gallie, Fla. 32935
Filed Jan. 17, 1974, Ser. No. 434,365
Int. Cl. B21d *7/00*
U.S. Cl. 72—388 **7 Claims**



1. A cable bender comprising:
a first bending member;
a second bending member rotatably joined to the first bending member about a common pivot axis;
two cable shoes, each joined to one of said bending members for holding cable to be bent across said bending members;
a first lever fixed to said first bending member at a point spaced outwardly from said pivot axis;
a second lever joined to said second bending member at a point spaced outwardly from said pivot axis;
means for fixing said second lever in a set position when rotational force is applied in one direction, said means further allowing said lever to rotate freely when rotational force is applied in a direction opposite to said one direction; and wherein
an imaginary line between each said point and said pivot axis is substantially parallel with cable held by said shoes and which is to be bent.

3,888,102
SWEDGER APPARATUS

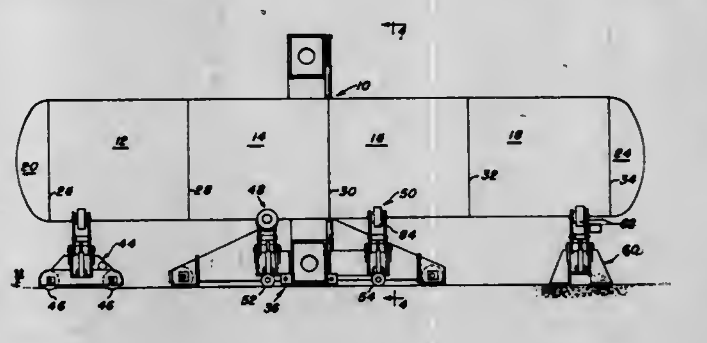
Salvatore A. Nigido, 141 Fairmount Dr., Belair, Md. 21014
Continuation of Ser. No. 295,865, Oct. 10, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 458,732
Int. Cl. B21d *41/02*
U.S. Cl. 72—393 **1 Claim**



1. Swedger apparatus for enlarging the inner diameter and surface of a pipe, comprising:
a tapered ram having a frustro-conical configuration;
an impulse producing device having a pump housing with hydraulic means therein, means for actuating said hydraulic means, a plunger within the pump housing and engageable at one end with said ram, said hydraulic means forcing the plunger and said ram toward the end opening of a pipe to be enlarged;
housing means attachable to said impulse producing device and housing the ram substantially therein, the housing means having an outer end portion;
cap means attachable to the outer end portion of the housing means and having a centrally disposed aperture therein; and,
expander means for engagement with the interior surface of a pipe to be enlarged, said expander means being disposed in the aperture in said cap means and having a central tapered cavity for receiving at least a portion of the ram centrally therein, the expander means including a plurality of segments of frustro-conical configuration circumferentially arranged for radial movement wherein the surface of the ram engages the inner surfaces of the segments to force said segments in a radial direction and against the inner surface of the pipe on movement of the ram in a direction coincident with the longitudinal axes of the pipe and toward the open end thereof, the segments of the expander means further having flange-like inner end portions which are disposed within the housing means and abut, on forwardly disposed surfaces of said portions, portions of the interior surface of the cap means, movement of the ram to a predetermined degree for causing radial expansion of the segments acting to cause outer perimetric portions of the flange-like inner end portions to abut against the interior surface of the outer end portion of the housing means, and an adapter ring mountable on the expander means externally of the housing means and cap means and including a plurality of segments circumferentially arranged for radial movement against the interior surface of the pipe on radial movement of the plurality of segments comprising the expander means.

3,888,103
FORMING APPARATUS

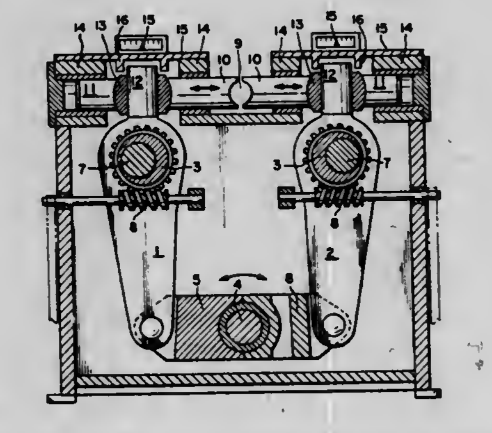
Robin Renshaw, 344 Fairview Ave., West Chicago, Ill.
Filed Jan. 25, 1971, Ser. No. 109,206
Int. Cl. B21d *7/03*
U.S. Cl. 72—399 **10 Claims**



1. Forming apparatus comprising a source of hydraulic fluid under pressure, a master cylinder, including a plunger, a plurality of slave cylinders, a first conduit means connecting said source to said master cylinder, said plunger means connecting said master cylinder to said slave cylinders, a hydraulic jack fluidly connected to each of said slave cylinders, said jacks being operable in response to actuation of said slave cylinders by said master cylinder, said jacks being disposed in spaced relation about the periphery of a hollow body and being operable upon actuation to form said body into a predetermined configuration.

3,888,104
FORGING MACHINE

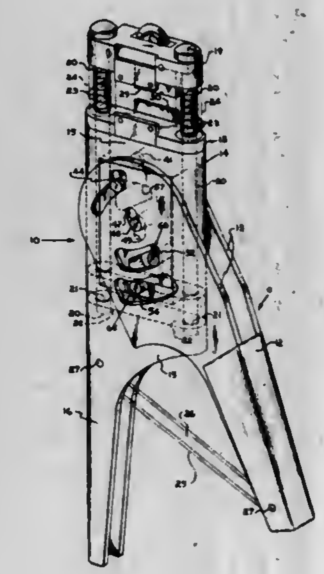
Bernd Ribback, Rue de Mertert 48, Wasserbilling/Lux., Germany
Filed Jan. 7, 1974, Ser. No. 431,470
Claims priority, application Germany, Jan. 12, 1973, 2301537
Int. Cl. B21j *9/18*
U.S. Cl. 72—407 **5 Claims**



1. A forging machine for providing linear movements for at least two forging tools along a common forging axis, despite arcuate movements of the associated drive, the machine comprising: two double-arm levers pivotably disposed adjacent one another and having respective pivot axes, for actuating the tools; linear displacement means for coupling the tools to outer arms of said levers, and for guiding the tools in areas that are laterally within the forging axis, so that the tools reciprocate linearly therealong; the tools having respective carriers coaxially aligned on the forging axis for linearly moving the tools into respective operative positions; said linear displacement means including coupling trunnions formed on said outer lever arms, having extensions substantially perpendicular to those of the respective carriers, bushings partly rotatable in said carriers and axially engaged by said trunnions for pivotably mounting and supporting said carriers, said bushings having bores therein for slidably journaling said trunnions, and cylindrical guides disposed laterally with respect to the forging axis and mounted coaxially opposite one another, for linearly guiding terminal portions of said carriers as well as the tools by the intermediary of said bushings, for linear reciprocation along the forging axis; said drive for the tools including two pressure-element levers pivotable about a central, eccentric drive shaft and pivotably connected to other lever arms, opposite said terminal portions of the carriers, for imparting reciprocatory arcuate movements to said levers; and wherein said trunnions of the linear displacement means provide compensation between the arcuate movements of said outer lever arms and the linear movements of said carriers.

3,888,105
TOGGLE CRIMPER

Silas E. Bert, Camp Hill, Pa., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.
Filed Oct. 15, 1973, Ser. No. 406,144
Int. Cl. B21d *37/12*
U.S. Cl. 72—410 **15 Claims**

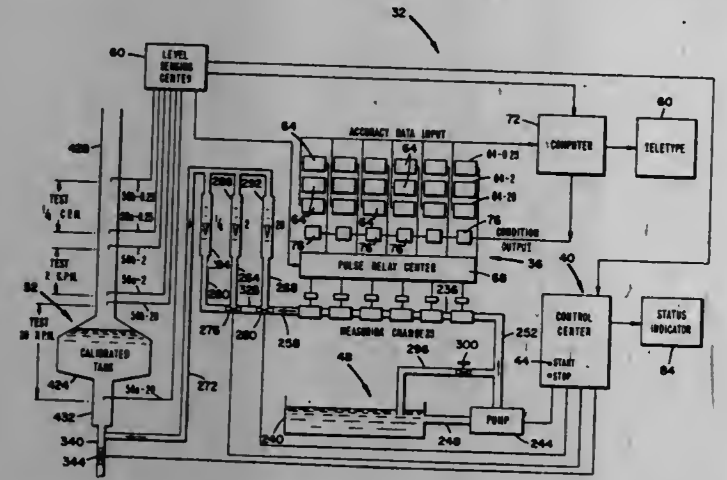


1. A hand-operated device for performing an operation by tooling carried thereby on a work piece or other object, said device comprising a pair of operating handle members operatively connected and manually actuated for movement relative to one another in two distinct repeated strokes thereof, thus to effect said operation of said tooling on the work piece, and a mechanical force-transmitting unit operated by said members, in two phases of action of the unit which correspond respectively to said two repeated strokes, to cause said tooling to perform its operation on said work piece, said force transmitting unit comprising a double linkage including a pair of toggle linkage sets, means pivotally articulating said sets with one another, means successively actuated by said operating members in said repeated strokes thereof to alter the length of one of said pair of toggle linkage sets during a first phase of action of said unit and to alter the length of the other of said pair of toggle linkage sets during a second phase of action of said unit.

3,888,106
TESTING APPARATUS FOR FLOW MEASURING DEVICES

Bernard Last; Eugene M. Weinberger, both of Uniontown; James R. Gray, Farmington; George W. Clements, Uniontown, and Ralph E. Deffenbaugh, Uniontown, all of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 7, 1973, Ser. No. 338,651
Int. Cl. G01f *25/00*
U.S. Cl. 73—3 **17 Claims**

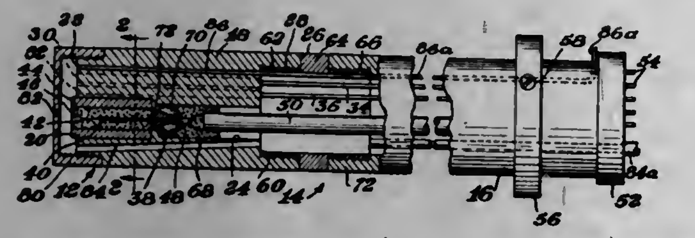


1. Apparatus for determining whether the accuracy of a flow measuring device is within acceptable limits, comprising a reservoir, means for pumping the test liquid from said reservoir through the flow measuring device being tested, means for collecting the fluid after it is displaced through the measuring device, means having an output indicative of the flow through the flow measuring device as measured by said device, means for comparing the measured flow with the volume of test fluid that is collected, a bypass from the discharge side of said pumping means to said reservoir and a pressure responsive valve in said bypass for maintaining the pressure on the discharge side of the pumping means constant, and means for changing the resistance to the flow of the test liquid on the downstream side of the flow measuring device to alter the rate-of-flow of the test fluid through the flow measuring device.

3,888,107
DIFFERENTIAL THERMAL ANALYSIS CELL ASSEMBLY

Horst G. Langer, Wayland, Mass., and Earl D. Ayers, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 871,517, Oct. 8, 1969, abandoned, which is a continuation-in-part of Ser. No. 856,396, Sept. 9, 1969, abandoned. This application Aug. 2, 1972, Ser. No. 277,236
Int. Cl. G01n *25/00*
U.S. Cl. 73—15 B **5 Claims**

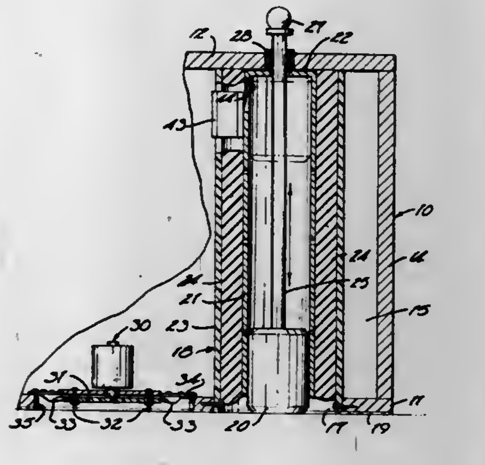


1. A differential thermal analysis cell assembly adapted to be inserted into and removed from a high vacuum part of an analytical instrument, comprising an elongated cell section made of a block of highly thermally conductive metal having side walls and a forward end part, said forward end part having a sample receiving bore therein, temperature sensing means for measuring the temperature of any material in said sample receiving bore, means for sensing the temperature of at least one other part of said block, end capping means coupled to and spaced from said forward end part, said end capping means and said forward end part defining a substantially enclosed space surrounding said sample receiving bore, said end capping means having an aperture extending therethrough, said aperture providing a gas leakage path into said high vacuum part of said instrument, and tubular passage means extending through said block and communicating with said substantially enclosed space for withdrawing gases from said substantially enclosed space.

3,888,108
PAVEMENT TESTING APPARATUS

Frank W. Brands, Rte. 2, Box 429, Pullman, Wash. 99163

Filed Aug. 2, 1973, Ser. No. 385,181
Int. Cl. G01n *29/00, 3/00*
U.S. Cl. 73—12 **4 Claims**



1. An apparatus for testing pavement structural condition, comprising;

an enclosed container adpated to be hand-carried, said container including vertically spaced top and bottom walls bounded by enclosing upright walls, said bottom wall being adapted to rest upon the surface of the pavement portion being tested:

a vertical guide tube assembly mounted within the container and extending along a vertical axis between said top and bottom walls, the bottom wall having an aperture formed therethrough across the lower end of the guide tube assembly;

a vertical hammer slidably mounted within the guide tube for gravitational movement through said aperture along said axis from a raised position in the guide tube assembly, to impact the pavement surface;

an upwardly extending stem fixed to said hammer and protruding through the top wall of the container to permit manual raising and release of the hammer;

a first electrical accelerometer yieldably mounted on the bottom wall of the container for contact with the pavement surface at a location adjacent the aperture for said guide tube assembly;

a second electrical accelerometer yieldably mounted on the bottom wall of the container for contact with the pavement surface at a location spaced from the location of said first electrical accelerometer to the side thereof opposite the aperture of said guide tube;

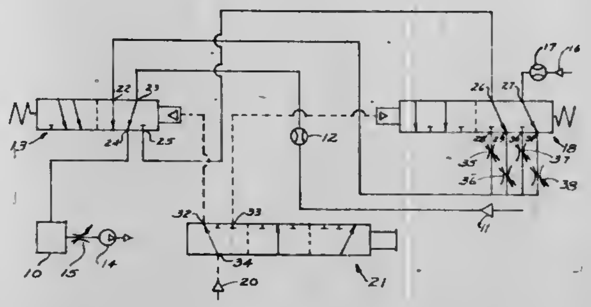
hammer sensing means on said guide tube assembly for detecting the presence of said hammer at its raised position;

and gated signal means operatively connected to said first and second electrical accelerometers and actuable in response to said hammer sensing means upon initial release of the hammer to monitor the electrical signals from said accelerometers during a preset time duration sufficient to assure impact of the pavement surface by said hammer.

3,888,109
GAS DILUTION UNIT

Martin James Sharki, and Clell D. Miller, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 16, 1973, Ser. No. 416,532
Int. Cl.^{2} G01N *31/00*
U.S. Cl. 73—23 **4 Claims**



1. Apparatus for analyzing a sample gas that will provide analysis of said sample gas under conditions wherein the concentration of said sample gas may be above the range of known measuring devices, comprising:

measuring means for determining at least one characteristic of said sample gas,

a source of diluting gas,

a first flow control valve for providing flow at a first rate,

a second flow control valve for providing flow at a second rate, said second rate being related to said first rate by a first ratio,

a third flow control valve for providing flow at a third rate,

a fourth flow control valve for providing flow at a fourth rate, said fourth rate being related to said third rate by a second ratio and said second ratio being different than said first ratio,

a first valve having a first inlet port for receiving said sample gas, a second inlet port connected to said source of diluting gas, a first outlet port connected to said first flow control valve, a second outlet port connected to said second flow control valve, a third outlet port connected to said third flow control valve, and a fourth outlet port connected to said fourth flow control valve, for directing said sample gas from said first inlet port to said first outlet port and said first flow control valve and directing said diluting gas from said second inlet port to said second outlet port and said second flow control valve in a first position; and directing said sample gas from said first inlet port to said third outlet port and said third flow control valve and directing said diluting gas from said second inlet port to said fourth outlet port and said fourth flow control valve in a second position,

means for combining said sample gas from said first control valve and said diluting gas from said second control valve and transmitting said combined gases to said measuring means;

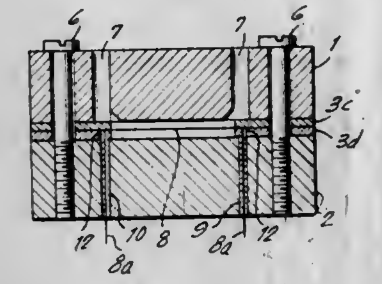
means for combining said sample gas from said third flow control valve and said diluting gas from said fourth control valve and transmitting said combined gases to said measuring means,

means for selectively moving said first valve to said first position and to said second position, a second valve for directing said sample gas to said first inlet port of said first valve in a first position and directing said sample gas directly to said measuring means in a second position, and means for selectively moving said second valve to said first position and to said second position.

3,888,110
APPARATUS FOR THE DETERMINATION OF THE THERMAL CONDUCTIVITY OF GASES

Anthony John Clark, 19, Crossways, Onslow Village, Guildford, Surrey, England

Continuation-in-part of Ser. No. 397,578, Sept. 18, 1964, abandoned. This application Nov. 3, 1967, Ser. No. 680,477
Claims priority, application United Kingdom, Dec. 14, 1966, 55959/66
Int. Cl. G01n *31/00*
U.S. Cl. 73—27 **13 Claims**

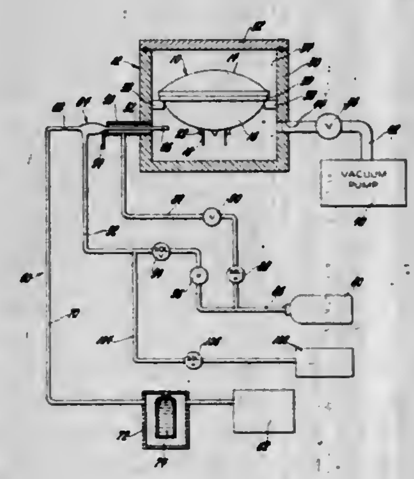


1. Apparatus for use in the determination of the thermal conductivity of gases comprising two blocks of a thermally conductive material having inlet and outlet passages, the axes of said passages being offset from one another, a perforated gasket which separates the blocks of thermally conductive material and defines with the blocks an enclosed cell having inlet and outlet ports communicating with said passages, substantially the total gas volume space of the cell lying within the thickness of the gasket at least one electrically heated detector element supported within said cell and means for making electrical connections to said detector element from outside of said blocks the perforated gasket and detector elements being constructed substantially as one single readily replaceable unit and the volume of the enclosed cell is so small as to permit analysis of gases separated on a capillary chromatographic column without significant loss of resolution.

3,888,111
SEALED BEAM HEADLAMP UNIT LEAK DETECTION SYSTEM

Gale M. Craig, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 21, 1973, Ser. No. 417,792
Int. Cl. G01m *3/00*
U.S. Cl. 73—40.7 **3 Claims**



1. A method of detecting leakage in a lamp unit having a gas fill including helium, comprising the steps of: placing the lamp unit in a sealed chamber; evacuating the chamber to draw said gas fill through any leakage paths in the unit; filling the chamber with carbon dioxide to atmospheric pressure; inserting a

probe into said chamber while maintaining said filling with carbon dioxide; shielding the probe with carbon dioxide to prevent atmospheric contamination thereof; connecting said probe to a device for detecting the presence of helium; drawing the contents of the chamber to draw thereinto; condensing the carbon dioxide of said contents prior to said device; conveying said contents including any leaked gas fill less said carbon dioxide to said device such that only the leaked gas fill is presented to the device for detection of the leaked helium.

3,888,112
APPARATUS FOR QUANTITATIVE ANALYSIS

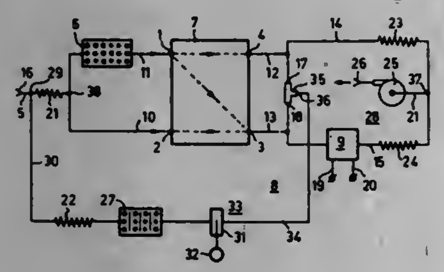
Paul De Leeuw, and Johan Christiaan Willem Kruishoop, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 28, 1973, Ser. No. 401,850

Claims priority, application Netherlands, Oct. 11, 1972, 7213711

Int. Cl. G01n *27/50*

U.S. Cl. 73—61.1 R **5 Claims**



1. An apparatus for the analysis of constituents of a fluid of the type comprising a measuring cell having an inlet and a discharge outlet connected to a discharge flow means; inlet means for supplying a fluid stream to be tested; means connected to said inlet means for filtering at least a portion of said fluid stream; calibration means for adding a known concentration of source fluid to a carrier fluid, said carrier fluid being at least a portion of said fluid stream; and interconnection means for supplying the inlet of said measuring cell alternatively with fluid filtered by said filtering means, unfiltered fluid, or calibrating fluid, said calibrating fluid comprising at least carrier fluid and source fluid from said calibration means; wherein said apparatus comprises a main flow resistance so connected that flow of the fluid stream causes a pressure drop between said inlet means and the inlet of said measuring cell; said calibration means comprises branch means connected between said inlet means and said main flow resistance for supplying a portion of the fluid stream to the calibration means to serve as carrier fluid; and a calibration flow resistance through which said carrier fluid flows for controlling the amount of carrier fluid flow; and said interconnection means comprises an interconnection valve having at least first and second outlets, a T-member having a leg and two sides, the sides being connected respectively to said first and second outlets, the second outlet being connected to said calibration means for receiving carrier and source fluid, and means connecting said first outlet to the inlet of the measuring cell.

3,888,113
REAGENT TUBE AND STOPPER ASSEMBLY

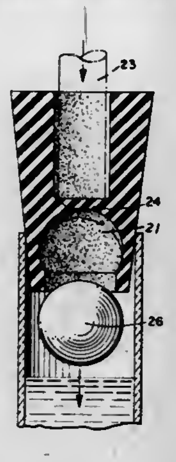
Eduardo V. Miranda, Huntington Beach, Calif., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed Oct. 3, 1973, Ser. No. 402,951

Int. Cl. G01n *11/12, 33/16*

U.S. Cl. 73—64.1 **7 Claims**

1. A reagent tube and stopper assembly comprising in combination a receptacle for containing a reagent solution and a flexible stopper for closure thereof and dispensing a spherical member into said reagent solution, said receptacle having a mouth and an elongated cylindrical wall, said flexible stopper having upper and lower surfaces, a generally cylindrical outer surface and upper and lower cavities, said lower cavity being generally spherical and having a downwardly disposed opening at said lower surface with a width less than the diameter of said spherical cavity, said upper cavity having an upwardly disposed opening at said upper surface and being separated from said lower cavity by a thin, flexible membrane, said outer surface being adapted for snug positioning within the inner cylindrical surface of the upper portion of said receptacle, said spherical cavity being adapted for holding a sphere having a diameter slightly less than the diameter of said receptacle.



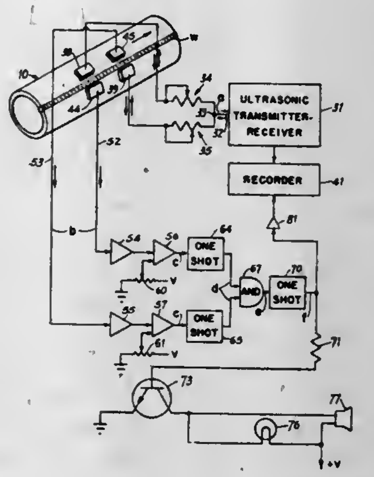
3,888,114
VERIFICATION MEANS FOR SHEAR WAVE ULTRASONIC INSPECTION SYSTEM

David O. Adams, Jr., and John H. Skaggs, both of Houston, Tex., assignors to AMF Incorporated, White Plains, N.Y.

Filed Mar. 6, 1974, Ser. No. 448,574

Int. Cl. G01n *29/04*

U.S. Cl. 73—67.8 R **10 Claims**



1. In an ultrasonic inspection system for inspecting a member capable of propagating ultrasonic energy, means for monitoring the operation of the system comprising

a plurality of pairs of ultrasonic transducers,

the transducers of each pair being positioned on opposite sides of a zone of the member to be inspected and arranged to provide an ultrasonic energy propagation path therebetween which passes through said zone,

said pairs of transducers being arranged relative to the zone so that all of the lengths of the propagation paths between pairs of transducers are substantially equal,

means for simultaneously energizing one transducer of each of said pairs for simultaneously directing ultrasonic energy along each of said propagation paths and through said zone,

means coupled to the other transducer of each of said pairs for producing a first output signal only when all of said other transducers are simultaneously energized by ultrasonic energy received in their respective propagation paths and for producing a second output signal only when said other transducers are not so simultaneously energized, and

indicating means operable in response to the occurrence of said second output signal.

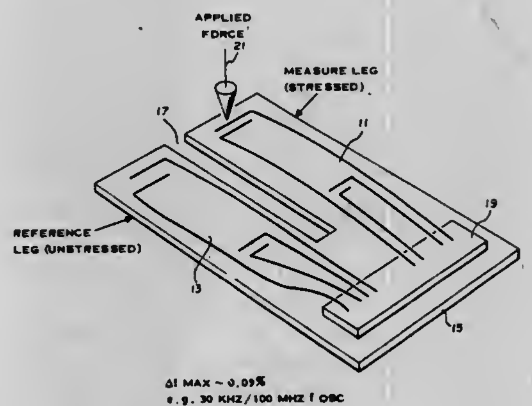
3,888,115
STRAIN SENSOR

Robert J. Schwartz, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 30, 1973, Ser. No. 346,516

Int. Cl. G01b *7/16;* **G01l** *1/10*

U.S. Cl. 73—88.5 R **4 Claims**



1. A strain sensor comprising:
- a. a first surface wave device deposited on a first substrate, first means connecting said first surface wave device into a first oscillator circuit oscillating within a first predetermined frequency range,
- b. a second surface wave device deposited on a second substrate, second means connecting said second surface wave device into a second oscillator circuit oscillating within a second predetermined frequency range, said first substrate having no deliberate mechanical force applied thereto,
- c. means for inducing a deliberate mechanical strain in said second substrate to alter the frequency of oscillation of said second oscillator circuit, and
- d. means for comparing the frequency of oscillation of said first and second oscillators to indicate the change in frequency of said second oscillator resulting from the application of deliberate strain in its substrate.

3,888,116
DIGITAL TORQUEMETER AND THE LIKE

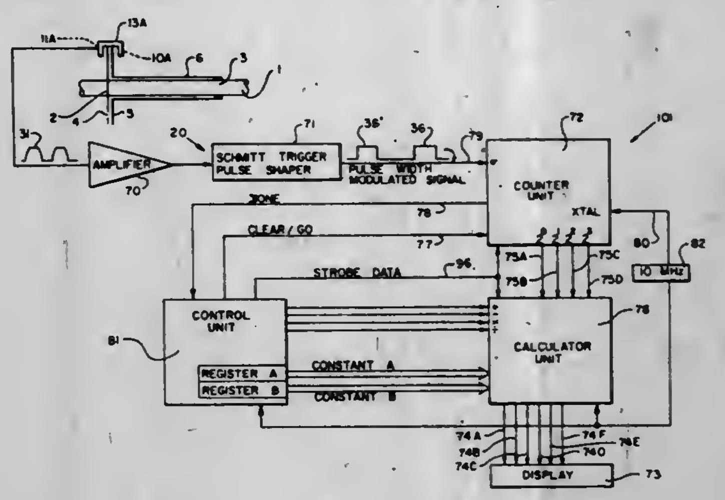
Rinaldo A. Spinella, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 11, 1973, Ser. No. 405,573

Int. Cl. G01l *3/12*

U.S. Cl. 73—136 A **6 Claims**

1. Apparatus for measuring torque transmitted by a rotating shaft that comprises, in combination, means for producing a pulse width modulated signal as a train of electric pulses, digital processing means to receive the signal and to relate the pulse width to the transmitted torque, said digital processing means including a first counter, a second counter, means to establish a given period of shaft rotation, a high frequency clock having very small variance connected as one input to the gating logic of each counter, the signal being connected as a further input to the gating logic of the first counter, the means to establish said given period having an electric output that is connected as a further input to the gating logic of each counter, calculator means connected to receive as input the outputs of both the first counter and the second counter and adapted to provide as output a number representing torque, and controller means to coordinate the functioning of the second counter, the means to establish said given period, and the calculation process for the numerical value of transmitted torque.



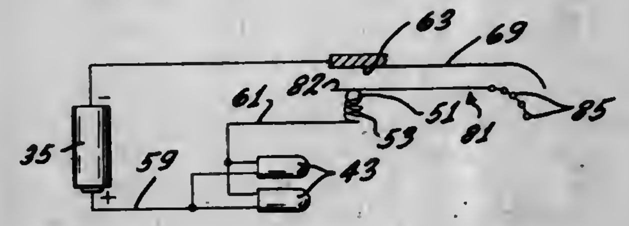
3,888,117
PRESSURE SENSOR AND INSTRUMENT UTILIZING SAME

Warren F. Lewis, Goleta, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 16, 1973, Ser. No. 379,776

Int. Cl. G01l *5/00*

U.S. Cl. 73—141 A **22 Claims**



1. A pressure indicating instrument comprising:

a pressure sensor including first and second conductors and a compressible insulator interposed between said conductors, said insulator normally holding said conductors out of electrical contact;

said insulator being compressible in response to a compressive pressure tending to bring the first and second conductors closer together;

at least a portion of at least one of said first and second conductors being adapted to contact the other of said first and second conductors in response to a predetermined amount of compression of said insulator, said predetermined amount of compression of said insulator corresponding to a predetermined magnitude of the compressive pressure on said pressure sensor;

indicator means coupled to said pressure sensor and being responsive to said conductors being in electrical contact for providing an indication of the presence or absence of said predetermined magnitude of the compressive pressure on said pressure sensor;

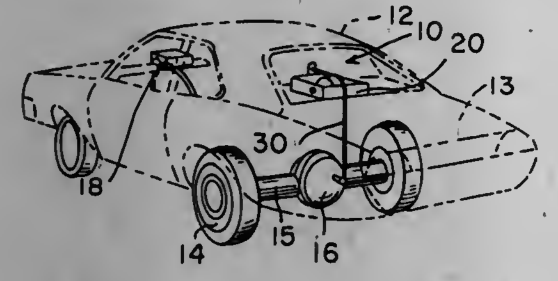
testing means disposed relative to the first and second conductors and being operable to enable the indicator means to provide the indication even when the insulator is not compressed; and

said pressure sensor including a flexible jacket having a surface with non-stick characteristics, said jacket enclosing at least substantial sections of said conductors and said insulator, said compressive pressure being transmittable to said insulator through said flexible jacket.

3,888,118
METHOD AND APPARATUS FOR DETERMINING ROAD ROUGHNESS

Jerry R. Nims, Baraboo, Wis., assignor to Soiltest, Inc., Evanston, Ill.

Filed Mar. 2, 1973, Ser. No. 337,544
Int. Cl. G01b *5/28*
U.S. Cl. 73—105 15 Claims



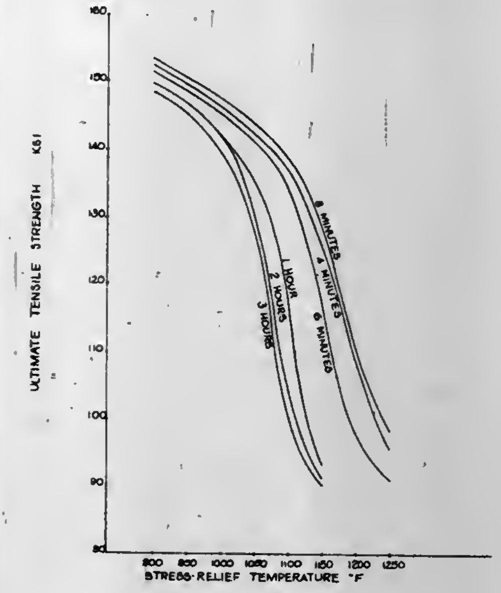
1. A transducer assembly particularly adapted for use in a road roughness meter to translate deflections sensed in a vehicle supporting surface to signals indicating road roughness including axial means mounted on the sprung portion of a vehicle constructed for travel over said supporting surface, said axial means being angularly movable with respect to said sprung portion, transducer means mounted on said axial means and movable therewith, signal emitting and signal receiving means disposed adjacent said transducer means, drive means operatively engaging at least a portion of said transducer means, said drive means being connected to the unsprung portion of said vehicle at one end thereof, and being connected through resilient means to the sprung portion of said vehicle at the opposite end thereof, said drive means being moved with respect to the sprung portion of said vehicle as said unsprung portion moves in response to the deflections in the vehicle supporting surface, such movement of said drive means angularly moving said transducer means on movement of said axial means relative to said sprung portion of said vehicle and said signal emitting and signal receiving means such that the movement of said transducer means by said drive means causes signals corresponding to the degree of each deflection in said vehicle supporting surface to be received by said signal receiving means, said transducer means including an encoded wheel means mounted on said axial means and angularly movable therewith, said wheel means having a plurality of coded openings formed therein corresponding to measureable increments of possible deflections in said vehicle supporting surface, said encoded wheel means being interposed between said signal emitting means and said signal receiving means, said encoded wheel means also having a series of aligning openings formed therein, said aligning openings being smaller in dimension than said coded openings and being disposed in spaced relationship near the perimeter of said wheel means such that angular movement of said wheel means to allow a signal to be passed from said signal emitting means through one of said aligning openings in said wheel means to said signal receiving means will assure that various desired coded openings are in centered alignment between said signal emitting means and signal receiving means.

3,888,119
PROCESS FOR COLD-WORKING AND STRESS-RELIEVING NON-HEAT HARDENABLE FERRITIC STAINLESS STEELS

Harry Tanczyn, Baltimore, Md., assignor to Armco Steel Corporation, Middletown, Ohio

Filed Jan. 18, 1974, Ser. No. 434,397
Int. Cl. B21c *9/00*
U.S. Cl. 72—364 7 Claims

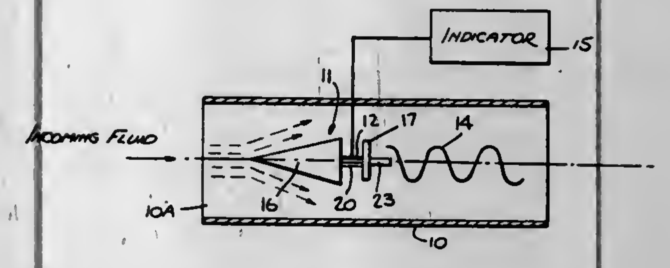
1. A process for increasing the ultimate tensile strength of non-heat hardenable ferritic stainless steel bar, rod, wire, strip and special shapes while retaining good ductility therein, comprising the steps of cold working a non-heat hardenable ferritic stainless steel containing from about 11% to about 30% chromium and balance substantially iron by passage through a die peripherally contacting said steel, said cold working effecting a reduction in thickness sufficient to increase the ultimate tensile strength of said steel by at least about 50 ksi, stress relieving said cold worked steel by heating within the temperature range of about 750° to 1,200° F with a time at temperature of about 2 minutes to about 3 hours, whereby to obtain an elongation value adequate to permit subsequent cold forming operations.



3,888,120
VORTEX TYPE FLOWMETER WITH STRAIN GAUGE SENSOR

Thomas H. Burgess, Horsham, Pa., assignor to Fischer and Porter Co., Warminster, Pa.

Filed Apr. 26, 1973, Ser. No. 354,803
Int. Cl. G01f *1/00*; G01p *5/00*
U.S. Cl. 73—194 B 8 Claims

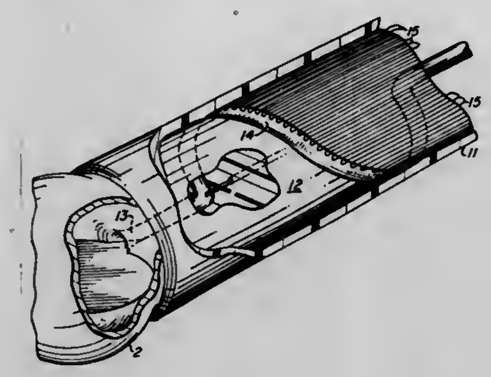


1. A flowmeter of the vortex type comprising:
A. a flow conduit through which fluid to be measured is conducted;
B. an obstacle assembly disposed within said conduit and constituted by a front section fixedly mounted across the conduit and contoured to cause flow separation and downstream vortex street having a periodicity which is a function of flow rate, and a rear non-streamlined section cantilevered behind said front section to define a gap which traps the vortices of the vortex street and strengthens and stabilizes the vortex street, said rear section being shaped to interfere with said vortex street, said rear section being slightly deflectable to a degree in which the maximum deflection thereof is not in excess of about 0.002 inches whereby it is excited into minute vibration by said street; and
C. strain gauge means to sense the vibrating motion of said rear section to produce a signal whose frequency is proportional to flow rate.

3,888,121
TEMPERATURE MEASURING APPARATUS

Donald E. Geldmacher, 40 N. McDonald, Mesa, Ariz. 85201

Filed Mar. 6, 1973, Ser. No. 338,573
Int. Cl. G01k *7/00*
U.S. Cl. 73—362 R 9 Claims



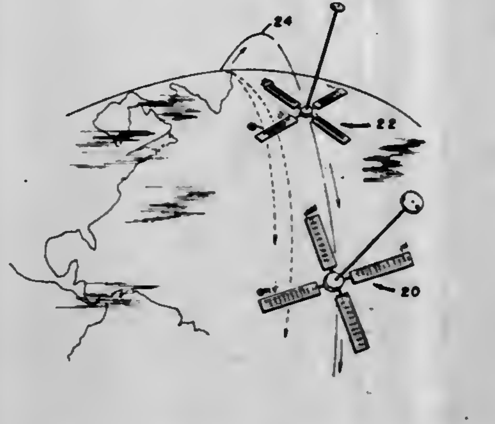
1. A thermometer comprising:
a mercury filled bulb,
a temperature sensing element attached to said bulb,
said sensing element comprising a pair of concentrically arranged inner and outer cylinders,
said inner cylinder having a canal formed in its outer surface a part of which traverses a helical path about the axis of said inner cylinder,
one end of said canal being connected to said bulb,
a plurality of conductors formed on the outer surface of said inner cylinder,
one end of each of said conductors being connected to a different point along the helical part of said canal to make electrical contact with the mercury in said canal when it expands to that point,
the other end of each of said conductors extending along said inner cylinder and terminating in an indicating device,
said outer cylinder surrounding said inner cylinder in sealing arrangement to encase the mercury moving in said canal,
an indicating device,
said device comprising a plate having a plurality of contacts one connected to the other end of all but a selected one of said conductors,
means for connecting the other end of the selected one of said conductors to a voltage actuated signal device, and a pointer on said plate connected to said voltage actuated signal device for selectively contacting the one of said contacts indicating the height of the mercury in said canal.

3,888,122
METHOD AND APPARATUS FOR OBTAINING THE FINE SCALE STRUCTURE OF THE EARTH'S GRAVITY FIELD

Harold D. Black, Highland, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 9, 1974, Ser. No. 495,954
Int. Cl. G01v *7/16*
U.S. Cl. 73—382 5 Claims

1. A method for determining the direction of the sub-track and cross-track components of the local gravitational force vector over the surface of an ocean, comprising the steps of:
orbiting at least two satellites in predetermined coincidental orbits, the satellites being spatially separated in the orbital plane by a predetermined temporal interval;
measuring the height of each satellite above mean sea level as each of the satellites pass through a given point in inertial space;
determining the difference in height above mean sea level measured by the two satellites during the respective passes through the given point;
mathematically processing the difference in height thus measured to yield the cross-track component;
measuring the height of either one of the two satellites at two closely spaced points in inertial space; and

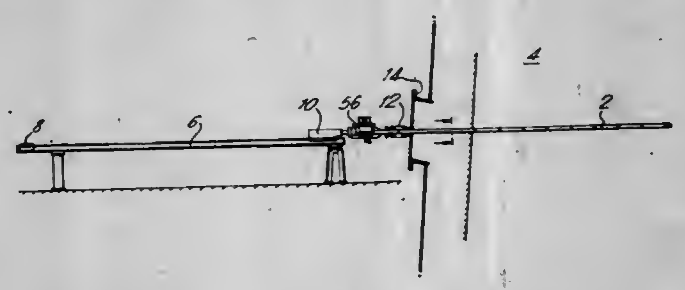


mathematically processing the two heights thus measured to yield the sub-track component.

3,888,123
APPARATUS FOR TAKING GAS SAMPLES IN SHAFT FURNACES

Ernest P. Küntziger, and Nicolas Lemmens, both of Assenede, Belgium, assignors to S.A. des Anciens Etablissements Paul Wurth, Luxembourg, Luxembourg

Filed Aug. 24, 1973, Ser. No. 391,361
Claims priority, application Luxembourg, Sept. 5, 1972, 65998
Int. Cl. G01n *1/24*
U.S. Cl. 73—421.5 A 9 Claims



1. Apparatus for taking gas samples from a plurality of locations within the charge burden on the hearth of a shaft furnace comprising:
moveable probe means, said probe means including an elongated probe adapted to be introduced into and withdrawn from the furnace charge via a port in the furnace wall, said elongated probe including a central supporting tube and a plurality of rigid gas sampling pipes symmetrically arranged around said supporting tube, said gas sampling pipes each being provided with a gas entry aperture, said gas entry apertures being individually displaced along the longitudinal axis of the probe, said probe further comprising a tubular outer sheath surrounding said gas sampling pipes, said sheath being concentric with said central supporting tube and being provided with a plurality of gas entry ports individually displaced along the longitudinal axis of the probe, said gas entry ports being individually coupled to respective of said gas entry apertures in said gas sampling pipes, said sheath and central supporting tube defining an annular housing for said gas sampling pipes and a path for coolant flow in the free interspace between said sampling pipes;
drive means for applying longitudinal force to said probe means to urge said probe means into and to withdraw said probe means from the furnace charge; and
vibrator means coupled to said probe means for superimposing vibratory movement on to the longitudinal force during introduction of the probe into the furnace charge.

3,888,124
ATMOSPHERIC MERCURY SAMPLING MATERIAL AND METHOD

Evan E. Campbell; Bernard C. Eutsler, both of Los Alamos, and Patricio E. Trujillo, Santa Fe, all of N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

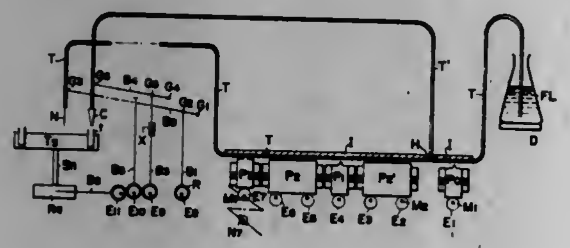
Filed Aug. 7, 1973, Ser. No. 386,465
Int. Cl. G01n *1/22*
U.S. Cl. 73—421.5 R 4 Claims

1. In a method for determining the content of metallic mercury vapor in air by passing a known volume of said air through a mercury vapor absorbing material and subsequently thermally desorbing the mercury adsorbed thereon and measuring its amount by atomic absorption spectroscopy, the improvement consisting of using as the adsorbing material a silvered particulate calcined diatomaceous earth substrate.

3,888,125
PUMP FOR PREPARING DILUTED LIQUIDS OF PREDETERMINED DEGREES OF DILUTION

El Mochida, 5-4, 2-chome, Komagome, Toshima-ku, Tokyo, Japan

Filed Apr. 10, 1974, Ser. No. 459,614
Claims priority, application Japan, Apr. 10, 1973, 48-40542
Int. Cl. G01n *1/12*
U.S. Cl. 73—423 A 5 Claims



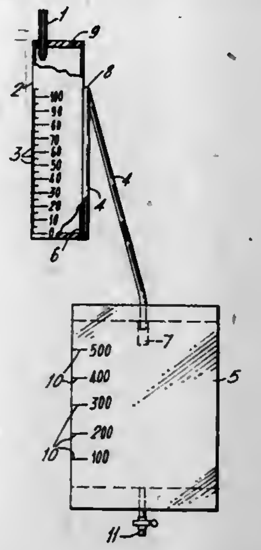
1. A pumping arrangement for preparing diluted liquids of a series of various degrees of predetermined dilution comprising a main tube of flexible and resilient material open at its extreme upstream end into a container of diluting liquid and its other end terminating with a fine charging tube, a branch tube extending from a base portion of the main tube provided at its extreme downstream end with a pipette, first upstream blocking means connected to block the main tube at a location upstream from the point of connection of the branch tube, second upstream from the point of connection of the branch tube, second upstream blocking means located downstream from the point of connection of the branch tube for blocking the main tube, and discharge means located adjacent the second upstream blocking means for pressing the main tube along a predetermined length thereof, and driving means for feeding test tubes successively one by one to the positions immediately below the pipette and the fine charging tube.

3,888,126
LIQUID MEASURING APPARATUS

David Edward Cross, Folkestone, England, assignor to Smiths Industries Limited, London, England

Filed July 11, 1973, Ser. No. 378,100
Claims priority, application United Kingdom, July 14, 1972, 32934/72
Int. Cl. G01f *19/00*
U.S. Cl. 73—426 14 Claims

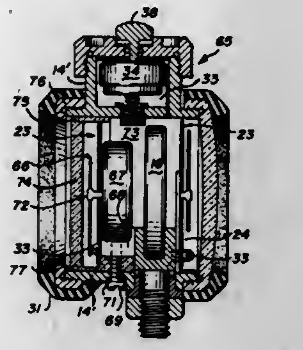
1. Liquid-measuring apparatus comprising a first chamber having an inlet for supplying the liquid to be measured to aa predetermined level in said first chamber, said first chamber communicating with ambient atmospheric presure above said predetermined level, a second chamber for the liquid being measured, said second chamber having a substantially larger liquid-holding capacity than said first chamber, and a passageway intercoupling the two chambers for automatically conveying selected increments of the liquid being measured from the first chamber to the second chamber, said passageway opening into said first chamber below said prdetermined level and extending upwardly to said predetermined level and then downwardly to said second chamber so as thereby to provide an automatic siphon for draining a predetermined unit quantity of the liquid out of the said first chamber and into said second chamber in response to the liquid content of the said first chamber reaching said predetermined level, said second chamber being graduated in terms of said unit quantity of liquid.



3,888,127
PORTABLE UNDERWATER INDICATING INSTRUMENT FOR DIVERS

Ralph B. Shamlian, Belmont, and Ashley J. Hollingsworth, Atherton, both of Calif., assignors to Farallon Industries, Inc., Belmont, Calif.

Continuation-in-part of Ser. No. 305,232, Nov. 10, 1972. This application Apr. 18, 1974, Ser. No. 462,099
Int. Cl. G01l *19/00*
U.S. Cl. 73—431 15 Claims



1. In a portable underwater indicating instrument to be carried by and for use by a diver:

first and second measuring means for measuring first and second quantities of interest to the diver;

first and second indicating means coupled to said respective first and second measuring means for indicating said first and second respective measured quantities to the diver; housing means common to and for housing said first and second measuring and indicating means;

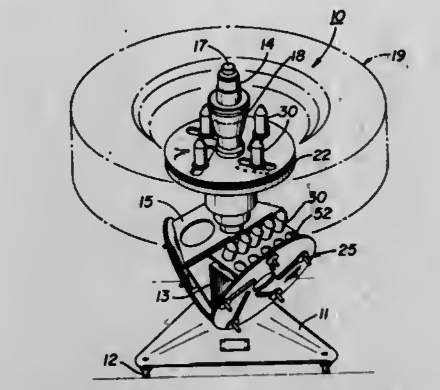
each of said indicating means including a face portion facing outwardly of said housing for viewing by the diver; and

said housing means including first chamber means open at opposite ends to receive and retain said first and second measuring and indicating means in back-to-back relation with their respective face portions facing outwardly of said housing means in opposite directions for viewing by the diver.

3,888,128
WHEEL BALANCING SYSTEM

Wallace F. Mitchell, Libertyville, Ill., assignor to Ammco Tools, Inc., North Chicago, Ill.

Filed May 31, 1974, Ser. No. 475,105
Int. Cl. G01m *1/12*
U.S. Cl. 73—484 10 Claims



1. In combination with a wheel balancing device of the type including a base, a vertical spindle pivotably balanced on said base, means indicating the angular relationship of said spindle to the vertical, and means for mounting a wheel to said spindle, the improvement being in said last named means and the improvement comprising

a support member mounted to said spindle and having a planar upper surface surrounding said spindle and lying perpendicular to the longitudinal axis thereof,

a plurality of upstanding wheel supports resting on said planar surface, and

first and second locating plates disposed in mutually parallel relationship and each having a plurality of symmetrically disposed slots through which said supports respectively and slidably extend,

said slots being rectilinear and extending tangentially to a circle concentric with said longitudinal axis of said spindle,

the slots in said first plate being the mirror image of the slots in said second plate with the slots in said first plate overlying the slots in said second plate,

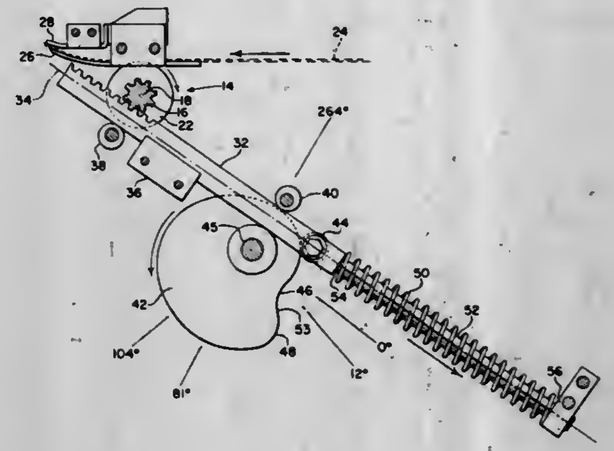
whereby relative rotation of said plates varies the radial positions of said wheel supports relative to said spindle without disturbing the symmetry of said locating plates and thus the balance of said spindle.

3,888,129
SHEET ACCELERATION AND SYNCHRONIZATION MECHANISM

George Michael Velan, Park Ridge, and Glenn Robert Peabody, Villa Park, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 21, 1974, Ser. No. 444,443
Int. Cl. F16h *19/04*
U.S. Cl. 74—29 5 Claims

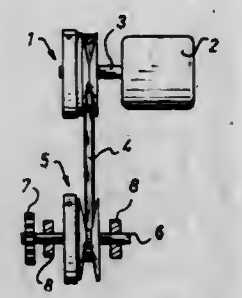
1. A sheet feeding mechanism comprising a first shaft, a rack gear having a longitudinal axis, a pinion gear on said first shaft in mesh with said rack gear, a feed roller on said first shaft for feeding said sheets, a rotationally driven second shaft, drive means for driving said rack gear along its longitudinal axis, said drive means comprising a cam follower coupled to said rack gear and a rack drive cam on said second shaft which has a cam surface that interacts with said cam follower and has a curvature such that the rack gear is accelerated in the direction along its longitudinal axis which accelerates said feed roller in its paper-feeding rotational direction, sheet stop means, sheet stop carrier means for carrying said sheet stop means comprising a sheet stop cam follower and a sheet stop cam on said first shaft for actuating and deactuating said sheet stop means at predetermined times, and first and second spaced apart frame members each of which support one of the opposite ends of said first shaft, said pinion gear being secured on the end of said first shaft adjacent said first frame member while said sheet stop cam is secured on the end of said first shaft adjacent said second frame member.



3,888,130
ROTATION RESPONSIVE VARIABLE DIAMETER PULLEY

Léon Blanchette, St. Nicephore, County of Drummond, Quebec, Canada

Filed Nov. 13, 1973, Ser. No. 415,309
Int. Cl. F16h *55/22*
U.S. Cl. 74—230.17 E 7 Claims



1. A variable diameter drive pulley comprising a pair of flanges coaxially mounted adjacent each other for rotation about a common axis, said flanges having one of their sides forming opposed faces which are radially diverging relative to each other to define a V-belt recess, one of said flanges is rotatably and axially displaceable relative to the other of said flanges, a cam means attached to said one flange, a cam-engaging means fixed to said other flange and arranged for bodily rotation therewith about said axis; said cam means having an axially camming surface engageable by said cam-engaging means upon relative angular retardation of said one flange relative to said other flange to axially displace said one flange towards said other flange, spring means biasing said one flange away from said other flange, and centrifugally responsive weight means urging said one flange in rotation relative to said other flange in a direction to cause angular retardation of said one flange relative to said other flange, and wherein said weight means are a pliable tie means attached at one end to said one flange and at its other end to said cam-engaging means, slackly extending between the same transversely of said common axis.

3,888,131
COVERING FOR BELT CONVEYOR IDLER ROLLS

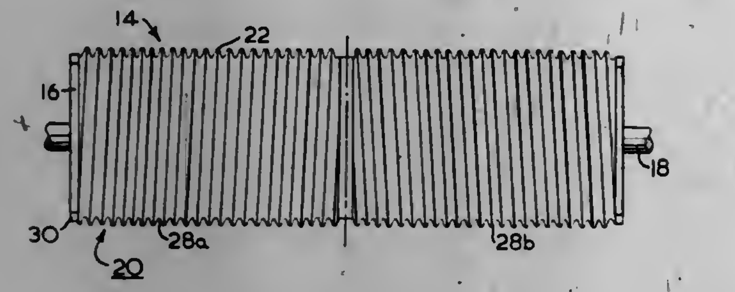
Charles M. Reid, Calgary, Alberta, Canada, assignor to Elast-O-Cor Products & Engineering Limited, Alberta, Canada

Filed Oct. 5, 1973, Ser. No. 404,003

Claims priority, application Canada, Oct. 23, 1972, 154596

Int. Cl. F16h *7/18*

U.S. Cl. 74—241 13 Claims



1. An idler roll covering for use in belt conveyor systems comprising a cylindrical sleeve of a flexible abrasion resistant material, said sleeve having thereon at least first and second outwardly projecting ribs integrally formed with said sleeve, said first and second ribs having respective inner ends located adjacent the mid-length portion of the sleeve and said ribs spiralling around said sleeve a plurality of times in the form of continuous spirals or helices towards opposing respective ends of the sleeve with the spiral or helix defined by the first one of said ribs being of opposite hand to the second one, first and second helical grooves being defined by the first and second spiral ribs respectively, said inner ends of said first and second ribs being spaced from one another at said mid-length portion of the sleeve, said ribs being dimensioned and proportioned in cross section such that when outer portions or crests of said ribs rollingly engage a surface of a loaded moving conveyor belt, the spiral or helical ribs are deflected and released in continuous cyclic fashion thereby tending to shake loose sticky particles and also tending to cause any particles in the grooves to be moved therealong, either toward the opposing ends of the sleeve or toward said mid-length portion of the sleeve, depending on the direction of rotation, whereby to permit said particles to escape from between said ribs.

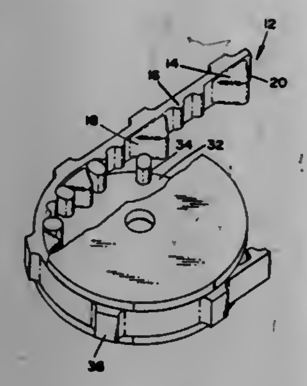
3,888,132
POSITIVE DRIVE BELT AND SYSTEM

Paul E. Russ, Sr., Englewood, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed May 15, 1974, Ser. No. 470,250

Int. Cl. F16g *13/02, 1/28;* F16h *55/30*

U.S. Cl. 74—247 10 Claims



1. A positive drive belt comprising:

spaced elastomeric primary teeth secured to the belt, eacn primary tooth having a longitudinal base thickness; and

at least two spaced elastomeric secondary teeth secured to the belt interpositioned between and spaced from successive primary teeth, each secondary tooth having a height less the primary teeth and a longitudinal base thickness less than half of each primary tooth.

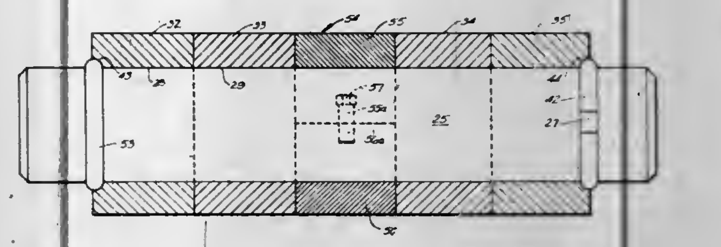
3,888,133
CONNECTING PIN AND RETAINING MEANS THEREFOR FOR MINING MACHINE TRIM CHAINS AND THE LIKE

Claude B. Krekeler, Cincinnati, Ohio, assignor to The Cincinnati Mine Machinery Company, Cincinnati, Ohio

Filed May 30, 1973, Ser. No. 365,271

Int. Cl. F16g *13/04;* E21c *25/34*

U.S. Cl. 74—254 18 Claims



1. In a chain of the type comprising a plurality of link elements arranged in groups one behind the other with the ends of the link elements of adjacent groups being in interdigitated relationship and having transverse perforations coaxially aligned, improved means to join said interdigitated link element ends of the each adjacent pair of said groups comprising an elongated connecting pin passing through said coaxially aligned perforations of said interdigitated ends, first and second retaining means comprising annular abutment means so positioned on said connecting pin near the ends thereof as to cooperate with the outermost link element ends on said connecting pin to prevent inadvertent removal of said connecting pin from said coaxial perforations, at least one of said retaining means being removable from said retaining position to permit removal of said connecting pin from said coaxial link element perforations, and means to protect said at least one removable retaining means from wear from external sources comprising an annular undercut at that end of said transverse perforation of said outermost link element end facing said at least one removable retaining means, said last mentioned retaining means being located in part at least in said annular undercut and means to releasably maintain said at least one removable retaining means in part at least within said undercut to protect said last mentioned retaining means and prevent its inadvertent removal from said annular undercut while permitting its purposeful removal therefrom for assembly and disassembly of said chain.

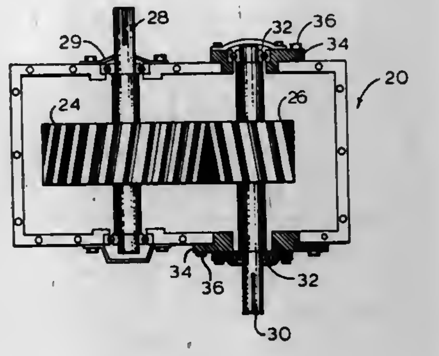
3,888,134
ECCENTRIC SHAFT MOUNTING APPARATUS

Lawrence Thomas Miranda, 1064 Puolo Dr., Honolulu, Hawaii 96818

Filed June 3, 1974, Ser. No. 475,898

Int. Cl. F16h *57/00, 55/18, 1/04*

U.S. Cl. 74—405 25 Claims



1. A power transmission apparatus with an adjustable, eccentric shaft mounting comprising:
a. a supporting frame,
b. a first rotary shaft rotatably mounted in the supporting frame,

c. a first toothed wheel mounted on the first rotary shaft,
d. rotatably adjustable eccentric bushings mounted in the supporting frame and capable of supporting a second rotary shaft at a point offset from the center of the eccentric bushing, and
e. a plurality of interchangeable second rotary shaft and second gear assemblies, rotatably mountable in the eccentric bushings comprising a plurality of second rotary shafts and a plurality of second toothed wheels of various diameters, each mounted on one of the interchangeable second rotary shafts and each equipped with a tooth structure capable of intermeshing with the tooth structure of the first toothed wheel;

whereby, a gear ratio of the power transmission apparatus can be adjusted by removing one second rotary shaft and second toothed wheel assembly from the eccentric bushings, mounting another second rotary shaft and second toothed wheel assembly on the eccentric bushings, and adjusting the eccentric bushings so that a replacement second rotary shaft and second toothed wheel assembly is supported in such a position that the tooth structure of the second toothed wheel engages the tooth structure of the first toothed wheel.

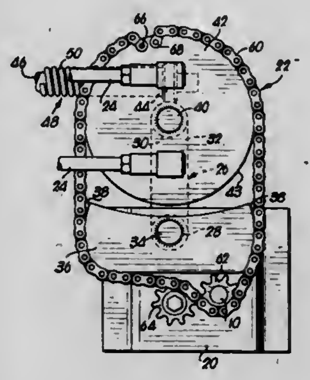
3,888,135
CONTROL FOR STEERING, SPEED AND DIRECTION

Lowell J. Goering, Moundridge, Kans., assignor to Hesston Corporation, Hesston, Kans.

Division of Ser. No. 369,249, June 12, 1973. This application Aug. 23, 1974, Ser. No. 500,062

Int. Cl. B62d *1/20*

U.S. Cl. 74—496 6 Claims



1. In a control mechanism:

a pair of members provided with arcuate peripheries;

means mounting one of said members for rotation about a first axis and for swinging about a second axis spaced laterally from said first axis;

a flexible drive entrained about the peripheries of said members;

means for operating said drive to rotate said one member and carry out a first control function; and

means for swinging said one member relative to the other to carry out a second control function,

said peripheries of the members being of substantially the same radius whereby said swinging of the one member may be carried out without causing operation of said drive and said rotation of the one member may be carried out without causing said one member to swing, enabling said control functions to be effected independently of and without influencing one another.

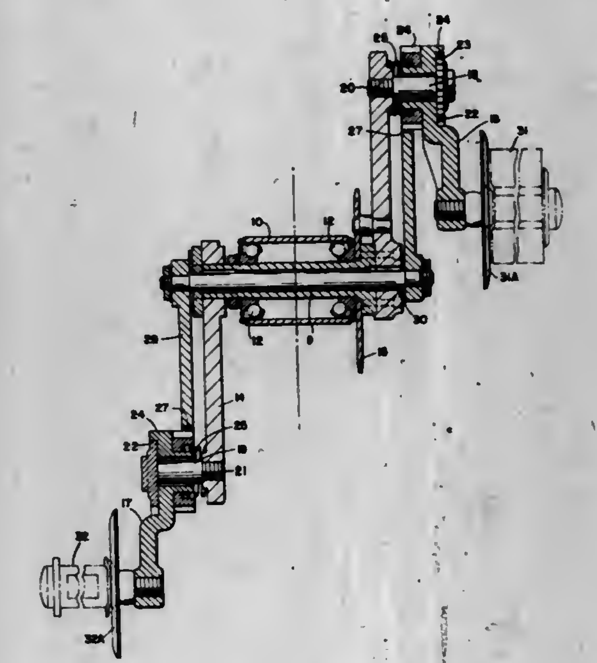
3,888,136
ADJUSTABLE PEDAL AND CRANK SYSTEM FOR FOOT PROPELLED VEHICLES

Fernand S. Lapeyre, 1224 Octavia St., New Orleans, La. 70115

Filed June 4, 1974, Ser. No. 476,207

Int. Cl. B62m *3/02*

U.S. Cl. 74—594.1 10 Claims



1. An adjustable pedal crank system for bicycles and the like for compelling rotation of the drive shaft, comprising a pair of primary drive cranks secured to said drive shaft, a pair of secondary drive cranks connected to the primary cranks and each having a pedal, means for locking said secondary drive cranks at any angular position of the secondary cranks relative to the primary cranks for propelling the vehicle, and foot actuated interconnecting means between both sets of secondary cranks for maintaining both pedals at equal distance from the drive shaft at all times even while effecting change of pedal drive arm length from the drive shaft axis.

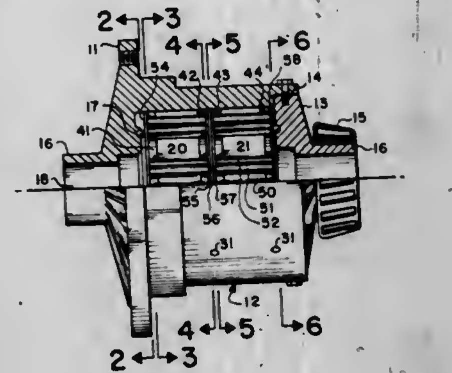
3,888,137
DIFFERENTIAL DRIVE MECHANISM

Charles Henry Brieten, 330 W. Mulberry, Fredericksburg, Tex. 78624

Filed Feb. 25, 1974, Ser. No. 445,455

Int. Cl. F16h *35/04, 1/44;* F16d *15/00*

U.S. Cl. 74—650 7 Claims

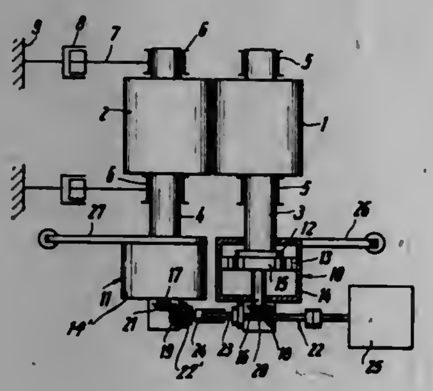


1. A differential drive mechanism comprising.
a. an elongated drive cylinder having a first end and a second end and an inside and an outside mounted for rotation in a housing,
b. means for rotating said drive cylinder,
c. a first drive cam having a first side and a second side mounted for rotary motion inside said drive cylinder, said first drive cam being capable of receiving and rotating an axle in either a clockwise or counterclockwise direction,

d. a second drive cam having a first side and a second side mounted for rotary motion inside said drive cylinder adjacent but not securely attached to said first drive cam, said second drive cam being capable of receiving and rotating an axle in either a clockwise or counter-clockwise direction,
e. each of said drive cams further comprising equal numbers of symmetrical multiple convex arcuate drive cam lobes,
f. the interspacing of said multiple convex arcuate drive cam lobes defining a multiplicity of drive cam valleys,
g. a multiplicity of drive rollers having progressive dimensions positioned inside said drive cylinder adjacent each side of each valley and each drive cam lobe,
h. said multiple drive rollers frictionally contacting a cam drive surface when said drive cylinder rotates in a clockwise direction, and conversely,
i. said multiple drive rollers frictionally contacting a cam overrun surface when said drive cylinder is rotated in a counter-clockwise direction.
j. a first drive roller support disc compartibly positioned in said drive cylinder adjacent the said first side of said first drive cam,
k. a second drive roller support disc compatibly positioned inside said drive cylinder adjacent the said second side of said first drive cam,
l. a third drive roller support disc compatibly positioned inside said drive cylinder adjacent the said first side of said second drive cam,
m. a fourth drive roller support disc compatibly positioned inside said drive cylinder adjacent said second side of said second drive cam.
n. said first and said second drive roller support discs rotatably supporting a multiplicity of said drive rollers adjacent the valleys of said frist drive cam, and
o. said third and said fourth drive rollers support discs rotatably supporting a multiplicity of said drive rollers adjacent the valleys of said second drive cam.

3,888,138
PLANETARY DRIVE SYSTEM FOR ROLLS IN A MILL

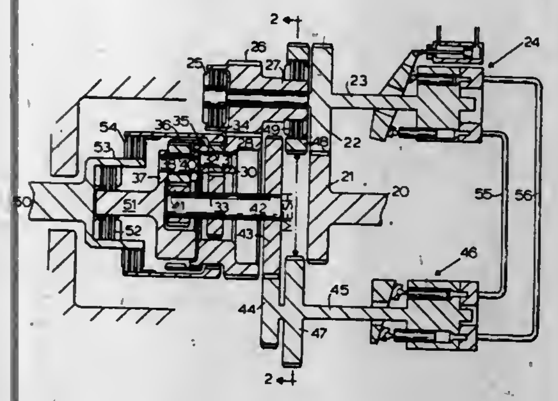
Heinz M. Hiersig, Dusseldorf-Oberkassel, Germany, assignor to Mannesmann-Meer Aktiengesellschaft, Monchengladbach, Germany
Filed Oct. 4, 1973, Ser. No. 403,633
Claims priority, application Germany, Oct. 11, 1972, 2250585
Int. Cl. F16h *37/06, 35/06*
U.S. Cl. 74—665 G **7 Claims**



1. In a drive system for two rolls in a rolling mill wherein at least one roll is journalled for displacement of its axis towards and away from the axis of the other roll, and including a drive motor for both said two rolls, comprising:
a first and second planetary gear each having a sun wheel, a spider for carrying planet gears meshing the sun wheel, and an internal ring gear meshing the planet gears, the spiders of the planet gears being respectively directly connected to the two rolls in coaxial relation to the respective roll for driving same;
a power branching transmission with a common, single, driven input connected to said drive motor and having shaft means extending transversely to said roll axes and having two driving outputs each providing a rotational output correspondingly effective transversely to said shaft means, said driving outputs being respectively connected to said sun wheels for driving same, said shaft means constructed for yielding displacement of the driving outputs relative to each other along the axial extension of the shaft means and following any displacement of said roll axes away from or towards each other, to maintain driving connection between the driven input and said driving outputs without interruption upon occurrence of said displacement;
and means for holding the internal ring gears of the planetary gears against rotation, the first and second planetary gears following the respective mutual displacement of the axes of the rolls.

3,888,139
HYDROMECHANICAL TRANSMISSION

Elias Orshansky, Jr., San Francisco, Calif., assignor to Orshansky Transmission Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 259,549, June 5, 1972, which is a continuation-in-part of Ser. No. 154,976, June 21, 1971, abandoned. This application Sept. 25, 1972, Ser. No. 29[illegible],803
Int. Cl. F16h *47/04*
U.S. Cl. 74—687 **49 Claims**



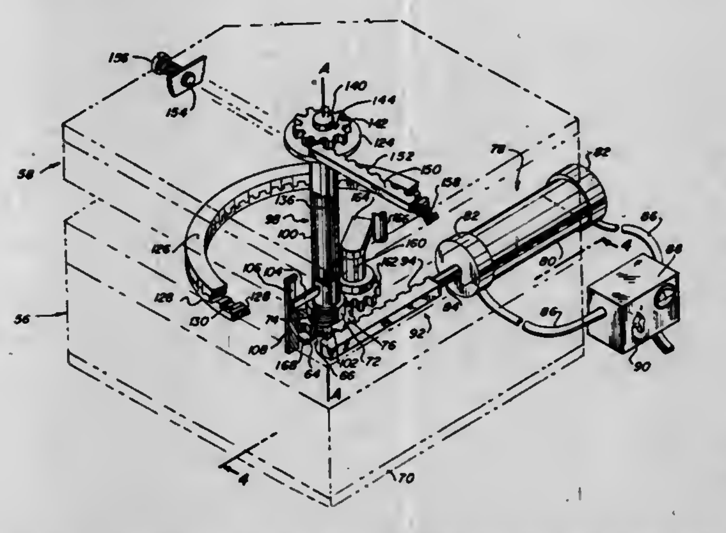
1. A power transmission comprising
input means,
output means,
a planetary assembly having an input member, two coaxial output members, and reaction means, and having two separate and distinct sets of planet gears, each set being mounted on separate and distinct rotatable carriers,
means for alternately and separately connecting each of said output members to said output means, and
speed-varying means for causing one said output member to increase its speed and for simultaneously causing the other said output member to decrease its speed and vice versa.

3,888,140
INDEXING TURRET

Philip A. Mackelvie, Commerce City, Colo., assignor to Multi-Point Tool Co., Inc., Commerce City, Colo.
Filed Apr. 15, 1974, Ser. No. 461,004
Int. Cl. B23b *29/32*
U.S. Cl. 74—826 **13 Claims**

1. An indexing turret for use in combination with a machine tool, comprising:
a supporting base having a reference axis perpendicular to the general plane of the base;
an indexing head carrier by the base and mounted for linear retraction and extension toward and away from the base in the direction of the reference axis and for rotational

movement about the reference axis to a plurality of indexed positions;
a first rotary actuator mounted on the base for rotation about the reference axis;
a first linear actuator connected to the first rotary actuator and mounted for reciprocating movement parallel to the general plane of the base to cause rotation of the rotary actuator in advancing and retracting directions through a predetermined angular range;
a reciprocating action servo motor connected to the first linear actuator;
a lift stud extending between the head and the base concentrically of the reference axis and slidably connected to the base for axial, non-rotary movement;
the stud having a first end threadedly connected to the first rotary actuator to be axially extended and retracted in response to advancing and retracting rotation of the actuator;

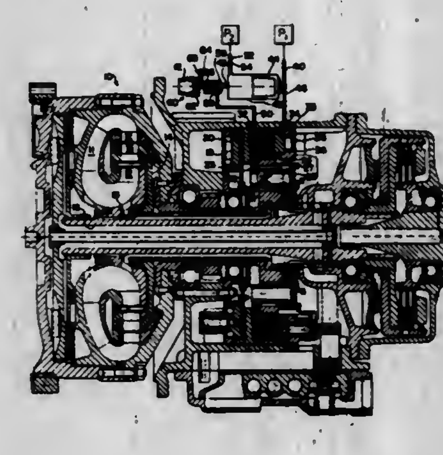


the stud having a second end connected to the head for rotary, non-axial relative movement to cause the head to extend and retract in unison with the stud;
interengaging indexing lock members connected to the head and base to lock the head in selected indexed positions and adapted to disengage upon extension of the head away from the base to allow rotation of the head;
a rotary drive shaft connected to a first end to the first rotary actuator to be rotated thereby;
and a second rotary actuator connected to the second end of the drive shaft to engage the head and rotate it through a predetermined angular distance to a succeeding indexed position;
the head being retractable toward the base in response to retracting rotation of the first rotary actuator to re-engage the indexing lock members and positively retain the head in its indexed position during a machining operation.

3,888,141
MODULATING ARRANGEMENT FOR SERVO-MOTOR ACTUATED DISC BRAKE

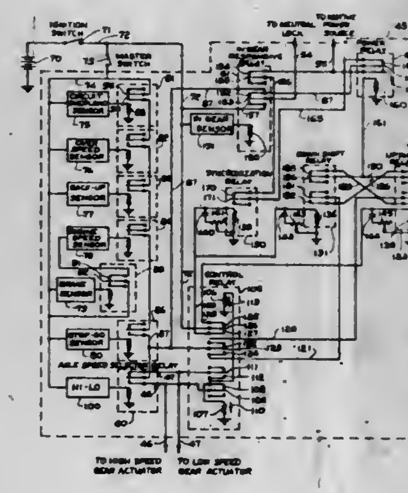
Karl Gustav Ahlen, Stockholm, Sweden, assignor to S.R.M. Hydromekanik Aktiebolag, Sweden
Division of Ser. No. 366,168, June 1, 1973. This application Mar. 15, 1974, Ser. No. 451,604
Claims priority, application United Kingdom, Mar. 21, 1973, 13599/73
Int. Cl. F16h *47/08;* **F16d** *33/00*
U.S. Cl. 74—730 **6 Claims**

1. A torque converter comprising: a stationary casing, a torridal chamber including a pump part, a turbine part, means for operatively connecting the turbine part to a turbine shaft, and a guide part, control means for varying the rotating speed of the guide part, said control means including a variable gear means and a friction brake for varying the operating position of the gear means, said friction brake having friction engaging surfaces, and including a servo-motor means for causing the friction braking surfaces to engage each other, a modulating means for modulating the engagement of the braking surfaces as the fluid is being supplied to the servo-motor, said modulating means comprising means for introducing pressurized oil into the location between the friction braking surfaces to at least partially and momentarily counter the force of the servo-motor tending to engage the braking surfaces, said modulating means being operable to introduce pressurized oil into the said location in response to delivery of pressurized fluid to the servo-motor to engage the friction braking surfaces.



3,888,142
POWER DRIVE DOLLY WITH TWO-SPEED DRIVE SYSTEM

Heinrich H. Ziegele, South Euclid, Ohio, assignor to White Motor Corporation, Cleveland, Ohio
Filed Aug. 26, 1971, Ser. No. 175,131
Int. Cl. B60k *21/04*
U.S. Cl. 74—852 **5 Claims**



1. An auxiliary drive for an over-the-highway load carrying vehicle including a two speed drive means, comprising:
a. drive input means adapted for connection to a source of motive power, said drive input means being selectively engageable with high speed drive output means and low speed drive output means;
b. actuator means adapted to initiate engagement of said drive input means selectively with either of said output means;
c. control means adapted to regulate the speed at which said drive input means is driven and adapted to control said actuator means;
d. said control means being operable to effect down-shifting of said input means from engagement with said high speed output means to engagement with low speed output

means, and being operable to effect upshifting of said input means from engagement with said low speed output means to engagement with said high speed output means;

e. said control means being operable to de-energize said input means during disengagement and engagement with said output means;

f. said control means additionally including timing means operable to provide a timed deceleration of said input means during upshifting and to provide a timed acceleration of said input means during downshifting, whereby said input means is more nearly brought to the speed of the output means it is about to engage;

g. said control means being adapted to energize and deenergize said motive power means whereby the speed of said input means may be controlled;

h. said control means being operable to de-energize said motive power means during engagement and disengagement of said input means with said output means;

i. said control means being operable to re-energize said motive power means during said downshift to provide acceleration of said input means; and,

j. said control means including timing means operable to de-energize said motive power means for a first preselected interval of time during said upshifting, to deenergize said motive power means for a second preselected interval of time during said downshifting, and to re-energize said input means for a third preselected interval of time during said downshifting.

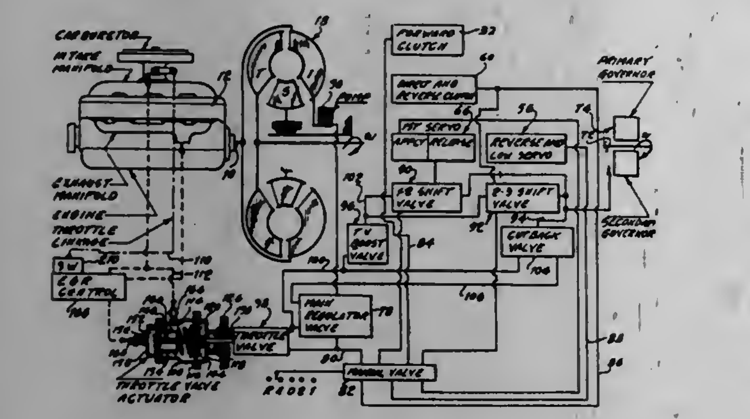
3,888,143
DUAL DIAPHRAGM ACTUATOR FOR A TRANSMISSION THROTTLE VALVE ASSEMBLY

Jack A. Kolehmainen, Detroit, and George E. Lemieux, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 240,916, April 4, 1972, Pat. No. 3,765,272. This application Aug. 16, 1973, Ser. No. 389,065

Int. Cl. B60k *23/00;* F02m *27/02*

U.S. Cl. 74—863 **4 Claims**



1. A control valve system for an automatic power transmission mechanism for use with an internal combustion engine in a wheeled automotive vehicle driveline having an air-fuel mixture intake manifold and an exhaust gas manifold, said engine having an engine distributor adapted to deliver timed fuel ignition pulses for the engine, an engine throttle controlled carburetor throat, a pneumatically operated means connected to the engine carburetor throat for retarding the timing of the distributor for any given operating speed of the engine, said transmission mechanism having geared, multiple speed ratio torque delivery paths between said engine and the vehicle traction wheels, valve means for controlling speed ratio change in said geared torque delivery paths including a transmission vacuum diaphragm valve assembly having an actuator housing and a pair of diaphragms located in said housing and defining therein a pair of pressure chambers, said diaphragms being coupled together and connected to a pressure modulator transmission throttle valve the output of which is utilized as an engine torque signal, a pressure passage connecting one of said transmission vacuum diaphragm valve assembly chambers to the pneumatic distributor timing retarding means and a second pressure passage connecting the other transmission vacuum diaphragm valve assembly chamber to the engine intake manifold, spring means for urging the diaphragms toward an increased throttle pressure output signal position, the pressure forces established on said diaphragms by the pressure in said other transmission vacuum diaphragm valve assembly chamber opposing the force of said spring means.

3. A control valve system for an automatic power transmission mechanism for use in an internal combustion engine in a wheeled automotive vehicle driveline, said engine having an air-fuel mixture intake manifold and an engine carburetor with engine throttle controlled carburetor throat communicating with said manifold, an exhaust gas recirculation valve means for establishing controlled communication between said intake manifold and an engine exhaust gas region, a pneumatic actuator for said exhaust gas recirculation valve, a pressure passage connecting said carburetor throat and said actuator, said transmission mechanism having geared, multiple speed ratio torque delivery paths between said engine and the vehicle traction wheels, valve means for controlling ratio changes in said geared torque delivery paths including a transmission vacuum diaphragm valve assembly adapted to produce a throttle pressure signal that is proportional in magnitude to engine torque including a modulator valve and an actuator for said modulator valve, said transmission modulator valve actuator comprising a pair of diaphragms coupled together, means for transmitting forces on said diaphragm to said modulator valve, a transmission throttle valve actuator housing enclosing said diaphragms, a first pressure chamber located between said diaphragms and defined by said diaphragms and said housing, a second pressure chamber located on one side of said coupled diaphragms and defined by one of said diaphragms and said housing, and spring means for urging said diaphragms in one direction tending to produce an increase in the throttle pressure signal, said second chamber communicating with said intake manifold and said first chamber communicating with said carburetor throat.

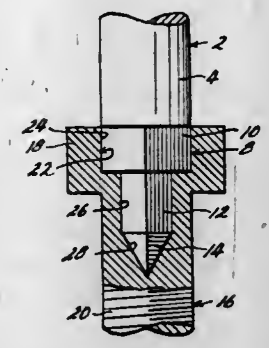
3,888,144
SCREW AND DRIVER

Joseph D. Parsons, 511 W. Osage St., Plattsburg, Mo. 64477

Filed Feb. 8, 1974, Ser. No. 440,850

Int. Cl. B25b *13/48*

U.S. Cl. 81—71 **1 Claim**



1. A screw and screw driver combination comprising:

a. a screw having a head and a reduced shank extending from said head, said screw having a socket formed therein and opening through the surface thereof opposite from said shank, said socket having a first section disposed entirely within said head and being square about the screw axis, a second section extending inwardly from the inner end of said first section and into said shank, said second section being coaxial with said first section and also square about the screw axis but of reduced size, and being of greater axial length than said first section, and a third section at the inner end of said second section, said third section forming an axial extension of the square cross-sectional contour of said second section but tapering to a point toward the free end of said shank, so as to be pyramidal in form, and

b. a screw driver having a bit corresponding in shape to the internal contour of said socket and adapted to be inserted slidably but non-rotatably therein to fill said socket completely, and having first, second and third sections corresponding respectively to the first, second and third sections of said socket, whereby as said bit is inserted into said socket, said third bit section first engages in the outer end of said second socket section both to center said bit coaxially with said socket, and also, if the bit is angularly misaligned with said socket, to apply a rotary cam torque to said bit to turn it into angular registry with said socket, so as to facilitate the entry of the first and second bit sections into the corresponding sections of said socket.

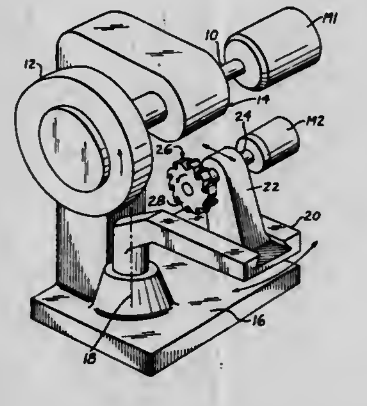
3,888,145
METHOD AND APPARATUS FOR REMOVING TREAD MATERIAL FROM VEHICLE TIRES

James W. Heaton, Greensburg, and William E. Fawcett, Latrobe, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Continuation of Ser. No. 379,372, July 16, 1973. This application May 17, 1974, Ser. No. 471,050

Int. Cl. B23b *3/00;* B26d *1/12*

U.S. Cl. 82—1 C **5 Claims**



1. The method of removing the tread material from a pneumatic tire preparatory to recapping thereof which comprises; inflating the tire, rotating the inflated tire on the axis thereof, mounting hard wear resistant circular cutting elements in circumferentially spaced and axially coplanar relation in a holder with each insert having a sharp peripheral edge protruding radially from the holder, presenting the holder to the tread of the tire with the axis of the holder parallel to the axis of the tire and with the inserts at a positive rake angle of at least about 25°, moving the holder with the inserts therein relatively to the tire, and feeding the holder and tire relatively in the radial and axial directions of the tire to cause each insert to take cleanly cut chips of substantial size from the tire tread whereby the said inserts form a plurality of circumferentially and axially distributed shallow grooves in the tire tread.

3,888,146
CONTOUR MACHINING

Arthur A. Tomenceak, Fairfield, Conn., assignor to The Bullard Company, Bridgeport, Conn.

Division of Ser. No. 305,653, Nov. 13, 1972, Pat. No. 3,822,618. This application May 6, 1974, Ser. No. 467,374

Int. Cl. B23b *3/00, 27/10*

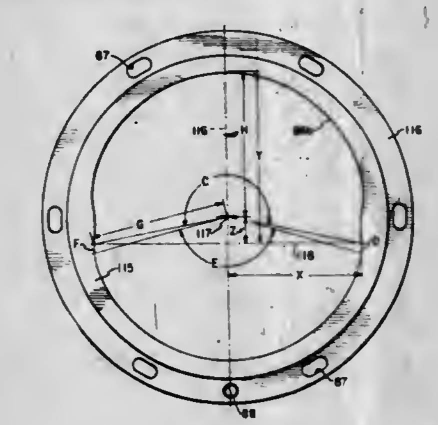
U.S. Cl. 82—1 C **7 Claims**

1. A method for machining a workpiece to form a chamber of generally epitrochoidal configuration, which comprises

a. rotatably supporting cutting tools for movement about an axis and causing the tools to be urged away from said axis;

b. so positioning the workpiece relative to the rotational axis of the cutting tools that said rotational axis intersects the major axis of the epitrochoidal contour at a point offset from the major axis thereof;

c. with the workpiece so positioned, machining a first lobe of said epitrochoidal contour, by advancing said workpiece and/or tools axially;



d. relatively repositioning the workpiece and cutting tools such that said rotational axis intersects said major axis on the opposite side of and offset from said minor axis; and

e. with the workpiece and tools thus relatively repositioned, machining the second lobe of the epitrochoidal contour.

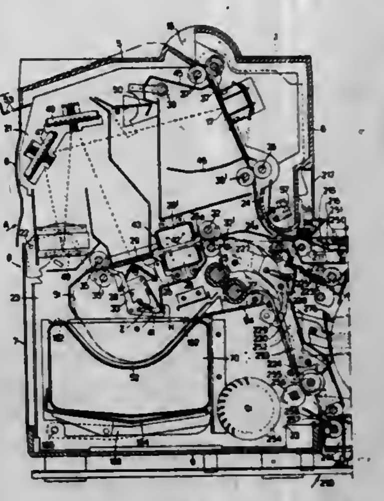
3,888,147
CUTTING DEVICE FOR CUTTING SHEETS FROM A ROLL IN A COPY MACHINE

Giovanni Ravera, Torino, and Nicola Cosmo, Ivrea, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Torino, Italy

Division of Ser. No. 251,994, May 10, 1972, Pat. No. 3,830,124. This application May 17, 1974, Ser. No. 471,079

Int. Cl. B26d *5/08*

U.S. Cl. 83—64 **5 Claims**



1. A cutting device for cutting sheets of paper from a roll in a copying machine comprising:

a rotatable cutting member having a cylindrical blade and a substantially helical cutting edge;

a movably mounted straight counter blade;

means for resiliently biasing said counter blade into contact with said cylindrical blade of said cutting member;

a first member mounted for rotation with said rotatable cutting member;

spring means for urging said first member in a first rotational direction;

latching means for preventing said first member from rotating under the influence of said spring means;

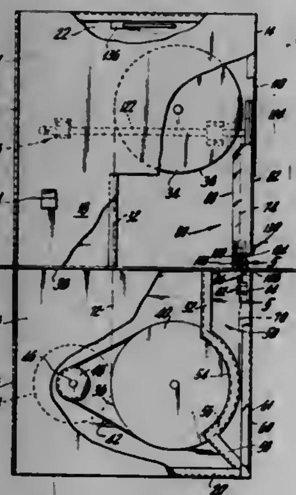
selectively actuatable release means for disengaging said latching means from said first member for allowing said first member to rotate under the influence of said spring means for rotating said rotatable member through a cutting stroke;

means for resiliently biasing said first member to rotate in a second rotational direction opposite to said first direction, the rotational moment of said biasing means being less than the moment of said spring means; and

means actuated by said first member near the end of its stroke for releasing the tension on said spring means to allow said first member to be reset in said second direction by said biasing means in order to open a space between said rotatable cutting member and said counter blade immediately after completion of the cutting stroke of said rotatable cutting member.

3,888,148
SAW BLADE GUARD

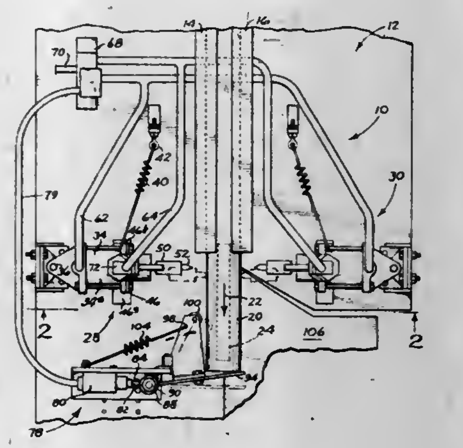
Bernard Weissman, 225 E. 48th St., New York, N.Y. 10017
Filed Sept. 14, 1973, Ser. No. 397,450
Int. Cl. B27g *19/06, 3/00;* **B23d** *55/02*
U.S. Cl. 83—100 **14 Claims**



1. In a power-operated saw having a vertically disposed saw blade wherein an upper portion of the blade is enclosed in a housing and the blade extends through an aperture provided in a generally horizontal work support table disposed below and spaced from said housing whereby an unconfined portion of the blade is disposed between said housing and work table, a saw blade guard for forming a barrier between said unconfined portion and an operator, said guard comprising an elongated barrier member disposed in confronting relation and spaced from the blade to present a barrier between the blade and the operator, the upper portion of said barrier member being mounted on said housing for vertical movement and is fully extended in full guard position when said member extends from said housing to a position adjacent said work table and may be manually raised to any desired degree of elevation along the otherwise exposed edge of the blade to thereby provide access to a selected portion thereof for operation on a work piece; and locking means for engaging said guard to maintain said enclosure at any one of a plurality of discreet selected vertical positions above the work table upon actuation of the saw and to release said guard and permit the same to drop to the level of the work table under the action of gravity to substantially cover the blade when the operation of the saw is terminated.

3,888,149
APPARATUS FOR CUTTING OFF SECTIONS OF AN ELONGATED MEMBER

Robert C. Hohmann, Grants Pass, Oreg., assignor to S. J. a/k/a Agnew Environmental Products, Tenino, Wash.
Filed June 1, 1973, Ser. No. 365,967
Int. Cl. B26d *5/38*
U.S. Cl. 83—291 **5 Claims**



1. Apparatus for breaking off portions of an elongated member moved longitudinally along a path, said apparatus comprising

a pair of opposed cutter elements disposed on opposite sides of said path and mounted for shifting along lines extending at substantial angles relative to said path between inoperative positions spaced laterally outwardly to opposite sides of said path and operative positions in said path, power-operated means operatively connected to said cutter elements operable on actuation to shift said cutter elements under power from their inoperative to their operative positions to drive the cutter elements into opposite sides of a member moving along the path therebetween, and

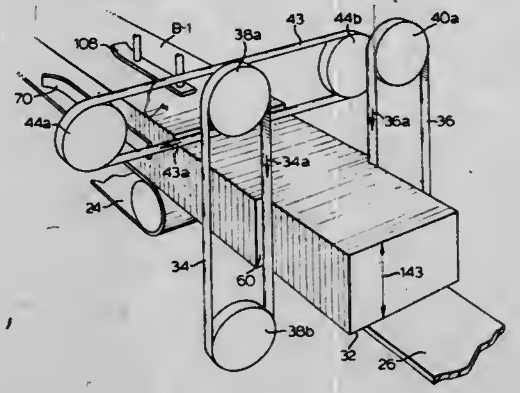
means mounting said cutter elements for movement with and at the same speed as said member is moved along said path, each cutter element being mounted for movement independently of movement of the other cutter element, whereby each element is permitted to follow the path of its associated side of the member independently of the other member.

3,888,150
BANDSAW BOOK TRIMMER

William Felix Stroud, deceased, late of McKellar, Canada; by Lois Evelyn Stroud, executrix, McKellar, Canada, and Edward John Stroud, McKellar, Canada, assignors to Stroud Graphic Equipment Limited, McKellar, Ontario, Canada
Filed Dec. 26, 1972, Ser. No. 318,617
Int. Cl. B26d *1/52*
U.S. Cl. 83—368 **4 Claims**

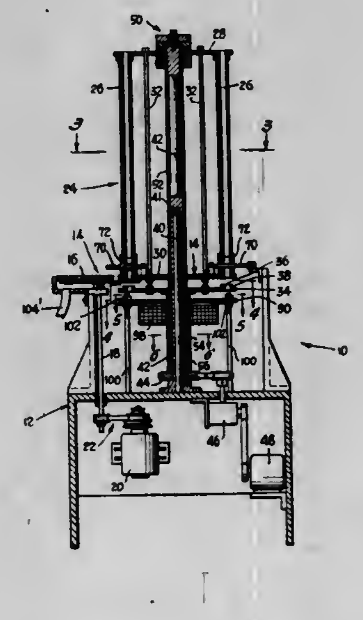
1. A machine for trimming selvage from a plurality of books comprising: a trimming station; means for advancing said books downstream to said trimming station; trimming means mounted on said trimming station and such that the edge from which the selvage is removed is opposite a spine of said book; a sensor mounted upstream of said trimming means and adapted to be resiliently biased into contact with one of said front page and said back page such that a change in the thickness of a book contacted by said sensor produces a corresponding change in the position of said sensor; and means operatively connected to said sensor and to said trimming means for detecting changes in the position of said sensor and

for causing a resulting change in the position of said trimming means when said book is trimmed thereby so that the width of selvage removed by said trimming means varies directly with the thickness of the book.



3,888,151
CUTTING APPARATUS FOR STRIP STOCK

Frank S. Beckerer, and Frank S. Beckerer, Jr., both of c/o Beckson Manufacturing Inc., Box 3336, Bridgeport, Conn. 06604
Filed July 23, 1973, Ser. No. 382,079
Int. Cl. B26d *7/06*
U.S. Cl. 83—411 A **3 Claims**

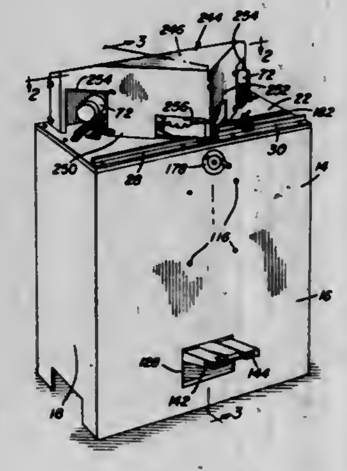


1. An apparatus for cutting elongate strips of stock into pieces of predetermined length, comprising in combination:

a. a machine frame having an operation-performing station,
b. a saw carried by said frame at said station,
c. powered means for driving said saw,
d. a carrier member,
e. means mounting said carrier member for turning movement on said frame about an axis,
f. a plurality of holder devices including clamps disposed on said carrier member for releasably holding strips of stock to be cut, said strips of stock being advanceable in directions substantially parallel to said axis when the clamps are released,
g. stop means for limiting the advance to predetermined positions of said strips of stock when the latter are released,
h. said carrier member advancing the holder devices seriatim to said operation-performing station so as to feed the strips of stock laterally into the blade of the saw as the carrier member undergoes turning movement,
i. said clamps automatically releasing the strips of stock after each cutoff to present fresh portions for subsequent cutting,
j. powered means for turnably driving said carrier member, and
k. a friction clutch drive disposed between said carrier member and said powered means, said drive being adapted to slip a predetermined extent in response to the load imposed on the carrier member occasioned by the normal cutting operation of the saw in severing the strips of stock.

3,888,152
ADJUSTABLE ANGLE DOUBLE CUTTING MITRE CUT-FF SAW

Glen B. Barton, P.O. Box 127, Calhoun City, Miss. 38916
Filed Feb. 6, 1974, Ser. No. 439,859
Int. Cl. B23d *45/14, 45/10, 47/00*
U.S. Cl. 83—471.3 **13 Claims**



1. A cut-off saw including a base provided with means defining a workpiece support surface, a pair of driven saw blades, mounting means supporting said blades in relatively angulated planes generally normal to said surface and with corresponding marginal portions of said blades closely adjacent each other and the line along which said planes intersect, for movement in said planes toward and away from said surface, and for angular displacement of said blades relative to said surface about axes at least closely adjacent and generally paralleling said line.

3,888,153
ANHARMONIC OVERTONE GENERATION IN A COMPUTOR ORGAN

Ralph Deutsch, Sherman Oaks, Calif., assignor to Nippon Gakki Seiko Kabushiki Kaisha, Hamamatsu-shi, Japan
Filed June 28, 1973, Ser. No. 374,680
Int. Cl. G10h *1/00, 5/00*
U.S. Cl. 84—1.01 **18 Claims**

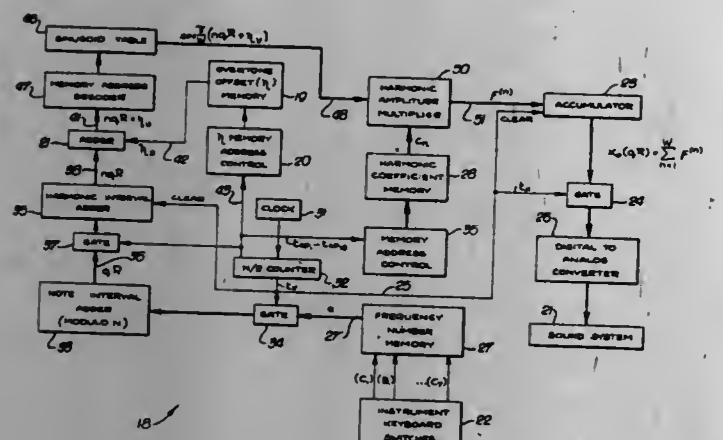
1. An electronic musical instrument for synthesizing musical tones having anharmonic overtones, comprising:

evaluation means for individually calculating the constituent Fourier component amplitudes $F^{(n)}$ of a musical waveshape in accordance with the relationship $F^{(n)} = C_n \sin(\pi/W)(nqR+\eta_\nu)$

wherein R is a frequency number establishing the fundamental frequency of the note, $n=1, 2, 3, \ldots, W$ designates the Fourier component and $\nu=n-1$ designates the overtone being evaluated, C_n is a harmonic coefficient establishing the relative amplitude of the th Fourier component, η_ν specifies the extent of anharmonicity of the ν^{th} overtone, and q is an integer incremented at regular time intervals t_x, all W of said constituent Fourier components being evaluated within each of said intervals t_x,

accumulator means for combining said separately calculated Fourier component amplitudes to obtain during successive time intervals t_x the waveshape sample point amplitudes

$$X_o(qR) = \sum_{n=1}^{W} F^{(n)}$$

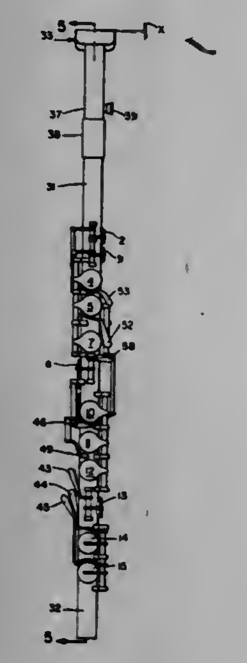


for successive sample points qR, and

converter means for converting said sample point amplitudes to musical tones as said calculations are carried out.

3,888,154
END BLOWN FREE AIR-REED FLUTE

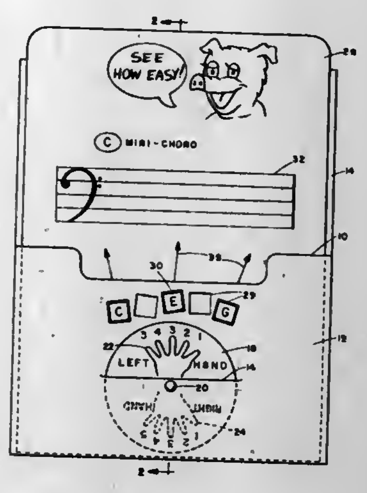
Sam Wesley, Sr., 52 Alvarado Ave., Pittsburg, Calif. 94565
Filed Feb. 25, 1974, Ser. No. 445,653
Int. Cl. G10d *7/02*
U.S. Cl. 84—384 **9 Claims**



1. A flute comprising a hollow tubular body less than 2 inches in diameter and open at both ends, said body having a plurality of holes through the side wall thereof and spaced from each other along the length thereof, and one of said open ends of said body being provided with an embouchure comprising a lip plate providing an aperture for establishing a free air-reed at said one end of said body, said lip plate providing a surface extending transversely to the cylindrical axis of said body, said surface being smoothly curved in a first plane containing said cylindrical axis of said body and rectilinear in a second plane containing said cylindrical axis of said body perpendicular to said first plane, said surface in said second plane defining a line which intersects said cylindrical axis at an angle which differs from the perpendicular by at least 1° and not more than 5°.

3,888,155
FINGER PATTERN INDICATOR

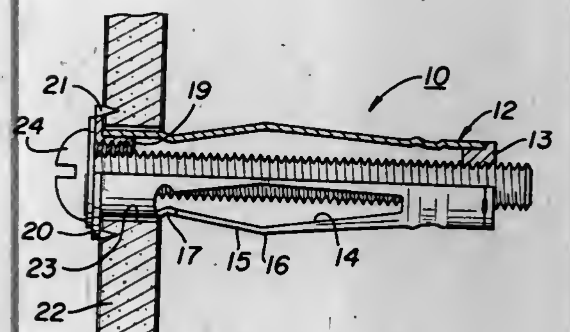
Verna M. Leonard, 8701 Hwg. 41, Fresno, Calif. 93710
Filed July 24, 1974, Ser. No. 491,257
Int. Cl. G09b *15/02*
U.S. Cl. 84—471 **5 Claims**



1. An aid for teaching keyboard fingering comprising:
a. an envelope having a rear panel and a forward panel, said panels being joined together at their side edges and bottom edges to define an upwardly open envelope;
b. a rotatable dial pivoted to said forward panel;
c. indicia representing a left and right hand displayed on opposite portions of the forward face of said dial, said indicia including pointing fingers;
d. said forward panel being provided with five apertures disposed substantially adjacent the periphery of said dial and positioned such that the dial is rotatable into positions in which the fingers of either the left hand or the right individually point toward the individual apertures;
e. at least one insert sheet having a lower portion dimensioned to fit within said envelope and having a plurlaity of scale tone names displayed thereon such that when said sheet is inserted in the envelope said scale tone names are visible through said apertures.

3,888,156
ANCHOR BOLT CONSTRUCTION

Raoul Fima, 655 West Diversey, Lisle, Ill. 60101
Filed Mar. 29, 1974, Ser. No. 455,995
Int. Cl. F16b *13/06*
U.S. Cl. 85—71 **6 Claims**

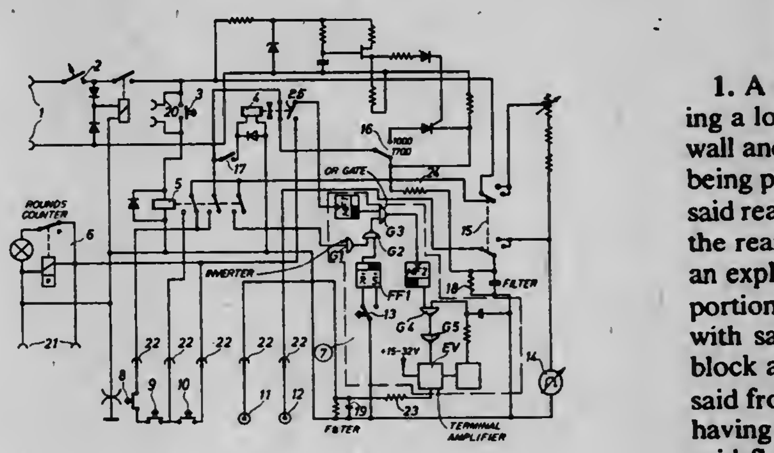


1. A removable anchor bolt for mounting to a hollow wall, comprising
a sleeve-like body having an external flange at one end,
an internally threaded nut positioned at the other end of said body,
said body having an internal thread in proximity to said one end,

the root diameter of said internal thread exceeding the root diameter of the thread in said nut and the minimum diameter of said external thread exceeding the root diameter of the thread in said nut
said body having a portion disposed between said internal thread and said nut which collapses radially outward in response to a compressive force exerted between said flange and said nut against the interior surface of a wall in which said anchor is disposed, and
the minimum internal cross-sectional dimension of said body being no less than the root diameter of said internal thread,
said body having an internal opening after said portion is collapsed against said wall which is no less than the root diameter of said internal thread,
whereby a screw mating with said internal thread can be threaded through said one end to engage said nut and stretch said body to reduce its external diameter to substantially its original size to permit removal of the anchor from a wall.

3,888,157
CIRCUIT ARRANGEMENT FOR WEAPONS USED IN ARMING AIRPLANES, PARTICULARLY TURRET GUNS

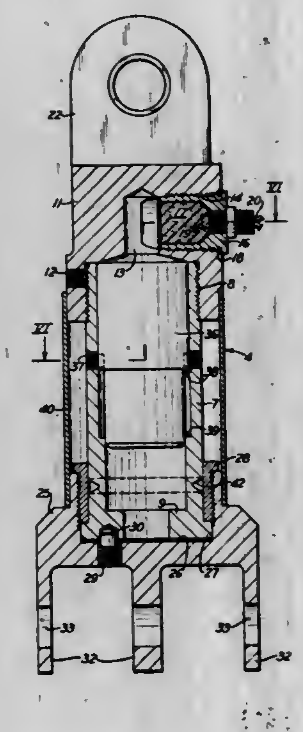
Ludwig Vorgrimler, Oberndorf (Neckar); Klaus Vorgrimler, Grunwettersbach, and Franz Stritt, St. Blasien, all of Germany, assignors to Industrie-Werke Karlsruhe Augsburg, Germany
Filed June 1, 1973, Ser. No. 366,163
Claims priority, application Germany, June 2, 1972, 2226760
Int. Cl. F41d *11/00*
U.S. Cl. 89—1 K **9 Claims**



1. In a circuit arrangement for loading electrically ignitable cartridges for weapons, particularly turret guns, destined for arming airplanes, and utilizing electronic components which are stable in a defined state, assume a metastable state, for the duration of a holding time, responsive to a triggering pulse, and flip back into the stable state at the expiration of the holding time, the improvement comprising, in combination, input terminals for connection to a source of electric potential; firing means actuable to establish a cartridge ignition circuit connected to said input terminals; a slow-acting relay energized from said source upon establishment of said ignition circuit and, after a predetermined time following interruption of the ignition circuit, with the weapon remaining inactive despite actuation of said firing means, closing a rely contact; a first said electronic component triggered, responsivie to closure of said relay contact, to generate an output pulse of defined duration; a second said electronic component; a first gate connecting said first said electronic component to said second said electronic component and triggered conductive by said output pulse to supply said output pulse to said second said electronic component; and an amplifier connected to the output of said second said electronic component and amplifying said pulse to the magnitude required for ignition of a loaded cartridge; said electronic components being monoflops.

3,888,158
EXPLOSIVELY ACTUATED SEPARABLE CONNECTING DEVICE

Ernest E. Temple, Murrysville, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.
Filed Aug. 30, 1973, Ser. No. 392,958
Int. Cl. F42b *3/00*
U.S. Cl. 89—1 B **2 Claims**



1. A separable connecting device for temporarily suspending a load from a support, comprising a barrel having a front wall and an opening in its rear end, the front end of the barrel being provided with a radial flange, a breech-block secured to said rear end and provided with a passage communicating with the rear end of the barrel, said passage being adapted to hold an explosive charge, a piston normally located in the rear end portion of the barrel but movable forward into engagement with said front wall, and means for connecting the breech-block and the front end of the barrel with a support and load, said front end connecting means being provided with a socket having an annular recess in its side wall of greater depth than said flange, said recess receiving said flange for limited axial sliding movements of the barrel relative to said front end connecting means, the side of said barrel being provided with an annular weakened area that will be fractured when the piston strikes said end wall upon detonation of said charge, whereby the barrel will separate into two parts and the front part will be driven forward relative to said front end connecting means.

3,888,159
LIQUID PROPELLANT WEAPON

Lester C. Elmore, Portola Valley, and Thomas M. Broxholm, Palo Alto, both of Calif., assignors to Pulsepower Systems, Inc., San Carlos, Calif.
Division of Ser. No. 179,759, Sept. 13, 1971, Pat. No. 3,803,975. This application Oct. 23, 1973, Ser. No. 408,572
Int. Cl. F41f *1/04*
U.S. Cl. 89—7 **3 Claims**

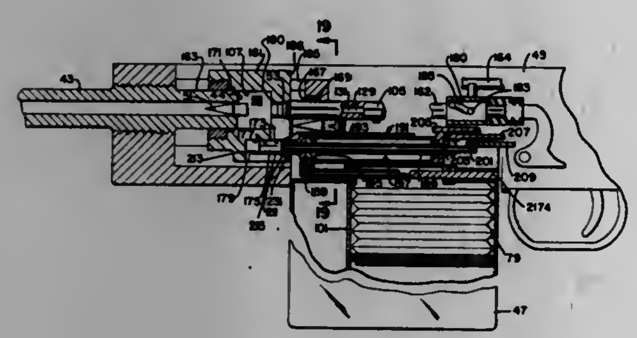
1. A leak path construction for a liquid propellant gun which insures leakage of combustion chamber gases to atmosphere rather than to the propellant supply and comprising,
a combustion chamber housing
a port in the housing for supplying liquid propellant to the combustion chamber in the housing,

a valve element moveable to control the flow of propellant through the port,

a high pressure seal engaged between the valve element and the combustion chamber housing at one side of the port, a vent opening to the atmosphere located downstream of the high pressure seal on a side of the seal opposite from the side of the seal facing the port,

a reservoir for the liquid propellant,

pumping means for supplying liquid propellant from the reservoir to said port,



said pumping means including outlet structure engagable with the valve element to close the outlet and to thereby control the flow of propellant out of the pumping means, additional seal means between the valve element and the outlet of the pumping means, and

leak path passageway means having one end located to pick up any leakage that leaks past the high pressure seal and having another end connected to said vent opening to atmosphere and constructed to extend around said additional seal means for insuring that any leakage past the high pressure seal leaks to atmosphere through said vent opening and is isolated from the propellant in the pumping means and reservoir.

3,888,160
TOBACCO SMOKE FILTER

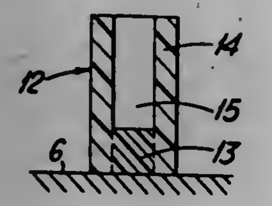
David Thomas Westcott, and Geoffrey Roger Woodman, both of Bristol, England, assignors to Imperial Tobacco Group Limited, London, England

Division of Ser. No. 217,797, Jan. 14, 1972, Pat. No. 3,791,265. This application Aug. 31, 1973, Ser. No. 393,591

Claims priority, application United Kingdom, Feb. 1, 1971, 3550/71

Int. Cl. A24c *5/50*

U.S. Cl. 93—1 C **8 Claims**



1. A method of making a selectively compacted tobacco smoke filter comprising providing a cylinder of filter material and compacting only a core section of the cylinder, leaving an annular uncompacted wall extending around the compacted core section.

3,888,161
CUTTING PROCESS AND DEVICE FOR PRODUCING PARALLEL-FLANKED GROOVES

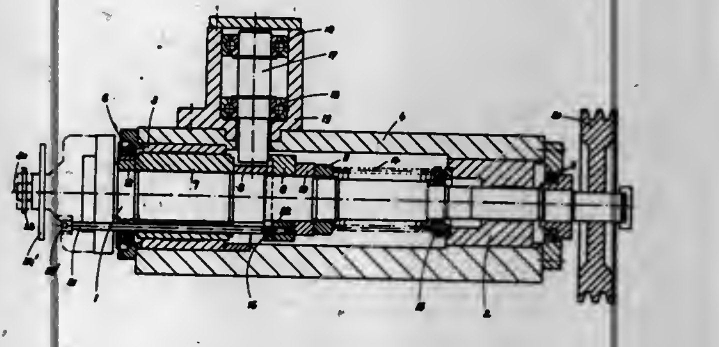
Adolf Baudermann, Neckarhausen, Germany, assignor to Cross Europa-Werk GmbH, Wendlingen, Germany

Filed Aug. 29, 1973, Ser. No. 392,641

Claims priority, application Germany, June 4, 1973, 2328372

Int. Cl. B23b *3/28;* **B27f** *1/02, 1/06*

U.S. Cl. 90—11 C **20 Claims**



1. The method of cutting a sidewall of a groove in a workpiece which comprises the steps of: providing a rotary cutter having a central body portion and at least on radially extending cutting portion rigidly connected thereto and a cutting edge along said radial cutting portion; rotating the cutter about its axis to bring the cutting edge thereof into the workpiece and simultaneously axially advancing the cutter as a unit toward the desired finished surface of the sidewall until the rotating cutting edge is tangent therewith; thereafter continuing to rotate the cutter in the same direction but now axially retracting the cutter to move the rotating cutting edge thereof away from the desired finished surface of the sidewall, and repeating the foregoing steps while the workpiece and the cutter are fed relative to each other along the path of the groove, the cutter being axially reciprocated once per each revolution of the cutting edge with a sinusoidal motion.

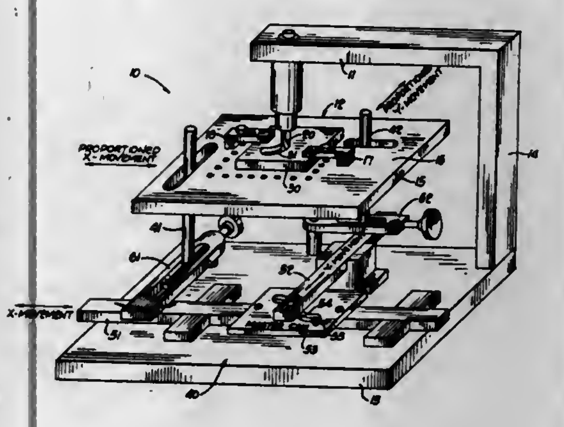
3,888,162
APPARATUS FOR GENERATING PROPORTIONAL CAMS FROM A MASTER CAM

Paul Maenner, 2959 Scarborough Rd., Cleveland, Ohio 44118

Filed May 22, 1974, Ser. No. 472,161

Int. Cl. B23c *1/18*

U.S. Cl. 90—13.1 **12 Claims**



1. A cam generating apparatus for moving a cam blank relative to a cam cutter to generate a cam contour from a master cam, comprising:

a. a base structure;

b. a pair of slides movably carried by said base structure for movement in mutually perpendicular directions;

c. a master cam carried on one of said slides;

d. a cam follower carried on the other of said slides and engageable with said master cam for moving said other slide in directions perpendicular to the movement of said one slide in accordance with the configuration of said master cam;

e. first proportioning means connected to said one slide for generating an output which is proportional to the movement of said one slide;

f. second proportioning means connected to said other slide for generating an output which is proportional to the movement of said other slide; and,

g. cam blank support means connected to said first and second proportioning means for moving a cam blank relative to a cam cutter in response to said outputs to generate a cam contour on such cam blank.

3,888,163
FOLDING CONTAINER FOR LIQUIDS

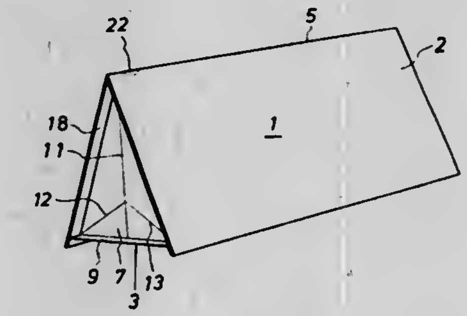
Masanori Watanabe, Tokyo, Japan, assignor to Toppan Printing Co., Ltd., Tokyo, Japan

Division of Ser. No. 135,896, April 21, 1971, abandoned. This application June 14, 1973, Ser. No. 370,162

Claims priority, application Japan, Apr. 23, 1971, 46-39836

Int. Cl. B31b *49/02*

U.S. Cl. 93—36.01 **2 Claims**



1. A method for producing a container for liquids in the shape of a triangular prism including the steps of:

a. folding a piece of cardboard along a center line thereof to provide a piece of folded cardboard;

b. inserting said folded cardboard into a triangular prismatic cavity of a mold so as to contact closely with the two rectangular inside surfaces of the cavity of the mold;

c. inserting a molten parison made of thermoplastic resin into the inner portion of said triangular prismatic cavity of the mold; and

d. blowing up said parison so as to form blown resin film attaching firmly on the inside surfaces of said cardboard and to form resin films on the remainder walls of the triangular prismatic cavity of said mold for forming creases on each of said resin films along fine ridged lines provided on the respective wall surfaces of the cavity for producing a folding container.

3,888,164
CARDBOARD BOX CONVEYOR

Carlo Taddei, Padenghe Sul Garda (Brescia), Italy, assignor to Seal Spout Europe S.p.A., Castiglione Delle Stiviere (Mantova), Italy

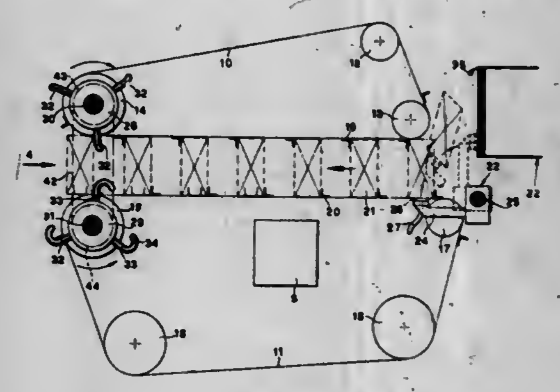
Filed Aug. 14, 1973, Ser. No. 388,250

Claims priority, application Italy, Aug. 24, 1972, 28480/72

Int. Cl. B31b *1/78*

U.S. Cl. 93—53 R **9 Claims**

1. In a conveyor system for cardboard boxes intended to have a parallelepipedal final shape including a magazine in which the boxes are stored flat one against the other with the sidewall closed and the end limbs open and a device adapted to draw the boxes from said magazine and to feed them onto a conveyor opened in their parallelepipedal final shape, the improvement comprising said conveyor which includes at least one flexible member driven in a closed loop so as to define two laps parallel to one another and spaced apart through a distance equal to the box width, a plurality of retaining members affixed to and properly spaced apart from each other on said flexible member, adjustable motive drive means for continuously moving said flexible member so that said parallel laps are advanced in the same direction and synchronously with respect to each other with the retaining members on said parallel laps staggered to correspond to the thickness of a box by defining a plurality of couples of confronting shoulders adapted to receive therebetween a box which will abut each shoulder couple in correspondence with two diagonally opposite edges of said box.



3,888,165
VENTILATOR FOR A MOTOR VEHICLE ROOF

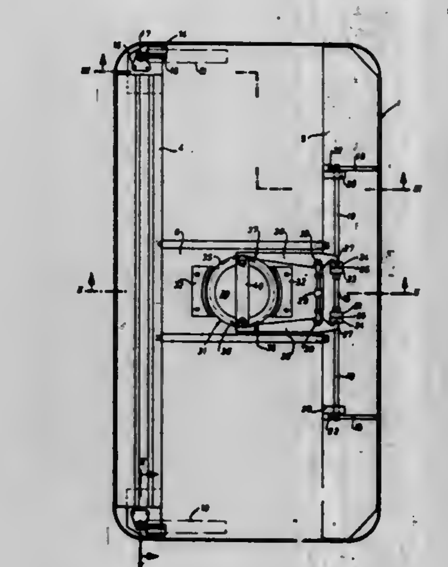
Rainer Hattass, Rothenbergen, and Herbert Kouth, Schoneck, both of Germany, assignors to H. T. Golde GmbH, Germany

Filed Nov. 9, 1973, Ser. No. 414,454

Claims priority, application Germany, Nov. 10, 1972, 2254962

Int. Cl. B60h *1/24*

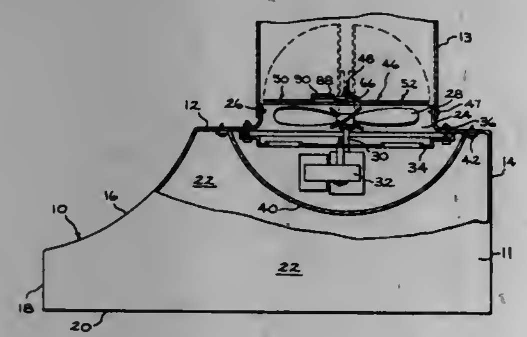
U.S. Cl. 98—2.14 **13 Claims**



1. In a ventilator for a motor vehicle roof having an opening in which the ventilator is displaceably positionable, comprising a cover arranged to be positioned within and to form a displaceable closure for the opening, said cover having a front side, a rear side, and a pair of spaced lateral sides extending between said front and rear sides, means for displaceably supporting said cover within the roof opening comprising first

means connected to said cover for pivotally mounting said cover adjacent its front side, second means connected to said cover for pivotally mounting said cover adjacent its rear side, locking means associated with said second means for locking said cover in any position, said means for displaceably supporting said cover comprises a frame fixed to and arranged to extend around and depend from the opening in the motor vehicle roof, said frame having a front side, a rear side, two lateral sides extending between the front and rear sides, and corresponding to the front side, rear side, and lateral sides, respectively, of said cover, said first means and second means connected to said frame, said frame being shaped to form a gutter located below the sides of said cover when it is in the closed position, said cover comprising a plate arranged to extend across the opening and a flange extending downwardly from the edges of said plate along each side of said cover, a seal member formed along the outwardly facing side of said flange on each said side of said cover for effecting a seal with the juxtaposed surface of said frame when said cover is positioned for forming a closure for the roof opening.

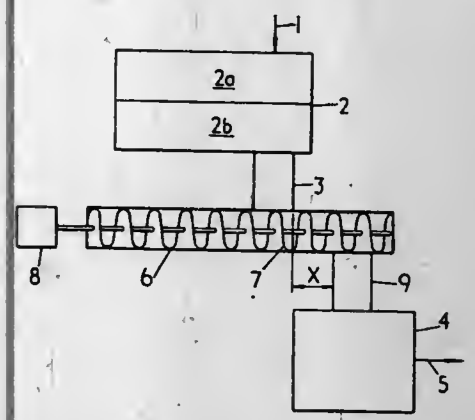
3,888,166
MOLDED PLASTIC FLUE DAMPER
Richard L. Stottmann, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Apr. 12, 1974, Ser. No. 460,344
Int. Cl. F23l *17/02*
U.S. Cl. 98—85 **9 Claims**



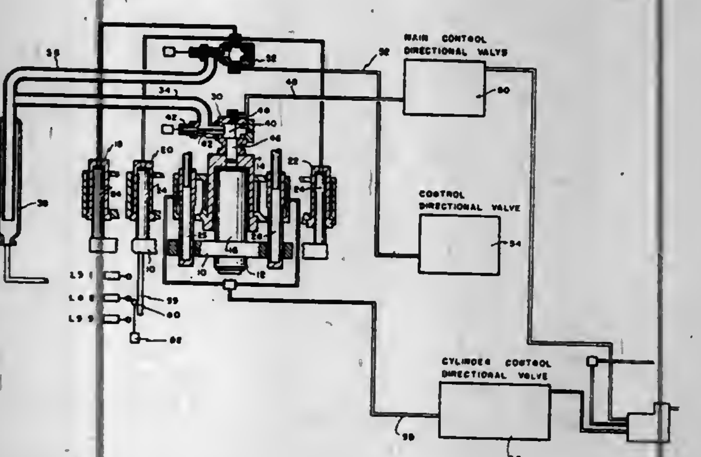
1. A flue damper comprising a stationary support beam and a generally flat, light-weight, hinged plate on at least one side of the beam, and a pair of spaced snap-together hinging means between the beam and the plate so that the plate may pivot freely with respect to the beam between a horizontal closed position and a vertical open position, each of said snap-together hinging means between the support beam and the hinged plate comprising a horizontal pivot bar on one member and releasible spring means on the other member for slipping around the pivot bar and forming a loose, generally frictionless, hinge connection, the beam including stop means beneath the plate for supporting the plate in a generally horizontal closed position, such that when an upward airflow is caused to bear against the underside of the hinged plate this plate will assume a generally vertical open position, and when the direction of airflow is reversed or the airflow discontinued then the hinged plate will naturally return to its normal horizontal closed position.

3,888,167
HEAT TREATMENT OF PARTICULATE SOLID MATERIALS IN CONTINUOUS FLOW
Granville Lewis Starkie, Crawley, England, assignor to The A.P.V. Company Limited, Crawley, Sussex, England
Filed Sept. 5, 1973, Ser. No. 394,495
Int. Cl. A23l *3/18*
U.S. Cl. 99—467 **5 Claims**

1. In a heat treatment plant of the positive displacement type for the treatment, such as sterilization, of particulate solid material in continuous flow and having a connection connected or connectable to a receiving plant such as an aseptic filling and sealing unit, the heat treatment plant comprising a hot zone in which the material is heated to the required treatment temperature and a cooling section in which the material is reduced to a temperature at which it can be held without significant damage: a reversible transfer conveyor situated downstream of the cooling section and upstream of the connection to the receiving plant, said conveyor having an input in communication with said cooling section and an output in communication with the connection to the receiving plant, said conveyor input and output being spaced apart a distance sufficient to insure that all material entering said conveyor input is first transported by said conveyor before entering said conveyor output, means defining a temporary retention zone at least equal in capacity to the hot zone, said retention zone being operatively associated with said conveyor, said conveyor normally transferring material from the cooling section to the connection to the receiving plant and whereby on stoppage of the receiving plant the conveyor may be reversed to feed treated and cooled material into the temporary retention zone until the hot zone has been cleared, and on recommencement of normal drive to the conveyor, the material in the temporary retention zone will be fed on to the connection to the receiving plant.



3,888,168
HYDRAULIC APPARATUS AND CONTROL FOR A PRESS
Francis Joseph Kent, Wallingford, and Seymour E. Steinbrook, Wynnewood, both of Pa., assignors to Wean United, Inc., Pittsburgh, Pa.
Filed June 4, 1973, Ser. No. 367,051
Int. Cl. B30b *15/20*
U.S. Cl. 100—48 **7 Claims**


MAIN CONTROL DIRECTIONAL VALVE
CONTROL DIRECTIONAL VALVE
CYLINDER CONTROL DIRECTIONAL VALVE
LS 1
LS 8
LS 9

1. In a press having at least a first piston cylinder assembly and a group of second piston cylinder assemblies for causing a ram of the press to pass through its working stroke,

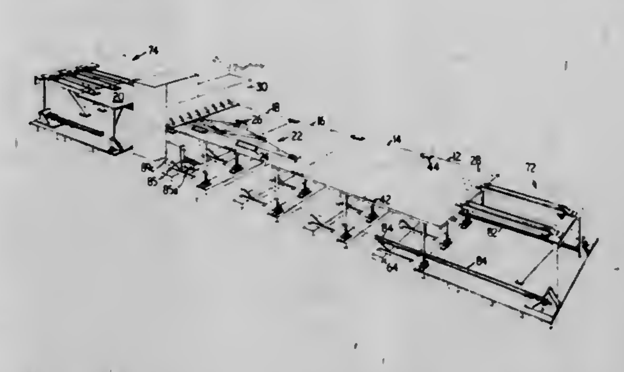
a first and a second power source for said piston cylinder assemblies,

means sentitive to a change in the speed of said ram during its working stroke,,

means for connecting one of said power sources to at least said first piston cylinder assembly to commence the working stroke, and

means for selectively connecting said other power source to at least one of said second piston cylinder assemblies with reference to a detected change in the speed of said ram to control the speed of said ram during its working stroke.

3,888,169
MACHINE TOOL WITH IMPROVED LONG FLOATING JIG FIXTURE TABLE
Melville McNaughton, Ottawa, Ontario, Canada, assignor to Campeau Corporation, Ottawa, Ontario, Canada
Filed Nov. 29, 1973, Ser. No. 420,047
Int. Cl. B30b *15/00*
U.S. Cl. 100—100 **8 Claims**



1. A machine for carrying out manufacturing operations on large structures comprising:

elongated flexible floating table having;

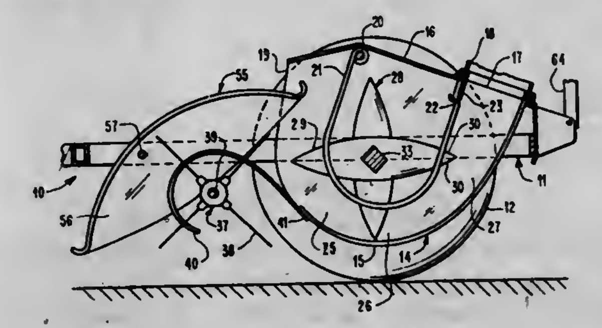
a plurality of large rectangular metal plates laid side by side;

a travelling tool means for applying a force to the upper surface of the table, said travelling tool also comprising a means for reacting the force at the under surface of the table;

a multitude of deflectable support members for supporting each plate over the entire area and for allowing passage of the force reacting means; and

means for joining one plate to an adjacent plate, said joining means comprising a keyway milled within the thickness of each plate, a key fitting within both keyways so as to maintain the surfaces of both plates flush and strap means securing the edges of the plates together.

3,888,170
APPARATUS FOR COLLECTING DEBRIS
Charles W. Doering, Clarksville, Ind., assignor to Brinly-Hardy Co., Inc., Louisville, Ky.
Division of Ser. No. 342,166, March 16, 1973, Pat. No. 3,849,824. This application May 6, 1974, Ser. No. 467,394
Int. Cl. E01h *1/04*
U.S. Cl. 100—177 **13 Claims**



1. An apparatus for collecting debris including:

a frame having wheels to support said frame;

a housing supported by said frame;

said housing having means to receive debris;

a plurality of blades disposed within said housing and mounted for rotation about an axis, said blades being spaced from each other in the axial direction;

means disposed within said housing between each adjacent pair of said blades and cooperating with said housing to form a debris confining chamber within said housing and a compression chamber within said housing between said receiving means and said debris confining chamber;

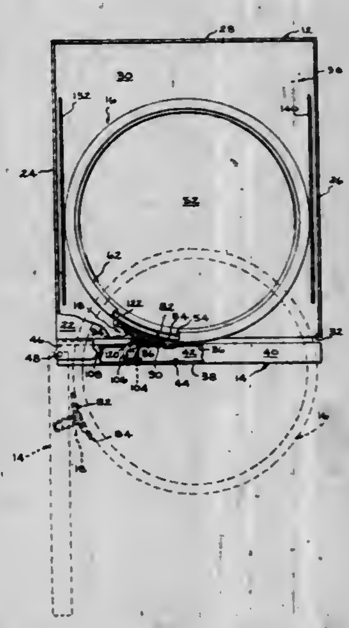
said blades advancing the debris from said receiving means to said compression chamber and from said compression chamber to said debris confining chamber to compress debris received by said receiving means by said blades advancing from said receiving means to said compression chamber, from said compression chamber to said debris confining chamber, and from said debris confining chamber to said receiving means;

said disposed means cooperating with said blades to substantially strip any debris from said blades prior to said blades advancing from said debris confining chamber to said receiving means;

said debris confining chamber having an outlet adapted to receive a debris containing device;

and means to rotate said blades.

3,888,171
REFUSE COMPACTOR
William A. Eckerle, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Apr. 26, 1974, Ser. No. 464,530
Int. Cl. B30b *1/18*
U.S. Cl. 100—229 A **10 Claims**



1. A household refuse compactor comprising:

a frame defining a compacting chamber and an access opening thereinto;

a door pivotally mounted along one of its sides to said frame adjacent said access opening;

means for pivotally mounting an open top refuse container on the inner side of the said door at a point intermediate the door sides; and

biasing means for urging the container toward the mounted side of the door, whereby the container pivots about the door hinge as the door is moved between an extreme open position and an intermediate position, at which the container is aligned with the frame access opening, and thereafter pivots about the pivotal mounting means to move along an approximately linear path within the compactor frame as the door is moved between said intermediate position and a closed position.

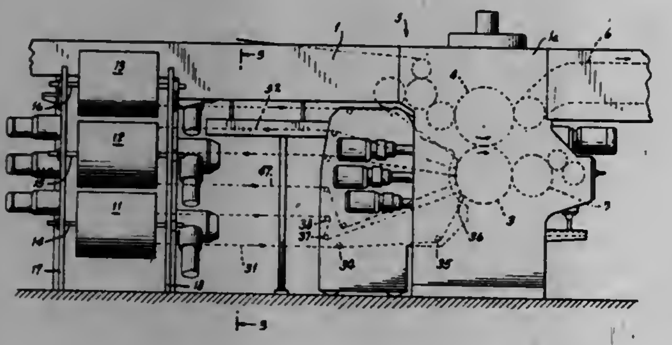
3,888,172
INTAGLIO PRINTING PRESS WITH WEB WIPING APPARATUS HAVING SUPPLY AND TAKE-UP REELS OUTSIDE FRAME

Salvatore F. D'Amato, Floral Park, and Chauncey P. Foote, Jr., Katonah, both of N.Y., assignors to American Bank Note Company, New York, N.Y.

Filed June 21, 1973, Ser. No. 372,087

Int. Cl. B41f *9/14*

U.S. Cl. 101—156 **11 Claims**



8. Web wiping apparatus for an intaglio press, comprising:
a. two parallel horizontally elongated press frame members between which the operative elements of the press are journaled;
b. a continuous wiping web;
c. a supply reel for said web;
d. a take-up reel for said web;
e. means for supporting said supply reel outside said frame members for rotation about an axis extending parallel to said frame members;
f. means for supporting the take-up reel outside the other of said frame members for rotation about an axis extending parallel to the frame members, said frame members being apertured in alignment with said supporting means to permit passage of the web therethrough;
g. a first angle bar between the frame members and adjacent the path of the web for turning the web from movement in a direction transverse to said frame members to a direction between and parallel to said frame members;
h. a second angle bar for turning the web from a return path between and parallel to said frame members to another transverse path leading to the take-up reel; and
i. support means for the angle bars.

3,888,173
TEMPERATURE RESPONSIVE INKING APPARATUS FOR A PRINTING MACHINE

Gerhard Ritzerfeld, Schorlemer Allee 14, 1000 Berlin 33, Germany

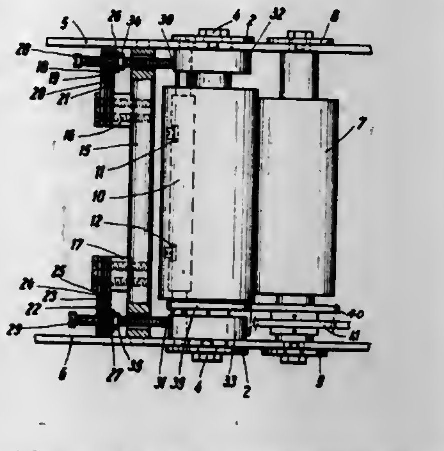
Filed Feb. 26, 1973, Ser. No. 335,919

Claims priority, application Germany, Feb. 28, 1972, 2210020

Int. Cl. B41f *31/32*

U.S. Cl. 101—350 **9 Claims**

1. Temperature responsive inking apparatus for a printing machine, comprising a first ink roller rotatable about a fixed axis; a second ink roller cooperating with said first ink roller for supplying ink thereto; means for supplying ink to said second ink roller; mounting means supporting said second ink roller for rotation about its axis and for movement toward and away from said first ink roller; and temperature responsive control means engaging said mounting means for pressing said second ink roller towards said first ink roller with a force decreasing with increase of the temperature of the apparatus and vice versa so as to automatically maintain between said first and second ink rollers an ink-containing gap of substantially constant width.



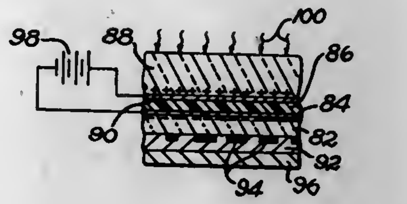
3,888,174
INFORMATION REPRODUCTION UTILIZING ELECTRET MATERIAL

Joseph Gaynor, Arcadia, Calif., assignor to Bell & Howell Co., Pasadena, Calif.

Continuation of Ser. No. 110,491, Jan. 28, 1971, abandoned. This application June 21, 1973, Ser. No. 372,373

Int. Cl. B41m *5/18, 5/20*

U.S. Cl. 101—467 **4 Claims**



1. In an electrostatic copy process, the steps of:
providing a transfer sheet having a surface coated with electret-forming, heat softenable, solid transfer material;
positioning a receiving sheet for said transfer material in contact with said transfer material;
applying a D-C potential across said transfer material;
thermally forming a design on said transfer material in the form of heat-softened transfer material for transfer of said softened transfer material to said receiving sheet;
cooling said transfer material to solid form while said D-C potential is applied; and
separating said receiving sheet from said transfer sheet whereby to carry said design on the surface of said receiving sheet in the form of a charged design of electret material raised in relief from said surface;
applying toner to said charged design of raised, electret material;
positioning a copy sheet in surface contact with the toned side of said raised electret material;
transferring toner from said raised electret material to said copy sheet to form said design in the form of toner thereon; and
separating said copy sheet from said receiving sheet.

3,888,175
MECHANICAL STABILIZER

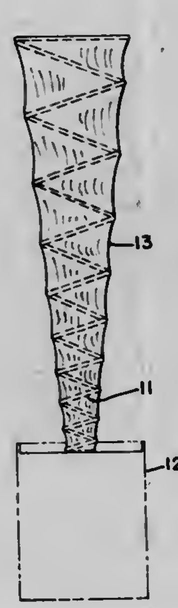
George D. Dusoe, and Joseph R. Messineo, both of Patterson, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 18, 1966, Ser. No. 588,279

Int. Cl. F42b *13/32, 25/00*

U.S. Cl. 102—4 **3 Claims**

1. In a munition having a body and a rear base, said rear base having a floor and an outer flange defining a recess, the improvement comprising, in combination therewith, a rear stabilizer for controlling the trajectory of said munition, said rear stabilizer comprising a helical coil spring having convolutions of gradually increasing widths, said spring being attached at its innermost convolution directly to the center region of said floor of said recess, and a collapsible frustoconical covering for said spring extending from the innermost to the outermost convolution of said spring,



said spring and covering being normally confined in compressed and collapsed condition in said recess and having the portion of the covering which surrounds the outermost convolution of said spring in engagement with the flange of said recess, and said covering forming in the released position of said spring an empty hollow elongated inverted frustoconical stabilizing surface at the rear of said munition;
whereby when said munition is launched, said spring will extend itself outwardly upon centrifugal forces generated by in-flight movements of said munition.

3,888,176
ALGICIDAL POST TREATED ROOFING GRANULES

John C. Horai, Jr., and David C. Little, both of Hagerstown, Md., assignors to GAF Corporation, New York, N.Y.

Filed Oct. 25, 1972, Ser. No. 300,864

Int. Cl. C09k *3/00*

U.S. Cl. 106—15 AF **30 Claims**

1. Algicidal roofing granules capable of inhibiting or preventing the growth of discoloring algae and fungi organisms upon exposure of roofing surfaces containing such granules to atmospheric weathering for extended periods of time, comprising:
a. base mineral granules;
b. a moisture permeable, durable, water insolubilized, pigmented, fired, inorganic alkali metal silicateclay coating on said base granules;
c. a processing oil composition present in an amount within the range of from about one-fourth gallon to about 1½ gallons per ton of base granules, said processing oil forming a thin film on the surface of said coated granules, said processing oil having a viscosity within the range of from about 100 to about 500 SUS, measured at 100° F; and
d. metallic algicides in the oil film and adhering to the surface of said granule coating, said algicides having a particle size not exceeding about 100 mesh and being present in amounts within the range of from about 0.05% to about 1.0% by weight based on the weight of the base mineral granules, metallic algicidal ions being leachable from said algicides upon exposure thereof to moisture during atmospheric weathering, whereby the weathering away of said processing oil upon stmospheric exposure of roofing surfaces incorporating said granules does not adversely affect the adherence of said metallic algicides to said granule coating, the presence of moisture during periods of rain and dew causing ionization of said metallic algicides with the resulting metallic ions being slowly leached from said granules to retard the growth of algae and fungi, thus enhancing the resistance of said roofing surfaces containing such granules to discoloration during extended periods of exposure of atmospheric weathering.

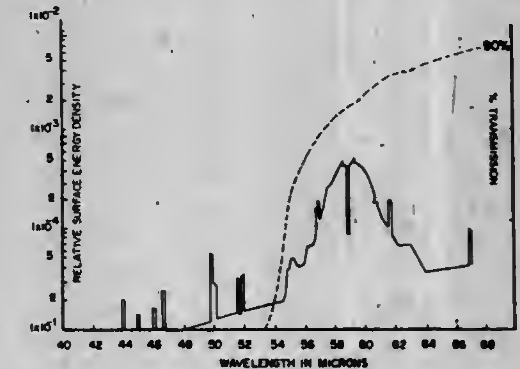
3,888,177
FLARE SYSTEM

Jesse F. Tyroler, Dover, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 195,880, Nov. 4, 1971, abandoned. This application Feb. 15, 1974, Ser. No. 443,161

Int. Cl.² F42B *4/26*; **G01J** *3/48*

U.S. Cl. 102—31 **4 Claims**



1. A method for discriminating between visible, apparently identically colored flares, wherein a polyemitter flare composition has at least two predominant color emitters which in combination produce a visible color apparently identical when viewed with the eye to that produced by another flare composition having a different predominant color emitter which comprises viewing the ignited flare compositions through a filter capable of eliminating the spectral wavelength of at least one of the predominant color emitters of the polyemitter flare composition, such that when viewed with the eye through the filter the polyemitter composition has a different color than the other flare composition.

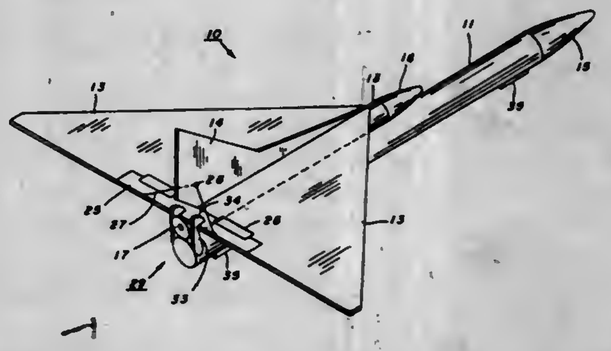
3,888,178
MODEL ROCKET-GLIDER

Walter E. Senoski, 1720 Elderslee Rd., Pittsburgh, Pa. 15227

Filed Oct. 30, 1974, Ser. No. 519,192

Int. Cl. F42b *15/16*; **A63h** *27/06*

U.S. Cl. 102—34.1 **12 Claims**

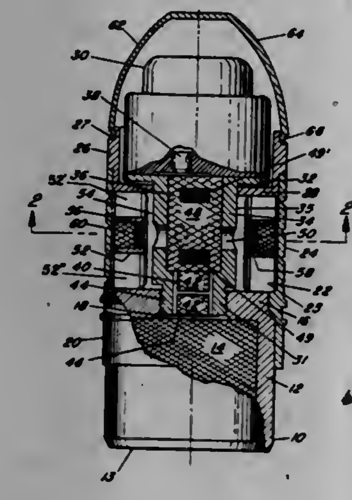


1. A model rocket-glider assembly, for use with a solid fuel motor having a propellant charge and a blow-out charge, said assembly comprising:
a. at least two tubes, said tubes being closed at their forward ends and open at their after ends, said tubes being secured parallel to their longitudinal axes, the interiors of at least two of said tubes being in open communication adjacent the forward portions thereof;

b. wings affixed to at least one of said tubes, said wings having a hinged elevator formed in the trailing edge thereof;
c. means for mounting the solid fuel motor in the after end of one of said tubes;
d. means disposed in the after end of at least one of the other of said tubes for retaining said elevator parallel to the horizontal plane of the wings prior to ignition of said blow-out charge, said elevator retaining means arranged so as to disengage from said elevator upon the urging of gases generated upon ignition of said blow-out charge, the said gases being propagated forwardly through the tube in which the motor is mounted and rearwardly through the tube in which the elevator retaining means is disposed; and
e. resilient means for biasing said elevator at a predetermined up-angle relative to the horizontal plane of the wings subsequent to disengagement of said elevator retaining means from the elevator.

3,888,179
INITIATOR FOR INCENDIARY PELLET

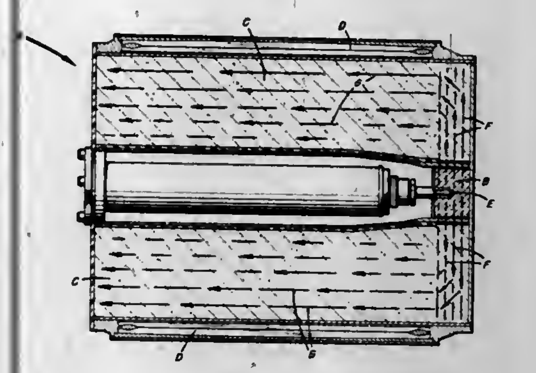
Kermit Nord, Harvest, Ala., and Francis C. Wallenhorst, Coon Rapids, Minn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Feb. 23, 1973, Ser. No. 334,786
Int. Cl. F42h *13/14*
U.S. Cl. 102—66 **5 Claims**



1. A multiple pellet dispensing incendiary cartridge which comprises:
a cylindrical housing incendiary material having a partially open end and a closed end;
an igniter charge in said housing;
a hollow frangible wall means having open ends, wherein one of said ends is fixedly attached to said partially open housing end;
a plurality of incendiary means annularly positioned within said frangible means;
means for trajectory improvement fixedly attached to said other frangible wall means end; and
means for fuzing, threadedly attached to said housing partially open end and intermediate to said trajectory improvement means and said plural incendiary means, for first igniting said igniter charge and said incendiary means upon impact of said cartridge, and then secondly for dispersing said ignited incendiary means in a combustible target area.

3,888,180
ROD WARHEAD

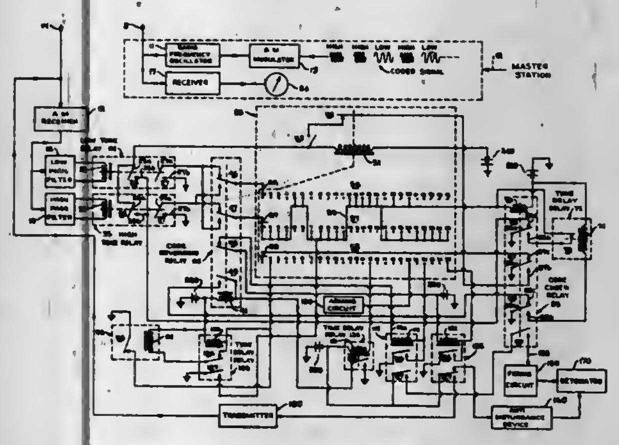
Eugene L. Nooker, San Luis Obispo, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Nov. 6, 1968, Ser. No. 774,228
Int. Cl. F42b *13/48, 25/00*
U.S. Cl. 102—67 **11 Claims**



1. In a rod warhead having a casing provided with a side wall, a projectile on the side wall and comprising a plurality of rods, and a high explosive charge in the casing and confronting the rods,
a booster in the casing and engaging the high explosive charge,
and a safety and arming unit in the casing and having a detonator engaging the booster,
the booster having wall means within the casing, said wall means having at least one point disposed in angular relationship other than zero degrees to that portion of the side wall which lies beneath the rods, whereby the detonation wave produced upon initiation of said booster will impinge on the rods substantially uniformly throughout their lengths.

3,888,181
MUNITION CONTROL SYSTEM

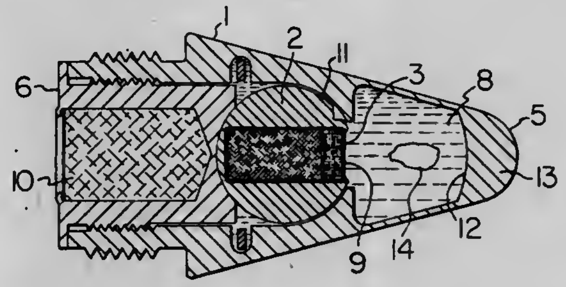
Edward F. Kups, Los Angeles, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Sept. 10, 1959, Ser. No. 839,264
Int. Cl. F42c *11/00*
U.S. Cl. 102—70.2 **2 Claims**



1. A munition safing, arming and firing system comprising means for transmitting a code consisting of pulses of differing frequencies, means for receiving said code, means for segregating the received pulses according to frequency, a stepping relay having a plurality of contact decks each of which corresponds to one of the frequencies contained in said code and one additional contact deck, each of said contact decks having an associated wiper arm, said wiper arms being ganged for conjoint movement, means connected to said segregating means for applying ground potential to only one of the wiper arms of said plurality of contact decks in response to a pulse of the corresponding frequency, means interconnecting the contacts of said plurality of contact decks in correspondence with a preselected code, switch means for advancing said wiper arms one contact position in response to each pulse received by said receiving means, code check means connected to said interconnecting means for free-running said stepping switch back to its initial position after a predetermined time delay in response to a pulse which deviates from said preselected code, time delay means connected to said code check means for free-running said stepping relay back to its initial position after a predetermined time independently of the receipt of an incorrect pulse, arming circuit means connected to a predetermined contact of said additional contact deck, firing circuit means connected to a contact succeeding said predetermined contact and to said code check means so that upon the receipt of a correct series of pulses followed by an incorrect pulse the firing circuit will be activated through said code check means.

3,888,182
PRESSURE INITIATING PRIMER SYSTEM FOR PROJECTILES

David S. Breed, Boonton, N.J., assignor to Breed Corporation, Fairfield, N.J.
Filed July 11, 1973, Ser. No. 378,158
Int. Cl. F42c *1/10*
U.S. Cl. 102—73 R **10 Claims**

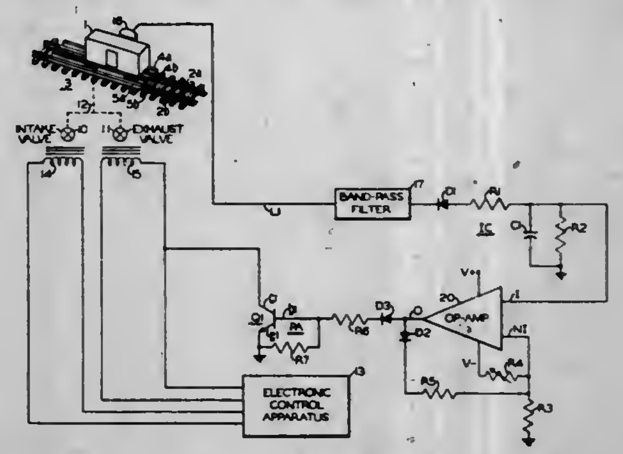


1. A pressure initiating primer construction for munitions comprising: a housing defining a sealed chamber, said chamber having a wall which is deformable in response to the striking of a target by said housing; a liquid substantially filling the chamber; and a pressure sensitive, sealed primer carried by said housing in intimate association with the liquid, whereby the striking of a target by said housing and the consequent deformation of said wall create a pressure pulse within the liquid which impinges on the primer with sufficient energy to initiate the primer.

3,888,183
CONTROL SYSTEM FOR SUPPRESSING WHEEL SQUEALING NOISE PRODUCED BY RAILROAD CAR RETARDERS

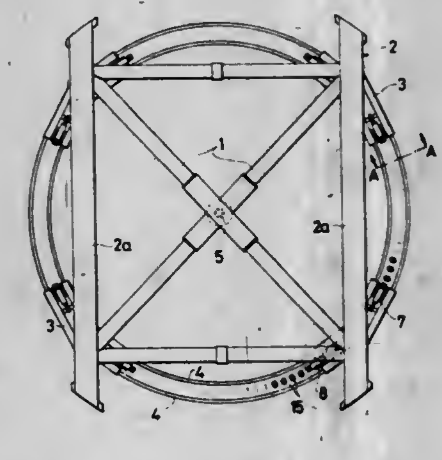
Peter M. Noble, Valencia, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.
Filed June 28, 1974, Ser. No. 484,140
Int. Cl. B61b *1/00*
U.S. Cl. 104—26 A **11 Claims**

1. A system for controlling wheel squealing noises produced by an activated railroad car retarder comprising, transducer means located in the vicinity of the car retarder for producing electrical signals in response to sound waves, filter means coupled to said transducer means for passing a selected range of frequencies of said electrical signals, rectifier-integrator means coupled to said filtering means for sensing the time integral of said filtered electrical signals, comparator means connected to said integrator means for producing an output signal when the time integral exceeds a given value, and output means coupled to comparator means and responsive to said output signal for deactivating the car retarder thereby suppressing wheel squealing noises.



3,888,184
TURNTABLE

Kazuo Maeda, Chibashi, Japan, assignor to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan
Filed June 24, 1974, Ser. No. 482,553
Claims priority, application Japan, June 27, 1973, 48-76285
Int. Cl. B60s *13/02;* **B61j** *1/00*
U.S. Cl. 104—37 **1 Claim**



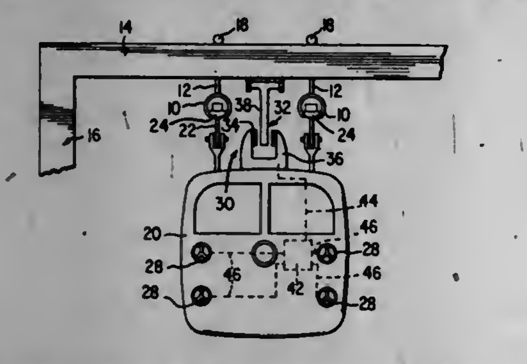
1. A turntable comprising circular rails provided on the ground, a frame for receiving a load mounted on said circular rails and turned along the rails, cylinder mechanisms provided in said frame so as to be extended and contracted tangentially to the circle of rotation, a plurality of holes provided along the rails, and means for engaging or disengaging a free end of each cylinder mechanism with one of said holes, whereby the frame can be turned by extension and contraction of said cylinder mechanisms and alternate engagement and disengagement thereof with said holes.

3,888,185
HIGH SPEED TRANSPORTATION SYSTEM

Robert Walsh, 3025 Cleveland Ave., N.W., Washington, D.C. 20008
Continuation-in-part of Ser. No. 190,765, Oct. 20, 1971, Pat. No. 3,774,542. This application Aug. 14, 1973, Ser. No. 388,161The portion of the term of this patent subsequent to Nov. 27, 1990, has been disclaimed.
Int. Cl.² B61B *3/02*
U.S. Cl. 104—89 **8 Claims**

1. A transportation system comprising track means comprising at least one substantially tubular track member extending along the length of the right of way to be traversed and

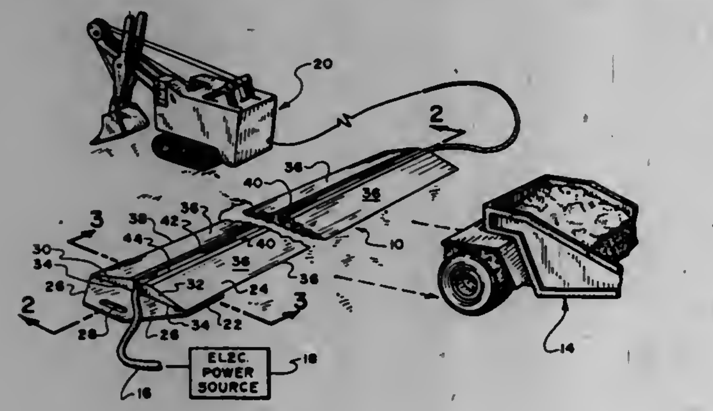
including a longitudinal slot in the underside thereof which extends the length of the track; means for supporting said track a predetermined distance above the surface of the earth, at least one vehicle; at least one elongate sled member slidingly disposed within said track for longitudinal movement therein, said sled member having a lower surface substantially conforming in shape to the lower inner surfaces of said track adjacent said slot; means, connected to said sled through said slot and to said vehicle, for supporting said vehicle from said sled; and linear induction motor propulsion means for moving said vehicle along said track.



3,888,186
HIGH STRENGTH PORTABLE CABLE CROSSOVER FOR HIGH TONNAGE EARTH MOVING VEHICLES

David P. Jentzsch, Sandy; Hyrum T. Anderson, and Lee J. Olsen, both of Salt Lake City, all of Utah, assignors to Rubber Engineering, Inc., Salt Lake City, Utah

Filed July 30, 1973, Ser. No. 383,644
Int. Cl.² E01B *7/28*
U.S. Cl. 104—275 **5 Claims**



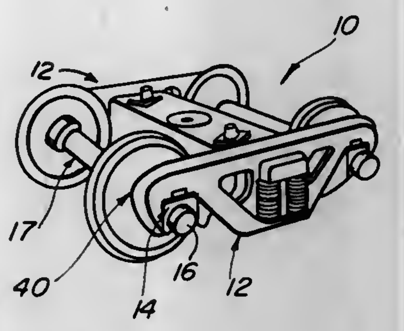
1. A ground-engaging cable crossover for out-of-doors use with heavy load earth moving vehicles weighing on the order of 200,000–400,000 pounds when loaded comprising:
- a body of molded synthetic resinous material molded as one piece and having a durometer hardness sufficient to support excavating vehicle loads in excess of 200 tons and a length of not less than 8 feet;

said body comprising:
- feathered front and back edges;
- front and back tapered ramps, each extending from one said feathered edge to the center of the body and each defining a continuously flat horizontal bottom load bearing surface, an angular top surface diverging from said bottom surface in a direction away from the associated edge and a solid interior between said flat bottom and said angular top surfaces;
- a central solid portion integrally of said one piece with each tapered ramp and bridging therebetween having a width substantially less than the width of either ramp, said central solid portion comprising a central continuously flat horizontal bottom load bearing surface linearly connecting one ramp continuously flat horizontal bottom surface with the other ramp flat bottom surface thereby creating a continuously flat horizontal load bearing crossover bottom surface and spaced generally horizontal top surface areas respectively joined to the adjacent ramp angular top surface, and a U-shaped recess spanning between said horizontal top surface areas and running the full length of the crossover for receiving an electrical cable by which an electrically driven excavator is powered, said recess having a vertical depth greater than the diameter of the cable, the spaced generally horizontal top surface areas and the solid material thereunder defining two support shoulders along the entire length of the crossover across which a ground-engaging vehicle having said weight load is displaced without deflecting said shoulders such as would impose vehicle load on the cable in the recess.

3,888,187
DAMPENED AXLE BEARING MOUNTING

John H. Van Moss, Jr., 3 Manor Lane, Highland Park, Ill. 60035

Filed Dec. 3, 1973, Ser. No. 421,404
Int. Cl. B61f *5/30, 5/38, 15/12*
U.S. Cl. 105—224.1 **4 Claims**



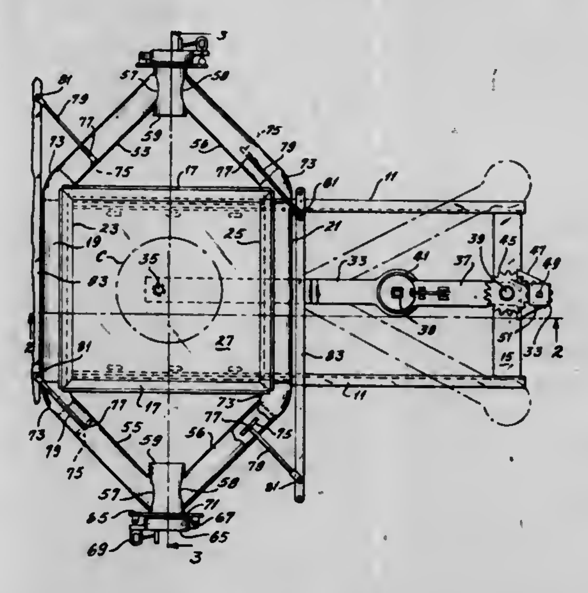
1. In a railroad car truck side frame assembly mounting standard axles in anti-friction bearings with adaptors the combination for improvement in axle suspension comprising:
- a. a flat-back bearing mounted in a central position relative to the axle on top of the adaptor for sliding in the longitudinal direction on a horizontal plane mounted on the side frame,
- b. a resilient axle centering means mounted between and in abutting contact with both the side frame and the adaptor and horizontally disposed in spaced relation to the axle, and
- c. an axle snubbing means damping movement of the axle mounted between the side frame and the outer race of the anti-friction bearing.

3,888,188
COMBINED PNEUMATIC AND GRAVITY HOPPER GATE CONTROLLED OUTLET

Oliver C. Fuller, Woodstock, Ill., assignor to Evans Products Company, Des Plaines, Ill.

Filed Apr. 25, 1974, Ser. No. 464,046
Int. Cl. B61d *7/20, 7/26;* B65g *53/46*
U.S. Cl. 105—282 R **8 Claims**

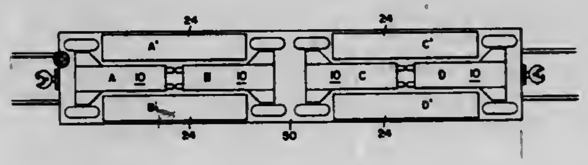
1. Hopper discharge means comprising means forming a downward discharge opening for a hopper having sloping walls, horizontal gate means closing said discharge opening, cylindrical pipes of uniform cross section disposed generally above said gate means and having their lower portions removed to accommodate the upper surface of said gate means and forming with said gate means parallel lading receiving conduits horizontally spaced apart and defining the opposite ends of said opening, said pipes being adapted to tangentially receive the sloping hopper walls irrespective of their angle of slope, the edges of said pipes adjacent said discharge opening being spaced above said gate to define, with the upper surface of the gate, lading inlet means in each of said lading receiving conduits and providing communication between said lading receiving conduits and said downward discharge opening, suction conduit means comprising additional pipes of the same cross section as said first-named pipes forming suction conduits individual to each lading receiving conduit, and common suction nozzle means connected to both said individual suction conduits, said suction conduits converging toward each other for connection to said nozzle means and being curved tangential to said lading receiving conduits whereby to avoid the formation of angular intersections and consequent creation of turbulence in said conduits.



3,888,189
METHOD OF LOADING AGRICULTURAL MACHINES ON A RAILROAD

Merlyn Duane Bass, and Ralph August Gerhardt, both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Division of Ser. No. 354,994, April 27, 1973. This application May 16, 1974, Ser. No. 470,376
Int. Cl. B60p *7/08*
U.S. Cl. 105—367 R **2 Claims**

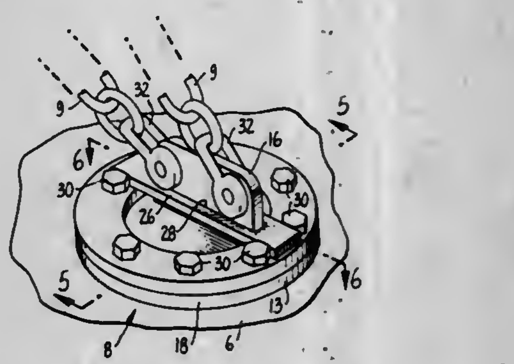


1. A method of shipping a plurality of agricultural machines on a railway car, having a width slightly greater than the width of the machines at the drive wheels, each machine having a transversely elongated removable header and a traction unit, with a fore-and-aft body mounted on a pair of forward drive wheels spaced outwardly from opposite sides of the body and a pair of rear caster wheels normally mounted on a rear axle structure on opposite sides and outwardly of the body, comprising: providing alternate mounting means for the caster wheels on the machine body adjacent the opposite sides; removing the headers from the plurality of machines; removing the caster wheels from their normal position on the axle and placing them in their alternate positions on the body on said machines; removing the axle structures; positioning at least one pair of the machines on the railway car, each pair being formed by positioning the traction units of two machines on a railway flatcar with their bodies in fore-and-aft alignment approximately at the fore-and-aft center line of the railway car and with the rearward ends of the traction units facing one another, and placing the headers for the two machines with the longitudinal dimension of the headers in a fore-and-aft direction on opposite sides of the traction unit bodies between the drive wheels of the opposite traction units.

3,888,190
TIEDOWN LUG

Henry W. Bigge, 50 Marsh Pl., Oakland, Calif. 94611

Filed Jan. 10, 1974, Ser. No. 432,404
Int. Cl. B61d *45/00*
U.S. Cl. 105—475 **4 Claims**

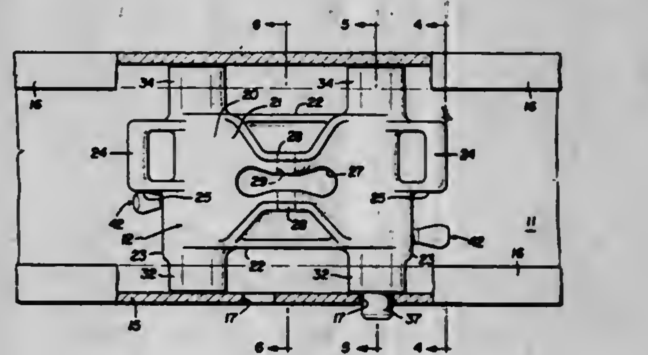


1. A tiedown device adapted to be secured in place on the deck of a transportation device such as a barge, the device comprising a ring means secured directly to the barge deck and providing a receptacle, a circular plate mounted for rotation in the receptacle, said ring means having an inner peripheral portion extending inwardly over an outer peripheral portion of the circular plate to retain the circular plate in position for rotation, the circular plate having an upstanding flange providing attachment means between the tiedown device and an object on the barge, and a removable swivel locking plate carried by the circular plate and cooperable with the ring means to selectively secure the circular plate from rotating.

3,888,191
VEHICLE HOLDDOWN

Roland P. Jones, Westland, Mich., assignor to Cast Metal Industries, Inc., Farmington, Mich.

Filed July 15, 1974, Ser. No. 488,547
Int. Cl. B61d *45/00*
U.S. Cl. 105—477 **2 Claims**



1. In a vehicle holddown for use in slidably fitting and engaging within an upwardly opening channel having narrow, inwardly turned flanges formed on the upper edges of its legs, with the channel fixed upon a supporting deck, with the holddown formed of a roughly rectangularly shaped, hollow relatively flat body having a generally horizontally arranged upper wall and integral, downwardly extending side and end walls; with means formed on the upper wall for engagement with and end of a connector member whose opposite end is formed for engagement with a vehicle to be supported upon the deck and secured to the holddown; and transversely extending, hollow bosses, integral with the body side walls near the corners of the body to form a pair of axially aligned, journal forming members at each of the ends of the body, with the bosses each arranged to extend beneath its adjacent channel flange;
- a horizontally accessed shaft slidably journalled through each pair of bosses, each shaft being retractable to fit within the body and bosses and being endwise slidable to

extend one end of the shaft a short distance transversely outwardly of one of its bosses for engaging within a preselected one of a number of spaced apart shaft receiving openings formed in one of the legs of the channel;

and each end wall being formed with an integral, approximately vertically arranged and longitudinally extending plate-like extension portion arranged roughly near the middle of its respective end wall, so that the extension portion is approximately arranged centrally of and normal to and is of the height of its respective end wall, the improvement comprising:

an L-shaped slot formed in each end wall, with each slot having a long, horizontal leg terminating near said one boss through which the shaft end extends outwardly, and a short upwardly extending leg which is located closely adjacent to said extension portion;

a pin-like lever extending through each slot, with each lever having an inner end portion fixedly engaged with its adjacent shaft and an outer end portion axially extending longitudinally of the body and normally extending at an upwardly directed acute angle, i.e., upwardly from its shaft towards the upper edge of its adjacent extension portion through the short slot leg when its shaft is retracted within the body and bosses, and with the free end of said lever outer portion generally arranged no higher than the upper edge of its extension and no further longitudinally outwardly than the free edge of its extension and being closely adjacent to its extension portion, wherein the lever outer end portion is normally protected by its closely adjacent portion;

and said lever outer portions each being swingable downwardly into the horizontal leg of its respective slot by means of a manually applied downwardly directed force upon its free end;

and a coil compression spring surrounding a portion of said shaft and having its opposite ends abutted against the shaft lever and a body portion for spring urging the shaft endwise to extend transversely outwardly of said one boss, wherein the lever slidably moves along the length of the long leg of its slot during endwise movement of the shaft, and wherein the shaft may be retracted by manually grasping the free end of the lever and also the extension portion and moving the lever along the slot long leg and upwardly into the slot short leg;

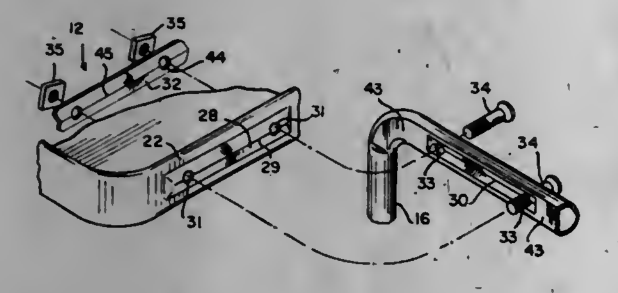
whereby an operator of the holddown may manually locate, grasp and move the lever blindly by feel alone, without actual view of the lever.

3,888,192
CART-LEG CONNECTION

Otis Basey, Columbus, Ind., assignor to Cosco, Inc., Columbus, Ind.

Filed Dec. 28, 1973, Ser. No. 429,379
Int. Cl. A47b *7/00*

U.S. Cl. 108—156 **4 Claims**



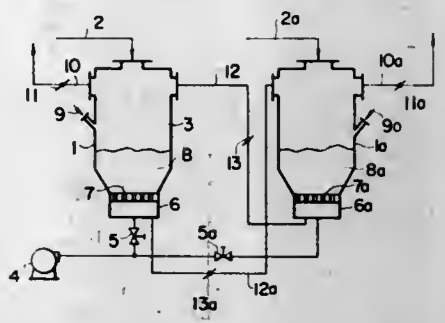
1. A shelf-leg connection for an article of metal furniture including a sheet-metal shelf having a peripheral border skirt lying in a plane normal to the general plane of said shelf and coupled to at least one leg formed of metal tubing, said connection comprising an outwardly projecting V-shaped rib formed in said skirt, said leg having a V-shaped recess formed therein generally corresponding in shape to the shape of said rib, a sheet-metal bracket having a V-shaped cross-section disposed along the inner face of said rib, said rib being matingly engageable between said bracket and recess, a bolt extending through aligned openings formed in said recess, rib, and bracket, and a nut drawn up on said bolt for bindingly interconnecting said bracket and recess with said rib disposed therebetween, said nut having a cross-sectional extent less than said bracket whereby said bracket will prevent said nut from turning after it has been drawn up on said nut.

3,888,193
INCINERATION METHOD FOR COMBUSTIBLE INDUSTRIAL WASTAGE AND A FLUIDIZED BED FURNACE USED THEREFOR

Kunio Kishigami; Hiroshi Kobayashi, both of Yokohama, and Shigenobu Oshima, Kawasaki, all of Japan, assignors to Babcock-Hitachi K.K., Tokyo, Japan

Filed Jan. 10, 1974, Ser. No. 432,239
Claims priority, application Japan, Jan. 16, 1973, 48-6642
Int. Cl. F23g *5/00*

U.S. Cl. 110—8 F **8 Claims**



1. A method for incinerating combustible industrial wastage, comprising the steps of: fluidizing the combustible industrial wastage with cement clinker granules serving as a fluidizing medium; heating the fluidized combustible industrial wastage and cement clinker granules sufficiently to incinerate the combustible industrial wastage and thereby generate combustion waste gases from the combustible industrial wastage as it is incinerated, which combustible waste gases include acid gases; contacting the combustion waste gases thus generated by the incineration of the combustible industrial wastage, which combustion waste gases include acid gases, with the fluidized cement clinker granules sufficiently to react the acid gases with the cement clinker granules and thereby remove the acid gases from the combustion waste gas.

3,888,194
METHOD FOR INCINERATING INDUSTRIAL WASTAGE

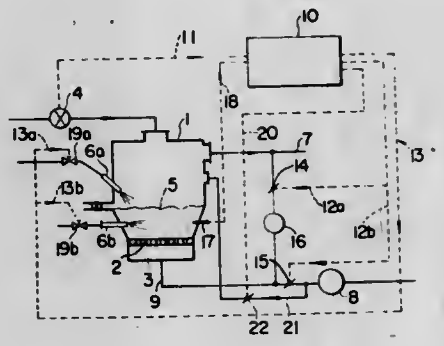
Kunio Kishigami; Hiroshi Kobayashi; Toru Sente, and Koichi Sugiyama, all of Yokohama, Japan, assignors to Babcock-Hitachi K.K., Tokyo, Japan

Filed Feb. 28, 1974, Ser. No. 446,895
Claims priority, application Japan, Nov. 21, 1973, 48-130187
Int. Cl. F23g *5/12*

U.S. Cl. 110—8 F **7 Claims**

1. In a method for incinerating combustible industrial wastage containing organic nitrogen compounds in a fluidized bed, wherein air for use in combustion is blown into a furnace from below to fluidized non-combustible fluidizing medium placed within said furnace, for forming a fluidized bed, and at the same time said combustible industrial wastage is supplied into said furnace from the upper portions thereof, which furnace has been preheated to a temperature above the combustion temperature of said combustible industrial wastage which is to be incinerated in said fluidizing bed, the improvements comprising the steps of: supplying combustible fuel material abundant in carbon content with said combustible industrial wastage into said fluidized bed; simultaneously maintaining the

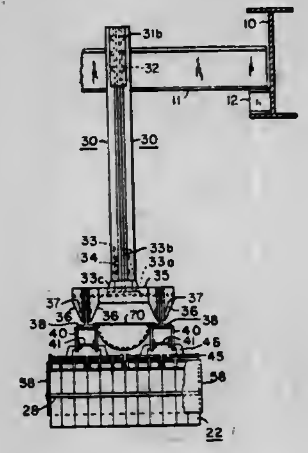
interior of said fluidized bed in a reductive atmosphere and at a temperature higher than the combustion temperature of said fuel material and the combustion temperature of said combustible industrial wastage; incinerating said combustible industrial wastage in the reductive atmosphere in said fluidized bed and producing nitrogen oxides from the combustion of the organic nitrogen compounds contained in said combustible industrial wastage and reducing the nitrogen oxides thus obtained from the organic nitrogen compounds within the reductive atmosphere of the fluidized bed and thereby removing the nitrogen oxides from the combustion gas produced by the combustion of said combustible industrial wastage and said fuel materials abundant in carbon content.



3,888,195
PANELIZED SUSPENDED BASIC FURNACE ROOF

Levi S. Longenecker, 61 Mayfair Dr., Pittsburgh, Pa. 15228
Continuation-in-part of Ser. No. 385,083, Aug. 2, 1973, Pat. No. 3,825,409. This application Apr. 26, 1974, Ser. No. 464,568
Int. Cl. F23m *5/02*

U.S. Cl. 110—99 R **24 Claims**



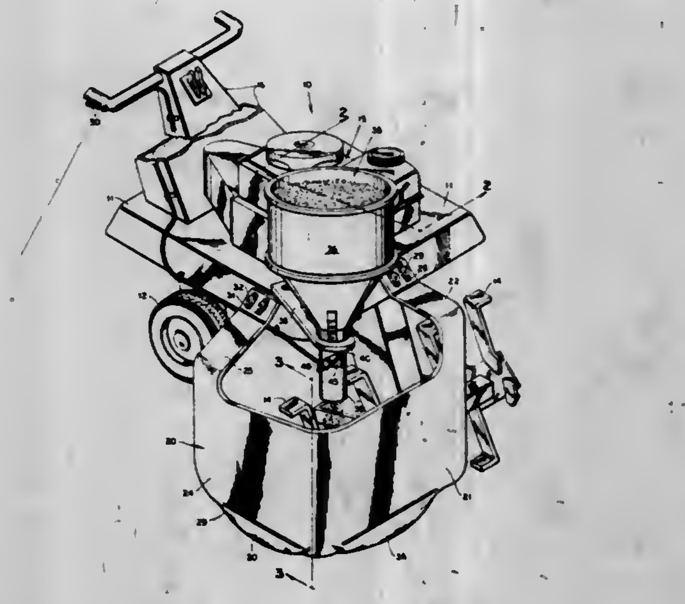
1. In an improved panelized suspended furnace roof construction for mounting on an overhead metal framework having spaced-apart substantially horizontally extending support members, downwardly extending post hanger members detachably suspended along the support members, a cross-extending yoke member carried by a lower end portion of each of said post hanger members, a pair of hanger supporting members suspended in a horizontally extending and spaced-apart relation with respect to each other from adjacent opposite ends of each of said yoke members, row pairs of tile-supporting hangers removably carried by said supporting members, and each of said hanger supporting members extending transversely with respect to its associated said yoke member and having a pair of spaced-apart latching portions therealong each of which is adapted to carry a row of said row pairs of tile-supporting hangers.

3,888,196
DISPENSING AND HOOD ASSEMBLY FOR ROTARY TILLER

William E. Glenn, R.F.D. #2, Carlton, Ga. 30627

Filed Jan. 31, 1974, Ser. No. 438,257
Int. Cl. A01c *7/08*

U.S. Cl. 111—10 **6 Claims**



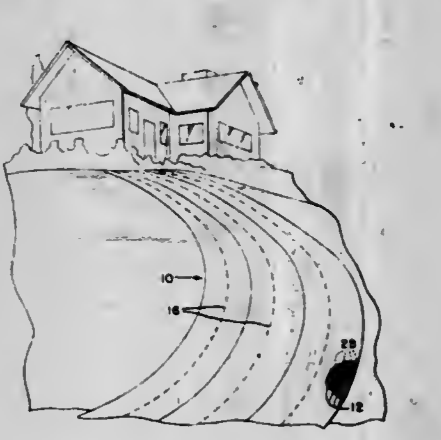
1. A dispensing and hood assembly, for a rotary tiller including a platform, a plurality of spade members mounted for rotation with an axle, means for rotating the axle, and a handle for control of the tiller, including a front wall mounted from said platform forwardly of said spade members and substantially parallel to said axle, said front wall defining a forwardly turned lip at the lowermost edge thereof, a side wall disposed at one end of said axle and substantially at right angles with respect to said front wall, said front wall and said side wall being substantially vertically diposed and defining an incorporation chamber, and dispensing means carried by said rotary tiller generally above said incorporation chamber for dispensing material into said incorporation chamber.

3,888,197
DEVICES, SYSTEMS AND METHODS EMPLOYING KNITTED FABRIC MULCH

Robert T. Seith, Tuscaloosa, Ala., and Otto M. Bundy, Bradenton, Fla., assignors to Gulf States Paper Corporation, Tuscaloosa, Ala.

Division of Ser. No. 333,782, Feb. 20, 1973, Pat. No. 3,848,359. This application Aug. 12, 1974, Ser. No. 496,764
Int. Cl. A01c *1/04*

U.S. Cl. 111—1 **3 Claims**



1. In a method of growing plants, wherein seeds are distributed over an area of the ground, the improvement comprising covering said seeds with an open-mesh knitted fabric consti-

tuted by a multiplicity of knittedly interconnected longitudinal and transverse yarn elements and having at least one porous irrigation tube between longitudinal yarn elements and interleaved with transverse yarn elements of said fabric, said tube being substantially wider than said yarn elements, and supplying water to said irrigation tube from an external source to irrigate seed seeds.

3,888,198

THREAD CUTTER DEVICE ON CHAIN STITCH SEWING MACHINE

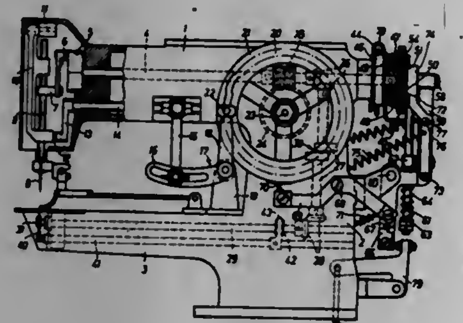
Wilhelm Bauer, Hauptstuhl, and Horst Stahlschmitt, Kaiserslautern, both of Germany, assignors to Pfaff Industriemaschinen GmbH, Kaiserslautern, Germany

Filed May 16, 1974, Ser. No. 470,543

Claims priority, application Germany, May 19, 1973, 2325564

Int. Cl. D05b *65/02*

U.S. Cl. 112—252 **3 Claims**



1. In a chain stitch sewing machine of the type having a rotating looper with a looper point and a looper back, a main shaft, a shaft for rotating the looper, means for driving the looper shaft from the main shaft and stopping mechanism for the main shaft adapted to substantially instantaneously stop said shaft in a predetermined angular position and including means permitting a slight over-run of said shaft and subsequent recoil of said shaft to said predetermined position, in which position the thread loop is held on the looper, an improved means for cutting the thread when the machine is stopped comprising knife means attached to the back of the looper and having a cutting edge spaced above the back of the looper and arcuately extending in the direction of the point of the looper, but substantially opposite the latter with respect to the axis of the looper shaft, whereby the recoil of the main shaft during stopping drives the looper in a reverse direction to apply the cutting edge of the knife means against a leg of the thread loop held on said looper to cut the thread.

3,888,199

METHOD OF MAKING A PRESS TAB CONTAINER END FROM A METALLIC WEB

Thomas R. Herrmann, Wheat Ridge, Colo., assignor to Coors Container Company, Golden, Colo.

Filed Dec. 3, 1973, Ser. No. 421,160

Int. Cl. B21d *51/00*

U.S. Cl. 113—80 R **13 Claims**

1. The method of making a press tab container end having a hinged pour opening closure tab and a hinged pressure release vent closure tab which comprises the steps of

a. forming in a metallic web an upwardly opening circular groove surrounding each of the proposed areas of a pour opening closure tab and a pressure release vent closure tab, and forming a rib located radially inwardly of each of said grooves,

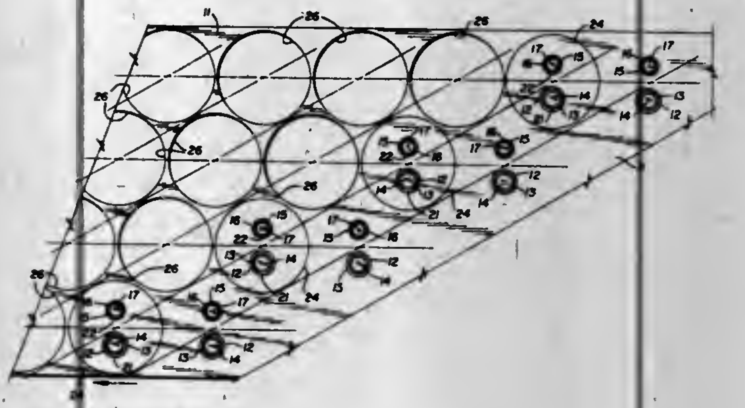
b. lancing the metal slightly inwardly of the top of said ribs to cut the tab areas from the web excepting where the tabs are joined hingedly to the web,

c. blanking out of the web a circular end including the two formed and lanced tabs,

d. drawing the peripheral portion of the blanked out end and forming a downwardly opening curved circumferential edge portion,

e. reforming the blanked out end to flatten and spread the tab areas,

f. coining the reformed end to make the tab edges underlie surrounding end areas,



g. subjecting the end to curling of the circumferential portion and insertion of gasket compound in the curled edge,

h. heating the end to temperature compatible with a sealant, and

i. applying the sealant to the heated end to cover the seam between the overlapping tabs and surrounding end surfaces to provide an air and fluid tight seal.

3,888,200

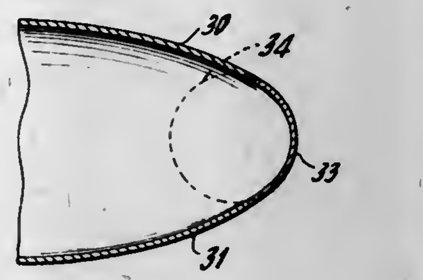
SHIP HULL CONSTRUCTION

Ovaldo Wendorf, 325 Broadway, Newark, N.J. 07104

Filed Feb. 8, 1974, Ser. No. 440,808

Int. Cl. B63b *1/32*

U.S. Cl. 114—56 **1 Claim**



1. The hull of a ship wherein below the water line the forward end portion of the bow is curved as seen in top cross-sectional view, wherein the said curve is a portion of a circle so that the bow is rounded, wherein the diameter of the said circle is at least one-third in length of the width of said hull at the hull's widest part, wherein said curved portion is a curved steel plate, the hull is constructed of steel side hull plates, said curved steel plate is connected to said side hull plate, and wherein the front of the bow below the water line is substantially vertical as seen in side view.

3,888,201

AUTO-PILOT

Bernard R. Zuvela, Fountain Valley, Calif., assignor to Scientific Drilling Controls, Newport Beach, Calif.

Filed Oct. 29, 1973, Ser. No. 410,713

Int. Cl. B63h *25/04*

U.S. Cl. 114—144 R **11 Claims**

2. An autopilot system for steering a craft, comprising:

a first pair of flux gate coils responsive to the earth's magnetic field and connected in series to have two end leads at opposite ends of the coil series and a common lead between the coils;

a second pair of flux gate coils connected in series and also having two end leads and a common lead between the coils;

core means of magnetic material associated with said four coils respectively;

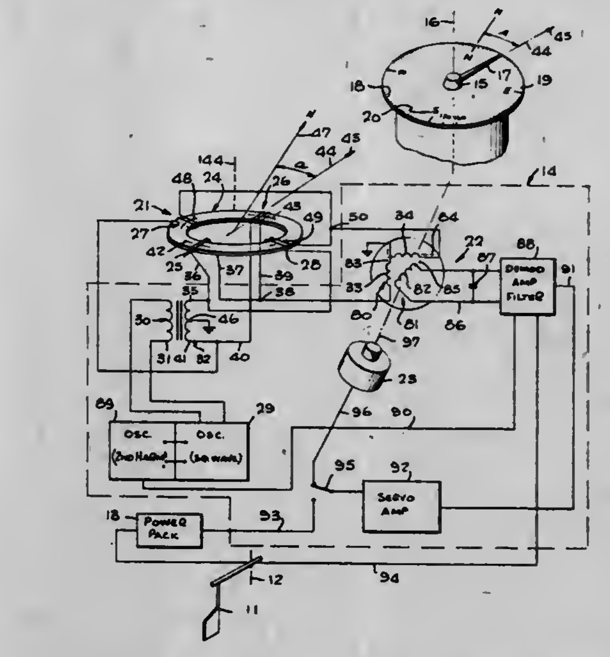
said four coils and said core means being adapted to be mounted on the craft in a predetermined orientation with respect to the heading of the craft, and to be fixed against rotation relative to the craft about a vertical axis;

the two coils of said first pair having axes extending in a common direction but being wound reversely to respond oppositely to a first component of the earth's magnetic field;

the two coils of said second pair having axes extending in a second common direction perpendicular to said direction of the first pair, and being wound reversely to respond oppositely to a second component of the earth's field perpendicular to said first component;

there being connected to each of said pairs of coils an alternating current power source, which may be the same source for both pairs, and which has two opposite end taps connected to said end leads respectively of the pair of coils and an intermediate tap between said end taps;

said alternating current being of a value to saturate said coils with flux on individual cycles and before reversal of polarity of the alternating current, so that a first signal representing said first component of the earth's field is produced between said common lead of said first pair of coils and said intermediate tap of the associated power source, and a second signal representing said second component of the earth's filed is produced between said common lead of the second pair of coils and said intermediate tap of its power source;



a resolver having a first section and a second section mounted for rotation relative to said first section to positions representing different desired course directions;

one of said sections of the resolver having two coils offset ninety degrees electrically with respect to one another;

means for energizing said two coils of the resolver in accordance with the intensities of said first and second signals respectively to produce a resultant magnetic field in said one section of the resolver representing the earth's field; the other section of said resolver having coil means in which a third signal is induced representing any deviation of the directional orientation of said coil means from the direction of said resultant field produced by said coils of the first resolver section; and

power operated steering means responsive to said third signal to turn the craft toward a position bringing said coil means and said resultant field into alignment, and thereby bringing the actual heading of the craft into correspondence with the setting of the second section of the resolver relative to said first section.

3,888,202

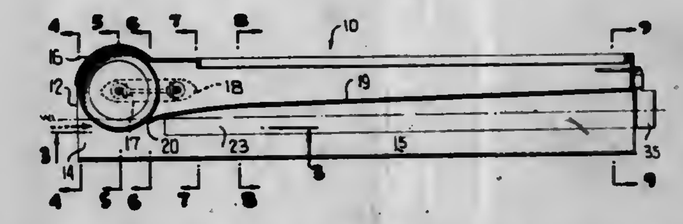
MARINE PROPULSION SYSTEM

James C. Willyard, 2211 Bucknell Ter., Silver Spring, Md. 20902

Filed July 5, 1973, Ser. No. 376,334

Int. Cl. B63h *11/02*

U.S. Cl. 115—16 **8 Claims**



1. In a marine vessel of the hull displacement type wherein the vessel hull is partially submerged when said vessel is in motion, a propulsion system comprising:

a flow duct extending along the bottom of said hull, said duct being open at both ends and closed along its top, bottom and side walls, said duct being mostly submerged with the upper portion of its forward end extending above the water line when said vessel is in motion;

a reaction device in the form of a rigid driven cylinder located at the forward end of said duct and entirely within the confines of said hull and proximate the forward end of said vessel, said cylinder having a longitudinal axis extending horizontally and perpendicular to the direction of vessel forward motion, the cylinder being positioned at a depth such that its periphery remains partially submerged during vessel motion, said cylinder having a smooth circumferential surface and arranged to be rotatably driven in a first direction about its longitudinal axis such that said circumferential surface viscously forces air and water under said cylinder and through said duct from forward of said vessel; and

means for selectively rotating said cylinder about said longitudinal axis in said first direction;

wherein said top wall of said duct extends from said cylinder to the stern of said vessel and has a leading edge positioned adjacent said cylinder at a level below the longitudinal axis of said cylinder and extending along the length of said cylinder near the water line of said vessel to direct water driven by said cylinder into said duct in a rearward flow direction;

wherein the bottom wall of said duct extends forwardly of said leading edge of said top wall of said duct at least as far as the forwardmost portion of said cylinder;

whereby water and air driven rearwardly through said duct by said cylinder initiates a reactive force which driver said vessel in a forward direction without imparting a lift force to said vessel.

3,888,203

STERN DRIVE FOR BOATS

Lawrence L. Lohse, Fond du Lac, Wis., assignor to Kiekhaefer Aeromarine Motors, Inc., Fond du Lac, Wis.

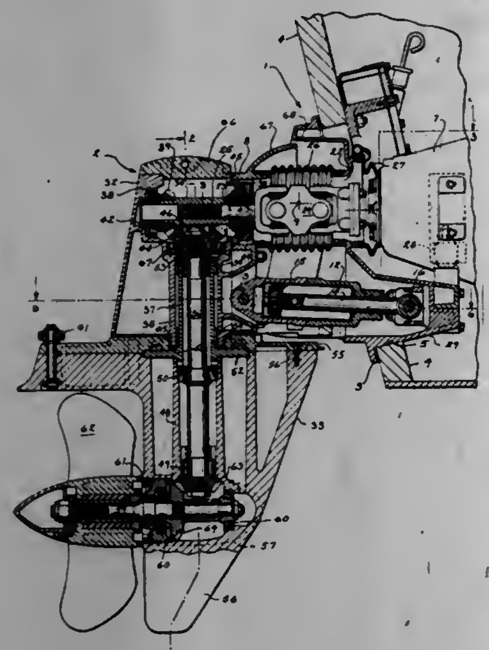
Filed Mar. 29, 1974, Ser. No. 455,998

Int. Cl. B63h *5/12*

U.S. Cl. 115—41 HT **23 Claims**

1. A stern drive for boats comprising a boat mounting assembly adapted to be secured to the transom of a boat and to provide a drive connection from an inboard engine; and a drive assembly removably secured to said boat mounting assembly and comprising a substantially vertical drive shaft having means connecting the same to said drive connection; an underwater dirigible unit suspended solely by said drive

shaft, a propeller carried by said unit and operatively connected to be driven by said shaft, said boat mounting assembly comprising a transom plate and a tilt housing pivotally secured to said transom plate on a transverse axis with adjustable trim



and power tilt mechanism therebetween, and said drive assembly being removably secured to said tilt housing to tilt therewith, and a double universal joint in said drive connection and substantially coincident to said transverse axis.

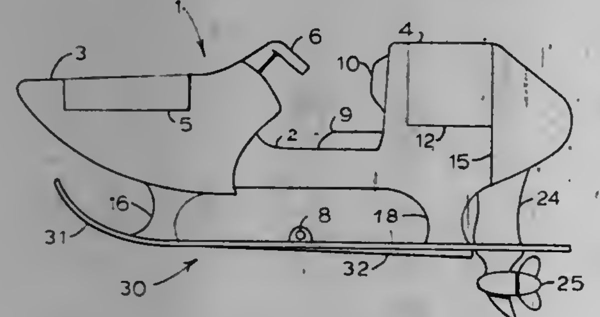
3,888,204
WATER SKI VEHICLE

Frank P. Zubick, Jr., 2848 South King St., Honolulu, Hawaii 96814

Filed June 8, 1973, Ser. No. 368,349

Int. Cl. B63h *5/00*

U.S. Cl. 115—70 **4 Claims**



1. An exposed passenger water vehicle comprising a relatively light main body hull, having upper portions of curvilinear cross sections transverse to a longitudinal axis, the hull having a relatively small cross sectional and elongated forward section and a relatively large cross sectional and short rearward section joined by a thin lower central section on which an occupant's seat is positioned, the forward section having a relatively rectangular cavity extending downward from an upper surface of the section for receiving a similar shaped gas tank, means for mounting an outboard engine housing within the rear section, whereby a drive shaft and propeller of the engine extend downward from the rear section, turnable steering means extending upward and rearward from the front portion and turnable shaft means extending downward and forward into the front section from the turnable steering means and connecting means extending rearward from the shaft to the rear section for turning the outboard engine and thereby steering the vehicle, a front strut extending downward from the front section, and a rear strut extending downward from the rear section, and a relatively heavy ski extending fore and aft from lower ends of the struts and rigidly secured thereto, and keel means extending rearward along a central, after portion of the bottom surface of the ski.

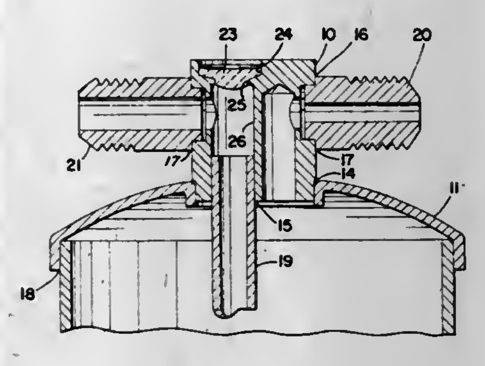
3,888,205
ARTICLE HAVING A SIGHT GLASS AND METHOD OF MAKING THE SAME

Julius M. Vitticore, Clyde, N.Y., and David N. Mooney, Moreland Hills, Ohio, assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Nov. 12, 1973, Ser. No. 415,178

Int. Cl. C03c *27/02*

U.S. Cl. 116—117 C **8 Claims**



1. The method of fusing a glass disk to a metal part comprising the steps of providing the metal part with a bore, an opening and a counterbore, the opening being between and intersecting the bore and the counterbore and smaller in diameter than either so as to form a first transverse surface between the opening and the bore and a second transverse surface between the opening the counterbore, providing a glass disk having a diameter slightly smaller than the counterbore, placing the glass disk within the counterbore, supporting said part in a position with the counterbore above the opening, and subjecting the glass disk to heat sufficiently high to soften the glass so that it will flow downwardly by gravity into the opening into engagement with the wall thereof and be limited in such downward flow by cohesive forces in the glass that substantially prevent the glass from flowing radially outwardly along said first transverse surface and whereby a portion of the softened glass disk will remain in the counterbore and gravity will cause it to flow radially outwardly into contact with the wall of said counterbore and become fused thereto.

7. An article of manufacture comprising a metal part having a bore, an opening, and a counterbore, the opening being between the bore and counterbore and smaller in diameter than either and being about one-half the diameter of the counterbore, a first transverse surface between the bore and opening having a radial width of at least 0.020 inch and intersecting the opening at a corner of substantially no more than 0.005 inch brake and making an angle with the wall of said opening of no more than about 90°, a second transverse surface between the opening and a circumferential wall of the counterbore and lying in a cone, and a glass disk in said counterbore and opening and fused to the circumferential walls thereof and to said second transverse surface, the disk extending to said first transverse surface but not appreciably radially overlapping the same, and said disk where fused to said counterbore circumferential wall having a meniscus also fused to said counterbore circumferential wall, the meniscus being on the side of the disk remote from said opening and axially spaced from the end of the counterbore remote from the opening.

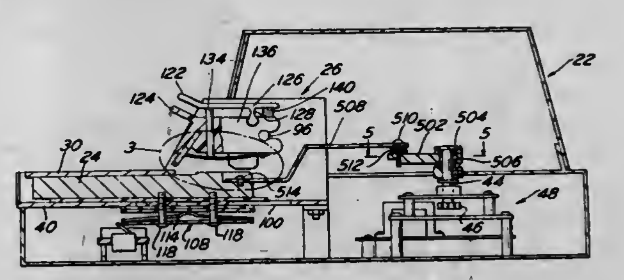
3,888,206
AUTOMATIC BLOOD SMEAR DEVICE WITH VIBRATION DAMPING MEANS

Albert A. Faulkner, Conshohocken, Pa., assignor to Geometric Data Corporation, Wayne, Pa.

Filed Aug. 29, 1974, Ser. No. 501,719

Int. Cl. B05c *11/04*

U.S. Cl. 118—100 **9 Claims**



1. In a smearing device for slides including holding means for supporting a slide, spreading means in contact with the slide and translation means for causing relative linear movement between the slide and the spreading means, said translations means including a motor rotating a shaft, the improvement comprising a linkage assembly for converting the rotation of the shaft to linear relative movement between the slide and the spreading means, said linkage assembly comprising a crank arm coupled to said holding means and freely rotatable on said shaft, bracket means fixedly secured to said shaft and adapted for applying a force to the arm at a point thereon to cause the arm to rotate as the shaft rotates and shock absorbing, resilient means located between said bracket and said arm at said point.

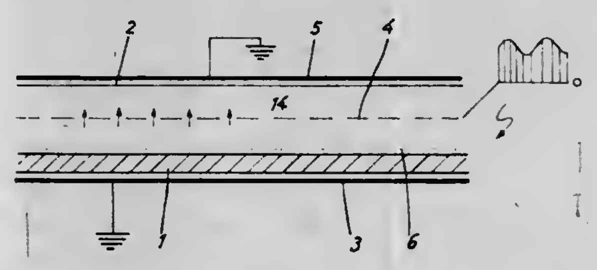
3,888,207
DEVICE FOR COATING OBJECTS WITH PULVERIZED OR GRANULAR PARTICLES OR FLAKES OR FIBRES

Erwin Stutz, Wetzgauerstrasse, Mutlangen, and Hugo Brennenstuhl, Seestr. 1-3, Tübingen-Pfrondorf, both of Germany

Filed July 24, 1972, Ser. No. 274,614

Int. Cl. B05c *5/02*

U.S. Cl. 118—621 **10 Claims**



1. A device for coating objects with small particles on a collecting element which comprises an insulating support means for such particles, means to agitate particles on the support, a first electrode member on one side of said support means, a counter-electrode member on the other side of the support means from said first electrode member, said counter-electrode member having spaces therethrough, said agitating means comprising means to create a first alternating current electrostatic field between the first electrode member and the counter-electrode member to displace particles from said support means, and means to create a second electrostatic field between the counter-electrode member and a collecting element on the opposite side of the counter-electrode member from the support means, said last means comprising means to charge said counter-electrode member and said collecting element with different potentials, whereby to deposit particles from said support means on such collecting element.

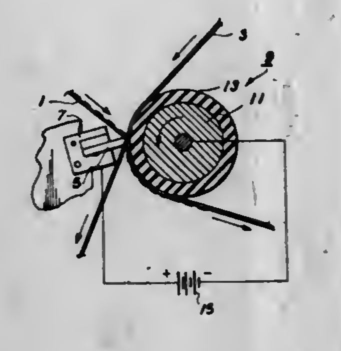
3,888,208
IMAGE TRANSFER PROCESS

Robert E. Gerace, Fairport; William L. Gary, Lyons, and Charles J. Hull, Jr., Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 28, 1973, Ser. No. 429,247

Int. Cl. G03g *13/16*

U.S. Cl. 118—637 **10 Claims**



1. An image transfer device which comprises an electrically conductive round tip blade in juxtaposition to an electrically conductive backup roller adapted to accept under pressure an image bearing medium and an image receiving medium therebetween, means to apply an electrical bias between said blade and said roller, said tip having a radius of from about 0.05 inches to about 0.1 inches, said blade being mounted at an angle to the horizontal plane of the axis of said roller and said roller and media being driven in the same direction.

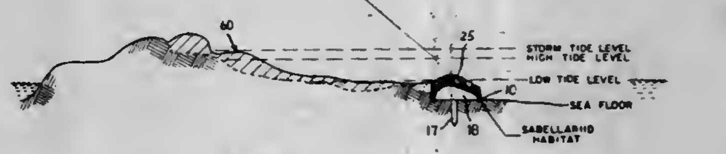
3,888,209
ARTIFICIAL REEF

Edmund R. Boots, 2310 Ocean Dr., Vero Beach, Fla. 32960

Filed Nov. 14, 1973, Ser. No. 415,690

Int. Cl. A01k *61/00;* E02b *3/04*

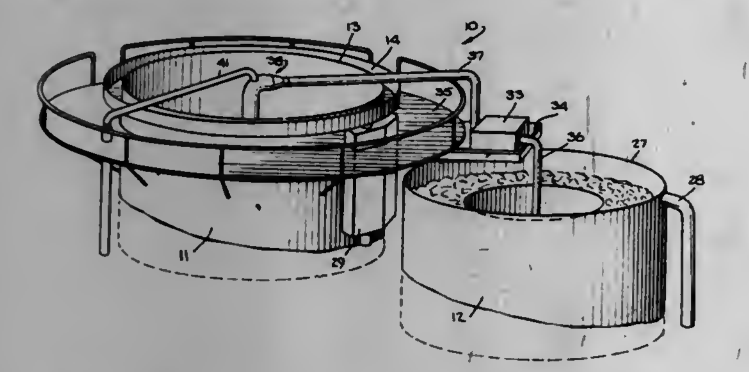
U.S. Cl. 119—1 **4 Claims**



1. A method for protecting a shoreline against undesirable erosion by positioning an artificial reef offshore to serve as a favorable habitat for sabellariid marine organism, comprising the steps of submerging a plurality of solid one-piece base reefs substantially end-to-end on the seabed adjacent and oblique to the shoreline, such that one end of the artificial reef is closer to the shoreline than the other end, each of said base reefs having an upper crown portion and a pair of spaced depending sidewalls each forming a substantially continuous interface surface extending from the seabed to the top of said reef, the lower ends of said sidewalls being adapted to be set on the seabed to define a chamber extending the length of the base reef between the seabed and the interior surface area of said sidewalls and said crown, said base reefs having an opening into said chamber in said crown to provide access to the chamber for sand and water, the mean water level relative to the seabed at the points of placement of said base reefs being no less than the height of the artificial reef, and permitting the sabellariid organisms to form an upper reef on said base reefs.

3,888,210
FISH HUSBANDRY SYSTEM UTILIZING AT LEAST PARTIAL RECIRCULATION OF WATER

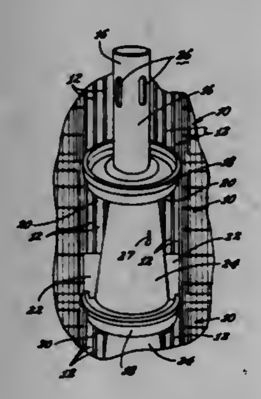
Keen W. Buss, Boalsburg, Pa., assignor to Marine Protein Corporation, Londonderry, Rockingham, N.H.
Continuation-in-part of Ser. No. 228,016, Feb. 22, 1972, abandoned. This application Feb. 28, 1974, Ser. No. 446,970
Int. Cl. A01k *63/00*
U.S. Cl. 119—3 **10 Claims**



1. Apparatus for intensive rearing of fish in a controlled environment for human consumption utilizing reuse of the water comprising at least one vertically extending fish rearing tank adapted for bottom to top relatively uniform substantially laminar upward water flow having an exit water overflow trough around its upper portion, means associated therewith including a reconditioning tank having an outer wall, an inner filtrate compartment, and an interstitial filter compartment defined by said filtrate compartment and said outer wall and containing filtration media therein, said filter compartment having respective inlet and exit means, first water conduit means interconnecting said overflow trough with said inlet means, said exit means communicating with said filtrate compartment, second water conduit means interconnecting said filtrate compartment with said rearing tank, pump means associated with said second water conduit means for pumping reconditioned water from said filtrate compartment to said rearing tank, oxygenation hood means disposed in said rearing tank having an upper inlet means and a lower exit means disposed adjacent the bottom interior portion of said tank, fresh water conduit means and said second water conduit means connected to said hood inlet means and degasification chamber means interposed in said first water conduit means for removing gaseous contaminants from said exit water.

3,888,211
POULTRY RAISING SYSTEM AND PROCESS

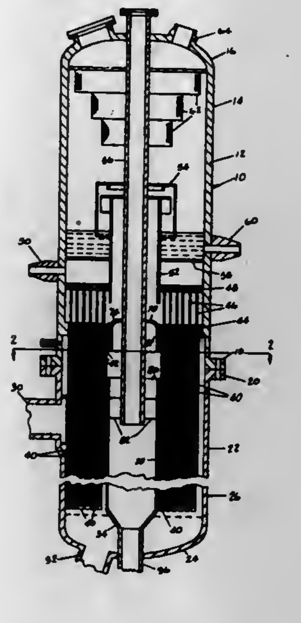
John A. Allen, 1674 Valley High, Thousand Oaks, Calif. 91360
Continuation-in-part of Ser. No. 230,838, March 1, 1972, abandoned, which is a continuation-in-part of Ser. No. 179,890, Sept. 13, 1971, abandoned. This application Jan. 23, 1974, Ser. No. 435,807
Int. Cl. A01k *39/00*
U.S. Cl. 119—18 **23 Claims**



1. Growth apparatus for fowl, or the like, comprising:
a container having tiers of enclosed compartments disposed vertically above one another;
vertical feed tube means extending between said tiers and having feed openings therein at levels corresponding to the interior of the individual compartments;
a plurality of feed trays;
first support means for supporting said feed tube means and said trays coaxially with respect to each other, with said trays being spaced along said feed tube means and under respective ones of said openings in said feed tube means, to receive feed from the interior of said feed tube means through said openings;
a corresponding plurality of silo members and;
second support means for supporting said silo members coaxially circumjacent said tube means and surrounding respective ones of said feed openings, with the lower edges of said silo members spaced up from the bottom of the corresponding ones of said trays; and
each of said trays having a dish-shaped configuration and including an upstanding peripheral rim surrounding the lower edge of the corresponding silo member.

3,888,212
LIQUID METAL STEAM GENERATOR

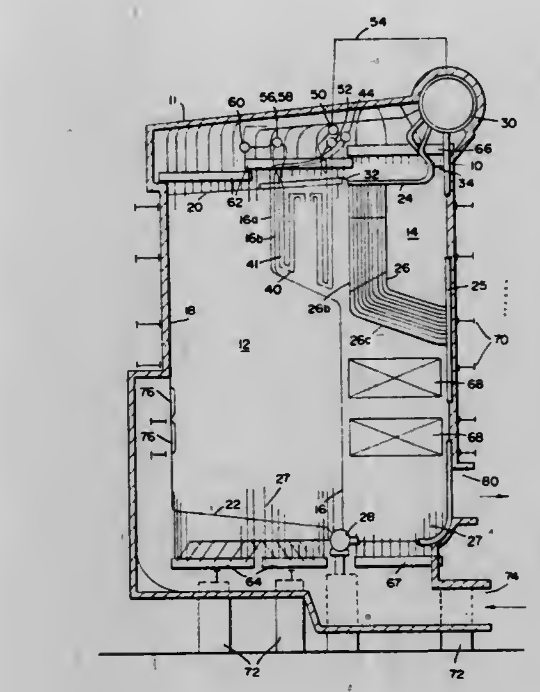
Walter Wolowodiuk, New Providence, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J.
Filed Oct. 24, 1972, Ser. No. 300,012
Int. Cl. F22b *1/06*
U.S. Cl. 122—32 **7 Claims**



1. A liquid metal heated heat exchanger wherein said liquid metal is the primary fluid and the secondary liquid is water which will react violently with the liquid metal if it should contact the metal, comprising:
an inner cylinder;
an outer cylinder coaxial with and encircling said inner cylinder, the top of said outer cylinder being higher than the top of said inner cylinder;
a primary fluid inlet for admitting fluid in the upper portion of the space between the inner cylinder and said outer cylinder;
a primary fluid outlet for allowing said primary fluid to pass out of the annular space between said inner cylinder and said outer cylinder;
heat exchange tubes for carrying secondary fluid to be heated by said primary fluid, said heat exchange tubes extending parallel to said inner cylinder and said outer cylinder in the annular space between said inner cylinder and said outer cylinder;
a relief pipe extending down into said inner cylinder, the bottom of said pipe being below the top of said cylinder;
a centrifugal separator positioned in the annular space between said relief pipe and said inner cylinder;
whereby in the event of a failure of one of said heat exchange tubes resulting in a reaction between said primary fluid and said secondary fluid, the products of said reaction will flow upwardly over the top of said inner cylinder and then downwardly through said cylindrical separator so that the heavier products of said reaction will be thrown outwardly and against said inner cylinder and the gaseous products of said reaction will be in the central portion of said inner cylinder to be free to move upwardly through said relief pipe.

3,888,213
BOILERS

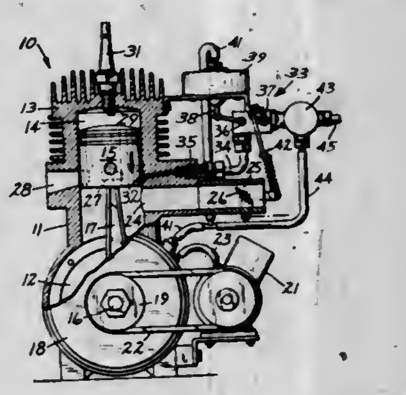
Nuri Uygun Akturk, Cheltenham, and Ronald Arthur Ashdown, Redhill, both of England, assignors to Foster Wheeler Corporation, Livingston, N.J.
Filed Mar. 15, 1974, Ser. No. 451,711
Claims priority, application United Kingdom, Mar. 15, 1973, 12617/73
Int. Cl.^{2} F22G *7/14;* **F22D** *1/02*
U.S. Cl. 122—478 **7 Claims**



1. A natural circulation steam boiler comprising:
a furnace enclosure,
water tube walls defining said furnace enclosure, said walls having upper and lower ends,
an upper steam drum,
tube means connecting said upper ends to said steam drum, a lower distribution header,
tube means connecting said lower distribution header and said lower ends,
downcomer tubes extending between said drum and said header, and,
a convection bank of evaporating tubes, said tubes being connected directly to said downcomer tubes at locations on said downcomer tubes between said drum and said header,
whereby the provision of a lower water drum in said steam boiler is obviated.

3,888,214
FUEL INJECTION SYSTEM FOR TWO CYCLE ENGINE

Gerald D. Reese; Gerald G. Shank, both of Roseau, and Lowell D. Carlson, Pencer, all of Minn., assignors to Textron Inc., Providence, R.I.
Division of Ser. No. 58,431, July 27, 1970, Pat. No. 3,707,143. This application June 1, 1972, Ser. No. 258,805
Int. Cl. F02b *15/00;* **F02m** *69/10*
U.S. Cl. 123—32 A **10 Claims**



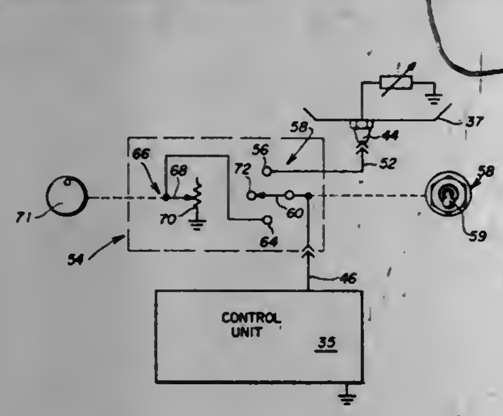
1. A method of low pressure injection of ignitable fuel under the combustion chamber of an internal combustion engine operable through cycles of intake,. compression, combustion and exhaust and which includes piston means sealably movable to vary the volume of the combustion chamber, means for supplying air to the combustion chamber during the intake cycle and means for exhausting combustion gases from the combustion chamber during the exhaust cycle, comprising:
a. supplying to and accumulating a discrete quantity of fuel sufficient to produce engine combustion in a storage cavity the entirety of which is sufficiently close to the combustion chamber to permit free and instantaneous discharge of the entire quantity of fuel therefrom into the combustion chamber, said quantity of fuel being supplied and accumulated at a time other than during the intake cycle;
b. blocking fluid communication between the combustion chamber and the storage cavity for a time other than during the intake cycle;
c. establishing fluid communication between the combustion chamber and the storage cavity during the intake cycle to release the entire accumulated quantity of fuel from the storage cavity and permit free and instantaneous discharge into the combustion chamber;
d. and supplying air to the combustion chamber separately from the accumulation of said quantity of fuel, said quantity of fuel and air being subsequently mixed in the combustion chamber for ignition and combustion therein.

3,888,215
FUEL-AIR MIXTURE CONTROL

Paul E. Maier, 3817 Runnels, Fort Worth, Tex. 76106
Filed July 16, 1973, Ser. No. 379,611
Int. Cl. F02b *3/00*
U.S. Cl. 123—32 EA **1 Claim**

1. In combination with a fuel injection system for a vehicle engine of the type wherein a temperature responsive variable resistance transducer is placed in contact with the engine, the transducer varies in resistance and is connected to a fuel control means to vary the amount of fuel injected into the engine in response to the temperature of the engine, the improvement which comprises:
a. a variable resistor means adjustable within the operating range of said transducer;
b. triple throw switch means which when engaged can selectively:
  1. connect said variable resistor means to said control means whereby the operator of the vehicle may manipulate the variable resistor means to control the amount of fuel injected into the engine,

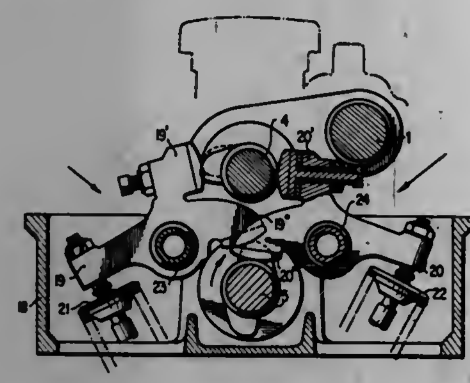
2. connect said transducer to said control means, and
3. disconnect said control means and said variable resistor means from said transducer whereby starting of the engine is prevented; and



c. said variable resistor means and said switch means are positioned on said vehicle so that the operator thereof can manipulate said variable resistor means and said switch means while operating said vehicle.

3,888,216
SYSTEM FOR THE CONTROL OF THE INTAKE AND EXHAUST VALVES OF INTERNAL COMBUSTION ENGINES

Stevan Miokovic, Paris, France, assignor to Regie Nationale des Usines Renault and Societe dite: Automobiles Peugot, France
Filed Oct. 2, 1973, Ser. No. 402,917
Claims priority, application France, Dec. 1, 1972, 72.42860
Int. Cl. F01l *1/34*
U.S. Cl. 123—90.15 **4 Claims**

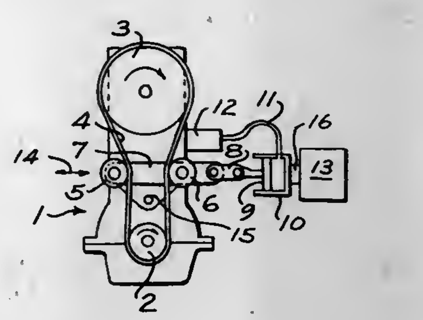


1. A system for the control of the intake and exhaust valves of internal combustion engines which permits the automatic variation, during engine operation, of valve overlap and the respective open angles thereof comprising, in conjunction with engine intake and exhaust valves:
two camshaft means for respectively lifting and closing said engine intake and exhaust vauves;
said camshafts having mutually adjustable timing means for adjusting the timing angles of said valves; and
a pair of rocker arms operated by said camshafts, and each of said rocker arms having two cam follower means thereon for respectively contacting cam means upon each of said camshafts.

3,888,217
CAMSHAFT BELT DRIVE FOR VARIABLE VALVE TIMING

Charles A. Hisserich, 447 Cabrillo St., Costa Mesa, Calif. 92627
Filed Sept. 24, 1973, Ser. No. 400,125
Int. Cl. F01l *1/02*
U.S. Cl. 123—90.31 **2 Claims**

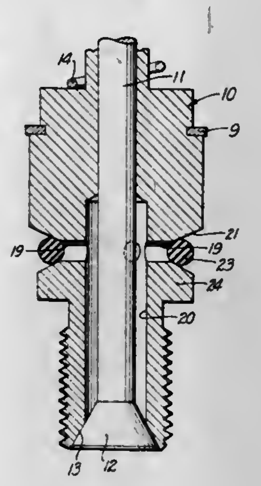
1. In an internal combustion engine having a crankshaft and a camshaft, toothed pulleys on each said shaft and a timing belt having internal teeth connecting said pulleys and having excess length;
a pair of idler pulleys bearing against intermediate free portions of said belt to take up said excess length;
a displaceable yoke carrying said idler pulleys; and
means to displace said yoke to vary the angular relation between said toothed pulleys and thereby vary the valve timing of said engine,



said means comprising a vacuum-responsive element and a speed-responsive element adapted to produce linear displacements and both connected mechanically in series to said yoke to thereby displace said yoke as a function of the sum of their individual displacements,
whereby said valve timing is varied as a function of both speed and of intake manifold vacuum.

3,888,218
COMPRESSION RELEASE FOR MOTORCYCLE ENGINES

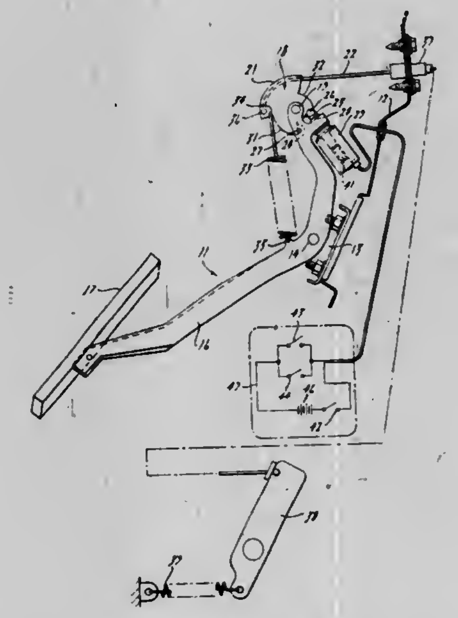
Everett D. Bonewitz, Santa Fe Springs, Calif., assignor to Victor Plastics, Inc., Santa Fe Springs, Calif.
Filed Dec. 26, 1973, Ser. No. 428,040
Int. Cl. F01l *13/08*
U.S. Cl. 123—97 B **8 Claims**



1. In a compression release for an internal combustion engine of the type having a body with a chamber therein connected to the engine, a valve member operable to open and close the connection between said chamber and engine, and at least one outlet opening in said body for venting gases passing into said chamber from the engine when said valve member is open, the improvement comprising a resilient high temperature and corrosion resistant annular O-ring overlying said outlet opening, said O-ring being mounted in a complementary groove extending around the outer periphery of said body, said outlet opening intersecting the inner most portion of said groove, said O-ring normally sealing off said outlet opening to prevent contaminants from entering said chamber, said O-ring and groove being constructed and arranged so that said O-ring is movable outwardly under the sudden application of high pressure from gases moving into said chamber when said valve member is open without said o-ring becoming unseated from said groove, said O-ring automatically flexing back to its normal position sealing said outlet opening when the pressure in said chamber is removed, said O-ring acting as a check valve to prevent the reverse movement of gases and impurities into said engine.

3,888,219
THROTTLE LINKAGE INCLUDING AN OVERSPEED PROTECTIVE DEVICE

Jerry B. Rogerson, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed June 10, 1974, Ser. No. 478,020
Int. Cl. F02d *11/04*
U.S. Cl. 123—97 R **13 Claims**

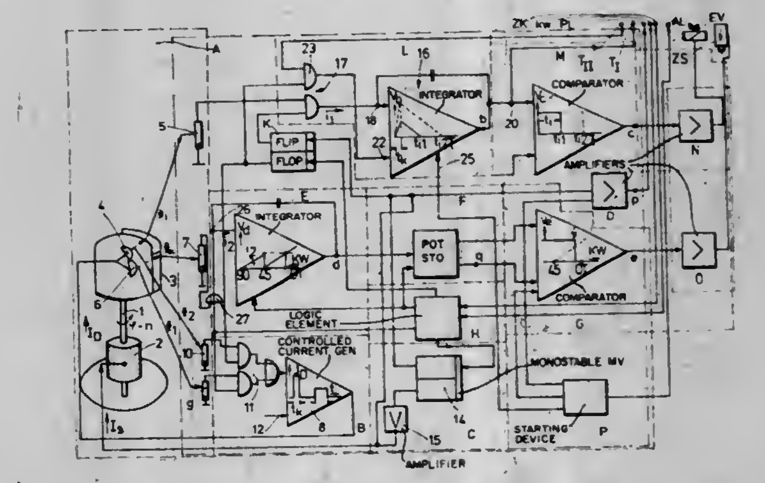


1. A linkage for the operation of a remote element including:
an actuating lever,
a fulcrum means pivotally supporting said actuating lever for movement about a first axis,
a pulley mounted on said lever for pivotal movement about a second axis spaced from said first axis,
a flexible linkage means interconnecting said pulley and the remote element,
spring means biasing said pulley toward a normal position,
latch means locking the pulley in said normal position relative to said lever,
said latch means being releaseable to permit said pulley to rotate relative to said lever when the tension of said flexible linkage exceeds that of said spring means.

3,888,220
INTERNAL COMBUSTION ENGINE PERFORMANCE CONTROL SYSTEM

Erhard Bigalke, Wolfsburg; Dietrich Radmann, Flechtorf; Erwin Klein; Rainer Melichar, both of Regensburg, and Kurt Biedermann, Stallwang, all of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany
Filed Aug. 28, 1973, Ser. No. 392,188
Claims priority, application Germany, Aug. 29, 1972, 2242477
Int. Cl. F02p *5/08*
U.S. Cl. 123—117 R **31 Claims**

1. A performance control system for a spark-ignited, internal combustion engine that uses at least two operating parameters of the engine for adjustment of the engine ignition spark advance, the ignition advance being dependent upon at least one characteristic performance curve of values that vary as a function of the operating parameters, said system comprising, in combination:
a. information storage means for storing the characteristic performance curve values;
b. information receiver means, connected to said storage means and responsive to the operating parameters, for extracting from said storage means a curve value associated with specific operating parameter values and producing an electrical signal having an amplitude related to said determined curve value;
c. analyzer means connected to said information receiver means for receiving said signal and producing electrical pulses having duration times related to said signal amplitude, said analyzer means including:
  1. integrator means for receiving said signal during a predetermined crankshaft angle of rotation and producing an integrated voltage output;



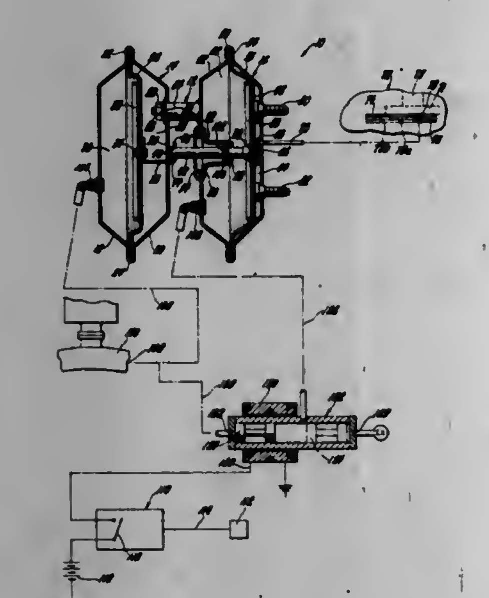
  2. time-controlled storage means, connected to said integrator means, for storing said integrated voltage output; and
  3. comparator means connected to said time-controlled storage means for receiving and comparing said integrated voltage output to an increasing voltage signal of predetermined slope beginning at the end of said predetermined crankshaft angle of rotation, and producing an electrical pulse when said increasing voltage signal equals said integrated voltage output; and
d. control means connected to said analyzer means for triggering said engine ignition in response to said electrical pulse.

3,888,221
CONSTANT SPEED RESPONSIVE SPARK CONTROLLER

Thomas A. Stacey, Jr., Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Apr. 25, 1974, Ser. No. 463,877
Int. Cl. F02p *5/08*
U.S. Cl. 123—117 A **4 Claims**

1. A spark advance controller for the ignition distributor in an internal combustion engine having a contact set carried by a movable breaker plate to adjust the contact set with respect to distributor cam means to control the spark advance from the distributor to spark plugs for igniting a combustible air-fuel mixture in the cylinders of the internal combustion engine comprising: main vacuum operator means including a movable diaphragm defining a main vacuum chamber, boost vacuum operator means including a second movable diaphragm forming a boost vacuum chamber, each of said main and boost vacuum chambers including a signal port thereto, means for communicating said main vacuum chamber port with the intake manifold of an internal combustion engine, a distributor spark advance lever having first and second control positions for producing a staged advance of a spark from a distributor, coupling means for connecting said spark advance lever to each of said first and second movable diaphragms, said first movable diaphragm and said coupling means being responsive to reduced intake manifold pressure produced during engine operation to move said advance lever into its first control

position to effect a first spark advance from the engine distributor, and signal producing means for directing a boost vacuum signal to said boost vacuum chamber upon the occurrence of a constant vehicle speed to operate said coupling means to move said distributor lever into its second control position thereby to produce a further advance of spark under road load, constant vehicle speed conditions to produce a resultant improvement in fuel economy without engine detonation.



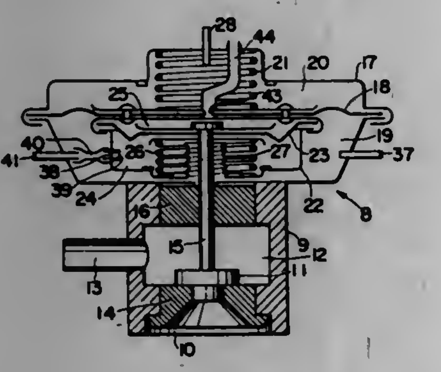
3,888,222
EXHAUST GAS RECIRCULATION
Tsutomu Tomita, Okazaki, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Aug. 20, 1974, Ser. No. 499,090

Claims priority, application Japan, Oct. 2, 1973, 48-110194

Int. Cl. F02m *25/06*

U.S. Cl. 123—119 A **3 Claims**



1. A system for controlling recirculation of exhaust gases from an exhaust manifold to an intake manifold in an internal combustion engine, a throttle valve of the engine being provided upstream of the intake manifold, comprising, in combination:

a recirculation passage connected between the exhaust manifold and the intake manifold;

a valve disposed in said recirculation passage including a valve member disposed such that the volume of gases flowing in said recirculation passage is proportional to the displacement of said valve member;

a first diaphragm box, said first diaphragm box being divided by a first diaphragm into a first diaphragm chamber and a second diaphragm chamber, means communicating said first diaphragm chamber with the surrounding atmosphere and means communicating said second diaphragm chamber with said intake manifold upstream of the throttle valve;

a second diaphragm box attached to said first diaphragm, said second diaphragm box being divided by a second diaphragm into a third diaphragm chamber in communication with the surrounding atmosphere and a fourth diaphragm chamber in communication with the intake manifold downstream of the throttle valve, displacement of said first diaphragm in a first direction being caused by vacuum pressure admitted in said second chamber, and displacment of said second diaphragm in an opposite direction being caused by vacuum pressure admitted into said fourth diaphragm chamber; and

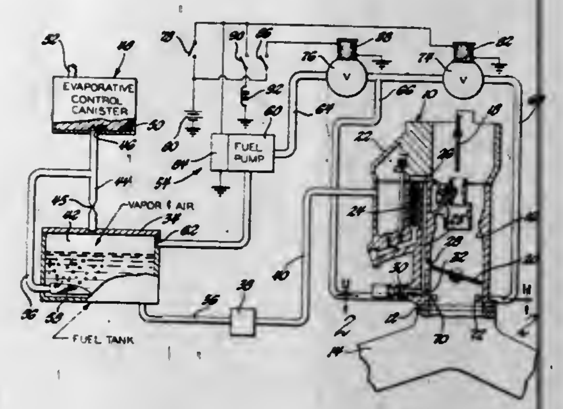
means connecting said second diaphragm to said valve member such that the degree of opening of said recirculation passage due to displacement of said valve member increases with displacement of said first diaphragm and decrease with displacement of said second diaphragm, whereby recirculation of exhaust gases varies in response to engine operating conditions.

3,888,223
CARBURETOR ENRICHMENT SYSTEM
James R. Mondt, Pontiac, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 12, 1974, Ser. No. 460,507

Int. Cl. F02m *17/08;* **F02b** *77/00;* **F02n** *17/00*

U.S. Cl. 123—136 **5 Claims**



1. A gasoline vapor carburetor enrichment system for association with a carburetor having a bore therethrough with one open end adapted to be connected to an air cleaner and an opposite open end adapted to supply an air-fuel mixture to the intake manifold of a vehicle and including a throttle valve located above the intake manifold for regulating air-fuel flow into the intake manifold comprising: a plurality of vapor ports in said carburetor bore below said throttle plate, a gasoline tank having a vapor space therein and a vent conduit therefrom, a canister including means for adsorbing fule vapors, said canister including an atmospheric vent and an inlet in communication with said vent conduit to receive fuel vapors from the tank and to adsorb said vapors within said canister, means for withdrawing vapors from said tank and said canister for a predetermined time prior to engine cranking for discharge through said plurality of vapor ports under engine start conditions to produce a precharge of vaporized fuel and air in the intake manifold to improve engine ignition under cold start conditions, said means for withdrawing vapors from said tank and said canister for discharge through said ports being operative to reduce the flow of vapor and air to said ports upon engine ignition, and means responsive to a predetermined increase in engine temperature to terminate flow of vapors from said gasoline tank and said evaporated canister to said ports.

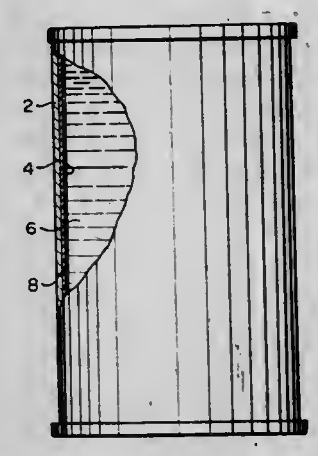
3,888,224
LIQUID FOOD PRESERVATION
Akira Okuhara; Masatoshi Saiki, both of Noda, and Nobuo Saito, Naygareyama, all of Japan, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Continuation-in-part of Ser. No. 17,059, March 6, 1970, abandoned. This application Oct. 26, 1972, Ser. No. 300,979

Claims priority, application Japan, May 30, 1969, 44-41653; Dec. 19, 1969, 44-101612

Int. Cl. B65d *25/14, 25/34*

U.S. Cl. 426—126 **18 Claims**



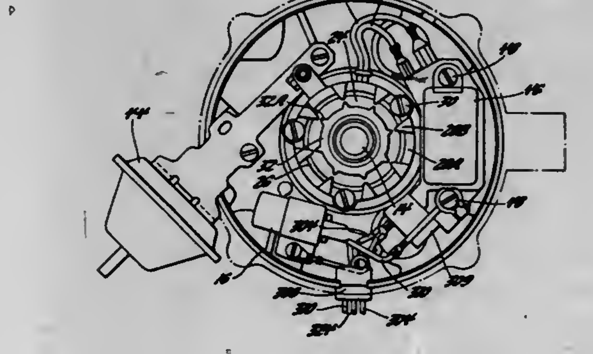
1. A metallic container containing melanoidin-containing liquid food and suitable for preserving and decolorizing melanoidin-containing liquid food contained therein, said container having an intermediate coating consisting of non-metallic material which covers all the interior surface of said container and an interior coating thereon of at least one metal selected from the group consisting of Al, Mn, Mg, and Zn, said metal being in direct contact with the melanoidin-containing liquid food.

3,888,225
INTERNAL COMBUSTION ENGINE IGNITION CONTROLLER
James A. Boyer, Anderson, and Charles L. Dusenberry, Chesterfield, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 26, 1973, Ser. No. 401,043

Int. Cl. F02p *1/00*

U.S. Cl. 123—148 E **10 Claims**



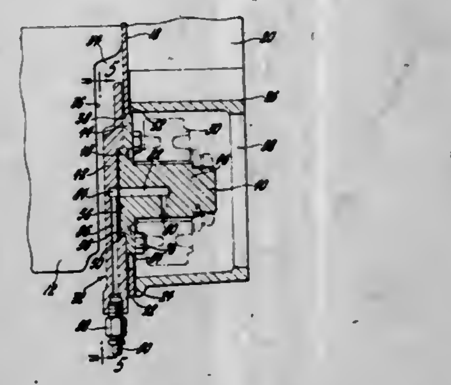
1. An ignition controller for an internal combustion engine comprising, a base member, a magnetic pick-up supported by said base member comprising, a pick-up coil and a permanent magnet, a rotor formed of magnetic material rotatable with respect to said base member, a magnetic circuit providing a path for flux linking said pick-up coil comprising said rotor and permanent magnet and including at least one air gap which varies as a function of rotor position whereby an alternating control voltage is induced in said pick-up coil when said rotor is rotated, an ignition coil supported from said base member spaced from said magnetic pick-up, said ignition coil having a magnetic core provided with an air gap, said core carrying the primary and secondary windings of said ignition coil, and ignition control means comprising a switching means, means connecting said pick-up coil and said switching means for causing said switching means to be biased substantially conductive when said alternating control voltage has a first polarity and substantially non-conductive and said alternating control voltage has a second opposite polarity, means connecting said switching means and said primary winding whereby said primary winding is energized when said switching means is conductive and is substantially deenergized when said switching means is substantially non-conductive when said switching means and primary winding are operatively connected to a voltage source, said air gap of said core of said ignition coil being so positioned with respect to said magnetic circuit that the leakage flux developed during energization of said primary winding across the air gap of said ignition coil core is applied to said magnetic circuit in such a direction and magnitude as to aid the flux in said magnetic circuit provided by said permanent magnet in generating a voltage of said first polarity to thereby prevent false triggering of said control means by stray magnetic fields.

3,888,226
ENGINE ACCESSORY DRIVE SUPPORT
Michael A. Wallace, Pontiac, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 19, 1973, Ser. No. 417,263

Int. Cl. F02f *7/00;* **F02b** *77/14*

U.S. Cl. 123—195 A **2 Claims**



1. In combination, an internal combustion engine including accessory drive means and comprising

an engine block assembly having an end plate mounted on one end of said block, said end plate having an accessory drive mounting portion adjacent one edge of said block, and including an opening for receiving accessory drive gear support means, said block being stepped longitudinally adjacent said drive mounting portion so as to provide a limited space between said end plate and said block adjacent said portion and open on at least one side thereof,

a gear housing mounted on said end plate and defining therewith an enclosure for an engine timing and accessory drive gear train, said gear housing having an opening axially aligned with said end plate opening, said gear housing opening being adapted to permit installation of an optional accessory drive gear in said gear train without requiring removal of said gear housing,

a gear support member having a flange portion and a hub portion extending axially from said flange portion, said hub portion being adapted to receive such accessory drive gear for rotation thereon and including oil passage means extending to the surface of said hub portion to supply oil for lubricating such gear, said flange portion being received and piloted within said end plate opening to position said hub and such accessory drive gear with respect to said gear train, said support member further including a protruding pilot extending axially from said flange portion in the direction opposite said hub portion, said pilot including an external annular pilot diameter and said oil passage means extending through said support member to the end of said pilot,

a support mounting plate disposed in the space between said engine block and said end plate, said mounting plate including a circular recess having an annular internal pilot diameter engaging and piloted on said support member pilot, said mounting plate including oil passage means extending from said recess to an outer edge of said plate and connecting with said support member oil passage means to provide for the supply of oil thereto from an external source,

first means securing said mounting plate to said end plate, and

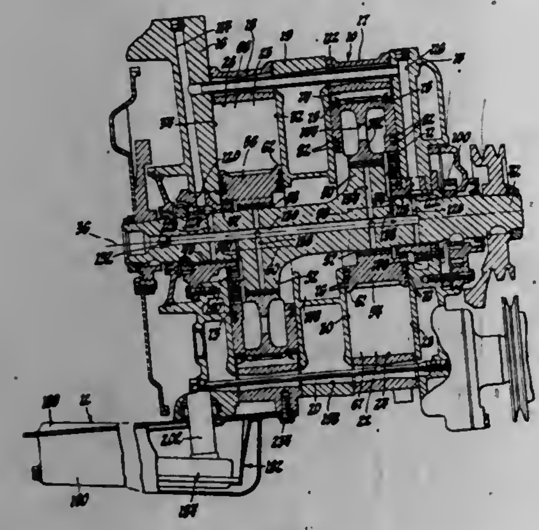
second means securing said support member to said mounting plate,

said mounting plate being sufficiently thin to permit installation in or removal from its location between said block and end plate without removing said end plate from said block, said support member flange width being smaller than said gear housing opening so as to permit installation or removal of said support member through said gear housing opening without removal of said gear housing from said end plate.

3,888,227
ENGINE OIL TANK

Raymond J. Green, Northville, and Paul D. Stevenson, Ann Arbor, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 15, 1974, Ser. No. 460,928
Int. Cl. F01m *1/10*
U.S. Cl. 123—196 R **6 Claims**

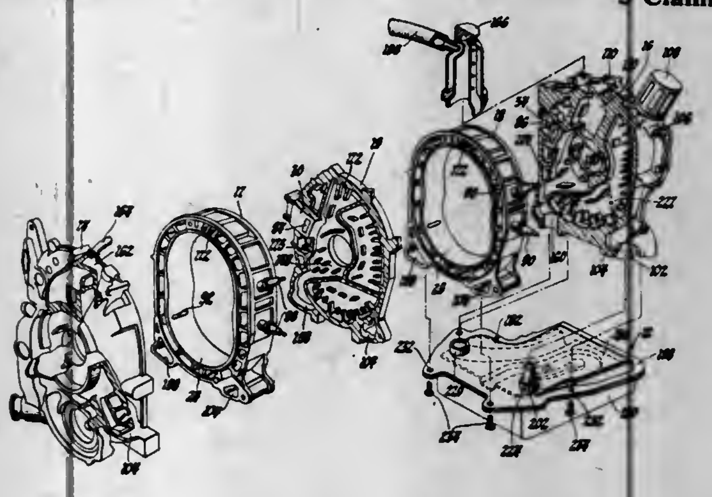


1. An oil tank for an engine that is normally used in a substantially horizontal position and is transported in a substantially vertical position, means for detachably securing said oil tank to said engine in an underneath location, said oil tank having a top and a bottom and at one end extending underneath the engine and at the other end projecting outward of the engine with said one end located downward and said other end located upward and above the engine when the engine is in the transporting position, said top having a drain-vent hole adjacent said one end of said oil tank providing a drain-vent passage for receiving oil draining from a first hole in the engine and also venting said oil tank to the engine, seal means for sealing said oil tank to the engine to prevent leakage from said drain-vent passage, said top further having a suction-vent hole adjacent said one end of said oil tank for communicating said oil tank with a second hole in the engine, suction passage means extending through said suctionvent hole and the second hole in the engine and also extending in said oil tank along said bottom a predetermined distance toward said other end of said oil tank to an opening and then turning and extending back toward said one end of said oil tank to an opening at said bottom at a location intermediate said ends of said oil tank where oil remains available during shifting of the oil level in said oil tank during engine operation whereby oil can be suctioned from said oil tank through said suction passage means to lubricate the engine during engine operation but is prevented from draining through said suction passage means to the engine when the engine is in the transporting position, said suction passage means and said top around said suction-vent hole defining an annular vent passage for also venting said oil tank to the engine, seal means for sealing said oil tank to the engine to prevent leakage from said vent passage, anti-drainback passage means in said oil tank connected to said drain-vent passage and extending along said top a predetermined distance toward said other end of said oil tank to an opening whereby oil is allowed to drain along a vented passage from said engine into said oil tank during engine operation but is prevented from draining back into the engine when the engine is located in the transporting position, and additional anti-drainback passage means in said oil tank connected to said vent passage and extending with a downward slope along said top a predetermined distance toward said other end of said oil tank and then turning and extending still with a downward slope back toward said one end of said tank to an opening at a location intermediate said ends of said oil tank above the highest normal oil level in said oil tank that occurs with shifting of the oil level in said oil tank during engine operation whereby venting of said oil tank is provided through said vent passage but oil is prevented from entering said vent passage during shifting of the oil level in said oil tank during engine operation and in addition oil is prevented from draining through said vent passage to the engine when the engine is in the transporting position.

3,888,228
ENGINE OIL TANK

Erkki A. Koivunen, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 15, 1974, Ser. No. 460,927
Int. Cl. F01m *1/10*
U.S. Cl. 123—196 R **3 Claims**

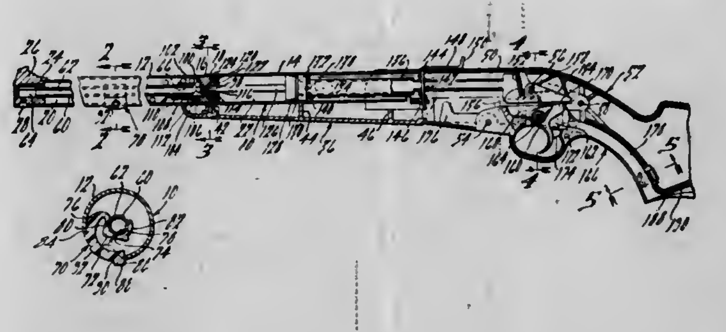


1. An oil tank, an engine, means for detachably securing said oil tank to said engine in an underneath location, said oil tank having a top and a bottom and at one end extending underneath the engine and at the other end projecting outward of the engine, said top having a drain-vent hole adjacent said one end of said oil tank providing a drain-vent passage for receiving oil draining from a first hole in the engine and also venting said oil tank to the engine, seal means for sealing said oil tank to the engine to prevent leakage from said drain-vent passage, said top further having a suction-vent hole adjacent said one end of said oil tank for communicating said oil tank with a second hole in the engine, suction passage means extending through said suction-vent hole and the second hole in the engine and also extending in said oil tank along said bottom a predetermined distance to an opening at said bottom at a location intermediate said ends of said oil tank where oil remains available during shifting of the oil level in said oil tank during engine operation whereby oil can be suctioned from said oil tank through said suction passage means to lubricate the engine during engine operation, said suction passage means and said top around said suction-vent hole defining an annular vent passage for also venting said oil tank to the engine, seal means for sealing said oil tank to the engine to prevent leakage from said vent passage, passage means in said oil tank connected to said drain-vent passage whereby oil is allowed to drain from said engine into said oil tank during engine operation, and additional passage means in said oil tank connected to said vent passage having an opening at a location intermediate said ends of said oil tank above the highest normal oil level in said oil tank that occurs with shifting of the oil level in said oil tank during engine operation whereby venting of said oil tank is provided through said vent passage but oil is prevented from entering said vent passage during shifting of the oil level in said oil tank during engine operation.

3,888,229
AIR GUN WITH ROTATABLE AMMUNITION LOADING DOOR

Earl L. Fischer, Bentonville, Ark., assignor to Victor Comptometer Corporation, Chicago, Ill.

Division of Ser. No. 54,354, July 13, 1970, Pat. No. 3,766,903. This application June 20, 1973, Ser. No. 371,731
Int. Cl. F41b *11/00;* **F41f** *1/04;* **F41c** *25/00*
U.S. Cl. 124—49 **5 Claims**



1. A gun for firing a projectile through a cylindrical bore in an elongated cylindrical barrel means comprising:

an elongated housing surrounding the cylindrical barrel means having a front end portion and a rear end portion and defined at least in part by a cylindrical wall having an inner cylindrical surface and defining a projectile storage chamber therebetween,

front end wall means mounted in said front end portion of said elongated housing providing a front end wall for said storage chamber,

rear end wall means mounted in said rear end portion of said elongated housing and providing a rear end wall for said storage chamber,

a projectile loading opening in said cylindrical wall intermediate said front end wall and said rear end wall of said elongated housing,

a loading door separate from said front and rear end wall means and axially spaced therefrom rotatably mounted within said housing circumjacent an intermediate portion of said barrel means between and in axially spaced relationship to said front end wall and said rear end wall,

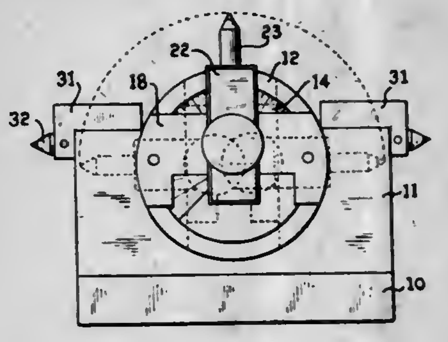
means rotatably supporting said loading door relative to said housing and said barrel means, and

said loading door having an outer cylindrical surface rotatably slidably supported by said inner cylindrical surface of said housing and being slidably rotatable relative to said housing and relative to said barrel means between a closed position and an open position relative to said loading opening.

3,888,230
GRINDING WHEEL ANGLE DRESSER

Wayne O. Fosbee, and Bruno J. Zapart, both of P.O. Box 1217, Hot Springs, Ark. 71901

Continuation-in-part of Ser. No. 342,821, March 14, 1973, abandoned. This application June 17, 1974, Ser. No. 479,700
Int. Cl. B24b *53/12*
U.S. Cl. 125—11 AT **6 Claims**



1. In a grinding wheel angle dressing tool having an upstanding wall plate, a ring bearing fixed in the wall plate, a rotatable carrier disk journaled in said ring bearing and locking means for selectively precluding rotatable movemtnt of said carrier disk, the improvement comprising

a cylinder block rigidly secured to the forward side of said disk and rotatable therewith,

said cylinder block extending transversely across said disk and a linear longitudinally extending slotted opening disposed along the underside of said cylinder block,

a reciprocally movable piston within said cylinder,

a U-shaped cutter holder movable with said piston, said cutter holder straddling said cylinder block from the forward side thereof,

the lower arm of said cutter holder being rigidly secured to the underside of said piston and extending forwardly in slidable engagement with the underside of said cylinder block and

the upper arm of said cutter holder extending rearwardly over and above the top of said cylinder block,

a manipulating handle projecting forwardly from the bight of said U-shaped cutter holder and

a grinding wheel cutter projecting outwardly from the upper arm of said cutter holder.

3,888,231
FIREPLACE FOR HEAT CONSERVATION AND DISTRIBUTION

Daniel T. Galluzzo, 3659 Fallston Rd., Jarrettsville, Md. 21084; Christopher G. Galluzzo, and Vincent Galluzzo, both of 1 Lakecliff Rd., Cockeysville, Md. 21030

Filed Mar. 4, 1974, Ser. No. 447,505
Int. Cl. F24b *7/00*
U.S. Cl. 126—120 **9 Claims**

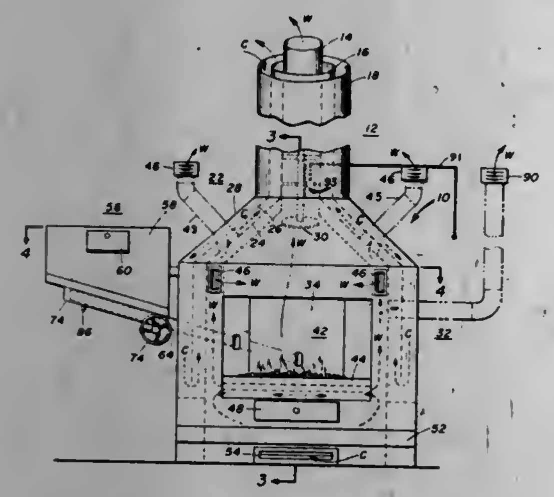
1. A fire place assembly for installation in a communicating relation with an environmental space in a structure such as a dwelling or the like, comprising:

firebox means having heat exchange surfaces thereon and in which a fuel is oxidized to generate heat;

means enclosing the firebox means in spaced relation thereto and cooperating therewith to define an air circulation chamber substantially therebetween;

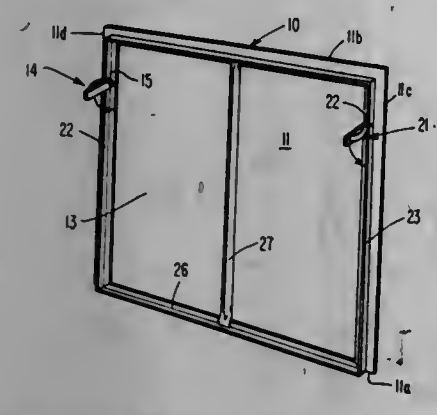
air intake means communicating the interior of the air circulation chamber with the aforesaid environmental space at a relatively low elevational level therein such that relatively cool air in said space is drawin into the air circulation chamber, the relatively cool air being heated therein on contact with the heat exchange surfaces on the firebox means, the air thus heated then being upwardly mobile to draw by way of a thermal suction effect additional relatively cool air into the air circulation chamber through the relatively low elevationally disposed air intake means;

air outlet means for distributing the heated air in the air circulation chamber to a desired point of use;
fuel hopper means disposed adjacent to said firebox means for introducing fuel contained in said hopper means into the firebox means, the fuel hopper means comprising
container means for holding the fuel, said container means having an opening in a lower portion thereof, and



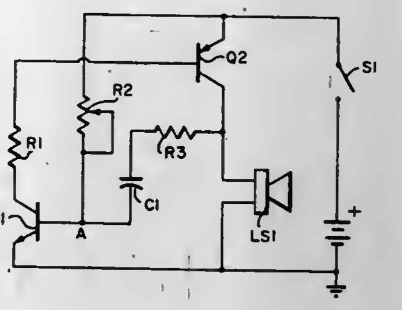
chute means disposed to receive fuel thereinto from the opening in the container means, the chute means being extendible into the interior of the firebox means through an opening therein to dispense fuel thereinto; and,
means for extending the chute means into the firebox means, said last-mentioned means comprising
rack means on the chute means, and
pinion means engageable with the rack means and moveable to advance the chute means into the interior of the firebox means.

3,888,232
FIREPLACE SHUTOFF
Clarence A. Le Brun, 693 Hidden Valley Rd., King of Prussia, Pa. 19406
Continuation of Ser. No. 455,626, Feb. 25, 1974, abandoned. This application July 17, 1974, Ser. No. 489,136
Int. Cl. F24c *15/28*
U.S. Cl. 126—140 **8 Claims**



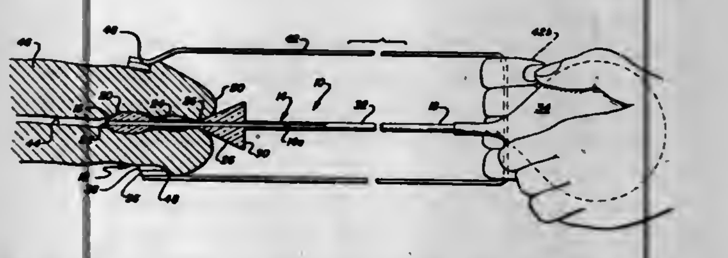
1. A fireplace shutoff device comprising:
a flat plate generally rectangular in shape and adapted to be moved toward and away from the opening of a fireplace whereby to cover and uncover the same;
at least one friction clip bracket disposed on the back side and adjacent one edge of said plate;
friction clip means displacably mounted on said clip bracket for movement between an operative position and an inoperative position, the clip means having mechanism providing for the same to be self-supporting in the operative position whereby to extend normal to the plate in position to engage the inside surface of the fireplace opening, the engagement providing for the clip means to be slidable over the surface to permit the plate to be moveable toward and away from the opening to cover and uncover the same and the engagement also providing for the clip means to exert sufficient pressure on the surface to hold the plate in position covering the opening and in the inoperative position the clip means being spaced away from the operative position so as to condition the device for storage and shipping purposes.

3,888,233
FIGURE WITH SIMULATED HEARTBEAT
H. Joe Ware, La Crescenta, Calif., assignor to Kamar Incorporated, Gardena, Calif.
Filed Jan. 17, 1974, Ser. No. 434,352
Int. Cl. A61b *19/00*
U.S. Cl. 128—1 C **5 Claims**



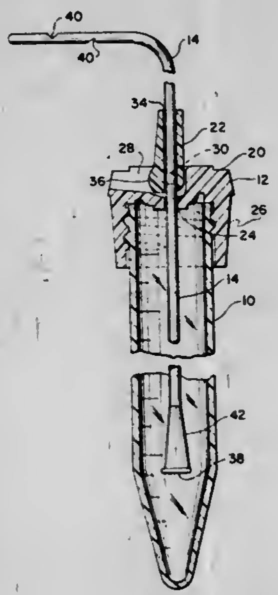
1. In a device having a body which simulates a living figure, the combination of means to emit an audible sound simulating a heartbeat in the figure, said means comprising an oscillator circuit whereby to produce electrical pulses of a predetermined duration and spacing and a speaker including a tranducer connected to produce audible sounds having a characteristic frequency and duration and a quality resembling heartbeats, said oscillator including a first transistor and a second transistor, resistors, a battery and switch means, circuit means including a capacitor and at least one of said resistors with a connection to the base of the first transistor for rendering said first transistor conductive upon charging of the capacitor, means whereby the conductance of the first transistor controls the conductance of the second transistor, circuit means between the second transistor and the said transducer to provide a first pulse to the transducer, and to oppositely charge the capacitor, and means to discharge said capacitor to render the first transducer non-conductive and to further discharge said capacitor to provide a further pulse in the transducer.

3,888,234
URETHROGRAM DEVICE
Samuel S. Clark, 592 Turner St., Glen Ellyn, Ill. 60137
Filed Sept. 11, 1972, Ser. No. 287,996
Int. Cl. A61b *5/02*
U.S. Cl. 128—2 R **2 Claims**



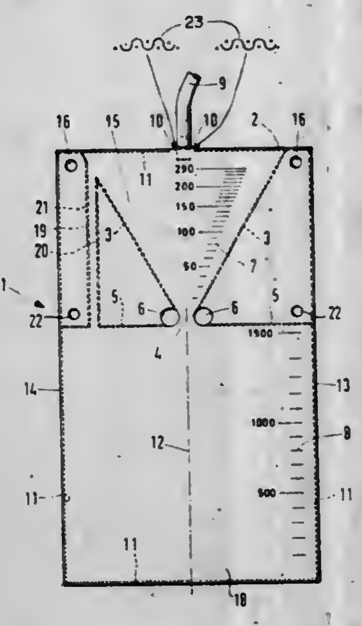
1. Apparatus for administering dye or the like to the urethra, comprising, in combination: an injection device which includes an elongate body having conduit means longitudinally therethrough and an outlet therein, said body having a distal end with said outlet disposed thereat and a proximal end, a first generally ovoid enlargement at said distal end and a second generally frusto-conical enlargement spaced slightly proximally from said first enlargement and defining therewith a reduced neck portion therebetween, a reservoir means at said proximal end of said body and spaced from said second enlargement by an elongate tubular portion which supports the reservoir means, said reservoir means being deformable for expelling a quantity of material therefrom and through the conduit means through said outlet, and clamp means including a clamp body portion of a size and shape for wrapping about the exterior of the penis and strap means extending outwardly from said clamp body portion for grasping during insertion of the distal end of said injection device into the penis for holding the injection device in place during the expulsion of dye into the urethra, said strap means being in the form of a strand extending generally transversely outwardly from said clamp body portion and terminating in a handle forming loop, said strand being of a length relative to said injection device so as to locate said loop adjacent said reservoir means when said clamp body portion is wrapped about the exterior of the penis and the distal end of said injection device is inserted into the urethra so that cooperative forces may be applied through said second enlargement and said clamp body portion in opposite directions facilitates maintaining said injection device in place during usage.

3,888,235
CATHETERIZATION KIT
Edwin A. May, Ridgewood, N.J.; Burton Salkin, Schaumburg, Ill., and Harold Paul McDonald, Jr., Memphis, Tenn., assignors to International Paper Company, New York, N.Y.
Filed Feb. 12, 1973, Ser. No. 331,595
Int. Cl. A61b *10/00;* **A61m** *25/00*
U.S. Cl. 128—2 F **13 Claims**



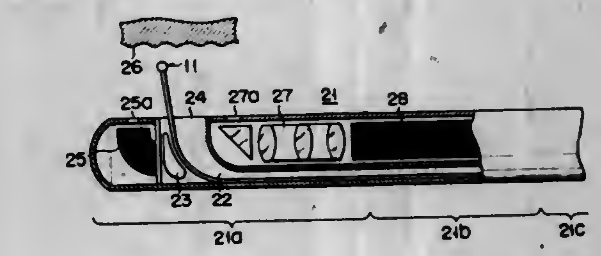
1. A catheterization kit for obtaining an uncontaminated sample of urine comprising:
- a. a urine collection receptacle, said urine collection receptacle including a vessel having a top opening, and a rigid top member closing said top opening, said top member including liquid sealing means that engage said vessel about the periphery of said opening, and an aperture that extends through said top member, said aperture permitting flow of fluid into and out of said receptacle;
- b. a catheter tube extending through said aperture of said top member, the distal end of said catheter including an opening for discharge of urine into said receptacle and terminating within said receptacle, said catheter tube slidably mounted in said aperture of said top member to permit removal of said catheter tube from said receptacle, the proximal end of said catheter terminating ouside said receptacle; and
- c. aperture sealing means mounted on said top member adjacent said aperture for closing said aperture after a sample of urine is obtained and after said catheter tube is removed from said receptacle.

3,888,236
APPARATUS FOR MEASURING A QUANITY OF URINE
Gunter Marx, Engadiner Str. 4, 8 Munich 71, Germany
Filed Mar. 28, 1973, Ser. No. 345,767
Claims priority, application Germany, Mar. 28, 1972, 7211842[U]
Int. Cl. A61b *5/10;* **A61f** *5/44*
U.S. Cl. 128—2 F **13 Claims**



1. A urine measuring and collecting container comprising two flat plastic sheets joined together by first weld seams to form said container, said container being divided into an upper measuring chamber and a lower collecting chamber by second weld seams joining said sheets together, said measuring chamber having the shape of an inverted cone defined by said second weld seams with the base positioned at the top of said container and the apex positioned above said collecting chamber, said measuring chamber having an opening in said base for receiving urine, said measuring chamber having indicia associated therewith for measuring the quantity of urine receive therein in a unit of time, the apex of said cone forming an outlet for transferring urine from said measuring chamber to said collecting chamber, and means associated with said outlet for enabling said outlet to be selectively closed.

3,888,237
PH-MEASURING DEVICE USED IN AN ENDOSCOPE
Toshiyuki Mori, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Oct. 15, 1973, Ser. No. 406,292
Int. Cl. A61b *5/05*
U.S. Cl. 128—2 E **6 Claims**



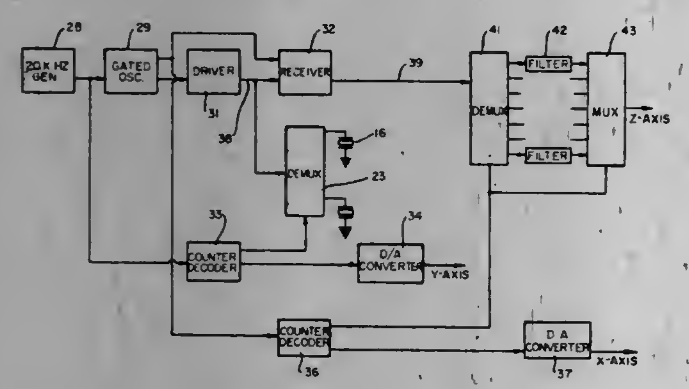
1. In an endoscope provided with an elongated forceps channel (22), a PH-measuring device (10) comprising:
an elongated flexible tubular member (16) including an elongated flexible tube (18) and an elongated flexible tubular metal coil (17) extending along and in the flexible tube (18), said tubular member (16) being inserted into

the elongated forceps channel (22) and extendable at one end into a body cavity;
- a glass electrode (11) coupled to said one end of the elongated tubular metal coil (17) so as to be extendable into a body cavity and adapted to contact with matter in said body to indicate a potential corresponding to the PH of said body matter which is to be examined; and
- an elongated electrical lead (20) passing through said elongated tubular metal coil (17) and connected at one end to the glass electrode (11) and at the other end adapted to be connected to an external potential measuring device through the flexible tubular member (16).

3,888,238
ULTRASONIC BLOOD VESSEL IMAGING SYSTEM AND METHOD

James D. Meindl, Los Altos, and Charles F. Hottinger, Stanford, both of Calif., assignors to Stanford University, Stanford, Calif.

Filed Sept. 28, 1973, Ser. No. 401,649
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 V **8 Claims**



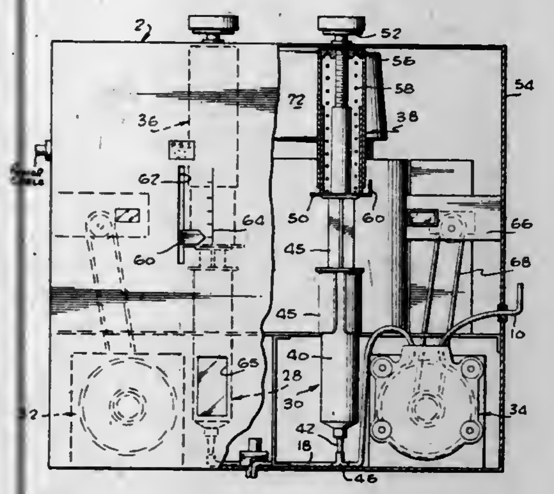
1. A system for imaging blood vessels by detecting the flow of blood particles through the vessels including a transducer comprising an array of transducer elements, means for periodically and sequentially driving each of said transducer elements with a pulse of energy having a predetermined frequency, a Doppler receiver means sequentially connected to each of said respective transducer elements and providing a video signal indicating the flow of blood particles in the vessels, means for periodically sampling the video signal from the Doppler receiver means and for generating an output indicating reflection from a moving blood particle located at a corresponding distance away from the respective transducer element, and means for forming a display indicating the location under each element of the array where moving blood particles have been detected to thereby form a display of the depth, location and size of the underlying vessel.

3,888,239
FLUID INJECTION SYSTEM

Morton K. Rubinstein, 3155 Antelo Rd., Los Angeles, Calif. 90024

Filed June 21, 1974, Ser. No. 481,501
Int. Cl. A61b *6/00*
U.S. Cl. 128—2 A **21 Claims**

1. An angio-graphic injection system for continuously providing to a catheter supplies of two separate fluids used in the performanee of a catheterization procedure, the injection system comprising:
- a pair of reservoir means for containing a ready supply of said two fluids, respectively;
- a pair of pressurizing means each connected to one of said pair of reservoir means for maintaining said fluids contained therein under a predetermined pressure;
- a pair of pumping means respectively connected to one of said reservoir means for pumping fluid into said reservoir means from a source thereof to continuously maintain said reservoir means in a filled condition;

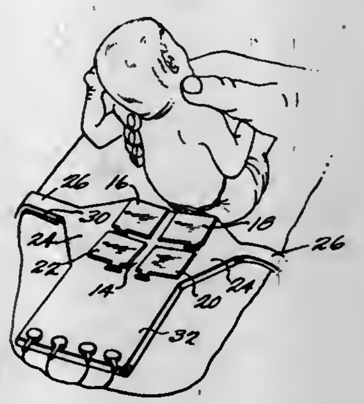


- and fluid conduit means for interconnecting said respective reservoir means and pump means, said fluid conduit means provided with means for being connected to a catheter to supply said fluids thereto.

3,888,240
ELECTRODE ASSEMBLY AND METHODS OF USING THE SAME IN THE RESPIRATORY AND/OR CARDIAC MONITORING OF AN INFANT

Herbert E. Reinhold, Jr., and Richard B. Toren, both of Rockville, Md., assignors to Survival Technology, Inc., Bethesda, Md.

Continuation-in-part of Ser. No. 440,750, Feb. 8, 1974, abandoned. This application May 8, 1974, Ser. No. 468,137
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 E **13 Claims**

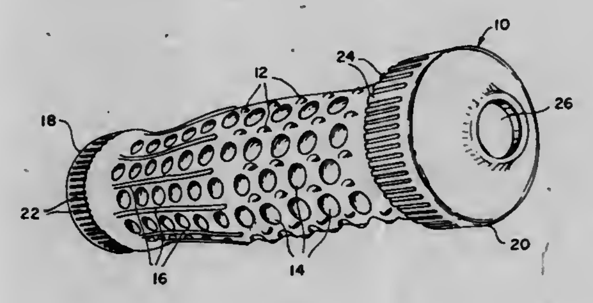


1. A disposable electrode assembly for use in respiratory and/or cardiac monitoring of an infant comprising a sheet-like pad of soft pliable non-conductive material having an infant back receiving area of approximately 4½ inches by 4½ inches, a plurality of separate flexible sheet form electrodes extending substantially throughout the back receiving area of said pad so as to be intimately contacted by the skin of an infant's back received on said back receiving pad area, said pad having portions converging outwardly from opposite sides of said back receiving area for extending generally beneath the armpits and along the lower edge of the rib cage of an infant when said converging side portions are held to the sides of the infant's torso, strap means of soft pliable material for extending across the chest cage of the infant centrally between said converging side portions, means for releasably adjustably securing said strap means in the aforesaid extending relation to thereby hold said converging side portions against the sides of the infant's torso so that said flexible sheet-form electrodes are maintained in skin contact with the infant's back without relative surface-to-surface movement therebetween when the infant moves to either side from a normal back supported position or is moved into a front supported position, and terminal means for effecting a detachable electrical connection of said electrodes with the leads of a monitoring instrument.

3,888,241
MASSAGE DEVICE

William L. Fischer, 3196 Carry Ave., P.O. Box 2336, East Liverpool, Ohio 43920

Filed Apr. 1, 1974, Ser. No. 456,528
Int. Cl. A61h *29/00*
U.S. Cl. 128—24.3 **6 Claims**

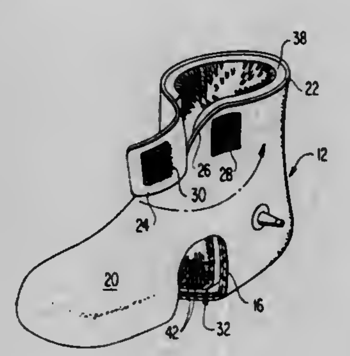


1. A hollow cylindrical shaped massage device with skull-cap shaped recesses on the surface of the cylinder, the improvement comprising a plurality of raised dimples which are separated from the skull-cap recesses and are raised above the surface from which the skull-cap recesses are recessed.

3,888,242
COMPRESSION MASSAGE BOOT

Stephen W. Harris, Box 147, Ranchester, 82839, and Clyde A. Praye, 305 1/2 State St., Rawlings, both of Wyo. 82301

Filed Aug. 23, 1974, Ser. No. 500,120
Int. Cl. A61h *7/00*
U.S. Cl. 128—64 **6 Claims**

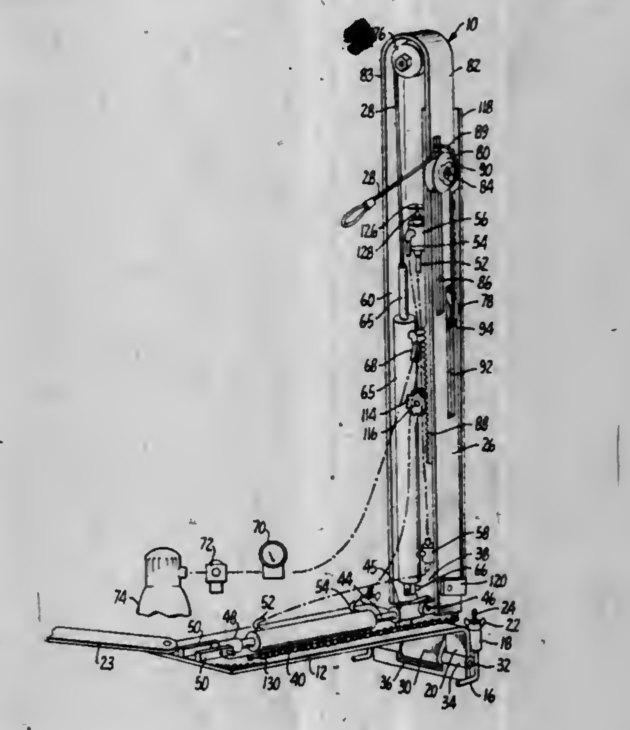


1. A compression massage boot for application to a human appendage, the boot comprising:
- an outer shell formed of semi-rigid material and having a main chamber section and a sleeve section;
- the sleeve section having an overlap portion with adjustable fastener means thereon whereby the sleeve section is adjustable in diameter;
- the outer shell having an inner surface and an outer surface; a flexible gland conformably fitted within the outer shell, the gland having an inner panel and an outer panel, said inner and outer panels being joined by edge connecting portions;
- the inner panel including an inside surface; and
- a plurality of stub tips formed of flexible material projecting inwardly on the inside surface of the inner panel to contact the appendage.

3,888,243
ADJUSTABLE TRACTION DEVICE

Roy Y. Powlan, No. 1 - Chapel Dr., Lafayette, Calif. 94549

Filed July 18, 1974, Ser. No. 489,617
Int. Cl. A61h *1/02*
U.S. Cl. 128—75 **11 Claims**

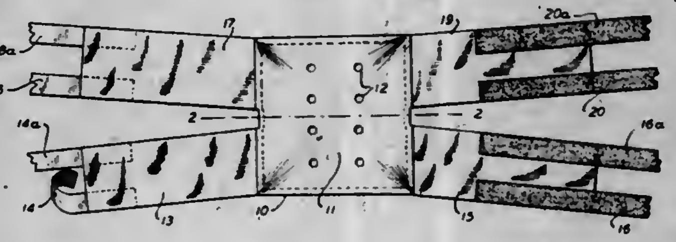


1. An adjustable traction device comprising:
- a. a base portion adapted to be mounted to a hospital bed,
  - b. an upright support extending above the level of the bed and swingably secured to the base portion whereby said support may be moved away from a patient in the bed,
- c. flexible cable means secured to said support for attachment to a patient in the bed, the vertical position of the point of attachment for said cable means being vertically adjustable relative to said support, and
- d. means for applying a force to said flexible cable means to place the patient in traction wherein said force applying means comprise pressure fluid means including a cylinder and piston for the cylinder, said piston being secured to said flexible cable and said cylinder being secured to said base portion.

3,888,244
MEANS FOR SUPPORTING A LIMB IN RELAXED POSITION

Steve Lebold, 45 Church St., Montclair, N.J. 07042

Filed Feb. 1, 1974, Ser. No. 438,632
Int. Cl. A61f *5/10*
U.S. Cl. 128—77 **5 Claims**



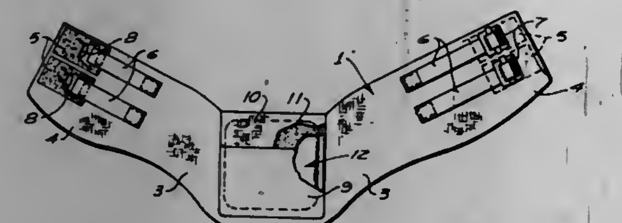
1. Means for supporting a limb in a relaxed angular position which comprises a resilient contoured pad having a semirigid backing adapted to engage the inside surfaces of the joint between upper and members of the limb, said pad and said backing being bent at an angle of at least 15° and a pair of cooperating strap members affixed to said pad and adapted to lie above and below said joint and adapted to surround said upper and lower members with sufficient tension to exert leverage upon said members and said joint to retain said members in angular position with respect to each other, said pad

and said strap members cooperating to restrain said limb from being extended and maintained in an angular position.

3,888,245
WEIGHTED SURGICAL BELT

E. Boyd Berntson, 5101 Marsha St., Apt.135, Bakersfield, Calif. 93309, and Douglas Lemmons, 4201 Columbus St., Apt. B, Bakersfield, Calif. 93306

Filed Nov. 19, 1973, Ser. No. 416,890
Int. Cl. A61f *5/02*
U.S. Cl. 128—78 **6 Claims**

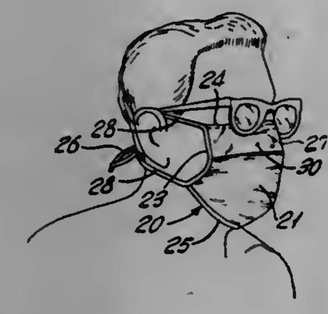


1. A surgical force applying means, comprising:
a. a weight member adapted to extend laterally of the sacral and coccygeal vertebraes to apply a distributed load, including a first side conforming essentially to the body surface, relatively thin margins, and an outwardly arched second side whereby the contour of the weight member blends with the body curvature; and
b. means adapted to extend over the lower back in confronting relation to the sacral and coccygeal vertebraes for fixing the weight member in position to exert a downwardly and anteriorly directed force on the sacral and coccygeal vertebraes.

3,888,246
ANTI-FOG SURGICAL FACE MASK

William Lauer, Madison, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 1, 1973, Ser. No. 411,873
Int. Cl. A61f *9/04*
U.S. Cl. 128—146.2 **16 Claims**

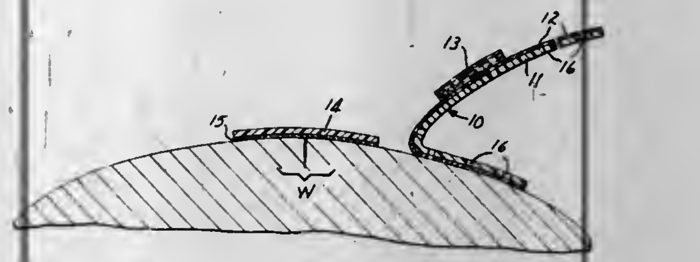


1. A surgical face mask comprising:
a. a body portion having an upper part, a lower part, an upper edge, a lower edge and a pair of side edges and comprising a filtration medium for filtering bacteria;
b. means for securing the mask over the mouth and nose of the wearer; and
c. a sheet of air impervious material having an upper edge, a lower edge, and a pair of side edges, the upper edge of said air impervious material being secured to the upper part of said body portion, the lower edge of said air impervious material lying between said upper and lower edges of said body portion and being substantially free from attachment to said body portion, said sheet of air impervious material extending substantially from side to side of said body portion whereby, when the mask is worn, exhaled breath is directed downwardly from the upper part of the mask and away from the eyes of the wearer.

3,888,247
FIRST AID BANDAGE

Carl B. Stenvall, Portchester, N.Y., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 10, 1973, Ser. No. 404,890
Int. Cl. A61l *15/01;* **A61f** *13/00*
U.S. Cl. 128—155 **7 Claims**

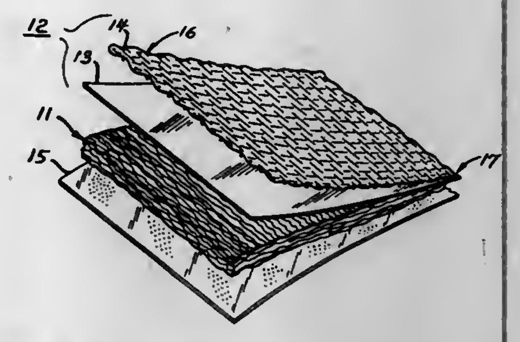


1. A first aid bandage comprising a first flexible adhesively coated sheet having an absorbent pad centrally adhesively secured thereto and a second flexible adhesively coated sheet superposed over said absorbent pad and being lightly releasably adhered to the adhesive of said first sheet, the adhesively coated surface of said second sheet being disposed in the same direction as the adhesively coated surface of said first sheet such that the entire surface of the first aid bandage is adhered to a wound in use.

3,888,248
ABDOMINAL PAD OR SURGICAL DRESSING

Francis C. Moore, and Leon R. Perkinson, both of Indianapolis, Ind., assignors to Moore-Perk Corporation, Indianapolis, Ind.

Filed July 23, 1973, Ser. No. 381,734
Int. Cl. A61f *13/00*
U.S. Cl. 128—156 **9 Claims**

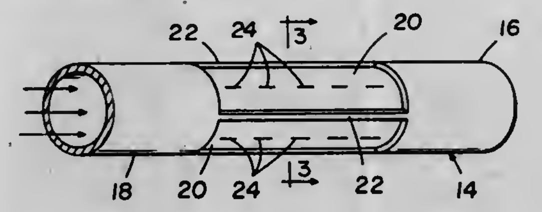


8. An abdominal pad or covering comprising a layer of highly absorbent core material having a thickness in the range one-fourth in. to three-eighths in.; an application covering comprising a thin layer of thermoplastic material having a thickness of about 0.2 inch and a layer of spun-bonded nylon exterior of said layer of thermoplastic sheet material, said application covering a width greater than the corresponding width of said core material; and a moisture-resistant barrier on the side of said central core material opposite said application covering and comprising a second layer of air-pervious, liquid impervious material adjacent the core material; said moisture-resistant covering also having a width greater than the corresponding width of said core material and being secured to said application covering under the application of heat and pressure about opposite peripheral edges about said core material, said spun-bonded nylon being bonded to said core material substantially throughout their opposing surfaces by said layer of thermoplastic material, and said moisture barrier being attached to said application covering.

3,888,249
ARTERIAL INFUSION CATHETER

David L. Spencer, 1243 N. State St., Chicago, Ill. 60606

Filed Nov. 2, 1973, Ser. No. 412,199
Int. Cl. A61m *05/00, 25/00*
U.S. Cl. 128—214 R **2 Claims**

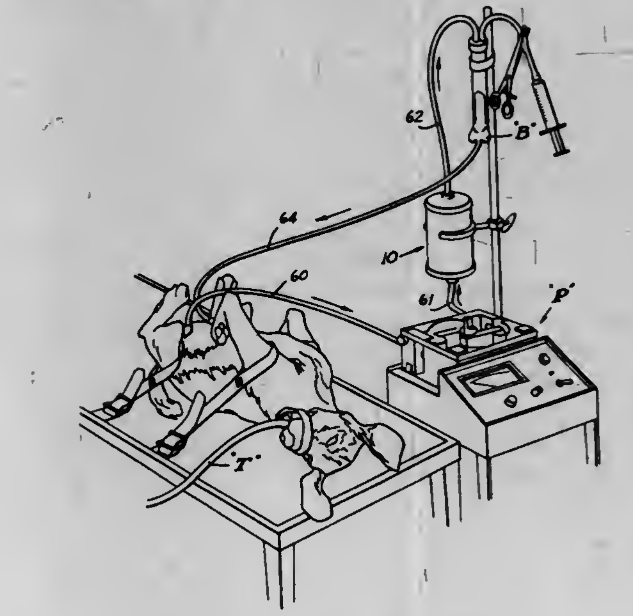


1. A catheter for use in arterial infusion of fluids and the like, said catheter comprising a cannula formed of a material sufficiently rigid to facilitate insertion thereof into an artery, said cannula having a distal end and a proximal end, a part of said cannula at the distal end having a plurality of cutout portions spaced around the circumference of said cannula and separating said distal end from the main body of the cannula, said cutout portions being separated by ribs extending longitudinally between the main body of said cannula and its distal end which ribs are formed integrally with said cannula, a flexible material extending completely over each of said cutout portions along the inside surface of said cannula and having a modulus of elasticity less than the modulus of elasticity for the material which forms said cannula, the flexible material covering each of said cutout portions having a plurality of slits therein to provide for discharge of fluid from inside of said cannula through said slits when the fluid pressure in said cannula exceeds the pressure on the outside of said cannula which preventing the retrograde flow of fluid into said cannula regardless of the pressure difference between the inside and outside of said cannula.

3,888,250
DISPOSABLE HEMOPERFUSION ASSEMBLY FOR DETOXIFICATION OF BLOOD AND METHOD THEREFOR

John B. Hill, Chapel Hill, N.C., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed July 2, 1973, Ser. No. 375,835
Int. Cl. A61m *5/00, 1/03*
U.S. Cl. 128—214 R **15 Claims**

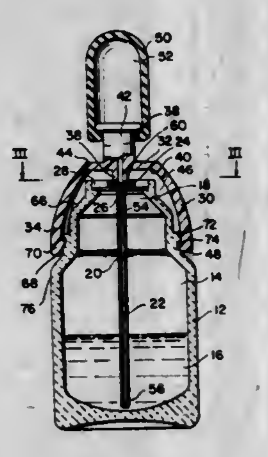


1. A hemoperfusion apparatus useful in the detoxification of blood comprising:
a. a housing having spaced outlet and inlet openings, blood transfering means connected thereto adapted to be connected to a source of blood to be detoxified and having an interior passageway for the blood extending between the inlet and outlet openings; and,
b. a detoxification cartridge assembly disposed in the passageway in the housing, said cartridge assembly including a base supporting sheet having a coating of adhesive on at least one side thereof and a uni-layer of individually spaced apart particles of adsorbent material between 100 and 5,000 microns in size bonded by the adhesive to the coated side of the sheet so that the major portion of the particles are free from bonding material whereby to prevent fragmentation of the adsorbent material said sheet being formed to provide a cartridge having alternate layers of base sheet material and adsorbent particles, said particles being in intimate contact with said layers;
c. said sheet material, adhesive, adsorbent particles and portions of the housing which the blood engages being inert to each other and being nontoxic and inert to blood.

3,888,251
OPTHALMIC DISPENSING DEVICE

Kenneth Harrison, Matawan, N.J., assignor to Lawrence Peska Assoc., New York, N.Y.

Filed May 13, 1974, Ser. No. 469,288
Int. Cl. A61m *1/00*
U.S. Cl. 128—233 **15 Claims**



1. An opthalmic dispensing device, comprising: (a) a receptacle member comprising a chamber for holding a fluid to be dispensed and comprising a mouth portion, (b) an insert member adapted to be mounted at said mouth portion, said insert member comprising a first tubular element extending from said mouth portion into said chamber, a socket element disposed at a first end of said tubular element located at said mouth portion, and an apertured plate member disposed at said first end and extending across the mouth of said receptacle member, (c) an eye cup element comprising a base portion and a wall portion and further comprising a second tubular element located at said base portion, said second tubular element comprising a first tubular projection extending from the interior face of said cup element only into the area defined by said base and wall portions and a second tubular projection extending from the exterior surface of said cup element, said first tubular projection being adapted to engage said socket element in substantially air tight relationship, and (d) a deformable bulb member disposed at said second tubular projection.

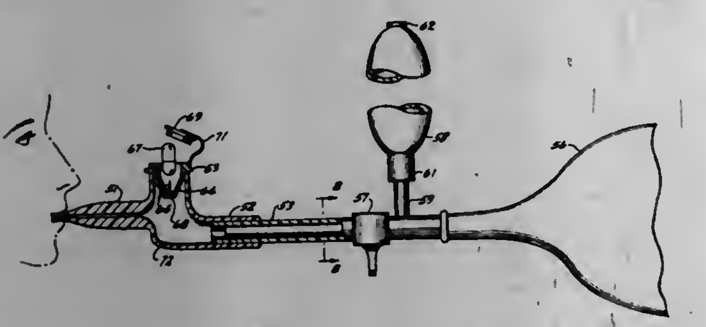
3,888,252
POWDER INHALER

Anthony J. Side, Goring-on-Thames, Oxfordshire, England, and Bernard McDonald, 18212 Pacific Coast Hwy., Malibu, Calif. 90265

Filed Jan. 23, 1974, Ser. No. 435,937
Int. Cl. A61m *15/06*
U.S. Cl. 128—266 **10 Claims**

1. A medicinal powder dispensing device for supplying powder to an air stream to be inhaled comprising:

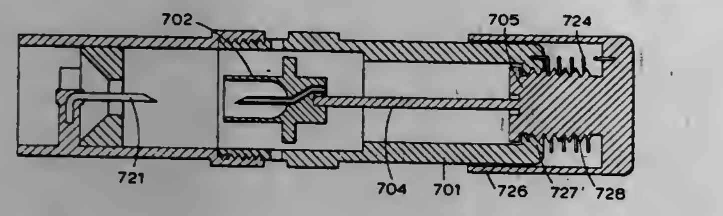
a mouthpiece having an air flow passage therethrough;
a means for providing an air stream including an inflatable normally flaccid elastic balloon;
means connected to the balloon for manually inflating the balloon;
means for temporarily closing the balloon in an inflated state;



disconnectable air passage means interconnecting the balloon and mouthpiece for controlling the passage of air from the balloon to the mouthpiece; and
means for introducing powder into the air stream between the balloon and the mouthpiece.

3,888,253
DEVICE FOR ADMINISTRATION OF MEDICINES

Peter Ridgway Watt, Ewhurst, and Harold George Wilkinson, Goring-by-Sea, both of England, assignors to Beecham Group Limited, England
Continuation of Ser. No. 382,214, July 24, 1973, abandoned. This application June 7, 1974, Ser. No. 477,487
Claims priority, application United Kingdom, Aug. 4, 1972, 36428/72
Int. Cl. A61m *15/00, 15/06*
U.S. Cl. 128—266 **24 Claims**

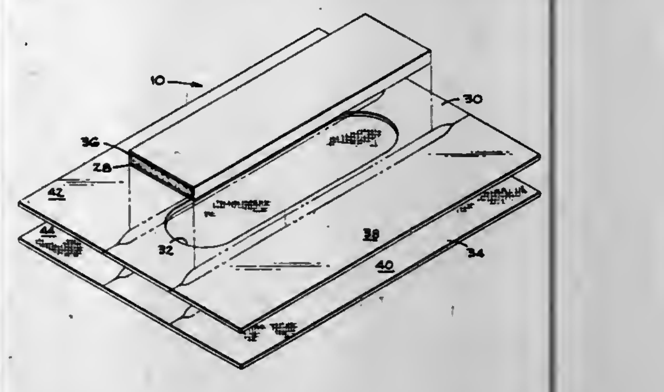


1. A device for the oral administration of finely divided solid medicaments which device comprises a hollow housing, an elongate semi-flexible vibratable member which is fixed adjacent one end thereof within the housing and free at the other end, a capsule holder attached to said end of the vibratable member at a point remote from its fixed end; said housing having inlet and outlet vents permitting air to flow through the housing, the outlet vent being adapted for application to or insertion into the mouth; and means for causing said member to vibrate comprising directed air flow means reacting with said flexible vibrating member.

3,888,254
SANITARY NAPKIN

Laurel A. Hendricks, P.O. Box 943, Palo Alto, Calif. 94302
Filed Feb. 11, 1974, Ser. No. 441,047
Int. Cl. A61f *13/16*
U.S. Cl. 128—290 R **9 Claims**

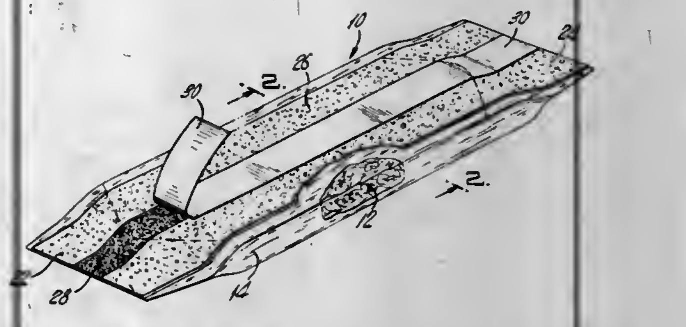
1. A sanitary napkin comprising:
a. an absorbent pad having a body-facing side and a garment-facing side;
b. a layer of liquid repellent material having an opening therein and being disposed about said pad with said opening positioned confronting the body-facing side of said pad and with opposite end portions thereof overlapping one another over the garment-facing side of said pad; and
c. a layer of absorbent material disposed around said pad with said layer of liquid repellent material disposed between said pad and said layer of absorbent material, said layer of absorbent material being approximately coextensive with said layer of liquid repellent material and opposite end portions of said layer of absorbent material and



said layer of liquid repellent material overlapping one another and being coextensive with the garment-facing side of said pad, said overlapping end portions of said layer of absorbent material and said layer of liquid repellent material being secured together.

3,888,255
SANITARY NAPKIN HAVING IMPROVED ATTACHMENT SYSTEM

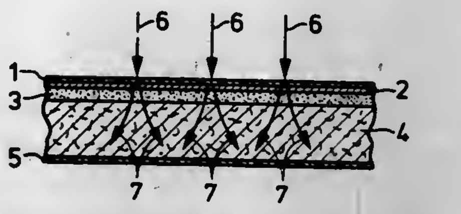
Praful H. Shah, Kendall Park, and Subramania Srinivasan, East Brunswick, both of N.J., assignors to Personal Products Company, Milltown, N.J.
Filed Oct. 4, 1974, Ser. No. 511,979
Int. Cl. A61f *13/16*
U.S. Cl. 128—290 R **9 Claims**



1. A sanitary napkin to be adhered to the crotch portion of a garment comprising a garment contacting surface, a body contacting surface and an absorbent element therebetween, said garment contacting surface having a first layer of material therein having a high co-efficient of friction, said first layer having over at least a portion thereof a second layer comprising a pressure sensitive adhesive.

3,888,256
LAYERED ABSORBANT PAD MATERIAL

Hans Studinger, 6 Johannisstrasse, 8500 Nurnberg, Germany
Filed Feb. 13, 1973, Ser. No. 332,229
Claims priority, application Germany, Feb. 22, 1972, 2208126
Int. Cl. B32b *5/16;* **A61f** *13/16*
U.S. Cl. 128—296 **1 Claim**

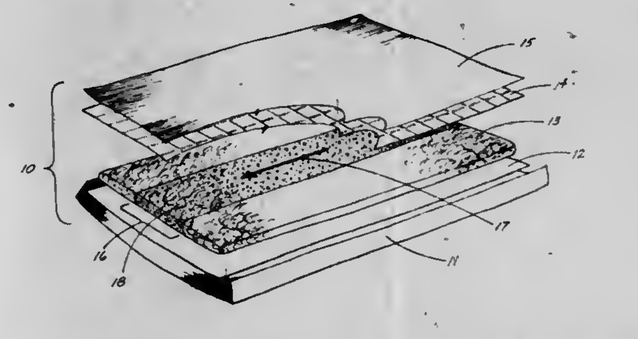


1. A layered absorbent hygienic pad of joined-together layers comprising:

an uppermost surface layer of plastics-bound fiber fleece, a next-adjacent carrier filter sheet of cellucotton, a next-adjacent layer of granulated particulate swelling substance formed from the group consisting of polyacrylamide or sulphonated polystyrene with spacings between adjacent particles,
an absorbent layer consisting of one or more laps of cellulose wadding and being free of any swelling substance, and a lowermost surface layer of a material formed from the group consisting of a plastics-bound fiber fleece or a liquidimpervious foil with the distribution of the particles of the layer of the swelling substance being such that the spacing between adjacent particles is no greater than half of the particle diameter increase realized upon particle swelling.

3,888,257
DISPOSABLE ABSORBENT ARTICLES

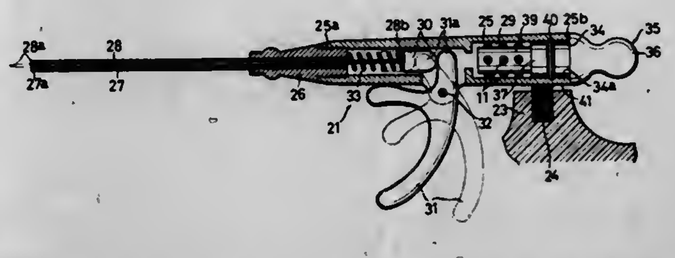
Roy G. Cook, and James P. Jackson, both of Greenwood, S.C., assignors to Parke, Davis & Company, Detroit, Mich.
Filed Oct. 1, 1973, Ser. No. 402,326
Int. Cl. B32b *5/16;* **A61f** *13/18;* **A47c** *21/06*
U.S. Cl. 128—296 **6 Claims**



1. A disposable machine-produced article for absorbing body fluid waste comprising an absorbent three-dimensional matrix of fiberized wood pulp in layered relation with a carrier sheet, the matrix having a rectilinear central zone of uniform width in the machine direction and, located within voids of the central zone, a three-dimensional dispersion of particles of water insoluble hydrocolloid polymer, the amount by weight of wood pulp fiber in the central zone for each part by weight of polymer particles being in the approximate range from 1 to 11.5, the water absorbing capacity of the polymer particles being on a weight basis at least 50 parts of water per part of polymer particles.

3,888,258
DRAIN FOR THE EARDRUM AND APPARATUS FOR INTRODUCING THE SAME

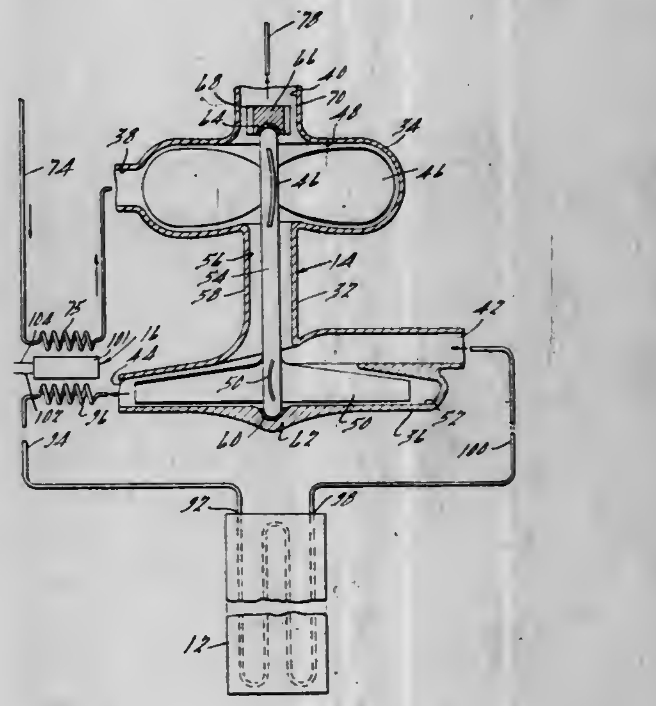
Taichiro Akiyama, 19-23 Shimoochia, 2-chome, Tokyo, Japan
Filed Oct. 29, 1973, Ser. No. 410,688
Claims priority, application Japan, Nov. 7, 1972, 47-111376; Nov. 7, 1972, 47-128293
Int. Cl. A61b *17/32, 17/43*
U.S. Cl. 128—305 **6 Claims**



1. Apparatus for inserting a hollow drain in the eardrum comprising:
a body;
a tube extending axially of said body from one end thereof;
a needle received within said tube and movable between a retracted position and an extended position in which its tip projects from the end of said tube remote from said body;
a contact element positioned within said body and mounted on the rear end of said needle opposite said tip;
a spring within said body urging said needle into said retracted position; and,
a pressing means mounted in said body for pressing on said contact element for moving said needle from said retracted position to said extended position, the outside diameter of said needle being substantially equal to the inside diameter of said drain whereby said needle is adapted to be received within the drain for positioning of the drain adjacent said tip, and the outside diameter of said tube being larger than the inside diameter of said drain whereby said remote end of said tube is adapted to bear against one end of said drain, said apparatus being thereby adapted to be moved into position adjacent the eardrum, said needle being adapted to be extended for forming a hole in the eardrum, and said tube being adapted to be thereafter forced against said drain for forcing the drain into said hole to thereby position the drain relative to the eardrum.

3,888,259
HYPOTHERMIA SYSTEM

Robert C. Miley, 2712 Roseland Ave., East Lansing, Mich. 48823
Filed Aug. 21, 1973, Ser. No. 390,271
Int. Cl. A61f *7/00*
U.S. Cl. 128—400 **14 Claims**



1. In a hypothermia system, the combination including hypothermia pad means, fluid heat exchange means, fluid pressure operated impeller-pump means having an impeller portion and a pump portion each provided with a fluid inlet and a fluid outlet, a source of fluid pressure, means for connecting the inlet of said impeller portion to said source of fluid pressure, and a closed fluid circuit connecting the outlet of said pump portion to the inlet of said pump portion through said heat exchange means and said hypothermia pad means, said source of fluid pressure comprising a second closed fluid circuit including the outlet of said impeller portion and second heat exchange means.

3,888,260

RECHARGEABLE DEMAND INHIBITED CARDIAC PACER AND TISSUE STIMULATOR

Robert E. Fischell, Silver Spring, Md., assignor to The John Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 267,114, June 28, 1972, abandoned. This application Apr. 26, 1974, Ser. No. 464,441

Int. Cl. A61n *1/36*

U.S. Cl. 128—419 PG **29 Claims**

23. In a demand inhibited cardiac pacer including a first electronic circuit means for generating output heart stimulating pulses for application to a patient's heart and a second electronic circuit means for monitoring the patient's heart beat and inhibiting the generation by said first electronic circuit means of said heart stimulating pulses in the presence of an acceptable natural heart beat rate, the improvement comprising,

a step-up transformer included in said first electronic pulse generating circuit means and having primary and secondary windings for increasing the amplitude of each heart stimulating pulse prior to application thereof to the patient's heart,

catheter means having one end connected electrically to said second electronic circuit means and connectable electrically to the secondary winding of the step-up transformer of said first electronic pulse generating circuit means and terminating at its opposite end in electrode means adapted to be disposed at a preselected location in the patient's heart for applying the heart stimulating pulses generated by said first electronic circuit means and for sensing the electrical R-wave signal emanating from the patient's heart when the heart beats, and

switching means for selectively connecting the secondary winding of the step-up transformer of said electronic pulse generating circuit means to said catheter means only when an output pulse is being generated by said pulse generating circuit means.

3,888,261

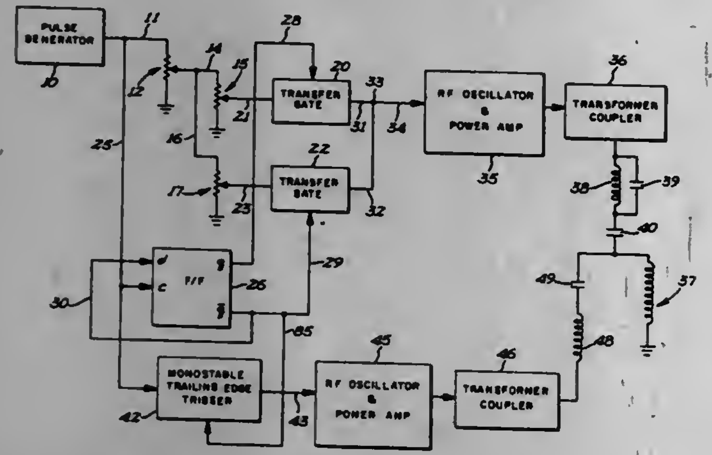
TIME SHARED STIMULATOR

Donald D. Maurer, Anoka, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Dec. 7, 1973, Ser. No. 422,896

Int. Cl. A61n *1/36*

U.S. Cl. 128—420 **22 Claims**



11. A time shared stimulator which comprises:

pulse generator means;

first means connected to receive the pulses from said pulse generator means for controlling the power level of said pulses;

second means connected to receive the pulses from said pulse generator for controlling the power level of said pulses independently of said first means;

means operatively connected to said first and second means for producing a train of pulses in which pulses from said first means alternate with pulses from said second means;

first and second output means adapted for connection to a living animal body; and

means connected between said pulse train producing means and said output means for alternately routing pulses in said pulse train between said first and second output means.

3,888,262

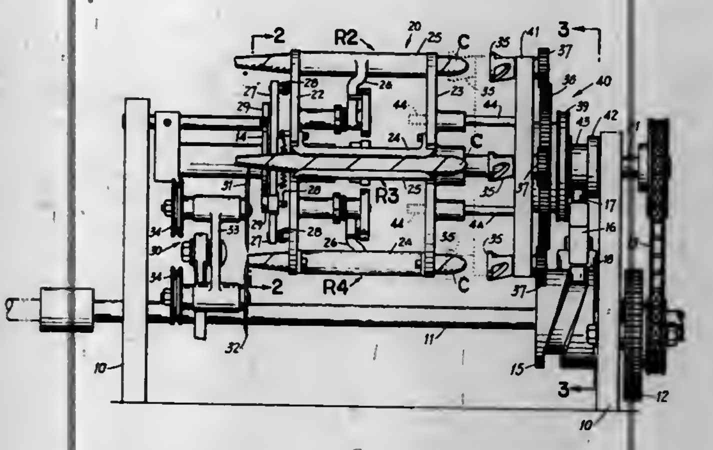
METHOD AND APPARATUS FOR FINISHING THE ENDS OF CIGARS

Frank Hollenton, and William P. Park, both of Richmond, Va., assignors to AMF Incorporated, White Plains, N.Y.

Filed Feb. 11, 1974, Ser. No. 441,689

Int. Cl. A24c *1/32*

U.S. Cl. 131—29 **13 Claims**



4. Apparatus for finishing the ends of cigars, comprising

a continuously moving carrier means having a series of equally spaced receivers for moving cigars from a feed-in means to a feed-out means,

control means causing each receiver to receive a cigar to be finished as it passes the feed-in means and to release a finished cigar as it passes the feed-out means,

knurling means spaced from one side of and moving in unison with said carrier means,

cam means cyclically moving said knurling means into and out of engagement with the head ends of the moving cigars to knurl a plurality of times and finish such cigar ends, and

cutting means disposed adjacent to the other side of said carrier means opposite from said knurling means for the end to be lighted of each cigar moving thereby approaching the feed-out means.

3,888,263

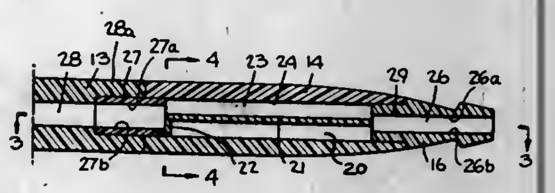
MOISTURE FREE PIPE STEM MOUTHPIECE

Gordon W. Blanchard, Toms River, N.J., assignor to Gordon W. Blanchard, Toms River, N.J.

Filed June 8, 1973, Ser. No. 368,227

Int. Cl. A24f *01/06*

U.S. Cl. 131—201 **5 Claims**



1. A mouthpiece for a tobacco smoking pipe or the like adapted to be used in a generally horizontal position and comprising a generally tubular stem portion having a bit end from which the smoke is drawn, and an opposite end, said tubular stem portion defining a longitudinal passage for smoke from said opposite end to said bit end thereof, a partition arranged longitudinally in said passage and spanning thereacross to divide said passage substantially into upper and lower halves, said partition being generally horizontally oriented in normal use of the mouthpiece, a wall extending downwardly from said partition and into circumscribing contact with that portion of the wall of said passage which is below said partition to close said lower half of said passage thereat and form a pocket beneath said partition, said pocket having an opening at the downstream end thereof, the upper half of said passage being substantially straight and unobstructed between said bit end and said opposite end of said stem portion, and means providing longitudinal grooves within said tubular stem portion adapted to receive opposite edge portions of said partition.

3,888,264

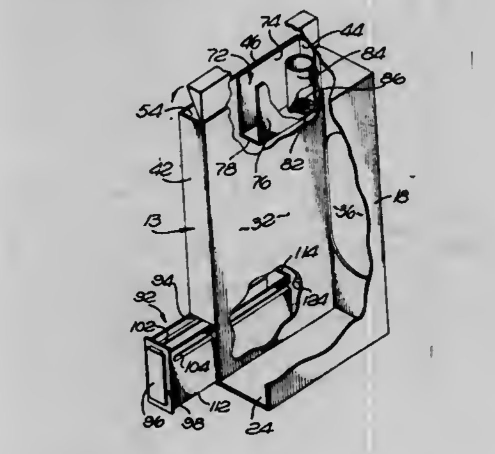
COMBINED CIGARETTE PACKAGE HOLDER AND ASHTRAY COMPARTMENT

Paul S. Baclit, 2167 College View Dr., Monterey Park, Calif. 91754

Filed Oct. 10, 1973, Ser. No. 405,193

Int. Cl. A24f *15/10, 19/14*

U.S. Cl. 131—235 R **5 Claims**



1. A combined cigarette package holder and ashtray compartment comprising:

a cigarette package holder defining a first elongate container whose dimensions are sufficient for placing a package of cigarettes therein, said container being defined by a first side wall and a second side wall spaced from one side of said first side wall to approximate the width of a package of cigarettes, an end wall, a top wall and a bottom wall;

an ashtray compartment of similar height and width dimensions as said cigarette package holder and defined as shallower than said package holder by a side wall spaced from the other side of said first side wall, a top wall, a bottom wall and first and second spaced end walls the top wall of said ashtray compartment including a lockable lid which can be adjusted for placing ashes therein and a shelf in said ashtray compartment adjacent said movable lid and spaced downwardly therefrom, screen material therein defining openings therethrough and a tubular depository carried on said shelf around said screen material, for enabling lit cigarettes to be extinguished.

3,888,265

PIPE HOLDER

Robert Eugene Yount, 11168 W. 70th Ter., Shawnee Kans. 66203

Continuation-in-part of Ser. No. 454,264, March 25, 1974, abandoned. This application Oct. 7, 1974, Ser. No. 512,738

Int. Cl. A24f *09/14*

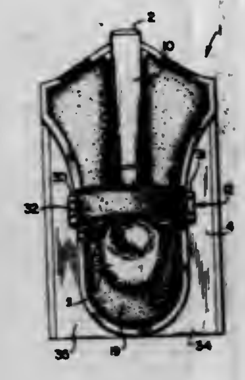
U.S. Cl. 131—260 **12 Claims**

8. A pipe support structure comprising:

a. a backplate member having opposite ends and opposite sides;

b. a pipe cushioning member mounted on one side of said backplate member and having portions defining an elongated recess therein and extending longitudinally from one end of said backplate member and adapted to receive a lower portion of a stem and bowl of a pipe;

c. retaining means mounted on said backplate member and extending transversely of the pipe cushioning member and adapted to resiliently engage an upper portion of the stem of said pipe to thereby retain same in the elongated recess in said pipe cushioning member, said retaining means having end portions positioned at respective opposite edges of said backplate member and adapted to have a center portion thereof move away from said cushioning member in response to opposed forces applied to said end portions; and



d. a support member having one end thereof hingedly mounted on the other side of said backplate member adjacent one end thereof and having the other end of said support member selectively movable to a position spaced from the other end of said backplate member when said other ends are in engagement with a supporting surface to position said backplate member and support member in a generally upstanding position.

3,888,266

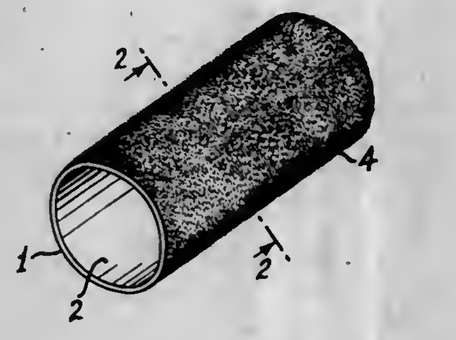
HAIR CURLING ROLLER

Weldon K. Weldon, deceased, late of Jacksonville, Fla., and Hazel W. Weldon, executrix, Jacksonville, Fla., assignors to Hazel W. Weldon, executrix, Jacksonville, Fla.

Filed Aug. 11, 1971, Ser. No. 170,746

Int. Cl. A45d *2/00*

U.S. Cl. 132—39 **4 Claims**



1. An elongated hair curling roller including a body having a myriad of short, straight filaments of synthetic plastic material adhered to the outer surface of said body, at least most of said filaments being oriented to have their inner ends connected to said surface of said body and to extend in a direction generally normal to said surface and outwardly therefrom and having free outer ends, said filaments being of between about 4 and 20 denier, having lengths of between about 0.04 and 0.1 inches and being arranged in a concentration in the order of tens of thousands of said short filaments per square inch of said surface.

3,888,267
APPARATUS AND METHOD FOR TEMPORARILY STORING SHEETS OF PAPER

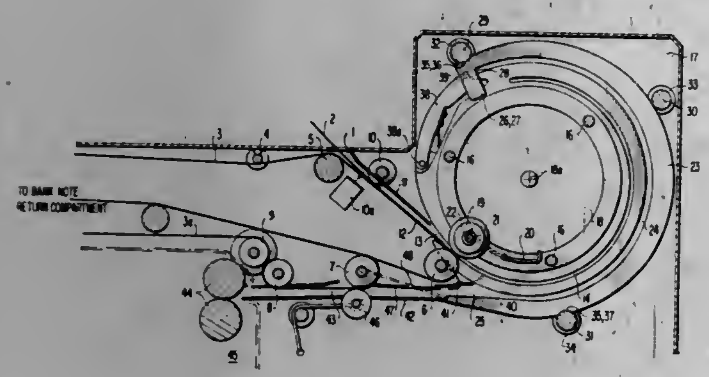
Kurt Gautschi, Onex, Switzerland, assignor to Sodeco-Saia AG., Geneva, Switzerland

Filed May 24, 1974, Ser. No. 473,294

Claims priority, application Switzerland, May 24, 1973, 7437/73

Int. Cl. B65h *29/58*

U.S. Cl. 133—3 R **20 Claims**



6. A paper currency handling apparatus for use with the vending of products or services having substantial value requiring payment with a plurality of paper sheets comprising: means responsive to the introduction of sheets of paper currency one at a time, for transporting each sheet into an inner slot of a rotatable sheet storage device while said device is stationary;

means for rotating said storage device one revolution in a first direction after each sheet is introduced into said inner slot to transfer said sheet to an outer slot; and

means for rotating said storage device one revolution in the opposite direction for removing simultaneously a group of sheets from said outer slot to a sheet deflector for optionally directing said group of sheets to either of two sheet transfer paths, one of said paths leading to the outside of said apparatus for return of said sheets of currency and the other of said paths transporting said sheets of currency to a repository.

3,888,268
METHOD FOR REDUCING MERCURY VAPOR CONTAMINATION OF THE AMBIENT ATMOSPHERE FROM LIQUID MERCURY

Medard F. Karpinski, Parma, Ohio, assignor to Kenneth F. Karpinski and Clarence M. Karpinski, both of Parma, Ohio

Filed Mar. 8, 1973, Ser. No. 339,207

Int. Cl.² B08B *7/00*

U.S. Cl. 134—4 **16 Claims**

1. A method of reducing mercury vapor contamination of the ambient atmosphere from liquid mercury droplets disposed on an exposed surface, which method comprises the step of applying a metal powder to the surface, the metal being one that will amalgamate with mercury, thereafter scrubbing the surface with water and removing the water from the surface with vacuum means, and passing the vacuumed fluid through a water filter unit to entrap in the filter any amalgamated mercury contained in the fluid, and thereafter coating said surface with a liquid composition which will solidify to a continuous film which is substantially impervious to mercury vapor.

13. A method of reducing mercury vapor contamination of the ambient atmosphere from liquid mercury droplets disposed on an exposed surface, which method comprises, applying a metal powder to said surface, said metal being one that will amalgamate with mercury, and thereafter removing the amalgamated particles from the surface.

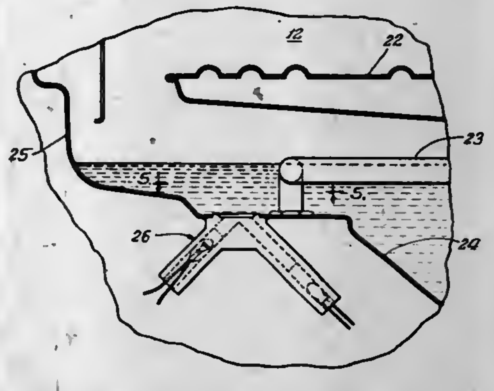
3,888,269
CONTROL SYSTEM FOR DISHWASHER

Larry Thomas Bashark, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed July 17, 1973, Ser. No. 380,102

Int. Cl. B08b *3/02*

U.S. Cl. 134—57 D **13 Claims**



1. In a dishwasher having means defining a chamber for holding dishes to be washed, means for providing water fills to said chamber, means for pumping the water against the dishes in the chamber, means for draining the water from the chamber, and means for heating the chamber to dry dishes therein, structure comprising:

means defining a liquid collecting receptacle communicating with said chamber;

sensing means for selectively sensing the turbidity of a water fill in the chamber and the depth of a collected portion of the water fill in said receptacle; and

control means responsive to said sensed turbidity and depth for controlling the dishwashing operation to operate seriatim said water providing means to effect a first fill of the chamber, operate said pumping means to rinse the dishes with the fill water, interrupt the rinse and operate said sensing means to determine the turbidity of the rinse fill water, operate the pumping means to complete the rinse with said fill water, operate the draining means to remove said fill water from the chamber, and selectively a. in the event the level of the sensed turbidity is at or above a preselected level operate said water providing means to effect a second fill of the chamber, operate said pumping means to rinse the dishes with the second fill water, operate the draining means to remove the second fill from the chamber, and permit the dishes to air-dry, or b. in the event the sensed turbidity is below said preselected level operate said heating means to heat dry the dishes in the chamber and evaporate fill water from said receptacle, and terminate the heating step when the sensed depth of fill water in said receptacle drops to a preselected level.

3,888,270
AUTOMATIC DEVICE FOR SURFACE TREATMENT

Jean Crapet, Chevilly Larue, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

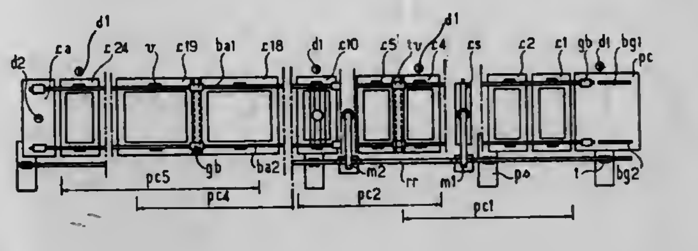
Filed Aug. 2, 1973, Ser. No. 384,840

Claims priority, application France, Aug. 2, 1972, 72.27940

Int. Cl. B08b *3/04;* **B05c** *3/14;* **C23b** *5/70*

U.S. Cl. 134—57 R **51 Claims**

1. An automatic arrangement for treatment of objects comprising: a plurality of alined treatment stations including a loading station and a shaker control station disposed at respective ends of said alined treatment stations, said loading station enabling the supplying of support frame means for carrying the objects to be treated, said shaker control station including a pair of parallelly disposed shaker bars and means for actuating said shaker bars; said shaker bars operatively interconnecting said loading station and said shaker control station; a roller track disposed parallel to said alined treatment stations; at least one mobile unit means for transferring the objects to be treated; means for intermittently moving said mobile unit means on said roller track, said mobile unit means transferring said support frame means loaded with objects to be treated from one treatment station to another.



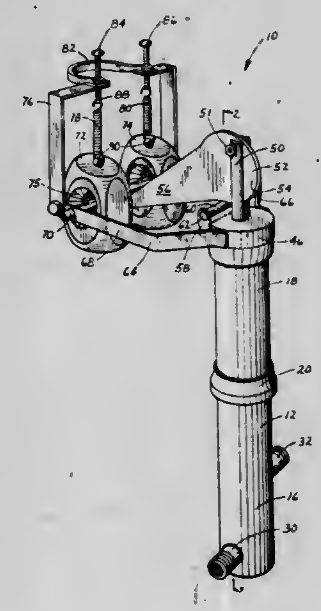
3,888,271
MOTION-RESPONSIVE SHUTOFF VALVE

Marshall G. Pettit, 255 E. Sandra, Tulare, Calif. 93274

Filed Mar. 25, 1974, Ser. No. 454,726

Int. Cl. F16k *17/36*

U.S. Cl. 137—45 **6 Claims**



1. In a motion-responsive shutoff valve of the type including a valve housing, means for conducting a flow of fluid through said housing and an axially displaceable closure plug seated in said housing and supported for advancement from a valve-open position to a valve-close position, the improvement comprising:

A. biasing means for continuously urging said closure plug to advance from a valve-open position to a valve-close position;

B. restraining means for restraining the plug from advancement toward said valve-close position including,

a fulcrum, a lever arm supported by said fulcrum characterized by a first end portion connected to said closure plug and a second end portion adapted to be supported against angular displacement about the fulcrum, and means for supporting said second end of said lever arm against angular displacement including a frangible member disposed in supporting engagement with said lever arm; and

C. means for releasing the closure plug for advancement toward said valve-close position in response to motion imparted to said housing comprising motion-responsive means including a pendulous mass for fracturing said frangible support member.

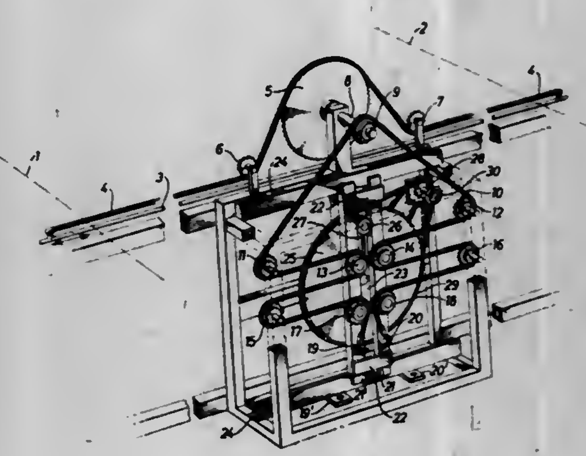
3,888,272
ACTUATION DEVICE FOR THE WEFT INSERTER ROD OF A LOOM HAVING TWO PARALLEL LOOM BODIES

Sten Herbert Larsson, Hulebacksvagen 20, Molnlycke, Sweden

Continuation of Ser. No. 311,328, Dec. 1, 1972, abandoned. This application July 26, 1974, Ser. No. 492,098

Int. Cl. D03d *47/00*

U.S. Cl. 139—123 **6 Claims**



1. An apparatus useful for imparting a reciprocable harmonic motion to a weft inserter rod in associated looms having parallel paths of fabric and being laterally separated by a space,

said apparatus comprising in combination

a. a carriage which is arranged in said space and is slidably mounted on guides for horizontal reciprocable movement in a direction transverse to said paths; said guides being mounted to the loom frames,

b. two pairs of chain wheels which are symmetrically journalled on said movable carriage;

c. two other pairs of chain wheels which are stationary and symmetrically journalled on the loom frames;

d. a driven chain wheel which is stationary journalled between said looms, and a driving means for said wheel;

e. a driving pin protruding parallel to the axis of said driving chain wheel and being lockable in desired positions in a radial slot in said driven wheel, said pin extending into a vertical slot in the carriage to impart thereto a simple harmonic horizontal motion, when said driven chain wheel is rotated;

f. a shaft located between said looms and parallel to said axis;

g. a first chain wheel on said shaft;

all said chain wheels being located in a common vertical plane transverse to said paths;

h. a first chain laid over all said chain wheels;

i. means for fixing the ends of said chain on one of said movable carriage and said frame structure, whereby fixing said chain ends on said movable carriage provides a movement gear ratio between carriage and chain of 3, and whereby fixing said chain ends on said frame structure provides a movement gear ratio between carriage and chain of 4;

j. a second chain wheel on said central shaft, located in a second plane parallel to said first plane;

k. a pair of chain-wheels symmetrically journalled on the loom frames in said second plane;

l. a second chain laid over all said wheels in said second plane, said second chain having its ends connected to the end portions of said rod.

3,888,273

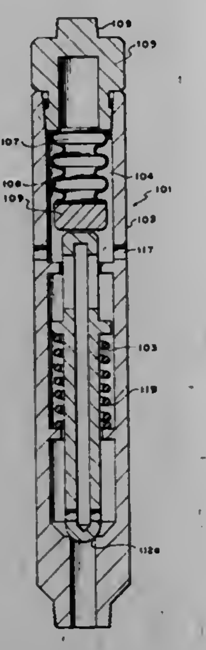
VARIABLE ORIFICE GAS LIFT VALVE

Bobby L. Douglas, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 21, 1974, Ser. No. 435,051

Int. Cl.^{2} F04F *1/20*

U.S. Cl. 137—155 **14 Claims**



1. A variable flow gas lift valve assembly comprising:
external housing means having an internal longitudinal bore passage therein and a plurality of ports through the wall thereof, said housing means adapted for interconnection in a well tubing string in a well bore;
an elongated valve member located slidably within said housing means and having an inner bore passage partially therethrough;
valve means between said valve member and said housing means;
differential pressure responsive means on said valve member responsive to a differential pressure between a well bore and a tubing string containing said gas lift valve assembly; and,
variable flow orifice means on said valve member arranged to communicate said plurality of ports with said valve means through a variable flow area inversely proportional to said differential pressure acting on said pressure differential responsive means.

3,888,274

AIR BLEEDING DEVICE FOR A PRESSURISED LIQUID SUPPLY SYSTEM

William A. Weston, Dunalastair House, Crawford, Scotland

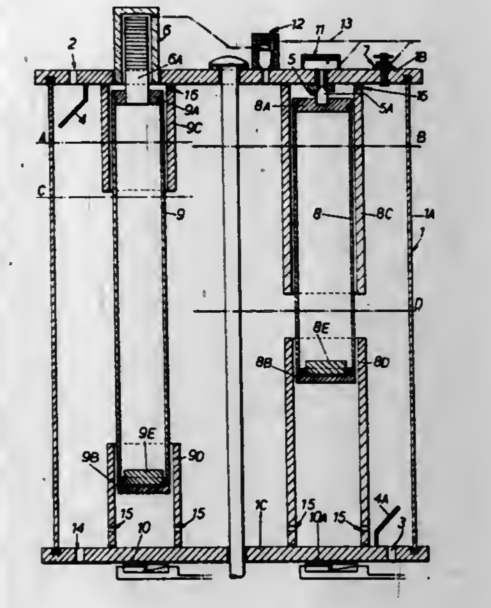
Filed Nov. 8, 1973, Ser. No. 414,526

Claims priority, application United Kingdom, Nov. 9, 1972, 51713/72

Int. Cl. F16k *31/22, 45/02*

U.S. Cl. 137—174 **3 Claims**

1. An air bleeding device in the fuel supply system of a fuel injection engine, said fuel system including a fuel injection pump, and said air bleeding device comprising a closed tank, side wall means and a top wall and a bottom wall forming said tank, means defining a fuel inlet in said tank, and means defining a fuel outlet in said tank connected to said fuel injection pump, an automatically operating air bleed valve in said top wall of the tank, a float in said tank for controlling operation of said valve and effecting opening of the valve when fuel in the tank, due to the presence of air trapped in the tank, drops below a predetermined level considerably spaced from said top wall, and a manually operable air bleed valve in said top wall opening directly into said tank; whereby, during filling of said tank with fuel, said manually operable bleed valve can be temporarily opened to permit the escape of air from said tank after the fuel has risen to said predetermined level and the automatically operating air bleed valve has closed, and the tank can thus be substantially completely filled with fuel and substantially completely evacuated of air, and said automatically operating air bleed valve remains closed unless an intake of air into the tank eventually forces the fuel to drop below said predetermined level considerably spaced from said top wall, at which time, and at intervals thereafter until the manually operable valve is again opened, the automatically operating air bleed valve opens to permit the escape of air and then closes when incoming fuel raises the level of the fuel in the tank, and said level continues to rise until the pressure inside the tank equals the pressure applied to the fuel entering the tank, so that the automatically opening valve does not hunt, and in which said tank is provided with a switch which is connected to a signal device, and is provided with a second float which has an actuator for actuating said switch and thus the signal device if the fuel falls to a second and lower predetermined level, and said tank is provided with a second switch which is connected to a fuel supply cut-off device for cutting-off the outlet of fuel from the tank, and said first mentioned float is provided with an actuator for actuating said second switch and thus said cut-off device for the fuel supply if the fuel falls to a third and still lower predetermined level.



3,888,275

FLUID FLOW SYSTEMS

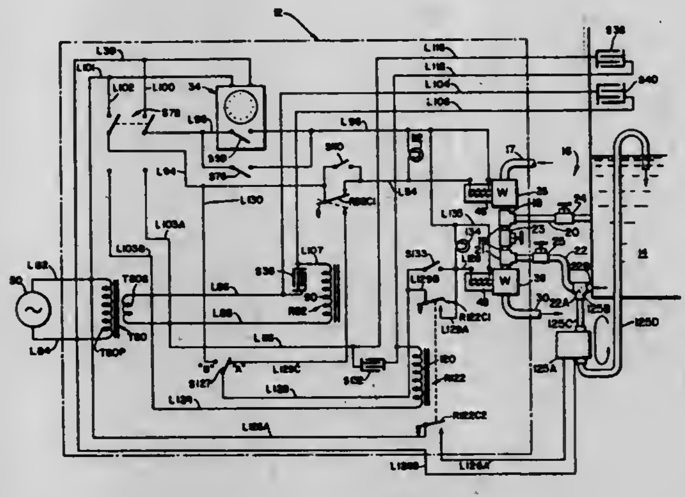
George E. Sanner, Sparks, Md., assignor to Santron Corporation, Towson, Md.

Continuation-in-part of Ser. No. 322,384, Jan. 10, 1972, Pat. No. 3,809,116, which is a division of Ser. No. 272,793, July 18, 1972, Pat. No. 3,848,616, which is a continuation-in-part of Ser. No. 18,829, March 12, 1970, abandoned, which is a division of Ser. No. 456,787, May 18, 1965, Pat. No. 3,500,844. This application Nov. 6, 1973, Ser. No. 413,255

Int. Cl. E03b *11/16*

U.S. Cl. 137—391 **12 Claims**

1. A fluid flow system comprising first and second conduits; first and second flow effecting means for controlling flow through said conduits; and control means operable in one selectable mode to so regulate the operation of said flow effecting means as to limit flow through each of said conduits to periods in which there is no flow in the other of said conduits and in a second selectable mode to so regulate the operation of the flow effecting means as to make the flow through said conduits independent so that there may be effected through one or the other of said conduits only or through both of said conduits.



3,888,276

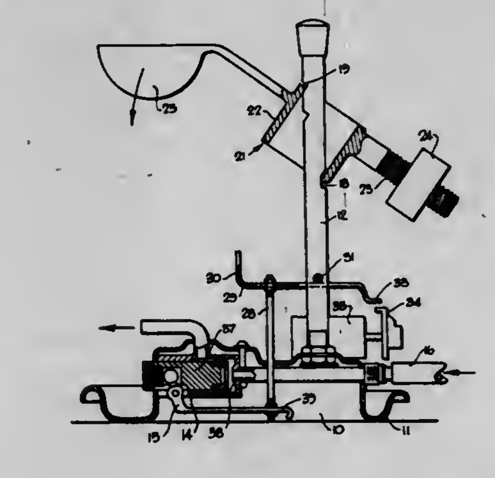
WATER CUT-OFF MEANS

Ian Richard Wannan, Eden Hills, Australia, assignor to Wannan Industries Pty. Ltd., Australia

Filed Nov. 29, 1973, Ser. No. 420,258

Int. Cl. F16k *31/44*

U.S. Cl. 137—402 **6 Claims**



1. Water cut-off means comprising a base having an upstanding post, a valve secured to the base, a valve operating arm extending from the valve and movable to open or close the valve, a lever arm pivotally movable with respect to the base having a tray on one end of the lever arm and a counterweight threadably engaging the other end of the lever arm, a pair of diametrically opposite notches in side wall of the post spaced axially from each other, said lever arm having a sleeve intermediate its ends, the sleeve being of greater diameter than the post and arranged to be supported with diagonally opposite edges of the sleeve engaged in respective notches when the sleeve is inclined relative to the post, but to be pivoted out of said notches upon a quantity of water entering the tray and thereupon to descend down the post and move the valve operating arm so as to close the valve.

3,888,277

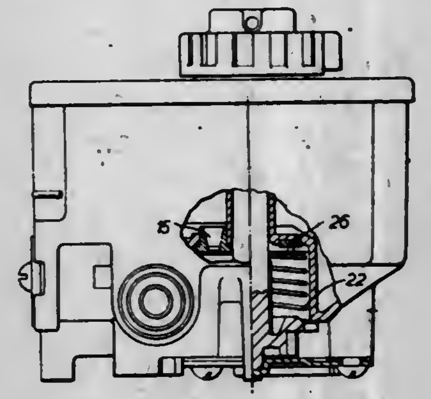
FUEL OIL FLOW CONTROLS

Laurens Zonneveld, Renkum, and Eugene Ehs, Nijmegen, both of Netherlands, assignors to Controls Company of America, Schiller Park, Ill.

Filed Nov. 23, 1973, Ser. No. 418,412

Int. Cl. F16k *11/02*

U.S. Cl. 137—405 **1 Claim**



1. An oil flow control device comprising
a housing defining therein a chamber for containing oil and having an outlet,
a metering disc having a plurality of apertures therein, the metering disc being movable to bring any selected one of its apertures into register with the outlet, and
a brush mounted within the housing separate from the orifice in engagement with said metering disc and said apertures in the disc as the disc is moved whereby dirt particles are dislodged from the apertures by the brush.

3,888,278

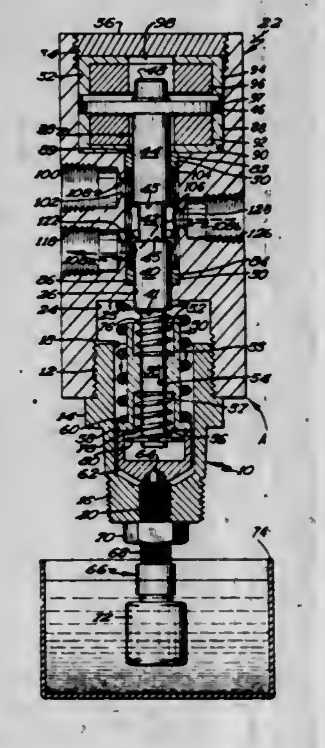
THERMAL-MAGNETIC SNAP ACTION VALVE

James V. Hanks, Minneapolis, Minn., assignor to Horton Manufacturing Co. Inc., Minneapolis, Minn.

Filed Nov. 29, 1973, Ser. No. 420,297

Int. Cl. F16k *11/07, 31/00, 1/06*

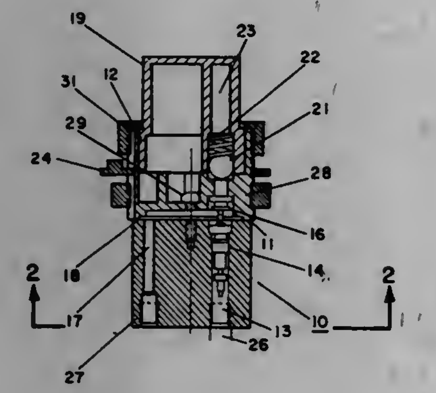
U.S. Cl. 137—625.65 **2 Claims**



1. A snap action valve comprising:
a. a valve housing having
b. inlet, outlet and service ports
c. a valve member carried by said housing and movable in opposite directions to selectable positions to connect said service port with either said inlet port or said outlet port,

- d. magnetic means mounted in said housing and including cooperating
- e. attracting and attractable magnetic members
- f. two of one type of said magnetic members being fixed relative to said housing,
- g. one of the other type being movable relative thereto and fixed relative to said valve member,
- h. guide means for guiding the movable magnetic member for movement toward or from the fixed magnetic member,
- i. valve operating means for movement of the valve member to a selected position whereby the magnetic means is brought into action to accelerate such movement,
- j. resilient means disposed between said valve member and valve operating means, effective when the valve member moves in one direction and
- k. other resilient means disposed between said valve and valve operating means effective when the valve member moves in the opposite direction.

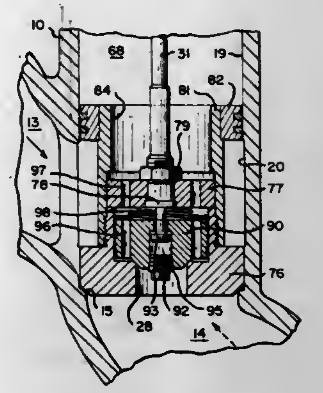
3,888,279
FLUIDIC SELECTOR VALVE
Albert R. Hiler, Lakewood, Colo., assignor to Sandoz, Inc., E. Hanover, N.J.
Filed Sept. 28, 1973, Ser. No. 401,925
Int. Cl. F16k *11/14*
U.S. Cl. 137—627 **1 Claim**



1. A fluidic selector valve device comprising in combination a switch body, a plurality of valve chambers in the switch body, a fluidic valve removably secured in each of the valve chambers, a valve actuator slidably received in each of the valve chambers, a port in the body in fluidic communication with the valve chambers, a rotatable valve selector slidably secured to the switch body, the selector comprising a housing and a chamber in the housing with a ball and spring in the chamber, the selector when rotated aligning the ball and spring housing such that the spring actuates the ball to compress the valve actuator to engage and open the valve to emit a fluid to the port.

3,888,280
BI-DIRECTIONAL PRESSURE BALANCED VALVE
Ralph W. Tartaglia, Bethel Park, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed Aug. 20, 1973, Ser. No. 389,687
Int. Cl. F16k *1/32*
U.S. Cl. 137—630.13 **2 Claims**

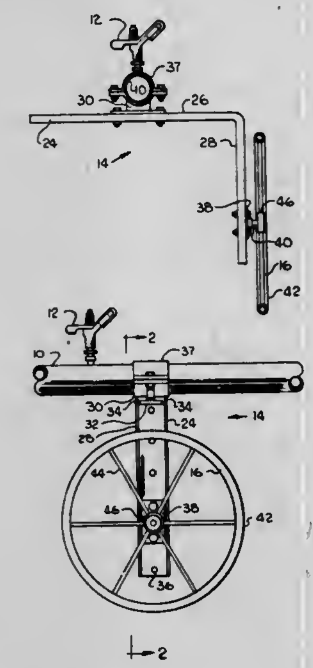
1. A valve assembly comprising: a body having two flow ports fluidly connected by a cylindrical valve control chamber; a first annular valve seat on the body between the control chamber and one of the flow ports; a cylindrical valve closure disc in the chamber having a first seating surface on the lower portion thereof and axially movable therewithin between an open position wherein said first seating surface is spaced from the first valve seat to permit fluid flow between the ports and a closed position wherein said seating surface sealingly engages said first annular valve seat to prevent flow past the seat between the ports; a cylindrical first bore coaxially formed in the upper portion of the closure disc; a hollow member rigidly coaxially connected at a lower end to the closure disc, said hollow member having an enlarged downwardly opening second bore at the lower end adjacent the first bore and defining therewith an annular chamber with axially spaced surfaces; means carried by the hollow member in axially spaced relationship to said closure disc, said means slidably engaging the surfaces of said control chamber and guiding said closure disc for axial movement in said control chamber between said positions; an axial fluid passage through said closure disc connecting said bores with said one of the flow ports and defining a supplemental flow path between said one of said flow ports and said control chamber; a second annular valve seat on the closure disc between the fluid passage and coaxial with the first bore; a cylindrical check valve having an outer surface slidably guidably supported in the first bore, said check valve having a second seating surface thereon engageable with the second valve seat and normally adapted to open or close said fluid passage through said closure disc in response to pressure changes in said ports and said control chamber; a valve stem; means for moving said valve stem in opposite directions; an actuator member slidably supported in the second bore and connected to said valve stem for lost motion movement between said axially spaced surfaces; fluid passages associated with the check valve and the actuator member for providing fluid communication therethrough between said one of said ports and the control chamber; end means projecting from the actuator member freely slidably associated with the check valve at a second lost motion connection, whereby said check valve is isolated from any guiding influence of the stem or the actuator member during lost motion movement at the second lost motion connection, said end means effective to lift the check valve from said second valve seat after said lost motion movement at said second lost motion connection.



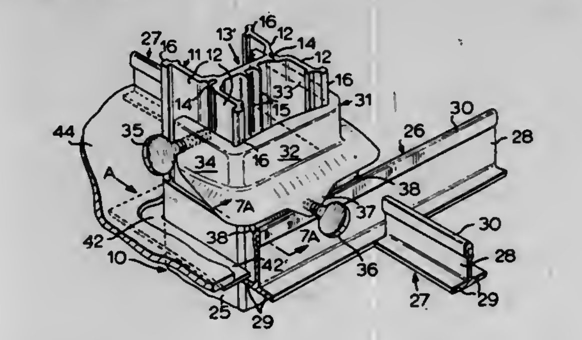
3,888,281
ONE WHEEL PULL-TYPE IRRIGATION SYSTEM
Rufus J. Purtell, Brownfield, Tex., assignor to Tri-Matic, Inc., Brownfield, Tex.
Filed Nov. 2, 1973, Ser. No. 412,501
Int. Cl. A01g *25/02;* **B05b** *15/06*
U.S. Cl. 137—344 **12 Claims**

1. In an agricultural irrigation system having
- a. an elongated pipe adapted
  - i. to carry water under pressure, and
  - ii. to discharge the water by sprinklers upon the land to be irrigated,
- b. an end vehicle at each end of the pipe, and
- c. a plurality of intermediate vehicles movingly supporting said pipe;
- d. the improvement in said intermediate vehicles comprising:
- e. each vehicle having only a single wheel,

- f. said wheel contacting the ground to one side of the pipe and spaced therefrom, and
- g. each wheel about equally spaced from wheels along the pipe on the opposite side thereof.



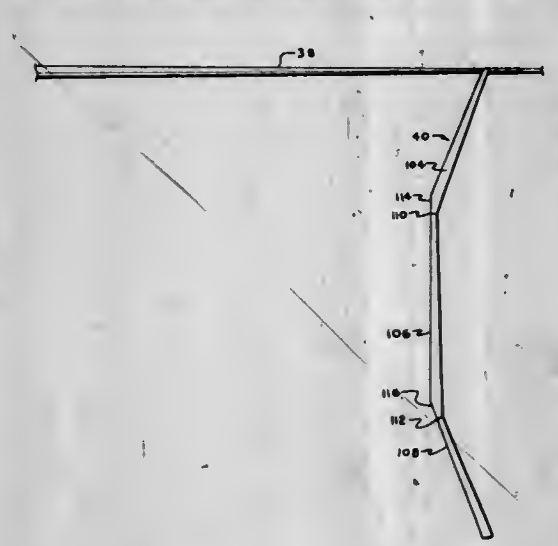
3,888,282
SERVICE COLUMNS
Jack Anthony Liddall, Mississauga, Ontario, Canada, assignor to Linac Systems International Ltd., Agincourt, Ontario, Canada
Filed July 16, 1973, Ser. No. 379,592
Claims priority, application United Kingdom, Nov. 28, 1972, 55011/72
Int. Cl. F16l *3/02, 3/10, 3/12*
U.S. Cl. 138—106 **14 Claims**



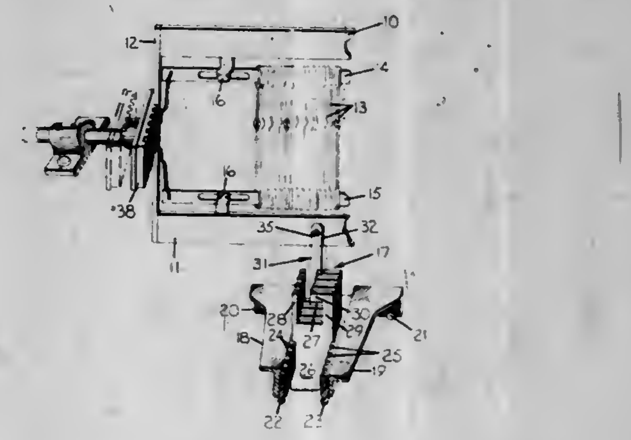
1. In combination, a service column, a ceiling structure, and a securement device releasably mounting the service column to the ceiling structure, wherein the service column comprises a core provided with a longitudinally extending service channel having a longitudinally extending open face, and a removable cover mounted on said open face, and the securement device securely embraces the column transversely thereof without overlying said service channel, the securement device being connected to the ceiling structure.

3,888,283
TAPERED POLE MADE OF VARIABLE WIDTH METAL STRIPS
Ford B. Cauffiel, 4940 Homerdale Ave., Toledo, Ohio 43623
Division of Ser. No. 212,228, Dec. 27, 1971, Pat. No. 3,771,978. This application Sept. 7, 1973, Ser. No. 394,965
Int. Cl. F16l *9/16*
U.S. Cl. 138—150 **2 Claims**

1. A tapered pole made from a plurality of ductile metal strips, each strip being of increasing width from one end to the other, said strips joined together and being wound in a generally helical manner but with the angles of the strips relative to the axis of the pole narrowing from one end of the strips to the other, the first of said strips being wound with edge portions of each wrap of the strip affixed to edge portions of adjacent wraps, and the second strip being wound over the first strip and having edge portions of each wrap affixed to edge portions of adjacents wraps, the edge portions of the second strip being set off to the side of the edge portions of the first strip at least through a substantial portion of their lengths, the wraps of both of said strips increasing in size from one end to the other.



3,888,284
LOOM HARNESS MECHANISM
Stanley C. Tiernan, Bellingham, and Ronald Berry, Hopedale, both of Mass., assignors to Rockwell International Corporation, Pittsburgh, Pa.
Filed Oct. 19, 1973, Ser. No. 408,024
Int. Cl. D03c *13/00*
U.S. Cl. 139—82 **4 Claims**

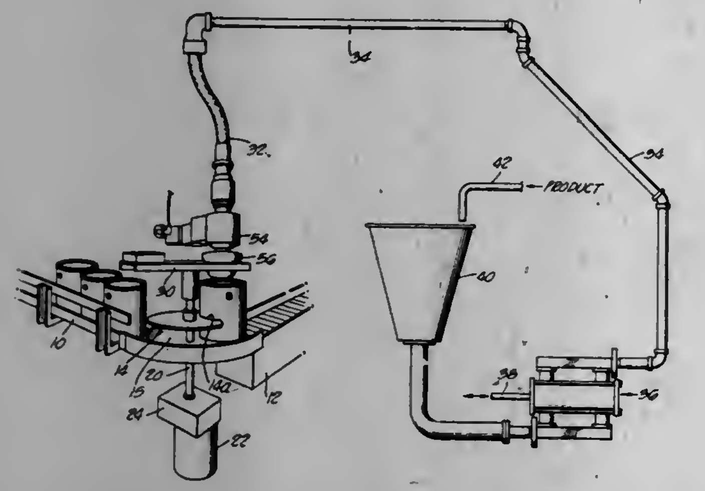


1. In combination with a loom having a plurality of harness frames with guideways disposed at each side thereof for guiding the harness frames during vertical reciprocation thereof, an improved means for transmitting a loom's shedding motion to the harness frames, comprising:
- a. a harness sheding drive plate for each of the harness frames disposed for vertical reciprocation below and in alignment with the harness frame individual thereto;
- b. a linkage member disposed in communication with each harness frame and drive plate which includes;
  - i. an elongated body portion having a first end attached to the lower exterior surface of a harness frame:
  - ii. a second end interconnecting and removably associated with its respective drive plate; and
  - iii. means for placing said linkage member into driving engagement with its drive plate for transmitting the motion of the latter to its respective harness frame.

3,888,285
CONTAINER FILLER APPARATUS

George Ashton, 12274 Laurel Terrace Dr., Studio City, Calif. 91604

Filed Oct. 23, 1973, Ser. No. 408,627
Int. Cl. B65b *43/42*
U.S. Cl. 141—168 **5 Claims**

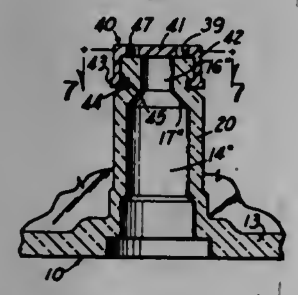


1. A machine for automatically filling each of a succession of containers with liquid, said machine comprising: transferring means; means for moving the containers in succession to said transferring means to be successively transferred thereby; a bracket mounted over said transferring means and movable therewith; a flexible hose having a spout at one end supported in said bracket and movable therewith to be disposed directly over the container transferred by said transferring means; a source of liquid displaced from said transferring means; and a pipeline displaced from said transferring means and extending from said source to the other end of the flexible hose to suspend the flexible hose over the bracket and for introducing liquid to the hose to be filled into the containers.

3,888,286
UNITARY RESILIENT SEALING VALVE

Harry L. Vaughan, Lawrenceville, Ga., assignor to Scripto, Inc., Atlanta, Ga.

Division of Ser. No. 89,257, Nov. 13, 1970, abandoned, which is a continuation of Ser. No. 310,396, Nov. 29, 1972, Pat. No. 3,841,366. This application Nov. 29, 1972; Ser. No. 310,397
Int. Cl. B65b *3/04*; **B67c** *3/02*
U.S. Cl. 141—291 **4 Claims**

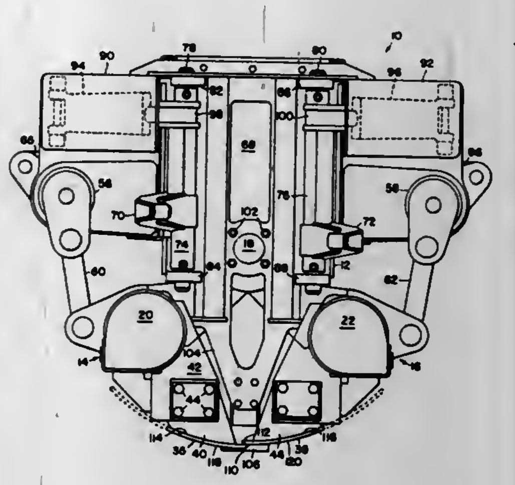


1. A fill valve for a lighter having a reservoir containing a supply of fuel therein and fill port means communicating with the reservoir adapted to receive a charging apparatus therein for introducing fuel into the reservoir and with the fill port means having a fuel flow passage extending therethrough to an apertured inner end surface and a circumferential outer surface disposed within said reservoir extending longitudinally from said inner end surface and having a circumferential groove therein, said fill valve comprising a resilient or elastic cap having a circumferential body portion fitted annularly outside the fill port and having an inwardly directed flange thereon for snap fitting engagement within said circumferential groove and about at least a portion of said fill port circumferential outer surface and a flexible top portion defining at least one passageway therethrough offset from said fuel flow passage and overlaying said fill port apertured end surface so that said fill port apertured end surface is normally sealably closed by the non-apertured part of said flexible top portion whereby a charging apparatus may be inserted in the fill port means and engage and flex the resilient cap top portion away from sealing engagement with the fill port end surface thereby opening the normally closed end of the fill port means to permit a flow of fuel from the charging apparatus through the fuel flow passage of the fill port means and the apertured passageway of the flexible top portion of the resilient cap and into the reservoir.

3,888,287
BLADE FOR TREE SHEAR HAVING VERTICALLY SWINGABLE BLADE SUPPORT ARMS

Earl Clinton Johnson, Bellevue, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Apr. 10, 1974, Ser. No. 459,538
Int. Cl. A01q *23/08*
U.S. Cl. 144—34 E **4 Claims**

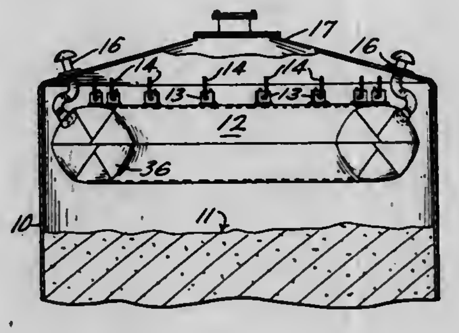


1. In a tree shear head of a type including a main support frame, a pair of blade support arms pivotally mounted on the frame for pivotal movement about an axis which extends horizontally when the frame is in an upright position, a pair of plate-like shear blades respectively fixed to the pair of support arms and being curved so as to be on respective radii emanating from said axis, said blades having respective beveled cutting edges which extend parallel to said axis and which are movable with said blade arms between an open position, wherein they are spread apart a distance slightly greater than the diameter of the largest tree to be severed, and a closed position wherein they are slightly overlapped, power-operated means connected to the blade support arms for swinging them towards and away from each other; and each of said blades, with reference to said axis, including inner and outer curved surfaces located on respective radii emanating from said axis with said cutting edge being formed by converging inner and outer planar surfaces respectively extending outwardly and inwardly from said inner and outer curved surfaces, the improvement comprising: the ratio of the area of the inner planar surface to the area of the outer planar surface being no greater than about 0.5 and the included angle formed at the intersection of the inner and outer planar surfaces of each blade being no less than about 45°.

3,888,288
SILO BREATHER BAG

Jerry J. Hickle, and Robert D. Sherbourne, both of Findley, Ohio, assignors to R. L. Kuss & Co., Inc., Findlay, Ohio

Filed Jan. 28, 1974, Ser. No. 436,906
Int. Cl. A45c *9/00*; **B65b** *3/00*; **B65d** *25/02*
U.S. Cl. 150—1 **3 Claims**

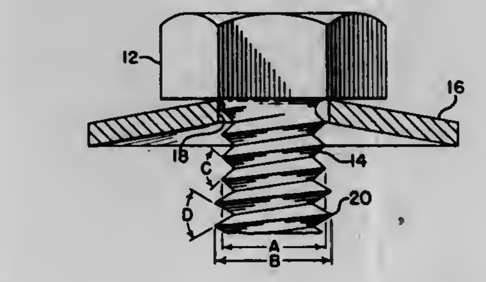


1. A tubular silo breather bag for use in a hermetically-sealed silo, comprising two sheets of material defining a top and a bottom, each sheet having a first arcuate edge, a second arcuate edge of shorter arcuate length and sharper curvature than said first edge, and two ends having serrated edges defining, at each end of the breather bag, pairs of opposed two and three sided projections, said two sheets being sealed together at corresponding arcuate edges and at adjacent edges of adjacent projections with the projections converging generally centrally at each end of said joined sheets, the projections in each pair being similar with at least one projection of a different shape located therebetween, one pair of projections being of length sufficient to form an overlapping sealed portion of corresponding opposed edges of the pair, the remaining sealed edges defining staggered noncoextensive lines, all of said projections when in sealed relationship forming a generally polygonal end with not more than three projections being contiguous to any one point, said assembled sheets forming an arcuate weiner-like inflatable bag, said bag having an air duct extending from one of said two sheets for connection to an opening in the silo.

3,888,289
PREASSEMBLED FASTENER UNIT

Richard Lee Reynolds, Carpentersville, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 334,512, Feb. 21, 1973, abandoned. This application May 17, 1974, Ser. No. 471,091
Int. Cl.^{2} F16B *33/02, 39/24*
U.S. Cl. 151—38 **4 Claims**

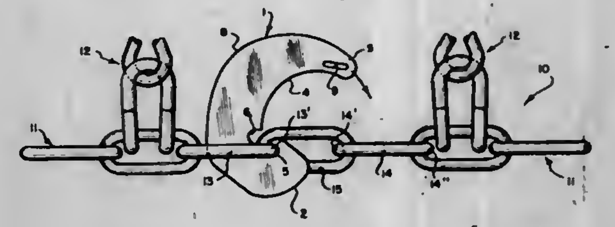


1. A preassembled composite fastener unit, for association with an apertured workpiece, comprising an apertured spring washer, and a screw type fastener having a shank extending through the washer aperture and a head presenting a clamping surface to the adjacent face of the washer; said shank having a first utility helical thread formation extending from adjacent the head clamping surface along a limited axial extent of the shank and of a predetermined crest diameter permitting free relative movement between the same and the surface of the washer aperture, and a second utility helical thread formation along a remaining portion of the shank and of a crest diameter at least adjacent the first thread formation slightly greater than the predetermined crest diameter of the first thread formation in interfering relation with the washer body around the aperture therein for trapping the washer on the shank in the region of the first thread formation, the root diameters of the first and second thread formations being substantially equal, the included flank angles of the first thread formation being greater than the included flank angles of the second thread formation wherein the second thread formation provides primary thread engagement with an associated workpiece and contributes to the clamping force capability of the unit while the first thread formation provides a prevailing torque capability to the unit in addition to contributing to the clamping force capability of the unit.

3,888,290
TIRE CHAIN TIGHTENER

Daniel E. Hess, and David William Bannier, both of York, Pa., assignors to American Chain Cable Company, Inc., Bridgeport, Conn.

Filed Dec. 1, 1972, Ser. No. 311,096
Int. Cl. B60c *27/10*
U.S. Cl. 152—217 **7 Claims**



1. A tightening device for shortening the length of a chain, comprising:

a. a flat plate like member of unitary structure having:
   1. open ended slot attaching means disposed at one end for removably receiving the first link of a chain to permit rotation of the member about said link,
   2. a handle defined by the other end of the member, said handle being adapted to be inserted through a second link spaced from the first link upon rotation of said member about the end of the first link,
   3. a concave surface extending along one edge of said member from said handle toward said first attaching means, said concave surface defining a camming surface for engaging the inner surface of the end of the second link and drawing it toward the first link as the handle is moved through the second link and the member is pivoted about the first link, and
   4. locking means at the end of the camming surface adjacent the attaching means for receiving the end of the link as it moves along said camming surface toward the first link, said attaching and locking means being spaced from each other to hold the first and second links in shortened spaced relation when received thereby.

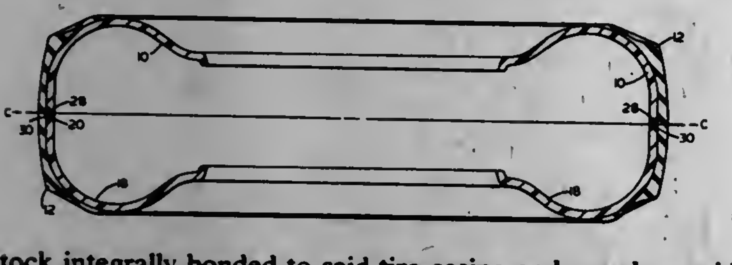
3,888,291
MOLDED OR CAST TIRES AND METHODS OF MANUFACTURE

Harold J. Herzlich, Wellingord, and Paul F. Fitzgerald, West Haven, both of Conn., assignors to The Armstrong Rubber Company, New Haven, Conn.

Filed Dec. 12, 1973, Ser. No. 424,097
Int. Cl. B60c *5/00, 9/00*
U.S. Cl. 152—330 R **11 Claims**

7. A pneumatic tire for vehicles comprising a tire casing formed essentially of a cast segmented thermoplastic copolyester elastomer including recurring polymeric long-chain ester units derived from dicarboxylic acids and low molecular weight diols, said thermoplastic elastomer having a medium to high durometer range of hardness, a tensile strength of about

6000 psi at room temperature and a melting point in the vicinity of 400°F, and a tread of conventional tread-rubber stock integrally bonded to said tire casing and cured on said tire casing with a bonding agent at the interface of said tread and casing that contains a non-volatile isocyanate.



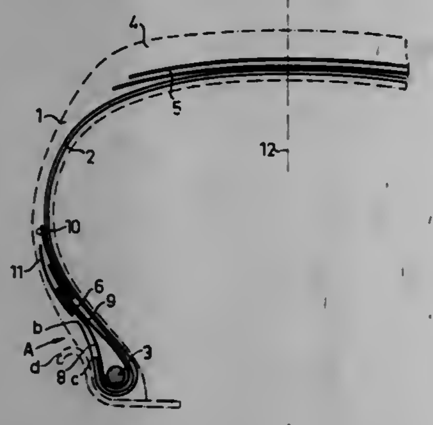
3,888,292
PNEUMATIC VEHICLE TIRE
Hans Menell, Ahlem, and Rach Heinz-Dieter, Garbsen, both of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

Filed July 12, 1973, Ser. No. 378,418

Claims priority, application Germany, July 14, 1972, 2234657

Int. Cl. B60c *15/06*

U.S. Cl. 152—362 **4 Claims**



1. A pneumatic vehicle tire provided with bead cores, which includes in combination a circumferential belt, a radial carcass, and core flags formed by steel cables arranged substantially parallel to each other and folded in a U-shaped manner around said bead cores, the rims of said carcass being looped around said core flags so as to anchor said carcass rims on said bead cores, and said steel cables which form said core flags extending at an acute angle inclined with regard to the tire circumferential direction of the tire and at least a part of the free ends of the carcass rims facing the outer surfaces of the tire side walls, and leg portions of said core flags which are adjacent to the interior of said tire as well as those portions of said core flags which are adjacent to the outside of said tire being symmetrically arranged with regard to the central tire plane perpendicular to the axis of rotation of said tire.

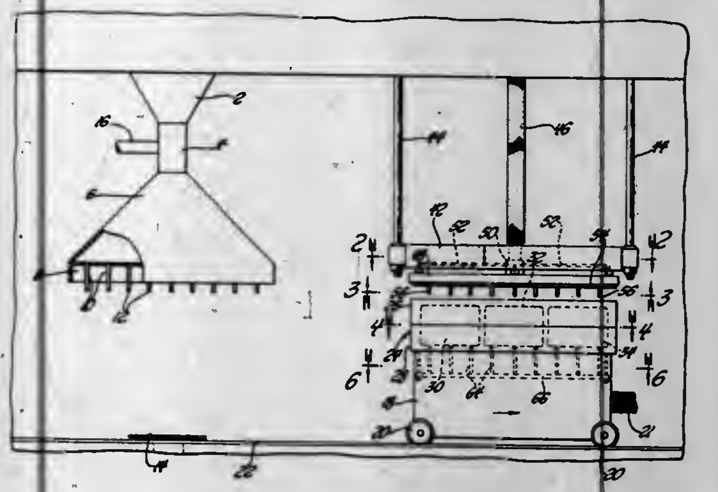
3,888,293
METHOD OF MAKING A FOUNDRY CORE
Henry A. Laforet, and Michael J. Zusack, both of Sarnia, Ontario, Canada, assignors to American Motors Corporation, Detroit, Mich.

Filed Apr. 20, 1973, Ser. No. 353,176

Int. Cl. B22c *9/12*

U.S. Cl. 164—16 **37 Claims**

27. A method for making a foundry core comprising mixing a foundry aggregate with a curable binder, shaping the mixture to form a green body; providing a ready, continuous supply of a pressurized vapor solution of a liquid curing agent in an inert carrier gas; introducing under pressure a first gas comprising said pressurized staurated vapor solution into said body; and immediately thereafter introducing a second gas under greater pressure into said body while inhibiting the escape of said first gas and said second gas from said body so as to force said first gas throughout said body, thereby uniformly and completely curing said binder.



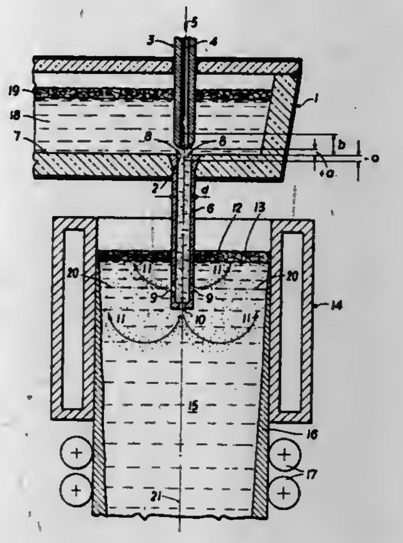
3,888,294
METHOD OF CONTINUOUSLY CASTING STEEL
Thorwald Fastner; Alois Niedermayr, and Ernst Bachner, all of Linz, Donau, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed May 24, 1974, Ser. No. 473,212

Claims priority, application Austria, June 14, 1973, 5223/73

Int. Cl. B22d *11/10*

U.S. Cl. 164—66 **14 Claims**



1. In a continuous steel casting method for a casting capacity of more than 1.5 metric tons of steel per minute, wherein at least one stream of molten steel is formed and cast into a vertically arranged, substantially rectangular mold, having a larger transverse axis and a smaller transverse axis, through a casting tube having a certain clear cross section and extending to below the level of molten steel in the mold, said casting tube having lateral openings whose axes lie in a vertical plane running through the larger transverse axis of the mold, and wherein said at least one stream of molten steel contains inert gas, the improvement comprising

casting the at least one stream of molten steel, having a certain cross section, through a casting tube provided, in addition to the said lateral openings, with at least one bottom opening directed vertically downward, said at least one bottom opening having a cross section smaller than the clear cross section of the casting tube and the cross section of the stream of molten steel, the axes of the said lateral openings being inclined by between 70° downward and 90° upward in relation to the horizontal and the total cross section of the lateral openings and of the at least one bottom opening being at least equal to the clear cross section of the casting tube, and

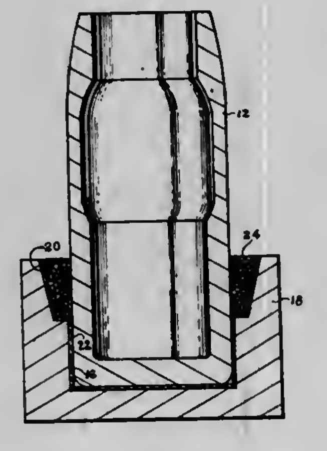
supplying the said inert gas to the said at least one stream of molten steel in an amount of 1 to 15 Ncm^3/kg steel over the entire cross section of the stream of molten steel at the place of origin of said at least one stream of molten steel above the mold.

3,888,295
METHOD OF BONDING AN ANNULAR BAND OF MATERIAL TO AN OBJECT
David E. Schillinger, 5235 Montour Street, Philadelphia, Pa. 19124

Filed Oct. 29, 1973, Ser. No. 410,862

Int. Cl. B22c *3/00*

U.S. Cl. 164—72 **3 Claims**



1. A method of bonding a rotating band to a projectile shell which has a higher melting point than the band material and a portion of substantially uniform outside diameter comprising the steps of

placing the shell into a refractory graphite mold having an annular cavity which surrounds the shell and a close-fitting nest which receives said portion of said outside diameter,

loading the annular cavity with band material so as to constitute an assembly of the mold, shell, and band material, heating the assembly by induction heating until the band material melts, the annular cavity being constructed such that when the band material is melted it will flow to and fuse to the adjacent annular surface of the shell, and

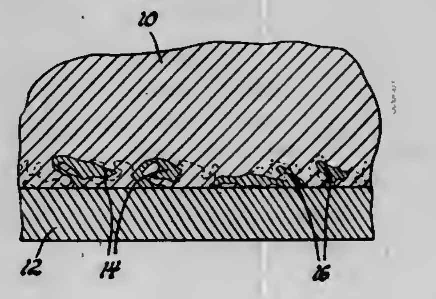
allowing the banded shell to cool.

3,888,296
METHOD FOR THE MANUFACTURE OF A COMPOSITE ARTICLE
Peter Vernia, Rochester, and James C. Holzwarth, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 30, 1974, Ser. No. 474,415

Int. Cl. B22d *19/02*

U.S. Cl. 164—97 **4 Claims**



1. Method of producing a composite metal article comprising an aluminum body having a ferrous metal layer attached thereto comprising the steps of:

applying a mono particle layer of ferrous metal machining chips on the surface of a ferrous metal layer;

brazing said chips to said ferrous metal layer;

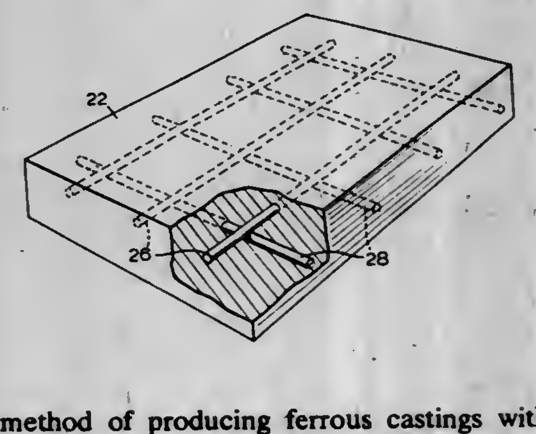
die casting said aluminum body onto said chips whereby the molten metal enters the interstices of said chips and on solidification the aluminum body is mechanically attached to said ferrous layer.

3,888,297
METHOD OF PRODUCING FERROUS CASTINGS WITH CAST-IN FERROUS INSERTS
Barry J. Davies, Hamilton, Canada, assignor to Canron Limited, Montreal, Quebec, Canada

Filed Nov. 2, 1973, Ser. No. 412,177

Int. Cl. B22d *19/00*

U.S. Cl. 164—100 **1 Claim**



1. A method of producing ferrous castings with cast-in ferrous metal inserts comprising the steps of

a. preparing the surface of the ferrous metal insert which is to be cast-in to receive a bondable coating,

b. applying at least one coat of a coating composition consisting of finely divided macroscopic vitreous silica dispersed in an aqueous silica sol containing a binder to the surface of the ferrous metal insert and allowing the coating to dry to form a hard nonyieldable refractory coating which prevents carburization and fusion during the casting step,

c. locating the coated insert in a mold in a manner such that it cannot be displaced during casting,

d. casting a ferrous metal about said refractory coated insert, said refractory coating preventing carburization of the insert and fusion of the insert with respect to the casting.

3,888,298
PRODUCTION OF INGOTS
Kenton Parkes Cooley, Fairfield, Conn., and Edward John Jago, Berea, Ohio, assignors to Foseco International Limited, Birmingham, England

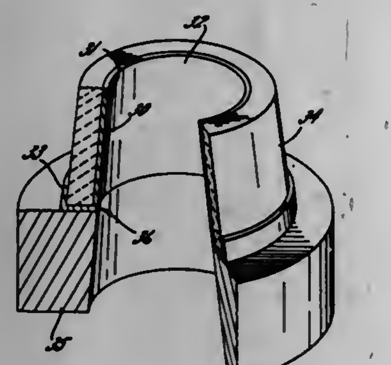
Continuation-in-part of Ser. No. 234,029, March 13, 1972, which is a division of Ser. No. 103,681, Jan. 4, 1971, Pat. No. 3,672,427. This application Mar. 22, 1974, Ser. No. 453,671

Int. Cl. B22d *7/10*

U.S. Cl. 164—137 **1 Claim**

1. In the lining of a head box for an ingot mould wherein the head box has an inner contour surface to be lined and an outside surface joined by a bottom surface adapted to rest on the upper surface of the ingot mould and wherein molten metal contacts a lining element, the method which comprises locating within the head box at least one lining element selected from the class consisting of lining slabs and sleeves of a deformable refractory composition, the lining element extending about the inner and bottom surfaces of the head box and the edge of the lining element terminating adjacent the outside surface thereof, securing the edge of the lining element to the outer surface of the head box by applying force in such a way as to deform the edge to the outside surface, assembling the head box on the ingot mould so that the lining

element forms a seal between the head box and the ingot mould, and charging molten metal into the assembled ingot mould and head box whereby the lining element about the inner surface of the head box is deformed to the contour of the inner surface by the metallostatic pressure of the molten metal contacting the lining element.



3,888,299
MACHINE FOR THE PRODUCTION OF FOUNDRY CORES AND MOULDS

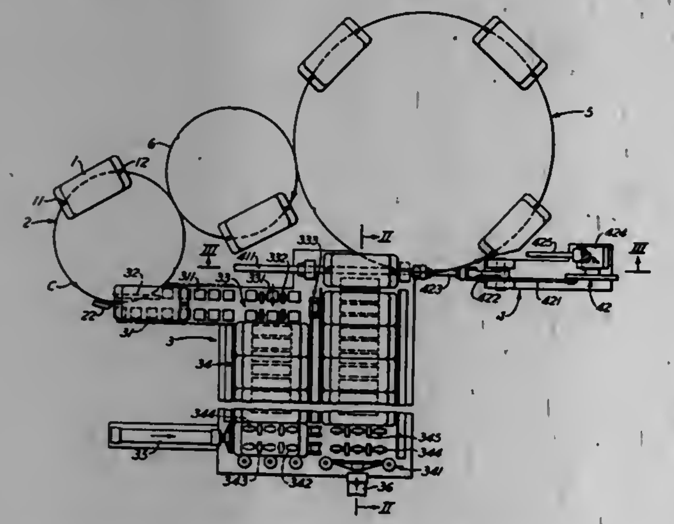
Gerard Bardet, Paris, France, assignor to Automatisme et Technique, Arcueil, France

Filed Mar. 22, 1973, Ser. No. 343,820

Claims priority, application France, June 29, 1972, 72.23555

Int. Cl. B22c *11/04*

U.S. Cl. 164—228 **10 Claims**



1. A machine operable in a continuous kinematic manner for the production of foundry cores with the aid of core boxes, the machine comprising a first continuously rotating barrel for introducing into the core boxes a mixture of sand and a polymerization constituent, a treatment chamber maintained at a predetermined temperature and having an inlet and an outlet, means for delivering core boxes in succession from said barrel to the inlet of said chamber, means for carrying the boxes through the treatment chamber for hardening the mixture in them, a second continuously rotating barrel for ejecting cores from the boxes as it carries them in a circular path faster than they are carried through the treatment chamber, accelerating means for receiving each successive box from the outlet of the treatment chamber and delivering the box to said second barrel along a path tangent to said circular path of the boxes, said accelerating means being formed and constructed to accelerate the speed of each box as it moves toward said second barrel until said speed matches the speed of the boxes moving in said circular path, and a transfer barrel for returning emptied boxes from said second barrel to said first barrel, whereby the boxes travel in a closed circuit continuously.

3,888,300
APPARATUS FOR THE CONTINUOUS CASTING OF METALS AND THE LIKE UNDER VACUUM

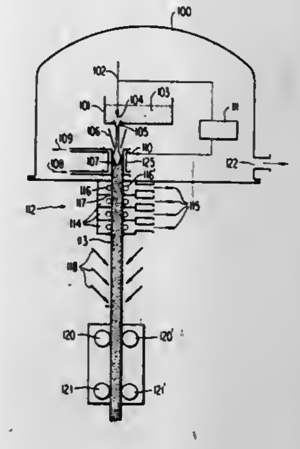
Claude Guichard, Voiron, and Jean-Claude Soret, Saint Egreve, both of France, assignors to Societe Anonyme: Societe Industrielle de Combustible Nucleaire

Continuation-in-part of Ser. No. 153,266, June 15, 1971, abandoned. This application Jan. 23, 1973, Ser. No. 326,056

Claims priority, application France, June 15, 1970, 70.21933

Int. Cl. B22d *27/16*

U.S. Cl. 164—256 **10 Claims**



1. In a device for the continuous casting of metals or metal alloy materials under vacuum, or under a controlled atmosphere, where degasing of the materials is required and/or the materials react easily with the surrounding air when they are hot, including a tundish for molten metal which is maintained under a vacuum, or under a controlled atmosphere; and interchangeable ingot mold associated with said tundish and equipped with a water cooling system and a level detecting device for detecting the level of molten metal in said mold; a dynamic air lock comprising a plurality of interconnected vacuum chambers whose inside pressures are reduced by means of a large capacity vacuum pump, the vacuum chambers being separated from one another by means of diaphragm walls having aligned apertures to permit passage of material from said mold, and support rollers mounted for rotation on shafts arranged in each vacuum chamber of the dynamic air lock on opposing sides of said diaphragm wall apertures, cooling means for cooling said support rollers and centering means for adjusting the position of said rollers to center said material with respect to said diaphragm wall apertures; a water spray means arranged at the outside of the dynamic air lock; and means for maintaining constant the static pressure in the metal which exists at the level of the dynamic air lock by adjusting the level of molten metal in the ingot mold in response to the output from said level detector, so as to maintain within a predetermined tolerance the difference obtained between the cross-section of the cast product and the diaphragm wall apertures.

3,888,301
MULTI-PART MOLD CLAMP

Douglas R. Hayes, Vernon, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

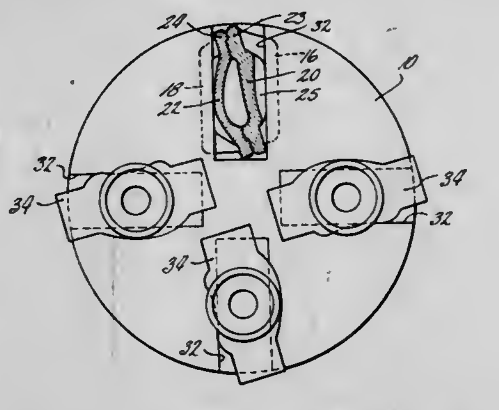
Filed June 7, 1974, Ser. No. 477,534

Int. Cl. B22d *33/04; 25/06*

U.S. Cl. 164—341 **6 Claims**

1. The combination with a multi-part, preformed mold for making castings, said mold being in at least two longitudinal parts and having an open end to rest on a chill plate and also having a peripheral flange at said open end, of a plate having at least one slot therein to hold said mold on the chill plate, said slot being dimensioned to receive the multi-part mold

therein and to engage opposite sides thereof such that the parts are held in operative assembled relation, said plate resting on and engaging said peripheral flange to hold the latter against the chill plate.



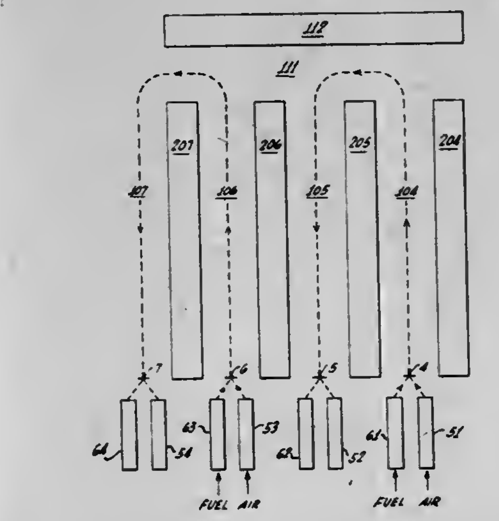
3,888,302
METHOD FOR REMOVING DEPOSITS FROM INTERIOR SURFACES OF REGENERATIVE HEAT EXCHANGERS

Gerald L. Rounds, Fontana, Calif., assignor to Kaiser Steel Corporation, Fontana, Calif.

Filed Oct. 1, 1973, Ser. No. 401,993

Int. Cl. F28g *13/00*

U.S. Cl. 165—1 **10 Claims**



1. In a regenerative heat exchanger having heat exchange surfaces on which deposits, including metal oxides, have formed, a method for removing said deposits from said surfaces while maintaining said regenerative heat exchanger in operation comprising the steps of maintaining said heat exchanger substantially at operating temperatures, causing a gas stream to flow in said exchanger thereby to contact said heat exchange surfaces, introducing a deposit reactive material into said gas stream thereby to carry said deposit reactive material into contact with said deposit for reaction with at least a major portion thereof to form reaction products, and removing said reaction products from said heat exchanger.

3,888,303
THERMAL EXCHANGE FLUID PREPARATION OF FOODS

Stephen F. Skala, 3839 S. Wenonah, Berwyn, Ill. 60402

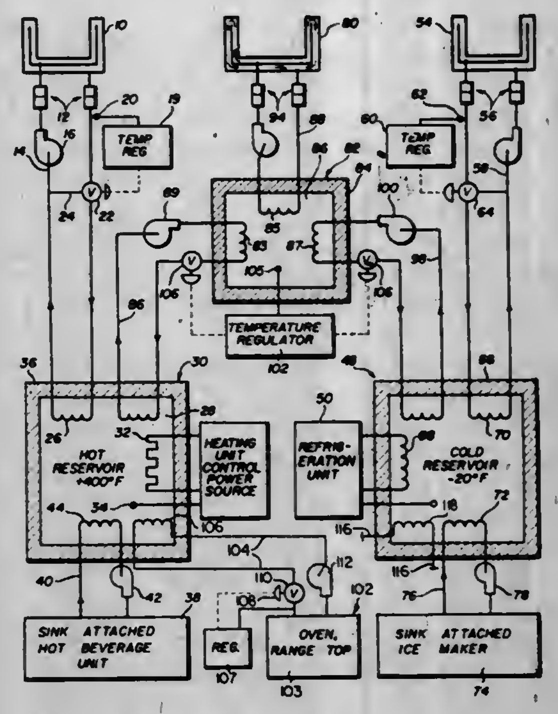
Filed Oct. 20, 1972, Ser. No. 299,214

Int. Cl. F25b *13/00*

U.S. Cl. 165—2 **7 Claims**

1. A method for rapidly attaining predetermined temperature levels of a food or beverage substance in a houseware unit by delivering thermal fluid to a chamber of said houseware unit which is connectable to a coupling and valving zone, including the steps of

storing a body of thermal fluid in a thermal reservoir,
attaining desired heat content of the stored body of thermal fluid in said thermal reservoir,
maintaining a desired heat content of the body of thermal fluid stored in said reservoir,
connecting said houseware unit to the coupling and valving zone,



opening said zone to the travelling thermal fluid,
delivering the travelling thermal fluid under pressure along a closed line through the connected open zone to the chamber houseware unit, and
returning said travelling fluid from the houseware unit through the opened connected zone to the thermal reservoir so that a succeeding charge of travelling fluid of desired heat content may be delivered to the houseware unit to attain predetermined temperature levels in said houseware unit.

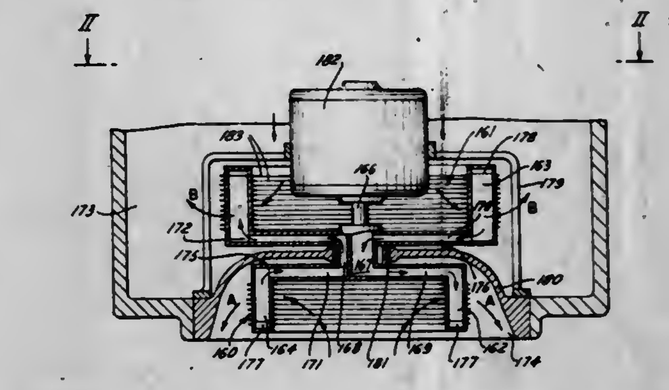
3,888,304
TEMPERATURE-CONTROL SYSTEM USING THERMOSIPON EFFECT

Nikolaus Laing, Hofener Weg 35-37, 7141 Aldingen, Germany

Division of Ser. No. 847,771, June 17, 1969, abandoned, Continuation-in-part of Ser. No. 802,704, Dec. 11, 1968, abandoned, Continuation-in-part of Ser. No. 585,819, Oct. 11, 1966, abandoned. This application Mar. 13, 1972. Ser. No. 234,433

Int. Cl. F28d *11/00;* **F28f** *5/00*

U.S. Cl. 165—86 **12 Claims**

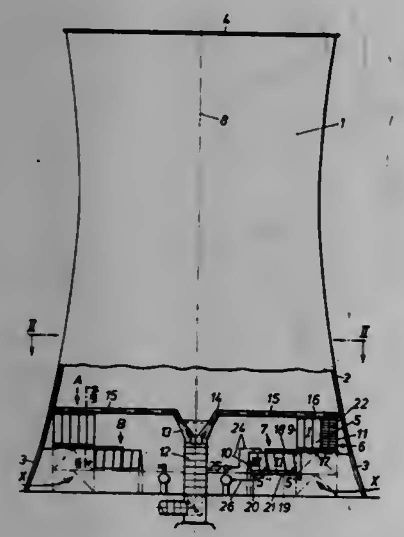


1. A temperature-control system for a space provided with means for maintaining a first fluid therein at a temperature differing substantially from that of a second fluid in an adjoining environment separated from said space by a wall, comprising:

a shaft passing through said wall;
drive means for rotating said shaft; and
a pair of coaxial rotors on said shaft, one of said rotors having a first hollow body disposed in said space for contact with said first fluid, the other of said rotors having a second hollow body disposed in said environment for contact with said second fluid;
said shaft having two passages communicating with the interiors of both rotors and forming therewith a closed path sealed against the atmosphere for the circulation of a heat-carrier medium abstracting heat from the warmer one of said fluids and giving off heat to the colder one of said fluids, said path including first radial extensions of said passages in said first rotor and second radial extensions of said passages in said second rotor, said first radial extensions differing in length from said second radial extensions for creating a thermosiphon effect by lengthening the radially outward flow path of the cooled medium and the radially inward flow path of the heated medium relatively to the radially inward flow path of the cooled medium and the radially outward flow path of the heated medium, said thermosiphon effect being the sole means for circulating said medium.

3,888,305
COOLING TOWER

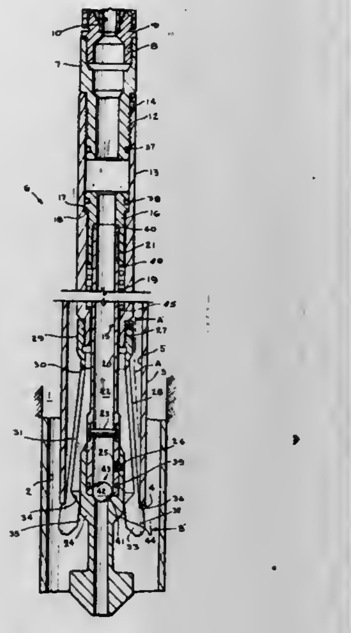
Hans-Bernd Gerz, Bochum, Germany, assignor to Gea Luftkuhlergesellschaft Happel GmbH & KG, Bochum, Germany
Filed May 31, 1974, Ser. No. 475,151
Claims priority, application Germany, Feb. 8, 1974, 2405999
Int. Cl. F28b *1/06, 9/10*
U.S. Cl. 165—113 **13 Claims**



1. A cooling tower for condensation of vaporous media, comprising an upright peripheral tower wall having a lower region with air inlet apertures, and an upper region with an air outlet; at least one upper annulus of first heat-exchange elements inwardly adjacent said wall, and at least one downwardly offset second lower annulus of heat-exchange elements inwardly spaced from said upper annulus, the elements of each annulus being upwardly and inwardly inclined and having upper and lower end portions, and at least some of said elements of each annulus acting as condensers; a supply conduit centrally within the confines of said tower wall for supplying vaporous medium; a plurality of straight connecting pipes radiating substantially horizontally from said supply conduit and communicating with said upper end portions of said first elements; and a plurality of substantially horizontal condensate collecting tubes communicating with said lower end portions of said first elements and also communicating with said upper end portions of said second elements, so as to convey both condensate and vaporous medium from said first to said second elements.

3,888,306
METHOD OF AND APPARATUS FOR POSITIONING AND CORRELATING THE END OF REMEDIAL TUBING IN RELATION TO THE LOWER END OF PRODUCTION TUBING IN A SUBTERRANEAN WELL

Rodney J. Wetzel, St. Martinville, La., assignor to Dixieco, Inc., Lafayette, La.
Filed Mar. 25, 1974, Ser. No. 454,376
Int. Cl.^{2} E21B *43/00*
U.S. Cl. 166—255 **32 Claims**



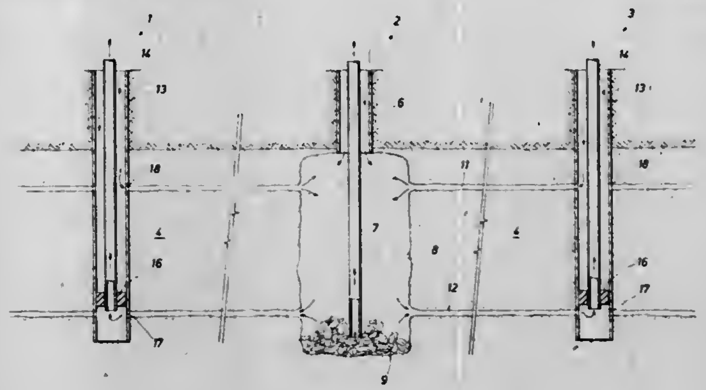
1. In a subterranean well, a method for correlating the lower end of production tubing and the lower end of remedial tubing inserted therein, comprising the steps of:

A. Affixing to the lower end of the remedial tubing an apparatus having:
   1. A hydraulically activated member;
   2. Locating means which may be urged outwardly by downward movement of the hydraulically activated member; and
   3. Means for retracting the locating means;
B. Lowering the apparatus affixed to the remedial tubing into the production tubing in the wall to a point at least lower than the lower end of the production tubing;
C. Activating the apparatus by applying fluid pressure through the remedial tubing to the hydraulically activated member to outwardly extend the locating means;
D. Raising the remedial tubing to a point whereby the extended locating means contact the lower end of the production tubing and cause interference with continued upward travel of the remedial tubing;
E. Flagging at the subterranean well surface the interference point determined by Step D.

22. An apparatus for correlation in a subterranean well of the lower end of production tubing and the lower end of remedial tubing inserted therein, comprising: (a) a hydraulically activatable member for initiating correlation; (b) means for locating said lower end of said production tubing, said means being urgeable outwardly by downward movement of the hydraulically activatable member; and (c) means for retracting the locating means upon correlation of said lower tubing ends.

3,888,307
HEATING THROUGH FRACTURES TO EXPAND A SHALE OIL PYROLYZING CAVERN

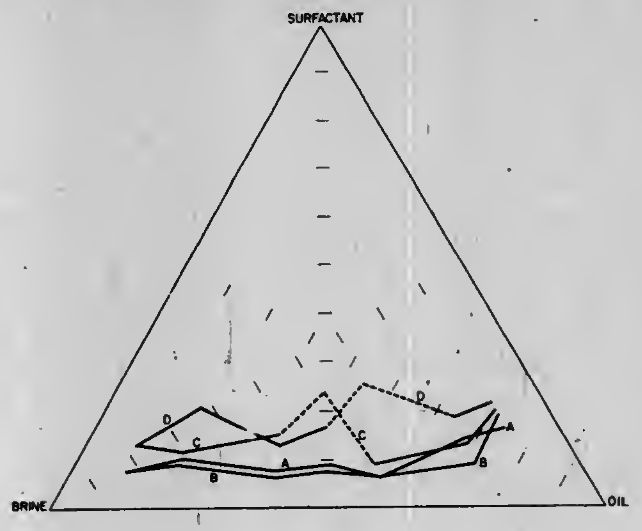
Philip J. Closmann, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.
Filed Aug. 29, 1974, Ser. No. 501,535
Int. Cl.^{2} E21B *43/24*
U.S. Cl. 166—272 **4 Claims**



1. In a shale oil producing process in which a relatively solids-free, rubble-containing cavity is formed within an otherwise substantially non-porous and impremeable subterranean oil shale, and fluid is injected into and withdrawn from the cavity, the improvement which comprises:
- forming at least two vertically-separated, substantially horizontal fractures that extend between the cavity and at least one adjacent well;
- inflowing a hot non-solvent-gas into the cavern through at least one of said fractures;
- outflowing a hot fluid containing oil shale pyrolysis products from the cavern through at least one other of said fractures; and
- adjusting the rate and temperature of the fluid inflowing and outflowing through the fractures so that the fracture walls are heated and become vertically separated, generally planar heat sources from which heat is transferred to portions of the oil shale formation surrounding the walls of the cavity.

3,888,308
USE OF MATERIALS AS WATERFLOOD ADDITIVES

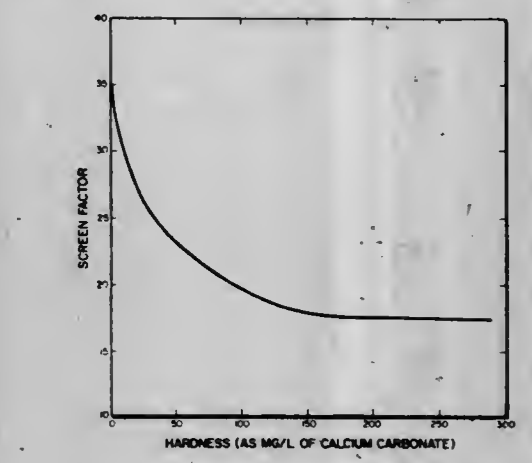
Walter W. Gale, Houston; Thomas L. Ashcraft, Jr., and Rhoderick K. Saunders, both of Baytown, all of Tex., assignors to Exxon Production Research Company, Houston, Tex.
Filed Jan. 2, 1974, Ser. No. 430,330
Int. Cl. E21b *43/22*
U.S. Cl. 166—273 **25 Claims**



1. In a method of recovering crude oil from a subterranean formation having at least one injection means in fluid communication with at least one production means wherein a displacing fluid is injected into said formation through said injection means to displace crude oil toward said production means and said displacing fluid is driven through said formation by means of a driving fluid, the improvement wherein said driving fluid comprises a single phase, transparent, aqueous solution of a water-soluble, sulfated, polyethoxylated alcohol, said sulfated, polyethoxylated alcohol being present in an amount effective to thicken said driving fluid, and said driving fluid being substantially free of any other thickening agent and any other surface active agent.

3,888,309
POLYMER WATERFLOODING BY CONTROLLING WATER HARDNESS

John S. Rhudy, and William B. Gogarty, both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio
Filed Aug. 17, 1973, Ser. No. 389,082
Int. Cl. E21b *43/22*
U.S. Cl. 166—274 **12 Claims**



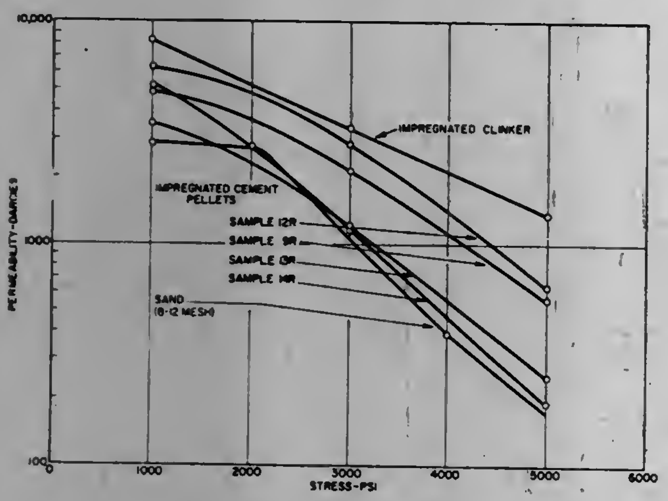
1. In a process of recovering hydrocarbon from a hydrocarbon-bearing subterranean formation wherein an aqueous polymer solution containing a salt-sensi'ive polymer is injected into the formation and displaced toward a production means in fluid communication with the formation to recover hydrocarbon therethrough and wherein the average molecule of the polymer is of sufficiently large physical size to effect a substantial reduction of the formation rock permeability and wherein the physical size of the molecule is reduced when contacted with an aqueous solution containing large concentrations of Ca^{++} and/or Mg^{++}, the improved process comprising increasing the total hardness of the water within the polymer solution to reduce the physical size of the polymer molecules, the result being to cause less permeability reduction of the formation rock as the polymer solution is displaced toward the production well and to permit higher injection rates.

3,888,310
PROCESS FOR INHIBITING SCALE DEPOSITION

Vernon H. Schievelbein, and Thomas E. Sample, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.
Division of Ser. No. 250,183, May 4, 1972, Pat. No. 3,849,328. This application June 24, 1974, Ser. No. 482,282
Int. Cl. E21b *43/00;* **C02b** *5/06*
U.S. Cl. 166—279 **7 Claims**

1. A method for inhibiting the formation of mineral scale upon surfaces in contact with scale prone waters, the surfaces including a well casing and related surface and subsurface equipment for a well drilled to and in fluid communication with a subterranean formation wherein the well and related equipment is used to inject the scale prone waters into the subterranean formation comprising
- dissolving sulfonated alkali lignins in the scale prone waters before the aqueous solution contacts the well casing and related equipment.

3,888,311
HYDRAULIC FRACTURING METHOD
Claude E. Cooke, Jr., Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.
Filed Oct. 1, 1973, Ser. No. 402,538
Int. Cl. E21b *43/26*
U.S. Cl. 166—280 **21 Claims**



1. In a hydraulic fracturing method wherein a fluid is injected into a subterranean formation to open a fracture therein, the improvement comprising propping said fracture with hydraulic cement or clinker pellets impregnated with an effective amount of a resin to reduce pellet fragmentation.

3,888,312
METHOD AND COMPOSITIONS FOR FRACTURING WELL FORMATIONS
Robert L. Tiner; Marlin D. Holtmyer, both of Duncan; Bobby J. King, and Richard A. Gatlin, both of Marlow, all of Okla., assignors to Halliburton Company, Duncan, Okla.
Filed Apr. 29, 1974, Ser. No. 465,378
Int. Cl.² E21B *43/26*
U.S. Cl. 166—308 **29 Claims**

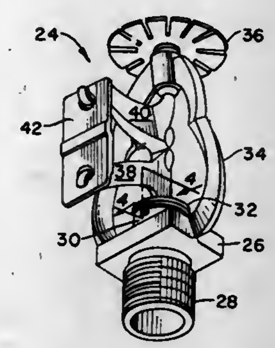
1. A process for fracturing a subterranean formation which comprises

introducing into said formation a crosslinked gel at a flow rate and pressure sufficient to produce a fracture in said formation;

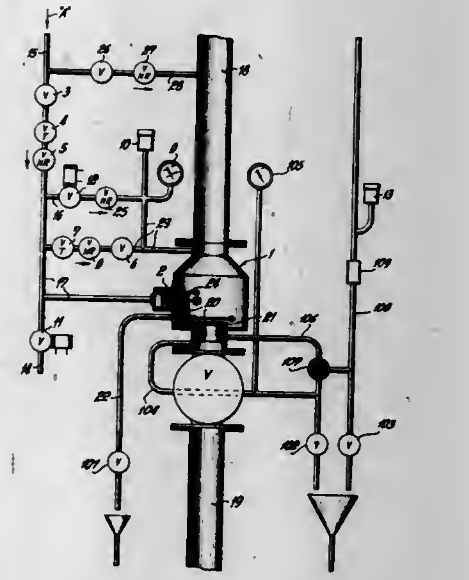
wherein said crosslinked gel is comprised of an aqueous liquid, a gelling agent selected from solvatable polysaccharides having molecular weights of at least about 100,000, and a crosslinking compound selected from organotitanates having titanium in the +4 oxidation state.

3,888,313
DISCHARGE HEAD AND FIRE PROTECTION SYSTEM UTILIZING SAID HEAD
Carvie Thomas Freeman, Norcross, Ga., assignor to Factory Mutual Research Corporation, Norwood, Mass.
Filed Oct. 8, 1974, Ser. No. 513,142
Int. Cl.² A62C *37/12*
U.S. Cl. 169—16 **12 Claims**

1. A discharge head for use in a fire protection system comprising a body member for containing pressurized extinguishant, said body member having an inlet for connecting to a source of said extinguishant and an outlet for discharging said extinguishant, closure means for said outlet, linkage means for applying a force against said closure means greater than, and in an opposite direction to, the force of said pressurized extinguishant against said closure means to retain said closure means in an operative position relative to said outlet where it prevents the discharge of fluid from said outlet, said linkage means adapted to respond to a predetermined fire condition in its vicinity for releasing its force, at least one shear pin connecting said closure means to said body member in said operative position, said shear pin adapted to break and release said closure means in response to the pressure of said extinguishant exceeding a predetermined value, said closure means being forced from said operative position by said extinguishant upon the existence of said fire condition and said predetermined extinguishant pressure to permit the discharge of said extinguishant from said outlet.

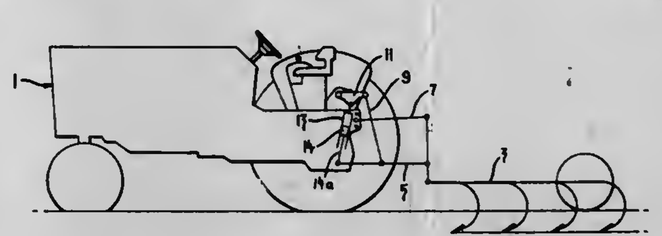


3,888,314
SPRINKLER SYSTEM
Ernst Landsberg, Bergisch-Gladbach, Germany, assignor to Walther & Cie Aktiengesellschaft, Koln-Dellbrueck, Germany
Filed Nov. 9, 1973, Ser. No. 414,539
Claims priority, application Germany, Nov. 11, 1972, 2255369
Int. Cl. A62c *35/22*
U.S. Cl. 169—20 **4 Claims**



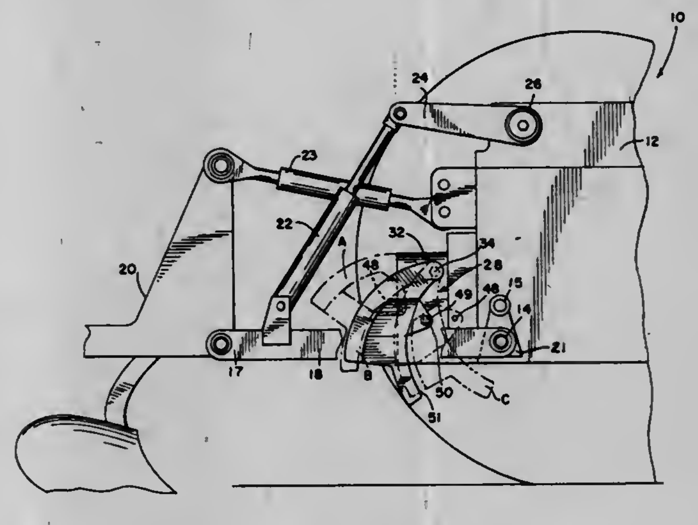
1. In a sprinkler system, a combination comprising a sprinkler conduit; a water supply conduit; a diaphragm valve interposed between said sprinkler conduit and said water supply conduit; a pressure conduit communicating with a source of pressurized gas and with said diaphragm valve for normally maintaining the latter closed by the pressure of said gas; a bypass conduit having one end portion communicating with said pressure conduit intermediate said source and said diaphragm valve, and another end portion communicating with said sprinkler conduit; a control valve interposed in said bypass conduit; a venting valve interposed in said pressure conduit; and a permanently energized fire alarm circuit connected with said control valve and said venting valve and normally maintaining both of them closed, said circuit being operative for opening said venting valve when detecting a fire, and for opening said control valve in automatic response to said circuit becoming inoperative.

3,888,315
DRAFT SENSING APPARATUS FOR TRACTOR
Lee E. Elfes, Bloomfield Hills, and Otto Mueller, Jr., Detroit, both of Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.
Filed Oct. 29, 1973, Ser. No. 410,926
Int. Cl. A01b *63/112*
U.S. Cl. 172—7 **5 Claims**



1. A tractor draft sensing apparatus having an elongated load measuring shaft mounted on spaced supports, draft means connected to the shaft at points spaced from the supports whereupon forces on said draft means causes the shaft to bend, sensing means for measuring deflection of the shaft including an elongated member attached at its first end to the shaft, means for measuring relative movement of the shaft and the other end of the member and means for limiting relative movement between said shaft and other end of the elongated member in one plane so that only relative movement between said shaft and the other end of the elongated member in a second plane is measured.

3,888,316
TRACTOR HITCH SWAY LIMITING DEVICE
Joseph A. Azzarello, Palos Heights, and Fosco L. Di Vita, Chicago, both of Ill., assignors to International Harvester Company, Chicago, Ill.
Filed Feb. 4, 1974, Ser. No. 439,514
Int. Cl. A01b *59/043*
U.S. Cl. 172—450 **5 Claims**



1. In a tractor having a hitch assembly including draft links laterally spaced and pivotally mounted at one end to the tractor for lateral and vertical movement relative thereto, the improvement comprising:

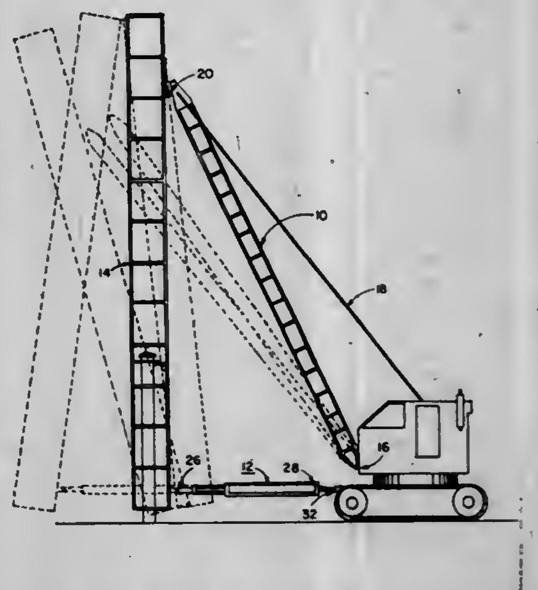
a pair of cam means pivotally carried by said tractor adjacent said draft links;

each of said cam means having a sway surface, a lock surface and a ramp surface, said sway and lock surfaces being arcs located in planes which are generally parallel and spaced apart;

blocking means secured to each of said draft links and having a cam follower capable of abutting engagement with one of said surfaces;

said cam means being capable of being selectively pivoted to and retained in a first locking position wherein said cam followers engage said locking surfaces over the entire range of vertical movement for said draft links, a second limited sway position wherein said cam followers engage said sway surfaces when said draft links are lowered and sequentially engage said ramp surfaces and said locking surfaces as said draft links are raised and a third free-sway position wherein said cam followers are free from any contact with said cam means when the draft links are in a lower position.

3,888,317
HYDRAULIC PILE DRIVER
John E. Walters, Casson Ln., West Paterson, N.J. 07424
Filed Mar. 27, 1974, Ser. No. 455,287
Int. Cl.² E02D *7/14*
U.S. Cl. 173—43 **5 Claims**



1. A powered pile driver assembly for use in conjunction with a crane having a boom which is rotatable through 360° and vertically adjustable, said assembly comprising:

a partial universal joint mounted at the free upper end of said boom for pivotal movement about a generally horizontal axis;

an extensible spotter mounted on said crane adjacent the base of said boom for pivotal movement about a generally horizontal axis and a generally vertical axis, mounting means comprising a universal joint;

said extensible spotter comprising a pair of elongated rectangular frames, one frame being telescopically arranged within the other;

a lead frame;

a universal joint mounted near the lower end of said lead frame;

a partial universal joint mounted near the uper end of said lead frame for pivotal movement about a generally vertical axis;

said lead frame being mounted at its lower end to said extensible spotter by said universal joint;

said lead frame being mounted at its lower end to said extensible spotter by said universal joint;

said lead frame being mounted near its upper end by said partial universal joints which together form a full universal joint;

hydraulic means for extending and retracting said spotter including:

a hydraulic cylinder mounted at each end of said spotter and having a piston slidably mounted therein;

an inlet valve for supplying hydraulic pressure to said cylinder;

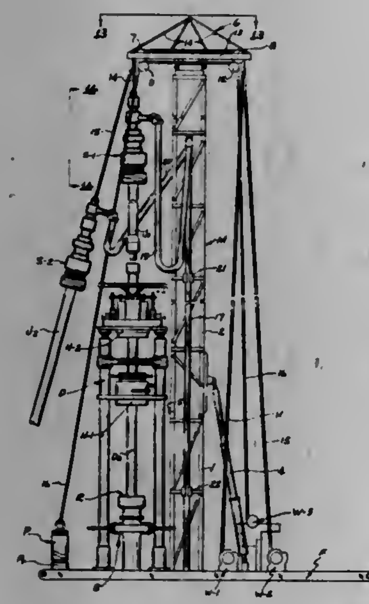
an outlet valve for relieving said hydraulic pressure;

a source of hydraulic pressure;

hoses to connect said inlet valve and said outlet valve to said source of hydraulic pressure;

a control manifold with an operating valve to control said hydraulic pressure;
hydraulic means for moving said spotter about a generally vertical axis relative to said crane body;
hydraulic means for moving said lead frame about a generally vertical axis relative to said spotter.

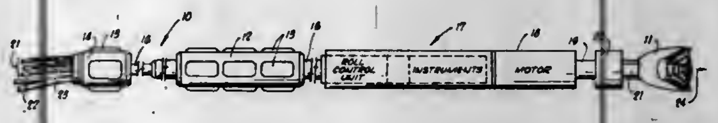
3,888,318
WELL DRILLING APPARATUS
Cicero C. Brown, P.O. Box 19236, Houston, Tex. 77024
Continuation-in-part of Ser. No. 181,067, Sept. 16, 1971, Pat. No. 3,722,603. This application Aug. 24, 1972, Ser. No. 283,334
Int. Cl. E21b *19/08*
U.S. Cl. 173—149 **8 Claims**



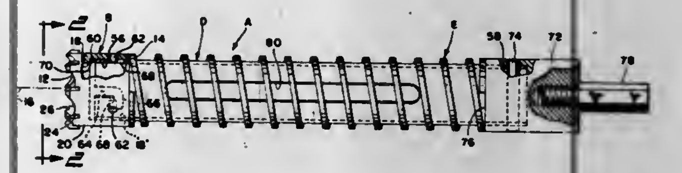
1. A portable well drilling unit comprising:
a. support means;
b. snubber means mounted on said support means having a fixed head, selectively engageable with a drill string for support thereof, and a rotating head, selectively and non-threadedly engageable with said drill string and reciprocally movable relative to said fixed head power means operatively connected to said rotating head for simultaneous driving rotation and reciprocation of a drill string during drilling operations, said rotating head surrounding upper joints of said drill string and being reciprocal thereon when not in engagement therewith so as to permit the upper portion of said drill string to extend through and vertically above said rotating head;
c. mast means mounted on said support means;
d. non driven swivel means suspended by cable means from said mast means for handling pipe joints to be added to or taken from said drill string and for supporting the upper end of the last joint of said drill string in a non-driving relationship during said drilling operations; and
e. power means connected to said cable means for reciprocation of said swivel means.

3,888,319
CONTROL SYSTEM FOR A DRILLING APPARATUS
Henry A. Bourne, Jr., Ponca City, Okla., and Rondon L. Schroeder, Shinnston, W. Va., assignors to Continental Oil Company, Ponca City, Okla.
Filed Nov. 26, 1973, Ser. No. 419,157
Int. Cl. E21b *7/08, 3/08*
U.S. Cl. 175—76 **15 Claims**

9. A roll control device for a drilling apparatus having a pressure mechanism and a drill means comprising a fractional-rotation torque motor attached to said pressure mechanism and having its output connected through a drive means and an antitorque means to said drill means, and means for applying power to said torque motor to fractionally rotate said drill means a predetermined number of degrees.

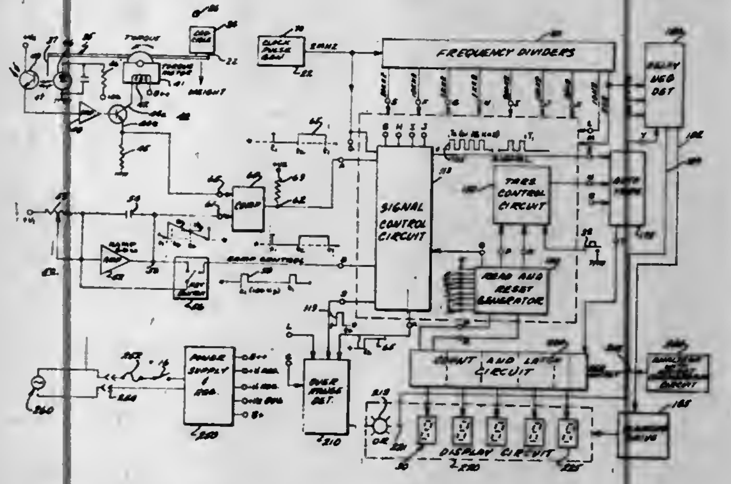


3,888,320
CORE DRILL
Richard D. Maxwell, Bay Village, Ohio, assignor to Tri-M Tool Corporation, Bay Village, Ohio
Continuation-in-part of Ser. No. 379,184, July 13, 1973, abandoned. This application Feb. 19, 1974, Ser. No. 443,409
Int. Cl. E21b *9/16, 17/046;* **E21c** *13/02*
U.S. Cl. 175—394 **6 Claims**



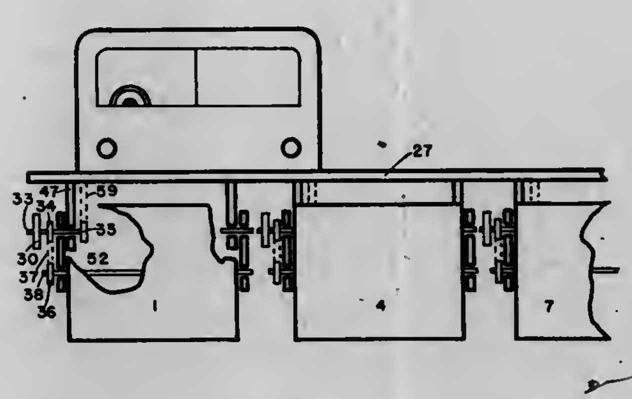
5. A core drill bit comprising; a hollow cylindrical member having a cutting end and an opposite end portion, an elongated hollow cylindrical drill sleeve having a bit mounting end portion receivable in said opposite end portion of said bit, releasable attaching means of a non-threaded type on said opposite end portion for releasably attaching such bit to said drill sleeve and cooperating releasable attaching means on said bit mounting end portion for cooperation with said releasable attaching means on said bit, said sleeve having an opposite driving end portion including an abutment, and further including a coil spring surrounding said sleeve and having opposite spring ends bearing against said abutment and said bit for normally biasing said bit outwardly relative to said sleeve.

3,888,321
ELECTRONIC BALANCE
Leroy E. Wiiki, St. Joseph, and George J. Sitek, Stevensville, both of Mich., assignors to Leco Corporation, St. Joseph, Mich.
Filed Feb. 16, 1973, Ser. No. 333,049
Int. Cl. G01g *23/14, 3/14*
U.S. Cl. 177—165 **5 Claims**



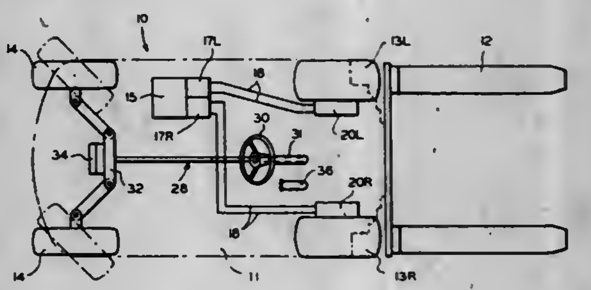
1. An electronic balance comprising:
circuit means for providing a plurality of electrical pulses, the total number of which represents the weight of objects positioned on the balance;
storage means coupled to said circuit means and selectively operated by a tare switch to store signals representing the unknown weight of an object positioned on the balance;
comparator means coupled to said circuit means and to said storage means for comparing signals stored in said storage means and signals representing the weight of said object and an additional object positioned on the balance and for providing a control signal when the number of pulses from said circuit means exceeds the stored number of pulses thereby indicating that an additional object is positioned on the balance;
negative weight detector means coupled to said circuit means and to said storage means for providing an output signal in the event signals from said circuit means are representative of a weight less than the stored weight signals;
display means;
blanking circuit means coupled to said display means and to said negative weight detector means and responsive to said output signals therefrom to blank said display means when the weight positioned on said balance is less than the weight represented by signals stored in said storage means; and
selectively operated coupling means coupled to said circuit means, to said display means and to said comparator means and responsive to said control signal from said comparator means for applying the pulses from said circuit means representing the weight of the additional object to said means to actuate said display means to provide an indication of the weight of the additional object.

3,888,322
WHEELED BELLYLESS VEHICLE
Paul Kehler, South Bend, Ind., assignor to Applied Inventions Corporation, North Tonawanda, N.Y.
Filed Nov. 29, 1973, Ser. No. 420,285
Int. Cl. B62d *11/02*
U.S. Cl. 180—6.2 **2 Claims**



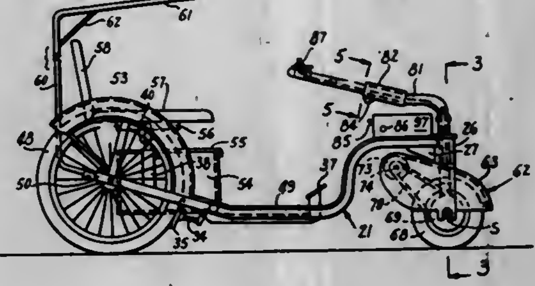
1. A vehicle comprising a main body,
a multiplicity of powered wheels that cover substantially the whole underside of said vehicle and that are operably connected into two outer rows of wheels that extend along the two sides of said vehicle and one or more inner rows of wheels that are positioned between said outer rows of wheels,
drive means for individually driving said outer rows of wheels and said inner rows of wheels,
and control means for transmitting power to said drive means and for selectively causing said outer rows of wheels to rotate in the same or in opposite directions at the same or at different speeds and (causing) said inner rows of wheels to rotate at a speed that is intermediate the speeds of its two adjacent rows of wheels when said outer rows of wheels are driven at different speeds.

3,888,323
HYDRASTATIC CONTROL FOR PIVOT STEERING
Jon Richard Patton, and Ronald Loren Sisson, both of Jackson, Mich., assignors to Clark Equipment Company, Buchanan, Mich.
Filed Jan. 24, 1973, Ser. No. 326,440
Int. Cl. B62d *11/04*
U.S. Cl. 180—6.3 **17 Claims**



1. In a pivot steering vehicle, the combination comprising,
a pair of driving wheels,
a hydrostatic motor for driving each wheel,
a variable pump for each motor and having a control element movable for adjusting the pump and thereby controlling the speed of the motor,
a hydrostatic actuator individual to each control element for moving it,
means for developing pressure and transmitting fluid under pressure to the actuators,
a steering regulator valve individual to each actuator for controlling the transmission of fluid under pressure to the respective actuator,
common means for steering the vehicle in either direction including a single steering member, and common means responsive to actuation of the steering member operative for controlling the steering regulator valves and simultaneously moving them and thereby simultaneously moving the actuators for relatively increasing the speed of the outside wheel and decreasing the speed of the inside wheel relative to a predetermined speed of each wheel, in the direction of steering.

3,888,324
ELECTRIC VEHICLE
Robert G. Kossow, 4941 62nd St., Sacramento, Calif. 95820
Filed Jan. 30, 1970, Ser. No. 7,072
Int. Cl. B62d *61/00;* **B60k** *17/30*
U.S. Cl. 180—21 **1 Claim**



1. An electric vehicle comprising a generally horizontal frame, a pair of wheels journalled in the rear end of said frame in spaced apart parallel relation, a seat secured to said frame, a battery box secured to said frame and underlying said seat, a vertical bushing secured to the forward end of said frame, a driving and steering unit positioned under and supporting the forward end of said frame, a neck secured to said driving and steering unit and journallled in said bushing for rotation about a vertical axis, a tiller bar secured to said neck and extending rearwardly therefrom for rotating said neck and said driving and steering unit to steer said vehicle, said driving and steering unit including a housing rigidly secured to said neck and turning therewith, said housing including a pair of spaced

parallel opposite side walls and an upper wall connecting said side walls, a pair of spaced apart front wheels in said housing and projecting therebelow, said front wheels being respectively adjacent said side walls of said housing, a shaft mounted transversely in said housing, said shaft having threaded opposite ends and said side walls of said housing having generally U-shaped slots formed therein with the threaded ends of said shaft projecting through said slots, a nut threaded on each end of said shaft releasably securing said shaft to said housing, a tubular shaft journalled on said shaft with said front wheels secured to said tubular shaft to revolve therewith, an electric motor secured in and enclosed by said housing a chain sprocket on said motor, a chain sprocket on said tubular shaft, a chain trained over said chain sprockets to rotate said tubular shaft and said front wheels, brake means in said housing for restraining rotation of said front wheels, control means for said electric motor on said tiller bar, and control means for said brake means mounted on said tiller bar for controlling said electric vehicle.

3,888,325

MOTOR-DRIVEN VEHICLE WITH HYBRID INTERNAL COMBUSTION AND ELECTRICAL DRIVE

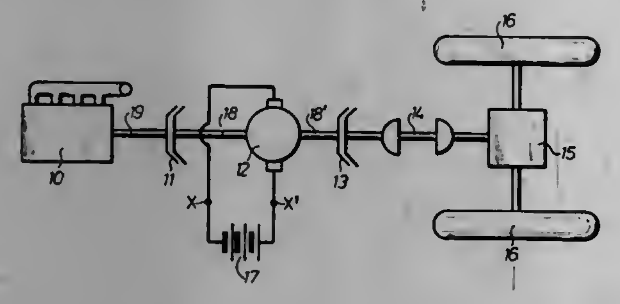
Hans Reinbeck, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Gerlingen-Schillerhohe, Germany

Continuation of Ser. No. 256,102, May 23, 1972, abandoned. This application Feb. 20, 1974, Ser. No. 444,121

Claims priority, application Germany, July 6, 1971, 2133485

Int. Cl. B60k *1/00*

U.S. Cl. 180—65 A **7 Claims**



1. Motor driven conveyance comprising

an internal combustion engine (10) having a power output rating in excess of that required to operate the conveyance and having an output shaft (19) forming one end of a power train for the conveyance;

at least one driven wheel (16); at least one driven wheel axle and a drive shaft connected to said axle (14, 15) forming one end of the power drive train;

a dynamo electric machine (12) of sufficient power to operate the conveyance, operable in generator mode or in motor mode, and having a double-ended shaft (18, 18′), one end (18′) being directed towards said drive shaft and the other end (18) being directed towards the internal combustion engine shaft (19), said dynamo electric machine forming an intermediate portion of the power drive train;

secondary battery means (17) carried on the conveyance to store power from, and supply power to the dynamo electric machine;

means (13) to selectively and positively either connect, or disconnect, without slip, one end (18) of the dynamo electric machine shaft to the drive shaft and hence directly to the wheel only when the motor conveyance is stopped to place the dynamo electric machine in fixed direct wheel driving connection in the drive train;

means (11) to gradually connect the other end (18) of the shaft of said dynamo electric machine to said internal combustion engine (10), independently of relative motion, or speeds of the shaft (19) of the internal combustion engine (10) and said other end (18) of the shaft of the dynamo electric machine (12);

said gradual connection means (11) being independent of said positive connection means (13) to permit connection of said positive connection means and hence positive drive connection from the dynamo electric machine (12) directly to the wheel upon energization of the dynamo electric machine (12) and moving of the conveyance with the internal combustion engine (10) stopped, and then gradual connection of the internal combustion engine and hence starting of the internal combustion engine during such motion of the vehicle and during operation of the dynamo electric machine.

3,888,326

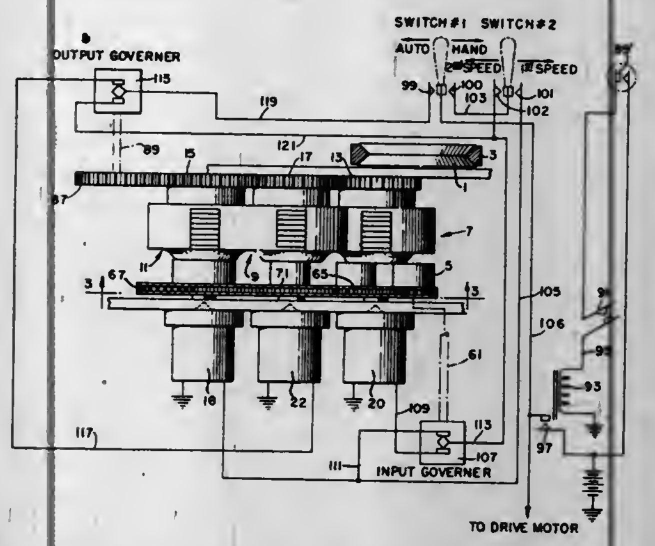
AUTOMATIC OR MANUAL MULTI-SPEED TRANSMISSION FOR ELECTRICALLY PROPELLED VEHICLES

Gordon W. Osborne, 180 Raeburn Ave., Rochester, N.Y. 14619

Filed Mar. 19, 1974, Ser. No. 452,636

Int. Cl. B60k *17/12*

U.S. Cl. 180—65 R **15 Claims**



1. An electrically propelled vehicle, including in combination, an electric motor for propelling the vehicle, batteries for powering the electric motor and a variable speed transmission including a gear train, said gear train being an output shaft connected to and being driven by said electric motor to drive the vehicle at different speeds, means, including input sprockets releasably connected to said gear train, one input sprocket being provided for each gear of said gear train, said input sprockets continuously operating when the electric motor is operating each sprocket being connected by a continuous chain to an input sprocket which in turn is connected to said electric motors, the vehicle being propelled at different selected speeds by said gear train while the speed of the electric motor remains constant, a plurality of separate means, to releasably connect each input sprocket with its respective gear of said gear train, controlling means to render any selected separate means operable to cause operative connection of an input sprocket to a gear to cause actuation of said gear while deactuating the other separate means to disconnect the remaining gears of said gear train from the remaining input sprockets so that said remaining gears will be rotated by the gear connected to said selected separate means.

3,888,327

VEHICLE RADIATOR PROTECTION DEVICE

Vernon N. Reece, Rt. 3, Box 443-C, De Queen, Ark. 71832

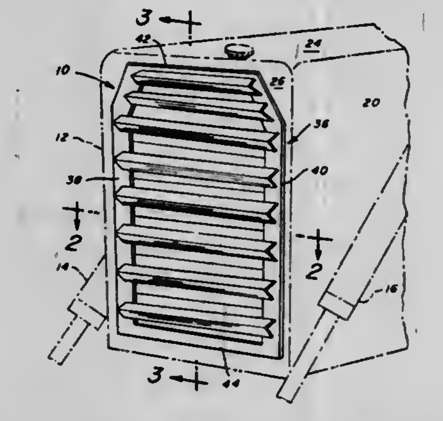
Filed Jan. 30, 1974, Ser. No. 427,689

Int. Cl. B60k *11/04*

U.S. Cl. 180—68 P **7 Claims**

1. A vehicle radiator protection device for protecting a vehicle radiator from protruding objects through the radiator

air opening while freely allowing air to pass through, said device comprising a plurality of spaced, elongated deflector bars secured across the outer surface of the air opening, the outer surface of each said deflector bar being convex in cross sectional shape and a plurality of spaced elongated stopping bars secured across the inside surface of the air opening between said deflector bars and the vehicle radiator, one said stopping bar being positioned in substantial alignment with each space between adjacent deflector bars, the outer surface of each said stopping bar being concave in cross sectional shape.



3,888,328

ARRANGEMENT FOR COMPENSATING YAWING MOMENTS

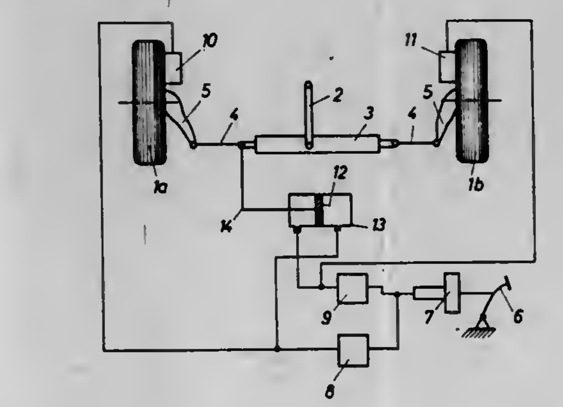
Heinz Leiber, Leimen, Germany, assignor to Teldix GmbH, Heidelberg, Germany

Filed Mar. 15, 1973, Ser. No. 341,471

Claims priority, application Germany, Mar. 15, 1972, 2212328

Int. Cl.² B62D *5/06*

U.S. Cl. 180—79.2 R **5 Claims**



1. An arrangement for compensating for yawing moments generated as a result of different braking forces acting on the steered wheels of a vehicle steered by a steering mechanism, comprising in combination:

a. an antilock device connected to the brake of each steered wheel for separately varying the braking pressure in the associated wheel as a function of the locking tendency thereof;

b. signal generating means connected to the brakes of said steered wheels for obtaining separate signals dependent upon the braking pressures in the brakes of said steered wheels;

c. comparator means connected to said signal generating means for comparing the signals characterizing the braking pressures in the brakes of the different steered wheels and for emitting a setting signal as a function of the difference in said braking pressures; and

d. a setting mechanism connected to said comparator means for receiving said setting signal; said setting mechanism being further connected to said steering mechanism for applying a moment thereto as a function of said setting signal for countering the effect of the yawing moment generated by said difference in said braking pressures.

3,888,329

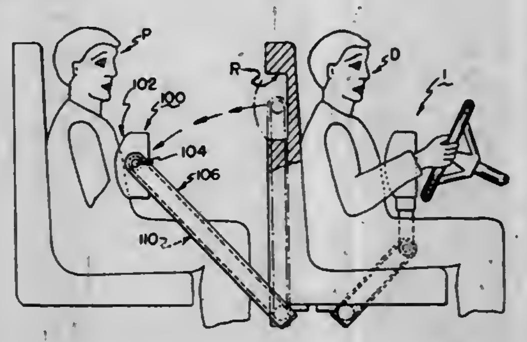
VEHICLE SAFETY DEVICE

James Monaghan, 11849 Clifton Blvd., Apt. 204A, Lakewood, Ohio 44107

Continuation-in-part of Ser. No. 250,413, May 4, 1972, Pat. No. 3,759,343, which is a continuation-in-part of Ser. No. 163,379, July 16, 1971, Pat. No. 3,741,330, said Ser. No. 250,413, is a continuation-in-part of Ser. No. 163,379,. This application May 14, 1973, Ser. No. 360,345

Int. Cl. B60r *21/08*

U.S. Cl. 180—103 **19 Claims**



1. A resuable vehicle safety device adapted for restraining a vehicle occupant comprising,

a resilient restraint pad,

a transversely extending crossmember for supporting said pad,

a rotatable support arm having one end operably connected to said crossmember,

a transversely extending pivot shaft,

said support arm having its opposite end pivotally connected to said pivot shaft for rotation of said support arm in a vertical longitudinal plane for moving said crossmember and said pad from a prepared storage position in front of and spaced from said occupant to a restraint position in contact with the torso of said occupant,

orientation maintenance means connected to said pivot shaft and said crossmember to control rotation of said crossmember about its transversely extending axis and resulting in an angular rotation of said crossmember with respect to said support arm which is substantially equal and opposite to the angular rotation of said support arm about said pivot shaft for substantially preserving a predetermined orientation of said pad with respect to said occupant as said support arm is moved in said vertical longitudinal plane,

manual means operably connected to said support arm for moving said support arm and said pad through said vertical longitudinal plane to a closer prepared position in closer proximity to the occupant's torso than when in said prepared storage position,

a manually-operated clutch means releasably locking said support arm in said closer prepared position,

sensing means for sensing a vehicle accident event when said restraining pad is in said prepared positions,

power means connected to said support arm for moving said support arm and said restraint pad from said prepared positions into contacting engagement with said occupant, said power means including actuation means operably connected to said sensing means for actuating said power means upon the sensing of an accident event by said sensing means, and

said clutch means including release means to enable said support arm to be rotated in a direction toward said occupant from said closer prepared position and preventing movement away from said occupant from said closer prepared position so that said restraint pad may be moved by said power means into contact with said occupant upon the sensing of an accident event by said sensing means while generally maintaining said predetermined orientation.

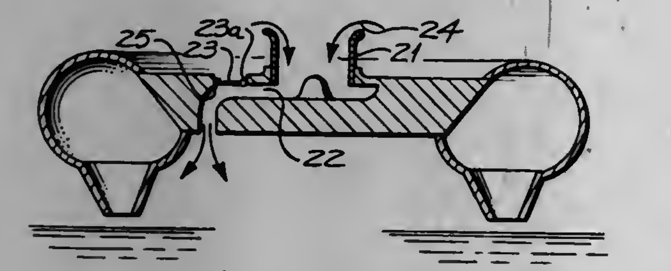
3,888,330
MEANS AND METHOD OF CONTROLLING FLUID CUSHION VEHICLES

Wilfred J. Eggington, Claremont, and Owen Douglas, Fair Oaks, both of Calif., assignors to Aerjet-General Corporation, El Monte, Calif.

Continuation of Ser. No. 63,487, Aug. 13, 1970, abandoned. This application Feb. 21, 1973, Ser. No. 334,791

Int. Cl. B60v *1/16*

U.S. Cl. 180—121 **12 Claims**



1. In a cushion cell vehicle adapted to travel or hover over terrain, said vehicle being of the type having a plurality of cushion cells, formed by downwardly distending skirts of flexible material which are open at the bottom, said cells being arranged around the periphery of the vehicle to form a central space bounded by the peripheral cells below the vehicle to provide a central fluid cushion, and wherein said cushion cells have in planform a lower edge and an upper edge which circumscribes a greater area than circumscribed by the lower edge, and having means for introducing pressurized fluid into the cells which leaves at their bottom openings to raise the pressure in the central cushion space as well as at the cells and exert lift to the vehicle, a system for operating at a selected partial hover height comprising means for controllably releasing fluid from the central cushion to the atmosphere to bring said pressurized peripheral cushion cells into constrictive contact with the terrain and the planform of said cushion cells lower edges become progressively larger as the cells become increasingly constricted, to the extent that the lift exerted by the constricted cushion cells is substantially equal to the vehicle weight, and said vehicle is stable in the rolling and pitching planes and in vertical translation while operating at said selected partial hover height.

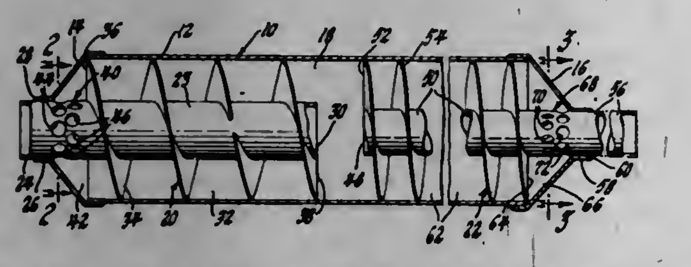
3,888,331
POWER TUNED WAVE INTERFERENCE SILENCER

Wei-Ming Wang, Grand Blanc, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 3, 1974, Ser. No. 466,526

Int. Cl. F01n *1/00*

U.S. Cl. 181—44 **4 Claims**



1. A silencer assembly for muffling noise and scavenging exhaust from an exhaust port of an engine comprising: an outer casing having an inlet end and an outlet end; a first open ended tube having one end located outside said casing and the other end thereof interiorly of said outer casing at the inlet end thereof to define a first outer flow path between said outer casing and said first tube, a second open ended tube having one end located outside said casing and the other end thereof directed interiorly of said outer casing at the outlet end thereof to define a second outer flow path between said outer casing and said second tube, said first and second tubes being located coaxially of one another and having open ends thereon located opposite one another in spaced relationship with respect to one another, said outer casing defining an open volume between said oppositely located open ends of said first and second tubes, a first wave interference helical baffle vane located within said first outer flow path having an inlet end and an outlet end in communication with said open volume, a second wave interference helical baffle vane located within said second outer flow path having an inlet end in communication with said open volume and an outlet end, means forming openings in said first tube communicating the interior of said tube with said first outer flow path at the inlet end of the first turn of said first helical baffle vane for producing a reflected wave from the open volume to the exhaust port of the engine, said first tube having a tuned length for producing a negative pressure at the exhaust port to reduce back pressure and to improve volumetric efficiency of the engine, said first interference helical baffle vane and said openings further serving to produce an interference wave for attenuating a first range of sound waves in said engine exhaust, said second tube having openings therein within said outer case in communication with the second outer flow path at the outlet end of said helical baffle vane to produce an interference wave to attenuate a second range of sound frequencies within said exhaust.

3,888,332
EXHAUST SILENCERS

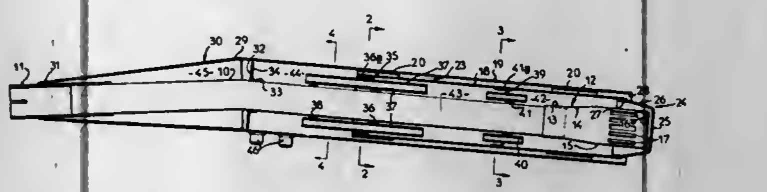
Geoffrey Ernest Roe, Bramhall, and John Edward Favill, Dudley, both of England, assignors to Norton Villiers Limited, Staffordshire, England

Filed Oct. 29, 1973, Ser. No. 410,409

Claims priority, application United Kingdom, Apr. 18, 1973, 18675/73

Int. Cl. F01n *1/08*

U.S. Cl. 181—53 **4 Claims**



1. An exhaust silencer comprising: a body which includes inner, intermediate and outer co-axial tubes; an exhaust gas inlet at one end of the body and in one end of the inner tube; an exit opening at the other end of the inner tube which is imperforate between its one end and the exit opening; an outlet at the other end of the body in the form of a slot; an outlet passage defined between concentric inner and outer walls provided by the intermediate and outer tubes respectively and being located immediately upstream of said slot in the general direction of flow of the exhaust gas, the outlet passage having an entrance at one end and terminating in the slot at the other end and being arranged so that all the exhaust gas flows therethrough; said concentric walls of the passage being imperforate and spaced apart by a constant distance over the whole of the overlapping lengths of the intermediate and outer tubes; said distance being such that the height of the passage between the walls is such as to cause attentuation of the noise of gas flowing through the outlet passage while the area of the slot and of the cross-section of the outlet passage transverse to the general direction of flow of the gas therethrough is at least as great as the cross-sectional area of the inlet transverse to the general direction of flow of exhaust gases through the inlet; the outlet passage having a length between the entrance and the slot equal to at least 50 times the height of the slot and providing a clear path for gas flow in a direction parallel to the longitudinal axis of the passage between the entrance and the slot; there being no part of the flow path of the gas between the inlet and the outlet which has a cross-sectional area transverse to the general direction of gas flow which is less than said cross-sectional area of the inlet; there being one or more chambers through which the gas flows on emerging from the exit opening of the inner tube and arranged so that the direction of flow of exhaust gases through the chamber or chambers is in a direction generally opposite to the direction of flow of exhaust gases through the inner tube and the passage, and there being a further chamber defined between the inner and outer tubes into which the gas flows on emerging from said first mentioned chamber or chambers, the general direction of flow of gas being reversed in said further chamber from the entrance to which the gas passes directly to the entrance to the outlet passage.

3,888,333
TREMOLO GENERATING DEVICE WITH MULTI-DIRECTIONALLY ROTATING SPEAKER

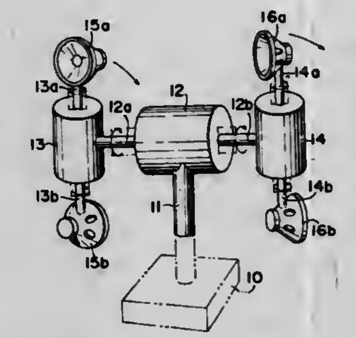
Kiminori Yamaguchi, Hamamatsu, Japan, assignor to Nippon Gakki Seiko Kabushiki Kaisha, Japan

Filed Apr. 11, 1973, Ser. No. 350,035

Claims priority, application Japan, Apr. 20, 1972, 47-39885; May 19, 1972, 47-58766; June 8, 1972, 47-67830

Int. Cl. H04r *1/20, 1/28*

U.S. Cl. 181—143 **9 Claims**



1. A sound effect producing device comprising:
at least one first rotary shaft,
means for rotating said first rotary shaft about its longitudinal axis,
an even number of second rotary shafts positioned symmetrically with respect to said first rotary shaft, said second rotary shafts extending at approximately right angles to the longitudinal axis of said first rotary shaft,
means secured to said first rotary shaft for rotating said second rotary shafts about their longitudinal axes, and
at least one sound radiating member mounted on each of said second rotary shafts and being rotatable therewith, said sound radiating members radiating sound waves in a direction making an approximate right angle to said second rotary shafts.

3,888,334
BICYCLE PEDAL-ACTUATED BRAKE AND FREEWHEEL SYSTEM

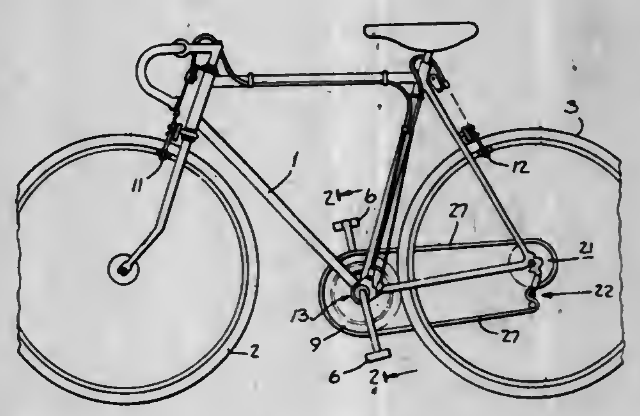
Richard B. Mack, 21 Westwood Rd., Woodbridge, Conn. 06525

Filed June 27, 1974, Ser. No. 483,523

Int. Cl. B62l *1/06*

U.S. Cl. 188—24 **5 Claims**

1. A bicycle comprising a frame, front and rear wheels supporting said frame, a crank-arm axle rotatively mounted by said frame, a drive sprocket connected with said axle, a driven sprocket connected with said rear wheel, a sprocket chain interconnecting said sprockets, a caliper brake for at least said rear wheel, and means for applying said brake by reverse rotation of said axle and releasing the brake by forward rotation of the axle; wherein the improvement comprises means for connecting said driven sprocket with said rear wheel so that the rear wheel can freewheel relative to the driven sprocket and the driven sprocket substantially cannot rotate forwardly when the rear wheel is held against rotation by said brake, and means for connecting said drive sprocket with said axle with a lost-motion action permitting limited relative rotation of said axle and said drive sprocket.



3,888,335
HYDRODYNAMIC RETARDER FOR VEHICLES, ESPECIALLY FOR MOTOR VEHICLES

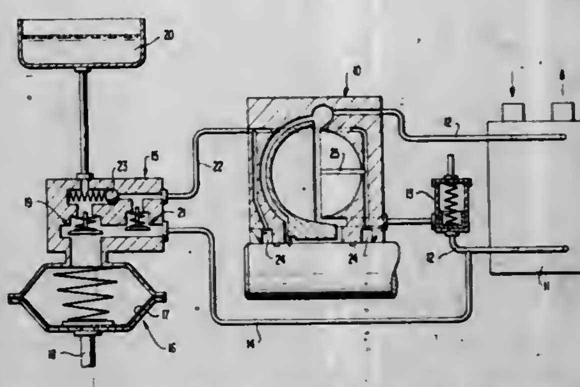
Hans Hanke, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Dec. 7, 1973, Ser. No. 422,651

Claims priority, application Germany, Dec. 8, 1972, 2260141

Int. Cl. F16d *57/02*

U.S. Cl. 188—290 **22 Claims**

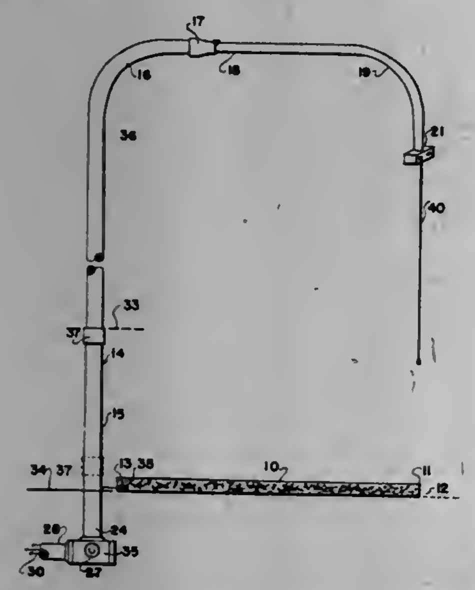


1. A hydrodynamic retarder for vehicles which includes an internal working circulatory system between at least one rotating blade wheel means and at least one stationary blade wheel means in a working space, an external cooling circulatory system, a by-pass valve in the external cooling circulatory system actuatable by the pressure thereof, a filling cylinder means operatively connected with the external cooling circulatory system by way of a filling and discharge line means, said filling cylinder means being selectively controlled by control valve means, a reservoir means operatively coordinated to the external cooling circulatory system, and pressure-relief means of the spaces disposed directly in front of shaft seals in the direction toward a place of the working circulatory system which is pressureless during operation, characterized in that a first spring-loaded disk valve means is operatively associated with the filling cylinder means, said first valve means being operable to close during a braking operation a connection between the filling and discharge line means and the reservoir means while opening a connection between the filling and discharge line means to the filling cylinder means, and said valve means being additionally operable to open the connection between the filling cylinder means, the reservoir means and the filling and discharge line means during idling operation, and in that additionally a lubricating line means is provided between the pressure relieved spaces at the seals and the filling and discharge line means, a second spring-loaded disk

valve means being operatively connected in said lubricating line means, said second valve means being operable to close during a braking operation but opening up during idling operation the connection between the lubricating line means and the filling and discharge line means, the lulbricating line means is connected with the reservoir means by way of a check valve means, when the pressure in the lubricating line means exceeds a predetermined pressure but always closes in the opposite direction, and characterized by such an arrangement and construction of the two disk valve means that the two disks thereof are disposed substantially transversely to the impinging flow from the filling cylinder means into the filling and discharge line means but are disposed approximately parallel to the reverse flow direction.

3,888,336
SIDEWALK PLUG-IN POLE FOR CAR HEATERS, WARMERS AND THE LIKE

James Zajic, Box 176, Wainwright, Alberta, Canada
Filed Apr. 5, 1974, Ser. No. 458,115
Claims priority, application Canada, May 3, 1973, 170315
Int. Cl. B60l *9/00*
U.S. Cl. 191—1 R **6 Claims**

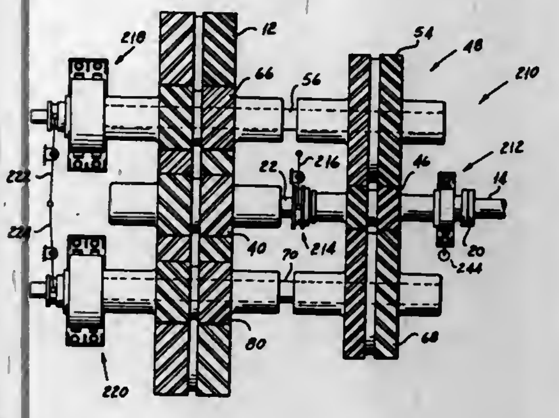


1. A plug-in device for supplying a source of electrical energy for car heaters and the like of cars parked at the curb at the edge of a sidewalk; comprising in combination a vertical standard adjacent the inner edge of the sidewalk, but spaced therefrom, an over-spanning portion extending from the upper end of said vertical standard, an electric plug receptacle on the distal end of said over-spanning portion, connectable to a source of electrical energy via said over-spanning portion and said vertical standard, said over-spanning portion being spaced above said sidewalk by at least six feet, and means to anchor said vertical standard within the ground, said means including a pipe tee secured at the base of said vertical standard, and relatively short lengths of pipe extending outwardly at right angles from each side of said tee in a substantially horizontal plane, to stabilize said vertical standard.

3,888,337
REVERSIBLE REDUCTION GEAR SYSTEM AND BRAKE FOR MARINE DRIVE

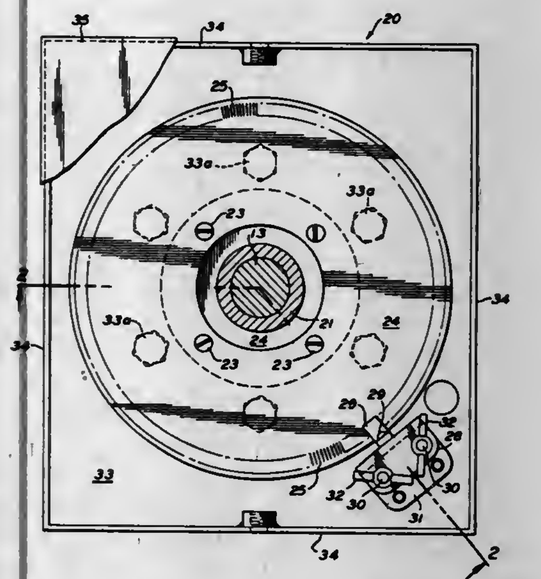
Eugene P. Worthen, deceased, late of Braintree, Mass., and New England Merchant natl. Bank, executor, Braintree, Mass., assignors to United Aircraft Corporation, East Hartford, Conn.
Division of Ser. No. 229,871, Feb. 28, 1972. This application July 5, 1973, Ser. No. 376,846
Int. Cl. B60k *29/02*
U.S. Cl. 192—4 C **8 Claims**

1. Reversible reduction gear apparatus for alternatively coupling an input shaft to an output shaft in a forward drive direction and in a reverse drive direction including in combination, an input shaft, an output shaft, an output gear carried by said output shaft for rotation therewith, a forward drive input gear carried by said input shaft for rotation therewith, a first intermediate shaft, a second intermediate shaft, respective intermediate gears carried by said intermediate shafts for rotation therewith, said intermediate gears meshing with said forward drive input gear, respective forward drive output pinions carried by said intermediate shafts for rotation therewith, said output pinions meshing with said output gear, a reverse drive pinion rotatably carried by said input shaft, a forward positive clutch actuatable between an engaged condition at which it couples said forward drive output pinions to said input shaft and a disengaged condition, a reverse positive clutch actuatable between an engaged condition at which it couples said reverse pinion to said input shaft and a disengaged condition, mechanical spring means normally biasing said forward clutch to engaged condition and said reverse clutch to disengaged condition, fluid pressure means for actuating said clutches against the action of said spring means to disengage said forward clutch and to engage said reverse clutch, a brake associated with one of said intermediate shafts, and control means for actuating said brake and for supplying fluid under pressure to said fluid pressure means to place said apparatus in a reverse drive condition.



3,888,338
ELECTRONIC INDEXING SYSTEM

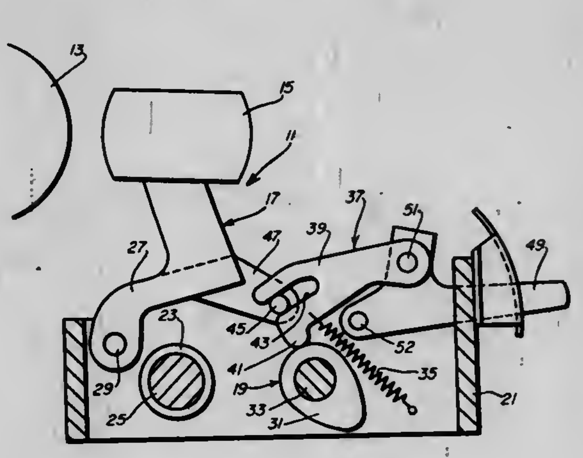
William T. Mars, Cuyahoga Falls, Ohio, assignor to McNeil Corporation, Akron, Ohio
Filed Oct. 3, 1973, Ser. No. 402,998
Int. Cl. F16d *13/22*
U.S. Cl. 192—142 **10 Claims**



1. Apparatus for moving a machine element a preselected distance, the machine element being operated by a motor which is successively activated and thereafter stopped by a braking device, comprising indicator means driven by the motor and indicating the amount of movement of the machine element, electronic means having a preselected setting therein corresponding to the preselected distance of movement of the machine element, said electronic means reading said indicator means and activating the braking device to stop the motor after the preselected setting has been reached, the motor moving the machine element an overtravel distance between the time of the activation of the brake and the stopping of the motor, said electronic means accounting for the overtravel distance by effectively deducting the overtravel distance of the previous activation from the preselected setting so that the machine element is moved the preselected distance on the next successive activation of the motor.

3,888,339
IMPRESSION CONTROL MECHANISM FOR A TYPEWRITER OR SIMILAR MACHINE

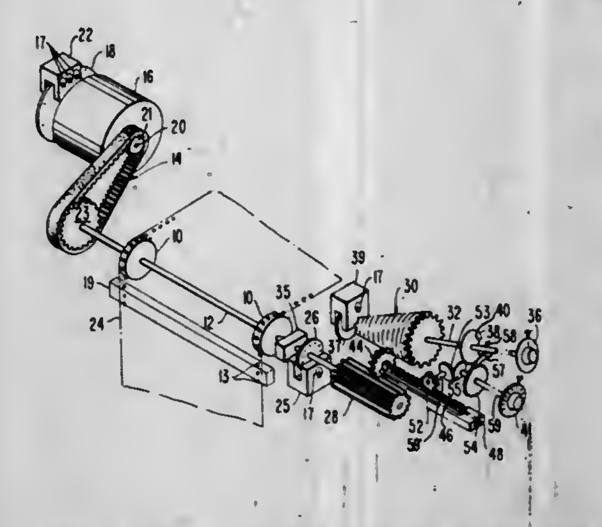
Gerald Nowak, Bienrode, and Herbert Decker, Lauf, both of Germany, assignors to Triumph Werke Nurnberg A. G., Nurnberg, Germany
Continuation of Ser. No. 277,591, Aug. 3, 1972, abandoned. This application Mar. 1, 1974, Ser. No. 447,229
Claims priority, application Germany, Aug. 7, 1971, 2139650
Int. Cl. B41j *1/60*
U.S. Cl. 197—55 **3 Claims**



1. A single element printing machine comprising
a frame,
a platen,
a type carrier having a plurality of type characters formed thereon,
means supporting said type carrier about a pivot axis on said frame whereby said type carrier can be driven from a rest position toward said platen to impact a selected character against said platen,
said support means having a pin thereon spaced from said pivot axis,
a drive cam rotatably mounted on said frame for driving said type carrier support means about its pivot axis,
a control member having one end located between said cam and said pin,
said one end supporting said pin and establishing a rest position of said type carrier support means,
and an operator controlled adjusting member for determining the impact velocity of said type carrier against said platen,
said control member being pivotally supported at its other end on said adjusting member at a point, said point and said pivot axis being on opposite sides of said pin,
said adjusting member being pivotally supported on said frame whereby pivotal movement thereof shifts said control member between said cam and said pin to rock said type carrier support means about its pivot axis to establish a rest position of said type carrier closer to or farther from said platen.

3,888,340
VARIABLE PITCH TAPELESS FORMAT CONTROL SYSTEM FOR LINE PRINTERS

Paul R. Hoffman, Farmington, Mich., assignor to Burroughs Corporation, Detroit, Mich.
Filed June 1, 1973, Ser. No. 366,122
Int. Cl. B41j *15/00*
U.S. Cl. 197—133 R **25 Claims**



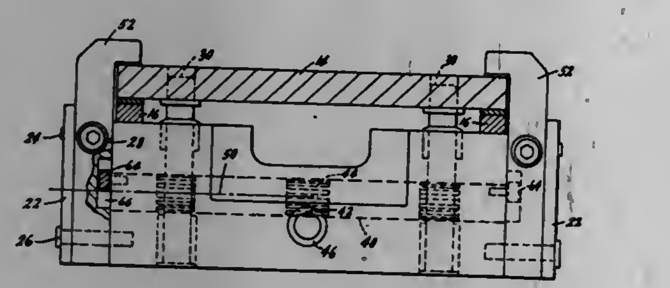
1. A tapeless format control apparatus for selectively advancing web paper in a line printer, said line printer having web paper handling and positioning means associated with a printing position thereof, said apparatus comprising:
- a. a stepping motor for operatively advancing said web paper relative to said printing position, said stepping motor being coupled to said web paper handling and positioning means,
- b. motor control means associated with said stepping motor and effective fot stopping and detenting said stepping motor,
- c. means for selectively determining the length of the web paper upon which lines of information are to be printed, to thereby constitute a selected form length, said web paper length determining means comprising:
  - a plurality of gears of varying diameters fixed to a rotatable first shaft in coaxial relationship to form a conical gear stack, each of said gears of said stack representing a different form length; an elongated cylindrical gear coupled to said web paper handling and positioning means of said line printer; and adjustable means for coupling said elongated cylindrical gear with a selected one of said plurality of gears forming said conical gear stack, said adjustable coupling means comprising:
  - a translatably supported toothed rack disposed intemediate and in parallel relationship relative to said elongated cylindrical gear and said conical gear stack; an idling coupling gear rotatably mounted on the innermost extremity of said toothed rack, said coupling gear being engageably disposed relative to said elongated cylindrical gear and individual ones of said plurality of gears forming said conical gear stack; and means responsive to manual manipulation for selectively translating said toothed rack and said coupling gear relative to said elongated cylindrical gear so as to cooperably couple a selected gear of said conical gear stack with said elongated cylindrical gear,
- d. means for receiving and storing externally originated print spacing instructions,
- e. a plurality of pulse generating means including first pulsing means for identifying each increment of advancement of said web paper, second pulsing means for identifying each increment of rotational motion of said stepping motor, and third pulsing means for identifying the passage of each unit of selected form length, and
- f. means cooperating with said motor control means and responsive to said externally originated print spacing instructions for controllably coordinating the pulses gen-

erated by said plurality of pulse generating means such that each line of information printed on said selected form length is properly spaced from the preceding line and all of the lines of printed information conform to a preselected format represented by said externally originated print spacing instructions.

3,888,341
PALLET LOCATING AND CLAMPING APPARATUS FOR WORK TRANSFER MACHINERY

John Konkal, Bloomfield Hills, and James Egbert, Union Lake, both of Mich., assignors to La Salle Machine Tool, Inc., Warren, Mich.

Filed Mar. 26, 1973, Ser. No. 344,757
Int. Cl. B65g *25/00*
U.S. Cl. 198—19 **3 Claims**



1. In work transfer apparatus which includes a work station and a pallet movable into said station, a main frame at said station, at least one movable locator engageable with said pallet in said station to accurately position the pallet, a plurality of spaced apart clamp arms pivotally mounted on said main frame for engagement with said pallet to clamp the same securely in said station, each of said clamp arms being pivotally mounted at one end thereof on said frame and engageable at the other end thereof with said pallet, a spring member extending between said main frame and each of said clamp arms and positioned in direct engagement with said clamp arm intermediate the ends thereof so as to urge said clamp arm toward an engaged position with said pallet, a plurality of support plates corresponding to said clamp arms, each of said support plates being mounted on and spaced from one side of said main frame, pivot means extending between each of said plates and said frame and pivotally supporting one of said arms at a position therebetween, abutment means extending between each of said plates and said frame at a position intermediate the ends of said one clamp arm, one of said spring members extending between said abutment means and one side of said clamp arm so as to urge said clamp arm in one direction, a rotatable actuator shaft, means responsive to rotation of said shaft in one direction for retracting said locator from said pallet and moving said clamp arms against the pressure of said springs to a position disengaged from said pallet, and means responsive to rotation of said shaft in an opposite direction for advancing said locator into engagement with said pallet and releasing said clamp arms for urging by said springs into engagement with said pallet.

3,888,342
DIVERTING ARRANGEMENTS FOR EXAMPLE IN CONVEYING DEVICES

Stephen Geller, Headcorn, England, assignor to Sovex Limited, Erith, England

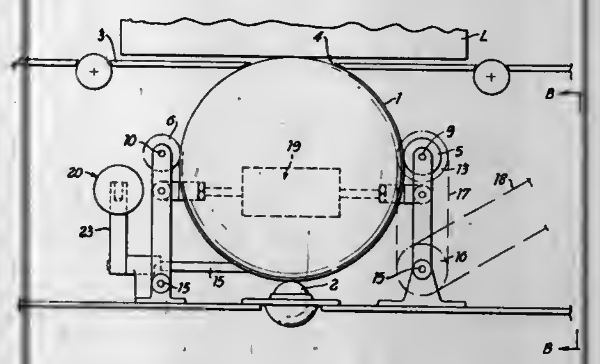
Filed May 24, 1973, Ser. No. 363,779
Claims priority, application United Kingdom, July 7, 1972, 31977/72
Int. Cl. B65g *47/22, 47/82*
U.S. Cl. 198—25 **11 Claims**

1. Conveyor apparatus for selectively diverting articles along a selected one of a plurality of available paths comprising,

conveyor means having a first surface along which the articles are transported and also a second opposite surface,

a spherical member disposed in major part opposite said first surface but having a minor portion thereof which protrudes through an aperture defined in said conveyor means so as to frictionally contact the articles propelled along said conveyor means,

support means for said spherical member permitting its free rotation,



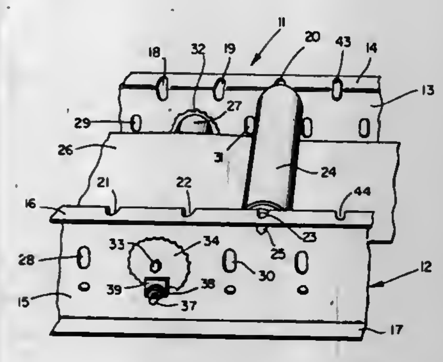
and drive means for said spherical member for rotating said spherical member selectively about at least two different axes,

whereby said spherical member selectively diverts the articles along respectively different paths as said articles come into frictional contact with said spherical member dependent upon the axis of rotation of said spherical member as selected by said drive means.

3,888,343
LOCKING DEVICE FOR A POSITIONING MEANS OF A CONVEYOR PRESSURE ROLLER

Bernard Rex Snyder, 3005 Azalea Ter., P.O. Box 698, Norristown, Pa. 19401

Filed Aug. 13, 1973, Ser. No. 388,030
Int. Cl. B65g *13/02*
U.S. Cl. 198—127 R **3 Claims**

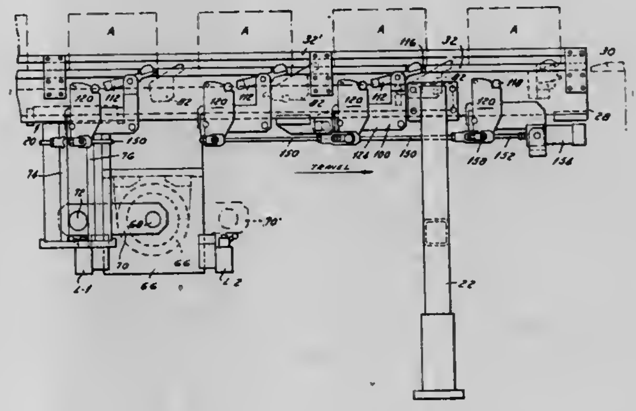


1. A locking device to be used with a means for positioning a conveyor pressure roller which is held supported by first and second side plates comprising in combination threaded stud means formed to have a first portion with a relatively large diameter and a second portion with a relatively small diameter, said threaded stud means disposed so that at least a part of said second portion is located in said first side plate so that said first portion is in abutment with said first side plate but protruding externally therefrom away from said second side plate, said stud means further disposed to be in close proximity to said means for positioning a conveyor pressure roller so that said means for positioning a conveyor pressure roller comes to rest on said first portion of said threaded stud means; securing means having a threaded cylindrical aperture therein and having a relatively large flat surface disposed orthogonally to the axis of said threaded aperture, said threaded aperture having threads formed to match the threads of said threaded stud means for being threaded thereon so that said relatively large flat surface can be held firmly against said means for positioning a conveyor pressure roller in response to said securing means being threaded toward said first side plate to come in abutment with said means for positioning a conveyor pressure roller.

3,888,344
ACCUMULATING CONVEYOR WITH ARTICLE POSITION SENSORS AND ARTICLE MOVEMENT SENSORS CONTROLLING THE PUSHER MEMBER

Harry Major, Grosse Pointe Woods, Mich., assignor to Harry Major Machine & Tool Co., Warren, Mich.

Filed Nov. 23, 1973, Ser. No. 418,437
Int. Cl. B65g *25/04*
U.S. Cl. 198—219 **9 Claims**



1. An accumulating conveyor mechanism comprising, in combination:

a base;

elongate article support means mounted in stationary relation upon said base and providing a plurality of article supporting stations spaced uniformly apart therealong;

a transfer carriage mounted for limited reciprocating movement with respect to said support means;

drive means coupled to said carriage for reciprocating the same;

a plurality of pusher members movably mounted on said carriage for transferring articles between said stations, each pusher member being biased to an article engaging position and shiftable to a non-engaging position;

cam means movably engageable with each pusher member for shifting it to said non-engaging position, said cam means including a cam track for engaging said pusher member and further including a counter-weight biasing said track in a direction urging the pusher member to its non-engaging position; an article sensor at each supporting station comprising a movable arm having a first portion normally projecting into the path of an article in a station and a second portion releasably inter-engaging said counter-weight, with said arm being shifted by an article in said station to release said counter-weight and thereby actuate said cam to shift the track in a direction urging the pusher member to its non-engaging position.

3,888,345
CONVEYOR BELT CLEANER

Laymon Mitchell, 307 Poinciana Dr., Homewood, Ala. 35209

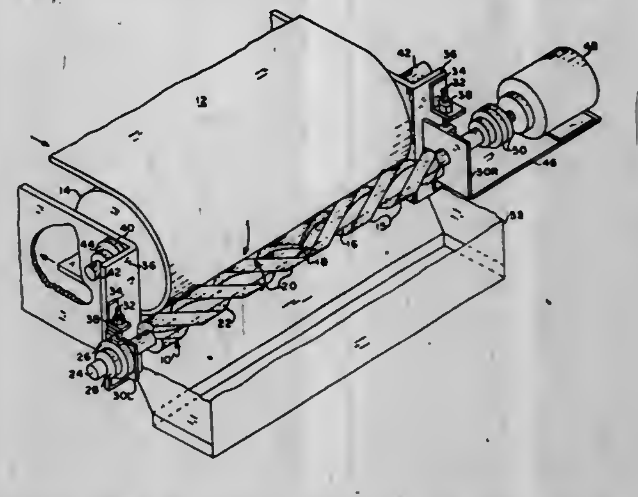
Continuation-in-part of Ser. No. 316,344, Dec. 18, 1972, abandoned. This application Nov. 26, 1973, Ser. No. 418,931
Int. Cl. B65g *45/00*
U.S. Cl. 198—230 **3 Claims**

1. In combination with a flexible belt entrained for movement about a pulley:

a cleaning roller 3 to 5 inches in diameter rotatably mounted about a rotational axis substantially parallel to that of the pulley;

means mounting said roller for rotation in peripheral contact with the belt and for adjustably positioning said roller with respect to said belt;

drive means drivingly connected to said roller for imparting rotation thereto in a direction corresponding to the direction of movement of said belt and a roller speed of 1½ to 2½ times the speed of movement of said belt;



said cleaning roller includes a plurality of circumferentially spaced continuous formations of a width of 1 to 1½ inches and projecting ¼ to ½ inch radially on said roller and forming helical grooves therebetween;

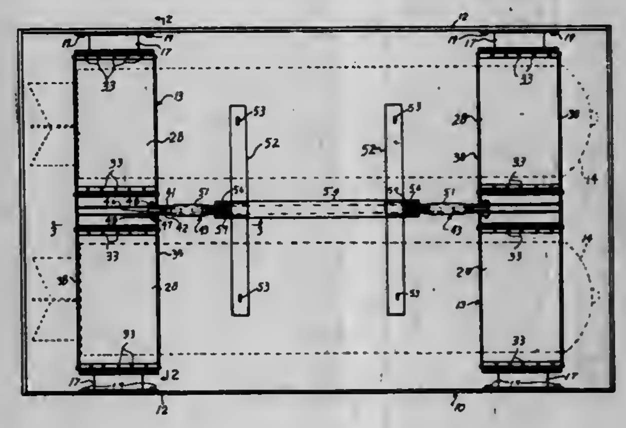
the helix angle of said formation, measured perpendicular to the axis of said roller, is within the range of 30° to 45°; and

the diameter of said roller increases from the center to each side of said roller at a rate of up to ⅛ inch in 12 inches.

3,888,346
CONTAINER FOR SUSPENDING A BOMB-LIKE MEMBER

Raymond L. Lancaster, Cullman, Ala., assignor to Lanson Industries, Inc., Cullman, Ala.

Filed Mar. 25, 1974, Ser. No. 454,560
Int. Cl. B65d *81/02*; **F42b** *37/00, 39/00*
U.S. Cl. 206—3 **11 Claims**



1. A container for suspending a bomb-like member comprising:

a. a generally horizontal support extending transversely of the container,
b. at least one pair of upstanding, spaced apart, fixed brackets carried by said horizontal support,
c. resilient means supporting the ends of said horizontal support from said container,
d. an upstanding, movable bracket pivotally connected adjacent its lower end to each of said fixed brackets,
e. means limiting outward pivotal movement of the movable brackets carried by each said pair of fixed brackets away from each other, and

f. a flexible support member connected adjacent opposite ends thereof to upper portions of said movable brackets and extending therebetween in position to extend transversely beneath and support a portion of a bomb-like member.

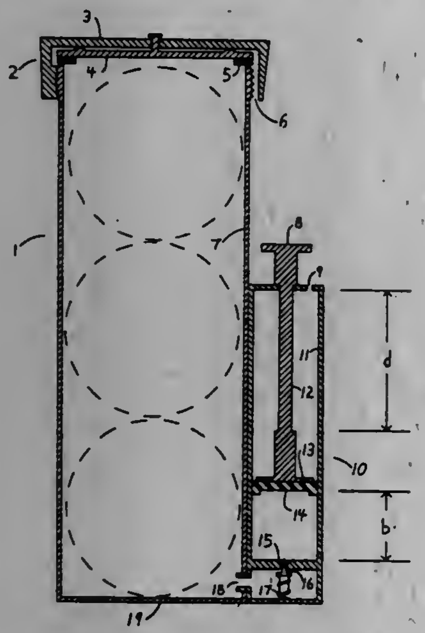
3,888,347
INFLATED CONTAINERS FOR FLUID PRESSURIZED BALLS

Thomas Rollin Kramer, 5056 MacArthur Blvd., N.W., Washington, D.C. 20016

Filed Aug. 6, 1973, Ser. No. 385,792

Int. Cl. B65d *85/00, 51/10*

U.S. Cl. 206—315 **3 Claims**



1. A ball storage container comprising a hollow pressure-tight first cylinder provided with a removeable cap, pump means connected to said first cylinder to inflate said first cylinder to a fixed maximum pressure, said pump means comprising a hollow second cylinder having end walls, a false bottom located in said second cylinder a spaced distance from one of said end walls to define a small chamber adjacent one of said end walls and a larger piston chamber adjacent the other of said end walls, a piston located in said piston chamber, a pump handle located outside said second cylinder and connected to the piston by a piston rod extending through the other of said end walls, said piston chamber communicating pressurized air to said first cylinder through said small chamber, a one way check valve located in said small chamber with means to admit the pressurized air from said piston chamber into said first cylinder and prevent the air from escaping from said first cylinder to said piston chamber, said piston having a maximum downstroke wherein it is a spaced distance from said false bottom, said distance determined so that said first cylinder can be inflated only to said fixed maximum pressure when the pump is used at normal atmospheric pressure.

3,888,348
PACKAGE FOR TUMBLERS AND THE LIKE

Raymond C. Frey, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Aug. 15, 1973, Ser. No. 388,406

Int. Cl. B65d *85/62*

U.S. Cl. 206—427 **3 Claims**

1. An improved molded plastic package for cylindrical articles comprising the combination of:

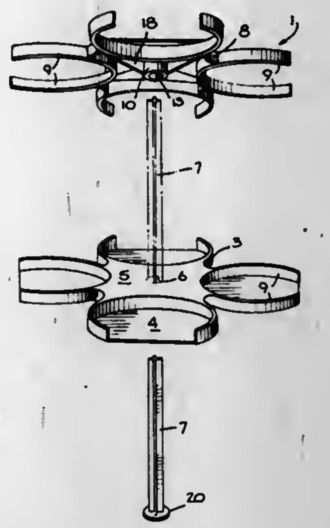
a plastic base with a central aperture;

a plurality of spaced article receiving receptacles on said base;

a plastic cover with a central receptacle;

a plastic post passing through said base aperture and connecting the receptacle on said cover to a central portion of said base for positioning a plurality of articles between said cover and said base;

a plurality of outwardly directed arcuate article clips on said cover forming a major part of a circle positioned for engaging arcuate portions of the article tops;



said post comprising an elongated member having a plurality of splines for frictionally engaging said base aperture and said cover receptacle; and

said cover receptacle including a locking detent for frictionally engaging said post and for positioning said cover clips with respect to said base receptacles.

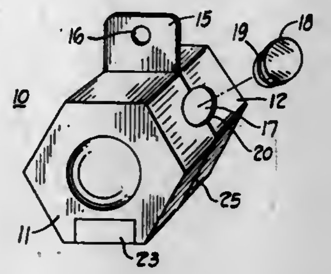
3,888,349
DISPLAY PACKAGE

Raymond W. MacFarland, Jr., 9508 Fairmount Blvd., Novelty, Ohio 44072

Filed Sept. 18, 1972, Ser. No. 289,978

Int. Cl. B65d *79/00*

U.S. Cl. 206—457 **11 Claims**



1. A reclosable display package containing a plurality of similar items for display on a display rack, comprising in combination:

a substantially rigid molded plastic body member forming a hollow package to contain the plurality of similar items, said body member having a tab extending therefrom and lying in a substantially flat plane,

said tab having a support aperture for hanging the package from the rack,

at least a portion of said body member extending outwardly of said plane and having an opaque surface,

each of the similar items having a substantially identical symmetry about less than three mutually perpendicular axes,

an access aperture in said body member,

a plug cooperating with said access aperture to secure to said access aperture to provide a reclosable access to the package,

the shape of said opaque surface of said body member having substantially the appearance of one of the plurality

of similar items to convey a visual impression of one of the plurality of similar items contained therein,

and said opaque surface being color coded to further indicate a characteristic of the items in the package.

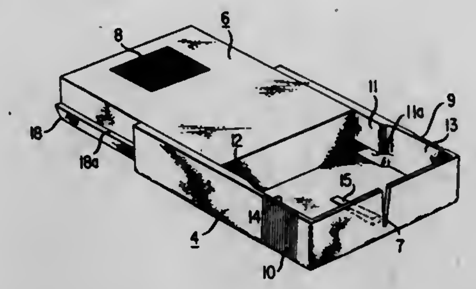
3,888,350
SAFETY CONTAINER

William Horvath, 10 Crestwood Dr., Watchung, N.J. 07060

Filed May 10, 1974, Ser. No. 468,759

Int. Cl. B65d *85/42*

U.S. Cl. 206—531 **9 Claims**



1. A safety container which comprises in combination:

a rectangular drawer,

a substantially rectangular cover comprising a closed top and depending rear and side walls, and constructed to move slidably to and fro on said drawer between closed and opened positions by engagement with guide means on opposite lateral walls of said drawer,

means comprising a cam-like member projecting downwardly from the underside of said cover intermediate between said side walls,

said cam having an edge disposed to form with the inner rear wall of said cover a slot for accommodating the peripheral edge of the rear wall of said drawer,

said cam tapered in decreasing thickness from back to front, forming at its frontal end a smooth junction with the underside of said cover,

and means constructed and arranged when said container is locked in closed position to respond to pressure on the two lateral walls of said cover adjacent its closed rear end to distend the top of said cover adjacent said slot thereby raising said cam and releasing the peripheral edge of the rear wall of said drawer from said slot to override the said cam.

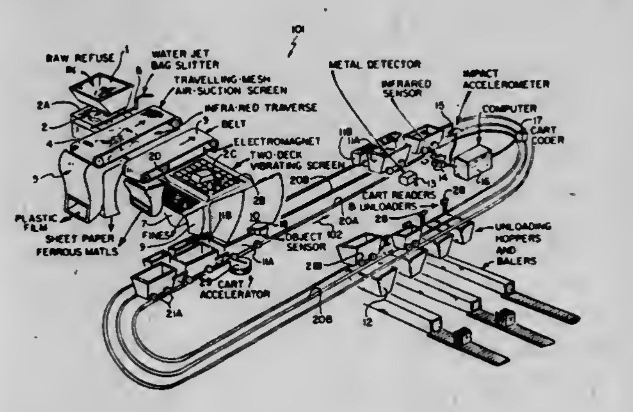
3,888,351
AUTOMATIC REFUSE RECLAMATION SYSTEM

David G. Wilson, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 31, 1974, Ser. No. 475,488

Int. Cl. B01d *37/02*

U.S. Cl. 209—75 **10 Claims**



1. A refuse-separation system that comprises, in combination:

pre-sorter means that includes means for mechanically agitating the refuse to break up clumps and to divide fines in the refuse from the large items therein and means to remove loose paper and plastic;

a plurality of carts, each being the leading cart of a queue of carts on a closed-loop track, positioned to receive the individual large items from the pre-sorter means;

acceleration means to propel each leading cart down the track and to accelerate the next cart in queue into position;

object-detector means to detect entry of a large item into each leading cart and connected to actuate the acceleration means for that cart;

propulsion means to move each accelerated cart around its closed-loop track;

uncoupling means to discontinue the propulsion means when the cart encounters another cart in a queue of carts; sensor means to provide signature-type messages from each individual large item and to provide a signal indicative of a plurality of characteristics of the individual large item present in each cart;

means for analyzing the signal to provide an indication of the character of the individual large item sensed; and means for removing the individual large item from each cart at a location determined by the characteristics of the item as indicated by said signal and interpreted by the means for analyzing.

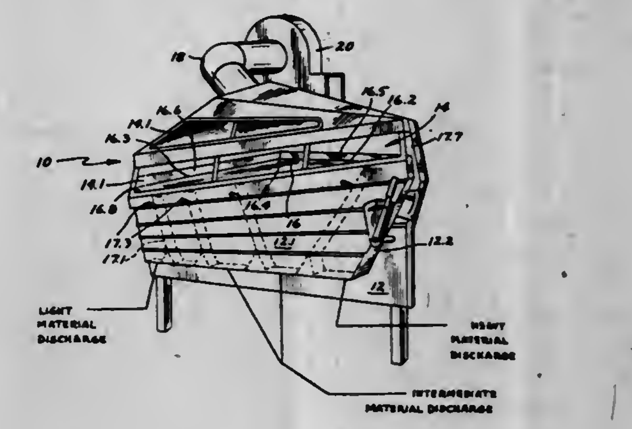
3,888,352
GRAVITY SEPARATOR

Leslie G. Kulseth, Thief River Falls, Minn., assignor to Forsbergs, Inc., Thief River Falls, Minn.

Filed June 21, 1974, Ser. No. 481,534

Int. Cl. B07b *13/10*

U.S. Cl. 209—115 **8 Claims**



1. A high capacity gravity separator for separating particulate material as to weight and comprising a stationary base; a substantially triangular deck mounted for side-to-side and up and down oscillation on the base and having a front edge from which separated particles are received and two side edges forming with the front edge respective side vertices and converging rearwardly to form a rear vertex, the deck sloping gently downwardly from the rear vertex to the front edge and from one side vertex to the other; a discharge port spaced above the deck for dropping a stream of particles toward the deck adjacent the rear vertex; and air flow means for directing a stream of air transversely through the falling particle stream and toward the lower vertex to cause lighter particles to separate from the falling particle stream and to be preferentially conveyed by the air stream toward the lower deck vertex, whereby the separation on the deck of lighter particles from the remaining particles is largely avoided.

3,888,353

STAND FOR STORAGE OF SHOES

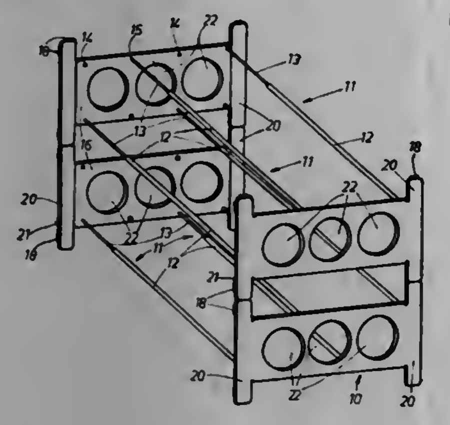
Günter Leifheit, Nassau, Lahn, Germany, assignor to Leifheit International Günter Leifheit GmbH, Nassau, Lahn, Germany

Filed June 18, 1973, Ser. No. 371,245

Claims priority, application Germany, June 19, 1972, 2229084

Int. Cl.² A47F *7/08*

U.S. Cl. 211—37 **4 Claims**



1. A stand for storage of shoes, comprising a pair of I-shaped end members each having a center portion and a pair of crossbar portions having parts which extend beyond opposite sides of said center portion at the respective ends thereof, each of said crossbar portions having an edge face facing away from the other crossbar portion and each of said parts having an end face extending substantially normal to the associated edge face so that each end member may be placed on a supporting surface in a position in which one of said edge faces or two of said end faces are juxtaposed with said supporting surface, said center portion of each of said end members being provided with a plurality of sockets aligned with corresponding sockets provided in the center portion of the respective other end member; a plurality of shoe-supporting telescopic crossties each having spaced end portions lodged in the respective aligned sockets of said end members and interconnecting the latter at a distance from one another which is adjustable by telescoping said crossties, the length of said shoe stand being variable at will by changing said distance between said end members of said pair with attendant telescoping of said crossties, and the working height and width of said shoe stand being selectable in dependence upon whether respective edge faces or end faces of said end members are juxtaposed with supporting surface; and a plurality of male and female portions in form of projections and recesses provided on said edge faces and on said end faces of said crossbar portions of said end members and adapted to engage complementary connecting crossbar portions of an identical additional shoe stand so that a stacked array may be provided which is composed of a plurality of said shoe stands.

3,888,354

ADJUSTABLE BRACKET ASSEMBLY

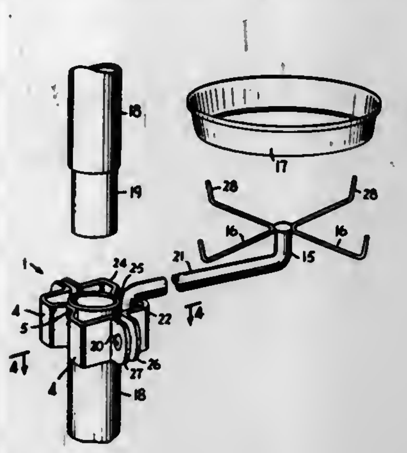
Efraim Margolin, and Michael Grunstein, both of New York, N.Y., assignors to Grun Mar Industries Inc., New York, N.Y.

Filed July 25, 1973, Ser. No. 382,459

Int. Cl. A47f *5/08*

U.S. Cl. 211—110 **5 Claims**

1. A bracket assembly comprising a front plate and a rear plate, said front plate having a recessed section with a forward section positioned on each side of said recessed section, said rear plate having a rearward section and a front section positioned on each side of said rearward section, a support opening defined by said front section and said recessed section and a support in said support opening, a plurality of holes defined by said forward section and support element and by said rearward section and support element, each hole being adapted to receive a support rod therein, at least one support rod in one of said holes, and means on both ends of said front and rear plates for adjustably connecting said front and rear plates, said means being positioned on either side of said support and being adjustable to move said plates to a first position in which said front section and recessed section firmly engages said support, said support rod being loosely held in said holes in said first position and to a second position in which the support is more firmly engaged and in which said support rod is firmly engaged in said holes.



3,888,355

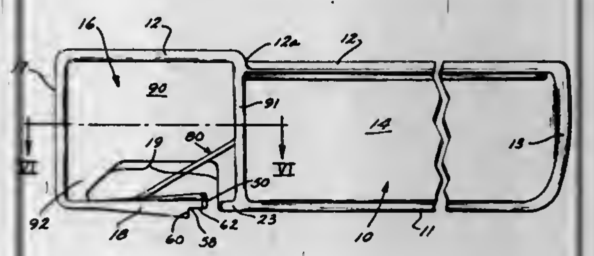
SLACKS HANGER

Judd F. Garrison, Grand Rapids, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.

Continuation-in-part of Ser. No. 91,036, Nov. 19, 1970, abandoned. This application Nov. 12, 1971, Ser. No. 198,238

Int. Cl. A17f *5/00*

U.S. Cl. 211—123 **16 Claims**



1. A hanger for slacks and the like having a bar and support member, said bar having an elongated body portion and a head portion at one end thereof, said support having a socket opening through one end thereof for receiving said head portion, the improvement in said hanger comprising: a resiliently flexible latch on one of said head and said support and a keeper on the other thereof; said latch being biased to a first position engaging said keeper to lock said bar against disengagement from said support and being movable out of said first position whereby said bar can be removed from said socket; said support including a socket for receiving said head and defining said socket opening; said socket including walls which generally limit the direction which said head can be extracted from said socket; said latch comprising a finger-like member depending from said head and extending generally towards the plane of said socket opening; said keeper lying in front of the free end of said latch; and a restraining means connecting said latch at a point spaced from the junction of said latch with said head, to said head.

7. The hanger described in claim 6 wherein the end of said latch includes a cutaway portion defining a keeper abutting face for engaging said keeper to prevent removal of said bar when said latch is moved into said wall opening and a stop face engageable with said keeper to prevent said latch being manipulated completely through said wall opening.

3,888,356

METHOD OF ASSEMBLING AN UNLOADING CRANE

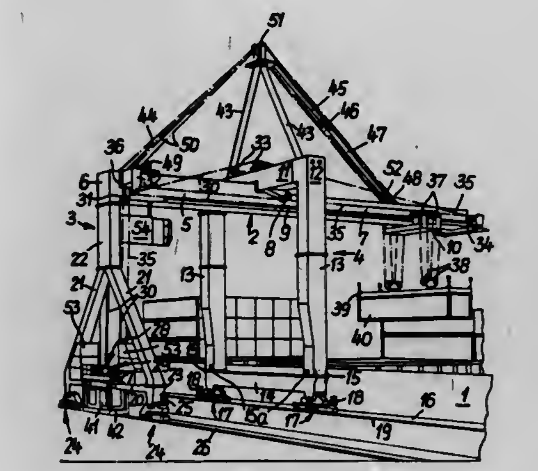
Hans Redelfs, Wilhelmshaven, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Feb. 7, 1974, Ser. No. 440,471

Claims priority, application Germany, Feb. 10, 1973, 2306722

Int. Cl. E04b *1/00*

U.S. Cl. 212—15 **7 Claims**



1. A method of mounting a crane having a bridge beam with a hoisting mechanism, and front and rear support means each of which is provided with a travelling beam having hinged thereto post means pivotable from an at least approximately horizontal position to an upright position, which includes the steps of: respectively placing said travelling beams upon crane rails and temporarily holding the same in a position in which they are spaced from each other in a direction transverse to the longitudinal extension of said front and rear travelling beams, placing a rear portion of said bridge beam upon the travelling beam of said rear support means and on a temporary auxiliary support, subsequently pivoting said post means into upright position and fixedly securing same to the pertaining travelling beam, hoisting said bridge beam upwardly and placing the same into its final position relative to said front and rear support means and connecting same to said post means.

3,888,357

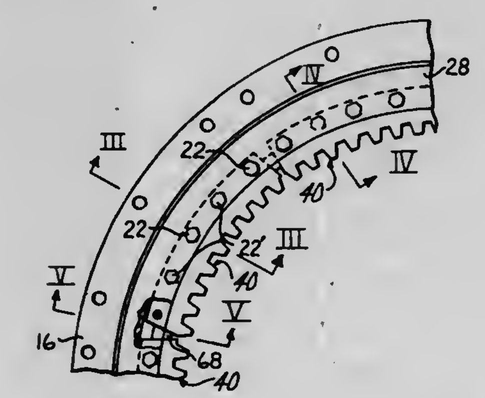
SWING BEARING WITH BOLT-ON SEGMENTED GEAR

Ralph L. Bauer, and Fred E. Simpson, both of Oswego, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 15, 1972, Ser. No. 306,707

Int. Cl. B66c *23/84*

U.S. Cl. 212—68 **9 Claims**



1. The combination of a swing bearing and swing gear for an excavator, comprising:
  an outer annular bearing race member;
  annular means including a pair of annular members defining inner bearing race means;
  said race members defining a raceway for receiving a plurality of bearing elements to support said members relative to one another;
  a plurality of arcuate gear segments detachably secured to said inner race member and defining an endless series of gear teeth forming a ring gear; and,
  said arcuate gear segments include a flange secured between said annular members.

8. The combination of a swing bearing and swing gear for an excavator, comprising:
  an outer annular bearing race member;
  annular means defining an inner bearing race member;
  said race members defining a raceway for receiving a plurality of bearing elements to support said members for rotation relative to one another;
  a plurality of arcuate gear segments, each having a flange extending radially therefrom and detachably secured to said inner race member and defining an endless series of gear teeth evenly spaced both circumferentially and radially to define an internal ring gear for driving engagement and relative rotation with a pinion gear;
  a mobile carriage;
  a platform rotatably supported on said mobile carriage by said swing bearing and including means for enclosing said ring gear; and
  means permitting replacement or removal of one or more gear segments, said means comprising an opening in said means for enclosing said ring gear having a length greater than a single gear segment but less than two segments for selectively providing access to any one of said gear segments without removal of said platform.

3,888,358

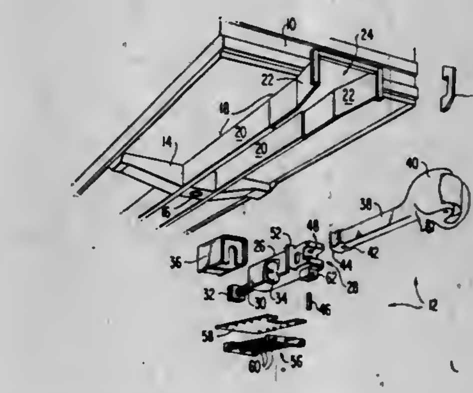
COUPLING ASSEMBLY

Richard C. Farris, Joshua, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed July 25, 1974, Ser. No. 491,950

Int. Cl. B61g *9/00*

U.S. Cl. 213—69 **9 Claims**



1. In a coupling assembly including:
  a sill connected to the underframing of a railway vehicle; a coupler bar including a coupler head and an elongated coupler shank extending into a forward portion of the sill, one end of the coupler shank opposite the coupler head having an aperture extending therethrough; a yoke operably interconnecting the sill and the apertured end of the coupler shank, the yoke having opposed essentially parallel legs extending forwardly toward the coupler bar and coaxial apertures extending transversely through the legs; and a circular cylinder coupler pin extending through the apertures of the yoke and the aperture of the coupler shank to pivotally connect together the coupler bar and the yoke;
the improvement comprising:
  a plurality of bounding surfaces forming in each leg of the yoke an enlargement of the aperture therein, one of the bounding surfaces forming a vertically planar forwardmost bounding surface of the aperture orthogonally oriented relative to the longitudinal axis of the leg; and a pair

of inserts each removably mounted in a forward portion of the aperture of a leg of the yoke and including

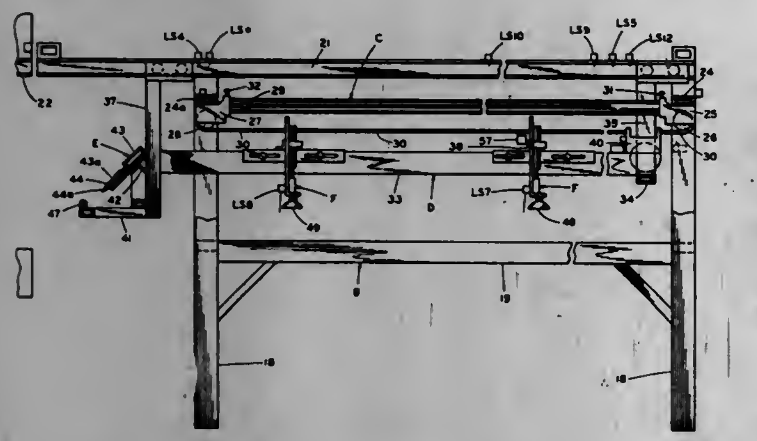
force receiving means for receiving draft forces transmitted from the coupler shank through the coupler pin; and

force distributing means connected to said force receiving means for distributing forces received by said force receiving means over the planar, forwardmost bounding surface of the aperture of the leg to reduce the concentration of forces exerted on the leg through the coupler pin.

3,888,359
MATERIAL HANDLING APPARATUS

Wilbur L. Moline, Joliet, Ill., assignor to Kemlite Corporation, Joliet, Ill.

Filed Oct. 1, 1971, Ser. No. 185,526
Int. Cl. B65h *5/10, 29/24*
U.S. Cl. 214—1 BB **27 Claims**



1. In apparatus for introducing a raw material sheet into a press, a carriage extendable into said press and retractable therefrom, a lip carried by said carriage and extendable under an edge portion of said sheet, said lip having a strip extending transversely thereof, a plurality of spaced needles carried by said carriage, and means for driving said needles through an edge portion of said sheet to a position behind said strip.

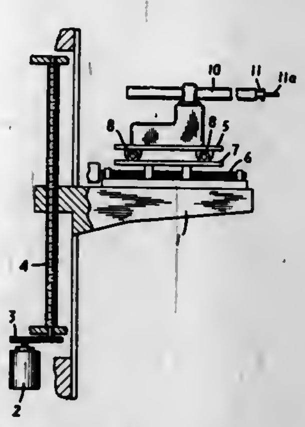
11. In apparatus of the character set forth, a press having jaws which open to receive material between said jaws, a carriage which is movable between said jaws into and out of said press, a fluid cylinder having a piston therein, means connecting said piston with said carriage whereby movement of said piston in one direction in said cylinder produces movement of said carriage into said press between said jaws and movement of said piston in another direction in said cylinder produces movement of said carriage in another direction out of said press, first means for introducing fluid into said cylinder on one side of said piston to move said piston in said one direction to extend said carriage into said press between said jaws, second means for introducing fluid into said cylinder on the other side of said piston to move said piston in said other direction to withdraw said carriage from said press, means on said carriage for picking up a finished sheet within said press after said carriage has been extended into said press, and means for starting the operation of said second means after the operation of said pickup means.

3,888,360
INDUSTRIAL ROBOT

Reijiro Ando, Funabashi, and Shigeru Iwai, Chiba, both of Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Apr. 8, 1974, Ser. No. 459,099
Claims priority, application Japan, Apr. 11, 1973, 48-42718
Int. Cl. B25j *11/00*
U.S. Cl. 214—1 BB **4 Claims**

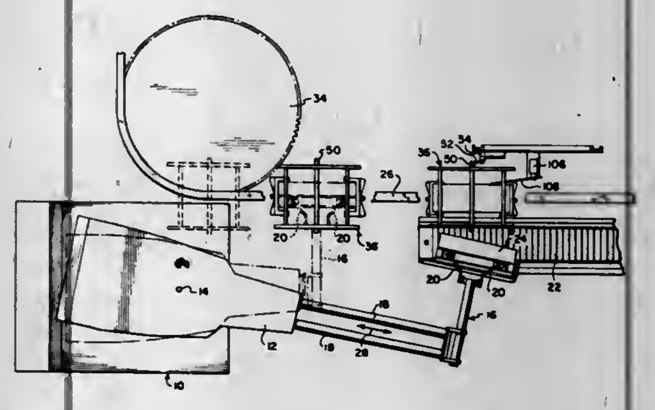
1. A programmable robot comprising, a bed means for moving the bed upwardly and downwardly, a base on said bed movable in opposite directions along two axes, a loading unit having a pneumatically operated lift member on said base operable upwardly and downwardly, a sweeping member on an upper end portion of said lift member mounted for rotation thereon, a transfer arm on said sweeping member having reciprocable means reciprocable horizontally, and a manipulator on said transfer arm reciprocable means having grippers for gripping articles, means rotatably mounting the manipulator on said transfer arm, and control means to effect three dimensional movements of said manipulator comprising means for controlling raising and lowering of the bed, and the lift individually and simultaneously, means in said control means to rotate said sweeping member, means in said control means to reciprocate said transfer arm, and means in said control means to rotate said manipulator relative to said arm, and means in said control means for controlling operating of said grippers.



3,888,361
PROGRAMMED MANIPULATOR ARRANGEMENT FOR CONTINUOUSLY MOVING CONVEYOR

John L. Becker, Sterling Heights, Mich.; Otto Hohnecker, Wilton, and Maurice J. Dunne, Newtown, both of Conn., assignors to Unimation, Inc., Danbury, Conn.

Filed May 15, 1974, Ser. No. 470,216
Int. Cl. B23k *9/12*
U.S. Cl. 214—1 BH **12 Claims**

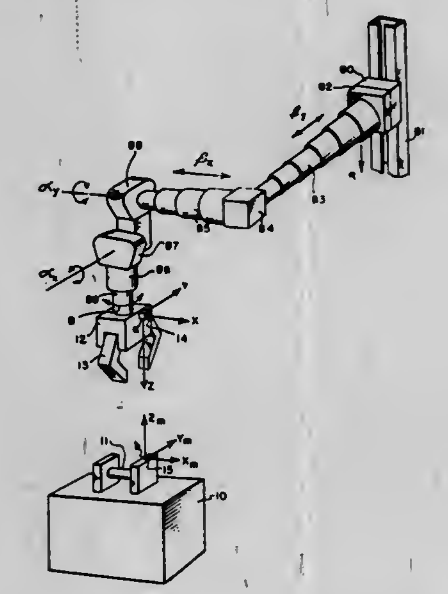


1. In a programmed manipulator, the combination of, a manipulator arm, means for moving said arm along a plurality of axes, a continuously moving conveyor positioned adjacent said programmed manipulator, first encoder means for developing a digital signal corresponding to the absolute position of said arm in one of said axes, second encoder means for developing a digital signal representing the actual position of said conveyor, means for developing a sequence of digital command signals having one component corresponding to desired positions of said arm along said one axis, means for comparing the encoder signal of said first encoder means and said one component of one of said command signals to develop an error signal equal to the difference therebetween, means responsive to said error signal for controlling said moving means to move said arm along said one axis in the direction to reduce said error signal, at least some of said command signals including an auxiliary control signal, and means responsive to said auxiliary control signal for connecting said second encoder means to said comparing means in place of said one component of said command signal, whereby the encoder signal of said second encoder means acts as a continuously variable series of command signals to control movement of said manipulator arm in said one axis in accordance with movement of said conveyor along the path thereof.

3,888,362
COOPERATIVE MULTIAXIS SENSOR FOR TELEOPERATION OF ARTICLE MANIPULATING APPARATUS

James C. Fletcher, Deputy Administrator of the National Aeronautics and Space Administration in respect to an invention of, and Alan R. Johnston, La Canada, Calif.

Filed May 31, 1973, Ser. No. 475,336
Int. Cl. G05b *1/06*
U.S. Cl. 214—1 B **6 Claims**



1. In apparatus for grasping an article under remote control, a system for detecting spatial position and orientation of a grasping effector relative to said article comprising

a sensor including a planar photodetecting means divided into four quadrants to define X and Y coordinates, and a first light emitting diode means on a Z axis normal to the X and Y axes and the plane of said photodetecting means, two additional light emitting means equally spaced on each side of said first diode in a plane defined by said X and Z axes, and means for sequentially energizing said light emitting means, and

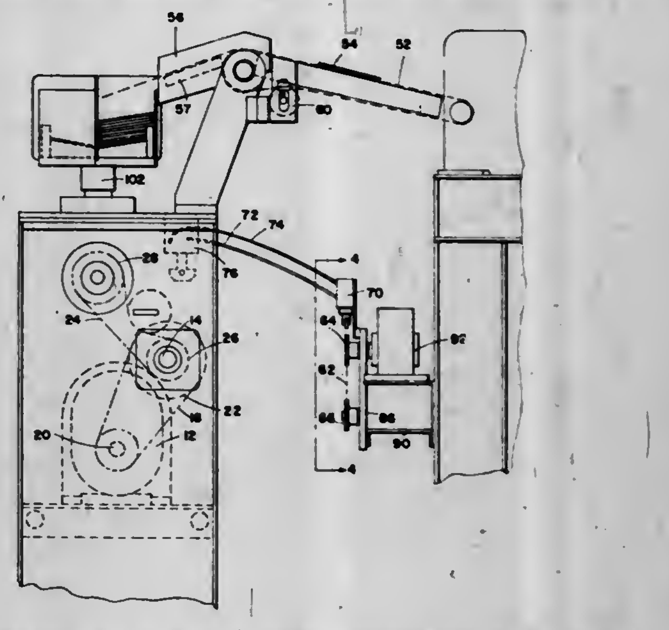
a target comprising two plane mirrors and a corner retroreflector mounted on said article to reflect images of said light emitting means as they are energized in sequence in order to produce signals from said quadrants which, when combined and nulled, will align said X, Y and Z axes of said sensor with corresponding axes X_m, Y_m and Z_m of said target where said Z_m axis is at equal angles from all sides of said retroreflectors, said X_m axis is perpendicular to said Z_m axis and passes through each of said two plane mirrors disposed on opposite sides of said retroreflector, and said Y_m axis is perpendicular to said Z_m and X_m axes, and will also decrease the distance between the sensor and the mirror to a predetermined value.

3,888,363
INDEXING STACKER

Arthur B. Erekson, San Diego, Calif., assignor to Borden, Inc., Columbus, Ohio

Filed Oct. 29, 1973, Ser. No. 410,436
Int. Cl. B65g *57/14*; **B65h** *33/14*
U.S. Cl. 214—6 D **10 Claims**

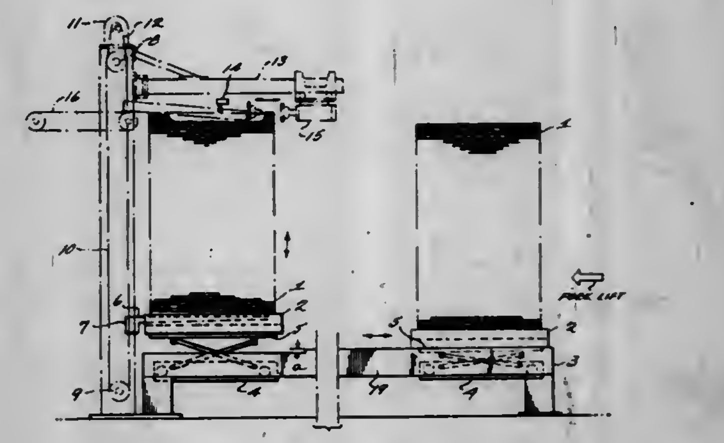
1. Apparatus, including a stacker and a conveyor means having an article supporting surface, for stacking substantially flat individual articles of a regular geometric form, said stacker comprising four compartments having a common apex; a common dividing wall between adjoining compartments; a peripheral wall disposed on the outside of each compartment defining an outside wall thereof, said peripheral walls are in a diagonal disposition and are of a lesser vertical extent than said dividing walls and said surface of said conveyor means; and a bottom wall defining the floor of each compartment disposed with an inclination in the X and Z planes directed downwardly to the common apex; wherein said conveyor means moves the articles to one of said compartments at a time.



3,888,364
UNLOADER SYSTEM

Yoshio Inoue, and Yasuaki Sato, both of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 27, 1973, Ser. No. 374,096
Claims priority, application Japan, July 19, 1972, 47-71634
Int. Cl. B65g *59/02*
U.S. Cl. 214—8.5 A **1 Claim**



1. An unloading system for stacked sheets, comprising:

a frame structure including horizontal frame means having upwardly presented support surface means which is presented at a higher level along a first portion of the length of the support surface means and which steps down to a lower level along a second, longitudinally adjacent portion of the length of the support surface means,

a travelling truck mounted on the frame structure for forth and back movement along the horizontal frame means;

a platform;

means mounting the platform on the travelling truck for movement therewith along the frame structure, said mounting means mounting the platform for vertical movement between an upper level wherein the platform lies above the upwardly presented support surface means of the horizontal frame means of both said first and second portions of the support surface means and a second, lower level wherein the platform lies below the higher level of support surface means, but above the lower level of the support surface means;

a pallet for support at least two longitudinally side-by-side vertical stacks of horizontal sheets, means defining a plurality of laterally spaced, longitudinally extending upwardly opening grooves in the pallet;

a lifting fork having a plurality of generally horizontal, laterally spaced, longitudinally extending prongs;

means mounting the lifting fork overlying one end of the second portion of the support surface means, away from the first portion of the support surface means;

the pallet being sized to be carried on said platform and said grooves being sized to be entered by respective ones of said lifting fork prongs,

whereby, the pallet, with at least two side-by-side stacks of sheets thereon, may be loaded onto the higher level of the support surface, the travelling truck positioned therebeneath with the platform lowered to the lower level thereof, then raised to lift the pallet and stack clear of the support surface, whereupon the travelling truck may be moved along the frame structure with the level of the lifting fork relative to the level of the platform adjusted so that the prongs enter the grooves of the pallet, so that both stacks may be transferred from the pallet to the lifting fork, whereupon the platform may be lowered to the lower position thereof, with the pallet remaining thereon, the travelling truck may be moved back so that only the foremost stack no longer overlies the pallet, whereupon the level of the lifting fork relative to the platform may be changed to cause the remaining stack to be again supported on the pallet on the platform on the travelling truck and thus the remaining stack may be moved back out of the way of the lifting fork for placement on the lifting fork after the foremost stack has been consumed;

sensing means positioned with vertical spacing over the lifting fork for sensing when the lifting fork is raised to such an extent that the top of the stack supported on the lifting fork is disposed at a predetermined level;

a conveyor positioned beside the lifting fork adjacent said predetermined level; and

pusher means mounted and positioned intermittantly to engage a predetermined number of sheets at once and to push them laterally from the top of the stack supported on the lifting fork when the top of that stack is at said predetermined level, and onto said conveyor.

3,888,365
STORAGE AND PROCESSING APPARATUS FOR RECORD CARRIERS

Herbertus Reimann, and Gunter Clauss, both of Dresden, Germany, assignors to Veb Pentalon Dresden, Dresden, Germany

Filed Mar. 5, 1973, Ser. No. 338,240
Int. Cl. B65g *1/04*
U.S. Cl. 214—16 B **1 Claim**

1. A storage and processing apparatus for record carriers contained in storage units arranged adjacent to each other on a support, comprising:

a plurality of storage units with record carriers;

at least one horizontally disposed rod forming a part of said support, means on each of said storage units for suspending said storage unit from said rod;

a coding surface on one side of each of said storage unit, coding elements mounted on said coding surface, means extending along a side opposite to the coding surface to prevent pivotal movement of said storage units when suspended on said rod;

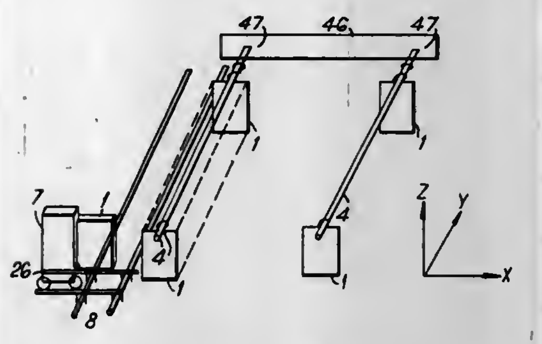
at least one movable collecting bar with pins thereon for supporting said storage units, means mounting said pins on said collecting bar in a substantially horizontal position in an axial alignment position with said rod;

record carrier processing station for processing said record carrier contained in said storage unit;

a seeker unit, at least one seeker head mounted on said seeker unit and operative to scan said coding surface to detect a selected code formed by said coding elements, detecting means mounted on said seeker head to detect said coding elements, each of said detecting means being located at a level corresponding to the level of a coding element;

storage unit retrieval means mounted on said seeker head, said retrieval means being operative to remove or deposit a storage unit relative to said rod and said pins;

means mounted on said seeker unit to move said seeker head and storage unit retrieval means thereon to a plurality of storage unit handling positions normal to said rod; track means extending at least the combined distance of said rod and pins for supporting said seeker unit for movement in a path parallel to said rod and pins, said track means being located on the side of said storage unit immediately adjacent and facing said coding surface, means to effect travel of said seeker unit along said track means whereby said seeker head and storage unit retrieval means can transfer said storage units between said rod and said pins;

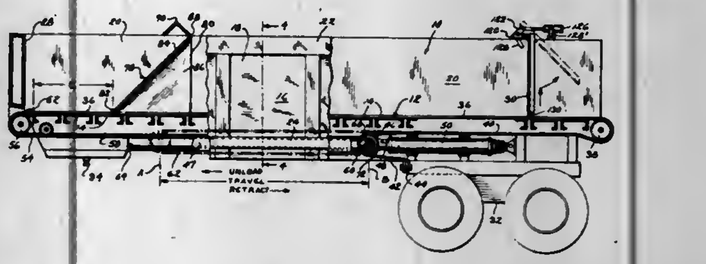


means for effecting and supporting said collecting bar for movement from a first position wherein said pins are axially aligned with said rod to a second position wherein said pins are position at said record carriers processing stations, means located at said processing station for controlling the movement of said collecting bar thereat and reciprocal means located adjacent one side of said collecting bar opposite to said pins for transferring said storage unit from said pins on to said rod.

3,888,366
SELF-UNLOADING VEHICLE

Eugene D. Prahst, Franklin, Wis., assignor to The Heil Co., Milwaukee, Wis.

Filed Aug. 30, 1973, Ser. No. 392,902
Int. Cl. B60p *1/00*
U.S. Cl. 214—83.22 **12 Claims**



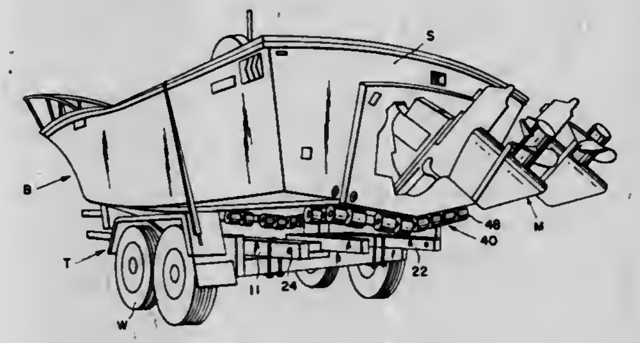
1. A self-unloading wheeled vehicle comprising a vehicle body having a floor and side walls extending upwardly therefrom. a transversely-extending rear roller journalled adjacent the rear end of the floor of said body, a flexible belt having an upper stretch normally covering said body floor and having a front end normally positioned adjacent the front of the body, said belt extending around said rear roller and having a first lower stretch extending forwardly beneath said body floor and a second lower stretch looped back to extend rearwardly beneath said body floor to a location where its end is deadended, spaced longitudinally-extending tracks supported beneath said floor, a drive roller having means at its ends for guiding engagement with said tracks positioned to rollably engage said looped portion of said belt between said forwardly and rearwardly-extending stretches thereof, and power means for said drive roller to move the belt forwardly beneath the body floor when the power means is operated in one direction to thereby cause the upper portion of the belt to move rearwardly over said body floor to unload the body, and means connecting said drive roller with the front end of said belt for returning the belt to normal position when the power means is operated in a reverse direction.

7. A self-unloading wheeled vehicle comprising a vehicle body having a floor and side walls extending upwardly therefrom, a transversely-extending roller at the rear end of said floor, a flexible belt normally covering said floor and extending around said roller, said flexible belt having a front end normally positioned adjacent to the front of the body, means for moving said belt rearwardly around said rear roller to eject the load from said vehicle body and for subsequently moving said belt forwardly to return it to its normal position, and a fixed bulkhead spaced a predetermined distance from the front of the body to provide an unloaded front belt portion which can accommodate fallback during an unloading operation, said bulkhead comprising a sloping central panel sloping downwardly toward the front of the vehicle, and a pair of converging side panels joined to opposite sides of said central panel, said central panel and side panels being spaced sufficiently above said belt to permit movement of the later.

3,888,367
BOAT TRAILER

William F. Cox, P.O. Box 338, Grifton, N.C. 28530

Filed Sept. 3, 1974, Ser. No. 502,679
Int. Cl. B60p *3/10*
U.S. Cl. 214—84 **7 Claims**

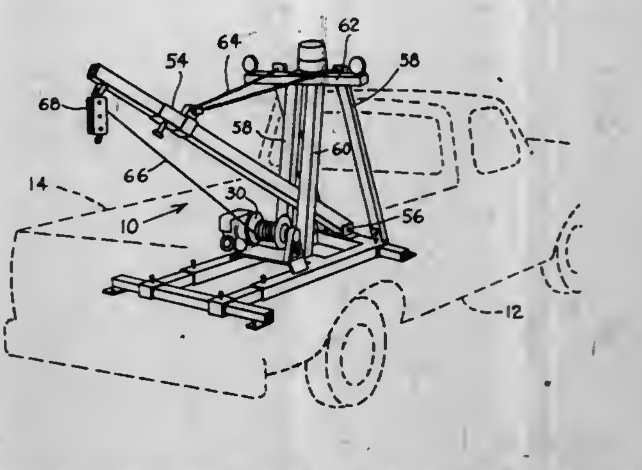


1. In a boat trailer, a wheel-carried main frame having a forward tongue with means for connecting to a towing vehicle, and means for supporting a boat on said main frame comprising an auxiliary frame pivoted on said main frame adjacent its rear end, a central keel roll on the front end of said auxiliary frame and a plurality of roller assemblies on the rear end of said auxiliary frame, one of said assemblies being pivotally mounted on a longitudinal axis on each side at the rear end of said auxiliary frame, each of said assemblies having transverse arms pivoted on said auxiliary frame on said longitudinal axis, a longitudinal member pivoted at an intermediate part on the end of each transverse arm on a transverse axis, a pair of transversely spaced resilient rollers rotatable on each end of each said longitudinal member, each of said rollers being mounted on a transverse axle with substantial play between said roller and axle to provide universal movement of said roller on said axle, the transverse and longitudinal pivotal axes of each assembly providing for universal movement of the assembly so that all eight rollers of each assembly will engage a boat hull supported thereon, the universal mounting of the individual rollers providing substantially surface contact with the hull along the circumference of the rollers, the axes of the rearward rollers lying approximately in a vertical plane so as to underlie a boat hull adjacent the transom from the keel to the outermost rollers and provide support for said transom, including an outboard motor if carried by the transom.

3,888,368
WRECKER ATTACHMENT

Wallace H. Hawkins, Rt. 7 Buncombe Rd., Greenville, S.C. 29609

Filed Sept. 6, 1973, Ser. No. 394,745
Int. Cl. B66c *23/44*
U.S. Cl. 214—86 A **2 Claims**



1. A wrecker attachment for mounting on the frame of a pickup truck and the like comprising: a base supporting member having a pair of laterally spaced elongated supporting members, each of said elongated supporting members including interconnected telescoping parts for varying the overall longitudinal length of said elongated supporting members movable longitudinally in unison to so vary the length, forward and rearward transverse tubular members carried adjacent opposite ends of said elongated supporting members maintaining a fixed transverse spacing between said elongated supporting members forming a fixed base, at least four laterally extending telescoping, independently adjustable extensions projecting outwardly from ends of said transverse tubular members each exension independently laterally adjustable relative to said base and longitudinally adjustable in pairs, brackets carried by said telescoping extensions having holes therein adapted to receive bolts for securing said base supporting members, telescoping parts, transverse tubular members and telescoping extensions being disposed in substantially the same horizontal plane, and, a lifting and towing hoist supported on said fixed base, said lifting and towing hoist having a boom pivoted on said forward transverse tubular member, a winch and cable, said cable being supported by an outer end of said boom for lifting heavy objects whereby said telescoping extensions and said telescoping parts forming said base supporting member can be adjusted so that said wrecker attachment can be mounted on various size trucks.

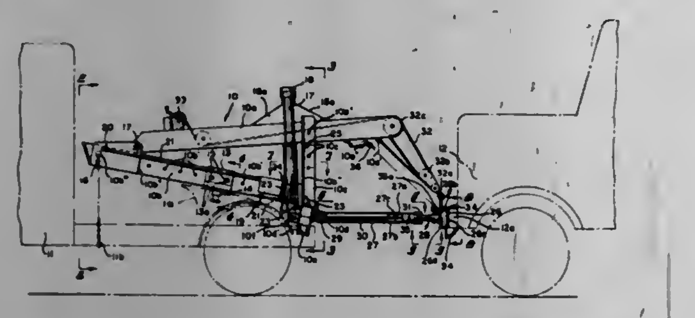
3,888,369
VEHICLE TOW RIG

Banks E. Kesselring, R.D. 1, St. Thomas, Pa. 17252

Filed Sept. 16, 1974, Ser. No. 506,540
Int. Cl. B60p *3/12*
U.S. Cl. 214—86 A **9 Claims**

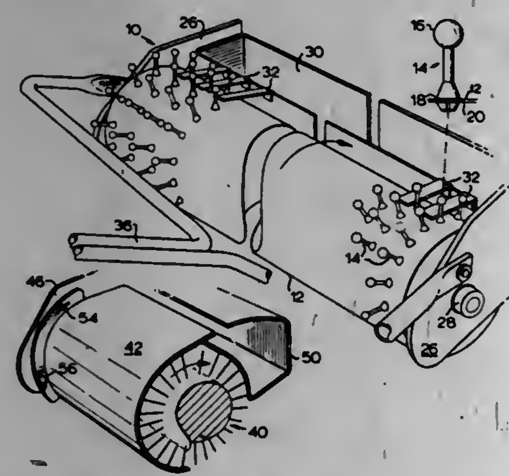
1. Vehicle tow rig comprising in combination an A-frame for mounting in a substantially vertical plane with the lower leg in a substantially horizontal position and the two legs thereof pivotally connected at the apex; means for connecting said lower leg with the fifth wheel of a retrieving tractor; means for securing the apex of said A-frame to said tractor; means for securing the rear of the A-frame to the rear of said

tractor; means secured to the upper leg of said A-frame and to a bumper member for correspondingly raising and lowering said bumper member relative to said upper leg for attachment to a vehicle to be towed; power means for increasing and decreasing the angle between said upper and lower legs of the A-frame and correspondingly raising and lowering said upper leg for raising and lowering said bumper means and vehicle; and tow for means secured to said A-frame and connecting with said bumper member.



3,888,370
BALL RETRIEVAL SYSTEM

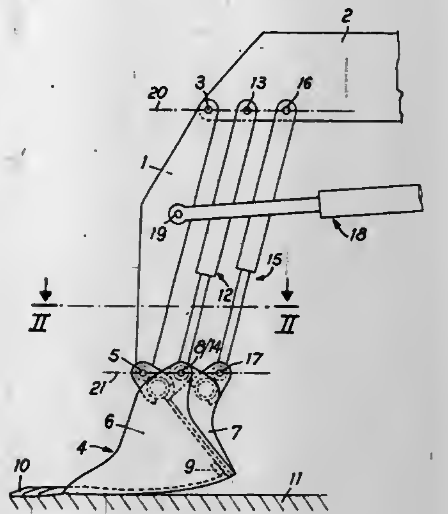
William E. S. Gamblin, 995 Carleton Pl., Ontario, Calif.
Continuation of Ser. No. 243,813, April 13, 1972, abandoned.
This application Apr. 4, 1974, Ser. No. 457,832
Claims priority, application Canada, Apr. 26, 1971, 111308
Int. Cl. B60p *1/00*
U.S. Cl. 214—356 **2 Claims**



1. A ball retriever comprising: a rotor having a pair of ends and a cylindrical outer surface, a plurality of peg receiving means in spaced row array about the cylindrical outer surface for receiving a peg in each said means, a plurality of resilient pegs, each of said pegs including an enlarged spherical head portion and a base portion, said base portion including means for mating with said peg receiving means, said base portion means comprising an endless groove and said receiving means comprising a slot for mating with said endless groove, a one of said pegs mounted in mating relation in a one of said peg receiving means with said enlarged spherical head portion extending outwardly of said cylindrical outer surface and forming a plurality of pockets, each of said pockets being adapted for trapping a ball of predetermined size in snug relation therein, a journal mounted centrally at each of said rotor ends, a pair of end plates, one of said end plates carried by each said journals, a ball receptacle carried by said end plates, said ball receptacle including a plurality of displacer plates spaced along a peripheral edge of said ball receptacle and a one of said displacer plates between each of the adjacent rows of pegs proximate the top excursion of said cylinder for directing trapped balls from within a pocket to said ball receptacle, and means for propelling said ball retriever secured to said end plates.

3,888,371
PUBLIC WORKS MACHINES AND PARTICULARLY TO BUCKETS THEREFOR

Rene V. Moreau, Ermenonville, France, assignor to Societe Anonyme: Poclain, Oise, France
Filed June 19, 1974, Ser. No. 480,869
Claims priority, application France, June 28, 1973, 73.23787
Int. Cl. E02f *3/30*
U.S. Cl. 214—767 **8 Claims**

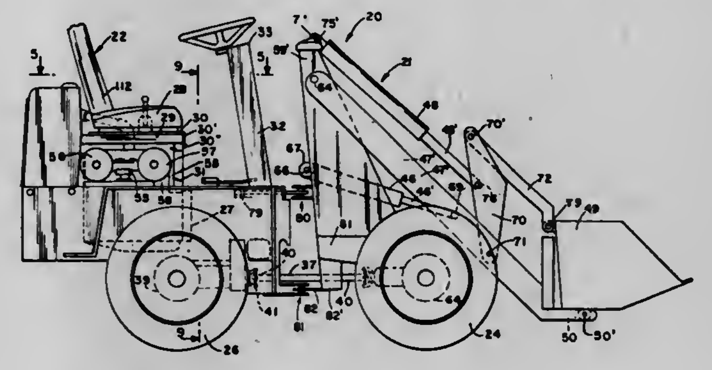


1. A Public Works machine comprising:
a support;
a balance beam mounted on said support for pivotal movement about a first spindle;
a bucket which is mounted on said balance beam for pivotal movement about a second spindle and includes a casing, a base pivotable about a third spindle on said casing and a stop for limiting pivotal movement of said base relative to said casing;
a first hydraulic jack for positioning said casing relative to said support and which is coupled to said support by a first primary spindle and to said casing by a second primary spindle;
and a second hydraulic jack for positioning said base relative to said support and which is coupled to said support by a first secondary spindle and to said base by a second secondary spindle;
wherein said first and second spindles, said first and second primary spindles and said first and second secondary spindles are parallel and offset in respect of the common pivoting plane of said bucket and said balance beam, and the distances between said first spindle and said first primary spindle, said first spindle and said first secondary spindle, and said first primary spindle and said first secondary spindle are equal respectively to the distances between said second spindle and said second primary spindle, said second spindle and said second secondary spindle and said second primary spindle and said second secondary spindle.

3,888,372
FRONT END LOADER DEVICE

Oliver L. Gorby, Fargo, N. Dak., and Dennis A. Rice, Cedar Falls, Iowa, assignors to Dynamic Industries, Inc., Barnesville, Minn.
Filed June 1, 1973, Ser. No. 366,104
Int. Cl. B66f *9/00*
U.S. Cl. 214—776 **2 Claims**

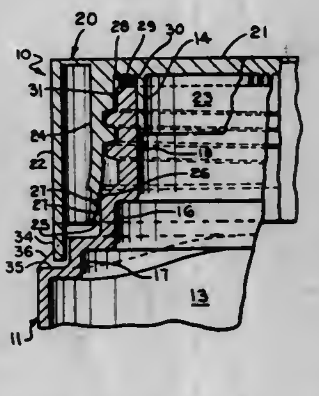
2. A front end loader comprising a front and rear frame spaced from one another, an articulated connection connecting the front and rear frames together loading arms pivotally mounted to the front frame hydraulic cylinder means to actuate the loading arms, said rear frame having an engine compartment with an engine mounted therein for powering the loader, an operator's seat mounted directly over the engine compartment, an operator's control panel mounted to said rear frame spaced in front of said engine compartment, a floor for the operator's feet extending from the bottom of the engine compartment to the bottom of the control panel, said articulated connection comprising three swivel connections, one of said swivel connections connecting the lower edge of the rear frame to the lower edge of the flat frame by means of relatively short lug means extending from the rear frame and relatively short lug means extending from the front frame overlapping one another with a swivel connection therebetween, said second of said swivel connections comprising a relatively long plate adjacent the upper end of the rear frame and a relatively short lug means extending from the upper edge of the front frame with the forward end of the plate and short lug means in overlapping relation to one another with a swivel connection therebetween, said rear end of the plate extending a substancial distance into the rear frame along the floor thereof with the rearward end of the plate rearward of the control panel and with a swivel connection connecting the rear end of the plate to the floor, said loader having a hydrostatic drive for powering said loader, said engine powering said hydrostatic drive, a foot pedal member is mounted to the floor of the rear frame between the engine compartment and control panel, said foot pedal member being positioned in length on said floor at a lateral angle extending horizontally toward one lateral side of the loader in relation to the longitudinal axis extending through the center of the rear frame from the rear to the front, said operator's seat being aligned along said longitudinal axis so that the foot pedal will be at an angle in relation to the operator's seat with the forward end of the pedal diverging laterally outward further than the rearward end of the pedal, said pedal being pivotally mounted about a horizontal axis perpendicular to said lateral angle to move upward and downward while remaining in said angled relation for the operating by the operator's foot while seated in the operator's chair, said hydrostatic drive being mounted in alignment with said longitudinal axis, an offset swivel connection means connecting said pedal to the hydrostatic drive whereby the pedal movement controls the hydrostatic drive.



3,888,373
CHILD-RESISTANT CLOSURE

Peter P. Gach, and Gary V. Montgomery, both of Evansville, Ind., assignors to Sunbeam Plastics Corporation, Evansville, Ind.
Filed Aug. 15, 1973, Ser. No. 388,594
Int. Cl. B65d *55/02*
U.S. Cl. 215—214 **2 Claims**

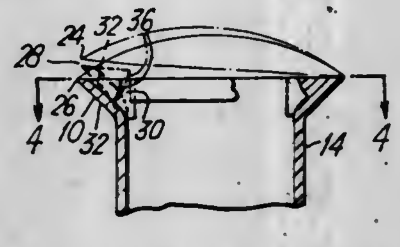
1. A child-resistant closure for containing liquid, said closure consisting of a container having a tubular neck, a body and a shoulder portion adjacent the base of said neck, and a cap for said container,
- a. said container neck having a flat annular lip and a smooth cylindrical inner surface,
- b. said cap having a disc-like top and three radially spaced concentric skirts depending from said top, the top of said cap having a central area overlying said container neck and an annular area circumjacent thereto and connecting said outermost skirt to said intermediate skirt,
- c. the outer surface of the innermost one of said skirts being substantially cylindrical and having an interference fit with the inner surface of said neck,
- d. at least one annular, downwardly extending, flexible, first sealing element in the space between said innermost one of said skirts and the intermediate one of said skirts, said first element being engaged in sealing contact with said container lip when said cap is in closed position on said container,
- e. cooperating mating threads on the exterior of said container neck and the interior of said intermediate skirt,
- f. that portion of said cap top overlying said container neck and that portion of said intermediate skirt where said threads are located being substantially thicker in cross section than said innermost skirt, said outermost skirt and said annular area of said cap top,
- g. the inner surface of said intermediate skirt and the outer surface of said neck having cooperating circumjacent areas that are opposed to each other when said cap is near to and in closed position on said container,



- h. the first of said areas being the inner cylindrical surface of a portion of said intermediate skirt at a level spaced below said threads, said portion having an inner diameter greater than the outside diameter of the threads on said neck and a cross sectional thickness less than the thickness of that portion of said intermediate skirt where said cap threads are located,
- i. the second of said areas being on said container neck and having integral, circumferentially extending, axially spaced and radially protruding sealing ribs thereon, said ribs having a diameter greater than the outside diameter of said threads and an interence fit interiorly with the first said area,
- j. said first cylindrical surface having a greater axial extent than said ribs for effecting a seal therewith when said cap approaches closed position and when said cap is at closed position and for maintaining a seal when said cap shifts axially due to thread manufacturing tolerances.

3,888,374
SAFETY CLOSURES

Thomas David Smith, Apt. 101, 109 Jameson Ave., Toronto 3, Ontario, Canada
Filed Oct. 6, 1972, Ser. No. 295,673
Int. Cl. B65d *55/02, 85/56;* **A61j** *1/00*
U.S. Cl. 215—216 **4 Claims**



1. Safety closure means for containers comprising in combination with said container and a cap therefor, a first diametrical annular outwardly projecting rim around the mouth ofthe container and a second diametrical annular outwardly project-

ing rim around said cap, an annular outer edge of said first rim being in hairline annular contact with said second rim when said means is in closed position, said first rim being substantially unyielding for the predominant part of its circumference, and means for distorting said first rim at a predetermined point on its circumference so as to exert a pry upon said cap by way of said second rim and thereby expose an opening gap in said contact, said means for distorting said first rim taking the form of at least one cavity provided upon the circumference of said first rim so as to interrupt the continuity of its circumference, and an inwardly yieldable membrane spanning said cavity and joining said interrupted circumference upon the normally seen surface thereof so as effectively to conceal said cavity, inward pressure upon said membrane being transferred to said second rim to exert said pry, said cap having a domed upper outer surface.

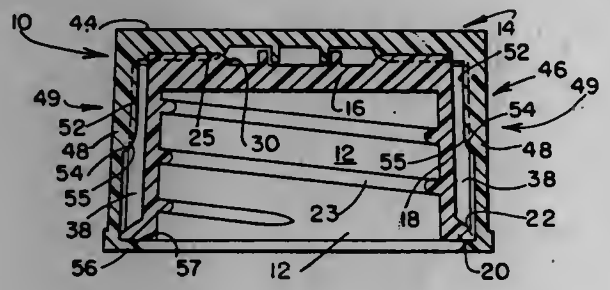
3,888,375
SAFETY CLOSURE ASSEMBLY

Richard G. Gerk, Palos Park, Ill., assignor to VCA Corporation, Baton Rouge, La.

Filed Dec. 17, 1973, Ser. No. 425,111

Int. Cl. B65d *55/02, 85/56;* **A61j** *1/00*

U.S. Cl. 215—219 **7 Claims**



1. A safety closure assembly comprising an inner closure cap having a top portion to cover the mouth of the container and a skirt to fit over the container immediately adjacent the opening, means on said inner closure skirt for engagement with members on the container, an outer cap of a size to receive said inner closure, said outer cap having a top portion and a skirt, with the skirt having a continuous and uninterrupted annular bottom edge, the underside of said top wall of said outer cap having spaced radially extending members and the top wall of said inner cap having spaced radially extending members adapted to be engaged by the spaced radially extending members of the outer cap when the outer cap is rotated in one direction to simultaneously rotate said inner cap to effect a closure of said inner cap with respect to said container and to permit a free rotation of said outer cap with respect to said inner cap when said outer cap is rotated in an opposite direction, said outer cap having a pair of spaced vertical slots extending from adjacent the top portion to adjacent the continuous and uninterrupted annular bottom edge to provide a skirt panel which is substantially the height of the skirt and which is radially deflectable inwardly by manual pressure, said deflectable skirt panel having means on the inside thereof which engage means on the skirt of said inner cap when said outer skirt panel is radially deflected so that when the said means are interengaged a rotation of the outer cap in the opposite direction will simultaneously rotate said inner cap to effect an unscrewing of said inner cap with respect to the container and when said outer skirt panel is not deflected rotation of said outer cap in said opposite direction will not impart rotation to said inner cap, said deflectable skirt panel being connected to said annular continuous and uninterrupted bottom edge, the inside of said annular continuous and uninterrupted bottom edge having a continuous inwardly extending lip which engages the bottom edge of the skirt of the inner closure cap to prevent separation of the inner cap relative to the outer cap.

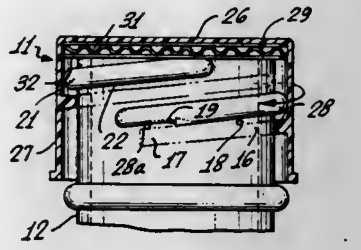
3,888,376
SAFETY CLOSURE CAP FOR CONTAINERS

Carl W. Cooke, Los Angeles, Calif., assignor to CWC Industries, Los Angeles, Calif.

Filed June 13, 1974, Ser. No. 479,044

Int. Cl. B65d *55/02, 85/56;* **A61j** *1/00*

U.S. Cl. 215—217 **8 Claims**



1. The combination of:

a container including a cylindrical neck having an open end;
  a closure for said container having a top overlying said open end and a depending cylindrical skirt surrounding a portion of said neck adjacent said open end;
resilient sealing means carried by said closure and disposed between said top and said open end for sealing said open end;
continuous thread means carried on the exterior of said neck and the interior of said cylindrical skirt portion for engagement upon rotation of said closure to axially draw said closure into sealing relation with said open end, said thread means including;
  cooperating locking means provided on said thread means of said neck and said cylindrical skirt adapted for inter-engagement when said closure is in sealing relation with said open end, said locking means on said thread means of said cylindrical skirt defining a portion of said thread means and being formed integrally therewith.

3,888,377
CLOSURE CAP FOR AN INFUSION FLASK

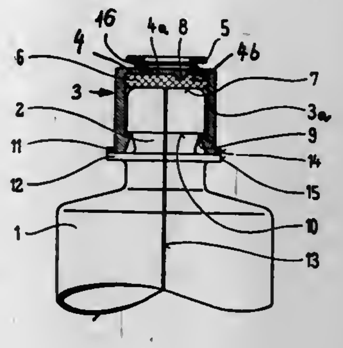
Reinhard Stadler, Karlsruhe, Germany

Filed May 14, 1974, Ser. No. 469,883

Claims priority, application Germany, May 30, 1973, 2327553

Int. Cl. B65d *47/36, 47/38, 41/50*

U.S. Cl. 215—249 **14 Claims**



1. A closure cap for application to the closed neck of an infusion flask to provide a sterile seal therefor, the cap comprising a skirt adapted to embrace the neck of the flask and an

end closure wall, a sealing disc cast or moulded in engagement with the inner face of the end closure wall, a tear-off cover portion integrally formed in the end closure wall whereby the sealing disc is exposed through the end closure wall when said cover portion is removed, and at least one projection on the inner face of said cover portion which locally reduces the thickness of the sealing disc for perforation.

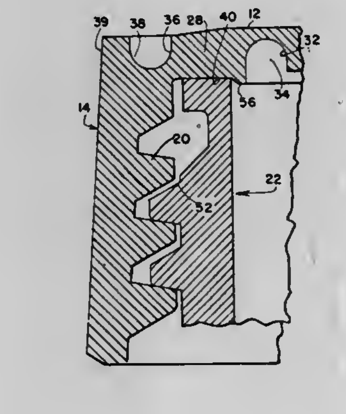
3,888,378
LINERLESS CLOSURE CAP

Richard G. Gerk, Palos Park, Ill., assignor to VCA Corporation, Baton Rouge, La.

Filed Sept. 19, 1973, Ser. No. 398,685

Int. Cl. B65d *53/02*

U.S. Cl. 215—344 **8 Claims**



1. A linerless closure cap formed of a plastic material and adapted for sealing engagement with an associated container in which the linerless closure cap comprises an end panel and a depending peripheral annular skirt, said peripheral skirt having means for securing the closure cap to a container, said end panel having an outwardly facing surface and an inwardly facing surface facing inwardly into said closure cap, said outwardly facing surface having an annular groove extending into said end panel and formed adjacent the peripheral edge but spaced therefrom and in substantial vertical alinement with the skirt to provide a second hinge means, said inner facing surface of said end panel having an annular sealing surface which is adjacent said annular skirt and extending inwardly and downwardly at an angle, another annular groove formed in the underside of said top end panel and extending into said end panel and facing inwardly in the direction of the interior of said closure cap to provide a first hinge means, said inwardly facing groove being adjacent the innermost portion of said annular sealing surface, said pair of hinge means permitting flexing of said end panel at said hinge means, said annular inclined sealing surface adapted when the closure cap is in sealing position to be compressed to assume a seal-tight engagement with the entire top edge of the container.

3,888,379
PALLET DISTRIBUTION CAGE

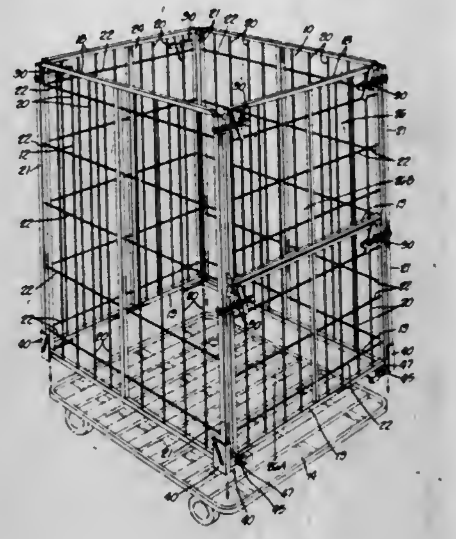
Fred G. Folberth, Stroudsburg, Pa., assignor to Banner Metals Division Intercole Automation, Inc., Compton, Calif.

Filed July 15, 1974, Ser. No. 488,736

Int. Cl. B65d *7/00*

U.S. Cl. 220—4 F **4 Claims**

1. A cage-like structure adapted to be removably secured to the peripheral edge of a rectangular pallet, said structure including: a pair of side panels spaced and parallel to one another; a pair of end panels spaced and parallel to one another; and a plurality of locking brackets secured to respective ones of said panels at the adjacent edges thereof, each of said locking brackets including an inclined clamp slide member secured to one of the panels, and a gravity clamp mounted in sliding engagement with said clamp slide member and having a hooked end portion engaging the edge of the adjacent panel.



3,888,380
POLYEPICHLOROHYDRIN AEROSOL GASKETS

Joel A. Gribens, Framingham, and Gregory P. Cogliano, Canton, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Division of Ser. No. 413,654, Nov. 7, 1973. This application July 25, 1974, Ser. No. 491,748

Int. Cl. B65d *7/34*

U.S. Cl. 220—81 R **1 Claim**

1. An aerosol can valve-mounting cup equipped with an annular gasket which has been deposited into the annular channel of the cup in the form of a solution of an amorphous polyepichlorohydrin elastomer having a molecular weight within the range of about 4,000 to about 20,000, the solution having been subsequently dried and the dry elastomer cured in situ at elevated temperature.

3,888,381
PROTECTIVE DEVICE FOR PREVENTING WITHDRAWAL OF LIQUID FROM A TANK

Wayne B. Russell, Jr., 3895 Lugo Ave., Lynwood, Calif. 90262

Filed May 17, 1974, Ser. No. 470,737

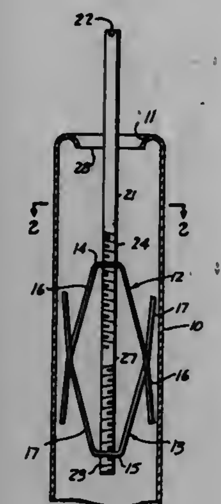
Int. Cl. B65d *25/02*

U.S. Cl. 220—86 AT **8 Claims**

1. A protective device for blocking a fill pipe of a liquid receptacle against insertion of an object comprising:
  two spiders each having a central plate, the plates of the two spiders being arranged one above the other and spaced from each other;
  a plurality of flexible legs extending outward from each plate and toward the other plate, the legs of the two plates being angularly spaced around the respective plate and being arranged in pairs;
  interlocking means at the legs of each pair causing one leg of each pair to cross the other leg of the pair to interlock with said other leg of the pair at a position intermediate between the plates and the ends of the legs of the pair;
  the upper one of the plates having a threaded hole through it and the lower one of the plates having a screw engaging means;
  a threaded screw passing threadedly through the threaded hole of the upper plate and engaging the screw engaging means of the lower plate, said screw having a torquing means at its end above the upper plate;

the end section of each leg beyond the position of crossing the leg of the other of the pair being bendable at the position of crossing;

whereby turning the screw draws the plates toward each other, causing the inner sections of the spider legs located



between the respective plates and the crossing positions to move more nearly parallel to each other so that said crossing positions meet the wall of the pipe, and the end sections extend longitudinally along the pipe wall, thereby setting the protective device.

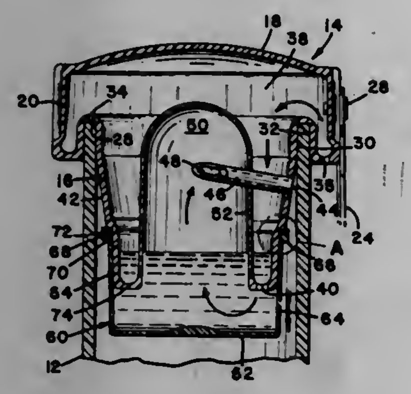
3,888,382
FILTER CAP CONSTRUCTION

Harold Blumhardt, Fredonia, N. Dak., assignor to Blumhardt Manufacturing, Inc., Ashley, N. Dak.

Filed Mar. 18, 1974, Ser. No. 452,274

Int. Cl. B65d *51/16*

U.S. Cl. 220—202 **12 Claims**



1. Cap apparatus for sealing a necked opening in a tank holding agricultural chemicals during field application comprising:

a. a unitary hollow cap defining a chamber therein, and having a plug portion with an outer surface, which plug portion extends a substantial distance into the neck during use, and an upper larger diameter portion extending outward of the neck during use, said plug portion also having a depression therein;

b. means defining a passageway from the outer surface of said plug portion to said depression;

c. a pair of orifices in said cap, a first one of which is placed in said plug portion below said passageway; and

d. cup means mating with said plug portion and, together with said depression, defining a chamber which communicates with the external surface of said plug portion by means of said passageway and with the atmosphere by means of said orifices.

3,888,383
CONTAINER HAVING A TAMPERPROOF CLOSURE

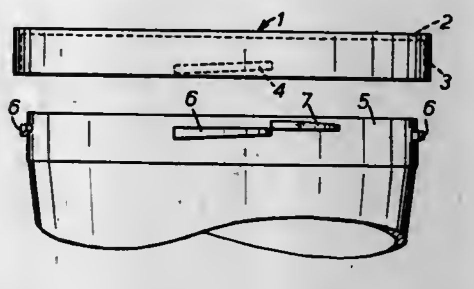
Martyn Rowlands, Epping, England, assignor to Bowater Packaging Limited, London, England

Filed Aug. 17, 1973, Ser. No. 389,313

Claims priority, application United Kingdom, May 7, 1973, 21582/73

Int. Cl. B65d *41/02, 41/32*

U.S. Cl. 220—265 **10 Claims**



1. An assembly comprising two elements, namely, a container and a closure cap for the container, wherein the cap and container are provided with at least one inwardly and at least one outwardly extending projection respectively which are engageable, by a relative turning movement in one sense between the cap and the container, to secure the cap on the container, and the cap and the container are each provided with a member, the two members being so arranged and constructed that, during the said relative turning movement, one member engages and rides across the other member and then disengages the other member, and that during relative turning movement in the opposite sense, one member so engages the other that continued relative turning movement in the said opposite sense in order to disengage the cap from the container is prevented unless one of the members becomes detached, in which assembly one of the two members is constituted by the projection or one of the projections on one of the elements.

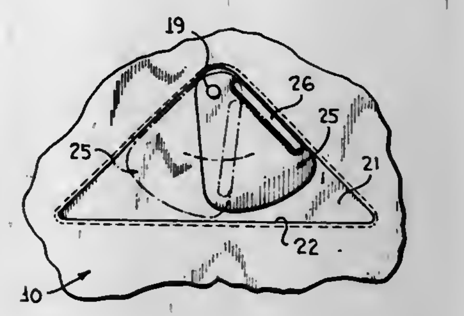
3,888,384
EASY OPENING END UNIT

James B. Novak, Glen Elly, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed May 17, 1974, Ser. No. 470,984

Int. Cl. B65d *41/32*

U.S. Cl. 220—268 **13 Claims**



1. An easy opening end unit comprising an end panel, a weakening line in said end panel, said weakening line defining a tear panel at least partially removable from said end panel, a rupture initiating member, means mounting said rupture initiating member for rotation relative to said end panel, end means for localizing rupturing forces of said rupture initiating member upon the rotation thereof contiguous said weakening line whereby severance of the latter is achieved to effect the at least partial removal of said tear panel from said and panel.

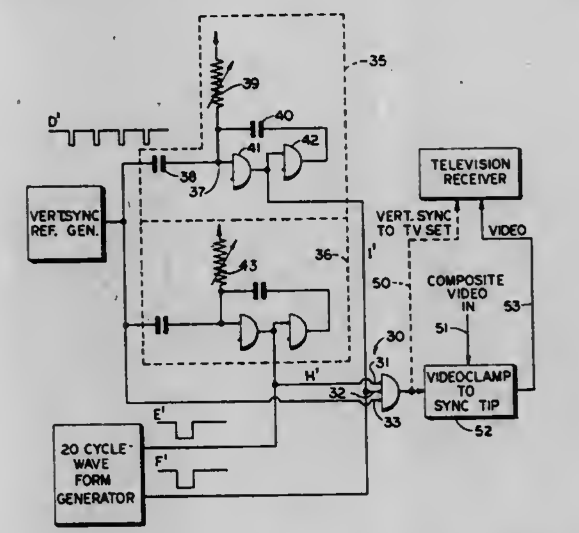
3,888,385
VERTICAL SYNCHRONIZATION TIME BASE ERROR CORRECTOR

Don J. Loughry, San Jose, Calif., assignor to Dart Industries Inc., Los Angeles, Calif.

Division of Ser. No. 234,022, March 13, 1972, Pat. No. 3,777,054. This application Mar. 8, 1973, Ser. No. 339,227The portion of the term of this patent subsequent to Dec. 4, 1990, has been disclaimed.

Int. Cl. H04m *1/22, 5/78*

U.S. Cl. 360—11 **1 Claim**



1. In a skip-two skip-field display sytem in which video fields are displayed by applying to a visual readout video intelligence and horizontal synchronizing signals from repetitive scanning of an odd field followed by video intelligence and horizontal synchronizing signals from repetitive triple scanning of an even field, the method of assuring continuity of horizontal synchronization and vertical synchronization of said readout, comprising the following stages:

providing vertical reference pulses at the standard cycle rate of N,

phase advancing the second scan in each series of three scans by a time equal to one-half horizontal line,

utilizing the second vertical reference pulse in each corresponding series for application to the readout,

generating pulses at N/3 rate in synchronism with the first scan in each series,

generating pulses at N/3 rate in synchronism with the third scan in each series,

utilizing the first vertical reference pulse and the first N/3 rate pulse in synchronism with the first scan to develop a first field delay pulse,

utilizing the third vertical reference pulse and the second N/3 rate pulse in synchronism with the third scan to develop a third field delay pulse, and

then utilizing the first field delay pulse and the third field delay pulse to slice the first and third vertical reference pulses in each corresponding series so as effectively to provide delayed vertical synchronizing pulses for application to the readout.

3,888,386
HINGE-LIKE DEVICE FOR CAPS OR COVERS

Harry Svensson, Loviselundsvagen 101, 162 35 Stockholm, Sweden

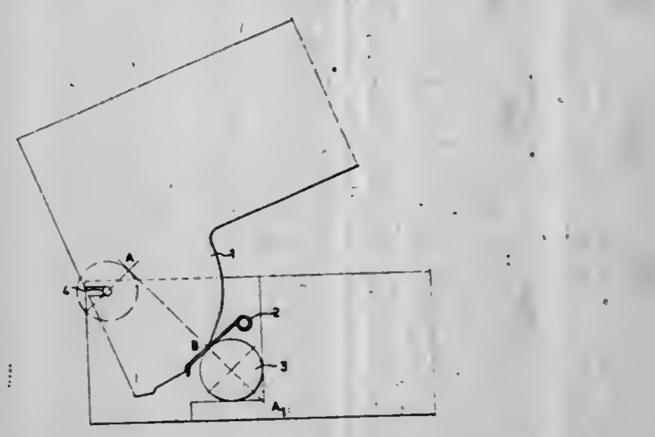
Filed May 3, 1974, Ser. No. 466,896

Claims priority, application Sweden, May 3, 1973, 061814/73

Int. Cl. B65d *43/24*

U.S. Cl. 220—335 **1 Claim**

1. A hinge-like supporting device for a horizontally arranged cover or the like, which is intended to be opened upwards around its back end, characterized by the fact, that a vertically located segment (1) substantially having the shape of a quarter of a complete circle and being attached to and extending downwards or alternatively backwards from the cover at said back end in a plane which is perpendicular to the rotation axis of the cover, and where the peripheral surface of the segment is formed in steps with two or more recesses, which at the movement of the segment around the rotation centre (4) of the cover is in steps influenced by a spring force



directed towards a point (A) in front of said rotation centre, so that the lever produced and the strength of the spring force will neutralize the weight of the cover at each step, whereby the cover will be retained at the opening angle relative to the horizontal plane corresponding to the position on the periphery of the segment of the recess (B) spring loaded at the respective moment.

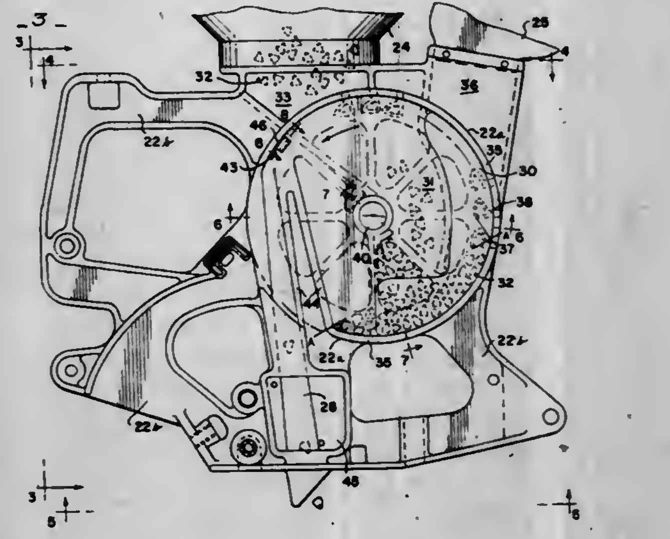
3,888,387
METERING APPARATUS FOR A SEED PLANTER

Harry C. Deckler, South Bend, Ind., assignor to White Farm Equipment Company, Cleveland, Ohio

Filed Oct. 12, 1973, Ser. No. 405,934

Int. Cl. B65g *29/00*

U.S. Cl. 221—278 **23 Claims**



1. In a seed planter for depositing seeds from a hopper into an underlying furrow at regular intervals, a seed metering apparatus, comprising, in combination:

a housing defining a chamber having an opening with margins lying in a single plane;

means comprising a drop chute for discharging seeds into said furrow;

gravity feed means for conveying seeds from said hopper to said chamber;

a disc shaped seed metering member having a flat inwardly-facing peripheral portion overlying said margins of said opening and having a plurality of pockets each dimensioned to receive a one or more of said seeds, said metering member being rotatably mounted so as to bring each of said pockets sequentially in communication with said chamber and said drop chute, and each of said pockets being provided with a pressure-relief passageway communicating to the outside of said housing;

means for supplying pressurized air to said chamber to urge said seeds into said pockets;

means for at least substantially isolating said pockets from said pressurized air while said pockets are in communication with said drop chute to allow the seeds in said pockets to fall into said drop chute; and

means for rotating said metering member as said seed planter moves along said furrow.

3,888,388

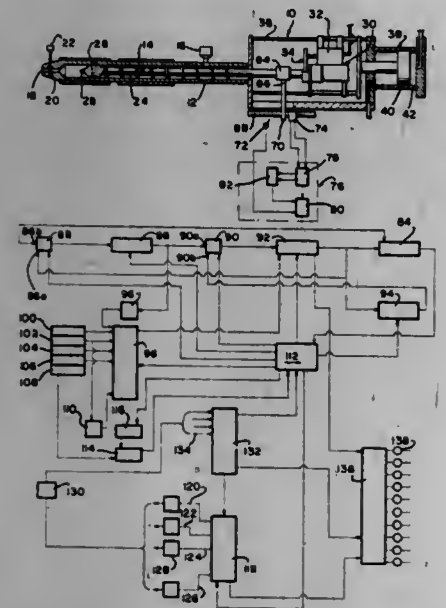
APPARATUS AND METHODS FOR CONTROLLING INJECTION RAMS

Francis E. Mahoney, Merrimack, N.H., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Nov. 1, 1973, Ser. No. 411,895

Int. Cl. B29f *1/02*

U.S. Cl. 222—1 **19 Claims**



1. Apparatus for controlling the movement of a ram disposed in a barrel for processing fluent material therein and axially driven from a variable position substantially spaced from a barrel discharge opening towards such opening to discharge processed material therethrough, said controlling apparatus comprising means for providing a signal indicating the actual location of the ram when the ram is in such variable position, and control means for controlling at least a portion of the driven movement of the ram from such variable position towards such discharge opening dependent upon said indicated ram location for maintaining a predetermined injection stroke displacement of the ram thereby.

3,888,389

FLOW CONTROLLER FOR FLOWING PRODUCTS, MORE PARTICULARLY, BULK MATERIALS

Hans Oetiker, St. Gallen, Switzerland, assignor to Gebruder Buhler AG, Switzerland

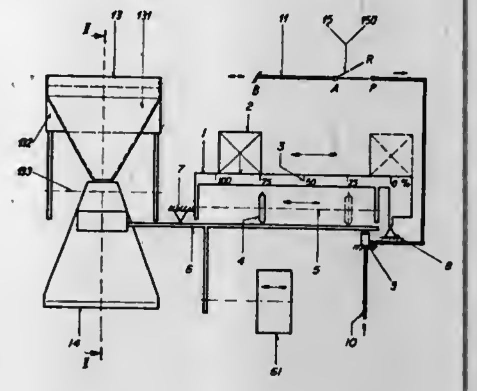
Filed Aug. 16, 1973, Ser. No. 388,783

Claims priority, application Switzerland, Aug. 23, 1972, 12498/72; Apr. 27, 1973, 6092/73

Int. Cl. G01d *11/08*

U.S. Cl. 222—23 **25 Claims**

1. In a flow controller for flowable products, particularly bulk materials, of the type having a closure member, of adjustable through-flow cross-section, arranged on a storage bin or a gravity discharge pipe, a regulating drive for regulating the through-flow cross-section, an inclined impact plate secured on a first lever arm of a balance beam in downwardly spaced relation to the closure member so that the impact force on the plate, due to deflection thereby of the product falling through a given distance, is proportional to the actual value of the flow rate of the product, expressed as quantity by weight per unit of time, the balance beam being pivotally connected intermediate its ends to a fixed frame and having at least one counterweight on a second lever arm remote from the impact plate, and an adjustable force-producing device acting on the balance beam in opposition to the impact force to regulate the through-flow cross-section with the deviation between desired value and actual value of flow rate of the product, resulting from the interaction between the impact force and the force-producing device being converted into a corresponding positive or negative pressure signal serving as a regulating signal for the regulating drive: the improvement comprising, in combination, an auxiliary beam pivotally connected separately to said fixed frame; the adjustable force-producing device loading said auxiliary beam; and a supporting edge mounted on said auxiliary beam for adjustment longitudinally thereof, and engaging said second lever arm of said balance beam to transmit, to said second lever arm, a precisely balanced proportion of the load produced by said adjustable force-producing means, indicative of the desired value of flow rate of the product, acting in opposition to said impact force.



3,888,390

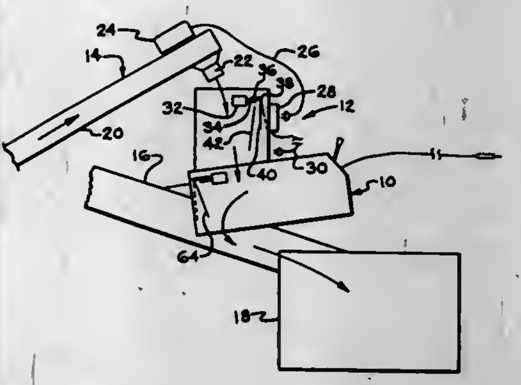
APPARATUS FOR METERING PARTICULATE MATERIAL

Theodore H. Grau, Sioux Rapids, Iowa, assignor to Toledo Stamping & Manufacturing Company, Toledo, Ohio

Filed June 17, 1974, Ser. No. 479,982

Int. Cl. B67d *5/06, 3/00*

U.S. Cl. 222—28 **18 Claims**



1. Metering apparatus for metering a quantity of particulate material, said metering apparatus comprising a housing forming a bin for receiving the particulate material, said bin having a bottom wall defining an opening therein, a gate slidably mounted on said bottom wall in a position for reciprocation across said opening, a windshield wiper drive mounted on said bottom wall within said housing, said drive comprising a DC motor and a gear unit, said gear unit having a drive shaft extending therefrom through said bottom wall, means connecting said drive shaft and said gate to cause said gate to reciprocate relative to said opening when said drive shaft is rotated, with said gate returning to a closed position closing off said opening when power to said motor is shut off.

3,888,391

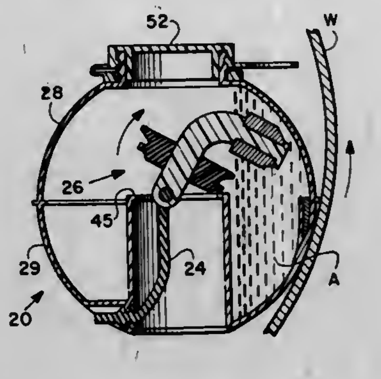
DISPENSER FOR RINSE-WATER ADDITIVE

Theodore Paul Merz, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sept. 12, 1974, Ser. No. 505,308

Int. Cl. D06f *39/02;* **B65d** *47/14*

U.S. Cl. 222—52 **6 Claims**



1. A free-body dispenser for automatically mixing a predetermined volume of a rinse water additive with rinse water during an agitated deep rinse portion of an automatic cycle of a spin-dry type washing machine following a post-wash spin-empty portion of said cycle, said dispenser comprising:

a body having a substantially spherical-shape outer wall and an aperture through said outer wall;

a tubular member having a proximal end and a distal end, said proximal end being sealingly secured to an annular area of said outer wall surrounding said aperture so that said tubular member extends radially inwardly from said outer wall, said tubular member being of sufficient length so that said distal end is centrally disposed in said body; and

manually closeable, centrifugally openable valve means for keeping said distal end of said tubular member closed during said cycle until said dispenser is subjected to a predetermined contrifugal force during said spin-empty portion of said cycle, and for opening said distal end of said tubular member upon being subjected to said predetermined centrifugal force,

said body and said tubular member being sized and configured to accommodate said predetermined volume of additive within said dispenser while said valve means is open regardless of the orientation of said dispenser,

whereby said additive will be retained in said dispenser until flushed out by rinse water during said agitated deep rinse portion of said cycle.

3,888,392

AEROSOL PACKAGE NOZZLE HAVING MEANS FOR REDUCING PRODUCT RETENTION THEREIN AND VALVE ACTUATOR

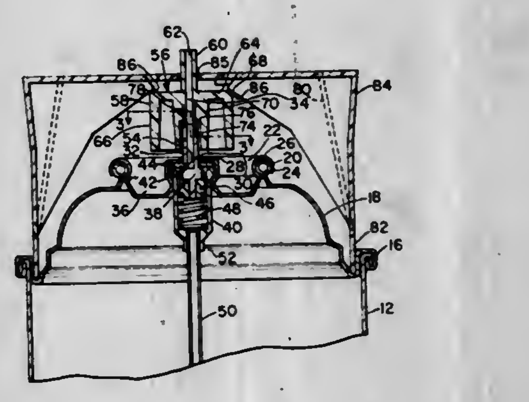
Robert H. Van Coney, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 28, 1974, Ser. No. 446,836

Int. Cl. B67d *1/16*

U.S. Cl. 222—108 **12 Claims**

1. In an aerosol package comprising a pressurized can of liquid product provided with a valve having an elongated tubular stem extending generally vertically upwardly of the can wherein the valve is of a type to be moved relative, as by being depressed inwardly of, the can for actuation to dispense the product through such tubular stem, the improvement comprising an elongated nozzle carried by said stem having a bore extending generally longitudinally therethrough, one end portion of said bore providing a socket configured for secured mating insertion of the outboard end portion of said stem therewithin to define mounting means for said nozzle so that said nozzle moves with said valve for actuation thereof and dispensing of such product outwardly through said bore and being provided with at least one groove therewithin for enabling draining of said bore downwardly outwardly past said stem to reduce retention of product within said bore when said valve is in the unactuated position thereof.



3,888,393

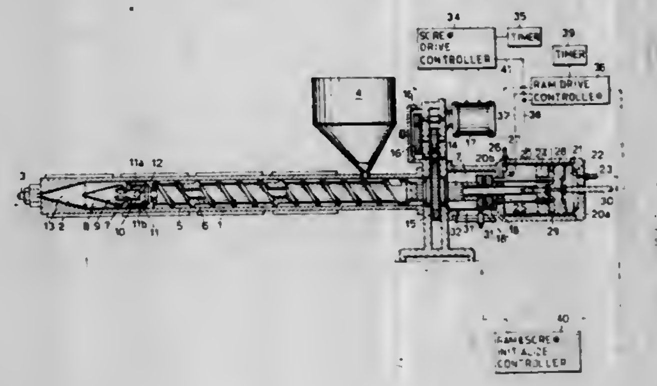
INJECTION MOLDER WITH RAM MOVABLE INDEPENDENTLY OF SCREW FEEDER

Mordeki Drori, 89 Zahal St., Kiron, Israel

Filed Jan. 22, 1974, Ser. No. 435,528

Int. Cl. B29f *1/04*

U.S. Cl. 222—229 **10 Claims**

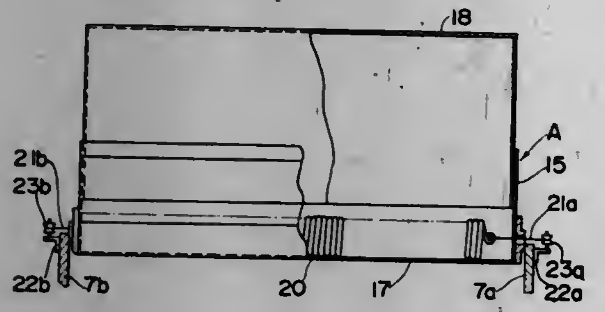


1. An injection unit particularly for injection moulding machines, comprising: a barrel carrying an injection nozzle at one end; a feeding device feeding the material to be injected into the barrel and towards the nozzle end thereof; a ram including a head and a drive shaft axially movable within the barrel independently of the feeding device for injecting the material through the nozzle; said feeding device being a screw feeder rotatable within said barrel independently of and coaxial with the ram; a partition member disposed within the barrel at the nozzle end thereof between the feeding device and the ram head and dividing the nozzle end of the barrel into a filling chamber for receiving the material from the feeding device, and an injection chamber for injecting the material through the nozzle by the ram head; said partition member including a passageway establishing communication between the filling chamber and injection chamber; and a valve member actuated to close said passageway upon the forward, injection movement of the ram head towards the nozzle, and to open said passageway to establish communication between the filling chamber and the injection chamber upon the return movement of the ram head away from the nozzle.

3,888,394
TONER DISPENSING DEVICE

Susumu Tanaka; Yuji Enoguchi, and Hidetoshi Kawabata, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka 541, Japan

Filed May 20, 1974, Ser. No. 471,779
Claims priority, application Japan, May 28, 1973, 48-62561
Int. Cl. G01f *11/00*
U.S. Cl. 222—230 **6 Claims**

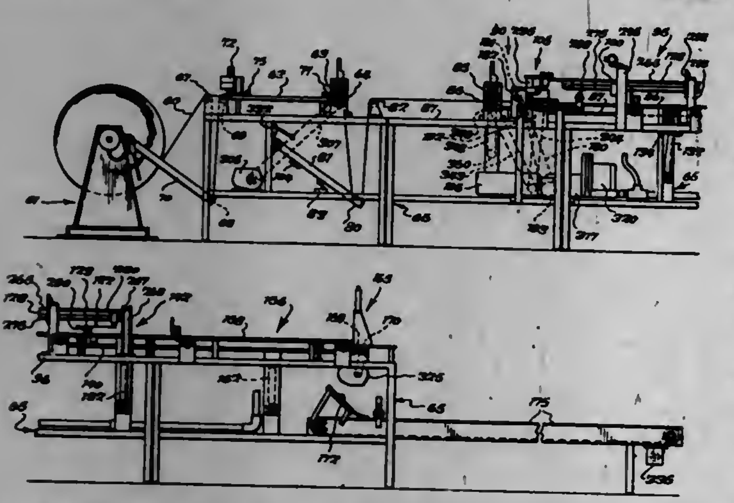


1. In a toner dispensing device for use in a developing apparatus of an electrostatic copying machine which comprises a dispenser casing retained in an opening formed on a wall of said developing apparatus, said dispensing casing having a slit formed in a bottom portion thereof, a container for toner powder removably received in and communicating with said dispenser casing, and a coil spring provided at the bottom of said dispenser casing above said slit with neighboring turns of said spring adapted to contact with each other in the contracted state of said spring, an improvement thereof for feeding toner powder uniformly and positively which comprises means for pulling one end of said spring for expansion thereof so that gaps are formed between said neighboring turns of said spring for toner powder to pass through said gaps and said slit, said pulling means being adapted to release pulling intermittently so as to allow said spring to be contracted with said neighboring turns thereof closed in order to suspend feeding of toner powder.

3,888,395
MACHINE FOR HANDLING SHEET MATERIAL

George A. Burt, Jr., and William M. Neill, both of Santa Clara, Calif., assignors to International Paper Company, New York, N.Y.

Filed Aug. 16, 1973, Ser. No. 388,813
Int. Cl. A41h *43/00*
U.S. Cl. 223—1 **31 Claims**

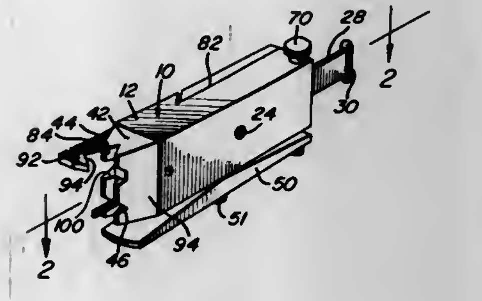


1. In a machine for moving, folding and cutting sheet material, comprising, in combination:
a source of flexible sheet material;
means for receiving a web of material from said source and directing the same along a feed path, the receiving means including first drive means including a first pair of rollers for advancing the web along its path;
edge folding means disposed along the feed path for turning over the longitudinal edges of the web to form a narrow fold along each of said edges;
a cutting mechanism positioned along the feed path for dividing the thus folded web into successive sheets, the cutting mechanism having a second pair of rollers and cutting means carried by one of the rollers in the second pair for severing the web along a straight line which extends in a direction transverse to the web's direction of movement along the feed path; and
second drive means interposed between the first drive means and the cutting mechanism for advancing the web thereto.

3,888,396
SEWING MACHINE NEEDLE THREADER

Lawrence S. Liebrecht, deceased, late of Delphos, Ohio, and by Francis M. Liebrecht, heir, 428 S. Franklin St., Delphos, Ohio 45833

Filed Apr. 16, 1974, Ser. No. 461,458
Int. Cl. A41h *31/00*
U.S. Cl. 223—99 **6 Claims**

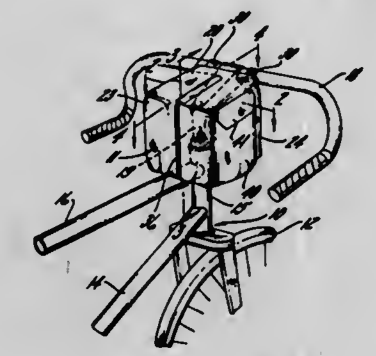


1. A needle threader for a sewing machine needle, said threader including body means defining a first elongated substantially straight and laterally outwardly opening groove, said body means including abutment means registered with one end of said groove and adjustably shiftable lengthwise thereof, said abutment means being adapted to have the pointed end of a needle seated in said groove abutted thereagainst for adjustably longitudinally positioning said needle in said groove, said body means also including means defining a second elongated substantially straight and laterally outwardly opening groove disposed at generally right angles relative to and including a longitudinal mid-portion intersecting with a longitudinal mid-portion of said first groove and with said first and second grooves opening laterally outwardly in substantially the same direction, said direction disposed generally normal to said plane, and an elongated blade portion having one terminal end thereof, having major and minor cross-sectional dimensions disposed at generally right angles relative to each other, supported from said body for guided longitudinal oscillation back and forth transversely through the intersecting portions of said grooves along a path generally paralleling said direction, said terminal end being disposed with its major cross-sectional dimension extending along said first groove for projection of said terminal end through the eye of a needle seated in said first groove, having its pointed end abutted against said abutment means and having its eye generally centered on said path, and cam means shiftably supported from said body for movement between a first retracted position to one side of said first groove and a second operative position extending across said first groove with a portion thereof projecting into said first groove from the open side thereof.

3,888,397
BICYCLE BAG

Edward S. Koizumi, 2446 N. Geneva Ter., Chicago, Ill. 60614

Filed July 26, 1973, Ser. No. 382,965
Int. Cl. B62j *7/06*
U.S. Cl. 224—35 **4 Claims**

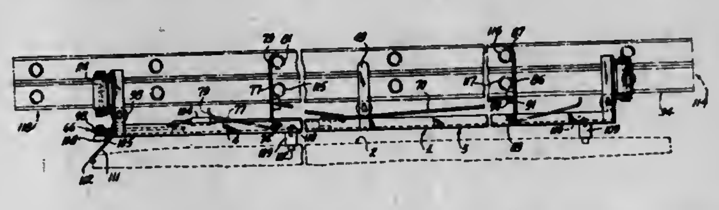


1. A carrying bag for a bicycle having a frame with a forwardly angled stem supporting a handlebar, said bag comprising front, rear, top, and bottom pnales with a pair of interconnecting side panels, said panels defining an interior storage area, said bottom panel being formed with a central front opening V-notch, and said front panel being formed with a recessed section comprising a pair of walls extending upwardly from the sides of the bottom panel V-notch to an elevation slightly below the top panel so as to define a central internal partition separting the interior storage area of the bag into two distinct compartments, said recessed central portion of the front panel of the bag and said central opening V-notch in the bottom panel of the bag thus forming a pocket to receive the angled handlebar support stem of the bicycle said bag being attached to and retaining said stem in said V-notch by a releasable, means on said front panel for releasably securing said bag to said handlebars on the rider's side of said handlebars with said front panel adjacent said handlebar, means on said bottom panel for securing said bag to a bar of the bicycle frame, and means in said top and rear panels for permitting selective access to the interior compartments of said bag.

3,888,398
LADDER RACK

Earl E. Payne, R.D. No. 2, Box 91, Blairsville, Pa. 15717

Filed Feb. 12, 1968, Ser. No. 704,629The portion of the term of this patent subsequent to Sept. 1, 1987, has been disclaimed.
Int. Cl. B60r *9/04*
U.S. Cl. 224—42.1 **9 Claims**

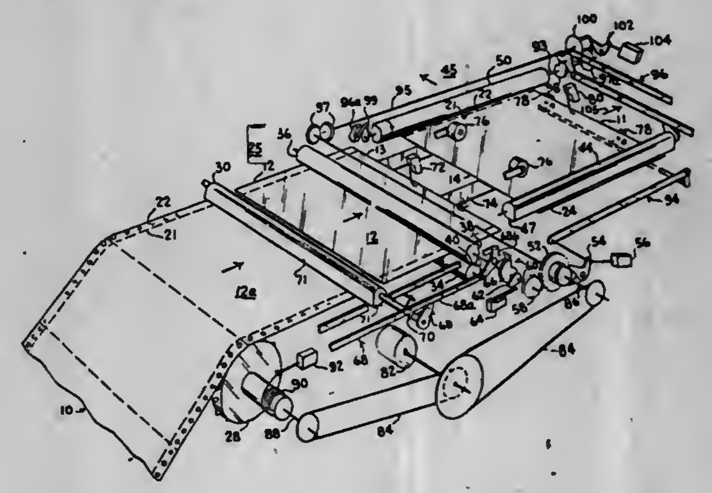


1. A roof rack for a vehicle to support and retain a ladder having side rails and rungs on the vehicle during normal travel of the vehicle comprising, in combination
an elongated frame comprising
spaced apart side members, and
cross members extending between and secured to said side members;
means securing the frame on the roof of a vehicle;
a plurality of support rollers
means mounting said rollers on said frame for rotation about axes spaced apart longitudinally of said frame, whereby a ladder on said rack engages said support rollers and is supported in spaced relation to the roof of the vehicle;
clamp means to secure a ladder to said frame, said clamp means being connected to said frame and including a first arm and a second arm,
said arms each having an arcuately curved ladder rung engaging portion;
mounting means mounting said first and second arms for pivotal movement in opposite directions about spaced apart axes,
to a first position in which said rung engaging portions are between a ladder on the rack and the roof of the vehicle, and
to a second position in which said arms extend between rungs of the ladder and said curved portions each engage a different rung of the ladder and exert force on the rungs to urge the ladder toward the support rollers;
a lever;
means mounting said lever on said frame at a location readily accessible for manipulation by a person adjacent the vehicle; and
linkage means interconnecting said lever and said first and second arms, said linkage means connecting said arms for simultaneous movement, one toward the other, during manipulation of said lever to move said arms from said first to said second positions.

3,888,399
BURSTING APPARATUS

Walter J. Hanson, Old Greenwich, and Eriks Parups, Norwalk, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Oct. 31, 1972, Ser. No. 302,607
Int. Cl. B26f *3/02*
U.S. Cl. 225—106 **5 Claims**



1. A bursting apparatus for separating a continuous series of forms having perforation lines therebetween into individual forms: comprising
A. feed means for intermittently advancing said continuous series of forms;
B. clamping means having a clamping condition for holding said continuous series of forms immobile and a release condition for allowing feed movement of said continuous series of forms;
C. actuating means for said clamping means;
D. burster roller means adapted when operated to apply a feed tension force to the leading form in said series of forms;
E. drive means for rotating said burster roller means; and
F. control means for controlling the operation of said clamp actuating means and said burster roller drive means to cause said burster roller means to apply a tension feed force to the leading form in said series while said clamping means is clamping the next form following said lead form in said series whereby said lead form may be separated from the remaining forms in said series;
G. said actuating means for said clamping means including a movable bar member and means for moving said bar

between clamping and release positions, said bar member having an operative longitudinal edge that serves to operate said clamping means for any form length adjusted position of said clamping means along the length of said bar member.

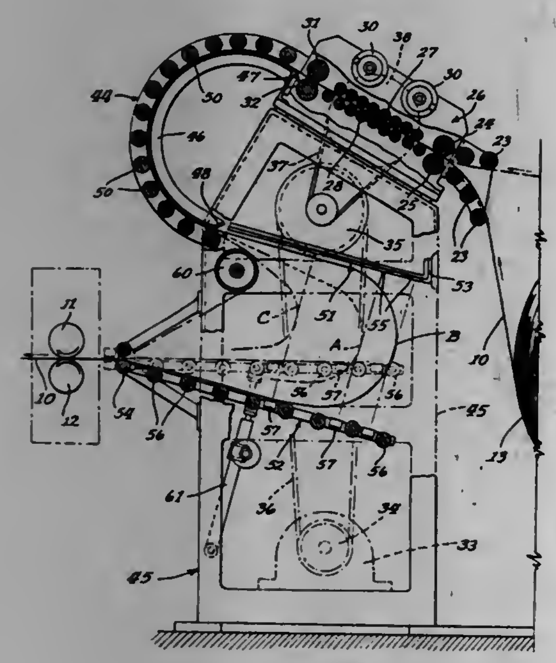
3,888,400
LOOP CONTROL APPARATUS FOR CONTINUOUS STRIP MATERIAL

Chester M. Wiig, Lincolnwood, Ill., assignor to F. J. Littell Machine Company, Chicago, Ill.

Filed Mar. 28, 1974, Ser. No. 455,567

Int. Cl. B65h *25/32*

U.S. Cl. 226—43 **3 Claims**



1. In loop control apparatus of the character described, in combination, a pair of feeding rolls having rotation for feeding continuously a strip of stock material, a second pair of feeding rolls spaced from the first mentioned pair and adapted to have intermittent rotation for advancing the strip material in an intermittent manner, loop forming structure located between the first and the second pair of feeding rolls and having operation to produce a pair of loops in the strip material approximately equal in size and which are formed in opposed relation whereby to simulate the letter S, said loop forming structure including first loop forming means and a pair of spaced platforms between which the second loop is formed, the loop forming means essentially consisting of a semi-circular frame member having a plurality of idler backing rollers journalled thereby and against which the strip material is caused to contact to thus form said first loop, the idler backing rollers being disposed transversely of the strip material and being spaced along the length of the first loop, the bottom platform of said spaced platforms also journalling a plurality of idler rollers against which the bottom part of the second loop is caused to engage, and loop-size detecting means carried by the platforms including a plurality of detecting units for detecting the size of the second loop and for controlling the speed of the first pair of feeding rolls accordingly.

3,888,401
FILAMENT FEEDING APPARATUS

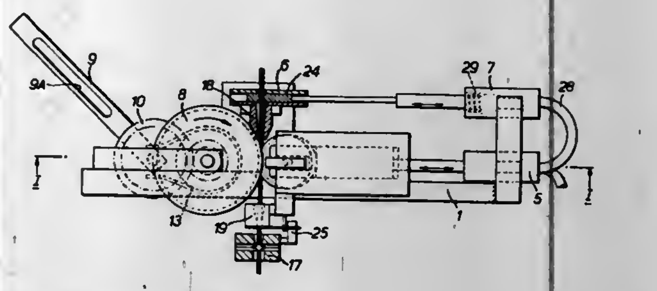
Anthony William Minall, and Edmond Thomas Palmer, both of Portsmouth, England, assignors to J. Evans & Son (Portsmouth) Limited, Portsmouth, England

Filed Mar. 8, 1974, Ser. No. 449,559

Claims priority, application United Kingdom, Mar. 20, 1973, 13351/73

Int. Cl. B65h *17/22*

U.S. Cl. 226—109 **9 Claims**



1. Apparatus for feeding brush-filling material to a brush-filling tool comprising in combination

1. a feed roller means with at least two separate circumferential material feed paths thereon,
2. drive means for rotating the feed roller a predetermined amount in a feeding direction,
3. at least two idler rollers each positioned to engage a different one of the feed paths to hold feed material in frictiional engagement with the feed roller when that material is to be fed,
4. means for selectively moving each roller into and out of engagement with the feed paths so as to feed material thereon, and
5. braking means for restraining movement of material when not being fed.

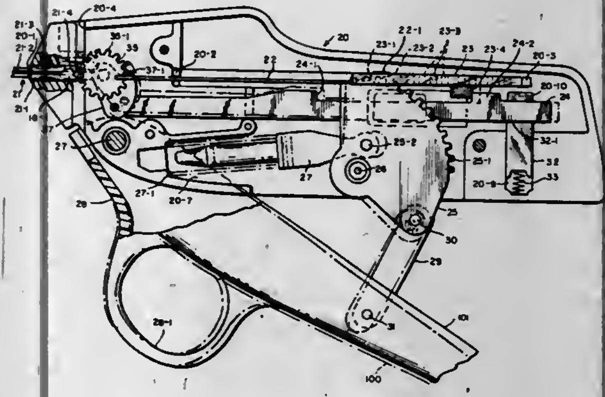
3,888,402
FEED MECHANISM FOR DISPENSING APPARATUS

Arnold R. Bone, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Nov. 21, 1973, Ser. No. 418,046

Int. Cl. B65h *17/22*

U.S. Cl. 226—157 **15 Claims**



1. In an apparatus for dispensing fastener attachment members or the like including means for forcing a portion of a fastener attachment member through a hollow slotted means or the like, and an indexing mechanism including an indexing wheel having a plurality of teeth, the improvement in the indexing mechanism comprising means for urging rotation of said wheel more than one tooth each time it is rotated.

3,888,403
TAPE DRIVE SYSTEM

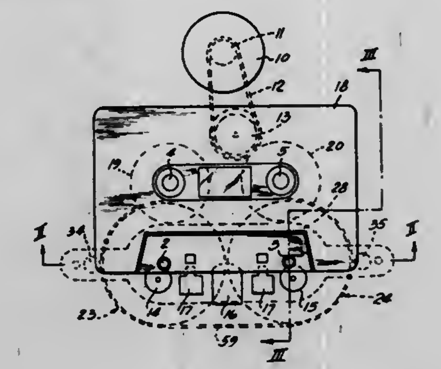
Kenji Yoshida, Tokyo; Tetsuo Sekiya, Yokohama, and Toyokazu Higo, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 20, 1973, Ser. No. 417,504

Claims priority, application Japan, Nov. 24, 1972, 47-117843

Int. Cl. B65h *17/22*

U.S. Cl. 226—188 **7 Claims**



1. A magnetic recording and/or reproducing apparatus comprising, a pair of capstans mounted on a mounting plate for transporting a tape in a predetermined direction in cooperation with a pinch roller, means for driving said pair of capstans, at least one of said driving means comprising a drive motor having an outer rotor secured to a rotor shaft of said motor, said rotor shaft acting directly as said capstan, axially spaced bearing means supporting said shafts and means for forming said mounting plate and all bearing members supporting said rotor shafts and their capstans for rotation in permanent rigidly fixed relation in integral mono-block.

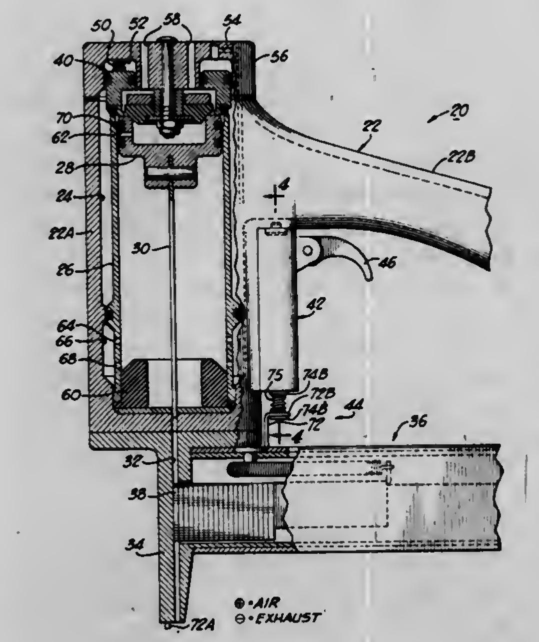
3,888,404
SAFETY FOR FASTENER DRIVING TOOL

Howard B. Ramspeck, Chicago, and Raymond F. Novak, Schiller Park, both of Ill., assignors to Duo-Fast Corporation, Franklin Park, Ill.

Filed Sept. 13, 1973, Ser. No. 397,021

Int. Cl. B25c *1/04*

U.S. Cl. 227—8 **14 Claims**



1. A tool for driving fasteners into a workpiece comprising a powered fastener driving assembly including a driver element actuated by a drive piston movable within a cylinder,

a fluid controlled main valve means opened to supply pressurized fluid to and closed to exhaust fluid from the cylinder,

a fluid controlled cycle valve coupled to the main valve means and movable to alternate positions to control opening and closing of the main valve means,

a first control means coupled to the cycle valve including a valve controlled by independently operable manual means and safety means actuated by placing the tool adjacent the workpiece for moving the cycle valve to a position effecting opening of the main valve means only when both of the manual means and the safety means are actuated,

and a second control means coupled to the cycle valve and responsive to the operation of at least one of the manual means and safety means for preventing movement of the cycle valve when the manual means is operated prior to the safety means.

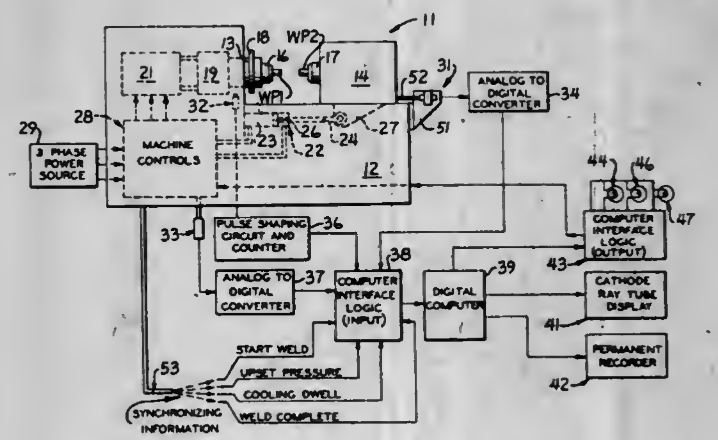
3,888,405
QUALITY CONTROL APPARATUS FOR INERTIAL WELDING

Thaddeus M. Jones, South Bend, Ind.; Jozef Kiwalle, Moylan, Pa., and Ernest J. Ruder, Pekin, Ill., assignors to Production Technology Inc., Peoria, Ill.

Continuation-in-part of Ser. No. 286,312, Sept. 5, 1972, abandoned. This application May 30, 1974, Ser. No. 474,844

Int. Cl. B23k *27/00;* **G05b** *13/00;* **G05f** *15/46*

U.S. Cl. 228—2 **9 Claims**


3 PHASE POWER SOURCE
MACHINE CONTROLS
WP1
WP2
ANALOG TO DIGITAL CONVERTER
PULSE SHAPING CIRCUIT AND COUNTER
ANALOG TO DIGITAL CONVERTER
COMPUTER INTERFACE LOGIC (INPUT)
DIGITAL COMPUTER
COMPUTER INTERFACE LOGIC (OUTPUT)
CATHODE RAY TUBE DISPLAY
PERMANENT RECORDER
START WELD
UPSET PRESSURE
COOLING DWELL
WELD COMPLETE
SYNCHRONIZING INFORMATION

1. Quality control apparatus in combination with a friction welding machine including a spindle means for relatively rotating two workpieces and hydraulic ram means for pressing the two workpieces into engagement at a common interface, the friction welding machine including an inertial mass operatively coupled for rotation with one of the workpieces to provide substantially all energy consumed at the interface of the workpieces, comprising

separate transducer means for respectively monitoring the conditions of relative rotating speed of the workpieces, fluid operating pressure in the hydraulic ram means and axial upset at the interface of the two workpieces,

computer means coupled with the separate transducer means by converter and input interface logic means to analyze representative signals from the separate transducer means,

signal means coupled with the computer means by output interface logic means for providing a substantially instantaneous signal corresponding to each of the monitored conditions, and

control means for automatically conditioning the welding machine to repeat a weld cycle, the control means being coupled with the output interface means to terminate operation of the machine when one of the monitored conditions in outside an acceptable range.

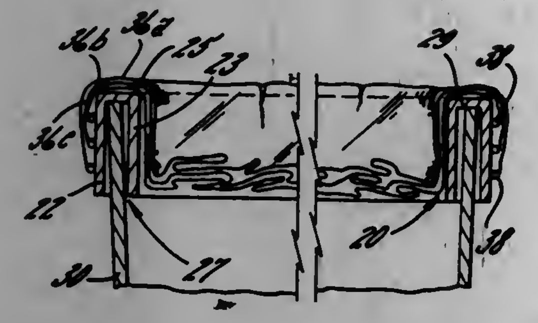
3,888,406
TRASH DISPOSAL APPARATUS

J. Timothy Nippes, 33 Maryland Ave., Annapolis, Md. 21401

Filed Jan. 2, 1973, Ser. No. 320,574

Int. Cl. B65d *5/60*

U.S. Cl. 229—14 R **7 Claims**



1. Trash disposal apparatus suitable for attachment to a frame assembly for providing a receptacle for use in the collection of trash, said trash disposal apparatus comprising support means adapted to be positioned upon the upper portion of the frame assembly and suitable for carrying a plurality of trash liner bags; a plurality of attachment means located on the periphery of the support means and separated into spaced groups each of which group is positioned for respectively carrying one of a plurality of trash liner bags in an opened-top, trash receptive manner; and a plurality of trash liner bags independently and detachably secured to the attachment means so as to be positionable in a trash receiving manner with respect to said frame assembly.

3,888,407
PACKETS

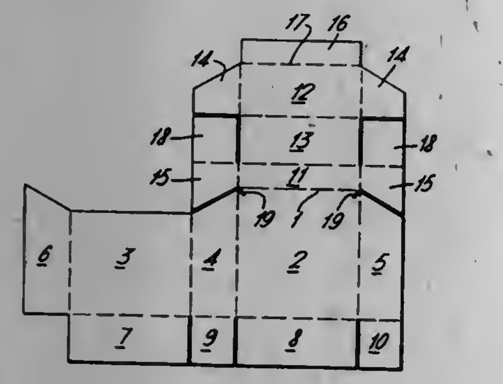
Robert William Davies, London, England, assignor to Molins Limited, England

Filed May 4, 1973, Ser. No. 357,116

Claims priority, application United Kingdom, May 8, 1972, 21455/72

Int. Cl. B65d *5/66*

U.S. Cl. 229—44 CB **11 Claims**



1. A blank for a hinged lid packet having a body portion and a lid portion, said body portion comprising a back panel connected along a hinge line to said lid portion, a front panel having a height smaller than said back panel, a first side panel connecting one side of said front panel to one side of said back panel, a second side panel having the same width as said first side panel and connected to the other side of the said front panel, and a third side panel connected to the other side of said back panel and adapted in the erect packet to underlie and be secured to the inside of said second side panel, the top edge of each side panel being inclined so that in the erect packet the top edge of said side panel slopes from said back panel down to said front panel.

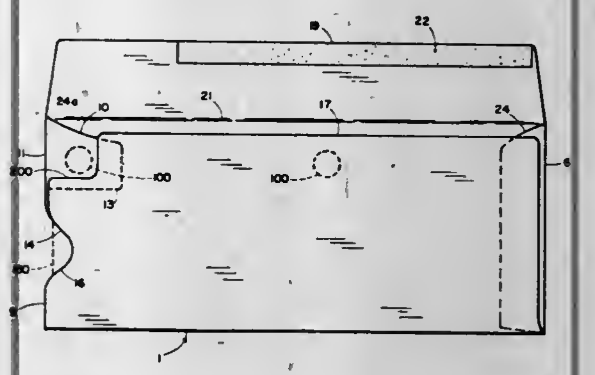
3,888,408
EASILY OPENABLE ENVELOPE

George R. Clipner, c/o Service Envelope Co., 11 Lincoln St., Kansas City, Kans. 66103

Filed May 25, 1972, Ser. No. 256,682

Int. Cl. B43m *5/00*

U.S. Cl. 229—85 **4 Claims**



1. An easily openable envelope for an enclosure, said envelope including generally rectangular panels overlying each other and interconnected along two adjacent edges of said panels to close two adjacent sides of said envelope to provide a pocket provided between said panels, one of the other two remaining edges of said envelope having between said panels a closeable insert opening through which an enclosure can be placed in said pocket, the other one of the remaining edges of said envelope having between its panels a withdrawal opening from which said enclosure can be subsequently withdrawn, a tab extending from a side edge portion of one panel across said withdrawal opening for holding contents in said envelope, said tab having a fold extending across the closing a portion of the withdrawal opening and positioning a portion of said tab in face-to-face contact with the inside of the other panel, said fold and the side edges of both panels being substantially in alignment, said tab being sufficiently flexible and the contacting faces of said tab and of said other panel being at least substantially unattached so that the withdrawal of said enclosure of said envelope through said withdrawal opening can be done by an operator without a rupturing of said tab into two part because said tab will unfold as an abutting edge of said enclosure presses against said tab during said withdrawal, a closure flap integral with one of said panels at the closeable insert opening for folding over the enclosure to engage the other of said panels, the remainder of said withdrawal opening being open so an operator can grasp said contents therethrough, said other panel having a suction element receiving means disposed opposite and exposing a lapping portion of said tab, said suction element receiving means being of substantial size for permitting an annular suction element of a content insertion machine to engage said tab on the same side of said envelope as said other panel for pulling said tab away from said one panel by suction so as to permit said contents to be placed in said envelope through said insert opening without excessive damage to said tab and envelope, said tab extending across less than the majority of the length of the adjacent side edge of said envelope.

3,888,409
AUTOMATIC SIGNAL NEWSPAPER RECEPTACLE

Leo J. Bolduc, 9861 Monument Dr., Grants Pass, Oreg. 97526

Filed Jan. 14, 1974, Ser. No. 433,226

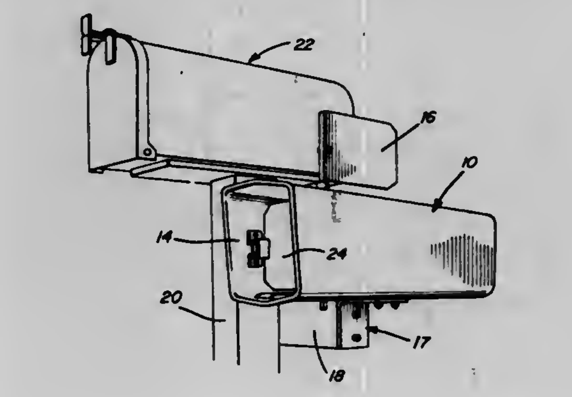
Int. Cl. A47g *29/12*

U.S. Cl. 232—1 C **4 Claims**

1. A signal newspaper delivery receptacle, comprising, in combination:

a. a receptacle arranged for the delivery of a newspaper; and provided with an inlet opening for the newspaper; and

b. means for indicating the presence of a newspaper in the receptacle; the means for indicating including, in combination:
  i. a door;
  ii. means for pivotally mounting the door adjacent the receptacle inlet opening for swinging movement between a position transverse of the receptacle and a position directed into the receptacle under pressure from an article inserted in the receptacle;
  iii. an indicator connected to the door for movement therewith, and arranged outside the receptacle; and
  iv. means for releasably retaining the door in a position blocking the inlet opening, the receptacle being normally disposed horizontally and extends longitudinally, the inlet opening forming one longitudinal end of the receptacle, and the door being a plate dimensioned to block substantially the entire inlet opening, the means for mounting including a shaft of substantially rectangular cross section, opposed holes provided in top and bottom walls of the receptacle and arranged adjacent and substantially parallel to a common side wall and the inlet opening thereof for pivotally receiving the shaft, the plate retained on the shaft, the indicator being a further plate forming a flag and having two bends made along one edge of the further plate to form a generally U-shaped channel dimensioned for mating with the shaft, the further plate retained on the shaft at right angles with respect to the door, and a collar arranged on the shaft between the further plate and the top wall of the receptacle for forming a bearing which facilitates pivotal movement of the shaft.



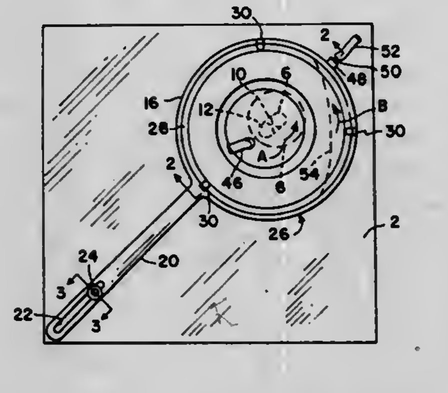
3,888,410
FLUID CONTROL APPARATUS AND METHOD

Charles W. McKee, Seaford, Va., assignor to United States Government National Aeronautics and Space Adm., Office of General Counsel-Code GP, Washington, D.C.

Filed Nov. 30, 1973, Ser. No. 420,424

Int. Cl. B04b *1/16*

U.S. Cl. 233—6 **4 Claims**



1. Apparatus for controlling fluids comprising:

base means;

a circular container having an outer peripheral wall;

drive means movable in an orbital path in a plane substantially parallel to the plane formed by the diameters of said circular wall including a rotating shaft, crank arm and crank pin;

means drivingly connecting said drive means to said container comprising a support plate fixedly attached to said container and journaled to said crank pin;

orienting means preventing rotation of said container due to the influence of said drive means, thereby causing said container to gyrate about said orbital path while remaining in substantially fixed orientation relative to said base means, comprising a stationary pin fixedly attached to said base means and an elongated slot in said support plate, generally radial to said crank pin, slidably engaging said stationary pin whereby any liquid in said circular container is forced against and moves tidally around the radial extremities of the inside of the outer peripheral wall of said container as a result of centrifugal force generated by the orbital motion of said container.

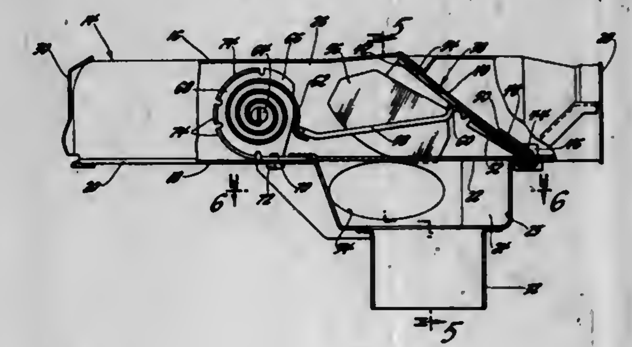
3,888,411
ENGINE INDUCTION AIR FLOW CONTROL

Robert T. Florine, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 3, 1974, Ser. No. 502,653

Int. Cl. G05d *23/08*

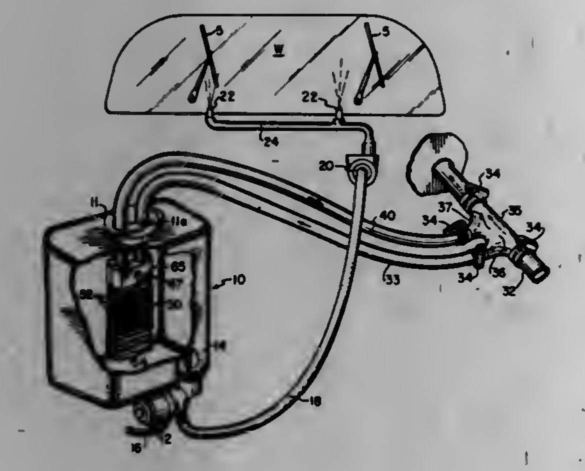
U.S. Cl. 236—13 **3 Claims**



1. An internal combustion engine induction air flow control comprising a conduit for air flow to the engine, said conduit having a primary inlet for air at ambient temperature and an auxiliary inlet downstream of said primary inlet for heated air, an air flow damper assembly, a pivot pin mounting said damper assembly in said conduit for pivotal movement between a first position obstructing flow through said primary inlet while permitting flow through said auxiliary inlet and a second position permitting flow through said primary inlet while obstructing flow through said auxiliary inlet, said damper assembly including guide and damper members independently pivoted on said pin and spring means biasing said members for concomitant movement, temperature responsive means disposed in said conduit downstream of said inlets and having an arm connected to said guide member, said temperature responsive means biasing said damper assembly toward said first position at air flow temperatures below a selected value and permitting movement of said damper assembly to said second position at air flow temperatures above the selected value and further positioning said damper assembly intermediate said positions to maintain air flow temperature at the selected value, said damper member being movable toward said second position against the bias of said spring means independently of said guide member by air flow above a selected rate to increase the flow of ambient temperature air for maximum efficiency.

3,888,412
APPARATUS FOR HEATING THE FLUID IN A WINDSHIELD WASHER SYSTEM

Herbert Lindo, Mineola, N.Y., assignor to Kenilworth Research & Development Corporation, Mineola, N.Y.
Filed Apr. 17, 1973, Ser. No. 352,009
Int. Cl. B60h *1/06*
U.S. Cl. 237—12.3 B **10 Claims**

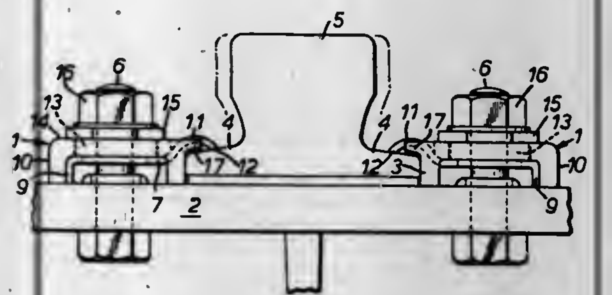


1. Apparatus for heating fluid in a windshield system of a motor vehicle having a liquid cooling system including a heater line in which the cooling system fluid flows, comprising a reservoir for holding windshield washer fluid, an opening formed in a portion of a wall of said reservoir, heat exchanger means comprising a heat exchanger housing of closed configuration and being of a size to fit through said opening and located completely within said reservoir, said heat exchanger housing having extending fin members for immersion in the windshield washer fluid and having a generally serpentine internal fluid flow passage therein with an inlet and an outlet, said heat exchanger also being formed with an open section in communication with the inlet and outlet of said fluid flow passage, a pair of nipples located in said housing open section in fluid flow communication respectively with the inlet and outlet of said fluid flow passage, a respective hose extending through said reservoir opening and attached to each of said nipples, cover means fastened to said heat exchanger housing at said open section and engaging said hoses to hold them in fixed relationship with the heat exchanger housing, and means for coupling said hoses to the cooling system heater line of the vehicle to bypass a portion of the cooling system fluid through the fluid flow passage of the heat exchanger and back to the cooling system.

3,888,413
RAIL ANCHORAGE PROVIDED WITH A RESILIENT CLAMPING ELEMENT

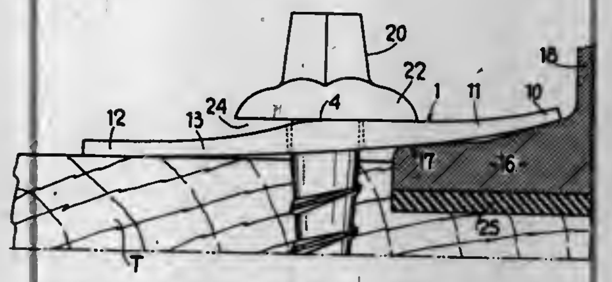
George Molyneux, Gloucester, England, assignor to Molyneux Rail Clips Limited, Gloucester, England
Filed Apr. 15, 1974, Ser. No. 461,124
Int. Cl. E01b *9/34*
U.S. Cl. 238—349 **8 Claims**

1. A flanged-rail anchorage, for securing to a support at one side of a rail having a flange, comprising a base adapted to be secured to the support, a resilient clamping element held by the base, a part of said element projecting beyond the base and having a lower surface to locate over and in contact with the flange of the rail, and an integral ear on said base extending on either side and in the same direction as the projecting part of said element, each ear having a lower surface positioned above the lower surface of said projecting part, so as to be able to extend over and only to engage with the rail flange if the rail is significantly distorted, so as to prevent excessive stress being applied to said clamping element.



3,888,414
RESILIENTLY YIELDABLE RAIL FASTENING

Michel Duchemin, Lambres Les Douai, France, assignor to Ressorts du Nord S.A., Paris, France
Filed May 3, 1974, Ser. No. 466,919
Claims priority, application France, May 3, 1973, 73.15918
Int. Cl. E01b *9/30*
U.S. Cl. 238—349 **12 Claims**



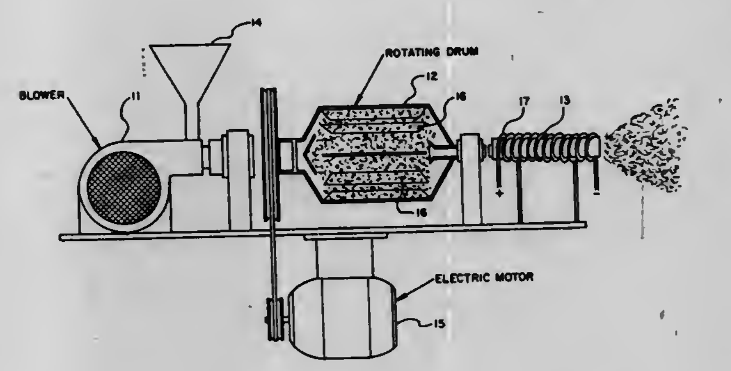
1. A fastening device for fastening to a railway tie a rail which has a flange and is supported by the tie through an elastically yieldable pad, comprising : a fastening comprising at least one resiliently yieldable plate bearing, in a first branch adjacent one end of the fastening at at least one point of the fastening, against the tie and, in a second branch adjacent an opposite end of the fastening at at least one point of the fastening, against the flange of the rail, means defining in the plate an aperture, between the two branches, the fastening having a thickening in a centre part of the fastening in the region of the aperture constituting a curved boss, the fastening progressively thinning down from the boss in directions toward said ends of the fastening; and tightening means for tightening down the fastening onto the rail flange extending through the aperture and connected to the tie, the tightening means being pivotally engaged with the upper face of the boss at a contact point located between a region in which the fastening bears against the tie and a region in which the fastening bears against the flange of the rail, whereby said fastening pivots around said contact point as the pad is compressed or depressed by the rail.

3,888,415
PARTICLE VAPORIZER

Irwin Koff, and William G. Finnegan, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed June 27, 1974, Ser. No. 483,862
Int. Cl. A01g *15/00*
U.S. Cl. 239—2 R **2 Claims**

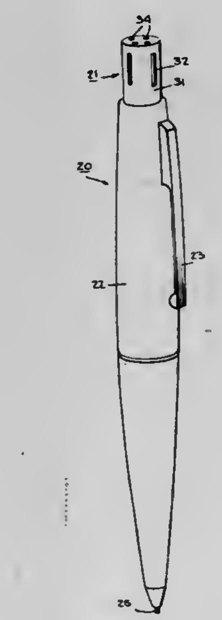
1. In a method for dispersing weather modification nuclei wherein a weather modification material is changed from one physical form to another, dispersed into the atmosphere and allowed to reconstitute itself into said nuclei, the improvement

residing in blowing discrete solid particles of said weather modification material into an electrically heated tube, vaporizing said weather modification material within said tube and dispersing the vapor formed within said tube from said tube into the atmosphere where it reconstitutes itself into said nuclei.



3,888,416
SCENTED WRITING INSTRUMENT

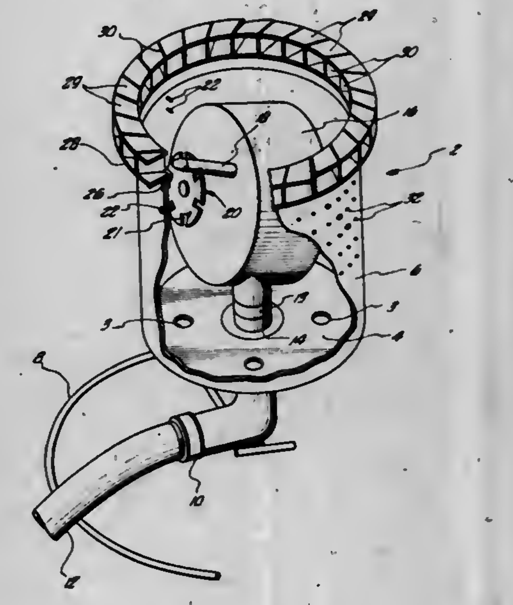
A. Oscar Lin, 42-06 66th St., Woodside, N.Y. 11377
Filed May 6, 1974, Ser. No. 467,377
Int. Cl. A24f *25/00*; A61l *9/04*
U.S. Cl. 239—34 **19 Claims**



1. In combination,
- a writing instrument including a housing, a retractable writing means at one end of said housing and a plunger at an opposite end of said housing for moving said writing means within said housing; and
- a vapor dispenser mounted on said plunger and extending from within said housing at said opposite end, said dispenser including a container for holding a supply of vaporizable material, said container having at least one opening therein to allow a flow of vapor therethrough, and a cover rotatably mounted about said container and having at least one opening therein for registering with said opening in said container upon rotation of said cover into predetermined positions relative to said container.

3,888,417
VARIABLE WATER VOLUME SPRINKLER

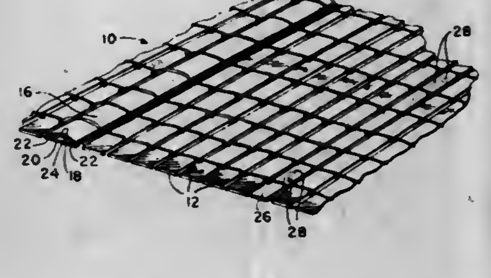
Al Harmon, 1548 East Altadena Dr., Altadena, Calif. 91001
Continuation-in-part of Ser. No. 287,511, Sept. 8, 1972, abandoned. This application Oct. 1, 1973, Ser. No. 402,103
Int. Cl. B05b *3/00*
U.S. Cl. 239—97 **31 Claims**



1. A water sprinkler assembly for delivering a variable volume of water comprising:
- at least one nozzle adapted to emit water from a constant source of water and mounted for rotational movement;
- means for applying a constant rotational force to the nozzle; and
- timing means for intermittently holding the nozzle stationary against the constant rotational force to vary the total volume of water emitted in a particular direction including a movable timing member and a plurality of relatively stationary members that are capable of restraining the co-ordinate movement of the timing member and the nozzle.

3,888,418
DEVICES, SYSTEMS AND METHODS EMPLOYING KNITTED FABRIC MULCH

Robert T. Seith, Tuscaloosa, Ala., and Otto M. Bundy, Bradenton, Fla., assignors to Gulf States Paper Corporation, Tuscaloosa, Ala.
Division of Ser. No. 333,782, Feb. 20, 1973, Pat. No. 3,848,359. This application Aug. 12, 1974, Ser. No. 496,753
Int. Cl. A01g *27/00*
U.S. Cl. 239—145 **9 Claims**

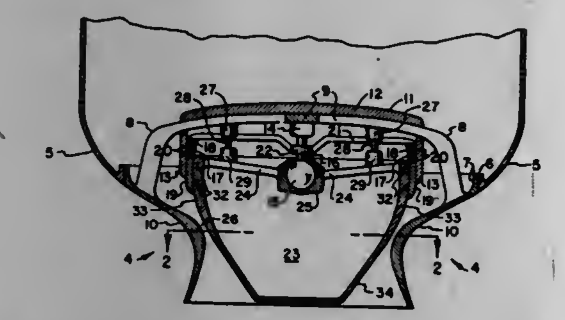


1. A mulch comprising an open-mesh knitted fabric constituted by a multiplicity of knittedly interconnected longitudinal and transverse yarn elements, said fabric having at least one irrigation tube between longitudinal yarn elements and interleaved with transverse yarn elements of said fabric, said irrigation tube being substantially wider than said yarn elements.

3,888,419
SPIKE NOZZLE FOR ROCKETS

Edward E. McCullough, and E. Eugene Anderson, both of Brigham City, Utah, assignors to Thiokol Corporation, Bristol, Pa.

Filed Sept. 13, 1971, Ser. No. 179,790
Int. Cl. B63h *11/10*
U.S. Cl. 239—265.19 **4 Claims**

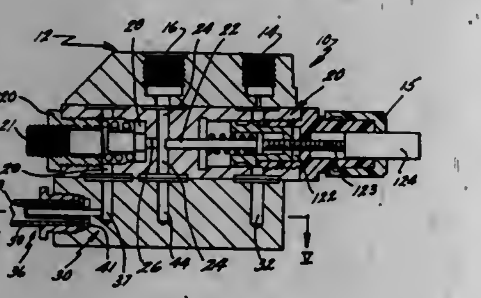


1. A thrust nozzle for rockets comprising:
- a convergent-divergent nozzle member having attachment means for attaching it to a rocket:
- a spider support fixed to the convergent portion of the convergent-divergent nozzle member;
- an insulating shield substantially in the form of a disk with a peripheral, annular flange extending aftwardly at right angles thereto, the shield being centrally fixed to the forward side of the spider support, the arms of which extend in sealed relationship, through the aftwardly-extending flange;
- a primary, fluid-operated actuator, having an actuation arm, centrally fixed to the spider support and extending aftwardly;
- a univrsal joint fixed to the actuation arm;
- a spike nozzle member fastened on the universal joint and extending aftwardly in the throat portion of the convergent-divergent nozzle member, whereby it may form an annular throat therewith that may be varied in size as the spike nozzle member is moved axially relative to the convergent-divergent nozzle member by the first actuator;
- a secondary fluid-operated actuator fixed to an arm of the spider support, spaced from the center therof, extending aftwardly, and having an actuation arm in contact with the spike nozzle member, whereby it may rotate the spike nozzle member about the universal joint; and
- sealing means between the spike nozzle member and the flange of the insulating shield to prevent hot, propulsive gases of the rocket from entering therein.

3,888,420
POSITIVE-DISPLACEMENT MIST LUBRICATOR

Wallace G. Boelkins, Grand Rapids, Mich., assignor to Uni-Mist, Inc., Grand Rapids, Mich.

Filed Nov. 16, 1973, Ser. No. 416,393
Int. Cl. B05b *1/30, 7/00*
U.S. Cl. 239—412 **17 Claims**

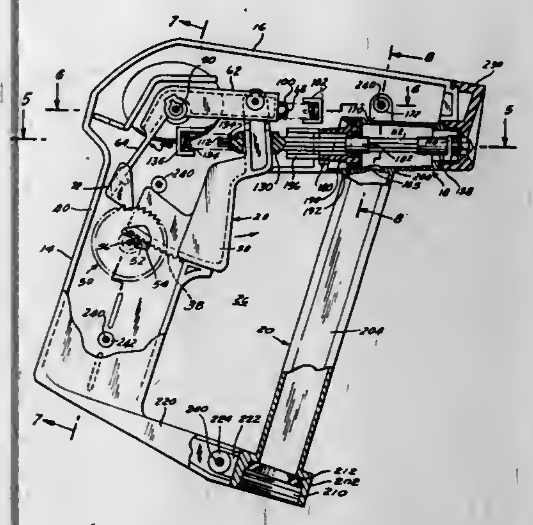


1. A positive-displacement fluid metering and mixing device, comprising in combination: means for repeatably dispensing a metered quantity of a first fluid in response to repeated pulse actuation by means of a reciprocating fluid displacement member movable through a metering passage means cooperative therewith, to positively volumetrically displace a metered quantity of said first fluid upon reciprocation of such member; means providing an inlet to supply fluid to and an outlet to convey a solid column of positively-displaced metered fluid from said fluid-dispensing means; conduit means forming a filled passage of positively-displaced metered fluid from said dispensing means, leading from said outlet to a dispensing point where metered quantities of said fluid are ejected volumetrically by operation of said displacement member; a supply of a second fluid under pressure, including a nozzle outlet at said dispensing point; and means at said dispensing point for mixing said first and second fluids at such point.

3,888,421
GUN TYPE FLUID CONTROL DEVICE

Ho Chow, River Edge, N.J., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Apr. 22, 1974, Ser. No. 462,806
Int. Cl. B05b *1/32*
U.S. Cl. 239—456 **38 Claims**

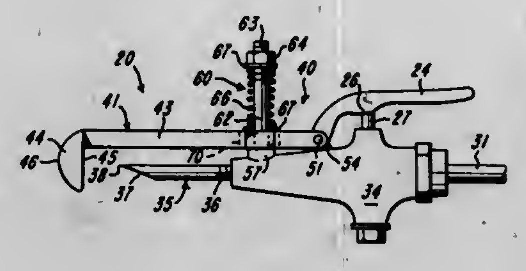


1. A gun type fluid control device comprising
- A. a gun body;
- B. nozzle means secured to said gun body and comprising a valve chamber and a valve slidably disposed at least in part in said valve chamber, said valve being spring biased to a valve closing position and movable from said valve closing position through a plurality of partially valve opening positions to a fully valve open position;
- C. fluid feed means for transporting fluid from a fluid supply to said valve chamber; and
- D. means for controlling the flow of fluid from said nozzle means including
  - i. trigger means having a manually actuatable portion for moving said trigger means between an unactivated position through a plurality of partially activated positions to a fully activated position;
  - ii. connecting means operatively connecting said trigger means and said valve for movement therewith;
  - iii. latch means within said gun body spring biased to an unlatching position and manually movable to a latching position operatively engaging and latching said trigger means in any one of said activated positions against movement towards said unactivated position;
  - iv. manually actuatable control means secured to said latch means within said gun body for movement of said latch means; and
  - v. release means operatively connecting said trigger means and said latch means when said latch means is in said latching position and effective, when said trigger means is moved in the direction from said unactivated position corresponding to the valve closing position toward said fully activated position corresponding to a fully valve open position, to release said latch means and enable return of said latch means to said unlatching position, thereby releasing said trigger means and enabling return of said valve to said valve closing position and said trigger means to said unactivated position.

3,888,422
AIR GUN

Douglas N. Robinson, Canton, N.C., assignor to Dayco Corporation, Dayton, Ohio

Filed Feb. 8, 1974, Ser. No. 440,922
Int. Cl. B05b *1/26*
U.S. Cl. 239—512 **1 Claim**



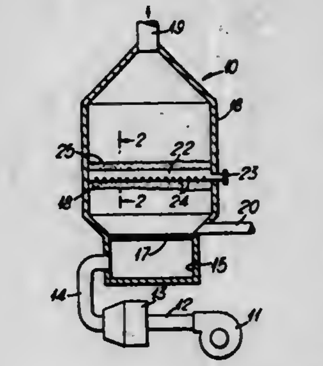
1. An air gun comprising a housing having an integral stop thereon; a discharge nozzle extending from said housing and having a wedge-like end portion terminating in a comparatively sharp terminal end; a safety device for said discharge nozzle comprising a roughly L-shaped member with a first leg having an elongated slot therein and arranged roughly parallel to said nozzle, and a second leg having an arcuate outer surface secured to one end of and extending transversely of said first leg, the other end of said first leg being bifurcated; said safety device serving as a shield for said discharge device and as a deflector for air which is inadvertently discharged from said nozzle, the central portion of said first leg being normally in aligned relation with said nozzle when serving as a deflector; means supporting said safety device on said housing allowing movement thereof away from said nozzle during operation of said air gun, said means comprising a supporting lug on said housing and a pivot pin extending through said lug and the bifurcated end of said first leg; a rod assembly fixed to said housing roughly perpendicular to said nozzle; and a compression spring acting between said rod assembly and said L-shaped member to urge said first leg against said stop, said rod assembly including a rod passing through the elongated slot of said first leg to allow movement of said L-shaped member relative to said nozzle.

3,888,423
SPRAY NOZZLE FOR FLUIDIZED BED APPARATUS

Neophytos Ganiaris, Riverdale, N.Y., assignor to Struthers Scientific, New York, N.Y.

Continuation of Ser. No. 152,888, June 14, 1971, abandoned. This application Nov. 6, 1972, Ser. No. 303,806
Claims priority, application United Kingdom, June 13, 1970, 28722/70
Int. Cl. B05b *1/18*
U.S. Cl. 239—567 **1 Claim**

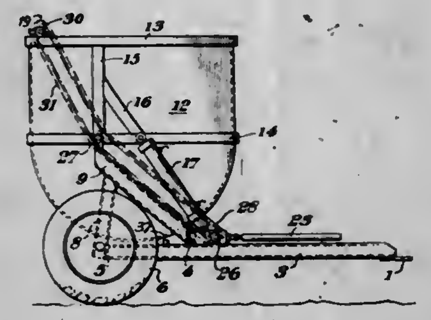
1. A liquid spray nozzle in combination with a fluidized bed apparatus comprising, in combination, a round pipe containing liquid spray apertures directed downward in its lower portion, and a sheet metal cover welded on the upper portion of said pipe, said cover having steeply sloping sides and a sharply peaked top extending along said pipe within a fluidized bed.



3,888,424
MANURE SPREADER

Arthur John Chapman, South Chailey, England, assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Nov. 19, 1973, Ser. No. 417,454
Claims priority, application United Kingdom, Nov. 29, 1972, 55165/72
Int. Cl. A01c *3/06, 15/00*
U.S. Cl. 239—657 **16 Claims**



1. A wheeled vehicle for distributing material comprising:
- a. an open-topped container for accommodating the material,
- b. means for pivotably mounting said container about a pivot axis located intermediate the top and bottom thereof,
- c. said pivot axis being substantially horizontal and passing through a normally vertical axis of the container which in turn passes in the vicinity of the center of gravity of the container,
- d. power means operable to control tipping of the container about the pivot axis, and
- e. support means for engaging the container in a rest or upright position thereof so that the weight of the container is taken by the support means, thereby relieving stress on the pivots which normally take the weight of the container in various other positions of the latter.

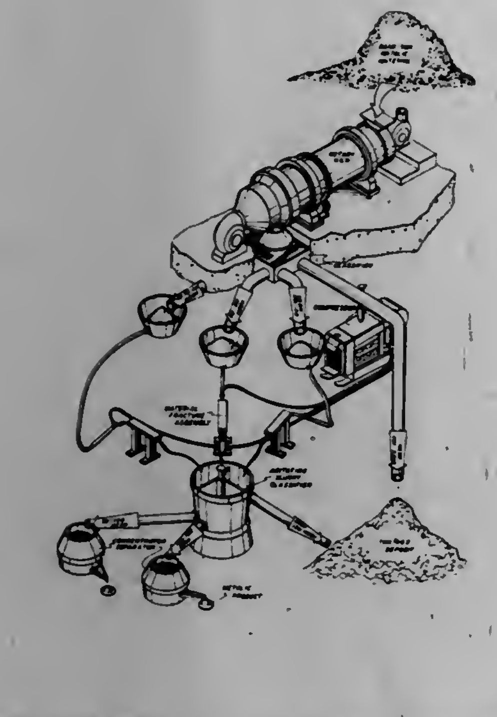
3,888,425
METHOD AND APPARATUS FOR TREATMENT OF FOLIATED METALLIC BEARING MATERIALS

William O. Collins, 2255 Foothill, Reno, Nev. 89502

Filed May 14, 1973, Ser. No. 359,932
Int. Cl. B02c *19/06*
U.S. Cl. 241—5 **7 Claims**

1. The method of treating foliated metallic bearing materials comprising the steps of
- heating and drying foliated metallic bearing materials,
- classifying said materials into selected size groups by permitting certain of the materials to pass through screens

having several preselected mesh sizes of 10 mesh to 150 mesh,



selecting one of said sized groups and blasting said group at substantially high velocity into a chamber to fracture the foliant matrix of said foliated metallic bearing material, by impinging the sides of said chamber,

separating metallic material from said foliant matrix.

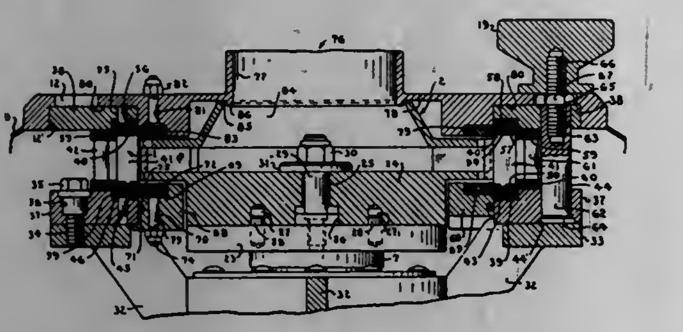
3,888,426
MACHINE AND METHOD FOR COMMINUTING PRODUCTS

Joe R. Urschel, 202 Michigan Ave., and Edgar R. Sanders, 708 Evans Ave., both of Valparaiso, Ind. 46383

Filed Aug. 6, 1973, Ser. No. 385,964

Int. Cl. B02c *13/18*

U.S. Cl. 241—5 **17 Claims**



1. In combination: a cutter assembly having a plurality of circumferentially spaced knives having inner cutting edges and impeller means comprising a pair of substantially round planar members, a plurality of circumferentially spaced blades interposed between and carried by said members, said blades having inner leading surfaces disposed within the confines of said impeller means and with outer leading surfaces extending outwardly and forwardly at an angle with reference to said inner surfaces for directing a product introduced into the impeller means against said cutting edges, and said knives also having outwardly extending surfaces and inner faces which are disposed to provide clearance whereby the product is caused to first substantially engage said cutting edges for cutting the product into fine particles and so that the latter will flow outwardly between said knives via said extending surfaces and substantially avoid engaging said inner faces.

3,888,427
DISPOSAL UNIT

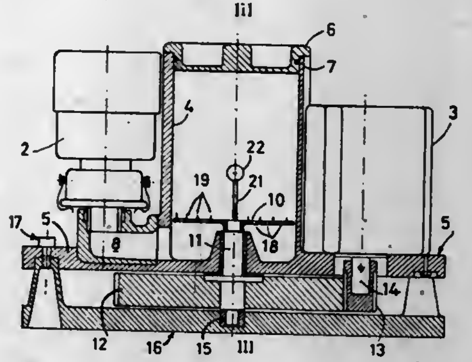
René Derouineau, Moulin de Pelissey 33, Gradignan, France

Filed Sept. 19, 1973, Ser. No. 398,695

Claims priority, application France, Sept. 26, 1972, 72.35059

Int. Cl. B02c *7/04*

U.S. Cl. 241—46.11 **5 Claims**



1. A grinder for a disposal unit or the like comprising a body having an inlet orifice for material to be ground and an outlet orifice for ground material, grinding apparatus interposed between said inlet and outlet orifices, said apparatus including a grinding plate member formed with a waste support surface having perforations formed therethrough, said plate member including tooth portions extending from said waste support surface, a coacting member disposed adjacent the waste support surface of said plate member, said coacting member including at least one notch portion, drive means for relatively moving said members in a predetermined path progressively to shift said tooth portions of said plate member through said at least one notch of said coacting member, and movable mounting means interposed between said members for enabling relative separating movements of said coacting member and said waste support surface responsive to passage between said members of a large solid waste object.

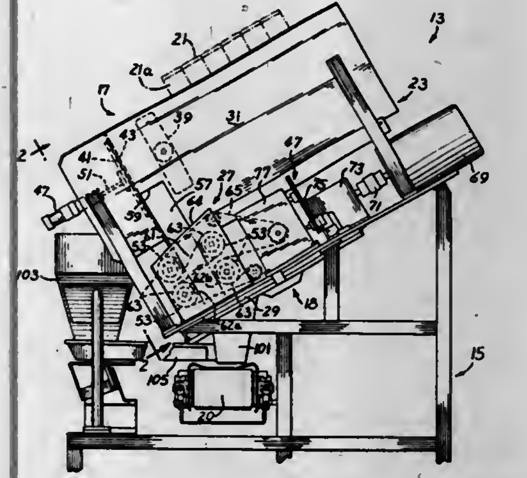
3,888,428
APPARATUS FOR SHREDDING

Harry A. Tabernacki, Wonder Lake, Ill., assignor to Kraftco Corporation, Glenview, Ill.

Filed June 8, 1973, Ser. No. 368,031

Int. Cl. B02c *18/06*

U.S. Cl. 241—92 **8 Claims**



1. Apparatus for shredding material in the form of rectangular blocks into discrete particles, comprising means for holding a plurality of said blocks in tandem with each other and with the long dimension of the blocks generally inclined from the vertical, a rotatable disc disposed in a plane generally inclined from the horizontal, said disc having shredder teeth on one surface thereof, the opposing surface being plain, an opening through the disc adjacent the teeth, said disc being disposed adjacent said holding means with the toothed face directed toward said holding means, means intermediate said holding means and said disc for continuously feeding an uninterrupted succession of single blocks of said material onto the toothed surface of said disc when said disc is rotating, means intermediate said holding means and said feeding means for automatically separating one block of said material at a time from those in tandem adjacent it on said holding means so that said separated block is free to be engaged by said feeding means, and fixed cutter means adjacent the plain surface of said disc disposed generally opposite said holding means.

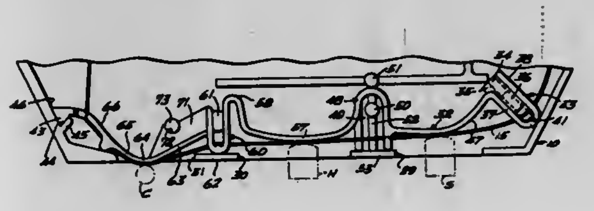
3,888,429
ENDLESS LOOP MAGNETIC TAPE CARTRIDGE WITH REMOVABLE TAPE GUIDE INSERT

Bernard Mack, 1750 N.E. 191 St., North Miami Beach, Fla. 33162

Filed July 20, 1973, Ser. No. 381,010

Int. Cl. B65h *17/48*

U.S. Cl. 242—55.19 A **4 Claims**



1. A tape guide insert for endless loop magnetic tape cartridges of the type comprising a cartridge case having a pair of relatively separable half shell portions defining an interior tape reel chamber and an elongated end face having a plurality of aligned, longitudinally-spaced through openings for the insertion, from the outside, of respective sensing switch, transducer and drive capstan members of associated recording and/or playback equipment, and further comprising a spindle for the removable assembly of a tape spool containing an endless winding of magnetic tape having an open loop adapted to be continuously guided across the inside of the cartridge end face for cooperative engagement with the sensing switch, transducer and drive capstan members upon application of the magnetic tape cartridge to the associated equipment for recording or playback, the improvement comprising an elongated tape guide member, said tape guide member having support means for guidingly constraining the open loop of the magnetic tape to flat-wise movement along one side of said guide member, and means for removably securing said tape guide member within one of said pair of half shell portions of the cartridge prior to the assembly of the other half shell portion thereto so that the open loop of the magnetic tape, when guidingly constrained by said tape guide member, is disposed for translatory guidance along the inside of the cartridge end face for continuous cooperative engagement by the sensing switch, transducer and drive capstan members of the associated equipment when the cartridge is applied thereto for playback or recording of the magnetic tape, said means for guidingly constraining the open loop of the magnetic tape comprising transversely-extending openings at each end of said tape guide member of sufficient width to permit the magnetic tape to pass flat-wise therethrough and along said one side of said guide member, while at the same time constraining it against relative lateral movement with respect thereto.

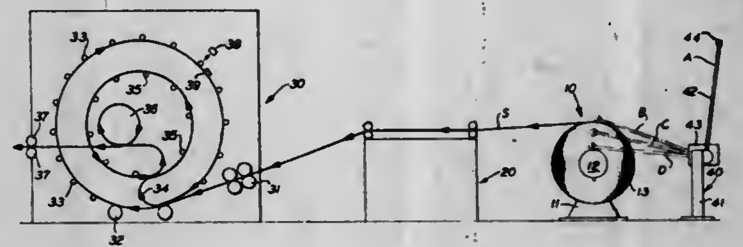
3,888,430
CONTROL SYSTEM FOR A STRIP ACCUMULATOR

Anthony C. Costello, Strongsville, and Leon L. Shaffer, Kent, both of Ohio, assignors to Loopco Industries, Inc., Twinsburg, Ohio

Filed Dec. 28, 1973, Ser. No. 429,052

Int. Cl. B65h *17/48*

U.S. Cl. 242—55 **12 Claims**



5. In combination, an uncoiler which carries a coil of strip material, an accumulator which receives said strip material from said uncoiler and at least temporarily stores the same while transferring said strip material to a processing line, means to feed the strip material from said uncoiler to the accumulator, and a control device, said control device comprising sensing means for monitoring the amount of strip material on said coil, first control means activated by said sensing means to interrupt the feed of said strip material from said uncoiler to said accumulator when a predetermined amount of said strip material remains on said coil, second control means actuated when said accumulator is substantially empty to reinitiate the feed of said strip material from said uncoiler to said accumulator, and third control means activated by said sensing means again stopping the feed of said strip material from said uncoiler to said accumulator when the strip material on said coil is substantially depleted.

3,888,431
REMOVABLE INTERCHANGEABLE HOLDER DEVICE FOR A RECORDER TAPE

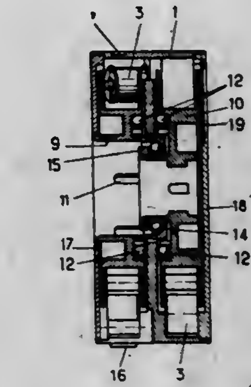
Michel Laine, 20 Rue Odilon Roson 91, Bievres, France

Filed July 7, 1972, Ser. No. 269,616

Claims priority, application France, July 7, 1971, 71.24791; June 14, 1972, 72.21525

Int. Cl. G11b *23/10*

U.S. Cl. 242—194 **6 Claims**



1. A tape cassette for magnetic recording tape comprising: a front surface, a rear surface and a central partition parallel to said surfaces, forming in said cassette a front and a rear compartment; a front and a rear cover; means closing said compartments; a spool in each of said compartments, the two spools having coaxial hubs having cylindrical parts and two faces each, one face on the inside next to said central partition, and the other face on the outside next to one of said covers, the rear cover and the central partition having openings on the same axis as the spool hubs; at least one straight roller and an oblique roller in each of said compartments, the two oblique rollers having parallel axes; magnetic tape running from a first spool to the straight roller, then to the oblique

roller of a compartment, and passing through the central partition and over the second oblique roller, then over the second straight roller and winding onto the second spool; a first plane ball bearing between the central partition and the inner surface of the front spool; a second plane ball bearing between the central partition and the inner surface of the rear spool; a third ball bearing between the inner cylindrical surface of the hub of the rear spool and the outer cylindrical surface of the hub of the front spool; means for clamping the hub of one of the spools on the hub of the other spool, to avoid play of said bearings by regulating pressure on the balls of the bearings between said central partition and said front faces; and means guiding, positioning and locking the cassette on a magnetic recording and pick-up instrument designed to use said cassette, at least one spindle of said instrument passing through the opening of the cover into one of said hubs and causing it to rotate.

3,888,432
RECORDING AND/OR REPRODUCING APPARATUS HAVING A REEL DISC DEVICE

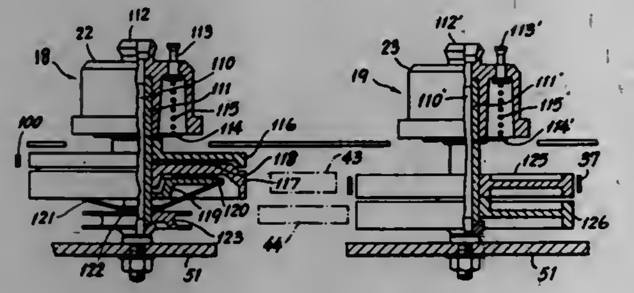
Hiroshi Katoh, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Kanagawa, Japan

Filed Aug. 8, 1973, Ser. No. 386,714

Claims priority, application Japan, Aug. 10, 1972, 47-79514; Aug. 18, 1972, 47-96115; Aug. 25, 1972, 47-98433

Int. Cl. G11b *15/30*

U.S. Cl. 242—201 **4 Claims**



1. A recording and/or reproducing apparatus having a reel disc device comprising:

a reel disc main structure for engaging and rotating a reel in a direction to take up a tape-form recording medium; a first reel disc part disposed below said reel disc main structure and adapted to rotate unitarily therewith;
a shaft-form member rotatable unitarily with the reel disc main structure and said first reel disc part;
a second reel disc part disposed below the first reel disc part and fitted onto said shaft-form member in a manner to rotate separately therefrom;
a third reel disc part disposed below said second reel disc part and rotating unitarily with the shaft-form member;
a fourth reel disc part disposed between second and third reel disc parts and fitted onto the shaft-form member in a manner to be rotatable separately from the shaft-form member and the second reel disc part;
driving means for transmitting rotational power to the second reel disc part;
coupling means operating, when in operative state, to couple the fourth and second reel disc parts for unitary rotation thereof and, when in inoperative state, to uncouple said reel disc parts;
first rotation transmitting means interposed between the first and second reel disc parts to transmit the rotation of the second reel disc part to the first reel disc part; and
second rotation transmitting means interposed between the fourth and third reel disc parts to transmit the rotation of the fourth reel disc part to the third reel disc part,
said second reel disc part, said first rotation transmitting means, and said first reel disc part forming a single first rotation transmission path from the driving means to the reel disc main structure, the rotation of said driving means being transmitted with a small torque from the second reel disc part by way of only said first transmission path when said coupling means is in the inoperative state, said second reel disc part, said fourth reel disc part, said second rotation transmitting means, said third reel disc means, and said shaft-form member forming a second rotation transmission path from the driving means to the reel disc main structure, in addition to said first rotation transmission path, when the coupling means is in the operative state, whereby the rotation of the driving means is transmitted from the second reel disc part simultaneously by way of the first and second transmission paths with a large torque to the reel disc main structure.

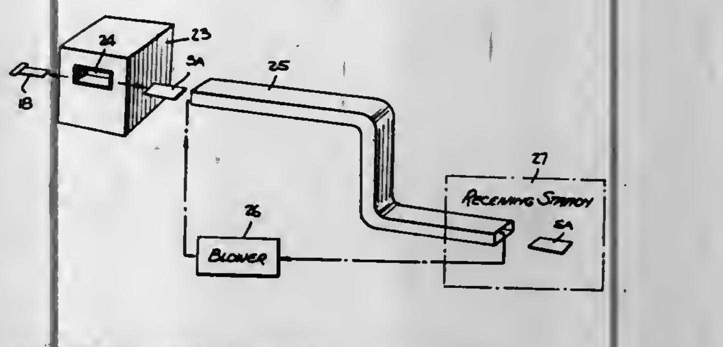
3,888,433
DISPOSABLE CARRIERS FOR PNEUMATIC CONVEYORS

Leonard A. Fish, Chicago, Ill., assignor to Bank Computer Network Corporation, Chicago, Ill.

Filed Mar. 29, 1974, Ser. No. 456,432

Int. Cl. B65g *51/06*

U.S. Cl. 243—1 **8 Claims**



1. A pneumatic conveyor system comprising:

A. a tube extending between input and output stations;
B. means coupled to said tube at said stations to produce a high velocity air stream flowing from the input to the output station; and
C. a disposable carrier to transmit material between said stations, said carrier being constituted by an envelope which is sealable to enclose the material in combination with a normally flat and expansible means which when the carrier is subjected to the stream expands to enlarge the effective cross-sectional area of the carrier whereby the carrier then forms an obstacle in the stream and is propelled thereby through the tube, said expansible means being constituted by a sheet adhered to the face of the envelope along its marginal sides and downstream end to define a pocket open at the upstream end thereof, which pocket is normally flat and is distended in the tube by air entering through said upstream end.

3,888,434
METHOD OF PIPELINE TRANSPORTATION OF NATURAL GAS

Nikolai Vasilievich Chersky, prospekt Lenina, 38B, kv. 14, Yakutsk; Alexandr Petrovich Klimenko, ulitsa Repina, 13, kv. 73, Kiev; July Izrailevich Bokserman, ulitsa A. Tolstogo, 12, kv. 47, Moscow; Alexandr Isaevich Kalina, ulitsa Grimau, 5/1, korpus 1, kv. 24, Moscow, and Farit Abdrakhmanovich Karimov, ulitsa Planetnaya, 19, kv. 5, Moscow, all of U.S.S.R.

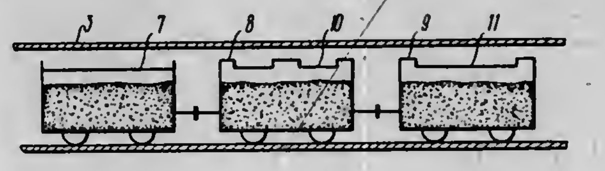
Filed Mar. 11, 1974, Ser. No. 450,156

Claims priority, application U.S.S.R., Mar. 12, 1973, 1889052

Int. Cl. B65g *51/02*

U.S. Cl. 243—38 **3 Claims**

1. A method of transporting natural gas by pipeline comprising converting the natural gas into the form of hydrates; loading said hydrates into containers; propelling said containers loaded with said hydrates through said pipeline filled with natural gas; and maintaining the pressure and the temperature in said pipeline at such a level as to preserve the physical state of said hydrates during the process of transportation.



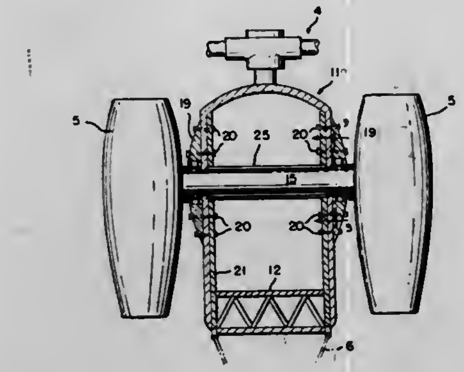
3,888,435
HELICOPTER WITH AUXILIARY LOAD-SUPPORTING AND LIFTING CAPACITY

Kenneth R. Foote, 14607 S.E. Madison St., Portland, Oreg. 97233

Filed July 18, 1974, Ser. No. 489,474

Int. Cl. B64d *41/00*

U.S. Cl. 244—58 **9 Claims**



1. A system for lifting and conveying loads whose weight exceeds the certified lift capacity of the powered rotor blades of a helicopter, comprising:

a helicopter having a frame and powered rotor blades providing vertical lift and means for transverse movement thereof,
load support means for securing a load,
mounting means at the center of gravity of the helicopter, one or more thruster units secured to the mounting means providing sufficient additional vertical lift capacity over the vertical lift capacity of the helicopter to lift the secured load, and
structural means extending between the mounting means, frame of the helicopter and load support means adapted to transfer the weight of the load exceeding the certified lift capacity of the helicopter to the mounting means and preventing greater than normal stress being exerted on the frame of the helicopter when lifting loads with a weight greater than the certified lift capacity of the helicopter.

3,888,436
AIRPLANE LANDING GEAR SHOCK ABSORBER

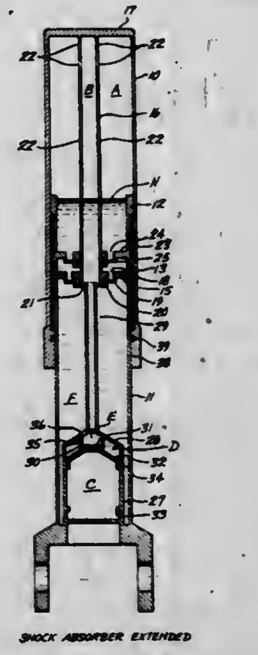
Francis Sealey, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 1, 1974, Ser. No. 457,003

Int. Cl. B64c *25/60*

U.S. Cl. 244—104 FP **8 Claims**

1. A shock absorbing strut comprising: an outer and an inner cylinder, each having a closed end and open end, the cylinders being telescopically engaged at their open ends; a first piston assembly fitting internally in said inner cylinder, closely fitting the interior wall of said inner cylinder, and supported by means of a tube member from the closed end of said outer cylinder; and a second piston assembly attached to the inner wall of said inner cylinder and closely fitting the exterior wall of said tube member; wherein said strut is internally divided into three annular volumes; the first annular volume being bounded by the inner walls of the inner and outer cylinders, the outer wall of the tube member, the closed end of the outer cylinder and the first piston; the second annular volume being bounded by the inner wall of the inner cylinder, the outer wall of the tube member, and the first and second pistons; and the third annular volume including as boundaries the inner wall of the inner cylinder, the outer wall of the tube member, the second piston and the closed end of the inner cylinder; a plurality of orifice means such that a portion of hydraulic fluid is forced through said orifice means during a compressive motion of said strut, thus dissipating energy through viscous friction; means for storing a portion of said energy by compression of a first volume of gas, said gas tending to expand said strut; means for dissipating a portion of said stored energy through viscous friction during expansion of said strut; means for storing addition energy by compression of a second volume of gas having a pre-determined initial volume; and means for reducing the viscous frictional forces opposing compression and expansion of said strut which means begin to function when said second volume of gas is compressed to a volume smaller than its said predetermined initial volume.



3,888,437
VEHICLE CONTROL SYSTEMS

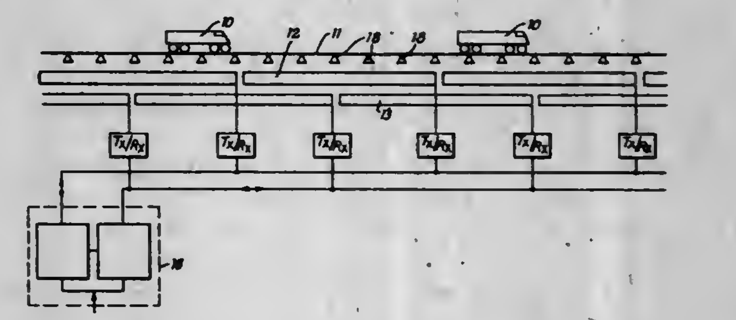
Michael S. Birkin, Derby, England, assignor to British Railways Board, London, England

Filed June 11, 1973, Ser. No. 368,790

Claims priority, application United Kingdom, June 14, 1972, 27869/72

Int. Cl. B61l *1/10, 27/00*

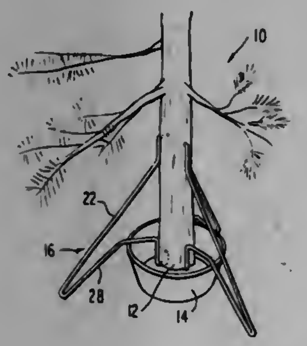
U.S. Cl. 246—63 A **8 Claims**



1. A bi-directional vehicle control system for generating information related to the location, direction, and velocity of a vehicle adapted to move along a fixed path which system operates regardless of the direction of vehicle motion along said path, said system comprising,

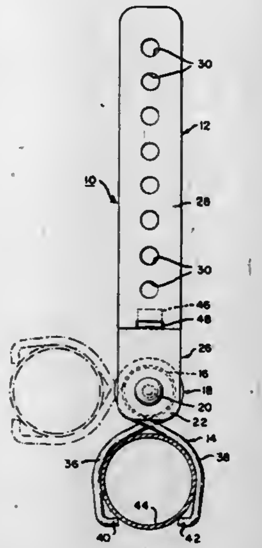
a plurality of uniquely identifiable transponder means positioned at known locations adjacent said path,
first means carried by said vehicle at one extreme end thereof for determining the identity of each transponder means passed by said first means,
second means carried by said vehicle at another extreme end thereof for determining the identity of each transponder means passed by said second means,
radiating cable communication means located adjacent said fixed path, and
vehicle carried communication means responsive to said first and second means and coupled to said radiating cable communication means for transmitting the identity of each transponder means passed by either said first or said second means to said radiating cable communication means.

3,888,438
DISPOSABLE CHRISTMAS TREE STAND
Ned W. Mizelle, 902 Sedgewick Ln., High Point, N.C. 27260
Filed Apr. 16, 1974, Ser. No. 461,468
Int. Cl. A47g *33/12*
U.S. Cl. 248—48 **5 Claims**



1. A Christmas tree stand comprising three substantially identical bracket members each adapted to be attached to the tree in generally equally spaced relation therearound, said members each being formed from a single elongated piece of metal rod bent intermediate its ends to form a depending loop defining a foot for engaging a supporting surface with the end portions of the rod extending from the loop at an acute angle relative to one another, one of said end portions extending upwardly and inwardly toward the tree and terminating in a short inwardly directed section adapted to pierce substantially radially into the trunk of the tree at a first point spaced substantially above the base of the tree, the other of said end portions extending upwardly from said loop and extending toward the tree and terminating in a downwardly depending upwardly open hook including a first vertically extending section adapted to engage the trunk of the tree at a second point intermediate said first point and the base of the tree and to extend from said second point along the trunk of the tree to said base, a second vertically extending inwardly spaced section adapted to penetrate said base, and a radially extending portion joining said first and second vertically extending portions and having a length less than the radius of the smallest tree to be supported thereon, said radially extending portion and said second vertically extending portion cooperating to support a portion of the weight of the tree and to retain said first section of said hook in firm contact with said tree trunk, said hook being spaced above the level of said foot whereby said tree base is positioned above the support surface.

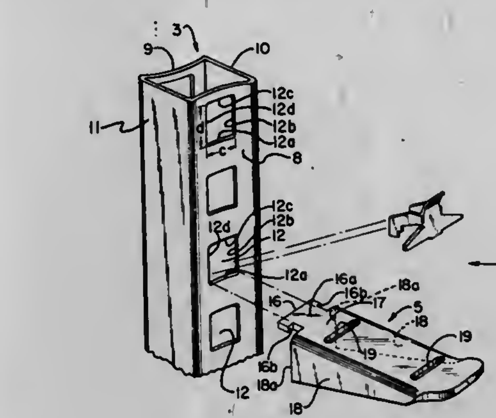
3,888,439
CONDUIT HANGER ASSEMBLY FOR AUTOMOTIVE AND SIMILAR USES
Thomas J. Tuttle, Cavanaugh Lake, Chelsea, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed Mar. 30, 1972, Ser. No. 239,691
Int. Cl.² F16L *3/02*
U.S. Cl. 248—54 R **4 Claims**



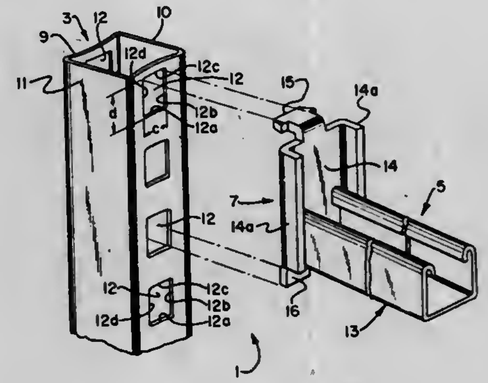
1. A conduit hanger assembly for automotive exhaust system components and the like including elongate fastening means adapted adjacent one end to be secured to a support structure, an annular elastomeric member, connecting means securing said elastomeric member to the other end of said fastening means, and a spring hanger comprising a torsion spring having a coil body and arms which are integral extensions of the opposite ends of the coil ends which form spaced apart tong arms between which an exhaust system component can be inserted to expand and be gripped by the tong arms, the coil body of said hanger being positioned about the periphery of said elastomeric member in frictional engagement therewith, the internal diameter of said coil body in an unstressed condition being less than the outside diameter of said elastomeric member whereby, by contraction of said tong arms forming spring extensions the frictional engagement between said coil and said elastomeric member can be reduced sufficiently to permit relative angular adjustment between said elastomeric member and said hanger and whereby expansion of the coil tong arm causes contraction of said coil into tighter immobilizing frictional engagement with said elastomeric member.

3,888,440
SUPPORT ARRANGEMENT
Hugo E. Rebentisch, Garden City, Mich., assignor to Unistrut Corporation, Wayne, Mich.
Filed Apr. 8, 1974, Ser. No. 458,885
Int. Cl. A47g *29/02*
U.S. Cl. 248—73 **11 Claims**

1. A support arrangement comprising:
a structural member including a side having a rectangular opening therein defined by top, bottom and side edge surfaces in the side, said side having a front surface and a rear surface and the rectangular opening in said side having a predetermined height and width;
a support member having a T-shaped end portion disposed in the rectangular opening in the side and a support portion adjoining the T-shaped end portion, said T-shaped end portion having a bottom surface abutting the bottom edge surface in the side of the structural member, front edges abutting the inner surface of the side of the structural member adjacent to the rectangular opening, a top surface, and a rear edge, said T-shaped end portion further having a maximum width less than either diagonal of the rectangular opening but greater than the width of the rectangular opening, and having a minimum width slightly less than the width of the rectangular opening whereby the T-shaped end portion is incapable of any significant lateral movement within the opening; and
a locking clip disposed in the rectangular opening and adjacent to the top surface of the T-shaped end portion of the support member, said locking clip having a main body portion; a leg portion adjoining the main body portion and having an upper surface and a free, notched end; and side portions adjoining the main body portion, the main body portion of the locking clip being disposed adjacent to the rectangular opening above the top surface of the T-shaped end portion of the support member and external to the outer surface of the side of the structural member, said leg portion of the locking clip extending into the opening with the free, notched end thereof engaging the rear edge of the T-shaped end portion and the top surface thereof abutting the top edge surface of the side at a predetermined region, thereby preventing any significant upward movement of the support member within the rectangular opening, and the side portions of the locking clip abutting the outer surface of the side of the structural member.

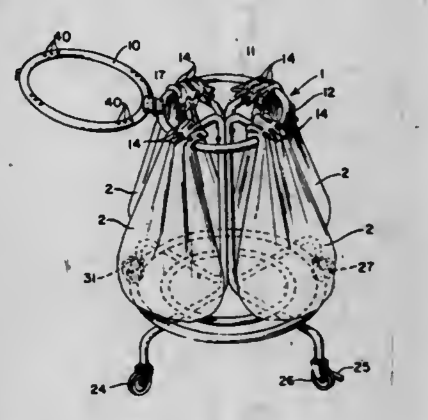


3,888,441
SUPPORT ARRANGEMENT
Hugo E. Rebentisch, Garden City, Mich., assignor to Unistrut Corporation, Wayne, Mich.
Filed Apr. 8, 1974, Ser. No. 458,886
Int. Cl. F16l *3/08*
U.S. Cl. 248—73 **6 Claims**



1. A support arrangement comprising:
a structural member including a side having a plurality of rectangular openings therein defined by top, bottom and side edge surfaces in the side, said side having a front surface and a rear surface and the rectangular openings in said side each having a predetermined height and width;
a support assembly including an end bracket and a support arm adjoining the end bracket, said end bracket including a first portion external to the outer surface of the side of the structural member, a T-shaped locking portion adjoining the first portion and extending into a first rectangular opening in the side of the structural member, and a tab portion adjoining the first portion and extending into a second rectangular opening in the side of the structural member;
said T-shaped locking portion having a bottom surface abutting the bottom edge surface associated with the first rectangular opening and front edges abutting the inner surface of the side of the structural member adjacent to the first rectangular opening, said T-shaped locking portion further having a maximum width less than either diagonal of the first rectangular opening but greater than the width of the first rectangular opening, and a minumum width slightly less than the width of the first rectangular opening whereby the T-shaped locking portion is incapable of any significant lateral movement within the first rectangular opening, said T-shaped locking portion further being capable of upward movement along the first rectangular opening when an upward motion is imparted to the support assembly; and
said tab portion including a first section having a surface abutting the inner surface of the side of the structural member below the bottom edge surface associated with the second rectangular opening, and a second section intermediate the first section of the tab portion and the first portion of the end bracket and extending from within the second rectangular opening to the first portion of the end bracket, said second section of the tab portion having a width slightly less than the width of the second rectangular opening whereby the tab portion is incapable of any significant lateral movement within the second rectangular opening, said first section of the tab portion also being capable of upward movement along the second rectangular opening, together with the T-shaped locking portion moving upwardly along the first rectangular opening, when an upward motion is imparted to the support assembly.

3,888,442
GARBAGE BAG SUPPORT AND STORAGE DEVICE
Harold J. Comeaux, 1448 Bonnabel Blvd., Metairie, La. 70005
Filed Sept. 7, 1973, Ser. No. 395,061
Int. Cl. B62b *3/04*
U.S. Cl. 248—98 **11 Claims**



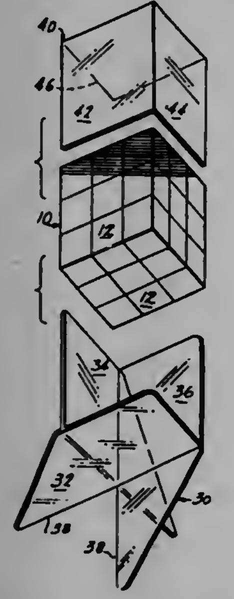
1. A portable garbage bag support and storage device comprised of:
a multiplicity of at least generally similar elongated members fastened together in vertical array;
a caster fixedly mounted on the lower end of each of said elongated members;
a first, horizontally disposed, upper member fastened to the upper ends of said elongated members opposite from said casters;
a second, upper member substantially identical and hingedly mounted to said first, upper member;
at least one lower, horizontally disposed support member means fixedly attached to the lower section of said elongated members for supporting the bottom of the bags

supported by the garbage bag device; each said elongated members being generally "C"-shaped, having a central portion and upper and lower portions or legs, with the central portions of the elongated members being secured together and the upper and lower portions radiating outwardly; said first and second upper members being supported on the upper portions or legs of said "C"-shaped members, and said lower member means being supported on the lower portions or legs of said "C"-shaped members; said first and second upper members and said lower member means being tubular and forming circular rings, with the rings having centers which lie along a line substantially coinciding with the central portions of the "C"-shaped members; said lower member means including two concentric, spaced rings, the inner one of which lies directly under and in line with said first upper member and is substantially identical thereto; and

grasping means mounted between said upper members for grasping the upper portions of bags supported by the garbage bag device.

3,888,443
SUPPORT STAND FOR PUZZLE BLOCKS OR OTHER ITEMS

Cameron D. Flanigen, P.O. Box 82565, Hapeville, Ga. 30354
Division of Ser. No. 225,788, Feb. 14, 1972, Pat. No. 3,771,795. This application Nov. 2, 1973, Ser. No. 412,338
Int. Cl. A47g *23/00;* **F16m** *11/22*
U.S. Cl. 248—152 **3 Claims**

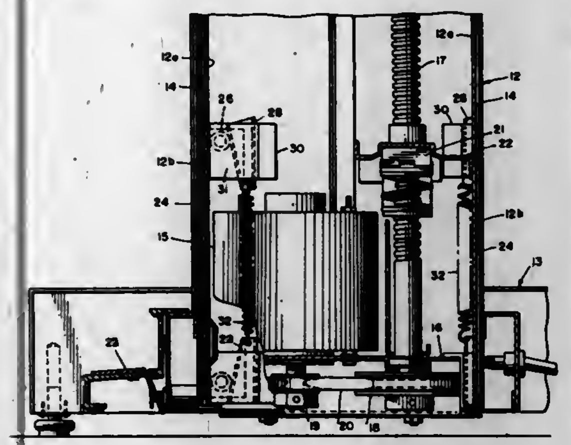


1. In a support stand: a three-sided, tilted support stand having three flat surfaces comprising one-half of an open parallelepiped supported in elevation, each surface being inclined with respect to a vertical axis thereby being capable of supporting loose items such as individual puzzle blocks arranged in a cube on the three surfaces, said stand being constructed from and comprising three flat attached sheets each having a tapered end and together providing three support legs which intersect, said sheets being supported along a respective edge of each sheet which edge extends along and across one of the other sheets.

3,888,444
ADJUSTABLE SUPPORT COLUMN

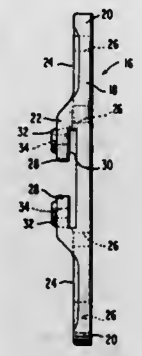
Leonard J. Yindra, Manitowoc, and Robert A. Karl, Kewaunee, both of Wis., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed July 26, 1971, Ser. No. 165,962
Int. Cl. F16m *13/00*
U.S. Cl. 248—188.5 **12 Claims**

1. An adjustable support column for tables and the like comprising a hollow outer tube of generally uniform cross section having substantially planar side walls meeting along a plurality of vertically-extending corners, a hollow inner tube of similar generally uniform cross section telescopingly received in said outer tube, one of said tubes being adapted for connection at its upper end to a table top or the like and the other of said tubes being adapted for connection at its lower end to a floor-engaging base, the external cross sectional dimensions of said inner tube being sufficiently smaller than the internal cross sectional dimensions of said outer tube to define a perimetric space therebetween, and a plurality of vertically-elongated bearing strips mounted upon said inner tube within said space and having vertical edge surfaces bearing against each of the inside surfaces of the walls of said outer tube adjacent the corners thereof, each of said strips extending along a plane parallel with one of said walls of said outer tube and having said vertical edge surface thereof bearing against a wall of said outer tube adjacent to said one wall.



3,888,445
BRACKET

Ralph T. Pence, Lewis, Ind., assignor to Jack M. Hallet, Terre Haute, Ind.
Filed Sept. 20, 1973, Ser. No. 399,246
Int. Cl. E06b *7/28;* **E05f** *3/00*
U.S. Cl. 248—225 **3 Claims**



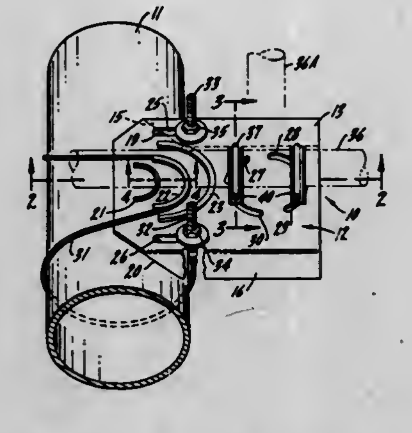
1. A bracket base member comprising:

first and second end portions, each having a plurality of mounting holes therethrough to permit mounting of said bracket base member on a surface;

a center portion joining said first and second end portions and having raised areas defining a mounting channel for receiving an attachment flange, with two threaded openings, one through each raised area, to receive threaded fastening means for clamping an attachment flange within the mounting channel, said threaded openings being non-centrally positioned with respect to said bracket base member and on opposite sides of the center thereof.

3,888,446
POLE MOUNTING BRACKET ATTACHMENT

Dennis H. O'Brien, Omaha, and Dennis D. Havranek, Fremont, both of Nebr., assignors to Valmont Industries Inc., Valley, Nebr.
Filed Apr. 2, 1974, Ser. No. 457,202
Int. Cl. F16b *7/00;* **B65d** *63/08*
U.S. Cl. 248—231 **7 Claims**



1. A bracket attachment for mounting a luminaire, traffic signal, or other device on a pole, adapted for use with poles in a range of varying diameters, comprising:

a flat mounting plate having two pole-engaging wedge elements formed integrally with the plate and bent from the plane of the plate to project outwardly of the obverse surface of the plate;

at least one retainer flange affixed to the mounting plate and projecting outwardly of the reverse surface of the mounting plate;

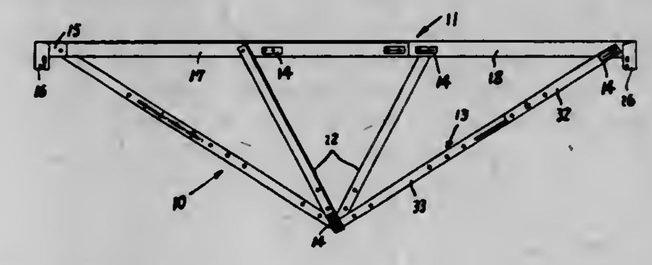
a flexible retainer member looped around the retainer flange, the two free ends of the retainer member extendable around a pole from the reverse surface of the mounting plate to the obverse surface of the plate;

adjustable fastening means for securing the free ends of the retainer member to the mounting plate to affix the mounting plate to a pole, tightening of the adjustable fastening means serving to draw the wedge elements into engagement with the pole, with one end of the mounting plate projecting outwardly from the pole in approximately tangential relation thereto;

and adjustable device mounting means for mounting a device on the projecting end of the mounting plate, at any mounting angle within a substantial angular range, and within a substantial displacement range relative to the mounting plate.

3,888,447
SCAFFOLDING FOR SUPPORTING FRESH CONCRETE FLOOR SLABS

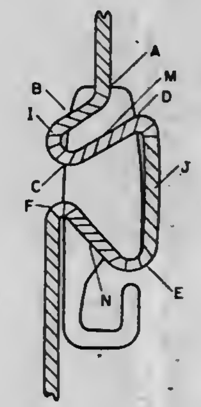
Yakichi Tsushima, Nagoya, Japan, assignor to Nisshin Tsushima Co., Ltd., Nagoya, Aichi and Iwatani & Co., Ltd., Osaka, both of, Japan, a part interest to each
Filed Feb. 15, 1974, Ser. No. 443,090
Int. Cl. E04g *3/00;* **E04b** *1/18;* **E04g** *11/50*
U.S. Cl. 248—235 **5 Claims**



1. A scaffolding for temporary support of a fresh concrete floor slab, comprising means defining a main chord member disposed substantially horizontally and a pair of lower chord members detachably joined together at adjacent ends, the free ends of said lower chord members being respectively detachably joined to said main chord member to define a triangular structure, and at least one bracing member detachably fastened at the joint between lower chord members, the free end of said bracing being detachably joined to said main chord member, said main chord member and the lower chord members each respectively consisting of two separate members which are overlappingly joined together so as to form a single chord, the two members of each lower chord being overlappingly joined together with an intermediate element interposed therebetween, said intermediate element including opposedly wound threads at opposite ends, each member being connected to said intermediate element through a screw means such that when said intermediate element is rotated said chord members are relatively moved to change the lengths of said lower chord members.

3,888,448
ADJUSTABLE HANGER

Charles A. Rowland, 595-D Hedgebrook Ave., Columbus, Ohio 43214
Filed Aug. 23, 1973, Ser. No. 390,954
Int. Cl. F16g *11/00*
U.S. Cl. 248—328 **2 Claims**



1. A unitary load suspension device for adjustable positioning along a vertically arranged length of cord or the like comprising:

a body member including an integral load supporting hook at one end thereof and means defining a plurality of passageways therethrough which when the cord is inserted therein confine the cord to a tortuous path to frictionally hole said body at a preselected position along the cord including:

a first passageway opening from the end of said body opposite from said hook, extending at an acute angle to the longitudinal axis of said body member and exiting through a side face thereof;

a second passageway, spaced from and parallel to said first, opening from said side face and exiting through the opposite side face; and

a third passageway spaced from said second, lying at an acute angle thereto, opening from a point on said hook end of said body and exiting to said side face, all of said passageways lying substantially in a common plane.

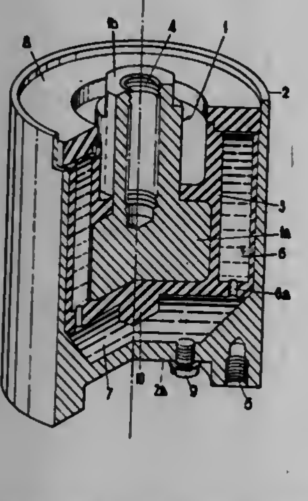
3,888,449
ANTI-VIBRATION MOUNTINGS

Jan Jablonski, North Halling, and Colwyn Francis Stone, Chatham, both of England, assignors to Elliot Brothers (London) Limited, Chelmsford, England
Filed Jan. 14, 1974, Ser. No. 433,250
Claims priority, application United Kingdom, Jan. 16, 1973, 2314/73
Int. Cl. F16m *13/00*
U.S. Cl. 248—358 R **3 Claims**

1. An anti-vibration mounting, for isolating equipment from

vibration of a structure on which the equipment is mounted, comprising:

- A. a first member adapted to be secured to one of the equipment and the structure;
- B. a second member coaxially surrounding the first member and adapted to be secured to the other of the equipment and the structure;
- C. a member of resilient material secured to the first member and to the second member;
- D. a number of cylindrical fluid-filled chambers arranged in annular configuration between the sides of the first and second members and each having a wall area formed at least partially by said resilient material member; and



- E. a further fluid-filled chamber positioned between the ends of said first and second members and having a wall area formed at least partially by said resilient material member;
- F. each said cylindrical chamber communicating via a respective bore with said further chamber so that fluid transfer between the chambers due to distortion of said resilient material member provides damping of relative movement between the first and second members.

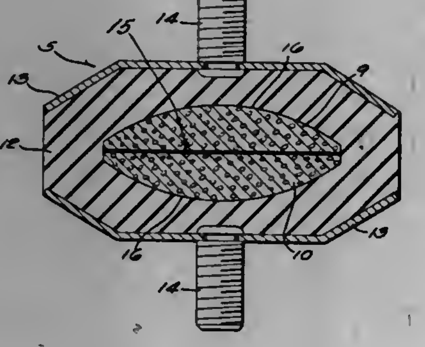
3,888,450
VIBRATION ABSORBING MOUNTING ELEMENT

Richard W. Seilenbinder, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed May 31, 1974, Ser. No. 475,045

Int. Cl. F16f *15/04*

U.S. Cl. 248—358 R **5 Claims**



5. A mounting element by which a vibration generating element can be carried by a supporting member in generally fixed relation to said supporting member, but by which the vibration generating device is permitted to have small movements relative to the supporting member, in response to the vibration forces generated by te device, and in which a substantial portion of the energy of such movements is absorbed so that the mounting element isolates the vibration of the device from the supporting member, said mounting element comprising:

- A. a pair of attachment members, one securable to a vibration generating device and the other securable to a supporting member which carries said device;
- B. a hollow elastomer pad having substantially thick wall portions and to opposite sides of which said attachment members are secured in substantially symmetrical relation to a plane through the hollow interior of the pad, said pad thus providing a resilient connection between the attachment members that provides for said small movements of the vibration generating device;
- C. a pair of rigid porous bodies in the hollow interior of the pad, one at each side of said plane, each having a smooth, flat surface parallel to said plane, said bodies having other surface portions bonded to the interior surface of the pad to be thus held with their said flat surfaces in opposing, slightly spaced apart relation, the bodies being thus constrained to partake to a substantial extent of relative motion between the attachment members; and
- D. a quantity of liquid lubricant in the hollow interior of the pad, filling the space between said flat surfaces of the bodies and substantially impregnating their pores, said liquid being of a kind that developes substantial shearing friction in consequence of relative movement between the bodies and thus serving to absorb a substantial amount of the energy that is expended in effecting relative motion between the bodies.

3,888,451
VEHICLE SEATS

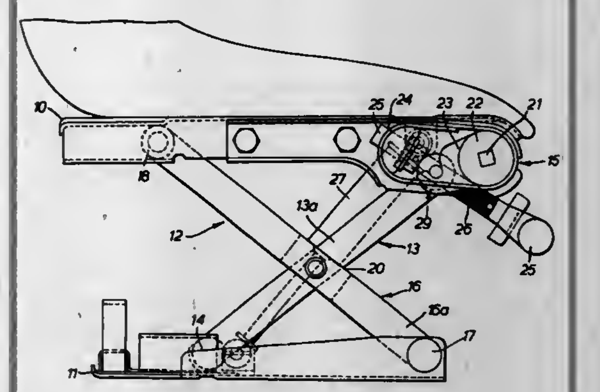
Robert R. Lacey, Bromham, England, assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 4, 1973, Ser. No. 421,712

Claims priority, application United Kingdom, Dec. 6, 1972, 56193/72

Int. Cl. B60n *1/02*

U.S. Cl. 248—399 **7 Claims**



1. A vehicle seat comprising a seat support and a base support interconnected and guided for upward and downward relative movement by a spring suspension, the spring suspension comprising a coupling arm having a first pivotal connection between an end part of the arm and the base support and a second pivotal connection between the opposite end part of the arm and the seat support, one of said pivotal connections comprising a torsion bar extending axially within a tube, the tube being journalled in one of said supports and rigidly connected to said arm, means rigidly coupling the torsion bar at spaced positions along its length to the tube and to said one support respectively, the coupling means between the torsion bars and said one support comprising a torque-transmitting coupling, and an adjustable up-stop device for selectively limiting the permissible upward movement of the seat support, the up-stop device comprising an abutment fixed on the tube, a guide mounted on said one support and extending transversely of the seat and an abutment slidably mounted in the guide, one of said abutments having steps thereon extending longitudinally of the guide, each step of one abutment being arranged for engagement with the other abutment at a different angular position of the tube relative to said one support

thereby to halt the upward movement of the seat support at a different height relative to the base support.

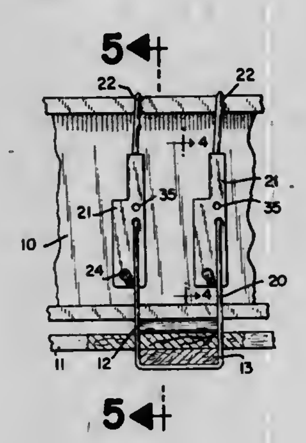
3,888,452
HANGER ASSEMBLY FOR ATTACHING A FORM TO A STRUCTURAL BEAM

Edward J. Anderson, 21 Brown St., West Babylon, N.Y. 11704

Filed June 26, 1973, Ser. No. 373,625

Int. Cl. E04g *13/04*

U.S. Cl. 249—23 **11 Claims**



1. A hanger assembly for holding a pouring form for encasing a structural member, said assembly comprising first and second pairs of U-shaped members, and separate toggle clip means for interconnecting each end of each U-shaped member of said first pair of U-shaped members to a separate end of the U-sahped members of said second pair of U-shaped members, the two ends of each U-shaped member of said first pair of U-shaped members being interconnected by separate said toggle clip means to the ends of separate U-shaped members of said second pair of U-shaped members.

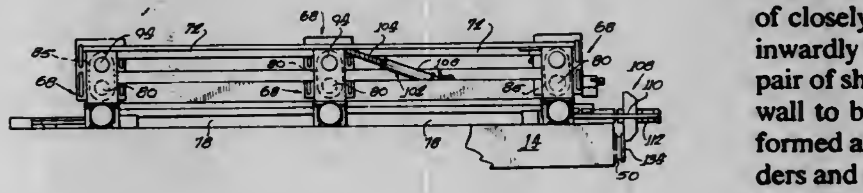
3,888,453
TOP BLOCK STOP FOR APPLYING A LONGITUDINAL FORCE TO THE TOP BLOCK OF A PRESSURE CASTING MOLD

Lyman Wood Jeffreys, Mt. Prospect, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Apr. 12, 1974, Ser. No. 462,612

Int. Cl. B22d *17/06*

U.S. Cl. 249—82 **6 Claims**



1. In a mold apparatus having side blocks laterally movable toward and away from each other and a plurality of movable inner blocks, including a longitudinally extending top block having first and second ends, said top block being positioned between the side blocks and engaged therewith, the side blocks and the inner blocks defining together a casting cavity and also a riser cavity at the first end of said top block, a top block support beam connected to said first end of said top block, a top block stop connected to said top block support beam at said second end of said top block, said top block stop having means reacting against a portion of said mold apparatus for applying an engaging force to said first end of said top block in a longitudinal direction away from said riser cavity.

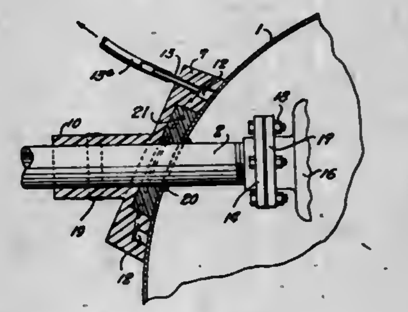
3,888,454
MEANS FOR FORMING A SEAL ABOUT A CONDUIT

Frank G. Treadaway, Mineral Wells, Tex., assignor to Harsco Corporation, Harrisburg, Pa.

Filed Jan. 3, 1973, Ser. No. 320,760

Int. Cl. B22d *19/04*; **B29c** *27/00*; **C09j** *5/10*

U.S. Cl. 249—90 **3 Claims**



1. A mold to form a seal about a conduit extending through a wall comprising; a hollow flexible cylindrical mold body having a central passage extending therethrough; upper and lower end surfaces on said hollow cylindrical mold body, said lower end surface having an annular groove formed therein adjacent the periphery thereof, said annular groove extending about said central passage; and means to evacuate air from said annular groove to secure said lower end surface on said cylindrical body to the wall about the conduit when the conduit is positioned to extend through said passage.

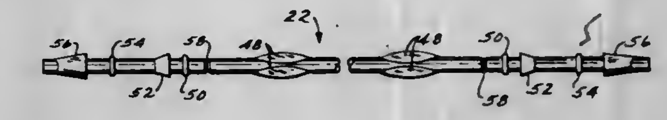
3,888,455
TIE BAR FOR SUPPORTING FORM WALLS OF A CONCRETE FORM

Glenn H. Mikus, 3820 Woodcrest Dr., St. Louis County, Mo. 63124

Division of Ser. No. 128,951, March 29, 1971, Pat. No. 3,767,158. This application Aug. 23, 1973, Ser. No. 391,152

Int. Cl. E04g *9/00*

U.S. Cl. 249—214 **3 Claims**



1. A tie bar for holding inner and outer form walls of a concrete form in spaced relation, comprising an elongate metal bar of generally circular cross-section throughout its length, a generally centrally located flattened ear extending laterally of said bar for holding said bar against rotation in said concrete wall, the ends of said bar having flat portions formed thereon for gripping with a wrench to twist said bar, a first pair of closely spaced shoulders formed near each end of said bar inwardly from said flat end portions, the innermost of said first pair of shoulders being coplanar with the faces of the concrete wall to be poured, a second pair of closely spaced shoulders formed at each end of said bar between said first pair of shoulders and said flat end portions, and score lines around said bar inwardly of the innermost of said first pair of shoulders.

3,888,456
COMBINATION TIE END LATCH AND REINFORCING TIMBER CLAMP

William E. Umstead, 1010 Ogden St., Denver, Colo. 80218

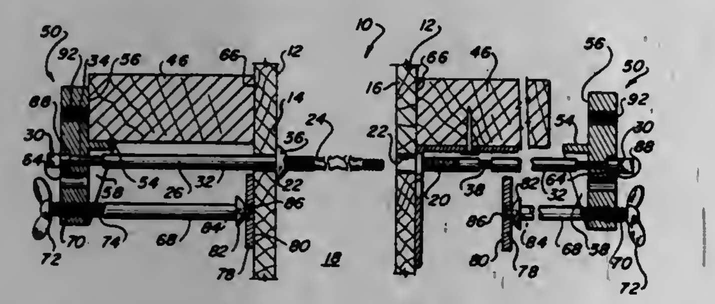
Filed Aug. 16, 1973, Ser. No. 388,972

Int. Cl. E04g *17/00*

U.S. Cl. 249—219 W **18 Claims**

1. The combination tie end latch and reinforcing timber clamp which comprises: bracket means; latch means carried by said bracket means for detachably connecting same for tiltable movement about an axis intermediate its margins to a concrete form tie or the like in spaced relation to a fixed

abutment; and, extendable means carried by said bracket means on one side of said axis of tiltable movement operative upon actuation to engage the fixed abutment and tilt the portion of said bracket means on the other side of said axis inwardly toward said abutment with a jaw-like action effective to clamp a reinforcing member against the latter when interposed therebetween.



3,888,457

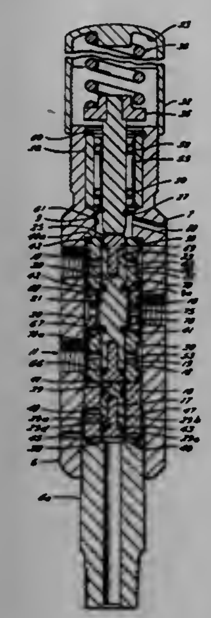
HIGH OR LOW PRESSURE CONTROL DEVICE

Joseph W. Taylor, 10010 Briarwild, Houston, Tex. 77055

Continuation of Ser. No. 312,856, Dec. 7, 1972, abandoned. This application Jan. 2, 1974, Ser. No. 430,162

Int. Cl. F16k *31/143*

U.S. Cl. 251—14 **9 Claims**



1. A device for controlling the flow of fluid in response to pressure variations in a controlled member, said device comprising:

a valve body having an axial bore therethrough;

said valve body having first and second inlet ports and an outlet port all communicating between said bore and exterior of said body;

cylindrical hollow adapter means positioned in said bore, said adapter means having lateral passages therethrough communicating between both of said inlet ports and the interior of said adapter means;

slide valve means positioned within the interior of said adapter means;

said slide valve means including a first pair of annular seal members positioned on opposite sides of said outlet port;

conduit means for communicating between said adapter means interior and said controlled member whereby pressure from said controlled member may exert a force against said slide valve means;

resilient means for yieldably urging said slide valve means in the direction of said conduit means, and means for varying the force so urging said resilient means;

combination means for selectively (a) opening fluid communication between said first inlet port and said outlet port while simultaneously blocking fluid communication between said second inlet port and said outlet port deemed a first position, (b) opening fluid communication between said second inlet port and said outlet port while simultaneously blocking fluid communication between said first inlet port and said outlet port, deemed a second position, and (c) blocking communication between both of said inlet ports and said outlet port, deemed a third position; and

said combination means including the following;

a radially enlarged annular portion of said slide valve means having oppositely facing shoulders,

oppositely facing shoulders provided said adapter means abuttable with said slide valve shoulders, and

the axial separation of said slide valve shoulders is sufficiently less than the axial separation of said adapter shoulders such that on one of said slide valve shoulders abutting an adjacent one of said adapter shoulders said first position is assumed, and on the other of said slide valve shoulders abutting the other of said adapter shoulders said second position is assumed.

3,888,458

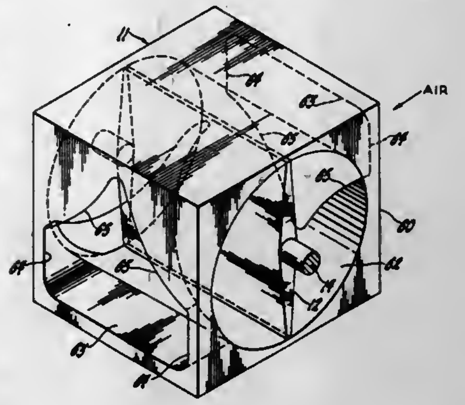
MASS FLOW AIR METER

William C. Bubniak, Troy; Louis W. Huellmantel, Warren, and Harry R. Mitchell, Bloomfield Hills, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 278,958, Aug. 9, 1972, Pat. No. 3,817,099. This application Nov. 19, 1973, Ser. No. 417,242

Int. Cl. F16k *47/00, 1/22*

U.S. Cl. 251—118 **4 Claims**



1. An air valve for use in an engine air induction system having throttle means for controlling air flow therethrough, said air valve including a housing in the system upstream of the throttle means, a cross bore in said housing, a first contoured hole of continuous profile extending from one surface of said housing to run out at said cross bore, a second contoured hole, identical in size but inverted with respect to said first contoured hole, extending from the opposite surface of said housing to run out at said cross bore, a rectangular valve plate rotatably mounted in said cross bore for movement between closed and open positions relative to said contoured holes, said valve plate when in an open position relative to said contoured holes defining flow areas, the total flow area uncovered for any given valve plate open position being comprised of two diametrically opposite orifices, the orifice areas uncovered by said valve plate being in planes parallel to the continuous cross sections of said contoured holes, said first contoured hole and said second contoured hole each being of a shape to provide a straight-through flow path through said housing with large flow areas immediately upstream and downstream, relative to fluid flow through said housing, from said orifices, and with predetermined scheduled flow areas, which as uncovered by said valve plate, define said orifices, the contoured shape of each of said scheduled flow areas being such so as to control the percentage change in flow area for a fixed incremental change in said valve plate rotative angle to a constant value.

3,888,459

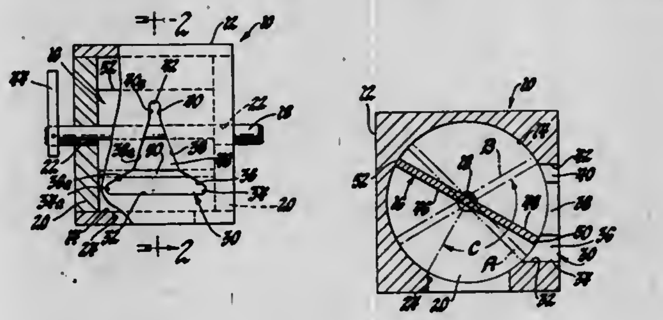
FLOW CONTROL VALVE

William C. Bubniak, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 23, 1973, Ser. No. 418,602

Int. Cl. F16k *47/00, 1/22*

U.S. Cl. 251—208 **4 Claims**



1. A flow control valve including a valve body having a circular cross bore therethrough, side covers secured to opposite sides of said valve body to enclose said cross bore, a contoured hole of continuous profile extending from one surface of said valve body to run out at said cross bore, said contoured hole in cross section being of a predetermined scheduled area configuration, a hole extending from a surface of said valve body to run out at said cross bore, a shaft journalled in said side covers and extending through said cross bore concentrically therewith, a rectangular valve plate fixed to said shaft for rotation in said cross bore about the axis of rotation of said shaft for movement between a closed position and a full open position relative to said contoured hole, the included angle in the cross bore between said contoured hole and said hole when said valve plate is in said full open position being less than 180°, said valve plate when in an open position defining with said contoured hole a flow area, the size of which increases at a predetermined fixed rate relative to the rotative angle of said valve plate as determined by the predetermined scheduled area configuration of said contoured hole.

3,888,460

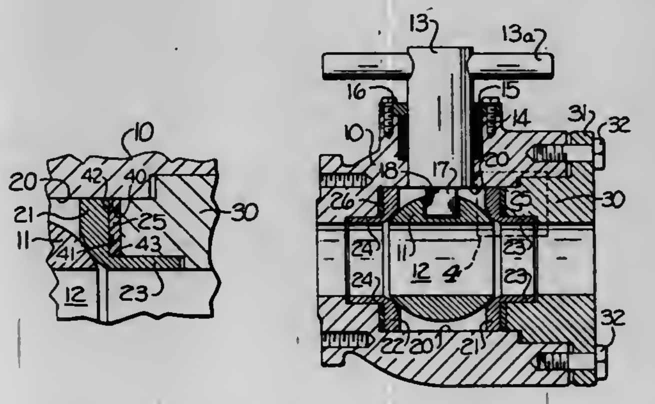
BALL VALVE COMPRESSION SEAT

James W. Sigmon, Charlotte, N.C., assignor to Sigmon Corporation, N.C.

Filed Mar. 18, 1974, Ser. No. 451,784

Int. Cl. F16k *5/06*

U.S. Cl. 251—315 **5 Claims**



1. A fluid flow controlling valve comprising:

a valve body having a conduit extending therethrough for guiding fluid flow from an upstream portion thereof toward a downstream portion thereof,

a valve member defining a spherical segment surface and mounted within said body portion for rotation about an axis perpendicular to said conduit and between flow permitting and flow blocking positions for controlling flow of fluid through said conduit,

seat ring means mounted within said body and encircling one of said upstream conduit portion and said downstream conduit portion for sealingly engaging said spherical segment surface of said valve member and cooperating with said valve member for sealing against fluid flow through said valve upon rotation of said valve member to the flow blocking position,

said valve body and said seat ring means having axially opposing surfaces extending generally perpendicular to said conduit and having circumferentially opposing surfaces extending generally parallel to said conduit and said opposing surfaces defining the boundary of a confining volume,

resilient thermoplastic compression seal means compressively confined within said confining volume for exerting on said seat ring means force biasing said seat ring means into engagement with said valve member, said seal means contacting the entirety of said boundary surfaces of said confining volume for sealing against leakage flow between said valve body and said seat ring means, and

means for applying to said seal means compressive force directed axially of said conduit for maintaining said seal means in compressive confinement and thereby for maintaining sealing engagement between said valve member and said seat ring means.

3,888,461

QUICK-ACTING WATER-TAP

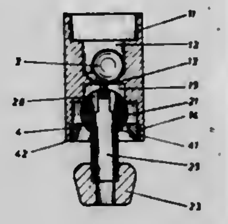
Dan Bron, Haifa, Israel, assignor to Unitrol Water Saving Products Ltd., Tel-Aviv, Israel

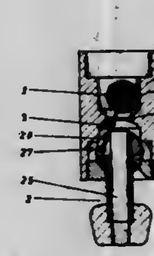
Filed Apr. 8, 1974, Ser. No. 459,035

Claims priority, application Israel, Apr. 18, 1973, 42057

Int. Cl. F16n *1/00;* **F16k** *31/50, 31/58*

U.S. Cl. 251—351 **6 Claims**





1. A quick-acting water-tap including a housing adapted to be connected to a faucet or the like, a valve seat within said housing, a receptacle disposed above said valve seat and a ball within said receptacle capable of being sealingly engaged upon said valve seat; said ball being freely movable within said receptacle, a water spout disposed within said housing below said valve seat, said water spout having a through water passage and comprising an outlet pipe having a spherical end portion, a finger projecting outwardly from said end portion, said water spout being fastened within said housing with the spherical end portion being movably and rotatably positioned below said valve seat said water spout being movable to a position whereby said finger will engage said ball to displace same from its seated condition when said water spout is coaxial with said valve seat, said water spout being angularly displaceable relative to said housing and movable to a position withdrawing said finger thereby enabling return of said ball to

its seated condition, with the degree of angular displacement determining the flow past the valve seat when the ball is unseated.

3,888,462

PHOTOGRAPHIC PROJECTOR WITH FADER DEVICE

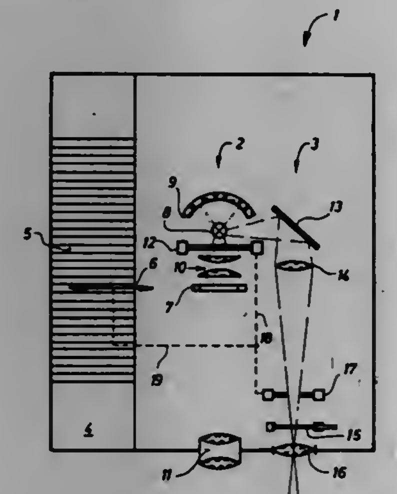
Reinhard Sobotta, Mascherode, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Oct. 24, 1973, Ser. No. 409,302

Claims priority, application Germany, Oct. 31, 1973, 2253267

Int. Cl. G03h *21/26, 23/16*

U.S. Cl. 353—29 **9 Claims**



1. A picture slide projector comprising means for projecting a main beam of light onto a viewing screen, slide holding means for holding a selected one of several picture slides in said main beam in position so that an image of such slide may be projected along said main beam onto the viewing screen, means for hold a slide magazine containing several picture slides, slide changing means for moving successive slides from said magazine to said slide holding means in said main beam and vice versa, means for projecting a non-picture auxiliary beam of light onto the same viewing screen for screen illumination purposes only without producing any picture image thereon, and fading means for fading out one beam and fading in the other beam alternately, so that the image of the picture slide may be faded from the viewing screen in connection with a change of slides and while so faded out the screen may be illuminated to approximately the same brilliance by light from the auxiliary beam and without any picture during such illumination by the auxiliary beam, there being no slide holding means in said auxiliary beam and no slide changing means for moving a slide into and out of said auxiliary beam.

3,888,463

SELF-LEVELING HOIST FOR WHEEL CHAIRS

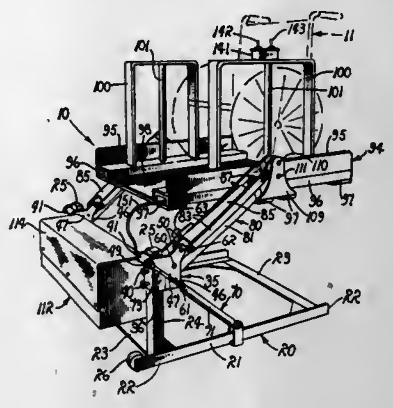
Robert A. O'Brien, 2303 E. Acacia, Fresno, Calif. 93726, and Manuel Peterson, 3128 Ventura, Fresno, Calif. 93702

Filed Aug. 20, 1973, Ser. No. 389,463

Int. Cl. B60p *1/48*

U.S. Cl. 254—10 C **4 Claims**

1. A wheel chair hoist comprising a mobile frame, elongated support means mounted on the frame and upwardly extended therefrom, bracket means mounted on the support means for elevational adjustment, means for securing the bracket means in adjusted position on the support means, a wheel chair platform having oppositely disposed open ends and a path of wheel chair travel between the open ends, substantially parallel arms pivotally connected to the bracket means and to the platform on opposite sides of the path mounting the platform on the frame at one side of the support means for concurrent longitudinal reciprocal movement and adjustable elevational movement in parallelism, powered means interconnecting the bracket means and the arms to raise and to lower the platform on the frame, and a counterbalance mounted on the bracket means on the opposite side of the support means from the platform for integral elevational adjustment with the bracket means.



3,888,464

INDEPENDENT JACKING SYSTEM FOR VEHICLES AND THE LIKE

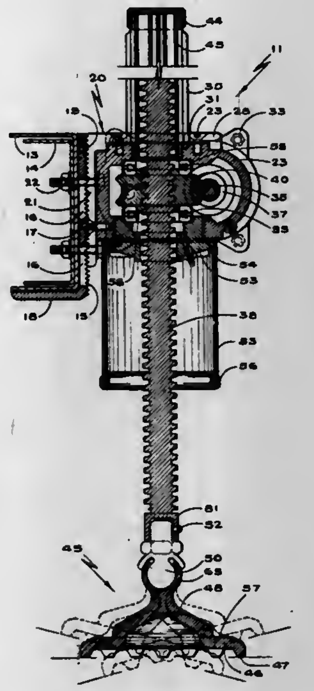
Karl H. Felsen, 47 Matinee Bay, Winnipeg, Manitoba, Canada

Filed May 7, 1974, Ser. No. 467,661

Claims priority, application Canada, June 26, 1973, 174930

Int. Cl. B66f *3/18*

U.S. Cl. 254—86 R **8 Claims**



1. A jacking device for vehicles and the like which include a longitudinally extending frame member and a source of electrical energy; comprising in combination means to secure said device to the frame member, a gear box enclosure secured to said means, a reversible electric motor secured to one side of said enclosure and being selectively connectable to said source of electrical energy, an elongated jack screw extending vertically through said gear box, means to support said screw for vertical extending and retracting movement relative to said gear box, means to inhibit rotation of said jack screw within said gear box, a jack shoe on the lower end of said jack screw, and worm and nut drive means within said gear box operatively connected between jack screw and said electric motor, a synchronized limit switch assembly secured to the other side of said gear box for disconnecting said electric motor from said source of electrical energy at the upper and lower limits of travel of said jack screw, said worm and nut drive means including a worm gear, a worm gear shaft journalled for rotation within said gear box and a nut screw threadably engaging around said jack screw and being engaged by said worm gear, said nut including bearing support means within said gear box, and constituting said means for supporting said jack screw, said limit switch assembly including a casing, a limit switch screw shaft journalled for rotation within said casing, gear means connecting said worm gear shaft with said limit switch screw shaft, a non-rotatable nut engaged around said limit switch screw shaft for travel therealong when said shaft is rotated, and upper and lower limit switches in said casing operated by said last mentioned nut when said nut is at the upper and lower limits of travel upon said limit switch screw shaft, said limit switches being operatively connected between said source of electrical energy and said electric motor.

3,888,465

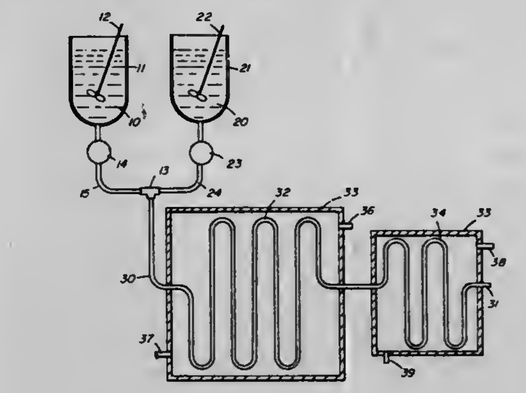
APPARATUS FOR COMBINING CHEMICALLY COMPATIBLE SOLUTIONS

James P. Terwilliger; Anthony D. Gingello, and John R. Tinney, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 231,841, March 6, 1972. This application Feb. 13, 1974, Ser. No. 442,272

Int. Cl. B01f *15/06*

U.S. Cl. 259—4 **1 Claim**



1. Apparatus for the continuous chemical sensitization of photographic emulsions, comprising the steps of:
  - means for pumping a separate flow of a photographic emulsion and of a sensitizer solution at a predetermined rate to a common junction at which the flows intermix into a common flow upon coming into contact;
  - means connecting the pumping means to the common junction and the latter to a discharge outlet and forming between the common junction and the outlet an extended path through which the common flow is moved by the pumping means for treatment thereof prior to discharge at the outlet;
  - means arranged in the extended path for treating the common flow comprising heat exchanger means in which a first section of the path is contained for maintaining the common flow at a predetermined temperature and cooling means in which a second section of the path is contained for rapidly reducing the temperature of the common flow to produce a uniformly sensitized emulsion; and means associated with the connecting means for continuously mixing the common flow during its movement through substantially the entire length of the path.

3,888,466

AGITATING APPARATUS

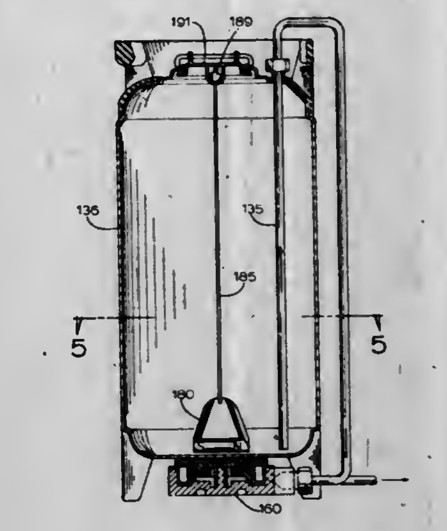
Jason K. Sedam, Dunwoody, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 111,959, Feb. 2, 1971, Pat. No. 3,744,764. This application May 7, 1973, Ser. No. 357,306

Int. Cl. B01f *13/08*

U.S. Cl. 259—44 **5 Claims**

1. An agitator dispenser having a container for holding a fluid to be dispensed as a consumable beverage wherein:
  - Agitating means are provided for agitating a dispensable fluid in the container and wherein driving means are provided for driving the agitating means, torque being applied to the driving means by the same dispensable fluid after it has been withdrawn from the container, and further wherein said agitating means comprises a magnetic element immersed within the container holding the fluid so as to form a magnetic coupling with said driving means when said torque is applied to the driving means.



3,888,467

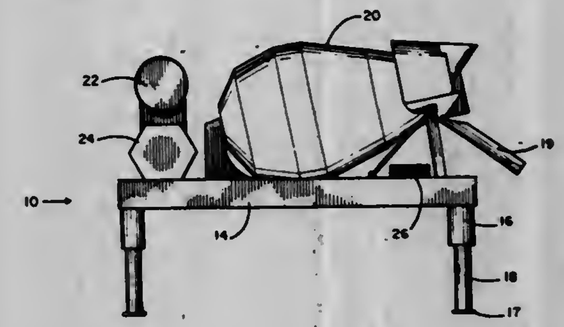
CONCRETE HOLDING AND MIXING ASSEMBLY AND METHOD OF TRANSPORTING AND DISTRIBUTING CONCRETE

Charles W. Sheets, 1321 Greenfield Dr. No. 12, El Cajon, Calif. 92021

Filed Sept. 27, 1973, Ser. No. 401,215

Int. Cl. B28c *5/18*

U.S. Cl. 259—148 **7 Claims**



1. An assembly independent from a truck chassis or trailer frame for holding and mixing concrete comprising: a mixing drum, power drive means for rotating said drum, a base support member to which said drum and drive means are secured, and hydraulic lift means for selectively raising and lowering said base support member and being extendable to support said assembly on a ground surface and retractable to lower said assembly for being mounted on a truck chassis or trailer.

3,888,468

MOBILE CONCRETE BATCH PLANT AND DUAL SHIFTABLE MOBILE MIXERS THEREFOR

Max D. Albin, Urbana, Ill., assignor to Koehring Company, Milwaukee, Wis.

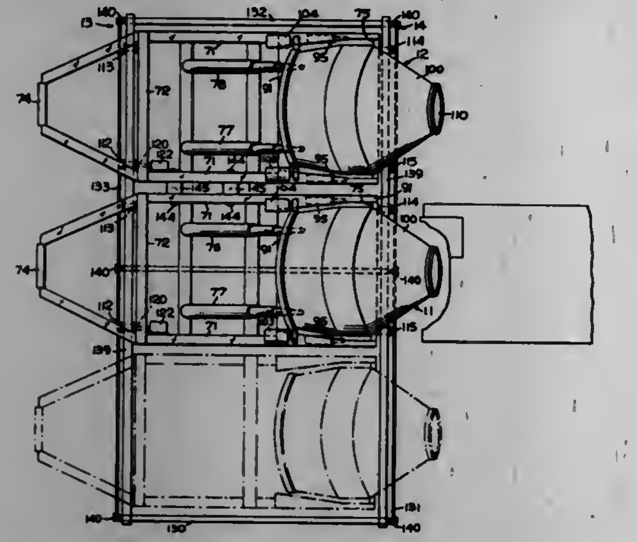
Filed Feb. 26, 1974, Ser. No. 446,004

Int. Cl.^{2} B28C *7/14, 9/04*

U.S. Cl. 259—171 **10 Claims**

6. In combination: a batch plant for supplying material from an elevated discharge outlet thereon, guide rail means spaced from and relatively below said discharge outlet, a plurality of mobile mixers for supplying vehicles, each mixer having

ground engaging wheels enabling over-the-road transport and further having guide wheels for engagement with said guide rail means, each mixer having a drum thereon for receiving material from said discharge outlet and for mixing and discharging said material into said other vehicles after it has been mixed, means for detachably connecting said plurality of mixers together to enable simultaneous movement of said plurality of mixers on said guide rail means, and means including reversible drive means for at least one of said guide wheels on one of said mixers for moving said plurality of mixers simultaneously on said guide rail means first in one direction and then in another direction so that the drum of one mixer is in one location to receive material from said discharge outlet while the drum of another mixer is in another location to discharge mixed material into one of said vehicles.



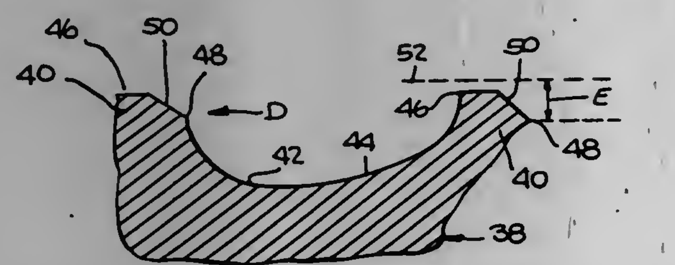
3,888,469
EXTRUSION MILL

Paul Geyer, Detroit, Mich., assignor to Uniroyal, Inc., New York, N.Y.

Filed Feb. 5, 1974, Ser. No. 439,776

Int. Cl. B29b *1/06*

U.S. Cl. 259—191 **9 Claims**



1. In a mill for mixing and extruding elastomeric stock, said mill including a barrel having an elongate bore, and a worm rotatably supported in said bore, said worm in axial cross-section presenting helical threads and grooves alternating with one another and which are adapted to mix and advance elastomeric stock in said bore, said threads terminating in respective crests which extend adjacent to an internal surface of said barrel defining said bore, each of said crests having frontal and distal portions facing downstream and upstream of said bore, respectively, an improvement comprising deaerating means for venting-to-atmosphere only unidirectionally upstream of said bore fluid collected in the latter from elastomeric stock mixed by said worm, said deaerating means defining a helical venting path between said internal surface of said barrel and said distal portion of each of said crests, said helical venting path having a maximum radial clearance which is greater than any clearance between said internal surface of said barrel and said frontal portion of each of said crests, each of said grooves having a tapered bottom which deepens in a direction downstream of said bore, the more shallow upstream region of each said tapered bottom acting to compress and deaerate elastomeric stock, the deeper downstream region of each said tapered bottom permitting fluid deareated from the elastomeric stock to advance downstream to said helical venting path.

3,888,470
METHOD AND APPARATUS FOR AUTOMATICALLY REGULATING THE PLASTICITY OF CERAMIC MATERIAL

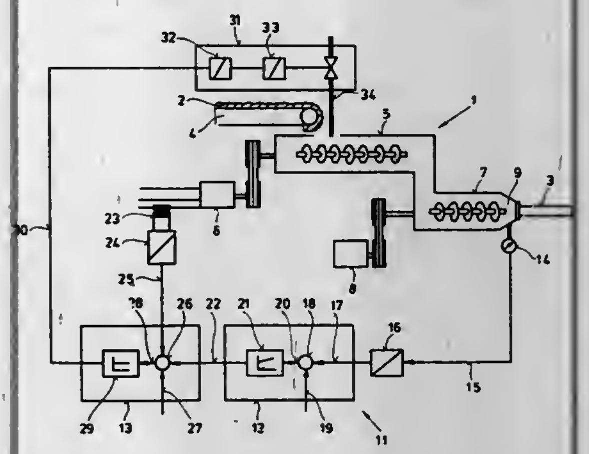
Wolfgang Leisenberg, Lich/Hesse, Germany, assignor to Manfred Leisenberg KG Industrifeuerungen, Germany

Filed Apr. 8, 1974, Ser. No. 459,009

Claims priority, application Germany, May 26, 1973, 2326969

Int. Cl. B29b *1/06*

U.S. Cl. 259—191 **14 Claims**



1. A method of controlling the plasticity of ceramic material in a production chain in which a mixer is fed raw material and feeds an extrusion press having an extrusion head, the mixer and the extrusion press being driven by respective prime movers, comprising the steps of:

generating a first signal indicative of the power consumption of the mixer prime mover;

generating a second signal indicative of the plasticity at the extrusion head;

comparing the second signal with a reference, third signal, representing desired plasticity, to obtain a correction signal;

combining the first and correction signals to obtain a corrected first signal;

comparing the corrected first signal with a reference fourth signal, representing desired power consumption, to obtain a fifth signal; and

adding moisture controlling substances to the mixer in accordance with the magnitude of the fifth signal.

3,888,471
APPARATUS FOR THERMALLY TRANSFORMING METAL PARTS

Lester Coch, Northport, N.Y., assignor to Waldes Kohinoor, Inc., Long Island City, N.Y.

Division of Ser. No. 105,932, Jan. 12, 1971, Pat. No. 3,756,871. This application Apr. 5, 1973, Ser. No. 348,091

Int. Cl. C21d *1/46*

U.S. Cl. 266—4 A **19 Claims**

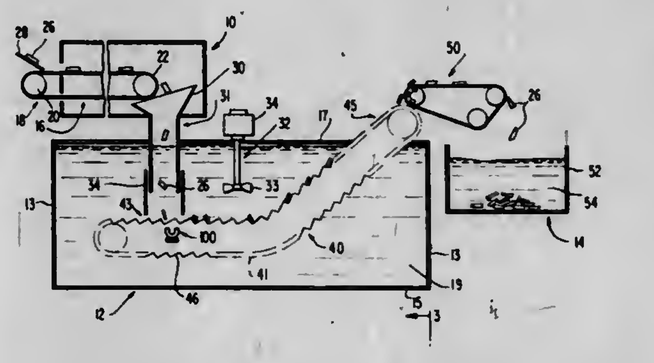
1. A system for thermally transforming metal elements heat treated at an elevated temperature, the system comprising:

a cooling and isothermal transformation reservoir including a quenching medium;

conveyor means for transporting metal elements from a conveyor loading station positioned within said quenching medium to a conveyor unloading station positioned externally of said medium;

guide means for guiding the metal elements heat treated at an elevated temperature from a location externally of said quenching medium toward said loading station of said conveyor means; and

magnetic flux producing means, positioned within said quenching medium adjacent said loading station, for controlling the holding time of the metal elements at quench temperature within said quenching medium by magnetically attracting the guided metal elements onto said conveyor means at said loading station so as to assist in positioning of the metal elements on said conveyor means.



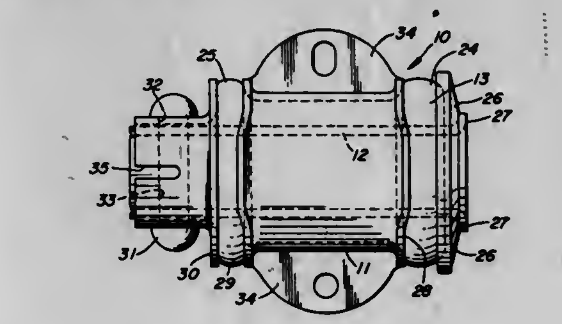
3,888,472
SUSPENSION INSERT FOR A TWO-HEADED RESILIENT BUSHING

A. J. Hofmann, Frankfurt, Ind., assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Apr. 25, 1974, Ser. No. 463,955

Int. Cl. F16f *1/38*

U.S. Cl. 267—57.1 R **8 Claims**



1. In a two-headed resilient bushing of the type including a rigid outer member, a rigid inner member concentrically disposed within said outer member, a first retainer member, a second retainer member, and a suspension insert including two end heads and mounted in radial compression and elongation between said inner member and said outer member with each of said heads respectively mounted between each of said retainer members and said outer member at the ends of said outer member, an improved suspension insert comprising:

A. A suspension insert of an elastomeric composition having (i) a generally cylindrical central body part of annular shape with inner and outer peripheries and adapted to be mounted in radial compression and under at least about 30% elongation between said inner member and said outer member and, (ii) first and second end parts axially positioned at opposite ends of said body part as integral portions of said body part;

B. said first head part having when unstressed (i) an outer periphery larger than the outer periphery of said body part, (ii) an inner periphery at least about as large as said body part, and (iii) a volume at least as large as the desired volume of a first stressed and formed head of said desired resilient bushing; and

C. said second head part having when unstressed (i) an outer periphery at least about as small as the outer periphery of said body part, (ii) an inner periphery smaller than the inner periphery of said body parts and annularly tapered at one end thereof to integrate with the interior of said body part at an angle of less than about 50°, and (iii) a volume at least as large as the volume of a second stressed and formed head of said desired resilient bushing.

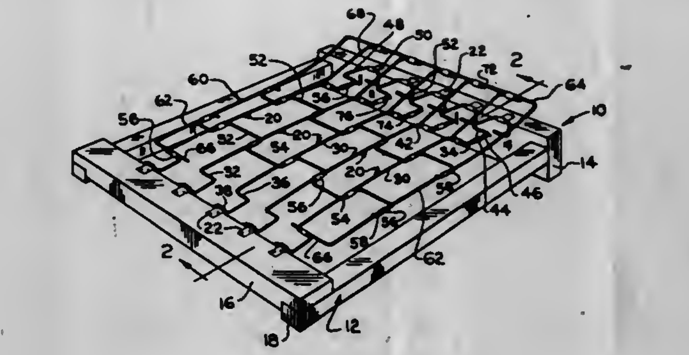
3,888,473
SEAT SPRING ASSEMBLY

Jack C. Mandusky, and Neville L. Riddle, both of Lexington, Ky., assignors to Hoover Ball and Bearing Company, Saline, Mich.

Filed Jan. 26, 1973, Ser. No. 327,142

Int. Cl. A47c *23/04*

U.S. Cl. 267—102 **5 Claims**



1. For use with a pair of spaced frame rails, a seat spring assembly comprising a plurality of transversely spaced main springs extending longitudinally between said rails, said main springs including means at the ends thereof for securing said springs to said rails, each of said springs having an intermediate body portion and end portions at least one of which is of zigzag shape, said intermediate body portion being comprised at least partially of a straight length of wire extending lengthwise of said spring, a plurality of tie wires connected to and extending between said intermediate body portions of said main springs, said tie wires extending generally perpendicular to said main springs and being spaced apart in a direction lengthwise of said springs, each of said tie wires including portions parallel to and adjacent said spring intermediate portions, clip means connecting said parallel tie wire and spring portions, said springs and tie wires being provided in sufficient numbers to form a spring deck which can be conventionally padded to provide a seating surface, said zigzag shape end portion including a pair of torsion bars and a connecting bar extending therebetween, a border wire having side portions parallel to said main spring intermediate portions and an end portion spaced above said zigzag spring end portions and extending between said side portions, and a plurality of uplift springs, each of said uplift springs being secured at one end to said border wire end portion and having a torsion bar at the opposite end affixed to a torsion bar on one of said main springs.

3,888,474
FRAME AND SPRING ASSEMBLY FOR FURNITURE AND THE LIKE

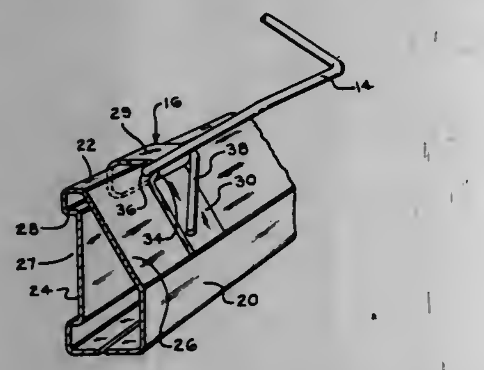
Jack C. Mandusky, and George F. Janko, both of Lexington, Ky., assignors to Hoover Ball and Bearing Company, Saline, Mich.

Filed Mar. 11, 1974, Ser. No. 449,956

Int. Cl. F16f *3/00, 3/02*

U.S. Cl. 267—110 **6 Claims**

1. In a frame and spring assembly, a frame rail having a top, an inner side and an outer side, said outer side being indented so as to form a generally downwardly facing surface thereon, a spring supporting clip slideably supported on said rail, said clip having a top portion hooked over the top of said rail and engaged with said surface and having a downwardly and inwardly inclined spring support leg located on the inner side of said rail, said clip having spring retainer means formed

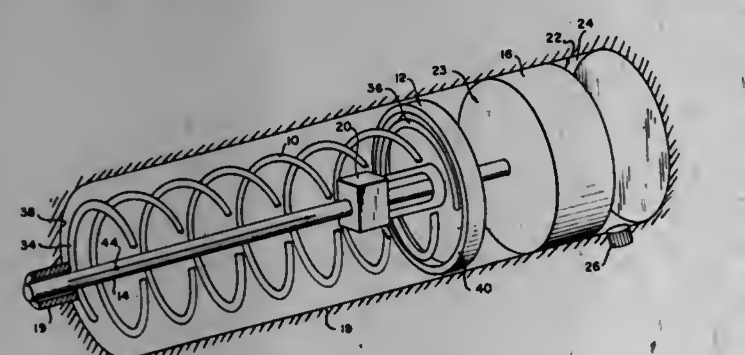


thereon at the upper end of said leg for retaining a spring in a supported position on said leg, said clip being engaged with said rail inner side at a position below said spring retainer means so that downward forces exerted on said leg by a spring supported on said clip will tend to hold said clip in a pre-established position on said rail, and a spring member having a torsion bar nested in said spring retainer means and an end portion engaged with the top side of said leg.

3,888,475

AXIAL COMPONENT FORCE TRANSMITTING ARRANGEMENT

Robert F. Cericola, Greenville, S.C., assignor to The United States of America, Washington, D.C.
Filed Feb. 27, 1974, Ser. No. 446,442
Int. Cl. F16z *1/12*
U.S. Cl. 267—174 **10 Claims**



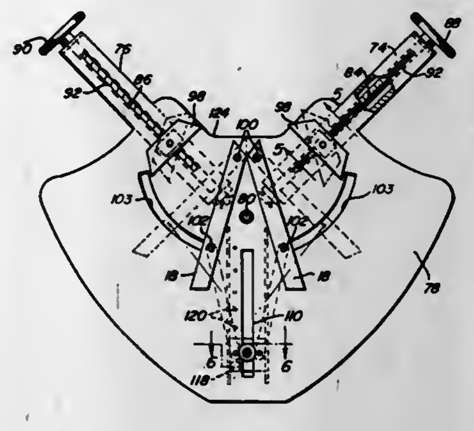
1. A device for exerting axial force upon an element adapted to move in an axial direction while minimizing non-axial force on said element comprising:

a stationary surface disposed so that an axis perpendicular to said surface is substantially colinear with said axial direction;
a seat disposed between said element and said stationary surface;
a linear actuator having both axial and non-axial force components and having an intended axial force axis that is coaxial with said axial direction,
said linear actuator positioned between said stationary surface and said seat,
said linear actuator having one end engaging said stationary surface and having its other end in engaging said seat; and gimbal means connected between said seat and said element acting to transmit only axial components of force to said element.

3,888,476

VARIABLE DEGREE VICE

Glen B. Barton, P.O. Box 127, Calhoun City, Miss. 38916
Filed Oct. 31, 1973, Ser. No. 411,202
Int. Cl. B25b *1/22*
U.S. Cl. 269—41 **2 Claims**

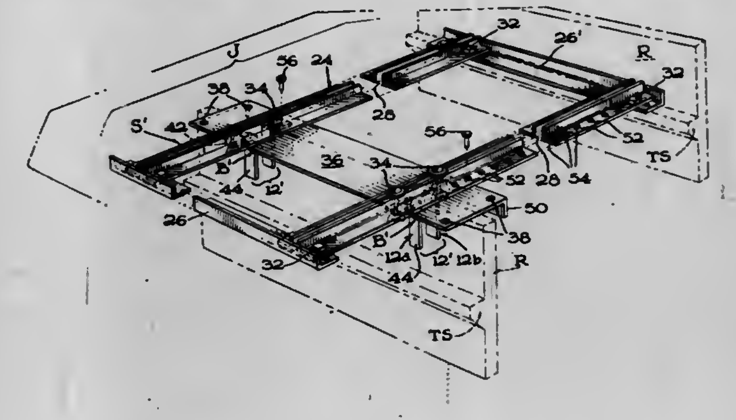


1. In combination, a base including a pair of upstanding generally parallel flange means, a horizontal bearing plate means secured across the upper ends of said flange means, a horizontal brace extending between and secured to the portions of the upper end portions of said flange means spaced below the upper terminal ends thereof with said brace spaced below said bearing plate means, a generally horizontal turntable overlying said bearing plate means and pivotally supported therefrom by means of vertical pivot fastener means secured through said turntable, bearing plate means and brace, said turntable and bearing plate means including coacting retaining means operative to releasably retain said turntable in selected predetermined angularly displaced positions relative to said bearing plate means, said base including a lower mounting portion adapted for stationary mounting from a support structure, said flange means including a first pair of upstanding lower flanges fixed relative to said lower mounting portion and a second pair of upper upstanding flanges between which said brace is secured, means pivotally securing corresponding pairs of said flanges together for relative oscillation about coinciding horizontal axes, means connected between said upper and lower flanges releasably retaining said upper and lower flanges in selected predetermined angularly displaced positions, a generally horizontal table, mounting means stationarily supporting said table from and above said turntable in vertically spaced relation relative thereto, a pair of relatively angulated horizontal arms overlying the upper surface of said table and oscillatably supported at adjacent ends from said table for swinging of the other pair of ends of said arms about axes generally normal and fixed relative to said table and arms toward and away from a line bisecting the included angle formed by said arms, and a pair of followers guidingly supported from said table and spaced outwardly from the remote sides of said arms for movement toward and away from the latter along paths disposed at generally right angles relative to each other and generally equally angulated relative to said line, said followers having abutment blocks overlying the upper surface of said table and pivotally supported from said followers for relative angular displacement about axes generally paralleling the axes of swinging movement of said arms, said abutment blocks including abutment surfaces opposing the remote sides of said arms, feed means operatively connected between said table and said followers for adjustably displacing said followers along said paths, said mounting means including a pair of tubular sleeves extending along said paths and sandwiched between, rigidly secured to and horizontally spacing said turntable and table, said feed means including a threaded feed screw journaled longitudinally in each sleeve, said follower means being threaded on said feed screws, said table including elongated slots formed therein extending along said paths, said followers including upwardly projecting pivot pin portions projecting through and slidingly received in said slots, said abutment blocks being oscillatably mounted on said pivot pin portions, said table further including arcuate slots formed therein having the axes of oscillation of said arms as their centers, depending pivot fastener means carried by the remote ends of said arms and projecting downwardly through said arcuate slots, actuating links disposed in the space between said table and turntable and having a first pair of ends pivotally attached to the lower portions of said pivot fastener means projecting below said table, a straight slot formed in said table generally bisecting the included angle of said arms, a slide member guidingly and slidingly received in said straight slot and including portions projecting above and below said table, the other pair of ends of said actuating links being pivotally attached to the portion of said slide member projecting below said table for equal and opposite angular displacement of said arms relative to said table in response to oscillation of said slide member in said straight slot, the spacing between said table and turntable providing operating space for said actuating links below said table.

3,888,477

SPACING TOOL

John F. P. Tate, 2819 Westhampton Avenue, S.W., Roanoke, Va. 24015
Continuation-in-part of Ser. No. 382,657, July 26, 1973, Pat. No. 3,813,831. This application Apr. 11, 1974, Ser. No. 460,197
Int. Cl. E04f *21/26*
U.S. Cl. 269—82 **12 Claims**



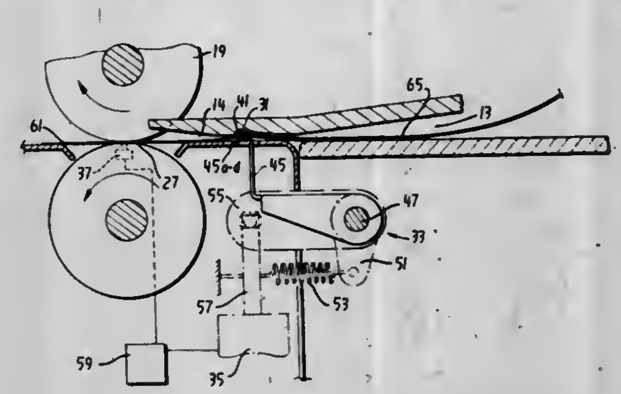
1. A jig for use in uniformly installing in sloping terrain preformed step riser elements of stairs fabricated from preformed interfitting riser and tread elements, said riser and tread elements each comprising generally planar rectangular members of predetermined thickness and having opposed generally planar faces, said jig comprising:

a. support means including a support member disposed for horizontal disposition, having one end constituting an index end portion from which to progressively gauge a predetermined spacing of said riser elements commencing from an initial starting point working down the slope and from each subsequently installed riser element;
b. riser-element-positioning bracket means dependingly attached transversely to said support member at a predetermined distance from said index portion end, said distance corresponding essentially to the selected tread distance of the steps being installed;
c. said bracket means comprising at least a first pair of laterally spaced bracket members each having linear portions spaced substantially the same distance from said index end portion, said linear portions being spaced laterally apart to attain coplanar engagement with at least portions of one common face of said riser elements to establish the spacing thereof from said index end portion and in an upright riser manner; and
d. the related stair installation including using riser elements having substantial extra height in excess of the finished step riser height, wherein a lowermost portion of each riser element is to be embedded within narrow excavated trenches, which lowermost portions are packed preferably with gravel and/or granular fill; and said riser-element-holding bracket means of said jig including a template having four strategically spaced apart holes, with two holes each disposed near laterally opposite sides of said support member so as to define by marking therethrough length and width corner limits of a predetermined size trench having a plan view greater than the thickness of said riser element, and within which said riser element is to be embedded generally centrally relative to the length and width of said trench.

3,888,478

SHEET LIMITER

Albert D. Alderman, Jr., Skippack, and Gabriel B. Cherian, York, both of Pa., assignors to Sperry Rand Corporation, New York, N.Y.
Filed May 23, 1974, Ser. No. 472,743
Int. Cl. B65h *5/00, 7/20*
U.S. Cl. 271—8 R **5 Claims**



1. A sheet-feed control mechanism to be used with a sheet processing apparatus which is designed to accept one sheet at a time and which cannot accept a subsequent sheet until a previous sheet has been processed to a predetermined degree, said sheet feed control mechanism comprising:

a guide means for defining a sheet entrance path and for guiding sheets inserted into said sheet processing apparatus along said sheet entrance path, said guide means defining a shoulder surface laterally disposed to said sheet entrance path and facing the direction from which sheets are inserted into said sheet entrance path;
a movable stop means positioned adjacent said sheet entrance path opposite said shoulder surface, said movable stop means being selectively movable into said sheet entrance path for directing the leading edges of sheets thereafter inserted into said sheet entrance path against said shoulder surface but for allowing a previously inserted sheet to continue to move beyond said shoulder surface, and movable out of said sheet entrance path for allowing sheets to pass said shoulder surface without the leading edge thereof being directed toward said shoulder surface;
a sensing means for sensing the position of sheets traveling along said sheet entrance path;
a motivating means coupled to said sensing means for selectively moving said stop means into and out of said sheet entrance path in response to said sensing means sensing the locations of said sheets.

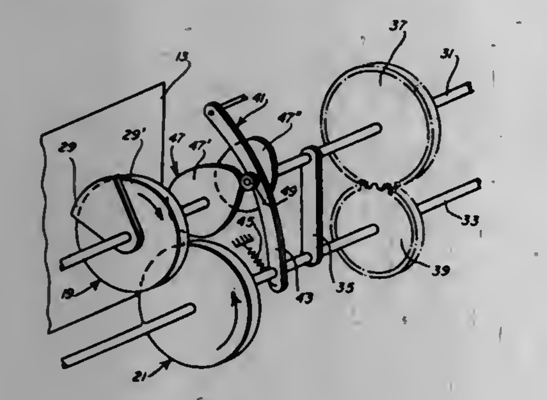
3,888,479

SHEET FEEDING MECHANISM

Hans Eder, Goethering; Heinz Meier, Berlin, and Arend Richter, Nurnberg, all of Germany, assignors to Triumph Werke Nurnberg A.G., Nurnberg, Germany
Filed Dec. 6, 1973, Ser. No. 422,252
Claims priority, application Germany, Dec. 23, 1972, 22633869
Int. Cl. B65h *3/34*
U.S. Cl. 271—22 **6 Claims**

4. In a mechanism for sequentially feeding a stack of sheets in a feeding direction of the type having an end stop and holding means for holding a stack of sheets, retracting means rotatably mounted and driven in the direction opposite the feed direction to retract a sheet from said end stop, and feeding means rotatably mounted and driven in the feed direction

to feed said sheet past the end stop wherein said retracting means and said feeding means are connected in timed relationship to cooperatively retract a sheet from said end stop and then feed the sheet past the end stop, the improvement comprising:

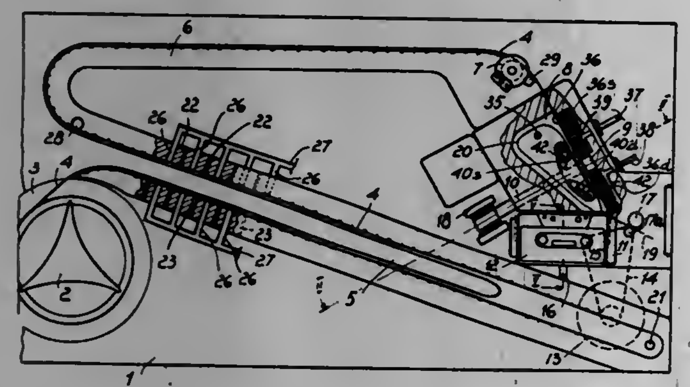


a pivotally supported arm connected to said feeding means for engaging said feeding means with and disengaging said feeding means from a sheet.

3,888,480
APPARATUS FOR LOADING A MAGNETIC TAPE INTO A CASSETTE

Ottaviano Clerici Bagozzi, Via Colautti, 1, Milan, Italy (20125)

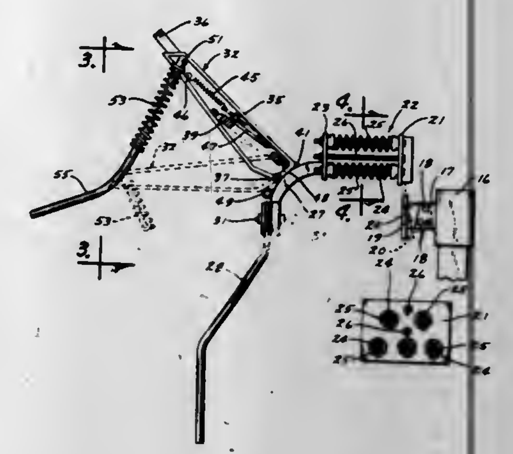
Continuation-in-part of Ser. No. 223,277, Feb. 3, 1972, abandoned. This application Dec. 13, 1973, Ser. No. 424,597
Claims priority, application Italy, Feb. 9, 1971, 20319/71
Int. Cl. B65h *19/20*
U.S. Cl. 242—56 R **9 Claims**



1. An apparatus for cutting, splicing and winding a magnetic tape into a cassette, comprising a support for positioning the cassette, means for extracting the leader of the tape already contained within the cassette through an opening of the cassette, positioning means for said leader and said magnetic tape including pivotable members having suction holes for holding said leader and said magnetic tape, means for cutting said leader and said magnetic tape held by said positioning means, means for splicing a free end of said leader respectively to a free end of said magnetic tape, after cutting, means for advancing and winding the magnetic tape into said cassette after splicing, means for controlling the winding speed and tension of said magnetic tape and means for removing said cassette from said positioning support, wherein, according to the improvement, said means for extracting the leader of the tape already contained within the cassette comprise a chamber having a height substantially equal to the height of said magnetic tape and of said leader and lateral walls defining a contour of length substantially equal to the length of said leader, an opening in said chamber opposite and proximate to said opening of the cassette positioned on said support, the height of said opening being substantially equal to the height of said tape leader, at least one hole in said chamber, and means for creating a vacuum within said chamber through said hole for the extraction of said leader from said cassette, and wherein said positioning means comprise pivotable members arranged within said chamber proximate to a portion of said lateral walls of said chamber and means for moving said pivotable members between a rest position spaced from said portion and an operative position contacting therewith, and suction holes arranged in said portion and means for creating a suction through said suction holes for holding said leader and said magnetic tape during cutting and splicing thereof when said pivotable members are in said operative position.

3,888,481
TRAINING AND PRACTICING APPARATUS FOR WRESTLING

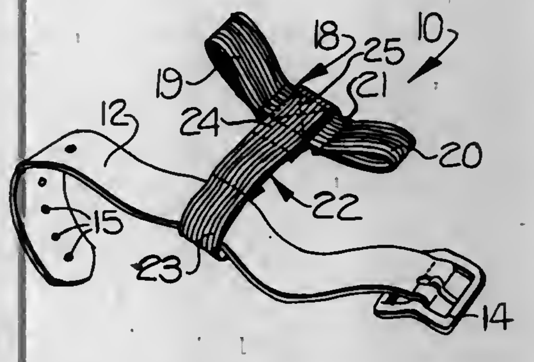
Edward Adams, Jr.; Carl Adams, and Ronald Adams, all of 660 Pineaire Dr., Bayshore, N.Y. 11706
Filed Sept. 16, 1974, Ser. No. 506,275
Int. Cl. A63b *69/00*
U.S. Cl. 272—83 R **17 Claims**



1. A wrestling practice device comprising:
support means;
a base member resiliently mounted to said support means;
leg shaped members attached to said base and extending downwardly therefrom;
a body section pivotally connected to said base member, said body member having a first position extending substantially vertically and a second position extending substantially horizontally; and
means for biasing said body section to said first position.

3,888,482
BASEBALL PITCHER'S TRAINING DEVICE

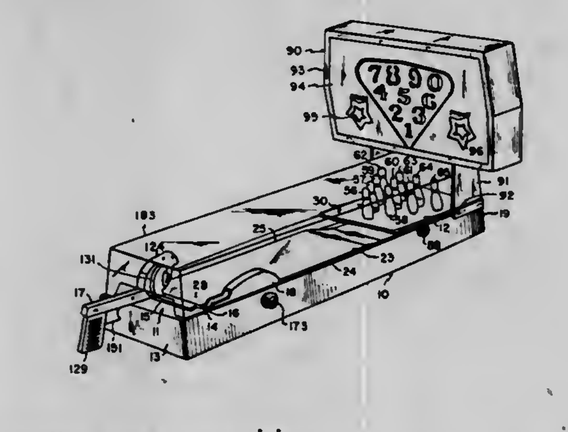
Herman P. Starrett, 2609 Carolyn Dr., Statesville, N.C. 28677, and George D. Bamberger, 2120 Forest Ridge Rd., Timonium, Md. 21093
Filed Mar. 7, 1974, Ser. No. 448,908
Int. Cl. A63b *69/40*
U.S. Cl. 273—26 C **6 Claims**



1. A training device useful in assisting an athlete develop the ability to properly throw a baseball or the like, and comprising a band adapted to fit about the wrist of a wearer, means for interconnecting two spaced fingers on the hand of a wearer and comprising a first loop adapted to encircle the base of the thumb of a wearer, a second loop adapted to encircle the base of another of the fingers of a wearer, and an elastically stretchable bridging strap of a length to extend across the palm of a wearer's hand from the thumb to the third finger and connected to and substantially spacing said first and second loops, such that the first loop encircles the base of the thumb while the second loop encircles the base of the third finger on the same hand of a wearer and with the third finger being laterally drawn toward the thumb to thereby draw the hand into a somewhat cupped configuration, and
an elastically stretchable connecting strap interconnecting said wrist band and the medial portion of said bridging strap and adapted to extend along the inside of the hand of a wearer so as to be directed toward the first and second fingers of the hand of a wearer, said connecting strap being fixedly connected to said medial portion of said bridging strap to preclude slippage of the connecting strap toward the thumb during use and being of a length to draw said bridging strap forwardly toward said wrist band when the device is positioned on a wearer's hand to thereby resiliently maintain the base of the encircled thumb and finger and the wrist in a somewhat forwardly flexed position and while permitting restrained rearward flexure of such fingers and wrist, whereby the connecting strap will tend to forwardly flex the wrist during the throwing motion.

3,888,483
BOWLING GAME

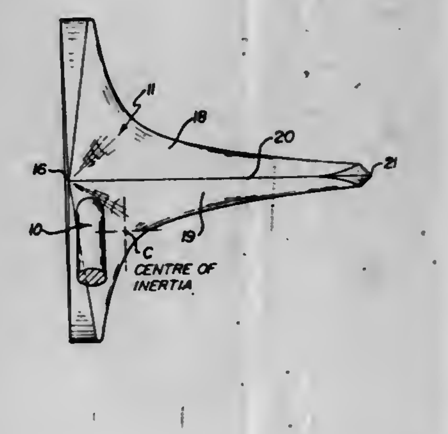
Fred Adickes, Playa Del Rey; James R. Livesey, Hawthorne; George Weir, Palos Verdes Peninsula, all of Calif.; Dennis Bailey, Greenwood, and John J. Mehelich, Booneville, both of Ark., assignors to Wolverine Toy Company, Booneville, Ark.
Filed Oct. 16, 1974, Ser. No. 515,432
Int. Cl.² A63D *3/02*
U.S. Cl. 273—38 **19 Claims**



1. A bowling game comprising:
A. a housing having a bowler position and a pin position;
B. an alley bed positioned in the housing having an elongated curvilinear shape, and extending from the bowler position to the pin position;
C. a pin deck positioned in the housing at the pin position spaced from the alley bed to enable bowling balls to roll along the alley bed from the bowler position and under the pin deck;
D. a plurality of bowling pins separately mounted pivotally on the pin deck in a spaced array, each pin being capable of rotatably moving from a first upright position to a second knockdown position;
E. a plurality of knockdown means separately appended to and through the pin deck, each knockdown means separately contacting a base portion of a corresponding pin when the pin is positioned in the first upright position and capable of causing the corresponding pin to move from the first upright position to the second knockdown position in response to contact of the knockdown means by a bowling ball rolling along the alley bed from the bowler position under the corresponding pin;
F. a ball return means for returning to the bowler position bowling balls rolled along the alley bed from the bowler position to the pin position;
G. a ball rolling member slidably and rotatably positioned in the housing at the bowler position capable of rolling a bowling ball from the bowler position to the pin position, said ball rolling member including (1) a support member slidably and rotatably mounted in the housing and extending therefrom, (2) an arm pivotally mounted on and extending from said support member toward the housing, (3) a ball holder rigidly mounted on the arm at end portions adjacent the housing, said ball holder including a permanent magnet and adapted for holding of a bowling ball on pick-up and releasing such a ball on rotation of the arm, and (4) propelling means for rotating said arm to roll a bowling ball from the ball holder along the alley bed to the pin position; and
F. a ball pick-up means for urging a bowling ball from the ball return means into the ball holder on the arm of the ball rolling member.

3,888,484
GOLF CLUB

Henry D. Zitko, 3860 W. 19th Ave., Vancouver 8, British Columbia, Canada
Filed Dec. 23, 1968, Ser. No. 785,894
Int. Cl. A63b *53/00*
U.S. Cl. 273—80 C **9 Claims**



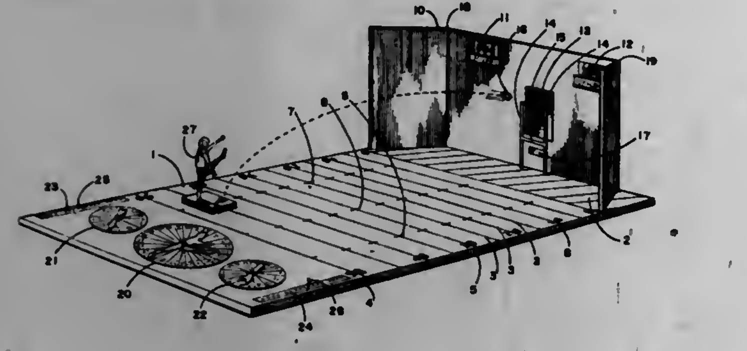
1. A golf club of the kind which is swung in a plane inclined to the vertical, comprising a shaft, an elongated hand grip on one end of the shaft, a club head on the opposite end of the shaft and having a wide substantially planar ball striking surface, said shaft being inclined relative to the head when the latter is in a normal ball-striking position, said club having a center of inertia when swung through a ballstriking stroke, and said hand grip having an axis lying in a plane normal to the striking surface and including said center of inertia.

3,888,485
FIELD GOAL GAME TOY

Carl Conti, 5921 Martita Ave., Las Vegas, Nev. 89108
Filed Mar. 21, 1974, Ser. No. 453,287
Int. Cl. A63f *7/10*
U.S. Cl. 273—94 R **4 Claims**

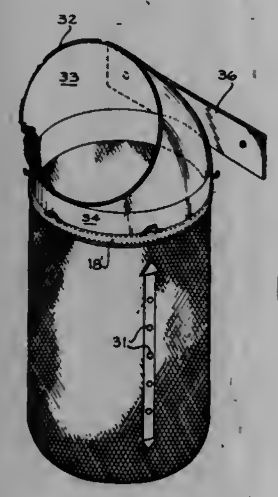
1. A game comprising a game board, a single goal scoring area located at one end of and elevated from said game board, said goal-scoring area consisting of a single pair of goalposts having a defined rectangular receptacle thereabove and therebetween for scoring, a ball, a toy kicker having a movable leg, said kicker being movable to a plurality of locations on said game board, means for holding the ball in front of the spring-operated leg, means associated with said movable leg for urging said leg toward the ball such that the leg can propel the

ball toward the goal-scoring area, first selection means for determining the placement of the kicker on the game board, and second selection means for use after an attempted kick to determine if the kick must be retried.



3,888,486
ARTICLE RECEIVING AND COLLECTING RECEPTACLE ASSEMBLY

Robert E. Sutter, 1911 Edgewood Dr., and David T. Mende, 512 Gerard Dr., both of Lodi, Calif. 95240
Filed Apr. 10, 1974, Ser. No. 459,544
Int. Cl. A63b *71/02*
U.S. Cl. 273—105 R **10 Claims**

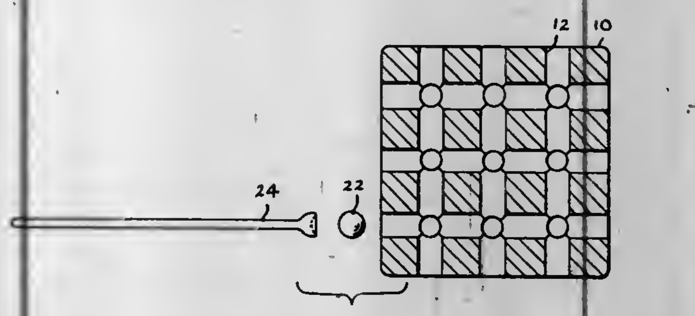


6. In a room the combination comprising a wall of the room, a member adapted to be secured to said wall and forming an open target for throwing articles therethrough, a container of pliant material having an open end and a closed end, said member being sufficiently rigid to retain its physical shape and to support said container, means coupling the open end of said container to said target member to collect and store articles thrown through said target member, and means other than said open or closed ends forming an access passage into said container for removing articles from within said container.

3,888,487
THREE DIMENSIONAL TIC-TAC-TOE DEVICE

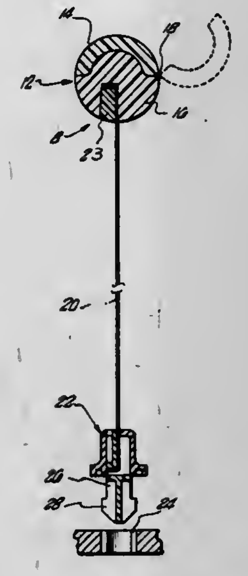
Daniel C. Replogle, 406 Spang St., Roaring Spring, Pa. 16673
Filed Nov. 5, 1974, Ser. No. 521,051
Int. Cl. A63f *3/00*
U.S. Cl. 273—130 AC **9 Claims**

1. In a game device; a body of transparent material, holes extending through said body in each of three directions along the lines of intersection of groups of planes, the planes in each group being parallel and each group extending through said body in one of said directions whereby said holes intersect within the body in groups of three, at least one resilient element slightly larger than a said hole receivable in a hole, and a pusher element operable for pushing said element into a hole and along the hole to a point of intersection of the hole with two other holes and from said point of intersection along one of the intersecting holes to a next adjacent said point of intersection.



3,888,488
BOARD GAME APPARATUS

Anson Sims, Redondo Beach, Calif., assignor to California R & D Center, Culver City, Calif.
Filed Sept. 3, 1974, Ser. No. 502,385
Int. Cl. A63f *3/00*
U.S. Cl. 273—131 BA **13 Claims**



1. A game apparatus to be played by one or more players comprising in combination:
- a game board having a coordinate array of indexed positions;
- a plurality of movable game pieces adapted to be positioned on the indexed positions of the game board, at least some of the movable pieces having a base portion for contacting the game board, an upper head portion and a resilient member connecting the base portion and upper head portion to permit the upper head portion to move relative to the base portion; and
- means on at least some of the upper head portions for indicating the impact of the upper head portion of one movable piece by the upper head of another movable piece.

3,888,489
FISHING GAME

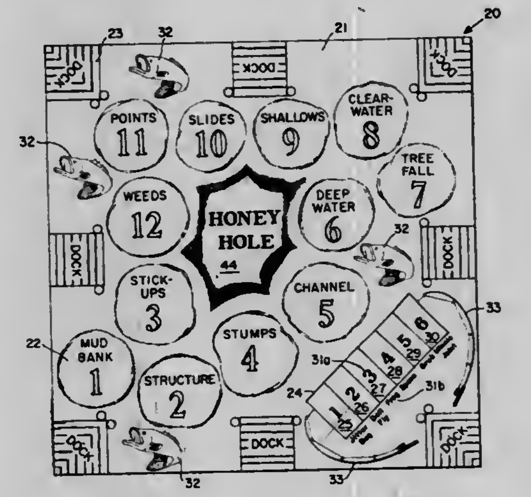
Rolland P. Kane, 42 Hadley Dr., Greenhills, Ohio 45218
Filed Feb. 6, 1974, Ser. No. 439,901
Int. Cl. A63f *3/00*
U.S. Cl. 273—134 B **5 Claims**

1. A game, comprising:

A. A playing surface, the playing surface having thereon a plurality of playing locations, each location being distinct from the other locations, each location having an identifier associated therewith, each identifier being different from the other identifiers;

B. Chance means for selecting by chance one of the playing locations, the chance means having a plurality of indexes, the indexes corresponding to the playing location identifiers;

C. A plurality of playing pieces, each piece adapted to be selectively moved to and placed adjacent any of the playing locations and being identifiable from the other pieces and therefore having an identifier associated therewith;

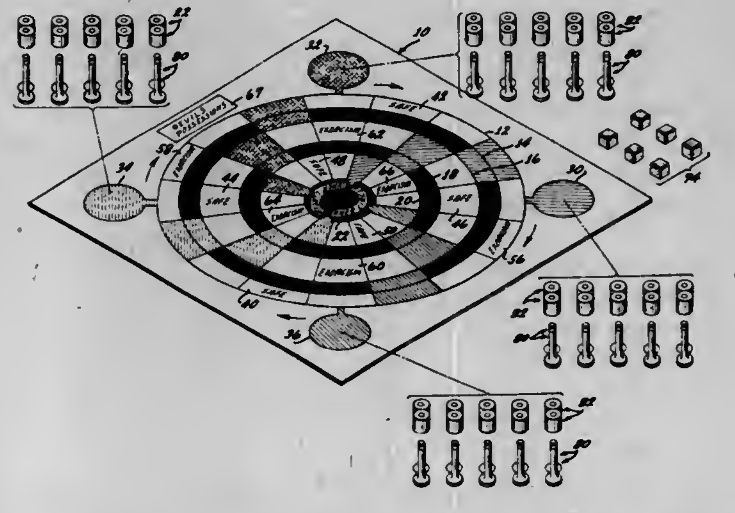


D. A plurality of chance cards, each card having a result noted on one side thereon, each card adapted to be placed upon the playing surface and stacked one on top of the other with the noted result face down; and

E. Chance means for selecting by chance one of the playing pieces, the chance means having a plurality of indexes, the indexes corresponding to the playing pieces' identifiers identifiers.

3,888,490
BOARD GAME INVOLVING THE CONCEPT OF EXORCISM

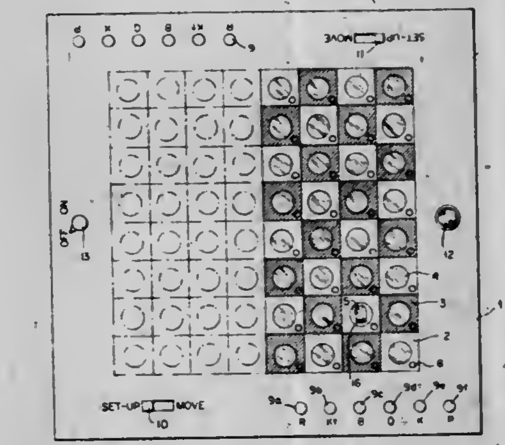
Larry G. Kline, 5065 Amestoy Ave., Encino, Calif. 91316
Filed Apr. 8, 1974, Ser. No. 458,693
Int. Cl. A63f *3/00*
U.S. Cl. 273—134 AD **6 Claims**



1. A game comprising: A playing board having a playing surface defined by successive discretely delineated spaces, at least some of which have identifying legends thereon having a relationship to playing acts including the legend EXORCISM; sets of marker pieces for individual players to indicate their positions on the playing surface, at least some of said marker pieces comprising a first part and a second part, said first part having a shape to enable it to be placed on and to rest on an individual delineated space of the playing surface, said second part being constructed to have cooperative relationship with said first part, to be associated therewith so that the two parts are movable together as a single marker piece, said second part being colored black to designate possession by the devil and having identification with an EXORCISM delineated space; said second part being removable from the first part to represent exorcism; and chance means manipulatable to determine moves of respective marker pieces.

3,888,491
ELECTRONIC CHESS BOARD AND DISPLAY SYSTEM

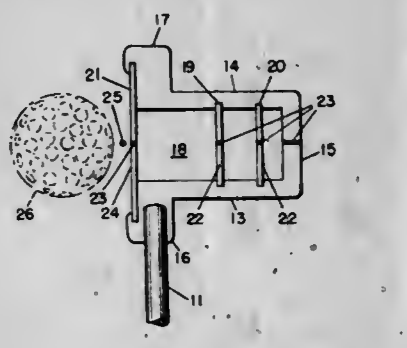
Harvey B. Bernard, Reading, and Karl H. Dolle, Swarthmore, both of Pa., assignors to Harvey B. Bernard, Reading, Pa.
Filed Mar. 19, 1974, Ser. No. 452,620
Int. Cl. A63f *3/02*
U.S. Cl. 273—136 A **9 Claims**



9. An electronic board game consisting of a playing board surface made up of a number of squares, display means for displaying at each of said squares an image of any one of those playing pieces required for the game, logic circuitry to permit each player of the game to selectively cause said images to be automatically transferred from one square to another, and means to selectively create or eliminate said images at preselected squares and wherein said logic circuitry represents the playing piece image by a binary code within the electronic logic of the game, one bit of which is used to identify the player to whom the pieces belong.

3,888,492
GOLF PUTTER WITH TRUE STROKE CHECKING DEVICE

Nat Cabot, 843 Maple Ln., East Meadow, N.Y. 11554
Filed June 19, 1974, Ser. No. 480,812
Int. Cl. A63b *69/36*
U.S. Cl. 273—186 A **2 Claims**



1. A golf club, specifically a putter, comprising:
- a. a handle; attached to
- b. a head; said head being substantially U-shaped and comprising two sides, a rear body member, with a substantially open main central body; said substantially open main central body being transversed by
- c. a forward striking plate;
- d. at least one intermediate alignment plate; said forward striking plate and said intermediate alignment plate being
- e. rigidly engaged in said head; and

f. an alignment means comprising Vee notches cut into the top surface of said forward striking plate, said intermediate alignment plate and said rear body member.

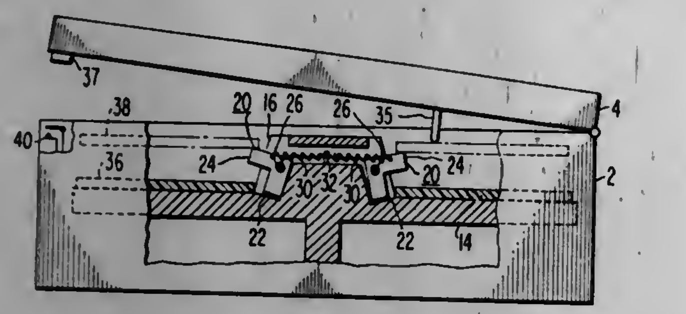
3,888,493
APPARATUS FOR INHIBITING A PLURALITY OF RECORDS FROM BEING DISPOSED ON A TURNTABLE

Leslie Albert Torrington, and Frederick Roland Stave, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 22, 1974, Ser. No. 462,769

Int. Cl. G11b *15/00, 3/60*

U.S. Cl. 274—1 R **8 Claims**



1. Apparatus for preventing a plurality of records from being disposed about a spindle on a supporting turntable, comprising:

record engaging means having first and second record engaging portions;

means mounting said record engaging means to said spindle for movement between first and second positions in response to movement of a record along said spindle;

in said first position said first record engaging portion being in the path of a record passed along said spindle with said second record engaging portion out of said record path; in said second position said first record engaging portion being maintained out of said path by a first record disposed on said turntable with said second record engaging portion thereby disposed in the path of a record along said spindle to prevent any further records from being passed along said spindle onto said turntable.

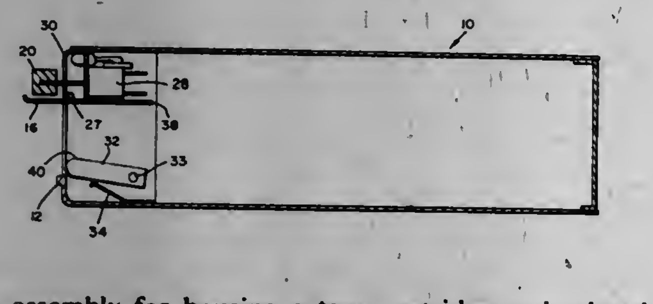
3,888,494
CONTAINER HAVING DISAPPEARING FRONT PANEL

Richard J. Herst, Woodland Hills, Calif., assignor to Car Tapes Inc., Chatsworth, Calif.

Filed Aug. 1, 1973, Ser. No. 384,784

Int. Cl. G11b *1/60*

U.S. Cl. 274—2 **6 Claims**



1. An assembly for housing a tape cartridge and related play-back equipment, comprising in combination:

a tape cartridge housing having an open front portion to permit insertion of a tape cartridge; and

a cover having a first side for substantially covering the open front portion of said housing and a second side having mounted thereon a plurality of control elements associated with the play-back equipment,

said cover being pivotably mounted to rotate in the open front portion of said housing about an axis whose frontward projection traverses a central region of the first side of said cover in its outwardly disposed position before said tape cartridge has been inserted,

said cover being forced to pivot by insertion of a tape cartridge to a portion in which said control elements mounted on said second side of said cover are exposed for use in said open front portion of said housing.

3,888,495
DUAL-COOLED SLIDE RING SEAL

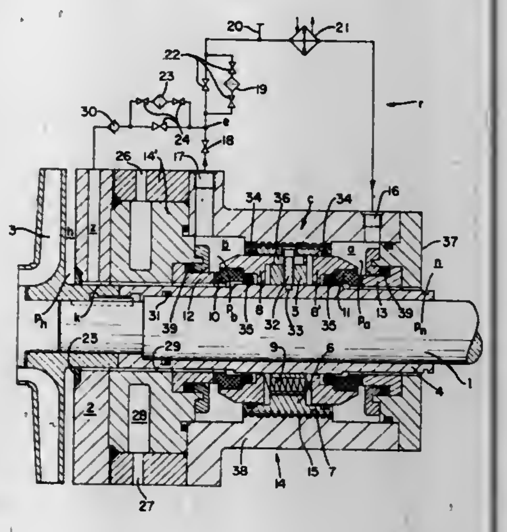
Ehrhard Mayer, Birkenallee 13, D8191 Eurasburg, Germany

Filed June 11, 1973, Ser. No. 368,596

Claims priority, application Germany, June 9, 1972, 2228296; July 27, 1972, 2236964

Int. Cl. F16j *15/40*

U.S. Cl. 277—3 **10 Claims**



1. Shaft seal apparatus for securing to a wall of a working fluid container to surround a shaft passing through a hole in said wall from a high pressure region inside said container to a low pressure region outside said container and comprising

means defining a seal casing attached to said wall,

means defining a first space situated in the seal case and sealed from the low-pressure region by a first slide ring and counter ring pair,

means defining a second space,

means defining a second slide ring and counter ring pair sealing said second space from the high-pressure region means forming an overpressure in said second space with respect to said high-pressure region,

means defining a recirculation loop bypassing said first and second slide ring-counter ring pairs for a sealing and cooling fluid which connects the first space to the second space via said pump means within said casing and also connects said space in a return portion of said loop outside said casing which contains at least one heat exchanger and has at least one injection point at an intermediate point of said loop outside said casing which is connectable to at least one pressurized source which replaces the sealing and cooling fluid that escapes due to leakage, and wherein

the pump drives fluid from said first to second spaces within said casing and from said second to first spaces outside the casing,

the pump discharge pressure is greater than the provided overpressure $(p_b - p_h)$ of the second space with respect to the high-pressure region and the high-pressure region comprises at least a portion of said pressurized sources, the portion of said recirculation loop outside said casing comprises flow resistances which cause a pressure drop $(\Sigma\Delta p)$ which is at least equal to the provided overpressure $(p_b - p_h)$ and is smaller than discharge pressure of the pump, and

the recirculation loop further comprises flow resistance between the injection point and the second space which generates a pressure drop corresponding essentially to the rp provided overpressure $(p_b - p_h)$.

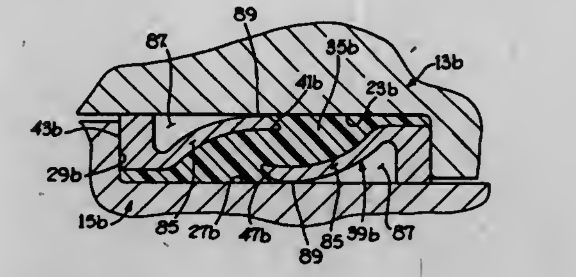
3,888,496
CAPTIVE SEAL WITH RETAINERS LOADED AGAINST NON-PARALLEL SURFACES

Eldon O. Dryer, Malibu, Calif., assignor to W. S. Shamban & Co., West Los Angeles, Calif.

Filed May 3, 1973, Ser. No. 357,068

Int. Cl. F16l *21/02*

U.S. Cl. 277—117 **4 Claims**



1. A captive sealing assembly comprising:

a seal ring of deformable sealing material;

first and second retainer rings positionable in engagement with said seal ring on opposite sides thereof;

each of said retainer rings having an inclined surface confronting the seal ring, each of said inclined surfaces being inclined in cross section with respect to the axis of the seal ring;

each of said retainer rings being sufficiently stiff to be capable of deforming said seal ring; and

at least one of said retainer rings including a base remote from said seal ring and a resilient arm integral with said base and projecting toward said seal ring, said resilient arm including an inclined section defining at least a portion of said inclined surface of said one retainer ring, said arm and said base defining a recess into which the arm can be resiliently deformed.

3,888,497
SAFETY SKI BINDING

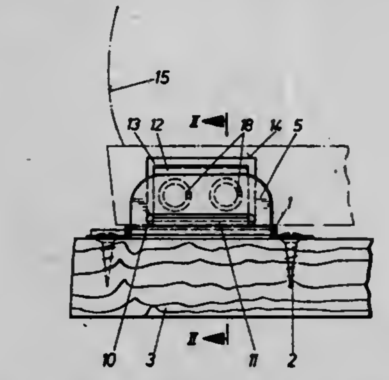
Johann Zahradka, Lassallestrasse 30/21, Wien, Austria

Continuation of Ser. No. 866,228, Oct. 14, 1969, abandoned. This application Nov. 8, 1971, Ser. No. 196,585

Claims priority, application Austria, Oct. 15, 1968, 10040/68; Sept. 9, 1969, 8565/69

Int. Cl. A63c *9/08*

U.S. Cl. 280—11.35 T **6 Claims**



. A safety ski binding which, upon the placing of a ski boot on a ski, automatically effects the connecting thereof by a coupling, said coupling being adapted to be disconnected intentionally by actuation of a release and unintentionally upon the occurrence of a force which is dangerous for the leg of the skier, and comprising a retaining means secured to said ski and a retaining means secured to said boot, an intermediate element positioned between and releasably connected to both said retaining means, a catch element connected to said intermediate element, said catch element serving as additional connection between ski boot and ski, and means on both sides of said intermediate element providing for a separate point of disconnection of the coupling, one of said points serving for the intentional opening of the binding and the other for the unintentional opening of the coupling.

3,888,498
RELEASABLE SKI BINDING

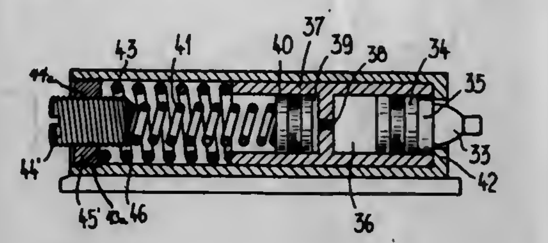
Ulrich Gertsch, Matten, and Valentin Balass, Zurich, both of Switzerland, assignors to Gertsch AG, Interlaken, Switzerland

Filed Nov. 9, 1973, Ser. No. 414,424

Claims priority, application Switzerland, Nov. 15, 1972, 16594/72

Int. Cl. A63c *9/08*

U.S. Cl. 280—11.35 T **17 Claims**



1. A releasable ski binding comprising a housing means, a locking element which is displaced back against spring force during release out of its holding position mounted in said housing means, a displacement element, said locking element being operatively coupled with said displacement element, means for providing two compartments defining a first compartment and a second compartment containing a fluid medium, means providing a throttle location for flow communicating with one another said two compartments, said displacement element immersing into one of said two compartments, a first spring coupled with the displacement element by means of the fluid medium in the first compartment and a second spring coupled with the displacement element by means of the fluid medium in both compartments.

3,888,499
RELEASABLE SKI BINDING

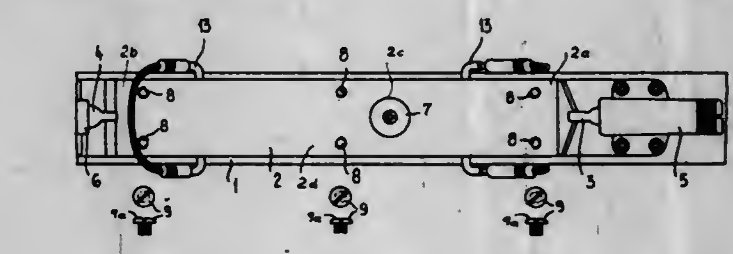
Ernst Gertsch, Wengen, and Ulrich Gertsch, Interlaken, both of Switzerland, assignors to Gertsch AG, Interlaken, Switzerland

Filed Apr. 23, 1973, Ser. No. 353,296

Claims priority, application Switzerland, May 15, 1972, 7203/72

Int. Cl. A63c *9/08*

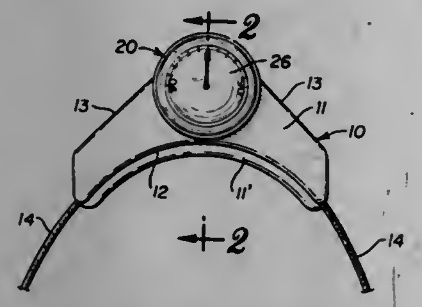
U.S. Cl. 280—11.35 K **7 Claims**



1. A releasable ski binding for use with a ski and a ski boot having a heel, sole and bottom tread, comprising a release plate, anchoring means for releasably anchoring the release plate at its ends to the ski, support means for the ski boot provided on the top surface of the release plate acting against the bottom tread of the ski boot for enabling adjustment of the inclination of the ski boot relative to the ski in the lengthwise direction of the ski and canting of the ski boot relative to the ski in the transverse direction of the ski, and adjustable holding means for the heel and sole of the ski boot mounted on said release plate for adapting the holding means to the assumed inclination and canting of the ski boot brought about by the action of the support means.

3,888,500
POSITION INDICATING DEVICE FOR ATTACHMENT TO A SKI BOOT

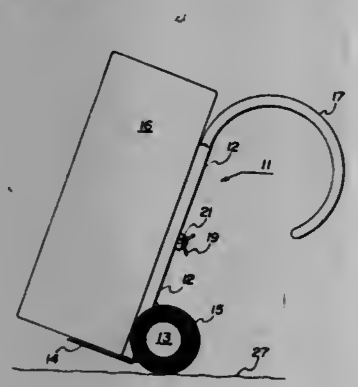
Armand J. Gauthier, 1018 W. 7th St., Hastings, Nebr. 63901
Continuation-in-part of Ser. No. 160,629, Nov. 9, 1971, abandoned. This application Apr. 10, 1974, Ser. No. 459,793
Int. Cl. A63c *11/00*
U.S. Cl. 280—11.37 E **8 Claims**



1. A position indicating device attachment for ski boots for developing foot control of the wearer, comprising
  a. a main base shaped to fit the toe of a ski boot,
  b. a dial unit including a magnetic dial marked to indicate angles, a rotatable shaft on which the dial is mounted for rotation with the shaft, a housing enclosing the magnetic dial, a dial unit base on which the housing is mounted, and a pointer fixedly mounted above the dial,
  c. a swivel joint mounted in the main base and connected to the base of the dial unit, and
  d. means attaching the device to a ski boot.

3,888,501
HAND TRUCK AND WHEEL-BARROW COMBINATION

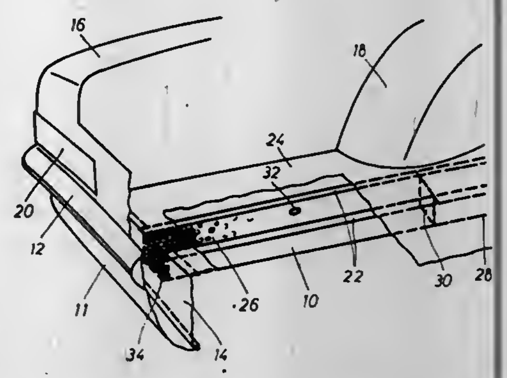
Vernon H. McChesney, 3314 Dumas St., San Diego, Calif. 92106
Filed Mar. 27, 1974, Ser. No. 455,118
Int. Cl. B62b *1/12, 1/20*
U.S. Cl. 280—47.18 **1 Claim**



1. A hand truck comprising:
a truck bed frame;
a loading platform coupled to the bottom of the truck bed portion;
first and second wheels rotatably coupled to a bottom poor-tion of said truck bed frame;
first and second hhandles attached to and projecting upwardly from said truck bed frame, said first and second handles being substantially circular and more than 180° in arcuate length;
a mounting bar adjustably coupled to the truck bed frame;
a wheelbarrow tub removably coupled to said mounting bar; and
first and second parallely disposed races carried by the undercarriage of said truck bed frame;
first and second nuts slidably carried by said first and second races, respectively;
first and second apertures in said mounting bar disposed over said first and second nuts; and
first and second wing bolts passing through said first and second apertures, respectively, and in threadable engagement with said first and second nuts, respectively.

3,888,502
ENERGY ABSORBER COMPONENTS FOR USE IN VEHICLES PARTICULARLY MOTOR VEHICLES

Bertold Felzer; Klaus Brunk, both of Russelsheim/Main, and Friedhelm Kraemer, Hochheim, all of Germany, assignors to General Motors Corporation, Detroit, Mich.
Filed Mar. 23, 1973, Ser. No. 344,445
Claims priority, application Germany, May 8, 1972, 2222557; Aug. 11, 1972, 2239485
Int. Cl. B62d *21/00*
U.S. Cl. 280—106 R **2 Claims**

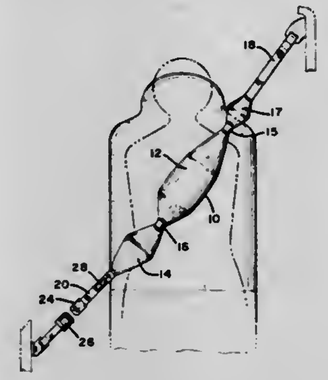


1. An energy absorbing structural component for a vehicle comprising, in combination, an elongated enclosed hollow member comprising a plurality of planar longitudinally extending side walls integrally joined by end walls, said side walls being formed of plastically deformable sheet metal collapsible into generally uniform longitudinally adjacent accordion folds under longitudinal impact loads applied to said side walls by one end wall and absorbing the energy of such impact loads by such plastically deformable collapse, and compressible plastic foam encased within and substantially filling said member, said impact loads being applied by said one end wall generally simultaneously to said compressible plastic foam and to said side walls to initiate said collapse of said side walls and compress said plastic foam, said compressed plastic foam initially applying outward pressure under said impact loads to said side walls at the area thereof immediately adjacent said one end wall to initiate collapse of this area of said side walls into an accordion fold containing compressed plastic foam while maintaining the remainder of said side walls in substantially original unfolded shape, said compressed plastic foam sequentially applying outward pressure to succeeding immediately adjacent areas of said side walls to sequentially collapse such areas into like accordion folds and absorb the energy of said impact loads with substantially square wave efficiency, the longitudinal extent of said side walls collapsing into folds being dependent upon the level of the impact loads applied thereto.

3,888,503
LIMITING OF CONTINUOUS EXTENT OF INFLATABLE RESTRAINT

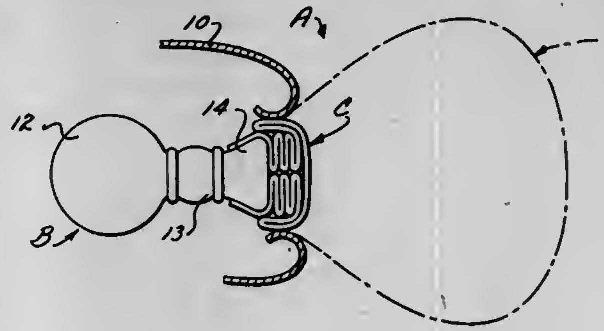
Brian K. Hamilton, Utica, Mich., assignor to Allied Chemical Corporation, New York, N.Y.
Filed Feb. 22, 1973, Ser. No. 334,804
Int. Cl. B60r *21/10*
U.S. Cl. 280—150 AB **2 Claims**

1. A folded inflatable restraining member for a vehicle safety system comprising a unitary inflatable member folded in uninflated condition to be in the form of a seat belt with frangible means ruptured on commencement of inflation to allow full inflation thereof, said folded member extending in a single pass across the chest of an occupant of the vehicle, said inflatable member comprising at least two fully inflatable sections integral therewith and one intermediate section integral therewith which is inflatable but to a lesser extent than said fully inflatable sections, said unitary member extending across the chest of the occupant to points of connection on the vehicle on either side of the inflatable sections, means capable of rupturing said frangible means on commencement of inflation of said member in response to a preselected condition of the vehicle, and said first inflatable sections in gas communication with one another via said intermediate portion.



3,888,504
VEHICLE SAFETY DEVICE

Clifford Bonn, Buffalo, N.Y., and Kenneth R. A. Wilson, Redondo Beach, Calif., assignors to Irvin Industries Inc., Greenwich, Conn.
Continuation-in-part of Ser. No. 22,429, March 25, 1970, abandoned. This application Dec. 24, 1970, Ser. No. 101,253
Int. Cl. B60r *21/06*
U.S. Cl. 280—150 AB **4 Claims**

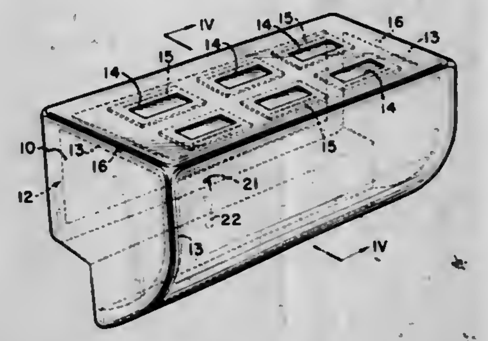


1. An inflatable restraint bag comprising at least in part a woven stretch fabric having a plurality of threads of stretch yarn extending in at least one direction in juxtaposition for elongation of the woven stretch fabric so that inflating fluid permeability of the woven stretch fabric portion of the inflated restraint bag is increased upon occupant impact against the restraint bag, said woven stretch fabric having substantially instantaneous recovery of at least 70% after elongation within the range of differential pressures to which such a restraint bag will normally be subjected so that inflating fluid permeability thereof is decreased upon dissipation of the forces of occupant impact against the restraint bag, the warp of said woven stretch fabric comprising threads of non-stretch yarn and the weft thereof comprising threads of 140-560 denier Spandex fiber wrapped with 2 ends of 210-420 denier high tenacity nylon.

3,888,505
INFLATABLE VEHICLE SAFETY DEVICE

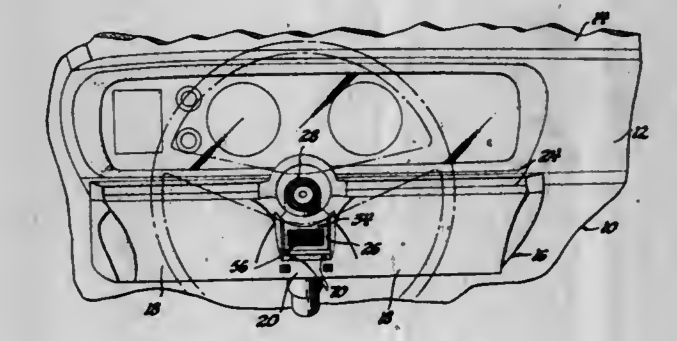
Iwao Shibamoto, No. 31-7, 2-chome, Nishi Sugamo, Tokyo, Japan
Filed Sept. 13, 1971, Ser. No. 179,973
Claims priority, application Japan, Sept. 14, 1970, 45-80327
Int. Cl. B60r *21/10*
U.S. Cl. 280—150 AB **1 Claim**

1. A safety device comprising a bag having folded and expanded positions, a tubular frame secured to said bag, means for introducing a pressurized gas into said tubular frame, said tubular frame being inflatable by said gas to expand said bag from its folded state to its expanded state when the pressurized gas is introduced into said tubular frame, the expansion of said bag producing a pressure differential between the inside and outside of said bag, said bag having a wall with air passage openings for introducing ambient air into the expanded bag under said pressure differential, and check valves on said bag for closing said air passage openings to trap the thus introduced air in said bag, said tubular frame having a wall with weakened portions therein adapted to be ruptured under the pressure of the gas introduced into said tubular frame, the rupture of said weakened portions causing the pressurized gas in said inflated tubular frame to flow into said bag to build up the internal pressure of the bag to a level higher than atmospheric pressure and close said check valves to isolate the interior of the bag from the ambient atmosphere.



3,888,506
OCCUPANT KNEE RESTRAINT

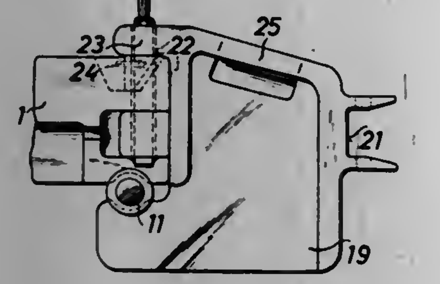
Ronald H. Haas, Okemos, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Oct. 10, 1973, Ser. No. 404,877
Int. Cl. B60r *21/04; 21/10*
U.S. Cl. 280—150 B **3 Claims**



1. In combination with an automotive vehicle including a collapsible energy absorbing steering column assembly engageable by the upper torso of a seated driver to absorb kinetic energy, a knee restraint including plastically deformable first portions located to each side of the column assembly and interconnected by a center portion partially surrounding the lower part of the column assembly and including an aperture opening thereto, closure means of non-plastically deformable frangible plastic material fitting in the aperture and extending adjacent to the lower part of the column assembly, means mounting the closure means on the center portion for movement therewith, deformation of the first portions by the driver's knees absorbing kinetic energy of the lower torso of the driver and applying compressive loads longitudinally of the femurs of the driver to control the kinematics of the upper torso of the driver with respect to the column assembly, the deformation of the first portions moving the center portion upwardly toward the column assembly to move the closure means into engagement with the lower part thereof, the frangible closure means breaking upon such engagement to permit collapse of the column assembly through the knee restraint without interference upon engagement of the upper torso of the driver with the column assembly.

3,888,507
VEHICLE BALLAST WEIGHT ASSEMBLY

Jakob Berghausen, Nievenheim, Germany, assignor to International Harvester Company, Chicago, Ill.
Filed Oct. 21, 1974, Ser. No. 516,568
Int. Cl.² B60R *27/00*
U.S. Cl. 280—150 E **10 Claims**

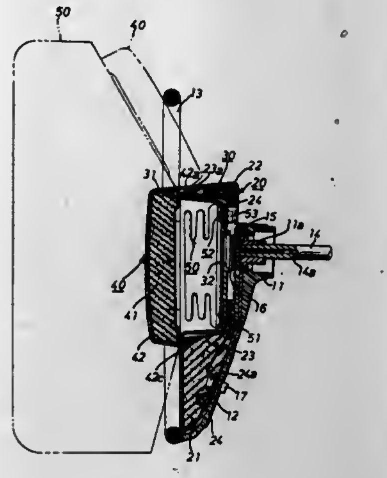


1. A ballast weight assembly for mounting on the front end of a tractor, comprising:
- a generally rectangular prismic-like base weight member connected across the front end of the tractor, the top side of the member having an elongate channel with at least one inclined wall extending upwardly toward the front side of the member and the inclined wall having at least one V-shaped notch also extending upwardly toward the front side of the member, the front side of the member having a centrally located cavity forming a clevis for a hitch, the top side further having a centrally located hole passing into the clevis, and the bottom side of the member having an elongate groove;
- a generally rectangular prismic-like first weight mounted on the member, the first weight having a generally U-shaped opening at one side of the prism, one leg of the U having a notch with an inclined wall extending toward the opening of the U and forming a hook with a tip depending into the channel of the member, the inclined wall of the hook having an inverted V-shaped surface mating with the V-shaped notch in the channel, the base of the U abutting the front side of the member and the other leg of the U extending under the bottom side of the mbmer and having a transversely extending groove aligning vertically with the elongate groove in the bottom side of the member; and
- an elongate bar passing in the space between the grooves keying the mounted first weight to the base member.

3,888,508
SAFETY APPARATUS FOR STEERING WHEEL ASSEMBLY

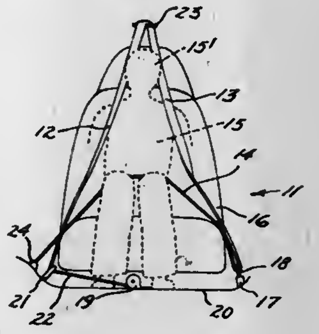
Ryohei Kizu; Tadao Muramatu, both of Toyota, and Teruo Kobayasi, Harutti-Mura, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed Apr. 13, 1973, Ser. No. 350,784
Claims priority, application Japan, Apr. 19, 1972, 47-39375
Int. Cl. B60r *21/08*
U.S. Cl. 280—150 AB **7 Claims**

1. A safety apparatus for a steering wheel assembly of a vehicle having a collision sensor and a fluid pressure source for activating said safety apparatus in response to a signal generated from said sensor, comprising:
- a pad member including a core cushion on spokes of said steering wheel assembly, said pad member including means defining a chamber in substantially the central portion thereof,
- a bag container made of synthetic resin in the shape corresponding to said chamber, said bag container being within said chamber and having, on its bottom portion, an inlet port connected to said pressure source through the steering column assembly for said steering wheel assembly,
- an inflatable bag confined air-tightly within said bag container; said inflatable bag being inflated by pressurized fluid from said pressure source through said inlet port in case of vehicle collision,
- said bag container further having drain valve means formed by at least one breakable portion normally integral with said bottom portion of said bag container whereby when the pressure in the bag upon inflation reaches a predetermined inner pressure a portion of the breakable portion breaks to let any exceeding pressure, above the predetermined pressure, escape out of the inflated bag, and
- a cover member having a core cushion formed in the shape corresponding to the opening of said bag container and a cover which overlies integrally said cover member core cushion; said cover member being mounted on said bag container to move from a position closing the opening thereof to a position lateral of said bag container opening in response to inflation of said bag.



3,888,509
BIFURCATED SHOULDER AND LAP CONTINUOUS SAFETY HARNESS

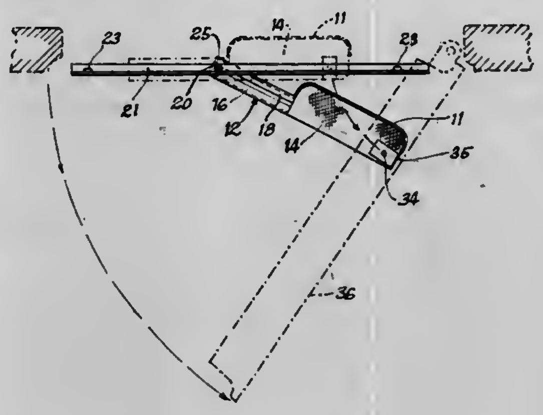
Ronald Albert Willey, Port Huron, Mich., assignor to The Firestone Tire & Rubber Company, Akron, Ohio
Filed Nov. 1, 1972, Ser. No. 302,791
Int. Cl. B60r *21/10*
U.S. Cl. 280—150 SB **5 Claims**



1. A safety harness for occupants of vehicles comprising:
- a floor anchor;
- a single length of webbing secured at one end to a retractor and partially extendable and retractable therefrom and thereinto and at the other end said webbing secured to said floor anchor;
- an anchor bar above and behind the head of a wearer;
- a portion of said webbing intermediate the ends thereof trained to extend upwardly to a slip position on said anchor bar and thence downwardly to form shoulder support loops;
- a lap portion extending from said loops and in continuation of said webbing and secured terminally to said floor anchor;
- a ring-tongue having tongue portion and a ring portion freely slidable on said webbing intermediate said shoulder support loops and said lap belt portions; and
- a receptacle secured to the floor of a vehicle into which the tongue portion of said ring-tongue is lockably and selectively releasable.

3,888,510
STEP FOR MOTOR VEHICLE

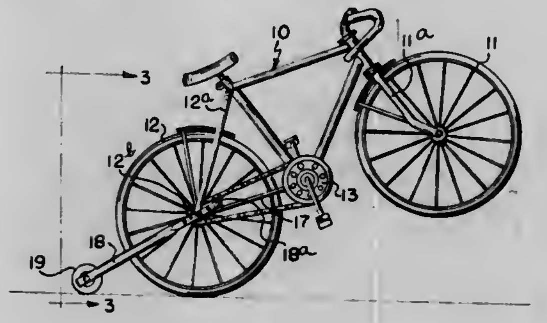
Robert L. Maske, 1405 Broadway St., Iowa City, Iowa 52240
Filed Mar. 25, 1971, Ser. No. 127,967
Int. Cl. B60r *3/02*
U.S. Cl. 280—166 **5 Claims**



1. A step for a motor vehicle, comprising a support bracket adapted to be connected to the body of a motor vehicle, a supporting arm pivotally secured to said support bracket, a step bracket secured to a door of said vehicle, a step pivotally secured to said step bracket, one end of said arm being rigidly connected with said step, and the other end of said arm supported for sliding movement relative to said support bracket, said arm comprising a pair of parallel, spaced-apart elongate members, said members being rigidly connected together at said other end of said arm, and including a vertical pivot shaft depending from said support bracket and passing between said members, and means secured to the bottom portion of said shaft to support said members.

3,888,511
SAFETY DEVICE TO PREVENT TIPPING A BICYCLE

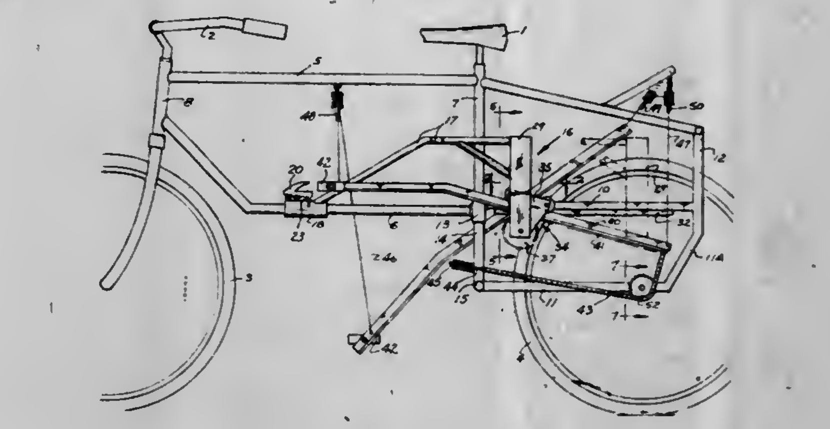
Salvatore C. Parrilla, 811 Literary Rd., Cleveland, Ohio 44113
Filed July 19, 1973, Ser. No. 380,748
Int. Cl. B62d *63/00*
U.S. Cl. 280—239 **1 Claim**



1. A safety device for attachment to a bicycle having a main frame and front and rear wheels to prevent the same being tipped over backward by its rider, said frame having two linear rigid horizontal frame members extending from opposite sides of a pedal sprocket to opposite sides of a rear wheel axle, comprising a pair of rigid struts generally parallel, a rotatable roller connected between said struts at one end adapted to engage the ground when the bicycle is tipped backward, a parallel projection means rigid with and extending from near the opposite ends of said struts with L-shape ends in position to overlie said horizontal frame members respectively, said struts being pivoted to said frame at a point along said projection means on the extended axle of said rear wheel, and a plurality of pairs of spaced registering openings through said projection means in position for varying said attachment to said bicycle frame.

3,888,512
POWER TRANSMISSION WITH ADJUSTABLE FULCRUM

Walter O. Peterson, 875 Classic Pl., Eugene, Oreg. 97401
Filed May 16, 1973, Ser. No. 360,677
Int. Cl. B62m *1/04*
U.S. Cl. 280—255 **12 Claims**



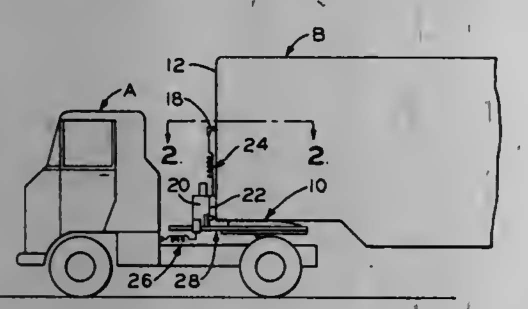
1. In combination with a first-class lever having means associated with the work performing end of the lever for imparting rotary motion to a driven member of a supporting structure, the improvement comprising,
- a fulcrum assembly including a fulcrum wheel in toothed engagement with said lever and about which said lever is powered in a rocking manner, keeper means retaining said lever in engagement with the fulcrum wheel during rocking lever motion, said keeper means rockably mounted for movement about the axis of said wheel during lever operation,
- a carrier for said fulcrum assembly positionable and lockable fore and aft along a fixed member of the supporting structure to position the fulcrum wheel and said keeper means along said lever to vary the mechanical advantage of the lever, and
- means for retention of the fulcrum wheel against rotational forces applied to the wheel periphery during lever operation, said retention means comprising a pinion on said carrier in coaxial alignment with said fulcrum wheel and in toothed engagement with the fixed member, sleeve means interconnecting said pinion and the fulcrum wheel to lock the latter against rotation other than during fore and aft movement of the carrier.

3,888,513
TRACTOR-TRAILER SERVICE LINE COUPLING

Gilbert B. Pilz, Toledo, Ohio, and James R. Vivian, Hoffman Estates, Ill., assignors to Young Daybrook, Inc., Southfield, Mich.
Filed Apr. 29, 1974, Ser. No. 464,781
Int. Cl. B60d *1/08*
U.S. Cl. 280—421 **16 Claims**

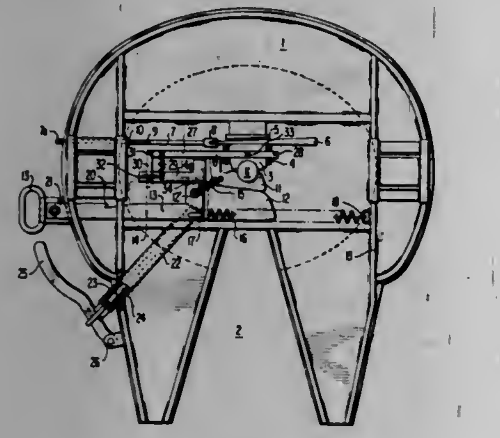
1. A coupling assembly for releaseably interconnecting supply lines of a tractor having a fifth wheel and corresponding supply lines on a trailer having front wall means and a kingpin interengageable with said fifth wheel comprising, mating male and female supply line coupling block members, each said block member including coupling connection means, one of said male and female coupling block members being mounted on said trailer wall means, means supporting the other of said male and female coupling block members on said tractor for mating engagement with said said one coupling block member upon relative movement of said tractor and trailer to bring said fifth wheel and kingpin into interengage-

ment, said fifth wheel having an axis, said supporting means including carrier means supported on said fifth wheel for pivotal movement about said axis, said carrier means including arm means extending radially of said axis, means mounting said other coupling block member on said arm means for sliding movement therealong, and means biasing said other coupling block member to slide toward said axis.



3,888,514
FIFTH WHEEL COUPLING

Haim Klein, 1 Shnizler St., Yafo, Israel
Filed June 11, 1973, Ser. No. 368,589
Claims priority, application Israel, June 28, 1972, 39780
Int. Cl. B62d *53/08*
U.S. Cl. 280—434 **5 Claims**



1. In a fifth wheel coupling mechanism for coupling a trailer to a tractor comprising a plate-shaped body having a concavity which is directed downward and having an entrance slot reaching to approximately the center of said plate-shaped body, the improvement comprising:

a king pin by which the trailer is coupled to a tractor;

a king pin holding means comprising a hook member and a stationary body, said hook member being pivotably mounted upon said plate-shaped body to extend across said entrance slot and containing a recess for the reception of said king pin, and said stationary body having a recess for the reception of said king pin, said recess of said stationary body faces the recess of said hook member in the coupled position, being urged against said stationary member, said king pin being completely enclosed in the coupled positon by said king pin holding means;

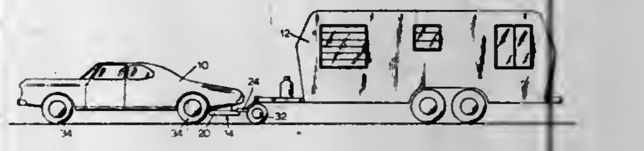
a movable locking wedge slidably mounted on said plate-shaped body urging, in the coupled position, said hook member against said king pin;

two guide rails disposed on said plate-shaped body, wherein said stationary body is slidable and fixable between said two guide rails; and

a wedge bar and a rib wherein said stationary body bears against said wedge bar positioned between said stationary body and said rib extending at a right angle from said guide rails, said wedge bar being slidable into the gap between said rib and said stationary body.

3,888,515
TRAILER HITCH MECHANISM

Charles M. Winter, 2580 W. Philadelphia St., York, Pa. 17404
Division of Ser. No. 314,952, Dec. 14, 1972, Pat. No. 3,834,735. This application Jan. 16, 1974, Ser. No. 433,666
Int. Cl.² B60D *7/00*
U.S. Cl. 280—476 R **1 Claim**



1. A hitch mechanism for attaching a trailer to the rear end of an automotive vehicle having chassis frame members and providing stable support for the front end of such trailer, said mechanism comprising in combination:

a. a pair of attaching bracket members adapted to extend respectively along the rearward portions of the chassis frame members of said vehicle,

b. means adapted to connect said members fixedly to said chassis frame members respectively along one surface thereof,

c. an auxiliary frame detachably connected to said attaching bracket members and including a pair of substantially parallel connecting members respectively comprising opposite side members of said auxiliary frame which also includes an auxiliary axle extending between and interconnected to said connecting members for support thereby,

d. auxiliary wheels supported by the opposite ends of said auxiliary axle,

e. spring means connected between said axle and connecting members to absorb shock imposed upon said wheels,

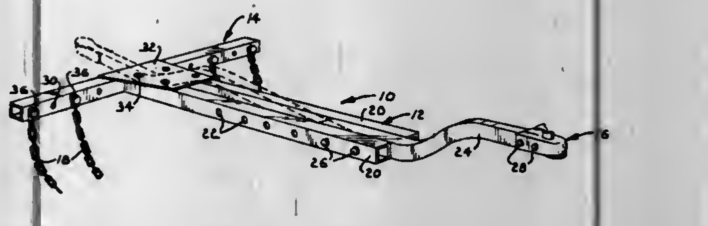
f. transverse members extending substantially horizontally in use between and fixed to said connecting members,

g. one of said transverse members having opposite ends respectively extending downward and forward in use from the transverse intermediate portion thereof and said ends being fixedly connected to said connecting members, whereby the transverse intermediate portion of said one transverse member normally is positioned above and substantially within a common vertical plane extending through the axes of said auxiliary wheels, and

h. a hitch connecting pivot for a trailer supported by said one of said transverse members intermediately between the ends thereof to dispose it vertically above the axes of said auxiliary wheels.

3,888,516
TOW BAR

Lirel G. Holt, 4721 Virginia, Kansas City, Mo. 64110, and Max B. Holt, 7528 E. 83rd St., Kansas City, Mo. 64138
Filed May 24, 1974, Ser. No. 473,196
Int. Cl. B60d *1/14*
U.S. Cl. 280—491 E **5 Claims**



1. A collapsible tow bar for coupling the front of a towed vehicle with the rear of a towing vehicle comprising:

first and second spaced apart elongated arms adapted to extend from the rear of said towing vehicle to the front of said towed vehicle and each having a plurality of aligned openings along its length;

a third arm received between said first and second arms projecting from one end of said first two arms and having a plurality of openings along its length adapted to be aligned with said openings in said first and second arms;

removable fastening means for coupling said third arm with said first and second arms in any one of a plurality of positions and accommodating pivotal movement of said third arm between folded and unfolded positions;

hitch means disposed on said third arm for coupling the latter with the towing vehicle;

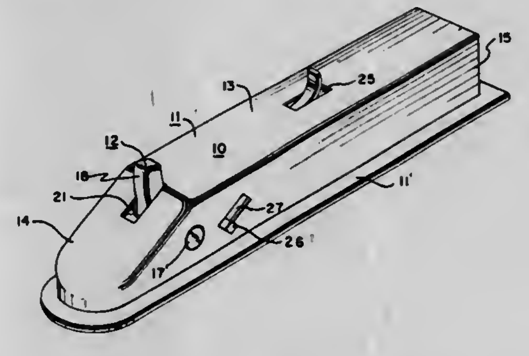
a cross tie extending transversely of said first and second arms and rigidly coupled therewith;

pressure plate means rigid with said cross tie and said first and second arms for distributing towing forces; and

flexible fastening means adapted to be coupled with said cross tie in spaced apart locations for securing said cross tie to the towed vehicle.

3,888,517
TRAILER HITCHING COUPLER

James D. Ray, Rt. 5, Box 208, Nampa, Idaho 83651
Filed Nov. 16, 1973, Ser. No. 416,697
Int. Cl. B60d *1/06*
U.S. Cl. 280—512 **2 Claims**



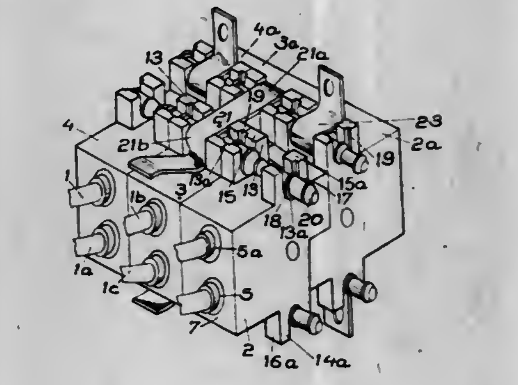
1. A trailer hitching coupler, comprising:

a body having a dome being engageable with a hitching ball from below and having a pair of parallelly disposed support walls fastened to the rearwardmost terminal side of said dome, and a top wall being coextensive with and being fastened to the uppermost terminal edges of said support walls and to said dome; and

a shoe assembly including a shoe being mounted on an axle fastened transversely between said support walls distally rearward of said dome, said shoe having a concave curved portion on the upper side of its forwardmost terminal end to mate with the lower curvature of said hitching ball, said dome having an entranceway in its rearwardmost terminal side to permit the forwardmost terminal side of said shoe to project through said dome adjacent said ball, a shoe-aligning tab issuing from the uppermost terminal side of said shoe engageable through a slot in said top wall for pivoting said shoe away from or adjacent to said hitching ball, and a knife-lock sub-assembly having a spring loaded knife-lock engageable with a notch in the rearwardmost terminal end of said shoe to retain said shoe adjacent said hitching ball, said knife-lock being provided on a handle which projects through a second slot in said top wall rearwardly of said slot carrying said tab and being guided by means provided in said body, said knife-lock sub-assembly comprises a substantially L-shaped handle carried rectilinearly in and being guided by a web member fastened to said support walls, a blade fastened transversely to the forwardmost terminal end of said handle to engage said shoe notch, said blade being carried at its terminal sides in slots disposed in said support walls, and a spring disposed about said handle between said blade and said web member to urge said blade and handle adjacent said knife-lock.

3,888,518
FLUID CONDUIT CONNECTING DEVICE

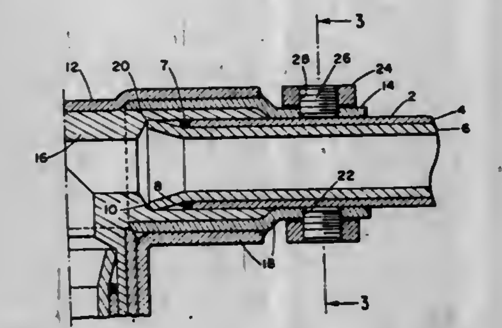
Marcel Delessert, Alens-sur-Cossonay, Switzerland, assignor to Societe Corobit Anstalt, Treuunternehmen, Lichtenstein
Filed Jan. 21, 1972, Ser. No. 219,802
Claims priority, application France, Jan. 21, 1971, 71.02004
Int. Cl. F16l *39/00*
U.S. Cl. 285—39 **5 Claims**



1. Multiple connection device for fluid conduits comprising a juxtaposition of a plurality of pairs of coupled elements, wherein all said elements are substantially identical and each one is formed with orifices on one of its faces and with means for attachment to the ends of said conduits to effect fluid communication between said conduits and respective of said orifices, and the opposite face of each element is provided with a bored male member and a bored female member capable of nesting respectively in a female member and a male member of another identical element so as to form a pair of elements which are interconnected by coupling members, the said element having inner passageways each communicating on one side with one of said orifices and on the other side with a bore in one of said members, each element being provided with means forming slots on two opposite faces with at least two slots situated close to the juxtaposed faces of said elements, the means forming said slots being resiliently deformable whereby said slots receive symmetrical lugs formed with recessed portions adapted to engage opposed surfaces of the means forming said slots to ensure assembly of said pairs of juxtaposed elements, at least two of said lugs forming an axis of rotation on which a fastener is engaged for coupling two of said elements.

3,888,519
COUPLING AND FITTING FOR LINED TUBING

Verity C. Smith, Dedham, and Lawrence H. Reynolds, Needham, both of Mass., assignors to Vaponics, Inc., Plymouth, Mass.
Filed Nov. 16, 1972, Ser. No. 307,124
Int. Cl. F16l *11/12*
U.S. Cl. 285—55 **10 Claims**



1. In a joint for coupling and fitting; a coupling member having a female receptacle with an inner surface formed of a non-contaminating material to a lined conduit having an inner lining of a non-contaminating material and an outer-tubing formed of a material dissimilar to said non-contaminating

material which is chosen to provide structural support, where the improvement comprises:

said coupling member enclosing a cylindrical segment of said outer-tubing;

said inner lining of non-contaminating material of said conduit extending beyond the end of said outer-tubing;

the non-contaminating material of said female receptacle forming a shoulder within said receptacle;

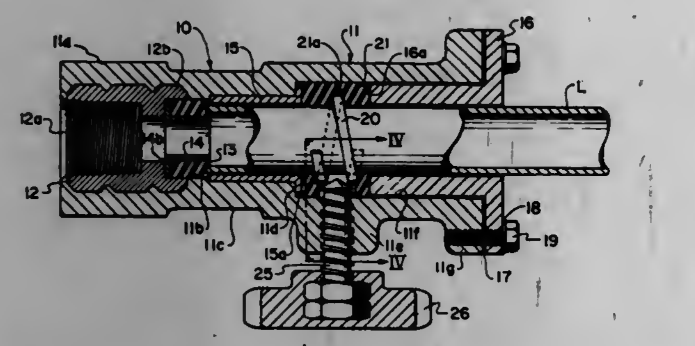
said non-contaminating lining of said conduit contacting the non-contaminating material of said shoulder;

a sealing member formed of a non-contaminating material abutted against the end of said outer-tubing, said flexible sealing member providing a fluid tight seal between the non-contaminataing material of said receptacle and the non-contaminating material of said inner lining so that fluid flowing through said joint only contacts non-contaminating material; and,

a ring located about the portion of said coupling member enclosing the cylindrical segment of said outer-tubing, said ring having a plurality of symetrically located, threaded, radially directed holes therethrough;

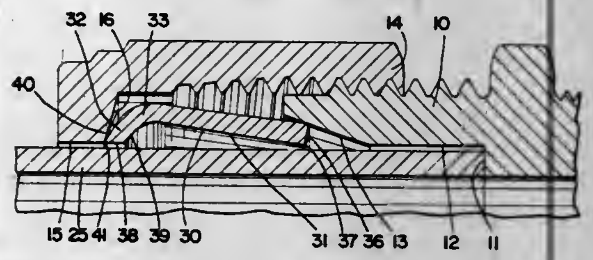
said coupling member also defining holes which are concentrically aligned with the threaded holes in the ring; and, set screws threaded into said threaded holes in said ring and extended through said holes in said coupling member and bearing against the exterior surface of said outer-tubing.

3,888,520
LANCE SUPPORTING COUPLING
James H. Brennan, Monroeville, Pa., assignor to Pittsburgh Brass Manufacturing Company, Irwin, Pa.
Filed Aug. 22, 1974, Ser. No. 499,705
Int. Cl. F16l *37/22*
U.S. Cl. 285—310 **11 Claims**



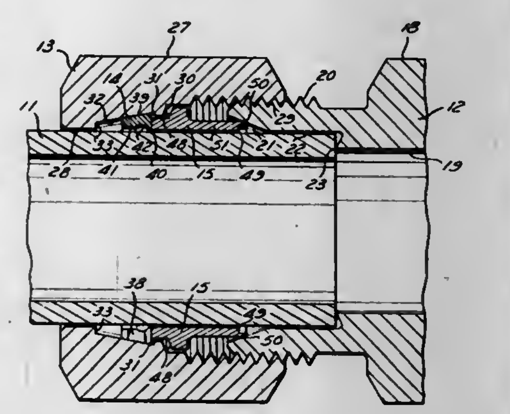
1. In a simplified positive latching and easily releasable fluid sealing-off coupling for connecting an end portion of a fluid delivering pipe member to a fluid supply line, a longitudinally extending coupling housing having a through-extending bore, connector means at a back end portion of the housing for securely connecting said bore to the fluid supply line, an annular gasket positioned within a back end portion of said bore adjacent said connector means, a pair of sleeve-like members along a forward end portion of said bore for slidably receiving a rear end portion of the pipe member in a longitudinally extending relation therein, means supporting said gasket in position within said bore to define a forwardly exposed end seat portion for a rear edge of the rear end portion of the pipe member, said pair of sleeve-like members defining a central recess portion therebetween within said bore, a ring-like locking element operatively carried within said recess portion and having a pair of spiral wings connected together at one end and adapted to curve about opposite sides of the pipe member to be held, said ring-like element having its wings connected in a flexibly held closely adjacent relation, a canting screw, a threaded boss on said housing in alignment with said recess portion for operatively receiving said canting screw, said canting screw having a canting head adapted to wedge between the wings of said ring-like element and force said wings apart into canted locking engagement with the pipe member positioned within said housing.

3,888,521
TUBE COUPLING AND FERRULE THEREFOR
Lawrence B. O'Sickey, University Heights, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio
Filed July 11, 1973, Ser. No. 378,332
Int. Cl. F16l *19/08*
U.S. Cl. 285—341 **4 Claims**



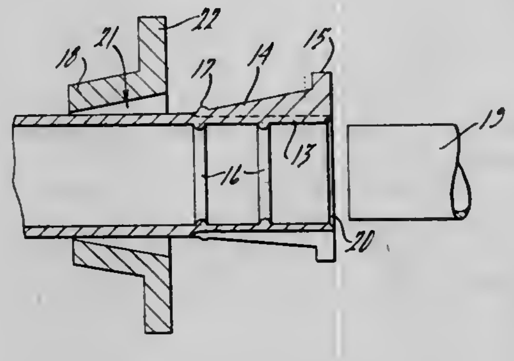
1. A tube coupling ferrule of thin wall having a forward and a rear portion the forward portion having radially inner and outer conical surfaces of different conicity that extend from smaller diameters at the forward terminal end of the ferrule to larger diameters toward the rear portion and which gradually converge toward each other in the direction toward their larger diameters whereby the thickness of the forward portion is least at such larger diameters, said rear portion having generally conical radially inner and outer surfaces that extend from smaller diameters at the rear terminal end of the ferrule to larger diameters toward the forward portion, said ferrule also having curved radially inner and outer surfaces that respectively join said inner surfaces and said outer surfaces at said larger diameters, said curved portion being of substantially uniform but thinner wall thickness than the major part of said forward conical portion.

3,888,522
FLARELESS FITTING
Luis Moreiras, Northfield, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio
Filed Apr. 1, 1974, Ser. No. 456,864
Int. Cl. F16l *17/00*
U.S. Cl. 285—341 **13 Claims**



1. In combination, a tube, a body, a nut, a rear sleeve, and a front sleeve, said body including a threaded body portion and a conical body camming surface, said nut including a threaded nut portion for threadably engaging said threaded body portion to axially advance said nut relative to said body from a starting position to a midway position and from said midway position to a tightened position, a conical nut camming surface, and a nut abutment surface, said rear sleeve being annular and including a rear sleeve inner peripheral surface and a rear sleeve outer peripheral surface, said inner peripheral surface including a radially inwardly extending rear sleeve tube cutting edge for cutting into said tube, said front sleeve being annular and being disposed between said rear sleeve and said body camming surface and including a front sleeve abutment surface, said nut abutment surface being axially spaced from said front sleeve abutment surface and separating it from said nut camming surface and said nut camming surface engaging said rear sleeve and said front sleeve engaging said rear sleeve to prevent axial movement of said rear sleeve when said nut is in said starting position, said rear sleeve tube cutting edge being radially inwardly embedded in said tube by operation of said nut camming surface and said nut abutment surface lightly engaging said front sleeve abutment surface and said front sleeve engaging said rear sleeve when said nut is in said midway position, and said front sleeve being radially inwardly contracted by operation of said body camming surface and said nut abutment surface tightly engaging said front sleeve abutment surface and said front sleeve being axially spaced from said rear sleeve by operation of said nut abutment surface when said nut is in said tightened position.

3,888,523
NON-THREADED TUBING CONNECTOR
Donald D. Bartholomew, Utica, Mich., assignor to Merit Plastics, Inc., East Canton, Ohio
Filed May 10, 1973, Ser. No. 358,916
Int. Cl. F16l *13/14*
U.S. Cl. 285—382 **4 Claims**



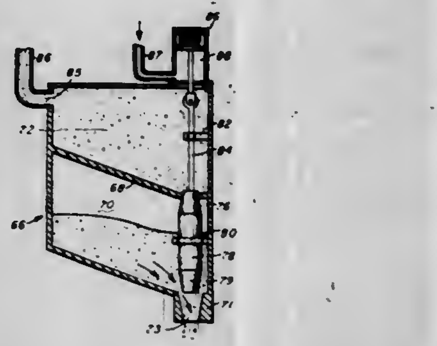
1. In a conductor for a fluid, a tube having a section at one end defined by a circumferentially continuous wall telescopingly insertable over a conduit to which it is to be secured in direct fluid conducting relation therewith circumferentially, spaced outwardly extending integral inclined plane means on said section diverging toward the end thereof, the wall of the section between and under the inclined plane means being deflectable, and a locking sleeve means on said end section slidable over said inclined plane means toward said one end for producing a uniform constriction of said circumferentially continuous wall thereby producing a locking and sealing force between said tube end section and said conduit.

3,888,524
WINTER EMERGENCY BRAKE SYSTEM
Poy Lee, 52 Tennyson St., Somerville, Mass. 02145
Division of Ser. No. 385,419, Aug. 3, 1973. This application May 28, 1974, Ser. No. 473,590
Int. Cl. B60b *39/04;* **B61h** *11/00*
U.S. Cl. 291—15 **4 Claims**

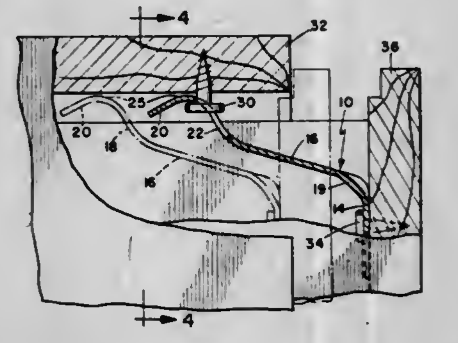
1. A storage apparatus for sand or the like for use with a motor vehicle to deposit the sand on the roadway adjacent at least one wheel of the vehicle, comprising;

a tank,

means partitioning the tank into upper and lower compartments and defining a port communicating therebetween, said upper compartment having means defining an inlet, said lower compartment having means defining an outlet, and valve means including a closure member that is movable to assume a first position permitting sand deposition and blocking communication between said compartments, and a second position inhibiting sand deposition and permitting said flow between said compartments.



3,888,525
HIDDEN DRAWER AND DOOR LATCH
William L. Kousens, 10834 Hansom Ln., Spring Valley, Calif. 92077
Filed Feb. 6, 1974, Ser. No. 439,902
Int. Cl.^{2} E05C *19/06*
U.S. Cl. 292—87 **8 Claims**



1. A resilient metal catch element for preventing opening of drawers or doors in cabinets or the like comprising;

means for providing a rigid projection that projects in a given direction and has a hook edge portion inside a cabinet adjacent a drawer or door,

a metal catch element having a base end for being secured to the inside surface of a drawer or door,

said catch element having a substantially planar portion with an upper surface,

said planar portion and said surface being normal to said given direction,

said planar portion being integral with and extending at an angle from said base end toward the interior of the cabinet and projection means and having an integral end with an upwardly curved portion and a downwardly curved portion relative to the plane of the upper surface of the planar portion,

a slot in the upwardly curved portion for passing over the projection means with the projecting means passing through said slot with the hook edge portion hooking through the slot on the upward side in a downward direction and being positively hooked through and locked over the edge of the slot,

said integral catch element being resilient whereby a pressing force against the upper side of the planar portion downwardly will bend the planar portion downwardly moving the slot edge away from hooking contact with the projecting means and allowing the drawer or door to be opened relative to the cabinet,

and said planar portion and said slot having a width that is several times the width of the projection means to assure catching the projection means even where there is slight misalignment between the projection means and the catch element.

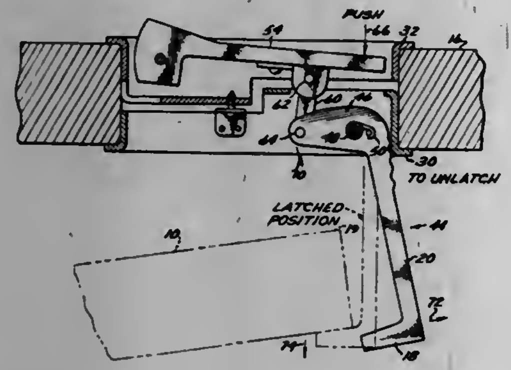
3,888,526
DOOR HOLDER AND RELEASE LATCH

Richard D. Dennis, Lakewood, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Feb. 8, 1974, Ser. No. 440,678

Int. Cl.^{2} E05C *3/30, 13/04, 15/02*

U.S. Cl. 292—97 **6 Claims**



1. A door holder and release latch for mounting in an opening in a wall structure to retain a first pivotal door in a position with its outer vertical edge in close proximity to said wall structure, said latch being adaptable for release of said door upon actuation thereof from either side of said wall structure, said latch comprising:

an inside mounting and an outside mounting adapted to be inserted in an opening in said wall structure, said mountings being connected together to retain them in said opening,
a latch member pivotally mounted on said outside mounting,
a remote release plate mounted on said inside mounting, and
a link interconnecting said plate and said latch member for interaction therebetween,
said latch member being mounted at a point intermediate the ends of said latch member, that portion of said latch member extending from said point in one direction forming a latch arm with the outer end thereof terminating in a door edge engaging latch element, and that portion of said latch member extending from said point in the other direction forming a link arm with its end connected to said link.

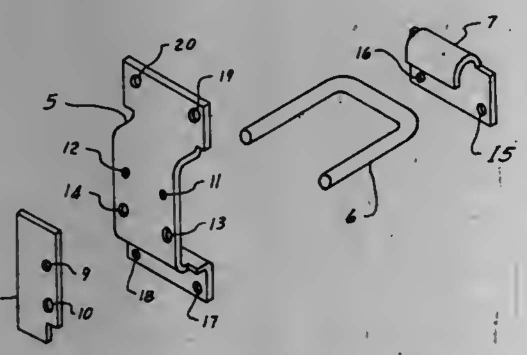
3,888,527
GATE LATCH

Melvin Roger Haisler, Rt. 5, Box 75, Denton, Tex. 76201

Filed Nov. 5, 1973, Ser. No. 412,981

Int. Cl.^{2} E05C *3/04*

U.S. Cl. 292—213 **3 Claims**



1. A pivoting fork gate latch containing a safety catch which automatically locks the fork in a horizontal position and firmly holds it in a vertical position, comprising:

a fork being a U-shaped rod resting on the top side of the lower of two angle-shaped flanges on a frame and held in place by a retainer, said retainer being a flat strap and having a portion shaped to fit over the axial section of said fork, said portion being notched on each side allowing it to fit between the legs of said fork;
said frame being formed of a strap to have an angle flange at top and bottom end and being slotted out on each side within the central portion allowing the fork to be engaged in this area, said slots beginning at inner end of a horizontal flange on lower end of said frame and extending into and through the horizontal portion of the said flange at top end of frame wherein said fork is supported in a horizontal position by the material remaining at the end of the two slots on the horizontal flange at bottom end of said frame and said fork is free to pivot upward to a vertical position;
a safety catch comprising, a flat strap of metal having a notched-out bottom corner on one side and a hole near the same side, said hole being a greater distance from the bottom end than the top end of said safety catch; when suspended in said hole with means connected to said frame in a corresponding location and facilitating proper relation between said notch and one leg of fork, said safety catch will automatically remain in a position that implements an obstruction which interferes with the pivoting movement of said fork; said safety catch must be manually forced into a position so that the notched edge coincides with the appropriate slotted edge of said frame in order to allow unrestrained pivoting movement of said fork.

3,888,528
HATCH BATTENING DEVICE

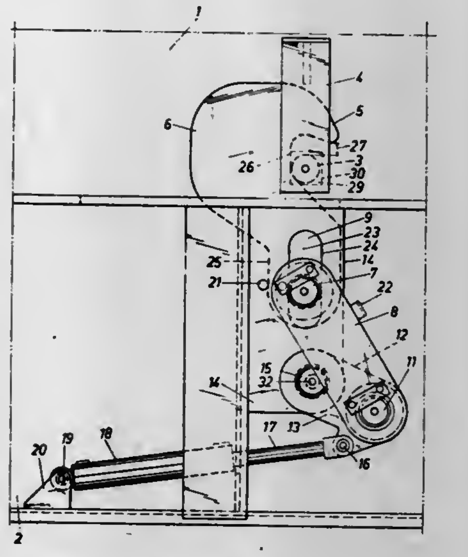
Boris Jericijo, Hisings Backa, Sweden, assignor to von Tell Trading Co. AB, Sweden

Filed May 3, 1973, Ser. No. 356,821

Claims priority, application Sweden, May 8, 1972, 6016/72

Int. Cl. B63b *19/14*

U.S. Cl. 292—256.5 **3 Claims**



1. An improved hatch battening device particularly intended for cargo hatches on board ships, said hatch battening device comprising a pin fixed relative to said hatch, a hook member associated with a coaming carrying said hatch, said hook member having a hook portion at one end thereof adapted to engage over said pin, means for operating said hook member between a latched position and a released position comprising a source of power, an arm supported for pivotal movement about a fixed pivot point on the coaming, means operatively connecting said source of power and said arm for pivoting said arm upon operation of said source of power, a link, means pivotally connecting said link to said arm, means providing a pivotal connection between said link and said hook member, means providing a guide for said last mentioned pivotal connection for constraining the movement of said last pivotal connection in a vertical direction intersecting said pin, and means independent of said guide providing a fulcrum about which said hook member may pivot for guiding said hook member during the battening operation to effect movement of said hookshaped portion of said hook member first in a pivotal direction relative to the last pivotal connection and into contact with the pin and finally guiding said hook member in a vertical direction for guiding the final tightening movement of said hook member in a vertical direction to preclude pivotal movement of said hook member relative to said pin.

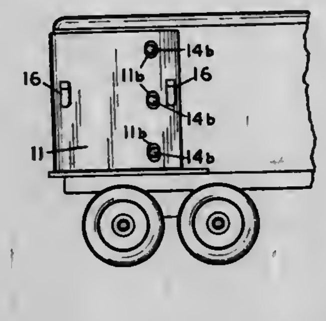
3,888,529
REAR DOOR LOCK FOR TRUCKS AND TRAILERS

Frank A. Mauritz, P.O. Box 9133, Fort Lauderdale, Fla. 33310

Filed Mar. 11, 1974, Ser. No. 450,091

Int. Cl.^{2} E05C *19/18*

U.S. Cl. 292—259 **7 Claims**



1. A rear door lock for a cargo-carrying vehicle, such as a trailer or truck, which has a rear door and opposite sides with protrusions located forward from said rear door, said door lock comprising: a generally U-shaped body of spring steel shaped and dimensioned to snugly straddle the rear end of the vehicle and presenting a back wall to extent immediately behind the rear door on the vehicle and generally parallel opposite legs projecting forward from the opposite ends of said back wall to extend closely along the opposite sides of the vehicle in front of the rear door, said body having a vertical extent of substantially the full height of the rear door on the vehicle, said legs of said body having openings therein toward their front ends for snugly receiving said protrusions on the sides of the vehicle when said back wall of said body extends immediately behind said rear door on the vehicle, whereby to releasably lock said body to the sides of the vehicle, and brackets on the outside of said opposite legs of the generally U-shaped body, said brackets having respective depending segments which are offset laterally outward from said legs so as to receive slidably between them the lift arms of a fork lift truck which are spreadably apart substantially to pull said legs apart and thereby disengage said openings from said protrusions.

3,888,530
BOLT GUARDS FOR DOOR

Edward Fabrici, 7000 Carolina Pl., Merrillville, Ind.

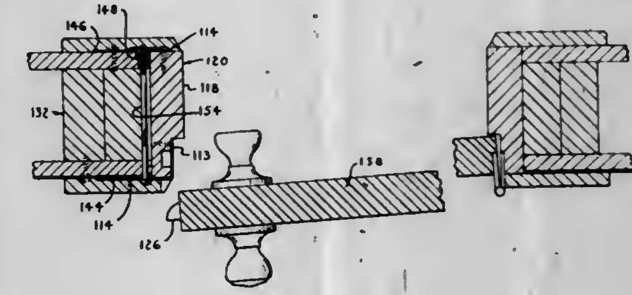
Continuation-in-part of Ser. No. 252,836, May 12, 1972, abandoned. This application Apr. 16, 1973, Ser. No. 351,494

Int. Cl. E05c *19/00*

U.S. Cl. 292—340 **8 Claims**

1. Guard means to which a door may be securely locked to a frame member wherein said frame member is connected in spaced relation to a structural member forming a door opening in a wall, comprising:

a sheet plate member overlapping said frame member and said structural member; a second sheet plate member formed in a generally L-shape having a strike plate and side plate, said strike plate overlapping said frame member and said plate of said second sheet plate member overlapping the other side of said structural member; and a rigid member between said frame member and said structural member secured at each end thereof to said sheet plate member and side plate of said second sheet plate member.



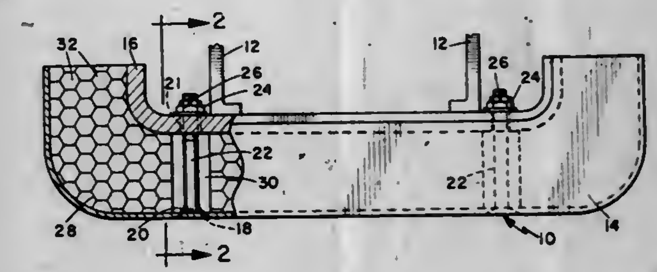
3,888,531
FRANGIBLE SHOCK ABSORBING BUMPER

George T. Straza, and Edward L. Parr, both of El Cajon, Calif., assignors to Straza Enterprises Ltd., El Cajon, Calif.

Continuation-in-part of Ser. No. 343,189, March 21, 1973, abandoned. This application Jan. 23, 1974, Ser. No. 424,442

Int. Cl. B60r *19/04*; **B61f** *19/04*; **F16d** *63/00*

U.S. Cl. 293—1 **10 Claims**



1. A shock absorbing bumper, comprising:

a forward impact bumper having upper and lower side plates forming a U-shaped cross section,
a back plate for attachment to a vehicle in a plane parallel to said forward bumper,
metal honeycomb material having a plurality of cells, with each cell extending through the entire thickness of said material in a direction substantially normal to said plane, said side plates abutting the upper and lower surfaces of said honeycomb material,
said cells of said honeycomb material having wax like material therein,
and means for securing said forward bumper to said back plate, sandwiching said honeycomb material between the forward bumper and back plate.

3,888,532
FENDER GUARD

Timothy H. Link, RR 2, Toronto, Kans. 66777

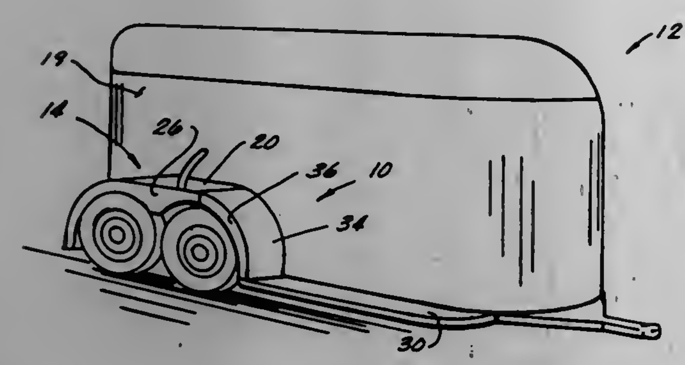
Filed Jan. 2, 1974, Ser. No. 429,522

Int. Cl. B60r *19/02*

U.S. Cl. 293—62 **3 Claims**

1. In a vehicle fender having an inner side portion secured to a vehicle, an outer sidewall portion and a forward wall portion merging into said outer sidewall portion, said outer sidewall portion having a wheel opening therein, the improvement of a guard for said fender in combination therewith, comprising:

a. a relatively thin, bendable, impervious hard surfaced member mounted on the forward portion of said fender and having a shaped edge portion overlying said fender's outer sidewall portion from said wheel opening to said forward wall portion and an integral forward portion to substantially completely cover said fender's forward wall portion, and

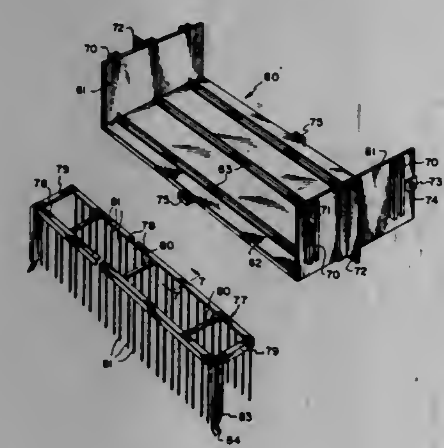


b. said member being secured flush against the exterior surface of said fender.

3,888,533

BULK TOBACCO RACK

William R. Long, Rocky Mountain Hwy., Tarboro, N.C. 27886
Division of Ser. No. 337,622, March 2, 1973, Pat. No. 3,834,137. This application May 17, 1974, Ser. No. 471,113
Int. Cl. A24b *1/08*
U.S. Cl. 294—5.5 7 Claims

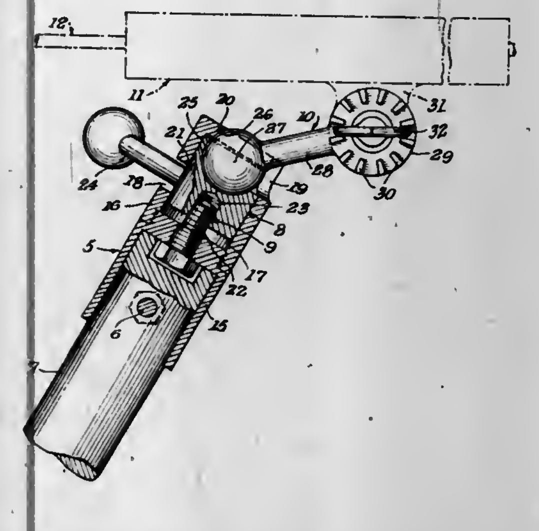


1. Container means for receiving tobacco leaves comprising a rack means for receiving tobacco leaves in a random haphazard manner with the stems of the leaves disposed in a plurality of different directions, said rack means including an elongated side member, an end member fixed to each end of said side member and extending outwardly substantially normal thereto, said side member having a predetermined length and a width substantially wider than the length of the tobacco leaves, a plurality of independent pin frames, each pin frame having a length substantially equal to the length of said side member, means for selectively mounting each of said pin frames on said end members in spaced relationship to each other, each of said pin frames having a plurality of tines of a length to extend through the tobacco leaves which are located on said rack means, and means on said side member for supporting at least some of said tines, whereby after the tobacco leaves have been placed on said side member, a plurality of pin frames are selectively mounted on said end members so that the tines penetrate the leaves and thereafter the rack means can be rotated to an upright position so that the tines support all of the leaves in an uninterrupted column.

3,888,534

LINEMAN'S TOOL-HOLDING FIXTURE

Barnes R. Hall, 4882 Hartwick St., Los Angeles, Calif. 90041, and Ralph W. Hanna, 4724 Barnard St., Simi Valley, both of Calif. 93065
Filed July 9, 1973, Ser. No. 377,768
Int. Cl. A47f *13/06*
U.S. Cl. 294—19 R 2 Claims



1. A lineman's fixture for holding a tool in operative engagement for carrying out operations on an electrically conducting wire or cable spanning between power line poles, said fixture being affixed to the end of an elongated handle and comprising:

a body secured to an end of said handle and having a cylindrical cavity beyond the end thereof,
a connector member disposed within said cavity and threadedly connected to said body to move both longitudinally and rotationally, said member being provided with a laterally directed handle that extends through an opening in said body and which, when moved in a plane transverse to length of the handle, effects the mentioned movement of the connector member,
said connector member and the outer end of the body being formed to provided a substantially hemispherical seat, and
a head member provided at one end with a ball that is fitted in said seat, is adjustably rotational therein when the connector member is moved rotationally to separate the head and body portions of the hemi-spherical cavity, thereby permitting universal adjustability of the head member in relation to the body, and is clamped against such universal movement when the connector member is moved to cause the same to move in the opposite direction and thereby effect clamping of said ball in fixed adjusted position relative to the mentioned body,
said head member having an arm portion extending from said ball, with a tool-connecting end that has fixed-incremental adjustable engagement with a wire- or cable-engaging tool.

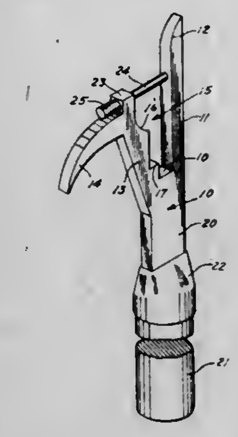
3,888,535

FIREMAN'S PIKE POLE OR THE LIKE

Charles Rosso, Cimarron, N. Mex. 87714
Filed June 21, 1974, Ser. No. 481,706
Int. Cl. B25f *1/00*
U.S. Cl. 294—19 R 5 Claims

1. A metal head for a fireman's pike pole, or the like comprising:

a shank for attachment to a pole;
a substantially flat body portion rigidly mounted on said shank;
said body portion having a generally triangular outline and comprising an elongated pointed portion extending in alignment with said shank and a lateral portion having a laterally extending hook thereon, and located inwardly from the end of the pointed portion;
said body portion having a recess between said pointed portion and said lateral portion and opening toward the end of said pointed portion; and,

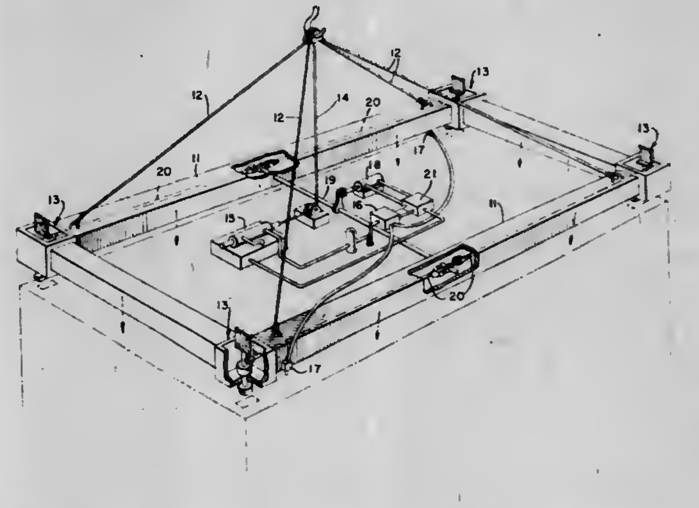


a retractable locking element mounted on said lateral portion and extending across the open end of said recess to close said recess whereby an object may be held in said recess and manipulated by the pike pole.

3,888,536

AUTOMATIC — SELF CONTAINED — LIGHT WEIGHT SPREADER BAR

Peter Durenec, Annandale, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Jan. 29, 1974, Ser. No. 437,566
Int. Cl. B66c *1/66*
U.S. Cl. 294—82 SF 4 Claims



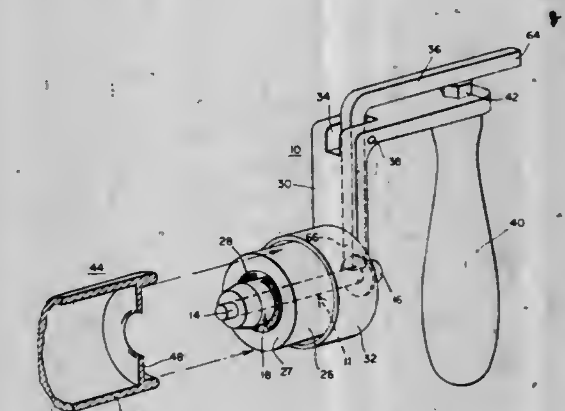
1. In a cargo container handling system, a spreader bar assembly including:

a moveable support;
a rectangular frame with corner attachments connected to said support;
a hydraulic power source assembly embodying a hydraulic piston means adapted such that selected movement of said piston means readies said hydraulic power source assembly for operation;
hydraulic control means for locking and unlocking the corner attachments of the spreader frame, said hydraulic control means including safety interlock means disposed at each point of attachment and responsive to the relative position of said spreader frame with respect to a cargo container, said control means adapted to lock and unlock corner attachments substantially simultaneously when a selected relative positioning of said spreader frame with respect to a cargo container occurs and the spreader frame concurrently fully rests on the cargo container; and
means connecting said hydraulic piston means of said hydraulic power source assembly to said moveable support such that a lift motion of said moveable support, with said spreader frame resting on the cargo container and undisturbed by said lift motion, pressurizes said hydraulic power source assembly.

3,888,537

CARRIERS FOR PIRNS AND OTHER ARTICLES

Gerard L. Lafond, 2811 Hunterdon Dr., Cinnaminson, N.J. 08077
Filed Oct. 5, 1973, Ser. No. 404,372
Int. Cl. B66c *1/54*
U.S. Cl. 294—93 7 Claims



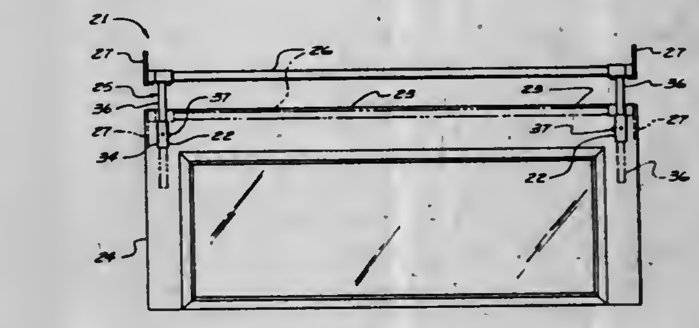
1. A carrier designed to securely engage a flanged member comprising:

a shaft;
a flexible washer-type member, a portion of which is fixed securely relative to said shaft and which when in the secured position abuts against the flange;
a member slideably mounted on said shaft which in the secured position has a portion which abuts against a portion of said washer-type member to prevent it from flexing thus securing the flange; and
means communicating with said shaft to separate said slideable member from the portion of said washer-type member to which it abuts in the secured position thereby allowing said washer-like member to be flexed and the flange disengaged.

3,888,538

VEHICLE UTILITY RACK

John T. McWilliams, 2726 Kelly St., Livermore, Calif. 94550
Filed May 25, 1973, Ser. No. 364,019
Int. Cl. B60p *3/40*
U.S. Cl. 296—3 12 Claims



1. In a utility rack for mounting on a vehicle including mounting means formed for mounting said rack to said vehicle proximate a top surface thereof and load supporting means formed with a horizontally extending loading portion for support of a load thereon and an upstanding ear portion extending above said loading portion for retention of said load against lateral movement, said load supporting means being mounted to said mounting means for vertical movement of said loading portion, the improvement comprising:

said mounting means being formed for mounting to an end wall of said vehicle proximate said top surface, and said mounting means and said load supporting means being formed for selective securement of said loading portion in a load supporting position disposed above said top surface and in a stored position between about the level of said top surface and below said top surface; and

said ear portion being movably mounted with respect to said loading portion and formed for selective securement in a load retaining position extending above said loading portion and in a moved position between about the level of said top surface and below said top surface when said loading portion is in said stored position for compact storage of said utility rack with said top surface of said vehicle being substantially unobstructed.

3,888,539

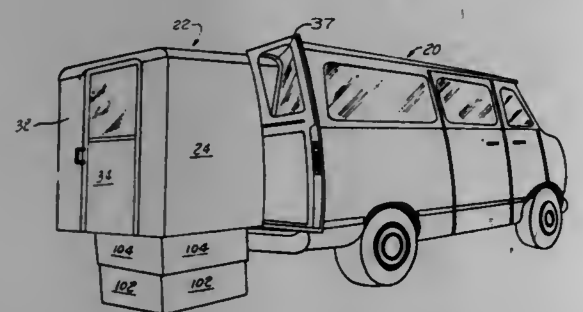
SELF-CONTAINED KITCHEN UNIT FOR A VAN TYPE VEHICLE

Robert A. Niessner, 2280 Summit Drive, Hillsborough, Calif. 94010

Filed Apr. 16, 1973, Ser. No. 351,520

Int. Cl. B60p *3/32*

U.S. Cl. 296—23 D **25 Claims**



1. A self-contained kitchen unit for insertion through the rear opening of a vehicle having a body providing an enclosed space behind the driver and rear doors providing a rear opening in the body which is substantially the full interior height and width of the vehicle body, said kitchen unit comprising, two sidewalls, a rear end wall, a ceiling, and a floor joined together to provide a kitchen unit which is itself completely enclosed except for a front end open to the interior of the vehicle, kitchen facilities adjacent the inner side of at least one of the walls, mounting means for mounting the kitchen unit in the vehicle for movement between a first, transport position in which the unit is completely contained within the vehicle and a second, operative position in which a substantial part of the enclosed unit extends outside the rear opening of the vehicle with a forward end portion of the kitchen unit retained within the vehicle to provide, in said operative position, a kitchen space behind the vehicle which is enclosed by the kitchen unit in combination with the vehicle body, said floor having a drop down part, and floor lowering means for lowering the drop down part of the floor to ground level in the second, operative position to provide stand up space in that part of the kitchen unit, and wherein the drop down part of the floor is so located with respect to said kitchen facilities as to provide access to the kitchen facilities in a working relation when the drop down part of the floor is lowered to provide such stand up space.

3,888,540

SAFETY DEVICE

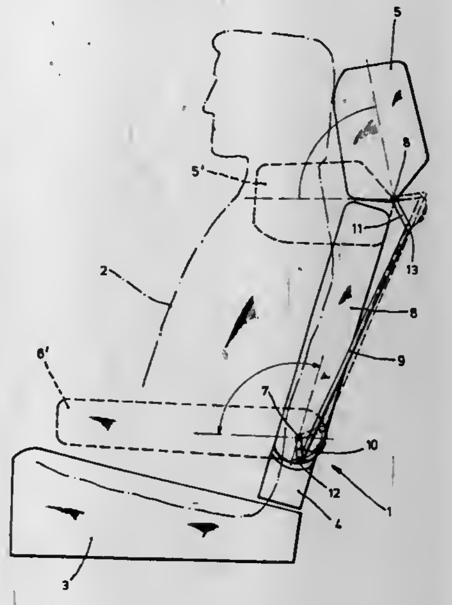
Dieter Protze, and Andreas Bauer, both of Fallersleben, Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Oct. 17, 1973, Ser. No. 407,100

Claims priority, application Germany, Oct. 31, 1972, 2253265

Int. Cl. A62b *35/00;* **A47c** *7/36*

U.S. Cl. 297—384 **10 Claims**



1. A safety device for an automotive vehicle having first and second passenger seats disposed along side each other, said second seat being provided with a head support extending above its back rest, said safety device comprising moving means for moving said head support from its head restraining position into a second position approximately at the height of the shoulder of a seated average adult passenger for laterally restraining the shoulder of said passenger seated in said first seat.

3,888,541

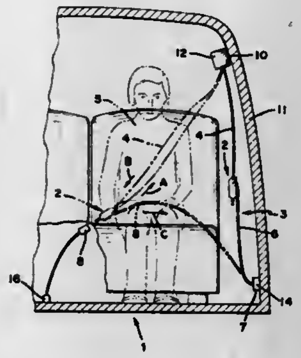
BELT LOCKING ASSEMBLY FOR SAFETY BELT BUCKLE

Robert L. Stephenson, Sterling Heights, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Filed July 1, 1974, Ser. No. 484,823

Int. Cl. A62b *35/00*

U.S. Cl. 297—388 **18 Claims**



1. A belt locking assembly for a vehicle safety belt adapted to be engaged by a buckle, said vehicle safety belt including a continuous length which forms a shoulder belt and a lap belt, said shoulder belt having a shoulder belt anchorage point and said lap belt having a lap belt anchorage point, said belt locking assembly being adapted to be mounted on the safety belt and adapted to slide upon a portion of the safety belt to adjust the length of the lap belt and shoulder belt, said belt locking assembly comprising:

a housing for said assembly;

a buckle engaging means extending from said housing and adapted to be engaged in said buckle;

a roller means supported by said housing and adapted to allow a portion of said safety belt to move upon said roller means to facilitate movement of said assembly with reference to said safety belt;

a lock bar mounted in said housing and having an unlocked position and a locked position, said lock bar adapted to be moved from said unlocked position to said locked position when said assembly is engaged in said buckle, said lock bar in said unlocked position allowing said assembly to slide with reference to said safety belt both in the direction of said shoulder belt anchorage point and in the direction of said lap belt anchorage point, said lock bar in said locked position preventing said assembly from sliding with reference to said safety belt in the direction of said shoulder belt anchorage point, but allowing said assembly to slide with reference to said safety belt in the direction if said lap belt anchorage point; and

biasing means mounted in said housing to bias said lock bar in said unlocked position.

3,888,542

ROAD PLANING MACHINES

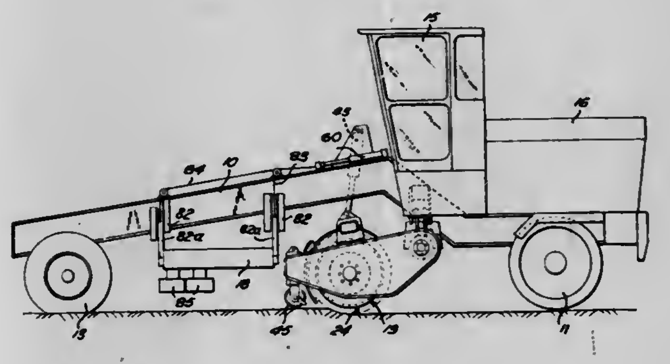
John Edward Gowler, Redhill, England, assignor to Non-Impact Surfaces Limited, Redhill, Surrey, England

Filed Dec. 14, 1973, Ser. No. 424,723

Claims priority, application United Kingdom, Dec. 22, 1972, 59513/72

Int. Cl. E21c *47/00*

U.S. Cl. 299—1 **10 Claims**



1. Apparatus for machining road surfaces of the kind comprising a body having road wheels and carrying a cutting drum mounted for rotation about an axis extending transversely of the direction of travel and movable into contact with a road surface to cut away a layer of the surface in which there is a first hydrostatic pump, connected to a hydrostatic motor for driving the drum in which there is a second hydrostatic pump connected to a hydrostatic motor for driving at least one of the road wheels and in which there is means to drive both of the pumps at constant speed, and both of the pumps have infinitely variable displacements, means being provided for varying the displacements of the pumps individually whereby any combination of drum and road wheel speeds may be provided, and valve means for connecting the pumps to the motors in a road machining position wherein the first pump is connected to the drum motor and the second pump is connected to the road wheel motor and a transit position wherein the first pump is connected to the road wheels.

3,888,543

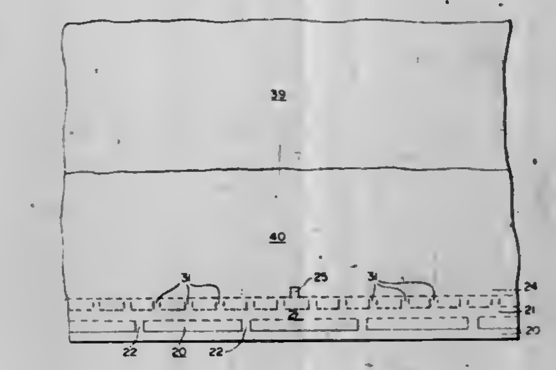
METHOD FOR MINING OIL SHALES, TAR SANDS, AND OTHER MINERALS

Robert W. Johns, 349 Ashley Crescent S.E., Calgary, Alberta, Canada

Filed Sept. 3, 1974, Ser. No. 502,296

Int. Cl.^{2} E21C *41/10*

U.S. Cl. 299—11 **9 Claims**



1. In the mining of subsurface friable mineral ore deposits, a mining system including a mine having at least two operating levels, interconnected by shaft means, and spaced one from the other in the vertical direction, said system comprising:

a. a first operating level, positioned substantially at the base of said deposit, and having a tunnel complex adapted for the utilization of the Fixed Arch Shield mining technique, which tunnel complex includes:
  i. a plurality of service tunnels bounding a designated mining area;
  ii. a main access tunnel centrally bisecting said mining area, and;
  iii. a plurality of transverse tunnels equidistantly spaced in parallel array, and extending from said main access tunnel to adjacent of said service tunnels, to provide communication therebetween, and to define a multiplicity of mining blocks, said level further including conveyor means adapted to collect and transport said mined ore to said shaft means;
b. means for mining said deposit, and;
c. a second operating level positioned below said first level and parallel therewith, said second level having a tunnel complex linked with said shaft means; said level further including means operatively associated with said shaft means, adapted to receive ore passing from said first level through said shaft means and to transport said ore from said mine.

3,888,544

SYSTEM FOR CHIPPING AND MOVING ICE

John D. Bennett, Denton, Tex., assignor to Sun Oil Company, Dallas, Tex.

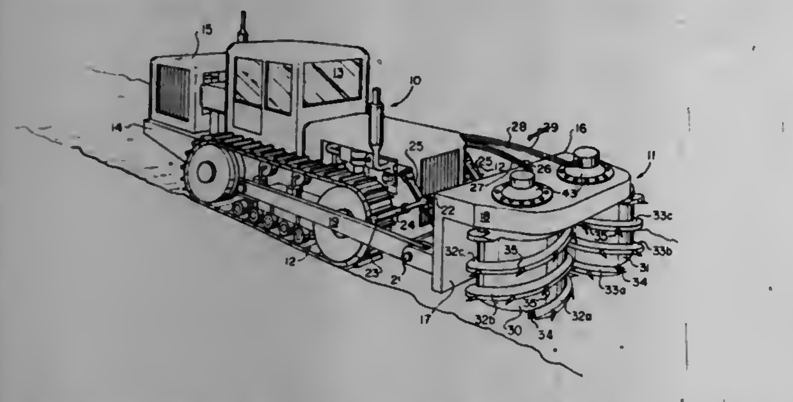
Filed Dec. 3, 1973, Ser. No. 420,815

Int. Cl. E01h *5/12*

U.S. Cl. 299—25 **11 Claims**

1. A system for chipping ice and forming a pathway through rough, icy terrain, comprising: a pair of cylindrical drums mounted for rotation about parallel vertical axes, each of said drums including a smooth, outwardly rounded lower end surface to support the weight of the drum; a plurality of spikes protruding outwardly from the cylindrical outside surface of each drum to engage and chip the ice, the circular paths formed by the tops of the spikes when the drums are rotated

being overlapping in the regioon between the drums; and means for rotating said drums in opposite directions to chip



ice and pull the drums forwardly through the ice to form a pathway along a generally level grade.

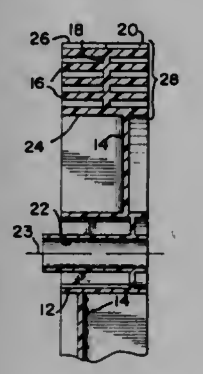
3,888,545
INTEGRAL MOLDED ARTICLE HAVING THE APPEARANCE OF A TIRE AND AN INTEGRAL WHEEL-IRE

Arthur R. Braun, 209 E. Mildred, Cary, Ill. 60013

Filed Oct. 23, 1973, Ser. No. 408,516

Int. Cl. B60b *5/02*

U.S. Cl. 301—63 PW **11 Claims**



1. An integral tire and wheel combination having the general appearance and functional capability of a tire, comprising: a central hub portion, a thin radially extending annular support disc, a plurality of concentric spaced-apart fins axially extending from at least one face of said disc and being integral therewith, and means including a support member extending radially between said hub portion and said support disc for supporting said disc in spaced relation to said hub portion.

3,888,546
PROPORTIONING VALVE SYSTEM FOR REAR BRAKING CIRCUIT

Calmer M. Stordahl, Jr., Metamora, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 14, 1973, Ser. No. 415,566

Int. Cl. B60t *8/14*

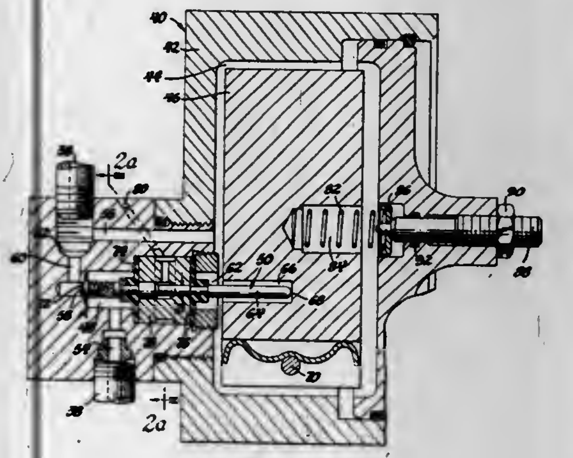
U.S. Cl. 303—6 C **1 Claim**

1. A vehicle brake pressure control valve and valve control mechanism comprising:

a housing having a fluid pressure inlet and a fluid pressure outlet and a valve chamber having an intermediate chamber section connected with said outlet and having opposite ends connected with said inlet, one of said chamber ends being formed about one inlet connection to provide a valve seat;

a valve assembly reciprocably received in said valve chamber and engageable with said valve seat at said one inlet connection to open and close said one inlet connection when reciprocably moved and having a first area exposed to inlet pressure at said one inlet connection, a second area opposed to and smaller than said first area and maintaining the other chamber inlet connection closed and exposed to inlet pressure, said chamber intermediate section and said outlet being fluid connected with said inlet through said one inlet connection when said valve is positioned to open said one inlet connection;

a vehicle deceleration sensing member positioned to act on said valve assembly against the force differential generated by said unbalanced valve areas and fluid pressure at said inlet acting thereon to overcome that force differential and move said valve to close said one inlet connection when the relationship between vehicle deceleration and the inlet pressure exceeds a predetermined ratio;



and adjustable biasing means acting on said deceleration sensing member in one direction and adjustable to change the predetermined ratio between vehicle deceleration and inlet pressure.

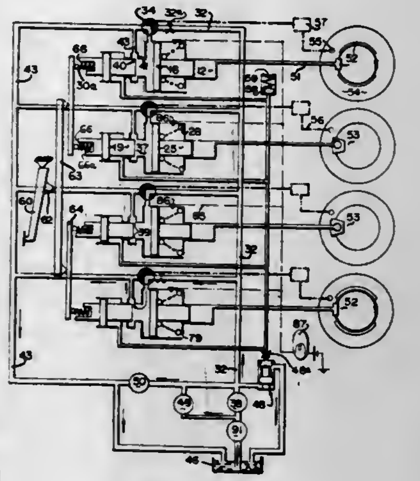
3,888,547
COMBINED POWER BRAKE AND ANTISKID ACTUATORS

Benjamin Ron, 10 Sanhedrin St., Tel-Aviv, Israel

Continuation-in-part of Ser. No. 166,399, July 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 80,899, Oct. 15, 1970, Pat. No. 3,751,919, which is a continuation-in-part of Ser. No. 34,143, May 4, 1970, abandoned. This application Apr. 3, 1972, Ser. No. 240,455

Int. Cl. B60t *8/06*

U.S. Cl. 303—21 F **6 Claims**



1. A combined Power Brake and Antiskid Actuators comprising in combination;

a. a brake pedal for accepting an operator's force and work inputs,

b. a plurality of brake control valves each comprising,

1. a housing defining a first and a second bore,
2. a power piston slideable in said first bore,
3. a reaction piston slideable in said second bore, being normally spaced from said power piston, and adapted to establish a mechanical abutment with said power piston after a certain relative movement therein between occurred,
4. a passage for servo fluid flow leading through a variable volume defined between the power piston the reaction piston and the housing, and continuing through a variable restriction point defined between said reaction piston edge and a lip of a peripheral groove formed around said second bore,

c. a mechanical differential linkage for distributing said force and work inputs between said reaction pistons,

d. a control unit for sensing a skid condition and relaying a command to at least one of said brake control valves.

e. a first control means for blocking said servo fluid flow from entering said variable volume of at least one of said brake control valves, in response to said command from a control unit

f. a second control means for blocking said reaction piston from mechanically abutting against said power piston in response to the existence of a pressure in said servo fluid wherein, in response to said command from said control unit said first control means block the entrance of said servo fluid flow into said variable volume and open a passage between said variable volume and a return line for bypassing said restriction point and venting said variable volume.

3,888,548
ANTI-LOCK VEHICLE BRAKE SYSTEM

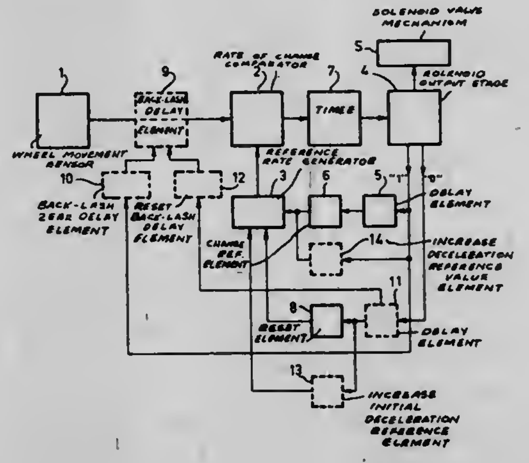
Denis Sharp, Salford, near Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 18, 1972, Ser. No. 272,776

Claims priority, application United Kingdom, July 27, 1971, 35321/71

Int. Cl. B60k *8/12*

U.S. Cl. 303—21 CG **12 Claims**



1. An electronic control system for an anti-lock vehicle brake system containing at least one brake, said control system being responsive to an input signal from a wheel movement sensor associated with a wheel of said vehicle system, which measures change in wheel speed, said signal varying in accordance with the rate of said speed change, said electronic control system comprising:

a solenoid valve mechanism connected to a brake of said anti-lock system for reducing brake pressure of said brake when braking takes place and wheel deceleration exceeds a reference value;

a control circuit connected to said wheel movement sensor and to said solenoid valve mechanism and having a reference control circuit therein, said reference control circuit being responsive on energisation of said solenoid valve mechanism by said control circuit for progressively varying said reference value in a positive sense at a predetermined rate, said solenoid valve mechanism being held energized by said control circuit until the rate of change of said wheel speed bears a given relationship to said varying reference value.

3,888,549
DEVICES FOR CONTROLLING THE BRAKING OF VEHICLE WHEELS

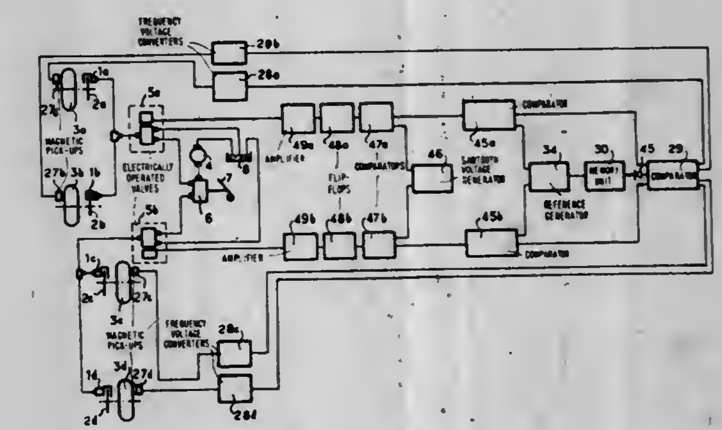
Albert Grosseau, Chaville, France, assignor to S.A. Automobiles Citroen, Paris, France

Filed Jan. 31, 1973, Ser. No. 328,304

Claims priority, application France, Feb. 8, 1972, 72.04583

Int. Cl. B60t *8/08*

U.S. Cl. 303—21 EB **20 Claims**



11. Apparatus for controlling the braking of front and rear wheels of a vehicle, which comprises:

a. first means operative to generate a first signal representing the speed of the fastest of said front and rear wheels, a second signal representing the speed of the slowest of said front wheels, and a third signal representing the speed of the slowest of said rear wheels;

b. second means operative to receive said first signal and generate a reference signal proportional thereto and representing a reference speed;

c. third means operative to receive said second, third, and reference signals and generate first and second pulsed current control signals; and

d. first and second electrically-operated valves operative to receive said first and second pulsed current control signals, respectively, and in response thereto automatically proportion braking pressure to said front wheels and rear wheels, respectively; and

e. said second means further comprises multiplier means operative to receive said first signal, generate said reference signal therefrom at a fraction of said first signal and automatically select one of a plurality of multiplier fractions according to the value of said first signal.

3,888,550
ANTI-WHEEL SKID CONTROL SYSTEM PROVIDING CONTROLLED REAPPLICATION OF BRAKE PRESSURE

Erich Reinecke, Beihorn, Burg; Fritz Isernhagen, Letter; Alfred Klatt, Ronnenberg; Lutz Weise, Misburg; Wilhelm Schlamann, Altwarmbuchen, and Klaus Lindemann, Hannover, all of Germany, assignors to Westinghouse Bremsen-und Apparatebau GmbH, Hannover, Germany

Filed Oct. 10, 1973, Ser. No. 404,849

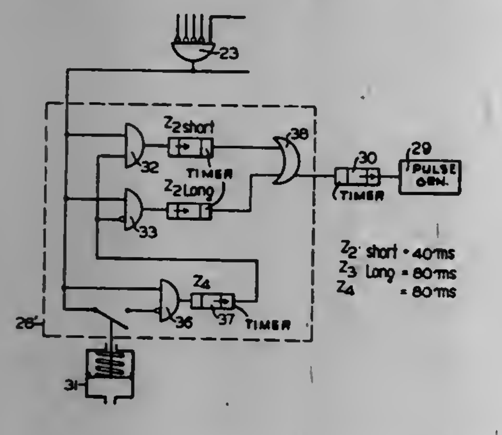
Claims priority, application Germany, Feb. 5, 1973, 2305589; Feb. 15, 1973, 2307368

Int. Cl. B60t *8/12*

U.S. Cl. 303—21 P **4 Claims**

1. For use in a vehicle having an anti-skid brake control system of the fluid pressure type employing signaling means for monitoring and evaluating the behavior of a wheel of said vehicle, and an electronic logic control device responsive to the signaling means, said electronic logic control device comprising:

a. control valve means for modulating fluid brake pressure delivered to a corresponding wheel of said vehicle;
b. control circuit means for operating said control valve means responsive to a first signal emitted by said signaling means when recovery of a skidding wheel is sensed following correction thereof so as to effect the reapplication of fluid brake pressure thereto;
c. pulse generator means for periodically interrupting said reapplication of fluid brake pressure; and



d. timing means activated responsive to said first signal for providing a time period during which operation of said pulse generator means is delayed to permit the reapplication of brake pressure to follow a reapplication brake pressure build-up curve having a predetermined brake pressure versus time characteristic such that during said time period, a greater degree of brake pressure reapplication occurs when the brake pressure is reapplied from a higher existing brake pressure than from a lower existing brake pressure.

3,888,551
APPARATUS FOR CONTROLLING THE ACTUATION OF THE BRAKES OF A MOTOR VEHICLE

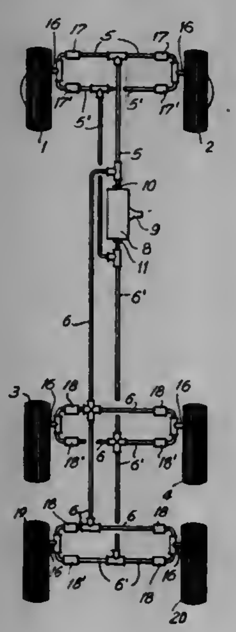
Antonio Maria Castello Brancoe Neves, Dominguisa, Tortasendo, Covilha, Portugal

Continuation of Ser. No. 138,658, April 29, 1971, abandoned. This application Oct. 29, 1973, Ser. No. 410,365

Claims priority, application Portugal, Apr. 30, 1970, 53698

Int. Cl. B60t *17/18*

U.S. Cl. 303—84 A **1 Claim**



1. Brake apparatus for hydraulic or pneumatic brakes of a motor vehicle having at least two wheels, said apparatus comprising two independent branch circuits each connected to all the wheels of the vehicle for operating the brakes thereof, and means connecting said circuits to said wheels in parallel with one another, said means comprising a T-shaped connector at each wheel having one arm connected to the brake actuator of such wheel and second and third arms connected to respective of said circuits, means including a single master cylinder feeding both said circuits separately with pressure fluid comprising a distribution valve having an inlet for pressure fluid and two outlets, each outlet being connected to a respective circuit, and a check valve in each circuit adjacent each T-shaped connector such that each of the second and third arms of each T-shaped connector is fed from the master cylinder via a respective one of said check valves, each check valve being constructed to close upon sudden pressure drop in the associated circuit to prevent flow of pressure fluid to such circuit from the other circuit and to remain closed after such closure thereof.

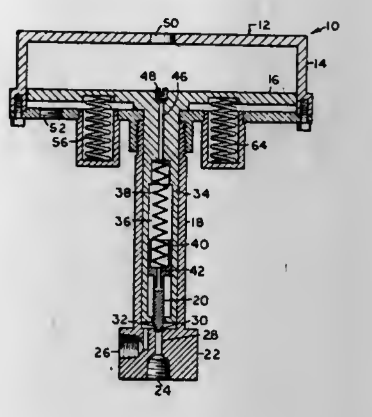
3,888,552
AUXILIARY OPERATING APPARATUS FOR VEHICLE SERVICE BRAKE

John G. Fontaine, Fort Lauderdale, Fla., assignor to Fail Safe Brake Corporation, Fort Lauderdale, Fla.

Division of Ser. No. 346,686, March 30, 1973, Pat. No. 3,845,932. This application Mar. 20, 1974, Ser. No. 452,742

Int. Cl. B60t *17/16*

U.S. Cl. 303—84 R **8 Claims**



1. In a vehicle having a service brake operated by hydraulic fluid in a conduit means, an auxiliary operating apparatus for said service brake comprising:
a housing having a chamber,
a valve stem movable axially in said housing,
orifice means in said housing at one side of said chamber forming a valve seat in the path of said valve stem,
first and second passages in said housing at said one side of said chamber providing a path for hydraulic fluid flow through said orifice means,
piston means in said chamber for operating said valve stem, connector me[ns for connecting said valve stem to said piston means to move said valve stem axially in said housing for opening and closing said orifice means,
said connector means and said valve stem being interconnected so as to allow movement of said piston means and said connector means towards said valve seat after said valve stem engages said valve seat for pressurizing hydraulic fluid adjacent to said valve seat,
and means to allow a fluid pressure change in at least one portion of said chamber to actuate said piston means, and said first and second passages being connected in hydraulic circuit with said conduit means for applying said service brake as a result of the aforesaid pressurizing of hydraulic fluid adjacent to said valve seat and for releasing said service brake upon retraction of said piston means and connector means.

3,888,553
LEVITATED ROTARY MAGNETIC DEVICE

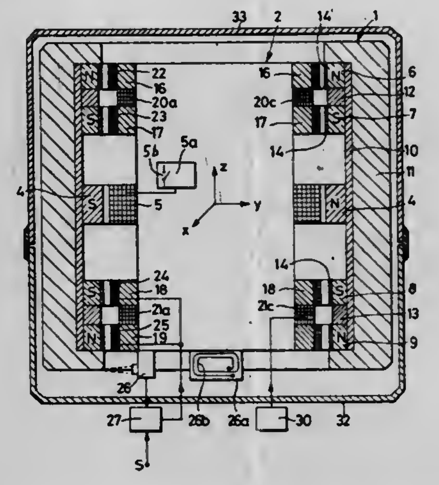
Heinz Wehde, Rothenberg, Germany, assignor to Teldix GmbH, Heidelberg, Germany

Continuation-in-part of Ser. No. 336,215, Feb. 27, 1973, Pat. No. 3,845,995. This application July 25, 1974, Ser. No. 491,957

Claims priority, application Germany, July 25, 1973, 2337696

Int. Cl. F16c *39/06*

U.S. Cl. 308—10 **21 Claims**



1. A magnetic device comprising, in combination:
a stator;
a rotor disposed for rotation relative to said stator;
a plurality of permanent magnets mounted on, and spaced around the circumference of, said rotor to be in the form of a ring with the magnets alternating in polarity around said rotor circumference in a manner such that the magnetic field lines extend substantially parallel to a surface of said rotor between said rotor and said stator in regions between adjacent magnets and extend substantially perpendicular to such rotor surface in the region of each magnet; a plurality of windings disposed on said stator and distributed around the circumference of said stator and intersected by said field lines; current generating means connected to said windings for providing currents in said windings which create forces acting on the rotor in the axial, radial and tangential directions, relative to the direction of rotor rotation; and
a plurality of annular magnetic rings mounted on said stator for producing magnetic forces which act on said rotor.

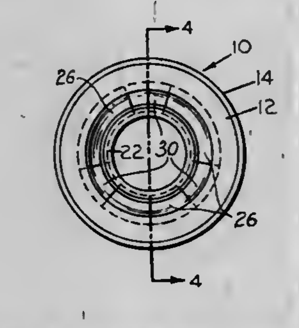
3,888,554
SELF LUBRICATING SPHERICAL BEARING ASSEMBLY

Albert R. McCloskey, Fairfield, Conn., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 10, 1974, Ser. No. 432,145

Int. Cl. F16c *23/04, 27/02, 33/20*

U.S. Cl. 308—72 **8 Claims**



1. A spherical bearing assembly having an inner race member and an outer race member, the inner surface of the outer race member being a concave spherical surface, the outer surface of the inner member being a complimentary convex spherical surface, the inner member including a spool member having two annular lips at each end thereof and at least three axially segmented spherical segments interlocked by said annular lips in an axial direction on the spool member, a gap provided between at least two of said spherical segments, a self-lubricating segment interposed between said two segments in the area defined said gap.

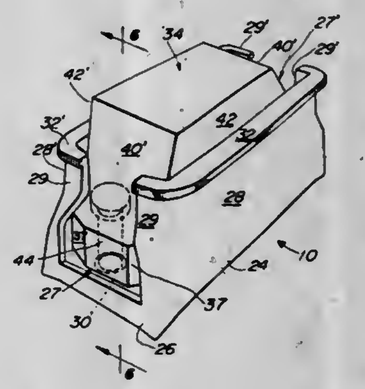
3,888,555
ELASTOMERIC RAILWAY CAR SIDE BEARING

John H. Van Moss, Jr., 3 Mavor Ln., Highland Park, Ill. 60035

Continuation-in-part of Ser. No. 283,044, Aug. 23, 1972, abandoned. This application Dec. 3, 1973, Ser. No. 421,405

Int. Cl. B61f *5/14;* **F16c** *17/10;* **F16f** *1/54*

U.S. Cl. 308—138 **5 Claims**



1. A side bearing for mounting on a truck bolster of a railway car bogie comprising:
a. a hollow structural housing having an open top, side, bottom and end walls, said end walls having straight vertical walls extending upwardly from said base and the upper ends of said walls arcuately tapered inwardly, and
b. an upright body member of hard elastomeric material having a top extending upwardly and outwardly of the housing and the major portion of the body member snugly fitting therein, said body member having a bottom wall and end walls extending upwardly in a vertical direction from the bottom wall and then tapered inwardly towards the top.

3,888,556
GLOVE BOXES AND SIMILAR CONTAINMENTS

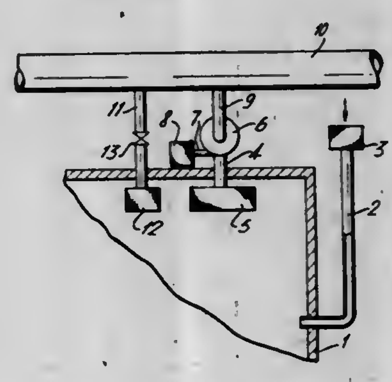
Robert Edmund Strong, Larbert; Kenneth Boyle, and John Grant, both of Warrington, all of England, assignors to British Nuclear Fuels Limited, Riseley Warrington Cheshire and United Kingdom Atomic Energy Authority, London, both of, England

Filed Nov. 30, 1973, Ser. No. 420,585

Claims priority, application United Kingdom, Dec. 11, 1972, 56987/72

Int. Cl. F15c *1/16*

U.S. Cl. 312—1 **4 Claims**



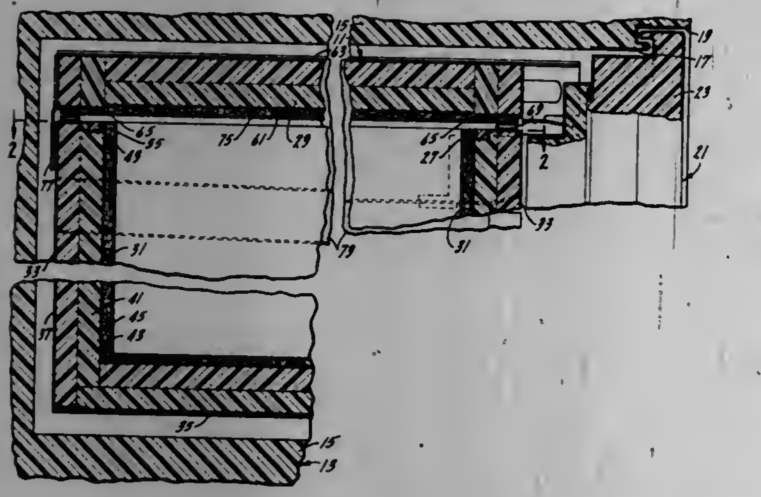
1. In a containment segregating a space from its surrounding atmosphere and provided with an extract system for the atmo-

sphere of the containment the improvement of including in the system a vortex amplifier venting into the system at a point where the system pressure is lower than that of the containment when the extract system is operating, the vortex amplifier also having its main inlet in fluid flow connection with the containment and a control inlet in fluid flow connection with the atmosphere outside the containment arranged to provide a control flow to throttle fluid flow through the vortex amplifier main inlet.

3,888,557
INSULATED INNER CONTAINER FOR A FIRE RESISTANT FILE CABINET

Clarence A. F. Anderson, Fruitport, and Robert A. Laird, Muskegon, both of Mich., assignors to Shaw-Walker Company, Muskegon, Mich.

Filed Feb. 28, 1974, Ser. No. 446,592
Int. Cl. E04b *2/34*; B65d *25/18*
U.S. Cl. 312—214 9 Claims



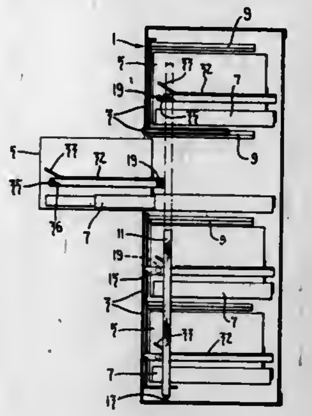
1. An insulated inner container for a fire resistive filing cabinet, including:
- a lower portion having bottom, side and end walls and an open top,
- said walls of said lower portion formed of inner and outer sheets of metal which are spaced apart to form a hollow enclosure with said inner and outer sheets of metal cooperating to form the top surfaces of said side and end walls, insulating material installed in said hollow enclosure of said walls,
- a groove formed in said insulating material at the top surfaces of said side and end walls,
- said inner and outer sheets of metal having downturned edges extending into said groove on opposite sides of the groove, and
- a thermal barrier of heat resistant adhesive filling said groove, and
- a removable cover for closing said open top of said lower portion of said container.

3,888,558
LOCK AND INTERLOCK MECHANISM

Ernst G. Himsl, Kitchener, Ontario, Canada, assignor to Sunar Limited, Waterloo, Ontario, Canada

Filed Feb. 19, 1974, Ser. No. 443,871
Int. Cl. E05b *65/46*
U.S. Cl. 312—216 16 Claims

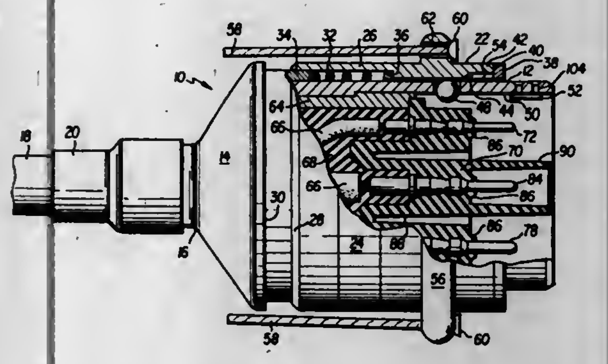
1. A cabinet having top, bottom, rear and side walls and an open front, a plurality of slidable shelves arranged to slide from an inner position out the open front to an exposed position and a plurality of pivoted doors swingable between vertical closed positions closing access to the shelves and horizontal open positions permitting access to the shelves, each door associated with one shelf, a combined lock means for simultaneously preventing the doors from being moved from their closed positions and preventing sliding of said shelves from their inner positions, said lock means including a vertically movable lock bar movable between a locking and an unlocking position, lock device means on said lock bar and engaging said doors when said lock bar is in locking position and said doors are in closed position said lock device means engaging said shelves to prevent the same from sliding out when the lock bar is in its locking position.



3,888,559
HIGH VOLTAGE QUICK DISCONNECT ASSEMBLY

R. Larry Geib, Elizabethtown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 243,723, April 13, 1972, abandoned. This application Nov. 19, 1973, Ser. No. 417,436
Int. Cl. H01r *3/54*
U.S. Cl. 339—46 11 Claims

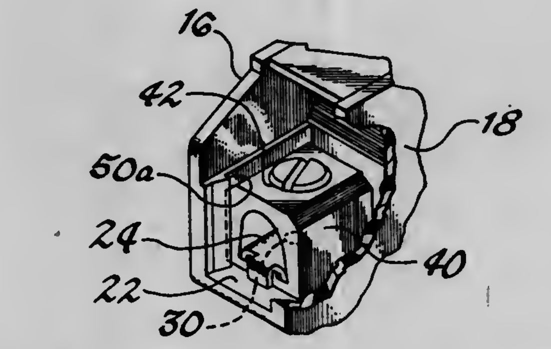


1. A high voltage quick disconnect assembly comprising:
- a plug assembly including a housing having an opening at one end thereof,
- movable lock operating means mounted around at least a portion of said housing and movable axially of said housing,
- actuating means coupled to said lock operating means for actuating said lock operating means,
- a plurality of movable locking members positioned in apertures in said housing, said housing including means for limiting movement of said locking members inwardly of said housing, said locking members being movable outwardly of said housing,
- a resilient biasing member surrounding the housing and located rearwardly of the locking members for biasing said lock operating means in a first direction,
- said lock operating means including a plurality of surfaces for engaging and selectively positioning said plurality of locking members in locked and unlocked position,
- indicating means mounted on said housing capable of providing a locked and unlocked visual indication and responsive to positioning of said locking members a predetermined distance outwardly from said point of limited inward movement thereof for providing said unlocked visual indication,
- a first plurality of electrical connectors positioned within said housing, and
- insulating means mounted within said housing surrounding at least a portion of said first plurality of electrical connectors,
- receptacle means for mating with said plug assembly including:
- a protruding portion shaped to fit into said opening in said housing, said protruding portion defining a locking groove means for interfitting with said plurality of locking members,
- said receptacle means including a ring of spring fingers for resiliently engaging an outer surface of said housing of said plug assembly.

3,888,560
ELECTRICAL TERMINAL CONFIGURATION

James I. Smith, Bristol, and James E. McGann, Plainville, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Feb. 13, 1974, Ser. No. 441,961
Int. Cl. H01r *7/08*
U.S. Cl. 339—59 R 7 Claims



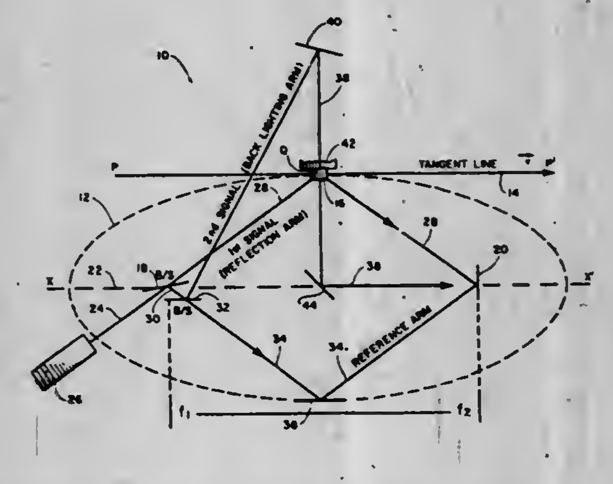
1. An electrical termination comprising, in combination:
- A. means forming a terminal recess, said recess bounded by an insulative backwall, opposed sidewalls and a bottom wall;
- B. an elongated terminal strap of conductive metal spring stock extending through said backwall into said terminal recess, said strap having
  - 1. turned down lateral edges,
  - 2. a turned down frontal tab engaging said bottom wall to support said strap with said lateral edges in spaced relation to said bottom wall, and
  - 3. means forming a tapped hole in said strap located inwardly from said tab; and
- C. an electrical connector engaging said strap for clamping an electrical conductor thereto.

3,888,561
REAL TIME, LARGE VOLUME, MOVING SCENE HOLOGRAPHIC CAMERA SYSTEM

Robert L. Kurtz, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 10, 1973, Ser. No. 387,266The portion of the term of this patent subsequent to Aug. 7, 1990, has been disclaimed.
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 4 Claims

1. An apparatus for producing holographic motion pictures of a scene, moving in a random direction within a volume, said moving scene having a velocity of motion represented by X, Y and Z velocity components, comprising:
- a light source for producing a coherent beam of radiation;
- first beam splitter means positioned to receive said coherent beam and to split said coherent beam into two beams, a first signal beam which passes straight through said first beam splitter means and becomes incident upon said moving scene and a reference beam which is reflected;
- second beam splitter means positioned to receive said reflected reference beam and to split a second signal beam from said reference beam, whereby said reference beam passes straight through said second beam splitter means and said second signal beam is reflected;
- third beam splitter means positioned to receive said second signal beam and to split a third signal beam from said second signal beam, whereby said second signal beam passes straight through said third beam splitter means and said third signal beam is reflected;
- a first light reflector means positioned to reflect said reference beam, after said reference beam passes through said second beam splitter means;
- a second light reflector means positioned to reflect said second signal beam so that it becomes incident upon said moving scene, after said second signal beam is split from said reference beam by said second beam splitter means;
- a third light reflector means positioned to reflect said third signal beam so that it becomes incident upon said moving scene, after said third signal beam is split from said second signal beam by said third beam splitter means;
- a motion picture camera back, said camera back having a film mounted on it, said film being positioned to receive said reference beam after reflection from said first light reflector means and said first, second and third signal beams after they are reflected from said moving scene, whereby said reference beam and said first, second and third signal beams all interfere with one another in the plane of said film;
- said first beam splitter means being positioned at the first focus of a first ellipse, said second light reflector means being positioned at the first focus of a second ellipse, and said third light reflector means being positioned at the first focus of a third ellipse, the said three ellipses being interrelated by having their long axes perpendicular to each other and their second foci coinciding, said three ellipses being oriented so that said X velocity component of said moving scene is tangent to said first ellipse, said Y velocity component of said moving scene is tangent to said second ellipse, said Z velocity component of said moving scene is tangent to said third ellipse, and said long axes of said three ellipses are respectively parallel to said X, Y and Z velocity components, the plane of said film being positioned so as to pass through the said coinciding second foci of the said three ellipses, said moving scene being positioned on the mathematical circumference of each of said ellipses in the vicinity of the intersection of the circumference of each said ellipse with its own semiminor axis, the size and shape of each of said three ellipses and the location of their said foci being determined by the formula $Vt = (\Delta L/2)^{1/2}, a^{3/2}/b \quad \Delta x$(or ΔY or ΔZ), where V is the velocity component; t is the time of exposure; L is the optical path length of said first signal beam and is equal to the ellipse constant, $2a$; ΔL is the maximum change in length L caused by the component of scene travel which is tolerable without causing blurring;

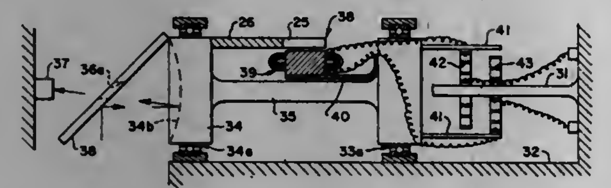


a is the semi-major axis; *b* is the semi-minor axis; *d* is the distance of separation between a focus and the origin of the ellipse; and *a* and *b* are related to the third ellipse parameter *d* by the formula $a^2 = b^2 + d^2$.

3,888,562
OSCILLATING SCANNER

Frank C. Rushing, Columbia, and Gordon S. Ley, Arnold, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 6, 1973, Ser. No. 330,163
Int. Cl. G02b *17/00*
U.S. Cl. 350—7 **12 Claims**



1. An oscillating scanner comprising:

a sensor for producing an electrical signal in response to rays having varying energy levels;

reflective means for directing said rays onto said sensor;

a primary body carrying said reflective means for movement about an oscillation axis passing through said primary body;

bearing support means rotatably carrying said primary body for oscillating motion of said reflective means and said primary body about said oscillation axis;

a reaction body having a moment of inertia bearing a predetermined proportional relation to the moment of inertia defined by the combination of said reflecting means and said primary body;

bearing support means rotatably carrying said reaction body for oscillating motion by said reaction body about said oscillation axis;

spring means interconnecting said primary body and said reaction body for supplying an elastic restoring force to produce sustained harmonic oscillations of said reflective means about said oscillation axis while said reaction body oscillates; and

driver means for generating a relative torque between said primary body and said reaction body in a manner to compensate for losses to said elastic restoring force to thereby maintain harmonic oscillations of said reflective means at a predetermined frequency and amplitude.

3,888,563
OBSERVATION AND MEASURING STAND FOR OPTRONIC DEVICES IN A VEHICLE

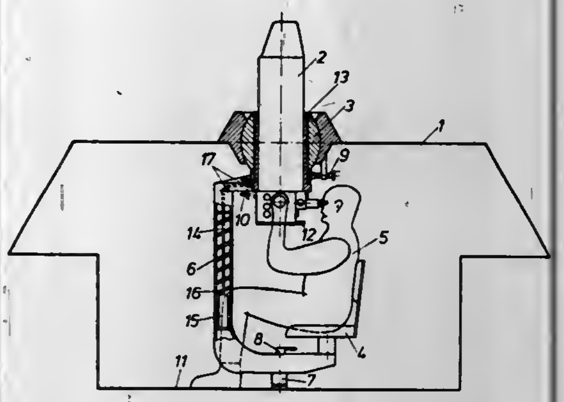
Hermann Dierkes, Vellmar, Germany, assignor to Rheinstahl Henschel Aktiengesellschaft, Kassel, Germany

Division of Ser. No. 159,127, July 2, 1971, Pat. No. 3,796,478. This application Dec. 4, 1973, Ser. No. 421,614

Claims priority, application Germany, July 7, 1970, 2033589; Aug. 13, 1970, 2040284; Aug. 21, 1970, 2041603; Aug. 25, 1970, 2042089

Int. Cl. G02b *21/24*
U.S. Cl. 350—85 **16 Claims**

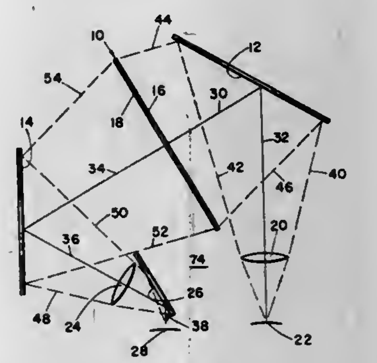
1. A special cardanic suspension in combination with an armored vehicle, including a frame having a top wall and a floor: a periscope-like optical device movable for fine and coarse adjustment during observation and measurement occurring only out of a stationary vehicle, said device having three rotary degrees of freedom given thereto in a minimum of space and extending through said top wall having a laterally directed objective end above said top wall and a laterally directed viewing end beneath said top wall, first bearing means rotatable about a vertical axis and supporting said optical device, second bearing means swivelly supporting said first bearing means in said top wall, first adjustable means for rotating said optical device in said first bearing means and second adjustable means for adjusting the swivelled position of said optical device in said top wall, a bushing surrounding said optical device, said first bearing means being interposed between said bushing and said second bearing means, said bearing means including preloading means so as to be play free.



3,888,564
VIEWING SYSTEM PROVIDING COMPATABILITY BETWEEN TWO DIMENSIONAL PICTURES AND THREE DIMENSIONAL VIEWING THEREOF

Marvin E. Lebow, 3431 E. 62 Pl., Tulsa, Okla. 74136

Filed Oct. 11, 1973, Ser. No. 405,392
Int. Cl. G02b *27/24*
U.S. Cl. 350—138 **7 Claims**



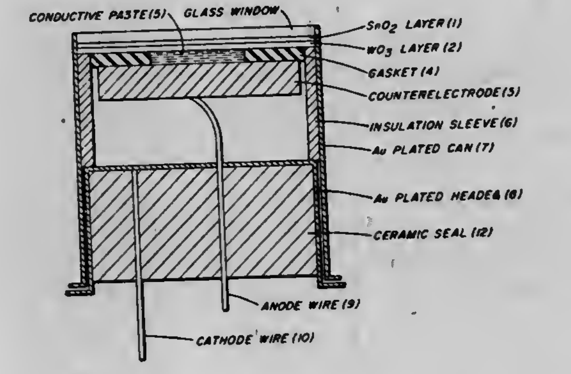
1. A method of providing compatibility between two dimensional pictures and three dimensional viewing thereof which consists of providing a left eye image and a right eye image of an identical scene, reversing one of said images with respect to the other, maintaining a normal image for the other of said images, securing said reversed image in aligned back to back relationship with said normal image whereby said normal image may be viewed in a standard two dimensional manner, providing a first sighting path for viewing of the left eye image by the left eye of a beholder, providing a second sighting path for viewing of the right eye image by the right eye of the beholder simultaneously with the left eye viewing whereby said images may be viewed in a simulated three dimensional manner.

4. In combination, a picture having a pair of right eye and left eye matched images disposed in aligned back to back relationship with one of said images being normal image and the other of said images being reversed image, and a three dimensional viewing apparatus comprising picture receiving means for supporting the picture for simultaneous viewing of both images thereof, first eye piece means, first reflector means interposed between the first eye piece means and the picture receiving means for transmitting said one image to the first eye piece and converting said one image to a normal image at the first eye piece means, second eye piece means spaced from the first eye piece means, second reflector means interposed between the second eye piece means and the picture receiving means for transmitting said other image to the second eye piece means and converting said other image to a normal image at the second eye piece whereby both images may be viewed simultaneously in simulated three dimensional viewing.

3,888,565
ELECTROCHROMIC VOLTAGE INDICATOR

Gottfried Christian Haacke, Stamford, and Donald John Tracey, Jr., Weston, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 2, 1973, Ser. No. 320,413
Int. Cl. G02f *1/36*
U.S. Cl. 350—160 **4 Claims**

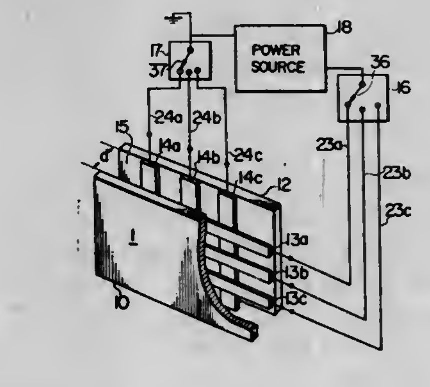


1. A device for fault detection in integrated circuitry comprising an electrochromic current flow indicator means, container means, and electrical circuit connector means, said container means comprising a metallic can sealed at one end with a glass window, and at the other end with a metallic cup, said indicator means being in said container means and comprising a layer of a persistent electrochromic material, a counterelectrode and an electrolyte therebetween, said electrical connector means being connected to said device so as to allow passage of an electrical current between said electrochromic layer and said counterelectrode.

3,888,566
ELECTRO-OPTICAL DEVICE INCLUDING AN IMPROVED LIQUID CRYSTAL COMPOSITION

Kazuhisa Toriyama; Fumio Nakano; Mikio Sato, all of Hitachi; Hidetoshi Abe, Katsuta, and Mikio Kanazaki, Mobara, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 10, 1973, Ser. No. 387,272
Claims priority, application Japan, Aug. 11, 1972, 47-79941
Int. Cl. G02f *1/16*
U.S. Cl. 350—160 LC **28 Claims**

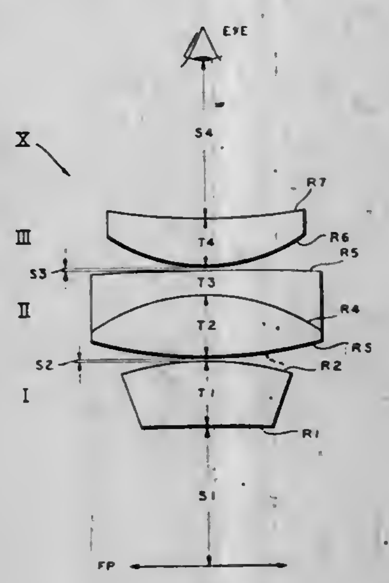


19. A composition comprising nematic liquid crystals and a sufficient amount of a halide salt of an organic quaternary nitrogen compound selected from the group consisting of pyridinium halide and acridinium halide to enhance the dynamic scattering motion of said nematic liquid crystals.

3,888,567
10X THREE ELEMENT EYEPIECE

Arthur H. Shoemaker, West Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed May 1, 1974, Ser. No. 465,934
Int. Cl. G02b *9/22*
U.S. Cl. 350—229 **3 Claims**



1. A microscope eyepiece having a magnification of about 10X, an apparent field of view of about 52.3° and a maximum exit pupil diameter of about 1.6mm, being well corrected for coma, astigmatism, distortion and color and having a focal length F and three lens elements aligned along an optical axis extending from the focal plane of said eyepiece, which comprises a concavo-convex positive singlet I as the first element, a double convex positive doublet II as the second element and a convex-concavo positive singlet III as the third element to provide a Petzval radius of 1.42F and eye relief of 0.77F.

3,888,568
MULTI-ELEMENT LENS ASSEMBLY

Philip R. Norris, North Reading, and Leon Rubinstein, Natick, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed June 20, 1974, Ser. No. 481,126
Int. Cl. G02b *7/02*
U.S. Cl. 350—252 **20 Claims**

1. A multi-element lens assembly comprising:

an uncentered lens element having a geometrical axis and an optical axis which is eccentric with respect to said geometrical axis such that diametrically opposed points along a periphery of said uncentered lens element, measured radially from said geometrical axis and said optical axis, are symmetrically disposed with respect to said geometrical axis but are not symmetrically disposed with respect to said optical axis;

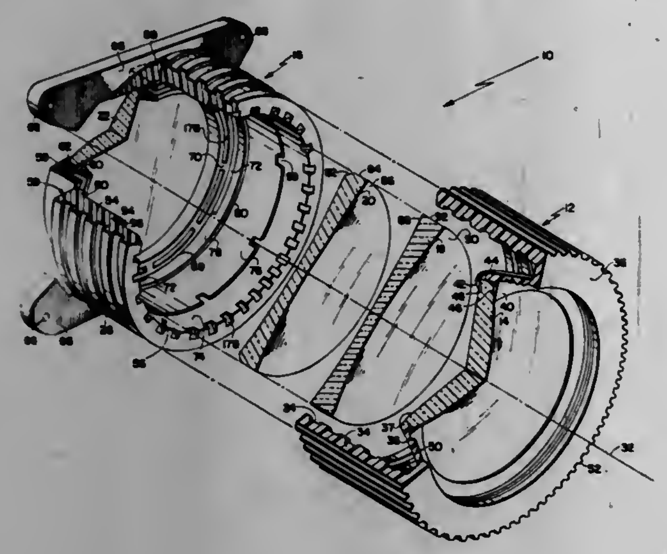
a plastic lens mount molded around said periphery of said uncentered lens element and including integrally formed means for retaining said uncentered lens element by said periphery thereof, said lens mount having a geometrical axis and said retaining means being formed to compensate for the eccentricity between said geometrical and optical axis of said uncentered lens element thereby causing said optical axis of said uncentered lens element to be concentric with said geometrical axis of said mount;

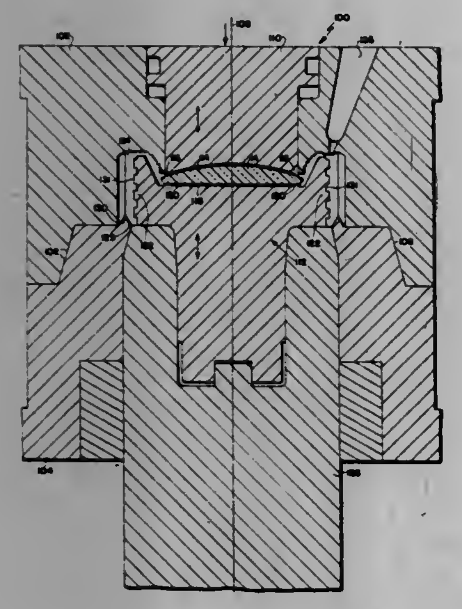
at least one centered lens element, having coincidental optical and geometrical axes, which is to be mounted in said plastic mount in optical alignment with said optical axis of said uncentered lens element retained in said mount;

means integrally formed with said mount, when said mount is molded around said uncentered lens element, for supporting said at least one centered lens element in said mount and for aligning said at least one centered lens element so that said optical axis of said at least one centered lens element and said optical axis of said uncentered lens element, held in said mount, coincide with each other and said geometrical axis of said mount; and

means integrally formed with said molded mount, when said mount is formed about said uncentered lens element, and being deformable, after said at least one centered lens element is supported and aligned in said mount, for engaging and retaining said at least one centered lens element in said mount in its said aligned relationship with said uncentered lens element.

7. A multi-element lens assembly for use with photographic apparatus of the type including a between-the-lens shutter and/or aperture defining mechanism, said lens assembly comprising:





an uncentered lens element having a geometrical axis and an optical axis which is eccentric with respect to said geometrical axis such that diametrically opposed points along a periphery of said uncentered lens, measured radially from said geometrical and optical axes, are symmetrically disposed with respect to said geometrical axis but are not symmetrically disposed with respect to said optical axis;

a plastic lens mount molded around said periphery of said uncentered lens and including integrally formed means for supporting and retaining said uncentered lens element by its said periphery, said lens mount having a geometrical axis and said supporting and retaining means being dimensioned to compensate for the eccentricity between said geometrical and optical axes of said uncentered lens elements thereby causing said optical axis of said uncentered lens element to be concentric with said geometrical axis of said mount;

means integrally formed with said mount, when said mount is molded around said uncentered lens element, for supporting and for retaining at least one other lens element in optical alignment and in axially spaced relationship with said uncentered lens element retained by said retaining means; and

means defining at least one access opening in said mount through which the shutter and/or aperture defining mechanism of the photographic apparatus may move in directions transverse to said geometrical axis of said mount to assume operative positions in an air space between said uncentered lens element and the at least one other lens element, said at least one access opening being integrally formed in said mount when said mount is molded around said periphery of said uncentered lens element.

3,888,569

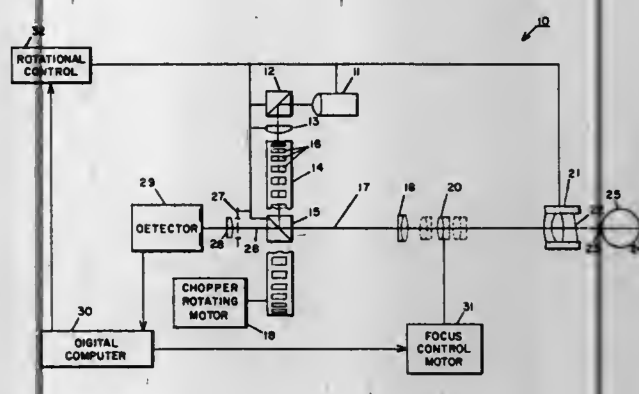
APPARATUS AND METHOD OF MEASURING THE REFRACTIVE ERROR OF AN EYE

Charles R. Munnerly, Fairport; Bruce R. Obinson, and James W. Horwitz, both of Rochester, all of N.Y., assignors to Tropel, Inc., Fairport, N.Y.

Continuation of Ser. No. 358,702, May 9, 1973, abandoned. This application Apr. 29, 1974, Ser. No. 465,274

Int. Cl. A61b *3/00*, *3/10;* G01n *21/46*

U.S. Cl. 351—6 26 Claims



1. In a method of measuring the refractive error of an eye by directing a pattern of radiant energy into said eye and detecting the focus of the radiant energy reflected from said eye, the improvement comprising:

a. converting the analog signal from said focus detection to a digital signal stream;
b. feeding said digital signal stream to a digital computer;
c. programming said digital computer to vary the focus and orientation of said radiant energy pattern directed into said eye;
d. storing selected results of said digital signal stream in said computer; and
e. programming said computer to use an algorithm to calculate said refractive error from said selected signal results.

3,888,570

FILM GUIDING PLAYBACK AND RECORDING MECHANISM

Joseph A. Stella, Peabody, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed June 28, 1973, Ser. No. 374,657

Int. Cl. G03b *31/02*

U.S. Cl. 352—29 2 Claims

1. Means for use in transcribing and broadcasting sound in conjunction with a moving film strip having a magnetic sound track on one face thereof and a photographic emulsion and a processing composition on the opposite face thereof, including:

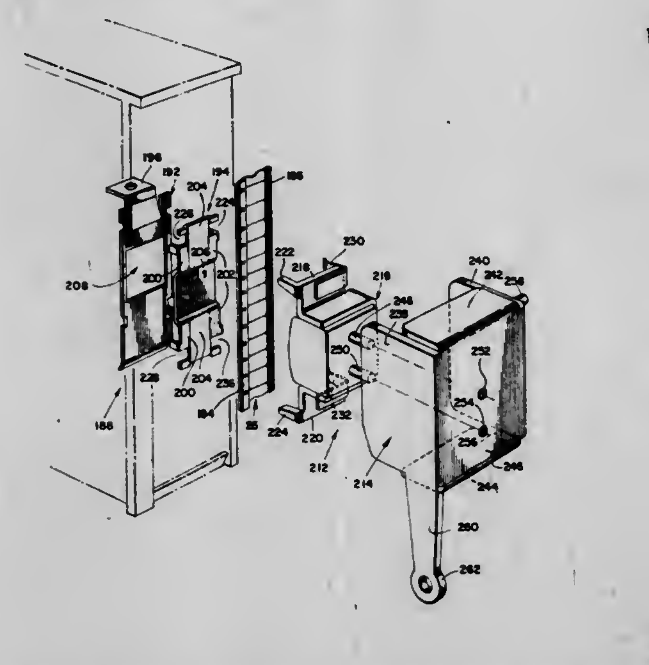
a base;

means connected to said base and initially spaced from said film strip for resiliently supporting said film strip;

said supporting means being configured so as to prevent same from contacting said processing composition after engagement with said film strip whereby said film strip may pass over said supporting means without any attendant interference with the processing of a photographic image;

means for moving said film strip into and out of engagement with said resilient supporting means;

said film strip being adapted to record a photographic image on a central portion of said opposite face and said supporting means being adapted to engage and resiliently support said film strip at spaced edge portions on opposite sides of said central portion;



a cassette for receiving and storing said film strip with said base forming a part of said cassette, said resiliently supporting means being disposed within said cassette;

said cassette comprising means forming an optical path through said film strip for cooperation with a photographic camera to effect exposure of said emulsion and the recording of said image and for cooperation with film drive and projection apparatus for the viewing of such image;

said cassette being provided with means for coating the emulsion bearing face of said film strip with said processing composition subsequent to said exposure to develop said image for subsequent viewing;

means cooperable with said resiliently supporting means for magnetically recording audio signals onto said sound track and for playing back such recorded signals, said magnetically recording means including a transducer adapted to engage at least a portion of said sound track and cooperable with said resiliently supporting means whereby said transducer means will move said film strip into engagement with said supporting means such that said film strip will be sandwiched between said transducer and said supporting means and be resiliently biased toward said transducer by said supporting means;

said transducer and said resiliently supporting means being provided with cooperating locating means for registering said transducer with respect to said supporting means;

guide means connected to said transducer for engaging the edges of said film strip and cause same to follow a predetermined path and maintain a given registration between said transducer and said sound track;

a frame member connected to one of said photographic camera and said film drive and projection system and further including means connected between said magnetically recording means and said frame member for biasing said transducer toward said film strip; and

means for moving said transducer between an idle position out of engagement with said sound track and an operative position in engagement with said sound track;

said guide means comprising plural rigid locating members adapted to extend over one edge of said film strip and engage said supporting means and plural resilient members adapted to extend over the opposite edge of said film strip and engage said supporting means, whereby said film strip will be guided between said locating members and said resilient members during its movement.

3,888,571

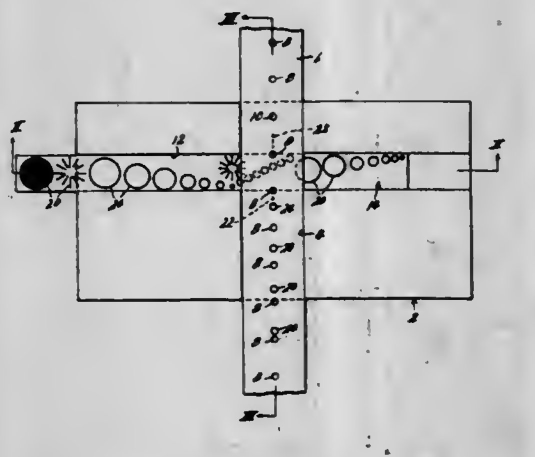
MOTION PICTURE TOY

John C. Schmidt, 2307 Castilla Isle, Fort Lauderdale, Fla. 33301

Filed May 8, 1974, Ser. No. 468,073

Int. Cl. G03b *21/32*

U.S. Cl. 352—87 4 Claims



1. A device for assisting in the production of hand-drawn images on a flexible, at least semi-transparent motion picture film tape in successively longitudinally spaced apart areas, or "frames" thereof, said device comprising:

a. a generally planar base having a groove formed in one face thereof having a width corresponding to that of said tape, and through which said tape may be advanced longitudinally to dispose each successive frame thereof over a specified area of the floor of said groove,
b. locator meams operable to position any selected frame of said tape accurately over said specified area of the floor of said groove, and
c. an image display means carried by said base and operable to display a pre-formed image in said specified area of the floor of said groove, said pre-formed image being viewable through said tape to serve as a guide for hand-drawing an image on the frame of said tape overlying said specified area, said image display means comprising duplicating means covering the floor of said tape groove to reproduce a veiwable duplicate of an image hand-drawn on said tape as it overlies said duplicating means, whereby after one image is so hand-drawn and duplicated, the next successive frame of said tape may be positioned over said duplicate image, so that the latter may serve as a guide for hand-drawing an image on said next successive tape frame.

3,888,572

METHOD AND APPARATUS FOR MAKING ANIMATED CARTOONS

Jean Veran Dejoux, Los Angeles, Calif., assignor to Optical Systems Corporation, Los Angeles, Calif.

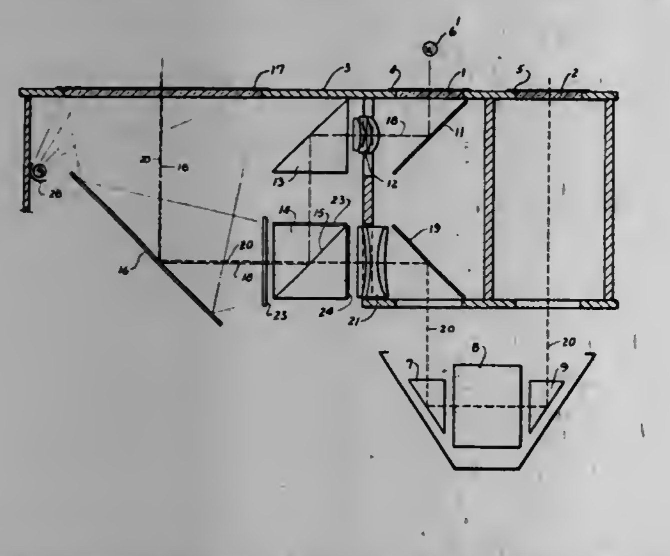
Filed Apr. 21, 1971, Ser. No. 135,931

Int. Cl. G03b *19/18*, *21/32*

U.S. Cl. 352—87 4 Claims

1. Apparatus for making animated cartoons and for viewing enlarged images of sequences thereof, comprising, a drawing table having at least two drawing windows therein of equal dimensions, and another viewing window therein of enlarged

dimensions which are multiples of the corresponding dimensions of said drawing windows, means for projecting onto said viewing window of enlarged dimensions equally enlarged images of film frames exposed at each of said first windows, said enlarged images being projected onto said viewing window in superposed relation, which said means includes two separate magnifying lens systems, one of which enlarges the image projected from one of said drawing windows, and the other of which enlarges the image projected from the other of said drawing windows, a beam splitter, means for causing an enlarged image projected from one of said first windows to enter one side of said beam splitter and to be reflected to emerge at right angles to the entrance direction, and means for causing an enlarged image projected from the other of said first windows to enter another side of said beam splitter at right angles to said first side to emerge on an axis coinciding with the axis of said first enlarged image, and a mirror adapted to intercept the coinciding images emerging from said beam splitter to reflect them onto said window of enlarged dimensions.



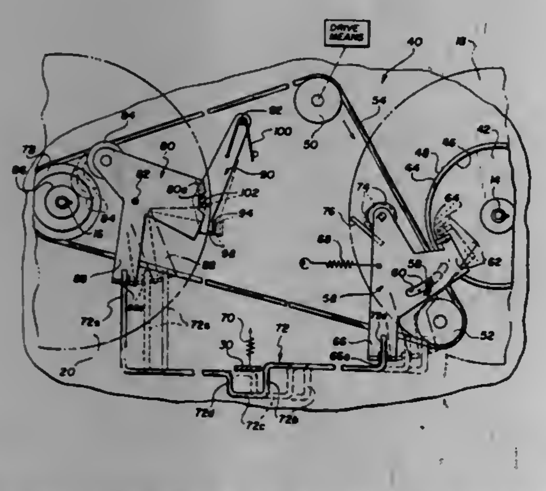
3,888,573
CONTROL MECHANISM FOR A WEB TRANSPORTING DEVICE

Donald O. Easterly, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 25, 1973, Ser. No. 382,621

Int. Cl. G03b *1/00*

U.S. Cl. 352—166 **12 Claims**



1. A control mechanism for a motion picture projector, said control mechanism comprising:

a. first and second spindles rotatably supported by said motion picture projector;
b. first drive means adapted to cooperate with and to rotatably drive said first spindle;
c. second drive means adapted to cooperate with and to rotatably drive said second spindle, said second drive means including (1) clutch means including
   i. a rotatably-powered driving member; and
   ii. a driven member frictionally coupled to said driving member such that said driven member is adapted to transmit an increased driving torque to said second spindle as a function of an increased force applied to said driver member; and
   iii. force applying means movable between a first condition wherein said force applying means is effective to apply an increased force to said driven member and a second condition wherein said force applying means is restrained from applying an increased force;
d. first and second brake means adapted to cooperate with and to brake rotation of said first and second spindles, respectively; and
e. control means adapted to control said first and second drive means, said first and second brake means, and said force applying means of said clutch means, said control means being positionable between (1) a still position wherein said first and second brake means cooperate with said first and second spindles respectively to restrain said spindles from rotation, (2) a project position wherein said second drive means rotatably drives said second spindle at a first rate, (3) a rewind position wherein said first drive means cooperates with said first spindle and rotatably drives said first spindle, and (4) a fast forward position wherein said second drive means rotatably drives said second spindle at a second and greater rate.

3,888,574
MECHANISM FOR SPEED REDUCTION AND STOPPING THE FILM DRIVE FOR USE IN CINEMATOGRAPHIC PROJECTORS

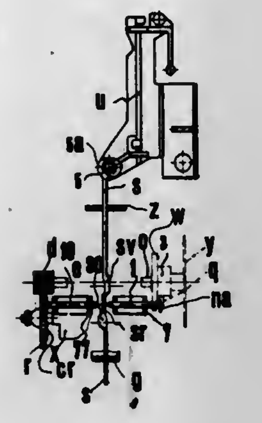
Roberto Bencini, c/o Dr. Ing. Misitano A.G., Via Padova, 217, 20-27 Milan, Italy

Filed Feb. 4, 1974, Ser. No. 439,559

Claims priority, application Italy, Feb. 15, 1973, 20449

Int. Cl. G03b *1/22*

U.S. Cl. 352—194 **3 Claims**



1. A mechanism for speed reduction and stopping of the film drive for use in cinematographic projectors, comprising a per se known claw drive acted on by first and second cams so as to give the claw end a rectangular profiled path, an elongated cam member displaceable between three operating positions, pusher means located on each side of the said elongated cam member and mounted to be displaceable laterally of the elongated cam member, one pusher means being adapted to co-operate with further cam means and the other pusher means being adapted to co-operate with the claw end, one position of the elongated cam member corresponding to the inoperative position of both pusher means, a second position of the elongated cam member effecting movement of said other pusher means to displace the claw end such that one of the first and second cams ceases to reciprocate the claw end, such that film transport ceases, the third position of the elongayed cam member coupling the pusher means so that said further cam means periodically causes said pusher means to inhibit the reciprocation of said claw end which results from the action of one of said first and second cams such that the speed of film transport is reduced.

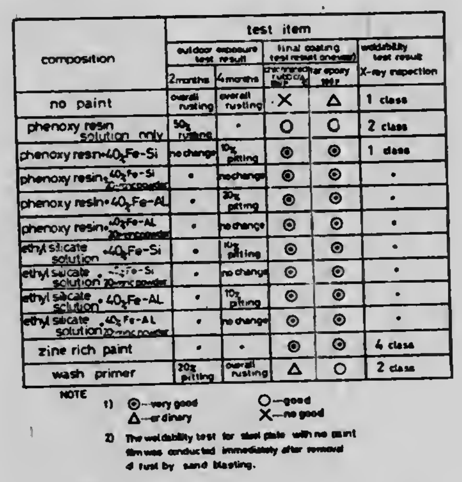
3,888,575
PREFABRICATION PRIMER FOR HIGH TENSILE STEEL

Masao Fujii, Okayama; Shiro Shimatani; Ryoji Orita, both of Tamano, and Isao Takemoto, Osaka, all of Japan, assignors to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 143,553, May 14, 1971, abandoned. This application Dec. 7, 1972, Ser. No. 312,908

Int. Cl. H01b *1/00*

U.S. Cl. 252—513 **1 Claim**



composition	test item				
	outdoor exposure test result		final coating test result (one year)		weldability test result
	2 months	4 months	chlorinated rubber [illegible]	tar epoxy [illegible]	X-ray inspection
no paint	overall rusting	overall rusting	×	△	1 class
phenoxy resin solution only	50% rusting	•	○	○	2 class
phenoxy resin + 40% Fe-Si	no change	10% pitting	◎	◎	1 class
phenoxy resin + 40% Fe-Si 20% zinc powder	•	no change	◎	◎	•
phenoxy resin + 40% Fe-AL	•	20% pitting	◎	◎	•
phenoxy resin + 40% Fe-AL 20% zinc powder	•	no change	◎	◎	•
ethyl silicate solution + 40% Fe-Si	•	10% pitting	◎	◎	•
ethyl silicate solution + 40% Fe-Si 20% zinc powder	•	no change	◎	◎	•
ethyl silicate solution + 40% Fe-AL	•	10% pitting	◎	◎	•
ethyl silicate solution + 40% Fe-AL 20% zinc powder	•	no change	◎	◎	•
zine rich paint	•	•	◎	◎	4 class
wash primer	20% pitting	overall rusting	△	○	2 class

NOTE
1) ◎—very good ○—good
△—ordinary ×—no good
2) The weldability test for steel plate with no paint film was conducted immediately after removal of rust by sand blasting.

1. A prefabrication primer paint composition comprising a paint base selected from the group consisting of an ethyl silicate solution and a phenoxy resin; a semiconductive pigment selected from the group consisting of ferroaluminum, ferrosilicon, ferromanganese, ferrochromium, silicon and iron oxide; a rust preventative pigment selected from the group consisting of zinc and aluminum; said paint base semiconductive pigment and rust preventative pigment being present in the primer paint in a sufficient quantity such that a solid film of said primer paint contains from about 10 to about 45% of said paint base, about 5 to about 65% of said rust preventative pigment, balance of said semiconductive pigment.

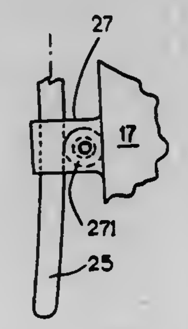
3,888,576
FILM PROJECTORS

Francis Bolgar, 24 Karamu St., and John James Fraser, 194 Helston St., both of Wellington, New Zealand

Continuation-in-part of Ser. No. 278,196, Aug. 7, 1972, abandoned. This application Sept. 23, 1974, Ser. No. 508,647

Int. Cl. G03b *21/22*

U.S. Cl. 353—76 **6 Claims**



1. An apparatus for projecting the image contained on transparent film onto a screen set at a fixed distance from the film, said apparatus being contained in a cabinet and including an optical arrangement whereby light issuing from a lamp is beamed through a primary condensing lens so as to emerge in a parallel beam and pass through a heat shield, reflect off a mirror, pass through a secondary condensing lens and converge through the film to a point within the boundaries of a projecting lens, diverge out of the projecting lens and pass onto a pair of angularly disposed reflecting surfaces before being reflected onto a transparent screen, and wherein the distance between the reflecting surfaces and the projecting lens and screen can be altered while a corresponding adjusting movement to the projecting lens is simultaneously effected to maintain the image in focus on the screen; characterised in that the adjusting movement is effected by means of a cam arrangement comprising a vertically disposed, elongated camming member pivoted at its upper end to said cabinet, a link pivotally connected to said camming member adjacent said upper end thereof, and connected to an arm carrying said projecting lens, and a cam-follower provided on a framework supporting the reflecting surfaces and slidably engaging the camming member; the camming member being shaped in such a manner that as the framework supporting the reflecting surfaces moves towards or away from the screen, the camming member is caused to pivot and thus to move said link which in turn moves said arm to produce said corresponding adjusting movement to the projecting lens.

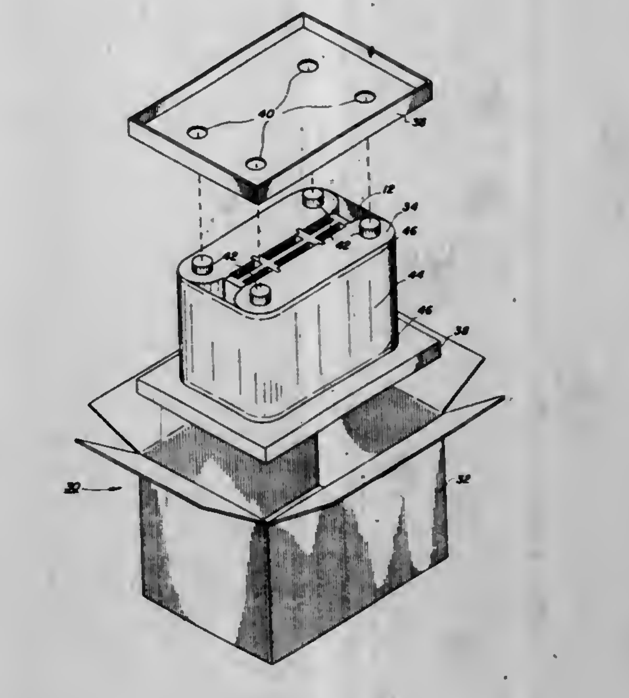
3,888,577
APPARATUS FOR PACKAGING AND SUBSEQUENTLY INSTALLING A BELT ONTO A ROLLER ASSEMBLY

Edwin A. Meyer, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 12, 1973, Ser. No. 331,400

Int. Cl. G03g *15/00*; B65d *71/00*

U.S. Cl. 355—3 R **5 Claims**



1. The combination of:

a. a printing machine having a roller assembly, said roller assembly having a plurality of rollers mounting for rotation about at least substantially parallel axes, said roller assembly being adapted to move an endless photoconductive belt around a closed path;
b. means including a container for storing said belt until the latter is to be mounted upon said roller assembly, and means adapted to be positioned within said container for expanding and carrying said belt under tension;
c. means for supporting said expanding and carrying means on one end of said roller assembly when it is desired to move said belt onto said roller assembly; and,
d. wherein said means for expanding and carrying said belt under tension includes means for releasing the tension on said belt while said expanding and carrying means is supported on said roller assembly so that said belt may then be moved onto said roller assembly.

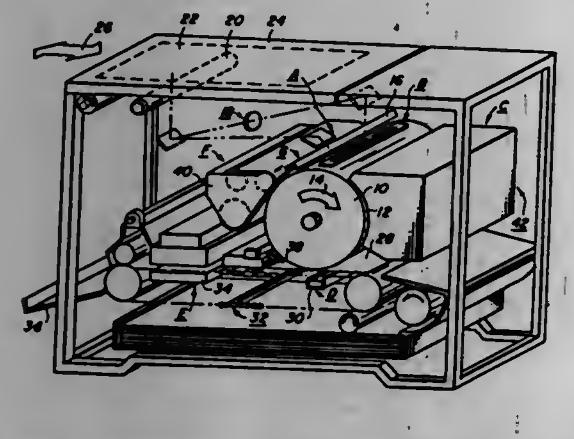
3,888,578
DEVELOPMENT APPARATUS FOR ELECTROPHOTOGRAPHIC PRINTING MACHINE

Yoshio Eto, Omiya, Japan, assignor to Rank Xerox, Limited, London, England

Division of Ser. No. 290,195, Sept. 18, 1972, Pat. No. 3,835,811. This application Jan. 30, 1974, Ser. No. 438,125

Int. Cl. G03g *15/00*

U.S. Cl. 355—3 DD **4 Claims**



1. An electrophotographic printing machine of the type having a corona generating device for charging a photoconductive surface to a substantially uniform level, and an exposure mechanism for irradiating the photoconductive surface with a light-image to record thereon an electrostatic latent image of an original document to be reproduced, wherein the improvement includes:

- means for forming a flow of carrier granules moving from a storage region to a discharge region;
- a hopper having an aperture therein in the lower region thereof, said hopper storing a quantity of toner particles arranged to be dispensed through the aperture therein into the discharge region;
- a shaft member mounted pivotably in said hopper;
- a plurality of spaced pin members mounted substantially fixedly on the circumferential surface of said shaft member and extending outwardly therefrom substantially normal to the longitudinal axis thereof, said shaft member being positioned such that said pin members are disposed substantially in the aperture of said hopper;
- means for reciprocating said shaft member about the longitudinal axis thereof so that said pin members feed toner particles toward the aperture of said hopper; and
- means for intermingling carrier granules with toner particles producing a substantially uniform mix, and, substantially simultaneously therewith, directing the flow of mix to cascade over the photoconductive surface creating a toner powder image on the electrostatic latent image recorded thereon.

3,888,579
DIGITAL CONTROLLED DOCUMENT FEEDER

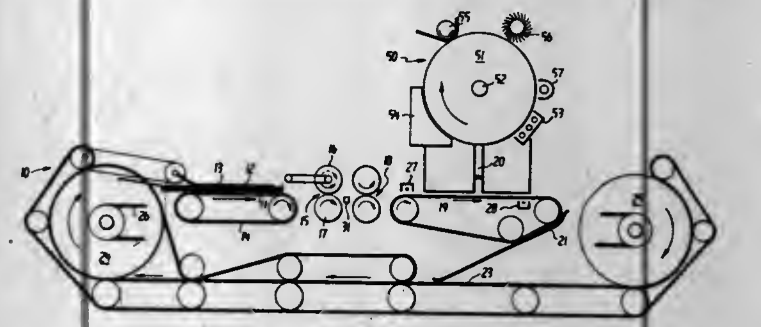
Victor Rodek, Rochester, and Raymond G. Ticknor, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 31, 1974, Ser. No. 438,489

Int. Cl. G03g *15/04, 15/00*

U.S. Cl. 355—14 **5 Claims**

1. Sheet feeding and processing apparatus comprising, first sheet conveyor means, second sheet conveyor means, cyclic processing means including an electrostatic photocopier having an endless and repetitively cycling photoreceptor cooperating with a sheet on said second conveyor means, means for identifying the cyclic position of said photoreceptor, means between said first and second conveyor means for detecting the presence of a sheet, means for relating the detection of a sheet by said detection means to the cyclic position of said photoreceptor as determined by said identifying means, and means responsive to said relating means for momentarily varying the speed of said first conveyor means to correct any deviation from a predetermined relationship between said cyclic position of said processing means and said detection of the presence of a sheet.



3,888,580
PROCESS OF AND SYSTEM FOR PRINTING IN COLOR PHOTOGRAPHY

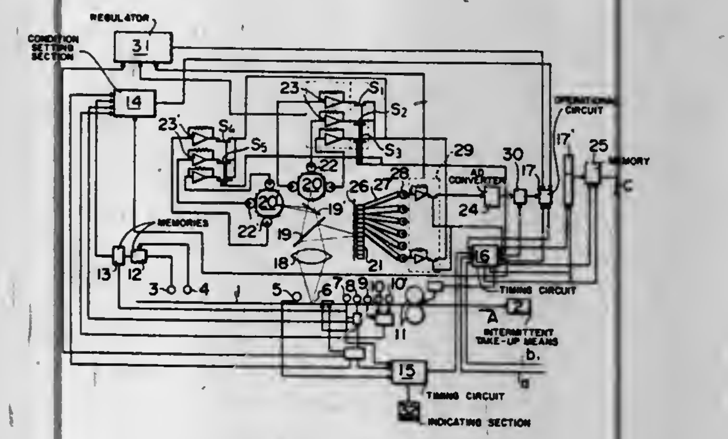
Tadashi Amano, and Ryuichi Andoh, both of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 23, 1973, Ser. No. 363,266

Claims priority, application Japan, May 25, 1972, 47-051176

Int. Cl. G03b *27/76*

U.S. Cl. 355—38 **5 Claims**



1. A process for printing in color photography comprising: measuring a plurality of kinds of densities of a photographic film to be printed;

- selecting, in accordance with the results of said measurement, one of a plurality of sets of sorted codes derived from previously encoded densities regarding photographic films expected to be printed, each of which codes in the set belongs to one kind of said plurality of kinds of densities;
- storing said selected set;
- printing said film in accordance with signals from codes of said stored set, said signals comprising correction signals for correcting exposure time, said correction signals being in accordance with a whole area transmittance density, a maximum transmittance density, a minimum transmittance density and a peripheral area transmittance density.

3,888,581
SEMI-AUTOMATIC DOCUMENT HANDLER

John R. Caldwell, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

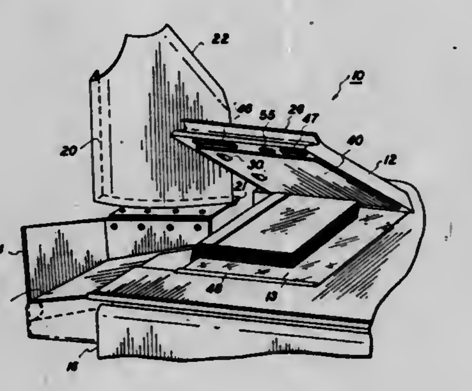
Filed Mar. 8, 1974, Ser. No. 449,401

Int. Cl. G03b *27/62*

U.S. Cl. 355—64 **9 Claims**

1. In a copying apparatus with a transparent document copying platen and scanning optical imaging means beneath said platen for imaging a stationary document on said platen, and a platen overlayable platen cover, said platen cover including uniform planar stationary document flattening surface means for holding documents of up to a predetermined maximum thickness substantially flatly against said platen for stationary copying, the improvement in automatically ejecting documents on said platen from said platen after copying comprising:

- document engaging sheet drive means in said platen cover for ejecting documents from said platen,
- said drive means extending through said stationary document flattening surface means for driving document engagement;



- means for selectively briefly driving said drive means in response to the completion of copying of a document on said platen to eject a document from said platen,
- retaining means for retaining said platen cover over said platen during both copying and ejecting of documents from said platen,
- and spacing means for holding said platen cover stationary document flattening surface means slightly uniformly spaced above said platen, while said platen cover is retained over said platen, by a pre-set spacing which is greater than said predetermined maximum thickness for facilitating said ejection of documents from said platen by said sheet drive means.

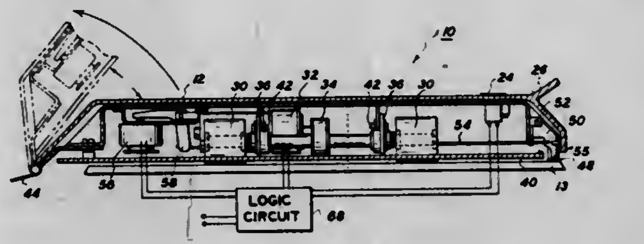
3,888,582
SEMI-AUTOMATIC DOCUMENT HANDLER

Augustus W. Griswold, Rush, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 8, 1974, Ser. No. 449,307

Int. Cl. G03b *27/76*

U.S. Cl. 355—69 **7 Claims**



1. In a copying apparatus with a document copying platen and an overlayable platen cover holding documents against the platen for copying, the improvement comprising:

- platen cover latching means for retaining said platen cover over said platen for the copying of documents on said platen,
- said latching means comprising a permanent magnetic latch between said platen cover and said copying apparatus which can be manually unlatched merely by manual lifting of said platen cover,
- said latching means including automatic unlatching means for automatically unlatching said platen cover subsequently to the completion of said copying of documents on said platen,
- said copying apparatus further including automatic platen cover lifting means for automatically lifting said platen cover away from said platen when said latching means is unlatched,
- and wherein said automatic unlatching means comprises electrically driven mechanical camming means forcibly camming said platen cover away from said copying apparatus sufficiently to slightly separate and unlatch said permanent magnetic latch so that said automatic platen cover lifting means lifts said platen cover away from said platen subsequent to the completion of said copying of documents on said platen.

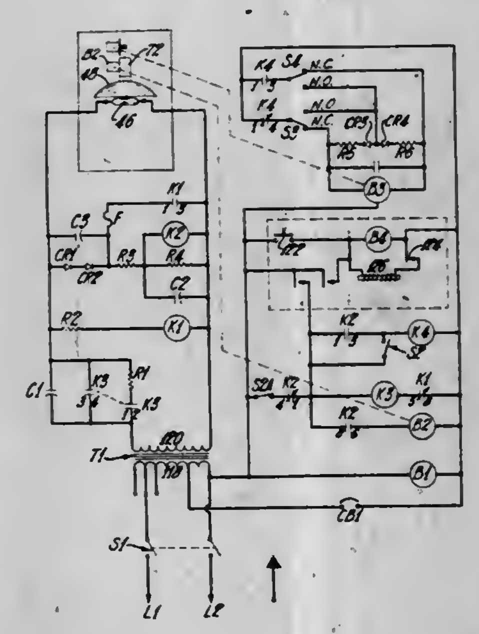
3,888,583
ILLUMINATING SYSTEM WITH GAS DISCHARGE LAMP USED AT LOW AND HIGH POWER LEVELS

Edward J. Kiefer, and Dale W. Rogers, both of Toledo, Ohio, assignors to Holophane Company Incorporated, New York, N.Y.

Division of Ser. No. 166,034, July 26, 1971, Pat. No. 3,760,226. This application July 26, 1973, Ser. No. 383,034

Int. Cl. G03b *27/76*

U.S. Cl. 355—71 **4 Claims**



1. An illuminating system comprising a gas discharge lamp, a housing for said lamp, a circuit including a transformer connected with a supply of alternating current for the lamp, a circuit for the lamp including a capacitor in series with the secondary of the transformer and the gas discharge lamp for low power operation of the lamp, a timer adapted to be adjusted to time the duration of high power operation of the lamp, relay means operable through the timer to short out the capacitor to establish high power operation of the lamp during the period for which the timer is adjusted, relatively movable shutter means comprising a sheet of flexible material associated with said housing, flexible cable means connected with the end regions of the sheet of flexible material, a motor having a drive roll engaging the cable means for actuating said sheet of material, said sheet being operable when in open position to pass light from the gas discharge lamp and in closed position to substantially impede the passage of light from the lamp, and second relay means energized through the timer to actuate the motor to move the sheet of material to open position, said second relay means being operable when the time period for high power operation of the lamp expires to connect the capacitor in series with the lamp for low power operation and to energize the drive motor to move the sheet of material to closed position.

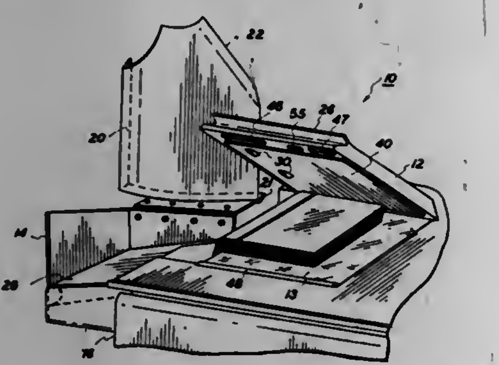
3,888,584
SEMI-AUTOMATIC DOCUMENT HANDLER

Craig A. Smith, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 8, 1974, Ser. No. 449,402

Int. Cl. G03l *27/62*

U.S. Cl. 355—75 **3 Claims**



1. In a copying apparatus with a generally horizontal document copying platen, said platen extending to one edge of said copying apparatus to provide for book copying on said platen with a portion of the book extending beyond said edge, and further including a platen overlayable platen cover for holding document sheets on said platen for copying, the improvement comprising:

- upper and lower document trays, both mounted to said apparatus extending beyond said same edge from closely adjacent said platen,
- said upper document tray normally overlying said lower document tray and being adapted to hold a stack of documents therein for movement of said documents from said upper document tray onto said platen,
- said upper document tray being pivotable away from said platen and said lower document tray to provide unobstructed book copying on said platen with a portion of the book extending beyond said edge,
- said lower document tray being spaced below said upper document tray and below said platen and positioned and formed to receive therein documents removed from said platen, and
- said lower document tray having a supporting surface extending downwardly sloping away from said platen at said edge for supporting the otherwise unsupported portion extending beyond said edge of a book being copied on said platen.

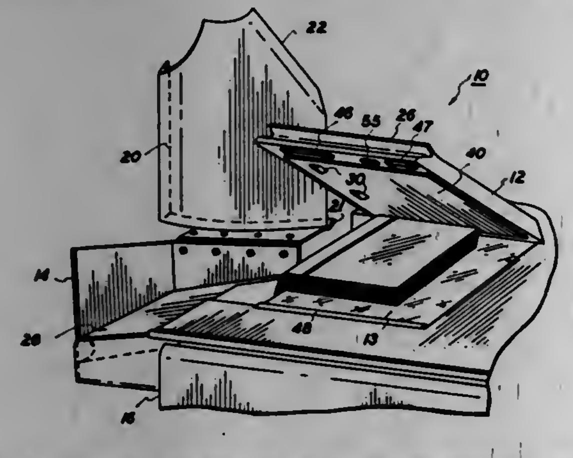
3,888,585
SEMI-AUTOMATIC DOCUMENT HANDLER

Thomas R. Cross, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 8, 1974, Ser. No. 449,572

Int. Cl. G03b *27/62*

U.S. Cl. 355—75 **10 Claims**



1. In a copying apparatus with a transparent document copying platen and optical imaging means beneath said platen for imaging a stationary document on said platen, and a platen overlayable platen cover, said platen cover including uniform document flattening surface means for pressing documents substantially flatly against said platen for stationary copying, the improvement in automatically ejecting documents on said platen from said platen after copying comprising:

- document engaging sheet drive means in said platen cover for ejecting documents from said platen,
- said sheet drive means extending through said document flattening surface means for driving document engagement;
- means for selectively briefly driving said sheet drive means in response to the completion of copying of a document on said platen to eject the document from said platen,
- retaining means for retaining said platen cover over said platen during both copying and ejecting of documents from said platen,
- and spacing means for temporarily lifting said platen cover document flattening surface means away from said platen, while said platen cover is retained over said platen, by a spacing which is greater than the thickness of a document on said platen, for facilitating said ejection of documents from said platen by said sheet drive means,
- and control means for controlling said spacing means to lift said document flattening surface means away from said platen during said driving of said sheet drive means but not during said copying of said documents.

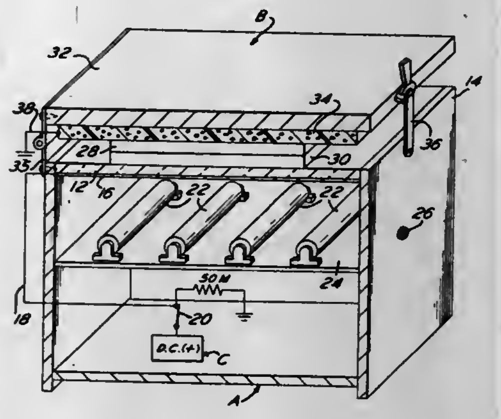
3,888,586
CONTACT PRINTING APPARATUS WITH ELECTROSTATIC HOLD-DOWN

Richard J. Arden, Wilmington, Del., and Harold A. Schweriner, Hatfield, Pa., assignors to The Simco Company, Inc., Lansdale, Pa.

Filed Feb. 4, 1974, Ser. No. 439,036

Int. Cl. G03b *27/02*

U.S. Cl. 355—78 **2 Claims**



1. Contact printing apparatus comprising:

- a transparent plate of insulating material having first and second surfaces and including a transparent electrode of electrically conductive material in contact with and substantially covering the first surface thereof,
- means for applying a D.C. high voltage with respect to ground on said transparent electrode,
- means for directing light through said transparent electrode and said transparent plate,
- a rigid cover for movement toward the second surface of said transparent plate,
- a conductive pad of compressively yielding material on said cover for resilient surface-to-surface contact with abutting sheets of material electrostatically laminated to the second surface of said transparent plate, and
- means for connecting said pad to ground, whereby pressing said conductive pad against the sheets electrostatically laminated to the transparent plate will increase the electrostatic force holding the sheets together and to the surface of said transparent plate and provide wrinkle-free flat disposition preparatory to exposure of the laminate to light.

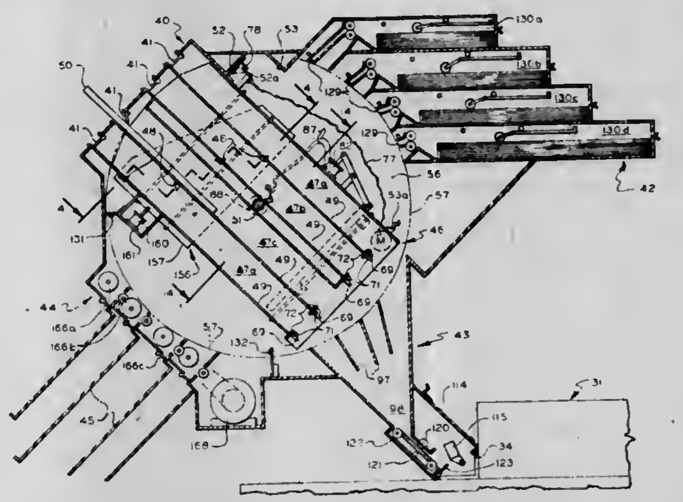
3,888,587
LIGHT-PROOFED RADIOGRAPHIC CASSETTE UNLOADER AND RELOADER

Theodore Perl, 58 Ely Dr., Fayetteville, N.Y. 13066

Filed July 11, 1974, Ser. No. 487,575

Int. Cl. G03g *27/14;* **H05g** *1/60*

U.S. Cl. 355—112 **4 Claims**



1. A light-proofed radiographic cassette unloader-reloader adapted for use with an automatic film processor and for use with a hinged cassette having a narrow flap along its opening side adapted to raise a film edge above the cassette base edge when the cassette lid is raised, comprising: a light-proofed cabinet, a magazine rotatably mounted within the cabinet and having at least one compartment means therein adapted to slidingly receive a cassette, the compartment means being open at one end and provided with cassette arresting stop means at the other end, means for turning the magazine from a first position in which the compartment floor is inclined at substantially 45° in one direction from vertical to a second position in which the floor is inclined at substantially 45° in the opposite direction from vertical, the cabinet having a cassette insertion station in which insertion door means register with the open end of the compartment means when the magazine is in its first position, the cabinet having an unloading station in which film-guide passage means register with the stop means end of the compartment means when the magazine is in its first position and means for passing unloaded film to the processor, the magazine having motor-operated means for unlocking cassettes therein and lifting cassette lids when the magazine is in its first position, the cabinet having a reloading station in which at least one chamber is adapted to contain a stack of film sheets of a size to fit the cassettes and downwardly inclined film supply passage means adapted to register with the stop means end of the compartment means when the magazine is in its second position, the compartment means having releasable latch means for holding the cassette therein adjacent the stop means end of the compartment means and the lid lifting means being adapted to maintain the cassette open when the magazine is turned from its first to its second position, means in the chamber for advancing and expelling a single sheet of film on demand through the film supply passage, the cabinet having a cassette ejection station in which cassette closing means and ejection door means register with the open end of the compartment means when the magazine is in its second position, and means in the magazine for releasing the releasable latch means, the releasing means being controlled at the ejection station; whereby a cassette falls to the stop means end of the compartment means when inserted, the exposed film falls and is carried to the processor when the cassette is opened, a fresh sheet of unexposed film falls into the open cassette after the magazine is turned to its second position, and the cassette is ejected when the latch means is operated.

3,888,588
INSTRUMENT FOR MEASURING DISTANCE

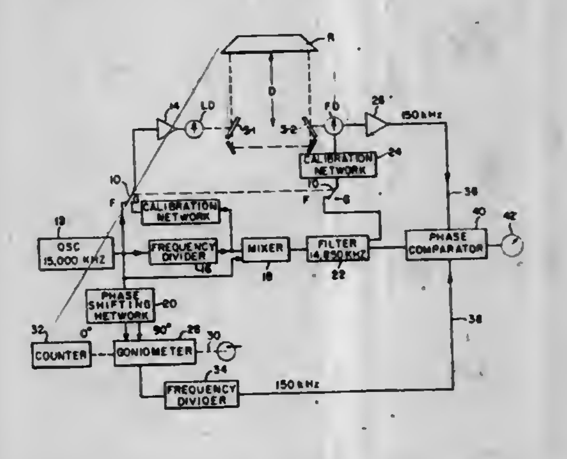
Carl-Erik Granqvist, Tulevagen 18, Lidingo, Sweden

Filed Jan. 30, 1973, Ser. No. 328,086

Claims priority, application Sweden, Feb. 3, 1972, 001220/72

Int. Cl. G01c *3/08;* **G01s** *9/04*

U.S. Cl. 356—5 **11 Claims**



1. An instrument for measuring distance utilizing two signal paths, one signal path being outside of the instrument for radiant energy transmitted to and received from a distant object and the other signal path comprising an internal signal channel for a signal at a high frequency, said internal signal channel including a variable delay device for shifting by controllable amounts the phase of the high frequency signal and a first frequency divider for the shifted signal having an output signal at a lower frequency that has a phase accuracy which is a multiple of the accuracy of the variable delay device; a radiant energy signal generator; means for modulating the radiant energy signal from said generator at a first frequency; a receiver for said radiant energy signal including means responsive to the reception of said radiant energy signal for producing a signal at said lower frequency; and a phase comparator circuit for indicating a predetermined relationship between the phases of the two signals at said lower frequency.

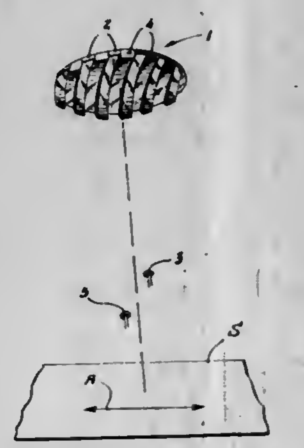
3,888,589
REFLECTION GRATING OPTICAL ODOMETER

David William Swift, Prestatyn, Wales, assignor to Pilkington P-E Limited, Flintshire, Wales

Filed Feb. 11, 1974, Ser. No. 441,473

Int. Cl.^{2} G01P *3/36;* **G02B** *5/08*

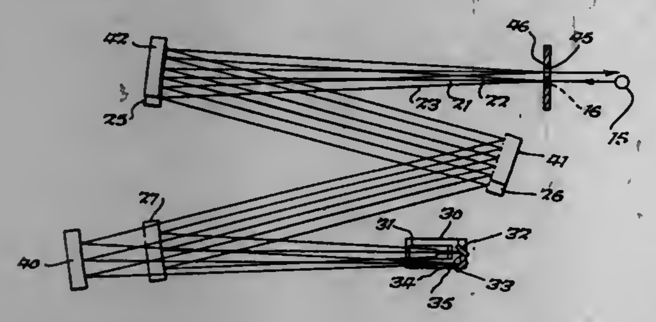
U.S. Cl. 356—28 **6 Claims**



1. Apparatus for measuring displacement or velocity relative to a surface above which said apparatus is independently supported for travel relative to the surface said apparatus comprising grating and light directing means having several pairs of light reflecting means with the light reflecting means of the several pairs being arranged in alternation and with the light reflecting means in each pair being adapted to reflect incident light received from the surface in two different gen-

eral directions, respectively, thereby to provide separate light signals representative of luminous intensity variations of the surface relative to which the apparatus travels, and means effective to compare said separate light signals and provide an output signal derived from the difference therebetween.

3,888,590
GRATING MONOCHROMATOR
John U. White, Contentment Island Rd., Darien, Conn. 06820
Filed Apr. 10, 1974, Ser. No. 459,170
Int. Cl. G01j *3/18*
U.S. Cl. 356—101 **22 Claims**



1. Apparatus for producing a portion of a spectrum, comprising, in combination:

means forming a curved entrance slit for admitting light from a source;

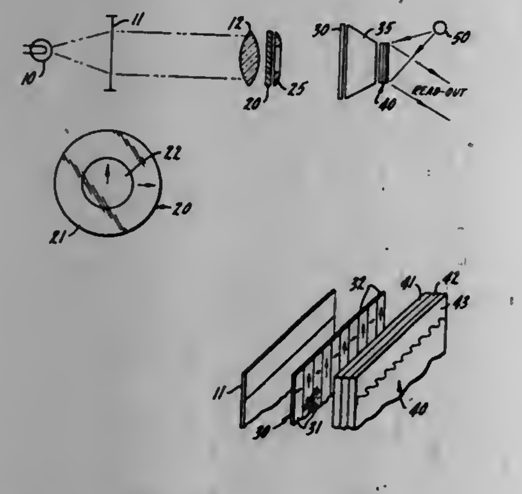
means forming a curved exit slit;

first grating monochromator means for dispersing the light admitted through the entrance slit and for forming a curved first dispersed image of the entrance slit;

second grating monochromator means for receiving light from the first monochromator means and again dispersing the same to form a curved second dispersed image of the entrance slit at the exit slit, the successive dispersions by the first and second monochromator means being in additive relationship with each other; and

mirror means located between the first and second grating monochromator means and including a convex reflecting surface and a concave reflecting surface for reversing the sense of the first dispersion with respect to the sense of the curvature of the first image, the curvature of the second image being substantially independent of wavelength.

3,888,591
IMAGE SUBTRACTION APPARATUS
Paul G. Roetling, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Jan. 21, 1974, Ser. No. 434,855
Int. Cl. G01n *21/40*
U.S. Cl. 356—114 **25 Claims**



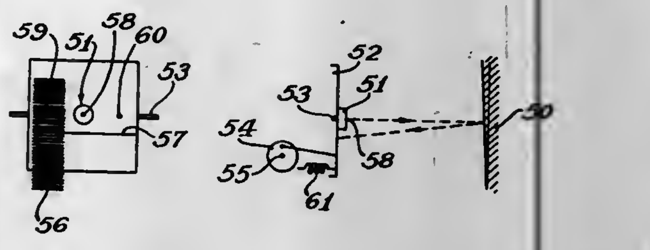
1. An image subtraction system comprising:

encoding means for producing a first encoded image and a second encoded image;

filtering means, in optical relationship with said encoding means, having a first area for passing said first encoded image and a second area for passing said second encoded image; said first area and said second area being alternately disposed on said filtering means; and

optical recording means, in optical relationship with said filtering means, responding to the absolute difference between said first encoded image and said second encoded image.

3,888,592
APPARATUS FOR MEASURING WHEEL ANGLES OF VEHICLES, PARTICULARLY MOTOR VEHICLES
Herman Robert Geul, Leiden, Netherlands, assignor to Sun Electric Corporation, Chicago, Ill.
Filed Sept. 13, 1973, Ser. No. 396,990
Claims priority, application Netherlands, Sept., 1972, 7212387
Int. Cl. G01b *11/275*
U.S. Cl. 356—155 **16 Claims**



1. A device for measuring the wheel angle on vehicles comprising an optical system including a projector, cooperating with the related wheel, for forming on an image plane an optical pattern consisting of one or more marks, at least one light sensitive element situated in the image plane, means for effecting relative movement between said light sensitive element and the mark (s) of said pattern, respectively, caused by an angular displacement of said projector with respect to a reference position, said relative movement causing signals to be generated in reference positions for enabling the wheel angle concerned to be determined, characterized in that by means of a suitable pattern, projected by the projector, on the light sensitive element, signals are generated which are counted for directly determining the wheel angle.

3,888,593
OPTICAL COMPARATOR AND INSPECTION APPARATUS
Paul S. Kempf, 703 Stratford Ct., Apt. 7, Del Mar, Calif. 92014
Continuation-in-part of Ser. No. 63,180, Aug. 12, 1970, abandoned. This application Oct. 18, 1971, Ser. No. 190,187
Int. Cl. G01b *9/08*
U.S. Cl. 356—164 **14 Claims**

1. An optical comparator and inspection apparatus for comparing a sample component with a master component by comparing respective images thereof comprising,

a single rear projection viewing screen,

carriage means including a carriage being slidable longitudinally from front to rear for supporting a sample component and a master component in spaced relation adjacent said screen,

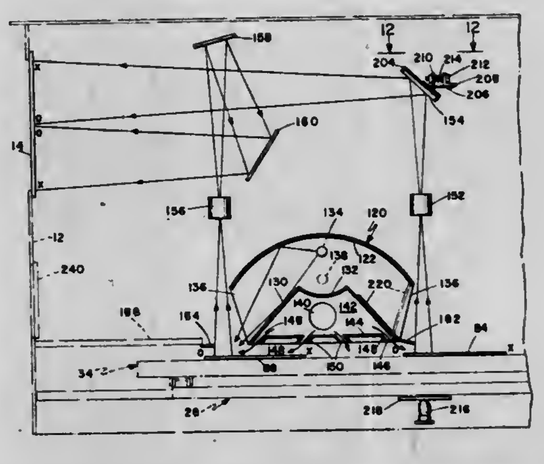
said carriage means including positioning frame means for fixedly positioning the sample component and reference component in a common plane on said carriage,

a light source,

means for focusing light from said light source onto the surface of respective similar portions of the sample component and the master component,

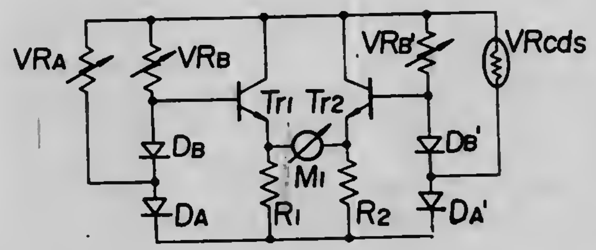
optical projection means including a lens and mirror system for each component for receiving light images reflected from the surface of each of the respective components and directing the light images, with one of the images inverted, to a common point of focus on the screen in abutting relationship with one component image being a mirror image at a given demarkation line of the other component image,

light stop means for simultaneously limiting the light images to common lines of demarkation on each component,



and moving means for moving the sample component and reference component on said positioning frame means and carriage means simultaneously in the common plane in a direction perpendicular to the optical axis of the respective lens and mirror systems on an axis longitudinal to a line between the optical centers of the two respective lens and mirror systems and past the light source and light stop means, whereby the two images converge and diverge from the lines of demarkation on the screen.

3,888,594
EXPOSURE CONTROL COMPUTING CIRCUIT
Toshikazu Ichiyanagi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Japan
Filed Sept. 18, 1973, Ser. No. 398,552
Claims priority, application Japan, Sept. 22, 1972, 47-95307
Int. Cl. G01j *1/44*
U.S. Cl. 356—226 **5 Claims**



1. An exposure control computing circuit capable of being set for photographic informations comprising:

bridge circuit means constituting a bridge circuit, said bridge circuit means having

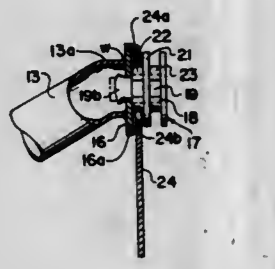
a first and second impedance means incorporated in two arms of the bridge circuit, and

a plurality of logarithmic-operating means incorporated in each of the other two arms of the bridge circuit,

a third and fourth impedance means of which one ends are connected to said first and second impedance means, and the other ends are connected to joints of said logarithmic-operating means, and

an exposure value determining means arranged to be connected between the output corners of the bridge circuit so that when at least two of the first to fourth impedance means are set for photographic informations, an exposure control parameter is derived as an output in the form of a product of the input signals representing the photographic informations to set said exposure value determining means connected between the output corners of the bridge circuit.

3,888,595
SCAFFOLD CAM LOCK CONSTRUCTION
Ronald G. Morris, Beaver Falls, Pa., assignor to Beaver-Advance Corporation, Ellwood City, Pa.
Filed May 13, 1974, Ser. No. 469,436
Int. Cl. E04g *7/22*
U.S. Cl. 403—14 **12 Claims**

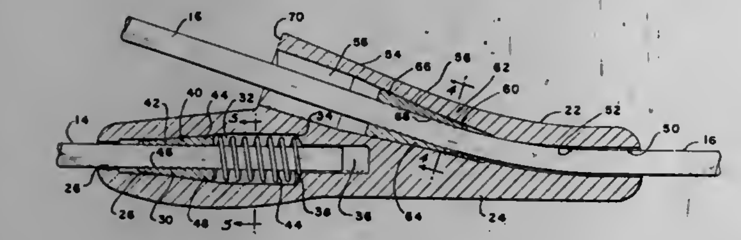


1. In a locking connector construction for a scaffold frame or the like which has a latching gusset plate unit for securing on the frame and having a side wall provided with an open-end substantially circular latching slot portion therein; and which also has a latching device for securing on an end portion of a connector member of the frame for movement into and out of latching engagement with the latching slot portion, wherein the latching device has a back flange for securing on the end portion of the connecting member, has a stub shaft secured at its back end to extend from the back flange, has a front guide flange secured on a front end of the stub shaft, and has a latching collar rotatably mounted on the stub shaft between the back and front flanges; wherein the collar carries a guide flange and has a pair of front spaced-apart arcuate-shaped latching lugs projecting from a front side of the guide flange, and the device has a handle operatively mounted for turning movement with said collar; the improvement which comprises, an open entry portion from a front edge of the side wall of the gusset plate unit into the circular latching slot portion thereof, said entry portion being provided by a pair of outwardly diverging and inwardly converging entry edges intersecting said substantially circular latching slot portion to provide an open mouth portion and the maximum inward convergence of said entry edges substantially as a common line edge, said open mouth portion being immediately open to said latching slot portion and defining an opening therebetween of a width substantially corresponding to the diameter of said stub shaft and smaller than the diameter of said latching slot portion, said latching slot portion having a diameter that substantially corresponds to a cross dimension representing the outer diameter of said pair of arcuate-shaped latching lugs as positioned on said stub shaft, said pair of entry edges being configurated to facilitate an inward rolling movement of said pair of latching lugs thereon into bypassing alignment with and through said open mouth portion and into said latching slot portion, and said handle being adapted to thereafter turn said pair of lugs into a locking position within said latching slot portion.

3,888,596
JACKING ANCHOR FOR POST-TENSIONING CONCRETE
William F. Kelly, 100 Bellaire Dr., New Orleans, La. 70124
Filed May 23, 1973, Ser. No. 362,908
Int. Cl. F16g *11/04*
U.S. Cl. 403—314 **4 Claims**

1. An anchor for use in the in-line tensioning by a jack of tendons extending from the opposed faces of a concrete structure to a jacking pocket, the anchor being positioned in the jacket pocket and including:

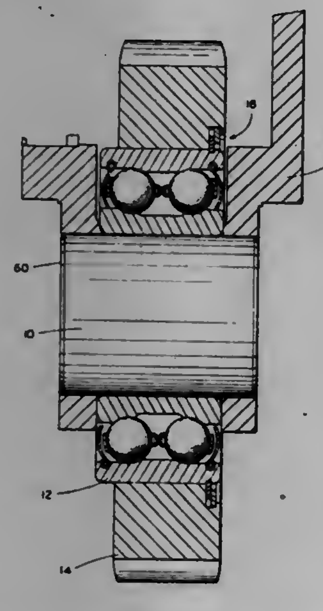
a. an elongated housing having first and second portions,
b. the opposite ends of said first portion of the housing being provided with first and second longitudinal bores along the common longitudinal axis of the first portion of the housing for receiving ends of the tendons extending from opposite faces of the concrete structure,
c. said first bore terminating in the interior of the housing and said second bore having a generally unobstructed constant diameter throughout,
d. a first movable gripping means in said first bore for holding an end of one tendon,
e. the second portion of the housing being angularly disposed with respect to the said longitudinal axis of the first portion of the housing and extending outwardly at a predetermined angle from the outer surface of the first portion of the housing,



f. said angularly disposed second portion having a bore extending therethrough and in communication with said second longitudinal bore of the first portion of the housing, whereby the other of the tendons may be passed through the second longitudinal bore and the bore of the angularly disposed second portion, said second longitudinal bore communicating solely with said bore in said second portion,
g. the angularly disposed second portion terminating in a face generally transverse to said bore in said second portion and disposed at a predetermined angle to the longitudinal axis of the first portion of the housing to facilitate operative engagement with the jack, and
h. a second movable gripping means in the bore of said angularly disposed second portion for holding the other tendon extending therethrough.

3,888,597
RETAINING ASSEMBLY

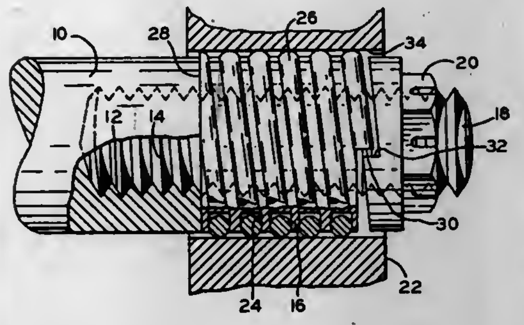
Arthur S. Datta, Willow Springs, Ill., assignor to International Harvester Company, Chicago, Ill.
Filed Feb. 24, 1972, Ser. No. 228,998
Int. Cl. F16d *1/06*
U.S. Cl. 403—326 **2 Claims**



1. A retaining assembly for securing an element against axial displacement along a cylindrical member, the cylindrical member having an external annular groove and the element having a bore with a two step internal annular groove therein, comprising:
a first snap ring of the external type seated in the external annular groove and extending radially toward one step of the internal annular groove, the external annular groove having an axial span substantially equal to the axial width of the first snap ring,
a second snap ring of the internal type seated in the one step of the internal annular groove and concentrically engaging one end of the first snap ring, the one step of the internal annular groove having a uniform depth and an axial span substantially equal to the combined width of both snap rings and with one end wall engaging the other end of the first snap ring and the second step forming a reduced annular opening means between the element and the cylindrical member for providing access for inserting and removing the snap rings.

3,888,598
MULTIPLE COIL WIRE LOCK ARRANGEMENT

David Samiran, 148 Northwest Rd., and Arthur H. Moore, 46 Northwest Rd., both of Westfield, Mass. 01085
Filed Dec. 11, 1973, Ser. No. 423,737
Int. Cl. F16d *1/06*
U.S. Cl. 403—372 **6 Claims**

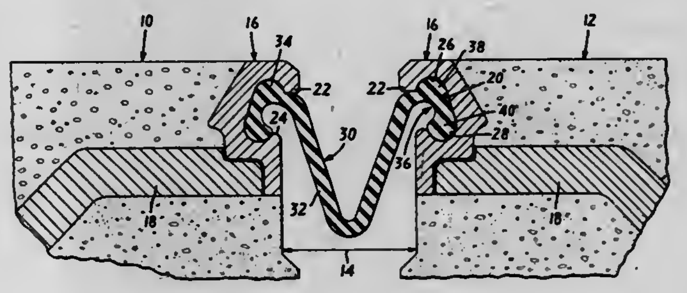


1. In combination; a shaft and a member to be fixed to the shaft and having a hole therein coaxial with the shaft, a multiple convolution helical wire coil disposed in the hole coaxial with said shaft and having ends, support means for said coil, said support means having a helical groove for receiving the inner side of said coil, abutment means nonrotatably connected to said shaft and engaging opposite ends of said coil, at least one of said abutment means being adjustable circumferentially of said shaft for expanding said coil into gripping relation with the hole to lock the member to said shaft so that the shaft and member can be rotated in either direction, and said support means comprises a cylindrical member coaxial with said shaft and fixed to one end of said shaft and having said helical groove formed in the outer surface thereof.

3,888,599
EXPANSION JOINT SEAL

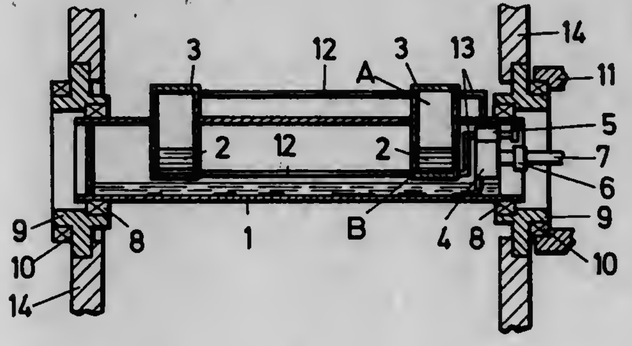
Howard B. Reifsnyder, Williamsport, Pa., assignor to Construction Specialties Inc., Cranford, N.J.
Filed Sept. 20, 1974, Ser. No. 507,664
Int. Cl. E01c *11/02*
U.S. Cl. 404—69 **4 Claims**

1. An expansion joint seal comprising a pair of spaced-apart, elongated frame members positioned substantially parallel to each other, each frame member having in cross-section a generally C-shaped cavity facing inwardly toward the space between the frame members, each such cavity opening toward the space between the frame members at an opening defined between opposed projecting portions of the frame members spaced from each other a distance substantially less than the maximum dimension within the cavity taken generally parallel to the opening, and an elongated resilient gasket sealing the space between the frame members and including a web portion spanning the space and a retaining bead portion extending along each edge of the web portion and received within the cavity of a respective frame member, each retaining bead portion having an outward surface substantially matching and in engagement with the cavity of the respective frame member and having a concavity on its inward surface facing generally inwardly, the concavity of each retaining bead portion of the gasket dividing the retaining bead portion generally centrally into upper and lower parts and defining a bending zone along which such upper and lower parts are bendable relatively toward each other for substantial reduction of the size of the bead portion such that the bead portion is receivable through the opening of a respective frame member into the cavity thereof, and each retaining bead portion joining the web portion of the gasket exclusively at one of said parts defined by the concavity.



3,888,600
VARIABLE MASS OSCILLATION EXCITER

Gulertan Vural, Emmelshausen, Germany, assignor to Koehring GmbH - Bomag Division, Boppard; Rhine, Germany
Filed July 19, 1974, Ser. No. 489,896
Claims priority, application Germany, July 25, 1973, 2337695
Int. Cl.^{2} E01C *19/38*
U.S. Cl. 404—117 **14 Claims**

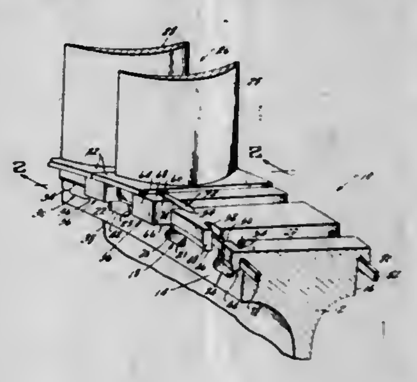


1. An oscillation exciter comprising at least one cylinder, means rotatably mounting said cylinder, means for rotating said cylinder, a piston movably mounted in said cylinder for dividing said cylinder into two chambers, and means for selectively injecting and venting liquid into and from both said chambers to move said piston so as to cause said piston and the liquid contained in said chambers to form an unbalanced mass.

3,888,601
TURBOMACHINE WITH BALANCING MEANS

Larry Earl Glassburn, Olean, N.Y., assignor to General Electric Company, Lynn, Mass.
Filed May 23, 1974, Ser. No. 472,815
Int. Cl. F01d *5/10*
U.S. Cl. 416—144 **8 Claims**

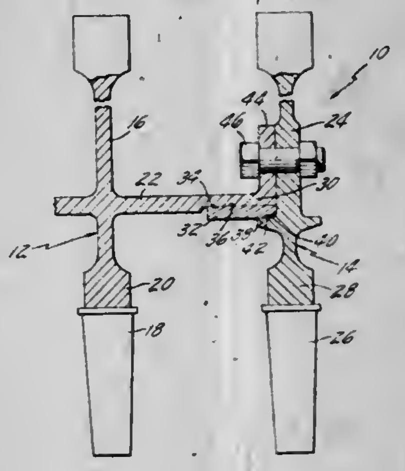
1. A turbomachine with means for balancing thereof comprising:
a rotating member having a plurality of circumferentially spaced apart, generally axially, extending grooves disposed about the outer periphery thereof;
a plurality of blade members having root and airfoil vane portions wherein the root portions are received for retention within the grooves;
a plurality of circumferentially spaced apart integral hook portions extending from a side of the rotating member wherein each integral hook portion has two opposed generally radially extending sidewalls, each one of which is intersected by a generally radially extending groove;



a plurality of balance weights each one of which has a pair of longitudinal and transverse faces intersected by a top and bottom face together with a pair of oppositely projecting tang members wherein each tang member extends from an opposing longitudinal face for engagement within a respective radially extending groove; and
a snap ring for insertion between the hook portions and rotating member for engagement with the bottom of the balance weights.

3,888,602
STRESS RESTRAINING RING FOR COMPRESSOR ROTORS

Arnold Douglas Nichols, Simsbury, and Cornelius Vickers Sundt, Windsor, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.
Filed June 5, 1974, Ser. No. 476,759
Int. Cl. F01d *5/06*
U.S. Cl. 416—198 **4 Claims**



1. An axial flow compressor for a gas turbine engine comprising:
an upstream compressor disk made from a first material and including an integral, axially extending wing flange having a downstream end, said downstream end including a radially outwardly facing cylindrical surface;
a downstream compressor disk made from a second material adjacent and connected to said upstream compressor disk and including means defining an inner snap diameter surface; and
a restraining ring disposed on said downstream end and having an outer snap diameter surface and a radially inwardly facing cylindrical surface, said radially inwardly facing cylindrical surface abutting said radially outwardly

facing cylindrical surface, said radially inwardly facing cylindrical surface having a free state diameter no greater than the free state diameter of said radially outwardly facing cylindrical surface, said outer snap diameter surface abutting said inner snap diameter surface, said restraining ring having the characteristic that it is stiff relative to the stiffness of said wing flange, said wing flange having the characteristic that it creeps during engine operation, said second material having a creep strength higher than said first material.

3,888,603
COMPRESSOR GOVERNOR

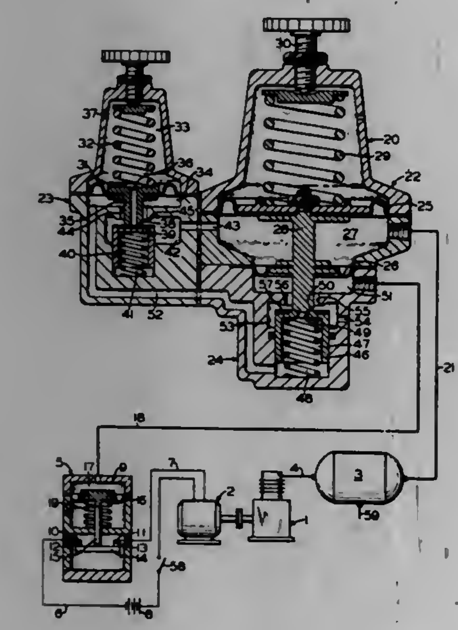
Minoru Nagase, Kobe, Japan, assignor to The Nippon Air Brake Company, Kobe, Japan

Filed Feb. 14, 1974, Ser. No. 442,358

Claims priority, application Japan, Mar. 10, 1973, 48-28404

Int. Cl. F04b *47/00*

U.S. Cl. 417—25 **5 Claims**



1. A compressor governor device for maintaining operating pressure in a storage reservoir supplied thereto by compressor means within upper and lower pressure limits of a prescribed range by controlling operation of switch means having an actuating position for actuating the compressor means when presssure in the reservoir reduces to the lower pressure limit and being operable responsively to fluid pressure to a shut-off position for shutting down the compressor means when the pressure in the reservoir attains the higher pressure limit, said governor device comprising:

a. delivery valve means communicating with a conduit connectable to the switch means, said delivery valve means having a normally closed position in which communication to said conduit is closed and being operable to an open position in which said communication is open and fluid pressure may be delivered to said conduit;

b. an actuator device connectable to the storage reservoir and operable responsively to fluid at said upper pressure limit for effecting operation of said delivery valve means to its said open position, said actuator device being operable responsively to fluid at said lower pressure limit for restoring said delivery valve means to its said closed position,

c. said delivery valve means being communicable with said actuator device whence the fluid pressure delivered by the delivery valve means to said conduit is supplied; and d. pressure reducing means of the self-lapping type interposed between said actuator device and said delivery valve means for effecting reduction of fluid pressure delivered via said delivery valve means to said conduit to a predetermined low value less than said lower pressure limit.

3,888,604
COMPRESSOR FOR A REFRIGERATING MACHINE

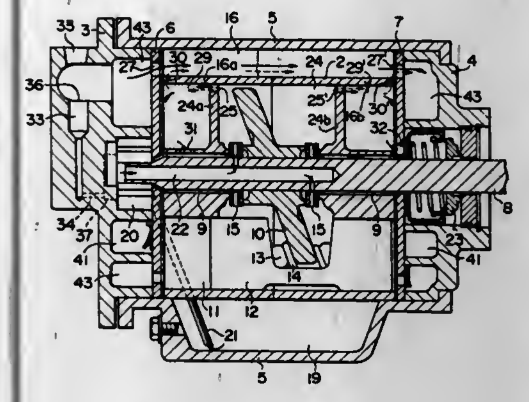
Ryoichiro Oshima; Atsushi Suginuma, both of Hitachi; Atsuo Kishi, Katsuta, and Kenichi Kawashima, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 25, 1973, Ser. No. 400,653

Claims priority, application Japan, Sept. 29, 1972, 47-97040; Sept. 29, 1972, 47-119004

Int. Cl. F04b *1/02*

U.S. Cl. 417—269 **11 Claims**



1. A compressor for a refrigerating machine in which rotary movements of a drive shaft are converted into reciprocatory movements of pistons in a crankcase and a refrigerant in a gaseous state is drawn by suction and compressed by a combination of pistons, cylinders, and inlet and discharge valve means, the compressor comprising passage means for maintaining the interior of the crank-case in communication with a low pressure gas passage on the suction side, and oil separating means disposed in said passage means for separating and recovering oil for lubricating the compressor from blow-by gas flowing from the crank-case to said low pressure gas passage including at least two balance holes, each of said balance holes having a small cross sectional area, and an oil separating chamber having a passage disposed between said balance holes, said passage being of a larger cross sectional area than each of said two balance holes.

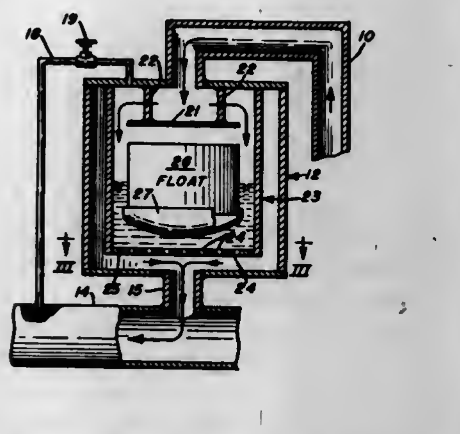
3,888,605
APPARATUS FOR CONTROLLING THE LEVEL OF SUBSURFACE WATER

Edward J. Moore, Morris Township, N.J., assignor to Moretrench American Corporation, Rockaway, N.J.

Filed June 10, 1974, Ser. No. 477,608

Int. Cl. F04b *49/04*

U.S. Cl. 417—279 **6 Claims**



1. Apparatus for controlling the level of subsurface water and comprising,

a. a float chamber having a plurality of openings formed in the bottom wall thereof,

b. a float in said chamber,

c. a flexible member secured to the bottom of the float and spanning the said openings,

d. a header pipe communicating with the said openings,

e. a pump connected to said header pipe for producing sub-atmospheric pressure within said header pipe,

f. a vertical pipe sunk in the ground and connected to said float chamber, said pipe having an inlet opening at the lower end portion thereof, and

g. means forming an air passageway between the header pipe and the top of the float chamber.

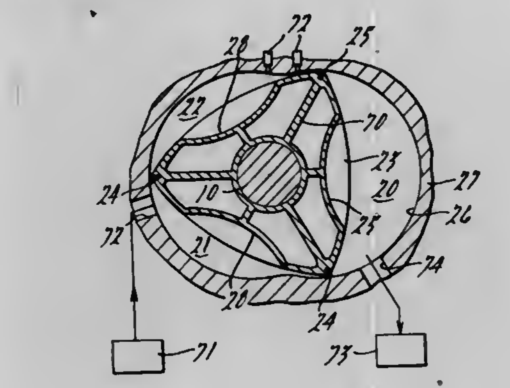
3,888,606
ROTARY INTERNAL COMBUSTION ENGINE

James C. Uy, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 26, 1973, Ser. No. 428,530

Int. Cl. F01c *21/00*

U.S. Cl. 418—179 **3 Claims**



1. In a rotary internal combustion engine, a rotor journal for movement within said engine, to assist in defining a plurality of variable volume combustion chambers, the rotor comprising:

a. a metallic substrate body presenting a plurality of angularly connected outer walls each facing said chamber, said body having at least one channel interrupting each of said walls,

b. an insulating coating adherent on said walls and channels for reducing heat transfer from said combustion chambers to the interior of said substrate body, said insulating coating being selected from the group consisting of magnesium oxide, mica, expanded stabilized zirconia, and thorium oxide, said insulating coating having a thickness in the range between 0.0005 and 0.01 inches, and

c. heat conductive means covering said insulating coating effective to quench the temperature of any zone of said coating to prevent unwanted preignition of gases within said combustion chambers, said heat conductive means comprising a coating of material selected from the group consisting of copper, aluminum, iron, nickel, chromium and alloys thereof.

3,888,607
GEAR OIL PUMP, ESPECIALLY FOR MOTOR VEHICLE INTERNAL COMBUSTION ENGINES

Manfred Flaig, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

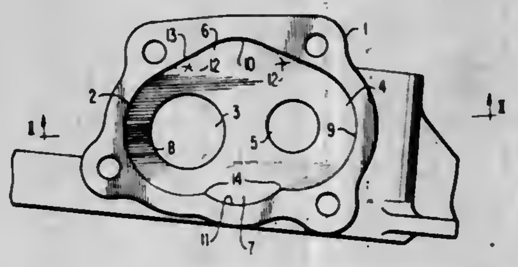
Filed June 1, 1973, Ser. No. 366,147

Claims priority, application Germany, June 3, 1972, 2227119

Int. Cl. F04c *1/08*

U.S. Cl. 418—206 **18 Claims**

1. A gear oil pump with axial housing means, said housing means being provided with first axial wall means for forming substantially cylindrical spaces for the arrangement of gears therein, wall means defining inlet space means, and discharge space means, characterized in that the inlet space means together with the substantially cylindrical spaces for the gears, form inlet edges which are axially bevelled with respect to said first wall means to form bevelled off portions, and the bevelled off portions form within the area of an inlet into the inlet space means an at least approximately tangential transition of the walls of the inlet space means into the walls of the cylindrical spaces for the gears.



3,888,608
APPARATUS FOR THE CONTINUOUS MANUFACTURE OF ENDLESS FOAMS

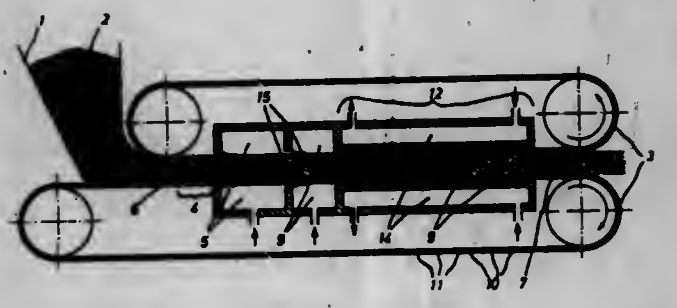
Norbert Holl, Battenberg, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 15, 1974, Ser. No. 488,786

Claims priority, application Germany, July 14, 1973, 2335892

Int. Cl. B29c *25/00*; **B29d** *27/00*

U.S. Cl. 425—4 C **3 Claims**



1. An apparatus for the continuous manufacture of endless foams from prefoamed particulate plastics capable of further expansion and consisting of means for filling the preformed particles into a channel formed by moving gas-permeable walls and stationary side walls and extending from said filling means over a heating and a cooling zone, said moving gas-permeable walls being composed of endless belts, wherein the belts are composed of transverse gas-permeable strips alternating with transverse gas-impermeable strips of the same thickness.

3,888,609
APPARATUS FOR PRODUCING FILMS IN ACCORDANCE WITH THE BLOWN TUBE PROCESS

Daniel R. Saint Eve, Thornhill, Ontario, and Ajit Kumar Bose, Don Mills, Ontario, both of Canada, assignors to Leco Industries Limited, St. Laurent, Quebec, Canada

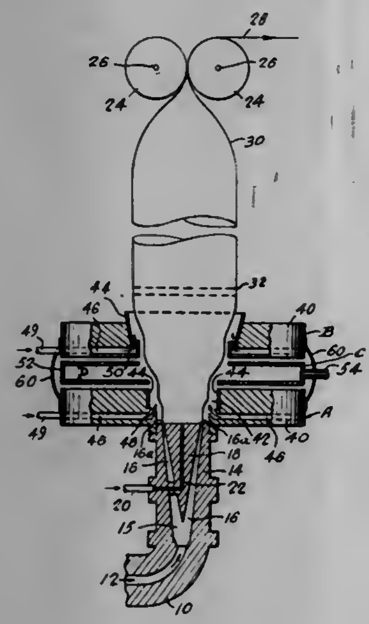
Continuation-in-part of Ser. No. 79,754, Oct. 12, 1970, Pat. No. 3,754,067. This application May 11, 1973, Ser. No. 359,563

Int. Cl. B29c *25/00*; **B29f** *3/08*

U.S. Cl. 425—72 **12 Claims**

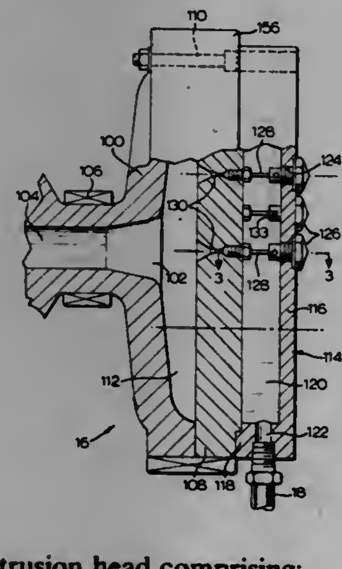
1. An apparatus for producing film by the blown tube process, wherein the apparatus includes at least one extruder and at least one extrusion die, the improvement comprising first and second cooling means, said first cooling means adapted to cool a molten tube of material extruded from said die, said first cooling means having a control chamber sized to receive said molten extruded tube for cooling same after extrusion from said die, said first cooling means being adapted to be mounted in operative downstream relationship to said die in the direction of movement of said film, said first cooling means adapted to cool said molten extruded tube to a temper-

ature above the crystallization formation temperature of the material but at a temperature at which said tube remains in a molten condition and sufficient to permit the formation of crystallites in the material, an annealing chamber located substantially midway between said first and second cooling means and located downstream from said first cooling means in the direction of movement of said film, said annealing chamber being sized to receive the film from the first cooling means while still in a molten condition, means for providing a vacuum operatively associated with said annealing chamber to withdraw sensible heat from said film and to permit expansion of same to the extent necessary to form crystallites therein, said second cooling means being in operative association with and located downstream from said annealing chamber in the direction of movement of said film, said second cooling means also having a chamber sized to receive said film from said annealing chamber for further cooling and solidifying the annealed molten film, to thereby produce an amorphous film having crystallites dispersed throughout said film and which is substantially free of crystal formation therein.



3,888,610
FORMATION OF POLYMERIC FIBRES

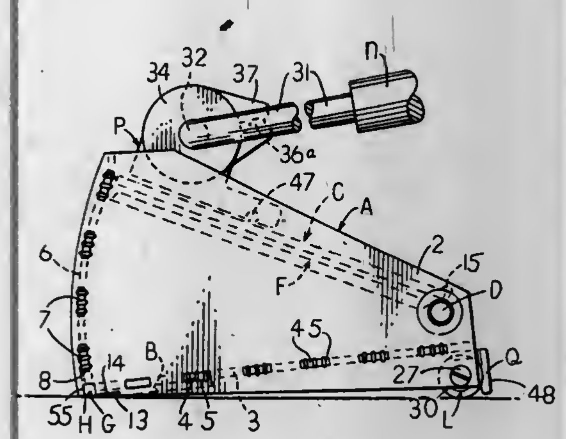
Warren A. Brackmann, Cooksville, and Daniel Diianni, Toronto, both of Ontario, Canada, assignors to Rothmans of Pall Mall Canada Limited, Toronto, Ontario M6A 2W4, Canada
Filed Aug. 24, 1973, Ser. No. 391,266
Int. Cl. D01d *3/00, 7/00*
U.S. Cl. 425—72 **13 Claims**



1. An extrusion head comprising:
a body,
an inlet orifice and passageway situated at one end of said body and adapted to communicate with a source of molten metal to be extruded,
a first hollow chamber formed in said body immediately adjacent and in fluid flow communication with said inlet orifice to receive the molten material therein,
a second hollow chamber in said body spaced from the inlet orifice a greater distance than said first hollow chamber,
a first plate separating said first and second hollow chambers and maintaining said second hollow chamber out of fluid flow communication with said first hollow chamber,
at least one inlet orifice communicating with said second hollow chamber, means to connect said at least one inlet orifice to a source of a heated gas under pressure, a plurality of narrow conduits each in fluid flow communication with said first hollow chamber through an individual aperture in said first plate and freely extending through said second hollow chamber out of fluid flow communication with said second hollow chamber, said second hollow chamber being defined by a second plate spaced from said first plate and a skirt integral therewith extending towards and contacting said first plate,
said second plate having a plurality of outlet orifices therein, the number of said plurality of outlet orifices equalling the number of said plurality of narrow conduits each one of which extends through a different one of the plurality of outlet orifices, and
means in said outlet orifices adapted to allow hot gas under pressure to be projected at high velocity from said second hollow chamber substantially parallel to each individual narrow conduit.

3,888,611
RECESS FILLING MASTIC APPLICATOR HAVING FOUR POINT CONTACT WITH SURFACE AND NOVEL TOOLTEERING MEANS

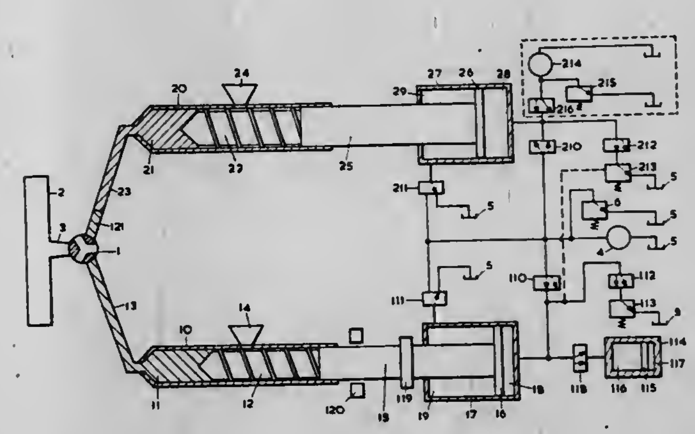
Robert G. Ames, Hillsborough, Calif., assignor to Ulysses Stanley Ames, San Carlos, Calif.
Filed July 22, 1974, Ser. No. 490,769
Int. Cl. B29c *3/00;* **B28b** *3/00*
U.S. Cl. 425—87 **6 Claims**



1. A recess filling mastic applicator comprising:
- a. a body for receiving mastic and having spaced apart side walls, an arcuate rear wall, and a bottom wall having a mastic outlet opening disposed adjacent to the rear arcuate wall;
- b. a mastic pressing plate having its front edge pivotally connected to said side walls, the side edges of said plate being disposed adjacent to the side walls and the rear edge of said plate lying adjacent to said arcuate rear wall;
- c. a handle pivotally connected to said pivoted plate;
- d. a trowelling blade extending transversely across the lower edge of said arcuate trailing wall and having an arcuate lower edge so that only the two ends of said blade will contact with the surface over which the tool is moved;
- e. a pair of spaced apart wheels operatively connected to said side walls of the tool body, said wheels having rubber tires which contact with the surface;
- f. the pivotal connection between the handle and said plate including means for urging the front of the tool body to the right or to the left when the operator exerts a lateral thrust on the handle toward the right or toward the left while pressing on the handle to maintain the tool body in a four point contact with the surface;
- g. whereby a lateral thrust of the handle to the right will cause the tool body front to swing toward the right so as to warp the rubber tire portions to the left that contact with the surface and permit the tool body to steer to the right and vice versa when the lateral thrust is to the left.

3,888,612
INJECTION MOULDING MEANS FOR FORMING A COMPOSITE PRODUCT

Klaus Schrewe, Leverkusen; Ullrich Knipp, Schildgen, and Akos Ravasz, Cologne, all of Germany, assignors to Imperial Chemical Industries Limited, London, England
Division of Ser. No. 221,251, Jan. 27, 1972, Pat. No. 3,801,684. This application June 29, 1973, Ser. No. 374,943
Claims priority, application Germany, Jan. 28, 1971, 2103885
Int. Cl. B28b *13/02*
U.S. Cl. 425—130 **14 Claims**



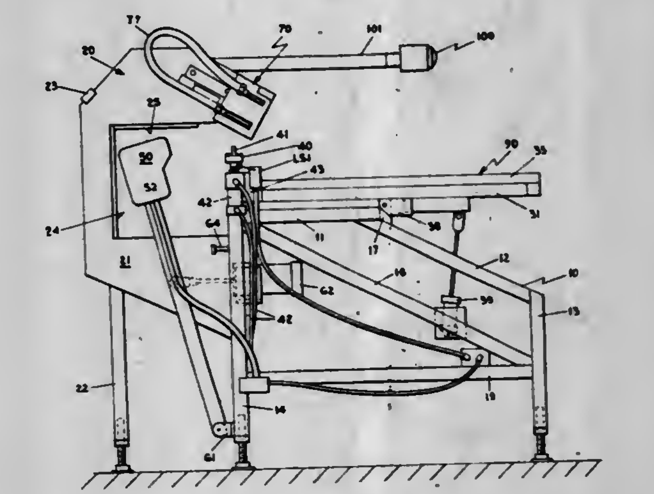
1. Injection apparatus for an injection moulding machine comprising:
1. an injection unit for a first material and
2. an injection unit for a second material, each injection unit comprising:
   - a. an injection ram reciprocatably mounted in
   - b. an injection barrel and
   - c. a feed channel connected to the injection barrel,

said feed channels being arranged to be in communication with each other and with a common sprue channel during injection of the materials from the injection barrels;

3. driving means for driving said injection rams to inject material in sequence from said first material and second material injection units;
4. control means to vary the position of the ram of the second material injection unit, during injection of the first material, whereby the interface between the first and second materials is caused to move up the second material feed channel towards the second material injection barrel and be maintained in said feed channel; and
5. limiting means to limit the flow of second material up the feed channel of the first material injection unit during injection of the second material.

3,888,613
APPARATUS FOR POST FORMING LAMINATES

Bernard J. Fries, Jenison, and Lance E. McLander, Grand Rapids, both of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.
Filed Aug. 8, 1973, Ser. No. 386,533
Int. Cl. B29c *17/02*
U.S. Cl. 425—160 **60 Claims**



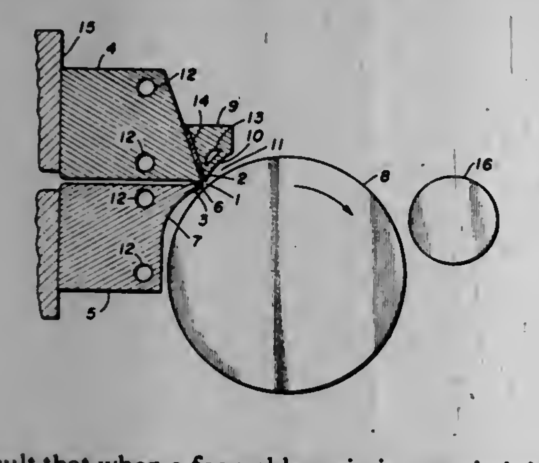
1. An apparatus for post forming laminate tops comprising: table means for supporting a top substrate and its overhanging laminate; a heater of generally C-shaped cross section for embracing said overhanging laminate, said heater including an opening through which said laminate extends into said heater; a former of generally C-shaped cross section having a top plate, a back plate and a bottom plate; means for moving said former and said table relative to one another in a first motion, said first motion being a wiping movement of said former past the edge of said substrate whereby said former wipes said overhanging laminate over the top edge of said substrate; means moving said table and at least said back and bottom plates of said former relative to one another in a second motion, said second motion being a clamping motion of at least said bottom plate and said back plate said former towards the periphery of said substrate whereby said former forces said laminate around the bottom edge of said substrate; said former including an inside dimension corresponding generally to the thickness of the periphery of said substrate whereby when said bottom and back plates of said former are moved towards said periphery, said former forms said laminate around said periphery, embraces said periphery and clamps said laminate to said periphery of said substrate.

3,888,614
APPARATUS FOR PRODUCING A FOAMED RESIN SHEET IN A CURVED DIVERGING EXPANSION ZONE

William R. Foster, Wrexham; Durgacharan Sen, Cwmbran, and Stanley J. Skinner, Newport, all of Wales, assignors to Monsanto Chemicals Limited, London, England
Division of Ser. No. 192,465, Oct. 26, 1971, Pat. No. 3,810,965. This application Jan. 17, 1974, Ser. No. 434,170
Claims priority, application United Kingdom, Nov. 3, 1970, 52268/70; Feb. 18, 1971, 4900/71
Int. Cl. B29d *27/00*
U.S. Cl. 425—224 **9 Claims**

1. An apparatus suitable for the extrusion of a sheet of foamed thermoplastic resin, comprising a slit die orifice communicating with an expansion zone defined by a pair of opposing curved surfaces that can be cooled, one of the surfaces being a convex surface that can move in a direction away from the slit die orifice and the other surface being concave, the curvatures and relative spacing of the opposing curved surfaces with respect to each other being such that the space between said curved surfaces is at a minimum at the beginning of said expansion zone proximate said slit die orifice and said

spacing progressively increases in a direction away from said slit die orifice to a maximum at the end of said expansion zone,



with the result that when a foamable resin is extruded through the die the opposing curved surfaces contact the expanding and foaming resin and there is produced a foamed resin sheet.

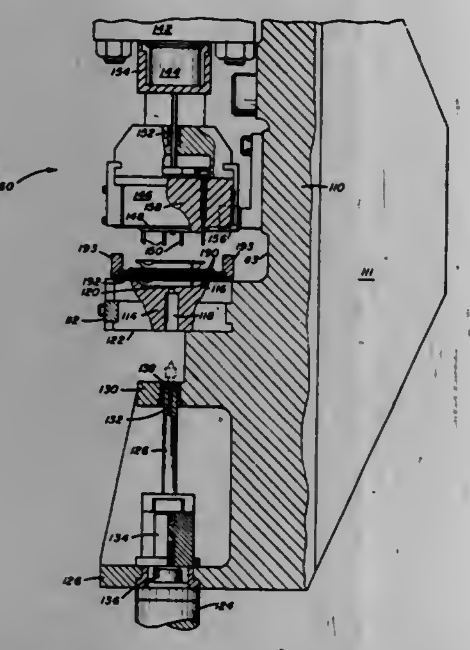
3,888,615
INJECTION MOLDING APPARATUS

Lawrence A. Ulmschneider, and Edward H. Dowling, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 323,606, Jan. 15, 1973, Pat. No. 3,833,329, which is a continuation of Ser. No. 86,668, Nov. 4, 1970, abandoned. This application Jan. 4, 1974, Ser. No. 430,834

Int. Cl. B29f *1/06*

U.S. Cl. 425—246 **6 Claims**



1. Continuous plastic injection molding apparatus comprising a plurality of mold assemblies each having a pair of separable mating die members, means arranged to selectively open and close said die members, means forming an injection chamber disposed in cooperating relationship with each pair of die members, said injection chamber opening through a sprue opening into the mold cavity formed between the die members and outwardly through the bottom surface of said injection chamber forming means, means for supplying molten plastic upwardly into said injection chambers through the opening in the bottom surface of the injection chamber, means for causing continuous relative movement between said mold assemblies and injection chambers and said molten plastic supply means about a vertical axis, said plastic being retained in said injection chamber after moving beyond said plastic supply means by frictional engagement of the plastic with the injection chamber, and ram means cooperating with each of said injection chambers arranged for upward movement into said injection chamber to force plastic therein into said mold cavity after said injection chamber and mold assembly have moved beyond said plastic supply means.

3. Continuous plastic injection molding apparatus comprising a plurality of mold assemblies each having a pair of separable mating die members, means arranged to selectively open and close said die members, means forming an injection chamber disposed in cooperating relationship with each pair of die members, said injection chamber opening through a sprue opening into the mold cavity formed between the die members and outwardly through an outer surface of said injection chamber forming means, means for supplying molten plastic to said injection chambers, means for causing continuous relative movement between said mold assemblies and injection chambers and said molten plastic supply means, and ram means cooperating with each of said injection chambers arranged to force plastic in said injection chamber into said mold cavity, said injection chamber being substantially unheated whereby excess plastic remaining therein after the mold cavity is filled is solidified at the same time as the material in said mold cavity, said ram means arranged to withdraw said solidified excess plastic from said injection chamber and to space said excess plastic from the outer surface of said injection chamber forming means.

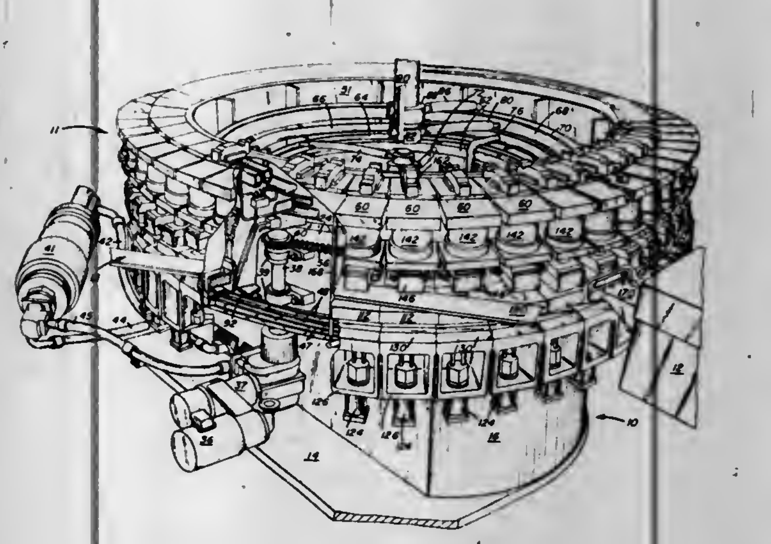
3,888,616
INJECTION MOLDING APPARATUS

Lawrence A. Ulmschneider, and Edward H. Dowling, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 323,606, Jan. 15, 1973, Pat. No. 3,833,329, which is a continuation of Ser. No. 86,668, Nov. 4, 1970, abandoned. This application Jan. 4, 1974, Ser. No. 430,839

Int. Cl. B29f *1/06*

U.S. Cl. 425—246 **3 Claims**



1. Thermoplastic injection molding apparatus comprising a pair of separable mating die members, means arranged to open and close said die members, a thermoplastic inlet opening communicating with the die cavity formed between said die members, means arranged to supply a molten thermoplastic material to said die members, and means for causing continuous unidirectional relative movement between said die members and said thermoplastic supply means, said supply means including a substantially horizontal thermoplastic extruder vertically and horizontally pivotally mounted at the end thereof remote from said die members, and means arranged to urge the outlet end of said extruder into contact with said inlet opening of said die members.

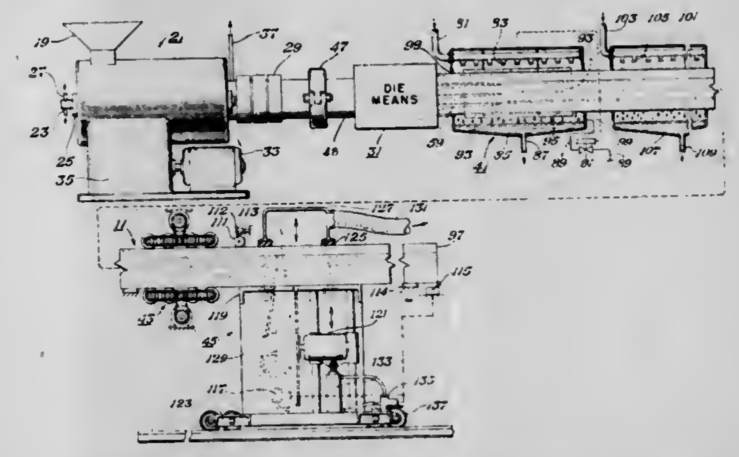
3,888,617
APPARATUS FOR FORMING MULTIPLE PASSAGEWAY CONDUIT

Louis H. Barnett, 3631 Encanto Dr., Fort Worth, Tex. 76109

Division of Ser. Nos. 149,910, June 4, 1971, abandoned, and Ser. No. 273,359, , Pat. No. 3,825,641. This application July 24, 1973, Ser. No. 382,142

Int. Cl. B29f *3/04*

U.S. Cl. 425—296 **7 Claims**



1. Apparatus for forming conduit means having exterior walls around a plurality of passageways extending longitudinally therewithin comprising:

- a. blender and extruder means for effecting extrusion of said conduit as a single, continuous, hot extrudate, and having:
  - i. hopper means for receiving a raw feed comprising plastic;
  - ii. plasticizer means connected with said hopper means for converting said raw feed into a viscous molten mass and for forcing said viscous molten mass through a die means under high differential pressure thereacross; and
  - iii. die means connected with said plasticizer means for converting said molten mass into said hot extrudate; said die means having a plurality of adjacent pin means that include at least one pin means that is surrounded by adjacent pin means so as to define at least one interior passageway that is totally surrounded by interior walls that cannot be cooled by an external coolant and that, consequently, are subject to sagging; said plurality of adjacent pin means being spaced apart so as to define a continuous extrusion passageway around each said pin means so as to form said hot extrudate into said conduit that is continuous and closed in cross section and that defines said plurality of longitudinally extending passageways, each passageway having at least a portion of its internal walls in common with an adjacent passageway, said pin means being elongated and having parallel and connected cooling passageways disposed interiorly therewithin and extending longitudinally therealong for flowing a cooling fluid into and out of said pin means for cooling and supporting walls of said hot extrudate to prevent intolerable sagging, said pin means also having a second cooling passageway extending longitudinally therethrough for passage of cooling and pressurizing fluid into said longitudinally extending passageways of said hot extrudate for supporting walls thereof to prevent sagging;
- b. cooling, sizing and vacuum chamber means for cooling said hot extrudate while simultaneously effecting a reduced pressure on the exterior thereof; said cooling, sizing and vacuum chamber means including:
  - i. cooling fluid aperture means for admitting a cooling fluid into said cooling, sizing and vacuum chamber means onto the exterior of said hot extrudate;
  - ii. vacuum producing means for exhausting said cooling fluid and effecting a predetermined reduced pressure within said cooling, sizing and vacuum chamber means that is less than the pressure within said hot extrudate, whereby the walls of said hot extrudate are urged outwardly in operation; and
  - iii. support means for sizing and preventing distortion of the pliable walls of said hot extrudate under the force of gravity and the differential pressure from the interior to the exterior thereof until the extrudate is cooled to a non-pliable state so as to resist and distortion;
- c. pulling means disposed downstream of and lineally along the longitudinal axis of said cooling, sizing and vacuum chamber means and when operational of said extrudate, for moving said hot extrudate away from said die means, said pulling means being adapted for engaging the self-supporting exterior walls of said extrudate;
- d. track means comprising a plurality of lineally aligned support means for supporting the non-pliable extrudate; and
- e. square cutting means for effecting a square cut of the multi-passageway conduit formed by said extrudate; said square cutting means including:
  - i. a table means that is reciprocally moveable longitudinally of said conduit and carrying a cutting blade and power means that is reciprocally movable perpendicularly of said conduit; and
  - ii. attachment means connected with said table means and with a length measuring means and adapted to releasably connect said conduit means and said movable table means for temporarily effecting concomitant movement thereof.

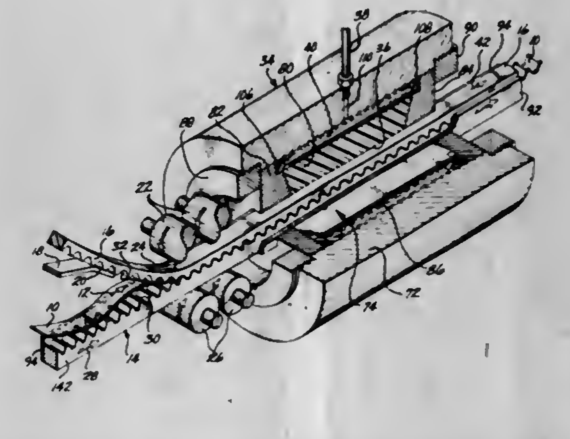
3,888,618
APPARATUS FOR DIE FORMING STRIP MATERIAL

Everett E. Jones, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 18, 1974, Ser. No. 461,995

Int. Cl. B29c *17/02*

U.S. Cl. 425—389 **4 Claims**



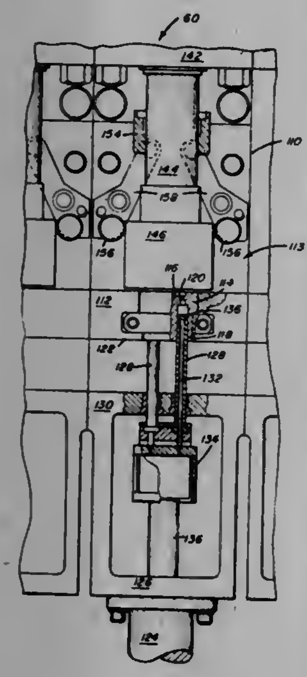
1. Apparatus for die forming elongate strips composed of material capable of undergoing plastic deformation comprising:

- an elongate, substantially rigid die half having a die face of predetermined configuration,
- an elongate, flexible die half having a die face of a configuration complementary to the die face of said rigid die half, said die faces capable of mating interrelationship over at least a predetermined length of said die halves, said predetermined length being less than the elongate dimension of said die halves,
- pressure means for exerting a force on said rigid die half and an opposing force on said flexible die half when said die halves are in mating interrelationsip, said forces being uniformly distributed over said predetermined length of said rigid and flexible die halves, said force on each of said die halves being directed toward the die face on the opposing die half, said forces being sufficient to cause a strip of material between said die halves to undergo plastic deformation,

first means for feeding said rigid die half along a substantially straight path into said pressure means,
second means for feeding said flexible die half from a first location spaced from said rigid die half and upstream from said pressure means into registration with said rigid die half at a second location upstream from said pressure means and for feeding said flexible die half along a substantially straight path conjunctively with said rigid die half from said second location to said pressure means.

3,888,619
INJECTION MOLDING APPARATUS

Lawrence A. Ulmschneider, and Edward H. Dowling, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 323,606, Jan. 15, 1973, Pat. No. 3,833,329, which is a continuation of Ser. No. 86,668, Nov. 4, 1970, abandoned. This application Jan. 4, 1974, Ser. No. 430,833
Int. Cl. B29 *1/06*
U.S. Cl. 425—436 R **9 Claims**

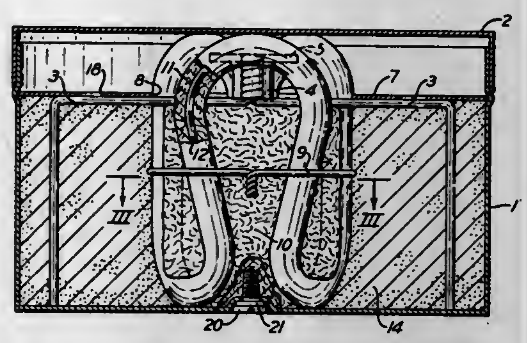


1. Injection molding apparatus comprising a pair of separable mating die members arranged for substantially continuous motion in a closed path, means arranged at a first location to inject a molten plastic material into the mold cavity between the closed die members to form a plastic part, means arranged at a second location to open said die members after said plastic part has solidified, conveyor means arranged to enter between said opened die members at a third location between said second and said first locations, said conveyor means having a part-receiving portion which has a velocity substantially equal to that of the die members at said third location, means to eject said solidified plastic part from said die onto said conveyor means whereby said plastic part is maintained in a predetermined orientation, and means mounting said conveyor means for pivotal movement out of said path in response to said die members failing to open.

9. The invention according to claim 8 wherein said excess plastic removing means includes an ejection pin extending substantially coaxially through the injection means and operable after said injection means is withdrawn from said injection chamber.

3,888,620
SOLID FUEL EMERGENCY BURNER FOR LIGHT AND HEAT

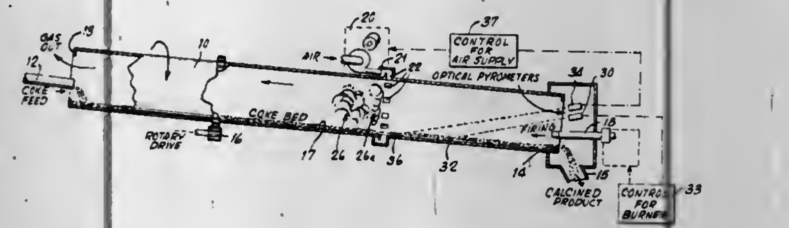
Harry J. Devon, Pittsburgh, Pa., assignor to Frederick E. Schuckman, Pittsburgh, Pa., a part interest
Filed May 1, 1974, Ser. No. 466,008
Int. Cl. F23d *3/16*
U.S. Cl. 431—291 **8 Claims**



1. A burner comprising a metal can having a removable cover, at least three wires joined together at the center of the can near the top and extending outwardly therefrom in substantially uniformly spaced relation to the side wall of the can where they are integrally connected to the upper ends of vertical portions extending downwardly to the bottom of the can, a metal plate resting on said wires and provided with a central opening, a metal heat conductor mounted on the wires at the junction thereof and extending up through said plate opening, wick means extending from the bottom of the can up through said plate opening beside said heat conductor, and a body of wax beneath said plate and filling the can around said wick means, whereby when the burner is burning, said wires will conduct heat from said heat conductor down into the wax to help melt it.

3,888,621
MONITORING AND CONTROLLING KILN OPERATION IN CALCINATION OF COKE

Merlyn Morris Williams, Kitimat, British Columbia, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada
Filed Apr. 12, 1974, Ser. No. 460,463
Int. Cl. F27b *7/20*
U.S. Cl. 432—19 **13 Claims**

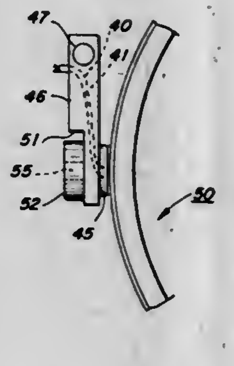


1. In a method of calcining coke wherein the coke is advanced from feed end to discharge end in a rotary kiln countercurrent to gas flow and wherein by causing heat to traverse the kiln, combustible volatiles are removed from the traveling coke and are caused to burn continuously in an intermediate region of the kiln and thereby to produce heat used in continuing removal of volatiles, said burning creating a condition of flame and/or smoke constituting a combustion disturbance across the kiln that is observable from the discharge end, and the place of said burning being indicated by the place of said observable disturbance and being movable, with accompaniment by corresponding movement of said observable disturbance, lengthwise of the kiln in accordance with operating conditions:
the procedure of monitoring kiln operation by optical pyrometer inspection of the interior of the kiln from the discharge end, such inspection of said combustion disturbance yielding a distinctive instability of temperature signals that is detectable as such but is meaningless as a reading of kiln temperature; said procedure comprising
- a. effecting said inspection of a first kiln locality downstream in the coke path from a desired place for said combustion disturbance, to obtain temperature signals significant to the effectiveness of the calcining operation,
- b. effecting said inspection of a second kiln locality spaced upstream in said path from the first locality but also downstream of said desired place, to determine, by appearance of temperature signals having or lacking said instability, whether said disturbance is or is not occurring at said second locality, and
- c. when said inspection of said second locality indicates occurrence of said disturbance, adjusting the kiln operation as to condition, to cause said volatile burning and disturbance to move upstream toward the desired place, away from the second locality, for keeping said disturbance away from said first locality.

12. Apparatus for calcining coke comprising
- a. a rotary kiln having a coke feed end and a coke discharge end and arranged for travel of gases countercurrent to the travel of coke,
- b. adjustable means for supplying air at least at one locality intermediate the ends of the kiln, for use in burning volatiles removed from the coke, the place of said burning being observable by combustion disturbance of said burning,
- c. optical pyrometer means for inspecting the interior of the kiln from the discharge end at a plurality of localities to yield temperature signals, said pyrometer means yielding a distinctive instability of temperature signals when inspecting a locality at or upstream of such combustion disturbance, said pyrometer means comprising
- d. first means for inspecting the kiln interior at a first locality closer to the discharge end than the feed end, to produce temperature signals indicative of the effectiveness of calcining, and
- e. second means for inspecting the kiln interior at a second locality upstream of the first locality, to produce temperature signals indicative of presence or absence of combustion disturbance at said locality, and
- f. means controlled by said pyrometer means and responsive to such distinctive instability of temperature signals from the second means, for adjusting the air supply means to increase the air supplied thereby for causing the burning of volatiles to be displaced upstream of said second locality.

3,888,622
TEMPERATURE SENSING DEVICE

Raghulinga R. Thettu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Aug. 15, 1973, Ser. No. 388,676
Int. Cl. F27b *9/24*
U.S. Cl. 432—36 **4 Claims**



1. A fuser control device for regulating the surface temperature of a heated fuser roll including
means to heat the fuser roll,
a temperature sensing probe positioned in close noncontiguous relation with the fuser roll surface whereby an air gap is formed therebetween,
magnetic means being arranged to establish a force field within said air gap,
a magnetic fluid located in said air gap and supported within the force field, said fluid having a relatively high coefficient of conductivity whereby heat energy at the roll surface is rapidly and efficiently transferred to said temperature sensing probe,
control means responsive to said temperature sensing probe being operatively connected to said means to heat said fuser roll for maintaining said fuser roll surface temperature at a predetermined level,
wherein the magnetic fluid has a lower surface energy than the surface energy of said fuser roll and wherein the size of the air gap is greater than the size of the magnetic fluid particles.

3,888,623

TRANSFER MATERIALS

William Clarke; Timothy Leslie Dawson, and Douglas Alan Nichols, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 28, 1973, Ser. No. 419,880

Claims priority, application United Kingdom, Dec. 8, 1972, 56675/72

Int. Cl. B41c *1/06;* **B41m** *5/00;* **D06p** *5/14*

U.S. Cl. 8—2.5 **6 Claims**

1. A transfer material which comprises a substrate which has been printed with at least one ink which contains two or more sublimable disperse dyestuffs which give a similar shade but having differing degrees of volatility.

3,888,624

PROCESS FOR DYEING WATER SWELLABLE CELLULOSIC MATERIALS WITH POLYPROPYLENE GLYCOLS

John Blackwell, Kennett Square, Pa.; William H. Gumprecht, Penns Grove, N.J., and Roy Emerson Starn, Jr., West Chester, Pa., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

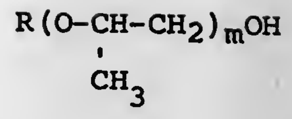
Continuation of Ser. No. 122,227, March 8, 1971, Pat. No. 3,706,525, which is a continuation-in-part of Ser. No. 778,809, Nov. 25, 1968, abandoned. This application Aug. 29, 1972, Ser. No. 284,477The portion of the term of this patent subsequent to Dec. 19, 1989, has been disclaimed.

Int. Cl. D06p *3/82*

U.S. Cl. 8—21 C **42 Claims**

1. The process for dyeing water swellable cellulosic materials which increase in size and flexibility upon exposure to water, at high utilization of dye, with a colored, preformed, high molecular weight disperse dye which has limited water solubility and does not require oxidation, reduction, hydrolysis or other chemical modification for fixation or development of color, which process comprises:

A. contacting the water swellable cellulosic material in any sequence, including simultaneously, at a temperature of 0°–225°C., with:
  1. water in an amount sufficient to swell the cellulosic material;
  2. a colored, preformed, high molecular weight disperse dye in an amount sufficient to color the cellulosic material, a boiling saturated solution of which dye in 0.1 Molar aqueous sodium carbonate exhibits an optical absorbance of 0–2 as calculated from the spectrophotometrically-determined optical absorbance of the solution obtained by diluting the saturated solution tenfold with a 90/10 mixture, by volume, of triethylene glycol dimethyl ether and water and then cooling to room temperature; and
  3. a solvent in an amount sufficient to maintain swelling of the cellulose if water is removed, and which
     a. is at least 2.5 weight % soluble in water at 25°C.,
     b. boils above about 150°C. at atmospheric pressure,
     c. is a solvent for the dye at some temperature in the range of about 0° to 225°C.,
     d. has the formula



$$R(O-\underset{\displaystyle CH_3}{CH}-CH_2)_mOH$$

wherein *R* is H or C_{1-8} alkyl and *m* is a positive whole number in the range 2–25 ; and

     e. has a molecular weight of less than 300; provided, however, that if the cellulosic material is contacted simultaneously with water and solvent, the water is 10 to 95 weight % and the solvent is 5 to 90 weight % of the combined water-solvent weights;

B. while maintaining the cellulosic material from (A) in its swollen state, contacting same throughout with a solution of the preformed dye in solvent or solvent-water;

C. fixing said preformed dye throughout the cellulosic material by precipitating same; and

D. recovering uniformly dyed cellulosic material which is fast to aqueous washing and organic solvent drycleaning.

3,888,625

METHOD OF CHROME-RETANNING LEATHER

William Orval Dawson, Milwaukee, Wis., assignor to Chemtan Company, Exeter, N.H.

Filed Jan. 29, 1973, Ser. No. 327,574

Int. Cl. C14c *3/06*

U.S. Cl. 8—94.27 **27 Claims**

1. In the process of chrome-retanning leather, the improvement which comprises contacting a leather to be chrome-retanned with basic chromium sulfate and a sulfite salt in an aqueous environment and thereafter contacting the leather with an aldehyde to deposit chrome as Cr_2O_3 in the leather and form a leather having over 6 percent by weight of Cr_2O_3 based on the dry weight of the leather.

3,888,626

USE AS CORROSION INHIBITORS: PHENANTHRIDINE PHOSPHONIC COMPOUNDS

Derek Redmore, Ballwin, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 173,296, Aug. 19, 1971, Pat. No. 3,755,057, which is a division of Ser. No. 801,856, Feb. 24, 1969, Pat. No. 3,673,196. This application Aug. 10, 1973, Ser. No. 387,290

Int. Cl. C23f *11/16, 11/00, 11/04*

U.S. Cl. 21—2.5 A **7 Claims**

1. A process of inhibiting corrosion of ferrous metals by corrosive media which comprises contacting said metal with a full nitrogen heterocyclic phosphonic compound or mixtures of full nitrogen heterocyclic phosphonic compounds wherein the nitrogen heterocyclic group is a phenanthridine group having an unsaturated bond between the nitrogen atom and one adjacent carbon atom and a saturated bond between the nitrogen atom and the other adjacent carbon atom and the phosphorus atom of the phosphonic group is bonded directly to a carbon atom of said phenanthridine group and said phosphonic group is ortho to the nitrogen atom on said phenanthridine group or on an adjacent ring.

3,888,627

USE AS CORROSION INHIBITORS: QUINOLINE AND ISOQUINOLINE PHOSPHONATES

Derek Redmore, Ballwin, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 173,296, Aug. 19, 1971, Pat. No. 3,775,057, which is a division of Ser. No. 801,856, Feb. 24, 1969, Pat. No. 3,673,196. This application Aug. 10, 1973, Ser. No. 387,535

Int. Cl. C23f *11/16, 11/04*

U.S. Cl. 21—2.5 A **7 Claims**

1. A process of inhibiting corrosion which is characterized by treating a metal with a composition comprising full nitrogen heterocyclic phosphonates and mixtures thereof and phosphonic acid derivatives thereof wherein the nitrogen heterocyclic group is a quinoline group or an isoquinoline group having an unsaturated bond between the nitrogen atom and one adjacent carbon atom and a saturated bond between the nitrogen atom and the other adjacent carbon atom and the phosphorus atom of a phosphonate group is bonded directly to a carbon atom of a quinoline group and a phosphonate group is ortho or para to the nitrogen atom in a quinoline group and ortho to the nitrogen group in an isoquinoline group.

3,888,628

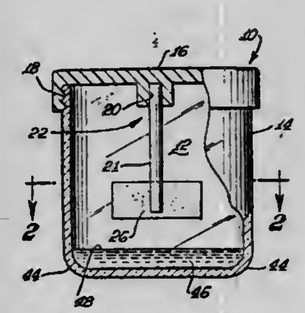
ANALYTICAL METHOD AND APPARATUS

J. Wallace Graham, 1501 N. Bundy Dr., Los Angeles, Calif. 90049

Filed Aug. 3, 1972, Ser. No. 277,775

Int. Cl. G01n *31/22, 33/16*

U.S. Cl. 23—230 B **13 Claims**



1. An analytical method comprising:

expanding the surface area of a liquid sample;

confining the resultant expanded sample within a closed chamber, said closed chamber also containing a vapor phase space and a liquid indicating reagent, said expanded sample being positioned in close proximity to and out of contact with said liquid indicating reagent;

allowing any volatile substance present with said expanded sample to vaporize to about room temperature into said vapor phase space and to react with said liquid indicating reagent; and

observing said liquid indicating reagent for a predetermined period of time to detect any indication of a reaction with said volatile substance.

3,888,629

PERFORMANCE OF CHEMICAL OR BIOLOGICAL REACTIONS WITHIN AN ABSORBENT MATRIX PAD

Kenneth Dawson Bagshawe, 115 George St., Marble Arch, London, W.1, England

Filed Sept. 8, 1972, Ser. No. 287,344

Claims priority, application United Kingdom, Sept. 8, 1971, 41972/71

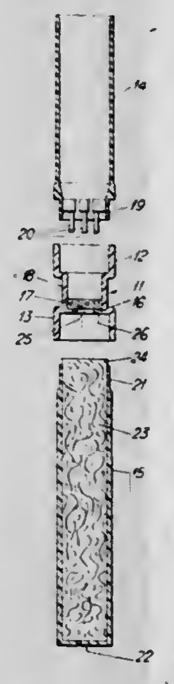
Int. Cl. G01n *33/16, 31/06*

U.S. Cl. 23—230 B **25 Claims**

1. A reaction cell of the type suitable for use in a radioimmunassay reaction in which a liquid reactant is employed and a particulate reaction product results, said cell comprising:

a container;

matrix-pad means in said container for holding all of the liquid necessary to enable said reaction and retaining said particulate reaction product while permitting passage therethrough of other reaction components, said matrix pad means comprising a matrix pad of porous absorptive material which is chemically inactive with respect to said reaction; and



support means in said container for supporting said matrix pad means such that liquid may pass through said matrix pad means from one side thereof to the other.

3,888,630

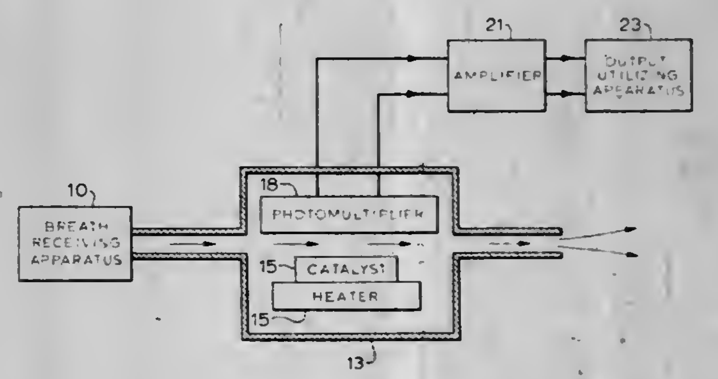
BREATH TESTING METHOD

Donald F. Hoeg, Mt. Prospect, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 26, 1973, Ser. No. 428,159

Int. Cl. G01n *33/16, 27/68*

U.S. Cl. 23—232 E **1 Claim**



1. A method for determining breath alcohol concentration comprising the steps of:

providing a sample of breath received from a person to be tested;

establishing a combusting zone;

flowing said breath sample through said combusting zone to oxidize any alcohol present in said sample, thereby producing oxyluminescence in an amount proportional to the alcohol concentration;

and developing, in response to the oxyluminescence, an electrical information signal indicative of the alcohol level in said breath sample.

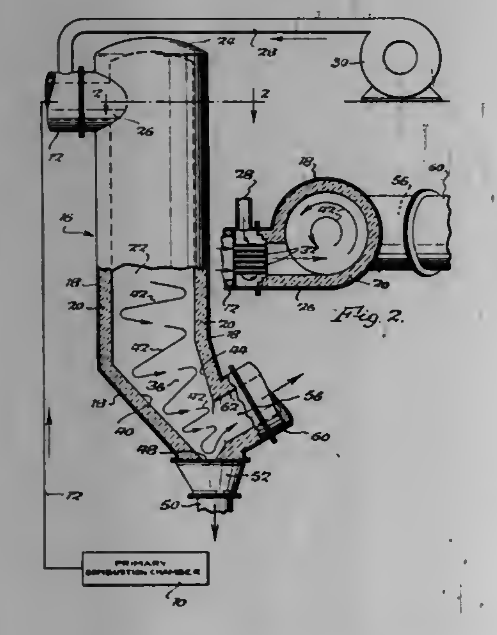
3,888,631
TEMPERATURE INDICATOR

Oskar Edwin Stürzinger, Kirchmattweg 6, Baar, Switzerland
Filed Apr. 8, 1974, Ser. No. 458,822
Claims priority, application Switzerland, Apr. 12, 1973, 5288/72
Int. Cl. G01k *1/02, 3/00, 11/00;* **G01n** *21/06*
U.S. Cl. 23—253 TP **3 Claims**

1. A temperature indicator for deep frozen products comprising a paper-like fibrous material containing a binder and two water soluble colorless reagents which react chemically when both reagents are liquid to produce a dye which imbues the fibers with a color which contrasts with the basic color of the fibrous material, at least one of the reagents being present in the form of a microencapsulated aqueous solution thereof, the solution being in the liquid state at a temperature below 0°C. and having a predetermined sub-zero freezing point, the microcapsules adapted to burst at a temperature of 4°C. to 0°C. as a result of the volume expansion of the water in the aqueous solution and permit the reagents to react to produce the dye until the temperature has been lowered to a point where at least one of the reagents freeze.

3,888,632
COMBUSTION CHAMBER

Jack J. Fritz, Buffalo, and Theodore W. Lucas, Jr., Williamsville, both of N.Y., assignors to Andco Incorporated, Buffalo, N.Y.
Filed Dec. 14, 1973, Ser. No. 424,812
Int. Cl. F23c *9/04;* **F23g** *7/06*
U.S. Cl. 23—277 C **10 Claims**

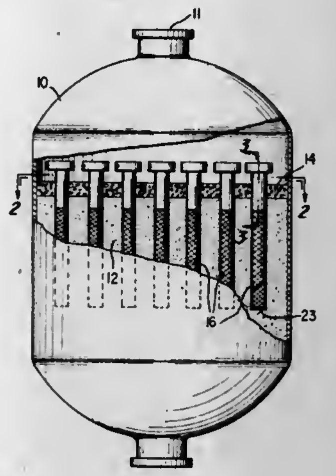


1. Apparatus for effecting combustion of combustible material, especially gases, tars, and suspended particulate material comprising:

a. a combustion chamber having a generally cylindrical upper portion wherein combustion of said material occurs and a lower portion for receiving liquid and solid products of the combustion;
b. means for introducing the material to be burned into said chamber for flow therealong during combustion;
c. first outlet means in said lower portion adjacent the bottom thereof for removing the liquid and solid products of combustion, said first outlet means being offset from the longitudinal axis of said upper portion; and
d. second outlet means in said lower portion adjacent said first outlet means for removing waste gas from the combustion, said second outlet means being located to cause the waste gas to travel along the entire length of said lower portion, whereby said waste gas supplies heat to maintain said liquid and solid products in a flowable state in said lower portion of said combustion chamber to facilitate removal of said liquid and solid products through said first outlet means.

3,888,633
CHEMICAL REACTOR HAVING MEANS FOR REMOVING IMPURITIES FROM A FLUID STREAM

Martin P. Grosboll, Homewood, and Robert R. Edison, Olympia Fields, both of Ill., assignors to Atlantic Richfield Company, Philadephia, Pa.
Filed May 24, 1973, Ser. No. 363,703
Int. Cl. B01j *9/00, 4/00;* **B01d** *23/20*
U.S. Cl. 23—284 **8 Claims**



1. A chemical reactor for processing a fluid stream comprising a chamber, a bed of discrete solid particles contained within said chamber, entrance means and exit means for said fluid stream with said entrance means being located above said exit means and said reactor having means for removing particulate impurities which may be present in said fluid stream, said means comprising at least one hollow elongated basket member being open at the upstream end thereof, and being adapted to be generally aligned along the principal axis thereof with the direction of fluid flow and to be extended along a substantial portion of the length thereof into said bed of solid particles, said basket member being defined by impervious upstream and pervious downstream sidewalls and a pervious downstream endwall, the pervious downstream endwall and pervious downstream sidewall adjacent said pervious downstream endwall being of open mesh construction, said impervious upstream sidewall being of length sufficient to extend below the surface of said bed and said open upstream end of said basket member containing flow restricting means arranged and constructed so as to provide said open upstream end with a cross-sectional flow path area which is substantially less than the cross-sectional flow path area defined by said impervious upstream sidewall.

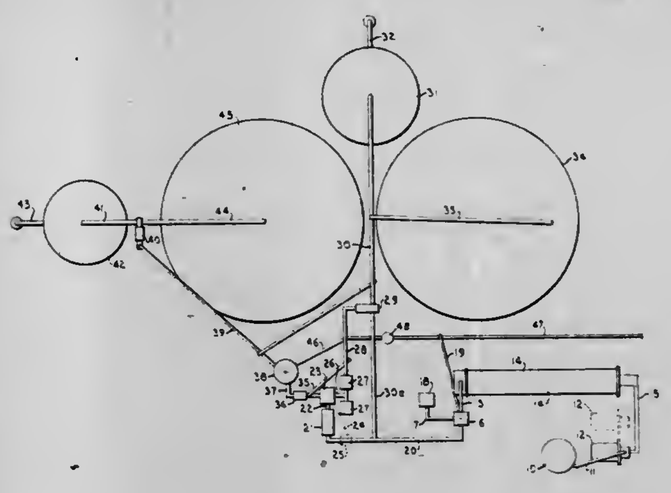
3,888,634
PROCESS FOR PREPARATION OF A FILM OF LEAD MONOXIDE

Masanari Shindo, Tokyo, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
Filed Mar. 23, 1973, Ser. No. 344,221
Claims priority, application Japan, Mar. 27, 1972, 47-29757
Int. Cl. C01f *7/34;* **C22b** *13/00*
U.S. Cl. 23—305 **11 Claims**

1. A process for the production of a lead monoxide film comprising heating a starting material containing lead monoxide in the presence of silicon dioxide in an evaporation zone to a sufficient temperature to cause evaporation of said lead monoxide, and depositing said evaporated lead monoxide on a substrate located outside said zone.

3,888,635
AGGLOMERATING SODIUM SULFATE

William W. Coghill, and William J. Rotramel, both of Tulsa, Okla., assignors to Ozark-Mahoning Company, Tulsa, Okla.
Filed Sept. 26, 1973, Ser. No. 400,800
Int. Cl. B01j *2/12;* **C01d** *5/00*
U.S. Cl. 23—313 **13 Claims**



1. A process of producing agglomerated particles of sodium sulfate of relatively low density in a desired size range comprising the steps of:

continuously passing quantities of relatively dense minus 100 mesh sodium sulfate fines into a mixing and mulling step with the addition thereto of 10 to 16 percent by weight of water,
continuously passing the mixed and mulled, wetted fines from the latter step to a simultaneous agglomerating and drying step,
agglomerating in said latter step balls or chunks of less dense sodium sulfate in a size range of +10 mesh to −100 mesh and simultaneously drying the water from same,
the agglomerating and drying step carried out in a single inclined rotary dryer without flights at the upper end thereof with the feed of mixed and mulled wetted fines thereto being at said upper end,
thereafter passing the completely dried, agglomerated sodium sulfate balls from said drying and agglomerating step to a size separating step, and,
separating oversize and undersize material from the desired product in said size separating step.

3,888,636
HIGH DENSITY, HIGH DUCTILITY, HIGH STRENGTH TUNGSTEN-NICKEL-IRON ALLOY & PROCESS OF MAKING THEREFOR

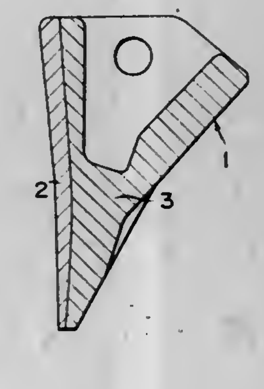
Francis E. Sczerzenie, and Frank I. Zaleski, both of Philadelphia, Pa., assignors to Government of the United States as represented by the Secretary of the Army, Washington, D.C.
Continuation of Ser. No. 111,757, Feb. 1, 1971, abandoned. This application Nov. 10, 1972, Ser. No. 305,640
Int. Cl. B22f *5/00;* **F42b** *13/04*
U.S. Cl. 29—182 **2 Claims**

1. A preformed penetrator for armor-piercing projectiles comprising an as-sintered alloy having at room temperature, a nominal dendity of 18.5 g/cc, a yield strength (.2% offset) of 100 ksi, an ultimate tensile strength of 137 ksi, an elongation in 1 inch of 11%, said alloy produced by the steps of

blending fine powders of tungsten, nickel and iron with a minor proportion of an atomized synthetic wax to form a blended mix,
pressing said blended mix to a density of at least 11.6 g/cc to form a green compact,
sintering said green compact for densification thereof, and cooling said densified sintered piece to form a finished piece devoid of voids and a matrix phase of nickel and iron totally homogeneous, said cooling being further characterized by the steps of
slow-cooling said sintered piece to a temperature of about 1,300°–1,400°C at a rate of about 15°C/minute, and
quenching said slow-cooled piece to below about room temperature in a reducing atmosphere chamber, said alloy consisting of, by weight,
about 97% tungsten,
about 1.5% nickel, and
about 1.5% iron.

3,888,637
RIPPER POINT PART

Kazuo Taguchi, Urawa, and Tadashi Satake, Isehara, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Japan
Filed Dec. 29, 1972, Ser. No. 319,670
Int. Cl. B32b *15/18*
U.S. Cl. 29—191 **9 Claims**



1. A ripper point part comprising a main part of softer, low-alloy steel and a surface layer of harder low-alloy steel arranged at the front side of said main part, wherein said harder surface layer is adhesively combined integrally with said softer main part and the ratio of thickness of said harder surface layer to said softer main part is 1 to 5 through 1 to 9 at a location 40–50 mm from the point.

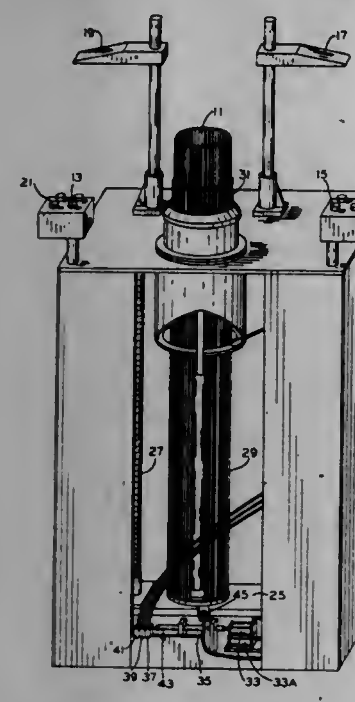
3,888,638
INSULATING WEDGE INSERTION

Robert G. Walker, Ossian, Ind., assignor to Industra Products, Inc., Fort Wayne, Ind.
Filed Feb. 28, 1974, Ser. No. 446,721
Int. Cl. H02k *15/10*
U.S. Cl. 29—205 E **11 Claims**

1. In a device for placing insulating wedges into slots of a magnetic core by linearly moving wedge push rods into a wedge containing magazine to force wedges axially from the magazine into core slots, a mechanism for accommodating the device to insert various length wedges comprising:

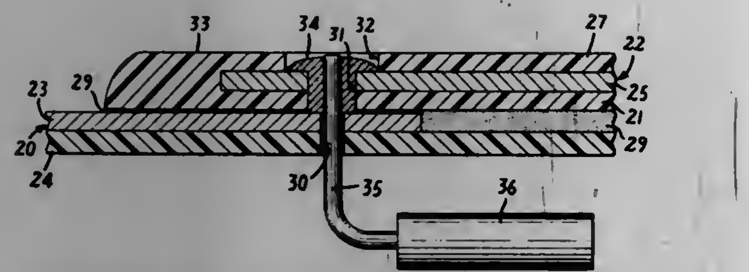
a carriage reciprocably movable in the direction of wedge insertion;
means coupling the carriage to the wedge push rods for

moving the wedge push rods including means for varying the distance between the carriage and certain of the wedge push rods to thereby vary the distance that the certain wedge push rods force corresponding wedges.



3,888,639
METHOD FOR CONNECTING PRINTED CIRCUITS

Myron L. Hastings, Hollis, and Joseph P. Roberts, Hudson, both of N.H., assignors to Teledyne Electro-Mechanisms, Nashua, N.H.
Filed Jan. 2, 1974, Ser. No. 429,917
Int. Cl. H05k *3/34*
U.S. Cl. 29—626 **8 Claims**



1. The method of connecting at least a first and second printed electrical circuit, each having at least one conductor plane in the form of a printed circuit configuration and one supporting substrate for the conductor plane, comprising the steps of:

creating at least a first hole in said first printed circuit at a location where a connection to at least one of the conductor planes is desired, said first hole passing only through to the conductor plane of said first printed circuit;

creating at least a second hole substantially concentric with said first hole, said second hole being slightly smaller than said first hole and passing completely through said first printed circuit;

applying an adhesive to at least one of said printed circuits;

registering the other printed circuit with respect to the one;

bringing the other printed circuit into contact with the adhesive;

creating at least a third hole, substantially concentric with and smaller than the second hole, through said second printed circuit; and

applying molten solder to the side of said first printed circuit having the first hole in it, thereby mechanically securing said printed circuits together and electrically connecting their conductor planes to each other.

3,888,640
COATING FOR FLEXIBLE ABRASIVE BANDS

Günter Bigorajski, Gehrden, and Joachim Ellerkamp, Langenhagen, both of Germany, assignors to Vereinigte Schmirgel- und Maschinenfabriken AG, Germany
Division of Ser. No. 98,964, Dec. 16, 1970, abandoned. This application Jan. 22, 1973, Ser. No. 325,866
Claims priority, application Germany, Jan. 15, 1970, 2001612
Int. Cl. C08g *51/12*
U.S. Cl. 51—298 **5 Claims**

1. A coated flexible abrasive band comprising a flexible support and abrasive grinding grains bonded on the flexible support, said grinding grains coated with a final coating comprising

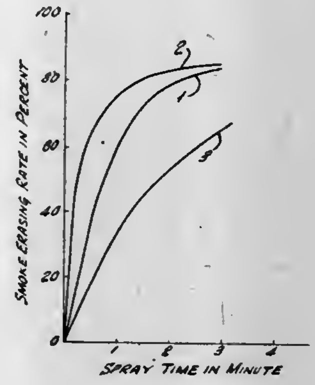
a. 25–30 parts by weight of phenol-formaldehyde resin in admixture with;

b. 10–25 parts by weight of a chlorinated paraffin having 50–70% by weight chlorine and selected from the group consisting of chlorinated solid paraffins and a liquid chlorinated paraffin oil having a viscosity at 20°C of at least 500 cp., and,

c. 50–60 parts by weight of calcium carbonate filler, said coating retarding the blunting of the grinding grains and improving the grinding efficiency and life of the band.

3,888,641
METHOD OF ERASING SMOKE

Shoji Ito, Tokyo, Japan, assignor to Nittan Limited Company, Tokyo, Japan
Filed July 17, 1973, Ser. No. 380,086
Claims priority, application Japan, July 24, 1972, 47-73470
Int. Cl. B01d *47/06*
U.S. Cl. 55—84 **1 Claim**

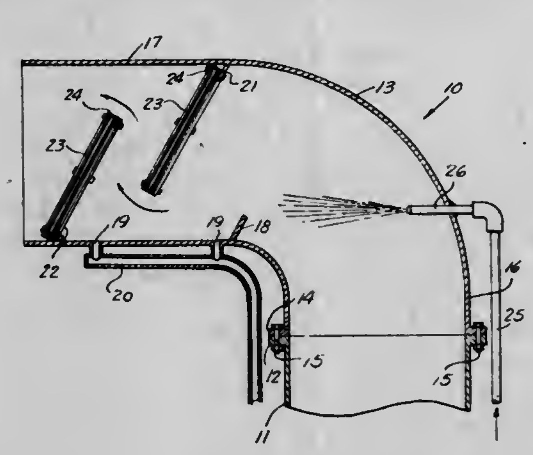


1. In the method of removing smoke in a building wherein smoke is produced by fire forming a smoke filled area, the improvement comprising the steps of forming a aqueous solution containing up to about 1% of a surfactant wherein said surfactant constitutes at least one substance selected from the group consisting of dialkyl sulfosuccinates, alkyl suflates, alkyl benzenesulfonates, recinolic ester sulfates, alkyl esters of α-sulfofatty acid, monosodium α-phosphonofatty acid esters, dialkyl phosphates, polyoxyethylenealkyl sulfates, polyethylenealkyl phenols, polyoxyethylenealkyl ethers and tripolyoxyethylenealkyl phosphates and then spraying said solution into the smoke filled area to settle the smoke particles.

3,888,642
STEAM DUST SCRUBBER ATTACHMENT FOR EXHAUST STACK

James Toyama, 1980 Cedar Ave., Long Beach, Calif. 90806
Filed Nov. 28, 1972, Ser. No. 310,103
Int. Cl. B01d *50/00*
U.S. Cl. 55—263 **1 Claim**

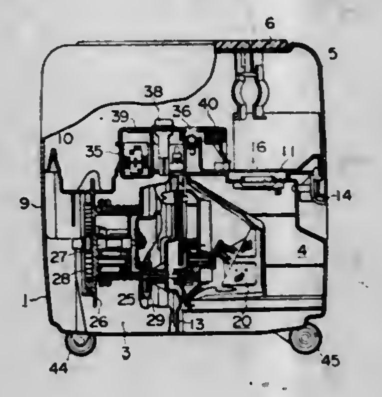
1. In an exhaust gas steam scrubbing system in combination with a stack for conducting pollutant containing exhaust gases, said stack being provided with an annular flange on the upper end thereof, a tubular elbow including a vertically disposed portion and a horizontally disposed portion that are arranged substantially at right angles with respect to each other, said elbow having an annular flange detachably secured to the flange on said stack, the vertical portion of said elbow leading upwardly from its flange, the horizontal portion of said elbow having its axis generally perpendicular to the axis of the vertical portion, a single solid baffle arranged to extend in an upwardly inclined relation from the base of the horizontal portion adjacent the vertical portion, a plurality of spaced apart drain ports opening through the bottom of the horizontal portion, a manifold drain pipe communicating with said drain ports and projecting downwardly therefrom, said baffle being positioned upsteam from the drain ports in order to prevent the flow of liquid back down in the stack, a generally U-shaped first baffle bracket rigidly affixed in the horizontal portion of the elbow downsteam from the baffle and projecting at an angle downwardly from the upper portion of the horizontal portion of the elbow, a second generally U-shaped bracket rigidly affixed in the horizontal portion of the elbow downstream from the first bracket and projecting upwardly from the base of the horizontal portion and positioned parallel and spaced from the first bracket, a filter baffle positioned in a frame and secured to each of said brackets, said filter baffles being arranged in spaced parallel relation with respect to each other and extending towards the opposite portion but spaced therefrom, a steam pipe extending from a source of steam under pressure, a steam jet nozzle operatively connected to said steam pipe and said steam jet nozzle being positioned at the juncture of the vertical portion and the horizontal portion of the elbow, and said steam jet nozzle being positioned with its axis parallel to the axis of the horizontal portion of the elbow and arranged above the upper edge of the solid baffle, and whereby steam is mingled with the exhaust gases by passage through the steam pipe and the steam nozzle and the mingled exhaust gases and steam pass through the spaces over the solid baffle beyond the filter baffles, and wherein the mingled gases on passing over the solid baffle and around the filter baffles change direction whereby some condensation of the steam takes place so that the condensing of the steam forms water droplets which entrain a portion at least of the solid materials in the gas, the water droplets with entrained solids flowing downwardly to the drain ports and out through the manifold pipe.



3,888,643
ELECTRIC VACUUM CLEANER AND STOOL

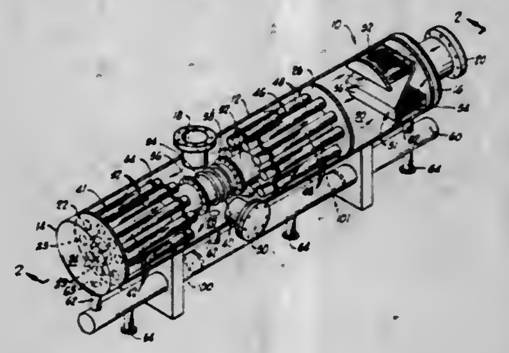
Hiromi Yoshikawa; Katsuo Sawada; Shigeyuki Asanari; Saburo Kajikawa, and Takao Kodama, all of Yokaichi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sept. 10, 1973, Ser. No. 395,436
Claims priority, application Japan, Sept. 12, 1972, 47-92078
Int. Cl. B01d *46/04*
U.S. Cl. 55—274 **10 Claims**

1. An electric vacuum cleaner and stool including a cleaner body comprising a generally box-like enclosure having a top wall, a bottom wall and side walls; an electrically operated fan and means stowing an electric cord both disposed within said enclosure adjacent one of said side walls and arranged in juxtaposed relationship; means stowing a flexible hose on said top of said enclosure; a first opening in a second side wall of said enclosure opposite said one side wall; a dust collector means including a generally box-shaped casing slidably movable through said first opening into and out of the interior of said enclosure, a handle on an outer wall of said dust collector casing, a second opening in the top of said dust collector casing, a third opening in a second wall of said dust collector casing opposite the wall on which said handle is provided; a filter assembly detachably mounted on said dust collector casing adjacent said third opening and being movable with said casing; means for sealingly coupling said filter assembly with said electrically operated fan when said dust collector casing is fully moved into said enclosure; an air inlet formed in said top of said enclosure and positioned such that said air inlet is in registry with said second opening in said top of said dust collector casing when the same is fully moved into said enclosure, said air inlet being adapted to be connected with a coupling head of said flexible hose for the passage of dust-containing air into said dust collector casing; an air outlet formed in said top wall of said enclosure adjacent said electrically operated fan; means rotatably mounted on said filter assembly for removing dust therefrom and including means being adapted to be drivingly connected to means on said cord stowing means when said dust collector casing is fully moved into said enclosure; and cover means designed to be detachably fitted over at least said top wall of said enclosure to cover said hose stowing means, said cover means having its top designed to provide a seat.



3,888,644
FILTER-SEPARATOR APPARATUS

Robert F. Holland, Yokohama, and Adrian J. Peterson, Tokyo, both of Japan, assignors to Black, Sivalls & Bryson, Inc., Houston, Tex.
Filed Dec. 3, 1973, Ser. No. 421,423
Int. Cl. B01d *50/00*
U.S. Cl. 55—318 **8 Claims**



6. A separator for removing solid particles and entrained liquids from a gas stream which comprises:

- a closed horizontal vessel having forward and rearward ends;
- a first upright partition having a central opening and a plurality of smaller openings positioned in spaced relationship around said central opening attached within said vessel so that a closed first compartment is formed in the forward end thereof;
- a second upright partition having a central opening and a plurality of smaller openings positioned in spaced relationship around said central opening attached within said vessel so that a closed second compartment is formed between said first and second partitions and a closed third compartment is formed at the rearward end of said vessel; a conduit having forward and rearward ends disposed within said second compartment, the forward end being sealingly attached to said central opening in said first partition and the rearward end being sealingly attached to the central opening in said second partition thereby communicating said first and third compartments, said conduit including a removable section positioned therein;
- a first plurality of filter elements disposed within said second compartment connected to said smaller openings in said first partition so that gas passing through said plurality of filter elements is caused to flow through said smaller openings into said first compartment, and then through said conduit into said third compartment;
- a second plurality of filter elements disposed within said second compartment connected to said smaller openings in said second partition so that gas passing through said second plurality of filter elements is caused to flow through said smaller openings into said third compartment;
- a gas stream inlet connection attached to said vessel and opening into said second compartment at a location betwen said first and second pluralities of filter elements disposed therein;
- an access connection attached to said vessel and opening into said second compartment;
- an outlet connection attached to said vessel and opening into said third compartment for withdrawing gas therefrom;
- liquid coalescing means secured within said third compartment so that gas passing through said third compartment is caused to flow through said liquid coalescing means prior to being withdrawn by way of said outlet connection; and
- at least one liquid outlet connection attached to said vessel for removing separated liquids therefrom.

3,888,645
TREATMENT OF GLASS FIBERS

Alfred Marzocchi, Cumberland, R.I., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

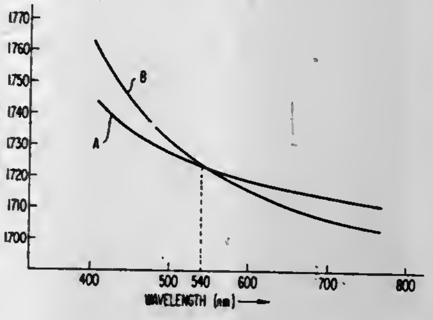
Filed Aug. 2, 1973, Ser. No. 385,126
Int. Cl. C03c *25/02;* B32b *17/04*
U.S. Cl. 65—3 **11 Claims**

1. A method for treatment of glass fibers comprising the steps of coating the glass fibers in a nascent state with an epihalohydrin and a polyhydroxylated compound and heating the resulting coated glass fibers to react the epihalohydrin with the polyhydroxylated compound on the glass fiber surfaces to form a thin sheath of a polyepoxide on the surfaces.

3,888,646
PROCESS FOR PRODUCING SPECIAL FILTER

Takayuki Kuriyama, and Motohiko Yagi, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan

Filed Dec. 3, 1973, Ser. No. 421,172
Claims priority, application Japan, Dec. 1, 1972, 47-120460
Int. Cl. C03b *23/20;* G02b *27/02;* C03b *35/04*
U.S. Cl. 65—18 **5 Claims**

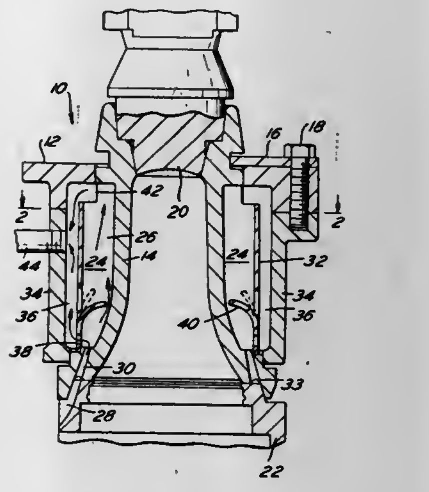


1. A process for producing a special filter comprising a glass composite, said composite comprising a glass matrix, which is solid at room temperature, containing dispersed therein fine particles of another glass, which is solid at room temperature, whose refractive index is the same as that of said glass matrix at a specific wavelength but different from that of said glass matrix at other wavelengths, and showing a maximum percent transmission at said specific wavelength, said glass dispersed in said glass matrix having a softening point higher than that of said glass matrix which comprises hot pressing a mixture of particles of said glasses in vacuo at a temperature higher than the softening point of said glass matrix but lower than the softening point of said dispersed glass, under a pressure of 50 to 3,000 kg/cm^2.

3,888,647
AIR COOLED ANNULAR PARISON BLANK MOLD

Donald H. Breeden, Millville, N.J., and John M. Bowles, Winchester, Ind., assignors to Maul Bros. Inc., Millville, N.J.

Filed Apr. 15, 1974, Ser. No. 461,059
Int. Cl. C03b *9/38*
U.S. Cl. 65—29 **20 Claims**



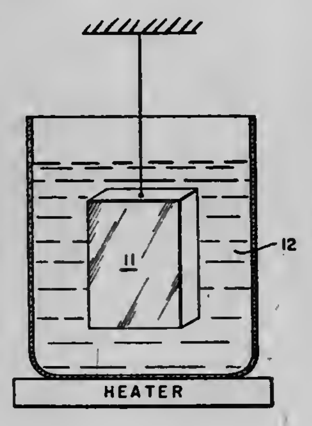
18. A method of cooling a parison blank mold comprising the steps of providing first and second annular flow chambers around a blank mold with the first chamber being between the second chamber and the blank mold, using the suction side of a vacuum pump to cause some air to cool said mold by flowing from an inlet through the first chamber and then to the second chamber, using the suction side of said vacuum pump to cause some air to flow from said inlet to said second chamber without the air passing through any substantial portion of said first chamber, and controlling the amount of air flowing from said

inlet to at least one of said chambers to thereby control the cooling effect of the air on said mold.

3,888,648
METHOD FOR FORMING AN OPTICAL WAVE GUIDE COUPLER

Edward J. West, Silesia, Md., and Thomas G. Giallorenzi, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 313,003, Dec. 7, 1972, Pat. No. 3,802,761. This application Mar. 6, 1974, Ser. No. 448,581
Int. Cl. C03c *25/02, 15/00*
U.S. Cl. 65—30 **10 Claims**



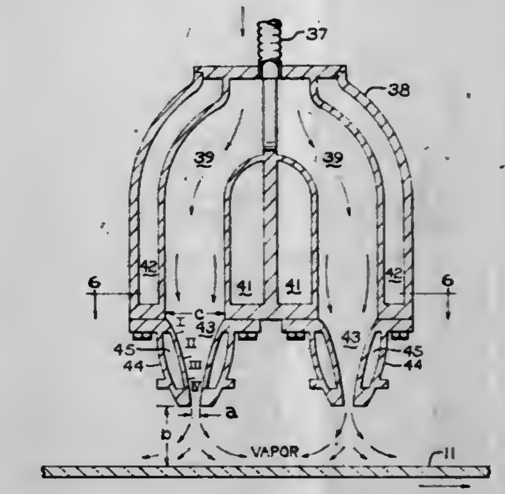
1. A method of forming an optical waveguide-coupler in a rectangular glass substrate along the outer surfaces by exchange of component ions, which comprises:
- heating to a molten solution a compound comprising ions to be exchanged with ions in said substrate;
- extending said glass substrate linearly into said molten solution with a linear portion thereof extending from said molten solution;
- leaving said glass substrate extended into said molten solution at the same depth for a time period sufficient to exchange a layer of component ions along the surfaces of said glass substrate extending within said molten solution with ions of said molten solution surrounding said substrate; and
- removing said substrate from said solution at the end of said time period;
- whereby a waveguide layer is formed along the surface with a tapered edge extending above said molten solution at the transition region between the ion exchange layer formed within the molten compound and the unexchanged region of said substrate;
- said tapered edge of ion exchanged area extending downwardly and inwardly from the outer surface to the inner face of the ion exchange region.

3,888,649
NOZZLE FOR CHEMICAL VAPOR DEPOSITION OF COATINGS

Krishna Simhan, Fischbach, Germany, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 15, 1972, Ser. No. 315,394
Int. Cl. C23c *11/00, 13/00*
U.S. Cl. 65—60 **5 Claims**

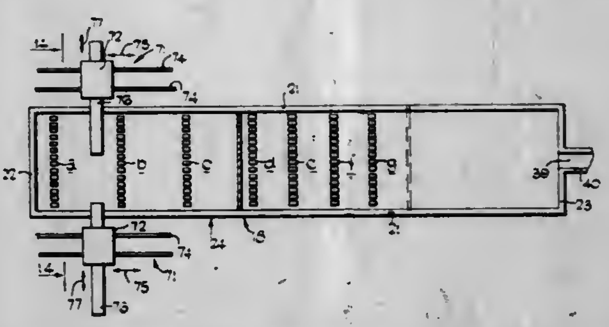
1. A method of applying a coating to a surface of a substrate, comprising the steps of:
- moving a gaseous mixture comprising at least one coating reactant through a nozzle (1) having an entrance end cross section and an exit end cross section that is smaller than the entrance end cross section and (2) as viewed at the exit end opening having a first pair of opposed interior sides and a second pair of opposed interior sides, the first pair of opposed interior sides having a length greater than the length of the second pair of interior sides to provide the nozzle with an elongated cross-section and at least the first pair of interior sides having increasing radii of curvature from the entrance end opening to the exit end opening to accelerate flow of the gaseous mixture adjacent the interior surfaces of the nozzle; and
- directing the gaseous mixture toward the surface of the substrate to coat the surface of the substrate



3,888,650
GLASS MELTING FURNACES

Philip Anthony Maunsell Gell, Enville, and Douglas Graeme Hann, Ryton, both of England, assignors to Elemelt Limited, London, England

Continuation-in-part of Ser. No. 294,097, Oct. 10, 1972, abandoned. This application Nov. 8, 1974, Ser. No. 522,276
Claims priority, application United Kingdom, Oct. 2, 1971, 45942/71; Dec. 17, 1971, 58763/71
Int. Cl. C03b *5/36*
U.S. Cl. 65—125 **15 Claims**



1. In a glass supply furnace comprising a bottom wall and upstanding side walls defining an elongate furnace chamber for longitudinal flow of a body of glass from a charging station, adjacent to one end, to a withdrawal station adjacent to the opposite end of said chamber and at which said chamber has outlet means for withdrawing glass at a level in the region of the surface of the glass, said chamber having a melting zone extending over part of the length of said chamber downstream from said one end and in which glass making batch materials in the solid state are present on the upper surface of the glass body, a conditioning zone extending over a further part of the length of said chamber upstream from said other end but terminating at a distance from said melting zone, in which conditioning zone said chamber affords a free space above the glass and the glass is isolated from physical disturbance other than said longitudinal flow, a refining zone extending over the remaining part of the length of said chamber intermediate said melting and conditioning zones and from which said batch materials are absent, and heating means for heating the glass body generally throughout said melting and refining zones, improved means for controlling the flow of glass comprising:
a. longitudinally spaced electrode arrays each extending upwardly from said bottom wall in an area in which, except for

said electrode arrays, said chamber affords, throughout substantially the entire depth of said body of glass, an unobstructed space for said longitudinal flow of glass, each of said electrode arrays extending transversely of said chamber across substantially the entire width thereof to define the longitudinal boundaries of a flow control column of glass situated in said refining zone,

b. electrical supply circuit means connected to said electrode arrays to pass current through said column from one to the other of said arrays, said circuit means including regulator means for varying the magnitude of the current passing through said column to vary the temperature of said column relatively to the temperatures of longitudinally spaced portions of said body of glass at respective longitudinal boundaries of said column.

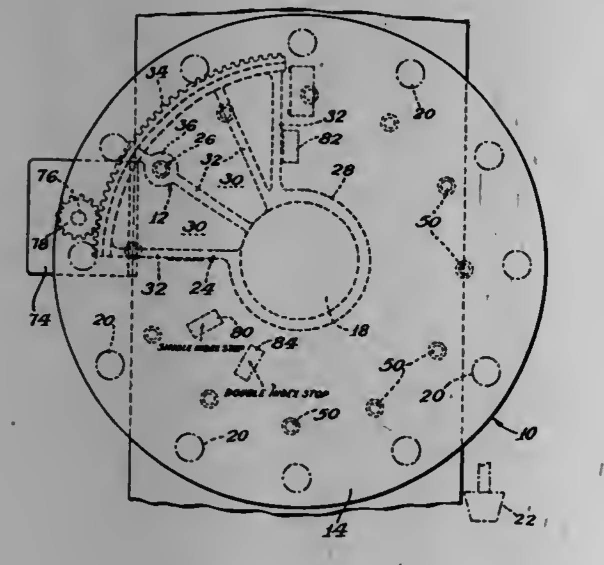
3,888,651
INTERMITTENT DRIVE MECHANISM FOR GLASS MOLDING TABLE

Richard James, Anderson, Ind., assignor to Lynch Corporation, Anderson, Ind.

Filed Dec. 10, 1973, Ser. No. 423,113

Int. Cl. C03b *9/00*

U.S. Cl. 65—361 3 Claims



1. Apparatus for imparting intermittent motion to a glass mold supporting table, said apparatus comprising, in combination, a base, a substantially horizontal mold supporting table carried on said base for movement in a forward direction only, an arm carried on said base for movement in a forward direction for a preselected distance, and in a reverse direction for said preselected distance, drive means for selectively moving said arm in said forward and reverse directions, a movable connector member carried on said arm, a plurality of spaced receiving means on said base for receiving said connector member, and means for moving said connector member into interlocking relationship with one of said receiving means when said arm is moved in said forward direction by said drive means and for moving said connector member from said interlocking relationship when said arm is moved in said reverse direction while said table remains in a stationary condition.

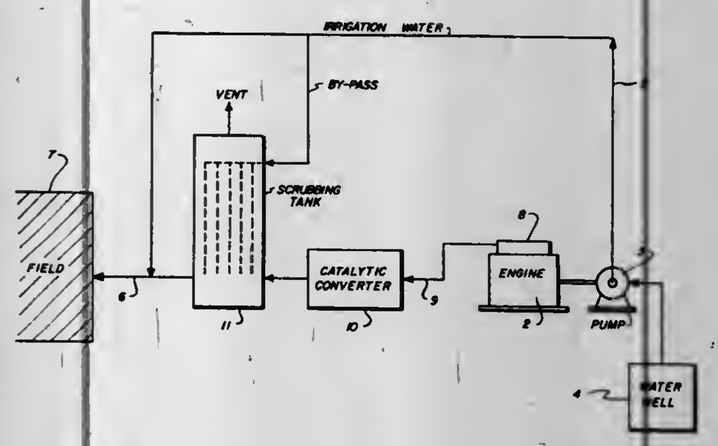
3,888,652
IRRIGATION ENGINE EXHAUST CONVERSION TO OBTAIN FERTILIZING SOLUTION

Gene G. Yie, Chicago, Ill.; S. J. Cummingham, Palos Verdes, Calif., and Robert E. Rosenberg, Hinsdale, Ill., assignors to Institute of Gas Technology, Chicago, Ill. and Southern California Gas Company, Los Angeles, Calif., part interest to each

Filed May 29, 1973, Ser. No. 364,656

Int. Cl. A01c *23/04*

U.S. Cl. 71—61 8 Claims



1. A method of fertilizing by converting exhausts from irrigation pump engines to obtain aqueous ammonia solutions, which includes the steps of:

- delivering exhaust from the irrigation pump engine to a catalytic conversion zone, said catalytic conversion zone containing catalysts for treating nitric oxide emissions to directly obtain ammonia in place under exhaust temperature conditions,
- delivering a portion of a body of water pumped by the irrigation engine to a scrubbing chamber,
- intimately contacting the formed gaseous ammonia with the water in said scrubbing chamber to form an aqueous ammonia solution,
- returning said aqueous ammonia solution to the body of water, and
- discharging said aqueous ammonia solution to fertilize a crop area.

3,888,653
METHOD OF PRODUCING PLANT FOOD

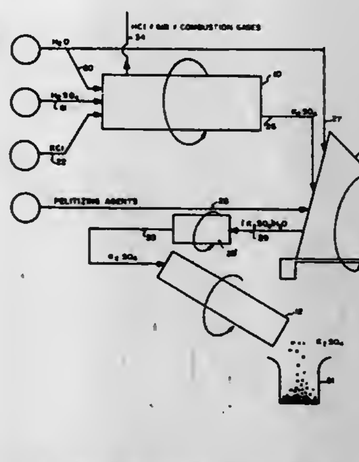
Samuel John Shirley, London, Ontario, Canada, assignor to Shamrock Chemicals Limited, Ontario, Canada

Filed Aug. 29, 1973, Ser. No. 392,563

Claims priority, application Canada, Oct. 23, 1972, 154424

Int. Cl. C05d *1/02*

U.S. Cl. 71—61 11 Claims



1. A method of producing a potassium sulphate fertilizer from spent sulfuric acid having impurities therein comprising the steps of:

a selecting as a first feed material spent sulfuric acid,

b selecting, as a second feed material, one consisting essentially of potassium chloride;

c mixing the first and second feed materials to achieve a feed mix;

d heating the feed mix at an elevated temperature in excess of 300°F whereby the potassium sulphate fertilizer is created in fine crystalline powder;

e mixing the recovered crystalline potassium sulphate with granulating agents and small amounts of water until the potassium sulphate congeals into small pellets; and

f grading the pellets into a predetermined range of sizes.

3,888,654
TOBACCO SUCKER CONTROL

Walter W. Abramitis, Downers Grove, Ill., assignor to Akzona Incorporated, Asheville, N.C.

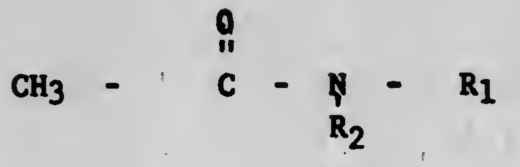
Filed Apr. 5, 1973, Ser. No. 348,391

Int. Cl. A01n *5/00*

U.S. Cl. 71—78 8 Claims

1. Composition for controlling the growth of suckers in tobacco plants, consisting essentially of:

a. from about 10 to about 75 percent by weight of a member of the group consisting of an N-substituted acetamide of the formula:



$$CH_3-\overset{O}{\overset{\|}{C}}-\underset{R_2}{N}-R_1$$

in which R_1 is selected from the group consisting of hydrogen, methyl, and cyclohexyl; R_2 is selected from the group consisting of alkyl having 6 to 15 carbon atoms, cyclohexyl, and cyclododecyl; and the soluble mineral acid salts thereof selected from the group consisting of the hydrochloride, phosphate and sulfate;

b. from about 0.05 to about 10 percent by weight of a surface active agent; and

c. from about 40 to about 80 percent of the total weight of the composition of an alkanol having 6 to 12 carbon atoms.

3,888,655
SYNERGISTIC HERBICIDAL MIXTURE

Adolf Fischer, Mutterstadt, Germany, assignor to Badische Anilin- Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Mar. 22, 1973, Ser. No. 343,629

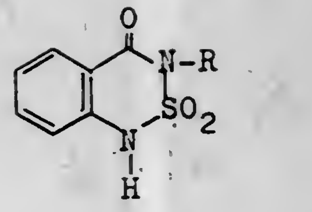
Claims priority, application Germany, Apr. 13, 1972, 2217722

Int. Cl. A01n *9/12*

U.S. Cl. 71—91 4 Claims

1. A herbicidal composition consisting essentially of an inert carrier containing a herbicidally effective amount of a mixture of

a. a compound of the formula



,

where R denotes lower alkyl of a maximum of 4 carbon atoms, or an alkali metal, ammonium, hydroxyalkylammonium, alkylammonium or hydroxy alkylalkyl ammonium salt thereof, and

b. 2,6-dichlorobenzonitrile in a weight ratio of *a* to *b* in the range of 5:1 to 1:5.

3,888,656
CHEMICAL TREE-PRUNING METHOD

Harvey D. Bidlack, Shepherd, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 17, 1973, Ser. No. 425,391

Int. Cl.² A01N *9/22*

U.S. Cl. 71—94 1 Claim

1. A method useful for chemically pruning trees which comprises applying to the upper branches of a growing tree an effective amount of naphtho(2,1-b)quinolizinium bromide whereby a constriction is caused to occur in the apical region so that the new growth from the apices of the treated branches occurs beyond a constriction and droops downward vertically, whereby a light breeze or stronger air movement breaks off the downwardly drooping new growth.

3,888,657
PROCESS FOR PRODUCTION OF METAL POWDERS HAVING HIGH GREEN STRENGTH

Erhard Klar, Baltimore, Md., and Elbert K. Weaver, Westborough, Mass., assignors to SCM Corporation, Cleveland, Ohio

Continuation of Ser. No. 102,682, Dec. 30, 1970, abandoned. This application Apr. 23, 1973, Ser. No. 353,659

Int. Cl. B22f *9/00*

U.S. Cl. 75—0.5 B 16 Claims

1. A process for the production of metal particles from finely divided atomized metal particulates for use in powder metallurgy comprising the steps of:

a. disposing said particulates in a loose mass and heating said loose mass at a temperature and for a time to produce a porous cake of miniumum density, said cake being particulates sintered together; and

b. breaking up said cake into particles each having multiple particulates and having a particle size substantially greater than said particulates, said cake being broken up under conditions which minimize densification.

3,888,658
PROCESS FOR THE DIRECT REDUCTION OF IRON ORE TO STEEL

William E. Shoupp, and James H. Bechtold, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 86,203, Nov. 2, 1970, abandoned. This application Jan. 22, 1973, Ser. No. 325,483

Int. Cl. C21c *5/52;* **C21b** *1/02*

U.S. Cl. 75—11 5 Claims

1. A process for producing steel and the production of gases, the reduction of iron ore, generation of power and utilization of the power and reduced ore to form steel, the steps comprising:

a. converting carbonaceous fuel to a mixture of at least two gas streams, one of said gas streams containing a high proportion of hydrocarbons and other stream containing reducing gases including a high proportion of CO and H_2;

b. conveying the hydrocarbons and distributing a portion thereof to a
  1. gas turbine;
  2. a boiler, and recycling the balance;

c. conveying the reducing gases and distributing a portion thereof to:
  1. a fluidized bed reactor; and
  2. the gas turbine;

d. reacting the reducing gases with iron ore in the fluidized bed reactor to produce iron particles and heat;

e. transferring the reduced iron particles to an electric arc furnace and adding thereto scrap and fluxes;

f. reacting a portion of the gaseous hydrocarbons, reducing gases, spent gases and heat from the fluidized bed reactor in the gas turbine coupled to an electrical generator for the production of electrical power;

g. generating steam by reacting in a boiler the combustion products of the gas turbine, a portion of the spent gases from the fluidized bed reactor and a portion of the gaseous hydrocarbons;

h. conveying the steam to a steam turbine connected to an electrical generator for producing electrical power; and

i. melting the contents of the electric arc furnace by utilizing the generated electrical power to form an arc thereby supplying the heat necessary for melting and refining said contents of said furnace for the production of steel.

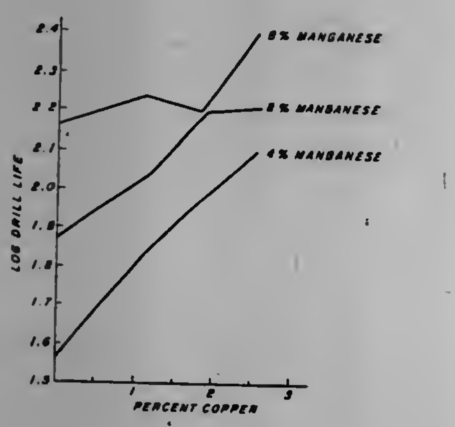
3,888,659
FREE MACHINING AUSTENITIC STAINLESS STEEL

Joseph A. Ferree, Jr., Natrona Heights, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 740,807, May 29, 1968, Pat. No. 3,460,939, which is a continuation-in-part of Ser. No. 418,991, Dec. 17, 1964, abandoned. This application June 18, 1969, Ser. No. 834,477The portion of the term of this patent subsequent to Aug. 12, 1986, has been disclaimed.

Int. Cl. C22c *39/26*

U.S. Cl. 75—125 **6 Claims**



1. A free machining, austenitic stainless steel consisting essentially of from a trace up to 0.15 percent carbon, from 2 to 10 percent manganese, from 4 to 13 percent nickel, from 10 to 20% chromium, from 0.5 to 3 percent copper, from 0.10 to 0.40 percent sulfur, 2 percent maximum silicon, and 0.10 percent maximum nitrogen, balance essentially iron and residual impurities, the constituents being controlled so that the delta ferrite forming characteristic is less than 10 according to the formula:

$$\text{delta ferrite potential} = \%\,Cr + 1.5(\%\,Si) - .87\,[30(\%\,C + \%\,N) + \%\,Ni + 0.5(\%Mn) + 0.3(\%\,Cu)] + 1,$$

and wherein the amount of copper is controlled so that it does not exceed 3.85 – 0.18 (% Mn- – 55/32% S).

3,888,660
ZINC ALLOY FOR BEARING

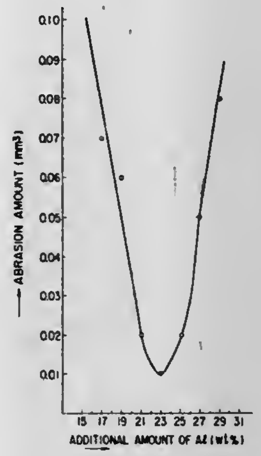
Akira Ebata, Fujisawa, and Teiji Kodate, Machida, both of Japan, assignors to Oiles Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1973, Ser. No. 425,714

Claims priority, application Japan, Dec. 25, 1972, 47-86394; Aug. 2, 1973, 48-129396

Int. Cl. C22c *21/00; 21/04*

U.S. Cl. 75—178 A **9 Claims**



1. An alloy for bearings consisting essentially of about 17–27 wt% of Al, about 2–4 wt% of Si, about 0.1–0.5 wt% of Ti and the remainder Zn.

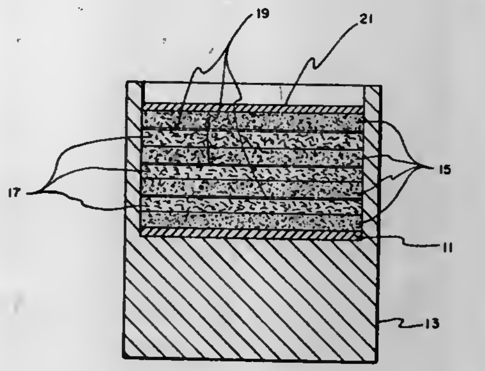
3,888,661
PRODUCTION OF GRAPHITE FIBER REINFORCED METAL MATRIX COMPOSITES

Albert P. Levitt, Newton Center, and Eugene Di Cesare, Wayland, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 278,129, Aug. 4, 1972, abandoned. This application Apr. 16, 1974, Ser. No. 461,318

Int. Cl.² B22F *7/02, 3/14;* **B32B** *15/00, 31/20*

U.S. Cl. 75—201 **11 Claims**



1. Method of producing a high strength composite article comprising placing in a hollow hot-press die a plurality of repeating sets of alternating layers of

A. a matrix metal selected from the group consisting of magnesium powder or magnesium alloy,

B. graphite fibers, and

C. titanium powder as a wetting and bonding agent between said matrix metals and graphite fibers, said titanium powder being present in an effective amount of up to about 4% by weight of said composite article, and

hot-pressing said layers at a temperature of about 725°–800°C, said temperature being sufficient to melt only said matrix metal, and at a pressure sufficient to form a compact.

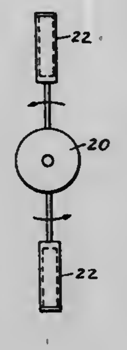
3,888,662
METHOD OF CENTRIFUGALLY COMPACTING GRANULAR MATERIAL USING A DESTRUCTIBLE MOLD

Benjamin Clark Boeckeler, Greensburg, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Feb. 9, 1973, Ser. No. 330,964

Int. Cl. B22f *3/06;* **B29f** *5/02*

U.S. Cl. 75—203 **11 Claims**



1. A method of making a sintered compact from particulate material which comprises; forming a flowable slurry of the particulate material and a liquid vehicle, said liquid vehicle including a holding agent to hold the particulate material in the compact together prior to sintering and a lubricant to promote free movement of the individual particles of the particulate material relative to each other during the centrifuging, placing the slurry in a mold which is closed on the bottom and on the sides and open only at the top and which is not soluble in said vehicle but which is soluble in a solvent different from any part of said vehicle, centrifuging the mold and the slurry contained therein to precipitate the particulate material with the open top of the mold facing the axis to form a compact which rests on the closed bottom of the mold, placing the mold and the compact therein into a bath of said solvent for the mold at least to soften the mold on the compact, removing the softened mold from the compact, drying the compact said solvent also being inert and immiscible with respect to said compact and the liquid fraction of said slurry and sintering the dried compact.

3,888,663
METAL POWDER SINTERING PROCESS

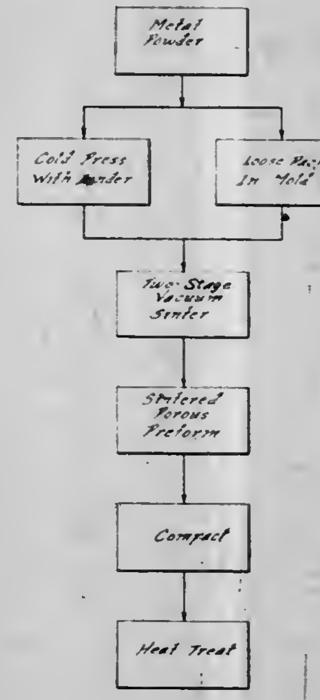
Steven H. Reichman, Ann Arbor, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Oct. 27, 1972, Ser. No. 301,433

Int. Cl. B22f *3/16*

U.S. Cl. 75—221 **11 Claims**

1. A process for making sintered articles which comprises the steps of providing a mass of nickel-base superalloy powder having an oxygen content of less than about 300 ppm and of the type characterized as normally having carbide and gamma-prime strengthening, forming said mass of powder into a three-dimensional shape of the desired configuration, heating the shaped said mass of powder in the substantial absence of a surrounding atmosphere to a first sintering and transformation temperature ranging from about 1600° to about 2000°F at which the chemical equilibrium is conducive for effecting a conversion of primary carbides to complex carbides, maintaining said mass at said first sintering temperature for a period of time to effect an appreciable conversion of said primary carbides to said complex carbides under the prevailing equilibrium conditions and to initiate a diffusion bonding and neck formation between the powder particles at their points of contact, heating said mass of powder to a second sintering temperature above said first temperature up to the incipient melting point of said powder particles for a period of time sufficient to effect growth of said neck and the formation of an integral porous sintered preform, and thereafter cooling said preform.



3,888,664
ELECTROPHOTOGRAPHIC PRINTING

Lee A. Carlson, Ashland, and Richard G. Miekka, Sudbury, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed Oct. 28, 1970, Ser. No. 84,811

Int. Cl. G03g *13/14, 13/22*

U.S. Cl. 96—1.4 **10 Claims**

1. An electrophotographic printing process comprising the steps of

charging a photoconductive plate uniformly;

irradiating said charged plate with an image pattern to produce an electrostatic latent image thereon;

applying a first developer material having a conductivity which is greater than the conductivity of said photoconductive plate to said charged plate to produce a conductive image thereon;

fixing said conductive developed image on said plate to form a master plate;

charging said master plate with a charge having a preselected polarity, the image areas on said plate having a relatively low charge acceptance as compared to the non-image areas thereon;

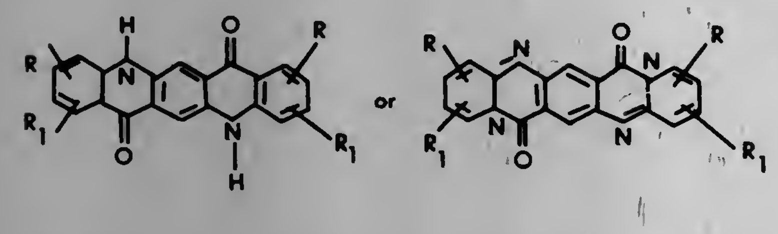
applying a second developer material with a charge of the same polarity as said preselected polarity to said master plate, said second developer material adhering to the fixed conductive image areas to form a visible unfixed image on said master plate;

transferring said visible unfixed image formed by said developer material to a transfer sheet to reproduce said image pattern on said transfer sheet.

3,888,665
ELECTROPHOTOGRAPHIC RECORDING MATERIAL WITH QUINACRIDONES

Wolfgang Wiedemann, Geisenheim-Johannisberg, Germany, assignor to Hoechst Aktiengesellschaft, Germany
Filed Apr. 25, 1973, Ser. No. 354,183
Int. Cl. G03g *5/02*
U.S. Cl. 96—1.5 **14 Claims**

1. Electrophotographic recording material comprising an electroconductive support and a photoconductive double layer of organic materials disposed thereon, said double layer being composed of a homogeneous, opaque, charge carrier producing dyestuff layer of a compound corresponding to one of the general formulae



wherein
R and R_1 may be the same or different and stand for hydrogen, alkyl or alkoxyl with 1 to 4 carbon atoms, halogen, a nitro group, a hydroxyl group, or together form a fused benzene or naphthalene group,

and a transparent top layer of insulating material containing at least one charge transporting compound, in which the transparent top layer comprises a mixture of a binder with a charge-transporting, monomeric heterocyclic compound having an extended π-electron system which is substituted by at least one dialkylamino group or by two alkoxy groups, or with a condensation product of 3-bromopyrene and formaldehyde.

3,888,666
REVERSAL DEVELOPING METHOD USING PHOTOCONDUCTIVE DEVELOPING ELECTRODE

Selji Matsumoto, and Vasuo Tamai, both of Osaka, Japan, assignors to Rank Xerox, Limited, London, England
Division of Ser. No. 210,883, Dec. 22, 1971, Pat. No. 3,800,744. This application Aug. 27, 1973, Ser. No. 391,926
Int. Cl. G03g *13/06, 13/22*
U.S. Cl. 96—1 R **10 Claims**

1. A method for performing reversal development of an electrostatic image comprising the steps of forming a latent image upon a first grounded photoconductive insulator as a pattern of charged and discharged areas, charging a second grounded photoconductive insulator spaced from the first photoconductive insulator, to the same level and polarity as said first photoconductive insulator charged area, and applying liquid developing particles to the space between said insulators, said liquid developing particles charged to the same level and polarity as said first photoconductive insulator charge area.

3,888,667
HETEROPHASE ADHESIVE COMPOSITIONS CONTAINING POLYSULFONE FOR METAL-SELENIUM COMPOSITES

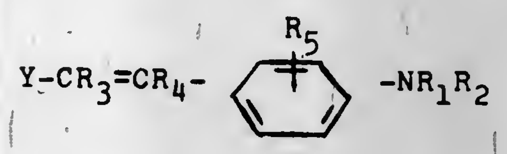
Lieng Huang Lee, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Aug. 17, 1973, Ser. No. 389,282
Int. Cl. G03g *5/02*
U.S. Cl. 96—1.5 **13 Claims**

1. A xerographic member which comprises a conductive substrate having thereon an interfacial barrier layer having a thickness of about 0.5 to 3.0 microns, said barrier layer comprising a polymer blend or mixture of a polysulfone and an elastomeric polymer which contains polar groups, with the elastomeric polymer being present in a concentration of from about 5 to 35 weight percent, and a photoconductive layer about 10 to 200 microns in thickness overlaying said interfacial layer.

3,888,668
IMAGING MEDIUM COMPRISING PHOTOCONDUCTOR OF TiO_2 AND SENSITIZING DYE

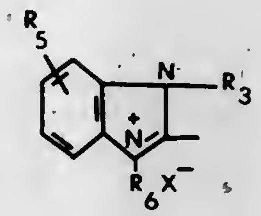
Juergen H. H. Keller, Chelmsford, Mass., assignor to Itek Corp., Lexington, Mass.
Division of Ser. No. 796,167, Feb. 3, 1969, Pat. No. 3,574,612. This application Oct. 2, 1972, Ser. No. 293,908
Int. Cl. G03g *5/00*
U.S. Cl. 96—1.6 **9 Claims**

1. An image reproduction medium comprising (1) a photoconductor comprising a radiation activatable photosensitive titanium dioxide and (2) a sensitizing dye compound of the formula:

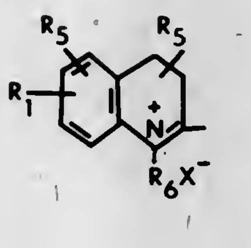


wherein Y is a radical of a heterocyclic aromatic compound containing at least one quaternary nitrogen hetero atom; and wherein Y is selected from the group consisting of:

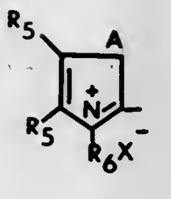
FORMULA I



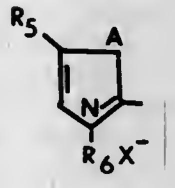
FORMULA II



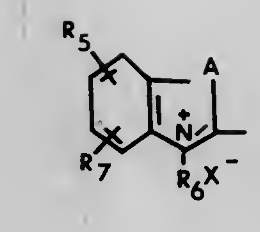
FORMULA III



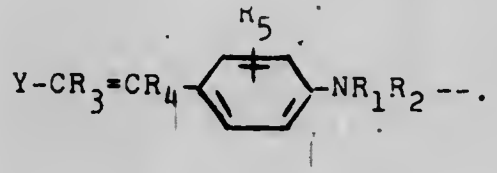
FORMULA IV



FORMULA V

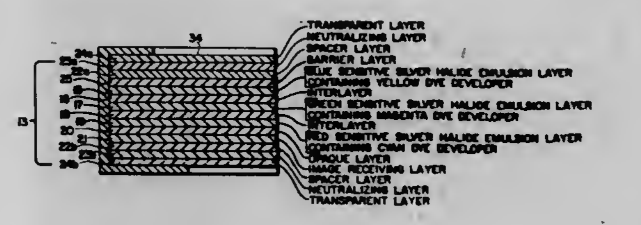


wherein A is oxygen, sulfur or selenium; R_7 is alkoxy or amino; R_6 is selected from the group consisting of hydrogen, alkyl, aralkyl and hydroxyalkyl; and X is a negative radical; R_1 and R_2 are each hydroxyalkyl; R_3 and R_4 are each selected from the group consisting of hydrogen and alkyl; and R_5 is selected from the group consisting of hydrogen, alkyl, aryl, aralkyl, alkoxy, and NR_1R_2 wherein R_1 and R_2 are each as described herein.



3,888,669
PHOTOGRAPHIC PRODUCTS AND PROCESSES WITH BARRIER LAYERS FOR DIFFUSABLE DYES

Paul A. Cardone, Framingham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Sept. 4, 1973, Ser. No. 393,799
Int. Cl. G03c *7/00, 5/54, 1/40*
U.S. Cl. 96—3 **27 Claims**


34
13
TRANSPARENT LAYER
NEUTRALIZING LAYER
SPACER LAYER
BARRIER LAYER
BLUE SENSITIVE SILVER HALIDE EMULSION LAYER
CONTAINING YELLOW DYE DEVELOPER
INTERLAYER
GREEN SENSITIVE SILVER HALIDE EMULSION LAYER
CONTAINING MAGENTA DYE DEVELOPER
INTERLAYER
RED SENSITIVE SILVER HALIDE EMULSION LAYER
CONTAINING CYAN DYE DEVELOPER
OPAQUE LAYER
IMAGE RECEIVING LAYER
SPACER LAYER
NEUTRALIZING LAYER
TRANSPARENT LAYER

1. A composite photographic diffusion transfer process film unit which comprises, in combination and in sequence, a first dimensionally stable transparent layer; a dyeable layer adapted to receive diffusion transfer process dye diffusing thereto; an opaque layer; a photosensitive silver halide layer having associated therewith a diffusion transfer process dye image-forming material adapted to provide, as a function of photoexposure, an imagewise distribution of dye possessing a first molecular size which is diffusible to said dyeable layer; a transparent polymeric layer impermeable to dye possessing said first molecular size and permeable to processing composition molecules possessing a second molecular size less than said first molecular size; a second dimensionally stable transparent layer; means for providing a processing composition intermediate the second dimensionally stable transparent layer and the dye image-forming material impermeable layer; and means for maintaining the composite unit intact subsequent to diffusion transfer processing.

3,888,670
IMAGING METHOD

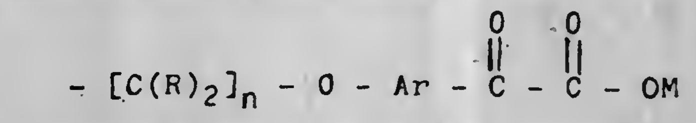
Milan Stolka, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Nov. 2, 1973, Ser. No. 412,523
Int. Cl. B44f *1/10;* **G03c** *11/22, 5/04, 1/58, 1/52*
U.S. Cl. 96—27 R **15 Claims**

1. An imaging method which comprises:
  a. contacting a substrate having dispersed on its surface in an imagewise configuration a film of a polyene having at least two conjugated double bonds per molecule with a solution of maleic anhydride to form a reaction product between the polyene and maleic anhydride,
  b. contacting the reaction product with a base to convert the carboxylic acid anhydride group of the maleic anhydride to its corresponding salt, and
  c. contacting the salt with a solution of a dye containing a colored cation capable of replacing the cation of said salt.

3,888,671
PHOTOREACTIVE COMPOSITIONS AND PRODUCTS MADE THEREWITH

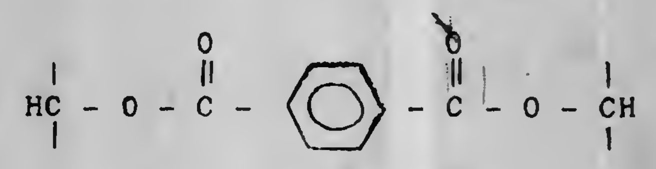
Thaddeus M. Muzyczko, Downers Grove, and Thomas H. Jones, Naperville, both of Ill., assignors to The Richardson Company, Des Plaines, Ill.
Filed June 29, 1972, Ser. No. 267,475
Int. Cl. G03f *7/02*
U.S. Cl. 96—33 **10 Claims**

1. A lithographic plate including a support member and a film formed from a photoreactive composition, said composition comprising a compound having at least two alkoxyaromaticglyoxy substituents per molecule, which substituents have the following general formula:



$$-[C(R)_2]_n-O-Ar-\overset{O}{\overset{\|}{C}}-\overset{O}{\overset{\|}{C}}-OM$$

wherein R is selected from the class consisting of H, aryl, alkyl, halo and aralkyl having up to 10 carbon atoms and n is integer from 1 to 18, Ar is an aromatic substituent and M is selected from the class consisting of H, alkali metal, ammonium and substituted ammonium, said compound having the following general formula:



3,888,672
PHOTOPOLYMERIZABLE PROCESS CAPABLE OF YIELDING A REVERSE IMAGE

Shung-Yan Luke Lee, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.
Division of Ser. No. 276,381, July 31, 1972, Pat. No. 3,782,951. This application Sept. 4, 1973, Ser. No. 394,262
Int. Cl. G03c *5/26, 1/68, 1/86, 1/94, 1/78*
U.S. Cl. 96—35.1 **9 Claims**

1. A process of forming a reverse image in a photopolymerizable composition consisting essentially of
  a. a hydrogen- or electron-donor compound,
  b. a hexaarylbiimidazole,
  c. an ethylenically unsaturated compound capable of forming a high polymer by free radical initiated, chain propagating, addition polymerization, and
  d. an organic polymer binder, wherein the concentrations of the components are, by weight, less than 0.4% (a), at least 1% (b), 30–70% (c), and 68–28% (d), with the ratio of (b)/(a) being 10/1 or greater, said process comprising
    1. imagewise exposing said composition to radiation which destroys polymerizability of the composition in the exposed areas, and
    2. exposing the entire composition to radiation which induces photopolymerization in the previously unexposed areas.

3,888,673
METHOD AND APPARATUS FOR MAKING ELECTROLUMINESCENT SCREENS FOR COLOR CATHODE RAY TUBES

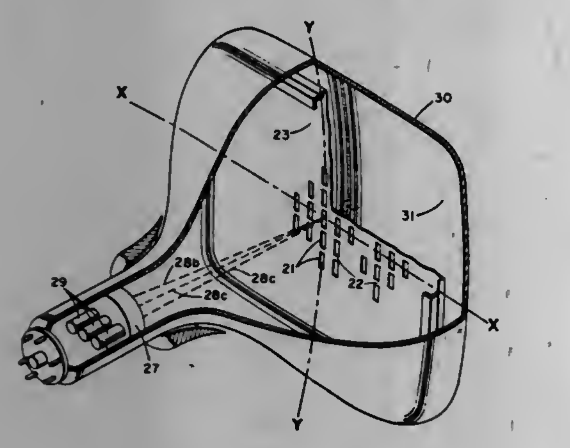
Takeshi Suzuki, Fukaya; Shigeo Takenaka, Kanagawa; Hiroshi Tanaka, Fukaya, and Masanori Akiyama, Honjo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Aug. 21, 1973, Ser. No. 390,253

Claims priority, application Japan, Aug. 21, 1972, 47-82832; Aug. 23, 1972, 47-83711

Int. Cl. G03c *5/00*

U.S. Cl. 96—36.1 **9 Claims**



3. A method of preparing a developable pattern comprising continuous vertical stripes on a panel for a color cathode-ray tube comprising:
  a. applying a film containing photosensitive material having a predetermined solvency in response to incident light onto the panel for the cathode-ray tube;
  b. attaching to said panel a shadow mask with a concave face having a number of beam-passable apertures arranged in rows substantially parallel with each other, said apertures in each of said rows being separated from each other by beam-intercepting bridging portions in each of the rows;
  c irradiating said shadow mask with light from a light source placed at a predetermined position with respect to said panel on the opposite side of said shadow mask from said panel to project said light on said film on the panel in a pattern comprising images defined by the apertures of said shadow mask, controlling the light emanated by said light source to limit the irradiation of said shadow mask to an area covering a partial length of the rows of the apertures, said lighted area being limited in length in the direction of said rows of apertures, the length of said lighted area having a nearly equal angle of inclination with respect to the vertical axis of said screen, said light source having a sufficient effective length to produce on said film an image of each aperture so expanded in the lengthwise direction as to be connected with the image of each adjacent aperture in the lengthwise direction to form said continuous vertical stripes;
  d. moving said light source back and forth in a direction perpendicular to the longitudinal axis of said light source with predetermined amplitude and frequency to superpose the radiation patterns on said screen from said light source through each of said apertures and thereby substantially reduce diffraction phenomena effects on the radiation pattern on said screen.

3,888,674
AUTOMATIC SLICE PROCESSING

James L. Nygaard, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 280,317, Aug. 14, 1972, Pat. No. 3,812,947, which is a division of Ser. No. 845,733, July 29, 1969, Pat. No. 3,765,763. This application Nov. 23, 1973, Ser. No. 418,637

Int. Cl. B44d *1/18;* **B05b** *13/02;* **B23q** *5/22*

U.S. Cl. 96—36 **2 Claims**

1. A method of spraying a fluid on a semiconductor slice comprising the steps of:
  a. positioning a semiconductor slice on a spindle;
  b. securing said semiconductor slice to said spindle;
  c. lowering said spindle including said secured semiconductor slice into a chamber;
  d. rotating said spindle including said secured semiconductor slice once said spindle has been lowered into said chamber; and
  e. spraying said fluid onto said semiconductor slice while it is rotating within said chamber.

2. In a method of operating an assembly line having a plurality of work stations for processing individual semiconductor slices, said slices each having two major surfaces, the sequence of steps of:
  a. providing a plurality of semiconductor slices having an oxide layer adherently formed on one of their two major surfaces;
  b. individually transporting said semiconductor slices along a predetermined path to a first spraying station;
  c. individually spraying said semiconductor slices including said oxide layer with a cleaning solution while individually rotating said semiconductor slices at said first spraying station;
  d. individually transporting said semiconductor slices along a predetermined path to a first flipping station;
  e. individually flipping said semiconductor slices so that the orientation of said two major surfaces is reversed at said first flipping station;
  f. individually transporting said semiconductor slices along a predetermined path to a second spraying station;
  g. individually spraying a photoresist material on the other of the two major surfaces of said semiconductor slices while rotating said semiconductor slices to form a first photoresist coating on said semiconductor slices at said second spraying station;
  h. individually transporting said semiconductor slices along a predetermined path to a first heating station;
  i. individually heating said semiconductor slices to cure said first photoresist coating at said first heating station;
  j. individually transporting said semiconductor slices along a predetermined path to a second flipping station;
  k. individually flipping said semiconductor slices so that the orientation of said two major surfaces is again reversed at said second flipping station;
  l. individually transporting said semiconductor slices to a third spraying station;
  m. individually spraying a photoresist material on the oxide layer of said semiconductor slices while rotating said semiconductor slices to form a second photoresist coating on said semiconductor slices at said third spraying station;
  n. individually transporting said semiconductor slices along a predetermined path to a second heating station;
  o. individually heating said semiconductor slices to cure said second photoresist coating at said second heating station;
  p. individually transporting said semiconductor slices along a predetermined path to an aligning and exposing station;
  q. precisely aligning said second photoresist coating with a patterned mask and exposing said second photoresist coating to a light source through such mask at said aligning and exposing station;
  r. individually transporting said semiconductor slices along a predetermined path to a fourth spraying station; and
  s. individually spraying a photoresist developer on said second photoresist coating while individually rotating said semiconductor slices to remove the portions of the second photoresist coating that were not exposed to the light source at said fourth spraying station.

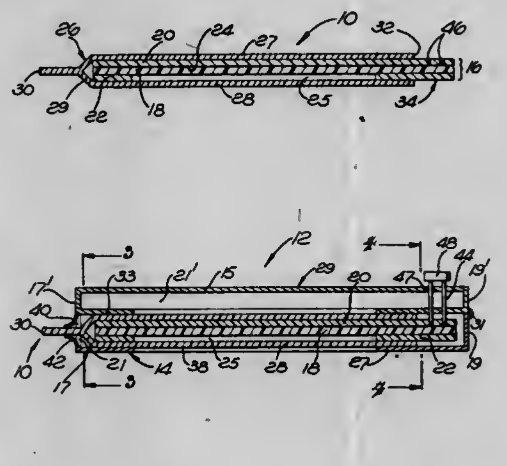
3,888,675
SINGLE FILM LIGHT-PROTECTED PHOTOSENSITIVE ELEMENT

Richard A. Corrigan, Temple City, Calif., assignor to Bell & Howell Co., Pasadena, Calif.

Division of Ser. No. 381,454, July 23, 1973, Pat. No. 3,821,762. This application Jan. 24, 1974, Ser. No. 436,261

Int. Cl. G03c *3/00;* **G03b** *17/50*

U.S. Cl. 96—67 **4 Claims**



1. A photographic medium slide packet, comprising:
A. a single film unit comprising
  a single sheet of generally flat photographic recording medium of extended surface area;
  a first layer of inert material releasably secured in direct contact against, and generally extensive with, one side of said recording medium;
  a second layer of inert material releasably secured in direct contact against, and generally extensive with, the opposite side of said medium and defining a light-transmitting window for exposing said medium; and
B. an outer envelope having opposing inner planar surfaces joined to define a closed end and an opposite open end, the opposing inner planar surfaces of said envelope being disposed in sliding light-sealing abutment with respective ones of said first and second layers whereby to enclose a major part of said film unit leaving a portion thereof unenclosed, said envelope being movable on said unit between positions of exposure and coverage of said window; said unenclosed portion defining means for securing said single sheet against relative movement of said envelope.

3,888,676
SILVER HALIDE FILMS WITH WIDE EXPOSURE LATITUDE AND LOW GRADIENT

Warren William Evans, Highland Park, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 27, 1973, Ser. No. 391,525

Int. Cl. G03c *1/02, 1/08*

U.S. Cl. 96—68 **9 Claims**

1. A photographic element comprising two silver halide emulsions separately coated or mixed and coated on a film support, one of said emulsions having a lesser degree of chemical sensitization than the other, and both of said emulsions being optically sensitized in the same spectral region.

3,888,677
SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING ANTIFOG AGENT WITH PROTECTED MERCAPTO GROUP

Werner Abele, Neu-Isenburg, and Rudolf Schneider, Sprendlingen, both of Germany, assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

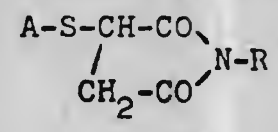
Filed Oct. 12, 1973, Ser. No. 405,801

Claims priority, application Germany, Oct. 13, 1972, 2250136

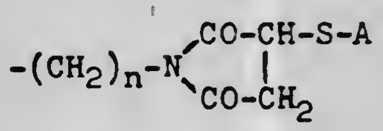
Int. Cl. G03c *1/34*

U.S. Cl. 96—76 R **7 Claims**

1. Photographic material comprising a film support and at least one light-sensitive silver halide emulsion layer containing an antifog agent or being in contact with an auxiliary layer containing an antifog agent, said antifog agent being present in an antifogging amount and having the formula:



wherein
  A is a heterocyclic radical containing nitrogen in a 5- or 6-membered heterocyclic ring, or a 4-acetaminophenyl radical,
  R is H, alkyl of 1 to 4 carbon atoms, aryl or



and *n* is 2 to 4.

3,888,678
METHOD FOR ADJUSTING TRIBOELECTRIC CHARGING CHARACTERISTICS OF MATERIALS

William J. Bailey, Jr.; James F. Houle, and Gilden R. Van Norman, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Division of Ser. No. 163,450, July 16, 1971, abandoned. This application Oct. 9, 1973, Ser. No. 404,552

Int. Cl. G03c *1/78*

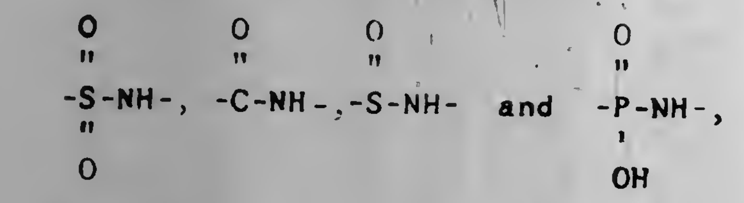
U.S. Cl. 96—87 A **78 Claims**

1. A method for adjusting the triboelectric charging characteristics of materials subject to the generation of an electrical charge when a surface thereof is brought into contact with another usually dissimilar surface comprising the steps of:
  a. measuring the electrical charge generated when the surface of the material normally subject to charging is brought into contact with said usually dissimilar surface under controlled conditions;
  b. measuring the electrical charge generated when surfaces of charge control agents are brought into contact with said usually dissimilar material under controlled conditions;
  c. based on the results of step (b), selecting at least one charge control agent which is capable of providing the adjustment desired for controlling the charging characteristics of said material; and
  d. modifying said material by incorporating at at least one surface thereof said charge control agent selected in step (c) in an amount sufficient to modify the triboelectric charging characteristics of said material and to produce a desired adjustment in the electrical charge of said material determinable by impact electrification of 20 psi impact pressure at 5% relative humidity and 70°F. against a stainless steel or anodized aluminum impacting surface, said charge control agent being selected from the group consisting of:

A. surfactant materials having the generic structure: $[A-Z(CH_2)_n-D]^+ X^-$ wherein

A is a member selected from the group consisting of hydrocarbon chains, partially fluorinated hydrocarbon chains, and fluorocarbon chains;

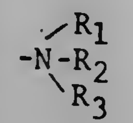
Z is a member selected from the group consisting of:



$$-\underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{S}}-NH-,\quad -\overset{\overset{O}{\|}}{C}-NH-,\quad -\overset{\overset{O}{\|}}{S}-NH- \text{ and } -\underset{\underset{OH}{|}}{\overset{\overset{O}{\|}}{P}}-NH-,$$

n is an integer ranging from 1 to about 8,

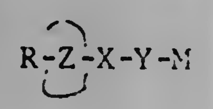
D is



wherein R_1, R_2 and R_3 are selected from the group consisting of hydrogen, lower alkyl and aryl; and

X is an anion;

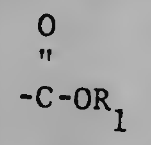
B. compounds of the following structural formula:



wherein:

Z represents the atoms necessary to constitute a member selected from the group consisting of aromatic hydrocarbon rings and alicyclic structures;

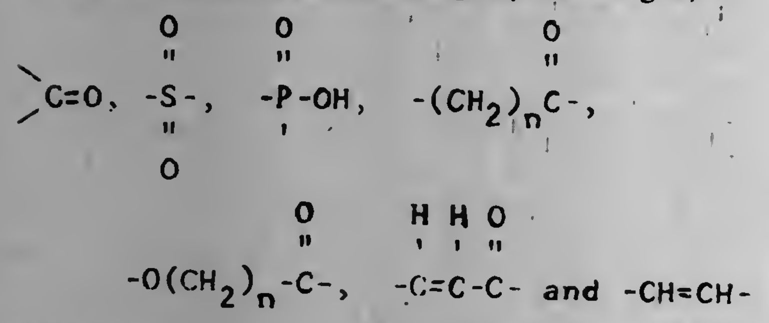
R is selected from the group consisting of single and multiple substitutions of members selected from the group consisting of halogen, nitro, nitroso, hydroxyl, carboxy, cyano, alkoxy, aryloxy, substituted alkoxy, and



$$-\overset{\overset{O}{\|}}{C}-OR_1$$

wherein R_1 is selected from the group consisting of alkyl, aryl, substituted alkyl or substituted aryl;

X is a member selected from the group consisting of;



$$>C=O,\quad -\underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{S}}-,\quad -\underset{|}{\overset{\overset{O}{\|}}{P}}-OH,\quad -(CH_2)_n\overset{\overset{O}{\|}}{C}-,$$
$$-O(CH_2)_n-\overset{\overset{O}{\|}}{C}-,\quad -\overset{\overset{H}{|}}{C}=\overset{\overset{H}{|}}{C}-\overset{\overset{O}{\|}}{C}- \text{ and } -CH=CH-$$

wherein n = an integer from 1 to about 10;

Y is a member selected from the group consisting of (1) O when M is a member selected from the group consisting of hydrogen, ammonium, metallic cations, and amine salt residues;

(2) $>NH$

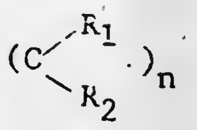
when M is H; and

(3) $>C=O$

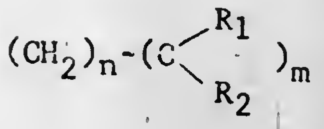
when M is selected from the group consisting of phenyl and substituted phenyl;

C. multifunctional carboxylic acids of the general formula: HOOC—R—COOH wherein R is selected from the group consisting of:

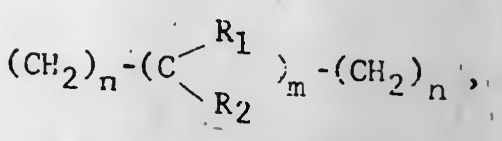
(1)



(2)

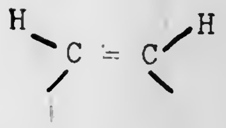


(3)



, and

(4)



wherein if R = (1) or (2) and R_1 is hydrogen, R_2 is selected from the group consisting of halogen, nitro, aryl, substituted aryl, hydroxyl;

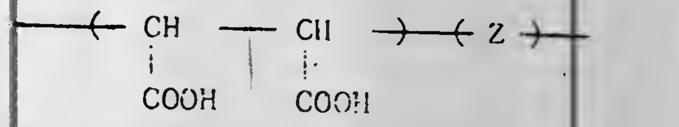
wherein if R = (3), R_1 and R_2 are selected from the group consisting of hydrogen, halogen, nitro, carboxyl, aryl, substituted aryl, alkyl and substituted alkyl;

n and m are integers;

and where R_1 is H, R_2 is a member selected from the group consisting of hydroxyl, hydrogen, halogen, nitro, carboxy, aryl, substituted aryl, alkyl and substituted alkyl;

D. polymeric compounds having structural formulas selected from the group consisting of:

I.

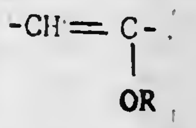


$$-\!\!\left(\underset{\underset{COOH}{|}}{CH}-\underset{\underset{COOH}{|}}{CH}\right)\!\!-\!\!\left(Z\right)\!\!-$$

wherein Z is selected from the group consisting of:

a. $—CH_2 — CH_2—$;

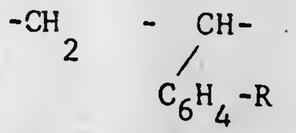
(b)



$$-CH=\underset{\underset{OR}{|}}{C}-$$

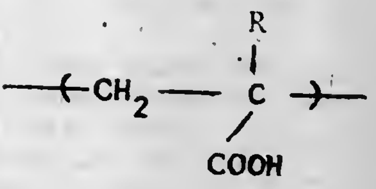
wherein R is lower alkyl; and

(c)



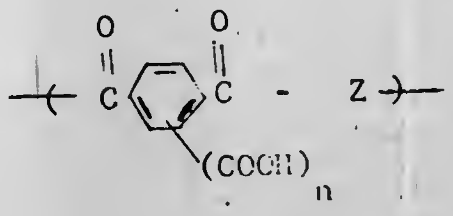
wherein R is selected from the group consisting of lower alkyl, halogen, hydroxyl and nitro groups;

II.



wherein R is selected from the group consisting of hydrogen and methyl;

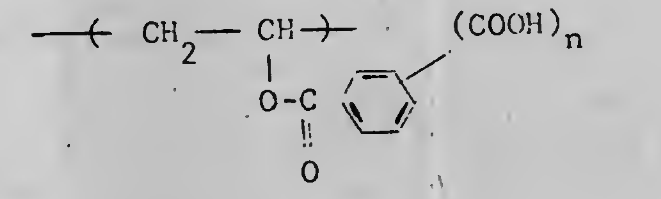
III.



wherein Z represents the atoms necessary to complete a member selected from the group consisting of:

a. a polyester, (b) a polyamide, and (c) a polycarbonate and n is an integer from 1 to 4;

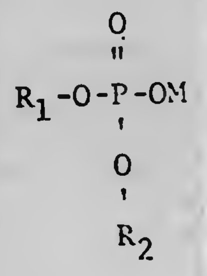
IV.



wherein n is an integer from 1 to 4; and

V. polymers containing both hydroxyl and aromatic carboxylic acid groups;

E. compounds of the formula



$$R_1-O-\underset{\underset{\underset{\underset{R_2}{|}}{O}}{|}}{\overset{\overset{O}{\|}}{P}}-OM$$

wherein (1) R_1 is $CH_3 — (CH_2)_n$ and n is an integer ranging from about 1 to about 19, then R_2 is selected from the group consisting of H, R_1 and R_1 with a different value for n;

2. R_1 and R_2 are selected from the group consisting of unsaturated hydrocarbon, aryl and substituted aryl residues;
3. R_1 represents the atoms of a polymeric structure in which case R_2 is selected from the group consisting of H and as defined in (1) and (2) above; and

M is selected from the group consisting of H, NH_4 and alkali metal cations; and

F. mixtures thereof.

3,888,679

POLYPROPYLENE SUPPORT FOR PHOTOGRAPHIC USE

Hajime Komatsu, Odawara, and Seio Mukai, Ichihara, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo and Chisso Corporation, Osaka, both of, Japan

Filed Jan. 28, 1974, Ser. No. 437,244

Claims priority, application Japan, Jan. 29, 1973, 48-11156; Jan. 29, 1973, 48-11157

Int. Cl. G03c *1/78;* **B44d** *1/22*

U.S. Cl. 96—87 R **9 Claims**

1. A polypropylene support for photographic use, comprising a main resin component of a polypropylene, together with 15 to 35% by weight of talc, 3 to 15% by weight of titanium white, and 0.1 to 5% by weight of a fatty acid metal salt, all the weight percents being based on the weight of said polypropylene support.

3,888,680

LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING BIS-PYRAZOLONE COUPLERS

Mitsuto Fujiwhara; Keiji Kasai; Ryosuke Satoh; Yoshinobu Nakagawa, and Tuneo Tanigawa, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

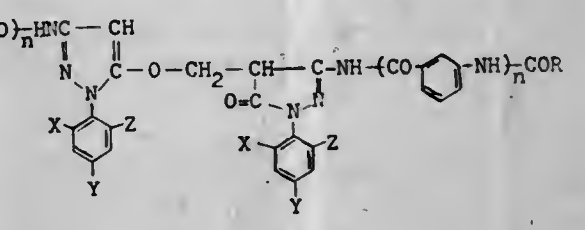
Continuation-in-part of Ser. No. 207,796, Dec. 14, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 428,207

Claims priority, application Japan, Dec. 18, 1970, 45-113100

Int. Cl. G03c *1/40*

U.S. Cl. 96—100 **4 Claims**

1. A light-sensitive silver halide color photographic material containing a bis-type coupler of the general formula,



wherein R is an alkyl, aralkyl or aryl group; X, Y and Z are individually a hydrogen or halogen atom or an alkyl or alkoxy group having 1 to 4 carbon atoms, either one of said X and Z being necessarily a halogen atom; and n is zero or 1.

3,888,681

PROCESS FOR THE RAPID HARDENING OF GELATIN

Ikutaro Horie, and Kameji Nagao, both of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Aug. 16, 1972, Ser. No. 281,095

Claims priority, application Japan, Aug. 23, 1971, 46-64134

Int. Cl. G03c *1/00;* **B44d** *1/44*

U.S. Cl. 96—111 **9 Claims**

1. A process for the rapid hardening of gelatin comprising coating a support with an aqueous gelatin solution containing as a hardener at least one of a halogenated diazine compound, a halogenated triazine compound, a compound having an active vinyl radical, a mucohalogen acid or a derivative thereof and a substituted or an unsubstituted 2,3-dihydroxy-1,4-dioxane, drying the coating at a constant rate for a period of time without irradiating and then after completion of the constant rate drying period, irradiating with high frequency microwaves.

3,888,682

ALGICIDAL POST TREATED ROOFING GRANULES

Arnold S. Nelson, Hagerstown, Md., assignor to GAF Corporation, New York, N.Y.

Filed Oct. 25, 1972, Ser. No. 300,852

Int. Cl. C09k *3/00*

U.S. Cl. 106—15 AF **30 Claims**

1. Algicidal roofing granules capable of inhibiting or preventing the growth of discoloring algae and fungi organisms upon exposure of roofing surfaces containing such granules to atmospheric weathering for extended periods of time, comprising:

a. base mineral granules;

b. a moisture permeable, durable, water insolubilized, pigmented, fired, inorganic alkali metal silicate-clay coating on said base granules;

c. a heavy processing oil composition present in an amount within the range of from about ¼ to about 1¼ gallons per ton of base granules, said processing oil forming a thin film on the surface of said coated granules, said processing oil having a viscosity within the range of from about 525 to about 950 SUS, measured at 100°F; and

d. metallic algicides in the oil film and adhering to the surface of said granule coating, said algicides having a particle size not exceeding about 100 mesh and being present in amounts within the range of from about 0.05 to about 1.0 percent by weight based on the weight of the base mineral granules, metallic algicidal ions being leachable from said algicides upon exposure thereof to moisture during atmospheric weathering,

whereby the weathering away of said processing oil upon atmospheric exposure of roofing surfaces incorporating said granules does not adversely affect the enhanced adherence of said metallic algicides to said granule coating, the presence of moisture during periods of rain and dew causing ionization of said metallic algicides with the resulting metallic ions being slowly leached from said granules to retard the growth of algae and fungi, thus enhancing the resistance of said roofing surfaces containing such granules to discoloration during extended periods of exposure to atmospheric weathering.

3,888,683

NOVEL ALGICIDAL POST TREATED ROOFING GRANULES

John C. Horai, Jr., and David C. Little, both of Hagerstown, Md., assignors to GAF Corporation, New York, N.Y.

Filed Oct. 25, 1972, Ser. No. 300,853

Int. Cl. C09k *3/00*

U.S. Cl. 106—15 AF **25 Claims**

1. Algicidal roofing granules capable of inhibiting or preventing the growth of discoloring algae and fungi organisms upon exposure of roofing surfaces containing such granules to atmospheric weathering for extended periods of time, comprising:

a. base mineral granules;

b. a moisture permeable, durable, water insolubilized, pigmented, fired, inorganic alkali metal silicate-clay coating on said base granules;

c. a processing oil composition present in an amount within the range of from about ¼ to about 1½ gallons per ton of base granules, said processing oil forming a thin film on the surface of said coated granules, said processing oil having a viscosity within the range of from about 100 to about 500 SUS, measured at 100°F; and

d. copper silicate in the oil film and adhering to the surface of said granule coating, said copper silicate having a particle size not exceeding about 100 mesh and being present in amounts within the range of from about 0.05 to about 1.0 percent by weight based on the weight of the base mineral granules, metallic copper ions being leachable from said upon exposure thereof to moisture during atmospheric weathering, whereby the weathering away of said processing oil upon atmospheric exposure of roofing surfaces incorporating said granules does not adversely affect the enhanced adherence of said copper silicate to said granule coating, the presence of moisture during periods of rain and dew causing ionization of said copper silicate with the resulting metallic ions being slowly leached from said granules to retard the growth of algae and fungi, thus enhancing the resistance of roofing surfaces containing such granules to discoloration during extended periods of exposure to atmospheric weathering.

3,888,684

ALGICIDAL ROOFING GRANULES

David C. Little, Hagerstown, Md., assignor to GAF Corporation, New York, N.Y.

Filed Oct. 25, 1972, Ser. No. 300,876

Int. Cl. C09k *3/00*

U.S. Cl. 106—15 AF **10 Claims**

1. Algicidal roofing granules having an enhanced ability, over an extended period of time, to leach algicidal ions to prevent or inhibit the growth of discoloring algae and fungi organisms upon atmospheric exposure of roofing surfaces containing such granules, comprising

a. base mineral granules;

b. an inner, moisture permeable, durable, water insolubilized, pigmented, fired, inorganic alkali metal silicateclay coating, said coating containing a mixture of zinc and copper algicides; and

c. an outer, moisture permeable, durable, water insolubilized, pigmented, fired, inorganic alkali metal silicateclay coating, said coating containing a mixture of zinc and copper algicides, the total zinc algicidal content of said inner and outer coatings being in the range of from about 0.05 to about 0.5 percent by weight based on the total weight of said base granules, the total copper algicidal content of said inner and outer coatings being in the range of from about 0.05 to about 0.5 percent by weight based on the total weight of said base granules and the total algicidal content of said outer coating being less than that of said inner coating, whereby when said coated granules are incorporated into roofing compositions and exposed to atmospheric weathering algicidal ions are slowly leached from the outer coating during periods of rain and dew to retard the growth of algae and fungi, said inner coating serving as a reservoir of algicidal ions, thus assuring the continued leaching of algicidal ions from said granules during use over an extended period of time and assuring the effective utilization of the algicidal content of the overall granule coating, said inner coating also tending to fill in voids in the base mineral granules so as to assure a more uniform outer coating, enhancing the uniformity of the resistance of roofing surfaces containing said granules to discoloration during such extended periods of exposure to atmospheric weathering.

3,888,685

SENSITIZED, SILVER-ACTIVATED, PHOSPHORUS PENTOXIDE-CONTAINING RADIO-PHOTOLUMINESCENT GLASS AND PROCESS OF MAKING SAME

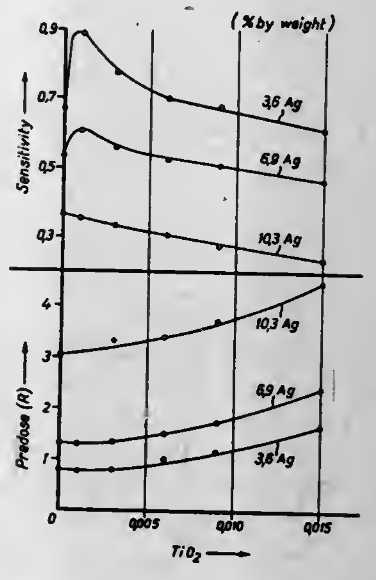
Hans-Herbert Kaes, Wetzlar; Dorlar, Germany, assignor to Ernst Leitz GmbH, Wetzlar, Germany

Filed Mar. 27, 1973, Ser. No. 345,368

Claims priority, application Germany, Apr. 1, 1972, 2216064

Int. Cl. C03c *3/26*

U.S. Cl. 106—47 R **10 Claims**



1. A sensitized, silver-activated, phosphorus pentoxide-containing radio-photoluminescent glass containing one of the elements selected from the group consisting of arsenic, zirconium, cerium, cesium, platinum, antimony, germanium, tin, hafnium, and titanium in a concentration of 0.0001 to 0.1 percent, by weight, calculated as oxide.

3,888,686

SEALING GLASS COMPOSITIONS CONTAINING CALCINED ZIRCONIA VANADIA SILICA STAIN

James L. Ellis, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 831,648, June 6, 1969, abandoned. This application June 19, 1972, Ser. No. 277,457

Int. Cl. C03c *3/10, 3/30, 3/22*

U.S. Cl. 106—53 **4 Claims**

1. An improved thermally crystallizable fusion-type sealing glass composition of matter wherein said composition consists essentially of a base sealing glass selected from the group consisting essentially of lead-zinc-borate and lead-borosilicate sealing glasses and wherein said base sealing glass has homogeneously blended therein about 2 to 18 percent by weight of a calcined zirconia vanadia silica stain, said resulting fusion-type sealing glass having therby a thermal coefficient of expansion in the devitrified state ranging from about $5 \times 10^{-7}/°C$ (0°–300°C) to $20 \times 10^{-7}/°C$ (0°–300°C) lower than the same glass in the devitrified state would have in the absence of the calcined zirconia vanadia silica stain.

3,888,687

ALUMINA-CHROME REFRACTORY

Edward L. Manigault, Cincinnati, Ohio, assignor to The Chas. Taylor's Sons Co., Cincinnati, Ohio

Continuation-in-part of Ser. No. 402,090, Oct. 1, 1973. This application Mar. 4, 1974, Ser. No. 448,008

Int. Cl. C04b *35/10, 35/12*

U.S. Cl. 106—66 **8 Claims**

1. A ceramic composition, useful as a ramming mix, comprising 59 to 98% tabular alumina, 0 to 10% calcined alumina, 1 to 25% chromic oxide and 1 to 18% of a phosphate compound.

3,888,688

INORGANIC PIGMENTS AND PROCESS FOR THEIR PRODUCTION

Arno Broll, Rothenbergen, and Herbert Mann, Dornigheim, both of Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Germany

Filed Apr. 30, 1974, Ser. No. 465,560

Claims priority, application Germany, May 10, 1973, 2323481

Int. Cl. C08h *17/04*

U.S. Cl. 106—308 B **12 Claims**

1. An inorganic pigment having discrete particles of a colored chalcogenide of (1) cadmium, (2) zinc, (3) mercury or (4) of manganese, said particles being encased in a crystalline form of silicon dioxide, and where the chalcogen has an atomic weight of 32 and 79.

3,888,689

AQUEOUS PRINTING INK CONTAINING PERFUME-CONTAINING MICROCAPSULES

Yukio Maekawa; Shizuo Miyano; Kenichiro Yazawa, and Asaji Kondo, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

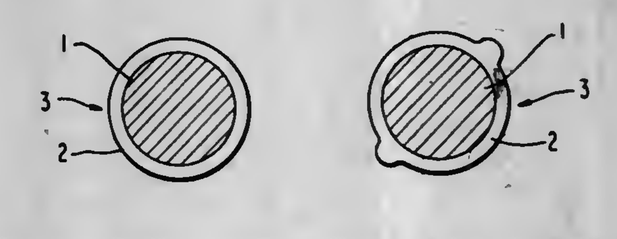
Filed Oct. 1, 1971, Ser. No. 185,492

Claims priority, application Japan, Oct. 1, 1970, 45-86239

Int. Cl. C09d *11/04, 11/14;* **C08f** *45/24*

U.S. Cl. 106—24 **14 Claims**

1. An aqueous phase comprising a printing ink containing perfumecontaining microcapsules comprising microcapsules dispersed in an aqueous solution of a polymer which is soluble in water but is less soluble in or swellable with an organic solvent, said microcapsules, each containing a single droplet of perfume and being produced by a conventional gelatin-polyanion complex coacervation process, the droplets of perfume having a size of from 15 to 70 microns and the amount of polymer, when dry, being less than twice the amount of the perfume, the polymer being one which does not deteriorate the gelatin-polyanion colloid coacervate of the microcapsules, wherein the aqueous phase contains a colored dye or pigment and the water soluble polymer dissolved therein and the perfume containing microcapsules.



3,888,690

MOLD-RELEASE MATERIAL

Edward M. Geiser, Downers Grove, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 9, 1973, Ser. No. 414,547

Int. Cl. C04b *35/68*

U.S. Cl. 106—38.24 **4 Claims**

1. A mold-release composition comprising from about 50% to about 90% of a paraffinic oil, from about 20% to about 40% of an organic solvent, and from about 0.1% to about 10.0% of a salt of an amine, a dicarboxylic acid in a ratio of about 0.5 to about 2.0 equivalents of amine per 0.5 to about 4.0 equivalents of the acid, and about 0.5 to about 1.5 equivalents of an alkyl acid phosphate per 0.5 to about 1.5 equivalents of the acid and about 2.0 equivalents of the amine.

3,888,691

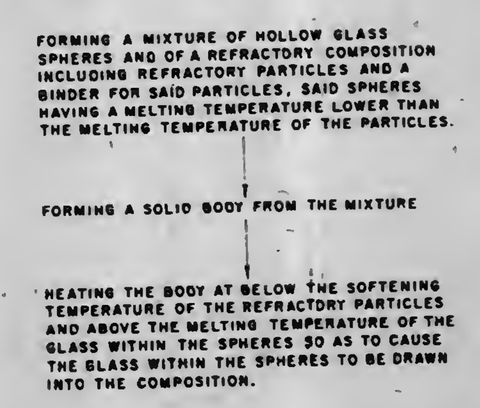
POROUS CERAMIC

Vincent Villani, Tujunga, and Ronald L. Topp, Poway, both of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Oct. 6, 1972, Ser. No. 295,608

Int. Cl. C03c *11/00*

U.S. Cl. 106—40 V **4 Claims**


FORMING A MIXTURE OF HOLLOW GLASS SPHERES AND OF A REFRACTORY COMPOSITION INCLUDING REFRACTORY PARTICLES AND A BINDER FOR SAID PARTICLES, SAID SPHERES HAVING A MELTING TEMPERATURE LOWER THAN THE MELTING TEMPERATURE OF THE PARTICLES.
FORMING A SOLID BODY FROM THE MIXTURE
HEATING THE BODY AT BELOW THE SOFTENING TEMPERATURE OF THE REFRACTORY PARTICLES AND ABOVE THE MELTING TEMPERATURE OF THE GLASS WITHIN THE SPHERES SO AS TO CAUSE THE GLASS WITHIN THE SPHERES TO BE DRAWN INTO THE COMPOSITION.

1. An unfired porous ceramic composition having a comparatively high strength per unit of weight which comprises:

a plurality of hollow glass spheres surrounded by and held separate and apart from one another in and by a continuous matrix phase of ceramic particles which are bonded to one another by an inorganic binder so as to encase and surround said spheres,

both said spheres and said particles are no greater than about 4 mesh standard Tyler screen size in diameter and no smaller than about 200 mesh standard Tyler screen size.,

from about 40 to about 75 percent of said particles by volume are of one size and the remainder of said particles are of a size having at least half of the diameter of the larger particles,

from about 40 to about 75 percent of said spheres by volume are of one size and the remainder of said spheres are of a size having at least half of the diameter of the larger of said spheres, said matrix consists essentially of from about 15 to about 30 percent by weight of said inorganic binder for said particles and the remainder of said particles,

said particles are irregularly shaped lithiumaluminum silicate particles having a melting temperature of at least 1,600°F,

said glass spheres have a melting temperature which is lower than the melting temperature of said particles,

said spheres constituting from about 30 percent to about 70 percent by volume of said body and constituting no more than about 50 percent by weight of the weight of said body,

said refractory particles being capable of taking up the material within said glass into their structures upon heating of said body to at least the melting temperature of said glass spheres.

3,888,692

FLINT OPTICAL GLASS

Shigeo Kuwayama, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Continuation-in-part of Ser. Nos. 182,876, Sept. 22, 1971, abandoned, and Ser. No. 33,500, April 30, 1970, abandoned, and Ser. No. 681,583, Nov. 8, 1967, abandoned. This application Aug. 21, 1973, Ser. No. 390,262

Claims priority, application Japan, Nov. 9, 1966, 41-73651

Int. Cl. C03c *3/04, 3/10, 3/30*

U.S. Cl. 106—53 **10 Claims**

1. A weather-proof, flint optical anastigmatic glass consisting essentially of on a percent by weight basis

from 12.5 to 19.5 percent SiO_2,
from 8.0 to 16.5 percent Al_2O_3,
from 12.0 to less than 20.0 percent B_2O_3
and from 42.0 to 60.0 percent PbO.

3,888,693

MULTI-PHASE RINSE AND RECOVERY METHOD

William Russell Schevey, Hawley, Pa.; Harold Freeman Jones, Dover, and Burton A. Spielman, Chatham, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Mar. 20, 1972, Ser. No. 235,994

Int. Cl. B08b *3/08, 3/10*

U.S. Cl. 134—10 **51 Claims**

1. The method for removing a contaminating first liquid from a surface of an article which comprises

a. washing said surface with a second liquid having a different density than said first liquid, said first liquid being not over 10 percent by weight soluble in said second liquid;
b. simultaneously washing said surface with a third liquid comprising water which is miscible and soluble with, but not the same as, said first liquid and not over about 10 percent by weight soluble in said second liquid, said third liquid being present in a weight percent of said second liquid greater than the weight percent solubility of said third liquid in said second liquid and less than about four hundred percent by weight of said second liquid thereby displacing said first liquid from said surface, all liquids being substantially free from surface active agents;
c. collecting the displaced first liquid, the second liquid and the third liquid, subsequent to said washing, and causing said liquids to separate into a second liquid phase and a first and third liquid phase; and
d. recycling said first and third liquid phase as third liquid.

3,888,694

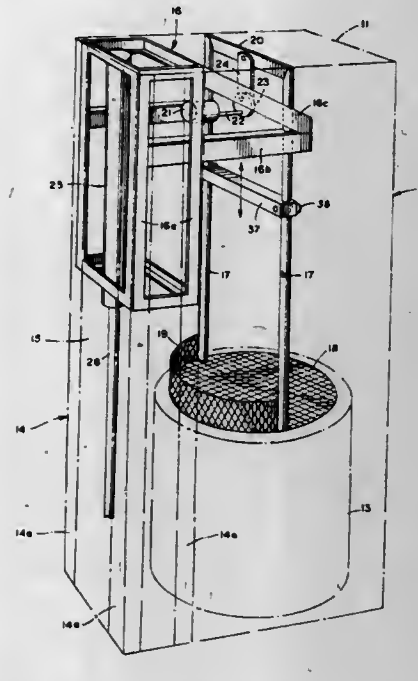
APPARATUS AND METHOD FOR CLEANING AIR FILTER ELEMENTS BY VERTICAL RECIPROCATION

Lee R. McKinney, P.O. Box 1182, Kalispell, Mont. 59901

Filed Apr. 26, 1973, Ser. No. 354,739

Int. Cl. B08b *3/10, 11/00*

U.S. Cl. 134—32 **9 Claims**



1. A method of cleaning a generally cylindrical air filter element having an enlarged opening at one end and being substantially closed at the opposite end thereof, said element also having an annular arrangement of longitudinally and radially extending folds of porous filter paper, comprising the steps of totally immersing said filter element in a body of cleaning liquid with the axis of said element extending generally vertically and with the enlarged end opening of said element facing downwardly and the sustantially closed opposite end facing upwardly, and thereafter axially reciprocating said element within said liquid at a frequency of approximately 100 to 400 cycles per minute and with a vertical stroke length within the range of 0.5 to 4 inches.

3,888,695

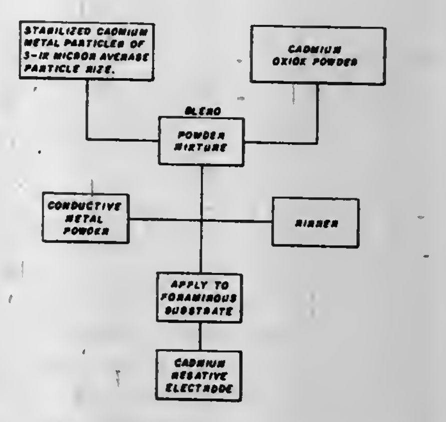
RECHARGEABLE CELL HAVING IMPROVED CADMIUM NEGATIVE ELECTRODE AND METHOD OF PRODUCING SAME

Henry A. Catherino, Gainesville, Fla., assignor to General Electric Company, Owensboro, Ky.

Division of Ser. No. 275,086, July 25, 1972. This application Nov. 23, 1973, Ser. No. 418,366

Int. Cl. H01m *43/04*

U.S. Cl. 136—24 **3 Claims**


STABILIZED CADMIUM METAL PARTICLES OF 3-12 MICRON AVERAGE PARTICLE SIZE.
CADMIUM OXIDE POWDER
BLEND
POWDER MIXTURE
CONDUCTIVE METAL POWDER
BINDER
APPLY TO FORAMINOUS SUBSTRATE
CADMIUM NEGATIVE ELECTRODE

1. An improved rechargeable cell having enhanced anti-fading and energy-density properties comprising:

a. an alkali-electrolyte resistant container having at least one insulated terminal thereon;
b. a positive electrode;
c. an alkali electrolyte; and
d. a cadmium negative electrode comprising a mixture of stabilized, generally spherically shaped cadmium metal particles formed by condensing cadmium metal vapors in the presence of oxygen, said particles having an average particle size of about 3–12 microns and cadmium oxide powder in a binder and applied to a foraminous substrate.

3. A method of making an improved rechargeable cell having enhanced anti-fading and energy-density properties comprising:

a. constructing a positive electrode containing, in an uncharged state, a predetermined amount of electrochemically active material corresponding to the desired capacity of the cell;
b. constructing a cadmium negative electrode by applying to a foraminous substrate a mixture of
   1. generally spherically shaped cadmium metal particles formed by condensing metal vapors in the presence of oxygen and having an average particle size of about 5–10 microns, in an amount sufficient to replenish active negative plate material which may become electrochemically inactive during operation of the cell;
   2. cadmium oxide powder in an amount at least approximately equal electrochemically to the amount of uncharged positive material;
   3. a suitable binder;
c. assembling the electrodes together into a container;
d. adding an electrolyte;
e. sealing the container; and
f. thereafter charging the cell.

3,888,696

ELECTROCHEMICAL SYSTEMS EMPLOYING ORGANIC ELECTROLYTIC SOLVENTS

Morris Eisenberg, Mountain View, Calif., assignor to Electrochimica Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 173,253, Aug. 19, 1971. This application Aug. 13, 1973, Ser. No. 387,679

Int. Cl. H01m *11/00*

U.S. Cl. 136—83 R **7 Claims**

1. An electrochemical system comprising an anode including a metal less noble than zinc; a cathode including a halide of a metal selected from the group consisting of copper, nickel, silver, cobalt and iron; and an electrolyte for electrolytic conduction between said anode and cathode, said electrolyte comprising a solute dissolved in a solvent comprising at least 50 percent by volume nitromethane and between 10 and 50 percent by volume nitroethane.

3,888,697

PHOTOCELL

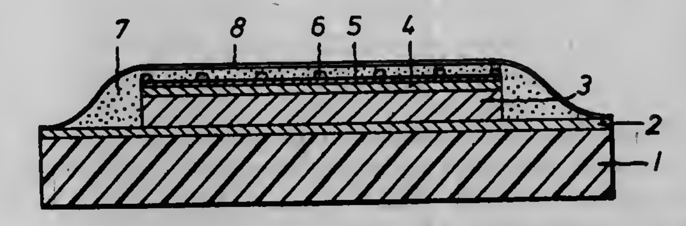
Klaus Bogus, Horkheim, and Siegfried Mattes, Heilbronn-Bockingen, both of Germany, assignors to Licentia-Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Oct. 16, 1972, Ser. No. 297,703

Claims priority, application Germany, Oct. 23, 1971, 2152895; Oct. 23, 1971, 7140208

Int. Cl. B44d *1/18;* **H01l** *15/02*

U.S. Cl. 136—89 **17 Claims**



1. A thin layer photocell comprising a semiconductor body of cadmium sulphide, a layer of cuprous sulphide on said cadmium sulphide body, and an additional layer of metallic copper arranged on said cuprous sulphide layer, said additional layer of copper being thin in relation to said cuprous sulphide layer.

4. A method of producing a thin layer photocell comprising the steps of forming a layer of cuprous sulphide on the surface of a semiconductor body of cadmium sulphide and forming an additional layer of copper, which additional layer is thin in relation to said cuprous sulphide layer, on said cuprous sulphide layer.

3,888,698

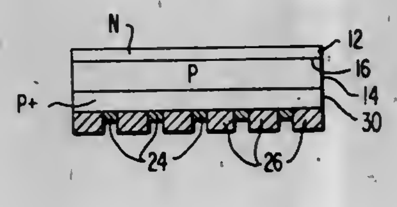
INFRARED-TRANSPARENT SOLAR CELL

Joseph Lindmayer, Bethesda; Denis John Curtin, Rockville; Joseph Gabriel Haynos, and Andrew Meulenberg, Jr., both of Gaithersburg, all of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed Nov. 9, 1972, Ser. No. 305,030

Int. Cl. H01m *29/00*

U.S. Cl. 136—89 **14 Claims**



1. A solar cell of the type comprised of at least two layers of semiconductor material of opposite type conductivity defining a p-n junction, the surface of one layer opposite said p-n junction being substantially closer to said p-n junction that the surface of said other layer opposite said p-n junction, the said surface of said one layer being the upper surface of said solar cell and being adapted to receive incident light, the said surface of said other layer being the bottom surface of said solar cell, said upper surface having an electrode configuration thereon through which light can pass to said top surface and into said semiconductor layers, the improvement comprising an electrode on said bottom surface formed in a pattern over said surface covering less than 10 percent of said bottom surface, and a layer of material covering at least those portions of said bottom surface not covered by said electrode, said latter mentioned layer of material being an electrical insulator and having an optical index of refraction intermediate that of the optical indeces of refraction for said semiconductor material and space wherein said electrode on said bottom surface pattern comprises a plurality of fine lines of metal interconnected by other metal lines terminating in larger metallic areas adapted for connecting said back electrode to external circuitry.

3,888,699

PRIMARY DRY CELL

Lewis F. Urry, North Olmsted, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

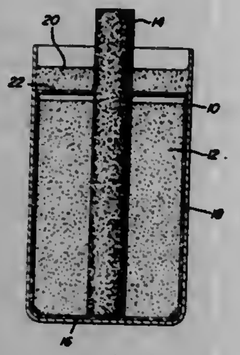
Continuation of Ser. No. 59,272, July 29, 1970, abandoned. This application Aug. 27, 1973, Ser. No. 391,611

Int. Cl. H01m *21/00*

U.S. Cl. 136—107 **3 Claims**

1. A primary dry cell comprising a zinc anode, a cathode depolarizer mix cake containing manganese dioxide, a conductive material and an inner electrolyte consisting essentially

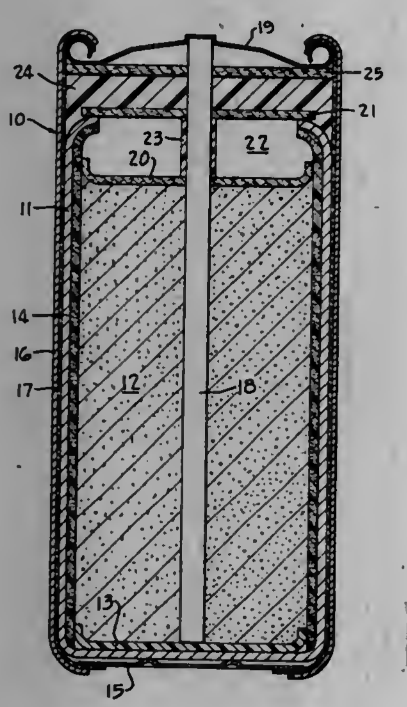
of an aqueous zinc perchlorate solution, and a separator interposed between said anode and said cathode depolarizer mix cake, said inner electrolyte constituting from about 60 to 71 percent by volume of the total cathode depolarizer mix cake.



3,888,700
ABSORBENT SEPARATOR FOR AN ELECTRIC BATTERY

Duane M. Larsen, Madison, Wis., assignor to ESB Incorporated, Philadelphia, Pa.

Filed Nov. 1, 1968, Ser. No. 772,775
Int. Cl. H01m *3/02*
U.S. Cl. 136—146 **14 Claims**

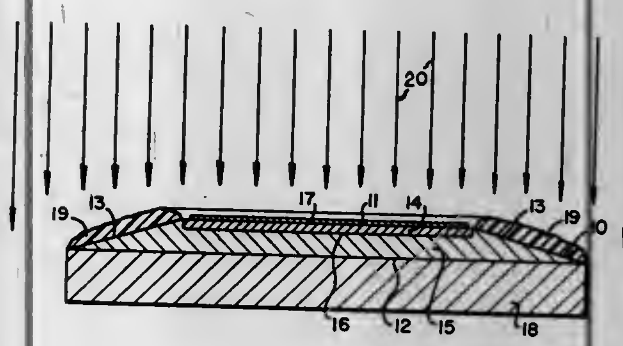


1. An electric battery having an anode, a cathode mix comprising a depolorizer and an aqueous electrolyte solution, and an absorbent separator sheet material between said anode and cathode, said absorbent separator consisting essentially of an elastomeric resin binder forming a continuous matrix blended with a gelling agent capable of absorbing and retaining battery electrolyte, said elastomeric resin binder comprising from about 10 to about 30 percent by weight of the separator with the balance being gelling agent, said binder and gelling agent being dry blended whereby the gelling agent is not gelled, and said separator being in the form of a film having a thickness from about 3 to about 15 mils.

3,888,701
TAILORING REVERSE RECOVERY TIME AND FORWARD VOLTAGE DROP CHARACTERISTICS OF A DIODE BY IRRADIATION AND ANNEALING

Krishan S. Tarneja, and John Bartko, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 9, 1973, Ser. No. 339,669
Int. Cl. H01l *7/54*
U.S. Cl. 148—1.5 **6 Claims**



1. A method of tailoring reverse recovery time and forward voltage drop characteristics of a diode comprising the steps of:
A. positioning a diode semiconductor body with given first reverse recovery time and first forward voltage drop values with a major surface thereof for exposure to a radiation source;
  B. increasing the forward voltage drop to a second forward voltage drop value below a desired value and decreasing the reverse recovery time to a second reverse recovery time value below a desired value by irradiating the positioned diode semiconductor body with the radiation source; and
  C. decreasing the forward voltage drop to a third desired forward voltage drop value and increasing the reverse recovery time to a third desired reverse recovery time value below said first reverse recovery time value by annealing the irradiated diode semiconductor body.

3,888,702
HYDROGEN PEROXIDE TREATMENT OF NICKEL SURFACES FOR SILICONE RUBBER BONDING

Richard J. Kujawa, Kokomo, and Rebecca A. Swails, Greentown, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 19, 1973, Ser. No. 417,423
Int. Cl. C23f *5/02*
U.S. Cl. 148—6.14 R **1 Claim**

1. A highly controllabel method for treating nickel surfaces before bonding silicone rubber thereto, that consistently and reliably enhances adhesion of the silicone rubber to the nickel surfaces, which method includes use of a room temperature, low concentration aqueous hydrogen peroxide solution that is insensitive to phosphate ion contamination up to 15 parts per million, said method comprising the steps of immersing said nickel surface in a substantially lead-free and generally room temperature solution consisting essentially of water and about 10% – 20 % by weight hydrogen peroxide, introducing into said aqueous solution at least one metal selected from the group consisting of pure lead and lead alloys in an amount sufficient to produce 0.5 – 20 parts lead ion per million parts solution to initiate a moderate decomposition of said hydrogen peroxide and an attendant moderate reaction with the nickel surface on said bodies, allowing said decomposition and reaction to proceed until substantially all of the hydrogen peroxide has decomposed, rinsing said nickel surfaces, and drying them.

3,888,703
METHOD OF PRODUCING CREEP RESISTANCE OF PB-B ALLOYS

Milton M. Tilman; Robert L. Crosby, and Leander A. Neumeier, all of Rolla, Mo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed May 22, 1974, Ser. No. 472,388
Int. Cl. C22c *11/00*
U.S. Cl. 148—11.5 R **5 Claims**

1. A method for treatment of lead-antimony alloys, containing up to about 5 percent antimony, comprising (1) breakdown deformation of the alloy with reductions per pass greater than about 10 percent for a total reduction of at least about 67 percent of the original thickness and (2) finish deformation of the alloy at a temperature of about 100° to 200°C and with reduction per pass less than 10 percent.

3,888,704
METHODS OF TREATING HARDENING OIL BEFORE USE BY ADDING A MIXTURE OF ETHOXYLATED ACYCLIC COMPOUNDS AND FILM-FORMING ACYCLIC COMPOUNDS

Per Olof Lindstedt, Molndal, Sweden, assignor to Olof Lindstedt & Co. AB, Molndal, Sweden

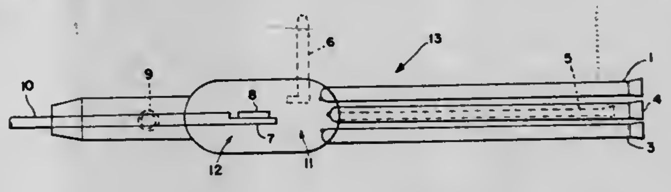
Filed Feb. 20, 1974, Ser. No. 444,223
Int. Cl. B23k *35/24*
U.S. Cl. 148—29 **5 Claims**

1. A method of improving a mineral oil-based oil for use in cooling metallic objects by rapidly immersing said objects in said oil, said method comprising adding to said oil 1–10 percent, by weight of said oil, of a mixture consisting of:
  A. 60–95 percent by weight of an emulsifier, said emulsifier being a biodegradable, ethoxylated, acyclic compound selected from the group consisting of esters, alkyl ethers, fatty acid amides and alkylamine-ethylene oxide adducts, wherein said compound contains 8–20 carbon atoms in alkyl groups and 2–15 hydrophilic, ethylene oxide units; and
  B. 40–5 percent by weight of a C_{10}–C_{26}, film-forming, acyclic compound selected from the group consisting of esters, alcohols, amides and amines, said film-forming compound being neither soluble in nor dispersible by water.

3,888,705
VAPOR PHASE GROWTH OF GROUPS III-V COMPOUNDS BY HYDROGEN CHLORIDE TRANSPORT OF THE ELEMENTS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration in respect to an invention of; Ramesh C. Tyagi, Delhi, India; William J. Debnam, Jr., Hampton, Va.; Maxwell F. McNear, Hampton, Va.; Roger K. Crouch, Hampton, Va., and Roger A. Breckenridge, Newport News, Va.

Filed Dec. 19, 1973, Ser. No. 426,405
Int. Cl. H01l *7/36;* **C23c** *11/00*
U.S. Cl. 148—175 **6 Claims**



1. A method of forming binary, ternary, and quaternary compounds derived from elements of Group III and Group V, which consists essentially of the steps of:
  a. passing a carrier gas consisting of hydrogen and hydrogen chloride, containing 1% to 10% of hydrogen chloride by volume separately over two to four elements of Group III and Group V, at least one of said elements being a Group III element and one being a Group V element, said elements being in separate source tubes and kept at a temperature below their sublimation temperature or boiling points, but at a temperature sufficient for their reaction with the hydrogen chloride, whereby the elements combine with the hydrogen chloride to form the corresponding sub-chlorides such that essentially no unreacted hydrogen chloride remains; and
  b. transporting the sub-chlorides obtained in (a) to a deposition zone containing a single crystal substrate derived from at least one Group III element and one Group V element whereby the elements deposit on the substrate, with the rate of flow of carrier gas over each of the elements being adjusted so that the elements are deposited on the substrate in sufficient amounts to provide a binary, ternary, or quaternary compound consisting of elements of Group III and Group V.

3,888,706
METHOD OF MAKING A COMPACT GUARD-BANDED MOS INTEGRATED CIRCUIT DEVICE USING FRAMELIKE DIFFUSION-MASKING STRUCTURE

Andrew Gordon Francis Dingwall, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 6, 1973, Ser. No. 385,668
Int. Cl. H01i *7/44*
U.S. Cl. 148—187 **12 Claims**

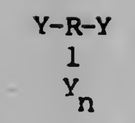
1. A method of making an integrated circuit device including an insulted gate field effect transistor, from a body of semiconductive material having a surface, comprising the steps of
  forming on said surface a diffusion-masking, framelike structure which has sides of predetermined width and a crossbar of predetermined width whereby two openings are defined therein, said framelike structure comprising a gate insulator layer on said surface of said body, a refractory conductor layer on said gate insulator layer, and an oxygen-impermeable layer on said conductor layer,
  diffusing conductivity modifiers into said body through the surface portions thereof within the two openings in said framelike structure to form spaced diffused regions in said body,
  diffusing conductivity modifiers into said body through surface portions outside and immeditely adjacent said framelike structure, and
  removing portions of at least the conductor layer and the oxygen-impermeable layer in said framelike structure to leave on said surface at least those portions of said layers located in the crossbar of said framelike structure.

3,888,707
FLEXIBLE, SELF-SUPPORTING EXPLOSIVE COMPOSITION

Julius Rothenstein, Sacramento, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 20, 1972, Ser. No. 243,504
Int. Cl. C06b *15/02;* **C06d** *5/06*
U.S. Cl. 149—19.4 **10 Claims**

1. A castable composition for forming a self-supporting, thermally stable, flexible explosive comprising 60-85 weight percent of fine particulate explosive filler selected from organic nitrates and organic nitramines dispersed in a binder formed of a low temperature curable liquid prepolymer of the formula

I. 

$$\begin{array}{c} Y{-}R{-}Y \\ | \\ Y_n \end{array}$$

and a coupling curing agent of the formula

$$Z—R^2—(Z)_m \; (II)$$

where n is an integer from 0 to 4, m is an integer of at least 2, R is an organic moiety having a molecular weight from 1,000 to 15,000, R^2 is an organic radical containing 2–50 carbon atoms and Z and Y are coreactive, condensible groups, capable of reaction to form ZY links which chain extend and crosslink the liquid prepolymer to form a continuous, flexible, thermally stable, high tensile strength explosive composition with high detonation velocity and low critical thickness, wherein Y is selected from the group consisting of thiol, hydroxyl, isocyanate, epoxy and amine and Z is a group coreactive and condensible with Y selected from the group consisting of isocyanate, carboxyl, amine, anhydride, hydroxyl or epoxy.

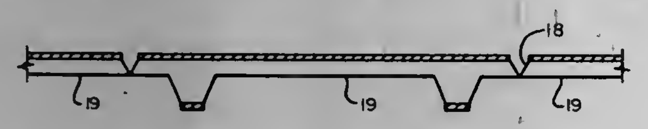
3,888,708
METHOD FOR FORMING REGIONS OF PREDETERMINED THICKNESS IN SILICON

Kensall D. Wise, 965 Buckeye Crt., Sunnyvale, Calif. 94086, and Samaun, Bandung Institute of Technology, Djl. Ganeco 10, Bandung, Indonesia

Continuation of Ser. No. 227,027, Feb. 17, 1972, abandoned. This application Apr. 10, 1974, Ser. No. 459,713

Int. Cl. H01l *7/50*

U.S. Cl. 156—11 **5 Claims**



1. A method of etching thin regions of predetermined thickness in a silicon body by use of an anisotropic etchant which comprises the steps of forming a silicon body with its (100) crystallographic plane extending parallel to opposite faces of the body, applying a layer resistant to the etchant to each of the opposite faces, removing a portion of said resistant layer from one face to form a slot of predetermined width in said layer to expose the underlying silicon, removing portions of the resistant layer from the opposite face in areas where the thin region of predetermined thickness is to be formed including removal of the resistant layer directly opposite said slot, subjecting the silicon body to said anisotropic etchant to remove silicon from the exposed areas on both faces, said etchant serving to form a groove of predetermined depth at said slot of predetermined width and quenching the etch when the silicon is removed to an extent that the etched opposite surface reaches the bottom of the groove.

3,888,709
CABLE FILLING COMPOUNDS

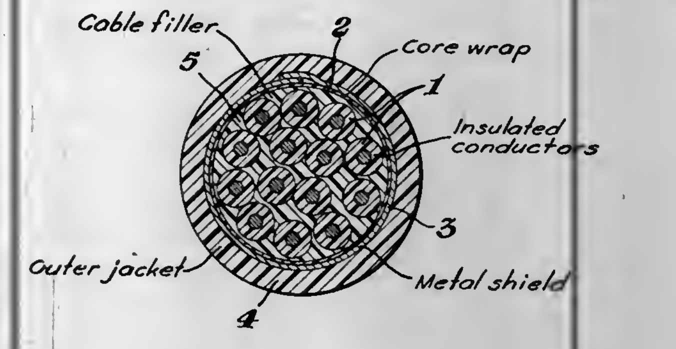
William R. Burk, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 10, 1974, Ser. No. 468,776

Int. Cl. H01b *13/00*

U.S. Cl. 156—48 **7 Claims**

1. A filling composition for electrical cables and devices, which composition comprises a major proportion of low density polyethylene constituent A and a minor proportion of low density polyethylene constituent B, which constituent A has melt flow rate value from about 5 to about 140 dg/min when measured by ASTM D–1238-70 at 50°C and 2,160 g total load using 0.0200 inch die orifice and which constituent B has melt flow rate value from about 0.2 to about 250 dg/min when measured by ASTM D–1238-70 at 190°C and 2,160 g total load using 0.0825 inch die orifice, the composition being a melt blended mixture of the constituents A and B and having



melt flow rate value from about 0.1 to about 25 dg/min when measured by ASTM D–1238-70 at 50°C and 2,160 g total load using 0.0200 inch die orifice.

3,888,710
PROCESSING CABLE FILLING COMPOUNDS

William R. Burk, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 10, 1974, Ser. No. 468,775

Int. Cl. H01b *13/00*

U.S. Cl. 156—48 **8 Claims**

8. In the manufacture of filled telecommunication cables by cold filling process wherein a plurality of insulated conductors are brought together and arranged to form a cable core bundle defining interstices and disposing in such interstices a cable filler compound at nearly ambient temperature whereby the resulting cable core is substantially filled with substantially solid material which resists flowing from the cable at temperatures below about 70°C, and wherein the filler compound is a blend comprising from about 89 to about 95 percent of low density polyethylene constituent A and from about 5 to about 11 percent of low density polyethylene constituent B, based on the combined weights of such constituents A and B, which constituent A has melt flow rate from about 25 to about 35 dg/min when measured by ASTM D-1238-70 at 50°C and 2,160 g total load using 0.0200 inch orifice die and which constituent B has melt flow rate from about 20 to about 50 dg/min when measured by ASTM D-1238-70 at 190°C and 2,160 g total load using 0.0825 inch orifice die, and the blend thereof having melt flow rate from about 1 to about 5 dg/min when measured by ASTM D-1238-70 at 50°C and 2,160 g total load using 0.0200 inch orifice die, the improvement which comprises quickly cooling the filler compound from a temperature of at least about 135°C to a temperature of at most about 75°C in a time not more than about five minutes, and thereafter disposing the resulting compound in the interstices of the cable core.

3,888,711
METHOD OF APPLYING METAL FILAMENTS TO SURFACES

Wilhelm Breitner, Bopser-Strasse 7, Stuttgart, Germany

Continuation of Ser. No. 154,586, June 18, 1971, abandoned. This application Aug. 28, 1973, Ser. No. 392,247

Claims priority, application Germany, June 19, 1970, 2030204

Int. Cl. B32b *17/04, 17/10*

U.S. Cl. 156—93 **9 Claims**

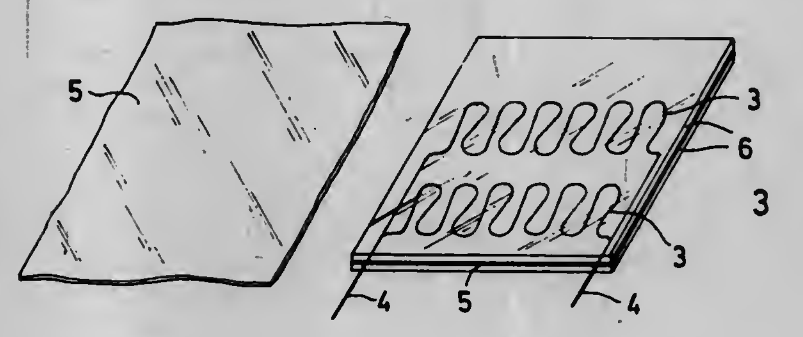
1. A method for producing a transparent glass sheet of a predetermined shape having an open transparent network of metallic filaments combined therewith, comprising the steps:

a. intertwining a plurality of metallic filaments in a transparent wavy pattern with electrically insulating fusible filaments by a technique other than weaving;

b. connecting said metallic filaments with a main electrical conductor;

c. stabilizing the metallic and insulating filaments by joining them together by means of a slight fusion of the metallic filaments with the metallic filaments at their junctions to form an open transparent stabilized self-supporting network;

d. shaping the stabilized self-supporting network to match with the shape of said glass sheet;



e. applying said network to a transparent plastic sheet and fusing the network into said plastic sheet to render said insulating filaments invisible;

f. fastening said plastic sheet containing the fused network to the surface of said sheet of glass.

3,888,712
METHOD FOR PRODUCING FIBERGLASS REINFORCED PLASTIC COMPOSITE PIPES

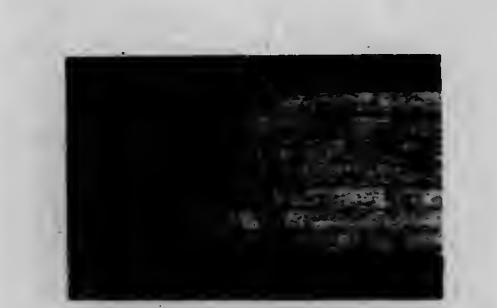
Katsumi Akiyoshi; Yukimasa Terui; Hitoshi Kirigaya, and Haruo Koyama, all of Tokyo, Japan, assignors to Bridgestone Tire Company Ltd., Tokyo, Japan

Filed Feb. 15, 1973, Ser. No. 332,758

Claims priority, application Japan, Feb. 22, 1972, 47-17725; Feb. 22, 1972, 47-17726; June 22, 1972, 47-62719

Int. Cl. B65h *81/02, 81/06*

U.S. Cl. 156—171 **11 Claims**



1. A method for producing fiber glass reinforced plastic composite pipes comprising the steps of

winding glass fiber threads impregnated with a thermosetting resin on a mandrel to form an inner tube,

applying a resinous concrete to said inner tube and of again winding glass fiber threads impregnated with a thermosetting resin, said layer thus forming an outer layer,

characterized in that the intermediate layer is formed by winding a sheet consisting of a resinous concrete, said sheet being prepared by thickening a mixture of

a. 100 parts of an unsaturated polyester resin,

b. 0.5 to 10 parts of an inorganic thickener selected from the group consisting of magnesium oxide, calcium oxide, calcium hydroxide, beryllium oxide and mixture thereof,

c. 0.1 to 5 parts of a cross-linking agent,

d. 0 to 5 parts of a cross-linking accelerator,

e. 100 to 900 parts of a filler, and

f. 0 to 30 parts of a diluting agent

at a temperature of 10° to 60°C and extruding the thickened mixture into the sheet.

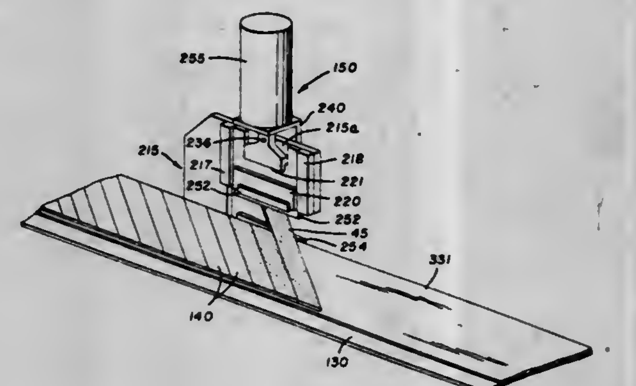
3,888,713
METHOD FOR PRODUCING REINFORCED FABRIC

Sterling W. Alderfer, Akron, Ohio, assignor to The Steelastic Company, Akron, Ohio

Division of Ser. No. 256,472, May 24, 1972, Pat. No. 3,803,965. This application Jan. 11, 1974, Ser. No. 432,692

Int. Cl. B32b *7/08*

U.S. Cl. 156—93 **7 Claims**



1. A method for fabricating reinforced elastomeric material comprising the cyclic steps of: encapsulating a reinforcement within a narrow ribbon of uncured, elastomeric material; orienting said reinforced ribbon on the first table of a bias cutting apparatus; engaging a length of said reinforced ribbon with a reciprocable shuttle head; transferring the support for said length of reinforced ribbon from said first table to the reciprocable shuttle head; vertically separating said length of reinforced ribbon, supported by the reciprocable shuttle head, from the first table; translating said length of reinforced ribbon, supported by the reciprocable shuttle head, past means for severing said reinforced ribbon to position a predetermined length of said reinforced ribbon over a second table; accurately depositing said predetermined length of said reinforced ribbon onto the second table of a bias cutting apparatus in contiguous juxtaposition with a previously deposited predetermined length of reinforced ribbon; and, severing the predetermined length of said reinforced ribbon.

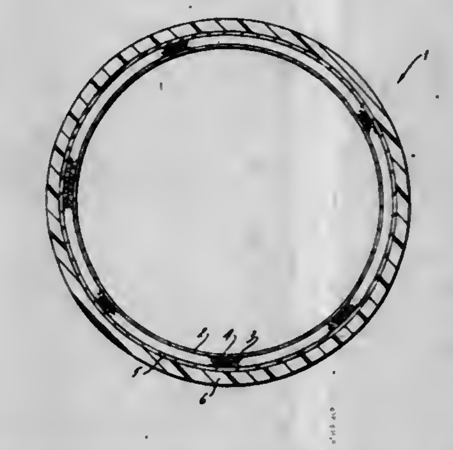
3,888,714
FIBER REINFORCED TUBULAR ARTICLE HAVING ABRASION RESISTANT LINER

James T. Fiser; Robert M. Jackman, and Ray R. James, all of Little Rock, Ark., assignors to A. O. Smith-Inland, Inc., Milwaukee, Wis.

Division of Ser. No. 250,767, May 5, 1972, Pat. No. 3,697,346. This application Sept. 11, 1973, Ser. No. 396,233

Int. Cl. B65h *81/00*

U.S. Cl. 156—171 **9 Claims**



1. The method of forming a tubular article having an inner liner resistant to abrasion, corrosion, and erosion including the steps of applying a fibrous material and a resin to a supporting surface, applying abrasion resistant particles to the fibrous material, maintaining the resin and particles in a con-

fined tubular condition to form the inner liner, applying fibrous filaments impregnated with thermosetting resin over the confined resin and particles, and curing the entire composite forming the tubular article.

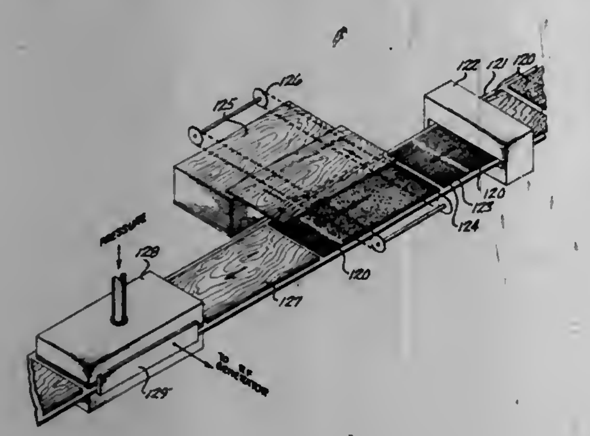
3,888,715
METHOD OF INDUCING HIGH FREQUENCY ELECTRIC CURRENT INTO A THERMOSETTING ADHESIVE JOINT

Richard S. Fraser, Los Angeles, Calif.; Cecil J. Allison, Jr., Richard W. Caster, Ronald J. McConnel, Robert E. Kribich, and Paul Y. Jone, all of Seattle, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation of Ser. No. 73,926, Sept. 21, 1970, abandoned. This application Aug. 27, 1973, Ser. No. 391,706

Int. Cl. B32b *21/04, 31/20*

U.S. Cl. 156—273 **19 Claims**



1. The process of bonding members with a thermosetting adhesive in a heat generating, dielectric, radio frequency field comprising:

locating a multiplicity of spaced apart, patterned field control elements within the glueline area between the members, said elements having a conductivity different from the adhesive and said pattern being a series of parallel stripes;

placing the members between the electrodes of the dielectric heat generator; and

applying the dielectric field parallel to the plane of the glueline area and perpendicular to the direction of the stripes for a time at least sufficient to induce bonding in the areas between the stripes.

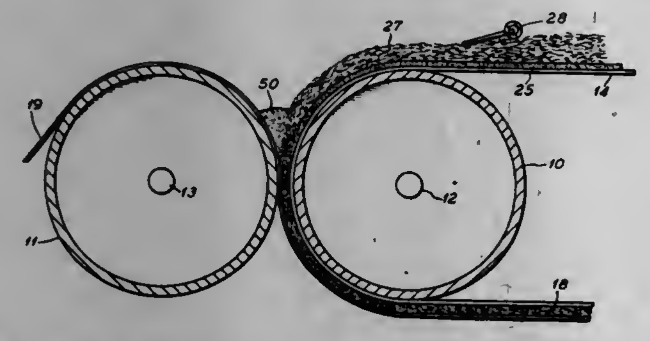
3,888,716
PREPARATION OF RESIN IMPREGNATED GLASS FIBER SHEETS

Donald B. Morse, Joliet, Ill., assignor to Kemlite Corporation, Joliet, Ill.

Filed June 5, 1972, Ser. No. 259,846

Int. Cl. B32b *31/12*

U.S. Cl. 156—276 **9 Claims**



1. A method of preparing a resin impregnated glass fiber sheet comprising depositing a layer of liquid thermosetting resin on a flexible film, depositing reinforcing glass fibers on the surface of said resin layer to form a structure in which a layer of intertangled glass fibers is held to said film by said resin, passing said structure along with a second film through the nip of a pair of spaced rolls with the film of said structure in contact with the surface of one of said rolls and said second film in contact with the surface of the other of said rolls and with said resin and glass fibers between said films, controlling the rate at which said resin is deposited on said first mentioned film with respect to the rate at which said resin is passed through said nip to provide and maintain a pool of liquid resin in advance of said nip and between said films, said structure being passed into and through said pool after the structure has been formed and before it passes said nip, and heating the combined resin and glass fibers to set the resin after they have passed said nip and while supporting and moving them away from said rolls.

3,888,717
SYSTEM FOR SUCCESSIVELY SPLICING BIAS-CUT PIECES OF RUBBER CLOTH

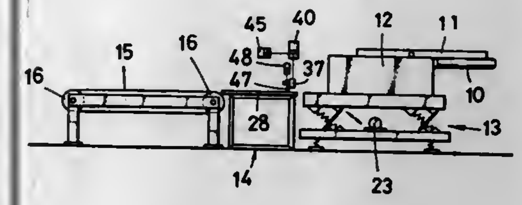
Masao Koyama, Hatano; Noboru Okada, Fujisawa, and Masahiro Ogawa, Hiratsuka, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Japan

Filed Sept. 21, 1973, Ser. No. 399,601

Claims priority, application Japan, Nov. 24, 1972, 47-118260

Int. Cl. B32b *31/10;* **G05g** *15/00*

U.S. Cl. 156—351 **10 Claims**



1. In a system for successively splicing parallelogram-shaped pieces of rubber cloth together, comprising in combination:

a vibrating conveyor onto which the pieces of rubber cloth of specified shape and size are supplied successively with a selected spacing from one to the next, said vibrating conveyor including: a trough; a guide plate formed along one edge of said trough, and means for imparting vibration to said trough whereby each of the successive pieces of rubber cloth is fed along said guide plate with one edge thereof in sliding contact with said guide plate into position for the splicing action; a splicer for joining the successive pieces of rubber cloth end to end, said splicer including: a table mounted in the direction of the splicing action from said vibrating conveyor and closely spaced therefrom so as to receive the successive pieces of rubber cloth from the vibrating conveyor; an elongate stop supported horizontally above said table for arresting the motion of each of the successive pieces of rubber cloth in a first position on said table; means for moving said stop up and down; a hollow suction arm supported horizontally above said table in side-by side relationship to said stop so as to be in registration with the leading edge of said each piece of cloth in said first position on said table, means communicating with said suction arm for creating a selected vacuum therein whereby the leading edge of said each piece of rubber cloth can be releasably adhered to said suction arm by suction exerted through at least one aperture formed at its bottom; means for moving said suction arm up and down independently of said stop; and means for moving said suction arm back and forth in the direction of the movement of the pieces of rubber cloth from said conveyor to said table so that the leading edge of said each piece of rubber cloth releasably adhered to said suction arm when the latter is in its depressed position is thereby elevated, carried forwardly over said table, and pressed down onto the trailing edge of the preceding piece of rubber cloth which has been held standing by in a second position on said table; and a take-up conveyor for carrying the spliced pieces of rubber cloth away from under such suction arm and said stop over a distance corresponding to the length of each piece of rubber cloth upon completion of each splicing operation.

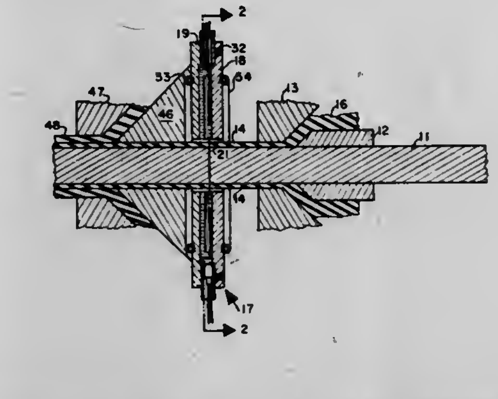
3,888,718
APPARATUS FOR APPLYING A DUAL EXTRUSION OVER A CABLE CONDUCTOR

Edwin H. Arnaudin, Jr., Marion; Wilbert W. Christiansen, Indianapolis, and Robert I. Hazelett, Jr., Marion, all of Ind., assignors to The Anaconda Company, New York, N.Y.

Division of Ser. No. 164,543, July 21, 1971, Pat. No. 3,746,575, which is a division of Ser. No. 873,811, Nov. 4, 1969, Pat. No. 3,626,196. This application Mar. 6, 1973, Ser. No. 338,720

Int. Cl. H01b *13/14;* **B29t** *3/10*

U.S. Cl. 156—356 **1 Claim**



1. Apparatus for applying a dual extrusion over a cable conductor comprising:

A. first die means continuously extruding a first layer of semiconducting polymeric material over said conductor,

B. a first plurality of optical fibers radially disposed around said conductor downstream of said die means,

C. means illuminating said conductor through said fibers,

D. a second large plurality of optical fibers radially disposed around said conductor so as to receive said illumination reflected from said conductor through any holidays in said coating said second plurality of optical fibers being axially displaced from said first plurality of optical fibers and said first and second pluralities of optical fibers being disposed in a plurality of planes wherein each of said planes is parallel to the conductor axis and includes the conductor axis,

E. sensing means communicating with said second plurality of fibers for sensing holidays in said coating, and

F. second die means downstream of said fibers for continuously extruding a second layer of polymeric material over said first layer.

3,888,719
ADJUSTABLE VACUUM PRESS

David A. Gibbs, Waban, Mass., and Donald N. Humphries, Oxford, Conn., assignors to Seal Incorporated, Derby, Conn.

Filed Apr. 10, 1973, Ser. No. 349,719

Int. Cl. B30b *15/34*

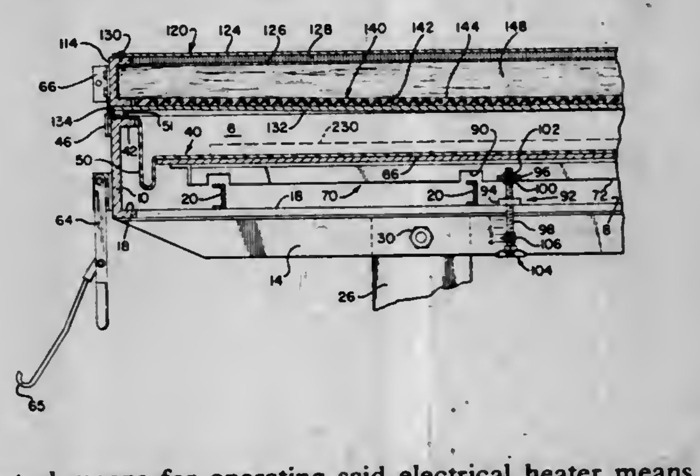
U.S. Cl. 156—378 **11 Claims**

11. A vacuum press comprising a platen assembly, a horizontal work support assembly below said platen assembly, and means hingedly connecting said platen assembly to said base so that said platen assembly is movable into and out of engagement with said work support assembly;

said platen assembly including a first frame, a flexible metal platen supported only at its edges by said first frame, and electrical heater means for heating said platen;

said work support assembly including a second frame, leg means attached to and supporting said second frame, and a flexible air-impermeable sheet mounted at its edges to said second frame, said sheet drooping between its edges; said platen assembly and said work support assembly when engaged providing an air-tight work-receiving chamber therebetween with said platen and flexible sheet forming opposite side walls of said chamber;

means for evacuating said chamber so that the atmospheric pressure exterior of said chamber will force said flexible sheet toward said platen and thereby compress a workpiece supported on said sheet;



control means for operating said electrical heater means and said evacuating means so that a workpiece in said chamber is both heated and compressed;

a vertically movable platform located below said flexible sheet for supporting at least part of the drooping portion of said sheet; and

means connected to said second frame for supporting and vertically moving said platform so as to vary the height at which the drooping portion of said sheet is supported by said platform.

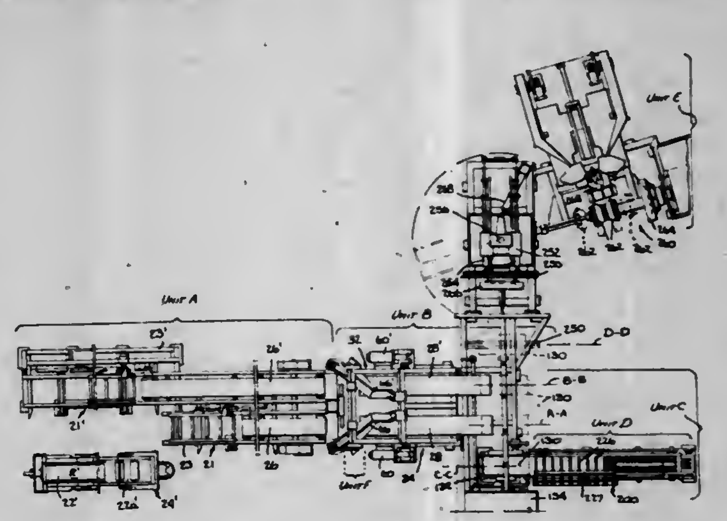
3,888,720
TIRE BUILDING MACHINE HAVING A VARIABLE DIAMETER TIRE BUILDING DRUM

William C. Habert, Fraser, Mich., assignor to Uniroyal, Inc., New York, N.Y.

Filed Feb. 5, 1973, Ser. No. 329,786

Int. Cl. B29h *17/16*

U.S. Cl. 156—414 **32 Claims**



1. A tire building drum for the building of a tire of a selected diameter from within a range of diameters comprising

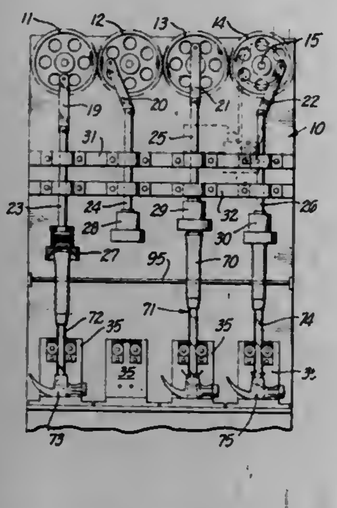
a plurality of arcuate segments forming the circumferential periphery of the drum, said arcuate segments being radially movable with respect to the longitudinal axis of rotation of the drum, each segment extending axially for the entire axial width of the drum, the segments being arranged circumferentially adjacent one another to form a substantially continuous rigid surface;

and drive means for uniformly radially moving all the segments simultaneously to the selected diameter, said drive means comprising a cam means having a single continuous spiral operatively, connected with each segment, each segment having a radially inward extending leg of a different length and a cam follower engaging the spiral cam means at different radial locations in the spiral to maintain the segmented drum with a uniform circumference.

3,888,721
APPARATUS FOR ATTACHING FIBERGLASS HANDLES

Joseph Allen Carmien, Beverly Hills; Elbert Davis, Glendale, and Roger G. Cervi, Inglewood, all of Calif., assignors to Nupla Corporation, Sun Valley, Calif.

Filed May 28, 1974, Ser. No. 473,725
Int. Cl. B29d *3/00;* **C72b** *3/00*
U.S. Cl. 156—423 10 Claims



1. An apparatus for making a fiberglass connection of the type in which one end of an elongated handle is mounted in an opening in a tool head, said apparatus comprising a rotatably mounted wheel, a member adapted to engage the upper end of an elongated vertically directed handle disposed beneath said member, means connecting said member to said wheel for reciprocal vertical movement of said member upon rotation of said wheel, means for disposing a tool head having a handle receiving opening beneath said handle with said opening aligned with said handle, said opening being adapted to hold a charge of potting compound, said member and handle being movable vertically downwardly upon rotational movement of said wheel to move the lower end of said handle into said opening, the downward movement of said handle being progressively slower as the lower end of said handle moves toward the bottom of said opening and engages the potting compound therein, whereby said potting compound is slowly displaced upwardly substantially evenly around and between all of the inner walls of said opening and the adjacent sides of said handle to form a bond between said handle and tool head.

3,888,722
BACK LINER APPLYING APPARATUS

Penn B. Blair, and John W. Demand, both of Topeka, Kans., assignors to Brackett Stripping Machine, Inc., Topeka, Kans.

Filed Nov. 9, 1973, Ser. No. 414,238
Int. Cl. B32b *1/04;* **B42c** *19/00*
U.S. Cl. 156—477 B 8 Claims

1. A back liner applying apparatus comprising:

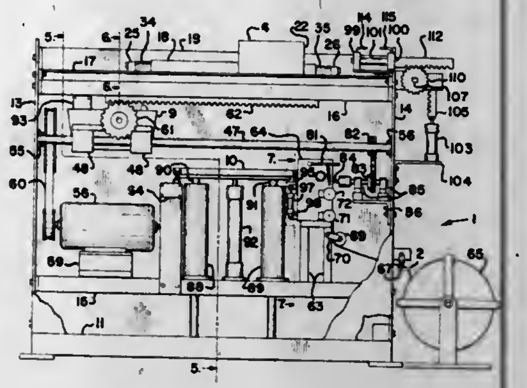
a. an elongate frame having a top portion and first and second ends;

b. a platform having an upper face with means on said frame for selectively effecting up and down movement of said platform;

c. clamping jaws above the platform and having opposed vertical faces extending longitudinally of the frame and on opposite sides of a longitudinal center thereof with means mounting said jaws for movement transversely of the frame;

d. means operatively connected to said clamping jaws for simultaneously moving same toward each other for clamping a plurality of elongate sheets to be joined together with back edges of the sheets resting on and supported in registry by said upper face of the platform, said plurality of clamped sheets being maintained in the clamped position centered relative to said longitudinal center;

e. a glue container mounted on said frame for reciprocable movement longitudinally under said back edges when the platform is in a lowered position, an applicator roller mounted in said glue container and rotatable on a transverse axis, said roller having a peripheral surface of a width greater than the width of said back edges and substantially centered relative to the longitudinal center of the frame, said roller periphery rolling a coating of glue of a selected thickness onto the back edges of said clamped sheets as the glue container is moved thereunder from adjacent said frame first end toward said frame second end and back toward said frame first end;



f. means on said frame adjacent said second end for dispensing back liner tape onto said platform upper face and centered relative to said longitudinal center of the frame, said tape dispensing means being operative in response to movement of the glue container and said tape being under said back edges and extending transversely and longitudinally beyond same;

g. said platform moving means being operative after return of the glue container to adjacent said frame first end to move said platform up and press the tape onto the glue coated back edges.

3,888,723
MACHINE FOR ASSEMBLING A GASKET ASSEMBLY

Paul J. Artzer, Arvada, Colo., assignor to Appleton Electric Company, Chicago, Ill.

Filed Oct. 10, 1973, Ser. No. 405,148
Int. Cl. B32b *31/04;* **B21d** *51/46*
U.S. Cl. 156—499 17 Claims

1. An apparatus for forming gaskets, each of which comprises an elastomeric washer having an axial opening therein and a cylindrical outer face and a rigid support member having an axial opening therethrough and a peripheral flange with an inner face, one of said faces having a thermo-responsive adhesive thereon, said apparatus comprising:

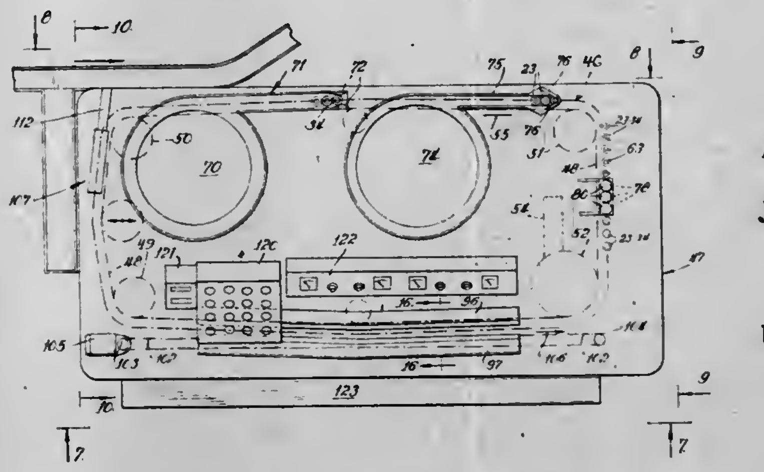
a frame;

endless conveyor means mounted on said frame and trained for movement in a given direction along a closed path, said conveyor having a plurality of vertically positioned mandrels with their distal ends upwardly, said mandrels being removably mounted, and including a second set of mandrels of a different diameter for use in forming gaskets of a second size;

power means connected to said conveyor means for moving the conveyor means in a given direction, said power means periodically indexing said conveyor means with a dwell between each indexing movement, the amount of the indexing movement being a multiple of the distance between adjacent mandrels;

first feeding means mounted on said frame and positioned at a first point along said path for positioning a support member with the flange upwardly on a mandrel as that mandrel is at said first point;

second feeding means mounted on said frame and positioned at a second point, in said direction from said first point, for positioning a washer on the mandrel above the support member as the mandrel carrying the support member is at said second point;



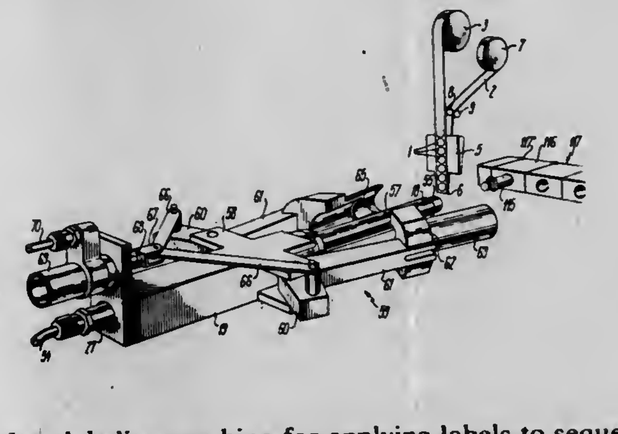
positioning means mounted on said frame and positioned above said path at a point at which mandrels carrying support members and washers move below it, said positioning means being movable downwardly over the mandrel for seating the washer into the member on the mandrel, said positioning means performing said downward movement during a dwell period; and

means on said frame for heating the support member for activating said adhesive.

3,888,724
LABELING MACHINE

Walter Spannknebel, Beuren, and Leopold Wicenec, Oberensingen, both of Germany, assignors to Schafer-Etiketten, Hubert H. Schafer, Wolfschlugen, Germany

Filed Oct. 23, 1973, Ser. No. 408,640
Int. Cl. B44c *1/00;* **B65c** *9/14*
U.S. Cl. 156—541 12 Claims



1. In a labeling machine for applying labels to sequentially presented objects, including means for sequentially presenting the labels; a label holder for carrying the presented label toward and applying it to the surface of the object to be labeled; guide means for guiding the object to be labeled into a defined position with respect to the label holder, the improvement comprising

a. a supporting face forming part of said label holder, said supporting face having an outline and being disposed perpendicularly to the direction in which said label holder carries and applies the label to the object to be labeled;

b. gripping means for attaching the label to and retaining it on said supporting face in a face-to-face relationship therewith, said gripping means being arranged for allowing displacement of the label in its plane on said supporting face;

c. aligning means for engaging edge portions of the label projecting beyond said outline of said supporting face for shifting the label in its plane on said supporting face into a defined position with respect to said supporting face;

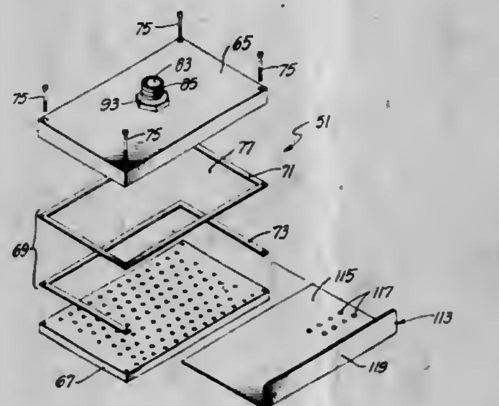
d. means for movably supporting said aligning means; and

e. means for moving said aligning means towards and away from said supporting face in a direction at least approximately parallel to the plane of said supporting face.

3,888,725
AIR MANIFOLD WITH MASK AND LABEL APPLICATOR UTILIZING THE SAME

John B. French, Hacienda Heights, Calif., assignor to Compac Corporation, Newark, N.J.

Filed Mar. 16, 1973, Ser. No. 342,283
Int. Cl. B65h *29/24*
U.S. Cl. 156—556 15 Claims



1. A label applicator for applying a label to an article comprising:

a supporting structure;

means on the supporting structure for releasably retaining the label;

a manifold on the supporting structure;

said manifold defining a chamber adapted to receive gas under pressure and having a slot leading from the exterior of said chamber to the interior of said chamber;

said manifold having aperture means for directing gas from the chamber to apply the label to the article;

a mask having opening means therein, said mask being insertable through said slot into said chamber; and

said manifold including means for mounting said mask in said chamber with said opening means and said aperture means being in at least partial registry and with said mask masking off part of said aperture means whereby said mask influences the configuration of the air pattern which moves from said chamber toward said preselected location.

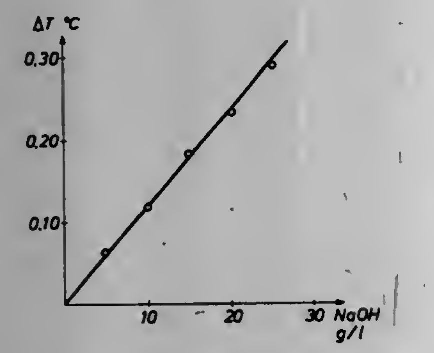
3,888,726
PROCESS FOR DETERMINING ALKALI CONTENT IN ALKALINE PULPING LIQUOR BY A CALORIMETRIC MEASUREMENT OF THE HEAT OF PARTIAL NEUTRALIZATION OF THE PULPING LIQUOR

Bengt Goran Hultman, Domsjoverken, Sweden, assignor to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed July 9, 1973, Ser. No. 377,856
Claims priority, application Sweden, July 14, 1972, 9342/72
Int. Cl. D21c *7/12;* **G01n** *25/48*
U.S. Cl. 162—49 21 Claims

1. A process for determining the effective alkali content of an alkaline pulping liquor comprising an alkali metal hydroxide and an alkali metal sulfide, which comprises taking a

sample of the alkaline pulping liquor, mixing the sample with an acid reacting buffer having a pH less than the pH of the alkaline pulping liquor, in an amount to bring the pH of the resulting mixture to within the range from about 9.5 to about



12.5, measuring the heat liberated in the resulting partial neutralization of the effective alkali calorimetrically, and from such measurement determining the effective alkali content of the pulping liquor.

3,888,727
TREATMENT OF LIGNOCELLULOSIC MATERIAL IN AN ALKALINE PULPING LIQUOR CONTAINING ANTHRAQUINONE SULPHONIC ACID FOLLOWED BY OXYGEN DELIGNIFICATION

Samuel Kenig, Longueuil, Quebec, Canada, assignor to Canadian Industries Limited, Montreal, Quebec, Canada

Filed Apr. 8, 1974, Ser. No. 459,112

Claims priority, application United Kingdom, Apr. 26, 1973, 19794/73; Dec. 31, 1973, 60303/73

Int. Cl.² D21C *9/10*

U.S. Cl. 162—65 **14 Claims**

1. A process for the delignification of lignocellulosic material which comprises the steps of

1. treating lignocellulosic material in a closed reaction vessel with pulping liquor containing a reagent selected from the group consisting of an alkali metal hydroxide and a mixture of an alkali metal hydroxide and an alkali metal sulphide, wherein there is added to said pulping liquor 0.02 to 2.0 percent, preferably 0.05% to 1.0% by weight, based on the weight of the lignocellulosic material of a material selected from the group consisting of anthraquinone mono sulphonic acid, anthraquinone disulphonic acid, alkali metal salts of said acids and admixtures of aforesaid acids and salts, at a temperature in the range 160°C to 195°C for a period of not greater than 120 minutes and preferably not greater than 90 minutes, the temperature and period of treatment being adapted to provide a pulp yield of 55 to 65 percent by weight,
2. displacing the pulping liquor from the lignocellulosic material with water, or an aqueous solution of alkali metal hydroxide,
3. treating the lignocellulosic material without prior defiberization at a consistency of 2.0 to 30.0 percent by weight in aqueous suspension for 0.5 to 30 minutes at 20°C to 90°C with 2.0 to 20.0 percent by weight of alkali metal hydroxide.
4. treating the alkaline lignocellulosic material in aqueous medium at a consistency of from 3.0 to 35.0 percent by weight with oxygen or an oxygen-containing gas for 10 to 120 minutes at a temperature of 80°C to 140°C and a partial pressure of oxygen of 30 to 200 pounds per square inch, and
5. washing the oxygen treated lignocellulosic material with water.

3,888,728
PROCESS FOR MANUFACTURING CARRIER SHEETS TREATED WITH HARDENABLE AMINOPLAST RESIN PRELIMINARY CONDENSATES FOR SURFACE COATING

Bruno Petrik, and Erich Ruf, both of Essen, Germany, assignors to TH Goldschmidt AG, Essen, Germany

Filed Sept. 10, 1973, Ser. No. 395,549

Claims priority, application Germany, Oct. 18, 1972, 2250991

Int. Cl. D21h *1/40*

U.S. Cl. 162—167 **6 Claims**

1. In the process of making a carrier sheet by saturating said sheet with an aqueous solution of at least one hardenable aminoplast resin preliminary condensate,

the improvement which comprises including in said saturating solution about 0.05 to 3 percent by weight, based upon solid resin, of a compound selected from the group consisting of an ethylene glycol fatty acid ester and a propylene glycol fatty acid ester.

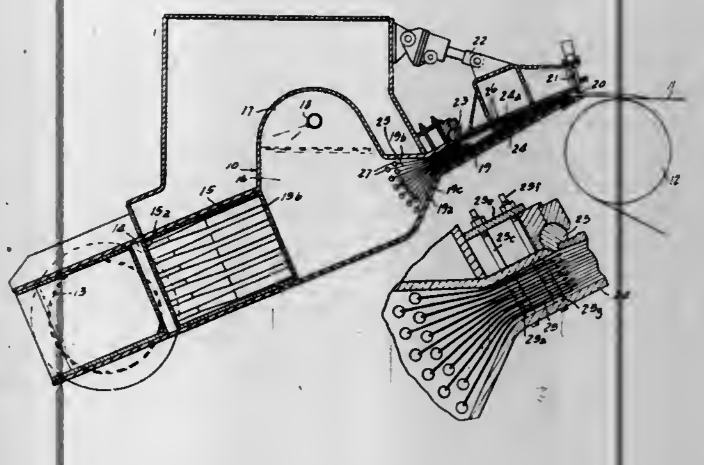
3,888,729
PAPERMAKING MACHINE HEADBOX SLICE CHAMBER CONTAINING PIVOTABLE THIN RIGID PLATES WITH FLEXIBLE ELEMENTS ATTACHED THERETO

Joseph D. Parker, deceased, late of 12052 S. Gate Rd., Roscoe, Ill. 61073; by Dorothy C. Parker, executrix, 12052 S. Gate Rd., Roscoe, Ill. 61073; Richard E. Hergert, 402 Liddle St., Rockton, Ill. 61072, and Arnold J. Roerig, 1508 S. Ridge Rd., Beloit, Wis. 53511

Filed Nov. 6, 1972, Ser. No. 303,972

Int. Cl. D21f *1/02*

U.S. Cl. 162—343 **16 Claims**



1. In a headbox for delivering stock to a forming surface, the headbox having a slice chamber and a slice opening, the improvement comprising,

a plurality of rigid plates positioned in the slice chamber,
  each of said plates extending transversely of said headbox and projecting downstream generally in the direction of stock flow,
trailing elements attached to the downstream ends of said plates,
  said elements being attached to said plates only at their upstream ends with their downstream portions unattached and constructed to be self-positionable so as to be solely responsive to forces exerted thereon by the stock flowing toward the slice opening,
and means yieldably supporting said rigid plates so that the plates are self-positionable in a direction transverse of their surfaces so as to be solely responsive to forces exerted thereon by the stock flowing toward the slice.

3,888,730
NUCLEAR REACTORS

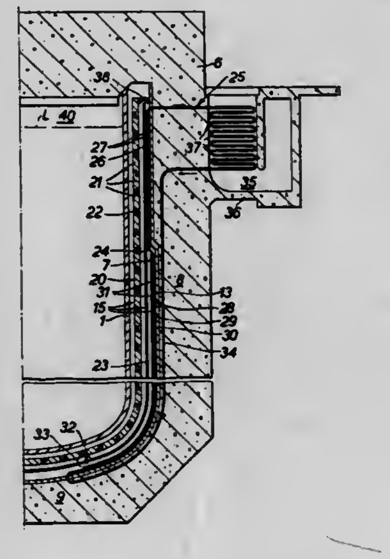
George Oliver Jackson, Timperley, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Feb. 17, 1969, Ser. No. 799,832

Claims priority, application United Kingdom, Feb. 23, 1968, 9038/68

Int. Cl. G21c *1/02*

U.S. Cl. 176—38 **1 Claim**



1. A liquid metal cooled fast reactor comprising a fast reactor core structure, a heat exchanger, and means for circulating a liquid coolant through said core structure and heat exchanger, wherein there is provided a single wall open top coolant tank containing a pool of liquid metal coolant in which said core structure is submerged and said heat exchanger and circulating means are immersed, a concrete vault structure comprising a wall part and a base part and a roof part containing said single wall coolant tank and spaced from the tank at said wall and base part, a membrane lining for said vault structure, sealing means between that part of the lining of the roof part and that part of the lining of the wall part of the vault structure, and means for cooling at least the wall part of said vault structure, there being provided, in the space between the coolant tank and the membrane lining, in the following order outwardly from the tank, a heat insulation structure, a baffle, and pipe means conducting coolant fluid, said pipe means extending into the body of the vault structure to cool at least the wall part of the vault structure, and through the vault structure to a heat exchanging coil outside the vault structure and from said coil back to the space between the coolant tank and membrane lining, and wherein said space is filled with an inert gas, with means for inducing convection circulation of said gas.

3,888,731
MODULAR CORE COMPONENT SUPPORT FOR NUCLEAR REACTOR

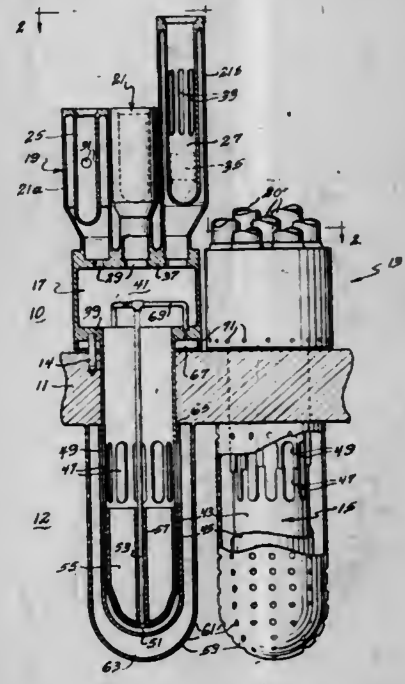
Lester M. Finch, and Andy J. Anthony, both of Pasco, Wash., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 15, 1973, Ser. No. 341,612

Int. Cl. G21c *15/00*

U.S. Cl. 176—50 **3 Claims**

1. In a nuclear reactor core including a grid plate with openings therethrough separating zones of high and low coolant pressure, a plurality of receptacles depending from said grid plate into said high pressure coolant zone, each of said receptacles having side wall openings for admitting coolant flow and a top opening aligned with an opening through said grid plate, and core components requiring a coolant flow therethrough supported by said grid plate, the improved combination comprising a plurality of replaceable and interchangeable core component modules each having a coolant inlet portion disposed through an opening in said grid plate into a corresponding one of said receptacles, said coolant inlet portion having side wall openings alignable with said side wall openings in said corresponding receptacle; each module having a vestibule with an internal chamber defined by upper, lower and lateral walls disposed above said grid plate, said lower wall having an opening for admitting coolant flow and being joined to said coolant inlet portion; and each module having a plurality of elongated, vertical socket members connected to and above said vestibule, each of said socket members including an inner receptacle part adapted to receive and support one of said core components, said receptacle part having side wall openings for admitting coolant flow to said core component, and each of said socket members including



an outer jacket spaced from and extending over the length of said receptacle part to define a coolant flow passageway to said side wall openings in said receptacle part, each of said outer jackets having a tubular neck at the lower end thereof connected into said upper vestibule wall at spaced apart locations and in communication with said vestibule internal chamber, said tubular necks being attached at peripheral and central locations on the surface of said upper vestibule wall and said tubular necks at said peripheral locations being axially offset on respective socket members and aligned inwardly toward the center of said upper vestibule wall surface to permit close assemblage of core components, said vestibule including said internal chamber for containing coolant, extending over and shielding said grid plate at locations beneath and intermediate said locations of tubular neck attachment from upwardly originating radiation.

3,888,732
INLET FOR FUEL ASSEMBLY HAVING FINGER CONTROL RODS

Ake Berglund; Antti Suvanto, and Lars Tornblom, all of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

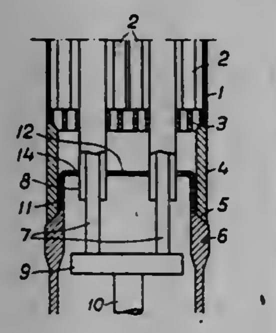
Continuation-in-part of Ser. No. 286,834, Sept. 6, 1972, abandoned. This application Sept. 14, 1973, Ser. No. 397,302

Int. Cl. G21c *15/02*

U.S. Cl. 176—50 **3 Claims**

1. In a liquid-cooled nuclear reactor having a bottom wall in which the core comprises vertically arranged fuel assemblies (1) placed on supporting members (6) comprising tubular members secured to the bottom wall and extending upwardly therefrom and having openings thereinto for cooling liquid and having control rods displaceably arranged in guide tubes (8) positioned between the fuel rods (2) inside the fuel

assemblies, the bottom end of said fuel assemblies and the top portion of said supporting members having mating surfaces, the top of said supporting member (6) being closed with a horizontal end piece (12) having openings therein forming throttling means (14, 15) for liquid flow which passes from below up through the supporting member and past the fuel rods in the fuel assembly, said end piece being affixed to and



a part of said supporting member, the lower ends of said guide tubes passing through said openings in said end piece to a position below said end piece, said lower ends of said guide tubes also being inlets to the guide tubes (8) for the control rods (7), where a higher pressure prevails at the inlets to the guide tubes than above the end piece, whereby a stronger flow of coolant is produced through the guide tubes than through the rest of the fuel assembly.

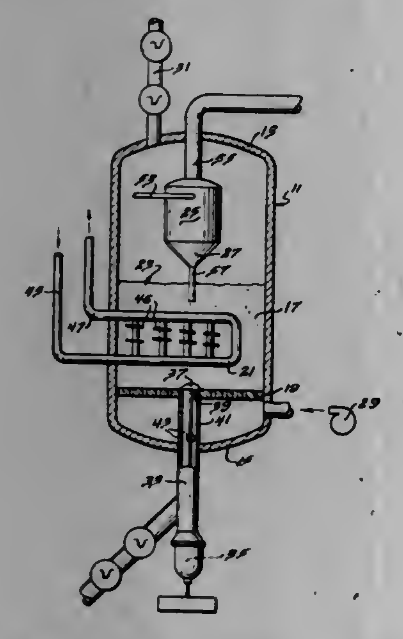
3,888,733
FLUIDIZED-BED NUCLEAR REACTOR

Earl S. Grimmett, and Jay F. Kunze, both of Idaho Falls, Idaho, assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Dec. 21, 1973, Ser. No. 427,391

Int. Cl. G21c *3/44*

U.S. Cl. 176—52 **1 Claim**



1. A fluidized-bed nuclear reactor comprising a reactor vessel having a gas inlet in the lower portion and a gas outlet in the upper portion;

- a mass of composite particles disposed within said reactor vessel, said composite particles having cores of $^{232}ThO_2$ of about 200 microns diameter enclosed within graphite coatings of about 200 microns thickness and being 2.6 to 3.8 gm/cm^3 in density;
- a first conduit circuit interconnecting said gas inlet to said gas outlet of said reactor vessel, said circuit having gas-pumping means for circulating gaseous $^{233}UF_6$ upwardly through said reactor vessel at about 40 atmospheres pressure and at an incipient fluidizing velocity of 25 to 30 cm/sec to fluidize said mass of particles in a state of aggregative fluidization in a volume of about 60 cubic meters, wherein a fission reaction is produced, having a heat exchanger within said circuit external to said reactor vessel for cooling said gaseous $^{233}UF_6$ and having absorber means within said circuit for removing fission products from said gaseous $^{233}UF_6$;
- a shunt conduit circuit connected into said first conduit circuit across said absorber means, said shunt conduit circuit including a reservoir and control valve means for controlling the pressure within said reactor vessel, for withdrawing $^{233}UF_6$ gas with fission products at a first location, and for adding $^{233}UF_6$ gas with at least a portion of said fission products removed at a second location downstream of said first location to establish and maintain a fission reaction;
- a second conduit circuit for circulating a coolant fluid and removing heat produced by said fission reaction within said reactor vessel, said circuit including a portion comprising tubing of zirconium-based alloy disposed within said reactor vessel at positions submerged within said mass of particles and a portion extending outside said reactor vessel including energy conversion means for removing and utilizing said heat produced.

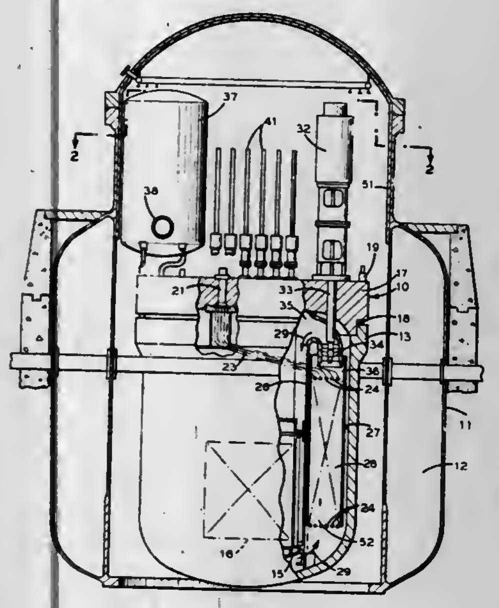
3,888,734
COMPACT NUCLEAR REACTOR

Slavko I. Juric, Lynchburg, Va., assignor to The Babcock Wilcox Company, New York, N.Y.

Filed June 15, 1971, Ser. No. 153,304

Int. Cl. G21c *15/22, 15/24, 15/18*

U.S. Cl. 176—61 **2 Claims**



1. A pressurized water reactor having a reactor core with a coolant flowpath that has a natural upward circulation direction and a structure for pressurized water flow therethrough, comprising a pressure vessel having a longitudinal axis for containing the pressurized water and promoting the flow of the pressurized water therewithin, said pressure vessel having a generally cylindrical shape that is open on one end, said open end being transverse to said longitudinal axis of said pressure vessel, a closure separably engaged to said pressure vessel and fitting over said pressure vessel opening, a longitudinally disposed shroud positioned in said pressure vessel forming an annular space with said pressure vessel for the pressurized water to flow upwardly through said annular space selectively in a forced flow direction that is opposite to a downward natural circulation longitudinal direction in said annular space, a bank of vapor generating tubes disposed in said annular flow space, said tubes having inlet and outlet openings, a plurality of inlet headers secured to said closure and in communication with said tube inlet openings and a plurality of outlet headers secured to said closure and which communicate with said tube outlet openings, a plurality of control rods operatively passing through said closure, at least one external pressurizer engaged to said closure and communicating with the interior of said pressure vessel through said closure to maintain the pressurized water in the liquid phase, and a plurality of pumps secured to said closure and each having a shaft passing through said closure, each of said shafts provided with an impeller positioned in said annular flow space beneath said closure for producing said forced flow upwardly over said vapor generating tubes and downwardly through said core, wherein said pressurized water flows through said annular space in the downward flow longitudinal direction and through the core in an upward natural circulation longitudinal direction for protection and safety upon failure of said pumps, and whereby separation of said closure from said pressure vessel for inspection, maintenance and repair will remove said inlet and outlet headers, said control rods, said pressurizer and said plurality of pumps from said pressure vessel.

3,888,735
INTEGRAL-FUEL BLOCKS

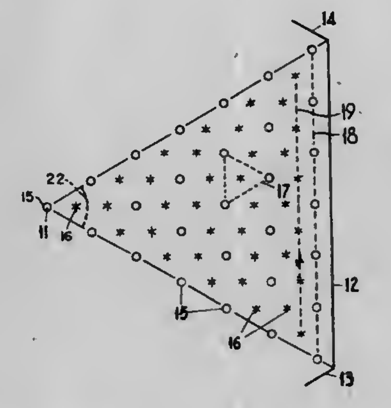
Christopher Cunningham, Leicester, and Sidney David Simpkin, Enderby, both of England, assignors to British Nuclear Design of Construction Ltd., Leicestershire, England

Filed June 25, 1973, Ser. No. 373,032

Claims priority, application United Kingdom, June 30, 1972, 30781/72

Int. Cl. G21c *5/02*

U.S. Cl. 176—84 **7 Claims**



1. A prismatic fuel-containing moderator block having two kinds of channels, namely fuel-containing channels and coolant channels, disposed parallel to each other and to edge faces of the block, with the coolant channels arranged in rows on an equilateral triangular lattice pattern and the fuel-containing channels disposed in a regular lattice pattern with one fuel-containing channel between and equidistant from each of the coolant channels in each group of three mutually-adjacent coolant channels, wherein the edge faces of the block are parallel to the rows of coolant channels and the channels nearest to each edge face are disposed in two rows parallel thereto, with one of the two rows containing only coolant channels and the other of the two rows containing only fuel-containing channels.

3,888,736
METHOD OF RECOVERING MICROBIAL CELLS CONTAINING PROTEIN

Hiroshi Iizuka; Naosuke Seto, both of Tokyo, and Sadao Sakayanagi, Kawasaki, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 20,054, March 16, 1970, abandoned. This application Aug. 1, 1972, Ser. No. 276,957

Claims priority, application Japan, Sept. 16, 1969, 44-72992

Int. Cl. C12d *13/00*

U.S. Cl. 195—28 R **10 Claims**

1. A method of recovering protein-containing cells, which comprises culturing a microorganisms selected from the group consisting of Mycobacterium cuneatum and Mycobacterium petroleophilum, bacteria belonging to the genus Mycobacterium under aerobic conditions in a culture medium containing as a carbon source selected from a mixture of CO_2 and H_2, $C_1 - C_5$ hydrocarbons and $C_{11} - C_{18}$ n-paraffins, and separating and recovering cells from the culture broth.

3,888,737
PROCESS OF PRODUCING L-LYSINE USING MIXED MICROORGANISMS

Kiyoshi Watanabe; Tamotsu Hirakawa; Kenji Takahara; Yoshio Nakamura; Sueo Iwasaki, and Tutomu Tanaka, all of Hyogo, Japan, assignors to Kanegafuchi Chemical Industries Co., Ltd., Osaka, Japan

Filed Feb. 22, 1974, Ser. No. 445,041

Claims priority, application Japan, Feb. 22, 1973, 48-21982; June 22, 1973, 48-71121

Int. Cl. C12b *1/00*

U.S. Cl. 195—28 R **10 Claims**

1. A fermentation process for producing L-lysine comprising aerobically culturing a mixture of (1) a hydrocarbon-assimilating and L-lysine producing bacterium and (2) at least one hydro-carbon non-assimilating microorganism which has low capability for L-lysine production in a nutrient medium which contains a hydrocarbon or a mixture of hydrocarbon as a main carbon source, and recovering said L-lysine from said medium.

3,888,738
METHOD FOR PURIFYING CYCLODEXTRIN-PRODUCING ENZYMES

Shigetaka Okada, Nara, and Sumio Kitahata, Osaka, both of Japan, assignors to Hayashibara Kabushiki-Kaisha, Okayama, Japan

Filed Oct. 31, 1973, Ser. No. 411,218

Int. Cl. C07g *7/02*

U.S. Cl. 195—66 R **4 Claims**

1. A method for purifying alpha-1,4-glucan 4-glycosyltransferase, comprising adsorbing the enzyme on cyclodextrin, desorbing and recovering the enzyme.

3,888,739
REAGENTS AND METHODS FOR DETERMINING AMYLASE CONCENTRATIONS

Lawrence C. Whetzel, Irvine, and Margaret E. Townsend, Tustin, both of Calif., assignors to Bio-Reagents & Diagnostics, Inc., Irvine, Calif.

Filed May 7, 1973, Ser. No. 357,905

Int. Cl. G01n *33/00*

U.S. Cl. 195—99 **4 Claims**

1. A solution of starch in distilled water for use with a prescribed iodine solution for determining the concentration of amylase, said solution comprised of the following:

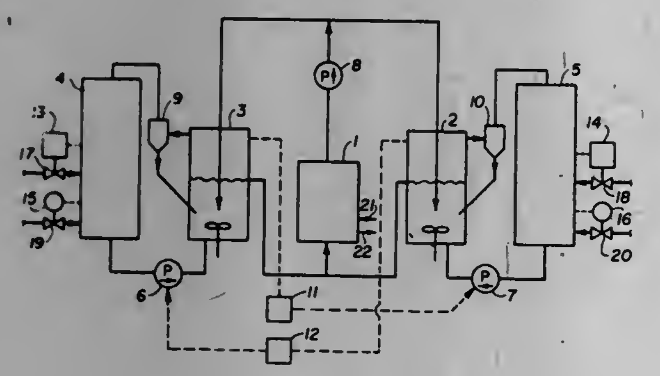
- a. a buffer in a concentration of about 0.002M to about 2.0M, and having a pH between about 6 to about 8;
- b. a chloride salt in a concentration of about 0.001M to about 1M; and
- c. a starch in a concentration of about 0.3 to about 20.0 grams per liter, and consisting essentially of a starch that is readily soluble in water at room temperature and will produce a definite blue color upon the addition of an aqueous iodine solution thereto,

said solution having a pH of about 7.0.

3,888,740
METHOD FOR CULTURING HYDROGEN OXIDIZING BACTERIUM

Ayaaki Ishizaki, Kawasaki; Yasushi Morinaga; Hiroyuki Sakakibara, both of Yokohama, and Masao Horiuchi, Kawasaki, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Aug. 28, 1974, Ser. No. 501,136
Claims priority, application Japan, Sept. 5, 1973, 48-99908
Int. Cl. C12b *1/14*
U.S. Cl. 195—109 **5 Claims**



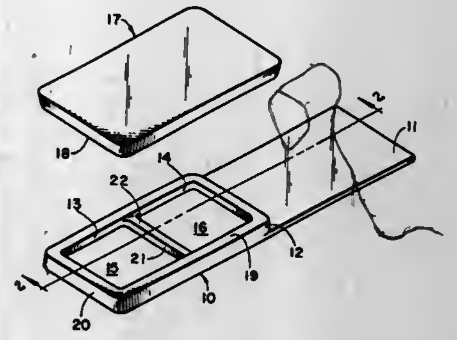
1. A method of culturing a hydrogen oxidizing bacterium which comprises:
   - a. inoculating an aqueous culture medium with said bacterium;
   - b. circulating a first portion of said medium between a container and a first enriching station;
   - c. circulating a second portion of said medium separate from said first portion between said container and a second enriching station;
   - d. dissolving hydrogen gas in said first portion at said first station;
   - e. dissolving oxygen gas in said second portion at said second station at a rate to keep the concentration of oxygen gas in the hydrogen gas at said first station below the explosive limit of the gas mixture at said first station,
     - 1. the hydrogen gas being dissolved in said medium at said first station at a rate to keep the concentration of hydrogen gas in the oxygen gas at said second station below the explosive limit of the gas mixture at said second station;
   - f. mixing said first and second portions respectively enriched with dissolved hydrogen and oxygen in said container; and
   - g. maintaining in said medium a concentration of dissolved carbon dioxide sufficient for maintaining the growth of said bacterium.

3,888,741
CULTURING MEANS AND TEST KIT

Ronald Freake; Mau H. Kuo, both of Elkhart, and Devendra Vaikunthlal Mehta, South Bend, all of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Apr. 25, 1974, Ser. No. 464,107
Int. Cl. C12k *1/10*
U.S. Cl. 195—139 **34 Claims**

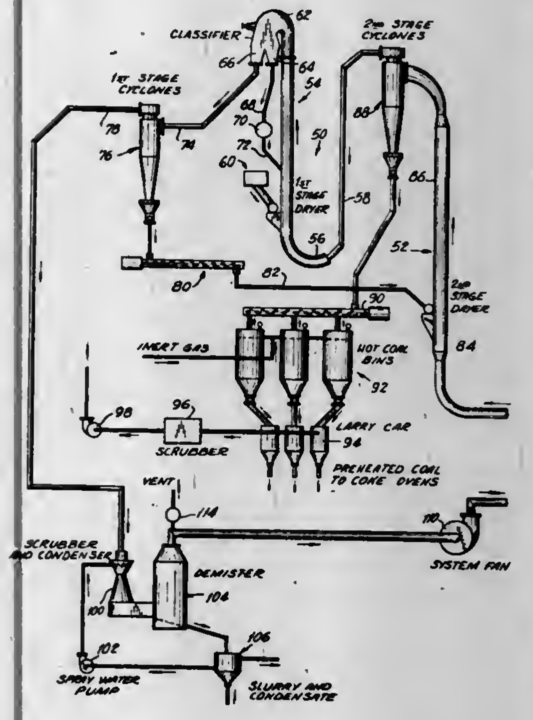
1. Means for culturing a microorganism in an environment enriched with a gas, comprising a microbiological nutrient means; a gas generating composition comprising at least two solid reactants which when contacted with water react to produce said gas and means for controlling the rate of reaction between said reactants, and thereby the rate of release of said gas; and means for enclosing said nutrient means and said gas generating composition.



3,888,742
POLLUTION-FREE COAL-PREHEATING WITH WASTE HEAT FROM DRY COKE-QUENCHING

Roland Kemmetmueller, Pittsburgh, Pa., assignor to American Waagner-Bird Company Inc., Pittsburgh, Pa.

Filed Jan. 23, 1974, Ser. No. 435,749
Int. Cl. C10b *39/02*
U.S. Cl. 201—39 **21 Claims**

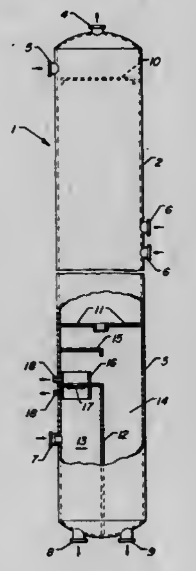


1. In a method for operating a coke plant, the steps of circulating an inert gas along a closed path, directing the inert gas as it circulates along said closed path through a body of hot coke shortly after discharge of the body of hot coke from a coke oven so that the inert gas cools the hot coke while extracting heat therefrom to raise the temperature of the inert gas, feeding wet coal to a part of the path to which the thus-heated inert gas travels after passing through the body of hot coke so that the wet coal is dried by direct contact with the heated inert gas, thus cooling the inert gas while drying the coal with heat extracted from the hot coke during direct contact between the wet coal and the heated inert gas, delivering the thus-dried coal to a coke oven, returning the inert gas along a return part of said closed path from the location where coal drying takes place back to a body of hot coke to again be heated by the latter before again returning to the location where the wet coal is situated to be dried by the heated inert gas, and completely drying the inert gas as it travels along the return part of the closed path to a body of hot coke so that the inert gas is in a moisture-free condition when reaching the body of hot coke.

3,888,743
DISTILLATION COLUMN REBOILER SECTION WITH INTERNAL FLOW SENSING MEANS

R. Gene Fickel, Roselle, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Apr. 11, 1974, Ser. No. 459,974
Int. Cl. B01d *3/14*
U.S. Cl. 202—158 **7 Claims**



1. A reboiler section adapted to be disposed within a distillation column which comprises, in combination:
   - a. a chordal baffle vertically-disposed in said reboiler section, connected at its lower end to the bottom of said column and terminating, at its upper end, a finite distance below the lowermost tray, or deck of said column, thereby forming two segmental bottom chambers in said reboiler section;
   - b. a first fluid outlet port in the bottom of the first of said two chambers, and a fluid inlet port in open communication with the second of said chambers;
   - c. flow-measuring means responsive to upward flowing vapors leaving said reboiler section within said second chamber, and disposed at the upper end thereof;
   - d. signal-sensing means, in open communication with said flow-measuring means, for transmitting a signal, representative of the rate of flow through said flow-measuring means, without the confines of said reboiler section; and,
   - e. an imperforate second baffle disposed between said lowermost tray and said flow-measuring means, said second baffle extending horizontally from said second chamber a distance less than the internal diameter of said column.

3,888,744
METHOD FOR ELECTRODEPOSITION OF NICKEL-CHROMIUM ALLOYS AND COATING OF URANIUM

Robert W. Stromatt, Richland, Wash., and Jerry R. Lundquist, San Jose, Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Oct. 24, 1974, Ser. No. 517,663
Int. Cl. C23b *5/32, 5/50*
U.S. Cl. 204—1.5 **7 Claims**

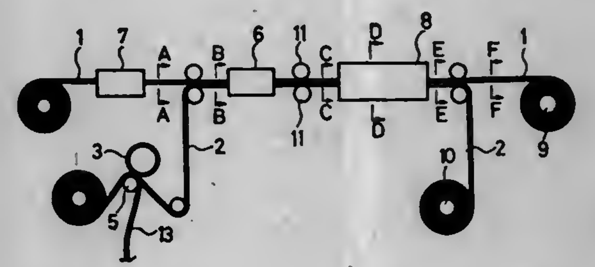
1. A process for the electrodeposition of a nickel-chromium binary alloy on a cathodic substrate comprising:
   - immersing the substrate in an aqueous plating bath consisting essentially of about 0.08 to 0.19 M disodium salt of ethylenediaminetetraacetic acid, about 0.5 to 1.0 M chromium potassium sulfate, about 0.25 to 0.5 M nickel sulfate and about 0.3 to 0.5 M boric acid;
   - adjusting the pH of the solution to about 1.5 to 2.5 and the temperature to between about 45° and 55°C.; and
   - agitating the solution while passing a current of from about 125 to about 330 mA/cm^2 through the solution to the cathodic substrate, thereby depositing a binary nickel-chromium alloy on the substrate.

7. In the process for protecting uranium metal from corrosion by applying a layer of nickel to the outer surface of the metal, the improvement comprising immersing the nickel-plated uranium metal in an aqueous plating bath consisting essentially of about 0.08 to 0.19 M disodium salt of ethylenediaminetetraacetic acid, about 0.5 to 1.0 M chromium potassium sulfate, about 0.25 to 0.5 M nickel sulfate and about 0.3 to 0.5 M boric acid;
   - adjusting the pH of the solution to about 1.5 to 2.5 and the temperature to between about 45° and 55°C.; and
   - agitating the solution while passing a current of from about 125 to about 330 mA/cm^2 through the plating solution to the nickel-plated uranium metal, thereby depositing a layer of a binary nickel-chromium alloy on the nickel-plated uranium metal.

3,888,745
CONTINUOUS AND PARTIAL PLATING PROCESS OF STRIP METAL

Tetsuya Hojyo, No. 110, Karasugatsuji-cho, Tennoji-Ku Osaka, Japan

Filed Feb. 13, 1974, Ser. No. 442,094
Claims priority, application Japan, Feb. 23, 1973, 48-21907
Int. Cl. B44d *1/52*
U.S. Cl. 204—18 R **6 Claims**



1. A process of continuous and partial plating of strip metal comprising the steps of:
   - syncronously supplying a strip of metal and a strip of tape covered with a hot-setting adhesive on one side thereof, said strip of tape having therein a perforation, to be used for uncovering the part of said strip of metal to be plated;
   - bringing together said tape and said strip of metal and causing said tape to stick onto said strip of metal by feeding said tape and said strip of metal through a heating step and thereafter pressing said tape and said strip of metal together;
   - introducing said strip of metal with said tape adherent thereto to a plating step wherein plating is carried out only on the uncovered part of said strip of metal; and
   - separating said tape from said strip of metal.

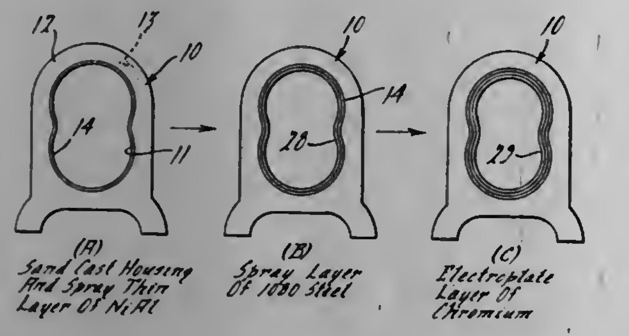
3,888,746
METHOD OF PROVIDING AN INTERMEDIATE STF LAYER FOR CHROME PLATING ON ROTOR HOUSI S

James C. Uy, Dearborn Heights, and Yeshwant P. Telang, Grosse Ile, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 4, 1974, Ser. No. 430,974
Int. Cl. C23b *5/62, 5/06*
U.S. Cl. 204—36 **10 Claims**

1. A method of fabricating a rotor housing for a rotary internal combustion engine, comprising:
   - a. preparing an aluminum casting defining said rotor housing having an annular configuration with an internal surface shaped as a trochoid, said casting having dimensionally machined sides and a rough as-cast trochoid surface, said casting having at least one passage opening

into said surface which is temporarily closed by an inert plug during subsequent processing,
b. with said casting maintained at a temperature of at least 200°F, applying a thin self-fused coating of heated nickel-aluminide particles across said entire trochoid surface to form a layer thereon with a thickness no greater than 0.01 inch,
c. immediately applying a uniform coating of carbon steel particles having at least the outer surfaces thereof heated to a temperature of at least 2,000°F for self-fusing when impelled against said first coated casting surface,


12
13
10
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11
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14
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10
22
(A)
Sand Cast Housing And Spray Thin Layer Of NiAl
(B)
Spray Layer Of 1080 Steel
(C)
Electroplate Layer Of Chromium

d. cooling said second coated casting to a temperature generally equal to or below the bath temperature of a selected chromium plating electrolyte, immersing said coated casting in said electrolyte and applying sufficient potential between an anode and said casting to deposit a third thin coating constituted of chromium on said casting surface in the thickness range of about 0.007 inch, and
e. cooling said tri-coated casting to ambient temperature conditions in a manner to insure a reduced internal stress condition of said coating, said triple coating having a combined thickness in the range of 0.048 to 0.076 inches.

3,888,747

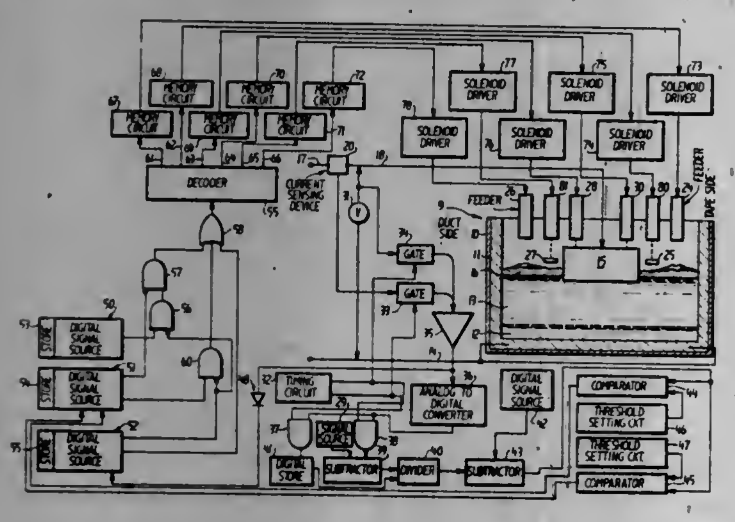
METHOD OF AND APPARATUS FOR PRODUCING METAL

Joseph A. Murphy, Murraysville, Pa., assignor to National-Southwire Aluminum Co., Hawesville, Ky.

Filed Oct. 18, 1972, Ser. No. 298,405

Int. Cl. C22d *3/12*; B01k *3/00*; C22d *3/02*

U.S. Cl. 204—67 **20 Claims**



1. A method of producing metal comprising providing an electrolytic bath containing dissolved oxide of the metal in a reduction cell, causing direct current to flow through said bath, collecting said metal on the bottom of said reduction cell, sensing the direct voltage across said cell, producing a limited output signal corresponding to the voltage across said cell up to a given level thereof, which is less than maximum anode effect voltage level, and producing a signal of ONE level upon occurrence of any output signal level if the limited output signal is in excess of a given threshold level, which is less than maximum possible level of the limited output signal, and developing a signal of ZERO level upon occurrence of any output signal level below the given threshold level, the signal of ONE level being indicative of occurence of anode effect.

3,888,748

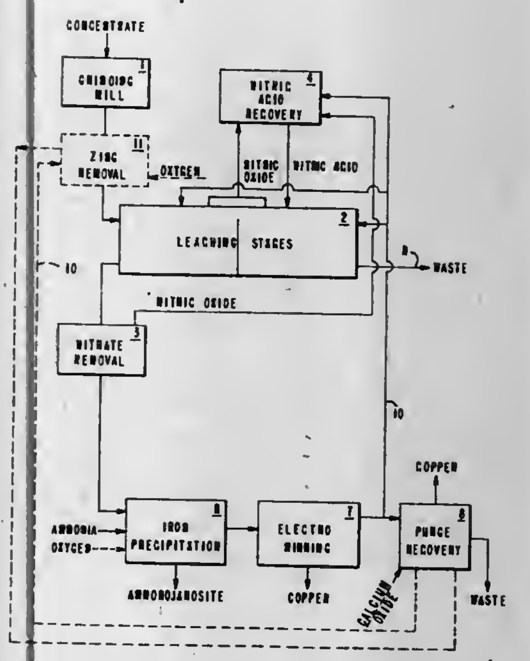
RECOVERY OF METAL VALUES FROM ORE CONCENTRATES

Henry M. Brennecke, Woodstown, N.J., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 267,075, June 28, 1972, abandoned. This application June 4, 1973, Ser. No. 366,876

Int. Cl. C22b *3/00*, *15/08*

U.S. Cl. 204—108 **28 Claims**



1. A hydrometallurgical process for recovery of metals from ore concentrates having copper, iron and sulfur therein which comprises
a. contacting said concentrate in an aqueous medium with a combination of nitric and sulfuric acids at a temperature of at least 50°C. until the nitrate is reduced to less than about 30 grams per liter in the presence of concentrate;
b. separating the liquid and solid from Step (a);
c. contacting the solids from Step (b) with an aqueous solution containing nitric acid in excess of that required to dissolve the copper in said solids at a temperature of at least 50°C. until substantially all of the copper in said solids is dissolved wherein the total amount of aqueous solution in Steps (a) and (c) contains sufficient acid to maintain copper and iron in solution and sufficient water to produce about 2–10 parts of copper per 100 parts of liquid from Step (b);
d. separating the solids from Step (c) and directing the liquid from Step (c) to Step (a);
e. heating the liquid from Step (b) to a temperature in the range of 140°–200°C. to reduce the nitrate concentration therein to less than about one part per 1,000 parts of solution;
f. precipitating iron from the liquid from Step (e) as jarosite;
g. electrowinning copper from the liquid of Step (f); and
h. recycling at least a portion of the liquid from Step (g) to further contact concentrate;
said process being further characterized in that oxidizing conditions are maintained in Steps (e) and (f) until substantially all of the iron is present as the ferric ion.

3,888,749

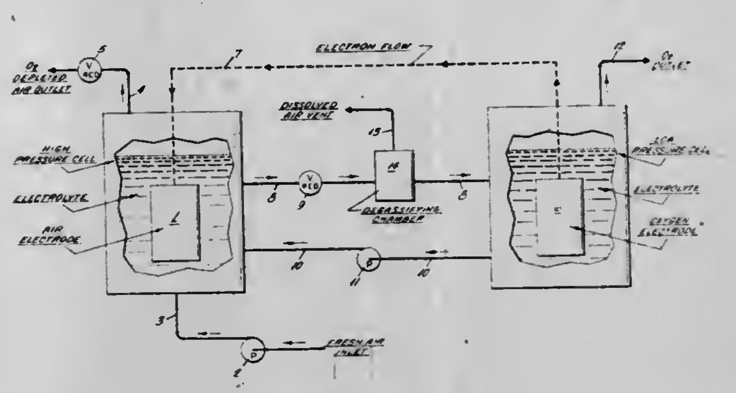
ELECTROLYTIC SEPARATION OF OXYGEN FROM AIR

Victor M. Chong, Media, Pa., assignor to Sun Research and Development Co., Marcus Hook, Pa.

Filed Aug. 31, 1972, Ser. No. 285,406

Int. Cl. C01b *13/04*; B01k *1/00*

U.S. Cl. 204—129 **4 Claims**



1. A process for the electrolytic separation of oxygen from air without application of external current comprising:
a. introducing air into a first electrolytic cell comprising a first electrode and an electrolyte,
b. circulating electrolyte between said first cell and a second electrolytic cell comprising a second electrode and an electrolyte, said first electrode and said second electrode being electrically connected to allow flow of current from said second electrode to said first electrode,
c. maintaining the partial pressure of oxygen in said first cell higher than the partial pressure of oxygen in said second cell,
d. withdrawing oxygen-depleted air from said first cell and
e. withdrawing oxygen from said second cell.

3,888,750

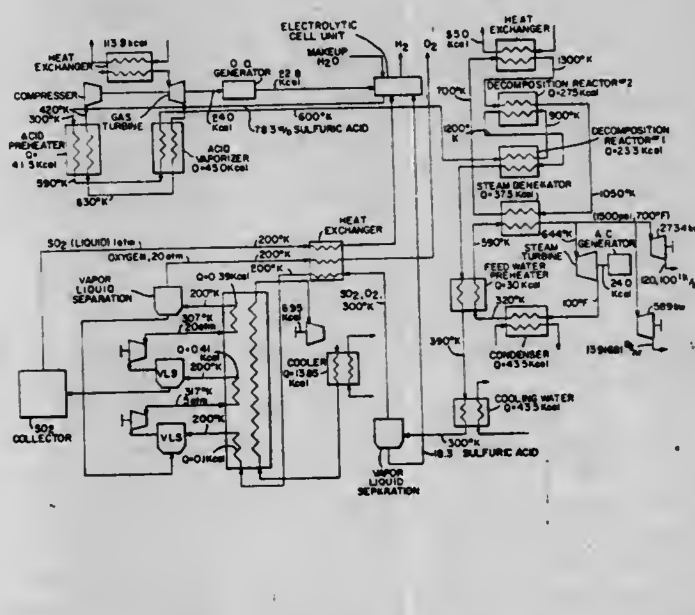
ELECTROLYTIC DECOMPOSITION OF WATER

Lee E. Brecher, North Huntingdon, and Christopher K. Wu, Turtle Creek, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 29, 1974, Ser. No. 437,571

Int. Cl. C01b *13/04*, *13/02*, *17/50*

U.S. Cl. 204—129 **6 Claims**



2. The method of claim 1 wherein the sulfuric acid derived from the electrolytic means is concentrated by the thermochemical means prior to being decomposed.

3,888,751

METHOD FOR PURIFYING WASTE WATER

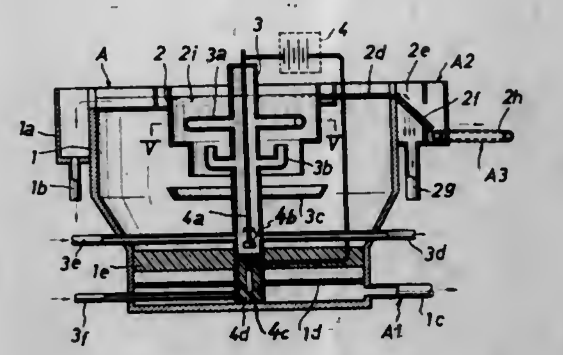
Toyomasa Minegishi, 1108,3-21-20, Nishlazabu, Tokyo, Japan

Filed Apr. 18, 1973, Ser. No. 352,281

Claims priority, application Japan, Dec. 20, 1972, 47-002358

Int. Cl. C02c *5/12*

U.S. Cl. 204—152 **3 Claims**



1. A method of treating waste water sludge in a vessel having an outer container and an inner tubular member of much smaller outer diameter than said outer container extending upwardly through the interior of the outer container and having spaced apart respective positive and negative electrical terminals therein at an electrical potential, comprising directing a sludge waste flow to be treated into the lower end of the inner tubular member and a quantity of electrolyte in order to produce an electrolytic action adjacent said terminals in a quantity and rate to cause the sludge waste to produce flocculation of the material, further directing a plurality of partial flows of sludge waste flow with the flocculants already produced upwardly and tangentially into the outer container to maintain the water level in the outer container to cause overflow thereof, mixing the partial flows to promote flocculation reaction in the outer container to form the flocculating materials into a ball size sludge and passing at least a portion of the overflow through a screen to separate the liquid from the solid flocculations, and collecting the floculations from the screen.

3,888,752

PHOSPHITE ESTER ANTIOXIDANTS IN RADIATION CURED STYRENE BUTADIENE ELASTOMERS

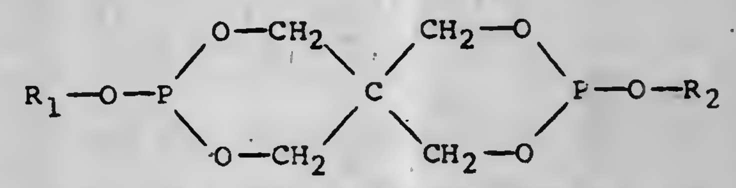
Roger J. Eldred, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1973, Ser. No. 419,702

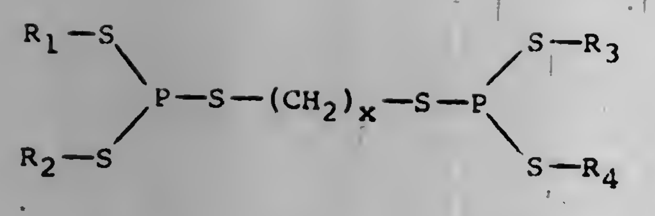
Int. Cl. B01j *1/10*, *1/12*

U.S. Cl. 204—159.18 **3 Claims**

1. In the process of crosslinking and curing a styrene-butadiene copolymer having a styrene to butadiene weight ratio in the range of 15:85 to 50:50 by the bombardment of high energy electrons, the improvement comprising incorporating an organic phosphite ester in the noncrosslinked styrene-butadiene copolymer composition prior to irradiation, said ester being selected from the group consisting of a pentaerythritol diphosphite having the general formula:



where R_1 and R_2 are alkyl groups containing from 12 to 20 carbon atoms, and a hexathio diphosphite having the general formula:



where R_1, R_2, R_3 and R_4 are alkyl groups containing from 10 to 15 carbon atoms and x is from 4 to 8, said organic phosphite ester being present in an amount ranging from 2 parts by weight to 15 parts by weight per 100 parts by weight of said styrene-butadiene copolymer composition, said organic phosphite ester being substantially nonreactive and noncatalytic during said irradiation induced crosslinking process and remaining in the crosslinked styrene-butadiene copolymer composition to provide protection against oxidative degradation.

3,888,753

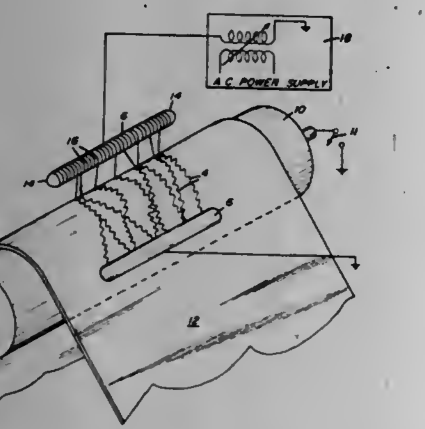
CORUSCATE ELECTRICAL DISCHARGE TREATMENT OF POLYMERIC FILM TO IMPROVE ADHERABILITY THEREOF TO GELATINOUS AND OTHER COATINGS

Lauri W. Kiikka, Victor, and Ronald L. Hartman, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 171,656, Aug. 13, 1971, Pat. No. 3,755,683. This application Jan. 2, 1973, Ser. No. 320,050

Int. Cl. G03c *1/82;* **H01t** *19/04*

U.S. Cl. 204—168 **11 Claims**



1. A method for producing a coruscate electrical discharge which comprises:

positioning a web of polymer between (1) a pair of spaced apart power and ground electrodes both located on the same side of said web and separated by air gaps from one surface of the web and (2) a conducting surface opposite the other surface of the web,

supplying high voltage alternating current electricity from a power supply to the power electrode, said electrode having an arcuate surface of substantially 90° and being provided with a multiplicity of arcuate knife edges,

discharging a multiplicity of intermittent flashes of high voltage electricity from said power electrode onto said one surface of the web,

tracking the discharges on said surface to the ground electrode, and

drawing off the electricity through the ground electrode,

said web of polymer consisting essentially of a linear polymer which is crystalline or partially-crystalline and is oriented or non-oriented.

3,888,754

OZONE MEASURING CELL

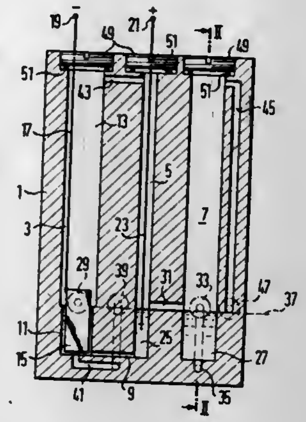
Helmut Karl Ernst Tiefenau, Gottingen-Weende, Germany, assignor to Max-Planck-Gesellschaft ZUR Forderung der Wissenschaften e. V., Gottingen, Germany

Filed Nov. 8, 1973, Ser. No. 414,613

Claims priority, application Germany, Nov. 9, 1972, 2254858

Int. Cl. G01n *27/46*

U.S. Cl. 204—195 R **7 Claims**



1. Ozone measuring cell comprising:

a. a measuring chamber which may be flushed by an ozone-containing gas;

b. a cathode and an anode arranged within said chamber in such a manner that potassium iodide reaction solution passes continuously from cathode to anode;

c. said measuring chamber including a cathode chamber which contains said cathode and an anode chamber separate from said cathode chamber which contains said anode;

d. said cathode chamber being connected to said anode chamber by a capillary tube;

e. means for supplying ozone-containing gas to the lower end of said cathode chamber;

f. said cathode chamber being divided into a reaction portion and a separating portion thereabove;

g. means for supplying said reaction solution to said cathode chamber at a point between the reaction and separating portions thereof;

h. a separating chamber positioned next to said anode chamber;

i. said cathode and anode chambers and said separating chamber being constructed in an airtight manner;

j. means connecting said anode chamber with the separating portion of said cathode chamber and adapted to supply a gas thereto;

k. means connecting said anode chamber with said separating chamber and adapted to discharge gas from said anode chamber; and

l. means for removing said reaction solution from said separating chamber at the upper liquid surface level thereof.

3,888,755

CYLINDER PLATING RACK

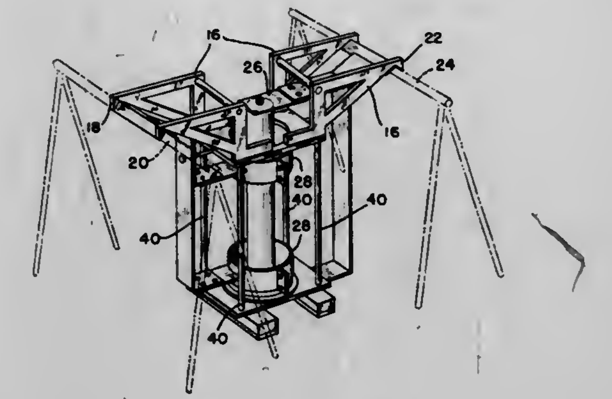
Bruce Evans Wallace, 1819 Robinhood Rd., Winston-Salem, N.C. 27104

Filed June 4, 1973, Ser. No. 366,420

Int. Cl. B01k *3/00;* **C22d** *1/02;* **C23b** *5/70*

U.S. Cl. 204—272 **2 Claims**

1. A plating and stripping rack for electroplating and cleaning the interior of hollow substantially cylindrical objects in a plating bath comprising: a support frame having two complementary sections, each of said sections having two winged members; an anode formed by one of said complementary frame sections; a cathode formed by the other of said complementary frame sections and positioned a fixed preselected distance from said anode by said frame; and a cylindrical insert having first and second ends and being of a composition dissimilar to the cylindrical object being plated for placement within the hollow cylindrical object affixed to said anode ends and forming a part thereof, said cathode having clamping means for securing the object to be plated, said frame including insulating means separating and maintaining said anode and cathode, and said insulating means including an upper and lower insulating plate maintaining said anode and said cathode in a fixed relationship each with the other.



3,888,756

APPARATUS FOR TREATING WATER CONTAINING IMPURITIES

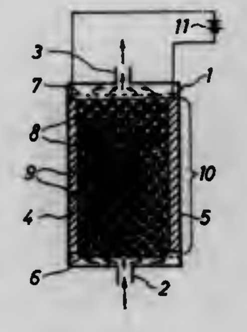
Toru Teshima, Hadano; Toshiie Nagasao, Machida; Minoru Tanaka Hachioji; Kazuo Ariga, and Kiyoshi Inoue, both of Tokyo, all of Japan, assignors to Stanley Denki Kabushiki Kaisha, Tokyo, Japan and Kabushiki Kaisha Inoue Japax Kenkyusho, Kanagawa, Japan

Filed July 23, 1973, Ser. No. 381,409

Claims priority, application Japan, July 28, 1972, 47-75754; July 26, 1972, 47-74875

Int. Cl.^{2} B01D *13/02;* **C02B** *1/82;* **C02C** *5/12*

U.S. Cl. 204—275 **13 Claims**



1. An apparatus for treating water containing impurities, comprising:

an electrolytic cell;

at least one pair of main electrodes opposed in the electrolytic cell;

a power source connected to the main electrodes;

a plurality of auxiliary electrodes disposed in pieces between the main electrodes; and

holder means of nonconductive materials in particulate form employed for insulating said auxiliary electrodes thereamong to uniformly arrange in a mutually close relationship so as to avoid any short circuit between said main electrodes.

3,888,757

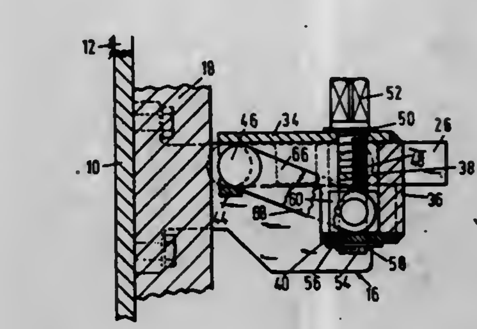
ANODE ROD CLAMPING ASSEMBLY

Johannes Roukema, Vleuten, and Frederik Noordegraaf, Leerdam, both of Netherlands, assignors to B. V. Nederlandse Kraanbouw Maatschapplj, Utrecht, Netherlands

Filed June 7, 1973, Ser. No. 367,884

Int. Cl. C23b *5/70*

U.S. Cl. 204—297 R **3 Claims**



1. An anode rod clamping assembly for allowing vertical adjustment as well as removal and replacement of an anode rod of an electric furnace device having a bus bar to which the anode rod is clamped when in operation, said assembly comprising the combination of:

a pair of spaced and horizontally projecting support brackets having forward ends adapted to be fixed in straddling relation to the area of a bus bar against which an anode rod is to be clamped and held;

a frame having means selectively engaging said support brackets for supporting the frame fixedly between said brackets while allowing vertical movement and complete separation of the frame from the brackets; and

clamp means captive in said frame for clamping an anode rod against a bus bar and including a vertically extending screw thread member to enable both the complete separation of the frame from the brackets and operation of the clamp means;

said clamp means including a clamp bar and said frame including guide means towards the forward ends of said brackets for horizontally guiding said clamp bar into and out of engagement with an anode rod;

said frame including a vertical reaction surface disposed in rearwardly spaced relation to said guide means, and said clamp means including a carrier engaged by said screw thread member and disposed against said reaction surface, and link means which connects said carrier to said clamp bar, said link means being movable in response to movement of said carrier to increase its angularity with respect to said reaction surface, as said clamp bar moves horizontally in said guide means to clamp an anode rod, toward a disposition in which it is perpendicular thereto.

3,888,758

APPARATUS FOR LARGE SCALE GEL ELECTROPHORESIS

Sheik Arshad Saeed, 9 Rostrevor Rd., London, S.W. 19, England

Filed June 28, 1973, Ser. No. 374,475

Int. Cl. B01k *5/00*

U.S. Cl. 204—299 **11 Claims**

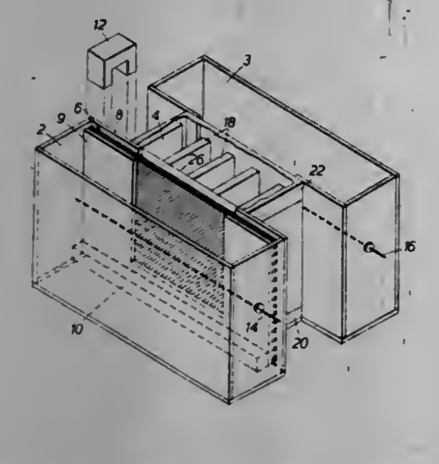
1. In apparatus for gel electrophoresis, the combination comprising:

wall means defining at least one gel chamber;

an electrode chamber adjacent one end of said gel chamber;

an elution compartment connected between said gel chamber and electrode chamber;

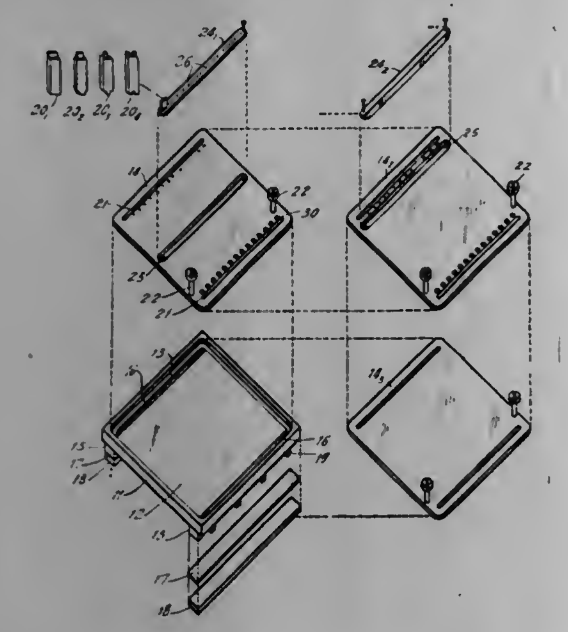
means for causing an eluting liquid to flow through said elution compartment;



and means for agitating the eluting liquid in said elution compartment.

3,888,759
FLAT PLATE ELECTROPHORESIS

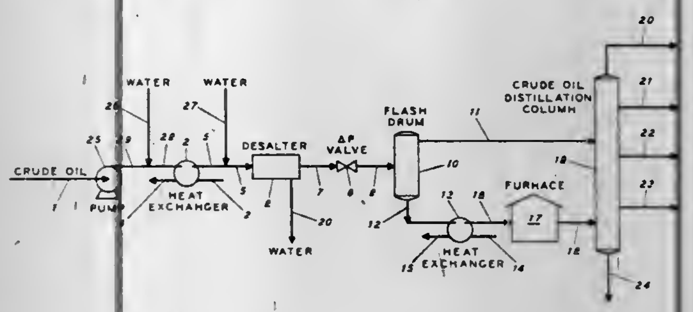
David Elson, and Shlomo Avital, both of Rehovot, Israel, assignors to Yeda Research & Development Co., Ltd., Rehovot, Israel
Filed May 25, 1973, Ser. No. 363,961
Int. Cl. B01k *5/00*
U.S. Cl. 204—299 **7 Claims**



1. A device for horizontal flat plate electrophoresis comprising in combination,
- a horizontal plate having an upper and a lower surface and surrounded by lateral walls, the upper surface of the plate and the lateral walls defining a rectangular gel bed;
- a step of predetermined height in each of the lateral walls thereby defining a ledge;
- a cover adapted to rest on the ledge and thereby define the thickness of the gel bed;
- a plurality of holes in the cover for the insertion of templates during polymerization of the gel to define predetermined holes of predetermined volume in the gel and for insertion of samples of predetermined volume in the holes;
- two legs attached to the lower surface of the plate at opposing sides thereof and coextensive with the sides to which the legs are attached; and
- a slot through the plate positioned over each leg, extending for the full length of the leg, and extending through the entire height of the leg.

3,888,760
AVOIDING HEAT EXCHANGER FOULING AFTER CRUDE OIL DESALTING

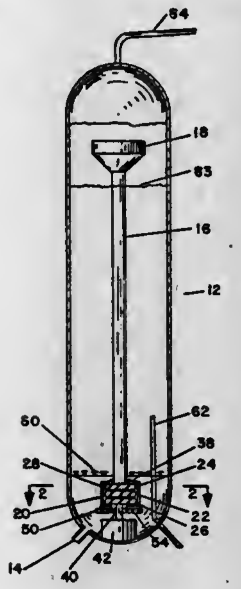
Wayne A. Ebert, Dublin, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Continuation-in-part of Ser. No. 184,738, Sept. 29, 1971, abandoned. This application Jan. 26, 1973, Ser. No. 326,615
Int. Cl. C10g *17/00*
U.S. Cl. 208—48 **8 Claims**



1. In a process which comprises heating and desalting and then further heating hydrocarbonaceous oil using heat exchangers and a desalter, the improvement which comprises flashing the oil to remove water after desalting the oil and before further heating of the oil in any heat exchanger.

3,888,761
H-OIL PROCESS

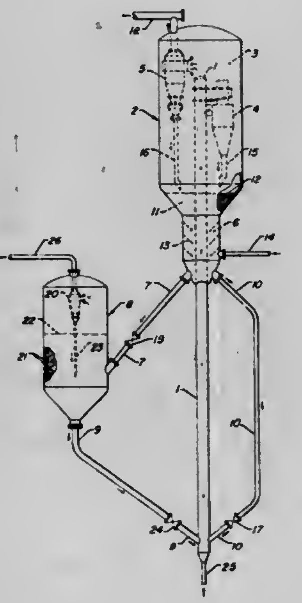
Norman C. Stewart, Lake Charles, La., assignor to Cities Service Research & Development Co., New York, N.Y.
Continuation-in-part of Ser. No. 88,764, Nov. 12, 1970, abandoned. This application June 20, 1973, Ser. No. 371,792
Int. Cl. C10g *1/08, 13/00*
U.S. Cl. 208—112 **7 Claims**



1. A method for catalytically treating a hydrocarbon comprising
- passing a heavy hydrocarbon oil feedstock upwardly through a particulate hydrorefining catalyst bed in a reaction zone, said particulate catalyst being at least one-sixty-fourth inch in size,
- recycling a portion of the upwardly flowing oil together with a minor portion of the particulate catalyst to the bottom of the reaction zone,
- simultaneously pulverizing at least a portion of the recycled particulate catalyst to a fine powder in the size range of between about 300 and about 600 microns,
- passing the recycled oil and finely powdered catalyst upwardly through the reaction zone, and
- removing an effluent stream of treated oil and powdered catalyst from the reaction zone.

3,888,762
FLUID CATALYTIC CRACKING PROCESS

Clarence G. Gerhold, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Continuation-in-part of Ser. No. 297,170, Oct. 12, 1972, abandoned, which is a continuation-in-part of Ser. No. 139,433, May 3, 1971, abandoned. This application Apr. 12, 1973, Ser. No. 350,665
Int. Cl. B01j *9/20;* **C10g** *11/18, 37/02*
U.S. Cl. 208—120 **8 Claims**



1. A fluid catalytic cracking process in which the activity of a catalyst blend which contacts a hydrocarbon feed is controllable to produce a desired product yield structure which process comprises the steps of:
- a. contacting a hydrocarbon feed stream with catalyst blend, comprising a freshly regenerated catalyst stream from a regeneration zone and a separate recycle spent catalyst stream withdrawn from a spent catalyst stripping zone, in a short-time dilute-phase riser reaction zone;
- b. passing the feed and catalyst blend in admixture through said reaction zone at catalytic cracking conditions, including the deposition of coke on the catalyst blend, to form spent catalyst and product components;
- c. discharging the mixture into a separation zone at separation conditions to effect the separation of catalyst from product components and any unreacted feed;
- d. recovering product and any unreacted feed and passing spent catalyst from said separation means into a spent catalyst stripping zone at stripping conditions to remove adsorbed and interstitial hydrocarbons therefrom to form stripped spent catalyst containing coke thereon;
- e. passing a first portion of stripped spent catalyst from said stripping zone into a regeneration zone maintained at oxidizing conditions and therein oxidizing coke from said catalyst to produce freshly regenerated catalyst;
- f. passing freshly regenerated catalyst from said regeneration zone to said riser of step (a) above; and,
- g. passing simultaneously a second portion of stripped spent catalyst from the stripping zone into said riser as the separate recycle spent catalyst stream of step (a) above at a rate to control the activity of the catalyst blend necessary to produce a desired yield structure.

3,888,763
HYDROCARBON CONVERSION WITH A SULFIDED BIMETALLIC CATALYTIC COMPOSITE

Frederick C. Wilhelm, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Continuation-in-part of Ser. No. 233,819, March 10, 1972, Pat. No. 3,798,155. This application Feb. 11, 1974, Ser. No. 441,198
Int. Cl. C10g *35/08;* **B01j** *11/74*
U.S. Cl. 208—139 **13 Claims**

1. A process for reforming a gasoline fraction to produce a high octane reformate which comprises contacting said fraction, at gasoline reforming conditions in the presence of hydrogen with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 1 wt. % sulfur, about 0.1 to about 3.5 wt. % halogen and bismuth in an amount sufficient to result in an atomic ratio of bismuth to platinum group metal of about 0.1:1 to about 1:1, wherein the platinum group metal and bismuth are uniformly dispersed throughout the porous carrier material and wherein substantially all of the platinum group metal and bismuth are present in the corresponding elemental metallic states.

3,888,764
CATALYST PURGING TECHNIQUE IN AN ON-STREAM CATALYST REGENERATION PROCESS

Arthur R. Greenwood, Niles, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Continuation-in-part of Ser. No. 194,030, Oct. 29, 1971, abandoned. This application July 30, 1973, Ser. No. 383,753
Int. Cl. B01j *11/02*
U.S. Cl. 208—140 **5 Claims**

1. In a hydrogenative hydrocarbon conversion process, having an on-stream oxidative catalyst regeneration system, wherein catalyst particles are withdrawn from a hydrocarbon conversion zone and transported to said catalyst regeneration system, and withdrawn from said regeneration system and transported to a hydrocarbon conversion zone, the method of purging volatile material from said catalyst particles, in a purging zone, prior to the transport thereof to said regeneration system, or to said hydrocarbon conversion zone, which method comprises the sequential steps of:
- a. introducing said catalyst particles into said purging zone and establishing therein a first static pressure level;
- b. introducing an inert gaseous medium into said purging zone while simultaneously increasing the static pressure to a predetermined, second level, over a time period in the range of about 10 to about 60 seconds also simultaneously venting volatile material and said inert gaseous medium from said purging zone;
- c. when said predetermined, second static pressure level is attained, ceasing the flow of said inert gaseous medium; d. continuing the venting of volatile material and inert gaseous medium while said static pressure decreases to said first pressure level over a time period in the range of about 10 to about 60 seconds; and,
- e. repeating the sequence of steps (b), (c) and (d) from 1 to about 6 times;

said method being further characterized in that said first and second static pressure levels are attained throughout the sequential steps without effecting fluidization of said catalyst particles in said purging zone, said first static pressure level being in the range of about 0 to about 5 psig. and said second static pressure level being in the range of about 5 to about 20 psig.

3,888,765
PRECISION OR MICRO SIEVE STRUCTURE

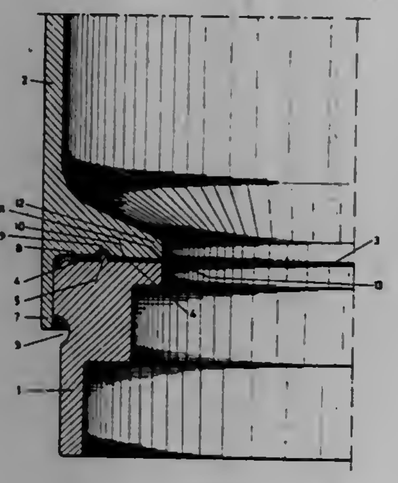
Fredrik Willem Bolk, Eerbeek, Netherlands, assignor to Veco Zeefplatenfabriek B. V., Netherlands

Filed May 17, 1973, Ser. No. 361,056

Claims priority, application Netherlands, May 18, 1972, 7206758

Int. Cl. B07b *1/46*

U.S. Cl. 209—352 **5 Claims**



1. A precision micro structure comprising two annular bodies axially aligned with each other and connected together, a flexible sieve surface mounted therebetween, an annular portion of the sieve surface being in contact with a bordering shoulder on each of the annular bodies, each bordering shoulder being substantially perpendicular to the axis of rotation of the annular bodies, the improvement comprising an annular groove on one bordering shoulder, an annular land on the other bordering shoulder axially aligned with the annular groove and adapted to fit therein, the opening of the groove being greater than the sum of the width of the land and twice the thickness of the sieve, and the depth of the groove being greater than the sum of the height of the land and the thickness of the sieve, whereby the annular portion of the sieve surface is clamped between the bordering shoulders of the annular bodies except in the region of the land and groove.

3,888,766
OIL SORPTION MATERIAL

Wayne J. De Young, Argos, Ind., assignor to Uniroyal, Inc., New York, N.Y.

Filed Mar. 9, 1973, Ser. No. 340,613

Int. Cl. E02b *15/04*

U.S. Cl. 210—36 **11 Claims**

1. A composition of matter for selectively absorbing oil from a surface supporting the same, comprising a polyurethane foam compressed to a thickness of about 7 percent of the starting thickness, said foam having a multiplicity of open cells or capillary domains therein and being impregnated with between about 4 and 20 percent by weight, based on the weight of the starting foam, of a sealant of natural rubber, said sealant coating the surface of said cells or capillary domains of said compressed foam and thereby minimizing the capability of said foam to absorb water when exposed thereto while maximizing the capability of said foam to absorb oil when exposed thereto, and said sealant also serving as a binder to retain said compressed foam in its compressed state until said sealant is dissolved or swelled by oil upon being contacted thereby.

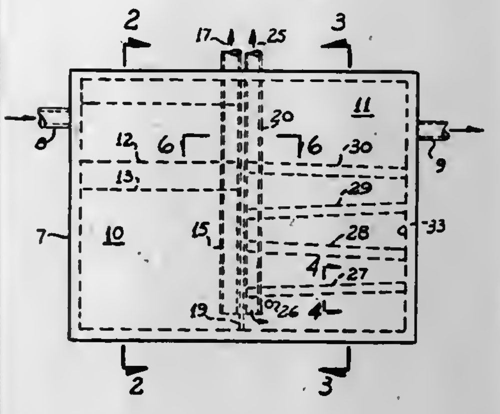
3,888,767
SEWAGE TREATMENT TANK

Paul D'Aragon, 525 Stuart Ave., Outremont, Quebec, Canada

Continuation-in-part of Ser. No. 872,521, Oct. 30, 1969, abandoned. This application Sept. 27, 1971, Ser. No. 184,168

Int. Cl. C02c *1/04, 1/16*

U.S. Cl. 210—151 **3 Claims**



1. A sewage treatment tank in which sewage is subjected to the action of anaerobs followed by the action of aerobs, the tank comprising in combination, a first digester compartment having a sewage entrance and adapted to digest solid sewage by action of anaerobs thereby producing gases, an open bottom lander disposed in said first compartment spaced inwardly from the walls parallel thereto and adapted to separate sewage into solid and liquid, a gas exit pipe for said first compartment, a second digester compartment, conduit means for conveying liquid sewage from the first compartment to the lower portion of the second compartment, a plurality of inverted trays in the second compartment arranged in series, one above another, each tray slanting in an opposite direction relative to and overlapping the tray immediately beneath it, means for injecting air into the second compartment below the lowermost tray whereby to digest liquid sewage by aerobs and produce gases, each slanted tray including a set of inverted cups adapted to bubble air from lower cups to upper cups of each tray and an aperture in an upper cup of each tray through which aperture the air bubbles from the upper cups of each tray to lower cups of the next higher tray, an exit pipe for evacuated gases and excess air provided on the second compartment, and an effluent discharge provided on the second compartment.

3,888,768
OIL RECTIFIER, APPARATUS WITH PROCESS

Paul J. Graybill, 61 Sunset Hill Dr., Pine Orchard, Conn. 06405

Filed June 15, 1973, Ser. No. 370,282

Int. Cl. B01d *43/00*

U.S. Cl. 210—223 **7 Claims**

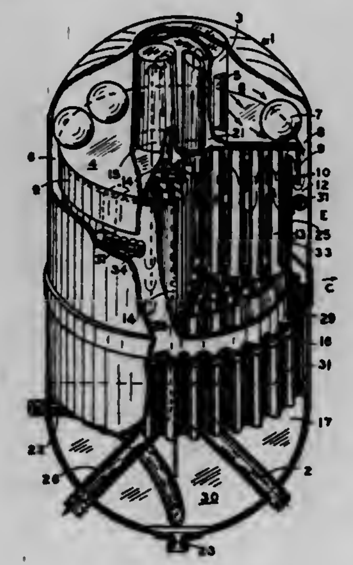
1. A liquid rectifying apparatus for the catalyzing, neutralizing, trapping, and finally removing or otherwise destroying the dispersed-phase from the continuous phase of a contaminated liquid dispersion, particularly industrial oils and lubricating oil in use in a motor, said dispersed-phase consisting of both soluable and insoluable contaminants such as sand, dirt, metal particles, carbon, acid, sulphur, gums, resins, ash, water, coolant, and other foreign materials of molecular and larger sizes all of which are widely dispersed in said oil and part of which are ionized, said apparatus comprising:

a generally cylindrical pressure tight casing having a generally vertically extended longitudinal axis,

an essentially medial fully cross-sectional honeycomb-like foraminous partition horizontally oriented in said casing, said foraminous partition being comprised of essentially non-porous material having said foramina essentially vertical therein and cooperating with the upper portions of said confined area in said casing to define generally an upper fully cross-sectional circulating area and with the lower portion of said confined area in said housing to define a bottomly positioned fully cross-sectional sludge sump, said foramina being so deposed as to allow contaminants to settle therethrough, moving from said circulating area into said sump;

inlet means mounted in said housing for introducing contaminated oil into a circulating chamber in the upper portion of said circulating area, said inlet means disposed so as to establish whirling flow of said oil within said circulating chamber to generate forces for displacing said heavy contaminants generally outwardly within said circulating chamber;

a series of concentric attractor baffles extending upwardly from said foraminous partition into the lower portion of said circulating area, said baffles being corrugated and having perforations therethrough, said baffles defining impingement surfaces for said coarse or ionized colloidal contaminants to facilitate the separation by sedimentation, electrostatic attraction, and cohesive bonding of said contaminants;



a doughnut shaped circulating chamber positioned about said concentric attractor baffles being defined by said baffles on its inner limits, by said housing on the outer and upper limits and said foraminous partition at its lower limits;

outlet means mounted in said housing generally centrally of said circulating chamber for removing said continuous phase oil after the separation of said dispersed-phase contaminants;

said sludge sump for receiving said settling contaminants after they have passed through said foraminous partition; outlet and inlet flow tubes centrally positioned and fully extended between the housing in said sump to the exact top of said circulating area thus preventing any appreciable drainback of said liquid when the system is not in operation since both the outlet and the inlet tube endings are well within the upper limits of said casing;

a centrally located louvered cap positioned above and a but the upper ends of said outlet tubes, said cap being articulated at its lower periphery to the floor of said circulating chamber, said floor also having at its outer periphery a downwardly extending flange thereabout, said louvers which are positioned in the side wall of said cap being so deposed as to set up acute centrifugal movement in the liquid entering said circulating chamber;

a flanged outlet cone positioned within said louvered cap and over and about said outlet tube, said flange extending outwardly on all sides contacting the lower surface of the floor of said circulating chamber chamber forming a seal therewith, thus creating a pressured inlet chambaer within said louvered cap;

said circulating chamber being defined on the lower portion by a floor, on its outer and upper portion by the walls of the casing and on its inner portion by the wall of said louvered cap, this configuration constituting a ball race having during operation extreme centrifugal movement in the liquid therein which enters the louvers and escapes downwardly about the outer periphery of the floor thereof, said ball race floor being positioned on said attractor baffles;

said ball race having a number of self cleaning inarticulated balls contained therein, said balls being constituted of various metal alloys having neutralizing and catalyzing properties inherent therein, said balls during operation being violently rolled about said race, keeping them highly polished thus assuring their reacting capabilities;

an anti-turbulance baffle of three or more blades positioned fully across the sump thereof extending fully upwardly to become the support means of the attractor element, but not extending completely to the lower extremity of the sump but resting on the curved side walls thereof;

draining means in said housing in said sump area to facilitate the removal of said contaminants.

3,888,769
SECURING DEVICE FOR PRESS DIAPHRAGMS IN PLATE FILTER PRESSES

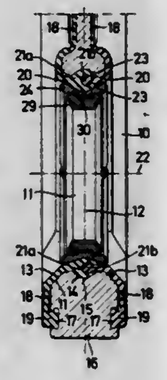
Alfons Schotten, and Franz Heimbach, both of Duren, Germany, assignors to Eberhard Hoesch & Sohne, Duren, Germany

Filed Jan. 2, 1974, Ser. No. 429,769

Claims priority, application Germany, May 17, 1973, 2324876

Int. Cl. B01d *25/12*

U.S. Cl. 210—227 **12 Claims**



1. In an arrangement composed of a filter plate and a press diaphragm, a device for the fluid tight securing of the press diaphragm to the filter plate in the zone of a slurry inlet bore provided in the filter plate, the bore having an axis, the diaphragm extending along the filter plate and has an opening in alignment with the inlet bore, comprising in combination:

a. means defining an annular groove in said filter plate, said groove surrounding said inlet bore and arranged coaxially therewith;

b. a skirt forming part of said diaphragm, said skirt bounding and surrounding said opening in said diaphragm and extending axially into said inlet bore of said filter plate, said skirt having an annular terminal enlargement surrounding said bore axis and conformingly received in said groove, said terminal enlargement having a projecting portion extending radially away from said groove towards said bore axis; and

c. a split ring disposed in said bore coaxially with said axis, said split ring including means defining an outer peripheral annular groove, said projecting portion of said terminal enlargement being conformingly received in and supported by said peripheral annular groove in said split ring.

3,888,770

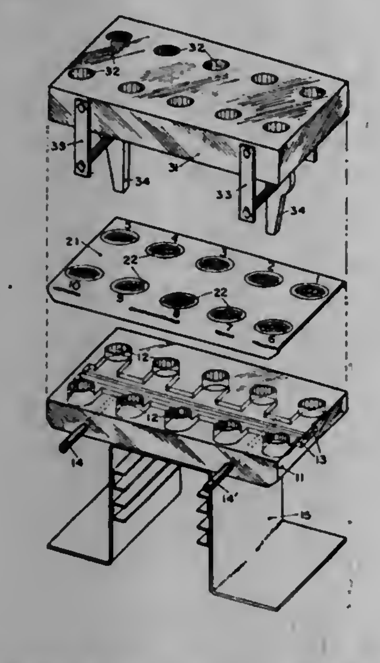
PLURAL-SAMPLE FILTER DEVICE

Shlomo Avital, 15 Bussel St., Rehovot; Menahem Silbermann, 78-Shikun Haamami, Ness-Ziona, and David Elson, 9 Meonot Shine, Rehovot, all of Israel

Filed Oct. 21, 1971, Ser. No. 191,164

Int. Cl. B01d *25/02*

U.S. Cl. 210—238 **1 Claim**



1. A plural-sample filter device, comprising, a base plate; a filter plate; a cover plate; and means for holding said plates together in superposed position with the filter plate interposed between the base plate and the cover plate; said cover plate being provided with a plurality of individual openings for introducing therethrough the samples to be filtered; said filter plate being provided with a plurality of filter areas corresponding to the number of, and aligned with, the openings in said filter plate, each of said filter areas being adapted to receive a filter; said base plate being provided with a plurality of receptacles corresponding to the number of, and aligned with, the filter areas in said filter plate; said base plate also being formed with an outlet and channel means connecting said receptacles to said outlet, the said filter plate having downwardly bent sides enabling it to be used as a stand when removed from the device, the width of the unbent portion of the filter plate being substantially of the same length as the width of the base and cover plates.

3,888,771

HOLLOW FIBERS OF CUPRAMMONIUM CELLULOSE AND A PROCESS OF THE MANUFACTURE OF SAME

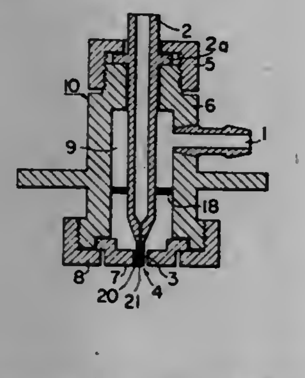
Masami Isuge; Shinichi Uematsu; Yotsuo Ono; Shokichi Eiga, and Minoru Makita, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 31, 1973, Ser. No. 365,500

Claims priority, application Japan, June 2, 1972, 47-54291; May 9, 1973, 48-51410

Int. Cl. B01d *31/00*

U.S. Cl. 210—500 M **7 Claims**



1. A dialyzing hollow fiber of cuprammonium regenerated cellulose having a smooth, skinless inner and outer wall surface and said wall having distributed throughout its thickness a netlike structure of passage routes, the routes having a diameter of not greater than 200, and said fiber having been prepared by the steps of

- extruding a spinning liquor of cuprommonium regenerated cellulose to form a hollow core extrudate and simultaneously therewith passing a non-coagulating organic solvent through the hollow core;
- passing the resulting extrudate through a gaseous atmosphere whereby the weight of said extrudate causes stretching to substantially reduce the outer diameter thereof;
- coagulating the hollow core extrudate by contacting said extrudate with a solution containing aqueous sodium hydroxide to form a hollow core fiber having a smooth, skinless inner and outer wall; and
- rinsing and drying the resulting fiber.

3,888,772

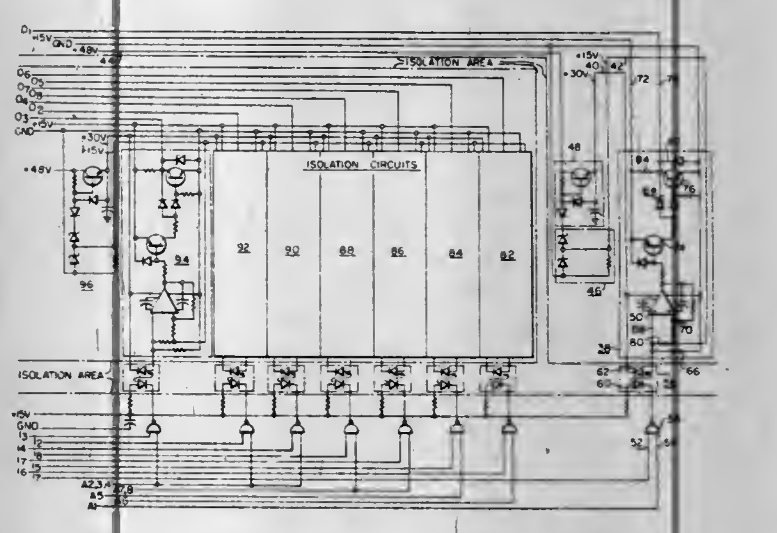
COMMUNICATION BETWEEN REDUNDANT PROTECTION AND SAFEGUARDS LOGIC SYSTEMS WITHIN NUCLEAR REACTOR POWER PLANTS BY MEANS OF LIGHT

James A. Neuner, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 4, 1972, Ser. No. 240,938

Int. Cl. H04b *9/00*

U.S. Cl. 250—199 **9 Claims**



1. An improved nuclear reactor protection and safeguard system having a plurality of sensors for monitoring reactor and environmental parameters associated with reactor operations, the sensors respectively providing an output representative of the monitored parameters which is communicated along two similar, electrically and physically isolated signal trains of logic to corresponding separate, redundant logic circuits which interpret the respective monitored signals and upon the occurrence of a predetermined combination thereof independently activate corresponding control and protection mechanisms associated with the reactor to control and protect against the occurrence of an adverse reactor operating condition, wherein the improvement comprises light communication means for effecting transmission between logic trains of the information contained therein while maintaining the electrical integrity of each train including:

- light generative means, independently responsive to the logical information conveyed by each of the isolated logic signal trains to radiate a separate, corresponding representative light output indicative thereof; and
- light receiving means independently responsive to the light output representative of each of the logic signal trains to respectively reproduce the logical information represented thereby in electrical form for communication to the other of the two trains while maintaining electrical isolation between trains and thus the integrity and independence of each train.

3,888,773

NITROGEN COMPOUNDS LINKED TO A HETEROCYCLIC RING AS MULTIFUNCTIONAL ADDITIVES IN FUEL AND LUBRICANT COMPOSITIONS

John C. Nnadi, Glassboro, and Israel Joel Heilweil, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 27, 1972, Ser. No. 248,226

Int. Cl. C10m *1/24, 1/32;* **C10l** *1/14*

U.S. Cl. 252—37.2 **4 Claims**

1. An organic composition comprising a major proportion of an organic fluid lubricant or fuel medium and a minor proportion sufficient to provide detergent antioxidant or antiwear properties thereto of tri-substituted pyrimidine, wherein each substituent is a bis-polyalkenylsuccinimide the amine of the bis-polyalkenylsuccinimide being an alkylene polyamine of the formula $H_2N—(C_mH_{2m}NH)_eH$ wherein m is 1 to 3 and e is 2 to 10 and the polyalkenyl group having from 8 to about 300 carbon atoms, said substituent being linked to the pyrimidine through a basic nitrogen atom of the substituent.

3,888,774

WOOD TREATING SOLUTION CONTAINING CREOSOTE AND ANTIMONY

Woodrow E. Kemp, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Division of Ser. No. 221,082, Jan. 2, 1967, Pat. No. 3,764,378. This application July 16, 1973, Ser. No. 379,267

Int. Cl. C07f *9/68, 9/90, 9/92;* **B27k** *3/50*

U.S. Cl. 252—8.1 **2 Claims**

1. A wood treating composition comprised of creosote having dissolved therein 1-(bis(2-hydroxypropyl)nitriloethylene)-5-stiba-1-aza-4,6-dioxacyclooctyl Sb-ether.

3,888,775

OIL COMPOSITION FOR SYNTHETIC STAPLE FIBERS

Yukimichi Koizumi; Yoshihiro Kobayashi, both of Mihara; Yasuhiro Murase, and Takamitsu Kondo, both of Matsuyama, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jan. 24, 1973, Ser. No. 326,452

Claims priority, application Japan, Jan. 29, 1972, 47-010756

Int. Cl. D06m *11/00*

U.S. Cl. 252—8.8 **7 Claims**

1. An oil for use in synthetic staple fibers, said oil consiting essentially of (a) 10–40 percent by weight of a monobasic acid ester or dibasic acid ester of a monohydric or polyhydric alcohol, (b) 10–40 percent by weight of a reaction product formed between 2 mols of a fatty acid containing 8–22 carbon atoms and 1 mol of polyethylene polyamine and having the formula

$$R_1CONH(CH_2CH_2NH)nCOR_2$$

wherein each of R_1 and R_2 is a hydrocarbon radical having 7–21 carbon atoms and n is an integer, (c) 10–30 percent by weight of an antistatic agent and (d) 10–70 percent by weight of an emulsifying agent other than (a) and (b) above.

3,888,776

TWO-CYCLE ENGINE OIL

Joseph J. Silverstein, Long Island City, N.Y., assignor to The Ore-Lube Corporation, New York, N.Y.

Filed Feb. 12, 1973, Ser. No. 331,488

Int. Cl. C10m *3/02;* **C10l** *1/10*

U.S. Cl. 252—25 **10 Claims**

1. A two-cycle engine lubricant composition which consists essentially of a polypropylene glycol concentration in the range of about 85 to about 97.5%, by volume, a sulfurized oxymolybdenum hydrocarbylphosphorodithioate in the concentration of about 0.85 to about 7.0 percent, by volume, a finely-divided molybdenum disulfide in the concentration of about 0.15 to about 0.63 percent, by volume, and a halogenated hydrocarbon detergent film strength improver in the concentration of about 1.0 to about 6.6 percent, by volume, all of the percentages being based upon the total volume of the polypropylene glycol-based lubricant composition.

3,888,777

HEAT TRANSFER AGENTS

Larry L. Jackson; Walter F. Seifert, and Daniel E. Collins, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 2, 1971, Ser. No. 130,839

Int. Cl. C09k *3/02*

U.S. Cl. 252—73 **10 Claims**

1. A composition of matter of, by volume,

5 to 90 percent of diphenyl oxide,
5 to 50 percent of biphenyl and
5 to 90 percent of biphenylyl phenyl ether.

3,888,778

BRIGHT DIP COMPOSITION FOR TIN/LEAD

Merton Beckwith, Rt. 74, R.F.D. 4, Rockville, Conn. 06066, and Grace F. Hsu, Scully Rd., Somers, Conn. 06071

Filed Mar. 13, 1973, Ser. No. 340,912

Int. Cl. C09k *3/00*

U.S. Cl. 252—79.3 **7 Claims**

1. A composition for bright dipping tin/lead alloys on a workpiece having exposed surfaces of copper or gold without contamination thereof comprising an aqueous solution, on a per liter basis, of:

A. about 50–250 grams of an acidic compound selected from the group consisting of fluoboric acid, tartaric acid, sulfamic acid, phenylsulfonic acid, gluconic acid, the ammonium and alkali metal salts thereof, and mixtures thereof;
B. about 15–50 grams of a thiourea compound selected from the group consisting of thiourea and mono- and di-N-substituted thioureas and mixtures thereof; and;
C. about 0.5–20 grams of a stabilizer selected from the group consisting of trichloroacetic acid, the ammonium and alkali metal salts thereof, and mixtures thereof;

said solution having a pH of about 0.2 to 3.0.

3,888,779

FLAME RETARDANT COMPOSITION CONTAINING TETRAKIS (HYDROXYMETHYL) PHOSPHONIUM OXALATE

Tsai Hsiang Chao, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 26, 1972, Ser. No. 317,998

Int. Cl. B27k *3/00*

U.S. Cl. 252—8.1 **4 Claims**

1. An aqueous flame retardant finish composition solution for cellulosic textile materials comprising:

- tetrakis(hydroxymethyl) phosphonium oxalate and at least one organic nitrogenous compound having a trivalent nitrogen bearing at least 2 members comprised of hydrogen atoms and methylol groups, or mixtures thereof wherein the ratio of nitrogen of the nitrogenous compounds to phosphine-derived phosphorus on a parts by weight basis is between 0.5 and 5.0.

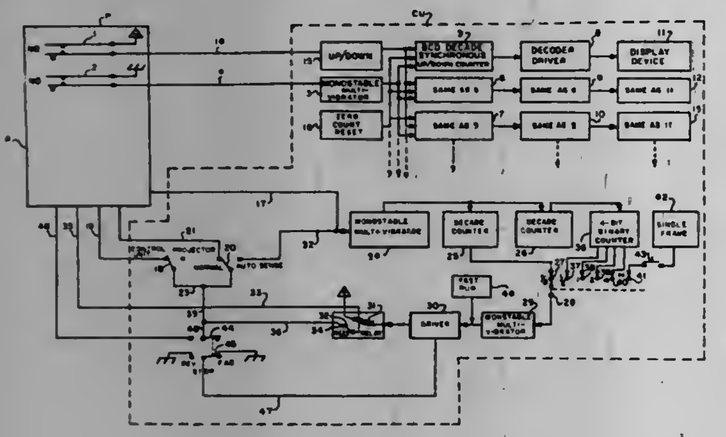
3,888,780
PROGRAMMABLE PROJECTION SYSTEM

Donald Spencer Tucker, 9216 S.W. Grane Ln., Portland, Oreg. 97225

Continuation of Ser. No. 272,560, July 17, 1972, abandoned. This application Nov. 23, 1973, Ser. No. 418,333

Int. Cl. G03b *21/48*

U.S. Cl. 352—92 **8 Claims**



PROGRAMMABLE PROJECTION SYSTEM

1. A system for projecting film having a series of frames, said system having a projection station, means for generating signals of a predetermined frequency,

- frequency dividing means responsive to the signals of said predetermined frequency for producing signals of lower frequency in its output,
- drive means for intermittently feeding successive film frames to said projection station at intervals corresponding to the frequency signals applied thereto and,
- means for selectively applying said signals of predetermined frequency or said signals of lower frequency to said drive means, whereby the film frames are fed to the projection station at intervals corresponding to the predetermined signal frequency or lower signal frequency.

3,888,781
PROCESS FOR PREPARING A GRANULAR AUTOMATIC DISHWASHING DETERGENT COMPOSITION

Gary W. Kingry, and Frank H. Lahrman, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sept. 5, 1972, Ser. No. 286,654

Int. Cl. C11d *7/54*

U.S. Cl. 252—99 **10 Claims**

1. A process for producing a crisp, free-flowing agglomerated granular detergent composition comprising the steps of:

a. charging to a mixing zone particulate matter comprising an alkaline builder salt;

b. agitating the particulate matter in the zone; and

c. with continuous agitation spraying onto the particulate matter a liquid mixture having a temperature of from 110°F. to 200°F. of an alkali metal silicate having a SiO_2.:alkali metal oxide ratio of from 3.2:1 to 2.5:1 and a nonionic detergent wherein the ratio of liquid alkali metal silicate to nonionic detergent ranges from 3:1 to 6:1 and wherein the liquid mixture is sprayed on at a level of from 25% to 50% based on the total composition to form said agglomerated granules.

3,888,782
SOFT CONTACT LENS PRESERVING SOLUTION

Malcolm P. Boghosian, Long Beach, and Milagros V. Blanco, Yorba Linda, both of Calif., assignors to Allergan Pharmaceuticals, Irvine, Calif.

Filed May 8, 1972, Ser. No. 250,931

Int. Cl. C11d *3/48*

U.S. Cl. 252—106 **7 Claims**

1. A sterile, non-toxic cleaning and sterilizing solution for plastic hydrophilic soft contact lenses comprising about 0.001 to about 0.05% chlorhexidine and about 0.5 to about 5% polyvinylpyrrolidone.

3,888,783
CLEANER FOR TIN PLATED FERROUS METAL SURFACES, COMPRISING PHOSPHATE, SILICATE AND BORAX

Edward A. Rodzewich, Flourtown, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Filed Oct. 10, 1973, Ser. No. 405,187

Int. Cl. C11d *3/06, 3/08*

U.S. Cl. 252—135 **7 Claims**

1. A cleaning composition which when added to water forms an aqueous solution for cleaning tin-plated ferrous metal surfaces, consisting essentially of an alkali metal metasilicate, a condensed phosphate selected from the group consisting of tripolyphosphate and pyrophosphate, and borax, wherein for each part by weight of borax in said composition there is from about 0.1 to about 0.5 parts by weight of alkali metal metasilicate and from about 0.1 part to about .6 parts by weight of condensed phosphate.

3,888,784
ELECTROCHEMICAL LUMINESCENT COMPOSITION

Albert Pighin, and Douglas Peter Malanka, both of Ottawa, Ontario, Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Nov. 29, 1972, Ser. No. 310,249

Int. Cl. C09k *3/00*

U.S. Cl. 252—188.3 CL **10 Claims**

1. A process for preparing a solution for an electrochemical luminescent cell, the solution comprising an aprotic solvent, a fluorescor dissolved in the solvent, the fluorescor selected from rubrene and 9, 10 - diphenylanthracene, and an electrolyte, the electrolyte an alkyl perchorate;

- wherein the fluorescor is dissolved in hot xylene and the resultant solution filtered while hot into methanol at room temperature to recrystallize the fluorescor, the resultant mixture then filtered to separate the recrystallized fluorescor, the dissolving, filtering into methanol, recrystallization and filteration carried out at least two times, and finally vacuum drying the recrystallized fluorescor in a nitrogen atmosphere.

3,888,785
INORGANIC SALTS AS INHIBITORS FOR TETRAKISDIMETHYLAMINO ETHYLENE-WATER CHEMICAL INTERACTION

Alfred F. Tatyrek, Maplewood, and Burton Werbel, West Orange, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 69,141, Sept. 2, 1970, abandoned. This application Dec. 22, 1972, Ser. No. 317,588

Int. Cl. C09k *1/02*

U.S. Cl. 252—188.3 CL **9 Claims**

1. A process for increasing the storage stability of a chemiluminescent composition containing TMAE and water in the absence of oxidizing and dehydrating agents, which comprises incorporating therein a water-soluble, inorganic alkali metal salt.

3,888,786
CHLORINATED BIS(PHENYLETHYNYL)ANTHRACENES AS FLUORESCERS IN CHEMILUMINESCENT SYSTEMS

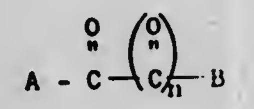
Donald Roy Maulding, Branchburg Township, Somerset County, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 261,888, June 12, 1972, abandoned. This application Nov. 23, 1973, Ser. No. 418,493

Int. Cl. C09k *3/00*

U.S. Cl. 252—188.3 CL **10 Claims**

1. A chemiluminescent composition for reaction with a hydroperoxide to obtain chemiluminescent light, said composition comprising (1) an ester of the formula:



$$A-\overset{O}{\overset{\|}{C}}-\left(\overset{O}{\overset{\|}{C}}\right)_n-B$$

where A and B represent aliphatic or aromatic ester groups, and *n* is an integer at least one, (2) a fluorescer comprising a bis(phenylethynyl)anthracene substituted by chloro, fluoro or lower alkyl, and (3) an organic solvent, said ingredients being present in sufficient concentration to obtain chemilinescence when reacted with hydrogen peroxide.

3,888,787
METHOD OF PRODUCING BALL-SHAPED METALLIC OXIDE OR METALLIC CARBIDE PARTICLES

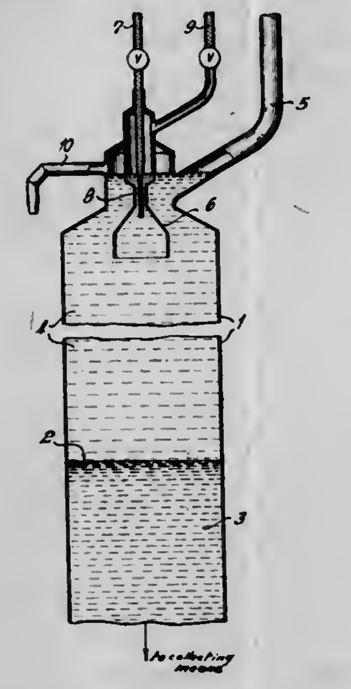
Kurt Hein, and Erich Zimmer, both of Julich, Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Sept. 11, 1972, Ser. No. 288,098

Claims priority, application Germany, Sept. 23, 1971, 2147472

Int. Cl. G21c *21/00*

U.S. Cl. 252—301.1 S **8 Claims**



1. A method of producing ball-shaped particles in a column, said particles being selected from the group consisting of metallic oxides and metallic carbides, which includes the steps of: introducing an organic phase into said column, said organic phase being one selected from the group consisting of ketones and ketone mixtures, which at room temperature have a dissolving power for water not greater than four per cent by weight at room temperature and a viscosity between one half and twice that of water said ketones and ketone mixtures containing a water quantity below that of ketones and ketone mixtures in equilibrium with ammonia; introducing an aqueous ammonia phase into said column, said aqueous ammonia phase having a higher specific gravity than said organic phase, thus settling below the latter; dropwise introducing into said organic phase an aqueous solution, said solution being one of a material selected from the group consisting of metallic nitrate, metallic chloride, mixtures of metallic nitrates and metallic chlorides, and colloidal solutions of metallic nitrates and metallic chlorides; and collecting the resulting particles.

3,888,788
PREPARATION OF STANNIC OXIDE AQUASOLS AND ORGANOSOLS

Paul Clifford Yates, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 93,862, Nov. 30, 1970, abandoned. This application Nov. 2, 1972, Ser. No. 303,208

Int. Cl. B01j *13/00*

U.S. Cl. 252—309 **13 Claims**

1. A method for making a positively charged stannic oxide aquasol which comprises deionizing an aqueous solution of a soluble salt of $Sn^{+}4$ with an anion exchange resin in the hydroxyl form until the cation-to-anion ratio is between about 0.5:1 and 5:1 and maintaining the pH below about 1.5.

6. A method for making a positively charged stannic oxide organosol which comprises.

a. deionizing an aqueous solution of a soluble of Sn^{+4} with an anion exchange resin in the hydroxyl form until the cation to anion ratio is between about 0.5:1 and 5:1 to provide an anion-stabilized aquasol, while maintaining the pH below about 1.5,

b. mixing the aquasol with a polar, hydrogenbonding organic liquid which has a boiling point above that of water or which forms a lower-boiling azeotrope with water; and

c. removing the water by vacuum distillation until the water concentration in the remaining organosol is less than about 1% by weight.

3,888,789
PREPARATION OF POLYMERIZATION CATALYST SYSTEMS

Robert A. Dombro; George E. Illingworth, both of Arlington Heights, and Richard A. Fronczak, Mount Prospect, all of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 15, 1972, Ser. No. 315,720

Int. Cl. B01j *11/84*

U.S. Cl. 252—429 B **13 Claims**

1. In the preparation of a polymerization system wherein a metal alkyl, metal alkyl halide or metal hydride of an a Group IA, IIA or IIIA metal and a Lewis Base modifier selected from the group consisting of hydrocarbyl phosphines, hydrocarbyl phosphine oxides, hydrocarbyl amines, hydrocarbyl amine oxides, hydrocarbyl arsines, hydrocarbyl arsine oxides, hydrocarbyl thioethers, hydrocarbyl oxyethers and hydrocarbyl sulfoxides are added to a halide of a Group IVB, VB or VIB metal supported on an oxide of a metal of Group IIA, IIB, IIIA or IVA while maintaining the compounds in an inert atmosphere, the improvement of haliding said Group IIA, IIB, IIIA or IVA metal oxide either before or after admixture of said metal oxide with said Group IVB, VB or VIB halide by contact at a temperature of from about 20°C. to about 400°C. with a halogenating agent in an amount sufficient to insure that the halide to Group IVB, VB or VIB metal atomic ratio is greater than 10:1, said halogenating agent having the formula:

$$X_2 \text{ or } RX_n$$

in which R is a hydrogen, SO, SO_2 or hydrocarbyl radical, X is a halogen and *n* is an integer of from 1 to 10.

3,888,790
PROCESS FOR PREPARING A CATALYTICALLY ACTIVE CERAMIC COATINGS

Dong Myung Chay, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 201,894, Nov. 24, 1971, Pat. No. 3,791,995. This application Sept. 20, 1973, Ser. No. 399,328

Int. Cl. B32b *15/18*; **B44d** *1/34*

U.S. Cl. 252—432 **4 Claims**

1. A process for preparing a catalytic porcelain coating on an article, said process comprising the following sequential steps:

- a. blending 70–85 parts by weight of a porous, catalytic, fired composition having a Moh's hardness of about 3–6 and a surface area of 0.2–6 $m^2/g.$, in powder form,
  - said composition consisting essentially of 40–80 weight percent of in-situ formed braunite; 10–50 weight percent of an alkali-free amorphous binder phase composed of a borosilicate glass made in situ from boron oxide, silicon oxide, and at least one of magnesium oxide, calcium oxide, and aluminum oxide with each other, said boron and silicon oxides being present in a weight ratio of SiO_2:B_2O_3 from about 1:1 to about 15:1; and 0–20 weight percent of a refractory crystalline phase composed of at least one of magnesium oxide, calcium oxide, strontium oxide, silicon oxide, aluminum oxide, titanium oxide, zirconium oxide, chromium oxide, iron oxide, cobalt oxide, nickel oxide, zinc oxide, and their reaction products with each other
  - with 15–30 parts by weight of a porcelain enamel composition having a firing range of 1350°–1500°F. and sufficient water to form a slip with a specific gravity of 1.58–1.62, the total weight being 100 parts of solids;
- b. applying the slip to the article to give one or more finished coatings about 3–5 mils thick;
- c. drying the coating to a bisque at a temperature below about 400°F.;
- d. heating the coating at 1400°–1550°F. for 3–5 minutes; and
- e. cooling to room temperature.

3,888,791
CATALYSTS FOR THE NON-SELECTIVE OXYCHLORINATION OF HYDROCARBONS

Jean Claude Daumas, Orsay, France, assignor to Rhone-Progil, Courbevoir, France

Filed Oct. 29, 1973, Ser. No. 410,967

Claims priority, application France, Oct. 31, 1972, 72.38553

Int. Cl. B01j *11/40, 11/32*

U.S. Cl. 252—455 R **11 Claims**

1. Catalysts for the non-selective oxychlorination of hydrocarbons to produce superchlorinated hydrocarbons at temperatures of at most equal to 380°C, said catalysts being formed primarily of silica originating from silica hydrogel and containing 5 to 30 percent by weight of a magnesium compound expressed as magnesia, up to 4 percent by weight of titanium in the form of a compound of titanium, 2 to 10 percent by weight of copper in the form of a compound of copper, and 0.5 to 3 percent by weight of a compound of a metal selected from the group consisting of an alkali metal and an alkaline earth metal.

3. Catalysts as claimed in claim 1 in which the catalyst includes alumina and rare earth metals.

3,888,792
CATALYST OF COBALT OXIDE AND A RARE EARTH METAL OXIDE AND ITS METHOD OF PREPARATION

David Owen Hughes, Boksburg, South Africa, assignor to African Explosives and Chemical Industries Limited, Johannesburg, South Africa

Continuation of Ser. No. 151,103, June 8, 1971, abandoned. This application Sept. 24, 1973, Ser. No. 400,129

Claims priority, application South Africa, June 26, 1970, 70/4407

Int. Cl. B01j *11/22*

U.S. Cl. 252—462 **11 Claims**

1. Method of preparing a shaped catalyst body comprising active Co_3O_4 together with at least one oxide of an element selected from the group consisting of scandium, yttrium, lanthanum, cerium, praseodymium, neodymium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium and lutetium, which comprises co-precipitating from solution as carbonates or basic carbonates cobalt and at least one of the elements of the oxides, washing and drying the precipitate and heating the dried precipitate within the temperature range of from 250° to 450° for a period of time sufficient to convert the carbonates substantially to their respective oxides, comminuting the mixture of oxides, shaping the mixture into bodies and heating the shaped bodies within the temperature range of from 600° to 850° for a period of time sufficient to give shaped catalyst bodies suitable for use in industrial processes, the co-precipitation being carried out by mixing an aqueous solution of a salt of cobalt and a salt of at least one of said elements and a compound selected from the group consisting of alkali metal carbonate, alkali metal bicarbonate, ammonium carbonate, ammonium carbamate or ammonium bicarbonate.

3,888,793
RARE EARTH CHRYSOTILE CATALYSTS

William F. Arey, Jr., and Willard H. Sawyer, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Jan. 17, 1973, Ser. No. 324,553

Int. Cl. B01j *11/40, 11/06, 11/32*

U.S. Cl. 252—454 **10 Claims**

1. A synthetic chrysotile of the general formula:

$$\left[(1-x-y)\,M^{(a)} + x\bar{M}^{(b)} + y\,RE^{(c)}\right]_n \quad (OH)_4Si_2O_5\cdot wH_2O$$

where M and M are selected from monovalent and multivalent metal cations, of Groups IA, IB, IIA, IIB, IIIA, IIIB, IVB, VB, VIB, VIIB and VIII of the Periodic Table of Elements, having an effective ionic radius ranging from about 0.5 to about 1.0 A, RE is a metal selected from the group of rare earth metals, *x* is a number which expresses the atomic fraction of the metal M and ranges from about 0 to 0.30, *y* is the atomic fraction of RE and ranges from about 0.02 to about 0.20, *a* is the valence of M and is an integer ranging from 1 to 7, *b* is the valence of M and is an integer ranging from 1 to 7, *c* is the valence of RE and is an integer ranging from 1 to 4, *n* is a number equal to the value defined by the ratio 6/[a(1−x−y)+bx+cy], and *w* is a number ranging from 0 to 4.

3,888,794
SPENT NUCLEAR FUEL SHIPPING CASKS

Alvin H. Kasberg, Murrysville, Pa., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Division of Ser. No. 160,498, July 7, 1971, Pat. No. 3,781,189. This application Oct. 3, 1973, Ser. No. 402,931

Int. Cl. G21f *1/08*

U.S. Cl. 252—478 **3 Claims**

1. A shield for neutron and gamma radiation comprising a UH_3-ductile cermet, said ductile metal being selected from the group consisting of aluminum, copper, lead, and mixtures thereof.

3,888,795
UH_3 CERMET

Alvin H. Kasberg, Murrysville, Pa., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Division of Ser. No. 160,498, July 7, 1971, Pat. No. 3,781,189. This application Oct. 3, 1973, Ser. No. 402,934

Int. Cl. C04b *35/50*

U.S. Cl. 252—478 **5 Claims**

1. A cermet composition comprising a compacted blend of UH_3 powder and powder of a metal from the group consisting of copper, aluminum, lead and mixtures thereof useful for shielding gamma and neutron radiation.

3,888,796
SEMICONDUCTIVE GLAZE COMPOSITIONS

Olaf Nigol, 272 Markland Dr., Etobicoke, Ontario, Canada

Filed Oct. 27, 1972, Ser. No. 301,340

Int. Cl. H01b *1/08*

U.S. Cl. 252—518 **12 Claims**

1. A semiconductive glaze composition especially adapted for use in the production of semiconductive glaze coatings on ceramic insulators, comprising a base glaze in admixture with tin oxide (SnO_2), antimony trioxide (Sb_2O_3) and zinc oxide (ZnO), the base glaze consisting essentially of silica, alumina and fluxes and being adapted to be fired at a temperature in the range 2200°F. to 2400°F., the tin oxide and antimony trioxide being present in an amount from 3 to 12.5% by weight of the total solids in the composition, and the zinc oxide being present in an amount from 0.5 to 3% by weight of the total solids in the composition.

7. A semiconducting glaze composition comprising a base glaze in admixture with zinc oxide (ZnO) and a pre-calcined mixture of tin oxide (SnO_2) and antimony trioxide (Sb_2O_3), the base glaze consisting essentially of silica, alumina and fluxes and being adapted to be fired at a temperature in the range 2200°F. to 2400°F., the pre-calcined mixture being present in an amount from 3 to 12.5% by weight of the total solids in the composition, and the zinc oxide being present in an amount from 0.5 to 3% by weight of the total solids in the composition.

3,888,797
DETERGENT COMPOSITION

Hideo Marumo, Tokyo, Japan, assignor to Carapus Company, Limited, Tokyo, Japan

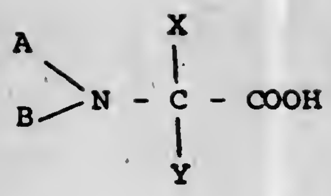
Division of Ser. No. 250,653, May 5, 1972. This application May 7, 1973, Ser. No. 357,579

Claims priority, application Japan, May 10, 1971, 46-30391; Jan. 26, 1972, 47-9019

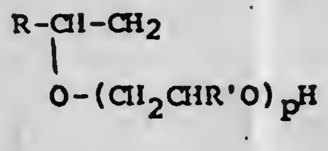
Int. Cl. C11d *3/066*; **C07c** *101/04, 101/24*

U.S. Cl. 252—527 **4 Claims**

1. A detergent composition consisting essentially of at least one surface active agent as the active component of the formula:



wherein either A or B is hydrogen and A and B are independently

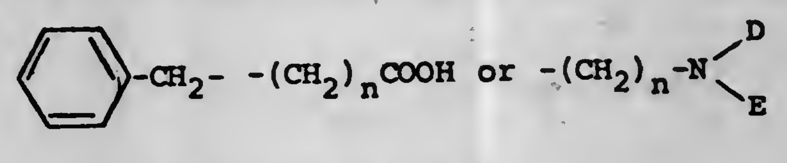


$$R-\underset{\displaystyle O-(CH_2CHR'O)_pH}{\underset{|}{CH}}-CH_2$$

—$(CH_2CHR'O)_qH$ or —$COCH_3$

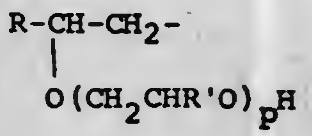
wherein R is an alkyl radical of 6 to 28 carbon atoms, R′ is hydrogen or methyl, and *p* and *q* are independently integers from 0 to 50;

X is hydrogen or an alkyl radical of 6 to 28 carbon atoms; Y is hydrogen, methyl, —$CH_2CH(CH_3)CH_3$,



where n is an integer from 1 to 5, and

D and E are independently A and B; provided that when X is hydrogen, at least one of A, B, D and E is



$$R-\underset{\displaystyle O(CH_2CHR'O)_pH}{\underset{|}{CH}}-CH_2-$$

and salts thereof.

3,888,798
LIQUID DETERGENT COMPOSITION

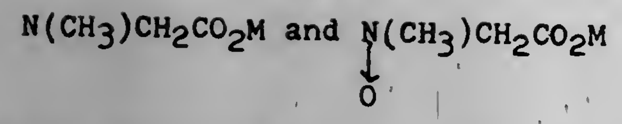
Kenneth R. Hansen, Staten Island, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 90,152, Nov. 16, 1970, Pat. No. 3,723,357. This application July 12, 1972, Ser. No. 271,194

Int. Cl. C11d *3/26, 1/18*

U.S. Cl. 252—545 **6 Claims**

1. A liquid detergent composition having enhanced foam stability and being free from inorganic salts in an amount which adversely affects the foaming power or effect which consists essentially of (I) 5% to 35% by weight of a water-soluble foaming detergent selected from the group consisting of N-alkyl amino carboxylates having the formula R—N(H)C_2H_4COOM, N-alkyl imino dicarboxylates having the formula RN(C_2H_4COOM)$_2$, alkyl sulfates having the formula R(OC_2H_4)$_m$$OSO_3$M, N-alkyl sulfobetaines having the formula R—N(R_1)(R_2)(CH_2)$_n$$SO_3$, C alkyl imidazolines and alkyl betaine detergents having the formula Z(N)-$R_1R_2CH_2CO_2$ where R is an alkyl group of 10 to 16 carbon atoms, *m* is 0 to 5, R_1 and R_2 are C_1–C_3 alkyl or C_1–C_3 hydroxyalkyl, *n* is 1–3, Z is selected from the group consisting of R, RC(O)NC_2H_4 or RC(O)NC_3H_6, and M is selected from a group consisting of sodium, potassium, ammonium, and mono, di, and triethanolammonium; (II) 2% to 27% by weight of a water-soluble drainage-time extender having the formula R—CH(OH)CH_2—Y wherein R is an alkyl group having from 8 to 16 carbons and Y is selected from the group consisting of



$N(CH_3)CH_2CO_2M$ and $\underset{\overset{\downarrow}{O}}{N}(CH_3)CH_2CO_2M$

wherein M is selected from the group consisting of sodium, potassium, ammonium, and mono, di, and triethanolammonium, the sum of (I) and (II) being 10 percent to 40 percent by weight of the composition; the ratio of said detergent to drainage-time extender being in the range of from about 9:1 to 1:9 and sufficient to improve the stability; and (III) an aqueous vehicle selected from the group consisting of water and a mixture of water and a C_2–C_3 monohydric or polyhydric alcohol.

3,888,799

FLUOROPHOSPHAZENE POLYMERS CURABLE AT ROOM TEMPERATURE

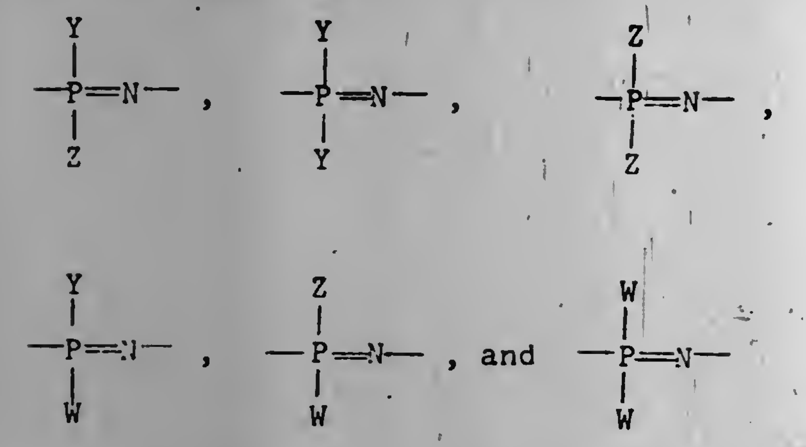
Selwyn H. Rose, Beachwood, and Kennard A. Reynard, Mentor, both of Ohio, assignors to Horizons Incorporated, Cleveland, Ohio

Division of Ser. No. 33,871, May 1, 1970, Pat. No. 3,702,833. This application Sept. 7, 1972, Ser. No. 287,205

Int. Cl. C08g *33/16*

U.S. Cl. 260—2 P **3 Claims**

1. Terpolymers having randomly distributed repeating units represented by the formulae:



$$-\overset{Y}{\underset{Z}{P}}=N-\ ,\quad -\overset{Y}{\underset{Y}{P}}=N-\ ,\quad -\overset{Z}{\underset{Z}{P}}=N-\ ,$$

$$-\overset{Y}{\underset{W}{P}}=N-\ ,\quad -\overset{Z}{\underset{W}{P}}=N-\ ,\ \text{and}\ -\overset{W}{\underset{W}{P}}=N-$$

where Y represents a monovalent radical selected from the group consisting of $F(CF_2)_n(CH_2)O$— and $H(CF_2)_n(CH_2)O$— and n is an integer from 1 to 4 and where Z represents a monovalent radical selected from the group consisting of $F(CF_2)_m(CH_2)O$— and $H(CF_2)_m(CH_2)O$— and m is an integer from $n + 2$ to $n + 5$ and the Y:Z ratio is between 1:3 and 3:1 and where W represents a group capable of further chemical reaction at moderate temperatures and selected from the group consisting of Cl and OH, and mixtures thereof; and the $(Y + Z)$:W ratio is greater than 5:1.

3,888,800

PREPARATION OF PHOSPHAZENE POLYMERS

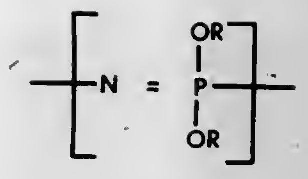
Harry Rex Allcock, State College, Pa., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 13, 1971, Ser. No. 188,440

Int. Cl. C08f *13/00;* **C08g** *25/00*

U.S. Cl. 260—2 P **1 Claim**

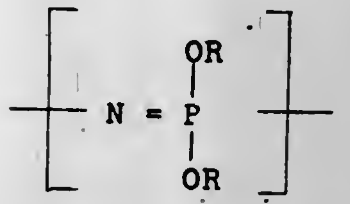
1. A process for preparing polyphosphazenes consisting of a skeletal chain composed of recurrring units represented by the general formula:



$$\left[-N=\overset{OR}{\underset{OR}{P}}-\right]$$

wherein each of OR and OR′ represents a monovalent radical selected from the group consisting of $-OCH_2(CF_2)_aCF_2F$ and $-OCH_2(CF_2)_bH$ and wherein R and R′ are different from each other, and wherein a and b are small integers between 0 and 9, which process comprises:

1. preparing homopolymers consisting of a skeletal chain composed of recurring units represented by the general formula:



$$\left[-N=\overset{OR}{\underset{OR}{P}}-\right]$$

in which R has the meaning given above; and

2. effecting replacement of some of the OR radicals in said homopolymer by radicals of the OR′ type by reacting said homopolymer with an alkoxide containing said OR′ radical, the radicals OR and OR′ being as defined above and being different from each other, whereby the resulting polyphosphazene possesses a desired distribution of OR and OR′ radicals attached to the P atoms along the —P=N— backbone.

3,888,801

GAS-EXPANDING POLYMERS USING HYDRAZODICARBOXYLATES

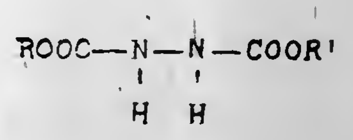
Byron A. Hunter, Woodbridge, and Franklin H. Barrows, Beacon Falls, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 354,818, April 26, 1973, abandoned. This application Apr. 1, 1974, Ser. No. 457,036

Int. Cl. C08j *1/20*

U.S. Cl. 260—2.5 R **22 Claims**

1. A composition comprising a gas-expandable polymeric material and a compound having a formula:



$$ROOC-\underset{H}{N}-\underset{H}{N}-COOR'$$

wherein at least one of R and R′ is selected from the group consisting of secondary and tertiary alkyl groups having from 3 to 5 carbon atoms and the other of R and R′ is selected from the group consisting of straight-chain and branched-chain alkyl groups having from 1 to 8 carbon atoms, cycloalkyl radicals having from 5 to 8 carbon atoms, aryl radicals having from 6 to 10 carbon atoms, and alkaryl and aralkyl radicals having from 7 to 10 carbon atoms.

3,888,802

OXALYLBIS(SULFONYL HYDRAZIDES), USED AS BLOWING AGENTS FOR GAS-EXPANDABLE POLYMERIC MATERIAL

Byron A. Hunter, Woodbridge, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Continuation of Ser. No. 354,819, April 26, 1973, abandoned. This application July 19, 1974, Ser. No. 489,879

Int. Cl. C08j *1/20, 1/22*

U.S. Cl. 260—2.5 R **7 Claims**

1. A composition comprising a gas-expandable polymeric material and a member selected from the group consisting of oxalylbis(sulfonyl hydrazides) and an oligomer made by reacting oxalyldihydrazide with at least one bis(sulfonyl halide).

3,888,803

HIGH TEMPERATURE POLYURETHANE FOAMS

Herman P. Doerge, Oakmont; Charles G. Slater, New Kensington, and Jerome A. Seiner, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 311,042, Nov. 30, 1972, abandoned. This application Jan. 4, 1974, Ser. No. 430,460

Int. Cl. C08g *22/16, 22/44*

U.S. Cl. 260—2.5 AQ **9 Claims**

1. A cellular rigid polyurethane resin displaying improved thermal stability, prepared from a mixture comprising:

A. an aminic polyol, said aminic polyol containing two or more hydroxyl groups, at least one amine group, and an average of no more than one ether group per molecule, said aminic polyol being the adduct of (1) a member selected from the group consisting of ammonia, diethylene triamine, ethylene diamine, mono-, di- or tri- alkanolamines and (2) an alkylene oxide or mixture of alkylene oxides;

B. an organic polyisocyanate; and

C. a cellulating system comprising a mixture of water and a fluorohalocarbon wherein the weight ratio of water to fluorohalocarbon is between about 1:1 and about 1:20.

3,888,804

PHOTODEGRADABLE HYDROCARBON POLYMERS

Carl E. Swanholm, and Robert G. Caldwell, both of Boise, Idaho, assignors to Bio-Degradable Plastics, Inc., Phoenix, Ariz.

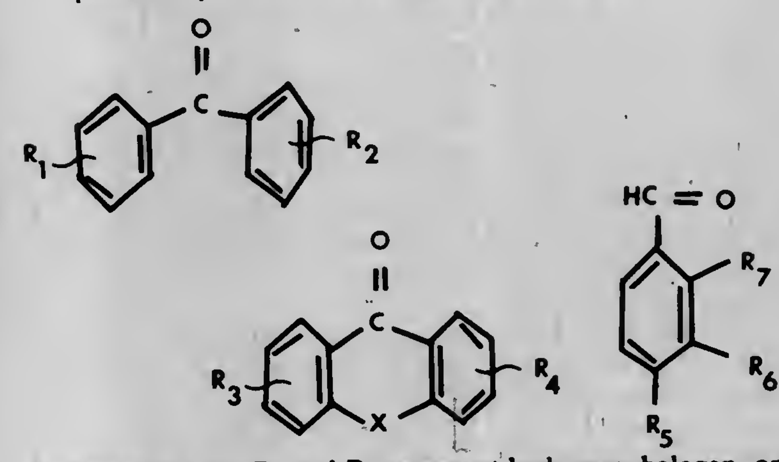
Continuation-in-part of Ser. No. 195,021, Nov. 2, 1971, abandoned. This application June 21, 1973, Ser. No. 372,046

Int. Cl. C08f *27/22, 27/28*

U.S. Cl. 260—2.5 HB **6 Claims**

1. Polymeric material photodegradable upon disposal by exposure to radiation within the spectrum of the ultraviolet content of sunlight in an atmospheric environment comprising a mixture of a hydrocarbon polymer selected from the group consisting of polystyrene and rubber modified polystyrene; and

a photosensitizing agent selected from the group of compounds represented by the general formulas



wherein R_1, R_2, R_3 and R_4 represent hydrogen, halogen, or alkyl or alkoxyl groups; R_5 and R_6 represent hydrogen, or hydroxyl or alkoxyl or alkyl groups; R_7 represents hydrogen, halogen or an alkyl or an alkoxyl group; and X represents a carbonyl group or a CHR_8 group where R_8 is hydrogen or an alkyl or alkoxyl group wherein said photosensitizing agent comprises 0.1% to 10% by weight of the polymer.

3,888,805

METHOD FOR BONDING POLYAMIDES TO RUBBER, ADHESIVE FOR THE SAME, AND ADHESIVE COATED POLYAMIDE REINFORCING ELEMENTS

Gerard E. Van Gils, Tallmadge, and Edward F. Kalafus, Akron, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 310,524, Nov. 29, 1972, abandoned. This application July 19, 1973, Ser. No. 380,937

Int. Cl. C09j *3/12*

U.S. Cl. 260—5 **11 Claims**

1. A method for adhering a polyamide reinforcing element to a rubber compound which comprises treating said element with a composition consisting essentially of an aqueous alkaline dispersion of 100 parts by weight of a rubbery vinyl pyridine copolymer, from about 2 to 28 parts by weight of trimethylol phenol, from about 0.5 to 24 parts by weight of a least one water soluble, thermoplastic and non heat hardenable resorcinol compound selected from the group consisting of resorcinol and a resorcinol-formaldehyde novolak, from about 0 to 3 parts by weight of an alkaline material selected from the group consisting of NH_3 and NaOH, and from about 170 to 1100 parts by weight of water, heating said treated element at a temperature and for a period of time sufficient to remove essentially all of the water from said composition and to leave on said element a heat cured adhesive in an amount of from about 0.5 to 7% by weight (dry) based on the weight of said reinforcing element, combining said dried and heat cured adhesive containing reinforcing element with an unvulcanized rubber compound, and vulcanizing the same.

3,888,806

POLYURETHANE COMPOSITE STRUCTURES

Earle L. Kropscoti, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 16, 1972, Ser. No. 307,150

Int. Cl. 264 *45, 122;* **C03c** *25/00*

U.S. Cl. 260—33.8 UB **3 Claims**

1. A polyurethane composite comprising

1. a fibrous matt material conformed to a desired configuration which prior to said conformation has disposed thereon granular plastic scrap material and
2. a rapid-setting polyurethane composition disposed about and throughout component (1);

wherein the rapid-setting polyurethane is a composition comprising:

A. a polyol selected from the group consisting of polyether polyols having from about 3 to about 8 hydroxyl groups and a hydroxyl equivalent weight of from about 75 to about 230, and dihydroxyl-containing compounds having an OH equivalent weight of less than about 250;

B. an organic polyisocyanate with the proviso that when component (A) is a dihydroxyl-containing compound, the polyisocyanate has an NCO functionality of at least 2.5;

C. a liquid modifier compound having a boiling point above about 150°C with the proviso that when the liquid modifier compound is a halogenated aliphatic compound containing substituent hydroxyl groups then the boiling point may be less than 150°C;

D. a non-amine-containing catalyst for urethane formation; wherein components (A) and (B) are present in quantities so as to provide an NCO:OH ratio of from about 0.8:1 to about 2:1, component (C) is present in quantities of from about 20 to about 50 percent by weight of the sum of components (A), (B) and (C); and component (D) is present in quantities of from about 0.2 to about 10 percent by weight of the sum of the weight of components (A), (B) and (C); with the proviso that when component (C) is a halogenated aliphatic compound, it is employed in a range of from about 0.2 to about 50 percent by weight of the sum of the weights of A, B and C, that when the halogenated aliphatic compound also contains hydroxyl groups and has an OH equivalent weight of less than about 500 it is employed in quantities of from about 0.2 to about 5 percent by weight based upon the sum of the weights of (A), (B) and (C), and that when component (C) is a non-ester-containing aromatic compound or a halogenated aliphatic compound, the non-amine containing catalysts, component (D), is employed in quantities of from about 0.01 to about 10 percent by weight of the combined weights of components (A), (B) and (C), and when component (A) is an amine initiated polyol, component (D) may be omitted.

3,888,807

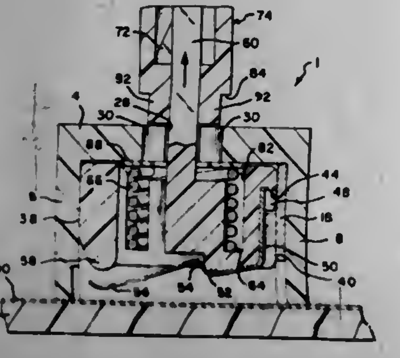
SLIDE SWITCH WITH RETRACTION FEATURES

Joseph Larue Lockard, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 366,926, June 4, 1973, abandoned. This application Sept. 5, 1974, Ser. No. 503,406

Int. Cl. H01h *15/00, 3/50*

U.S. Cl. 200—16 R **11 Claims**



said carriage including a knob portion selectively positionable in registration within at least a selected one of said notches,

said spring resiliently urging said knob portion into detenting engagement within said selected notch,

said knob portion and said carriage and said terminal being displaceable to compress resiliently said spring and also to disengage said knob portion from said selected notch and to retract said terminal from said open side of said base member,

said carriage being displaceable along said slot with said terminal being retracted from said open side of said base member and with said knob portion being disengaged from said series of notches.

3,888,808

TALL OIL EPOXY ESTER EXTERIOR COATING FOR LAP-SEAM BEVERAGE CANS

John D. Downs, Bradley, and Andrew Leo Massa, Kankakee, both of Ill., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 293,635, Sept. 29, 1972, abandoned. This application Nov. 30, 1973, Ser. No. 420,401

Int. Cl. C08g *30/04*

U.S. Cl. 260—18 EP **9 Claims**

1. A thermosetting resin that consists essentially of a polyglycidyl ether of a bisphenol, having a molecular weight of between about 170 and about 200 and an Epoxy Value between about 0.50 and about 0.60, upgraded in molecular weight with a stoichiometric amount of additional bisphenol by reaction at temperatures of between about 215°C and about 225°C for between about 20 minutes and about 30 minutes, forming an upgraded epoxy having a WPE of between about 1600 and about 2000; and said upgraded epoxy being esterified with an unsaturated fatty acid mixture, obtained from tall oil, consisting essentially of, by weight 25 to 55 percent oleic acid, 35 to 65 percent linoleic acid, with the balance essentially being conjugated linoleic acid; esterification being carried out using a weight ratio of upgraded epoxy: fatty acid mixture of between about 65:35 and about 70:30 at temperatures between about 225°C and about 250°C for between about 6 hours and about 8 hours.

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bark-dust and paper-mill wastes; and 2 – 100 parts by weight of fibrous materials selected from the group consisting of polyester fiber, polyamide fiber, polyacrylic fiber, glass fiber, silica-alumina fiber and rayon.

3,888,811

WATER-MOISTENABLE HOT-MELT APPLICABLE ADHESIVE COMPOSITION

Jilius Sirota, Plainfield; Robert S. Forsyth, Basking Ridge, and David Fergesen, Neshanic Station, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Sept. 26, 1973, Ser. No. 400,926

Int. Cl. C08f *19/14, 21/04*

U.S. Cl. 260—23 R **11 Claims**

1. A water-moistenable hot-melt applicable adhesive composition

A. characterized by the absence of blocking at 75 percent relative humidity under a 0.4 p.s.i.g. load at 22°C for 24 hours; and

B. consisting essentially of a blend of

1. at least one water-sensitive vinyl pyrrolidone/vinyl acetate copolymer,
2. at least one water-soluble solid polyethylene glycol based wax having an average molecular weight of at least 4,000, and
3. at least one water-insoluble solid wax.

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wherein the sum of the emulsifier components (a), (b) and (c) adds up to 100 percent by weight.

3,888,813

TIRE CORD DIP FOR POLYESTER FIBERS

Roy H. Moult, and Richard T. Hood, both of Murrysville, Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 373,274, June 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 232,270, March 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 105,552, Jan. 11, 1971, abandoned, which is a continuation-in-part of Ser. No. 815,491, April 11, 1969, abandoned. This application May 28, 1974, Ser. No. 473,439

Int. Cl. C08g *51/24*

U.S. Cl. 260—29.3 **6 Claims**

1. A water insoluble phenol formaldehyde resorcinol resin comprising a phenylene portion which is from about 55 to about 75 mole percent phenol and from about 25 to about 45 mole percent resorcinol and a formaldehyde portion which is from about 60 to about 70 mole percent formaldehyde based on the phenylene portion and wherein the mole ratio of formaldehyde to phenol is from about 0.75:1 to 1.1:1 and wherein the resin is prepared by:

a. reacting the phenol and the formaldehyde at a temperture between about 60°C and the boiling point of the phenol formaldehyde reaction mixture, under mildly alkaline conditions at an initial pH of about 8 to 10 until the phenol-formaldehyde reaction mixture has a molecular weight of 1,000–1,600 and a dilutability of from about 1:1.2 to about 1:0.8 at the pH of the phenol-formaldehyde reaction mixture;

b. adding the resorcinol and reacting the phenol formaldehyde reaction mixture with the resorcinol to form a phenol formaldehyde resorcinol resin;

c. distilling the phenol formaldehyde resorcinol resin to drive the reaction of step (b) to completion and to remove substantially all the water and unreacted phenol;

d. washing the distilled phenol formaldehyde resorcinol resin with a dilute aqueous acid solution to remove the unreacted resorcinol and low molecular weight oligopresent in quantities of from about 0.2 to about 10 percent by weight of the sum of the weight of components (A), (B) and (C), with the proviso that when component (C) is a halogenated aliphatic compound, it is employed in a range of from about 0.2 to about 50 percent by weight of the sum of the weights of A, B and C, that when the halogenated aliphatic compound also contains hydroxyl groups and has an OH equivalent weight of less than about 500 it is employed in quantities of from about 0.2 to about 5 percent by weight based upon the sum of the weights of (A), (B) and (C), and that when component (C) is a non-ester-containing aromatic compound or a halogenated aliphatic compound, the non-amine containing catalysts, component (D), is employed in quantities of from about 0.01 to about 10 percent by weight of the combined weights of components (A), (B) and (C), and when component (A) is an amine initiated polyol, component (D) may be omitted

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3,888,807

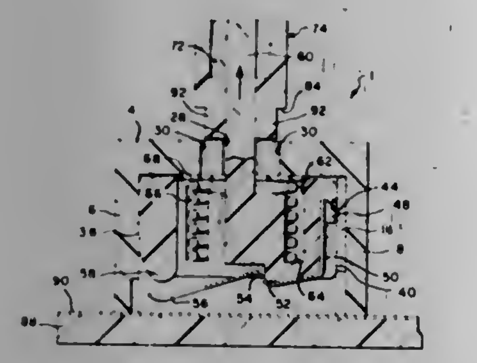
SLIDE SWITCH WITH RETRACTION FEATURES

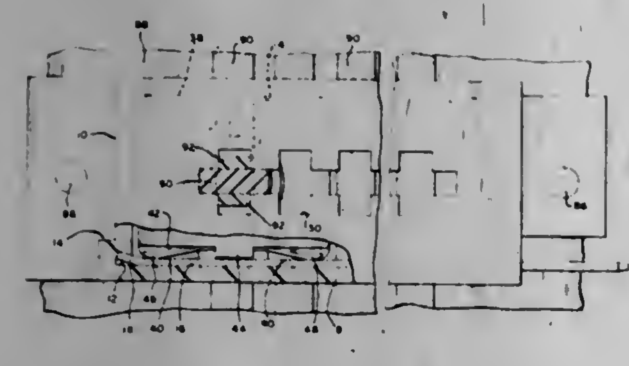
Joseph Larue Lockard, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 366,926, June 4, 1973, abandoned. This application Sept. 5, 1974, Ser. No. 503,406

Int. Cl. H01h *15/00, 3/50*

U.S. Cl. 200—16 R **11 Claims**





1. An switch, comprising:
a dielectric base member having an elongated slot and a series of notches spaced along said slot,
an elongated strip contact on said base member,
a carriage protruding through said slot,
an electrical terminal mounted on said carriage and in slidable engagement on said strip contact,
said base member having an open side,
a resilient spring in compression between said base member and said carriage and resiliently urging said carriage and said terminal to project toward said open side of said base and to establish an electrical terminal projecting toward said open side of said base,
said carriage being displaceable along said slot,
said carriage including a knob portion selectively positionable in registration within at least a selected one of said notches,
said spring resiliently urging said knob portion into detenting engagement within said selected notch,
said knob portion and said carriage and said terminal being displaceable to compress resiliently said spring and also to disengage said knob portion from said selected notch and to retract said terminal from said open side of said base member,
said carriage being displaceable along said slot with said terminal being retracted from said open side of said base member and with said knob portion being disengaged from said series of notches.

3,888,808

TALL OIL EPOXY ESTER EXTERIOR COATING FOR LAP-SEAM BEVERAGE CANS

John D. Downs, Bradley, and Andrew Leo Massa, Kankakee, both of Ill., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 293,635, Sept. 29, 1972, abandoned. This application Nov. 30, 1973, Ser. No. 420,401

Int. Cl. C08g *30/04*

U.S. Cl. 260—18 EP **9 Claims**

1. A thermosetting resin that consists essentially of a polyglycidyl ether of a bisphenol, having a molecular weight of between about 170 and about 200 and an Epoxy Value between about 0.50 and about 0.60, upgraded in molecular weight with a stoichiometric amount of additional bisphenol by reaction at temperatures of between about 215°C and about 225°C for between about 20 minutes and about 30 minutes, forming an upgraded epoxy having a WPE of between about 1600 and about 2000; and said upgraded epoxy being esterified with an unsaturated fatty acid mixture, obtained from tall oil, consisting essentially of, by weight 25 to 55 percent oleic acid, 35 to 65 percent linoleic acid, with the balance essentially being conjugated linoleic acid; esterification being carried out using a weight ratio of upgraded epoxy: fatty acid mixture of between about 65:35 and about 70:30 at temperatures between about 225°C and about 250°C for between about 6 hours and about 8 hours.

3,888,809

PAINT CONTAINING PULLULAN

Seizo Nakashio, Nishinomiya; Noriyuki Sekine, Osaka; Nobuhiro Toyota, Osaka, and Fumio Fujita, Osaka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka and Hayashibara Biochemical Laboratories, Inc., Okayama, both of, Japan

Filed Sept. 24, 1974, Ser. No. 508,844

Claims priority, application Japan, Sept. 29, 1973, 48-10994

Int. Cl. C08d *9/06*

U.S. Cl. 260—17.4 ST **6 Claims**

1. A paint containing pullulan.

3,888,810

THERMOPLASTIC RESIN COMPOSITION INCLUDING WOOD AND FIBROUS MATERIALS

Toshihiko Shinomura, Kawasaki, Japan, assignor to Nippon Oil Co., Ltd., Tokyo, Japan

Filed July 9, 1973, Ser. No. 377,711

Claims priority, application Japan, July 11, 1972, 47-69222

Int. Cl. C08g *45/18*

U.S. Cl. 260—17.4 BB **3 Claims**

1. A thermoplastic resin composition comprising 100 parts by weight of one or more thermoplastic resins selected from the group consisting of polyethylene, polypropylene, polystyrene, polyvinyl chloride and acrylonitrile-styrenebutadiene resin; 10 – 500 parts by dry weight of one or more wood materials selected from the group consisting of saw-dust, bark-dust and paper-mill wastes; and 2 – 100 parts by weight of fibrous materials selected from the group consisting of polyester fiber, polyamide fiber, polyacrylic fiber, glass fiber, silica-alumina fiber and rayon.

3,888,811

WATER-MOISTENABLE HOT-MELT APPLICABLE ADHESIVE COMPOSITION

Jilius Sirota, Plainfield; Robert S. Forsyth, Basking Ridge, and David Fergesen, Neshanic Station, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Sept. 26, 1973, Ser. No. 400,926

Int. Cl. C08f *19/14, 21/04*

U.S. Cl. 260—23 R **11 Claims**

1. A water-moistenable hot-melt applicable adhesive composition
  A. characterized by the absence of blocking at 75 percent relative humidity under a 0.4 p.s.i.g. load at 22°C for 24 hours; and
  B. consisting essentially of a blend of
    1. at least one water-sensitive vinyl pyrrolidone/vinyl acetate copolymer,
    2. at least one water-soluble solid polyethylene glycol based wax having an average molecular weight of at least 4,000, and
    3. at least one water-insoluble solid wax.

3,888,812

PROCESS FOR THE MANUFACTURE OF AQUEOUS EXPOXIDE RESIN EMULSIONS

Wolfram Plettner, Glinde, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed July 18, 1973, Ser. No. 380,390

Claims priority, application Switzerland, July 25, 1972, 11104/72

Int. Cl. C08c *9/18;* **C08d** *3/40*

U.S. Cl. 260—24 **10 Claims**

1. In a process for the manufacture of an aqueous emulsion of an epoxide resin, which aqueous emulsion has a water content of 50 to 70 percent by weight relative to the total amount of the emulsion, by emulsifying liquid epoxide resin or an epoxide resin which is liquid between 20° and 80°C using water in the presence of an emulsifier, the improvement which comprises
  using as the emulsifier from 0.5 to 15 percent by weight, relative to the total weight of the epoxide resin, of an emulsifier mixture consisting of
    a. 30 to 50 percent by weight of an abietic acid polyglycol ester,
    b. 20 to 40 percent by weight of an ether selected from the group consisting of a polyglycol ether of a fatty alcohol, a polyglycol ether of a p-alkylphenol, and mixtures thereof, and
    c. 10 to 30 percent by weight of long chain aliphatic alcohol of 8 to 18 carbon atoms,
  wherein the sum of the emulsifier components (a), (b) and (c) adds up to 100 percent by weight.

3,888,813

TIRE CORD DIP FOR POLYESTER FIBERS

Roy H. Moult, and Richard T. Hood, both of Murrysville, Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 373,274, June 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 232,270, March 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 105,552, Jan. 11, 1971, abandoned, which is a continuation-in-part of Ser. No. 815,491, April 11, 1969, abandoned. This application May 28, 1974, Ser. No. 473,439

Int. Cl. C08g *51/24*

U.S. Cl. 260—29.3 **6 Claims**

1. A water insoluble phenol formaldehyde resorcinol resin comprising a phenylene portion which is from about 55 to about 75 mole percent phenol and from about 25 to about 45 mole percent resorcinol and a formaldehyde portion which is from about 60 to about 70 mole percent formaldehyde based on the phenylene portion and wherein the mole ratio of formaldehyde to phenol is from about 0.75:1 to 1.1:1 and wherein the resin is prepared by:
  a. reacting the phenol and the formaldehyde at a temperture between about 60°C and the boiling point of the phenol formaldehyde reaction mixture, under mildly alkaline conditions at an initial pH of about 8 to 10 until the phenol-formaldehyde reaction mixture has a molecular weight of 1,000–1,600 and a dilutability of from about 1:1.2 to about 1:0.8 at the pH of the phenol-formaldehyde reaction mixture;
  b. adding the resorcinol and reacting the phenol formaldehyde reaction mixture with the resorcinol to form a phenol formaldehyde resorcinol resin;
  c. distilling the phenol formaldehyde resorcinol resin to drive the reaction of step (b) to completion and to remove substantially all the water and unreacted phenol;
  d. washing the distilled phenol formaldehyde resorcinol resin with a dilute aqueous acid solution to remove the unreacted resorcinol and low molecular weight oligomers.

3. In a polyester tire cord adhesive dip comprising a rubber latex and a phenolic resin, the improvement comprises using as the said resin a water insoluble phenol formaldeyde resorcinol resin comprising a phenylene portion which is from about 55 to 75 mole percent phenol and from about 25 to about 45 percent resorcinol and a formaldehyde portion which is from about 60 to 70 mole percent formaldehyde based on the phenylene portion and wherein the mole ratio of formaldehyde to phenol is from about 0.75:1 to 1.1:1 and wherein the resin is prepared by:
  a. reacting the phenol and the formaldehyde at a temperature between about 60°C and the boiling point of the phenol formaldehyde reaction mixture, under mildly alkaline conditions at an initial pH of about 8 to 10 until the phenol formaldehyde reaction mixture has a molecular weight of 1,000–1,600 and a dilutability of from about 1:1.2 to about 1:0.8 at the pH of the phenol formaldehyde reaction mixture;
  b. adding the resorcinol and reacting the phenol formaldehyde reaction mixture with the resorcinol to form a phenol formaldehyde resorcinol resin;
  c. distilling the phenol formaldehyde resorcinol resin to drive the reaction of step (b) to completion and to remove substantially all the water and unreacted phenol;
  d. washing the distilled phenol formaldehyde resorcinol resin with a dilute aqueous acid solution to remove the unreacted resorcinol and low molecular weight oligomers.

3,888,814
RUBBER COMPOSITIONS WITH IMPROVED PERFORMANCE AT SUB-ZERO TEMPERATURES

Paul Chalex, and Selwyn R. Mather, both of Elmhurst, Ill., assignors to The Richardson Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 102,506, Dec. 29, 1970, abandoned, which is a continuation-in-part of Ser. No. 682,518, Nov. 13, 1967, abandoned. This application Aug. 24, 1972, Ser. No. 283,599

Int. Cl. C08c *11/18, 11/22;* **H01m** *1/02*

U.S. Cl. 260—33.6 AQ **7 Claims**

1. A molded article having improved impact peformance at sub-zero temperatures, the article being formed by curing in a mold a rubber composition characterized by an elastomeric butadiene polymer having a reduced styrene content of less than about 10 weight percent, the composition containing about 8–20 weight percent of the polymer, and based on the weight of the polymer about 8–25 weight percent sulfur and about 40–70 weight percent of a saturated oil, and the remainder primarily an inert filler of semi-anthracite coal wherein said oil is characterized by maximums of about 8 percent nitrogen base components and 17 percent first acidaffins and a minimum of about 75 percent of saturates, second acidaffins, or mixtures thereof said composition containing an activator comprising lime.

3,888,815
SELF-BONDING TWO-PACKAGE ROOM TEMPERATURE VULCANIZABLE SILICONE RUBBER COMPOSITIONS

Stanley J. Bessmer, Cohoes, and Warren R. Lampe, Ballston Lake, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 389,733, Aug. 20, 1973, abandoned, which is a continuation of Ser. No. 180,068, Sept. 13, 1971, abandoned. This application June 12, 1974, Ser. No. 478,824

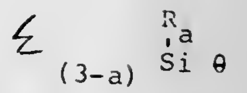
Int. Cl. C08g *51/04*

U.S. Cl. 260—37 SB **38 Claims**

1. A self-bonding room temperature vulcanizable silicone rubber composition comprising (a) a linear, fluid organopolysiloxane containing terminal silicon-bonded hydroxy groups and having a viscosity of 500 to 10,000,000 centipoise when measured at 25°C, the organic groups of the aforesaid organopolysiloxane representing monovalent hydrocarbon radicals; (b) 5 to 300 percent by weight of a filler; (c) from 0.1 – 15 percent by weight of an alkyl silicate selected from the class consisting of (1) a monomeric organosilicate corresponding to the general formula,

$$(R^{40}O)_3Si—R^{41},$$

where R^{40} is a radical selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals and R^{41} is selected from the class consisting of alkyl, haloalkyl, aryl, haloaryl, alkenyl, cycloalkyl, cycloalkenyl, cyanoalkyl, alkoxy and acyloxy radicals, and (2) a liquid partial hydrolysis product of the aforementioned organosilicate monomeric compounds; (d) from 0.1 to 5 percent by weight of the organopolysiloxane of a catalyst which is metallic salt of an organic monocarboxylic or dicarboxylic acid in which the metal ion is selected from the class consisting of lead, tin, zirconium, antimony, iron, cadmium, barium, calcium, titanium, bismuth and manganese, and e from 0.1 to 10 percent by weight of a nitrogen-functional silane of the formula,



$$\epsilon_{(3-a)}\overset{R_a}{Si}\,\theta$$

where R is selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals, ϵ is a hydrolyzable group selected from the class consisting of alkoxy, phenoxy, amino, and dialkylamino and θ is a nitrogen-functional radical which is a saturated, unsaturated or aromatic hydrocarbon residue which in addition to nitrogen-functionality may be functionalized by a radical selected from the class consisting of amino, cyano, thiom oxo, and ester, and multiples and combinations thereof and a is a whole number that varies from 0 to 2.

3,888,816
PROCESS FOR PRODUCING BOUND AGGREGATE BUILDING MATERIAL

Lloyd H. Brown, Crystal Lake, and Daniel S. P. Eftax, Barrington, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Continuation-in-part of Ser. No. 112,487, Feb. 3, 1971, abandoned. This application June 18, 1973, Ser. No. 371,067

Int. Cl. C08g *51/04*

U.S. Cl. 260—39 R **16 Claims**

1. A process for producing a bound aggregate building material composition consisting essentially of the steps of:

a. forming a first mixture comprising a monomeric binder mixture of from 99.5 percent to 99.9875 percent by weight monomeric furfuryl alcohol, and from 0.5 percent to 0.0125 percent by weight of a silane coupling agent of the general formula:

$$X—R'—Si—(OR'')_3$$

wherein R′ is a short chain alkylene containing between about 3 and 6 carbon atoms; R″ is a radical selected from the group consisting of aryl, alkyl, substituted aryl, and heteroalkyl; and X is a reactive member selected from the group consisting of amino, mercapto, epoxy, and glycidoxy;

b. forming a second mixture comprising a mixture of aggregate and acidic catlyst, said aggregate and said acidic catlyst being mixed in a proportion such that when from 2 percent to 20 percent by weight of said first mixture is mixed with from 98 percent to 80 percent by weight of the aggregate-acidic catalyst mixture, the acidic catalyst is present in an amount of from 5 percent to 50 percent by weight of the monomeric binder; and

c. admixing said first mixture and said second mixture in an amount such that the first mixture contributes from 2 percent to 20 percent by weight and said second mixture contributes from 98 percent to 80 percent by weight.

3,888,817
STABILIZED POLYESTER COMPOSITIONS

Paul C. Georgoudis, Dunellen, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Apr. 5, 1973, Ser. No. 348,217

Int. Cl. C08d *7/10*

U.S. Cl. 260—45.7 PH **6 Claims**

1. A saturated polyester composition stabilized against thermal degradation comprising,

a. a polyester blended with

b. 0.3 5.0 percent, by weight, of the polyester, of a combination comprising

   1. 10 to 90 percent, by weight, of at least one cyclic organic carbonate having at least one cyclic organic carbonate group per molecule containing 5–6 atoms in the ring, and
   2. at least one antioxidant selected from the group consisting of alkyl phosphites and arylphosphites wherein the alkyl groups contain from 2 to 18 carbon atoms.

3,888,818
THERMAL STABILIZATION OF VINYL RESINS WITH DERIVATIVES OF ALPHA-PHENYLINDOLE

Claude Deblandre, La Hulpe, and Jean Guyaux, Brussels both of Belgium, assignors to Solvay & Cie, Brussels, Belgium

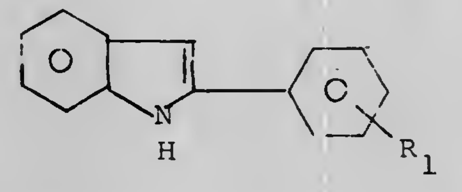
Filed Sept. 7, 1973, Ser. No. 395,063

Claims priority, application France, Sept. 8, 1972, 72.32076

Int. Cl. C08f *45/60*

U.S. Cl. 260—45.8 N **6 Claims**

1. In a thermally stabilized vinyl resin composition comprising vinyl resin and at least one thermal stabilizer distributed therein, the improvement wherein said stabilizer comprises a compound having the formula:



in which:

R_1 is a linear or branched alkyl or cycloalkyl chain containing from 4 to 20 carbon atoms, said stabilizer being present in an amount of from about 0.05 to 1 part by weight per 100 parts by weight of vinyl resin.

3,888,819
COMPOSITIONS COMPRISING SULFAMIDE FOR INCREASING FLAME RESISTANCE OF POLYMERS

Francis E. Evans, Hamburg, N.Y., and Kenneth B. Gilleo, St. Paul, Minn., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Apr. 29, 1974, Ser. No. 465,224

Int. Cl. C08g *17/56*

U.S. Cl. 260—45.8 N **10 Claims**

5. A step-reaction polymer selected from the group consisting of polyesters, polyanhydrides, polyacetals, polyamides and polyurethanes containing from about 1 to about 15 weight percent of a composition comprising:

a. sulfamide; and

b. from about 40 to about 85 weight percent of a compound selected from the group consisting polyhydroxypolycarboxy acids and their metal and ammonium salts, mercapto polycarboxylic acids and their metal and ammonium salts, polyhydroxy benzoic acids and their metal and ammonium salts, the lithium and sodium salts of monohydroxy polycarboxy acids, and the metal and ammonium salts of trithiocyanuric acid.

3,888,820
NOVEL FLAME RETARDANT COMPOSITIONS OF MATTER

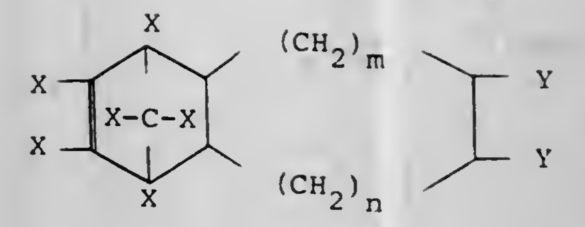
Irving Touval, Fords, and Morris Dunkel, Paramus, both of N.J., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 20, 1972, Ser. No. 316,942

Int. Cl. C08c *11/24*

U.S. Cl. 260—45.7 R **7 Claims**

1. A novel flame retardant composition of matter comprising a polymeric material and a compound possessing the formula:



in which X is selected from the group consisting of hydrogen and halogen, at least two X's being halogen, Y is halogen, and *m* and *n* are an integer of from 1 to 2.

3,888,821
AROMATIC POLYAMIDE FIBERS CONTAINING ULTRAVIOLET LIGHT SCREENERS

George Noel Milford, Jr., Waynesboro, Va., assignor to E. I. Du Pont De Nemours & Company, Wilmington, Del.

Filed Nov. 2, 1972, Ser. No. 303,202

Int. Cl. C08f *45/58;* **C08g** *51/58*

U.S. Cl. 260—45.8 NT **7 Claims**

1. An aromatic polyamide fiber containing an effective amount of an ultraviolet light screener in which the screener is microdispersed in the fiber in a discrete form such that any agglomerate thereof is less than 0.01 micron in diameter, and in which the screener absorbs electromagnetic radiation in the 340 to 390 millimicron wavelength region.

3,888,822
PROCESS FOR INCREASING FLAME RESISTANCE OF NYLON AND RESULTING FLAME RESISTANT NYLON COMPOSITION

Kenneth B. Gilleo, Depew; Francis E. Evans, Hamburg, and Allen W. Sogn, Williamsville, all of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Dec. 17, 1973, Ser. No. 425,488

Int. Cl. C08f *45/58*

U.S. Cl. 260—45.8 NT **41 Claims**

1. A composition comprising nylon and from about 0.5 to about 25 weight percent of a compound of the formula

$$(R_1)_n—Q=(R_2)_m$$

wherein Q comprises a heterocyclic ring structure which may be substituted and contains at least one sulfur or nitrogen atom in the ring; R_1 is independently at each occurrence a monovalent radical containing no more than 55 weight percent carbon and at least one sulfur or nitrogen atom; R_2 is independently at each occurrence a divalent radical containing fewer than 10 atoms other than hydrogen and at least one sulfur or nitrogen atom; *n* is 0 or an integer 1 through 6 and *m* is 0 or an integer of 1 through 3 and the sum of $n + 2m$ is 0 or an integer of 1 through 6, with the proviso that said compound contains at least one nitrogen atom and at least one sulfur atom, contains no non-cyclic imine group, and the ratio of the number of carbon atoms in the compound to the total number of atoms having an atomic number greater than two other than carbon in the compound being 2:1 or less, said compound including no carbon chain containing over six carbon atoms and being free of phosphorous, arsenic, halogens, and hexavalent sulfur which is directly bonded to a carbon atom:

3,888,823

METHOXY CARBOXYLIC ACID ESTER ULTRAVIOLET STABILIZERS FOR POLYMERS

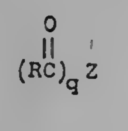
Robert G. Gough, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Division of Ser. No. 297,446, Oct. 13, 1972, Pat. No. 3,814,729. This application Jan. 9, 1974, Ser. No. 431,913

Int. Cl. C08f *45/60*

U.S. Cl. 260—45.8 A **22 Claims**

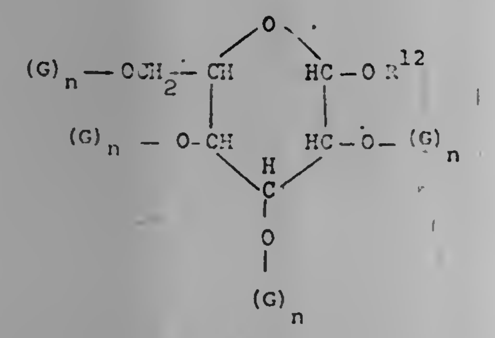
1. A composition comprising a member of the group consisting of solid monoolefin polymers and solid polyolefin polymers containing a stabilizingly effective amount of a compound having the formula



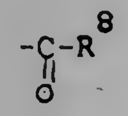
$$(R\overset{O}{\overset{\|}{C}})_q Z$$

where R is alkoxyphenyl, dialkoxyphenyl or alkylene dioxyphenyl, the alkoxy groups having 1 to 8 carbon atoms, and the alkylene group having 1 to 4 carbon atoms, q is 1 to 4, Z is

(a)



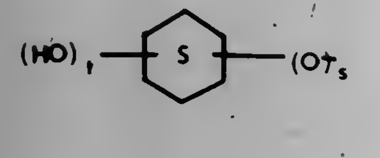
where R^{12} is lower alkyl and G is H or



$$-\underset{\underset{O}{\|}}{C}-R^8$$

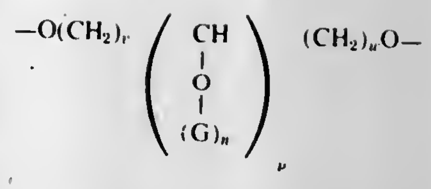
R^8 is hydrocarbyl N is 0 or 1 and where at least one of the n's must be zero;

(b)



where s is 1 to 3 and t is from 0 to 2, the total of s and t being not over 3;

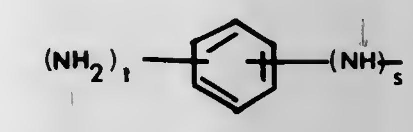
(c)



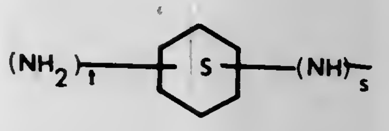
$$-O(CH_2)_v\left(\begin{array}{c}CH\\|\\O\\|\\(G)_n\end{array}\right)_p(CH_2)_wO-$$

where v and w are each 1 to 4 and p is 2 to 4;

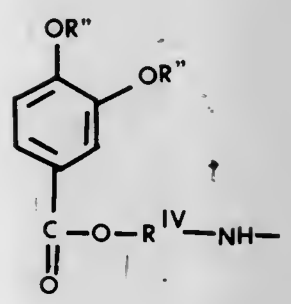
(d)



(e)

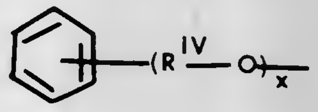


(f)



where R″ and R‴ are 1 to 8 carbon atom alkyl or where R″ and R‴ together with the oxygen atoms attached thereto and the adjacent carbon atoms of the benzene ring for a 5 or 6 membered heterocyclic ring and R^{IV} is 1 to 4 carbon atom alkylene;

(g)



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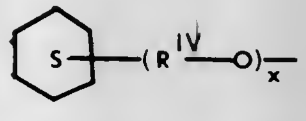
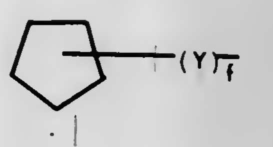


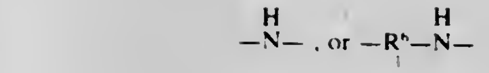
where x is 2 to 3;

(h) alkoxy of 1 to 18 carbon atoms;

(i) NHR^9 where R^9 is 1 to 18 carbon atom alkyl or H; or



where Y is —O—, —R^6—O— where R^6 is alkylene 1 to 3 carbon atoms,



$$\overset{H}{-N-}, \text{ or } -R^h-\overset{H}{N}-$$

and f is 2 to 4.

3,888,824

N-AROYL-N′-(ALKYLHYDROXYPHENYL) ALKANOYLHYDRAZINE STABILIZERS

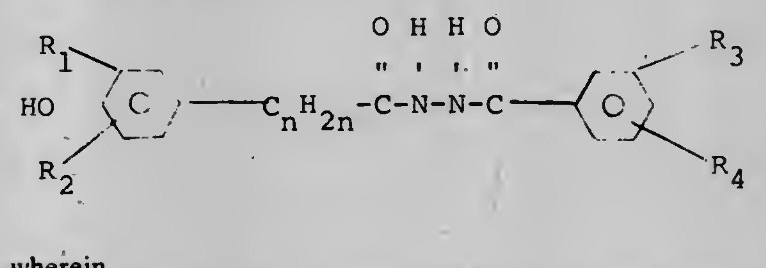
Martin Dexter, Briarcliff Manor, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 231,391, March 2, 1972, Pat. No. 3,773,830, which is a continuation-in-part of Ser. No. 28,048, April, 1970, Pat. No. 3,660,438. This application Nov. 19, 1973, Ser. No. 417,336

Int. Cl. C08f *45/60;* **C08g** *51/60*

U.S. Cl. 260—45.9 NC **5 Claims**

1. An organic composition subject to oxidative and/or thermal degration stabilized with 0.01 to 2% by weight of a compound having the formula



wherein

R_1 is an alkyl group containing from 1 to 5 carbon atoms,

R_2 is hydrogen or an alkyl group containing from 1 to 5 carbon atoms,

R_3 and R_4 are independently hydrogen, alkyl, alkoxy or halogen, where the alkyl group has up to 18 carbon atoms, and

n is an integer from 0 to 5.

3,888,825

COPPER INHIBITORS FOR POLYOLEFINS

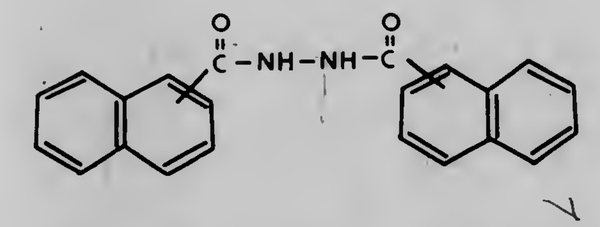
Edward Joseph Schurdak, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 19, 1973, Ser. No. 408,213

Int. Cl. C08f *45/60*

U.S. Cl. 260—45.85 B **11 Claims**

9. Polypropylene stabilized against copper-catalyzed thermal degradation by the combination of (a) an amount of a hindered-phenol antioxidant sufficient to stabilize said polypropylene against thermal degradation in the absence of copper and (b) an amount of a compound of the formula



sufficient to reduce the effects of copper on such thermal degradation even in the presence of said hindered-phenol antioxidant.

3,888,826

PROCESS FOR PREPARING AROMATIC POLYCARBONATES

Hirosuke Yamana, Nagoya; Tadashi Kunii, Tomotaka Furusawa, Yoshihiro Sugimura, Hiroshi Nakai, all of Yokkaichi, and Yasuo Hiro, Suzuka, all of Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

Filed July 2, 1973, Ser. No. 375,492

Claims priority, application Japan, July 10, 1972, 47-68253; Oct. 28, 1972, 47-107621

Int. Cl. C08g *17/13, 35/00*

U.S. Cl. 260—47 XA **4 Claims**

1. In a process for preparing an aromatic polycarbonate by interesterifying diphenyl carbonate and bisphenol A in the presence of a catalyst for the interesterification, the improvement comprising the steps of:

1. effecting a continuous or batch polymerization of diphenyl carbonate and bisphenol A firstly at a temperature of 160°–250°C and a reduced pressure for a period of 2–5 hours, the reduced pressure being gradually decreased from 50–200 mmHg to 1–10 mmHg during said period, and lastly at a temperature of 240°–270°C and a reduced pressure of not higher than 5 mmHg for a period of 1–30 minutes to produce a polycarbonate prepolymer having a viscosity-average molecular weight of 5,000–12,000 wherein the number of the terminal hydroxyl groups is 50–80% of that of the total terminal functional groups, and then
2. feeding the thus-produced polycarbonate prepolymer continuously to a film evaporator type reactor wherein the prepolymer is subjected to further polymerization at a temperature of 230°–330°C and a reduced pressure of not higher than 1 mmHg for a residence time of 5–30 minutes to obtain a high molecular weight, aromatic polycarbonate.

3,888,827

1,2-EPOXY RESIN COMPOSITIONS CONTAINING AMINIMIDE COMPOUNDS

Kanji Matueda, Futatsubashi; Hideki Niino, Yokohama, and Yoshitomo Nakano, Yokkaichi, all of Japan, assignors to Permachem Asia Co. Ltd. and Mitsubishi Petrochemical Co. Ltd., both of Tokyo, Japan

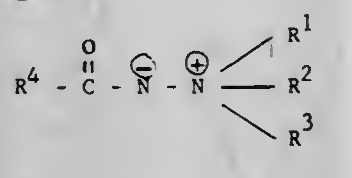
Filed Nov. 16, 1973, Ser. No. 416,667

Claims priority, application Japan, Nov. 20, 1972, 47-115704

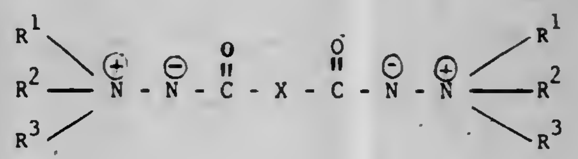
Int. Cl. C08q *30/14*

U.S. Cl. 260—47 EC **25 Claims**

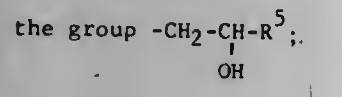
1. Epoxy resin compositions of superior hardenability which consist essentially of a 1,2-epoxy resin, a polycarboxylic acid anhydride at an equivalent rate of 0.6 to 1.2 per equivalent of the epoxy resin and an aminimide compound of the formula



or

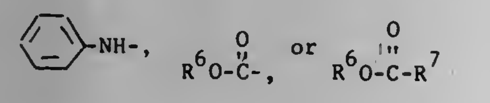


wherein R^1 is an alkyl group, a benzyl group or the group

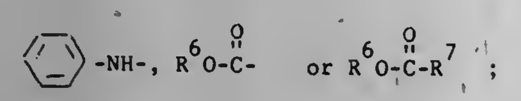


the group $-CH_2-\underset{OH}{\underset{|}{C}H}-R^5$;

R^2 and R^3 are the same or different, and each represents an alkyl group; R^4 is an alkyl group, an aryl group, an aralkyl group, a cycloakyl group, an alkoxy group, aryloxy group, an alkenyl group,



when R^1 is a benzyl group, and



R^5 is a hydrogen atom, an alkyl group, an aryl group, an alkoxyalkyl group, an aryloxyalkyl group, an allyloxyalkyl group, a hydroxyalkyl group, a methacryoxymethyl group or an acryloxymethyl group; R^6 is an alkyl group, an aryl group or an aralkyl group; R^7 is a residue of an aliphatic, cycloaliphatic or aromatic hydrocarbon; and X is a direct bond in an amount of 0.1 to 5 parts by weight of the epoxy resin.

3,888,828

SULFOSUCCINIC ACID SEMI-ESTERS OF OXYALKYLATED POLYNUCLEAR ALKYL-PHENOLS

Max Grossmann, Frankfurt am Main; Ruth Faber, Burgkirchen, and Heinz Uhrig, Steinbach, Aunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

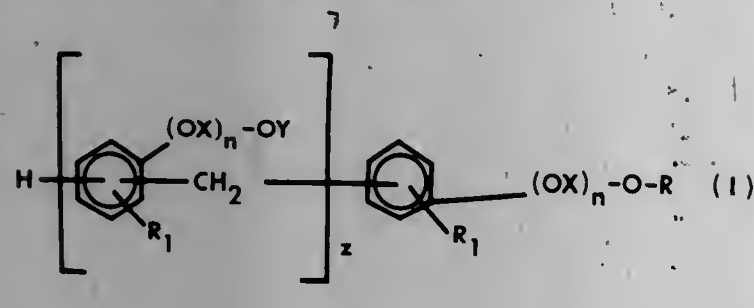
Filed June 29, 1972, Ser. No. 267,512

Claims priority, application Germany, June 30, 1971, 2132405

Int. Cl. C08g *5/18*

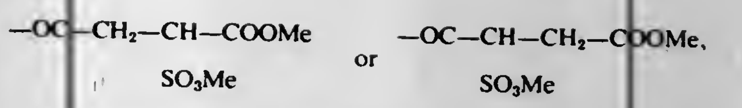
U.S. Cl. 260—49 **5 Claims**

1. Sulfosuccinic acid semi-esters of oxalkylated polynuclear alkyl-phenols of the general formula I



(I)

in which R represents a group of the formula



$-OC-CH_2-\underset{SO_3Me}{CH}-COOMe$ or $-OC-\underset{SO_3Me}{CH}-CH_2-COOMe$,

—(O—X) represents oxyethylene, oxypropylene and mixture thereof, R_1 represents a saturated straight chain or branched alkyl group having 6 to 14 carbon atoms, Y represents hydrogen or has the same meaning as that given for R, *n* represents a number from 2 to 25, *z* represents a number from 1 to 9 and Me stands for hydrogen or an alkali metal.

3,888,829

N,N'-BIS[3-HYDROXY-2-(3,4-DIHYDROXY-PHENYL)-1-PROPYL] ALIPHATIC-DIAMINES

Jean-Michel Bastian, Therwil, and Klaus Hasspacher, Riehen, both of Switzerland, assignors to Sandoz, Inc., Basel, Switzerland

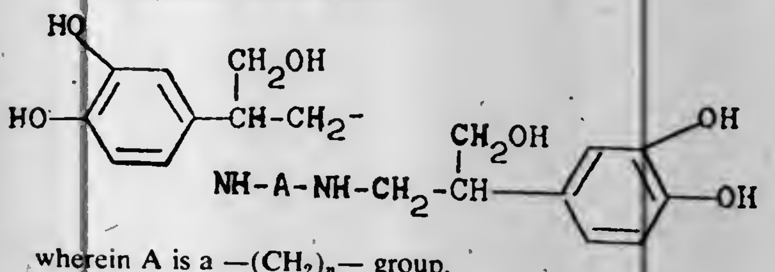
Filed June 20, 1972, Ser. No. 264,422

Claims priority, application Switzerland, June 25, 1971, 9347/71; Aug. 26, 1971, 12494/71

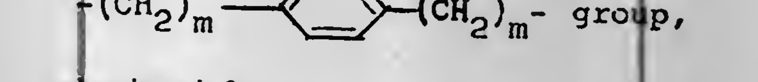
Int. Cl. C07c *91/16*

U.S. Cl. 260—570.6 **8 Claims**

1. A compound of the formula:



wherein A is a $-(CH_2)_n-$ group,
wherein *n* is an integer from 2 to 10, or a



wherein *m* is 2,
or a pharmaceutically acceptable acid addition salt thereof.

3,888,830

CURABLE COMPOSITIONS

Takahisa Ogasawara; Yoshimichi Senzaki; Hiroyuki Kato, and Hidemaro Tatemichi, all of Nagoya, Japan, assignors to Toagosei Chemical Industrial Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1973, Ser. No. 412,878

Claims priority, application Japan, Nov. 10, 1972, 47-112624

Int. Cl. C08g *17/10;* **C07c** *69/54*

U.S. Cl. 260—76 **5 Claims**

1. A curable composition comprising a radical polymerization initiator and an oligoacrylate containing 4-6 acryloyl groups and at least one cyclohexene nucleus in the molecule and having a boiling point of not lower than 200°C and an acryloyl group equivalent of not more than 1000, the oligoacrylate being a reaction product prepared by interesterifying a mixture of acrylic acid, at least one member selected from the group consisting of tetrahydrophthalic acid and anhydride thereof, and at least one member selected from the group consisting of trimethylolpropane and pentaerythritol.

3,888,831

CURING WITH COMPLEXES OF SELECTED DIAMINES AND ALKALI METAL SALTS

Irving Charles Kogon, Wilmington, Del., assignor to E. I. Du Pont De Nemours & Company, Wilmington, Del.

Filed Oct. 1, 1973, Ser. No. 402,490

Int. Cl. C08g *22/00*

U.S. Cl. 260—77.5 AM **20 Claims**

1. In a process for curing an amine-curable polymer or prepolymer with a curing agent which is either

1. a complex of 4,4'-methylene dianiline and a salt selected from the group consisting of sodium chloride, sodium bromide, sodium iodide, sodium nitrite, lithium chloride, lithium bromide, lithium iodide, lithium nitrite, and sodium cyanide, or
2. a complex of racemic 2,3-di(4-aminophenyl) butane with a salt selected from the group consisting of sodium chloride, sodium bromide, sodium iodide, potassium chloride, potassium bromide, potassium iodide, rubidium chloride, rubidium bromide, rubidium iodide, cesium chloride, cesium bromide and cesium iodide; the ratio of said dianiline or said butane to said salt in the complex being 3 moles to 1 mole,

the improvement comprising employing said curing agent in conjunction with a polar or polarizable compound having no reactive hydrogen and selected from (A) compounds having dipole moments in excess of 0.4 debye in which there are no more than a total of eight CH_3—, CH_2, or tertiary carbon radicals per polar group contained in the compound, and (B) benzene and biphenyl; said polar or polarizable compound representing about 0.25–25% by weight of the total weight of complex and polar compound.

3,888,832

PROCESS FOR OBTAINING POLYAMIDES

Michael Biensan, and Philippe Potin, both of Billiere, France, assignors to Societe Aquitaine-Total Organico, Courbevoie, France

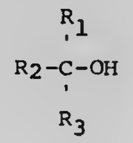
Filed Aug. 16, 1972, Ser. No. 281,152

Claims priority, application France, Aug. 25, 1971, 71.30755

Int. Cl. C08g *20/18*

U.S. Cl. 260—78 L **7 Claims**

1. In a process for preparing stabilized polyamides of high molecular weight by anionic polymerization of lactams, the improvement comprises polymerizing said lactam in an anhydrous medium with an alkali catalyst and adding to the resulting polymer at least one tertiary alcohol of the formula



$R_2-\underset{R_3}{\overset{R_1}{C}}-OH$

wherein R_1, R_2, and R_3 are paraffin radicals, the amount of the added tertiary alcohol being from about 0.05 to about 2.00 moles per 100 moles of the starting lactam.

3,888,833

METHOD FOR BINDING ANTITHROMBOTIC OR ANTICLOTTING SUBSTANCES TO A SUSCEPTIBLE MATERIAL INVOLVING THE USE OF AN AROMATIC SULFONYL NITRENE

Daniel Lednicer, Portage, and Edward E. Nishizawa, Schoolcraft, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

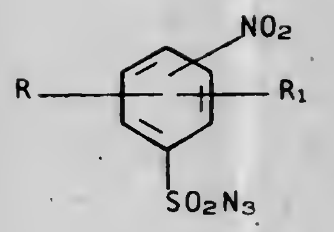
Filed May 30, 1972, Ser. No. 258,016

Int. Cl. C08f *3/92*

U.S. Cl. 260—79.3 R **10 Claims**

1. A process for inhibiting the thrombogenic or clotting ability of materials which are susceptible to interaction with an aromatic sulfonyl nitrene which comprises

a. contacting the said material with a compound of the generic structure



wherein R and R_1 are the same or different and are selected from the group consisting of hydrogen, halogen, and alkyl of one to four carbon atoms, inclusive,

b. irradiating the said contacted material and compound of step (a) for a time sufficient to generate a nitrene,

c. converting the nitro group to a diazonium salt, and

d. coupling the diazonium salt to a compound which inhibits the thrombogenic or clotting activity of the material.

3,888,834

PROCESS FOR PREPARING IMPROVED ETHYLENE COPOLYMER

Kazuo Yamaguchi, Tokyo; Natsuki Kanoh, Sagamihara; Isao Ito, Tokyo, and Nobuo Enokido, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Apr. 25, 1973, Ser. No. 354,362

Claims priority, application Japan, Apr. 25, 1972, 47-41533

Int. Cl. C08f *1/42, 15/04, 15/40*

U.S. Cl. 260—80.7 **6 Claims**

1. A process for preparing an improved ethylene copolymer, which comprises:

copolymerizing ethylene and a diolefin selected from the group consisting of 1,3-butadiene and an alkyl substituted 1,3-butadiene, or ethylene, an α-olefin and a diolefin selected from the group consisting of 1,3-butadiene and an alkyl substituted 1,3-butadiene, wherein the mole ratio of said diolefin to said ethylene is 0.1 – 3.0, in the presence of a catalyst system comprising a first solid component prepared by reducing a mixture or a reaction product of (a) a titanium halide and (b) a vanadyl trialcoholate with an alkylaluminum dihalide at a temperature of 50° – 100°C; and

a second component of an organoaluminum compound.

3,888,835

METHOD FOR THE POLYMERIZATION OF COPOLYMERIZATION OF ETHYLENE

Akira Ito; Kazuhiro Matsuzaki, and Yoshio Morimoto, all of Nagoya, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed July 5, 1972, Ser. No. 269,156

Claims priority, application Japan, July 22, 1971, 46-54824

Int. Cl. C08f *1/56, 3/06*

U.S. Cl. 260—88.2 R **9 Claims**

1. A method of polymerizing ethylene which comprises polymerizing or copolymerizing ethylene in a suspension polymerization system in the presence of a catalyst consisting of

A. a co-comminuted composition of the following components:
  a. at least one component selected from the group consisting of titanium tetrachloride and titanium trichloride, said titanium tetrachloride comprising 1–35% by weight and said titanium trichloride comprising 1–80% by weight of component (A),
  b. an aluminum halide-ether complex wherein the ether component thereof is a saturated or unsaturated ether of the formula $R^1—O—R^2$ wherein R^1 and R^2 each is a hydrocarbon residue or a halogen-substituted hydrocarbon residue or together form a cyclic ether, said aluminum halide-ether complex comprising 5–50% by weight of component (A) and

c. magnesium halide; and

B. an organo-aluminum compound.

3,888,836
PENTAPEPTIDE INTERMEDIATE OF LHRH AND DERIVATIVES THEREOF

Daniel F. Veber, and Stephen F. Brady, both of Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 30, 1972, Ser. No. 257,623

Int. Cl. C07c *103/52;* **A61k** *27/00*

U.S. Cl. 260—112.5 4 Claims

1. The pentapeptide pyroglu-his-trp-ser-tyr, and hydrazide, azide, and lower alkyl ester derivatives thereof.

3,888,837
TUBERCULIN ACTIVE PROTEINS AND PEPTIDES FROM THE CELLS OF TUBERCLE BACILLI

Toru Tsumita, and Seishi Kuwabara, both of Tokyo, Japan, assignors to Mitsui Pharmaceuticals, Incorporated, Tokyo, Japan

Filed June 28, 1973, Ser. No. 374,663

Int. Cl. C07c *103/52;* **C07g** *7/00;* **C08h** *1/00*

U.S. Cl. 260—112.5 4 Claims

1. A tuberculin active simple protein from *Mycobacterium tuberculosis* strain Aoyama B which is composed of 89 amino acid residues and whose amino acid sequence is as follows

1 2 3 4 5 6 7 8 9 10

H_2N-Arg-Leu-Leu-Asp-Asp-Thr-Pro-Glu-Val-Lys- ....

27 68 70 71 72 73 74 88 89

Cys ....Cys ....Asp-Gly-Ser-Glu-Met- ....Ala-Lys-COOH.

3,888,838
DECAPEPTIDE HAVING LUTEINIZING HORMONE (LH)-AND FOLLICLE STIMULATING HORMONE (FSH)-RELEASING ACTIVITY, SALTS AND COMPOSITIONS THEREOF, A PROCESS FOR PREPARING SAME, AND INTERMEDIATES THEREFOR

Hans U. Immer; Verner R. Nelson, both of Montreal, Quebec, and Manfred K. Gotz, Hudson, Quebec, all of Canada, assignors to Ayerst McKenna and Harrison Ltd., Montreal, Canada

Filed July 10, 1972, Ser. No. 270,140

Int. Cl.² C07C *103/52;* **C07G** *7/00;* **A61K** *27/00*

U.S. Cl. 260—112.5 25 Claims

1. A process for preparing a decapeptide of the formula I H — Pyr — His — Trp — Ser — Phe — Gly — Leu — Arg — Pro — Gly — NH_2 in the form of its salt, which comprises treating the hexapeptide N-[N-[N-[N-[-(5-oxo-L-prolyl)-L-histidyl]-L-tryptophyl]-L-seryl]-L-phenylalanyl]glycine hydrazide trifluoroacetate in an anhydrous inert organic solvent with a strong mineral acid selected from the group consisting of hydrogen chloride, hydrogen bromide and sulfuric acid and an organic nitrite selected from the group consisting of t-butyl nitrite and isoamyl nitrite at a temperature within the range of from about −30°C to about −10°C, making the mixture alkaline by addition of a strong organic base, adding a solution of N-[N-[N-(N-L-leucyl-L-arginyl]-L-prolyl]glycinamide diacetate in an anhydrous inert organic solvent, agitating the mixture at a temperature within the range from about −30°C to about 0°C, and isolating the decapeptide of formula I as the strong mineral acid salt.

3,888,839
ISOLATED YEAST PROTEIN PRODUCT WITH INTACT RNA AND A PROCESS FOR MAKING SAME

Jon Albert Newell, Webster Groves; Robert Dudley Seeley, Crestwood, and Ernest Aleck Robbins, High Ridge, all of Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed Nov. 29, 1972, Ser. No. 310,455

Int. Cl. A23j *1/18*

U.S. Cl. 260—112 R 9 Claims

4. A process for producing a substantially cell free yeast protein product comprising the steps of:
   - a. Rupturing yeast cells,
   - b. Extracting the protein from the ruptured yeast cells at a pH of about 5.5 to about 11 and a temperature of 0°C. to about 60°C. while maintaining the protein in soluble form,
   - c. Separating the ruptured yeast cells into an insolubles fraction and a solubles fraction,
   - d. Combining the solubles fraction and a food grade acid to a pH of about 3.5 to about 5.5 at a temperature of 0°–100°C. to insolubilize the protein, and
   - e. Separating the insolubilized protein from the solubles fraction.

3,888,840
NOVEL HYDRAZINOCARBOXAMIDE DERIVATIVES AND PREPARATION THEREOF

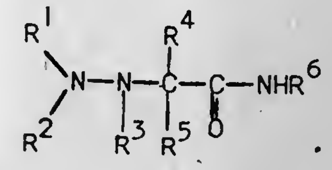
Amedeo Failli, Montreal; Verner R. Nelson, Kirkland; Hans U. Immer, St. Laurent, and Manfred K. Gotz, Hudson, Quebec, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Feb. 7, 1973, Ser. No. 330,359

Int. Cl. C07c *103/52;* **A61k** *27/00*

U.S. Cl. 260—112.5 8 Claims

1. A compound of the formula:



in which R^1 and R^2 each are lower alkyl or R^1 and R^2 together with the nitrogen atom to which they are joined form a piperidino or morpholino radical; R^3 is hydrogen, lower alkanoyl, benzoyl, p-nitrobenzoyl, p-aminobenzoyl, p-chlorobenzoyl, isocyanoacetyl, N-formylglycyl or N-carbobenzoxyglycylglycyl;

R^4 is lower alkyl, CHR^7COOR^8 or $CH_2CH_2COOR^8$ wherein R^7 is hydrogen or phenyl and R^8 is hydrogen or lower alkyl; R^5 is hydrogen or lower alkyl; or R^4 and R^5 together with the carbon atom to which they are joined form a cyclohexylidene radical; and R^6 is CHR^9COY wherein R^9 is hydrogen or benzyl and Y is hydroxyl, lower alkoxy or amino, with the provisos that when Y is hydroxyl then R^8 is hydrogen, that when Y is lower alkoxy then R^8 is lower alkyl and that when Y is amino R^4 is lower alkyl.

3,888,841
PROCESS FOR DIAZOTIZING AROMATIC AMINES

Ernst Spietschka, Oberauroff, Taunus, and Josef Landler, Hofheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed July 10, 1972, Ser. No. 270,256

Claims priority, application Germany, July 10, 1971, 2134519

Int. Cl. C07c *113/04*

U.S. Cl. 260—141 2 Claims

1. A process for diazotizing a diazotizable amine compound which consists of the steps of: dissolving or suspending a diazotizable amine compound which does not carry a strongly

negative substituent in an excess of a heterocyclic base inert toward the action or compounds capable of splitting off nitrosyl groups, selected from the group consisting of pyridine, quinoline, picoline, lutidine and mixtures thereof; and diazotizing the said diazotizable amine compound at a temperature of from −15°C to 10°C and in the absence of acid conditions with a compound capable of splitting off nitrosyl groups selected from the group consisting of nitrosylsulfuric acid and nitrosyl chloride.

3,888,842
QUERCETIN DERIVATIVES

Michel Cazaux, Pessac, and Jean Cros, Ramonville, both of France, assignors to Societe Cortial, Paris, France

Filed Aug. 28, 1973, Ser. No. 392,309

Claims priority, application France, Aug. 31, 1972, 72.30873; July 6, 1973, 73.24835

Int. Cl. C07c *47/18*

U.S. Cl. 260—210 F 7 Claims

1. Quercetin substituted in one or more of positions, 3, 7 and 4′ by the vicianosyl group.

3,888,843
4-CARBAMOYL-1-β-D-RIBOFURANOSYLIMIDAZOLIUM-5-OLATE

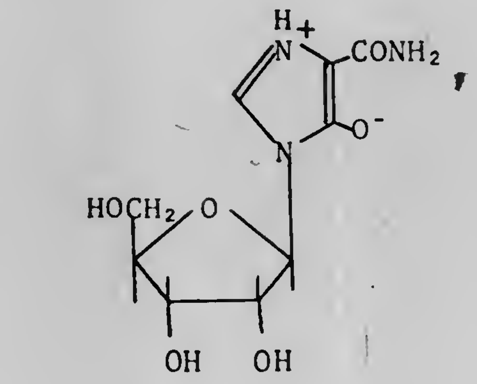
Kimio Mizuno; Takuji Ando; Masatoshi Tsujino; Masaki Takada; Munetoshi Yoshizawa; Tetsuo Matsuda, and Mitsuo Hayashi, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka-ken, Japan

Filed June 12, 1973, Ser. No. 365,794

Int. Cl. C07d *51/52*

U.S. Cl. 260—211.5 R 1 Claim

1. 4-carbamoyl-1-β-D-ribofuranosylimidazolium-5-olate, a compound of the formula



3,888,844
HALOGENATED ESTERS OF PHOSPHORUS-CONTAINING ACIDS (II)

Gaetano F. D'Alelio, 2011 E. Cedar St., South Bend, Ind. 46617

Continuation-in-part of Ser. No. 179,543, Sept. 10, 1971, Pat. No. 3,780,144, which is a continuation-in-part of Ser. No. 785,335, Dec. 19, 1968, abandoned. This application July 30, 1973, Ser. No. 383,600

Int. Cl. C08b *3/00*

U.S. Cl. 260—214 30 Claims

1. A polymeric ester having fire-retardant properties and having the formula $Q[OP(O)(ORCX{=}CXR')_2]_n$ wherein Q represents a polymeric organic moiety having a valency of n; *n* represents an integer of at least 2;

R represents a divalent hydrocarbon radical having 1–20 carbon atoms; R′ represents X, hydrogen or R″;

R″ represents a monovalent hydrocarbon radical containing 1–20 carbon atoms; and

X represents chlorine or bromine;

said polymeric organic moiety being a hydroxy-containing polymer selected from the class consisting of (a) polymeric (hydroxyhydrocarbon) esters of acrylic, methacrylic and beta-chloroacrylic acids, (b) hydroxy-containing polystyrenes, (c) hydroxy-containing polymeric vinyl ethers, (d) polymeric alkanolamines, (e) linear phenolaldehyde polymers, (f) polymeric polyesters having unreacted hydroxy groups, (g) polyvinyl alcohols, partially etherified polyvinyl alcohols and partially esterified polyvinyl alcohols, and (h) cellulose, partially etherified cellulose and partially esterified cellulose.

3,888,845
PROCESS FOR PRODUCING EPSILON-CAPROLACTAM

Yutaka Fujita; Tatsuyuki Naruchi, and Eishin Yoshisato, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Mar. 5, 1971, Ser. No. 121,550

Claims priority, application Japan, Mar. 9, 1970, 45-20008; Apr. 10, 1970, 45-31012; Apr. 15, 1970, 45-32074; Oct. 12, 1970, 45-88773; Oct. 15, 1970, 45-90060; Nov. 19, 1970, 45-102166; Dec. 28, 1970, 45-123958

Int. Cl. C07d *41/06*

U.S. Cl. 260—239.3 A 8 Claims

1. A process for producing ϵ-caprolactam which comprises contacting at least one compound selected from ϵ-caprolactone and C_1–C_4 lower alkyl esters of ϵ-hydroxycaproic acid with hydrogen and ammonia in the vapor phase at a temperature of 200° to 320°C. with a solid catalyst consisting essentially of
   - A. at least one oxide selected from the group consisting of titanium dioxide, alumina, alumina-silica and silica,
   - B. metallic copper, and
   - C. at least one component selected from the group consisting of metallic nickel and chromium sesquioxide the sum of the amounts of the metallic copper (B), the component (C) being 0 to 200 parts by weight.

3,888,846
PROCESS FOR 2[2-(1,3-DIAZACYCLOALK-2-ENYL)]BENZOPHENONE DERIVATIVES AND 1,3-DIAZACYCLOALKENYL[2,1-A]ISOINDOLE DERIVATIVES

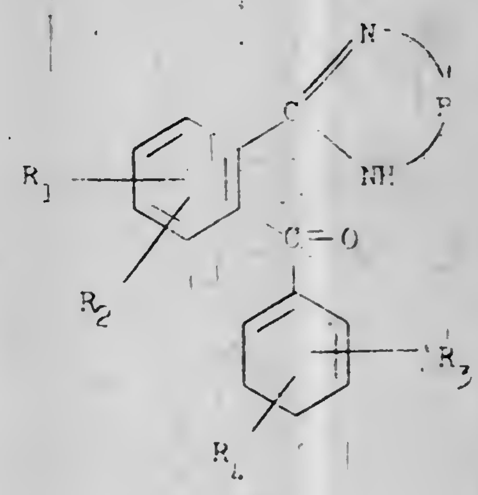
Werner Metlesics, Clifton, and Leo Henryk Sternbach, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 626,965, March 30, 1967, abandoned. This application May 18, 1967, Ser. No. 639,315

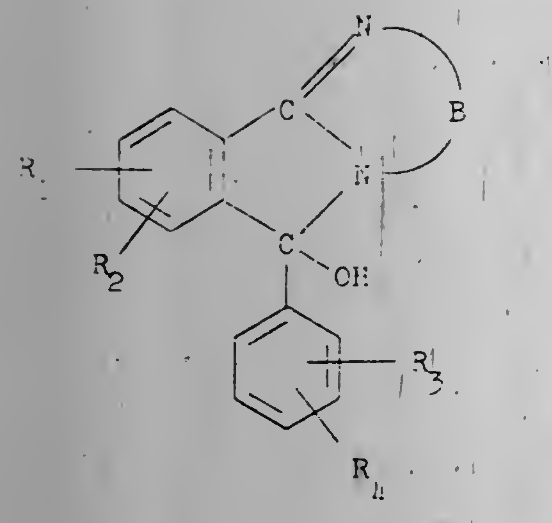
Int. Cl. C07d *51/28, 57/14, 53/02*

U.S. Cl. 260—239 BC 5 Claims

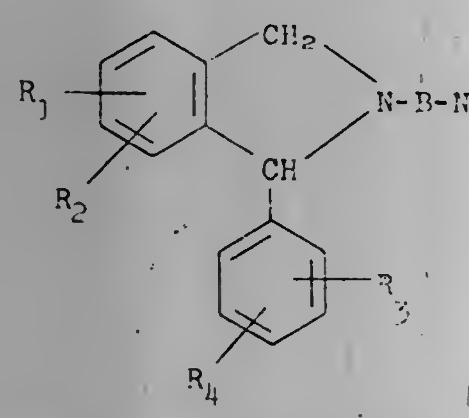
1. A process for the preparation of a compound of the formula



and its tautomer of the formula



wherein B represents an alkylene chain of 2 to 4 carbon atoms in which one or more of the hydrogens can be replaced by straight chain lower alkyl of 1 to 6 carbon atoms; and R_1, R_2, R_3 and R_4 are each independently selected from the group consisting of hydrogen, halogen, straight chain lower alkyl of 1 to 6 carbon atoms, lower alkoxy of 1 to 6 carbon atoms, hydroxy and trifluoromethyl which comprises treating a compound of the formula:



wherein B, R_1, R_2, R_3 and R_4 are as defined hereinabove with an oxidizing agent.

3,888,847

AZIRIDINYL HALOFORMIMIDES

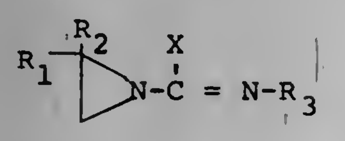
Donald A. Tomalia, and Thomas J. Giacobbe, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 76,649, Sept. 29, 1970, Pat. No. 3,754,032. This application May 11, 1973, Ser. No. 359,562

Int. Cl. C07d *23/06*

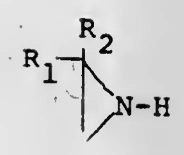
U.S. Cl. 260—239 E **8 Claims**

1. A compound of the formula



wherein X is chloro or bromo, R_1 and R_2 are H or lower alkyl and R_3 is alkyl of from one to 18 carbon atoms, cyclohexyl, phenyl, naphthyl, alkyl-substituted phenyl wherein the alkyl group has from one to eight carbon atoms, phenalkyl wherein the alkyl group has one to four carbon atoms, β-naphthylethyl, mono- or dihalosubstituted phenyl or mononitrosubstituted phenyl.

8. A process for producing the compound defined in claim 1 comprising reacting by contacting, in the presence of an acid acceptor, (a) an aziridine of the formula



with (b) an isocyanide dihalide of the formula R_3—N CX$_2$, said process being conducted at a temperature of from about −20° to about 5°C.

3,888,848

AMPICILLIN-CHLORAL HYDRATE COMPLEX

Takeru Higuchi, and Kaneto Uekama, both of Lawrence, Kans., assignors to Alza Corporation, Palo Alto, Calif.

Filed Nov. 8, 1971, Ser. No. 196,441

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 **1 Claim**

1. 6-(D-2-amino-2-phenylacetamido)penicillanic acid-2,2,2-trichloro-1,1-ethanediol complex.

3,888,849

17α-SUBSTITUTED-ALLENE-BEARING STEROIDS

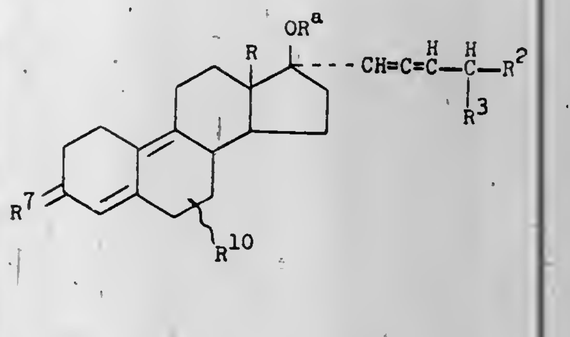
Imre Bacso, Morristown, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 219,555, Jan. 20, 1972, abandoned. This application July 13, 1973, Ser. No. 379,160

Int. Cl.^{2} C07C *173/10*

U.S. Cl. 260—239.5 **20 Claims**

1. A compound of the formula



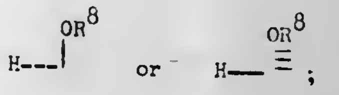
wherein

R is alkyl having from 1 to 4 carbon atoms;

R^a is a hydrogen atom, tetrahydropyran-2-yl, tetrahydrofuran-2-yl, 4-methoxytetrahydropyran-4-yl, alkanoyl having from 2 to 4 carbon atoms or acetoacetyl;

each of R^2 and R^3, independently is a hydrogen atom, or alkyl, provided that the total number of carbon atoms of R^2 and R^3 does not exceed 4 carbon atoms;

R^7 is oxo,



wherein

R^8 is a hydrogen atom, tetrahydropyran-2-yl, tetrahydrofuran-4-yl, 4-methoxytetrahydropyran-4-yl, alkanoyl having from 2 to 4 carbon atoms, or acetoacetyl; and

R^{10} is a hydrogen atom.

3,888,850

SUBSTITUTED P-AMINOSTYRYL-5-CHLOROINDOLINIUM DYES

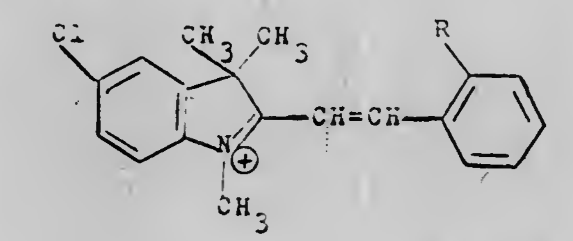
Roland Entschel, Basel, and Viktor Kaeppeli, Allschwil, Basel, both of Switzerland, assignors to Sandoz, Inc., Basel, Switzerland

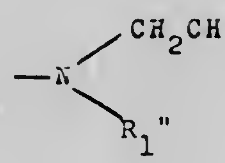
Continuation of Ser. No. 101,399, Dec. 24, 1970, abandoned. This application Apr. 9, 1973, Ser. No. 349,460

Int. Cl. C09b *23/14*

U.S. Cl. 260—240.9 **4 Claims**

1. A compound of the formula





wherein

a. R is methyl, and

R''$_1$ is ehtyl, or

b. R is ethyl, and

R''$_1$ is 2-chloroethyl, and

A^- is an anion.

3,888,851

2,4-DIAMINO-SUBSTITUTED THIENO(3,2-D)PYRIMIDINES AND SALTS THEREOF

Berthold Narr; Josef Roch; Erich Müller, and Josef Nickl, all of Biberach an der Riss, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

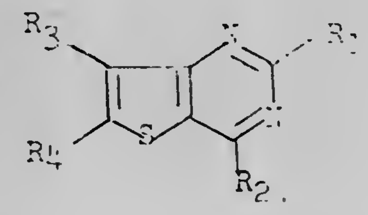
Filed May 3, 1972, Ser. No. 249,782

Claims priority, application Germany, May 4, 1971, 2121950; July 26, 1971, 2137431; Mar. 29, 1972, 2215299

Int. Cl. C07d *99/10*

U.S. Cl. 260—243 R **9 Claims**

1. A compound of the formula



wherein:

one of R_1 and R_2 is piperazino, N''-methyl-piperazino, N'-benzyl-piperazino, N'-(β-hydroxy-ethyl)-piperazino, dimethyl-piperazino or 1-oxido-thiomorpholino,

the other of R_1 and R_2 is 1-oxido-thiomorpholino, 1,1-dioxido-thiomorpholino or 2-methyl-1-oxido-thiomorpholino,

provided, however, that R_1 and $R_2$are other than 1-oxido-thiomorpholino and 1,1-dioxido-thiomorpholino or 2-methyl-1-oxido-thiomorpholino, respectively, at the same time,

one of $R_3$and R_4 is hydrogen or methyl,

and the other of R_3 and R_4 is hydrogen, methyl, chlorine, bromine or nitro,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,888,852

10-IMIDOYLPHENOXAZINES

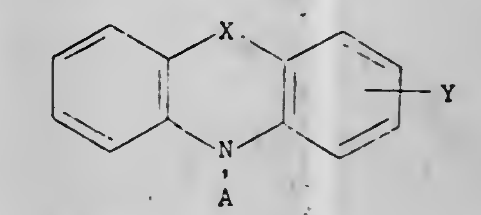
Yao Hua Wu, and Walter G. Lobeck, Jr., both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Feb. 28, 1973, Ser. No. 336,671The portion of the term of this patent subsequent to Mar. 6, 1990, has been disclaimed.

Int. Cl. C07d *87/50*

U.S. Cl. 260—244 R **13 Claims**

1. A compound selected from the group consisting of 10-imidoylphenoxazines having the formula

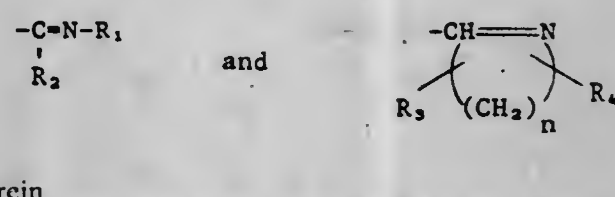


and a non-toxic pharmaceutically acceptable acid addition salt thereof wherein

X represents oxygen

Y represents hydrogen, trifluoromethyl, halogen, dihalogen, lower alkyl of 1 to 4 carbon atoms inclusive, lower alkoxy of 1 to 4 carbon atoms inclusive; and

A is selected from the group consisting of



wherein

R_1 is lower alkyl of 1 to 4 carbon atoms inclusive or cycloalkyl of 3 to 6 carbon atoms inclusive;

R_2 is hydrogen or lower alkyl of 1 to 4 carbon atoms inclusive;

R_3 and R_4 are independent members selected from the group consisting of hydrogen or lower alkyl of 1 to 4 carbon atoms inclusive;

n is an integer of 3 to 5.

3,888,853

1,2,5,6-TETRAHYDROPYRIDINES

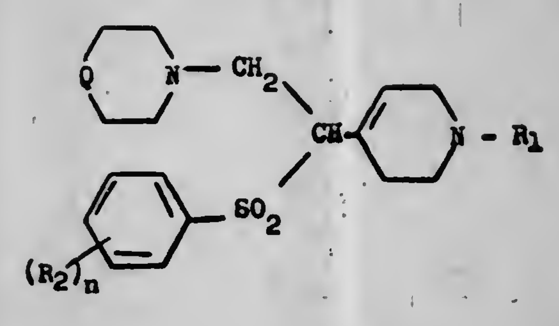
Robert E. Manning, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation of Ser. No. 194,687, Nov. 1, 1971, abandoned. This application Sept. 19, 1973, Ser. No. 398,582

Int. Cl. C07d *87/46*

U.S. Cl. 260—247.1 M **2 Claims**

1. A compound of the formula



(I)

where

n is 0, 1 or 2

R_1 is lower alkyl and

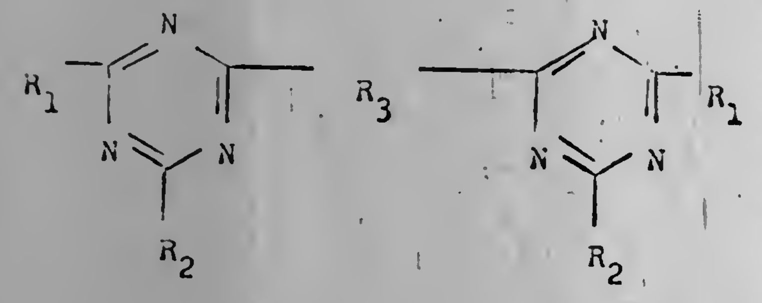
R_2 is halo having an atomic weight of about 19 to 36, lower alkyl or lower alkoxy or

a pharmaceutically acceptable acid addition salt thereof.

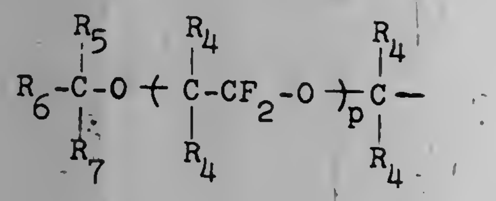
3,888,854
BIS-TRIAZINE COMPOUNDS
Paul D. Schuman, Hawthorne, and Eugene C. Stump, Jr., Gainesville, both of Fla., assignors to PCR, Inc., Gainesville, Fla.

Filed Nov. 18, 1971, Ser. No. 200,212
Int. Cl. C07d *55/50*
U.S. Cl. 260—248 CS **11 Claims**

1. Compound of the formula:



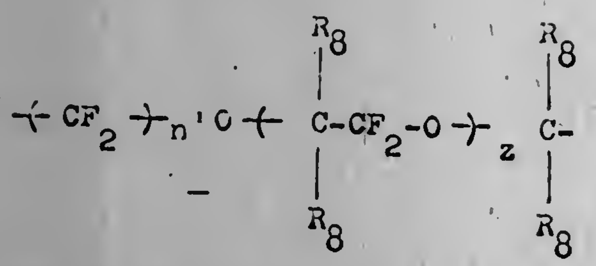
wherein R_1 and R_2 are independently selected from the group consisting of
- a. perfluoroalkyl of 1 – 12 carbon atoms,
- b. perhalogenated chlorofluoroalkyl of 1 – 11 carbon atoms, and
- c. radicals of the formula:



$$R_6-\overset{R_5}{\underset{R_7}{C}}-O(\overset{R_4}{\underset{R_4}{C}}-CF_2-O)_p\overset{R_4}{\underset{R_4}{C}}-$$

wherein each R_4 is independently selected from the group consisting of F, Cl and perfluoroalkyl of 1 to 5 carbon atoms, and R_5, R_6 and R_7 are independently selected from the group consisting of F, Cl, perfluoroalkyl of 1 – 7 carbon atoms, ω-hydroperfluoroalkyl of 2 to about 12 carbon atoms, perhalogenated chlorofluoroalkyl of 1 to 7 carbon atoms, and p is a number from 1 – 20, and ω-hydroperfluoroalkyl of 3 to about 13 carbon atoms, and R_3 is a member selected from the group consisting of

$$-CF_2(OCF_2CF_2)_xO(CF_2)_n$$
$$O(CF_2CF_2-O)_yCF_2-,$$



$$-(CF_2)_{n'}O(\overset{R_8}{\underset{R_8}{C}}-CF_2-O)_z\overset{R_8}{\underset{R_8}{C}}-$$

perhalogenated chlorofluoroalkylene of 2 to about 20 carbon atoms, and mixtures thereof, wherein each R_8 is independently F, Cl, perfluoroalkyl of 1 – 5 carbon atoms, or perhalogenated chlorofluoroalkyl of 1 – 5 carbon atoms, x and y are independently numbered from 0 – 20, z is a number from 1 to 20, n is a number from 5 to 20, and n' is a number from 2 – 20.

3,888,855
PREPARATION OF LOW BULK DENSITY SODIUM DICHLOROISOCYANURATE DIHYDRATE
Sidney Berkowitz, Highland Park, N.J., assignor to FMC Corporation, New York, N.Y.

Filed July 13, 1973, Ser. No. 378,829
Int. Cl. C07d *55/38*
U.S. Cl. 260—248 C **6 Claims**

1. A process for the production of a storage-stable, free-flowing, thermal-decomposition resistant, low bulk density sodium dichloroisocyanurate dihydrate which comprises contacting water-wet sodium dichloroisocyanurate dihydrate with a water miscible organic solvent, drying the solvent treated sodium dichloroisocyanurate at a temperature less than about 48°C to remove the organic solvent and not the waters of hydration, and recovering a low bulk density, sodium dichloroisocyanurate dihydrate having a bulk density of about 0.1 to about 0.3 grams/cubic centimeter.

3,888,856
PREPARATION OF ALKALI METAL SALTS OF DICHLOROISOCYANURIC ACID
John A. Wojtowicz, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Sept. 4, 1974, Ser. No. 503,213
Int. Cl. C07d *55/40*
U.S. Cl. 260—248 C **21 Claims**

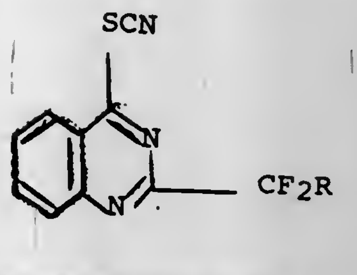
1. A process for preparing an alkali metal salt of dichloroisocyanuric acid which comprises reacting trichloroisocyanuric acid with an alkali metal salt of an acid selected from the group consisting of:
1. inorganic acids selected from the group consisting of cyanic acid, thiocyanic acid, hydrocyanic acid, nitrous acid, chlorous acid, silicic acid, aluminic acid, and boric acid,
2. aliphatic carboxylic acids selected from the group consisting of aliphatic monocarboxylic acids and hydroxy-substituted aliphatic monocarboxylic acids wherein said aliphatic group contains from one to about six carbon atoms, and aliphatic polycarboxylic acids and hydroxy-substituted aliphatic polycarboxylic acids wherein said aliphatic group contains from two to about six carbon atoms,

said reaction being conducted in the presence of water, and recovering said alkali metal salt of dichloroisocyanuric acid produced thereby.

3,888,857
FUNGICIDAL 4-THIOCYANO QUINAZOLINE COMPOUNDS
Antonius Gerhardus Maria Willems, Weesp, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 1, 1973, Ser. No. 384,685
Claims priority, application Netherlands, Aug. 9, 1972, 7,210,866
Int. Cl. Co7d *51/48*
U.S. Cl. 260—251 Q **3 Claims**

1. A 4-thiocyano-quinazoline of the formula

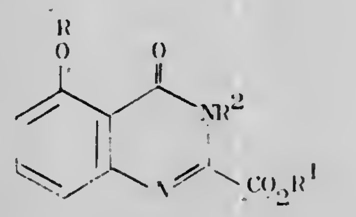


wherein R is a member selected from the group consisting of fluoro and difluoromethyl.

3,888,858
3,4-DIHYDRO-4-OXO-2-QUINAZOLINECARBOXYLIC ACIDS, SALTS AND ESTERS AS ANTI-ALLERGIC AGENTS
John H. Sellstedt, Pottstown; Charles J. Guinosso, King of Prussia, and Stanley C. Bell, Penn Valley, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Feb. 22, 1974, Ser. No. 444,945
Int. Cl. C07d *51/48*
U.S. Cl. 260—251 QA **8 Claims**

1. A compound of the formula:



in which
- R is alkyl of one to six carbon atoms;
- R^1 is hydrogen, alkyl of one to six carbon atoms, an alkali metal cation or the ammonium ion; and
- R^2 is hydrogen or alkoxymethyl containing from two to seven carbon atoms.

3,888,859
METHOD FOR A FREEZE DRIED FORTIFIED COFFEE HAVING IMPROVED RATE OF SOLUBILITY
George B. Ponzoni, Spring Valley, N.Y., and Richard J. Leonard, Totowa, N.J., assignors to General Foods Corporation, White Plains, N.Y.

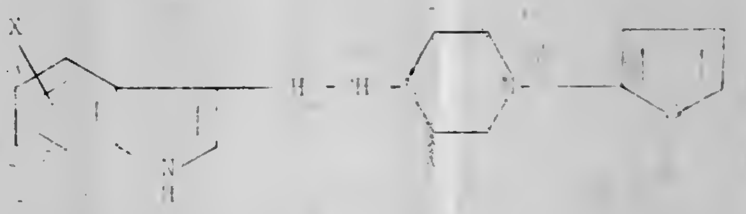
Filed Oct. 2, 1972, Ser. No. 294,063
Int. Cl. A23l *3/36;* **A23f** *1/06*
U.S. Cl. 426—262 **4 Claims**

1. A method for producing a readily-soluble, fortified, freeze-dried coffee product comprising the steps of:
- a. obtaining a coffee extract containing from about 20 to 30% soluble solids,
- b. increasing the solids concentration of said coffee extract to between 35 and 50% solids by the addition of fortifying ingredients selected from the group consisting of sugars, hydrolized cereal solids, proteins, vitamins, minerals and combinations thereof,
- c. continuously cooling the fortified extract from a temperature of between 35° and 40°F to its eutectic point over a period of at least 40 minutes,
- d. further cooling the fortified extract to thoroughly freeze the extract,
- e. freeze-drying the thoroughly frozen extract.

3,888,860
3-[2-(4-THIENOYLPIPERAZIN-1-YL)ETHYL]INDOLES
Richard A. Schnettler, Brown Deer, and John T. Suh, Mequon, both of Wis., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,094
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 BC **3 Claims**

1. A compound selected from a compound of the formula

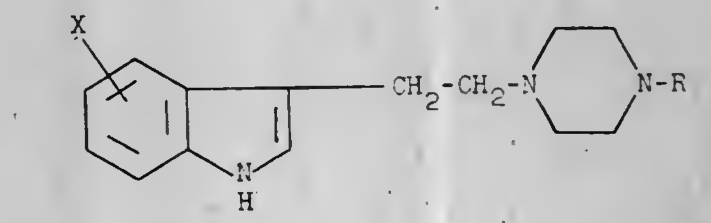


in which X is hydrogen, halogen, hydroxy and methoxy, and pharmaceutically acceptable acid addition salts thereof.

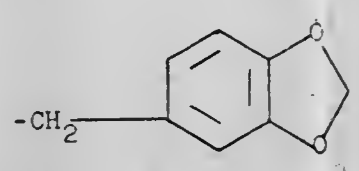
3,888,861
3-[2-(4-SUBSTITUTED-PIPERAZIN-1-YL)ETHYL]INDOLES
Richard A. Schnettler, Brown Deer, and John T. Suh, Mequon, both of Wis., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,106
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 BC **9 Claims**

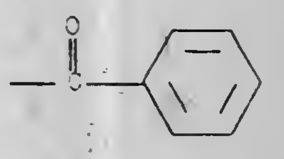
1. A compound selected from compounds of the formula



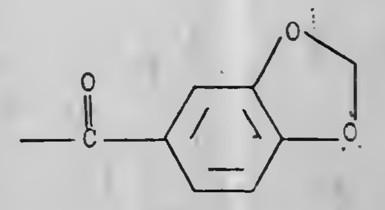
in which R is



;



; and



and X is hydrogen, halogen, trifluoromethyl, or lower alkoxy of one to four carbon atoms, and pharmaceutically acceptable acid addition salts thereof.

3,888,862
WATER-SOLUBLE REACTIVE XANTHENE DYESTUFFS AND PROCESS FOR PREPARING THEM

Fritz Meininger, Frankfurt am Main, and Folker Kohlhaas, Kelkheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

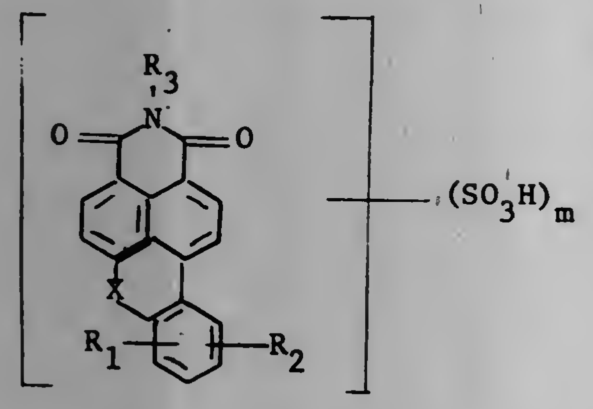
Filed June 30, 1972, Ser. No. 267,958

Claims priority, application Germany, July 2, 1971, 2132963

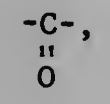
Int. Cl. C07d *35/00*

U.S. Cl. 260—281 **6 Claims**

1. A water-soluble reactive xanthene dyestuff of the formula

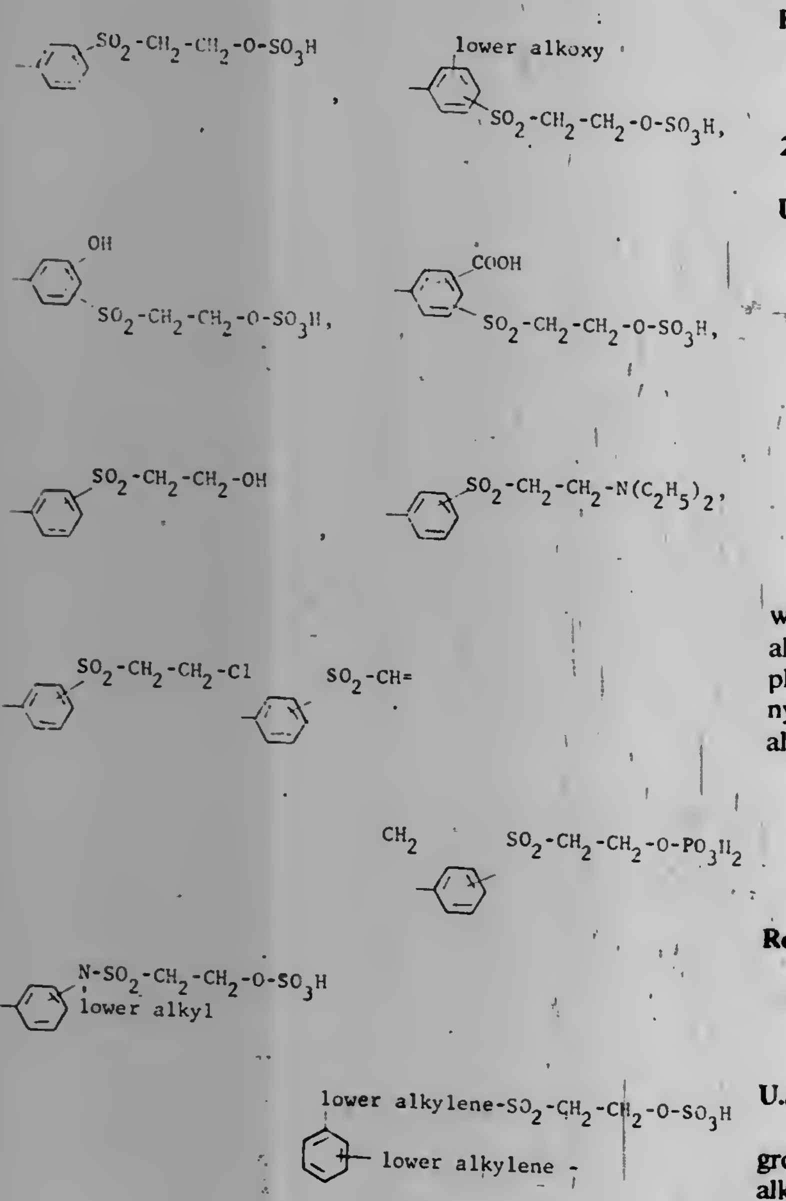


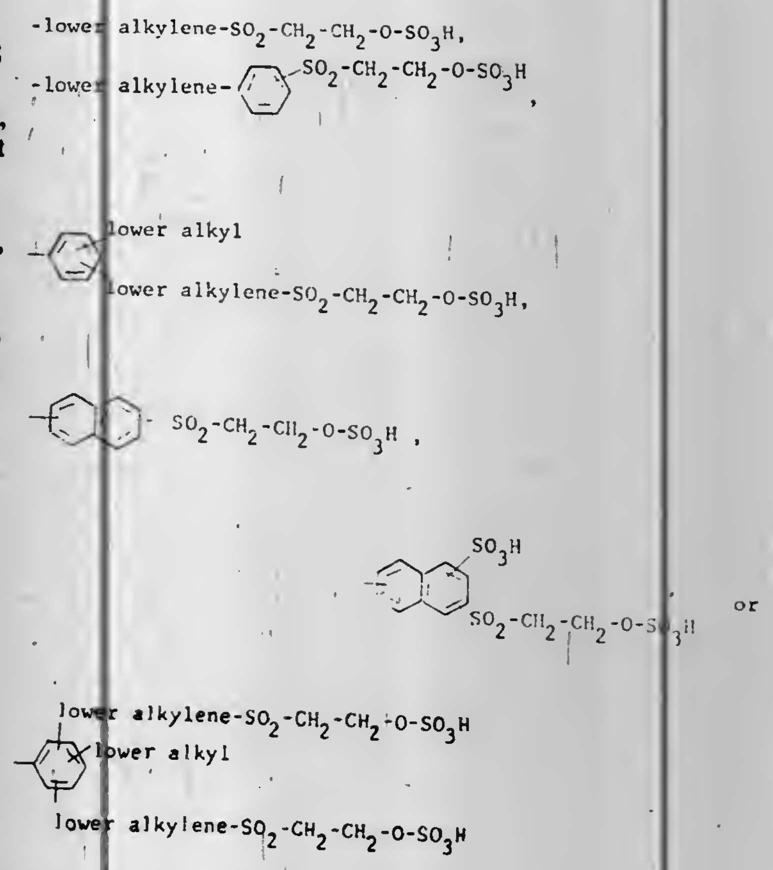
wherein R_1 and R_2 each is hydrogen, chlorine, bromine, lower alkyl or lower alkoxy, X is sulfur, oxygen or



$\underset{\underset{O}{\|}}{-C-}$,

R_3 is




-lower alkylene-SO2-CH2-CH2-O-SO3H,
-lower alkylene-
SO2-CH2-CH2-O-SO3H
lower alkyl
lower alkylene-SO2-CH2-CH2-O-SO3H,
SO2-CH2-CH2-O-SO3H ,
SO3H
SO2-CH2-CH2-O-SO3H
or
lower alkylene-SO2-CH2-CH2-O-SO3H
lower alkyl
lower alkylene-SO2-CH2-CH2-O-SO3H

and *m* is a value of 1 to 3.

3,888,863
BENZOXANTHENE AND BENZOTHIOXANTHENE DYESTUFFS AND PROCESS FOR THEIR MANUFACTURE

Helmut Troster, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

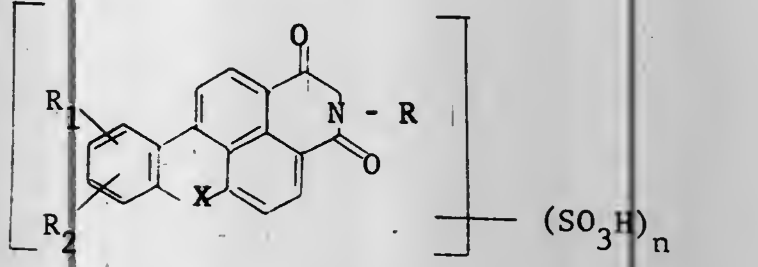
Division of Ser. No. 133,351, April 12, 1971, Pat. No. 3,759,953. This application Jan. 2, 1973, Ser. No. 320,578

Claims priority, application Germany, Apr. 14, 1970, 2017764

Int. Cl. C07d *39/00*

U.S. Cl. 260—281 **7 Claims**

1. A dyestuff of the formula



wherein X is oxygen or sulfur, R is hydrogen, amino, lower alkyl, cyclohexoxy lower alkyl, lower alkoxy-lower alkyl, phenyl, chlorophenyl, lower alkyl phenyl, di-lower alkyl phenyl, R_1 and R_2 each is hydrogen, chlorine, bromine, lower alkyl or lower alkoxy, and *n* is a value from 1 to 3.

3,888,864
AMINO LOWER ALKYL ETHER DERIVATIVES OF OPIUM ALKALOIDS

Roy Cleeland, Jr., Short Hills, N.J., and Hans Jacob Hager, New York, N.Y., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed June 29, 1973, Ser. No. 374,849

Int. Cl. C07d *43/28, 43/32*

U.S. Cl. 260—285 **3 Claims**

1. An amino lower alkyl ether of the phenolic hydroxyl group of morphine, heroin and codeine wherein the lower alkyl has two to eight carbon atoms.

3,888,865
PROCESS FOR THE PREPARATION OF EBURNAMONINES

Csaba Szantay; Lajos Szabo; Janos Kreidl; Gyorgy Kalaus; Tibor Keve; Peter Turczanyi; Istvan Polgar; Maria Farkas nee Kirjak, and Katalin Lakszner, all of Budapest, Hungary, assignors to Richter Gedeon Vgyeszeti Gyzr Rt., Budapest, Hungary

Filed Sept. 14, 1973, Ser. No. 397,217

Int. Cl. C07d *33/50*

U.S. Cl. 260—288 **5 Claims**

1. A process for the preparation of racemic or optically active (dextrorotatory or levorotatory) eburnamonine by the oxidation of vincaminic acid, which comprises the step of reacting vincaminic acid in an organic solvent selected from aliphatic and aromatic hydrocarbons and mixtures thereof, with an oxidizing agent having low solubility in said solvent medium and selected from silver carbonate, silver oxide and manganese dioxide.

3,888,866
NITROGEN DERIVATIVES OF BENZOYL ECGONINE

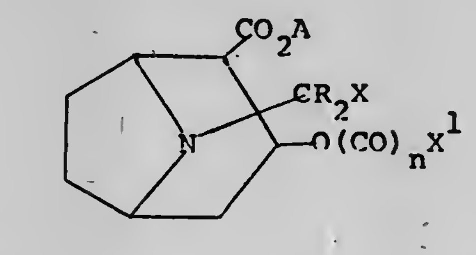
Richard K. Leute, Sunnyvale, and Gunner Bolz, Woodside, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Filed June 1, 1973, Ser. No. 365,915

Int. Cl. C07d *43/06*

U.S. Cl. 260—292 **12 Claims**

1. A compound of the formula:



wherein:

A is hydrogen or methyl;
R is hydrogen or alkyl of from 1 to 3 carbon atoms;
X is hydrogen or ϕ—Y;
X^1 is hydrogen, phenyl or ϕ—Y;
ϕ is phenylene;
n is zero when X^1 is hydrogen and is one when X^1 is other than hydrogen; and
Y is amino or diazonium, having a neutral or weakly basic counterion,

there being only one ϕ—Y per molecule.

3,888,867
4-[4-(ALPHA-HYDROXYBENZYL)PIPERIDINO]4'-FLUOROBUTYROPHENONE DERIVATIVES

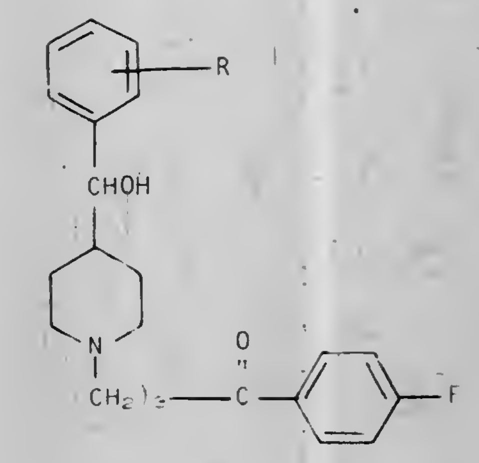
Albert Anthony Carr, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Continuation-in-part of Ser. No. 249,886, May 3, 1972, Pat. No. 3,852,455, which is a continuation of Ser. No. 93,495, Nov. 27, 1970, abandoned. This application Nov. 2, 1973, Ser. No. 412,101

Int. Cl. C07d *29/20*

U.S. Cl. 260—293.8 **6 Claims**

1. A compound of the formula



wherein R is a member selected from the group consisting of hydrogen, chlorine, fluorine, bromine, alkyl having from one to four carbon atoms, alkoxy having from one to four carbon atoms, thioalkoxy having from one to three carbon atoms, trifluoromethyl, phenyl or phenoxy; or a pharmaceutically acceptable acid addition salt thereof.

3,888,868
PREPARATION OF CHLOROPYRIDYLSULFONE-N-OXIDES

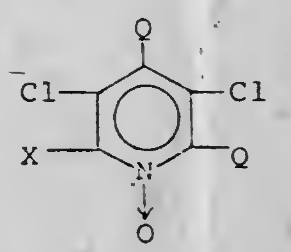
Demetrios Kyriacou, Clayton, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 17, 1973, Ser. No. 425,571

Int. Cl. C07d *31/48*

U.S. Cl. 260—294.8 F **6 Claims**

1. A method of preparing compounds which correspond to the formula



wherein X represents hydrogen or chloro and each Q represents hydrogen, chloro or loweralkylsulfonyl ($-SO_2R$, wherein R represents a straight or branched chain loweralkyl radical of from one to four carbon atoms), with the proviso that at least one Q is always loweralkylsulfonyl which comprises reacting an alkylthio- or alkylsulfonyl polychloropyridine with hydrogen peroxide and concentrated sulfuric acid at temperatures of from about 45° to about 75°C.

3,888,869
BIS (THIOCYANOMETHYLTHIO) THIADIAZOLES

R. Garth Pews; Christian T. Goralski, both of Midland, and George A. Burk, Bay City, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 13, 1973, Ser. No. 387,984

Int. Cl. C07d *91/60, 91/62*

U.S. Cl. 260—302 SD **3 Claims**

1. A member of the group consisting of [2,5-bis-(thiocyanomethylthio)-1,3,4-thiadiazole] and [3,5-bis(thiocyanomethylthio)-1,2,4-thiadiazole].

3,888,870
2-SULFINYL-THIAZOLES AND OXAZOLES

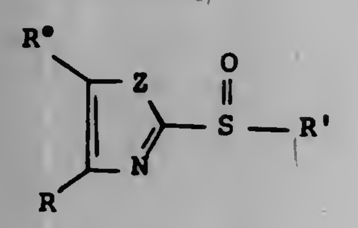
Thomas E. Jackson, Madison, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Mar. 8, 1974, Ser. No. 449,511

Int. Cl. C07d *91/32, 85/44*

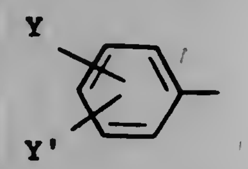
U.S. Cl. 260—302 S **12 Claims**

1. A compound of the formula:



wherein

R° and R are independently hydrogen, lower alkyl of 1 to 4 carbon atoms or phenyl of the formula:



where Y and Y' are independently hydrogen, halo of atomic weight of from 18 to 80, lower alkyl of 1 to 4 carbon atoms, lower alkoxy of 1 to 4 carbon atoms or trifluoromethyl,

R' is alkyl of 1 to 6 carbon atoms, and

Z is an oxygen or a sulfur atom, with the proviso that at least one of R° and R is phenyl as defined above.

3,888,871
PROCESS FOR THE PREPARATION OF 4-CHLORO-2-HYDROXYBENZOTHIAZOLE

James L. Lowe, Nottingham, England, assignor to The Boots Co., Ltd., Nottingham, England

Filed Nov. 23, 1973, Ser. No. 418,733

Claims priority, application United Kingdom, Dec. 1, 1972, 55684/72

Int. Cl. C07d *91/44*

U.S. Cl. 260—304 **7 Claims**

1. In a process for preparing 4-chloro-2-hydroxybenzothiazole which comprises diazotising 2-amino-4-chlorobenzothiazole hydrohalide in the presence of a solvent and hydrolysing the product, the improvement consisting of conducting the diazotisation in the presence of a halogenated aliphatic hydrocarbon solvent in which the major products of the diazotisation reaction are soluble to the extent of at least 10% w/v at 20°C, as said solvent.

3,888,872
N-ALKOXY-N-ALKYLAMINO SUBSTITUTED DITHIAZOLIUM SALTS

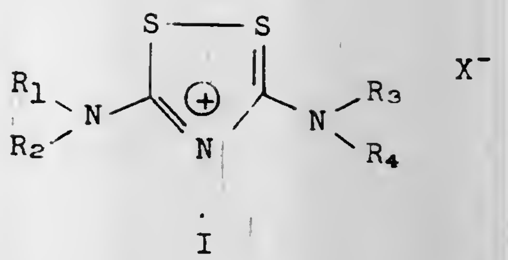
Russell Frank Bellina, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Nov. 8, 1972, Ser. No. 304,792

Int. Cl. C07d *91/70*

U.S. Cl. 260—306.8 R **3 Claims**

1. Compounds of formula



I

where

R_1 and R_3 are C_1–C_2 alkyl;

R_2 is C_1–C_2 alkyl or C_1–C_2 alkoxyl;

R_4 is C_1–C_2 alkoxyl; and

X^- is an anion of the corresponding acid HX having an ionization contant of at least 1×10^{-7}.

3,888,873
4H(1)BENZOTHIOPYRANO(3,4-D)-ISOXAZOLES

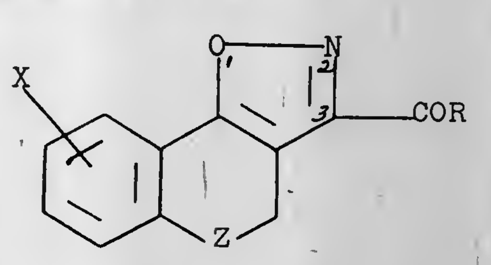
Jules Freedman, Thiensville, Wis., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 27, 1973, Ser. No. 391,950

Int. Cl. C07d *85/22*

U.S. Cl. 260—307 H **5 Claims**

1. A compound of the formula



I

in which X is hydrogen or chloro, Z is —S(O)— or —S(O)-(O)—, R is hydroxyl, lower alkoxy of 1 to 4 carbon atoms or $N(R_3)(R_4)$, in which R_3 and R_4 are the same or different and are selected from hydrogen or lower alkyl of 1 to 4 carbon atoms, or, alternatively, R_3 and R_4, together with the nitrogen atom to which they are attached, form pyrrolidino.

3,888,874
PHOSPHORUS ESTERS OF 5-AMINO-1,2,4-TRIAZOL-3-L

Dag Dawes, Pratteln; Willy Meyer, Basel, and Beat Bohner, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

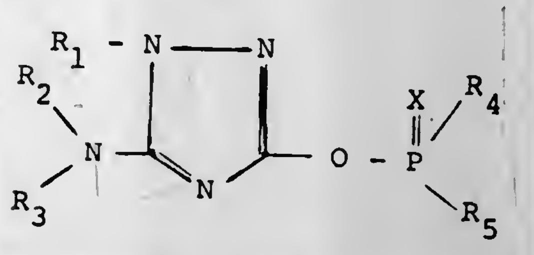
Filed May 25, 1973, Ser. No. 364,175

Claims priority, application Switzerland, June 19, 1972, 9113/72; Apr. 18, 1973, 5501/73

Int. Cl. C07f *9/08, 9/16, 9/24*

U.S. Cl. 260—308 DR **5 Claims**

1. A compound of the formula



wherein R_1 represents C_1—C_6 alkyl or cyclopentyl; R_2 represents hydrogen, C_1—C_6 alkyl or allyl; R_3 represents hydrogen, C_1—C_6 alkyl, allyl, phenyl or benzyl; or R_2 and R_3 together with the nitrogen atom to which they are bonded represent morpholino or pyrrolidino; R_4 represents C_1—C_6 alkoxy or C_1—C_6 allkylthio; R_5 represents C_1—C_6 alkyl, C_1—C_6 alkoxy, C_1—C_6 alkylamino or phenyl; and X represents oxygen or sulphur.

3,888,875
NOVEL PROCESSES FOR PHOTOGRAPHIC PRODUCTS

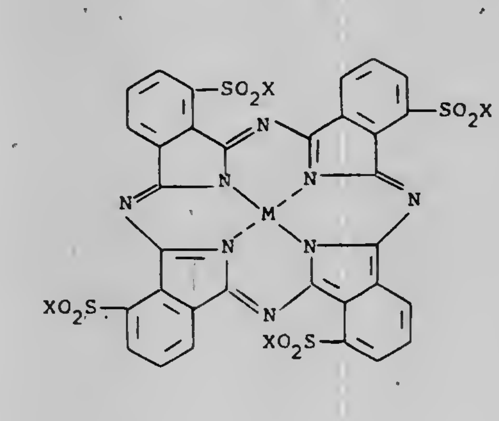
Henry Bader, Newton Center, and Donald O. Rickter, Arlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 29, 1973, Ser. No. 392,655

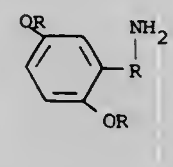
Int. Cl. C09b *47/08*

U.S. Cl. 260—314.5 **12 Claims**

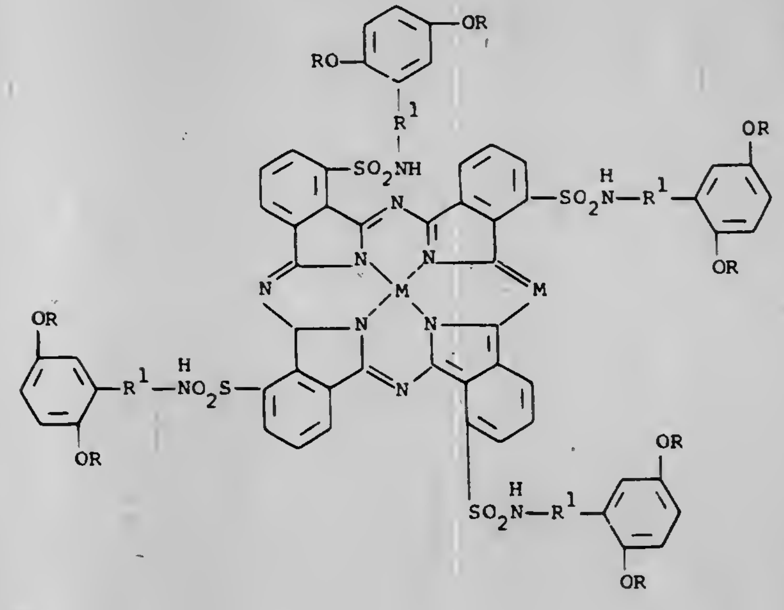
1. In a process comprising the step of reacting a compound of the formula:



where X is a halogen and M is a metal selected from the group consisting of cobalt, nickel, copper, chromium, magnesium and zinc with an amine of the formula:



where R is an alkyl radical having from 1–6 carbon atoms to provide a compound of the formula:



wherein R is an alkyl radical having from 1–6 carbon atoms and R^1 is an alkylene radical having from 1–6 carbon atoms;

the improvement wherein the compounds are reacted in a medium comprising acid neutralizing reagents and said medium comprises a mixture of water and a solvent which is a solvent for said amine but which is not miscible in said water to any substantial extent.

3,888,876
NOVEL PROCESSES FOR PHOTOGRAPHIC PRODUCTS

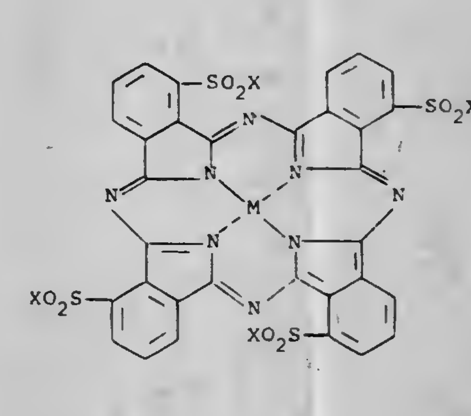
Henry Bader, Newton Center, and Alexander Boag, Arlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 29, 1973, Ser. No. 392,656

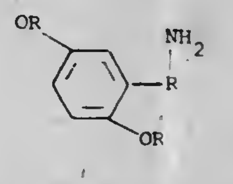
Int. Cl. C09b *47/08*

U.S. Cl. 260—314.5 **10 Claims**

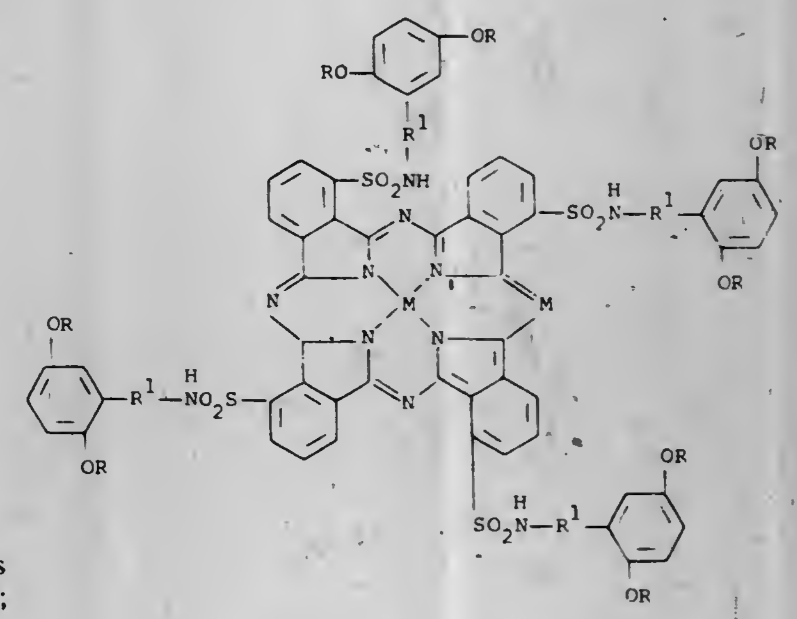
1. In a process comprising the step of reacting a compound of the formula:



where X is a halogen and M is a metal selected from the group consisting of cobalt, nickel, copper, chromium, magnesium and zinc with an amine of the formula:



where R is an alkyl radical having from 1-6 carbon atoms to provide a compound of the formula:



where R is an alkyl radical having from 1–6 carbon atoms and R^1 is an alkylene radical having from 1–6 carbon atoms; the improvement wherein the compounds are reacted in an aqueous medium comprising acid neutralizing reagents and said aqueous medium comprises from about 5 to about 25 percent by volume of a solvent which is a solvent for said amine and also miscible in said aqueous medium.

3,888,877
MACROCYCLIC COMPOUNDS AND COMPLEXES THEREOF

Jean-Marie Lehn, Strasbourg, France, assignor to Schering Corporation, Kenilworth, N.J.

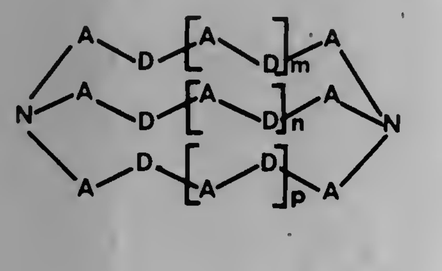
Continuation-in-part of Ser. No. 43,979, June 5, 1970, abandoned. This application Mar. 26, 1973, Ser. No. 344,682

Claims priority, application United Kingdom, June 11, 1969, 29564/69; Feb. 17, 1970, 7594/70

Int. Cl. C07d *93/00*

U.S. Cl. 260—327 R **24 Claims**

1. A macrocyclic compound selected from the group consisting of a compound of following formula I:



I

wherein each A is a hydrocarbon radical having from 2 to 8 carbon atoms;

each D is a member selected from the group consisting of oxygen, sulfur, a hydrocarbon radical having up to 8 carbon atoms, and =N—R (R being a member selected from the group consisting of hydrogen, a hydrocarbon radical having up to 12 carbon atoms, an aryl hydrocarbonsulfonyl radical having up to 12 carbon atoms, a lower alkoxycarbonyl radical, a lower alkoxycarbonylmethylene radical and a carboxymethylene radical); at least two of said D members being heterosubstituents selected from the group consisting of oxygen, sulfur and =N—R;

m, *n*, and *p* are integers from 0 to 5;

and N-oxides of formula I;

ammonium quaternary salts of formula I;

and acid addition salts of formula I.

3,888,878
METHOD OF MAKING 5,6-DIHYDRO-2-METHYL-1,4-OXATHIIN-3-CARBOXAMIDE 4,4-DIOXIDES

Gyan S. Pande, Guelph, Ontario, and Julius A. Balatoni, Kitchener, Ontario, both of Canada, assignors to Uniroyal Inc., Montreal, Canada

Filed Dec. 24, 1970, Ser. No. 101,429

Int. Cl. C07d *89/14*

U.S. Cl. 260—327 P **27 Claims**

1. A method of oxidizing a 5,6-dihydro-2-methyl-1,4-oxathiin-3-carboxamide to the corresponding 5,6-dihydro-2-methyl-1,4-oxathiin-3-carboxamide 4,4-dioxide comprising bringing together with agitation the said 5,6-dihydro-2-methyl-1,4-oxathiin-3-carboxamide, and a two-phase liquid medium made up of formic acid, an inert organic solvent substantially immiscible with water, and aqueous hydrogen peroxide, whereby the said 5,6-dihydro-2-methyl-1,4-oxathiin-3-carboxamide is oxidized to the corresponding 5,6-dihydro-2-methyl-1,4-oxathiin-3-carboxamide 4,4-dioxide, and thereafter recovering the said 5,6-dihydro-2-methyl-1,4-oxathiin-3-carboxamide 4,4-dioxide from the reaction mixture.

3,888,879
FUNGICIDAL N-POLYHALOALKYLTHIOSULFONAMIDOTHIOPHENES

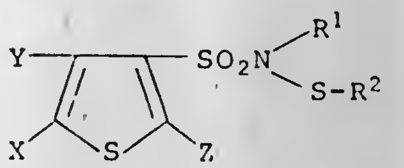
Laroy H. Edwards, Napa, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed July 29, 1974, Ser. No. 489,310

Int. Cl. C07d *63/00*

U.S. Cl. 260—329 S **10 Claims**

1. A compound of the formula



wherein X is fluoro, chloro or bromo, Y is hydrogen, fluoro, chloro or bromo, Z is fluoro, chloro or bromo, R^1 is alkyl of 1 to 6 carbon atoms, phenyl or phenyl substituted with up to 2 of the same or different substituents selected from the group consisting of fluoro, chloro, bromo and alkyl of 1 to 3 carbon atoms, and R^2 is polyhaloalkyl of 1 to 3 carbon atoms and 2 to 7 of the same or different halogens selected from the group consisting of fluoro, chloro and bromo.

3,888,880
SYNTHESIS OF DIETHER-ALDEHYDES AND DIETHER-LCOHOLS

Thomas C. Snapp, Jr., and Alden E. Blood, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 30, 1973, Ser. No. 411,118

Int. Cl.² C07D *319/12*

U.S. Cl. 260—340.6 **1 Claim**

1. The compound p-dioxanecarboxyaldehyde.

3,888,881
3-HYDROXY-P-DIOXANE-2-METHANOL

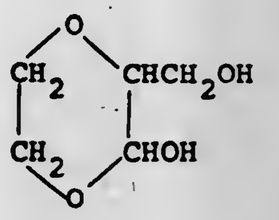
Russell D. Harken, Maryland Heights, and F. Wyman Morgan, Ballwin, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 18, 1974, Ser. No. 452,309

Int. Cl. C07d *15/12*

U.S. Cl. 260—340.6 **1 Claim**

1. A compound represented by the formula



3,888,882
N-ALPHA-HALOACETYL-N-(1,3-DIOXAN-2-YLALKYL)ANILIDS

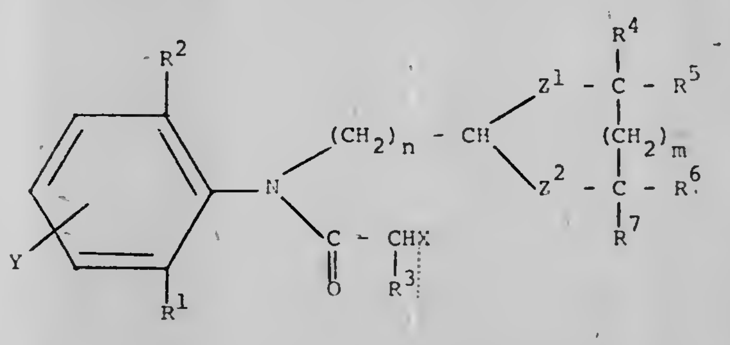
Sidney B. Richter, Chicago, and John Krenzer, Oak Park, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 357,746, May 7, 1973, Pat. No. 3,859,308. This application June 3, 1974, Ser. No. 475,544

Int. Cl. C07d *13/04;* **A01n** *9/28*

U.S. Cl. 260—340.7 **4 Claims**

1. A compound of the formula



wherein Y is selected from the group consisting of hydrogen, lower alkyl and halogen; R^1 is selected from the group consisting of hydrogen, lower alkyl and lower alkoxy; R^2 is lower alkyl; R^3, R^4, R^5, R^6 and R^7 are independently selected from the group consisting of hydrogen and lower alkyl; X is halogen; m is the integer 1; Z^1 and Z^2 are oxygen; and n is an integer from 1 to 2.

3,888,883
PRODUCTION OF COUMARIN

Nils J. Christensen, Palatine, and Ted Symon, Lombard, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Aug. 1, 1973, Ser. No. 384,762

Int. Cl. C07d *7/28*

U.S. Cl. 260—343.2 R **6 Claims**

1. A process for the production of coumarin which comprises continuously passing o-methyl coumarate through a reaction zone containing a refractory oxide packing at cyclization conditions including a temperature in the range of from about 200° to about 350° C. and a liquid hourly space velocity of from about 0.1 to about 3.0, and recovering the resultant coumarin.

3,888,884
PROCESS FOR THE PREPARATION OF PIVALOLACTONE

Hans-Jurgen Arpe, Fischbach/Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 6, 1972, Ser. No. 260,277

Claims priority, application Germany, June 8, 1971, 2128406

Int. Cl. C07d *3/00*

U.S. Cl. 260—343.9 **9 Claims**

1. In a process for the preparation of α,α-dimethyl-β-propiolactone (pivalolactone) by thermally splitting off acetic acid from β-acetoxy-pivalic acid in the presence of a carrier catalyst having alkali metal and/or alkaline earth metal compounds selected from the group consisting of an oxide, a hydroxide, hydrogen-carbonate, carbonate or salt of a carboxylic acid having up to 4 carbon atoms of lithium, sodium, potassium, rubidium, caesium, magnesium, calcium, strontium or barium, the improvement which consists essentially of using a silicic acid carrier in which more than 50% of the pore volume is attributable to pores having a pore diameter of from 100 to 1000 A.

3,888,885
PROCESS FOR THE PREPARATION OF 4-CHLORO-NAPHTHALIC ACID ANHYDRIDE

Walter Deucker, Neuenhain, Taunus, and Helmut Troster, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 28, 1973, Ser. No. 392,176

Claims priority, application Germany, Aug. 30, 1972, 2242513

Int. Cl. C07d *7/20*

U.S. Cl. 260—345.2 **4 Claims**

1. A process for the preparation of 4-chloro-naphthalic acid anhydride, wherein an alkali metal salt of naphthalic acid is chlorinated in an aqueous solution at a pH value of between 6.8 to 9.0 and at a temperature of from 0° to 30°C.

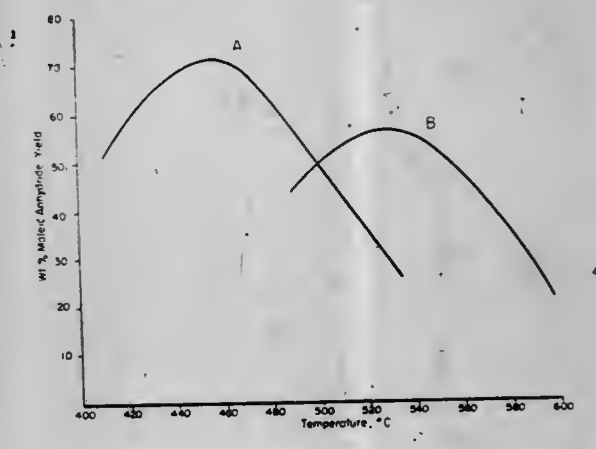
3,888,886
OXIDATION OF ALKANES TO MALEIC ANHYDRIDE USING PROMOTED VANADIUM-PHOSPHORUS CATALYST

Lewis B. Young, Kendall Park; Benjamin Weinstein, Morganville, and Anthony T. Jurewicz, Kendall Park, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 379,667, July 16, 1973, which is a continuation-in-part of Ser. No. 261,030, June 8, 1972, abandoned. This application Apr. 17, 1974, Ser. No. 461,777

Int. Cl. C07c *57/14*

U.S. Cl. 260—346.8 **22 Claims**



1. An improved process for oxidizing an alkane or cycloalkane to maleic anhydride, that comprises contacting a mixture of a molecular oxygen-containing gas and an alkane having 4–10 carbon atoms, a cycloalkane having between 4 and 10 carbon atoms, or a mixture of alkanes and cycloalkanes having between 4 and 10 carbon atoms at a temperature of about 300°–600°C., with a catalyst consisting essentially of vanadium, phosphorus and oxygen promoted with a metal selected from the group consisting of chromium, hafnium, zirconium, lanthanum, and cerium; the atomic ratio of phosphorus/vanadium being between about 0.5 and about 2; and the atomic ratio of promoter metal/vanadium being between about 0.0025 and about one.

3,888,887
DERIVATIVES OF 3-AMINO-2-HALO-2-CYCLOHEXEN-1-ONE

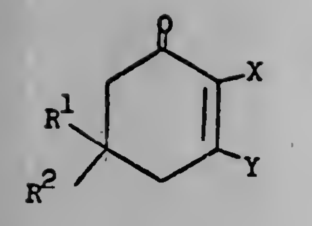
Ivo L. Jirkovsky, Montreal, Quebec, Canada, assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 217,958, Jan. 14, 1972, Pat. No. 3,823,189. This application May 6, 1974, Ser. No. 467,181

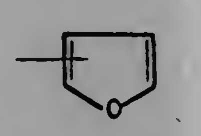
Int. Cl. C07c *87/36;* **C07d** *5/16*

U.S. Cl. 260—347.7 **5 Claims**

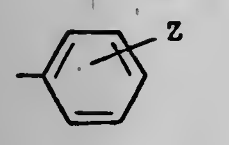
1. A compound of the formula



in which R^1 and R^2 both are hydrogen or lower alkyl; X is selected from the group consisting of chlorine, bromine and iodine and Y is amino or $NH(CH_2)_nR^3$ wherein *n* is an integer from 1 to 2 and R^3 is a radical selected from the group consisting of



and



in which Z is hydrogen, halo or trifluoromethyl.

3,888,888
INSECTICIDAL ACTIVE GERANYL AND CITRONYL AMINE DERIVATIVES AND THEIR EPOXIDES

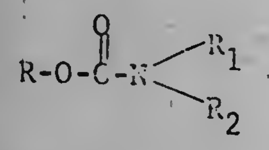
Ferenc M. Pallos, Walnut Creek, and Julius J. Menn, Saratoga, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 172,203, Aug. 16, 1971, abandoned. This application Apr. 5, 1973, Ser. No. 348,457

Int. Cl. C07d *1/22*

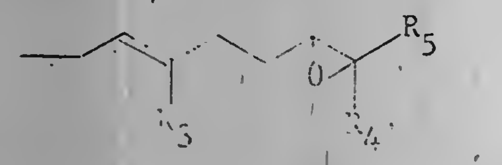
U.S. Cl. 260—348 A **11 Claims**

1. A compound having the formula:



$$R-O-\overset{\overset{O}{\|}}{C}-N\begin{matrix}R_1\\R_2\end{matrix}$$

wherein R is selected from the group consisting of cyclohexyl and substituted phenyl wherein said substituents can be selected from halogen, lower alkyl, lower alkoxy and lower thioalkyl; R_1 is hydrogen; and R^2 is



wherein R_3, R_4 and R_5 are independently selected from methyl and ethyl.

3,888,889
PROCESS FOR PROPYLENE OXIDE

Alexander John Kolombos, Sutton; Colin Christopher McCain, Horley, and Eric Andrew Porter, Sutton, all of England, assignors to BP Chemicals International Limited, London, England

Filed June 18, 1973, Ser. No. 370,923

Claims priority, application United Kingdom, June 27, 1972, 29954/72

Int. Cl. C07d *1/12*

U.S. Cl. 260—348.5 **21 Claims**

1. A process for the production of propylene oxide comprising reacting propylene and a molecular oxygen containing gas in the vapor phase at a temperature between about 180° to 300°C and at a pressure between 1 and 20 atmospheres in the presence of a catalyst composition comprising elemental silver modified on its surface by an additive which is a compound of a Group VB or Group VIB metal, the amount of said additive on the surface of said elemental silver is from 1×10^{-6} to 100×10^{-6} gram moles per gram of silver having a surface area of one square meter.

3,888,890
CERTAIN 1-ALKYL-9,10-ANTHRAQUINONES AND THEIR 5,6,7,8-TETRAHYDRO DERIVATIVES AND THE USE OF THE LATTER IN THE PRODUCTION OF HYDROGEN PEROXIDE

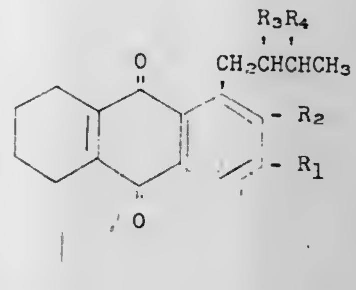
Jack R. Kirchner, and Lawrence G. Vaughn, both of Wilmington, Del., assignors to E. I. du Pont de Nemours & Co., Wilmington, Del.

Division of Ser. No. 79,643, Oct. 9, 1970. This application Aug. 31, 1972, Ser. No. 285,124

Int. Cl. C09b *1/00*

U.S. Cl. 260—369 **4 Claims**

1. A 5,6,7,8-tetrahydro-1-alkyl-9,10-anthraquinone having the formula:



in which each of R_1, R_2, R_3 and R_4 is hydrogen or a 1 to 8 carbon straight chain alkyl hydrocarbon group.

3,888,891
SILICONE-COMPATIBLE DYESTUFFS

Carl Mayn Smith, White Bear Lake, and George Van Dyke Tiers, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 26, 1972, Ser. No. 275,190

Int. Cl. C08g *51/04*

U.S. Cl. 260—375 **1 Claim**

1. A clear, transparent and colored, cured silicone polymer comprising, diffused or homogeneously dispersed therein, about 0.01 to about 5% tris(trimethylsilyloxy)silylalkylamino substituted organic dyestuff.

3,888,892
LIQUID CRYSTALLINE COMPOUNDS

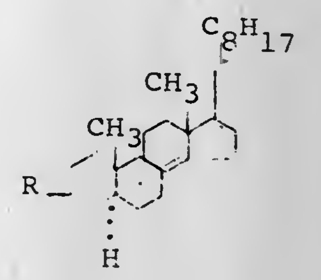
Lewis B. Leder, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 24, 1972, Ser. No. 300,050

Int. Cl. C07c *169/58, 169/60*

U.S. Cl. 260—397.2 **4 Claims**

1. Liquid crystalline compounds having a cholesteric mesophase which are represented by the formula



wherein R represents a member selected from the group consisting of halogens, aliphatic ester radicals having from three to fifteen carbon atoms and carbonate radicals having up to and including fifteen carbon atoms.

3,888,893
UNSATURATED AMIDES

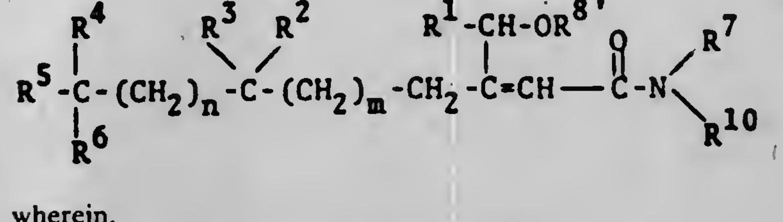
John B. Siddall, 2470 Greer St., Palo Alto, Calif. 94303

Division of Ser. No. 153,074, June 14, 1971, Pat. No. 3,755,356, which is a continuation-in-part of Ser. Nos. 860,086, Sept. 22, 1969, abandoned, and Ser. No. 874,678, Nov. 6, 1969, Pat. No. 3,631,080. This application Feb. 16, 1973, Ser. No. 333,260

Int. Cl. C07c *103/30*

U.S. Cl. 260—404 **9 Claims**

1. A compound selected from those of the following formula:



$$R^5-\underset{R^6}{\overset{R^4}{C}}-(CH_2)_n-\overset{R^3\ \ R^2}{C}-(CH_2)_m-CH_2-\overset{R^1-CH-OR^{8'}}{C}{=}CH-\overset{O}{\overset{\|}{C}}-N\begin{matrix}R^7\\R^{10}\end{matrix}$$

wherein,

m is zero or the positive integer one to five;

n is the positive integer two to six;

each of R^1, R^2, R^6, R^7 and R^{10} is hydrogen or lower alkyl;

R^8 is hydrogen, and

each of R^3, R^4 and R^5 is lower alkyl.

3,888,894
TERTIARY DIAMIDES

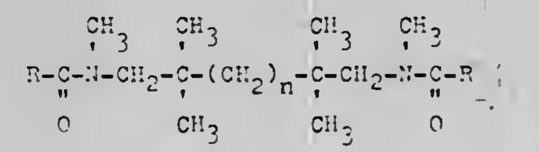
Robert M. Thompson, Chalfonte, Del., assignor to Sun Research and Development Co., Philadelphia, Pa.

Filed Oct. 2, 1972, Ser. No. 293,979

Int. Cl. C07c *103/00*

U.S. Cl. 260—404.5 **3 Claims**

1.



$$R-\underset{O}{\overset{\|}{C}}-\overset{CH_3}{N}-CH_2-\underset{CH_3}{\overset{CH_3}{C}}-(CH_2)_n-\underset{CH_3}{\overset{CH_3}{C}}-CH_2-\overset{CH_3}{N}-\underset{O}{\overset{\|}{C}}-R$$

wherein

$n = 0–10$

$R = -(CH_2)_m-CH_3$

wherein

$m = 4–12$.

3,888,895
PRODUCTION OF TITANIUM ACETYLACETONATE BIS(DIMETHYLAMINE)

Andrew J. Manning, Randolph Township, and Michael J. Ram, West Orange, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Feb. 13, 1974, Ser. No. 442,039

Int. Cl. C07f *7/28*

U.S. Cl. 260—429.5 **9 Claims**

1. Titanium acetylacetonate bis(dimethylamine).

2. A process for the production of titanium acetylacetonate bis(dimethylamine) comprising:

a. providing a solution of titanium acetylacetonate in isopropanol,

b. heating said solution in the presence of N,N-dimethylacetamide until titanium acetylacetonate bis(-dimethylamine) is formed, and

c. recovering the titanium acetylacetonate bis(dimethylamine) product.

3,888,896
METHANOL PRODUCTION

Ramon L. Espino, New York, and Thomas S. Pletzke, Cambria Heights, both of N.Y., assignors to Chem Systems Inc., New York, N.Y.

Filed May 29, 1973, Ser. No. 364,347

Int. Cl. C07c *31/06*

U.S. Cl. 260—449.5 **4 Claims**

1. In a process for the catalytic preparation of methanol from carbon monoxide and hydrogen in the presence of a methanol-forming catalyst comprising zinc and chromium, the improvement of saturating a polyalkylbenzene selected from the group consisting of pseudocumene, xylene, durene, isodurene, mesitylene and diethyl benzene. With carbon monoxide and at least 2 moles of hydrogen per mole of carbon monoxide and contacting the saturated polyalkylbenzene at a temperature of from 200° to 400° C., and a pressure of from 200 to 10,000 psia.

3,888,897
CYANO-AND CYANOMETHYL-BENZENSULFONAMIDES

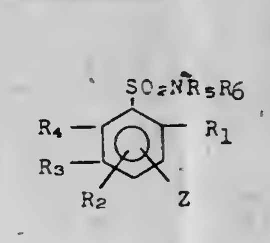
Elmore Louis Martin, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 243,404, April 12, 1972, abandoned. This application Feb. 21, 1973, Ser. No. 334,411

Int. Cl. C07c *121/52*

U.S. Cl. 260—465 E **3 Claims**

1. A compound of the formula



(1)

wherein

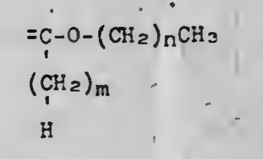
Z is cyano, or cyanomethyl;

R_1, R_2, R_3, and R_4 are the same or different and are independently selected from the group consisting of hydrogen, alkyl of 2 to 7 carbon atoms and halogen provided that:

- a. two of R_1, R_2, R_3, and R_4 are alkyl of 2 to 7 carbon atoms;
- b. no alkyl groups are ortho to each other;
- c. at least one of R_1, R_2, R_3, and R_4 is alkyl of 3 to 7 carbon atoms;
- d. two of R_1, R_2, R_3, and R_4 are independently hydrogen or halogen;
- e. the total carbon content of R_1, R_2, R_3, and R_4 is not greater than 9 carbon atoms; and
- f. each alkyl group has from 2 to 3 carbon atoms in a straight chain from the point of attachment to the aromatic ring; and

R_5 is hydrogen, alkyl of 1 to 3 carbon atoms, allyl or propynyl;

R_6 is hydrogen, alkyl of 1 to 3 carbon atoms, allyl, propynyl, lithium, sodium, potassium, calcium or acyl or 1 to 3 carbon atoms; and R_5 and R_6 together can form



$$=\underset{\underset{H}{|}}{\underset{(CH_2)_m}{\underset{|}{C}}}-O-(CH_2)_nCH_3$$

where

m is 0 or 1 and *n* is 0 or 1.

3,888,898

N,N'-BIS-(3-PHENOXY-2-HYDROXY-PROPYL)-ALKENEDIAMINES AND SALTS THEREOF

Herbert Koppe; Helmut Stahle; Werner Kummer; Gojko Muacevic, and Werner Traunecker, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

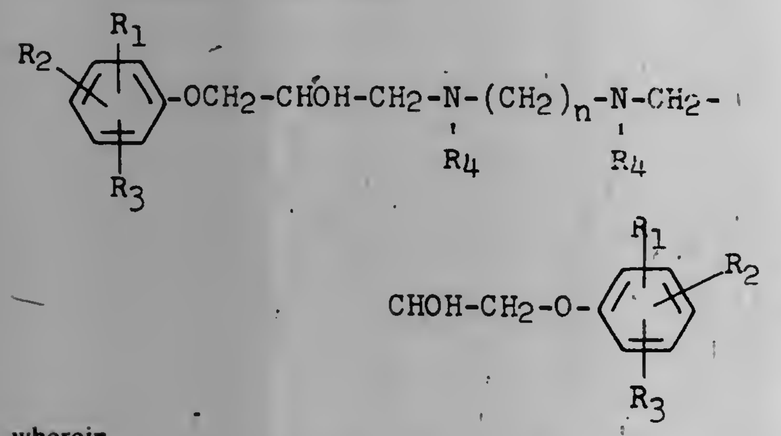
Filed Feb. 27, 1973, Ser. No. 336,269

Claims priority, application Germany, Mar. 6, 1972, 2210620; Dec. 11, 1972, 2260444

Int. Cl. C07c *121/78*

U.S. Cl. 260—465 E **4 Claims**

1. A compound of the formula



wherein

R$_1$ is —(CH$_2$)$_x$—CN, where x is 0,1,2 or 3,

R$_2$ is hydrogen, halogen, alkyl of 1 to 5 carbon atoms, alkoxy of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms or alkenyloxy of 2 to 5 carbon atoms;

R$_3$ is hydrogen, halogen, alkyl of 1 to 5 carbon atoms or alkoxy of 1 to 5 carbon atoms;

R$_2$ and R$_3$, together with each other and the carbon atoms to which they are attached, form a saturated or unsaturated carbocyclic ring of up to 6 carbon atoms;

R$_4$ is hydrogen, alkyl of 1 to 5 carbon atoms or aralkyl; and n is an integer from 1 to 10, inclusive;

or a non-toxic, pharamcologically acceptable acid addition salt thereof.

3,888,899

CYANOALKYLAMINO-AMIDO BENZOPHENONES

Heinz Gunter Greve, and Klaus Resag, both of Frankfurt am Main-Fechenheim, Germany, assignors to Cassella Farbwerke Mainkur Akt., Frankfurt am Main, Germany

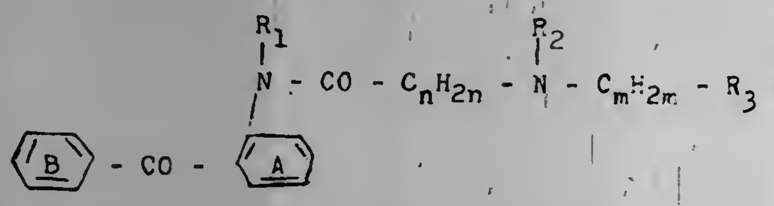
Filed May 8, 1973, Ser. No. 358,455

Claims priority, application Luxembourg, May 12, 1972, 65340

Int. Cl. C07c *121/78*

U.S. Cl. 260—465 D **8 Claims**

1. Benzophenone derivatives having the structural formula



and the acid addition salts thereof, wherein R$_1$ and R$_2$ are substituents selected from the group consisting of hydrogen, allyl and alkyl having 1 to 4 carbon atoms; R$_3$ is CN; n is an integer selected from 1 and 2; and m is an integer selected from 1, 2 and 3, and wherein the ring A is selected from the group consisting of phenylene, halogenphenylene, nitrophenylene, trifluoromethylphenylene, methylphenylene, methoxyphenylene and methylmercaptophenylene; the ring B is selected from the group consisting of phenyl, fluorophenyl and chlorophenyl.

3,888,900

7-CYANO-HEXAHYDRO PLEIADENES

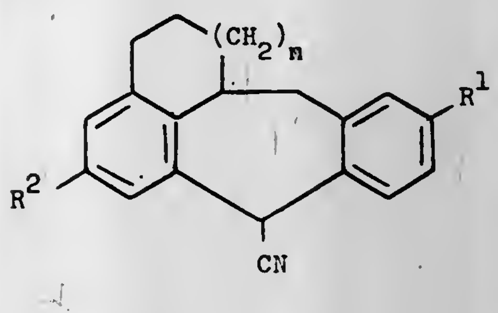
William J. Houlihan, Baden, Austria, and Jeffrey Nadelson, Parsippany, N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 172,587, Aug. 17, 1971, Pat. No. 3,763,233. This application June 12, 1973, Ser. No. 369,208

Int. Cl. C07c *121/64*

U.S. Cl. 260—465 R **2 Claims**

1. A compound of the formula



wherein

n represents 1or 2;

R^1 represents H, halo having an atomic weight of 19–36, or trifluoromethyl; and

R^2 represents H, Halo having an atomic weight of 19–36, trifluoromethyl, straight chain lower alkyl, or straight chain lower alkoxy.

3,888,901

PROCESS OF PREPARING 3-ALKYL-3-(BENZOYL)PROPIONITRILES

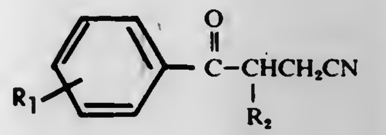
George Rodger Allen, Jr., Old Tappan, N.J., and Francis Joseph McEvoy, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 273,585, July 20, 1972, Pat. No. 3,824,271. This application Dec. 6, 1973, Ser. No. 422,395

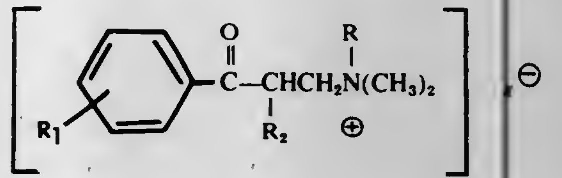
Int. Cl. C07c *121/66*

U.S. Cl. 260—465 R **7 Claims**

1. The process of preparing compounds of the formula:



wherein R$_1$ is selected from the group consisting of halogen, nitro and lower alkanoylamino and R$_2$ is selected from the group consisting of methyl, etheyl and n-propyl which comprises contacting a quaternary salt of the formula:



wherein R$_1$ and R$_2$ are as hereinabove defined, R is lower alkyl, and X$^-$ is selected from the group consisting of chloride, bromide, iodide, sulfate and lower alkyl sulfate with an alkali metal cyanide or an alkaline earth metal cyanide in an inert solvent at ambient temperatures for a period of time sufficient for a substantial degree of displacement to occur.

3,888,902

CYANO-INDENYL ACETIC ACIDS

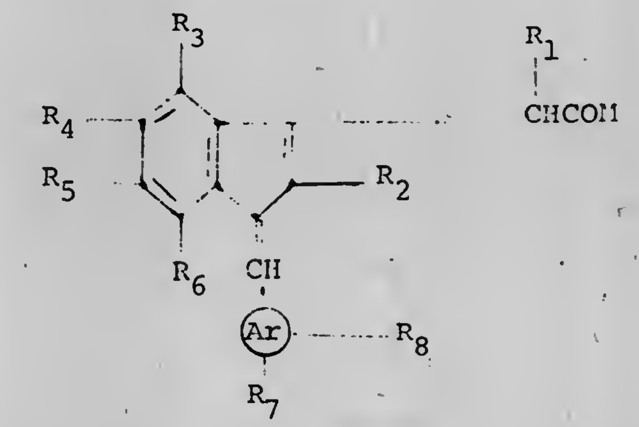
Tsung-Ying Shen, Westfield, N.J.; Richard B. Greenwald, Framingham, Mass.; Howard Jones, Holmdel, N.J.; Bruce O. Linn, Somerville, N.J., and Bruce E. Witzel, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 301,914, Oct. 30, 1972, abandoned, which is a division of Ser. No. 187,197, Oct. 6, 1971, Pat. No. 3,725,548, which is a division of Ser. No. 33,891, May 1, 1970, Pat. No. 3,654,349, which is a continuation-in-part of Ser. No. 848,736, Aug. 8, 1969, abandoned. This application June 11, 1974, Ser. No. 478,548

Int. Cl. C07c *121/64*

U.S. Cl. 260—465 D **6 Claims**

1. A compound of the formula:



wherein:

Ar is phenyl;

R$_1$ is hydrogen, C$_{1\text{-}5}$ loweralkyl or halogenated C$_{1\text{-}5}$ loweralkyl;

R$_2$ is hydrogen or C$_{1\text{-}5}$ loweralkyl;

R$_3$, R$_4$, R$_5$ and R$_6$ are each hydrogen, C$_{1\text{-}5}$ loweralkyl, acyloxy, C$_{1\text{-}5}$ loweralkoxy, nitro, amino, acylamino, C$_{1\text{-}5}$ loweralkylamino, di-C$_{1\text{-}5}$ loweralkylamino, di-C$_{1\text{-}5}$ loweralkylaminoalkyl, sulfamyl, C$_{1\text{-}5}$ loweralkylthio, mercapto, halogen, hydroxy, hydroxy C$_{1\text{-}5}$ loweralkyl, C$_{1\text{-}5}$ loweralkylsulfonyl, cyano, carboxyl, carb C$_{1\text{-}5}$ loweralkoxy, carbamido, halogeno C$_{1\text{-}5}$ loweralkyl, cycloalkyl, cycloalkoxy, alkynyl, alkenyl or aroyl at least one of R$_3$-R$_6$ being cyano;

R$_7$ may be C$_{1\text{-}5}$ loweralkylsulfinyl or C$_{1\text{-}5}$ loweralkylsulfonyl;

R$_8$ may be hydrogen, halogen, hydroxy, C$_{1\text{-}5}$ loweralkoxy or halo C$_{1\text{-}5}$ loweralkyl; and

M may be hydroxy, C$_{1\text{-}5}$ loweralkoxy and the group OMe in which Me is a cation.

3,888,903

PHENYL-N-(1-ALKENYL)-N-METHYLCARBAMATES

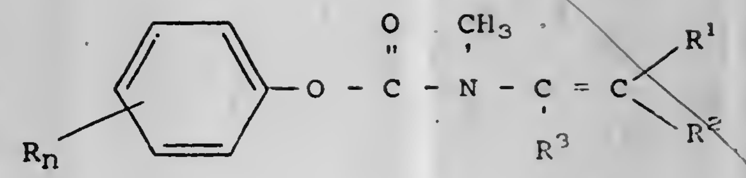
John Paul Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 20,044, March 16, 1970, Pat. No. 3,764,695. This application June 21, 1973, Ser. No. 372,434

Int. Cl. C07c *125/06*

U.S. Cl. 260—468 E **10 Claims**

1. A compound of the formula



wherein R is alkyl or alkylamino of a maximum of 6 carbon atoms,

R^1, R^2 and R^3 are hydrogen or alkyl of a maximum of 4 carbon atoms,

R^2 and R^3 can together form an alkylene group of 3 through 6 carbon atoms,

and n is an integer from 0 through 2.

3,888,904

PROCESS FOR EXTRACTING PROSTAGLANDINS

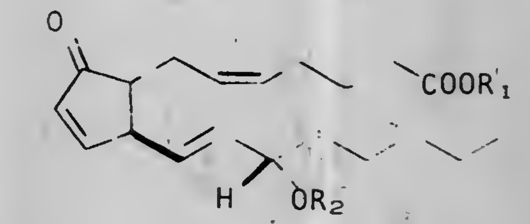
William P. Schneider, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 159,526, July 2, 1971, abandoned, which is a continuation-in-part of Ser. No. 71,431, Sept. 11, 1970, abandoned. This application Jan. 9, 1974, Ser. No. 431,835

Int. Cl. C07c *51/48, 67/06*

U.S. Cl. 260—468 D **24 Claims**

1. A process for producing a compound of the formula:



wherein R$_1$ and R$_2$ are both hydrogen, or wherein R$_1$ is methyl and R$_2$ is hydrogen or acetyl, which comprises the steps (1) extracting colonies or colony pieces of the marine invertebrate *Plexaura homomalla* (Esper), 1792, forma S with a liquid halogenated hydrocarbon having a boiling point below about 100° C., and (2) separating said compound from the resulting extract.

3,888,905

PROSTAGLANDIN INTERMEDIATES AND OPTICALLY ACTIVE ISOMERS THEREOF

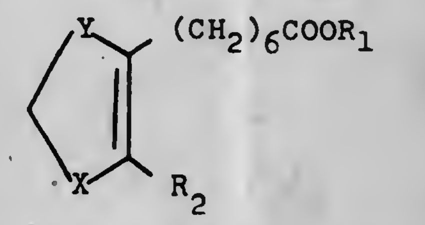
Masateru Miyano, Morton Grove, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 799,965, Feb. 17, 1969, abandoned. This application Oct. 7, 1971, Ser. No. 187,508

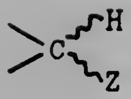
Int. Cl. C07c *65/02, 65/20, 69/76*

U.S. Cl. 260—471 A **20 Claims**

1. A compound of the formula



wherein R$_1$ is hydrogen or a lower alkyl radical containing 1–7 carbon atoms inclusive, R$_2$ is a, α,β-dihydroxyphenethyl or phenethyl radical, Y is a carbonyl, hydroxyiminomethylene or semicarbazonomethylene radical and X is a carbonyl radical or a radical of the formula



with Z being hydroxy, (−)-menthoxyacetoxy, (−)-O-methylmandeloxy, (+)-O-methylmandeloxy, (lower alkanoyl-)oxy or chloro(lower alkanoyl)oxy and the wavy lines represent the α and β stereochemical configurations or the racemic mixture.

7. As in claim 6, the compound which is 3-hydroxy-5-hydroxyimino-2-styrylcyclopent-1-eneheptanoic acid.

3,888,906
ORTHO-CARBAMYLOXY-BENZAMIDE BACTERICIDES

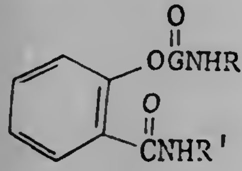
Llewellyn W. Fancher, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed May 2, 1974, Ser. No. 466,107

Int. Cl. C07c *125/06*

U.S. Cl. 260—472 **3 Claims**

1. A compound having the formula



wherein R is halogen substituted phenyl, substituted at least one of which is in the meta position and R′ is selected from the group consisting of hydrogen and phenyl.

3,888,908
POLYESTER POLYOLS

James M. Cross, New Martinsville, W. Va.; George A. Hudson, Venetia, and Joseph C. Hixenbaugh, Aliquippa, both of Pa., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Mar. 6, 1973, Ser. No. 338,470

Int. Cl. C07c *69/76, 69/80*

U.S. Cl. 260—475 P **2 Claims**

1. A polyester polyol prepared by a process comprising reacting a dicarboxylic acid other than a dimer acid, a dicarboxylic acid anhydride, a dihydric alcohol and a trihydric alcohol such that the molar ratio of dihydric alcohol to trihydric alcohol is from about 2.5 to 1 to about 6 to 1, said polyester containing from about 0.7 to about 1.3 branch points per 1000 molecular weight units, having a molecular weight from about 3,250 to about 3,750 and having a hydroxyl number of from about 72 to about 78.

3,888,909
MIXED MELLITATE COMPOUNDS

Roland Hendrickriem, Oakville, Ontario, and Alfred Johannes Dieterman, Mississauga, Ontario, both of Canada, assignors to Emery Industries, Inc., Cincinnati, Ohio

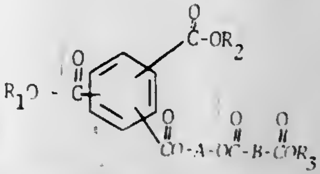
Filed Nov. 20, 1973, Ser. No. 417,585

Claims priority, application Canada, Nov. 23, 1972, 157257

Int. Cl. C07c *69/76*

U.S. Cl. 260—475 P **6 Claims**

1. A mixed mellitate composition of the formula



wherein R_1, R_2 and R_3 are saturated hydrocarbon radicals

---

or a non-toxic, pharamcologically acceptable acid addition

PROCESS OF PREPARING

wherein R_1, R_2 and R_3 are saturated hydrocarbon radicals

or a non-toxic, pharamcologically acceptable acid addition salt thereof.

3,888,899

CYANOALKYLAMINO-AMIDO BENZOPHENONES

Heinz Gunter Greve, and Klaus Resag, both of Frankfurt am Main-Fechenheim, Germany, assignors to Cassella Farbwerke Mainkur Akt., Frankfurt am Main, Germany

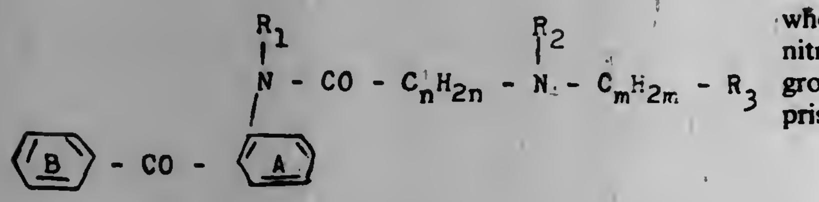
Filed May 8, 1973, Ser. No. 358,455

Claims priority, application Luxembourg, May 12, 1972, 65340

Int. Cl. C07c *121/78*

U.S. Cl. 260—465 D **8 Claims**

1. Benzophenone derivatives having the structural formula



and the acid addition salts thereof, wherein R_1 and R_2 are substituents selected from the group consisting of hydrogen, allyl and alkyl having 1 to 4 carbon atoms; R_3 is CN; *n* is an integer selected from 1 and 2; and *m* is an integer selected from 1, 2 and 3, and wherein the ring A is selected from the group consisting of phenylene, halogenphenylene, nitrophenylene, trifluoromethylphenylene, methylphenylene, methoxyphenylene and methylmercaptophenylene; the ring B is selected from the group consisting of phenyl, fluorophenyl and chlorophenyl.

PROCESS OF PREPARING 3-ALKYL-3-(BENZOYL)PROPIONITRILES

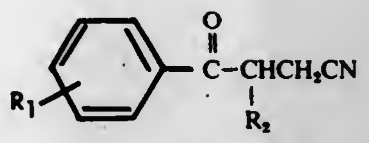
George Rodger Allen, Jr., Old Tappan, N.J., and Francis Joseph McEvoy, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 273,585, July 20, 1972, Pat. No. 3,824,271. This application Dec. 6, 1973, Ser. No. 422,395

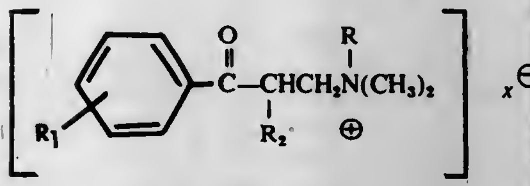
Int. Cl. C07c *121/66*

U.S. Cl. 260—465 R **7 Claims**

1. The process of preparing compounds of the formula:



wherein R_1 is selected from the group consisting of halogen, nitro and lower alkanoylamino and R_2 is selected from the group consisting of methyl, etheyl and n-propyl which comprises contacting a quaternary salt of the formula:



wherein R_1 and R_2 are as hereinabove defined, R is lower alkyl, and X^- is selected from the group consisting of chloride, bromide, iodide, sulfate and lower alkyl sulfate with an alkali metal cyanide or an alkaline earth metal cyanide in an inert solvent at ambient temperatures for a period of time sufficient for a substantial degree of displacement to occur.

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loweralkylamino, di-C_{1-5} loweralkylamino, di-C_{1-5} loweralkylaminoalkyl, sulfamyl, C_{1-5} loweralkylthio, mercapto, halogen, hydroxy, hydroxy C_{1-5} loweralkyl, C_{1-5} loweralkylsulfonyl, cyano, carboxyl, carb C_{1-5} loweralkoxy, carbamido, halogeno C_{1-5} loweralkyl, cycloalkyl, cycloalkoxy, alkynyl, alkenyl or aroyl at least one of R_3-R_6 being cyano;

R_7 may be C_{1-5} loweralkylsulfinyl or C_{1-5} loweralkylsulfonyl; R_8 may be hydrogen, halogen, hydroxy, C_{1-5} loweralkoxy or halo C_{1-5} loweralkyl; and

M may be hydroxy, C_{1-5} loweralkoxy and the group OMe in which Me is a cation.

3,888,903

PHENYL-N-(1-ALKENYL)-N-METHYLCARBAMATES

John Paul Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 20,044, March 16, 1970, Pat. No. 3,764,695. This application June 21, 1973, Ser. No. 372,434

Int. Cl. C07c *125/06*

U.S. Cl. 260—468 E **10 Claims**

1. A compound of the formula

wherein R_1 and R_2 are both hydrogen, or wherein R_1 is methyl and R_2 is hydrogen or acetyl, which comprises the steps (1) extracting colonies or colony pieces of the marine invertebrate *Plexaura homomalla* (Esper), 1792, forma S with a liquid halogenated hydrocarbon having a boiling point below about 100° C., and (2) separating said compound from the resulting extract.

3,888,905

PROSTAGLANDIN INTERMEDIATES AND OPTICALLY ACTIVE ISOMERS THEREOF

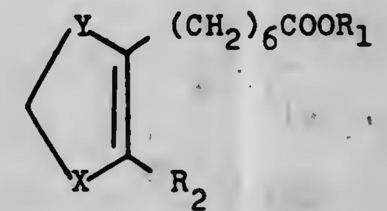
Masateru Miyano, Morton Grove, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 799,965, Feb. 17, 1969, abandoned. This application Oct. 7, 1971, Ser. No. 187,508

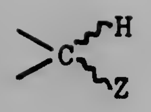
Int. Cl. C07c *65/02, 65/20, 69/76*

U.S. Cl. 260—471 A **20 Claims**

1. A compound of the formula



wherein R_1 is hydrogen or a lower alkyl radical containing 1–7 carbon atoms inclusive, R_2 is a, α,β-dihydroxyphenethyl or phenethyl radical, Y is a carbonyl, hydroxyiminomethylene or semicarbazonomethylene radical and X is a carbonyl radical or a radical of the formula



with Z being hydroxy, (−)-menthoxyacetoxy, (−)-O-methylmandeloxy, (+)-O-methylmandeloxy, (lower alkanoyl-)oxy or chloro(lower alkanoyl)oxy and the wavy lines represent the α and β stereochemical configurations or the racemic mixture.

7. As in claim 6, the compound which is 3-hydroxy-5-hydroxyimino-2-styrylcyclopent-1-eneheptanoic acid.

3,888,906
ORTHO-CARBAMYLOXY-BENZAMIDE BACTERICIDES

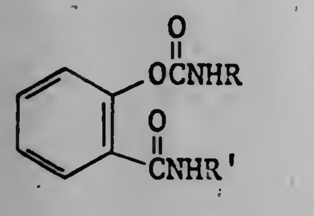
Llewellyn W. Fancher, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed May 2, 1974, Ser. No. 466,107

Int. Cl. C07c *125/06*

U.S. Cl. 260—472 **3 Claims**

1. A compound having the formula



wherein R is halogen substituted phenyl, substituted at least one of which is in the meta position and R′ is selected from the group consisting of hydrogen and phenyl.

3,888,907
LOWER ALKYL ESTERS OF 2-(3,4-DIMETHOXYPHENYL)-4,6-DIOXOCYCLOHEXANE CARBOXYLIC ACID

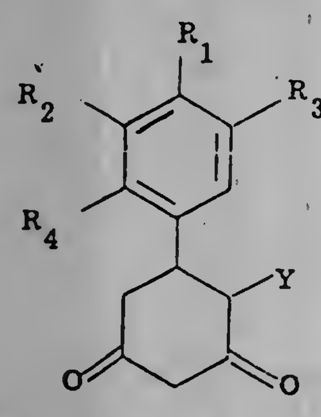
Arnold Brossi, Verona, and Benjamin Pecherer, Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 884,327, Dec. 11, 1969, Pat. No. 3,751,487, which is a continuation-in-part of Ser. No. 559,383, June 22, 1966, abandoned. This application Mar. 23, 1973, Ser. No. 344,382

Int. Cl. C07c *69/76*

U.S. Cl. 260—473 R **2 Claims**

1. A compound of the formula



wherein R_1 and R_2 are each lower alkoxy; R_3 and R_4 are each hydrogen; and Y is a carboxylic acid lower alkyl ester group.

3,888,908
POLYESTER POLYOLS

James M. Cross, New Martinsville, W. Va.; George A. Hudson, Venetia, and Joseph C. Hixenbaugh, Aliquippa, both of Pa., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Mar. 6, 1973, Ser. No. 338,470

Int. Cl. C07c *69/76, 69/80*

U.S. Cl. 260—475 P **2 Claims**

1. A polyester polyol prepared by a process comprising reacting a dicarboxylic acid other than a dimer acid, a dicarboxylic acid anhydride, a dihydric alcohol and a trihydric alcohol such that the molar ratio of dihydric alcohol to trihydric alcohol is from about 2.5 to 1 to about 6 to 1, said polyester containing from about 0.7 to about 1.3 branch points per 1000 molecular weight units, having a molecular weight from about 3,250 to about 3,750 and having a hydroxyl number of from about 72 to about 78.

3,888,909
MIXED MELLITATE COMPOUNDS

Roland Hendrickriem, Oakville, Ontario, and Alfred Johannes Dieterman, Mississauga, Ontario, both of Canada, assignors to Emery Industries, Inc., Cincinnati, Ohio

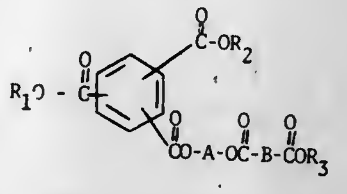
Filed Nov. 20, 1973, Ser. No. 417,585

Claims priority, application Canada, Nov. 23, 1972, 157257

Int. Cl. C07c *69/76*

U.S. Cl. 260—475 P **6 Claims**

1. A mixed mellitate composition of the formula



wherein R_1, R_2 and R_3 are saturated hydrocarbon radicals containing from 1 to 22 carbon atoms, A is a saturated bivalent hydrocarbon radical containing from 2 to 8 carbon atoms and B is a saturated bivalent hydrocarbon radical containing 2 to 22 carbon atoms.

3,888,910
SURFACTIVE MATERIAL AND ITS PREPARATION

Fred Smeets, Tienen, Belgium, assignor to La Citrique Belge, N.V., Tiene, Belgium

Continuation of Ser. No. 742,540, July 5, 1968, abandoned, which is a continuation-in-part of Ser. No. 563,816, July 8, 1966, Pat. No. 3,586,715. This application Sept. 14, 1971, Ser. No. 180,450

Claims priority, application United Kingdom, July 19, 1965, 30640/65; July 5, 1967, 31014/67; Oct. 19, 1967, 47676/67

Int. Cl. C07c *143/54*

U.S. Cl. 260—479 R **11 Claims**

1. A biodegradable surface-active compound prepared by the process comprising the steps of:

a. forming an unsaturated polycarboxylic acid material by pyrolyzing an alkaline earth citrate at a temperature between 250° to 400° C. for a period of time until an increase in titratable alkalinity of the reaction mixture is obtained and until not more than 32% by weight of the alkaline earth citrate remains in the reaction mixture, and hydrolyzing the material thus obtained to an acid;

b. forming an ester from the said acid material by reacting at least one carboxylic acid group thereof with a mono- or polyhydroxy-containing non-ionic surfactant selected from at least one $C_1 - C_{24}$ monohydric or polyhydric aliphatic alcohol and a polyalkoxylated alkyl phenol; and

c. sulphonating the double bonds of the unsaturated polycarboxylic acid either before or after esterification to form sodium sulphonate groups thereon.

3,888,911
PROCESS FOR THE PREPARATION OF ETHYLENE POLYMER TELOMER WAXES

John E. Dench, Dover; Harry Knutson, Brookside, and Manfred K. Seven, Long Valley, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Mar. 2, 1971, Ser. No. 120,356

Int. Cl. C07c *69/66*

U.S. Cl. 260—484 R **19 Claims**

18. In the process for preparing wax telomer polymers of ethylene having a molecular weight of 1,000 to 5,000 by vapor phase reaction of a feed stream containing ethylene, a telogen and a free radical initiator, the improvement which comprises utilizing as initiator a member of the group consisting of t-butylperacetate, t-butylperoctoate, 1-cyano-1(t-butylazo)cyclohexane, 2-(t-butylazo)isobutyronitrile and 2-t-butylazo-2-phenylpropane.

3,888,912
PROCESS FOR MAKING BETA-ACRYLOYLOXYPROPANOIC ACID

Mario D. Burguette, North St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 20, 1973, Ser. No. 389,945

Int. Cl. C07c *69/54*

U.S. Cl. 260—486 R **6 Claims**

1. The process for producing β-acryloyloxypropanoic acid which comprises heating acrylic acid in the presence of a catalytic amount of aluminum trichloride.

3,888,913
NOVEL CYCLIC SULPHONES AND DERIVATIVES THEREOF

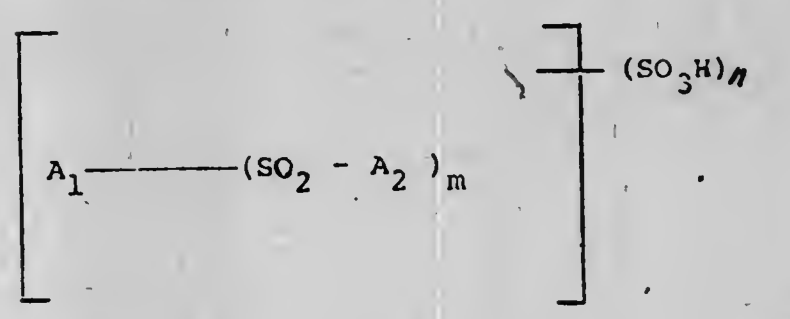
Hans-Peter Baumann, Baselland, and Robert-Christian Keller, Basel, both of Switzerland, assignors to Sandoz, Inc., Basel, Switzerland

Division of Ser. No. 620,231, March 3, 1967, Pat. No. 3,538,151. This application June 29, 1970, Ser. No. 60,169

Int. Cl. C07c *143/24*

U.S. Cl. 260—501.19 **7 Claims**

1. A compound which is a member of the group consisting of (1) sulphones of the formula

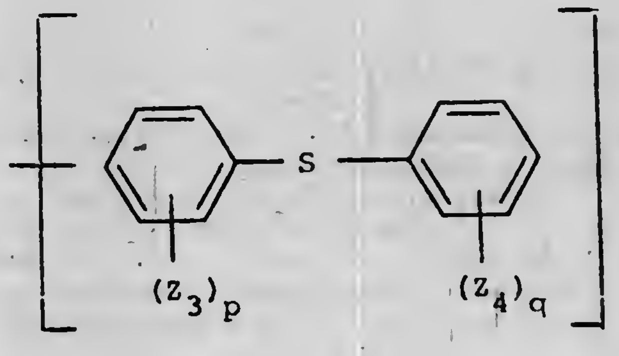


wherein

m represents 1 or 2,

n represents 1, 2, or 3,

A_1 and A_2 are identical with or different from one another and each represents a radical of the formula



wherein each of Z_3 and Z_4 represents hydrogen, halogen, lower alkyl or phenyl,

and each of p and q represents 1 or 2 and (2) the water soluble salts thereof with cations selected from the group-consisting of ammonium, alkali metal, alkaline earth metal and ammonium groups containing 1 to 3 alkyl or hydroxy-alkyl groups of 1 to 3 carbon atoms and hexamethylene tetramine.

3,888,914
NOVEL CHEMICAL COMPOUNDS, PROCESSES FOR MAKING THEM AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

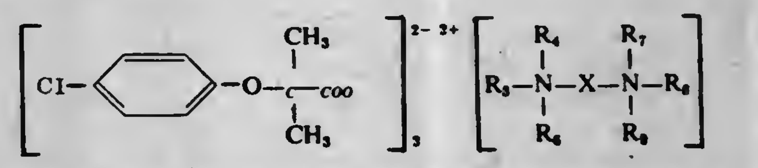
Andre Foldes, and Geza Delmar, both of Montreal, Quebec, Canada, assignors to Delmar Chemicals, Limited, Ville La-Salle, Quebec, Canada

Continuation of Ser. No. 9,417, Feb. 6, 1970, abandoned. This application Oct. 10, 1972, Ser. No. 296,074

Int. Cl. C07c *63/00*

U.S. Cl. 260—501.16 **2 Claims**

1. An amine salt of p-chlorophenoxyisobutyric acid which has the formula:



wherein X is a straight chain lower alkylene, and R_4, R_5, R_6, R_7, R_8 and R_9 are each hydrogen.

3,888,915
N-NITROSO-N-PHOSPHONOMETHYL GLYCINE COMPOUNDS AND HERBICIDAL USE THEREOF

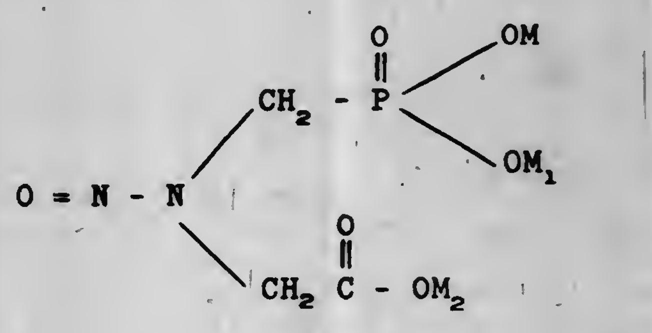
Gerhard H. Alt, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sept. 4, 1973, Ser. No. 394,019

Int. Cl. C07d *105/22*

U.S. Cl. 260—501.21 **4 Claims**

1. A compound of the formula



wherein M, M_1 and M_2 are each individually hydrogen or a saltforming cation selected from the class consisting of alkali metals, alkaline earth metals, ammonium, mono-, di-, and trialkyl ammonium each containing 1 to 6 carbon atoms, cycloalkyl ammonium containing 3 to 6 carbon atoms, aniline and substituted anilines wherein the substituents are halo, nitro, methoxy, methyl or ethyl groups, with the proviso that at least one of M, M_1 and M_2 is hydrogen when the others are other than an alkali metal or an alkaline earth metal.

3,888,916
AMANTADINE SALT OF 16,16-DIMETHYL-PGE_2

Anthony A. Sinkula, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 1, 1974, Ser. No. 493,544

Int. Cl. C07c *97/00*

U.S. Cl. 260—501.1 **2 Claims**

1. The amantadine salt of 16,16-dimethyl-PGE_2.

2. Free-flowing crystals of the amantadine salt of 16,16-dimethyl-PGE$_2$.

3,888,917
ORGANIC SULFONATE EXTRACTION PROCESS

Denton C. Fentress, Littleton, and Kent W. Robinson, Englewood, both of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 763,185, Sept. 27, 1968, abandoned. This application May 6, 1971, Ser. No. 141,032

Int. Cl. C07c *139/00*

U.S. Cl. 260—504 R **15 Claims**

1. A process of recovering alkane sulfonates containing about 6 to about 30 carbon atoms per molecule from an aqueous reaction mixture comprised of said alkane, alkanols containing 1-6 carbon atoms sulfonates, water, unsaturaged hydrocarbons containing about 6 to about 30 carbon atoms, sulfonating agents selected from the group consisting of alkali metal and ammonium bisulfites, pyrosulfites and metabisulfites, and by-products from sulfonating the unsaturated hydrocarbons with said sulfonating agent, the process comprising:

1) contacting the aqueous reaction mixture with sufficient amount of a substantially watersoluble alkanone containing 3-6 carbon atoms to cause the organic sulfonate within the mixture to precipitate,

2) permitting said alkane sulfonate within the resulting mixture to precipitate, and then

3) separating said alkane sulfonate from the aqueous mixture.

3,888,918
PROCESS FOR REACTING A SULTONE WITH A NON-BASIC ALKALI METAL, ALKALINE EARTH METAL OR AMMONIUM HALIDE SALT IN AN ANHYDROUS SYSTEM

Gerhard O. Kuehnhanss, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 7, 1972, Ser. No. 312,948

Int. Cl. C07c *143/16*

U.S. Cl. 260—513 R **18 Claims**

1. A process for producing an alkene sulfonic acid salt which comprises reacting a sultone having from about 6 to about 36 carbon atoms per molecule in an anhydrous system with a non-basic alkali metal, alkaline earth metal or ammonium halide salt at a temperature from about 50° to about 250°C producing a volatile hydrogen halide and alkene sulfonic acid salt, while removing said volatile hydrogen halide to enhance conversion of the sultone to the alkene sulfonic acid salt.

3,888,919
11,15 DIMETHYL PGE$_1$ AND PGF$_{1\alpha}$

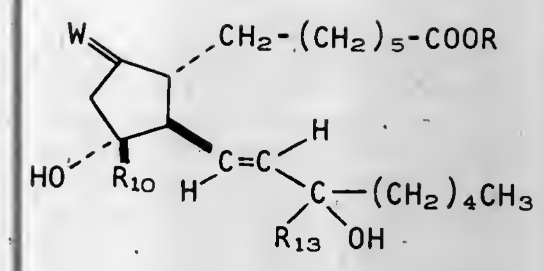
John E. Pike, and William P. Schneider, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 123,370, March 11, 1971, abandoned, which is a continuation-in-part of Ser. No. 648,992, June 26, 1967, abandoned. This application Dec. 8, 1972, Ser. No. 313,368

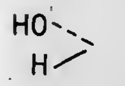
Int. Cl. C07c *61/32, 61/36, 69/74*

U.S. Cl. 260—514 D **9 Claims**

1. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein R is hydrogen or a hydrocarbyl group containing from 1 to 12 carbon atoms, inclusive, wherein W is



or O=,

and wherein R$_{10}$ and R$_{13}$ are both alkyl of one to 4 carbon atoms, inclusive.

3,888,920
ARYL SUBSTITUTED-4-ALKENOIC ACIDS

Marcel K. Eberle, Madison, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Aug. 6, 1973, Ser. No. 386,085

Int. Cl. C07c *63/30*

U.S. Cl. 260—515 R **2 Claims**

1. The compound which is 2,2,3-triphenyl-4-pentenoic acid.
2. The compound which is 2-(p-chlorophenyl)-3-phenyl-4-pentenoic acid.

3,888,921
METHOD FOR PURIFYING 2,6-NAPHTHALENEDICARBOXYLIC ACID

Kiyoshi Yamamoto, and Gentaro Yamashita, both of Iwakuni, Japan, assignors to Teijin Ltd., Osaka, Japan

Filed May 31, 1973, Ser. No. 365,702

Int. Cl. C02c *63/68*

U.S. Cl. 260—525 **11 Claims**

1. A method for purifying a crude 2,6-naphthalenedicarboxylic acid obtained by the oxidation of a 2,6-dialkylnaphthalene, which comprises

a. preparing an aqueous solution of a dialkali salt of said crude 2,6-naphthalenedicarboxylic acid, whose alkali moieties are derived from one of the group consisting of: sodium and potassium hydroxides, carbonates, hydrogen carbonates, sulfites, and bisulfites; aqueous ammonia; and aqueous solutions of water-soluble organic amines,

b. precipitating 40 to 97 mol percent of the dialkali 2,6-naphthalenedicarboxylate dissolved in said aqueous solution substantially as a monoalkali salt of the 2,6-naphthalenedicarboxylic acid while maintaining the pH of said aqueous solution at a value not lower than 6.3, and separating the precipitate, and

c. converting the separated precipitate to a 2,6-naphthalenedicarboxylic acid.

3,888,922
STABILIZING ACRYLIC ACID WITH ALKYLATED PHENOLS

Leon B. Levy, and Gene J. Fisher, both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Apr. 30, 1973, Ser. No. 355,390

Int. Cl. C07f *69/54*

U.S. Cl. 260—526 N **6 Claims**

1. A composition consisting essentially of acrylic acid stabilized with at least about 0.001% its weight of at least one stabilizing branched lower alkyl-substituted phenol which is a member of the group consisting of tri-lower alkyl phenols and lower alkyl-lower alkoxy phenols.

3,888,923
PROCESS OF MAKING PENICILLAMINE

Friedrich Asinger, Aachen; Karl-Heinz Gluzek, Orsoy, and Heribert Offermanns, Grossauheim, all of Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed Aug. 23, 1972, Ser. No. 283,233

Claims priority, application Germany, Aug. 24, 1971, 2142336

Int. Cl. C07c *101/20, 99/00*

U.S. Cl. 260—534 S **18 Claims**

17. A process as defined in claim 1 in which the 2-isopropyl-5,5-dimethylthiazolidine is 2-isopropyl-5,5-dimethylthiazolidine-4-carboxylic acid hydrochloride.

3,888,924
BIS(DIALKYLAMINO)SULFUR DIFLUORIDES

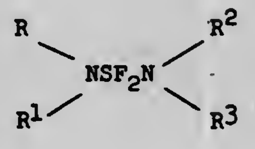
William Joseph Middleton, Chadds Ford, Pa., assignor to E. I. Du Pont De Nemours & Company, Wilmington, Del.

Filed Mar. 23, 1973, Ser. No. 344,168

Int. Cl. C07d *29/34, 27/02;* **C07c** *145/00*

U.S. Cl. 260—543 F **4 Claims**

1. A compound of the formula



wherein R, R^1, R^2 and R^3, alike or different, are each a primary alkyl group of 1 to 6 carbons, or when R and R^1 taken together, and R^2 and R^3 taken together, are $-(CH_2)_4-$ or $-(CH_2)_5-$.

3,888,925
SUBSTITUTED DICHLOROSULFENAMIDES

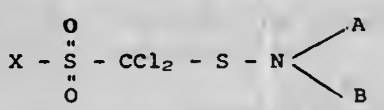
Wendell Gary Phillips, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 159,034, July 1, 1971, Pat. No. 3,766,172. This application Apr. 30, 1973, Ser. No. 355,836

Int. Cl. C07c *145/00*

U.S. Cl. 260—551 S **6 Claims**

1. A substituted dichlorosulfenamide of the formula



wherein X is phenyl, phenyl substituted by 1 to 3 halo, phenyl substituted by 1 to 3 trihalomethyl, or phenyl substituted by 1 to 3 lower alphyl, A is hydrogen, methyl alkenyl having from 3 to 5 carbon atoms, inclusive, branched alkynyl having from 4 to 5 carbon atoms, inclusive, lower alkyl, lower alkoxyalkyl, and B is methyl alkenyl having from 3 to 5 carbon atoms, inclusive, branched alkynyl having from 4 to 5 carbon atoms, inclusive, phenyl, phenyl substituted by 1 to 3 halo, trihalomethyl, or lower alkyl, or phenyl substituted by 1 to 3 lower alkoxyalkyl.

3,888,926
METHOD OF PREPARING INDOPHENOLS AND OXICHROMIC COMPOUNDS

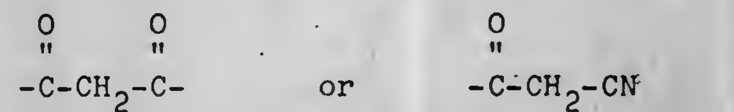
Daniel Francis Reardon, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 206,927, Dec. 10, 1971, abandoned. This application Aug. 30, 1973, Ser. No. 393,242

Int. Cl. C07c *91/44*

U.S. Cl. 260—559 A **8 Claims**

1. A process comprising reacting 1) an open-chain keto-methylene photographic coupler compound comprising the group:



$-\overset{O}{\overset{\parallel}{C}}-CH_2-\overset{O}{\overset{\parallel}{C}}-$ or $-\overset{O}{\overset{\parallel}{C}}-CH_2-CN$

which is α-brominated on the methylene carbon atom shown in said formulae with 2) an aromatic primary amine which is a 2,6-dihalo-4-aminophenol, said reaction being carried out a) in a basic medium containing a tertiary amine acid acceptor which is a weak base and b) in the presence of a polar solvent.

3,888,927
ANTI-INFLAMMATORY N,N′-DISUBSTITUTED AMIDINES

Hiroshi Hamakawa; Sadami Kobari; Takeshi Shimizu; Kentaro Fujimoto; Kazuo Hayano, and Tetsuo Matsuda, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed June 7, 1974, Ser. No. 477,347

Claims priority, application Japan, June 7, 1973, 48-64555; June 7, 1973, 48-64556

Int. Cl. C07c *123/00*

U.S. Cl. 260—564 R **7 Claims**

1. N-cyclohexyl-N′-3,4-dichlorophenyl-benzamidine hydrochloride.

3,888,928
1,4-BIS(DIALLYLAMINOMETHYL)-BENZENE

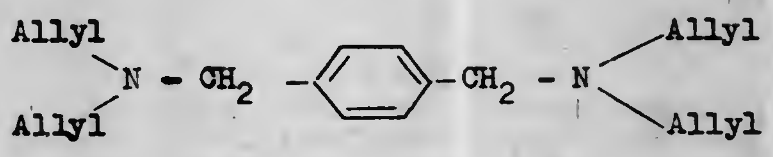
Donald Willis, Blackburn; Hendrik Adriaan Jacobus Battaerd, North Clayton; Gunter Anton Lang, Tullamarine, and Donald Eric Weiss, Blackburn, all of Australia, assignors to ICI Australia Limited, Melbourne and Commonwealth Scientific and Industrial Research Organization, Campbell, both of, Australia

Filed July 31, 1972, Ser. No. 276,528

Int. Cl. C07c *87/28*

U.S. Cl. 260—570.9 **1 Claim**

1. The monomer:



3,888,929
PROCESS FOR DEHALOGENATION OF POLYHALOGENATED AROMATIC COMPOUNDS

Georges Rivier, Bron, France, assignor to Rhone-Progil, Paris, France

Filed Nov. 21, 1972, Ser. No. 308,459

Claims priority, application France, Nov. 30, 1971, 71.43773

Int. Cl. C07c *87/60*

U.S. Cl. 260—578 **9 Claims**

1. A process for the preparation of chlorinated anilines having at least a chlorine atom in the meta position to the

amino group, in which tri- to pentachloranilines are dechlorinated, said process consisting essentially of:

- reacting in a dechlorination zone, said tri- to pentachloroanilines having at least a chlorine atom in the meta position and at least a chlorine atom in another position, in the vapor phase with hydrogen, in the presence of an hydrogenation catalyst selected from the group consisting of the chlorides, oxides, nitrates, sulfates and chromites of copper or silver, to provide by dechlorination said chlorinated anilines having at least a chlorine atom in the meta position;
- and recovering said chlorinated anilines having at least a chlorine atom in the meta position.

3,888,930

NEW TERTIARY PHOSPHINE OXIDES AND PROCESS FOR THEIR PREPARATION

Hans-Jerg Kleiner, Bad Soden, Taunus: Walter Dürsch, Schneidhain, Taunus; Gerhard Stahler, Frankfurt am Main, and Werner Racky, Wiesbaden, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

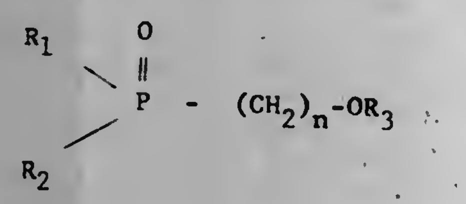
Filed Nov. 28, 1973, Ser. No. 419,549

Claims priority, application Germany, Nov. 30, 1972, 2258662

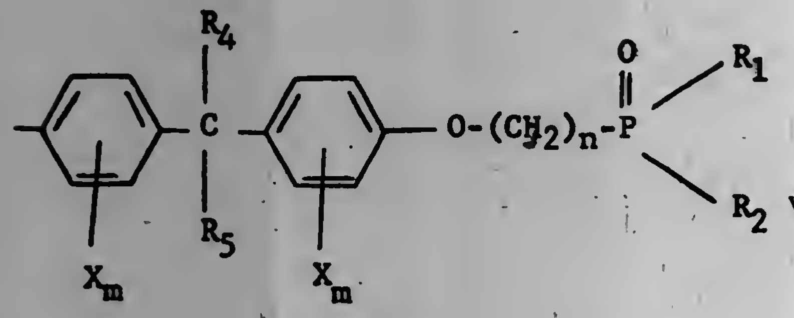
Int. Cl. C07f *9/28*

U.S. Cl. 260—606.5 P **8 Claims**

1. A tertiary phosphine oxide of the general formula



wherein R_1 and R_2 represent alkyl groups of 1 to 6 carbon atoms and may be the same or different and R_3 represents a phenyl group which may be substituted by 1 to 5 chlorine and/or bromine atoms or the group having the general formula



in which X is selected from chlorine and bromine, *m* is 1 to 4, R_1 and R_2 are as defined above, R_4 and R_5 are hydrogen atoms or alkyl groups of 1 to 6 carbon atoms, and *n* is 1 to 3.

3,888,931

PREPARATION OF ALKYL VINYL ETHERS

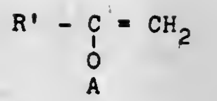
Charles M. Starks, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 97,301, Dec. 11, 1970, abandoned, which is a continuation-in-part of Ser. No. 807,092, March 13, 1969, abandoned. This application Aug. 10, 1972, Ser. No. 279,571

Int. Cl. C07c *41/00*

U.S. Cl. 260—611 A **8 Claims**

1. A process for forming vinyl ethers of the formula



$$R'-\underset{\substack{|\\ O\\ |\\ A}}{C}=CH_2$$

wherein

R' is alkyl, alkenyl, aryl or an alkaryl radical; and

A is an aliphatic C_1–C_{30} hydrocarbon radical; which comprises reacting (1) a halogen-substituted hydrocarbon having the general formula

$R'-CH=CHX$

wherein R' is as defined above, and X is halogen, with (2) a primary or secondary alcohol represented by AOH wherein A is as defined, in the presence of a base stronger than ammonium hydroxide at autogeneous pressures and temperatures in the range of 150°C to 400°C.

3,888,932

HERBICIDAL 4-TRIFLUOROMETHYL-4-NITRODIPHENYL ETHERS

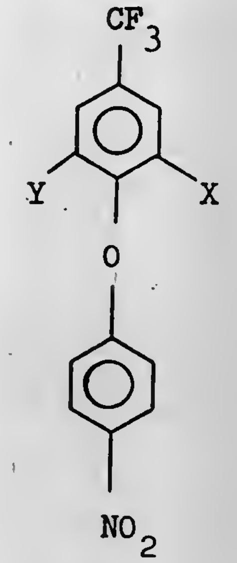
Horst O. Bayer, Levittown; Colin Swithenbank, Perkasie, and Roy Y. Yih, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Mar. 14, 1972, Ser. No. 234,656

Int. Cl. C07c *43/20*

U.S. Cl. 260—612 R **5 Claims**

1. A compound of the formula



wherein

X is a halogen atom and

wherein Y is a hydrogen or a halogen atom

3,888,933

4-HYDROXYETHYL-BIPHENYLYL-BUTADIENOLS

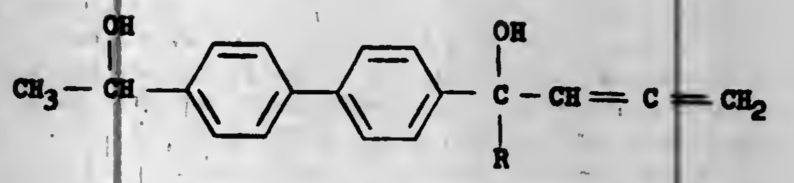
Paul L. Anderson, Dover, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Dec. 28, 1973, Ser. No. 429,388

Int. Cl. C07c *33/02*

U.S. Cl. 260—618 R **2 Claims**

1. A compound of the formula



wherein

R is a hydrogen atom, methyl or ethyl.

3,888,934

BIPHENYLENE-SUBSTITUTED-BUTADIENOLS

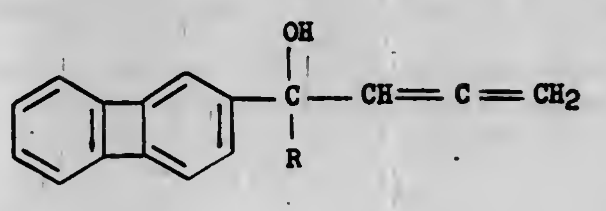
Paul L. Anderson, Dover, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Dec. 28, 1973, Ser. No. 429,389

Int. Cl. C07c *33/02*

U.S. Cl. 260—618 F **2 Claims**

1. A compound of the formula:



wherein

R is a hydrogen atom, methyl or ethyl.

3,888,935

PROCESS FOR PRODUCING ALKYL FLUORIDES FROM MONO-OLEFINS

Jay E. Sobel, Highland Park, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 190,020, Oct. 18, 1971, abandoned. This application June 4, 1973, Ser. No. 366,832

Int. Cl. C07c *17/08, 19/08*

U.S. Cl. 260—653.6 **6 Claims**

1. A process for producng an alkyl fluoride which comprises contacting a hydrocarbon reactant consisting essentially of at least one C_3–C_5 mono-olefin at fluorination conditions with a liquid solution of from about 40 weight percent to about 65 weight percent of hydrogen fluoride and from about 60 weight percent to about 35 weight percent of a hydrogen fluoride-soluble hydrocarbon having a molecular weight between about 150 and 600 and selected from the group consisting of polymers of olefins of from 3 to 5 carbon atoms, polycyclic aromatic hydrocarbons and terpene polymers, said fluorination conditions including a temperature of from about 0°F. to about 150°F., a pressure of from about 1 to about 40 atmospheres, a volume ratio of said mono-olefin to said solution of about 1:100 to about 5:1, and a contact time of from about 0.1 to about 60 minutes, and recovering said alkyl fluoride from the resulting mixture.

3,888,936

REMOVAL OF FREE RADICAL INHIBITORS TO PROMOTE SYNTHESIS OF ALPHA, OMEGA-DICHLOROALKANE TELOMERS FROM ETHYLENE AND SULFURYL CHLORIDE

Joseph A. Hudson, Jr., Waco, Tex., assignor to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 233,321, March 9, 1972. This application Jan. 19, 1973, Ser. No. 324,901

Int. Cl. C07c *17/02*

U.S. Cl. 260—659 R **1 Claim**

1. In a process for the telomerization of ethylene and sulfuryl chloride to form alpha,omega-dichloroalkanes wherein the telomerization is conducted at a temperature of 100°–300°C and at a pressure of 100 to 30,000 psig, the improvement comprising conducting the telomerization in a reaction environment which is previously rendered free from oxygen and initiating it thermally.

3,888,937

CATALYTIC HYDROGENATION WITH A MIXTURE OF METAL HALIDE AND ANHYDROUS PROTONIC ACID

Michael Siskin, Maplewood, and Jos P. Wristers, New Brunswick, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed June 12, 1973, Ser. No. 369,304

Int. Cl. C07c *5/10*

U.S. Cl. 260—667 **13 Claims**

1. A process for hydrogenating a feed comprising organic compounds containing one or more ethylenic linkages which comprises:

1. contacting said feed in the presence of hydrogen with a catalyst comprised of
   - a. a metal halide wherein said metal is aluminum, gallium, tin, lead, vanadium, niobium, tantalum, arsenic, chromium, molybdenum, tungsten, rare earth and/or transuranium metal and said halide is fluoride, chloride, bromide and/or iodide, and
   - b. at least an equal molar amount, based on metal halide, of a protonic acid capable of being a proton donor to the system and further being characterized by the formula HX, $R_aX_bQO_c$ or mixtures thereof where H is hydrogen, X is chlorine, bromine, fluorine and/or iodine; R is hydrogen, C_1–C_4 alkyl, C_3–C_{10} cycloalkyl and/or C_6–C_{10} aryl, Q is either phosphorus or sulfur; O is oxygen; *a* is an integer ranging from 1 to 4 and *b* and *c* are integers ranging from 0 to 6; and
2. recovering a product having an average molecular weight higher than the average molecular weight of the feed.

3,888,938

PROCESS FOR OBTAINING 2,6-DIMETHYLNAPHTHALENE-RICH OR 2,7-DIMETHYLNAPHTHALENE-RICH PRODUCT

Makoto Ogasawara; Kazuyoshi Suzuki; Takanori Urasaki; Takeo Shima; Shizuka Kurisu, and Yasuji Hirabayashi, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed May 22, 1974, Ser. No. 472,440

Claims priority, application Japan, May 26, 1973, 48-58236; June 5, 1973, 48-62503

Int. Cl. C07c *5/24, 15/24*

U.S. Cl. 260—668 A **4 Claims**

1. In the process for obtaining a 2,6-dimethylnaphthalene-rich or 2,7-dimethylnaphthalene-rich product by carrying out the liquid phase catalytic intramolecular rearrangement, respectively, of dimethylnaphthalenes consisting of the 2,6-dimethylnaphthalene family or the 2,7-dimethylnaphthalene family whose content of the 2,6-dimethylnaphthalene or the 2,7-dimethylnaphthalene is less than its thermodynamic equilibrium concentration, wherein said rearrangement reaction is carried out at a temperature ranging from 260° to 500° C. in the presence of a mordenite catalyst; the improvement comprising using as the starting material that consisting of dimethylnaphthalene whose content of the dimethylnaphthalene family is at least 60 % by weight and not containing in excess of 10 mol% of trimethylnaphthalene, and carrying out said rearrangement reaction in the presence of a mixed catalyst consisting of

- a. 70–95 % by weight of a hydrogen form of mordenite in which above 80 % by weight of the metal cations are replaced with hydrogen ions, and
- b. 30–5 % by weight of a promoter selected from the group consisting of bentonite and fuller's earth.

3,888,939

PROCESS FOR SEPARATING OLEFINS BY ADSORPTION

Donald H. Rosback, Elmhurst, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 401,782, Sept. 28, 1973. This application May 17, 1974, Ser. No. 471,069

Int. Cl. C07c *7/12*

U.S. Cl. 260—677 AD **6 Claims**

1. A process for separating olefins from a feed mixture comprising olefins and saturates which process comprises contacting said mixture with an adsorbent prepared by the steps of:

- a. contacting a base material comprising type X or type Y zeolite with a fluoride-containing aqueous sodium hydroxide solution at ion exchange conditions to effect the addition of sodium cations and the extraction of alumina from said base material;
- b. washing the sodium-exchanged base material at washing conditions until essentially free of sodium hydroxide; and,
- c. drying the material at conditions to reduce the LOI at 900° C. to less than about 10 wt. percent, thereby selectively adsorbing at adsorption conditions said olefins.

3,888,940

STEAM-ACTIVATED OLEFIN DISPROPORTIONATION CATALYSTS

Donald H. Kubicek, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 26, 1973, Ser. No. 354,550

Int. Cl. C07c *3/62*

U.S. Cl. 260—683 D **11 Claims**

1. In the process of converting at least one reactant selected from the group consisting of cyclic and acyclic mono and polyene olefin hydrocarbons of at least 3 carbon atoms and mixtures of at least one such olefin hydrocarbon and ethylene according to the olefin reaction by contacting with a catalyst composition comprising molybdenum oxide or rhenium oxide on a silica, alumina, or silica- or alumina-containing support, optionally with a cobalt component when said catalyst composition is said molybdenum oxide on a support, under conditions suitable for obtaining a product of the olefin reaction which, as defined herein, can be visualized as the reaction between two first pairs of carbon atoms, carbon atoms of each first pair being connected by an olefinic double bond, to form two new pairs from the carbon atoms of said first pairs, two carbon atoms of said new pairs being connected by an olefinic double bond, within a conversion temperature range of about −60°F. to 1100°F. and a pressure in the range of about 0 to 2000 psig, the improvement which comprises the employment of a thermally activated catalyst composition prepared by the process of treating said catalyst composition under thermal activation conditions with water or water vapor at elevated temperatures of at least about 700°F and thereafter calcining said thermally treated catalyst composition.

3,888,941

MODIFIED ABS POLYMERS

Ebon Paul Weaver, Naugatuck, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Feb. 26, 1974, Ser. No. 446,074

Int. Cl. C08f *31/04, 39/00*

U.S. Cl. 260—829 **21 Claims**

1. A thermoplastic polymer blend having improved flex fatigue resistance comprising

- A. 100 parts of an acrylonitrile-butadiene-styrene interpolymer comprising styrene-acrylonitrile resin combined with a styrene-acrylonitrile monomer mixture grafted onto a rubber spine selected from polybutadiene and butadiene-styrene copolymer, wherein said interpolymer comprises 10–40% acrylonitrile monomer, 5–65% butadiene monomer, and 25–85% styrene monomer, all by weight;
- B. 20 to 60 parts of an alkyl acrylate-butadiene-styrene terpolymer; and
- C. 5 to 25 parts of a coumarone-indene resin, wherein the weight ratio of (B) and (C) is at least 1 to 1.

3,888,942

RESINOUS COMPOSITIONS AND LAMINATES MADE THEREFROM

Lo Kwang Tsen, Coshocton, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 13, 1973, Ser. No. 424,517

Int. Cl. C03c *25/02*

U.S. Cl. 260—830 TW **6 Claims**

1. A resinous composition comprising, by weight,

- a. an epoxy resin composition comprising a blend of about 50 to 90 percent of an epoxy resin having an epoxy equivalent weight of from about 170 to 200 and about 10 to 50 percent of the fusion reaction product of an epoxy resin and tetrabromobisphenol-A, said fusion reaction product having an epoxy equivalent weight of from about 900 to 1,900.
- b. from about 1 to 20 parts per hundred of the epoxy resin composition of (a) of a phenoxy resin,
- c. from about 25 to 75 parts per hundred of the epoxy resin composition of (a) of tricarboxylic anhydride, and
- d. from about 0.01 to 0.5 part per hundred of the epoxy resin composition of (a) of a tertiary amine curing promoter.

5. A circuit board substrate characterized by a low Z-axis coefficient of expansion under heat cycling, said substrate comprising at least one lamina treated with the resinous composition of claim 2.

3,888,943

POWDER COATING COMPOSITIONS COMPRISING A BLEND OF COREACTIVE POLYMERS - I

Santokh S. Labana, Dearborn Heights, and Ares N. Theodore, Farmington, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 19, 1973, Ser. No. 426,168The portion of the term of this patent subsequent to Dec. 25, 1990, has been disclaimed.

Int. Cl.² C08G *45/04*

U.S. Cl. 260—836 **8 Claims**

1. A thermosettable powder coating composition which exclusive of pigments and other non-reactive components comprises a coreactive mixture of

1. epoxy-functional copolymer of about 5 to about 20 weight percent of a glycidyl ester of a monoethylenically unsaturated carboxylic acid and about 80 to about 95 weight percent of monoethylenically unsaturated, quantitatively-monofunctional monomers, and having average molecular weight in the range of about 1500 to about 15,000 with no more than 5 percent thereof having molecular weight above 20,000.
2. an anhydride-functional copolymer of about 5 to about 20 weight percent of an anhydride of an olefinically-unsaturated dicarboxylic acid and about 80 to about 95 weight percent of monoethylenically unsaturated, quantitatively-monofunctional monomers and having average molecular weight in the range of about 1500 to about 15,000 with no more than 5 percent thereof having molecular weight about 20,000, said anhydride-functional copolymer.being present in an amount such as to provide about 0.4 to about 1 anhydride group per epoxy group in the epoxy-functional copolymer, and
3. a polymeric flow control agent forming at least about 0.5 to about 4.0 weight percent of the mixture.

3,888,944

ANTISTATIC FIBER CONTAINING CHAIN-EXTENDED TETROLS BASED ON DIAMINES

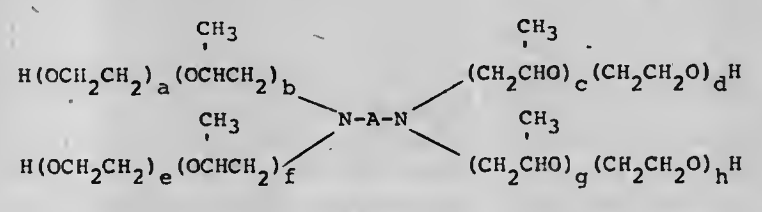
Lamberto Crescentini, and Rodney Lee Wells, both of Chester, Va., assignors to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 271,316, July 12, 1972. This application Aug. 5, 1974, Ser. No. 494,423

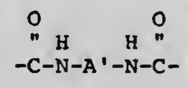
Int. Cl.² C08G *41/04*

U.S. Cl. 260—857 PG **10 Claims**

1. In a process for the formation of an antistatic polyamide fiber from a fiber-forming polyamide polymer containing about 1 to 12% by weight of an antistatic compound which is a chain-extended reaction product of a tetrol compound represented by the formula:

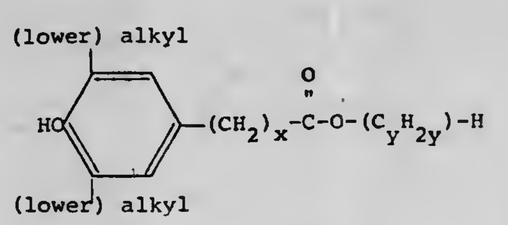


where *a*, *b*, *c*, *d*, *e*, *f*, *g*, and *h* are each a whole number and A is a difunctional radical from a hydrocarbon containing 1 to 13 carbon atoms, said tetrol compound having a molecular weight between about 4,000 and about 50,000 and at least one compound selected from the group consisting of compounds which yield the following divalent radical:

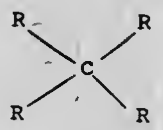


$$-\overset{\overset{O}{\|}}{C}-\overset{H}{N}-A'-\overset{H}{N}-\overset{\overset{O}{\|}}{C}-$$

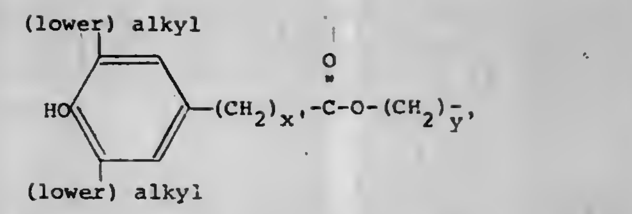
where A′ is a difunctional radical from a hydrocarbon containing 1 to 30 carbon atoms, by extruding the molten polymer through an orifice into a quenching medium and thereafter stretching the resulting filaments, the improvement comprising dissolving in the extrudate prior to extrusion at least 0.1% by weight, based on the weight of the antistatic compound, of a phenol compound selected from the group consisting of:



where *x* has a value of from 1 to 6 and *y* has a value of from 6 to 30; and



in which R is



wherein *x*′ has a value from 1 to 6 and *y*′ has a value of 1 to 6.

3,888,945

METHOD FOR PREPARING POLYMERS IN SOLID PARTICULATE FORM

Peter Joseph Arndt, Jugenhelm; Horst Pennewiss, Hermann Plainer. Wilhelm Krall. all of Darmstadt; Juergen Masanek, Pfungstadt, and Manfred Mueller, Rossdorf Uber Darmstadt, all of Germany, assignors to Rohm GmbH, Darmstadt, Germany

Filed July 10, 1972, Ser. No. 270,144

Claims priority, application Germany, July 22, 1971, 2136585

Int. Cl. C08g *15/00, 19/00*

U.S. Cl. 260—876 R **10 Claims**

1. A method for preparing a water-soluble polymer in solid particulate form, which method comprises finely distributing droplets, of an average droplet size between 0.1 mm and 10 mm, of an aqueous solution of said polymer in a non-polar organic suspending medium which is not a solvent for said polymer, said aqueous solution of polymer comprising as the solvent therein water or a mixture of water and a polar organic solvent, said aqueous solution and said non-polar organic suspending medium.being substantially immiscible whereby a liquid/liquid dispersion is formed, and then removing water from the dispersion by azeotropic distillation, at least a portion of said water being distillatively removed in the presence of an organic water-in-oil suspending agent having a polar portion solvated by said aqueous solution and a non-polar portion solvated by said non-polar suspending medium.

3,888,946

PYRANO BENZOPYRANS

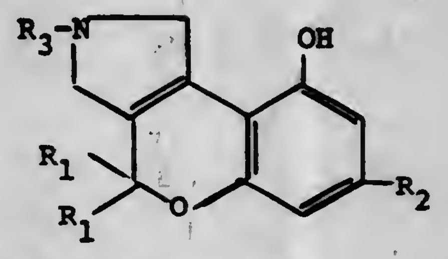
Harry G. Pars, Lexington, and Raj K. Razdan, Belmont, both of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 144,244, March 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 842,690, July 17, 1969, abandoned. This application Feb. 14, 1973, Ser. No. 332,404

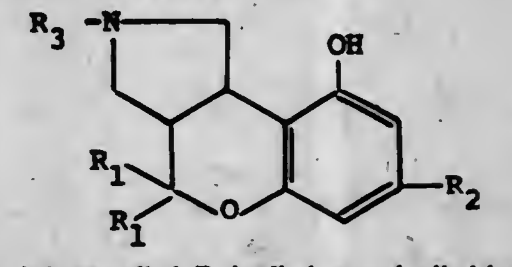
Int. Cl. C07d *27/30*

U.S. Cl. 260—326.5 B **19 Claims**

1. A member of the group consisting of compounds having the formula



and compounds having the formula



wherein R_1 is lower-alkyl; R_2 is alkyl or cycloalkyl-lower-alkyl; R_3 is hydrogen, benzyl, cycloalkyl-lower-alkyl, lower-alkenyl or lower-alkynyl; the lower-alkyl groups containing from 1 through 6 carbon atoms, the alkyl groups containing from 1 through 20 carbon atoms, the cycloalkyl groups containing from 3 to 8 ring carbon atoms and the lower-alkenyl and lower-alkynyl groups containing from 3 through 7 carbon atoms.

3,888,947
BIS-BIGUANIDES

Ronald Arthur Stephenson, Henley-on-Thames, England; Bente Lissy Laursen, Ektorp, and Ove Henning Mattsson, Taeby, both of Sweden, assignors to Kemanord Aktiebolag, Sweden

Filed May 18, 1972, Ser. No. 254,440
Claims priority, application Sweden, May 18, 1971, 6431/71
Int. Cl. C07c *101/00*
U.S. Cl. 260—501.11 **1 Claim**

1. A salt selected from the group consisting of:
mono-chlorhexidine nitrilotriacetate,
tri(chlorhexidine) di(diethylenetriaminepentaacetate)
mono-chlorhexidine N,N-dihydroxyethylaminoacetate,
mono-chlorhexidine N-hydroxyethylethylenediaminetriacetate, and
mono-chlorhexidine di[N-hydroxyethylethylenediaminetriacetate].

3,888,948
POLYVINYL CHLORIDE TYPE RESINS

Peter Pinten, Cihogne Duetz; Hans Naubereit, Troisdorf-Oberlar, and Werner Trautvetter, Spich, all of Germany, assignors to Dynamit Nobel AG, Troisdorf near Cologne, Germany

Division of Ser. No. 871,665, Nov. 3, 1969, abandoned, which is a continuation of Ser. No. 797,326, Jan. 10, 1969, abandoned, which is a continuation of Ser. No. 340,783, Jan. 28, 1964, abandoned. This application May 9, 1972, Ser. No. 251,756
Claims priority, application Germany, Jan. 31, 1963, 40801
Int. Cl. C08F *15/00*
U.S. Cl. 260—878 R **7 Claims**

1. In the production of resins of the polyvinyl chloride class, the improvement which comprises dissolving polymer of ethylene and acrylic acid ester in a medium consisting essentially of vinyl chloride and polymerizing vinyl chloride, the ester moiety in said polymer being about 35–50% by weight of the polymer, and said polymer dissolved in said medium being about 5–40% by weight of the polymer-vinyl chloride mixture.

3,888,949
BLENDS OF PROPYLENE-ALPHA-OLEFIN COPOLYMERS AND POLYPROPYLENE

Chi-kai Shih, Wilmington, Del., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

Filed June 21, 1973, Ser. No. 372,048
Int. Cl. C08f *37/18*
U.S. Cl. 260—897 A **5 Claims**

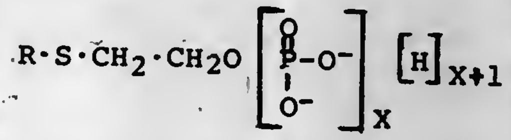
1. An intimate polymer blend comprising
a. thermoplastic elastomeric copolymer of propylene and at least one α-olefin having from 6 to 20 carbon atoms, the copolymer having stereoregular crystalline sequences and amorphous sequences, about from 10 to 50 weight percent of the copolymer being derived from the α-olefin, the remainder being derived from propylene, the copolymer having a melt index of about from 0.01 to 200 at 190°C and a crystallinity number of about from 40 to 70; and
b. about from 5 to 95%, by weight of the copolymer blend, of polymer having at least one melting transition above 155°C and which consists essentially of substantially stereoregular polypropylene, said polymeric components (a) and (b) having propylene sequences of similar stereoregularity.

3,888,950
ARYLMERCAPTOETHYL PHOSPHATES

Saran A. Narang, Ottawa, Ontario, Canada; Surinder K. Dheer, King of Prussia, Pa., and Robert H. Wightman, Ottawa, Ontario, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Mar. 23, 1973, Ser. No. 344,237
Int. Cl. C07f *9/08*
U.S. Cl. 260—933 **3 Claims**

1. Aryl mercaptoethylphosphate compounds having the following structural formula:



$$R\cdot S\cdot CH_2\cdot CH_2O\left[\begin{matrix}O\\ \|\\ P-O^-\\ |\\ O^-\end{matrix}\right]_X[H]_{X+1}$$

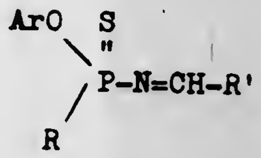
where R = phenyl, or methoxy- substituted phenyl, or tolyl, and x = 1, 2 or 3.

3,888,951
O-ARYL-THIONO ALKANEPHOSPHONIC ACID ESTERORMAMIDINES

Hellmut Hoffmann, Wuppertal-Elberfeld; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 9, 1974, Ser. No. 431,833
Claims priority, application Germany, Jan. 27, 1973, 2304062
Int. Cl. C07f *9/24;* **A01n** *9/36*
U.S. Cl. 260—945 **6 Claims**

1. An O-aryl-thionoalkanephosphonic acid esterimide derivative of the formula



$$\begin{matrix}ArO & & \overset{S}{\|} \\ & \diagdown & \\ & & P-N=CH-R' \\ & \diagup & \\ R & & \end{matrix}\qquad (I)$$

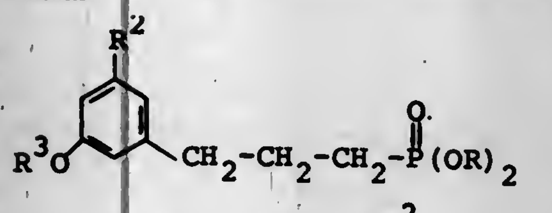
in which
R is lower alkyl,
R′ is mono-lower alkyl-amino or di-lower alkyl-amino, and
Ar is optionally halogen-substituted phenyl.

3,888,952
PHOSPHONATES

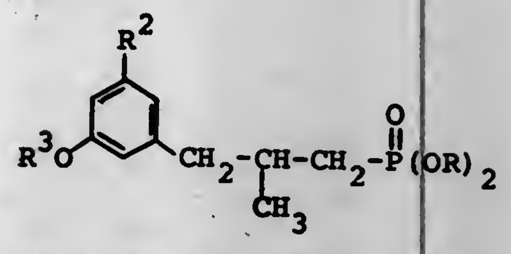
John H. Fried, Palo Alto, Calif., assignor to Syntex Corporation, Panama, Panama

Division of Ser. No. 125,854, March 18, 1971, Pat. No. 3,773,789, which is a division of Ser. No. 687,502, Dec. 4, 1967, Pat. No. 3,639,428. This application June 29, 1973, Ser. No. 374,903
Int. Cl. C07f *9/40*
U.S. Cl. 260—951 **4 Claims**

1. A phosphonate selected from the group having the formulas



and



wherein R² is hydrogen or lower alkoxy; R³ is lower alkyl; and R is lower alkyl or a phenyl.

3,888,953
PREPARATION OF TRIS (2-CHLOROETHYL) PHOSPHITE

James J. Anderson, Richmond, Va., and Vasco G. Camacho, Iselin, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

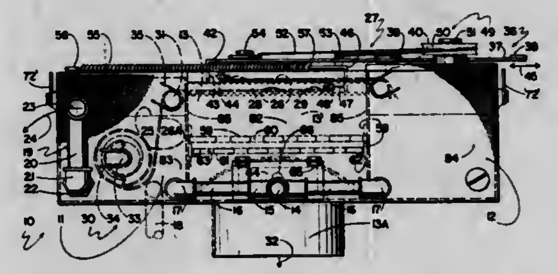
Filed Dec. 7, 1973, Ser. No. 423,049
Int. Cl. C07f *9/08*
U.S. Cl. 260—977 **2 Claims**

1. A process for the preparation of tris (2-chloroethyl) phosphite, which comprises simultaneously adding ethylene oxide and phosphorus trichloride, in a molar ratio of between about 3.2:1 and about 3.9:1, to performed tris (2-chloroethyl) phosphite in an amount between about 10% and about 100% of the reactants at a temperature between 0°C. and about 10°C.

3,888,954
LIQUID VAPORISING UNIT

John Eberle, 2027 28th Ave., S.W., Calgary, Alberta, Canada

Filed Apr. 9, 1973, Ser. No. 349,658
Int. Cl. F02m *25/02*
U.S. Cl. 261—18 A **16 Claims**



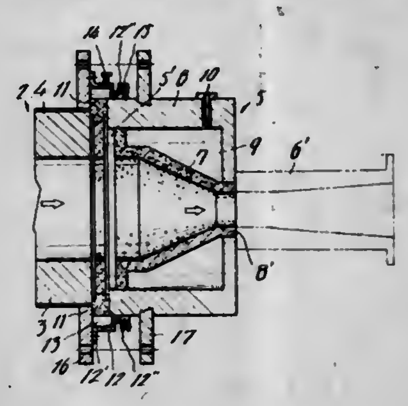
1. A liquid vaporizing device comprising in combination a liquid container, means to convey liquid to said container and means to control the level of liquid in said container, at least one flexible porous capillary strip of material in said container, an air flow passage, said strip of material extending into said passage and means to control the amount of material in said passage from a minimum amount to a maximum amount thereby controlling the amount of liquid evaporated from the strip of material by air passing through said passage, said means to control the amount of material in said passage including a control bracket assembly, means to mount said bracket assembly for movement across said air flow passage, one end of said capillary strip being secured to said bracket assembly, and means on said strip for tensioning said strip relative to said bracket assembly, said control bracket assembly including an actuating bar and a capillary strip securing bar secured at right angles to one end of said actuating bar, and spring means reacting between said assembly and said container normally biassing said assembly to the minimum material amount within said passage.

3,888,955
CONNECTION DEVICE

Saburo Maruko, 1663 Seya-machi, Seya-ku, Yokohama, Japan

Filed Mar. 21, 1974, Ser. No. 453,348
Claims priority, application Japan, Apr. 4, 1973, 48-37762
Int. Cl. B01f *3/04*
U.S. Cl. 261—99 **13 Claims**

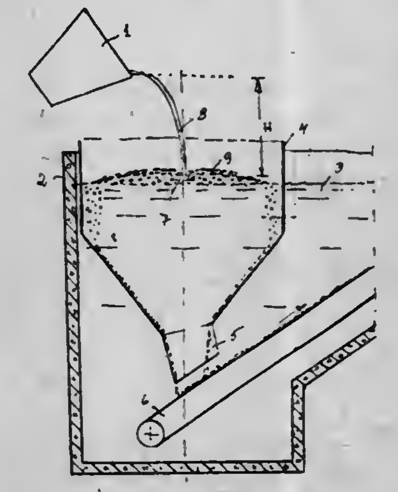
1. A connection device for connecting between the flue conduit extending from a combustion furnace and a washing-absorption tower and concurrently serving as high temperature flue gas quenching means, comprising a double-walled cylindrical structure including an inner porous cylinder and an outer impervious cylinder surrounding said inner cylinder in a peripherally spaced relationship to said inner cylinder to define a cooling liquid jacket therebetween; cooling liquid inlet means in said outer impervious cylinder for directing cooling liquid into said jacket; an annular porous barrier means disposed between said flue conduit and double-walled cylindrical structure for protecting said flue conduit against the effect of said cooling liquid; and inert gas inlet means adjacent to said barrier means. for directing inert gas through said barrier means.



3,888,956
METHOD OF MAKING GRANULATE

Nils J. Klint, Hagfors, Sweden, assignor to Uddeholms Aktiebolag, Hagfors, Sweden

Continuation-in-part of Ser. No. 788,293, Dec. 31, 1968, abandoned. This application July 17, 1970, Ser. No. 55,629
Claims priority, application Sweden, Feb. 2, 1968, 1435/68
Int. Cl. B01j *2/00*
U.S. Cl. 264—5 **1 Claim**



1. In a method of making a granulate from normally solid but meltable material having relatively high melting point and selected from the group consisting of crude iron, steel and ferro-alloys from a melt of said material, which melt is cooled and caused to solidify in a liquid bath, the improved technique according to which a continuous stream of the material in molten state is caused freely to fall onto the upper horizontal surface of a fixed plate made from a material which is non-wettable by said melt and selected from the group consisting of refractory ceramics, graphite, refractory metal compounds and combinations of said compounds; any deviation of the stream from the vertical direction at contact with the plate not being greater than 10°; and wherein the height of the free fall of the molten metal stream and the number of centigrade degrees by which the temperature of the metal melt exceeds the solidus temperature of the metal are defined by the area A-B-C-D-E of FIG. 2 of the accompanying drawing, whereby the molten metal stream by its own kinetic energy is disintegrated against the plate into separate drops which drops spread out from the plate like an umbrella and fall down into the cooling bath where they solidify to smooth granules, at least 90 weight-percent of which granules have sizes varying from 2 mm to 25 mm and have shapes varying from round or oval discs to drops and spheres.

3,888,957
METHOD OF MAKING HOLLOW SPHERES BY SPRAY DRYING

David I. Netting, Springfield, Pa., assignor to Philadelphia Quartz Company, Valley Forge, Pa.

Continuation-in-part of Ser. No. 223,314, Feb. 3, 1972, abandoned. This application Mar. 17, 1972, Ser. No. 235,851The portion of the term of this patent subsequent to Mar. 19, 1991, has been disclaimed.

Int. Cl. B01j *2/02*

U.S. Cl. 264—13 **8 Claims**

1. A method of producing hollow spheres having a size of 10–400 mesh and being free from holes, comprising:

A. mixing in a chamber:
   1. a first aqueous solution consisting essentially of sodium silicate having an SiO_2:Na_2O mole ratio of 1.5:1 to 4.0:1 and an Na_2O content of 5 to 20 percent on a weight basis, maintained at a temperature between room temperature and the solution boiling point, and
   2. a second aqueous solution consisting essentially of 16 to 18 percent sodium pentaborate on a weight basis, maintained at a temperature between room temperature and the solution boiling point,

   to produce with agitation a homogeneous third aqueous solution having a solids concentration of 5 to 35 percent, a sodium pentaborate concentration of 6 to 7 percent and a weight ratio of sodium pentaborate to Na_2O of 1.1:1 to 1.3:1 maintained at a temperature below said third solution boiling point;

B. spraying droplets of said third aqueous solution into a dryer utilizing air having an inlet temperature between 200° C and 500° C while maintaining said droplets entering said dryer at a temperature below said third solution boiling point and recovering a product consisting essentially of a mass of hollow spheres having a water content less than 25 percent;

C. subjecting said spray dried product to further drying at a temperature between about 70° – 400° C for a time sufficient to reduce the moisture content below about 7 percent and avoiding intumescence, and

D. recovering a mass of generally hollow closed spherical particles having a bulk density of about 2 – 20 lbs./ft.^{3} and a particle size within the range of 10 – 400 mesh.

3,888,958
PROCESS FOR MAKING SHAPED PIECES FROM LOW TEMPERATURE COKE OF LOW BULK WEIGHT

Harald Juntgen; Karl Knoblauch, and Dieter Zündorf, all of Essen, Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Continuation-in-part of Ser. No. 125,745, March 18, 1971, abandoned. This application Jan. 24, 1973, Ser. No. 326,288

Claims priority, application Germany, Mar. 21, 1970, 2013604

Int. Cl. B29c *25/00*

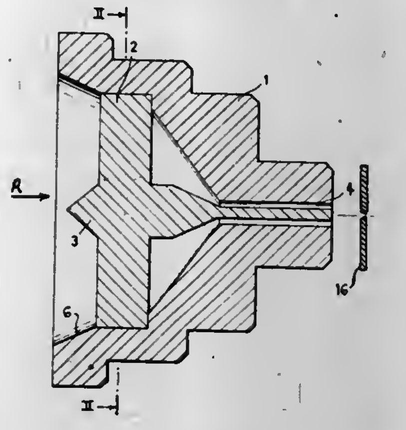
U.S. Cl. 264—29 **4 Claims**

1. Process for the manufacture of a ring-shaped carbonaceous body of low temperature coke type having high absorptive capacity and low bulk weight comprising the steps of:

a. preparing a plastic mixture consisting essentially of a powdered source of carbon selected from the group consisting of anthracite, charcoal, oxidized coal, coke, peat and lignite, and a binder selected from the group consisting of hard pitch, soft pitch, tar and anthracene oil, the weight proportion of the binder to carbon material ranging from about 17.5 to about 28 percent,

b. heating said mixture to a temperature between about 50°C and about 95°C and maintaining said mixture at that temperature for a sufficient time to attain an extrudable consistency and forming the mixture into a ring-shaped cylindrical body by extrusion under a pressure between about 5 and about 100 atmospheres,

c. introducing said formed body into a heating zone and heating it at a rate between about 20°C and about 70°C per minute for a sufficient time to attain a temperature from about 300°C to about 450°C said body being in a soft state with substantial exclusion of outside air from the atmosphere in said heating zone, and



d. further heating said body at a rate of about 50°C to about 500°C per minute, with limited admission of air, to a final temperature between about 600°C and to about 900°C and maintaining it at that temperature until the body is substantially completely carbonized.

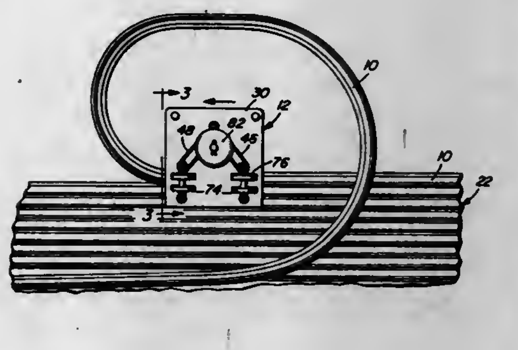
3,888,959
PROGRESSIVE MOLDING METHOD

Buster C. Phillips, 550 Morgan Street, West Liberty, Ky. 41472

Continuation-in-part of Ser. No. 238,805, March 28, 1972, abandoned. This application Nov. 15, 1973, Ser. No. 416,324

Int. Cl. E04b *1/16*

U.S. Cl. 264—32 **10 Claims**



1. In a process for constructing a structural member having one surface extending in a closed path and being formed from a hardenable material by placing the hardenable material while in a workable condition against a form wall and permitting the material to harden in situ, the improvement wherein said structural member is formed progressively from one end thereof by constructing a first form wall around said closed path with said wall extending from said one end for a portion of the length of said structural member by progressively shaping a strip of material into a series of convolutions extending around said closed path to define the path wall, progressively moving said first wall along said surface from said one end by progressively removing the convolutions of said strip of material from the end of said first form wall adjacent said one end of said structural member and applying convolutions of said strip material to the other end of said first form wall, and progressively casting hardenable material against said first form wall from said one end thereof and permitting said hardenable material to harden before said convolutions of strip material are removed therefrom, whereby said structural member is progressively cast from said one end as said form wall is moved along said one surface thereof.

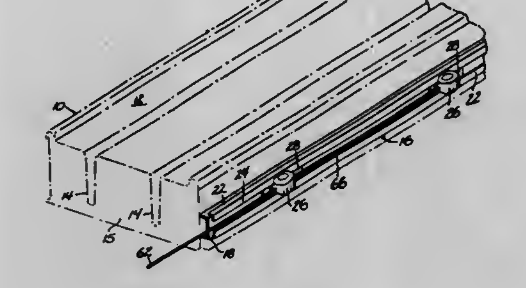
3,888,960
METHOD OF SETTLING FLUENT AND LIKE MATERIAL IN A FORM

Peter Augustus Fischer, Neponset, Ill., assignor to Martin Engineering Co., Neponset, Ill.

Division of Ser. No. 353,995, April 24, 1973, Pat. No. 3,839,918. This application Dec. 28, 1973, Ser. No. 429,362

Int. Cl. B28b *1/08*

U.S. Cl. 264—71 **8 Claims**



1. The method of settling a fluent or like material in an elongated form, comprising: rigidly attaching to the form an elongated track substantially coextensive in length with the form, mounting a selectively activatible and deactivatible vibrator on the track by means of a selectively lockable and releasable male-female connection enabling positioning of the vibrator along the track without dismounting thereof from the track, operating the vibrator and connection substantially in unison to activate the vibrator and lock the connection and to deactivate the vibrator and release the connection, and successively activating and deactivating the vibrator while respectively locking and releasing the connection to enable selective positioning of the vibrator lengthwise along the track, and repositioning the vibrator at selected positions spaced apart lengthwise of the track during periods of deactivation of the vibrator and release of the connection.

8. The method of settling a fluent or like material in an elongated structure, comprising: rigidly attaching to the structure an elongated track substantially coextensive in length with the structure, mounting a selectively activatible and deactivatible vibrator in the track by means of a selectively lockable and releasable interlocking connectors, activating and deactivating the vibrator in a starting position while locking same to the track, and moving the vibrator, while unlocked from and retained by the track, from said starting position through an infinite number of other positions along the track and locking and activating the vibrator at each of said positions.

3,888,961
BLOW MOLDING PROCESS INCLUDING ARTICLE COOLING

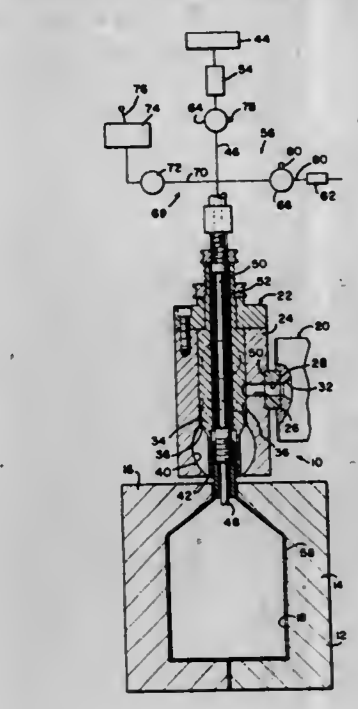
Roger L. Schonewald, Belle Mead, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Division of Ser. No. 295,591, Oct. 6, 1972, Pat. No. 3,807,927. This application Nov. 12, 1973, Ser. No. 414,994

Int. Cl. B29c *17/07, 25/00*

U.S. Cl. 264—89 **8 Claims**

1. A blow molding process comprising the steps of providing a hollow parison of plasticized material in a mold cavity contoured to the predetermined configuration of the hollow article to be blown, forming said parison in said mold cavity into a hollow article of said predetermined configuration of said mold cavity by pressurized blowing fluid supplied internally thereof, thereafter initiating cooling of said previously blown hollow article while in the mold cavity by repeated and alternate discharge of cooling fluid from, and supply of cooling fluid into, the interior of said blown hollow article, whereby repeatedly the pressure of fluid in said blown hollow article is resultantly alternately decreased and increased and, during said cooling of said blown hollow article, maintaining a minimum fluid pressure therein sufficiently high to prevent injury to the surface of said blown hollow article.



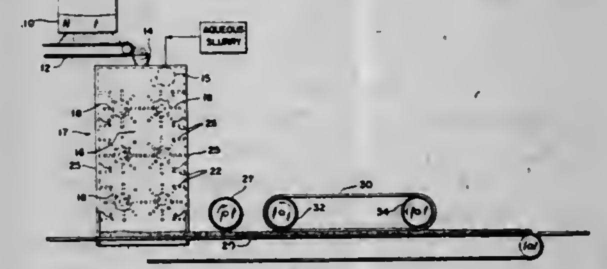
3,888,962
INSULATING PRODUCT AND DRY PROCESS FOR ITS MANUFACTURE

Robert J. Ostertog, Bloomfield, and Anthony J. Page, North Plainfield, both of N.J., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Nov. 24, 1972, Ser. No. 309,395

Int. Cl.^{2} B29J *5/02*

U.S. Cl. 264—122 **10 Claims**



1. A continuous dry process for making a low density perlite board comprising:

a. feeding 12 to 38 parts per 100 of expanded perlite, and a stream of 62, to 88 parts per 100 of aqueous slurry to a mixing zone containing air, said slurry including about 5 to 15 percent of binder solids and said perlite being the major solids component in the combination of perlite and slurry and in the ultimately formed board;

b. passing the perlite and the slurry through the mixing zone while exposing the mix to intense mechanical shearing forces for less than about 10 seconds to intimately admix the solids components of the mix and form a fluffy mass having a density on a dry basis of from 5.5 to 7.0 lb/cu. ft.;

c. continuously depositing said fluffy mass across the width of a traveling endless conveyor to form board stock;

d. shaping the top surface of said board stock to obtain a planar top surface;

e. compressing said board stock to the desired board thickness; and

f. evaporating water from the compressed board.

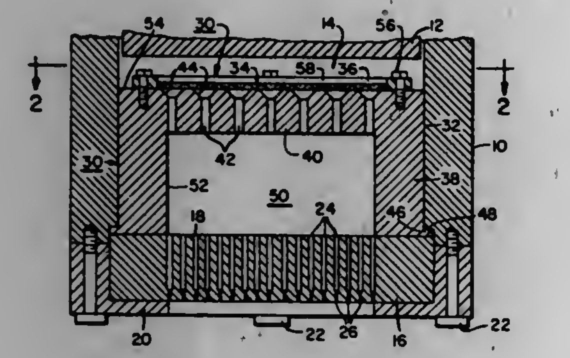
3,888,963
IN-LINE HOMOGENIZING OF EXTRUDABLE CERAMIC BATCH MATERIALS

Francis L. Orso, and Giacomo J. Piazza, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Sept. 18, 1973, Ser. No. 398,379

Int. Cl. B28b *3/20, 17/02*

U.S. Cl. 264—176 R **4 Claims**



1. In a discontinuous process of extruding ceramic batch material wherein an interface is formed between individual successive batch charges, a method for eliminating interfacial discontinuities between adjacent batch portions which comprises, loading an extrusion chamber with an initial predetermined amount of batch material so that all batch interfaces within said chamber are at least a given predetermined distance upstream from an extrusion die attached to an outlet end of said chamber, applying a pressing force to the predetermined batch material loaded within said extrusion chamber and flowing said batch material through a plurality of passages within said chamber downstream of said predetermined distance but upstream of said extrusion die, breaking up and dissipating interfacial discontinuities in the batch material as said material is passed through said passages, forming a plurality of strands of batch material as said material is discharged from said passages, compacting said strands of batch material within said chamber into a continuous homogeneous slug of batch material, extruding said homogeneous slug of batch material through said extrusion die, discontinuing the application of said pressing force to the batch material so that a portion of said material remains upstream of the extrusion die at least said given predetermined distance, reloading said extrusion chamber with an additional predetermined amount of batch material so that all batch interfaces in said chamber are at least said predetermined distance upstream of the extrusion die, and again applying a pressing force to the batch material to flow such material through said passages, compact the resulting strands and extrude such material through the extrusion die in the manner set forth with regard to the initial batch material.

3,888,964
THERMALLY REVERSIBLE POLYMER COMPOSITIONS PREPARED FROM POLYISOTHIOCYANATES

Peter James Stratford Bain, Lower Hutt, New Zealand; Ernest Bryson McCall, Bierges, Belgium, assignors to Monsanto Chemicals Limited, London, England

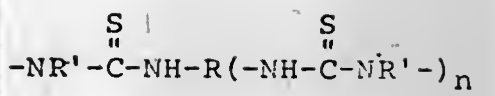
Filed Apr. 18, 1974, Ser. No. 461,905

Claims priority, application United Kingdom, Apr. 25, 1973, 19563/73

Int. Cl. B29c *25/00*

U.S. Cl. 264—236 **16 Claims**

1. A thermally reversible vulcanizate having a molecular structure wherein polymer chains of a diene polymer or copolymer are linked, directly or via groups pendant from the polymer chains, by units having the formula



$$-NR'-\overset{S}{\overset{\|}{C}}-NH-R(-NH-\overset{S}{\overset{\|}{C}}-NR'-)_n$$

where R is an organic radical such that the adjacent nitrogen atoms are each linked to a non-aromatic carbon atom of R, R′ is a hydrogen atom or an aliphatic or cycloaliphatic group, *n* is an integer having a value of at least 1, each of the terminal nitrogen atoms of the unit being linked to a non-aromatic carbon atom of the polymer chain or of a group pendant from the polymer chain.

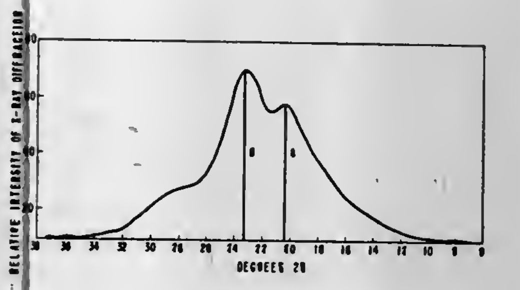
3,888,965
METHOD OF INCREASING THE INITIAL MODULUS AND REDUCING THE ORIENTATION ANGLE OF UNDRAWN POLY (PARA-BENZAMIDE) FIBERS

Stephanie Louise Kwolek, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 30,089, April 20, 1970, abandoned, which is a continuation of Ser. No. 644,851, June 9, 1967, abandoned, which is a continuation-in-part of Ser. No. 556,934, June 13, 1966, abandoned. This application Feb. 9, 1973, Ser. No. 331,322

Int. Cl. B29c *25/00*

U.S. Cl. 264—342 RE **1 Claim**



1. A method for increasing the initial modulus and reducing the orientation angle of undrawn fibers consisting essentially of poly(p-benzamide having an orientation angle of up to about 55° comprising heating the undrawn fibers at a temperature of at least 350°C. While under tension or, while relaxed.

3,888,966
ENHANCED COBALT RECOVERY FROM AMMONIACALLY LEACHED REDUCED ORES USING CYANIDE, HYDRAZINE, OR HYDROXYLAMINE COMPOUNDS

David James Miller, Gretna, La., assignor to Freeport Minerals Company, New York, N.Y.

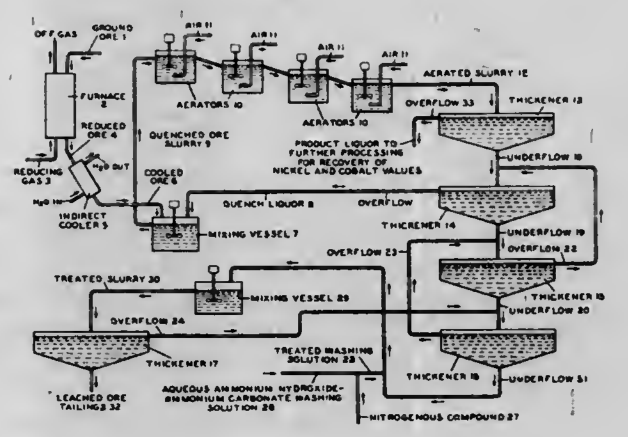
Filed June 2, 1972, Ser. No. 259,081

Int. Cl. C01g *51/12*

U.S. Cl. 423—150 **8 Claims**

1. In a reduced ammoniacal leaching process for the recovery of nickel and cobalt values from an ore which comprises treating a slurry consisting of (a) a solid phase comprising a reduced cobalt containing ore and (b) a liquid phase comprising an aqueous ammoniacal solution having a pH above 7, with a gas containing elemental oxygen in at least one leaching stage to solubilize nickel and cobalt values of the ore in the liquid phase of the slurry, and then washing the slurry with an ammoniacal washing solution in at least one washing stage, without passing a gas containing elemental oxygen through the slurry during the washing stage, to recover a product liquor containing the solubilized nickel and cobalt values:

the improvement for enhancing the solubility of the cobalt values of the ore in the liquid phase of the slurry which comprises providing in the slurry, during the washing stage, a nitrogenous compound selected from the group consisting of hydrazine and a soluble salt of hydrazine, wherein the amount of the compound in the slurry is sufficient to provide a hydrazine content, expressed as N_2H_4, of from about 0.01 to 10% of the total weight of slurry.



3,888,967
METHOD AND APPARATUS FOR OXIDIZING SULPHIDE-CONTAINING AQUEOUS SOLUTIONS

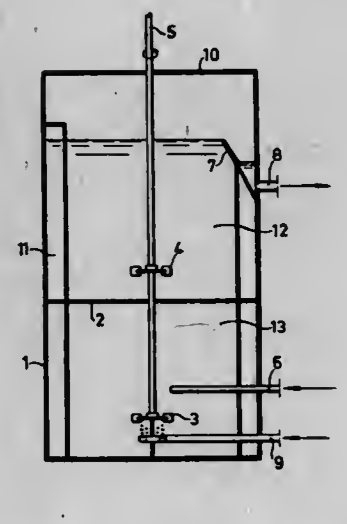
Per-Erik Andersson, and Einar Horntvedt, both of Sundsvall, Sweden, assignors to Svenska Cellulosa Aktiebolaget, Sundsvall, Sweden

Filed Feb. 9, 1973, Ser. No. 331,298

Claims priority, application Sweden, Mar. 8, 1972, 2936/72

Int. Cl. C01b *17/64*

U.S. Cl. 423—206 **1 Claim**



1. A method of converting to a non-volatile reaction product comprising sodium thiosulphate the sodium sulphide content of soda solution containing finely divided active carbon obtained by recovering chemicals from waste liquor from the digestion of lignocellulosic material, in which recovery process the waste liquor is evaporated to a content of solid material of at least 40%, and thereafter is pyrolyzed at a temperature of 700°–800°C. under reducing conditions for the production of a combustible gas and a solid residue and containing active carbon from the pyrolyzing step, sodium carbonate and sodium sulphide, according to which method said solid residue is separated and dispersed in water, the dispersion is oxidized by means of an oxygen-containing gas, under stirring, the amount of active carbon in the dispersion amounting to from 1 to 150 grams of carbon per liter of solution and the gas being introduced into the body of the solution, at a locus adjacent the bottom of the body, at a temperature of 10°–90°C., the gas being maintained in intimate contact with the solution for a period of 2–40 minutes.

3,888,968
METHOD OF SEPARATING IMPURITIES FOR REMOVAL IN DESULFURIZATION OF EFFLUENT GAS IN A WET LIME-GYPSUM PROCESS

Masumi Atsukawa; Naoharu Shinoda, and Haruo Kuwubara, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Nov. 8, 1972, Ser. No. 304,638

Claims priority, application Japan, Nov. 11, 1971, 46-90115

Int. Cl. C01b *117/00*

U.S. Cl. 423—242 **2 Claims**

1. In a method for the removal of sulfur oxide from an effluent gas using a wet lime-gypsum process wherein sulfur oxide is removed from a sulfur oxide containing gas by passing the gas through a cooling tower to remove carbon dust therefrom, and then through a gas adsorption column containing a lime slurry as an absorbent to produce calcium sulfite, passing the calcium sulfite through an oxidizer to convert it to calcium sulfate in the form of a gypsum slurry which is then passed through a slurry concentrator wherein the supernatant fluid therefrom is passed to a neutralizer to precipitate the hydroxides of the metallic impurities, and a filter to separate the hydroxides and to obtain a purified filtrate, the improvement which comprises adding the carbon dust obtained from the cooling tower to the neutralizer to facilitate the precipitation and flocculation of the hydroxides.

3,888,969
ANTIOXIDANT FOR THE AQUEOUS SOLUTIONS OF SULFITE AND/OR BISULFITE OF SODIUM OR POTASSIUM AND PROCESS FOR PREVENTING THE OXIDATION OF SAID AQUEOUS SOLUTION

Kensuke Kawamoto; Tomoaki Tsuno, and Teruo Namiki, all of Kitakyushu, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

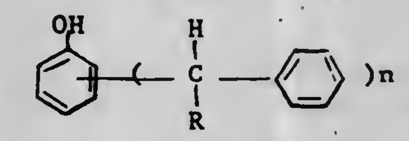
Filed Sept. 5, 1972, Ser. No. 286,559

Int. Cl. C01b *17/00*

U.S. Cl. 423—243 **10 Claims**

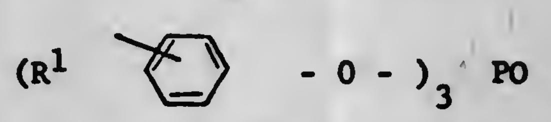
1. A composition for the absorption of sulfur dioxide which comprises antioxidant and aqueous solutions of sodium or potassium sulfite or bisulfite or mixtures thereof, said antioxidant being taken from the class consisting of

1. substituted phenols represented by the formula:



wherein R is a lower alkyl group and *n* is an integer of from 1 to 5

2. tris (alkylphenyl) phosphates represented by the formula:



wherein R^1 is an alkyl group having 6–18 carbon atoms

3. trialkyl phosphites represented by the formula:

$$(R^1 - O -)_3 P$$

wherein R^2 is an alkyl group having 8–18 carbom atoms

4. glycerin monofatty acid esters represented by the formula:

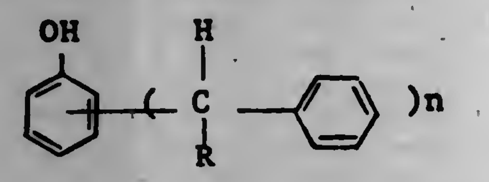
$$R^3\ COOCH_2CH(OH)CH_2OH$$

wherein R^3 is an alkyl group having 8–22 carbon atoms said antioxidant being present in an amount of 1 to 5000 ppm based on the weight of said solutions.

2. The method for absorbing and removing sulfur dioxide from waste gas which comprises contacting waste gas containing sulfur dioxide with a composition containing aqueous solutions of sodium or potassium sulfite or bisulfite or mix-

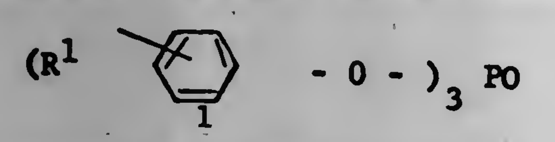
tures thereof and 1 to 5000 ppm based on the weight of said solutions of an antioxidant taken from the class consisting of

1. substituted phenols represented by formula:



wherein R is a lower alkyl group and *n* is an integer of from 1 to 5

2. tris (alkylphenyl) phosphates represented by the formula:



wherein R^1 is an alkyl group having 6–18 carbon atoms

3. trialkyl phosphites represented by the formula:

$$(R^2 - O -)_3 P$$

wherein R^2 is an alkyl group having 8–18 carbon atoms

4. glycerin monofatty acid esters represented by the formula:

$$R^3\,COOCH_2CH(OH)CH_2OH$$

wherein R^3 is an alkyl group having 8–22 carbon atoms.

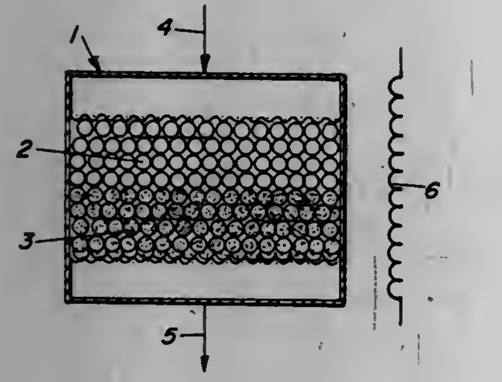
3,888,970
DOUBLE LAYER CATALYST BED FOR REMOVING SO_2 FROM WASTE GASES

Larry A. Haas, Burnsville; Sanaa E. Khalafalla, and Thomas H. McCormick, both of Minneapolis, all of Minn., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Feb. 12, 1973, Ser. No. 331,726

Int. Cl. B01d *53/34;* **C01b** *17/04*

U.S. Cl. 423—244 **6 Claims**



1. A process for removing SO_2 from a dry waste gas comprising passing said waste gas through a single bed of catalyst said bed having a temperature of about 400°C in the presence of CO; said CO and SO_2 being present in a $CO:SO_2$ mole ratio of at least 2:1; said bed consisting of a first and second layer of catalyst, said first layer consisting of iron, chromium, nickel, cobalt or manganese supported on alumina, said second layer consisting of alumina; and wherein said gas enters said bed through said first layer, passes therethrough into said second layer, and exits from said bed from said second layer.

3,888,971
PROCESS FOR THE MANUFACTURE OF HYPOPHOSPHITES

Wolfgang Scheibitz, Hurth-Knapsack; Horst Staendeke, Bruhl, and Siegfried Burkhardt, Bruhl-Kierberg, all of Germany, assignors to Hoechst Aktiengesellschaft, Knapsack near Cologne, Germany

Filed May 22, 1972, Ser. No. 255,442

Claims priority, application Germany, May 24, 1971, 2125587

Int. Cl. C01b *15/16, 25/26*

U.S. Cl. 423—307 **6 Claims**

1. A process for the manufacture of hypophosphites by the reaction of yellow phosphorus at a temperature of about 40°C – 90°C with hydroxides of alkali metals, carbonates of alkali metals, hydroxides of alkaline earth metals, carbonates of alkaline earth metals, or mixtures thereof in the presence of water and organic solvents selected from the group consisting of hydrocarbons, halogenated hydrocarbons, alcohols of more than 5 carbon atoms or amines of more than 10 carbon atoms, which combine the property of dissolving phosphorus with immiscibility or limited miscibility with water and are liquid at the reaction temperature and, following completion of the reaction, separating with a separator from the resulting nonaqueous phase of the organic solvents the resulting aqueous phase having hypophosphites therein.

3,888,972
PROCESS FOR PREPARATION OF WIDE-PORE ADSORBENT FOR USE IN CHROMATOGRAPHY

Andrei Vladimirovich Kiselev, Leninskie Gory, MGU, Zona "M", kv. 160, Moscow; Galina Lvovna Kustova, ulitsa Burevestnika, 9, kv. 9; Boris Alexandrovich Lipkind, ulitsa Burevestnika, 9, kv. 3, both of Gorky, and Jury Stepanovich Nikitin, Leningradskoe shosse, 120, korpus 3, kv. 4, Moscow, all of U.S.S.R.

Filed May 11, 1972, Ser. No. 252,462

Int. Cl. C01b *33/16, 33/18*

U.S. Cl. 423—338 **2 Claims**

1. A process of preparing a porous silica adsorbent adapted for use in chromatography comprising the steps of (1) mixing finely dispersed non-porous silica having a specific surface area of 35 to 380 m^2/g with water to form an aqueous suspension; (2) spray drying the suspension at a temperature of 400° to 450°C. to form a particulated silica xerogel; (3) hydrothermally treating the xerogel at a temperature of 100° to 380°C. and a pressure of 1 to 300 atm.; and (4) drying the treated xerogel at a temperature of 100° to 300°C.

3,888,973
METHOD OF INCREASING THE SPEED OF CHEMICAL REACTION BETWEEN LIQUID AND SOLID REACTANTS USING CENTRIFUGAL FORCE

Robert E. Colwell, Palos Park; William A. Liegois, Palos Hills; Gerald W. Wilks, Grays Lake, and Mihailo J. Vreelj, La Grange Park, all of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Oct. 24, 1972, Ser. No. 300,071

Int. Cl. C01g *49/10*

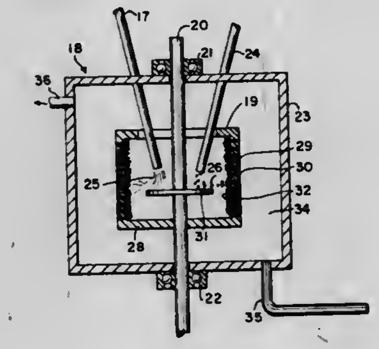
U.S. Cl. 423—493 **10 Claims**

1. A process for effecting a heterogeneous chemical reaction between a first reactant in a solid, particulate phase and a second reactant in a liquid phase comprising the steps of

charging the solid, particulate reactant to a reaction chamber having a plurality of openings in its sidewalls, the size of the openings being smaller than the size of the solid particulate reactant,

rotating the chamber with sufficient rotational speed to generate a centrifugal force to cause the solid particulate reactant to be propelled outwardly against the walls of the chamber and be fixed thereon to form a continuous bed of solid particulate reactant,

charging the second reactant to the rotating chamber, the second reactant being propelled outward into contact with the bed of solid particulate reactant fixed on the walls of the chamber and caused to move radially therethrough under the action of centrifugal force, the second reactant during its passage through the solid particulate layer entering into chemical reaction with the solid particulate layer and then



collecting the chemical reaction product expelled from the chamber through the openings therein.

3,888,974
PROCESS FOR HYDROGEN ISOTOPE EXCHANGE AND CONCENTRATION BETWEEN LIQUID WATER AND HYDROGEN GAS AND CATALYST ASSEMBLY THEREFOR

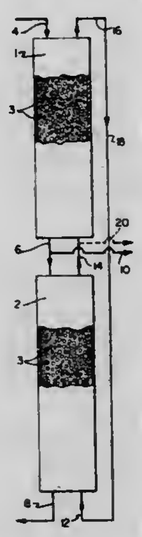
William H. Stevens, Deep River, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada

Filed July 13, 1973, Ser. No. 379,164

Claims priority, application Canada, Jan. 28, 1970, 73320

Int. Cl. C01b *5/00;* **B01j** *9/04, 11/08*

U.S. Cl. 423—580 **15 Claims**



1. A bithermal, catalytic, isotope exchange process for hydrogen isotope concentration between liquid water and hydrogen gas, comprising:

a. contacting at a temperature in the range 15°C to 70°C, in a first section liquid feed water and, the hydrogen gas from a second section with one another and with a catalyst consisting of at least one catalytically active metal selected from Group VIII of the Periodic Table so that the deuterium isotope of hydrogen is transferred to and concentrated in the liquid water passing through and leaving the first section from the hydrogen gas passing through and leaving the first section, in either counter-current or cocurrent flow,

b. contacting at a temperature in the range 150°C to 200°C, in a second section pressurized to keep water liquefied, the liquid water from the first section and the hydrogen gas, passing to the first section, with one another and with a catalyst consisting of at least one catalytically active metal selected from Group VIII of the Periodic Table so that the hydrogen isotope deuterium is transferred to and concentrated in the hydrogen leaving the second section from the liquid water passing through the second section, and

c. withdrawing from between the first and second sections a portion of the liquid water having the hydrogen isotope deuterium concentrated therein or the hydrogen gas having the hydrogen isotope deuterium concentrated therein, and wherein the improvement comprises:

d. the catalyst is provided in the first and second sections as at least one catalyst assembly, and comprises the catalyst and a substantially liquid-water-repellent organic resin or polymer coating thereon, which is permeable to water vapour and hydrogen gas, whereby:

e. each catalyst assembly causes hydrogen isotope exchange and concentration to occur as follows:

$$\text{HD gas} + H_2O \text{ vapour} \;{}^{\text{catalyst}}\; H_2 \text{ gas} + \text{HDO vapour},$$

and

$$\text{HDO vapour} + H_2O \text{ liquid} \;{}^{\text{liquid water}}\; \text{HDO liquid} + H_2O \text{ vapour}$$

so that direct contact between the catalyst metal and liquid water and wetting of the catalyst is retarded by the organic polymer or resin coating, thereby retarding poisoning of the catalyst by the liquid water.

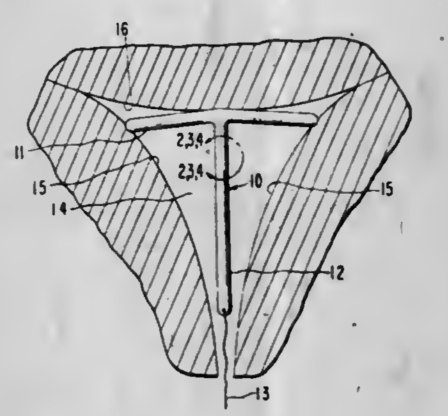
3,888,975
ERODIBLE INTRAUTERINE DEVICE

Peter W. Ramwell, Palo Alto, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Dec. 27, 1972, Ser. No. 318,890

Int. Cl. A61k *27/12*

U.S. Cl. 424—15 **2 Claims**



1. An intrauterine device for the controlled local administration of prostaglandin to the uterus comprising a hollow cervical cylindrical body having a central passageway shaped and sized for insertion and retention in the uterus, the body made of a release rate controlling material consisting essentially of cross-linked gelatin that is cross-linked with a member selected from the group consisting of an aldehyde, ketone, carbodimide and dicarboxylic acid at a concentration of 0.01 to 60% by weight of gelatin at a temperature of 4°C to 35°C for a reaction period of 0.1 hour to 5 days, the material containing from about 250 micrograms to about 100 milligrams of a prostaglandin that induces uterine contractions, the release rate controlling material bioeroding at a controlled rate over a period of 3 hours to 30 days in response to the environment of the uterus and concurrently therewith releasing 1 microgram to 25 micrograms per hour of the dispersed prostaglandin to the uterus to produce the desired result.

3,888,976
ZINC AND STRONTIUM ION CONTAINING EFFERVESCENT MOUTHWASH TABLET

William P. Mlkvy, Hollystone Farm, R.D. No. 2, Holland, Pa. 18966, and Raymond J. Tucci, 347 Saly Rd., Yardley, Pa. 19067

Continuation-in-part of Ser. No. 290,914, Sept. 21, 1972, Pat. No. 3,772,431. This application Nov. 1, 1973, Ser. No. 411,949The portion of the term of this patent subsequent to Nov. 13, 1990, has been disclaimed.

Int. Cl. A61k *9/00, 11/02, 11/04*

U.S. Cl. 424—44 **4 Claims**

1. An effervescent mouthwash tablet comprising an effervescent couple consisting of at least one each of a solid pharmaceutically acceptable acid and a solid pharmaceutically acceptable base material, which effervescent couple reacts to produce carbon dioxide when dissolved in water causing effervescence, and an effective amount of strontium ion, zinc ion and mixtures thereof as an astringent-desensitizing agent.

3,888,977
MODIFIED NEUROTOXIN

Murray J. Sanders, 3009 Spanish Trl., Delray Beach, Fla. 33444

Filed Feb. 1, 1973, Ser. No. 328,724

Int. Cl. A61k *27/00*

U.S. Cl. 424—98 **22 Claims**

1. A method of treatment of animals suffering from a progressive degenerative neurological disease of motor nerve cell origins to neuromuscular junction, axones and nerve myelin sheaths comprising administering to the animal a disease mitigating amount of detoxified, and neurotropically active modified snake venom neurotoxin composition wherein the said snake venom neurotoxin is derived from the venom of a species of the Bungarus genus or from the venom of a species of the Bungarus genus and the Naja genus, and wherein said composition exhibits at least a 30% inhibition of plaques in the Semliki Forest virus test and a bioassay shows that the composition is atoxic, as demonstrated by essentially no signs of toxicity in inoculation of laboratory animals.

3,888,978
CERTAIN PHOSPHORUS ACID ESTERS AS DISINFECTANTS

Dieter Düwel, Hofheim, Taunus; Helmut Diery, Kelkheim, Taunus, and Ulrich Cuntze, Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

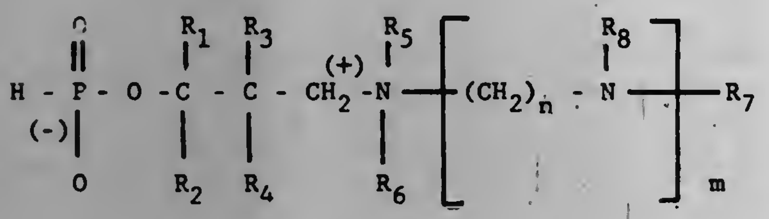
Filed Aug. 9, 1973, Ser. No. 386,858

Claims priority, application Germany, Aug. 12, 1972, 2239790; Apr. 14, 1973, 2319046

Int. Cl. A01n *9/36*

U.S. Cl. 424—199 **11 Claims**

1. A disinfectant composition comprising a disinfectant amount of an active compound of the formula



$$\mathrm{H-\underset{\underset{O}{|}}{\overset{\overset{O}{\|}}{P}}^{(-)}-O-\underset{R_2}{\overset{R_1}{C}}-\underset{R_4}{\overset{R_3}{C}}-CH_2-\underset{R_6}{\overset{R_5}{\overset{(+)}{N}}}-\left[(CH_2)_n-\overset{R_8}{N}\right]_m-R_7}$$

in which R_1 and R_2 each represents hydrogen or methyl,

R_3, R_4, R_5, R_6 and R_8 each represents hydrogen or alkyl of from 1 to 4 carbon atoms, R_7 represents alkyl or alkenyl of from 8 to 18 carbon atoms,

n stands for 2 or 3,

m is an integer from zero to 4,

R_2 being hydrogen when *m* is 1 to 4,

R_3 and R_4 being hydrogen when *m* is zero and R_1 and R_2 are methyl, and

R_4 being hydrogen when *m* is zero and R_3 is propyl or butyl, said active compound being present in an amount of from 20 to 90 percent by weight, the balance being water.

3,888,979
CONTROL OF PESTS WITH O-ETHYL-S-(N)-PROPYL-S-CARBAMOYLALKYL DITHIOPHOSPHATES

Ernst Beriger, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

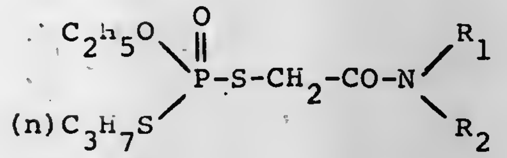
Division of Ser. No. 315,973, Dec. 18, 1972, Pat. No. 3,845,171. This application Aug. 19, 1974, Ser. No. 498,347

Claims priority, application Switzerland, Dec. 24, 1971, 18909/71; Nov. 3, 1972, 16041/72

Int. Cl. A01n *9/36*

U.S. Cl. 424—211 **5 Claims**

1. A pesticidal composition for combating pests selected from the group consisting of insects, acarids and nematodes which comprises (1) as active ingredient a pesticidally effective amount of a compound of the formula



wherein R_1 represents hydrogen or methyl and R_2 represents $—CH_2OCH_3$, $—C_2H_4OCH_3$ or $—C_3H_6OCH_3$, and (2) a pesticide carrier.

3,888,980
ANTIMICROBIAL COMPOUNDS OF 2′, 5′ SUBSTITUTED NITROANILIDES OF SUBSTITUTED NITROSALICYLIC ACID FOR QUADRUPED ANIMALS

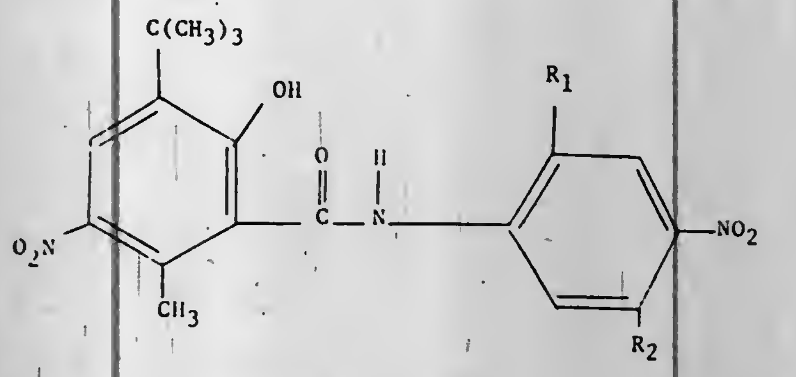
William H. Meek, Northfield, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Division of Ser. No. 277,075, Aug. 1, 1972, Pat. No. 3,801,637, which is a continuation-in-part of Ser. No. 186,514, Oct. 4, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 427,816

Int. Cl. A61k *27/00*

U.S. Cl. 424—230 **10 Claims**

1. A process for treating a parasite-infested quadruped animal comprising administering orally to said animal an antiparasitically effective but nontoxic quantity of a nitroanilide of 3-tert.butyl-6-methyl-5-nitrosalicylic acid having the general formula:



in which R_1 is hydrogen, alkyl of 1 to 4 carbon atoms, or alkoxy of 1to 4 carbon atoms, and R_2 is hydrogen or methyl.

3,888,981
TREATMENT OF BENIGN PROSTATIC HYPERTROPHY

Clara Revesz, Montreal, Quebec, Canada, assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 442,270, Feb. 13, 1974, abandoned, which is a continuation of Ser. No. 259,707, June 5, 1972, abandoned. This application Sept. 3, 1974, Ser. No. 502,338

Int. Cl. A61k *17/00*

U.S. Cl. 424—242 **1 Claim**

1. A method of treating a male human adult afflicted with the symptoms of benign prostatic hypertrophy which comprises administering orally to said male human adult an alleviating amount of from 30 to 100 mg/day of medrogestone, daily, until statistically significant improved changes in the manifestation of symptoms of benign prostatic hypertrophy are obtained, without causing overt signs of masculinization, feminization or suppression of adrenal function.

3,888,982
CHEMOSTERILANT TRIARYL TIN COMPOUNDS

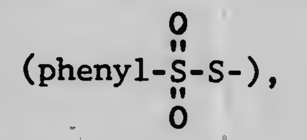
Eugene E. Kenaga, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 422,554, Dec. 31, 1964, Pat. No. 3,577,548, which is a continuation-in-part of Ser. No. 244,917, Dec. 17, 1962, abandoned. This application Oct. 27, 1969, Ser. No. 871,356

Int. Cl. A61k *27/00*

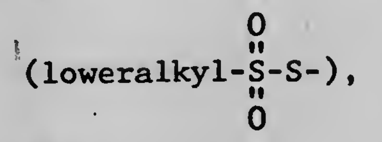
U.S. Cl. 424—245 **11 Claims**

1. A method useful in controlling population growth which comprises administering to an animal a minimal sterilant amount of a triaryltin compound selected from the group consisting of $R_3 — Sn — Z$ and $(R_3 — Sn)_2\,Y$ wherein, in all of its occurrences in any given triaryltin compound, R represents the same member selected from the group consisting of phenyl, pyridyl, mono-substituted phenyl wherein the substituent is a member selected from the group consisting of halo, loweralkyl, and loweralkoxy, and mono-substituted pyridyl wherein the substituent is a member selected from the group consisting of halo, loweralkyl, and loweralkoxy; Z represents a monovalent moiety selected from the group consisting of (phenylloweralkyl), a 2 to 12 carbon alkenyl, a 4 to 12 carbon alkadienyl, a 5 to 6 carbon cycloalkenyl, a 5 to 6 carbon cycloalkadienyl, halo, hydroxy, mercapto, hydrogen, a 2 to 18 carbon alkanoate, a 3 to 18 carbon alkenoate, loweralkoxy, loweralkylthio, diloweralkylcarbamate, diloweralkylthiocarbamate, diloweralkyldithiocarbamate, radical of the formula



$$(\text{phenyl-}\underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{S}}\text{-S-}),$$

radical of the formula

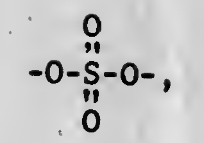


$$(\text{loweralkyl-}\underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{S}}\text{-S-}),$$

radical fo the formula

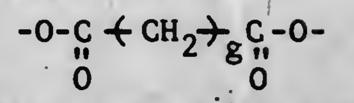
$—Sn—R_3$,

1-imidazolyl, 1-aziridinyl, and 1-benzimidazolyl; Y represents a divalent moiety selected from the group consisting of —O—, —S—, methylene, ethylene,



$$\text{-O-}\underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{S}}\text{-O-},$$

carbonyl, 1,3-butadien-1,4-ylene, and



$$\text{-O-}\underset{O}{\underset{\|}{C}}\!\left(CH_2\right)_g\!\underset{O}{\underset{\|}{C}}\text{-O-}$$

wherein *g* is an integer of from 1 to 10, both inclusive; wherein in R_3SnZ compounds, when R is phenyl or a said mono-substituted phenyl, Z is 1-imidazolyl, 1-aziridinyl or 1-benzimidazolyl, and wherein, when Z is a said monovalent moiety other than 1-imidazolyl, 1-aziridinyl or 1-benzimidazolyl, R is pyridyl or a said mono-substituted pyridyl; and wherein, in $(R_3Sn)_2Y$ compounds, R is pyridyl or a said mono-substituted pyridyl moiety.

3,888,983
DERIVATIVES OF THIAZOLINO-PYRIMIDIN-6-ONES, IN INDUCING ANALGESIA

Jacques L. E. Baetz, La Garenne-Colombes, France, assignor to Seperic, Morat, Switzerland

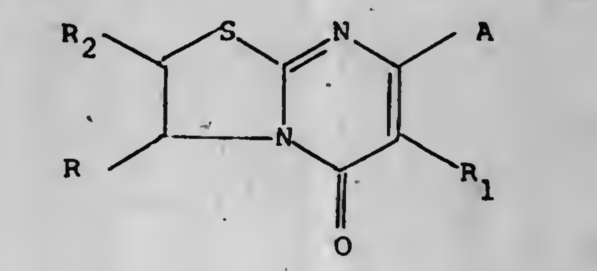
Division of Ser. No. 222,291, March 8, 1972, abandoned, which is a continuation-in-part of Ser. No. 168,212, Aug. 2, 1971, abandoned. This application June 15, 1973, Ser. No. 370,233

Claims priority, application United Kingdom, Aug. 14, 1970, 168,212/70

Int. Cl. A61k *27/00*

U.S. Cl. 424—251 **15 Claims**

1. A method of inducing analgesia in a patient comprising administering to said patient by any of the oral, parenteral and rectal routes, a quantity of from 100 to 300 mg of an active principle selected from a thiazolino-pyrimidin-5-one compound of the formula



in which:

R, R_1 and R_2 are each selected from hydrogen and the (1-4C) alkyl groups, and

A is selected from (a) the phenyl group, and the phenyl group substituted with halogen, (1-4C) alkyl, (1-4C) alkoxy and trifluoromethyl groups, and (b) cycloalkyl having up to 6 C-phenyl-(1-4C) alkyl, trifluoromethyl and (1-4C) alkyl groups, and a pharmaceutically acceptable acid addition salt thereof.

3,888,984
OXAZOLE AND IMIDAZOLE DERIVATIVES AS ANTIFUNGAL AGENTS

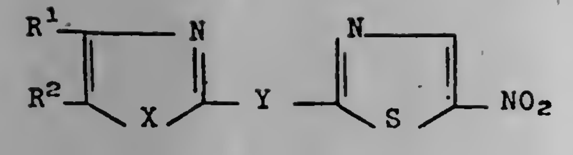
Peter Graham Hughes, Sunningdale, and John Pomfret Verge, Middle Assendon, both of England, assignors to Lilly Industries Limited, London, England

Division of Ser. No. 234,337, March 13, 1972, Pat. No. 3,813,401. This application Feb. 8, 1974, Ser. No. 440,906

Int. Cl. H61k *27/00*

U.S. Cl. 424—270 **10 Claims**

1. Fungicidal composition comprising as an active ingredient a fungicidally effective amount of a compound of the formula



wherein Y is sulphur or a sulphonyl group; X is oxygen or -NR³; R³ is selected from hydrogen, C_{1-4} alkyl, C_{1-4} hydroxyalkyl, C_{2-4} alkenyl, phenyl and phenyl-C_{1-4} alkyl; and R¹ and R² are individually selected from hydrogen, C_{1-4} alkyl and phenyl, or R¹ and R² together form a —CH=CH—CH—CH=R⁴— chain wherein R⁴ is =CH— or =N—, in association with a non-phytotoxic carrier or diluent therefor.

3,888,985
METHOD AND COMPOSITION FOR LOWERING INTRAOCULAR PRESSURE

Wilbur Lippmann, Montreal, Quebec, Canada, assignor to Ayerst McKenna and Harrison Ltd., Montreal, Quebec, Canada

Continuation-in-part of Ser. No. 387,842, Aug. 13, 1973, abandoned, which is a continuation of Ser. No. 188,508, Oct. 12, 1971, abandoned, which is a division of Ser. No. 878,581, Nov. 20, 1969, abandoned. This application Nov. 4, 1974, Ser. No. 520,396

Int. Cl. A61k *27/00*

U.S. Cl. 424—275 **6 Claims**

1. The method of lowering intraocular pressure which comprises administering topically to the eye of a person suffering from an open-angle glaucomatous condition an intraocular pressure lowering amount of an isotonic aqueous solution containing about 1 to 10 milligrams per milliliter, as the base, of epinephrine or an acid addition salt of epinephrine with a pharmaceutically acceptable acid, in conjunction with a potentiating amount of 1 to 5 milligrams per milliliter, as the base, of N,3,3-trimethyl-1-phenyl-1-benzo[c]-thiophenepropylamine or of its acid addition salt with a pharmaceutically acceptable acid.

3,888,986
CERTAIN 1-(5-NITRO-2-THIENYL)-1-ACYLAMIDOALKANES FOR TREATING HISTOMONIASIS

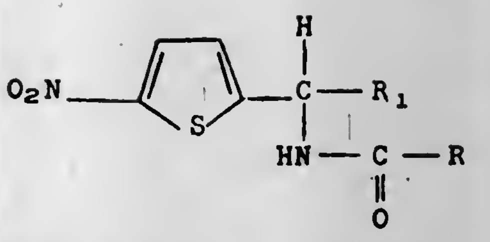
Eric Panitz, Hamilton Square, and Peter J. L. Daniels, Cedar Groove, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Jan. 28, 1974, Ser. No. 437,409

Int. Cl. A61k *27/00*

U.S. Cl. 424—275 **5 Claims**

2. A process for inhibiting or treating histomoniasis in poultry which comprises orally administering to said poultry an amount, sufficient to inhibit or treat histomoniasis, of a thiophene of the formula:



wherein R is alkly having 1 to 6 carbon atoms, and R_1 is alkyl having 1 to 4 carbon atoms.

3,888,987
DERIVATIVES OF CERTAIN GERANYL PHENYL ETHERS AND THEIR USE IN CONTROLLING INSECTS

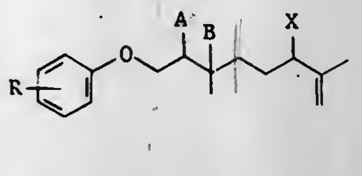
Ferenc M. Pallos, Walnut Creek, and Chien K. Tseng, El Cerrito, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 198,018, Nov. 4, 1971, Pat. No. 3,772,365. This application July 5, 1973, Ser. No. 376,772

Int. Cl. A01n *9/28*

U.S. Cl. 424—278 **6 Claims**

1. A method of controlling *Tenebrio molitor* comprising applying thereto at any stage of their development a metamorphosis hindering amount of a compound of the formula:



in which R is hydrogen; 3 or 4-halogen; 3 or 4-alkyl having 1 to 6 carbon atoms; 3 or 4-alkoxy having 1 to 4 carbon atoms; 4-allyl; 4-alkylthio having 1 to 4 carbon atoms; or 4-nitro; X is chlorine or bromine; and A and B together form an epoxide link.

3,888,988
OXOBENZOFURAN CARBOXAMIDES IN ALLEVIATING INFLAMMATION

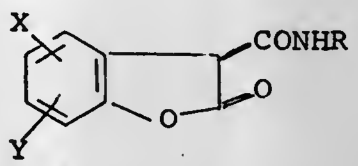
Saul B. Kadin, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 246,491, April 21, 1972, Pat. No. 3,829,446, which is a division of Ser. No. 81,162, Oct. 15, 1970, Pat. No. 3,676,463. This application Mar. 15, 1974, Ser. No. 451,424

Int. Cl. A61u *27/00*

U.S. Cl. 424—279 **10 Claims**

1. A method for alleviating inflammation in the treatment of a subject afflicted with inflammatory disorders, which comprises administering to said subject an effective amount of a compound selected from the group consisting of a 2-oxobenzofuran carboxamide of the formula



and the base salts thereof with pharmacologically acceptable cations, wherein X and Y are each a member selected from the group consisting of hydrogen, fluorine, chlorine, bromine, alkyl and alkoxy each having from one to five carbon atoms, trifluoromethyl and trifluoromethoxy; and R is a member selected from the group consisting of naphthyl, phenyl and mono and di-substituted phenyl wherein esch substituent is chosen from the group consisting of fluorine, chlorine and bromine, alkyl having up to four carbon atoms, alkoxy and thioalkoxy each having up to three carbon atoms, trifluoromethyl and trifluoromethoxy.

3,888,989
COMPOSITION AND METHOD FOR TREATING VIRUS INFECTIONS

Joseph W. Blaszczak, 19 Dosoris Way, Glen Cove, N.Y. 11542

Continuation-in-part of Ser. Nos. 256,539, Feb. 6, 1963, abandoned, and Ser. No. 458,759, May 25, 1965, Pat. No. 3,479,335, and a continuation of Ser. No. 877,523, Nov. 17, 1969, abandoned. This application Aug. 9, 1972, Ser. No. 279,273

Int. Cl. A61k *27/00*

U.S. Cl. 424—280 **3 Claims**

3. A method of treating virus infections selected from the group consisting of the fowl pox virus, the virus causing infectious laryngotracheitis in animals, the virus causing infectious bronchitis in animals, the virus causing Newcastle disease, the virus causing hog cholera, the virus causing canine distemper, and the influenza A virus animals, said method consisting in administering to said infected animal the reaction product of ascorbic acid and formaldehyde at a dosage effective to treat said virus infections, said reaction product being produced by heating and melting an aqueous solution of ascorbic acid with formaldehyde at a temperature between 80°C. and 120°C. and at an acid pH, the formaldehyde being present in a molar ratio exceeding 1 with respect to said ascorbic acid, and continuing said heating until excess formaldehyde is removed from the reaction mixture by evaporation.

3,888,990
MEDICAMENTS CONTAINING EPICATECHIN-2-SULFONIC ACIDS AND SALTS THEREOF

Pierre Courbat, and Andre Valenza, both of Nyon, Switzerland, assignors to ZYMA S.A., Nyon, Vaud, Switzerland

Continuation-in-part of Ser. No. 117,718, Feb. 22, 1971, abandoned. This application Sept. 6, 1973, Ser. No. 394,627

Claims priority, application Switzerland, Mar. 13, 1970, 3809/70

Int. Cl. A61k *27/00*

U.S. Cl. 424—283 **2 Claims**

1. A medicament against vascular disease and conjunctive tissue disorders, comprising

a pharmaceutically effective amount of a compound selected from the group consisting of (+)-epicatechin-2-sulfonic acid, (−)-epicatechin-2-sulfonic acid, (+)-epicatechin-2-sulfonic acid and a pharmaceutically acceptable salt thereof, and

a pharmaceutically acceptable carrier.

3,888,991
METHOD AND COMPOSITION FOR LOWERING INTRAOCULAR PRESSURE

Wilbur Lippmann, Montreal, Quebec, Canada, assignor to Ayerst McKenna and Harrison Ltd., Montreal, Canada

Continuation-in-part of Ser. No. 392,898, Aug. 30, 1973, abandoned, which is a continuation of Ser. No. 198,993, Nov. 15, 1971, abandoned, which is a continuation of Ser. No. 878,581, Nov. 20, 1969, abandoned. This application Nov. 4, 1974, Ser. No. 520,397

Int. Cl. A61k *27/00*

U.S. Cl. 424—285 **6 Claims**

1. The method of lowering intraocular pressure which comprises administering topically to the eye of a person suffering from an open-angle glaucomatous condition an intraocular pressure lowering amount of an isotonic aqueous solution containing about 1 to 10 milligrams per milliliter, as the base, of epinephrine or an acid addition salt of epinephrine with a pharmaceutically acceptable acid, in conjunction with a potentiating amount of 1 to 5 milligrams per milliliter, as the base, of N,3,3-trimethyl-1-phenyl-1-phthalanpropylamine or of its acid addition salt with a pharmaceutically acceptable acid.

3,888,992
NEMATOCIDAL N-POLYHALOVINYLTHIOFORMAMIDES

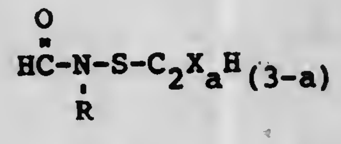
Melancthon S. Brown, deceased, late of Berkeley, Calif. (Gustave Kohn, administrator), assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 253,643, May 15, 1972, Pat. No. 3,771,991, which is a division of Ser. No. 33,878, April 29, 1970, Pat. No. 3,697,571, which is a continuation-in-part of Ser. Nos. 810,368, March 25, 1969, abandoned, and Ser. No. 748,642, June 30, 1968, abandoned, said Ser. No. 810,368, is a continuation-in-part of Ser. No. 748,642, , and Ser. No. 704,555, Feb. 12, 1968, abandoned, said Ser. No. 748,642, is a continuation-in-part of Ser. No. 704,555,. This application Aug. 6, 1973, Ser. No. 386,270

Int. Cl. A01n *9/12*

U.S. Cl. 424—298 **10 Claims**

1. A nematocidal composition comprising a nematocidally effective amount of a polyhalovinylthioformamide of the formula



$$\overset{\displaystyle O}{\overset{\|}{HC}}-\underset{\displaystyle R}{\underset{|}{N}}-S-C_2X_aH_{(3-a)}$$

wherein R is hydrogen or alkyl of one to four carbon atoms, X is halogen of atomic number 17 to 35 and *a* is 2 or 3, and an inert carrier.

3,888,993
PHARMACEUTICAL COMPOSITION CONTAINING AMINO ALCOHOLS DERIVED FROM ORTHO-TRANS-HYDROXYCINNAMIC ACIDS, THEIR ESTERS AND THEIR AMIDES

Eugene Boschetti, Venissieux; Darius Molho, Boulogne-Sur-Seine, and Louis Fontaine, Lyon, all of France, assignors to Lipha, Lyonnaise Industrielle Pharmaceutique, Lyon, France

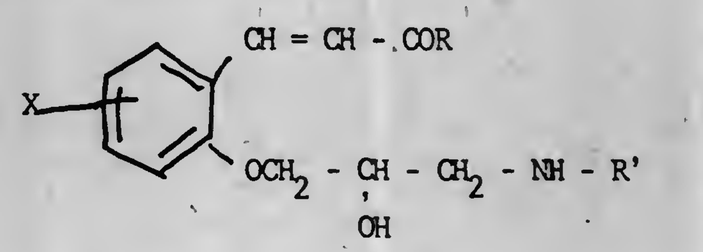
Division of Ser. No. 241,381, April 5, 1972, Pat. No. 3,828,095. This application May 3, 1973, Ser. No. 356,786

Claims priority, application France, Apr. 9, 1971, 71.12.668

Int. Cl. A61k *27/00*

U.S. Cl. 424—309 **14 Claims**

1. A pharmaceutical composition for the treatment of chest angina and tachyarrhythmia, comprising, as active principle, an amount sufficient to block beta-sympathetic receptors of a compound of formula



in which R is a member of the group consisting of an hydroxy, and lower alkoxy;

R' is a lower alkyl radical; and

X is hydrogen or bromine, and a physiologically acceptable pharmaceutical carrier.

3,888,994

CHOLERETIC MEDICINE

Josef Wagner, Grunwald, and Helmut Grill, Vaterstetten, both of Germany, assignors to Chemisch-Pharmazeutische Fabrik Adolf Klinge & Co., Munich, Germany

Filed Oct. 23, 1973, Ser. No. 408,945

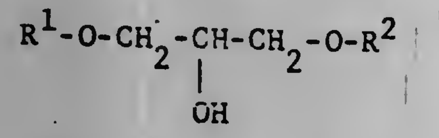
Claims priority, application Germany, Oct. 26, 1972, 2252637

Int. Cl.^{2} A61K *27/00*

U.S. Cl. 424—342 **1 Claim**

1. A method of producing a choleretic effect in a patient in need of said therapy comprising:

orally administering, in unit dosage form, to a patient in need of said therapy, a choleretic-effective non-toxic amount of a 1,3-dialkyl glycerine ether of the formula



$$R^1\text{-O-CH}_2\text{-}\underset{\displaystyle\text{OH}}{\underset{|}{\text{CH}}}\text{-CH}_2\text{-O-}R^2$$

in which R^1 and R^2 can be identical or different and represent straight or branched alkyl radicals with 1–8 C atoms which are saturated or contain a double bond and are optionally substituted by a lower alkoxy radical, or represent cycloalkyl radicals with 5–6 C atoms, and a pharmaceutical diluent.

3,888,995

FATTY ALCOHOL-PROPYLENE GLYCOL VEHICLE

Martin Katz, Atherton, Calif., and Herbert M. Neiman, Philadelphia, Pa., assignors to Syntex Corporation, Panama

Division of Ser. No. 745,989, July 19, 1968, Pat. No. 3,592,930. This application Mar. 3, 1971, Ser. No. 120,691. The portion of the term of this patent subsequent to July 13, 1988, has been disclaimed.

Int. Cl. N61k *9/06*

U.S. Cl. 424—358 **11 Claims**

1. A substantially anhydrous pharmaceutical vehicle of cream-like consistency consisting essentially of

a. from 20 to 35 parts by weight saturated fatty alcohol having from 16 to 24 carbon atoms,

b. from 55 to 80 parts by weight of a glycol solvent selected from the group consisting of 1,2-propylenediol, 1,3-propylenediol, dipropylene glycol, and mixtures thereof,

c. from 0 to 15 parts by weight of compatible plasticizer,

d. from 0 to 15 parts by weight of compatible coupling agent,

e. from 0 to 20 parts by weight of penetrant, and

f. from 0 to 3 weight percent water, the composition being substantially free from petrolatum, mineral oil, monohydric fatty alcohols and fatty acids which are unsaturated, and monohydric alcohols, fatty acids and fatty amides which have less than 16 carbon atoms, said vehicle being particularly suitable for providing an occlusive film for releasing topically active cortico-steroids, and for distributing medication over the skin surface and maintaining it there until beneficial action occurs.

3,888,996

BAKERY FORMULATION CONTAINING NON-FAT DRY MILK SUBSTITUTE

Eugene J. Turro, Lombard, and Endre F. Sipos, Elmhurst, both of Ill., assignors to Central Soya Company, Inc., Fort Wayne, Ind.

Filed July 23, 1973, Ser. No. 381,857

Int. Cl. A21d *2/36, 2/26, 2/22*

U.S. Cl. 426—62 **1 Claim**

1. In a bread formulation where flour, water, sugar, shortening and yeast or chemical leavening are augmented by about 1.5 percent to about 3 percent of non-fat dry milk, the improvement comprising the substitution for at least a part of the non-fat dry milk of an equivalent weight of a mixture consisting essentially of 87–89 percent soy flour characterized by a Nitrogen Solubility Index of not less than about 66 percent, 5–7 percent soy protein isolate, 0.25–0.5 percent ascorbic acid with the remainder of said formulation being edible calcium salts with at least 50 percent of said salts being calcium lactate.

3,888,997

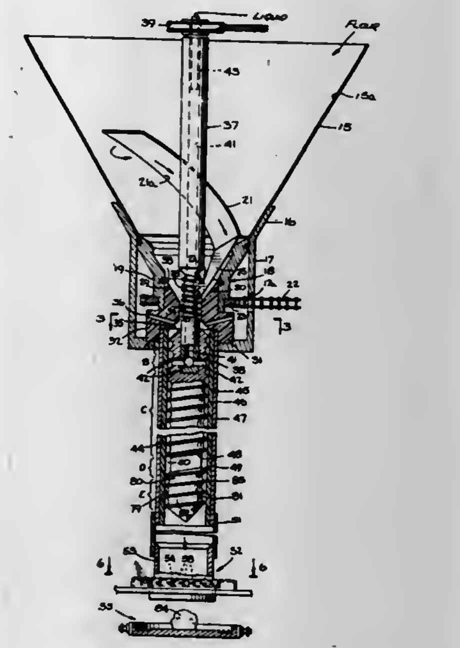
METHOD AND APPARATUS FOR PROCESSING DOUGH

Raul Guibert, c/o Hotel Shoreham 33 W. 55th St., New York, N.Y. 10019

Filed May 9, 1973, Ser. No. 358,483

Int. Cl. A21c *1/00*

U.S. Cl. 426—27 **16 Claims**



1. In a method of processing dough from flour and a dough-forming solution, the steps of providing a vertical tubular chamber, feeding the flour into said chamber and centrifugally hurling it against the inner wall of the chamber thereby depositing the flour in a thin film upon the inner wall of the chamber, feeding said solution into said chamber and centrifugally hurling it against the thin film of flour thereby intimately admixing it with said film to form a pasty film on said inner wall, directing said pasty film downwardly along said inner wall along a helical path, scraping said pasty film from said inner wall to form a downwardly extending helical ribbon, and subjecting said ribbon to a kneading action as the ribbon travels downwardly.

3,888,998

BEVERAGE CARBONATION

Ronald Lee Sampson, Cincinnati, and David Denzil Whyte, Wyoming, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 200,849, Nov. 22, 1971, abandoned. This application Oct. 30, 1972, Ser. No. 302,149

Int. Cl. A23l *1/00*

U.S. Cl. 426—67 **20 Claims**

1. A process for carbonating a potable aqueous solution comprising contacting said solution with an effective amount of a porous crystalline zeolite material, said zeolite having adsorbed therein at least about 5% by weight of carbon dioxide, said contact taking place at a temperature below about 110°F and a pressure of at least about 1 atmosphere.

12. A composition for making a flavorful carbonated beverage from tap water or the like comprising a dry beverage mix and an amount effective to carbonate the beverage of a porous crystalline zeolite said porous crystalline zeolite material having adsorbed therein at least about 5% by weight carbon dioxide.

3,888,999

COFFEE PERCOLATOR PACKAGES AND METHOD

Gary V. Jones, Ramsey, N.J.; John A. Pereira, Pearl River, N.Y., and Warren C. Rehman, Montvale, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 30, 1973, Ser. No. 365,305

Int. Cl. B65d *85/70;* **A23f** *1/08*

U.S. Cl. 426—77 **4 Claims**

1. In a process for making a circular percolator package for use in brewing coffee which comprises degassing roasted and ground coffee, compressing said coffee at a pressure between 8,000 and 13,000 p.s.i. for a sufficient period of time to form a self-sustaining, annular tablet which is capable of releasing at least 10 percent more extractable solids than an equivalent charge of uncompressed coffee but insufficient to express undesirable lipids, and enclosing said annular tablet in a porous filter material by means of an inner seal extending around and spaced apart from the inner circumference of the annular tablet and an outer seal extending around and spaced apart from the outer circumference of the annular tablet, said material having a pore size between 0.01 and 0.1 inch and said enclosure having a volumetric capacity at least 30 percent greater than the volume of the enclosed coffee tablet, the improvement comprising forming at least one incompletely sealed area in the inner or outer seals, the incompletely sealed area forming a passageway between the interior and exterior of the percolator package.

4. An annular shaped percolator package comprising a compressed annular shaped coffee tablet enclosed within a filter material by means of an inner heat seal extending around and spaced apart from the inner circumference of the annular tablet and an outer heat seal extending around and spaced apart from the outer circumference of the annular tablet, said inner seal being incomplete in at least one location, the incompletely sealed area forming a passageway between the interior and the exterior of the percolator package.

3,889,000

PERCOLATOR PACKAGES AND PROCESS THEREFOR

Charles J. Cante, Ossining, and John R. Frost, Yonkers, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 30, 1973, Ser. No. 365,306

Int. Cl. A23f *1/08, 19/14*

U.S. Cl. 426—84 **10 Claims**

1. In a coffee percolator package having a compressed tablet of roast and ground coffee said tablet being enclosed by a filter material having a porosity conforming to between about an 8 and 60 U.S. mesh screen, the improvement comprising said package containing an amount of linear organosiliconoxide polymer sufficient to reduce the incidence of superheating when brewing coffee from said package.

3,889,001

HYDROLYZED PROTEIN IN NON-DAIRY WHIPPED TOPPING

Norma F. Buide, New York; Joaquin C. Lugay, Thornwood, and Rex J. Sims, Pleasantville, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Aug. 20, 1973, Ser. No. 389,842

Int. Cl. A23g *3/00, 5/00*

U.S. Cl. 426—565 **10 Claims**

1. A whippable oil-in-water emulsion composition comprising:

a. 10 to 30 percent of a fat having a normally high solids content and a rapid melt down to a low solids content at body temperature;

b. 20 to 30 percent carbohydrate;

c. 40 to 60 percent water;

d. 0.5 to 2.0 percent emulsifier;

e. 0.05 to 2.0 percent stabilizer; and

f. an amount, less than 0.5 percent of a protein hydrolysate having an average molecular weight of from about 300 to 15,000 which is effective to provide the ability of the composition to be whipped to an overrun of over 200 percent and also provide freeze-thaw stability.

3,889,002

SPOONABLE FROZEN GELATIN DESSERT CONCENTRATE

Adolph Scott Clausi, Cos Cob, Conn.; Martin Glicksman, Valley Cottages, and Elizabeth Farkas, Yonkers, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed June 8, 1973, Ser. No. 368,150

Int. Cl. A23l *1/04, 1/06*

U.S. Cl. 426—576 **11 Claims**

1. A method of producing a thick, stirrable gelatin-based suspension which can be readily cleaved with a spoon for use as a gelatin dessert concentrate that is readily dispersible and soluble in hot tap water and quick-setting on subsequent refrigeration to produce a convenient-to-serve gelatin dessert, which method comprises:

a. soaking gelatin in a polyhydric alcohol for an initial period of at least one hour to allow the gelatin to become discrete and swollen but prior to assuming a cohesive appearance, the gelatin and polyhydric alcohol being in a respective weight ratio of 5:1 to 1:3;

b. dry blending sucrose, food acid, flavoring and coloring and mixing these dry ingredients with the gelatin and polyhydric alcohol suspension to form a homogenous mixture;

c. allowing the homogenous mixture to stand for the purpose of equilibration.

3,889,003

BAKED PRODUCT AND PROCESS FOR PREPARING SAME

Maxine N. Yourman, 49 Potomac Ln., Sayville, N.Y. 11782

Filed June 25, 1973, Ser. No. 372,909

Int. Cl. A23c *9/00*

U.S. Cl. 426—580 **6 Claims**

1. The process of making a baked product consisting essentially of skim milk powder, egg white, egg yolk and dextrin comprising the steps of beating the whites of eggs which are separated from the yolks until they are stiff

gradually adding ice water and dextrin and sweetner to the whites while beating the whites

adding skim milk powder to the whites while they are being beaten

beating the yolks with dextrin and sweetner and flavoring until the yolks are thick

folding the egg mixture into the egg white mixture

pouring the ingredients into an ungreased pan, and

baking the composition at between 300°–325°F for between 50 and 60 minutes, the egg whites being in an amount sufficient to produce a rising type composition, the skim milk powder being in an amount sufficient to stabilize the egg white and hold them in the risen condition, and the dextrin being in a sufficient amount that when added to the egg white and baked, results in a baked product that rises and stays risen so that it has bulk and consistency.

3,889,004
HIGH PRESSURE INJECTION OF A FATTY IN AQUEOUS PHASE

Heinrich Gottlieb Schmidt, Wedel, Holstein; Kunc Gustav Strauss, Hamburg, and Josef Tennikat, Delmenhorst, all of Germany, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 292,192, Sept. 25, 1972, abandoned, which is a continuation-in-part of Ser. No. 129,776, March 3, 1971, abandoned. This application Dec. 20, 1973, Ser. No. 427,004

Int. Cl. A23d *3/02*

U.S. Cl. 426—188 **13 Claims**

1. A process for preparing an aqueous fatty emulsion in which a first liquid is injected through a nozzle into a stream of a second liquid flowing at between about 2 and about 50 cms/sec per nozzle through and filling a pipe with, immediately before injection, a pressure difference between said first and said second liquid of at least 100 atmospheres and a pressure in said second liquid of at least 0.3 atmospheres, said first and second liquids consisting essentially of a fatty and an aqueous phase.

3,889,005
EMULSIFIER SYSTEM

Klaus-Rudiger Brammer, and Theophil Wieske, Hamburg, both of Germany, assignors to Lever Brothers Company, New York, N.Y.

Filed Sept. 14, 1973, Ser. No. 397,505

Claims priority, application Luxembourg, Sept. 15, 1972, 66093

Int. Cl. A23d *3/00*

U.S. Cl. 426—189 **8 Claims**

1. An improved edible emulsion, which is a low calorie fat spread of the water-in-oil type, having improved microbiological stability and organoleptic properties consisting essentially of 30–60 percent of a fatty phase, an aqueous phase and an improved emulsifier system therefor, said improved emulsifier system consisting essentially of saturated fatty acid partial glycerides and unsaturated fatty acid partial glycerides, the weight ratio of said unsaturated fatty acid partial glycerides to said saturated fatty acid partial glycerides being about 1.5–1 to 10–1 and wherein said saturated fatty acid partial glycerides have a dominant proportion of stearic acid partial glyceride.

3,889,006
AN ANIMAL FEED OF HIGH DIGESTIBILITY

Taro Nagasawa, Tokyo; Joji Ono, Chiba; Tutomu Kudo, Kawasaki, and Yoshitugu Harada, Tokyo, all of Japan, assignors to Morinaga Milk Industry Co. Ltd., Japan

Division of Ser. No. 142,530, May 21, 1971. This application July 2, 1973, Ser. No. 375,898

Int. Cl. A23k *1/00*

U.S. Cl. 426—656 **2 Claims**

1. A foodstuff of high digestibility containing a yeast mass of cells obtained by (1) alkaline treating (2) precipitating and (3) drying of yeast cells which are at least partially deprived of cell wall integrity and at least partially devoid of mannan, said yeast cells being selected from the group consisting of hydrocarbon assimilating mutants of Candida MA7002, M7005, M7006, M7007 and M7010.

3,889,007
AQUATIC ANIMAL FOOD COMPOSITION

Gordon Gunter, and Amaraneni Venkataramaiah, both of Ocean Springs, Miss., assignors to Ocean Food Inc., White Stone, Va.

Filed Jan. 26, 1973, Ser. No. 327,232

Int. Cl. A23k *1/00*

U.S. Cl. 426—74 **20 Claims**

1. An aquatic animal food comprising: fish meal, a fish extract in an amount sufficient to impart a fish flavor to said meal, sea water in an amount of 150–400 parts per 1,000 parts of fish meal, and an organic binder, non-toxic to marine life, in an amount sufficient to form particles capable of withstanding disintegration or leaching from sea water of varying natural salinity and a temperature range of 10°–33°C. for several days.

3,889,008
FIXED VOLATILE FLAVORS AND METHOD FOR MAKING SAME

William A. Mitchell, Lincoln Park, N.J.; Howard D. Stahl, Hartsdale, and William C. Seidel, Monsey, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 36,666, May 12, 1970, Pat. No. 3,787,592. This application Sept. 20, 1973, Ser. No. 399,201The portion of the term of this patent subsequent to Jan. 22, 1991, has been disclaimed.

Int. Cl. A23l *1/26*

U.S. Cl. 426—534 **16 Claims**

1. A method for producing a solid flavoring composition containing low levels of volatile flavoring compounds comprising the steps of:

a. forming a supersaturated aqueous solution of sucrose, said solution also containing a volatile flavoring compound,
b. crystallizing sucrose from the solution to fix a portion of the volatile flavoring compound within individual sucrose crystals at a level of less than about 0.5% by weight of the crystal, and thereafter,
c. drying the crystals.

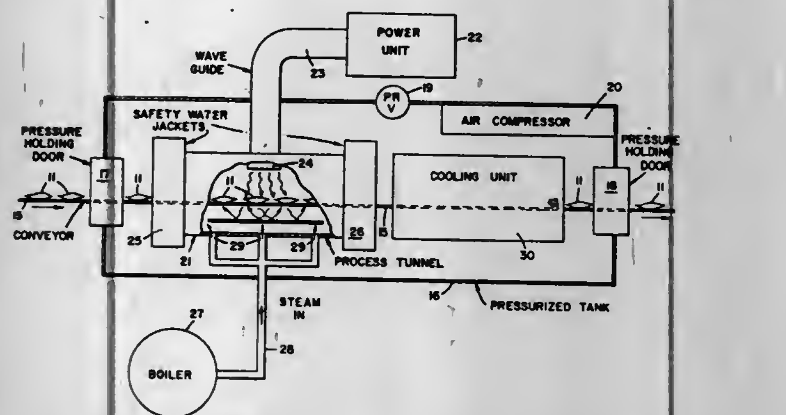
3,889,009
METHOD FOR CONTINUOUS ELECTROMAGNETIC STERILIZATION OF FOOD IN A PRESSURE ZONE

Samuel P. Lipoma, 825 - 19th Pl., Delano, Calif. 93215

Continuation of Ser. No. 276,579, July 31, 1972, abandoned. This application Sept. 11, 1974, Ser. No. 505,138

Int. Cl. A23l *3/04*

U.S. Cl. 426—234 **4 Claims**



1. A method for sterilizing food at high temperatures comprising the steps of:

conveying the food on conveying means through pressure-retaining means at the entrance to a pressure zone defined by a tank and continuously through the pressure zone and conducting the sterilizing process there under pressure above atmospheric,

conducting said food on the conveying means through a sterilizing tunnel contained fully within the pressure zone and separate from the tank defining the pressure zone whereby dissipation of heat in the tank walls can be avoided and heat energy confined to the tunnel interior, while keeping the tunnel under the same pressure as applies to the later process steps carried on in said pressure zone, and also whereby flexibility is obtained as to the time of sealing the food in a container, said tunnel having an entrance and an exit with said conveyor means passing through said tunnel via said entrance and exit,

subjecting said food to electromagnetic energy emitted within said sterilizing tunnel and thereby sterilizing the food,

cooling the food beyond said sterilizing tunnel and within said pressure zone in a cooling unit separate from and fully within the tank defining the pressure zone and while still under said pressure to a temperature at least below the boiling point of water at atmospheric pressure, and then conveying the food on the conveying means through pressure-retaining means at the outlet from the pressure zone and wherein the food is sealed in the container prior to the time the food is conveyed through the pressure-retaining means at the outlet from the pressure zone.

3,889,010
PROCESS FOR THE PREPARATION OF A PROTEIN FOOD PRODUCT

Anton H. J. Brouwer, Velp (Gld.), Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed Oct. 26, 1972, Ser. No. 300,975

Int. Cl. A23j *3/00*

U.S. Cl. 426—276 **12 Claims**

1. A process for the preparation of a protein containing food product having a fibrous, cohesive texture, which comprises dissolving an edible protein containing material in an aqueous liquid, foaming said protein-containing liquid so that the foam contains up to 50% by volume of protein containing liquid, extruding the foamed protein-containing liquid into a non-toxic coagulant, drawing said foamed protein material as it coagulates and drying the protein material.

3,889,011
FAT PRODUCTS

Colin Barrington Read, Gravesend, England, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 164,442, July 20, 1971, abandoned. This application Sept. 4, 1973, Ser. No. 393,864

Claims priority, application United Kingdom, July 23, 1970, 35874/70

Int. Cl. A03b *1/00*

U.S. Cl. 426—604 **6 Claims**

1. A process for producing margarine having improved spreading characteristics which comprises:

i. preparing a fat phase by performing in either order the steps of:
    a. corandomising at a temperature of from 50° to 100°C a blend consisting essentially of 25–65 wt % of a palmitic fat with 75–35 wt % of a C_{16}-C_{18} vegetable oil in the substantial absence of water and in the presence of an effective amount of an alkali metal catalyst; and
    b. partially hardening at least one of the components of the blend in the presence of an effective amount of a metal hydrogenation catalyst under isomerisation conditions, and continuing the said steps until the combined fatty acid content of the glycerides of the blend consists essentially of at least 3% trans acid and at most 35% saturated fatty acid, of which palmitic acid predominates, these amounts being by weight of the total combined fatty acid content, and its dilatation value at 20°C is at least 275 and at 35°C at most 90;
ii. incorporating into the fat phase an aqueous phase including flavours and an effective amount of a water-in-oil eumlsifier at an elevated temperature at which both phases are liquid;
iii. emulsifying the phases to form a water-in-oil emulsion; and
iv. passing said emulsion successively through a scraped surface heat exchanger and a scraped surface mixer in which the emulsion is chilled and tempered to crystallise at least part of the fat phase.

3,889,012
METHOD OF MANUFACTURING TWISTED PASTRY ARTICLES

Jacques Riviere, Reims, and Raymond Simon, Soisy-sur-Seine, both of France, assignors to Lu, Brun & Associes S.A., Athis-Mons, France

Filed Mar. 7, 1973, Ser. No. 338,743

Claims priority, application France, Mar. 10, 1972, 72.08519

Int. Cl. B66c *17/08;* **B65g** *27/00;* **A21b** *1/42*

U.S. Cl. 426—500 **4 Claims**

1. A method of manufacturing articles in the shape of twisted bars, from a strip of pastry or like material, comprising:

a. cutting the strip transversely into successive ribbons;
b. gripping each ribbon transversely thereto at several points spaced along its length, the extreme gripped portions corresponding to the two terminal parts of the ribbon;
c. twisting a portion of the strip about the longitudinal axis of the strip between adjacent gripped portions, to form a twisted part, one twisted part being formed between each pair of gripped portions;
d, flattening the twisted part so that they do not become untwisted when each ribbon is liberated from the gripping action, each ribbon then being in the form of a bar with flat parts separated by at least one twisted part.

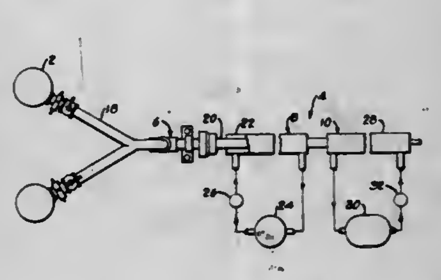
3,889,013
METHOD FOR MAKING SKINLESS FOOD PRODUCTS

Rex E. Moule, 2404 S. Patrick Dr., Indialantic, Fla. 32903

Continuation of Ser. No. 124,442, March 15, 1971, abandoned, which is a division of Ser. Nos. 674,309, Oct. 10, 1967, abandoned, and Ser. No. 155,271, June 21, 1971, abandoned. This application Mar. 21, 1973, Ser. No. 343,354

Int. Cl. A22c *11/00*

U.S. Cl. 426—513 **1 Claim**



1. A method of continuously making a skinless sausage food product from a sausage food mixture comprising the steps of: ejecting the sausage food mixture from a pressurized supply tank into a pressurizing and metering pump;

injecting the untreated sausage food mixture under a pressure from 150 – 300 pounds per square inch into the inlet end of a thermally conductive conduit under pressure from a pressurizing and metering pump;

moving the sausage food mixture at a high rate of speed through the thermally conductive conduit;

passing the food mixture at a high rate of speed through the heated first portion;

simultaneously heating a first portion of the thermally conductive conduit adjacent the inlet end of said conduit to a temperature between 200° to 500° Fahrenheit, thereby heating a surface portion of the sausage food mixture to a temperature that liquifies fatty substances on a surface and that unites into a coherent mass other ingredients in a surface portion, while keeping continuous pressure on the food mixture to fill voids with the mixture itself;

cooling a second portion of said conduit adjacent said heated portion and axially in line with the flow of said food mixture to a temperature between 33° and 50° Fahrenheit, thereby cooling the sausage food mixture before heat penetrates inward beyond the surface portion, whereby the surface portion of the food mixture is cooled to solidify the outer thickness into a casing for the food product;

ejecting the food mixture from the outlet end of said conduit whereby a sausage food mixture is continuously transformed into a skinless food product.

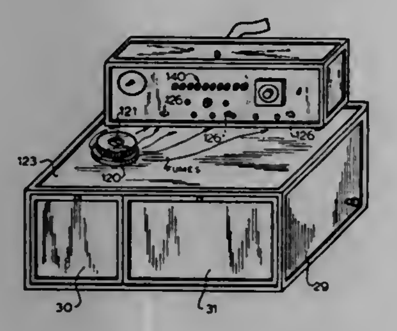
3,889,014
AUTOMATIC ELECTRON MICROSCOPY TISSUE PROCESSOR METHOD

Thomas D. Kinney, and John E. P. Pickett, both of Durham, N.C., assignors to Triangle Biomedical Equipment, Inc., Durham, N.C.

Division of Ser. No. 228,115, Feb. 22, 1972, Pat. No. 3,771,490. This application Aug. 23, 1973, Ser. No. 390,950The portion of the term of this patent subsequent to Nov. 13, 1990, has been disclaimed.

Int. Cl. A01n *1/00*

U.S. Cl. 427–4 **3 Claims**



1. The method of processing in a closed, automatic processor wherein a plurality of individual electron microscopy size particles of the character of having at least one dimension no greater than one millimeter are separately contained while being bathed simultaneously according to a predetermined program for varying lengths of time in successive selected aqueous and non-aqueous electron microscopy tissue processing solutions drawn from separate containers thereof so as to prepare the particles preparatory to embedding, comprising the steps of:

a. separating the particles to be processed into groups;

b. installing and physically isolating each group in a respective uniform tissue receptacle which is porous to the extent of having for each solution at least some porous portion permeable thereto;

c. placing a plurality of such receptacles in an open top processing chamber having a removable top cover, an entry-discharge port in the bottom thereof and a vent hole proximate the top cover and replacing the cover;

d. in a predetermined time sequence and for each solution cycle:

1. withdrawing from one of said solution containers into a controllable metering means located externally of said processing chamber a metered amount of said solution used in such cycle;
2. connecting said external metering means holding said metered solution to said port and with said port open forcing said metered amount of said solution from said external metering means into said chamber through said port and then closing said port;
3. retaining the said metered amount of solution for a predetermined amount of time in said chamber;
4. opening said port and while blocking return of the used solution to said external metering means allowing the used solution to drain from said chamber through said port; and
5. during each such sequence holding the receptacles successively submerged in each respective solution and in a depth of solution determined solely by said metered amount thereby allowing each of the selected solutions to be exchanged with each group of particles by penetration and drainage through said pores while maintaining said system closed, a fixed amount of solution in said chamber and each said group physically isolated from the other.

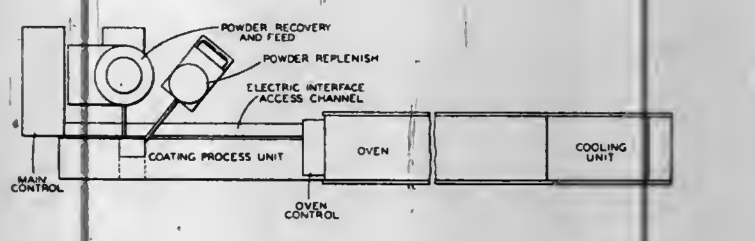
3,889,015
COATING METHOD WITH CLEANING

William P. English, Bridgeport, Conn., assignor to Electrostatic Equipment Corporation, New Haven, Conn.

Filed May 24, 1972, Ser. No. 256,294

Int. Cl. B05b *5/02;* **B44d** *1/095*

U.S. Cl. 427—21 **7 Claims**



1. A method for the production of a coating of resinous material upon only a portion of a workpiece, comprising the steps of:

a. producing a cloud of electrostatically charged solid particles of resinous material;

b. exposing said workpiece to said charged particles with said workpiece charged effectively opposite thereto to cause a layer of particles to deposit thereon;

c. thereafter, contacting a particle-coated portion of said workpiece with a relatively resiliently deformable contact surface having a small open-cell construction, under conditions avoiding relative movement between elements of said workpiece portion and of said contact surface while in such contact, thereby lodging particles from said coated portion in the cells of said contact surface while avoiding substantial wiping action between said contact surface and said workpiece portion; and

d. thereafter, separating said contact surface and said workpiece with said particles lodged within the cells of said contact surface to thereby effect the removal of particles, from said contacted portion.

3,889,016
METHOD OF MAKING A DIRECT CURRENT ELECTROLUMINESCENT DEVICE

Natalya Andreevna Vlasenko, ulitsa Entuziastov, 15, kv. 175; Alla Nikolaevna Gergel, ulitsa Krasnoarmeiskaya, 145, kv. 187, both of Kiev, and Andrei Antonovich Shkola, Belotserkovsky raion, selo Kozhenitskogo, Kievskaya Oblast, all of U.S.S.R.

Filed May 26, 1972, Ser. No. 257,347

Int. Cl. B44d *1/18, 1/16*

U.S. Cl. 428—66 **3 Claims**

1. A method of making a direct-current electroluminescent device, in which an electroluminescent film is deposited onto a heated substrate covered with an optically transparent electrode, comprising vacuum evaporating zinc sulphide doped with manganese, copper, and chlorine from a first evaporator at a temperature between 1,050°C–1,250°C and simultaneously vacuum evaporating metallic zinc from a second evaporator at a temperature between 360°C–400°C, thereby enabling the desired concentration of zinc to be obtained in said film; and vacuum evaporating a metal onto said film to form an electrode on said film.

3,889,017
CHEMICAL FILMING SOLUTION AND PROCESS FOR PLATING THEREWITH

Helmut Franz, Oakmont, and David E. Lecoco, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 2, 1971, Ser. No. 111,904

Int. Cl. C03c *17/10;* **B44d** *1/02*

U.S. Cl. 427—160 **11 Claims**

1. In the method of forming metal based films on nonmetallic substrates comprising the steps of sensitizing the substrate and then simultaneously contacting the substrate with a solution containing a salt of a metal selected from the group consisting of nickel, cobalt and iron and a solution containing a boron-containing reducing agent wherein bulk precipitation rapidly occurs in the solution mixture, thereby inactivating it and preventing full deposition of the metal on the substrate as a film the improvement comprising carrying out said simultaneous contacting in the presence of an effective amount of at least one monocarbonyl containing compound selected from the group consisting of linear alkyl ketones, saturated cyclic ketones, and condensation alcohols of linear alkyl ketones and saturated cyclic ketones to retard bulk precipitation and enhance film deposition.

9. A method of providing a transparent substrate with a transparent film having a metallic luster such substratefilm combination having a transparency or luminous transmittance of less than about 50 percent of that of the substrate alone comprising the steps of:

1. cleaning the substrate;
2. contacting the substrate with a solution comprising a compound containing a metal selected from the group consisting of tin and palladium whereby the substrate is sensitized;
3. washing away residue sensitizing solution from step 2;
4. simultaneously contacting the substrate with a metal containing solution and a reducing solution for the contemplated metal so that the solutions mix,

the metal solution comprises a salt of a metal selected from the group consisting of nickel, cobalt and iron and a monocarbonyl containing compound selected from the group consisting of linear alkyl ketones, saturated cyclic ketones, and condensation alcohols of linear alkyl ketones and saturated cyclic ketones in an effective amount to retard bulk precipitation of metal, and

the reducing solution comprising an alkali metal borohydride and sufficient alkaline material so that the mixture has an initial ph upon contacting greater than 7;

5. washing away residue filming solution mixture from step 4; and
6. drying the filmed substrate.

3,889,018
METHOD OF SIMULTANEOUSLY COATING THE OPPOSITE SIDES OF A PAPER WEB

Richard J. Quint, Dixfield, Maine, assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 341,928, March 16, 1973, which is a continuation of Ser. No. 82,475, Oct. 20, 1970, abandoned, which is a division of Ser. No. 703,924, Feb. 8, 1968. This application Aug. 1, 1973, Ser. No. 384,689

Int. Cl. B05c *11/02*

U.S. Cl. 427—209 **14 Claims**

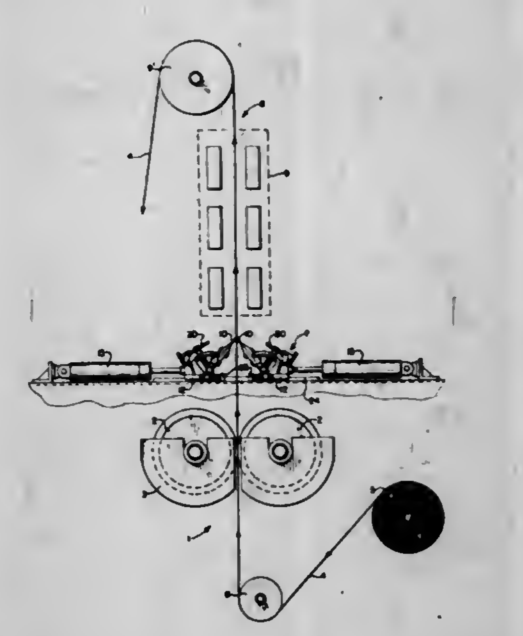
1. The method of simultaneously coating the opposite sides of a paper web comprising the steps of:

a. applying a layer of coating material to the opposite sides of the web;

b. feeding said coated web along a predetermined path;

c. engaging said coated web, as it moves along said predetermined path, by a pair of flexible metering blades disposed and aligned on opposite sides of the web, each said blade extending freely at an acute angle relative to the plane of the coated web in the direction from which the coated web is approaching the the blades, each said blade having a generally flat beveled working face where it engages the coated web; and

d. simultaneously applying equal and opposed pressure against aligned opposite sides of the coated web over an area defined by the width of the web and a distance along its length as it moves along said predetermined path by urging said blades toward each other with a force sufficient to establish and maintain at least a partially flush engagement of said working faces with the opposite sides of the coated web.



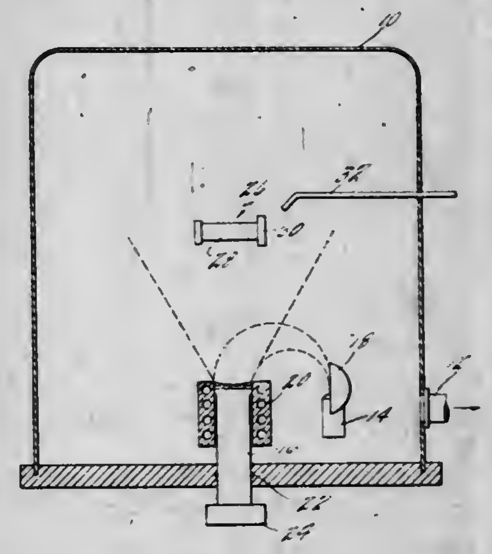
3,889,019
VAPOR RANDOMIZATION IN VACUUM DEPOSITION OF COATINGS

Sol S. Blecherman, Newington; Mitchell J. Bala, Hazardville; Dennis J. Evans, Rocky Hill, and Nicholas E. Ulion, Vernon, all of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Continuation of Ser. No. 806,873, March 13, 1969, abandoned. This application Aug. 12, 1971, Ser. No. 171,292

Int. Cl. C23c *13/02, 13/04*

U.S. Cl. 427—251 **2 Claims**



1. A process of vacuum vapor depositing a protective metal coating on a metallic substrate comprising:

positioning a source of material to be vaporized within an evacuated enclosure;

positioning the substrate within the enclosure above said source in direct line-of-sight thereof such that vapor particles produced by heating said source material impinge on and coat line-of-sight portions of said substrate;

- heating said source material to produce a vapor cloud of coating material moving generally line-of-sight from said source to said substrate and coating line-of-sight portions of the substrate;
- introducing at low velocity an inert gas to increase the pressure in the enclosure to at least 2.0×10^{-4} mm Hg to decrease the mean free collision path of vapor cloud atoms to randomize their direction and cause coating of non-line-of-sight portions of said substrate, said pressure being sufficiently low to prevent sustaining a gas plasma discharge.

3,889,020
METHOD FOR TREATING WOOD

Joseph Amundsen; William H. Wetzel, both of Federal Way; Norma Naimy, Seattle, and Robert J. Goodwin, Puyallup, all of Wash., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

Continuation of Ser. No. 244,877, April 17, 1972, abandoned. This application Mar. 6, 1974, Ser. No. 448,543
Int. Cl. B05c *3/00;* **B27k** *3/08;* **B44d** *1/26*
U.S. Cl. 427—297 12 Claims

12. The method for the production of light colored wooden structures according to claim 1 wherein the amount of co-solvents, waxes, resins, decolorants, surfactants and inhibitors added ranges from about 0.01% to about 1% by weight.

3,889,021
METHOD OF MAKING TOP PLATES FOR RANGE

Shigeo Kuwayama, and Motohiko Yagi, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 24, 1972, Ser. No. 247,057
Claims priority, application Japan, Apr. 23, 1971, 46-26578
Int. Cl. C04b *41/06;* **C03c** *17/04;* **B32b** *17/06*
U.S. Cl. 427—376 5 Claims

1. A method of producing a top plate for a range consisting essentially of coating the surface of a crystalline glass plate with a layer of a suspension in a liquid medium of a mixture consisting essentially of (1) a powder of a crystallizable glass which after being crystallized has substantially the same thermal expansion coefficient as that of said crystalline glass plate or (2) a powder of a glass or ceramic having substantially the same thermal expansion coefficient as that of said crystalline glass plate; a powder of a bonding clay; and an inorganic adhesive containing as the main component from 0.5 to less than 2percent by weight, based on the total weight of the solid components, of an aluminum phosphate selected from the group consisting of an aluminum primary phosphate and aluminum chromium phosphate, drying said coated layer, and subjecting said layer to a burning treatment at a temperature of from about 600°C to 900°C.

3,889,022
FLAME RETARDANT COMPOSITE ARTICLES

Kenneth Whittaker, and David Ronald Morgan, both of Sutton Coldfield, England, assignors to Dunlop Limited, London, England

Filed June 24, 1974, Ser. No. 482,584
Claims priority, application United Kingdom, May 29, 1973, 33663/73
Int. Cl. D03d *25/00;* **B32b** *5/18*
U.S. Cl. 428—262 11 Claims

1. A flame-retardant composite article having a core made from at least one combustible material, wherein said core is covered, at least in part, by a combination of

a. at least one flexible, intumescent, char-forming material; and

b. at least one textile fibrous layer, said combination forming at least one layer or zone.

3,889,023
SILICONE ELASTOMERS BONDED TO SOLID SUBSTRATES

Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 320,375, Jan. 2, 1973, Pat. No. 3,794,612. This application Oct. 4, 1973, Ser. No. 403,685
Int. Cl. B32b *15/08;* **C03c** *17/30*
U.S. Cl. 428—429 5 Claims

1. A composite article comprising a solid substrate having bonded thereto a cured silicone rubber composition comprising (a) 100 parts by weight of a mixture consisting essentially of an organopolysiloxane gum of the unit formula $R_nSiO_{(4-n)/2}$ in which R is selected from the group consisting of methyl, vinyl, phenyl and 3,3,3-trifluoropropyl radicals and n has an average value of from 1.98 to 2.01 inclusive, a reinforcing silica and an organoperoxide vulcanizing agent; and (b) from about 2 to 10 parts by weight of diallylphthalate.

3,889,024
METHOD OF CONTROLLING THE MIGRATION OF RESIN COMPOSITIONS IN THE MANUFACTURE OF POROUS MATERIALS

Arthur H. Drelich, Plainfield, and George J. Lukacs, Perth Amboy, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Feb. 1, 1973, Ser. No. 328,555
Int. Cl. B44d *1/44*
U.S. Cl. 427–243 11 Claims

1. A method of applying a stable aqueous resin composition to porous or absorbent materials and controlling the migration thereon which comprises: applying to porous or absorbent materials a stable, aqueous resin composition comprising from about 0.1 percent to about 60 percent by weight on a solids basis of a synthetic resin and from about 0.01 percent by weight to about 6 percent by weight, based on the weight of the synthetic resin, of an aluminum chlorhydroxide Werner type complex migration control agent selected from the group consisting of: (a) aluminum chlorhydroxides; (b) reaction products of aluminum chlorhydroxide and polyhydroxy compounds; (c) reaction products of aluminum chlorhydroxide and monocarboxylic acids; (d) and mixtures thereof; and substantially immediately diluting said aqueous resin composition to substantially immediately destroy the stability thereof and coagulate said resin whereby the migration of said resin on said porous or absorbent materials is controlled.

3,889,025
PROTECTIVE COATINGS

Donald J. Peterson, Springfield Twsp., Hamilton City, Ohio, assignor to The Procter & Gamble Company, Ohio

Division of Ser. No. 208,024, Dec. 3, 1971, Pat. No. 3,839,502, which is a continuation-in-part of Ser. No. 158,527, June 30, 1971, abandoned. This application Mar. 27, 1974, Ser. No. 455,466
Int. Cl. B44d *1/26*
U.S. Cl. 428—413 9 Claims

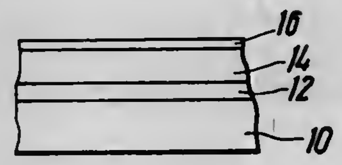
4. A process according to claim 1 wherein the organotin compound is applied at a rate from about 0.01 g. to about 10 g. per square meter of surface area of the wood being treated.

3,889,026
HEAT-REFLECTING PANE

Rolf Groth, Witten, Germany, assignor to BFG Glassgroup, Paris, France

Filed Nov. 5, 1973, Ser. No. 412,985
Claims priority, application Germany, Nov. 17, 1972, 2256441
Int. Cl. B32b *17/06, 1/04*
U.S. Cl. 428—34 11 Claims

1. Heat-reflecting pane consisting essentially of a transparent layer support, a light-transmitting silver layer applied to the transparent layer support, and a dielectric layer selected from the group consisting of zinc sulfide, cerium dioxide, titanium oxide and bismuth oxide that is absorption-free or at least of low absorption for visible light, disposed between the layer support and the silver layer and having a refractive index greater than 2, characterized in that, for the achievement of color neutrality both upon viewing from the inside and upon viewing from the outside, the thickness of the silver layer is between 140 and 240 A and the thickness of the dielectric layer is between 400 and 600 A.



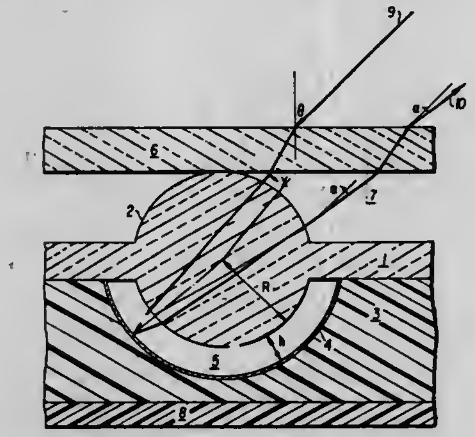
7. A safety laminate pane comprising at least two panes joined by an adhesive interlayer, of which at least one is the heat-reflecting pane of claim 1 and is so disposed that the silver layer faces the adhesive interlayer.

10. A double-glazing unit comprising at least two panes in spaced apart relationship, of which at least one is the heat-reflecting pane of claim 1 whose coated side faces the gap between the panes.

3,889,027
RETROREFLECTIVE FILM

Michael L. White, Morrisville, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 238,046, March 27, 1972, abandoned. This application Apr. 12, 1974, Ser. No. 460,638
Int. Cl. B44f *1/02*
U.S. Cl. 428—34 4 Claims



1. A retroreflective laminate comprising a first film having hemispherically formed depressions of uniform size and shape on one surface thereof, said surface having a reflective material deposited thereon, a second optically transparent film with each surface being so fashioned as to form matched and opposed substantially hemispherical projections of uniform size and shape from each surface of said film, where said projections have an identical center-to-center spacing but a smaller radius than that of the hemipsherical depressions of the first film, the first and second films being arranged so that the substantially hemispherical projections on one surface of the second film are matched concentrically with the hemispherical depressions of the first film to leave a space therebetween, and a third optically clear overlay film, disposed over the substantially hemispherical projections on the other surface of the second film, said overlay film making tangential contact with said projections to leave a space therebetween, the laminate being bonded together discontinuously over about 20 percent or less of the total area of the laminate to minimize optical inactivity caused by the bonding process.

2. A retroreflective laminate comprising a first film having hemispherically formed depressions of uniform size and shape on one surface thereof, said surface having a reflective material deposited thereon, a second optically transparent film having substantially hemispherical projections of uniform size and shape formed on one surface of said film, where said projections have an identical center-to-center spacing but a smaller radius than that of the hemispherical depressions of the first film, the first and second films being arranged so that the substantially hemispherical projections of the second film are matched concentrically with the hemispherical depressions of the first film to leave a space therebetween, the other surface of the second film forming an outer surface of said laminate, the laminate being bonded together discontinuously over about 20 percent or less of the total area of the laminate to minimize optical inactivity caused by the bonding process.

3,889,028
NON-WOVEN MATERIALS

Hermann Hosterey, Bad Mingolsheim; Hans Horst Moller, Keimen, and Ernst Raabe, Bad Mingolsheim, all of Germany, assignors to Imperial Chemical Industries Limited, London, England

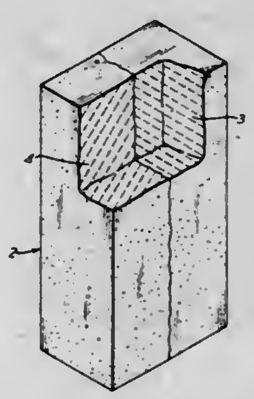
Filed July 18, 1972, Ser. No. 272,841
Int. Cl. D04h *11/08*
U.S. Cl. 428—88 17 Claims

1. A textile material comprising a base fabric formed from a non-woven web having a loop-pile surface in which the fibres in the loops extend at angles of 45° to 90° to the plane of the base fabric, said fibres being integral with the base fabric and derived therefrom wherein at least 5 percent of the fibres in both the base fabric and the pile are composite fibres each formed of at least two fibre-forming synthetic polymer components arranged in distinct zones across the cross-section of the fibre, at least one of said components being potentially adhesive under conditions which leave the remainder of the components unaffected and occupying at least part of the outer surface of the composite fibre, the structure being bonded by the potentially adhesive components of said composite fibres at a multiplicity of points between contiguous fibres in both the base and the loop-pile.

3,889,029
LADLE BRICK FOR LINING HIGH TEMPERATURE VESSELS

Leroy A. Keller, Sarver, Pa., assignor to Freeport Brick Company, Freeport, Pa.

Filed Nov. 9, 1973, Ser. No. 414,314
Int. Cl.^{2} B32B *13/04*
U.S. Cl. 428—212 6 Claims



1. A fired refractory brick for lining a vessel for molten metal, the brick having a vessel-engaging face and an opposite face for engagement by molten metal, the brick being formed from two different compositions integrally united between said faces, the composition of the portion of the brick with said vessel-engaging face being at least one inch thick and essentially a blend of refractory bond clay and calcined fire-clay, and the composition of the portion of the brick with said metal-engaging face being essentially a blend of refractory bond clay and calcined high alumina material, whereby said

last-mentioned face has more resistance to corrosion and erosion by molten metal than said first-mentioned face, said blends having substantially the same coefficients of thermal expansion during firing of the brick, and said first-mentioned portion of the fired brick having the property of greater expansion than the other portion of the brick when the fired brick is heated above 2,400°F in use.

3,889,030

METHOD OF COATING GLASS ARTICLE AND IMPROVED COATED GLASSWARE PRODUCT

Roy S. Arrandale, Elmira; Wayne A. Walding, Horseheads, and Barney R. Daugherty, Elmira, all of N.Y., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Aug. 22, 1972, Ser. No. 282,824
Int. Cl. C03c *17/32;* **B32b** *17/10*
U.S. Cl. 428—215 **11 Claims**

8. Coated glassware article having improved durability and resistance to shattering comprising

a. a glass container

b. a first coating consisting essentially of a polymer of an ethylenically unsaturated carboxylic acid; and

c. a second coating consisting essentially of a homopolyer of an olefin said second coating being relatively thicker than said first coating.

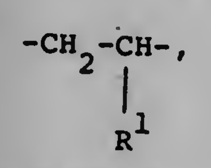
3,889,031

COATED GLASS BOTTLES

Testujiro Tatsumi; Reiji Miyamoto, both of Chiba; Yutaka Matsui, Shizuoka; Seiji Kazama, Hyogo; Tadao Takemura, Nara, and Hikoyoshi Kanayama, Chiba, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka and Mitsui Polychemicals, Co., Ltd., Tokyo, both of, Japan

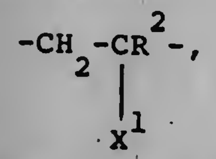
Filed Oct. 26, 1972, Ser. No. 301,245
Claims priority, application Japan, Nov. 24, 1971, 46-94362
Int. Cl. B41m *1/18;* **B44c** *3/02;* **B44d** *1/02*
U.S. Cl. 428–216 **7 Claims**

1. A glass bottle, the surface of which has been initially coated with an olefine copolymer containing repeating units of (a)



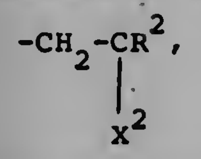
$$-\mathrm{CH_2}-\underset{\substack{|\\ \mathrm{R}^1}}{\mathrm{CH}}-,$$

wherein R^1 is hydrogen or lower alkyl, (b)



$$-\mathrm{CH_2}-\underset{\substack{|\\ \mathrm{X}^1}}{\mathrm{CR}^2}-,$$

wherein R^2 is hydrogen or methyl, and X^1 is $-OH$ or $-COO(CH_2)_nOH$ in which n is 1 to 3 and (c)



$$-\mathrm{CH_2}-\underset{\substack{|\\ \mathrm{X}^2}}{\mathrm{CR}^2},$$

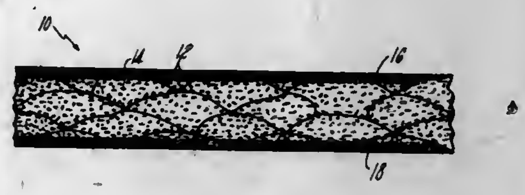
wherein R^2 has the same meaning as above and X^2 is $-OCOR^3$ or $-COOR^4$ in which R^3 and R^4 are lower alkyl, the total amount of the repeating units (b) and (c) in the copolymer being about 1 to about 50 mole percent, and the amount of the repeating unit (b) being about 50 to about 100 mole percent relative to the total amount of the repeating units (b) and (c), such copolymer showing a melt index of about 0.5 to about 1,000 g/10 min, and then subsequently coated with a polyisocyanate, a mixture of polyisocyanate and a polyol or a mixture of a polyisocyanate and a thermoplastic polyurethane.

3,889,032

FOAMED PLASTIC SHEET MATERIAL AND SYSTEM FOR ITS MANUFACTURE

Lester Max Koelsch, 219 Conestoga St., Windsor, Conn. 06095

Filed May 10, 1972, Ser. No. 251,944
Int. Cl. B32b *3/12*
U.S. Cl. 428—218 **4 Claims**



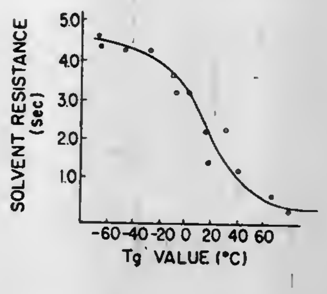
1. A foamed plastic sheet material of improved flexibility and reduced brittleness suited for use in place of fiber board material for book cover backings and the like consisting essentially of compressed polyvinyl aromatic plastic particles of closed-cell structure having a density of 5–15 pounds per cubic foot, said sheeting having planar exposed surfaces, a thickness of about 0.50–0.25 inch and a cross-section of uniform thickness containing a latticework comprised of a multiplicity of continuous, diagonally extending and intermeshed areas of cell-separating fused particle interface winding through the interior of the thin sheet wherein the areas of fused particle interface extend between the exposed surfaces of the sheet at sharp acute angles thereto and intersect to provide a hinge effect at their points of intersection, the closed and separated cells being elongated along the plane of the sheet and of a generally elliptical configuration, each exposed surface exhibiting a smooth, continuous uninterruped surface skin of said thermoplastic material, said sheet exhibiting a density gradiant across its thickness with the higher density being at both of said planar surfaces.

3,889,033

TRANSFERRING PAPER FOR ELECTROPHOTOGRAPHY

Hiroshi Tanaka; Ikuo Soma, both of Tokyo; Yoshikazu Ito, and Masayasu Kamijo, both of Fuji, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1973, Ser. No. 337,118
Claims priority, application Japan, Mar. 3, 1972, 47-22002
Int. Cl. D21h *1/28*
U.S. Cl. 428—323 **5 Claims**



1. A transferring paper for an electrophotographic process comprising developing an electric latent image with a liquid developer and transferring the image thus developed to the transferring paper which comprises a base paper and a coating layer produced by coating on the base paper a coating agent composed of 100–400 parts (as solid) of a polymer emulsion having a second order transition temperature of from −40°C to 25°C as a binder, and 100 parts of a white inorganic filler of a particle size of less than 3 microns and selected from the group consisting of clay, titanium oxide, calcium carbonate and barium sulfate in the amount of 2–10 g./m² (as a solid), carrier resistance of the resulting transferring surface being

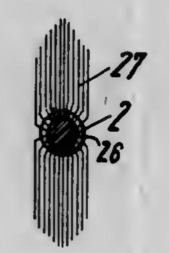
1.5–15 sec., smoothness of the resulting transferring surface being 30–300 sec. and density being 0.75–100 g./cm³.

3,889,034

CHENILLE YARN AND METHOD OF MAKING SAME

Gerhard Lenards, and Walter Bahren, both of Rheydt, Germany, assignors to Kuhn Vierhaus & Cie. AG., Rheydt, Germany

Filed Jan. 18, 1974, Ser. No. 434,573
Claims priority, application Germany, Jan. 27, 1973, 2304049
Int. Cl. D02g *3/42;* **B44c** *1/08*
U.S. Cl. 428—372 **4 Claims**



1. A chenille yarn comprising:

a core filament;

a layer of adhesive surrounding said filament; and

a multiplicity of flocking fibers projecting from said filament and each having one end imbedded in said layer, said fibers being oriented generally parallel to one another and transverse to said filament from about the point of exit from said adhesive layer.

2. A method of making a chenille yarn comprising the steps of:

coating a core filament with an adhesive layer;

electrostatically charging a mass of flocking fibers;

passing the coated filament through said mass whereby said fibers adhere to and flock said coated filament, said filaments each having one end embedded in said adhesive layer;

flattening and fixing the coated and flocked filament; and

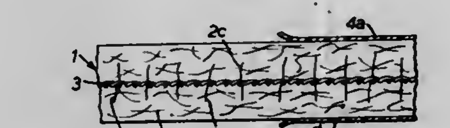
orienting said fibers generally parallel to one another and transverse to said filament from about the point of exit of said fibers from said adhesive layer.

3,889,035

FIBER-REINFORCED PLASTIC ARTICLES

John Harry Jakes, Stamford, England, assignor to Marling Industries Limited, London, England

Filed Nov. 27, 1972, Ser. No. 309,617
Int. Cl. B32b *17/04, 17/10, 17/12*
U.S. Cl. 428—227 **12 Claims**



1. A moldable sheet material, comprising

a. a mass of incompletely polymerized thermosetting resin;

b. at least one continuous web of stretchable glass fiber knitted fabric contained within and extending longitudinally of said resin mass;

c. first layers of randomly arranged glass fibers disposed on opposite sides of said fabric, respectively, for spacing said fabric from the major faces of said sheet material; and

d. a plurality of reinforcing glass fibers passing through said fabric with the ends of said reinforcing fibers locked in normal arrangement to the glass fiber layer surfaces, thereby to secure together said glass fiber layers.

3,889,036

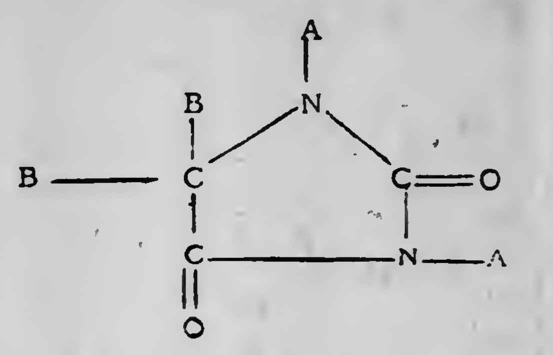
THEIC-HYDANTOIN-ESTER RESINS FOR WIRE COATINGS

Jerome A. Preston, Angola, Ind., assignor to Essex International Inc., Fort Wayne, Ind.

Division of Ser. No. 402,977, Oct. 3, 1973, Pat. No. 3,835,121, which is a continuation-in-part of Ser. No. 275,922, July 18, 1972, Pat. No. 3,779,991, which is a continuation-in-part of Ser. No. 58,173, July 24, 1970, Pat. No. 3,681,282. This application May 9, 1974, Ser. No. 468,517
Int. Cl. H01b *3/42;* **C08g** *22/08*
U.S. Cl. 428–383 **8 Claims**

1. An electrical conductor having a first coating of a resin composition having hydantoin and isocyanurate radicals in the polymer backbone which comprises the reaction product of:

a. a monomeric hydantoin compound having the structural formula



wherein A is H, OH; ROH; COOH; RCOOOH; NH_2; RNH_2; $(OR)_x$ OH wherein R is $(CH_2)_y$, y is 1-5, and x is an integer in the range of 1 to 10; or, $R_1—O—R_2$ wherein R_1 and R_2 are $C_1—C_5$ alkyl groups; and, B is H, OH, ROH, COOH, RCOOH, NH_2, RNH_2, or a $C_1—C_{10}$ alkyl group, or dimers or trimers of said monomeric hydantoin compound;

b. an aromatic carboxylic acid having at least two carboxy groups or an anhydride, ester, or chloride of said acid; and,

c. tris (2-hydroxyethyl)isocyanurate, as a polyhydric alcohol component;

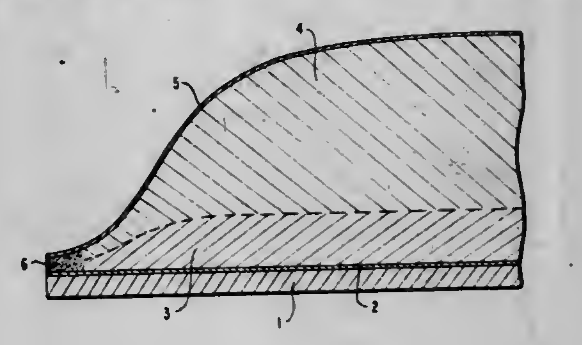
d. said reaction effected at a temperature of about 150°C to about 280°C, and, a second nylon topcoat over said first coating.

3,889,037

MULTIPLE-LAYERED, WELDABLE PADDED ELEMENT

Heinz van den Berg, Hennef, Stadt Blankengerg, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Germany

Filed May 16, 1974, Ser. No. 470,586
Claims priority, application Germany, May 16, 1973, 2324615
Int. Cl. B32b *3/26*
U.S. Cl. 428—302 **5 Claims**



1. A multiple-layered padded element weldable in a high-frequency field, for example for use in the automobile industry, comprising a layer of PVC foam material provided between a cover layer of a thermoplastic synthetic resin film, and a dimensionally stable bottom layer, optionally coated with an auxiliary polymeric welding agent, and a layer provided be-

tween the PVC foam layer and the dimensionally stable bottom layer, said layer being joined to the layer of PVC foam material and comprising a welding wad of fibrous material wetted on its surface with a dispersion of a mixture of polyvinyl chloride and polyvinyl acetate.

3,889,038
COATED FILAMENT AND METHOD OF FORMING SAME

Sol B. Wiczer, 3235 Sleepy Hollow Rd., Falls Church, Va.

Continuation of Ser. No. 515,806, Dec. 21, 1965, abandoned, which is a continuation-in-part of Ser. No. 157,591, Dec. 6, 1961, Pat. No. 3,278,329, which is a continuation-in-part of Ser. No. 777,344, Dec. 1, 1958, abandoned, which is a continuation-in-part of Ser. No. 353,003, May 4, 1953, Pat. No. 2,862,284. This application July 11, 1969, Ser. No. 871,747

Int. Cl. D02g *3/00*

U.S. Cl. 428—361 **10 Claims**

1. Separate individual filaments each capable of use as artificial fiber comprising a filament core having a substantially even continuous plastic film surface coating thereon, interrupted only by open pocks and pores in said surface coating.

3,889,039
NUCLEATION AND ORIENTATION OF LINEAR POLYMERS

Eugene Wainer, Shaker Heights, Ohio, assignor to Horizons Incorporated, Cleveland, Ohio

Filed Apr. 26, 1973, Ser. No. 354,594

Int. Cl. B32b *5/16;* **H01f** *1/11, 1/30*

U.S. Cl. 428—404 **17 Claims**

1. A shaped synthetic polyalkylene terephthalate polymer article with enhanced physical properties consisting essentially of the following:

a body of liner polymer consisting of amorphous and crystalline segments and up to 50 percent by weight of a nucleating agent consisting of particles of a solid inorganic acicular silicate material distributed uniformly throughout said body and oriented in a preferred direction, said inorganic material consisting of crystals with A, B, and C-axes, the length of the *C*-axis of said crystals being within 10 percent of the length of the *C*-axis of the crystalline polymer, and the lengths of either the A or B axis of said crystals being within 20 percent of the lengths of the A or B-axis of the crystalline polymer, and the angle between the A-axis and the C-axis of said inorganic crystalline material being within 20 percent of the angle between the A-axis and the C-axis of said crystalline polymer.

9. The article of claim 1 additionally containing up to about 20 percent by weight of at least one magnetic non-metallic sweeping agent selected from the group consisting of oxide and phosphate compounds of Cr, Co, Fe, Mn or rare earth elements other than La, Y and Ce.

10. The article of claim 1 which has been subjected to a magnetic field of between 1 and 1000 gauss during at least a part of the molding of the article.

3,889,040
PROCESS FOR THE CONTINUOUS COATING OF PLASTICS

Joachim Wank, Zons; Eckart Reese, Dormagen; Josef Rohrbach, Schildgen, and Rolf Bruck, Odenthal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed May 21, 1973, Ser. No. 362,483

Claims priority, application Germany, May 26, 1972, 2225644

Int. Cl. B32b *27/08*

U.S. Cl. 428—412 **1 Claim**

1. In the process for manufacturing a laminate by coating a substrate of an impact-resistant first plastic material with a second plastic material which is a polyurethane or an unsaturated polyester having a coefficient of static friction of up to 0.5, a modulus of elasticity of between 200 and 2,000 kg/cm², a maximum tolerated surface limiting work in the linear region of the stress-strain diagram, determined from a high-speed tear test at 10 m/sec on a test rod according to Buchmann, of less than 2,500 mkp/s . 1/cm² and a speed of recovery after stressing of between 1 and 10 m/sec, the improvement which comprises coating the first plastic material with a 30 to 80 percent by weight solution of said second plastic material containing admixed therewith a 5 to 40 percent by weight solution of a cellulose ester or a 0.1 to 10 percent by weight solution of a silicone oil, the amount of cellulose ester solution employed supplying 0.5 to 5 percent by weight of cellulose ester and the amount of silicone oil solution employed supplying 0.01 to 2 percent by weight of silicone oil, said amounts being based on the amount of second plastic material coated on said substrate.

3,889,041
MULTILAYER METALLIZED BERYLLIA CERAMICS AND A METHOD FOR PRODUCING THE SAME

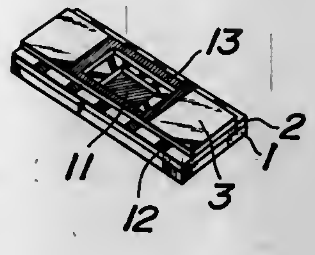
Shunzo Mase, and Tetsuo Watanabe, both of Nagoya, Japan, assignors to NGK Insulators Ltd., Nagoya, Japan

Filed Nov. 16, 1972, Ser. No. 307,147

Claims priority, application Japan, Nov. 22, 1971, 46/92997

Int. Cl. C04b *39/12;* **B32b** *31/26*

U.S. Cl. 428—472 **2 Claims**



1. Multilayer metallized sintered beryllia ceramics prepared from at least one metallizing layer present between unsintered beryllia sheets, said metallizing layer made from a metallizing paste consisting of 60–97% by weight of at least one metal selected from the group consisting of molybdenum and tungsten, 1.5–39.6% by weight of beryllia and 0.03–20% by weight of at least one rare earth metal oxide selected from the group consisting of lanthanum oxide, yttria and praseodymium oxide, provided that the amount of the rare earth metal oxide being not more than the amount of beryllia, a part of said metallizing layer being present in the sintered beryllia ceramics.

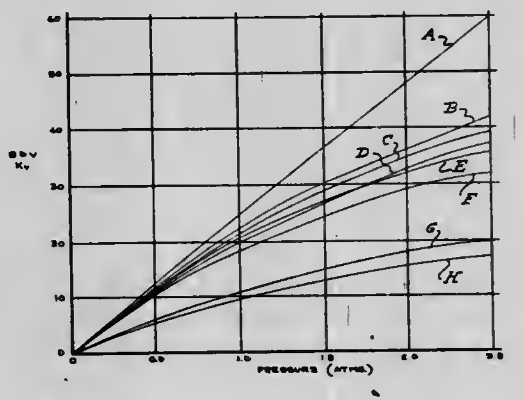
3,889,042
METHOD AND APPARATUS FOR COOLING AND INSULATING ELECTRICAL EQUIPMENT

Whitney H. Mears, Buffalo, N.Y., assignor to Allied Chemical Corporation, New York

Continuation-in-part of Ser. No. 318,301, Dec. 26, 1972, abandoned, which is a continuation-in-part of Ser. No. 60,680, Aug. 3, 1970, abandoned. This application Dec. 10, 1973, Ser. No. 423,614

Int. Cl. H01b *7/34*

U.S. Cl. 174—15 R **28 Claims**



1. A method for cooling and insulating high voltage electrical equipment which comprises bathing said high voltage electrical equipment in a fluidized bed comprising a particulate solid dielectric material, which is a dielectric anhydrous oxide or a plastic, said particulate solid dielectric material being chemically stable and solid at a temperature of about 150°C. and which is fluidized with a dielectric gas.

3,889,043
EARTHING JOINT FOR SHIELDING CHAMBERS ELECTRICALLY AND ELECTROMAGNETICALLY

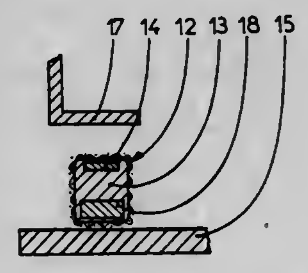
Emile Paul Jules Jean Ducros, 37, avenue of Saint Mande, Paris, France

Filed June 7, 1973, Ser. No. 367,833

Claims priority, application France, June 9, 1973, 72.20885

Int. Cl. H05k *9/00*

U.S. Cl. 174—35 GC **4 Claims**



1. A shielding gasket for use in an earthing joint for shielding chambers electrically and electromagnetically, comprising:

a flexible strip;

a magnetized material in the form of a first strip embedded close to one edge of said flexible strip; and,

an electrically conducting envelope of a metal mesh enclosing said flexible strip and its first strip of embedded magnetized material.

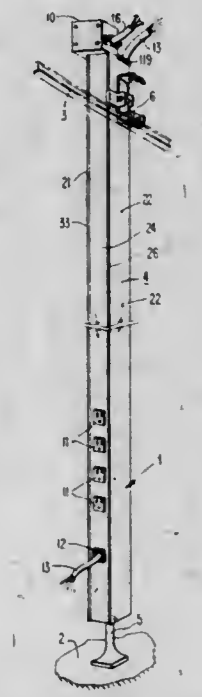
3,889,044
SERVICE POLES

Charles T. Flachbarth, and John L. Myers, both of Parkersburg, W. Va., assignors to Textron Inc., Providence, R.I.

Filed Apr. 29, 1974, Ser. No. 464,803

Int. Cl. H02g *3/04*

U.S. Cl. 174—48 **16 Claims**



1. A service pole for supplying power and/or telephone outlets in a room, the pole being adapted to extend between the floor and the ceiling of the room and the ceiling being the suspended type having inverted T-bar members for supporting panels, the pole comprising:

an elongated, hollow housing for carrying power and/or telephone conductors, the housing being formed with one side open;

a cover removably connected to the housing and extending over said open side, the open side providing access to the interior of the housing with the cover removed; and

a T-bar and tie-rod hanger comprising a base engaging said housing adjacent the top thereof, removable clamp means engaging the housing and said base and holding the hanger against the housing, a pair of spaced jaws extending outwardly from the bottom of the base for receiving the leg of a T-bar therebetween, a screw threaded in one jaw and operative to engage the T-bar leg and clamp the same against the other jaw and a connector flange extending outwardly from the top of the base and having a slot for receiving a tie rod, said base, said clamp, said jaws and said connector flange each being spaced from said cover so as not to interfere with removal of the cover.

3,889,045
SECURING OF SERVICE LINES IN HOLLOW BOAT MASTS

John Logsdon, 101 Gedney St., Nyack, N.Y. 10960

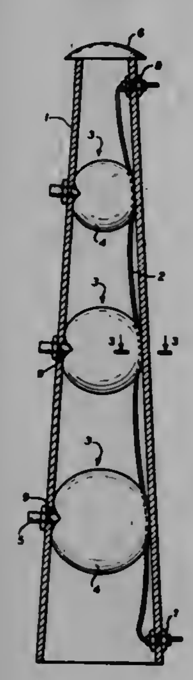
Filed Oct. 7, 1974, Ser. No. 512,600

Int. Cl. B63b *15/00;* **H02g** *3/02*

U.S. Cl. 174—70 R **6 Claims**

1. In a boat mast having a longitudinally extending passageway therein rendering the mast hollow and having a line disposed within the passageway extending longitudinally thereof over a length such that the line tends to slap against the inside wall of the passageway when the boat rocks or pitches, thereby generating disturbing noise, the improvement which comprises at least one inflated balloon disposed within the passageway intermediate the ends thereof, closing the pas-

sageway, and holding the line against the passageway wall so that the slapping of the line against the passageway wall is

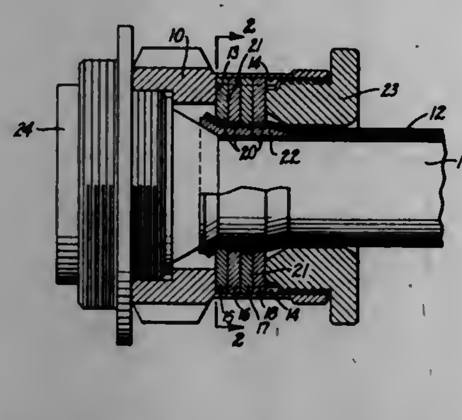


reduced, whereby said generating of disturbing noise is reduced.

3,889,046
STRAIN RELIEF AND GROUNDING DEVICE FOR SHIELDED ELECTRICAL CABLES

Robert C. Oberdiear, Los Angeles, Calif., assignor to Amex Systems, Inc., Lawndale, Calif.

Filed Aug. 27, 1973, Ser. No. 392,045
Int. Cl. H02g *15/02*; **H01r** *3/02*
U.S. Cl. 174—78 **5 Claims**

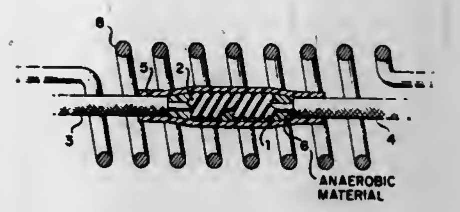


1. A strain relief and grounding assembly in combination with a shielded electrical cable, said assembly comprising a substantially cylindrical housing having an electrically conductive inner wall, four electrically conductive rings having equal outer diameters substantially corresponding to the inner diameter of said housing, said rings being mounted for longitudinal movement within said housing, stop means within said housing for limiting the longitudinal movement of said rings within said housing, said rings having openings therein of equal diameter which are slightly larger than the outer diameter of said cable, the opening in each of said rings being out of alignment with the openings in all of the other rings when said rings are mounted in said housing, said cable being movable through the openings in said rings when said rings are spaced apart from each other within said housing, and means exerting pressure against the opposite sides of said rings to move said rings into substantially adjacent relationship with each other so that the openings of said rings form a single combined opening of smaller diameter than the outer diameter of said cable, the inner peripheries of said rings being thereby held in tight engagement with the shielding of said cable at four different places spaced around the periphery of said shielding to provide simultaneous strain relief and electrical grounding of said cable, the compressive and strain relief force being divided between all of said rings.

3,889,047
SEALING AND MOISTURE-PROOFING OF ELECTRICAL JOINTS

David Carver, Sherman Oaks, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Feb. 15, 1974, Ser. No. 443,105
Int. Cl. H02g *15/08*
U.S. Cl. 174—84 R **3 Claims**

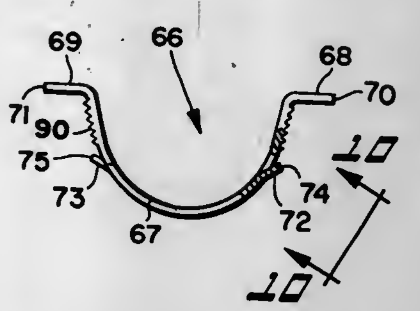


3. An hermetically sealed electrical joint comprising:
- first and second electrical conductors which have been joined to provide a circuit path therethrough;
- a mass of polymerized anaerobic sealant covering the joined portions of said conductors; and
- a dielectric sleeve of heat-shrunk material disposed about the outer surface of said sealant so as to maintain the polymerization thereof by the exclusion of ambient air thereto.

3,889,048
ELECTRICAL CONNECTOR AND CLIP THEREFOR HAVING BARBS TO ENSURE PROPER PREASSEMBLY

John Elmer Groth, Cleveland Heights, Ohio, assignor to Erico Products, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 298,769, Oct. 4, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 428,137
Int. Cl. H02g *15/08*
U.S. Cl. 174—94 R **3 Claims**

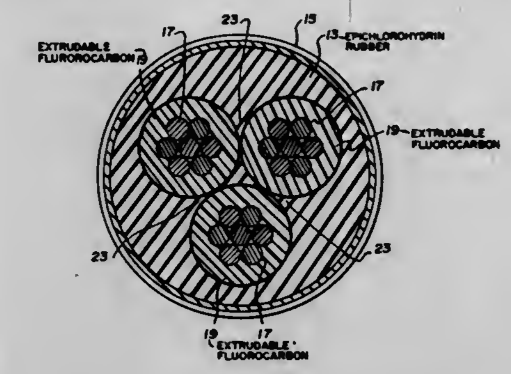


1. An electrical connector comprising a deformable relatively soft body having at least one conductor receiving slot therein, which has smooth planar side walls, an omega-shape resilient clip in said slot having a curved central portion and outwardly bent oppositely directed legs, said legs overlying the edges of said slot while said clip is held in said slot by spring pressure of the constricted curved central portion of said clip, said central portion of said clip having sharp projections biting into said planar side walls of said body resisting withdrawal of said resilient clip from said slot, the legs of said clip terminating in relatively sharp hard edges whereby when said clip is forced into said slot by a conductor, the body of said clip will enfold about the conductor while the sharp hard edges bite into the walls of such slot holding the conductor in such slot, said sharp projections being barbs struck from the sides of the curved central portion of said clip and projecting symmetrically one on each side of the clip outwardly of said slot at an angle to the walls thereof and having sharp terminal ends biting as aforesaid into the planar sidewalls of said body.

3,889,049
SUBMERSIBLE CABLE

Leo V. Legg, Tulsa, Okla., and Donatas Tijunelis, Buffalo Groove, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 342,008, March 16, 1973, abandoned. This application Jan. 14, 1974, Ser. No. 433,332
Int. Cl. H01b *7/18*, *3/30*
U.S. Cl. 174—102 R **4 Claims**

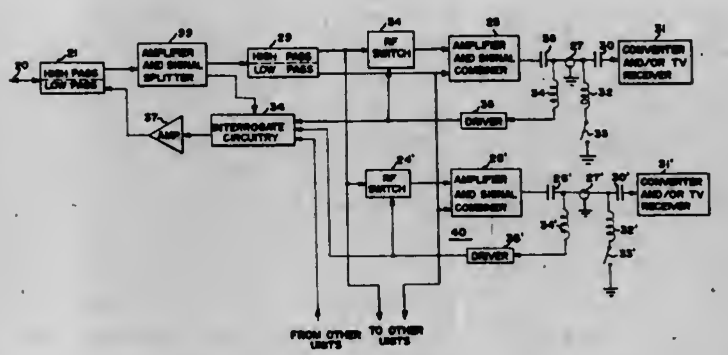

EXTRUDABLE FLUROROCARBON 19
17
23
15
13 EPICHLOROHYDRIN RUBBER
17
19 EXTRUDABLE FLUOROCARBON
23
23
19
17
EXTRUDABLE FLUOROCARBON

1. A multicomponent electrical cable for use with a submersible motor in high temperature, high pressure oil wells and in the presence of oil well fluids comprising:
- at least one electrical conductor;
- an extruded layer of insulating material having an average thickness of 0.010 inch to 0.080 inch surrounding the conductor;
- said layer being of an extrudable fluorocarbon having a melting point of about 460°F;
- a resilient fluid impervious jacket surrounding said insulating material;
- said impervious jacket being of an epichlorohydrin rubber of high molecular weight protecting said extruded layer from well fluids; and
- an outer armor surrounding said resilient jacket.

3,889,050
SUBSCRIPTION TELEVISION SYSTEM AND SWITCHING STATION THEREFOR

Wallace T. Thompson, El Paso, Tex., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Apr. 11, 1974, Ser. No. 460,025
Int. Cl. H04n *1/44*
U.S. Cl. 178—5.1 **23 Claims**

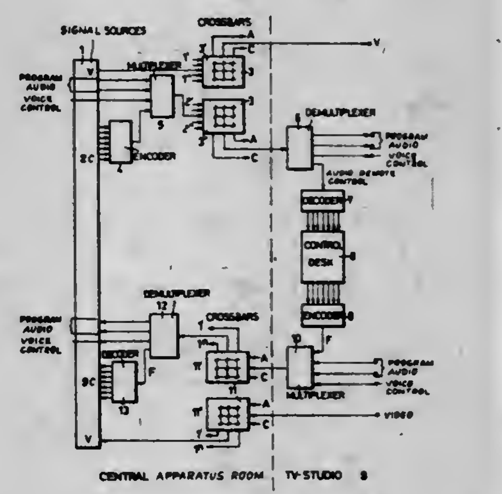

HIGH PASS LOW PASS
AMPLIFIER AND SIGNAL SPLITTER
HIGH PASS LOW PASS
RF SWITCH
AMPLIFIER AND SIGNAL COMBINER
CONVERTER AND/OR TV RECEIVER
INTERROGATE CIRCUITRY
DRIVER
RF SWITCH
AMPLIFIER AND SIGNAL COMBINER
CONVERTER AND/OR TV RECEIVER
DRIVER
FROM OTHER UNITS
TO OTHER UNITS

1. In a subscription television system wherein television signals are distributed via a cable, a switching station comprising:
- coupling means for connection to said cable for receiving a composite signal including television signals and interrogation signals;
- signal splitting means connected to said coupling means for separating the received signals;
- switching means connected to said signal splitting means for receiving said television signals and for coupling said television signals therethrough in response to a switching signal;
- output means connected to said switching means for providing signals to a subscriber drop cable;
- sensing means connected to said output means and to said switching means for providing a switching signal to said switching means when the presence of a subscriber demand signal from the subscriber drop cable is detected thereby; and
- interrogating means connected to said coupling means, said signal splitting means, and said sensing means for providing a signal to said coupling means indicative of the signal from said sensing means in response to said interrogation signals.

3,889,051
METHOD AND SYSTEM FOR TRANSMITTING SIGNALS FROM A SELECTED ONE OF A PLURALITY OF VIDEO SOURCES IN A CENTRAL APPARATUS ROOM AND THE ASSOCIATED AUDIO AND CONTROL SIGNALS TO AT LEAST ONE TELEVISION STUDIO

Ernst Legler, Seeheim, Germany, assignor to Robert Bosch Fernsehanlagen G.m.b.H., Darmstadt, Germany

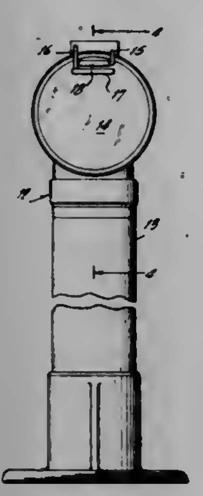
Filed May 16, 1974, Ser. No. 470,468
Claims priority, application Germany, May 18, 1973, 2325192
Int. Cl. H04n *7/10*, *7/18*
U.S. Cl. 178—5.6 **12 Claims**



8. In a television complex having at least one television studio and one central apparatus room having a plurality of video signal sources for furnishing video signals, program audio signal sources for furnishing program audio signals associated with corresponding ones of said video signals and remote control signal sources for furnishing DC remote control signals associated with corresponding ones of said video signals, a method for transmitting a selected one of said video signals and the program and remote control signals associated therewith from said central apparatus room to said television studio comprising, in combination, the steps of converting each of said DC remote control signals to a corresponding audio frequency remote control signal; multiplexing each of said audio frequency remote control signals with the corresponding one of said program audio signals and furnishing corresponding multiplexer output signals; and switching said selected video signal and the corresponding one of said multiplexer output signals to a determined output for transmission to said television studio.

3,889,052
NAVIGATION AND SURVEILLANCE SYSTEM

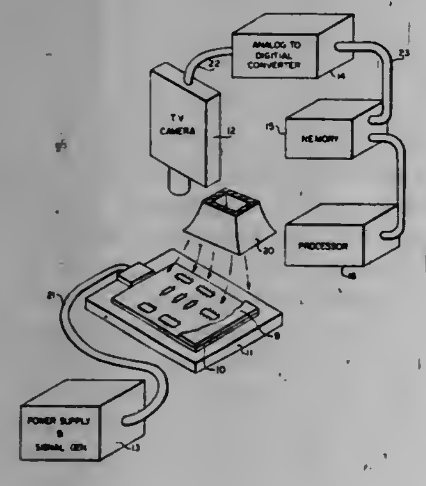
Frank G. Back, 53 Sea Cliff Ave., Glen Cove, N.Y. 11542
Filed Oct. 19, 1973, Ser. No. 408,110
Int. Cl. H04n *7/18*
U.S. Cl. 178—6 **5 Claims**



1. A surveillance system comprising, in combination, two horizontally spaced viewing stations, each having a rotatable hollow housing, a window in the housing to admit light from an area to be viewed into the housing, a rockable prism to receive the light passing through the window and redirect it, a zoom lens to receive the light coming from the prism, a television camera to receive the light transmitted by the zoom lens, a television receiver connected to each of the television cameras to display the scene viewed by each of the viewing stations and cleaning means carried by the housings and directed at the outer surface of the windows to remove foreign matter therefrom.

3,889,053
CONTACTLESS TEST SYSTEM

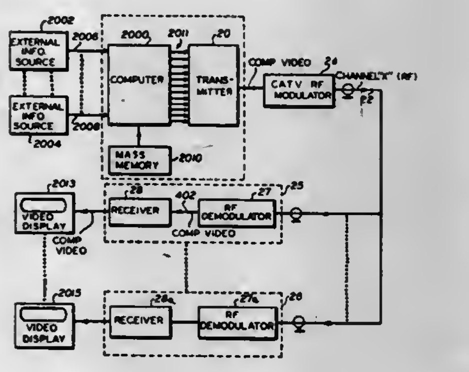
Raymond A. Lloyd, Laurel, and William L. Hrybyk, Linthicum, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Oct. 30, 1973, Ser. No. 411,116
Int. Cl. H04n *7/18*
U.S. Cl. 178—6 **9 Claims**



1. A method for inspecting a member of a class of related device to determine its operational status, comprising the steps of:
- a. coating the surface of a reference member with a first heat sensitive layer to convert heat patterns to light patterns;
- b. scanning the surface of said first heat sensitive layer with a light sensitive device to generate a reference signal indicative of the temperature distribution of the surface of said reference member;
- c. coating the surface of the member to be inspected with a second heat sensitive layer to convert heat patterns to light patterns;
- d. scanning the surface of said second heat sensitive layer with a light sensitive detector to generate a test signal indicative of the temperature distribution of the surface of said member;
- e. comparing said reference and test signals to identify difference therebetween;
- f. statistically analyzing said difference to determine if said member to be inspected is operating within prescribed limits.

3,889,054
ROW GRABBING SYSTEM

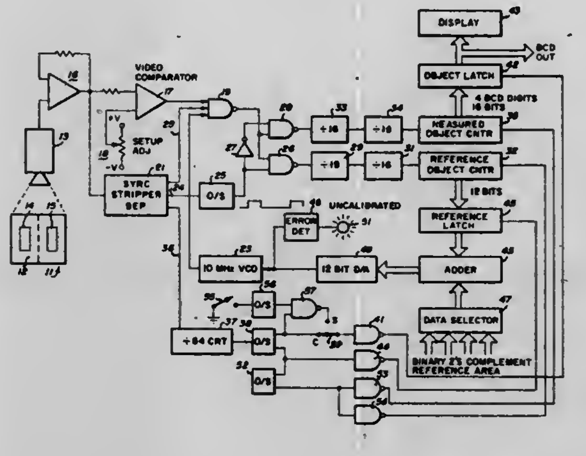
Robert H. Nagel, New York, and Richard Saylor, Monsey, both of N.Y., assignors to IDR, Inc., New York, N.Y.
Filed Jan. 17, 1974, Ser. No. 434,226
Int. Cl. H04n *1/02*
U.S. Cl. 178—6.8 **27 Claims**



1. A real time frame grabbing system for substantially instantaneously providing a continuous video display of a selectable predetermined video frame of information on a video display means from continuously transmittable video information comprising means for transmitting said video information as a plurality of pseudo video scan lines, each of said pseudo video scan lines having a television video scan line format and capable of comprising a complete self-contained packet of digital information sufficient to provide an entire displayable row of video data characters, said pseudo video scan line having an associated transmission time equivalent to said television video scan line, said packet of digital information comprising at least address information for said displayable row and data information for said displayable characters in said displayable row, each of said pseudo video scan lines further comprising a horizontal sync signal at the beginning thereof, said horizontal sync signal providing a record separator between adjacent pseudo video scan lines, said transmitting means further comprising means for providing a vertical sync signal after a predetermined plurality of pseudo video scan lines have been transmitted, said pseudo video scan line being a composite video signal, said system further comprising television signal distribution means for distributing said transmitted composite pseudo video scan line signals to said video display means for providing said continuous video display.

3,889,055
OPTICAL METHOD AND APPARATUS FOR THE AREA MEASUREMENT OF OPAQUE OBJECTS

Robert F. Knight, Sunnyvale, Calif., assignor to International Imaging Systems, Mountain View, Calif.
Filed May 13, 1974, Ser. No. 469,076
Int. Cl. H04n *7/18*
U.S. Cl. 178—6.8 **4 Claims**

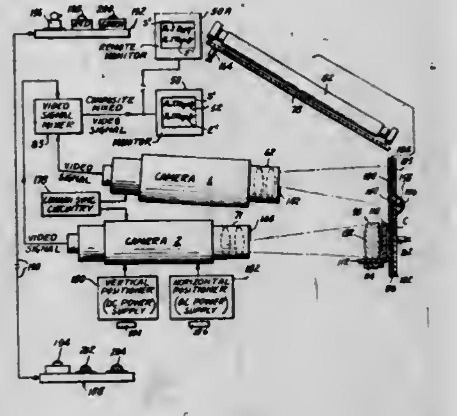


1. The method for measuring the surface area of an opaque object comprising the steps of;
- scanning the opaque measured object to produce a video signal output having a first time period directly proportional to the area of the object and scanning an opaque reference object with a known surface area to produce a video signal output having a second time period proportional to the area of said reference object,
- passing a flow of pulses from a pulse source with a controllable pulse rate to a first counter during said first time period, the pulses counted during said first time period being proportional to the area of said measured object and serving as a measure of said area,
- passing a flow of pulses from said pulse source to a second counter during said second time period, the pulses counted during said second time period being proportional to the area of said reference object,
- comparing the pulse count obtained from said reference object scan with an established predetermined pulse count directly proportional to the surface area of said reference object to obtain an error signal output where said actual pulse count from said reference object during said scan differs from said established pulse count, and
- controlling the rate of said pulses produced from said pulse source in response to said error signal to maintain said actual count from said reference object scan substantially equal to said established predetermined count.

3,889,056
VIDEO SIGNATURE DECODER AND COMPARATOR AND METHOD

George L. Mayer, Jr., New Orleans, La., and David L. Dobbins, Austin, Tex., assignors to Coded Signatures, Inc., New Orleans, La.
Filed July 10, 1972, Ser. No. 270,053
Int. Cl. H04n *7/18*
U.S. Cl. 178—6.8 **41 Claims**

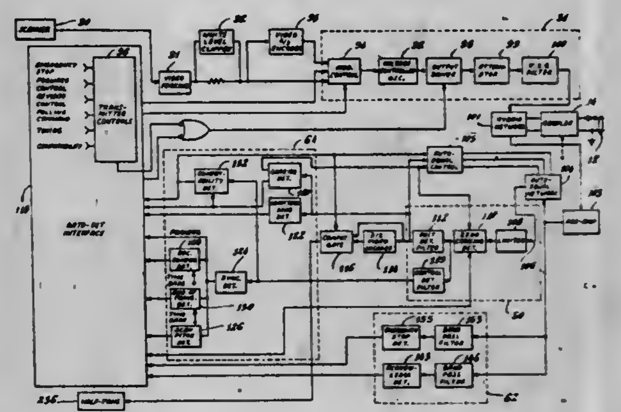
1. The method of decoding encoded, recorded data comprising an array of discrete images obtained by the use of a fly's eye lens for comparison with other data, comprising the steps of: decoding the encoded data and producing an image thereof by positioning a similar fly's lens in confronting relation to the encoded data; simultaneously scanning, with television camera means, said decoded image and the data to be compared therewith; and transmitting the video signals from said camera means to a television set to visually present a



picture of the decoded image and the matter to be compared therewith on the screen of said television set.

3,889,057
FASCIMILE COMMUNICATION SYSTEM

Donald A. Perreault, Pittsford; Victor Lee Bedzyk, Fairport; Larry Richard Matthews, Victor; Roy Wilben Rivers, Conesus; David Rolling Shuey, Webster, and John David Torpie, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Division of Ser. No. 253,827, May 16, 1972. This application Aug. 27, 1973, Ser. No. 391,694
Int. Cl. H04n *1/36*
U.S. Cl. 178—69.5 F **1 Claim**



1. A facsimile communication system having a transmitting station and a receiving station, said transmitting station adapted for line scanning graphic information which is to be transmitted to said receiving station and forming a video signal for transmission, said receiving station adapted for receiving said video signal and for line scanning a record medium for forming thereon a graphic image in accordance with information contained in the video signal and conforming to the image at said transmitting station, said receiving station including means for transporting a surface upon which an image is to be reproduced in a direction which is substantially perpendicular to the direction of motion of a scanning means, said transmitted signal including a synchronizing signal component for periodically synchronizing a scanning means at the receiving station with a scanning means at the transmitting station, said transmitting station including means for modulating said synchronizing signal to have a demodulated amplitude for indicating the rate at which said surface is to be transported, said transporting means being responsive to said demodulated amplitude for transporting said surface at the indicated rate.

3,889,058

TELEPHONE SYSTEMS WITH REDUCED ACOUSTIC FEEDBACK

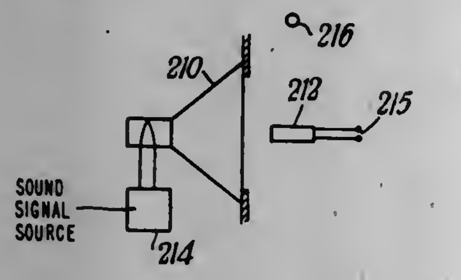
Saad Zaghoul Mohamed Gabr, London, England, assignor to A.R.D. Anstalt, Vaduz, Liechtenstein

Continuation of Ser. No. 1,743, Jan. 9, 1970, abandoned. This application Dec. 18, 1972, Ser. No. 315,807

Claims priority, application United Kingdom, Jan. 15, 1969, 2453/69; Feb. 4, 1969, 6009/69

Int. Cl. H04m *1/22*

U.S. Cl. 179—1 FS **10 Claims**



1. In combination, housing means, a single loudspeaker having a diaphragm having an axis of movement and an electrical input, microphone means having diaphragm means with exposed opposite sides and an electrical output, means mounting said single loudspeaker and said microphone means in close proximity in said housing means so that sound waves radiated by the loudspeaker diaphragm in response to energization of the loudspeaker travel in a direction parallel to the sides of the microphone diaphragm means directly and by a single sound path to the microphone means, the microphone diaphragm means being disposed substantially in a plane lying along the axis of movement of the loudspeaker diaphragm when the loudspeaker diaphragm moves in response to an electrical input to the loudspeaker, said opposite sides of said microphone diaphragm means being equidistant from said loudspeaker diaphragm, whereby the sound waves radiated by the loudspeaker diaphragm fall directly and substantially equally on said opposite sides of the microphone diaphragm means, so that the electrical output of the microphone means due to the sound waves from the single loudspeaker diaphragm is substantially zero.

3,889,059

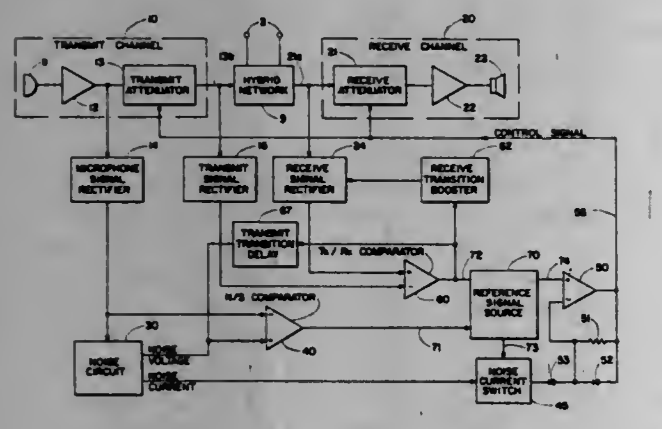
LOUDSPEAKING COMMUNICATION TERMINAL APPARATUS AND METHOD OF OPERATION

James Lawrence Earl Thompson; Wallace Eugene Clarke, both of Ottawa, Ontario, and James Gale, Hazeldean, Ontario, all of Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Mar. 26, 1973, Ser. No. 345,223

Int. Cl. H04m *1/60*

U.S. Cl. 179—1 P **9 Claims**



1. In a loudspeaking communication terminal apparatus for connection to a transmission facility and having a transmit channel including a microphone, a receive channel including a loudspeaker, and a control means for activating the transmit channel to provide a transmit mode of operation and for activating the receive channel to provide a receive mode of operation, an improvement in the control means comprising: means, responsive to signals from the microphone, having substantially monotonous amplitude envelope characteristics and substantially non-responsive to other signals, for generating a noise reference signal, representative of sounds of a substantially steady nature in the operating environment;

means, responsive to the activating of the transmit channel, for regulating the amplification thereof in inverse relation to the amplitude of the noise reference signal, whereby the natural tendency of a user to speak more loudly in a noisy environment, characterized by substantially monotonous noise, than in a quieter environment, is compensated to present a more constant signal level to the transmission facility.

3,889,060

FEEDBACK AMPLIFIER DISTORTION-CANCELLING CIRCUIT

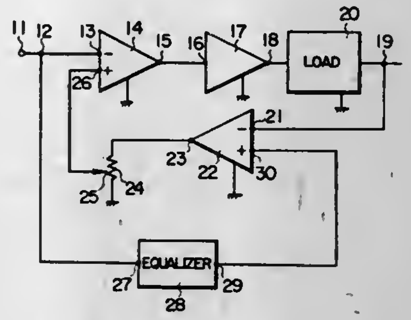
Toshiyuki Goto, Kadoma; Kouichi Kido, Neyagawa, and Akitoshi Yamada, Daito, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sept. 10, 1973, Ser. No. 395,431

Claims priority, application Japan, Sept. 11, 1972, 47-91544; May 18, 1973, 48-55866; May 30, 1973, 48-61295; Aug. 15, 1973, 48-91827; Aug. 5, 1973, 48-91828

Int. Cl. H03f *1/32*

U.S. Cl. 179—1 F **7 Claims**



1. A sound reproducing system comprising an amplifier for amplifying an input signal, a speaker driven by the output of said amplifier, and a differential amplifier for comparing a signal derived from said speaker containing a distortion component generated due to the non-linear characteristics of said speaker with another signal obtained in proportion to said input signal to extract only the distortion component, the output of said differential amplifier being coupled in opposite polarity to said amplifier, thereby eliminating the distortion component.

3,889,061

FOUR-CHANNEL REPRODUCING SYSTEM

Ryosuke Ito, and Susumu Takahashi, both of Tokyo, Japan, assignors to Sansui Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 315,928, Dec. 18, 1972. This application Dec. 26, 1973, Ser. No. 428,423

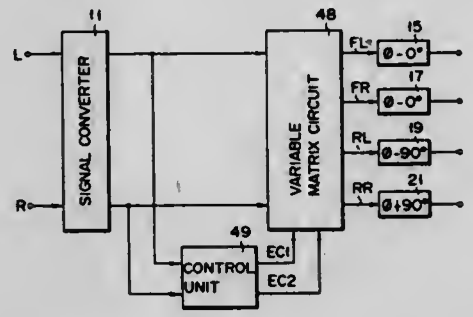
Int. Cl. H04r *5/00*

U.S. Cl. 179—1 GQ **13 Claims**

1. A sound reproducing system for reproducing stereophonically related first and second channel signals from a two-channel signal source by means of a four-channel reproducing system, said system comprising a combination of:

first means connected to receive the first and second channel signals for producing first and second composite signals by combining the first and second channel signals with such amplitude and phase relationships that the first composite signal contains a greater proportion of the first channel signal and a smaller proportion of the second channel signal, the second composite signal contains a greater proportion of the second channel signal and a smaller proportion of the first channel signal, and for producing phase differences between the first and second composite signals with respect to the first and second channel signals respectively which vary as a function of frequency of the first and second channel signals;

control means connected to receive the first and second composite signals for producing control outputs the levels of which vary depending on the phase relationship between the first and second composite signals; and



second means connected to receive, as first and second input signals, the first and second composite signals or the first and second channel signals for producing four-channel output signals by combining the first and second input signals, said second means being operative to produce the four-channel output siganls varying at least mixing ratios of the first and second input signals depending on the levels of the control outputs of said control means.

3,889,062

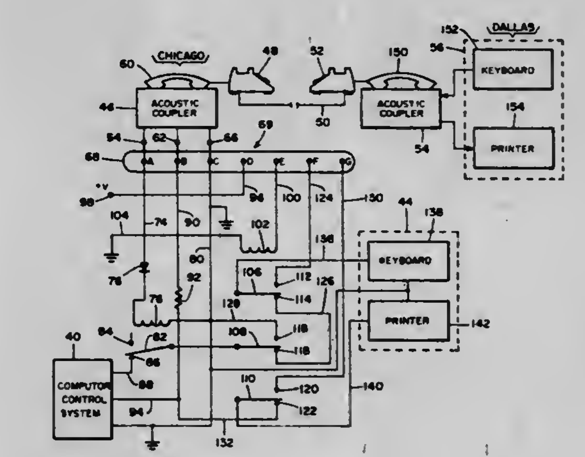
SYSTEM AND METHOD FOR COUPLING REMOTE DATA TERMINALS VIA TELEPHONE LINES

Barry M. Epstein, Dallas, Tex., assignor to Action Communication Systems, Inc., Dallas, Tex.

Filed Oct. 2, 1972, Ser. No. 293,774

Int. Cl. H04h *11/06*

U.S. Cl. 179—2 DP **5 Claims**



1. A data station comprising:

a data terminal having input apparatus and an output display,

a computer system for receiving input signals from said input apparatus and for controlling the operation of said output display,

means for coupling said input apparatus and output display through a conventional telephone channel to a remote data terminal,

means selectively operable in conjunction with said coupling means for interrupting the connections between said computer system and said input apparatus of said data terminal, means for substituting an alternate input connection to said computer system to simulate the impedance of said data terminal in an inactive mode to prevent interruption of the operation of said computer system, and

means for coupling said disconnected data terminal through a conventional telephone channel to input and receive data to and from a remote computer and to a remote data terminal.

3,889,063

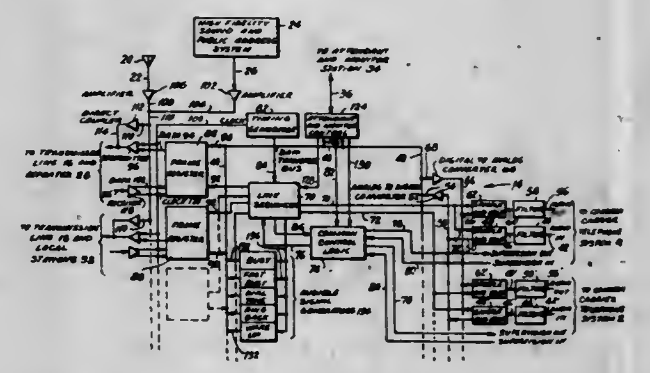
MULTIPLEXED DIGITAL DATA COMMUNICATION SYSTEM

Martin J. Slavin, Huntington, L.I., N.Y., assignor to Phonplex Corporation, Huntington, L.I., N.Y.

Continuation of Ser. No. 173,168, Aug. 19, 1971. This application Sept. 24, 1973, Ser. No. 399,037

Int. Cl. H04j *3/00*

U.S. Cl. 179—15 A **22 Claims**



1. A digital data communication system for connection between a user and a telephone system having a plurality of input channels comprising, central station means coupled to said telephone system for receiving analog signals therefrom and for applying analog signals thereto; a plurality of local station means each adapted to receive analog signals from said user and for supplying analog signals to said user; communication transmission means operatively coupling said plurality of local station means to said central station means, said central station means and said local station means both being adapted to coordinately digitize and multiplex the analog signals received thereby at a first sampling rate for producing a communication signal applied to said transmission means including a series of discrete digital signals in a series of time slots, both said central station means and said local station means being adapted to coordinately demultiplex and convert from digital to analog portions of said communication signal received thereby for applying selected analog signals to said telephone system input channels to said user respectively; and data transmission means for automatically substituting digital data signals for the discrete digital signals representative of said analog signals in periodically spaced selected ones of said time slots of said communication signal, said data transmission means causing said substitution to be made at a second rate substantially lower than said first sampling rate.

3,889,064

ASYNCHRONOUS, MULTIPLEXING, SINGLE LINE TRANSMISSION AND RECOVERY DATA SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Tage O. Anderson, Salt Lake City, Utah

Filed Mar. 27, 1974, Ser. No. 455,163

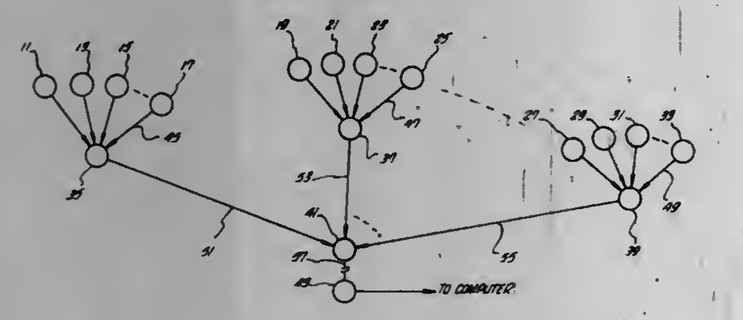
Int. Cl. H04j *3/06*

U.S. Cl. 179—15 BS **11 Claims**

1. A unidirectional, single channel communication system for transmitting binary data from a plurality of satellite data sampling sites to a central location, comprising:

means at each of said satellite data sampling sites for forming of a pair of satellite message frames each having a binary synchronizing sequence, a satellite identification sequence and data words;

means responsive to received satellite message frames from said plurality of sampling sites for asynchronously multiplexing a pair of frames from each satellite location onto a single transmission channel; and



satellite message receiving means at said central location for synchronizing and demultiplexing a frame in accordance with the satellite identification sequence, the binary synchronizing sequence and the data words per frame.

3,889,065

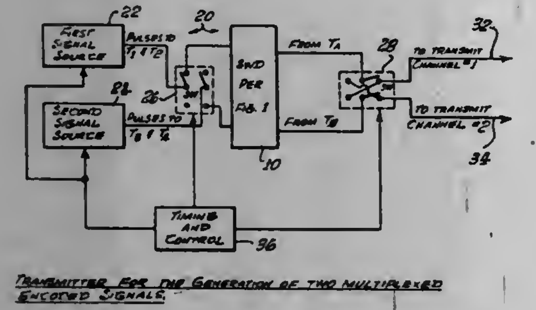
ACOUSTIC DEVICES FOR TIME-MULTIPLEXED COMMUNICATION

James M. Alsup, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 1, 1974, Ser. No. 484,490

Int. Cl. H04k *1/10*

U.S. Cl. 179—15 BC **6 Claims**



1. A transmitter for time-multiplexed communication utilizing complementary non-interacting codes, comprising:

an acoustic surface-wave device, which provides two parallel signal propagation paths on its surface, comprising;
  - a substrate, capable of propagating acoustic surface waves;
  - a pair of coded interdigitated electrode structures disposed upon the substrate, one structure in each of the propagation paths, one structure coded according to one member of a complementary pair, the other structure coded according to the other member of a complementary pair, each coded electrode structure transducing an acoustic wave propagating in its respective propagation path into an output electrical signal which may be transmitted externally of the substrate by means of output leads; and

two pairs of uncoded interdigitated electrode structures disposed upon the substrate, one pair in each of the two propagation paths on each side of the coded electrode structures;

the acoustic surface-wave device having the property that a single electrical pulse applied to the uncoded electrode structure results in a multiple-pulse (or multisample) electrical output signal at the output leads;

a first signal source for generating pulses, whose output is connected to those two of the uncoded electrode structures which are on the same side of the coded electrode structures; one structure from each pair of uncoded electrode structures, the signal source generating a stream of pulses;

a second signal source, also for generating pulses, whose output is connected to the other two uncoded electrode structures, the second signal source generating a stream of pulses in the intervals of time when the first signal source is not generating a stream of pulses;

a signal source switch, whose input terminals are connected to the outputs of the first and second signal sources and whose output terminals are connected to, respectively, each pair of the uncoded electrode structures;

a multiplexing double-pole double-throw switch, for alternately switching an output signal from each of the coded electrical structures to each of two transmit channels; and

a timing and control apparatus connected to the first and second signal sources and to the signal source and multiplexing switches, which control (1) the time periods, or intervals, during which the first and second signal sources are alternately energized, and (2) the switching of the arms of the switches from one position to the other in synchronism with the alternate enegization of the signal sources;

with the result that a stream of intermittent pulses from the signal sources becomes a pair of more or less continuous streams of samples which are sent via two transmit channels, with channel exchange occurring at intervals determined by the timing control, the streams of output samples concealing coded information.

3,889,066

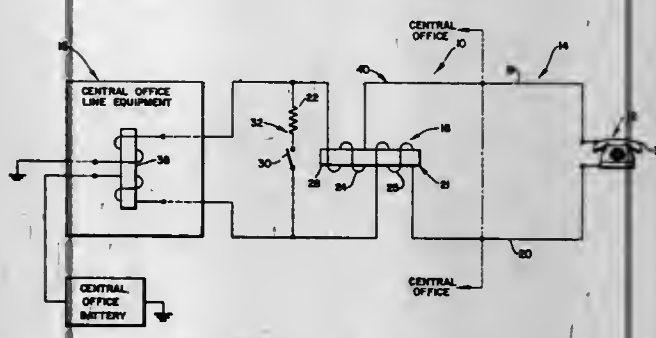
RELAY RANGE EXTENDER FOR TELEPHONE SYSTEMS

Frank L. Simokat, Euless, and Clifford E. Greene, Fort Worth, both of Tex., assignors to Superior Continental Corporation, Hickory, N.C.

Filed Oct. 12, 1973, Ser. No. 405,787

Int. Cl. H04m *1/76*

U.S. Cl. 179—16 F **1 Claim**



1. In a telephone transmission circuit, a telephone having a hookswitch, central office line equipment for said telephone, a two-conductor telephone transmission line having first and second conductors, and a relay range extender for increasing the amount of operating current fed to said line equipment without electrically disconnecting said telephone from the central office in which said line equipment is located, said relay range extender comprising a balanced two-winding relay and resistor means, said relay having a set of normally open contacts and a pair of windings which have substantially equal resistances and which are respectively connected to and in series with said first and second conductors, said telephone being electrically connected by said line and said windings to said line equipment, said windings, said conductors and said hookswitch being connected in a loop circuit to provide for current flow serially through one of said windings, said first conductor, said hookswitch, said second conductor and the other of said windings, said resistor means and said set of normally open contacts being connected in series in a circuit branch which is in parallel with said loop circuit, said hookswitch being effective upon closure to complete a circuit through said loop circuit for energizing said windings and for maintaining said windings energized as long as said hookswitch is closed, and said set of contacts being closed by energization of said windings to complete a circuit which electrically connects said resistor means in parallel with said loop circuit and in series with at least one relay in said line equipment as long as said hookswitch is closed, said resistor means having a pre-selected resistance which when connected in parallel with said loop circuit branch by closure of said set of contacts increases the operating current for said line equipment relay over the value that it would have if said resistor means were not connected in parallel with said loop circuit without reducing the telephone operating current fed through said loop circuit below the amount needed for operation of said telephone.

Referring to the drawing, the telephone transmission circuit, which incorporates the principles of this invention, is generally indicated at **10** and comprises a subscriber's telephone **12** of conventional construction, a two-conductor telephone transmission line **14**, conventional central office line equipment **16** and a relay range extender **18**. The conductors of line **14** are indicated at **19** and **20** respectively. Conductors **19** and **20** are conventionally connected to operating terminals of telephone **12** which is remote from the central office.

3,889,067

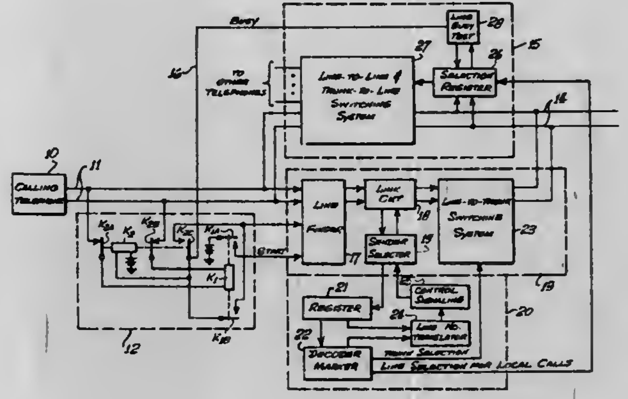
DIGITAL TELEPHONE SWITCHING SYSTEM

Irving S. Reed, Santa Monica, and Irving R. Obenchain, Jr., Pacific Palisades, both of Calif., assignors to Technology Service Corporation, Santa Monica, Calif.

Filed Oct. 24, 1973, Ser. No. 409,062

Int. Cl. H04m *3/00*

U.S. Cl. 179—18 J **6 Claims**



1. In a telephone system of the type in which dialing or other control signals are used to determine the connection to be made between any one of a plurality of telephone lines calling another line selected from the same or other plurality of telephone lines, a switching matrix at one site interfacing with standard two or four-wire telephone transmission lines for switching from one line to another communication signal of the form produced by the user independently of the switching matrix, said switching matrix comprising

means responsive to a calling line initiating a call for generating a digital code, X_M, uniquely identifying said calling line,

means responsive to control signals received from said calling line for generating a digital code, X_N, uniquely identifying another line called,

a plurality of converting means, one for each of said plurality of lines which may be calling, each converting means serving to convert communication signals received from its associated line to digital form,

a plurality of reconverting means, one for each of said plurality of lines which may be called, each reconverting means serving to convert communication signals received to analog form for transmission through its associated line, and

switching means resposive to said digital codes X_M and X_N for routing communication signals in digital form from a converting means associated with a calling line to a reconverting means associated with a called line, all of said converting, switching and reconverting means being at said one site, whereby all transmission to and from said switching matrix is in digital form.

3,889,068

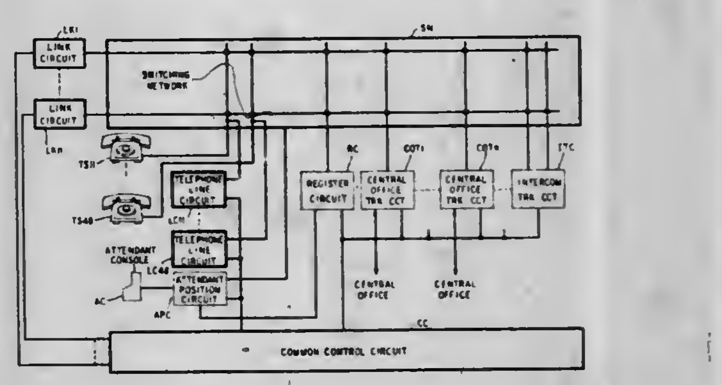
CAMP-ON CIRCUITRY

Raymond Whyte Dellecker, Denver, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 27, 1974, Ser. No. 483,898

Int. Cl. H04m *3/42*

U.S. Cl. 179—18 BG **19 Claims**



1. Camp-on circuitry for use in a communication system having

a plurality of line circuits and

means for selectively applying an enabling signal to said circuits to determine the busy-idle call status of said circuits, and said circuitry comprising;

means responsive to a receipt of a busy call status signal from a called one of said circuits for withdrawing said enabling signal from said circuits to ascertain the camp-on busy-idle status of said called one of said circuits, and busy control means subsequently responsive to a receipt of a camp-on busy status signal from said called one of said circuits for controlling a return of a supervisory busy signal to a calling station.

3,889,069

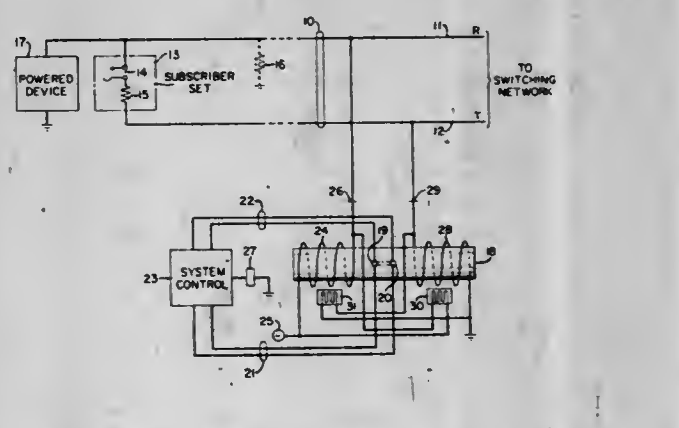
LINE SUPERVISORY CIRCUIT

Cyrus Frank Ault, Wheaton, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 4, 1974, Ser. No. 439,346

Int. Cl. H03k *17/82;* **G11c** *11/14*

U.S. Cl. 179—18 F **4 Claims**



1. An electrical circuit for monitoring current in a monitored circuit comprising

a magnetic element of a material exhibiting substantially rectangular hysteresis characteristics and presenting a closed and a partial flux path,

an interrogate winding coupled to said closed flux path for selectively establishing remanent flux in said closed flux path to a first state and to a second state,
means for generating an inhibiting flux in said magnetic element for preventing said remanent flux from switching from said first state to said second state comprising
a first and a second drive winding coupled to said partial flux path, said monitored circuit completing a conducting path between said first and second drive windings when in one operative state, said drive windings being individually coupled in a sense and in a number of turns so that a current of a predetermined value in said monitored circuit is sufficient to induce said inhibiting flux in said partial flux path,
means for sensing said switching of said remanent flux comprising a readout winding coupled to said closed flux path, and
means for inhibiting the induction of an inhibiting flux in said partial flux path due to current in only one of said drive windings comprising first and second magnetoresistor means electrically connected respectively in parallel with said first and second drive windings and inductively coupled respectively to said second and first drive windings, each of said magnetoresistor means having first and second resistance values in the presence of first and second predetermined magnetic fields, respectively.

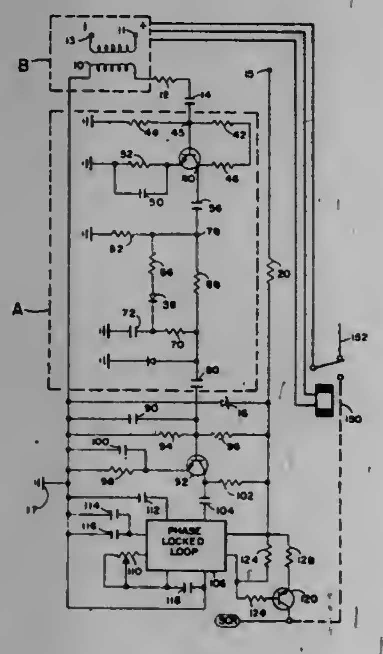
3,889,070
TONE DETECTING TELEPHONE CONNECTION MONITOR

Melvin Neal Oatis, Tustin, and Henry V. McNulty, Corona Del Mar, both of Calif., assignors to Telephonic Equipment Company, Santa Ana, Calif.

Filed June 4, 1973, Ser. No. 366,720

Int. Cl. H04b *3/46;* **H04m** *1/00*

U.S. Cl. 179—18 F **5 Claims**



1. The new and novel combination comprising:
a telephone temporary connection means for connecting at least two telephone lines at a remote location from the central office;
monitor means associated with said connection means for detecting a tone having the frequency of the timeout indicator tone developed at the central office;
a frequency sensitive means connected to the output of said monitor means for responding to said timeout indicator tone wherein an output signal can be provided when said frequency sensitive means senses the timeout indicator tone; and,
a warming device which is responsive to the output signal of said frequency sensitive means for apprising an operator of said connection apparatus of a terminated usage of the connected lines.

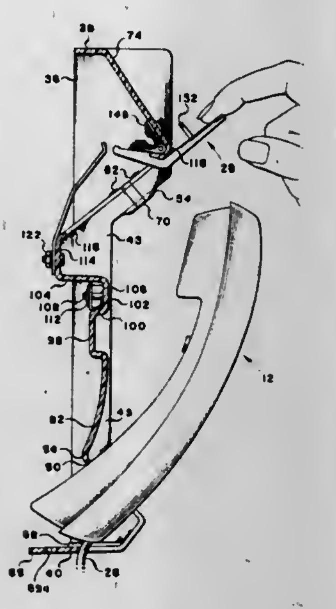
3,889,071
HANDSET CRADLE

John E. Davis, Sun Valley, and Wayne E. Bulgrin, Lone Pine, both of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Oct. 1, 1973, Ser. No. 402,633

Int. Cl. H04m *1/02, 1/18*

U.S. Cl. 179—100 R **10 Claims**



1. A wall-mountable cradle for a telephone handset comprising a body formed with upper and lower forward-facing openings to receive the two ends of the handset, a bottom wall defining the bottom of said lower opening to locate the handset in the body, spring means at the inside of said upper opening adapted to urge the upper end of said handset out of said upper opening, release means at the upper front end of said upper opening, said release means having a first position wherein it secures the upper end of said handset against said spring means and a second position wherein it is substantially clear of the normal path of motion of said upper end of said handset in and out of said opening, and means to normally bias said release means to said first position.

3,889,072
BI-DIRECTIONAL AMPLIFICATION APPARATUS

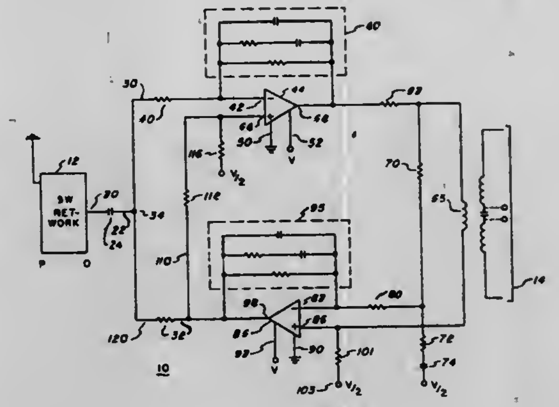
Alan Stewart, Elk Grove Village, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 19, 1973, Ser. No. 407,914

Int. Cl. H04b *3/36*

U.S. Cl. 179—170 R **5 Claims**

1. A two-wire, bi-directional voice amplification apparatus adapted to transmit and receive voice frequency signals between a single wire, ground return line coupled to one end of the apparatus and a line coupled to the other end, said apparatus comprising a single wire path for each direction of transmission with both said single wire paths joined to the respective lines at the ends of said apparatus, amplifying means in each path, each said amplifying means including a first and a second input and a single output, means biasing each said amplifying means to a difference amplifier configuration for providing unidirectional signal passage therethrough, the first input to a first of said amplifying means being coupled to said one end of the apparatus and the first input to a second of said amplifying means coupled to the line at the other end, respective feedback networks coupling the second input of each of said amplifying means to the output of the respective other amplifying means for cancelling signals fed back from the respective outputs through the feedback paths, means balancing the first input of said first amplifying means against the second input to cause amplification of signals transmitted to said inputs, and means in the feedback network from the output of said first amplifying means for attenuating AC signals directed to the input to which said network is coupled to prevent noise due to voice frequency alternating current signals and oscillation in said apparatus.



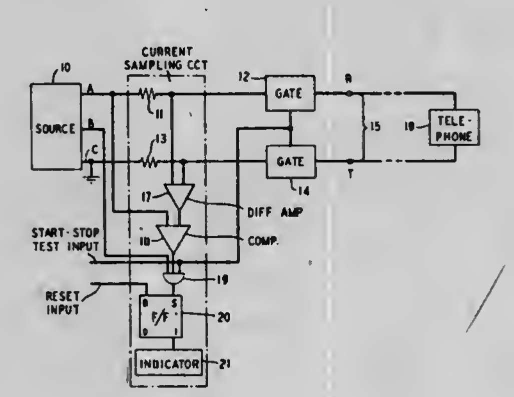
3,889,073
DETECTION OF SERIES-RESONANT CIRCUITS CONNECTED ACROSS TRANSMISSION PATHS

Richard Scott Hoppough, and Herbert Bryant Walker, all of Greensboro, N.C., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 6, 1974, Ser. No. 448,456

Int. Cl. H04b *3/46*

U.S. Cl. 179—175.2 B **5 Claims**



1. In a test circuit for detecting an impedance connected across a transmission path by connecting a source of voltage across said path and a current monitoring means in said path, an improvement to enable the detection of an impedance in the form of a series-resonant circuit,
said improvement comprising, said source producing a series of substantially rectangular waves where said waves have a fundamental component at substantially the same frequency as the resonant frequency of said series-resonant circuit, and
said current monitoring means samples said current to produce an output in response to said current exceeding a predetermined level during the midportion of at least one of said rectangular waves.

3,889,074
HEAD PHONE UNIT

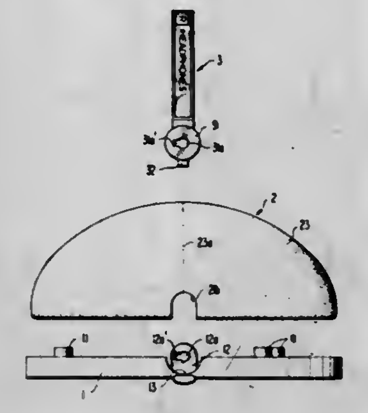
Tadasi Itagaki, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 6, 1973, Ser. No. 413,285

Claims priority, application Japan, Nov. 14, 1972, 47-130300; Nov. 14, 1972, 47-130301

Int. Cl. H04r *1/10*

U.S. Cl. 179—182 R **5 Claims**



1. A head phone unit having a speaker comprising:
a. a frame to which the speaker is attached,
b. a cover to enclose the rear of the speaker,
c. a layer of cushioning material attached to the outer surface of the cover, the cushioning material having a seam extending across said cover,
d. means to attach said cover to said frame, wherein said attachment means covers said seam in said cushioning means,
e. means to pivotally connect said frame to a head band.

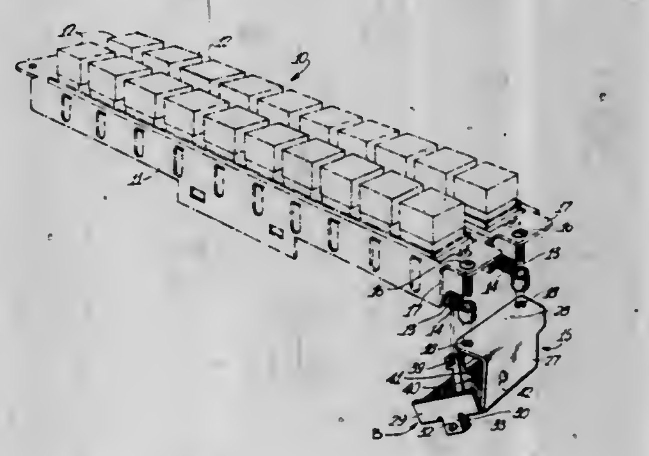
3,889,075
INTERCONNECTOR LATCH ASSEMBLY FOR PLURAL BANKS OF MULTIPLE PUSHBUTTON SWITCHES

Ronald Joseph Morrell; Beverley William Gumb, and Graham Stirling Laing, all of London, Ontario, Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Nov. 6, 1974, Ser. No. 521,357

Int. Cl. H01h *9/26*

U.S. Cl. 200—5 E **7 Claims**



1. An interconnector for mechanically interconnecting latch bars of at least two multiple pushbutton switch assemblies, said latch bars adapted to lock down any pushbutton moved to an actuated position and movable from said lock down position to an unlocking position, said interconnector comprising an extension on one end of each latch bar;
a frame member mounted adjacent said ends of said latch bars and including a base flange and two side webs, a web on each end of said base flange;

- a connecting member having spaced parallel edges;
- means on one of said edges pivotally mounting said connecting member in said side webs;
- means on the other of said edges in engagement with said extensions on said latch bars;
- and means resiliently engaging said connecting member to urge said latch bars to said lock down position;
- the arrangement such that actuation of any pushbutton actuates said connecting member and every latch bar engaging with said connecting member.

3,889,076

COMBINATION OF A PRESSURIZED-GAS INSULATED HIGH-VOLTAGE SWITCHING INSTALLATION AND A MULTI-POLE GROUNDING SWITCH DEVICE

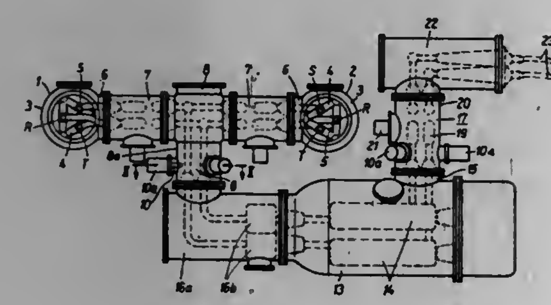
Willi Olsen; Dieter Lorenz, and Heinz Beer, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 16, 1973, Ser. No. 416,524

Claims priority, application Germany, Nov. 30, 1972, 2259056

Int. Cl. H01h *21/28*

U.S. Cl. 200—48 R **4 Claims**



1. The combination of a pressurized-gas insulated high-voltage installation having a metal housing for accommodating a plurality of phase-conductors and of at least one multi-pole grounding switch device including a plurality of ground switching pins corresponding to respective ones of the phase-conductors, each of the switching pins being movable between open and closed positions to respectively disconnect and connect the corresponding phase-conductor electrically with the metal housing, the switching pins being disposed in a radially extending transverse to the metal housing and being arranged in spaced relation one from the other about the periphery of the housing.

3,889,077

TIRE AIR PRESSURE SENSOR SWITCH WITH TEMPERATURE RESPONSIVE BIMETALLIC FIXED CONTACT ASSEMBLY

Tadashi Hayashi, Yokosuka, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

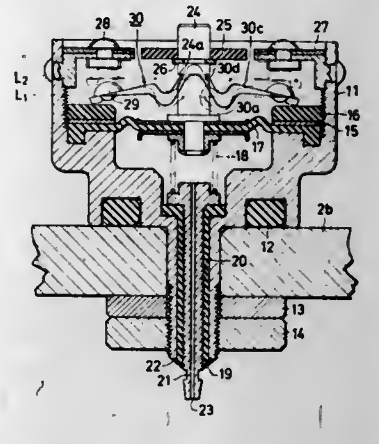
Filed Feb. 19, 1974, Ser. No. 443,619

Claims priority, application Japan, Feb. 20, 1973, 48-20333; Mar. 16, 1973, 48-29978

Int. Cl. H01h *35/24*

U.S. Cl. 200—61.25 **4 Claims**

1. A tire pressure sensor comprising:
- housing means;
- a diaphragm disposed in said housing means so as to sealingly divide said housing means into first and second chambers, said first and second chambers respectively communicating with the inside of the tire and the atmosphere;
- a compression spring disposed in said second chamber for urging said diaphragm toward said first chamber;
- an actuating rod disposed in said first chamber and connected at its one end to said diaphragm so as to longitudinally move with said diaphragm when pressure change within the tire occurs;
- a snap-action spring blade fixed at the central portion thereof on a generally intermediate portion of said actuating rod and having a pair of movable contacts at the opposed positions thereof, said spring blade having first and second states of operation thereof and changing its states when it receives two opposite moments about the central portion thereof, said first state being a state in which said movable contacts are near to said diaphragm



and said second state being a state in which said movable contacts are remote from said diaphragm; and
- a pair of bimetallic support members fixedly disposed in said first chamber so that said spring blade is interposed between said support members and said diaphragm, said support members being constructed to bend toward said second chamber when heated and being provided with a pair of stationary contacts respectively contacting with said movable contacts when said spring blade moves into said second state thereof.

3,889,078

APPLIANCE LID INTERLOCK MECHANISM WITH LID OPERATED SWITCH AND SOLENOID CONTROLLED LID LATCH

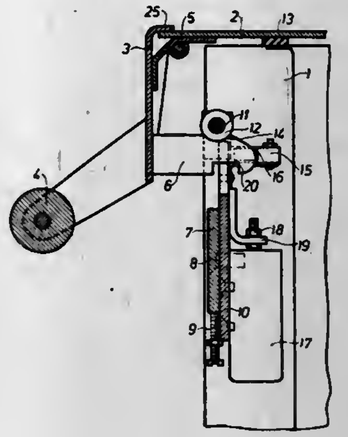
Bo Henry Wessman, Motala, Sweden, assignor to AB Motala Verkstad, Motala, Sweden

Filed May 9, 1973, Ser. No. 358,541

Claims priority, application Sweden, May 10, 1972, 6249/72

Int. Cl. H01h *3/16*

U.S. Cl. 200—61.64 **4 Claims**



1. In a container having a lid associated therewith for opening and closing the same, in combination, an arrangement for retaining the lid in closed position comprising a clasp plate hinged adjacent at one end to a margin of the interior side of said lid for pivotal movement between operative lid-retaining and inoperative lid-releasing positions, a latching tongue projecting from said plate generally toward said container for movement with said plate, said tongue having a depression on the side thereof facing said lid, detent means supported on said container for cooperative engagement with said depression when said clasp plate is pivoted to said operative position to retain said lid in its closed position, and a flange lip projecting rigidly from the hinged end of said clasp plate to positively bear against the adjacent marginal edge of said lid when said clasp plate is in operative position, said lip moving out of such engagement when said clasp plate is pivoted to inoperative position, whereby the latching force active on said clasp plate is carried substantially by said lip bearing against the lid edge rather than by said hinge.

3,889,079

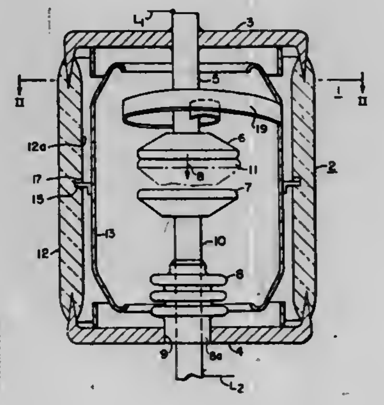
VACUUM-TYPE CIRCUIT INTERRUPTERS HAVING AN AXIAL MAGNETIC FIELD PRODUCED BY CONDENSING SHIELD COILS

Werner S. Emmerich; Clive W. Kimblin, and Richard L. Hundstad, all of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 14, 1973, Ser. No. 397,564

Int. Cl. H01h *33/66*

U.S. Cl. 200—144 B **18 Claims**



1. A circuit-interrupting device of the vacuum type comprising, in combination:
- a. means defining a highly-evacuated envelope including an insulating casing;
- b. a pair of electrodes disposed within said highly-evacuated envelope and having a fixed gap therebetween at least in the fully-open position of said interrupting device;
- c. means for at times establishing an arc across said gap between the two electrodes;
- d. metallic condensing-shielding means disposed interiorly of said highly-evacuated envelope for preventing deposition of metallic vapor from the arcing region onto the inner walls of said insulating casing for preventing flash-over across the insulating casing;
- e. magnetic field-producing means for developing across said gap an axial magnetic field that has its lines of force extending across said gap generally parallel to the longitudinal axis of said arc; and,
- f. said magnetic field-producing means including a field-coil electrically interconnecting said metallic condensing shielding means to one of said electrodes.

3,889,080

VACUUM INTERRUPTER SHIELD PROTECTOR

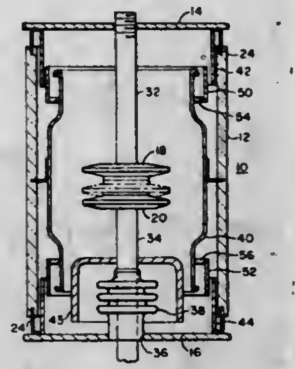
Werner S. Emmerich, Pittsburgh, and Francis Alan Holmes, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 19, 1973, Ser. No. 426,392

Int. Cl. H01h *33/66*

U.S. Cl. 200—144 B **16 Claims**

1. A vacuum type circuit interrupter comprising:
- a tubular insulating envelope being sealed and evacuated;
- a first end cap sealing one end of said tubular insulating envelope;
- a second end cap sealing the other end of said tubular insulating envelope;
- a stationary contact supported from said first end cap within said tubular insulating envelope;
- a movable contact disposed within said insulating envelope being relatively movable with respect to said stationary contact between a closed position in engagement with said stationary contact and an open position separated



from said stationary contact to form an arcing gap therebetween;
- a main shield generally tubular shaped partially surrounding said first contact and said second contact and being aligned with the longitudinal axis of said tubular insulating envelope; and,
- said main shield being metallic and including a layer of insulating material surrounding and on at least the outside ends of said main shield.

3,889,081

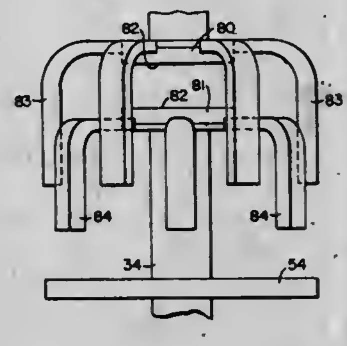
VACUUM INTERRUPTER CONTACTS HAVING ENERGY DISSIPATION SURFACES

Richard L. Hundstad, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 264,700, June 20, 1972. This application Feb. 12, 1974, Ser. No. 441,925

Int. Cl. H01h *33/66*

U.S. Cl. 200—144 B **9 Claims**



1. A vacuum-type circuit interrupter comprising:
- a sealed highly evacuated insulating envelope;
- a first contact being relatively stationary and disposed within said evacuated insulating envelope;
- a second contact being relatively movable between a closed position in engagement with said first contact and an open position spaced from said first contact to form an arcing gap therebetween across which an arc is formed during circuit interruption and being disposed within said evacuated insulating envelope;
- said first and said second contacts each including a central main contact portion;
- a first plurality of circumferentially spaced radially outward and axially extending conducting L-shaped arc dissipation surfaces emanating radially outward from said central main contact portion of said first contact past the central main contact portion of said second contact;
- a second plurality of circumferentially spaced radially outward and axially extending conducting L-shaped arc

dissipation surfaces emanating radially ourward from said central main contact portion of said second contact and extending axially in the same direction as said first plurality of circumferentially spaced radially outward and axially extending conducting L-shaped arc dissipation surfaces whereby upon separation of said contacts the arc established is moved to a position between one of said L-shaped arc dissipation portions of said first contact and one of said L-shaped arc dissipation portions of said second contact so that vaporized metal will be free to disperse radially and axially of said arc dissipation surfaces.

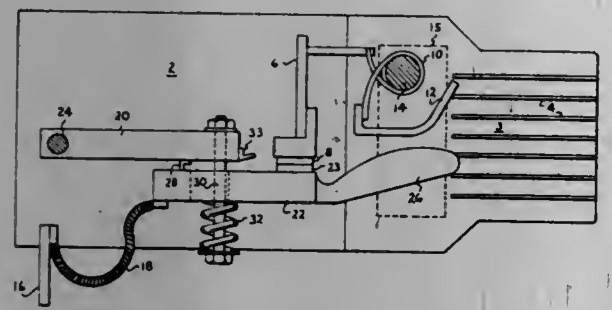
3,889,082
HIGH VOLTAGE CONTACTOR

George L. McFarland, Salem, Va., assignor to General Electric Company, Salem, Va.

Filed Dec. 19, 1973, Ser. No. 426,063

Int. Cl. H01h *33/12*

U.S. Cl. 200—146 R **1 Claim**



1. A contactor having an arc supporting capaability and comprising:
  a housing including arc suppression means comprising an arc chute;
  a stationary contact tip for carrying current when said contactor is closed;
  first arc supporting means electrically connected to said stationary contact tip and disposed within said arc chute for carrying current during the opening and closing of said contactor;
  closure means pivotally mounted within said housing;
  a second contact tip disposed upon said closure means for making electrical contact with said first contact tip to effect closing of said contactor;
  second arc supporting means fixedly connected to said second contact tip and disposed so as to be separated a predetermined distance from said first arc supporting means after closing of said circuit breaker and to contact said first arc supporting means upon pivoting of said closure means; and
  said arc chute and said first and second arc supporting means having a width substantially less than the width of said contact tips, said second arc supporting means extending into said arc chute wherein arcing between said first and second arc supporting means is initiated within said arc chute.

3,889,083
GAS CIRCUIT BREAKER INSULATING TUBE SUPPORT AND HIGH PRESSURE VESSEL

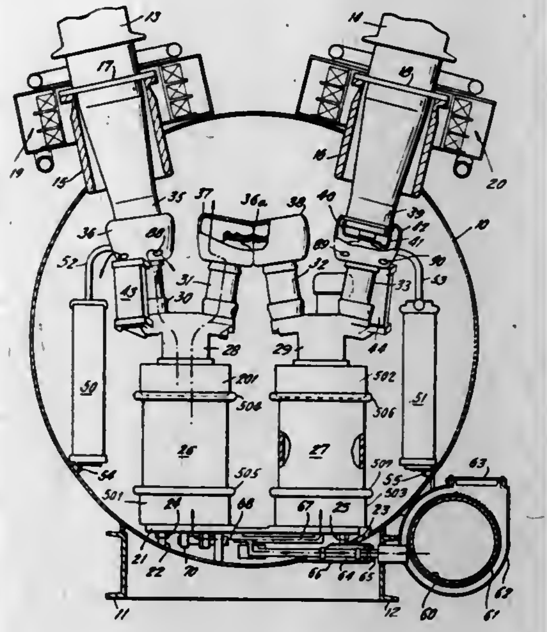
Giovanni Paolo Guaglione, Irvine; James R. McCloud, Burbank, both of Calif., and Hansruedi Aumayer, Harleysville, Pa., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Sept. 19, 1973, Ser. No. 398,858

Int. Cl. H01h *33/42*

U.S. Cl. 200—148 B **10 Claims**

1. A dead tank circuit breaker comprising, in combination: a generally flattened spherical metallic tank filled with a dielectric gas at relatively low pressure;
  a pair of terminal bushings entering the top of said tank and extending into the interior of said tank;
  a plurality of gas blast circuit interrupters supported within said tank and insulated from said tank and electrically connected in series with one another, and electrically connected between said pair of terminal bushings;
  a support platform secured to the bottom of said tank;
  a relatively high pressure supply means disposed externally of said tank;
  and an interrupter support; said interrupter support comprising a hollow uniform cylindrical insulation tube of relatively thin wall thickness, and first and second spaced end caps connected to the opposite ends of said insulation tube;



  said insulation tube being disposed within said tank with its axis extending in a vertical direction;
  said first end cap being mechanically connected to said plurality of interrupters; said second end cap being connected to said support platform, whereby said interrupters are mechanically supported from said platform, and are electrically insulated from said tank;
  and means connecting the interior of said insulation tube to said high pressure supply, whereby said insulation tube is at a relatively high pressure; the interior volume of said insulation tube being sufficiently large to store relatively high pressure gas in sufficient amount for at least one gas blast operation of said plurality of interrupters.

3,889,084
CONTACT FOR HIGH VOLTAGE GAS BLAST CIRCUIT BREAKER WITH TIME-DELAYED OPENING

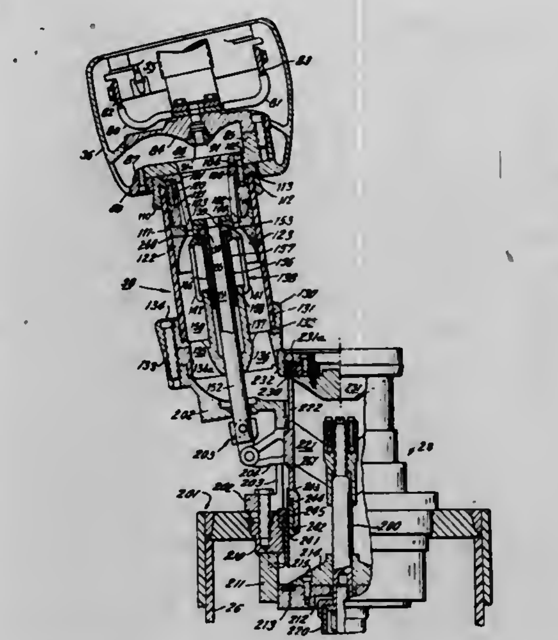
Leonard J. Kucharski, Harleysville, Pa., assignor to I-T-E Corporation, Spring House, Pa.

Filed Sept. 19, 1973, Ser. No. 398,870

Int. Cl. H01h *33/42*

U.S. Cl. 200—148 R **8 Claims**

1. In a circuit interrupter;
  a generally tubular stationary contact, one end of said generally tubular contact being segmented in an axial direction to define a generally circular cluster of contact fingers;
  a generally tubular movable contact movable into and out of engagement with said stationary contact, one end of said generally tubular movable contact being segmented in an axial direction to define a generally circular cluster of contact fingers, the opposite end of said movable contact being a generally solid ring;
  said tubular stationary and movable contacts being coaxial; said solid ring end of said movable contact being movable into engagement with surfaces of said circular cluster of contact fingers of said stationary contact and having a diameter different than the diameter defined by said surfaces of said cluster of stationary contact fingers when they are unflexed, thereby to create a given contact pressure when said movable and stationary contacts are in engagement;
  and a generally stationary conductive tube supported in insulated relation with respect to said stationary contact; said tubular movable contact being coaxial with respect to said stationary conductive tube and being in sliding contact engagement therewith; said segmented movable contact fingers engaging a surface of said conductive tube; said conductive tube having a diameter different than the diameter defined by the engaging surfaces of said movable contact fingers when they are unflexed, thereby to create a given contact pressure when said movable contact slides relative to said conductive tube;



  a longitudinally movable operating shaft connected to said tubular movable contact and being movable along the axis of said tubular movable contact to move said movable contact into and out of engagement with said stationary contact;
  a lost-motion connection means for connecting said operating shaft to said movable contact;
  and gas blast means operatively connected to said operating shaft and operable for producing a blast of gas between said stationary and movable contacts during their movement to a disengaged position;
  and wherein said lost-motion connection means delays the time at which said movable contact moves to said disengaged position until after said gas blast means produces a blast of gas whereby increased gas pressure is established in the region of engagement of said movable and stationary contacts before said contacts are opened.

3,889,085
REST MECHANISM FOR MANUALLY OPERATED NUMBER WHEELS CARRYING INDICIA TAPE

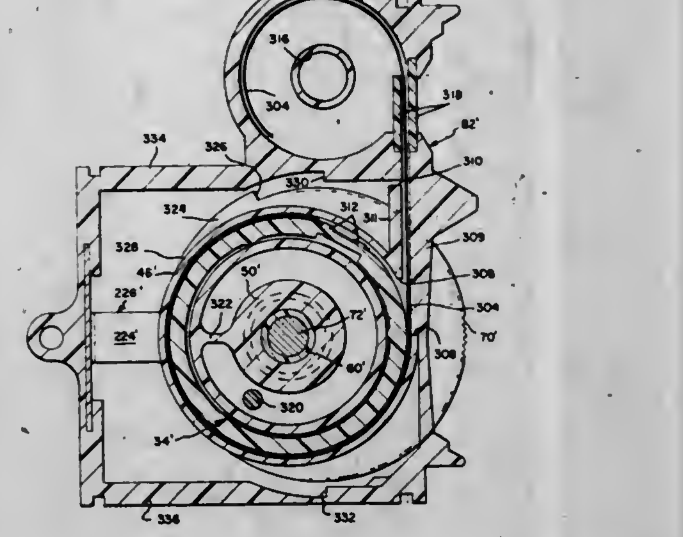
Joseph LaRue Lockard, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 351,944, April 17, 1973, Pat. No. 3,818,155, which is a continuation-in-part of Ser. No. 262,394, June 13, 1972, abandoned. This application Jan. 30, 1974, Ser. No. 438,099

Int. Cl. H01h *3/58*

U.S. Cl. 200—153 R **2 Claims**

1. A resettable thumb wheel assembly, comprising:
  a housing, a thumb wheel mounted for rotation in the housing, a clutch wheel, gearing means coupling aiaid thumb wheel to said clutch wheel, resilient means urging said clutch wheel into engagement with said gearing means, a tape having indicia thereon reeled over said number wheel, and reset means engageable with said clutch wheel and forcibly displaceable against said clutch wheel to displace said clutch wheel against the action of said resilient means, thereby disengaging and uncoupling said clutch wheel from said gearing means to permit independent rotation of said clutch wheel and the number wheel



thereon to reel said tape over the periphery of said number wheel which rotates with said clutch wheel independently of rotation of said thumb wheel, said thumb wheel being rotatable manually to rotate said clutch wheel and said number wheel to unreel said tape from said number wheel.

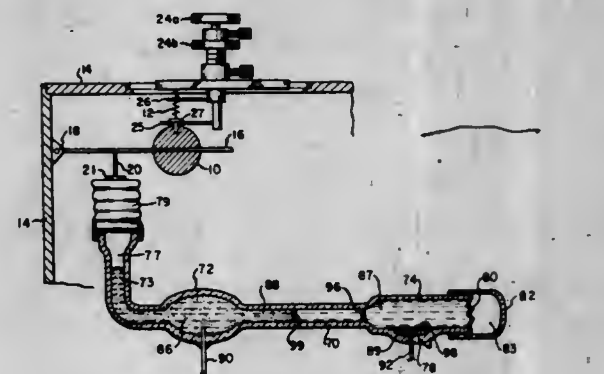
3,889,086
TRANSDUCERS UTILIZING ELECTROCAPILLARY ACTION

Arsene N. Lucian, P.O. Box 300, Manasquan, N.J. 08736

Continuation-in-part of Ser. No. 301,268, Oct. 2, 1972, Pat. No. 3,825,709, which is a continuation-in-part of Ser. No. 37,965, May 18, 1970, Pat. No. 3,701,868. This application July 1, 1974, Ser. No. 484,620

Int. Cl. H01h *29/06*

U.S. Cl. 200—192 **19 Claims**



1. An electrocapillary transducer comprising an envelope including a tube portion having capillary transverse interior dimensions, a metallic liquid contained within said envelope and extending into said tube portion, a liquid electrolyte contained within said envelope and extending into said tube portion, said metallic liquid and said electrolyte being immiscible in each other and forming a single interface only in said capillary tube, electrode means respectively in electrical contact with said metallic liquid and said electrolyte, means external of said envelope for applying a force across said metallic liquid and said electrolyte effective to move the interface of said liquids and to change the interfacial tension between said liquids to produce a voltage at said electrodes due to the electrocapillary effect, said means including means for sealing

off an end of said envelope, a suspended mass responsive to vibrations to cause movement thereof for producing corresponding movement of said sealing means, and a material between said sealing means and one of said liquids for transmitting the force to the said one liquid.

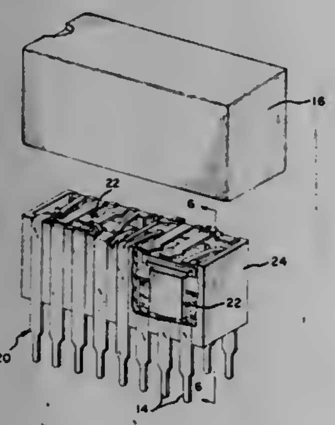
3,889,087
ELECTROMAGNETIC RELAY

Norwood Claude Graeff, Harrisburg, Pa., assignor to AMP Incorporation, Harrisburg, Pa.

Continuation-in-part of Ser. No. 306,112, Nov. 13, 1972, abandoned. This application Sept. 20, 1973, Ser. No. 399,021

Int. Cl.² H01H *1/24, 1/26*

U.S. Cl. 200—246 **9 Claims**



1. A contact-lead frame stamped and formed from a coplanar sheet of conductive material, comprising:
- a. a plurality of contact members positioned on one or another of two parallel, spaced apart elongated side strips, said members including,
  - i. a first contact member having an inner end forming a first fixed contact;
  - ii. a second contact member positioned on the same side strip as the first contact member and having a inner end consisting of a laterally projecting tab forming a second fixed contact, said second fixed contact being spaced above the plane of the first fixed contact, and
  - iii. a movable contact member positioned on the other side strip opposite said first and second contact members and having an inner end forming a movable contact arm extending to and adapted for contacting said first and second fixed contacts; and
- b. means for connecting said contact members to electrical circuits.

3,889,088
ELECTRICAL COMPONENT WITH PUSH-PUSH SWITCH ACTUATOR

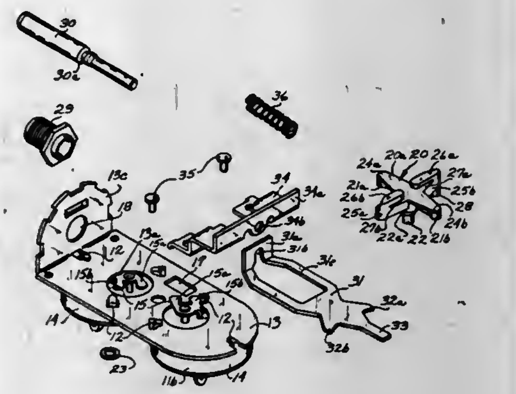
John Zdanys, Edwardsburg, and William L. Kelver, Cassopolis, both of Mich., assignors to CTS Corporation, Elkhart, Ind.

Filed Dec. 21, 1973, Ser. No. 427,421

Int. Cl. H01h *13/60*

U.S. Cl. 200—330 **13 Claims**

1. In an electrical component, the combination of a mounting bracket provided with a pair of openings, a pair of rotary switches fixedly secured to the mounting bracket, actuating means carried by each of the switches and extending through the openings in the mounting plate, one of the actuating means being 180° out of phase to the other of the actuating means, a star cam pivotally secured to the mounting bracket between the switches and cooperable with the actuating means, the star cam comprising a pair of laterally spaced fingers extending toward each other and defining a pair of slots, a drive actuator engageable with the star cam and movable in the slots defined by the fingers, and a shaft supported by the bracket and interconnected with the drive actuator whereby initial axial movement of the shaft causes the drive actuator to engage one of the fingers of the star cam and further axial movement of the shaft pivots the star cam until the actuating means shift from the first switch position through a labile position to a second switch position.



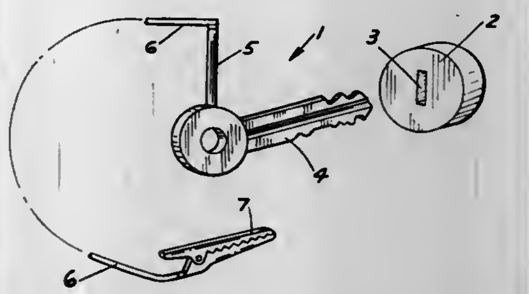
3,889,089
OPERATION ACTUATED IGNITION-KILL DEVICE

Allen J. Tomlin, 1506 S. Chister Dr., Shreveport, La. 71055

Continuation-in-part of Ser. No. 301,427, Oct. 27, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 428,438

Int. Cl. H01h *27/06*

U.S. Cl. 200—334 **4 Claims**



1. An ignition-kill device for use in a key-operated boat comprising;
- a. a tension member attached in essentially vertical relationship to the key of said key-operated boat;
- b. a flexible member attached to the free end of said tension member;
- c. means attached to the free end of said flexible member for securing said free end of said flexible member to the operator of said boat; and
- d. a ring attached to said boat and located between said key and said means attached to the free end of said cable, said cable being positioned through said ring.

3,889,090
INDUCTION HEAT COOKING APPARATUS

Raymond W. Mackenzie, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

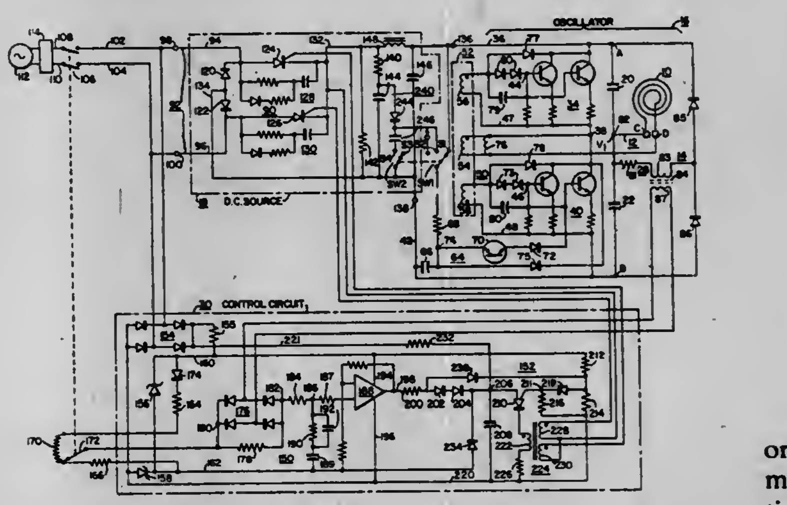
Continuation of Ser. No. 370,253, June 15, 1973, abandoned, which is a continuation of Ser. No. 243,713, April 13, 1972, abandoned. This application Nov. 15, 1973, Ser. No. 416,327

Int. Cl. H05b *5/04*

U.S. Cl. 219—10.49 **7 Claims**

1. In apparatus for heating a cooking utensil by magnetic induction and operative with DC power supply lines, said apparatus comprising the combination of:
- induction coil means adapted to be coupled to cooking utensil;
- series resonant circuit means including coil means;
- DC power supply means including said DC power supply lines for supplying power to said induction coil means;
- switching means connected to said DC power supply lines for converting DC power to AC power, and for energizing said series resonant circuit means;

- means connected to said induction coil means and to said DC power supply lines for providing a signal representative of voltage excursions of said induction coil means under resonance condition of operation beyond the voltage level of said DC power supply lines;
- means for controlling the voltage level of said DC power supply lines in response to said signal, wherein said signal comprises a component that is a non-linear function of the Q of said induction coil means;
- said means for controlling being adapted to lower said DC voltage level in response to said signal when the Q of said induction coil means increases; and
- means responsive to the Q of said induction coil means and operative beyond a predetermined high value of said Q to modify said signal for providing continued operation of the apparatus.



5. In an induction heat cooking apparatus comprising a resonant circuit having a frequency in the ultrasonic range including a heating coil and capacitor means connected in series resonance with the inductance of said heating coil, a source of DC power for supplying energy to said heating coil, switching means consisting of first and second power transistor means connected to said DC source and transformer means responsive to said resonant circuit for feeding back current to drive said first and second power transistor means reciprocally in the switching mode at the frequency of resonance of said heating coil, said apparatus further comprising phase shifting means connected between the input of said transformer means and the output thereof for synchronizing the response of said first and second power transistor means to said frequency of resonance by introducing a phase advance between operation of said resonant circuit and driving of said first and second power transistor means to compensate for inherent slowness in response of said first and second power transistor means.

3,889,091
ELECTRONIC OVEN WITH A COOKING TIME SETTING MECHANISM AND A REMAINING TIME INDICATION MECHANISM

Teruo Ishikawa, Fuji, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

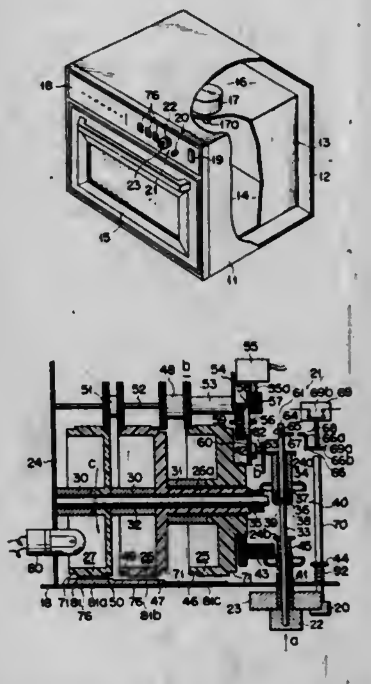
Filed Feb. 6, 1974, Ser. No. 440,034

Claims priority, application Japan, June 4, 1973, 48-62679; June 22, 1973, 48-70589; Feb. 10, 1973, 48-17908; June 22, 1973, 48-74222; June 22, 1973, 48-74225

Int. Cl. H05b *9/06*

U.S. Cl. 219—10.55 E **6 Claims**

1. An electronic oven comprising a housing provided with a heating chamber and heating time indicating windows, a high-frequency oscillator, second and minute time unit setting shafts provided in the housing to be rotatable about the longitudinal axis thereof and movable in an axial direction, rotatable second and minute indication bodies associated with each other so that a remaining heating time is displayed through the heating time indicating windows, connecting means operatively connecting the time setting shafts to the time indication bodies to cause the time indication bodies to be rotated an amount corresponding to the extent of rotation involved when the time setting shafts are rotated from an original position after an axial movement, and adopted to cut off the operative connection between the time indication bodies and the time setting shafts when the time setting shafts are returned to the original position, a starting shaft provided in the housing to be movable in an axial direction, means adapted to return the time setting shafts to the original position when the time starting shaft is moved, means for causing the high-frequency oscillator to be operated when the starting shaft is moved, and a timer motor causing the time indication bodies to be rotated by said amount in a reverse direction when the starting shaft is moved.



3,889,092
APPARATUS FOR SELECTIVELY MACHINING INTERFITTING PARTS

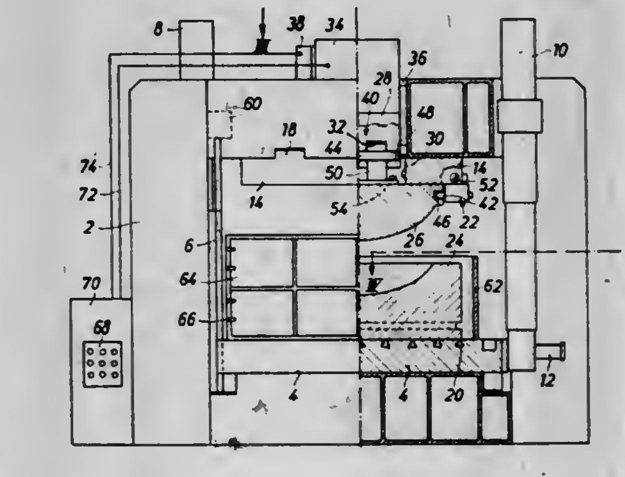
Gustav Adolf Hessmert, Ludenscheid, Westfalen, Germany, assignor to Gustav Hessmert K.G., Ludenscheid, Germany

Filed June 11, 1973, Ser. No. 368,466

Claims priority, application Germany, June 29, 1972, 2231800

Int. Cl. B23p *1/08*

U.S. Cl. 219—69 R **7 Claims**



1. Apparatus for selectively machining first and second interfitting parts by mechanical means and spark-erosion means comprising, in combination, a supporting frame, first support means for said first part, means movably mounting said first support means upon said frame for transfer of said first support means between a first mechanical machining

means access position and a second spark-erosion machining position, second support means for said second part, means movably mounting said second support means on said frame for transfer of said second support means toward and away from said first support means when in said second position, and movable between a first mechanical machining means access position and a second spark-erosion machining position, said first and second support means being aligned with each other when in said second position, motor means mounted on said frame operatively connected to said first and second support means for transferring said first and second support means upon their associated movable mounting means, and spark-erosion means electrically connectable to said parts whereby said parts may be machined by spark-erosion when said first and second support means are in said second machining positions.

3,889,093

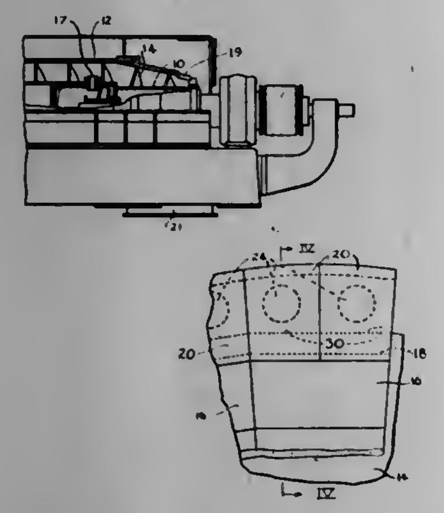
HARDFACED MEMBER AND METHOD OF ATTACHING HARDFACING ELEMENT THERETO

William E. Fawcett, Latrobe, and William D. Armbrust, Greensburg, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Jan. 23, 1974, Ser. No. 435,682

Int. Cl. B23k *9/04*

U.S. Cl. 219—77 **16 Claims**



1. A method of securing a first member to a second member with said members having parallel opposed faces of substantial area in engagement, said first member being steel and said second member being a cemented hard metal carbide, said second member being in the form of a plate having a thickness which is a fractional part of any lateral dimension thereof, said method comprising; forming recess means in the first member through said one face thereof, placing said faces of the members together, placing plug means on said face of the second member with the plug means extending into said recess means in said first member, and brazing the plug means to the face of said second member and to the periphery of the said recess means in said first member.

3,889,094

RESISTANCE WELDING

James C. Needham, Saffron Walden, England, assignor to The Welding Institute, Abington, Cambridge, England

Filed May 19, 1969, Ser. No. 825,586

Claims priority, application United Kingdom, May 22, 1968, 24476/68

Int. Cl. B23k *11/16*

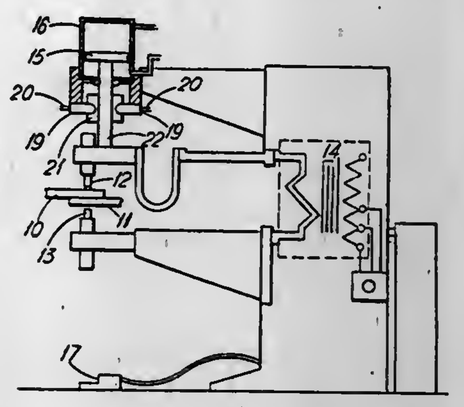
U.S. Cl. 219—89 **4 Claims**

1. Apparatus for joining workpieces by resistance welding, comprising:

a pair of electrodes, at least one electrode being movable to permit the clamping of superimposed workpieces to be joined between the electrodes;

a source of current for connection across the electrodes; and

mounting means for the electrodes providing a first compliance in response to small displacements of the electrodes away from one another and a second reduced compliance when the movement of the electrodes away from one another exceeds a predetermined amount, whereby when the second reduced compliance is effective further movement of separation of the electrodes results in the application to the electrodes of a pressure which varies as a function of the said separation.



3,889,095

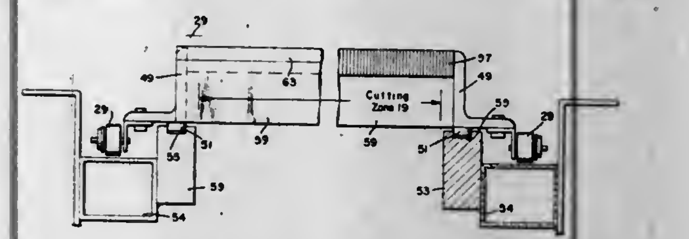
WORKING SURFACE FOR RADIANT ENERGY BEAM CUTTER

Georgette S. Egan, Granada Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 218,896, Jan. 19, 1972, Pat. No. 3,811,554. This application Mar. 8, 1973, Ser. No. 339,661

Int. Cl. B23k *27/00*

U.S. Cl. 219—121 L **1 Claim**



1. A material handling system for a radiant energy cutter comprising in combination:

a. a periodically advancing working surface for supporting and advancing material being cut by a focused beam of radiant energy directed toward said surface, said surface including:
  1. a plurality of slats, each including
    A. an elongate, heat conductive honeycomb core having an open top surface, a pair of long parallel sides and a pair of shorter ends; and
    B. a support member extending along and attached to, each of said sides, each support member having a tapered edge nearest said top surface;
  2. means operatively connected to said slat ends to connect said slats into an endless belt in which the support members of adjacent slats extend in closely spaced-apart parallel relationship, said support members being further characterized in that the included angle between the tapered edges of adjacent support members is sufficiently sharp to prevent reflection of said radiant energy back toward said working surface; and
  3. means for periodically advancing said belt along a plane, the top surfaces of said slats in said plane forming said working surface;

b. means for supporting a bolt of said material rotatably near the upstream end of said surface;

c. means for guiding said material from said bolt onto said surface; and

d. means for turning said bolt periodically so as to dispense material from said bolt onto said surface at the same linear rate as that at which said surface advances.

3,889,096

ELECTRIC SOLDERING IRON DELIVERING HEAT BY CHANGE OF STATE OF A LIQUID HEAT TRANSPORTING MEDIUM

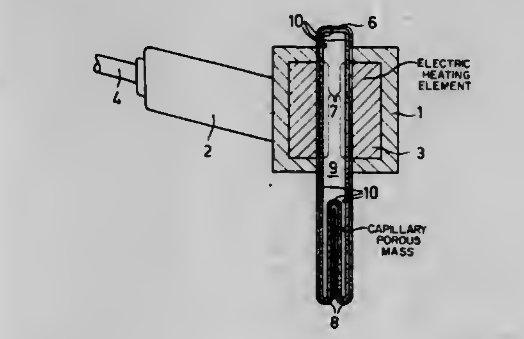
George Albert Apolonia Asselman, and Adrianus Petrus Dirne, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 160,732, July 8, 1971. This application Feb. 22, 1973, Ser. No. 334,866

Claims priority, application Netherlands, July 11, 1970, 7010304

Int. Cl. H05b *1/00;* **B23k** *3/04;* **F28d** *15/00*

U.S. Cl. 219—229 **3 Claims**



1. A soldering device comprising a holder, at least one hollow and closed soldering element supported by said holder, a heating place formed by a first heat transmission wall located at one point on said soldering element at which point heat can be supplied to said soldering element, at least one hollow soldering tip located at an end of said element formed by at least one second heat transmission wall located at a different point on said soldering element at which point heat can be delivered by said soldering element for performing a soldering operation, a source of heat supported by said holder positioned for supplying heat to said first heat transmission wall of said soldering element, means connected to said heating source for causing it to produce thermal energy, a vaporizable liquid heat transporting medium carried within and partially filling said soldering element for absorbing heat from said source of heat through said first heat transmission wall so that said medium will thereby change from the liquid phase to the vapor phase and will supply heat to the second heat transmission wall and thereby change from the vapor phase back to the liquid phase, and a capillary mass of porous material for providing capillary action contained within said soldering element and extending continuously between said first and second heat transmission walls so that said heat transporting medium in the liquid phase after condensation from the vapor phase can flow back from the second to the first heat transmission wall as a result of capillary action.

3,889,097

PERMANENT WAVING MACHINE

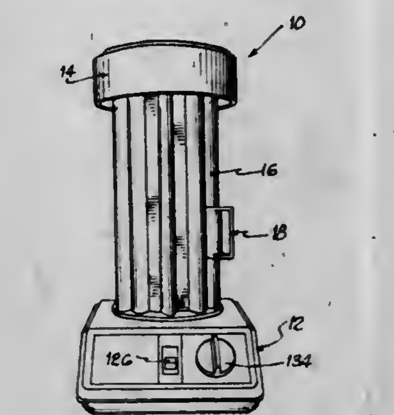
John R. Forsberg, Arlington Heights, Ill., assignor to Helene Curtis Industries, Inc., Chicago, Ill.

Filed July 26, 1973, Ser. No. 382,886

Int. Cl. H05b *1/02;* **A45d** *4/00*

U.S. Cl. 219—242 **3 Claims**

1. A permanent waving machine comprising a base housing, an elongate vertically positioned tubular heater element and a cap assembly, the tubular heater element comprising a tubular wall and a plurality of enlarged elongate heater fins extending outwardly from said tubular wall, said base housing, tubular wall and cap asseembly providing a substantially enclosed heating chamber, means securing said cap assembly to the upper end of said tubular heater element and means securing the lower end of said tubular heater element to said base housing and supporting said tubular heater element for rotation relative to said base housing, and a resistance heater mounted on said base housing and extending upwardly therefrom into said tubular heater element and out of contact with its interior for tubular heating said heater element and said heater fins, said tubular heater element being an extrusion in which each of said heater fins is integrally connected to said tubular wall by a spacer rib which extends outwardly from said tubular wall, said heater being controlled by an operating thermostat and a control thermostat in parallel with each other, the operating thermostat being located within said base housing and set at a specified temperature, and the control theremostat being located within said heater element and set at a temperature higher than said specified temperature, said cap assembly being non-rotatably secured to said tubular heating element and including a handle to rotate said heater element relative to said base housing.



3,889,098

SWITCHING DEVICE HAVING CONTACTS OF TWO OR MORE LAYERS

Anthony Steinmetz, Hilversum, Netherlands, and Hidde Walstra, Attleboro, Mass., assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 3, 1974, Ser. No. 466,713

Claims priority, application Netherlands, May 9, 1973, 7306445

Int. Cl. H01h *1/02*

U.S. Cl. 200—268 **2 Claims**

1. A switching device having moving contacts of which at least the contact surface is clad with a contact coating which consists of at least two layers, characterized in that the inner layer having a thickness of at least 0.5 /μm of a metal having a melting point of more than 1800°C on which an interrupted or uninterrupted layer having a thickness of 0.01 – 1 /μm is present which layer consists of a metal or a metal alloy having a melting point of less than 500° C.

3,889,099

DOOR COOLING SYSTEM

James J. Nuss, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

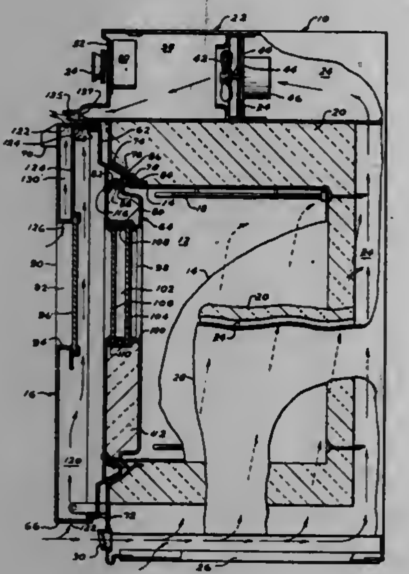
Filed July 31, 1974, Ser. No. 493,332

Int. Cl. F27d *11/02*

U.S. Cl. 219—393 **3 Claims**

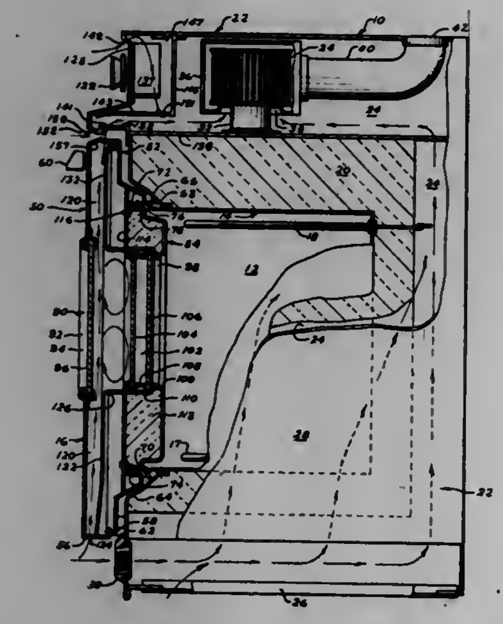
1. An oven having a cooking cavity formed by a box-like oven liner and a front-opening access door, heating means for applying heat energy to the cooking cavity, thermal insulating means surrounding the oven liner and also included within the said door for retaining the oven heat within the cooking cavity, an outer oven cabinet surrounding the insulated oven liner, cooling air channels formed within the oven cabinet around the oven liner as well as within the door for reducing the outer surface temperatures of the cabinet and door as room ambient air flows through the air channels, the door

having air inlet openings along its bottom edge and air outlet openings along its top edge to create a vertical flow of natural convection air currents, the outer oven cabint having air inlet means for introducing air into the cooling air channels of the cabinet, blower means located in the oven cabinet for producing a forced draft of air in the air channels within the oven cabinet; the invention comprising a converging exhaust nozzle communicating with the top air channel of the oven cabinet to overlie the top edge of the door and sweep a high velocity curtain of exhaust air over the air outlet openings in the door and thus reduce the static pressure at the air outlet openings of the door so as to asprirate air up through the door for an increased reduction in outer surface temperatures of the door.



3,889,100
OVEN VENTILATING SYSTEM

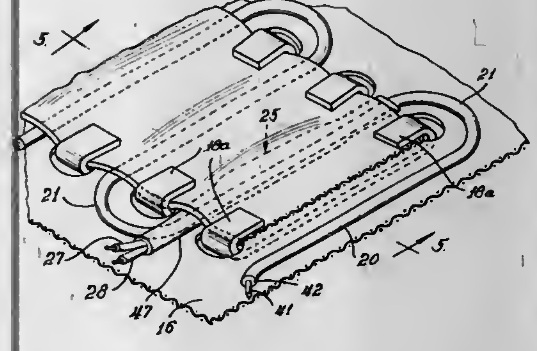
Raymond L. Dills, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed July 31, 1974, Ser. No. 493,333
Int. Cl. F27d *11/02*
U.S. Cl. 219—393 5 Claims



1. An oven having a cooking cavity formed by a box-like oven liner and a front-opening access door, heating means for supplying heat energy to the cooking cavity, thermal insulating means surrounding the oven liner and also included within the said door for retaining the oven heat within the cooking cavity, an outer oven cabinet surrounding the insulated oven liner, cooling air channels formed within the oven cabinet around the oven liner as well as within the door for reducing the outer surface temperatures of the cabinet and door as room ambient air flows through the air channels, the door having air inlet openings along its bottom edge and air outlet openings along its top edge to create a vertical flow of natural convection air currents, the outer oven cabinet having air inlet means for introducing air into the cooling air channels of the cabinet, and an oven control panel located above the oven door and mounted on the oven cabinet; the invention comprising a suction fan located in the air channel above the oven liner and behind the control panel for drawing air up through the air channels within the oven cabinet, said top air channel also having air inlet means beneath the control panel and generally in alignment with the air outlet openings in the top edge of the door, a constriction formed in the door gap above the top edge of the door a slight amount forward of the air outlet openings in the door so as to increase the velocity of ambient air flow over the top edge of the door and thereby reduce the static pressure just above the said air outlet openings in the door so that the vertical air flow through the door is augmented by an aspirator effect created by the said constriction.

3,889,101
MOIST HEATING PAD

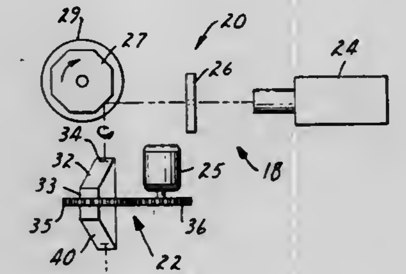
Thomas G. Woods, Battle Creek, Mich., assignor to Battle Creek Equipment Company, Battle Creek, Mich.
Filed Oct. 15, 1974, Ser. No. 514,633
Int. Cl. H05b *3/36*
U.S. Cl. 219—527 10 Claims



1. A moist heating pad comprising:
a. a flexible moisture permeable base sheet,
b. an electrical resistance wire heating element having an insulation sleeve mounted on said flexible base in a pattern comprising a plurality of substantially parallel banks of backward and forward sinuous loops having straight portions substantially perpendicular to the longitudinal direction of said banks,
c. at least one thermostat encased in an insulation jacket connected in series with said heating element and connected at both of its ends by insulated lead wires of a highly conductive metal, said thermostat being positioned parallel and in close proximity to a straight portion of one loop of said heating element,
d. a plurality of strips of a water absorption lead alloy mounted on said flexible base sheet each within one of said sinuous loops,
e. an electrical line cord having a switch therein being electrically connected to said heating element, and
f. a flexible moisture permeable cover enclosing said flexible base sheet, said heating element, said metal strips and said thermostat.

3,889,102
OFF-AXIS CIRCULAR COORDINATE OPTICAL SCANNING DEVICE AND CODE RECOGNITION SYSTEM USING SAME

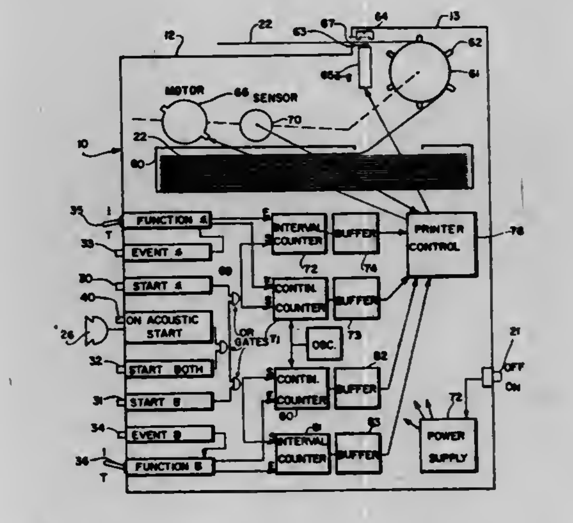
John C. Dahlquist, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Nov. 2, 1973, Ser. No. 412,174
Int. Cl. G06k *7/10*
U.S. Cl. 235—61.7 R 16 Claims



1. An optical scanning device comprising (i) line scanning means for producing a light beam in at least one planar scan and (ii) angular scanning means comprising
an optical inversion member having an optical axis and at least one face intercepting said axis, said member being positioned so that said intercepting face intercepts at least one planar scan off said optical axis, and
means for rotating the member about its optical axis to precess each off-axis intercepted planar scan which is transmitted by the member so that the transmitted scan upon impinging a plane normal to said axis defines an area bounded by two closed curves.

3,889,103
ELECTRONIC TIMER PRINTER

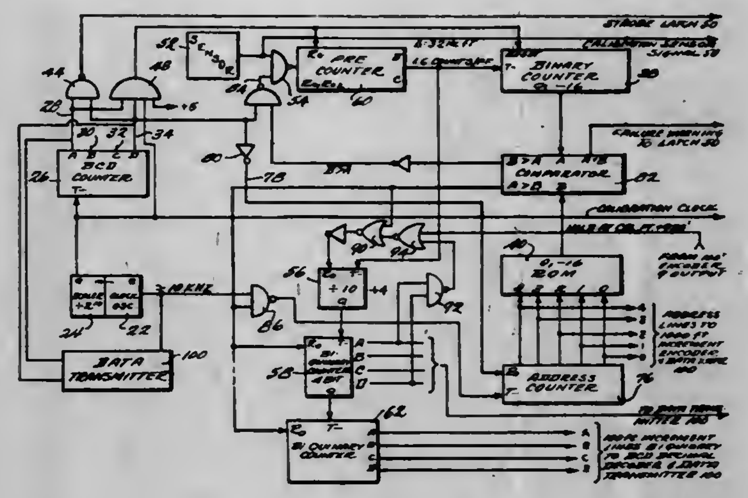
Lewis B. Russell, 1469 N. Glassell, and William F. Kelly, 745 N. Lemon, both of Orange, Calif. 92667
Filed July 5, 1973, Ser. No. 376,626
Int. Cl. G06K *1/12*; G06F *7/38*; G08B *25/00*
U.S. Cl. 235—61.9 A 17 Claims



1. An electronic timer-printer comprising:
a source of timing signals
a counter connected to said source of timing signals for counting signals from said source;
a switch for starting said counter;
a second switch for reading the count of said counter;
a signal storage device;
means responsive to the operation of said second switch for reading signals from said counter to said signal storage device;
a printing device including a motor, a drive roller for advancing a web having printed thereon digital indicia;
a sensor coupled to said drive roller for sensing the longitudinal position of said web;
means responsive to different positions of said web for encoding said positions in the same code as signals contained in said storage device;
means responsive to the reading of information from said counter and storage in said pulse storage means for energizing said motor;
and comparator means responsive to the same code in said storage device as encoded by said position sensor and encoding means for enabling said printing means to produce an identifiable indication on said web.

3,889,104
ALTITUDE DIGITIZER

Philip L. Smith, Richmond, Va., assignor to Aero Industries, Inc., Sandston, Va.
Filed Apr. 8, 1974, Ser. No. 459,206
Int. Cl. G01l *9/12*; H03k *13/24*
U.S. Cl. 235—150.2 13 Claims



1. An electrical circuit for providing a digital output signal to an aircraft transponder comprising:
means for producing a pulse train having a frequency which varies as a function of altitude,
gating means for producing a signal defining a first gating period in which pulses from said producing means are counted and a second gating period in which counted pulses are employed to generate said digital output signal,
counter means connected to said gating means and to said producing means for receiving and accumulating a count of pulses from said producing means during said first gating period,
a read only memory having a plurality of output states each indicative of a count and corresponding to an address which is associated with a given number of first foot increments of altitude,
comparator means connected to said read only memory and to said counter means for providing a first output when the count in said said counter means exceeds an applied output state of said read only memory and a second output when the count in said counter is equal to or less than the applied output state of said read only memory,
addressing means connected to said gating means and said read only memory for successively applying different addresses to said read only memory, during said second gating period, to cause said read only memory to apply successive output states associated with increasing numbers of first increments to said read only memory, and
output gate means connected to said addressing means for producing a digital signal from the address applied to said read-only memory after said comparator means shifts to said second output state.

3,889,105

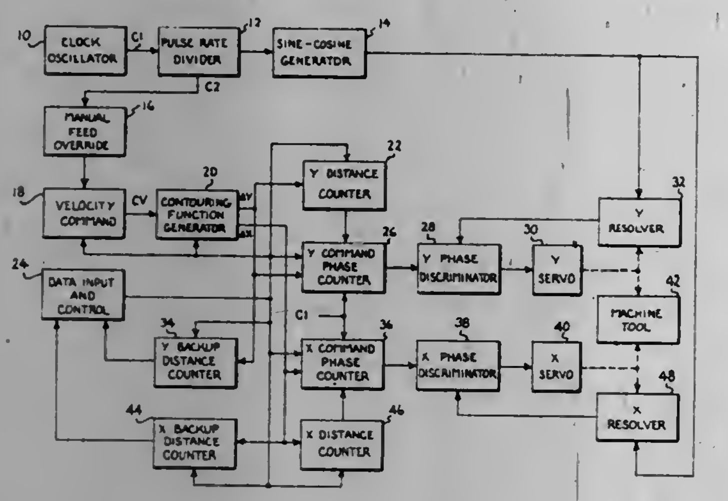
AUTOMATIC BACK UP OF A NUMERICAL CONTROL

Ulrich H. Schneekloth, Waynesboro, Va., assignor to General Electric Company, Salem, Va.

Filed Aug. 20, 1974, Ser. No. 499,265

Int. Cl. G05b *19/36, 19/18*

U.S. Cl. 235—151.11 **3 Claims**



1. An improved numerical contouring control of the type having a function generator for generating first and second pulse trains, each pulse representing a commanded increment of motion along a first and second orthogonal axis, said function generator including first and second counters for controlling the rate of generating the pulses, said control also having first and second motor command circuits each responsive to one of said pulse trains and to a direction signal for positioning a machine tool and first and second distance counters for keeping track of the distance to be commanded, along each axis, wherein the improvement comprises:

a. first backup counter responsive to the first pulse train for counting the commanded distance along one axis;

b. second backup counter responsive to the second pulse train for counting the commanded distance along the other axis;

c. control means responsive to a signal indicating that the control is in a backup mode for reversing the motor command direction signals and for reversing the counting direction of the function generator counters, the distance counters and the backup counters; and

d. logic means for sensing a count in the first and second back up counters and automatically ending the backup mode of operation.

3,889,106

METHOD AND SYSTEM FOR NUCLEAR POWER PLANT SYNCHROSCOPE SIMULATION FOR OPERATOR TRAINING

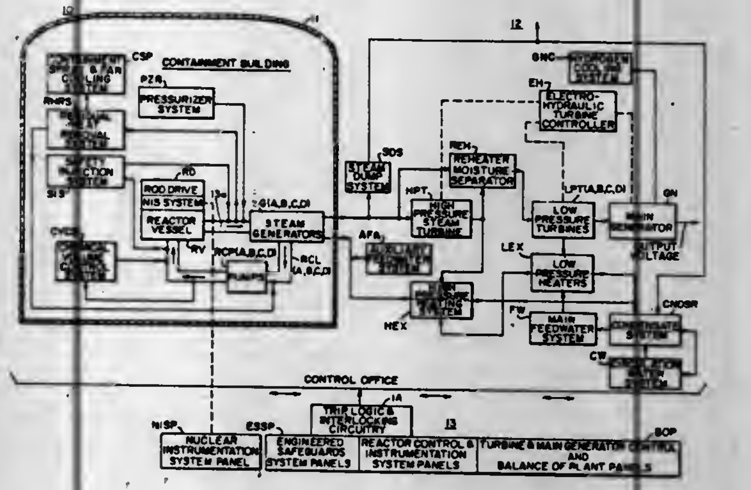
William H. Alliston, Murrysville, and Steven J. Johnson, McKnight Rd., both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 14, 1973, Ser. No. 341,181

Int. Cl. G06f *15/06, 15/56;* **G06b** *9/00*

U.S. Cl. 235—151.21 **14 Claims**

1. A system for the dynamic simulation of the real-time operation of a nuclear power plant, comprising a plurality of manually operable devices for remotely operating simulated plant devices, including varying a simulated alternating current voltage output frequency, a plurality of indicating devices for monitoring the operation of the simulated plant including synchroscope indicating means for comparing the frequency and phase of an alternating voltage on isolated electrical conductors, first means to generate physical values relating to the voltage frequency output of a first simulated electrical generating source in accordance with values relating to the operation of predetermined manually operable devices, second means to generate physical values relating to the voltage frequency output of a second electrical generating source, third means to generate a third physical value in accordance with the difference between the first and second physical values, means responsive to the third physical value to generate an analog signal representative of the third physical value, means to generate an alternating current voltage having a frequency representative of the value of the analog signal, means to apply a reference alternating voltage to the synchroscope indicating means, and means responsive to the generated frequency and the reference frequency to operate the synchroscope indicating means in accordance with the third physical value to monitor the difference frequency between the isolated electrical conductors in accordance with the speed of rotation of the synchroscope indicating means.



3,889,107

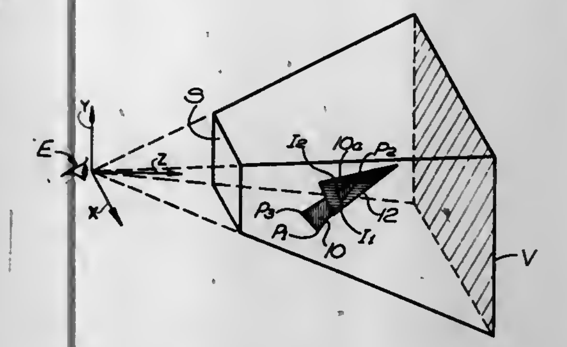
SYSTEM OF POLYGON SORTING BY DISSECTION

Ivan E. Sutherland, Salt Lake City, Utah, assignor to Evans & Sutherland Computer Corporation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 298,084, Oct. 16, 1972, Pat. No. 3,816,726. This application Sept. 27, 1973, Ser. No. 401,479

Int. Cl. G06f *7/38, 15/20*

U.S. Cl. 235—152 **9 Claims**



1. A method for processing data in relation to a volume of space comprising the steps of:

representing data in the form of electrical signals manifesting objects and positional relationships of said objects in said volume of space;

defining a selected viewpoint in relation to said volume of space;

selectively defining a specific plane in terms of electrical signals, from various possible planes lying in said volume of space, said specific plane being related to one of said objects, said possible planes including planes extending transverse to the axis of said selected viewpoint; and

testing said electrical signals manifesting objects and positional relationships of said objects in said volume of space in relation to said specific plane to generate signals that are definitive of data representing said objects on each side of said specific plane.

3,889,108

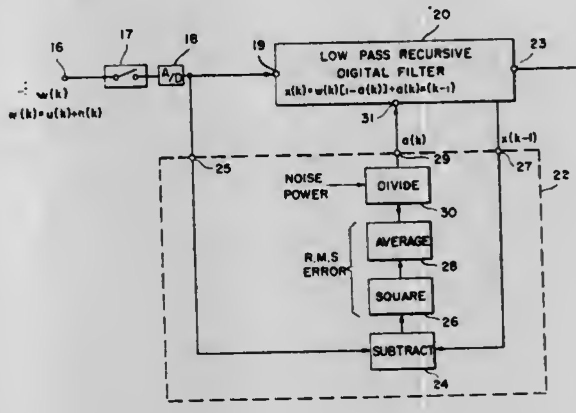
ADAPTIVE LOW PASS FILTER

Ben H. Cantrell, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 25, 1974, Ser. No. 491,890

Int. Cl. G06f *15/20;* **H03g** *5/24*

U.S. Cl. 235—152 **4 Claims**



1. An adaptive filter having a bandwidth responsive to a change of condition of an input signal comprising:

an adjustable response characteristic digital filter having a control terminal; and

control means coupled between the input and output of said digital filter and connected to said control terminal, said control means providing a signal to control said digital filter, said control signal being formed by the ratio of the expected noise-power of said input signal divided by a function of said input signal and the prior output signal of said digital filter.

3,889,109

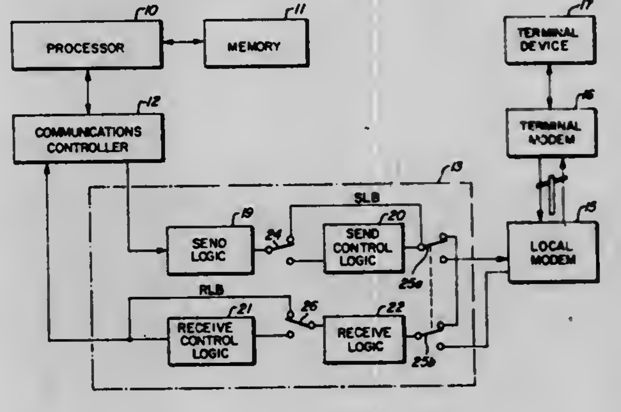
DATA COMMUNICATIONS SUBCHANNEL HAVING SELF-TESTING APPARATUS

Ronald W. Blessin, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Oct. 1, 1973, Ser. No. 402,247

Int. Cl. G06f *11/00*

U.S. Cl. 235—153 AK **4 Claims**



1. A data communications subchannel having self-testing apparatus for use with a processor, and a communications controller, a source of message characters connected to said controller and a modem, said subchannel comprising:

send logic, said send logic being coupled to said controller;

send control logic;

means for selectively connecting said control logic between said modem and said send logic, said send control logic and said send logic transferring characters from said controller to said modem when said send control logic is connected between said modem and said send logic;

receive logic;

means for selectively connecting said receive logic to said send control logic in a wrap-around test mode;

switch means responsive to test mode control signals from said processor for selectively bypassing said send control logic and thereby test for possible defects in said send control logic in said wrap-around test mode;

receive control logic;

means for selectively connecting said receive logic between said modem and said receive control logic, said receive logic and said receive control logic transferring characters from said modem to said controller when said receive logic is connected between said modem and said receive control logic;

switch means responsive to test mode control signals from said processor for selecting bypassing said receive control logic and thereby test for possible defects in said receive control logic in said wrap-around test mode; and

means for connecting said receive control logic to said controller.

3,889,110

DATA STORING SYSTEM HAVING SINGLE STORAGE DEVICE

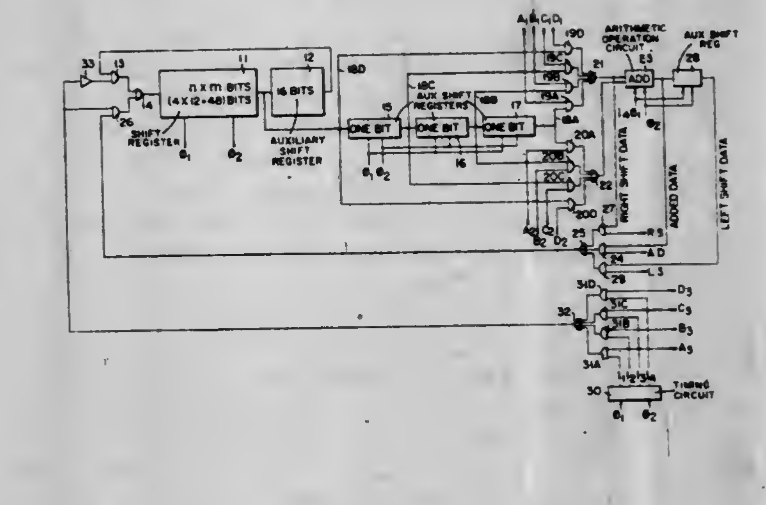
Masayuki Hakata, Iruma, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1973, Ser. No. 336,502

Claims priority, application Japan, Mar. 3, 1972, 47-022086

Int. Cl. G06f *7/38*

U.S. Cl. 235—176 **8 Claims**



1. A memory device for storing a plurality of data items, each data item having a plurality of binary coded decimal digits, said memory device comprising:

a single storage means;

control means coupled to said single storage means and responsive to said data items for causing combined digits sequentially arranged from a lower order combined digit to a higher order combined digit to be stored in said single storage means, each combined digit being formed under control of said control means which includes means for combining the same order digits of the data items and forming a plurality of bit groups sequentially arranged from a lower order bit group to a higher order bit group, each bit group comprising sequentially arranged same order bits of the same order digits of the data; and

read-out means coupled to the output of said storage means for selectively reading out any given item of the data stored in said storage means by selectively reading out the bits constituting the given item of the data.

3,889,111

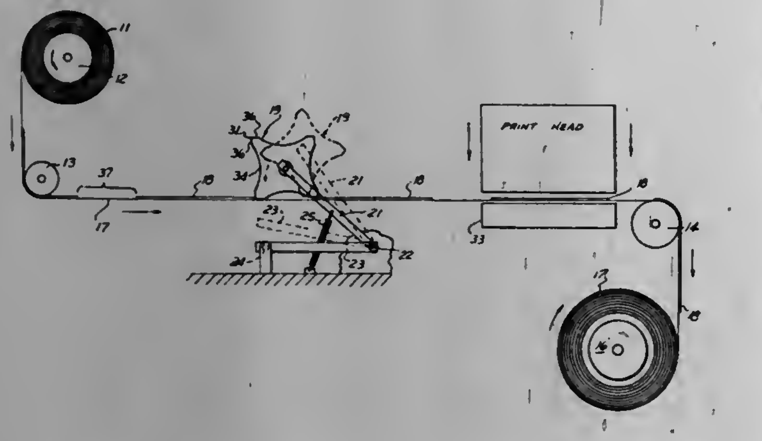
DEVICE FOR POSITIONING STOCK IN A PRINTING MECHANISM

James R. Moss, Mt. Clemens, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 26, 1973, Ser. No. 427,884

Int. Cl. H01j *5/16*

U.S. Cl. 250—237 R **9 Claims**



1. A device for sensing and positioning stock in a feed mechanism, said stock including edges spaced at selected positions to define positions at which an operation will occur in said feed mechanism comprising:

- a sensing element arranged to slide along said stock and positioned to contact said edges, said sensing element having sharp portions in the vicinity of said contact so that said sharp portions contact said edges;
- shaft means, said sensing element being rotatably mounted on said shaft means, said shaft means being pivotably mounted with respect to a fixed point;
- light opaque fixedly coupled to said shaft means;
- light source means and light detection means, said light opaque means being normally interposed with said light source means and said light detection means;
- said sensing element being symmetrically configured about the point of rotation with respect to said shaft and being configured so that rotation of said sensing element displaces said opaque element and permits light from said light source to impinge upon said light detector.

3,889,112

METHOD AND APPARATUS FOR MEASURING THE CONCENTRATION OF WATER, IRON AND ALUMINUM IN IRON ORE BY NEUTRON RADIATION

Ralph John Holmes, South Yarra, New South Wales; Alan Wilson Wylie, Nunawading, New South Wales, and Kenneth Gordon McCracken, Roseville, New South Wales, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australian Capital Territory, Australia

Filed June 11, 1973, Ser. No. 368,785

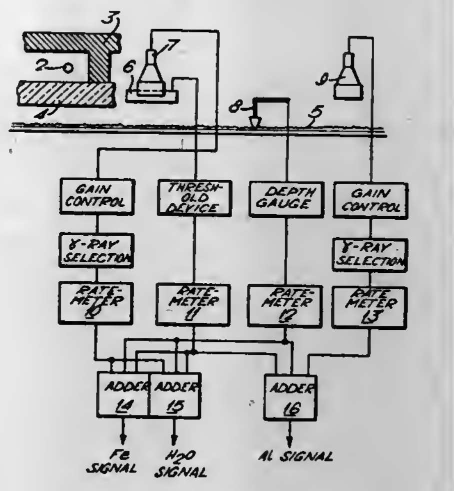
Claims priority, application Australia, June 9, 1972, 9294/72

Int. Cl. G01t *1/16*

U.S. Cl. 250—265 **18 Claims**

1. A method of quantative measurement of the concentration of water and a specific component in a material comprising the steps of

- i. irradiating the material with neutrons,
- ii. measuring the neutron flux in the region of the irradiated material,
- iii. measuring the number of gamma rays characteristic of the specific component emitted per unit time from the material,
- iv. measuring the differences between
  - a. the measured neutron flux and number of gamma rays and
  - b. known values of these parameters obtained from samples of the material having known concentrations of water and the specific component, and



- v. from the difference measurements, determining the concentration of water and the specific component in the material being examined.

3,889,113

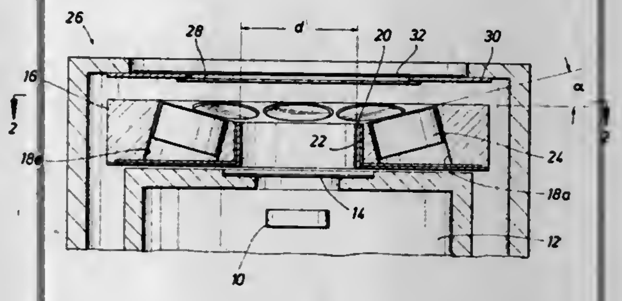
RADIOISOTOPE-EXCITED, ENERGY-DISPERSIVE X-RAY FLUORESCENCE APPARATUS

John R. Rhodes, Austin, Tex., assignor to Columbia Scientific Industries, Inc., Austin, Tex.

Filed May 3, 1973, Ser. No. 356,830

Int. Cl. H01j *37/20*

U.S. Cl. 250—272 **16 Claims**



1. In a radioisotope X-ray fluorescence analyzer for analyzation of specimens in an atmospheric environment, said analyzer including

- a sealed radioisotope excitation source means, and
- a detection system for selecting the energies of the characteristic X-rays excited in a specimen under analysis and measuring their intensities,

the improvement, comprising

- a first holder for the source means, said holder defining a plurality of receptacles disposed in annular array, said source means being a plurality of radioactive sources being disposed one within each of said receptacles,
- a second holder for a detector in the detection system, said first and second holders being located on the same side of the specimen,
- said first holder being encased in a helium-filled compartment having a window toward the specimen, the source being located at a distance in the range of 0.05 to 0.4 inch of said window and the specimen being positionable in the atmospheric environment on the side of said window opposite said source.

3,889,114

ELECTRON MICROSCOPE FOR DARK-FIELD ILLUMINATION

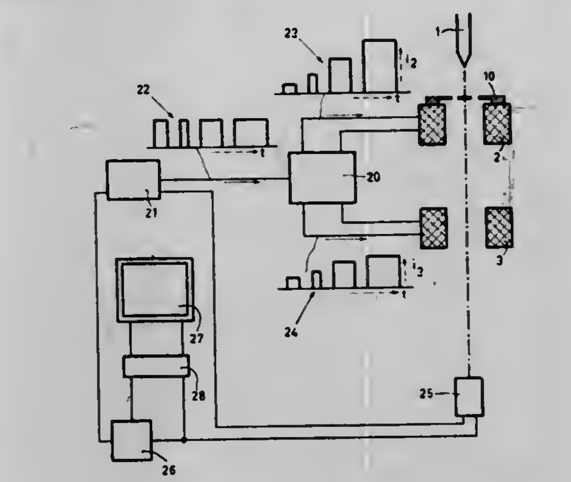
Karel Jan van Oostrum, Emmasingal, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 11, 1974, Ser. No. 449,844

Claims priority, application Netherlands, Mar. 28, 1973, 7304298

Int. Cl. H01j *37/26*

U.S. Cl. 250—306 **6 Claims**



1. Electron microscope having an annular diaphragm which is arranged about an optical axis and serves to illuminate a specimen at an angle to the optical axis, characterized in that the electron microscope includes, viewed in the direction of propagation of the electron beam, after an electron source a first condenser lens and a second condenser lens for imaging the electron source on the specimen, in that the condenser system is provided with a supply source which is individually adjustable for each of the condenser lenses, and in that the annular diaphragm is disposed between the electron source and the second condenser lens.

3,889,115

ION MICROANALYZER

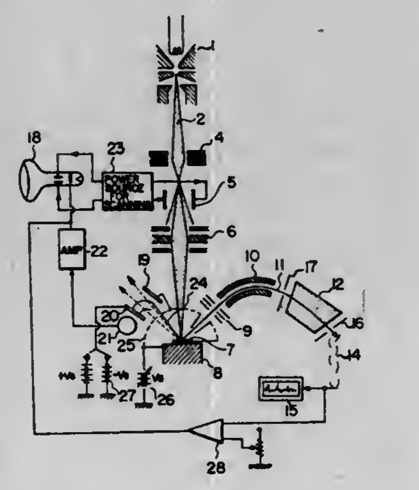
Hifumi Tamura, Hachioji, and Toshio Kondo, Sagamihara, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 16, 1973, Ser. No. 341,846

Claims priority, application Switzerland, Mar. 17, 1972, 26561/72

Int. Cl. H01j *37/26*

U.S. Cl. 250—307 **15 Claims**



1. An ion microanalyzer comprising:

- means for producing an ion beam;
- means for scanning the surface of a specimen with said ion beam;
- means for directly detecting a first portion of the secondary ions emitted from said specimen;
- a cathode ray tube having means for scanning the electron beam thereof synchronously with the scanning of said ion beam;
- a mass spectrometer for mass-analyzing a second portion of said secondary ions and for providing a signal representative of the mass-analysis;
- means for modulating the intensity of the electron beam of said cathode ray tube by the detected signal from said means for directly detecting a first portion of the secondary ions emitted from said specimen; and
- means for superimposing the signal obtained from said mass spectrometer on the signal obtained from said means for directly detecting a first portion of the secondary ions emitted from said specimen.

3,889,116

AUTOMATIC CARRIAGE FOR RADIOGRAPHING WELDINGS FROM THE INSIDE OF PIPELINES BY MEANS OF X-RAYS AND RELEVANT DEVICES

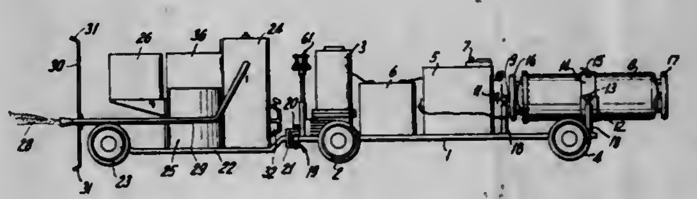
Arnaldo Gambini, San Donato Milanese, and Giacomo Capitelli, Milano, both of Italy, assignors to Snam-Progetti S.p.A., Milan, Italy

Continuation of Ser. No. 332,649, Feb. 15, 1973, abandoned. This application Aug. 13, 1974, Ser. No. 497,064

Claims priority, application Italy, Feb. 17, 1972, 20661/72

Int. Cl. G03b *41/16*

U.S. Cl. 250—320 **7 Claims**



1. A device for radiographing weldings from the inside of a pipeline, said device adapted to be controlled by a permanent horseshoe magnet positioned on the exterior of said pipeline at a preselected distance from a welding to be inspected, comprising:

- a carriage having self-adjusting wheels; a D.C. geared motor operative with said wheels for driving said carriage; an X-ray tube for longitudinal or panoramic radiography; means removably mounting said X-ray tube on said carriage; electronic programer means for operating said X-ray tube; means for stabilizing the voltage supplied to said X-ray tube at preselected levels; a power supply including an internal combustion engine mounted on said carriage and an electric energy generator operatively coupled to said engine and adapted to power said X-ray tube; a battery electrically coupled to said D.C. geared motor to drive said carriage and to said energy generator, such that said battery supplies power for starting said engine and is charged by said energy generator when the engine is running to maintain an operative charge; and a magnetic compass control sensor mounted on said carriage and adapted to be operated by said horseshoe magnet; said sensor being coupled to said programer means having three positions, a neutral position and two deflection positions, whereby the movement and radiography is controlled.

3,889,117

TAPERED DETECTOR SCANNING ARRAY SYSTEM

George W. Shaw, Jr., Cincinnati, Ohio, assignor to Cincinnati Electronics Corporation, Cincinnati, Ohio

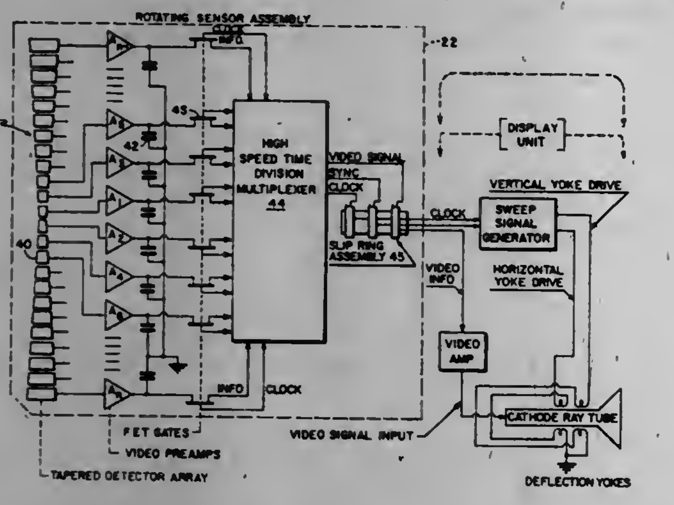
Continuation of Ser. No. 138,456, April 29, 1971, abandoned. This application May 3, 1973, Ser. No. 357,881

Int. Cl. G01t *1/00*

U.S. Cl. 250—332 **14 Claims**

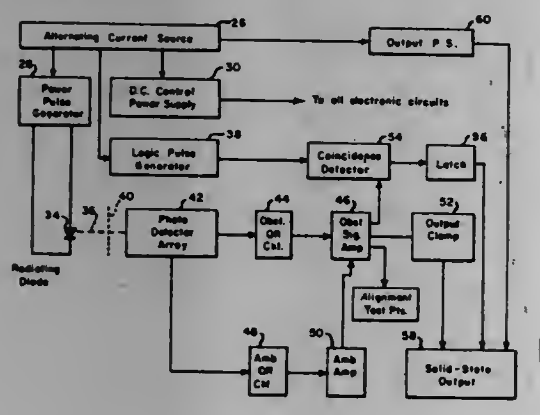
1. An electro-optical system comprising a radiation sensitive detector array consisting of a series of discrete detector elements tapering outwardly from the mid-point to each end, means for scanning an optically focused scene on said array and means for electrically reproducing said scene on a display

device wherein the tapering orientation of said elements is accomplished approximately in steps by providing one group of the smallest elements centrally of said array and progressively larger groups extending outwardly toward each end thereof.



3,889,118
ELECTRONIC PRESENCE SENSING DEVICE

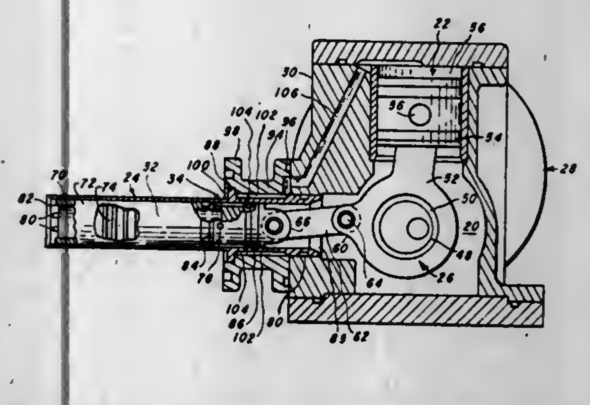
Edward J. Walker, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Continuation of Ser. No. 370,160, June 14, 1973, abandoned. This application Apr. 18, 1974, Ser. No. 462,168
Int. Cl. H01j *1/00*
U.S. Cl. 250—341 **1 Claim**



1. An electronic detection and control device compriing a first electronic circuit means having its input connected to an electrical source, the output of said first electronic circuit means connected to at least one radiation-emitting semiconductor device, said first electronic circuit means for providing electrical energy to said semiconductor device to excite said semiconductor device to produce a radiated signal, said radiated signal defining a radiating screen, a radiation sensing semiconductor device whose input receives said radiated signal, the output of said radiation sensing semiconductor device connected to a second circuit means, said second circuit means providing an output signal responsive to the presence or absence of an obstruction in said electronic screen, and responsive to the presence or absence of any ambient radiated energy received by said radiation sensing semiconductor device, said second circuit means providing an output signal responsive to an open or short condition in any of the components or circuits of said device and responsive to any failure of said electrical source, said first circuit means being further provided with a first electronic timing means whose output signal is synchronized with the output of a second electronic timing means, the input of said second electronic timing means being connected to said electrical source, said second circuit means having means to steer the output signal of said radiation-sensing semiconductor device and means to then amplify the steered signal, said second electronic timing means providing an output signal, said third electronic circuit means to electronically compare the time coincidence of the output signals of said second circuit means with the output signal of said second electronic timing means, said first electronic circuit means is a half-wave rectifier pulse generator whose frequency is developed from said electrical source.

3,889,119
CRYOGENIC COOLER OFF-AXIS DRIVE MECHANISM FOR AN INFRARED RECEIVER

Stephen L. Whicker, Dallas, and Carol O. Taylor, Anna, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed June 25, 1973, Ser. No. 373,355
Int. Cl. G01t *1/16*
U.S. Cl. 250—352 **5 Claims**



1. In an infrared receiver including an infrared detector in a scanning path for infrared energy emanating from a source thereof for producing electrical signals representative of impinging infrared energy; an electro-optical system coupled to the detector for processing video signals from the electrical signals produced by the detector; and a refrigerator for cooling the detector to an operating temperature, the refrigerator having a cooling member including a cylinder, a regenerator-displacer reciprocally mounted in the cylinder, and a cold chamber formed between an end of the cylinder and the regenerator-displacer, a housing enclosing a cylinder-piston type compressor motor and drive mechanism and a passage means interconnecting the compressor cylinder, regenerator-displacer, and cold chamber of the cooling member, said compressor cylinder, passage, regenerator-displacer, and cold chamber forming the working volume for a cryogen, the improvement comprising an off-axis drive means mounted in the housing exteriorly of the cold member and compressor cylinder to allow the compressor cylinder and piston to be matched in size with the regenerator-displacer for increased refrigerator efficiency, said off-axis drive mechanism interconnecting the regenerator-displacer of the cold member and the compressor piston to the motor, whereby the motor actuates the off-axis drive mechanism to sequentially reciprocate the regenerator-displacer and the compressor piston for circulating the cryogen throughout the working volume.

3,889,120
METHOD AND APPARATUS FOR DETERMINING FLOW CHARACTERISTICS IN A PIPELINE OR THE LIKE

John E. Greaney, 18610 Cape Charles Ln., Houston, Tex. 77058
Continuation-in-part of Ser. No. 149,957, June 4, 1971, Pat. No. 3,766,388. This application Jan. 26, 1973, Ser. No. 327,017
Int. Cl. G01t *1/00*
U.S. Cl. 250—356 **13 Claims**

1. A system for measuring the flow characteristics of a material moving in a pipeline or the like, comprising

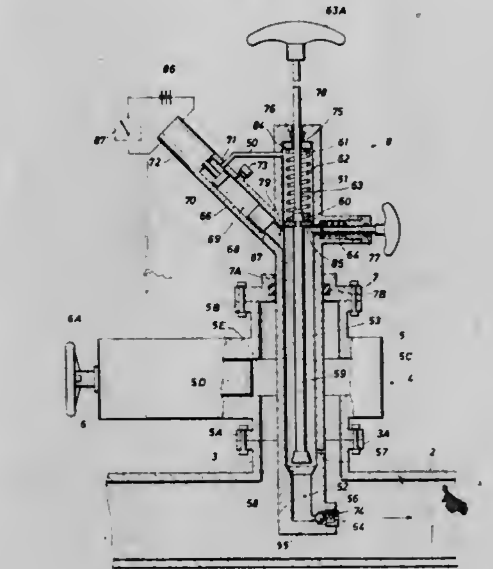
an elongate housing having a discharge port at one end for communication with the interior of said pipeline,

a tubular member positioned outside of said pipeline and having one end connected to said housing for communication with the interior of said housing,

a cylindrical member disposed in stoppering fashion in the end of said tubular member adjacent the interior of said housing,

a quantity of radioactive material disposed in said cylindrical member and composed of a mixture of a discrete quantity of an isotope having a relatively long half-life and decaying to form a daughter product having a relatively short half-life and a discrete quantity of a granulated non-radioactive material in ion exchange relationship with said isotope and not with said daughter product,

a quantity of a reagent material capable of permeating said cylindrical member and dissolving daughter product accumulated therein and not capable of dissolving any significant amount of said granulated non-radioactive material,



means interconnected with said tubular member for urging a discrete portion of said reagent material through said cylindrical member into said housing,

ejection means for said dispensing said urged portion of reagent material from said housing into the interior of said pipeline, and

detection means externally spaced along said pipeline from said housing for sensing the presence of said discharged portion of reagent material and for deriving therefrom a functional indication of fluid flow in said pipeline.

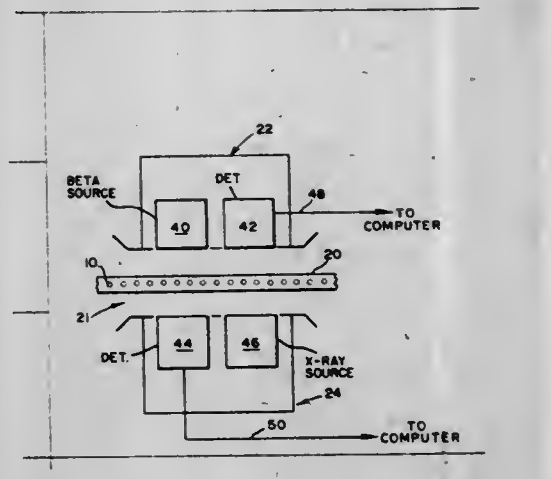
3,889,121
APPARATUS FOR MEASURING THE WEIGHT PER UNIT AREA OF A MANUFACTURED SHEET PRODUCT CONSISTING OF A REINFORCING MATERIAL SURROUNDED BY A BULK MATERIAL

David A. Bossen, Woodside, Calif., assignor to Measurex Corporation, Cupertino, Calif.
Filed July 12, 1973, Ser. No. 378,430
Int. Cl. G01n *23/06*
U.S. Cl. 250—359 **9 Claims**

1. Apparatus for measuring the weight per unit area of various constituents of a tire fabric manufactured by calendering rubber onto both sides of a metal cord, comprising:

a first radiation source and radiation detector for generating a first electrical signal proportional to the radiation received at said first radiation detector, said first source being such that the rubber in said fabric absorbs a first fraction of said radiation and the metal cord in said fabric absorbs a second fraction, said second fraction being greater than said first fraction of said radiation whereby the radiation received at said first detector is primarily a measure of the metal weight per unit area of said tire fabric;

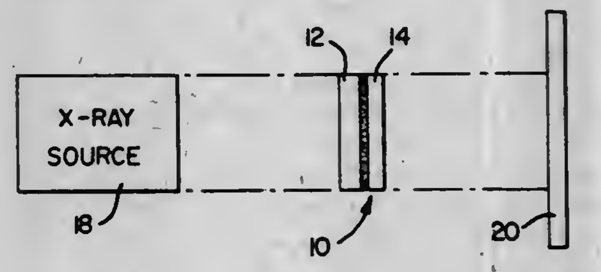
a second radiation source and detector for generating a second electrical signal proportional to the radiation received at said second detector, said second source being such that a first fraction of its radiation is absorbed by said rubber and a second fraction of its radiation is absorbed or blocked by said metal cord whereby the radiation received at said second detector is primarily a measure of the rubber weight per unit area; and



means for combining said first and second signals to form a third electrical signal proportional to the total weight per unit area of said tire fabric.

3,889,122
METHOD OF DETERMINING BOND QUALITY OF POWER TRANSISTORS ATTACHED TO SUBSTRATES

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Thomas A. Telfer, Clinton, N.Y.
Filed Apr. 26, 1974, Ser. No. 464,721
Int. Cl. G01t *1/16*
U.S. Cl. 250—359 **6 Claims**



1. A method of determining the quality of the bond between a power transistor chip and a heat conductive, electrically insulating substrate between which is a thin layer of bonding material, the chip, substrate and material in combination constituting a unit, comprising:

a. selecting an index of bond quality for a production run unit in terms of the ratio that the area of bond voids in a minimally acceptable unit bears to the entire bond area;
b. X-raying the bond area of a production run unit to obtain an X-ray exposure transparency;
c. measuring the average optical density of the transparency; and
d. comparing the measured average optical density of the transparency with the index to determine the bond quality of the production run unit relative to a minimally acceptable unit.

3,889,123

IRRADIATION PLANT FOR FLOWABLE MATERIAL

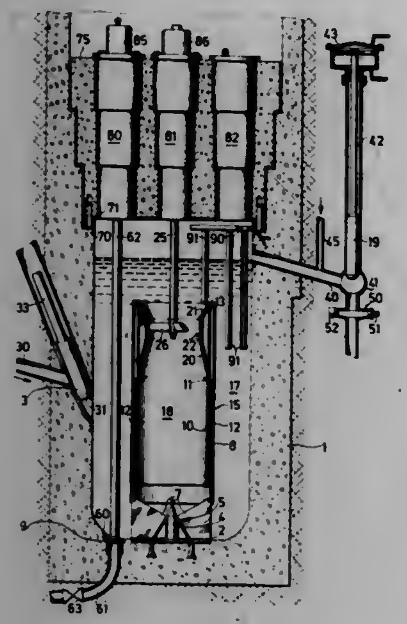
Ernst Bosshard, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Feb. 15, 1973, Ser. No. 332,707

Claims priority, application Switzerland, Feb. 16, 1972, 2234/72

Int. Cl. G01n *21/26*

U.S. Cl. 250—437 **18 Claims**



1. An irradiation plant for the batch treatment of flowable material comprising

- a vessel having a wall defining a surface of revolution about a vertical axis and enclosing an irradiation chamber;
- a partition within said chamber defining a coaxial surface of revolution with said wall and dividing said irradiation chamber into two coaxial zones; and
- a circulating means in said irradiation chamber for circulating the flowable material successively through said two coaxial zones and in a sequence of opposite flow directions.

3,889,124

STANDARD LIGHT SOURCE UTILIZING SPONTANEOUS RADIATION

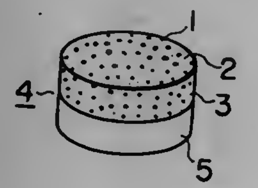
Osamu Yamamoto, Hirakata; Mutsuo Takenaga, Katano, and Yoshinobu Tsujimoto, Kashihara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 21, 1973, Ser. No. 372,306

Claims priority, application Japan, June 26, 1972, 47-64363

Int. Cl. G21h *3/02*

U.S. Cl. 250—493 **4 Claims**



1. A standard light source utilizing spontaneous radiation which comprises a mixture of

- a fluorescent substance $LnVO_4$:X wherein Ln is selected from the group consisting of Y and Gd, and X is selected from the group consisting of Dy and Eu and,
- a radioactive substance containing a radioactive isotope.

3,889,125

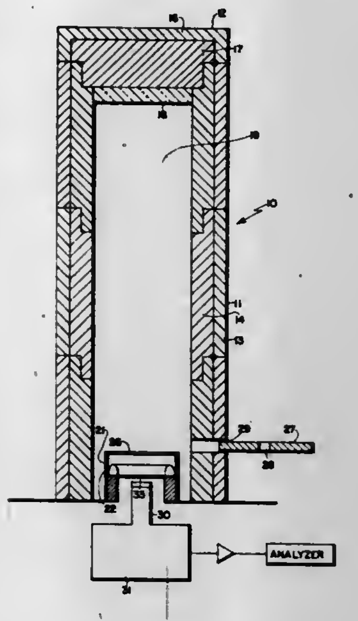
RADIATION SHIELD FOR X-RAY FLUORESCENCE ANALYTICAL DEVICE

Arthur M. Gerber, Boston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 21, 1973, Ser. No. 334,217

Int. Cl. G21f *1/00*

U.S. Cl. 250—515 **8 Claims**



1. In an X-ray fluorescence analytical device which includes an X-ray source, a radiation shield, a detector, an amplifier and an analyzer, wherein said source, said shield and said detector are linearly aligned, the improvement which comprises providing as said shield a chamber having side walls and end cap of radiation adsorptive materials, said chamber of sufficient height above said source to substantially obviate back-scattered radiation onto said detector.

3,889,126

AIR PUMP

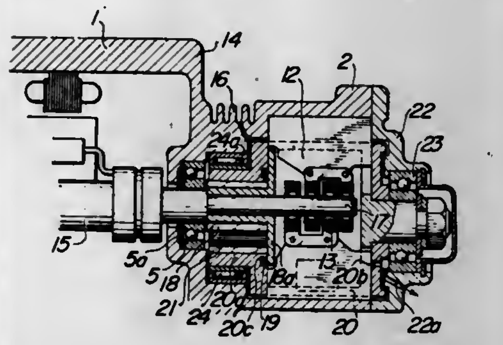
Shinya Ishihara, and Yoshihiro Suzuki, both of Anjo, Japan, assignors to Nippondenso Co., Ltd., Japan

Continuation-in-part of Ser. No. 299,450, Oct. 20, 1972. This application Sept. 26, 1973, Ser. No. 400,834

Claims priority, application Japan, Sept. 28, 1972, 47-113258

Int. Cl. F01n *3/10*

U.S. Cl. 290—1 **1 Claim**



1. An air pump constructed in a unit with a generator and adapted for use in an exhaust emission control system of an vehicle engine comprising a vane shaft integral with a shaft of a generator carrying gear teeth at a peripheral portion thereof, a pump rotor having an annular shaft, said annular shaft being provided with gear teeth formed at the inner surface thereof for speed reducing engagement with said gear teeth on the generator shaft, a flange integral with said gear teeth on the generator shaft and providing a surface facing a wall of said annular shaft, an annular groove formed in said wall or said surface, a packing ring accommodated in said annular groove, a first bearing means for rotatably supporting said generator shaft, said first bearing means being provided at its end adjacent to the generator with a first sealing means for preventing lubricant from scattering, a second bearing means for supporting said rotor, said second bearing means being provided at its end adjacent to the air pump with a second sealing means for preventing lubricant from scattering, an air escaping passage formed through a wall of the rotor and through an end cover of the air pump so as to connect the interior of the rotor to the atmosphere.

3,889,127

ELECTRIC CONTROL SYSTEM FOR DRIVING AN ELECTRIC VEHICLE INCLUDING FIRST AND SECOND CONVERTERS

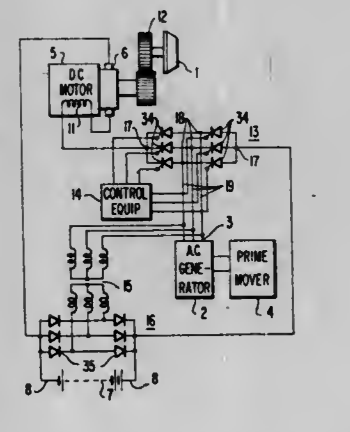
Fukuo Shibata, Hyogo, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Continuation of Ser. No. 264,087, June 19, 1972, abandoned. This application Mar. 22, 1974, Ser. No. 453,892

Claims priority, application Japan, June 19, 1971, 46-4426; June 26, 1971, 46-46499; July 2, 1971, 46-48640

Int. Cl. H02p *5/28*

U.S. Cl. 290—14 **7 Claims**



1. An electric control system for driving an electric vehicle having at least one wheel, said system comprising:

- a. alternating current electric generator means which has output terminals;
- b. prime mover means for driving said electric generator means;
- c. first electric motor means, having input terminals, for driving said wheel of the vehicle;
- d. an electric battery which has output terminals connected electrically with the input terminals of said first electric motor means and with the output terminals of said electric generator means;
- e. a first converter composed of controlled rectifiers and having A.C. side terminals connected electrically with the output terminals of said electric generator and D.C. side terminals connected electrically in series with the input terminal of said first electric motor and the output terminals of said electric battery;
- f. control means connected to vary the turn on point of said controlled rectifiers to operate said first converter as a converter converting A.C. power into D.C. power or as an inverter converting D.C. power into A.C. power thereby controlling the electric generator voltage connected in said circuit with said first electric motor means; and
- g. second converter having A.C. side terminals connected electrically with the output terminals of said electric generator and D.C. side terminals connected electrically with the output terminals of the said electric battery;

whereby said first electric motor means is variably supplied with electric power from said electric battery and said electric generator means permitting control of said first electric motor means over a wide speed range.

3,889,128

VARIABLE THRESHOLD ELECTRONIC RATE DETECTION SYSTEM FOR WHEEL SKID CONTROL

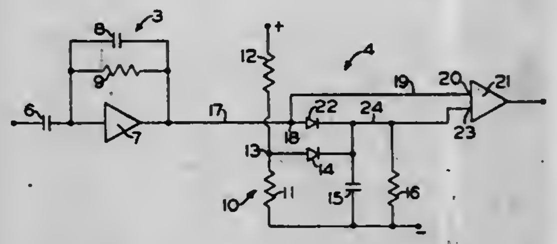
Dieter Luhdorff, Hannover, Germany, assignor to Westinghouse Bremsen-und Apparatebau GmbH, Hannover, Germany

Filed July 30, 1973, Ser. No. 383,824

Claims priority, application Germany, Sept. 6, 1972, 2243778

Int. Cl. B60t *8/12*

U.S. Cl. 307—9 **4 Claims**



1. An anti-skid brake control system for a vehicle comprising:

- a. means for generating a speed signal proportional to the rotational velocity of a wheel of said vehicle;
- b. differentiator means responsive to said speed signal for generating a deceleration signal; and
- c. wheel skid detector means for providing a wheel skid control signal to modulate brake force at a wheel whose generated deceleration signal exceeds a deceleration threshold, and for automatically adjusting said deceleration threshold from a first chosen value to a different value corresponding to the maximum value attained by said deceleration signal when said deceleration signal exceeds said first chosen threshold value such that a subsequent decrease of said deceleration signal below said different threshold value terminates said wheel skid control signal at a point in time prior to the time said deceleration signal decreases below said first chosen threshold value.

3,889,129

DIRECT-CURRENT SUPPLY CONNECTOR

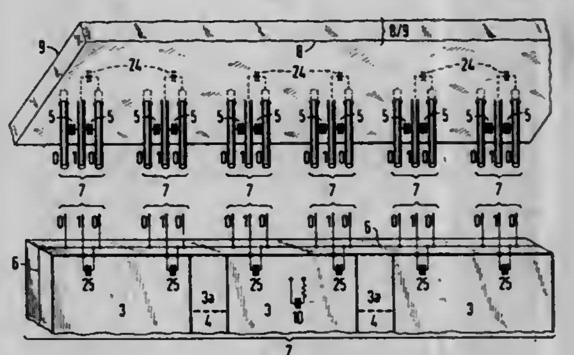
Willi Menzel, Gauting, and Gundolf Milde, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 20, 1973, Ser. No. 399,336

Claims priority, application Germany, Sept. 22, 1972, 2246602

Int. Cl. H02j *1/02*

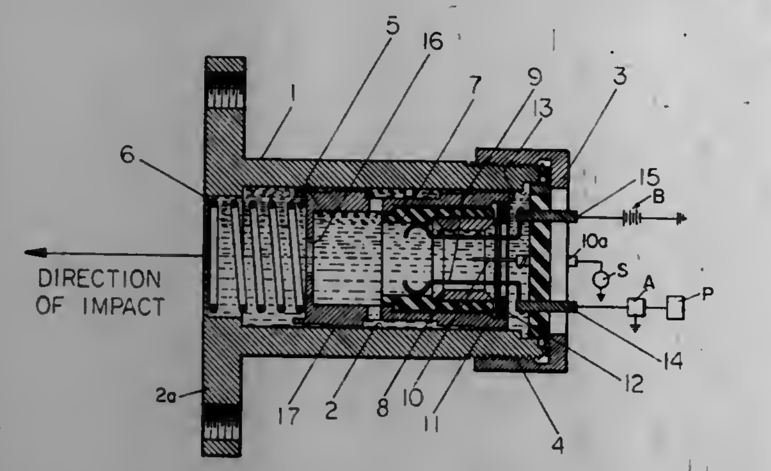
U.S. Cl. 307—105 **12 Claims**



1. A direct-current supply connector comprising a plurality of pairs of terminals for providing electrical connection between, on the one side of said connector, an elongated flat module (2) provided with a low-inductance direct-current supply line and, on the other side of said connector a module rack for receiving a plurality of said elongated modules, said module rack being connected with each of said modules over one of said connectors, current being supplied from said direct

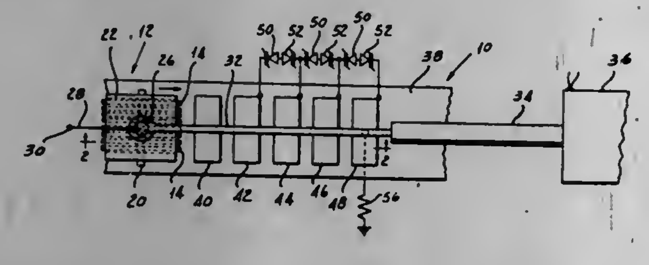
current supply line of said module rack to said module, wherein a first individual pair section of each of said terminal pairs which is connected to an outgoing line of said direct-current supply line is connected with a second pair section of said each terminal pair which is connected to a return line of the direct-current supply over a shunt capacitor disposed in the immediate vicinity of said each terminal pair.

3,889,130
MASS IN LIQUID VEHICULAR CRASH SENSOR
David S. Breed, Boonton, N.J., assignor to Breed Corporation, Fairfield, N.J.
Filed June 4, 1973, Ser. No. 366,427
Int. Cl. H01h *35/14*
U.S. Cl. 307—121 **16 Claims**



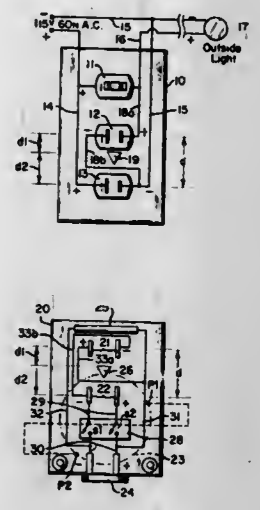
1. A crash sensor for sensing acceleration above a predetermined acceleration threshold of a vehicle having a normally inactive passenger restraint system and means for actuating said system, said sensor comprising a housing having a wall defining a chamber; a sensing mass occupying said chamber, the cross-sectional dimension of said chamber being greater than the corresponding dimension of said mass to provide an annular clearance between said mass and said wall and the longitudinal dimension of said chamber being greater than the corresponding dimension of said mass whereby said mass is enabled to move in a direction longitudinally of said chamber, said mass having a passage extending therethrough in the direction of longitudinal movement thereof; a liquid having kinematic viscosity lower than 100 centistokes at 70° F. and together with said mass substantially filling said chamber whereby the liquid may flow through said passage and said clearance operating means including means carried by said mass and responsive to predetermined movement of said mass in one direction to operate said actuating means; and biasing means acting on said mass and disabling said movement thereof in said one direction until said predetermined acceleration threshold is exceeded.

3,889,131
LONG LIFE RELIABLE RELAY
Jack B. Speller, 400 E. 56th St., New York, N.Y. 10022
Filed Oct. 29, 1973, Ser. No. 410,719
Int. Cl. H01h *9/30*
U.S. Cl. 307—136 **14 Claims**



1. A relay for applying a voltage to a load including a combination, a first contact, a plurality of spaced second contacts, means mounting said first contact and said second contacts for relative movement to cause said first contact successively to engage said second contacts, respective zener diodes connected between adjacent said second contacts, and means for applying said voltage and said load between said first contact and the last second contact engaged by the first contact, the breakdown voltages of said diodes being such as to ensure that the voltage change at the load is less than the breakdown potential between the first contact and the second contact engaged thereby as the first contact successively engages the second contacts.

3,889,132
TIMER ASSEMBLY FOR OUTSIDE LIGHT
Robert L. Vreeland, 2531 Neptune Pl., Calif. 93041
Filed Feb. 21, 1974, Ser. No. 444,420
Int. Cl. H01h *43/00*
U.S. Cl. 307—141 **7 Claims**



1. A timer assembly for an outside light comprising, in combination:

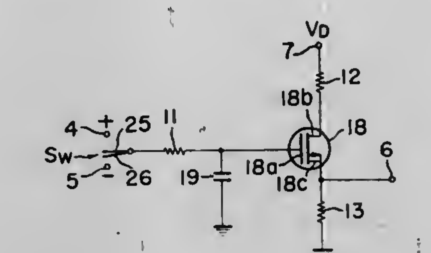
a. a wall plate including a toggle switch for turning said outside light on and off and first and second electrical outlets spaced a given distance from each other, said first and second electrical outlets normally connecting to positive and negative electrical power lines;

b. first interconnecting means in said wall plate removing the connection to the negative power line from one side of the first electrical outlet and connecting it to the side of the toggle switch connecting to the outside light, and second interconnecting means removing the other side of the first electrical outlet from the positive power line and connecting it to the negative power line so that said first electrical outlet is in parallel with the outside light;

c. a plug casing having first and second sets of plug blades extending therefrom and spaced from each other by said given distance, a timer in said casing having inlet and oulet leads, the inlet leads connecting to the second set of plug blades, and an electrical timer socket exposed on said casing connected to the outlet leads said timer including switch means for connecting the inlet leads to the outlet leads and time setting means connected to the switch means to close the switch means such that energy from said second set of plug blades is supplied to said timer socket during a predetermined time interval as set by said time setting means when said second set of plug blades is plugged into said second electrical outlet in said wall plate to energize the timer; and

d. third interconnecting means in said plug casing connecting to the positive side of the outlet leads of the timer connecting to the timer socket, and a fourth interconnecting means connecting the negative side of said first set of plug blades to the negative plug blade of the second set of plug blades; said first set of plug blades being received in said first electrical outlet in said wall plate and said second set of plug blades being received in said second electrical outlet in said wall plate, whereby said outside light is automatically turned on for said predetermined time interval by said timer.

3,889,133
OUTPUT-VOLTAGE VARIABLE DEVICE
Shunzo Oka, and Shunji Minami, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 12, 1973, Ser. No. 340,347
Claims priority, application Japan, Mar. 16, 1972, 47-31952[U]; Mar. 16, 1972, 47-27189; Mar. 28, 1972, 47-31336; Mar. 28, 1972, 47-31337; Apr. 25, 1972, 47-49489[U]; Apr. 25, 1972, 47-41978
Int. Cl. H03k *17/00*
U.S. Cl. 307—239 **5 Claims**



1. An output-voltage variable device comprising

a. a metal oxide semiconductor field-effect transistor having a gate, a drain and a source,

b. an input resistor, a neon discharge lamp connected in series with the input resistor, a single-pole double-throw center-off switch having a movable contact arm connected through said input resistor and said neon discharge lamp to the gate of said field-effect transistor and having fixed positive and negative contacts connected to positive and negative DC sources, respectively, and connected to said movable contact arm by operative movement of said arm,

c. a non-polarized capacitor connected between said gate of said field-effect transistor and ground,

d. a drain resistor connected between the drain of said field-effect transistor and a positive DC supply,

e. an output resistor connected between the source of said field-effect transistor and ground,

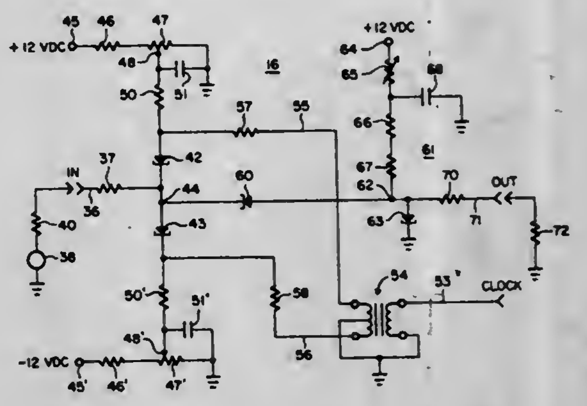
f. an output terminal connected to said output resistor for deriving an output voltage whereby movement of said movable contact arm from the positive to the negative source and from the negative source to the positive source gradually charges and discharges said non-polarized capacitor, the output voltage thereby following the voltage on said non-polarized capacitor,

g. a casing for housing therein said MOS field-effect transistor, said input resistor, said switch, said capacitor, said drain resistor and said output resistor, said casing being provided with a positive input terminal electrically connected to said positive contact of said switch, a negative terminal electrically connected to said negative contact, a bias terminal electrically connected to said drain resistor, an output terminal electrically connected to said source of said field-effect transistor, and a ground terminal electrically connected to the grounding end of said capacitor and said output resistor, all of said terminals of said casing being used for external connections to said positive and negative DC sources, said bias DC supply, and ground,

h. an operating shaft drivingly connected to said movable contact arm, and

i. a variable resistor mechanically connected to said shaft, said variable resistor being adjusted simultaneously with the actuation of said single-pole double-throw center-off switch.

3,889,134
TUNNEL DIODE DIGITAL DATA SAMPLE, DECISION AND HOLD CIRCUIT
Jack K. Basham, Los Angeles, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Filed May 16, 1974, Ser. No. 470,691
Int. Cl. H03k *5/01*, *19/10*
U.S. Cl. 307—268 **10 Claims**



1. A high speed sample, decision and hold circuit for sampling and reconstructing a nonreturn to zero digital data input, said circuit comprising:

a. a first and a second tunnel diode, the cathode of said first diode being directly connected to the anode of said second diode to form junction point;

b. means for applying the nonreturn to zero data to said junction point;

c. means coupled to said first and said second diode for biasing and balancing said diodes to form a Gotó pair;

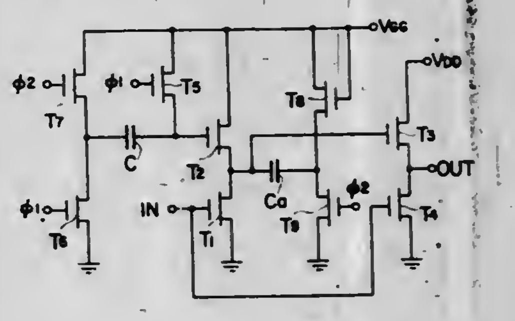
d. means for applying a clock signal of opposite polarity to said first and second diodes so that each diode is supplied with a clock signal of a predetermined polarity, whereby the data in conjunction with the clock signal will drive a selected one of said diodes into its injection region;

e. a memory circuit including a third tunnel diode;

f. means for biasing said third diode so that it is in a bistable condition; and

g. coupling means for coupling said first junction point to said third tunnel diode and for applying the voltage at said first junction point to said third diode to drive it from one stable state to the other or for maintaining it in its previous stable state depending upon the decision made by said first and second diodes.

3,889,135
BOOTSTRAP CIRCUIT EMPLOYING INSULATED GATE TRANSISTORS
Kosei Nomiya; Yoshikazu Hatsukano, and Kazuo Minorikawa, all of Tokyo, Japan, assignors to Hitachi, Ltd., Japan
Filed June 28, 1973, Ser. No. 374,815
Claims priority, application Japan, July 21, 1972, 47-72528
Int. Cl. H03k *17/06*, *17/10*, *17/60*
U.S. Cl. 307—270 **3 Claims**



1. A bootstrap circuit employing insulated gate field effect transistors comprising:

a first insulated gate field effect transistor having a source, a drain, and a gate electrode;

first means for coupling the drain electrode of said first transistor to a first power source;

a second insulated gate field effect transistor having a source, a drain, and a gate electrode;

a first capacitor connected between the drain electrode of said second transistor and the gate electrode of said first transistor;

second means for coupling the source electrode of said second transistor to a source of reference potential;

third means for coupling a first clock pulse to the gate electrode of said second transistor;

a first impedance coupled between said first means and the drain electrode of said second transistor;

a second impedance coupled between said first means and the gate electrode of said first transistor;

a third insulated gate field effect transistor having a source, a drain and a gate electrode, the drain and source electrodes of which being respectively connected to the source electrode of said first insulated gate field effect transistor and said source of reference potential;

an inverter means including a fourth and a fifth insulated gate field effect transistor connected in series between a second power source and said source of reference potential, the gate electrode of said fourth insulated gate field effect transistor being connected to the source electrode of said first insulated gate field effect transistor, and the gate electrodes of said third and fifth insulated gate field effect transistors being connected together to an input signal terminal;

an output means for deriving an output from said inverter means connected to the source electrode of said fourth insulating gate field effect transistor; and

further including a sixth insulated gate field effect transistor having a source, a drain and a gate electrode, the source electrode of which is connected to said second means, a second capacitor connected between the source electrode of said first transistor and the drain electrode of said sixth transistor, a third impedance connected between said first means and the drain electrode of said sixth transistor, and fourth means for coupling a second clock pulse, shifted in time relative to said first clock pulse, to the gate electrode of said sixth transistor.

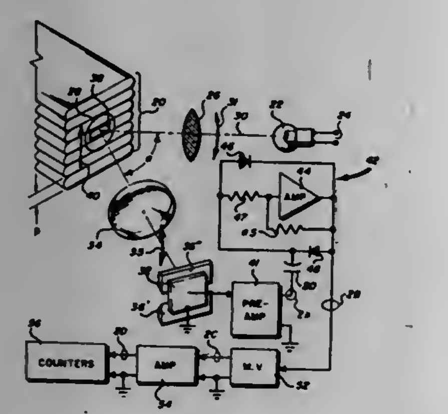
3,889,136
SIGNAL STRIPPING CIRCUIT

William L. Mohan, and Samuel P. Willits, both of Barrington, Ill., assignors to Spartanics, Ltd., Rolling Meadows, Ill.

Division of Ser. No. 301,661, Nov. 2, 1972, abandoned, which is a division of Ser. No. 120,889, March 4, 1971, Pat. No. 3,790,759, which is a division of Ser. No. 780,367, Dec. 2, 1968, Pat. No. 3,581,067. This application June 29, 1973, Ser. No. 375,105

Int. Cl. H03k *1/16*

U.S. Cl. 307—295 **7 Claims**



1. A circuit for stripping the highest frequency above a preset threshold level present in a signal wave train having more than one frequency component comprising

capacitive input coupling means, and

non-linear clamping circuit means comprising a diode clamped operational amplifier having a preset threshold level and connected at its input to said capacitive input coupling means to maintain the charge thereon in substantially matching relationship with said highest frequency above said preset level, the output of said non-linear circuit means being a square wave indicative of said highest frequency above said preset threshold level present in said signal wave train.

3,889,137
CIRCUIT ARRANGEMENTS COMPRISING A SWITCHING TRANSISTOR

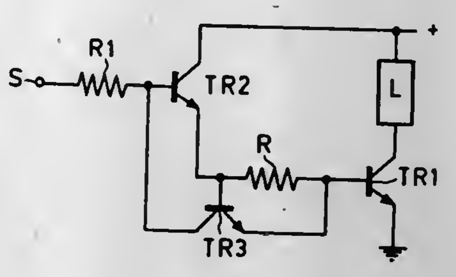
Malcolm John Kay, Lockleys, Australia, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 10, 1973, Ser. No. 423,275

Claims priority, application Australia, Dec. 20, 1974, 59174/73

Int. Cl. H03k *17/00*

U.S. Cl. 307—300 **7 Claims**



1. A switching circuit arrangement comprising:

a switching transistor;

means for supplying a switching signal for rendering said switching transistor conductive;

an amplifier for supplying said switching signal to said switching transistor, said amplifier having a current sensing impedance connected between the amplifier output and the base of the switching transistor; and

a feedback transistor for supplying a negative feedback signal to the input of the amplifier, said feedback transistor having its base-emitter junction connected across the current sensing impedance and having its collector supplying said feedback signal to the amplifier input, the base current being supplied to the switching transistor also operating to forward bias the base-emitter junction of the feedback transistor.

3,889,138
ELECTROSTATIC GENERATOR

William Douglas Allen, Quirang Burcot, near Abingdon, and Michael Morris, Frodsham, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

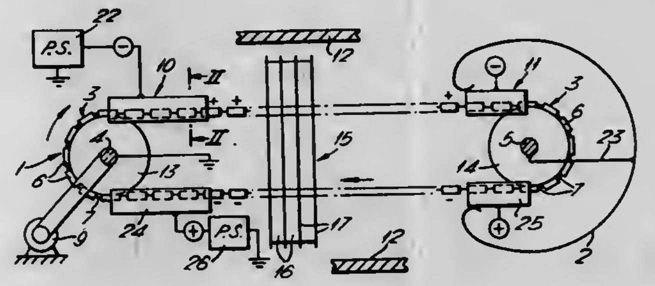
Continuation of Ser. No. 297,838, Oct. 16, 1972, abandoned. This application Feb. 28, 1974, Ser. No. 446,954

Claims priority, application United Kingdom, Oct. 28, 1971, 50287/71

Int. Cl. H02n *1/00*

U.S. Cl. 310—6 **4 Claims**

1. For electrically charging a high voltage terminal, the combination comprising a series of electrically conducting members of elongated form having smooth uncovered external surfaces, mechanical linkages interconnecting and electrically insulating adjacent members from one another thereby to arrange the members in substantially parallel side-by-side array in an endless chain, a charging station and discharging station of which at least the former comprises induction electrode means disposed on both sides of the elongated members, the discharging station being arranged for the transfer of charge from the members to the high voltage terminal, and



means for driving the endless chain along a path of travel from the charging station to the discharging station.

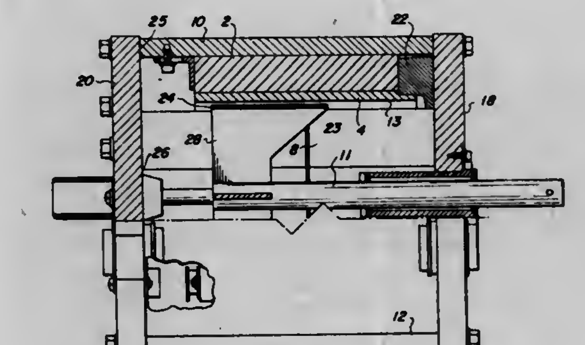
3,889,139
LINEAR MOTOR ACTUATOR

Gordon F. Hughes, Los Angeles, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 14, 1974, Ser. No. 442,727

Int. Cl. H02k *41/02*

U.S. Cl. 310—13 **9 Claims**



1. A linear magnetic actuator comprising:

an outer pole having substantially perpendicular and equal vertical and lateral exterior dimensions, and having a circular cylindrical bore centrally located about the longitudinal center line of said outer pole,

magnetic means for generating magnetic lines of force perpendicular to the top, side and bottom exterior surfaces of said outer pole,

a shaft slidably mounted along said center line of said outer pole and within said outer pole bore,

a hollow coil assembly of circular cylindrical shape rigidly attached to said shaft with said assembly longitudinal axis coincident with said outer pole center line and having a diameter smaller than the diameter of said bore,

drive current means for providing varying amounts of d.c. drive current,

winding means connected to said drive current means and wound around and rigidly attached to said coil assembly and having a radial thickness smaller than the radial dimension of the space between said outer pole and said coil assembly for producing a longitudinal driving force on said shaft when drive current from said drive current means is provided,

plate means for providing a low-reluctance circuit along the top, side, bottom, front and back external surfaces of said linear magnetic actuator, and

center pole means connected to said plate means for providing a low reluctance circuit through the interior of said coil assembly to the front and back external surface of said linear magnetic actuator.

3,889,140
INDUCTION BRAKE OR CLUTCH

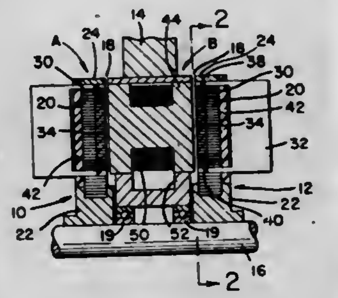
Max Baermann, Cologne, Germany, assignor to Firma Max Baermann, Cologne, Germany

Continuation-in-part of Ser. No. 153,785, June 16, 1971, abandoned, which is a continuation of Ser. No. 853,764, Aug. 28, 1969, abandoned. This application June 8, 1973, Ser. No. 368,279

Claims priority, application Germany, Aug. 31, 1968, 1763894

Int. Cl. H02k *49/04*

U.S. Cl. 310—103 **18 Claims**



1. An electrical induction device comprising: a fixed first member, a second member mounted on a rotatable shaft for rotation relative to said first member in close spaced relationship thereto, said first member including a plurality of poles and said second member including means for causing an alternating flux field in said poles when said members rotate relative to each other, said second member means including a plurality of circumferentially spaced, wafer-shaped, permanent magnets each having a pair of pole surfaces, ferromagnetic pole shoes having inner and outer ends disposed intermediate said pole surfaces, said magnets being magnetized in the direction of their thin dimension with adjacent pole surfaces having the same polarity so that the outer ends of said pole shoes define a second member circumference comprised of magnetic poles of alternating polarity, and said inner ends of said pole shoes including means for securing said pole shoes to said shaft and said outer ends of said pole shoes having short-circuit windings thereon.

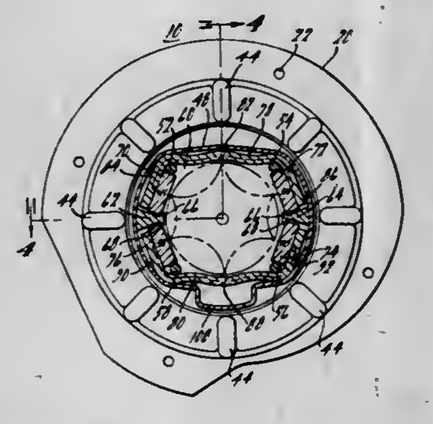
3,889,141
SIX POLE PERMANENT MAGNET MOTOR

Frank R. Merriam, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 24, 1973, Ser. No. 363,992

Int. Cl. H02k *21/26, 23/04*

U.S. Cl. 310—154 **16 Claims**



1. A permanent magnet dynamoelectric machine comprising a rotor and a stator rotatably supporting said rotor, four permanent magnets, and two ferro-magnetic flux path members mounted in said stator, each of said flux path members having end portions engaging two of said permanent magnets both of the permanent magnets in contact with one of said flux path members having a first commonly designated magnetic pole facing said armature and having their oppositely desig-

nated magnetic poles in engagement with said end portions of said one ferromagnetic flux path member, both of the permanent magnets in contact with the second flux path member having a first commonly designated magnetic pole in engagement with said end portions of said second flux path member and their oppositely designated magnetic poles facing said rotor whereby one of said flux path members is polarized as a magnetic north and the other of said flux path members is polarized as a magnetic south and the portions of the flux path member intermediate their ends form consequent poles to provide a six pole dynamoelectric machine using only four permanent magnets.

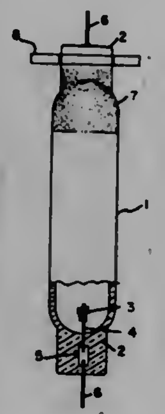
3,889,142
METAL HALIDE DISCHARGE LAMP HAVING HEAT REFLECTIVE COATING

William M. Keeffe, Rockport, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Mar. 25, 1974, Ser. No. 454,397

Int. Cl. H01j *1/02*

U.S. Cl. 313—44 **4 Claims**



1. An arc discharge lamp comprising an arc tube, made of high silica glass and having press seals at each end, containing a filling including inert starting gas, mercury and metal halide, having electrodes sealed therein at opposite ends and having a heat reflective coating of ZrO_2 and ZrB_2 on the ends of said arc tube.

3,889,143
PHOTOCATHODE MANUFACTURE

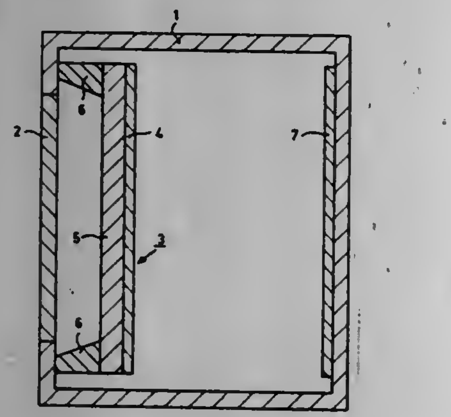
Jonathan Paul Gowers, Salfords, near Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 23, 1973, Ser. No. 418,295

Claims priority, application United Kingdom, Aug. 21, 1973, 54387/73

Int. Cl. H01j *39/16, 39/06*

U.S. Cl. 313—94 **6 Claims**



1. A photocathode structure containing a photocathode material, comprising:
a. a plate of single crystal gallium indium phosphide having major surfaces and relative proportions of gallium and indium such that the lattice parameter thereof is substantially the same as that of said photocathode material, and
b. an epitaxial layer of photocathode material located on a first said major surface of said crystal, the thickness of said layer of photocathode material being of the order of the diffusion length of electrons therein and at least part of a second said major surface of the gallium indium phosphide plate being substantially free from contact by solid material.

3,889,144
IMAGE INTENSIFIER TUBE

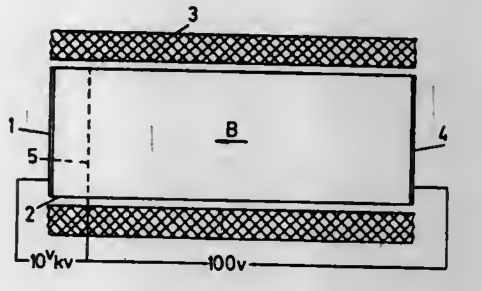
James Dwyer McGee, London, England, assignor to Electron Physics Limited, England

Filed Nov. 22, 1972, Ser. No. 308,725

Claims priority, application United Kingdom, Nov. 24, 1971, 054554/71

Int. Cl. H01j *39/10, 39/02*

U.S. Cl. 313—99 **5 Claims**



1. Image intensifier tube apparatus comprising a phoshpor screen, a photocathode spaced from and parallel to said phosphor screen, a fine wire electrode for producing a substantially equipotential surface in a plane substantially parallel to said phosphor screen, said plane being disposed intermediate said phosphor screen and said photocathode at a distance from said phosphor screen which is equal to or less than one-fourth of the distance between said photocathode and said phosphor screen, means for applying a first potential between said photocathode and said electrode and a second potential between said electrode and said phosphor screen, said first potential being relatively small with respect to said second potential and means for establishing a magnetic field transverse to said plane to focus photoelectrons emitted from said photocathode onto said phosphor screen, said disposition of said plane and said relation between said first and second potentials causing a major portion of magnetic focusing to occur in a region of relatively low electric field strength.

3,889,145
COLOR CATHODE RAY TUBE WITH PHOSPHOR STRIPS CONCAVE TOWARD VERTICAL CENTER LINE

Takeshi Suzuki; Hiroshi Tanaka, both of Fukaya; Takeo Ito, Honjo, and Hiroaki Komatsu, Fukaya, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawaski-shi, Japan

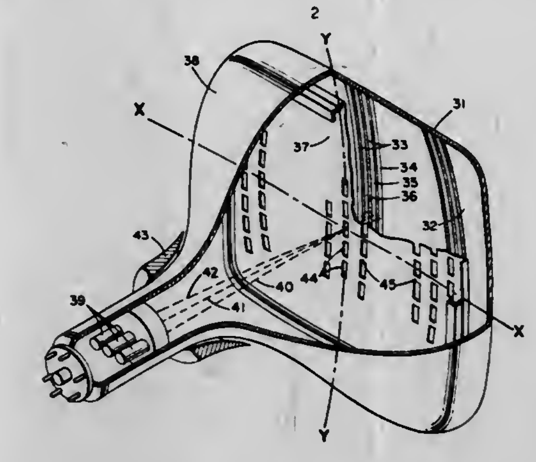
Filed Aug. 30, 1973, Ser. No. 393,028

Claims priority, application Japan, Aug. 30, 1972, 47-86354

Int. Cl. H01j *29/06, 29/08*

U.S. Cl. 313—408 **9 Claims**

1. A color cathode ray tube comprising a curved screen panel having an inner surface with successive groups of three different elemental color vertical phosphor stripes arranged cyclically therein,
election gun means arrayed on a plane perpendicular to said phosphor stripes for generating three electron beams directed toward said screen for impinging on corresponding ones of said phosphor stripes,
a shadow mask interposed between said gun means and said inner panel surface and having substantially the same curvature as said panel, said mask having vertical rows of beam-passable apertures, said apertures being separated from one another along each row by narrow bridge portions, each of said rows of apertures being associated with one of said groups of phosphor stripes and limiting the illumination thereof by said gun means,
said phosphor stripes and associated rows of apertures being substantially straight on and near the vertical axis of the tube as viewed in the direction of the central axis of the tube, and the remainder of said phosphor stripes and associated rows of apertures being outwardly curved in the horizontal axis direction on both sides of the Y-axis of the screen, the color stripes and associated rows of apertures becoming increasingly concave toward the axis of the screen with distance from it.



3,889,146
ELECTRON GUN ASSEMBLIES FOR USE IN COLOUR PICTURE TUBES

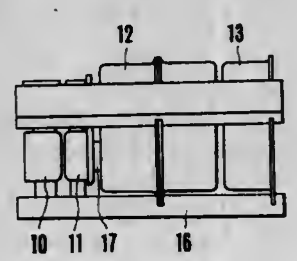
Kihachiro Koizumi, Chiba; Yukihiro Izumida, Mobara and Yoshihiko Miyata, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 6, 1974, Ser. No. 448,548

Claims priority, application Japan, Aug. 29, 1973, 48-96106

Int. Cl. H01j *29/50*

U.S. Cl. 313—414 **6 Claims**



1. A delta type electron gun assembly for use in a colour picture tube comprising cathode electrodes arranged in a regular triangular configuration, first grid electrodes disposed in front of said cathode electrodes respectively, second grid electrodes disposed in front of said first grid electrodes respectively, a third hollow cylindrical grid electrode disposed to confront said second grid electrodes and extending substantially coaxially with said tube in the direction of travel of the electron beams emitted by said cathode electrodes, said third grid electrode being provided with three electron beam transmission perforations through one end wall far from said cathode electrodes thereof, said three perforations being also arranged in a regular triangular configuration, a fourth cylindrical grid electrode disposed in front of said third grid electrode, said fourth grid electrode being also provided with three electron beam transmission perforations arranged in a regular triangular configuration through a wall facing to said one end wall thereof, said third and fourth cylindrical grid electrodes comprising members for forming a main electron lens by applying different potential thereon, and means for supporting said cathode electrodes and said grid electrodes.

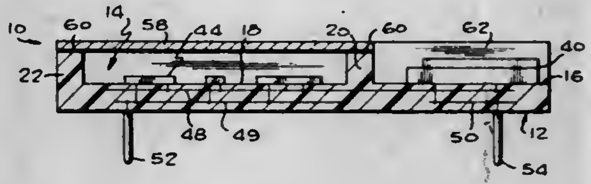
3,889,147
LIGHT EMITTING DIODE MODULE

Henry Tobin Groves, Van Nuys, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Sept. 30, 1974, Ser. No. 510,495

Int. Cl. H05b

U.S. Cl. 313—500 **8 Claims**



1. A light emitting diode module having self-contained electronic circuitry, the module comprising:
a. module base having at least a first base compartment,
b. a plurality of electrical conductors formed within said base,
c. at least first and second electrical power conductor pins extending outwardly from said base and electrically connected to first and second ones of said electrical conductors respectively,
d. light emitting diode array positioned on said base and electrically connected between said second electrical conductor and a third one of said electrical conductors, said array positioned on said base so that adjacent arrays and arrays on adjacent modules are equidistant between array centers,
e. electronic circuitry positioned in said first base compartment and electrically connected between said first and third electrical conductors to drive and switch said array in a selected manner,
f. a cover for said first base compartment, and
g. a transparent protective means covering said array.

3,889,148
TRANSIT TIME AMPLIFIER TUBE HAVING AN ATTENUATED DELAY LINE

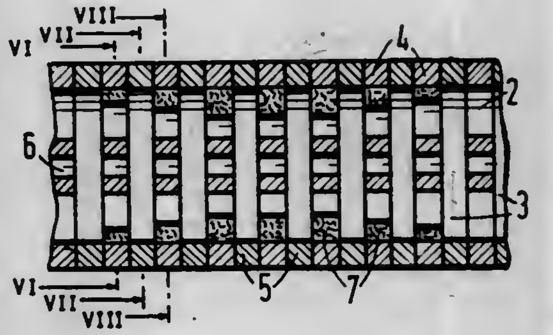
Franz Gross, Schwanseestrasse 50, 8000 Munich 90, Germany

Filed Sept. 24, 1973, Ser. No. 399,963

Claims priority, application Germany, Oct. 23, 1972, 2251887

Int. Cl. H01j *25/34*

U.S. Cl. 315—3.5 **5 Claims**

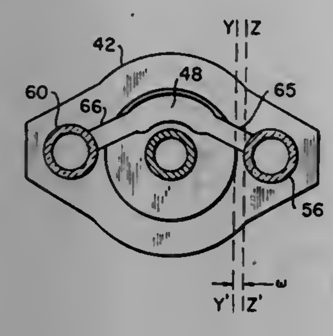


1. A transit time amplifier tube comprising a delay line including a hollow tube of circular inner cross section, said tube divided by successive transverse elements into cells, attenuating bodies in at least a few of said cells, said bodies consisting of material subject to losses and said bodies mounted in direct contact with the walls of said hollow tube, said attenuating bodies acting on a wide frequency band and having the form of segments of said circular inner cross section of said hollow tube and two of such bodies extending from opposite parts of said walls toward the longitudinal axis of the delay line by the same width.

3,889,149
LIQUID COOLED ATTENUATOR

Lester M. Winslow, Alexandria, Va., and Hazel E. Brown, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 24, 1973, Ser. No. 409,204
Int. Cl. H01j *25/34*
U.S. Cl. 315—3.5 **10 Claims**

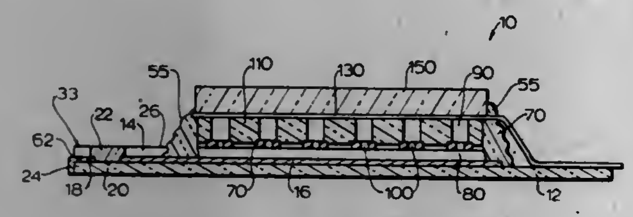


1. In a traveling-wave tube having means for providing a stream of electrons along a predetermined path and means propagating electromagnetic energy comprising means defining a plurality of intercoupled interaction cavities in a manner so that interaction takes place with the stream of electrons further comprising:
- a plurality of support pole pieces, each having at least one coupling hole means providing intercoupling of electromagnetic energy between said interaction cavities;
- at least one lossy transmission line means disposed proximate and external to said predetermined path; and
- means for preventing bondedge oscillation comprising a plurality of coupling irises located in said support pole pieces coupling directly at least one of said lossy transmission line means and at least one of said coupling means.

3,889,150
GASEOUS DISCHARGE DISPLAY PANEL WITH SCANNING ANODE BASE PLATE ASSEMBLY INCLUDING RESISTIVE MASSES

George John Przybylek, Martinsville, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed July 30, 1974, Ser. No. 493,098
Int. Cl. H01j *17/34*
U.S. Cl. 315—58 **7 Claims**

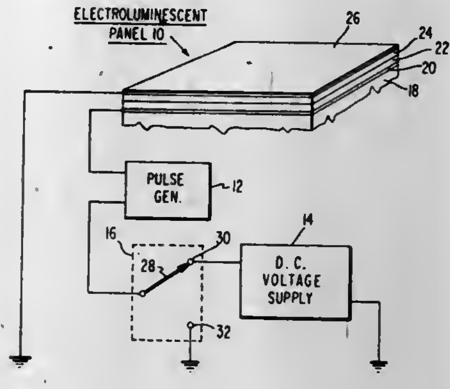


1. A base plate assembly for a gas cell display panel comprising:
- an insulator base plate having a plurality of slots formed therein with floors for receiving a plurality of scanning anodes;
- a plurality of scanning anodes disposed on the floors of said slots with a discontinuity provided in each of said scanning anodes;
- a resistive mass contained within each of said slots and bridging each of said discontinuities; and
- a common bus provided across one end of said insulator base plate and coupled to said scanning anodes for providing a single terminal for coupling said scanning anodes with an external power supply.

3,889,151
ENERGIZING TECHNIQUE FOR ELECTROLUMINESCENT DEVICES

Joseph John Hanak, Trenton, and Peter David Southgate, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 2, 1973, Ser. No. 384,882
Int. Cl. H05b *37/00*
U.S. Cl. 315—170 **12 Claims**

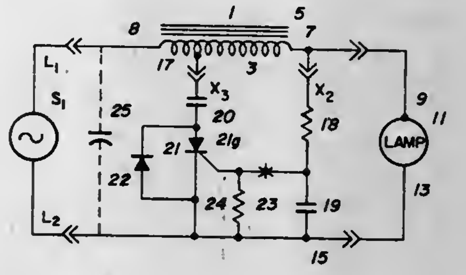


1. The combination comprising:
- a. a given electroluminescent device having a non-linear current-voltage characteristic that a first voltage there across having a first level of a given polarity results in an insignificantly small current therethrough and an insignificant brightness of light emitted thereby and a second voltage thereacross having a second level of said given polarity which is higher than said first level results in a significantly large current therethrough and a significant brightness of light emitted therby, and
- b. power supply means coupled across said device, including a DC voltage supply and a pulse generator connected in series with each other, said DC voltage supply supplying a continuous DC voltage magnitude of said first level and given polarity, and said pulse generator generating a series of intermittent DC pulses at a given duty cycle which is not in excess of one percent, with each pulse having said given polarity and an amplitude equal to the difference between said second level and said first level.

3,889,152
STARTING AND OPERATING BALLAST FOR HIGH PRESSURE SODIUM LAMPS

Richard Hill Bodine, Jr., Germantown, Tenn., and Marion Rosiak, Mt. Prospect, Ill., assignors to Litton Systems, Inc., Bellwood, Ill. and Bodine Co., Inc., Collierville, Tenn.

Filed Oct. 10, 1974, Ser. No. 513,711
Int. Cl. H05b *37/00*
U.S. Cl. 315—205 **7 Claims**



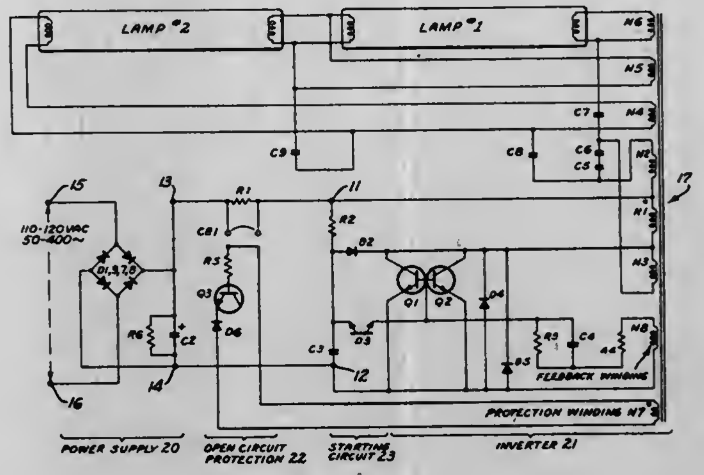
1. Means for starting and operating an arc discharge lamp comprising:
- inductive ballast means, said ballast means containing a magnetic core and at least a first winding of N turns of insulated wire mounted on said core;
- tap means on said winding at a position approximately N_T turns from said first end of said winding, wherein $N-N_T/N_T$ is a quantity greater than 1;

- a circuit common;
- means for connecting said lamp means in an electrical series circuit between an end of said winding and said circuit common;
- means for monitoring the instantaneous voltage across said first winding, said means comprising:
- first resistor;
- first capacitor; means connecting said first resistor and first capacitor means in electrical series circuit between said winding end and said circuit common;
- second capacitor means;
- first and second semiconductor controlled rectifier means, each of said rectifier means containing an anode, a cathode and a gate electrode;
- means connecting the anode of one controlled rectifier means to the cathode of the other controlled rectifier means to form a series circuit and means connecting said second capacitor means in series with said aforementioned series circuit between said tap and said circuit common;
- diode rectifier means, said diode rectifier means being connected in shunt of said series circuit of said controlled rectifier means and in opposite polarity thereto;
- second and third resistor means connected electrically in series across said diode rectifier means;
- means placing the midpoint of said series resistor circuit electrically in common with a point in circuit between said series connected controlled rectifier means;
- fourth resistor means connected between said gate electrode of said first controlled rectifier means and said cathode thereof;
- fifth resistor means connected between the gate electrode of said second controlled rectifier means and said common lead;
- third capacitor means connected between said gate electrode of said first controlled rectifier and said common lead; and
- diac means connected between the gate electrode of said second controlled rectifier to said capacitor of said voltage monitoring circuit.

3,889,153
POWER SOURCE FOR FLUORESCENT LAMPS AND THE LIKE

John T. Pierce, Chemlsford, Mass., assignor to Iota Engineering Inc., Tucson, Ariz.

Filed Oct. 1, 1973, Ser. No. 402,317
Int. Cl. H02h *7/10;* **H05b** *41/29*
U.S. Cl. 315—209 R **5 Claims**

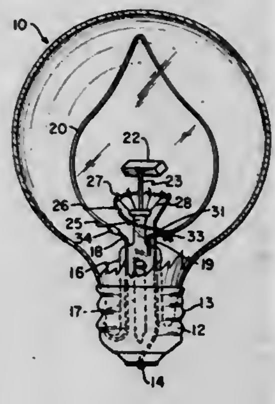


1. In a high frequency, high voltage power source for a load such as gas discharge lamps, the combination of:
- an inverter comprising an oscillator circuit and transformer, said transformer having primary, secondary and feedback windings, said oscillator circuit including a transistor having emitter and collector electrodes connected in series with said primary winding across a pair of dc input terminals and having the base and one of said electrodes connected across said feedback winding;
- an inverter starting circuit including a first resistor and first capacitor connected in series across said dc input terminals, and a breakdown device connected between the junction of said resistor and capacitor and said base, with said capacitor charging through said resistor and discharging through said breakdown device providing a starting current pulse to said transistor;
- a protection winding on said transformer;
- a second resistor connected in series at one of said dc input terminals;
- a thermal circuit breaker for shunting said second resistor; and
- heating circuit means connected across said protection winding and positioned adjacent said circuit breaker;
- with said transformer providing an increased output at said protection winding when there is no load at said secondary winding for energizing said heating circuit means and actuating said circuit breaker to the open condition and developing a voltage drop across said second resistor reducing the current in said primary winding and transistor, and
- with said heating circuit means including a third resistor for heating said circuit breaker and a second breakdown device permitting current flow through said third resistor from said protection winding when the protection winding voltage exceeds a predetermined amount.

3,889,154
VIBRATING FILAMENT LAMP WITH AUXILIARY STATIONARY FILAMENT

Wolfgang E. Thouret, Verona, N.J., and Rudolph Kaufman, Bronxville, N.Y., assignors to Duro-Test Corporation, North Bergen, N.J.

Filed Sept. 27, 1974, Ser. No. 509,831
Int. Cl. H01k *7/06, 9/00*
U.S. Cl. 315—267 **10 Claims**



1. An incandescent lamp for operation from a source of alternating current comprising:
- a transparent envelope,
- means for producing a magnetic field,
- a first filament, means for supplying the alternating current to said first filament to cause said first filament to incandesce, means for mounting said first filament at a predetermined orientation with respect to said magnetic field to produce an interaction between said magnetic field and the current flowing through said first filament to cause said first filament to vibrate,
- and second means having electrical resistance properties electrically connected to said first filament to produce a voltage drop across said second means.

3,889,155

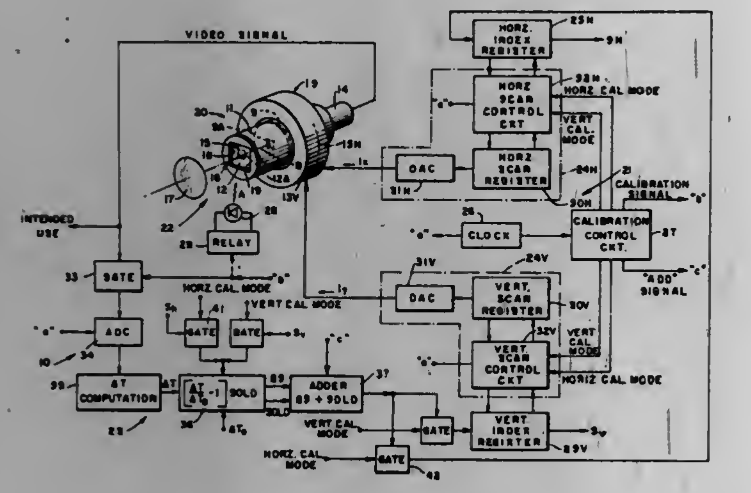
APPARATUS FOR CALIBRATING AN IMAGE DISSECTOR TUBE

Edwin E. Klingman, III, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 5, 1974, Ser. No. 448,325

Int. Cl. H01j *31/26*

U.S. Cl. 315—369 **10 Claims**



1. Apparatus for automatically calibrating a TV camera tube having a photosensitive screen on which an electron image of the scene being televised is formed, and a system for developing a video signal from a beam of electrons originating from the screen at a selected elemental area whose position depends on the level of current flowing through deflection coils associated with the tube, the apparatus comprising:

a. means generating a calibration signal;
b. light source means responsive to the calibration signal for illuminating the screen with a light pattern having parallel opposite edges;
c. a settable slope control circuit;
d. a current generator responsive to the calibration signal for supplying to the deflection coils a sweep signal that sequentially moves the location of the selected elemental area along a line crossing the pattern in a direction perpendicular to the edges and extending therebeyond whereby the pattern is scanned and the tube produces a video pulse;
e. the sweep signal being in the form of a time-variable current whose average rate of change is constant and dependent on the setting of the slope control circuit; and
f. automatic means responsive to the duration of the video pulse for changing the setting of the slope control circuit if such duration is different from a standard associated with the tube.

3,889,156

DOUBLE TUNED RETRACE DRIVEN HORIZONTAL DEFLECTION CIRCUIT

Manohar L. Arya, Hoffman Estates, Ill., assignor to Warwick Electronics Inc., Chicago, Ill.

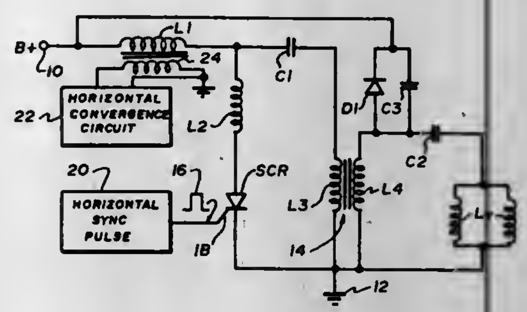
Filed Sept. 21, 1973, Ser. No. 399,988

Int. Cl. H01j *29/70*

U.S. Cl. 315—408 **10 Claims**

1. A scanning circuit for producing in a deflection winding a generally sawtooth deflection current having a trace period and a retrace period, comprising:

a voltage source;
a reactive impedance for storing energy;
coupling means for supplying current to said deflection winding;
a charge circuit for charging the reactive impedance from said voltage source during the trace period;
a semiconductor device having a first state, and a second state occurring in response to a predetermined electrical flow;
a discharge circuit energized by said semiconductor device during the retrace period for discharging the reactive impedance through said coupling means to produce in said deflection winding a generally sawtooth current, said discharge circuit being resonant at a first frequency related to the retrace period for generating a fundamental current flow through said semiconductor device and resonant at a second frequency higher than the first frequency for generating at the end of a said retrace period a secondary current flow which switches said device to said first state.



3,889,157

ARRANGEMENT FOR THE GENERATION OF UNIPOLAR AIR IONS

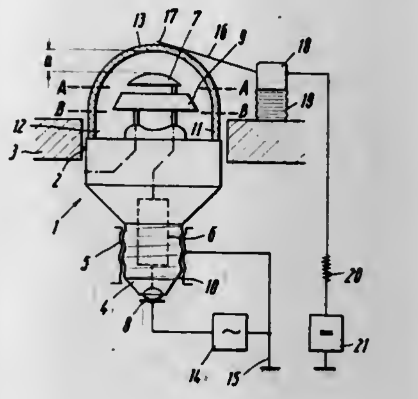
Constantin Graf Von Berckheim, Friedrichstrasse 9, Weinheim, Germany

Filed Nov. 29, 1973, Ser. No. 420,171

Claims priority, application Germany, Dec. 11, 1972, 2260521

Int. Cl. H01t *19/00*

U.S. Cl. 317—4 **14 Claims**



1. An arrangement for the production of unipolar air ions, particularly for the electrical climate control of habitable enclosed spaces, comprising, in combination, a glow lamp comprised of a glass wall defining an enclosed space containing two spaced electrodes, at least one of said electrodes being spaced from a predetermined portion of said glass wall by a distance less than 10 millimeters; means connected across said electrodes and operative for establishing thereacross a potential difference producing a glow discharge in the immediate vicinity of at least said one of said electrodes; and means operative for establishing a D.C. electric field which interacts with the ultraviolet radiation emitted in said glow discharge to produce said unipolar air ions, and including an electrical conductor having a tip portion located outside the enclosed space defined by said glass wall but in the immediate vicinity of said predetermined portion of said glass wall, so as to be located close to said glow discharge, and means for maintaining said tip of said electrical conductor at a high D.C. potential.

3,889,158

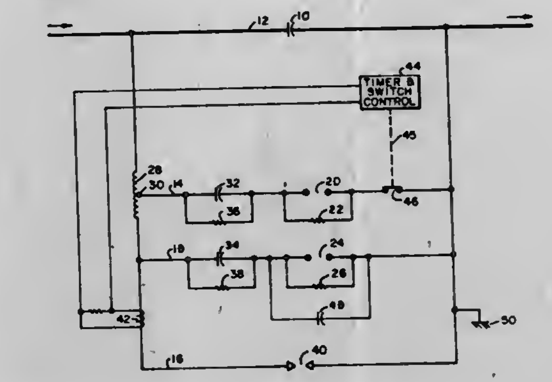
SERIES CAPACITOR PROTECTION EQUIPMENT WITH DUAL SPARKOVER FEATURE

Charles A. Peterson, Bloomington, Ind., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 27, 1974, Ser. No. 500,996

Int. Cl. H02h *7/16*

U.S. Cl. 317—12 A **6 Claims**



1. Protective apparatus for electrical equipment comprising: first, second, and third circuit branches connected electrically in parallel across the equipment to be protected;

said first circuit branch including means for bypassing the equipment at a first predetermined over-voltage level;
said second circuit branch including means for bypassing the equipment at a second predetermined over-voltage level higher than said first predetermined over-voltage level;
said third circuit branch including means for bypassing the equipment at a third overvoltage level higher than said second overvoltage level;
voltage cascading means for causing said second and third circuit branches to have their bypassing means operate upon the occurrence of an overvoltage effective to cause operation of the bypass of said first circuit branch;
means for disabling said first circuit branch upon the occurrence of the bypass through the third circuit branch and for restoring said first circuit branch to its original operating condition at a predetermined time after it is disabled.

3,889,159

METHOD AND SYSTEM TO PROTECT ELECTRONIC SWITCHING COMPONENTS

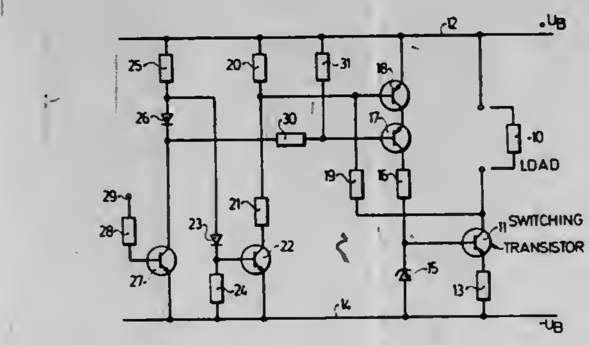
Wolf Wessel, Schwieberdingen, Germany, assignor to Robert Bosch G.m.b.H., Gerlingen-Schillerhoehe, Germany

Filed Jan. 16, 1974, Ser. No. 433,732

Claims priority, application Germany, Mar. 2, 1973, 2310448

Int. Cl. H02h *3/20*

U.S. Cl. 317—31 **21 Claims**



1. Method of protecting an electronic semiconductor switching element (11) against short circuits in a load (10) connected in series therewith, comprising

generating a test pulse upon connection of the load (10);
connecting said test pulse to the switching element (11) to render said switching element conductive;
testing the voltage at the junction of the switching element (11) and the load (10) and blocking the switching element (11), or permitting the switching element to remain conductive, in dependence on the level of the sensed test pulse.

3,889,160

SPARK-PRODUCING ARRANGEMENT FOR A LIGHTER WITH A BATTERY

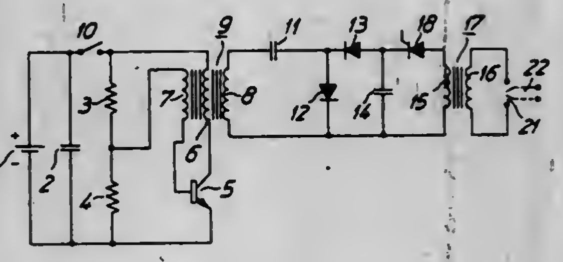
Claus Christian Cobarg, Steinbach, Germany, assignor to Braun Aktiengesellschaft, Kronberg, Taunus, Germany

Filed Sept. 6, 1973, Ser. No. 394,749

Claims priority, application Germany, Sept. 6, 1972, 2243695

Int. Cl. F23q *3/00*

U.S. Cl. 317—96 **1 Claim**



1. A spark-producing circuit comprising a source of D.C. voltage, an oscillating means including spark means coupled to said course of D.C. voltage, a sensing means placed adjacent said flame and sensing the presence of the flame for turning off said oscillating means when a flame is present, said oscillating means comprises a voltage transducer means having a primary, a secondary and a feedback winding, a transistor device having a base electrode connected to said feedback winding, a primary winding connected to said collector electrode, a voltage dividing circuit including said sensor means connected through said feedback winding to the base electrode of said transistor device, an operating switch means connecting said voltage divider circuit to one terminal of said D.C. voltage source, a discharge circuit connected to said secondary winding and including a storage capacitor means and a thyristor device connected in a series therewith and capable of producing a high voltage pulse when the charge in said storage capacitor attains a predetermined breakdown voltage of said thyristor means, a high voltage step-up transformer means having a primary winding connected in series with said storage capacitor means and said thyristor means and a secondary winding, a spark gap means connected in series with said secondary winding of said step-up transformer means, whereby a spark is produced in said spark gap means when said storage capacitor discharges over said thyristor device.

3,889,161

ELECTRONIC CONTROL SYSTEM

Steven F. Trush, P.O. Box K (Cross Ave.), Morrisville, N.Y. 13408

Filed Nov. 16, 1973, Ser. No. 416,570

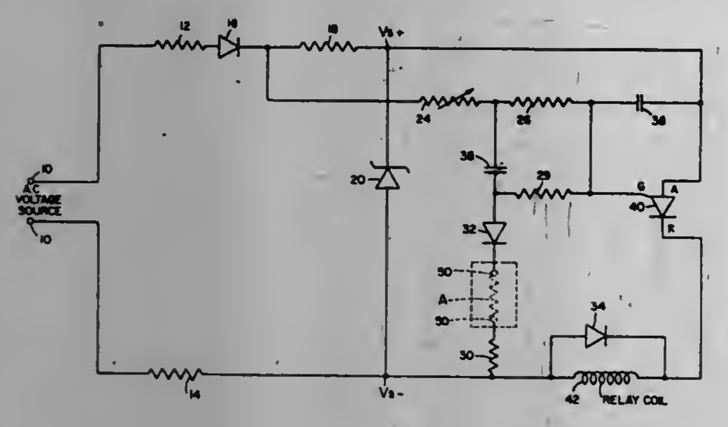
Int. Cl. H01h *47/32*

U.S. Cl. 317—148.5 B **8 Claims**

1. An electronic control system including:

a rectifying input circuit to be connected to an alternating current voltage source and having a positive lead and a negative lead across which a unidirectional operating potential is established;
a programable unijunction transistor having anode and cathode electrodes and having a gate electrode;
a controllable electric device connected in series with the anode and cathode electrodes of said unijunction transistor across the positive and negative leads of said rectifying input circuit;
resistance means;
a resistance-sensitive sensing element connected with said resistance means as a voltage divider across the positive

and negative leads of said rectifying input circuit; and

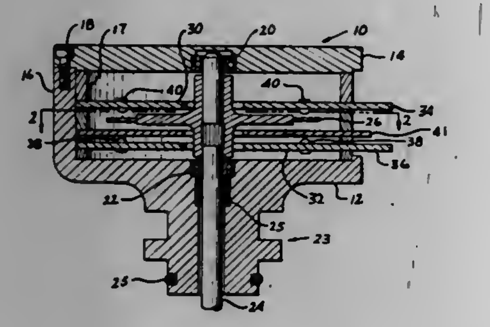


further resistance means connecting the gate electrode of said unijunction transistor to a point on said voltage divider.

3,889,162
SOLENOID DRIVING MEANS

John L. Myers, Dayton, Ohio, assignor to Ledex, Inc., Dayton, Ohio

Filed Feb. 4, 1974, Ser. No. 439,380
Int. Cl. H01h *47/32*
U.S. Cl. 317—148.5 R **9 Claims**

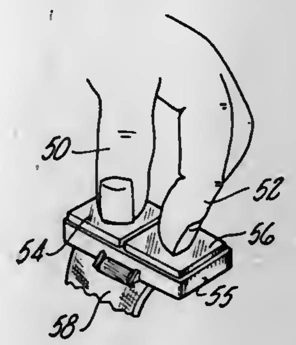


1. A solenoid driving circuit comprising, in combination,
first operational amplifier means having an inverting input, a non-inverting input, an output, and feedback means connecting the output and the non-inverting input;
input signal means connected to the non-inverting input of said first operational amplifier means and capable of applying an input signal thereto;
means for connecting a source of threshold potential to the inverting input of said first operational amplifier means;
second operational amplifier means having an inverting input, a non-inverting input, an output, and feedback means connecting the output and the non-inverting input;
means for connecting a source of threshold potential to the non-inverting input of said second operational amplifier means;
signal transmitting means for applying a signal from the output of said first operational amplifier means to the inverting input of said second operational amplifier means, and including signal duration limiting means;
high-voltage driver means connected to the output of said second operational amplifier means and responsive to a signal on said output to produce a high-voltage solenoid-energizing pulse; and
low-voltage driver means connected to the output of said first operational amplifier means and responsive to a signal on said output to produce a low-voltage solenoid holding pulse following termination of the high voltage solenoid-energizing pulse.

3,889,163
MEANS TO ASSIST A PERSON IN OVERCOMING HABITS

Eliot Norman Symmes, Seattle, Wash., assignor to Habi-chek Corporation, Campbell, Calif.

Filed Jan. 14, 1974, Ser. No. 433,344
Int. Cl. A61n *1/38*
U.S. Cl. 317—262 S **1 Claim**

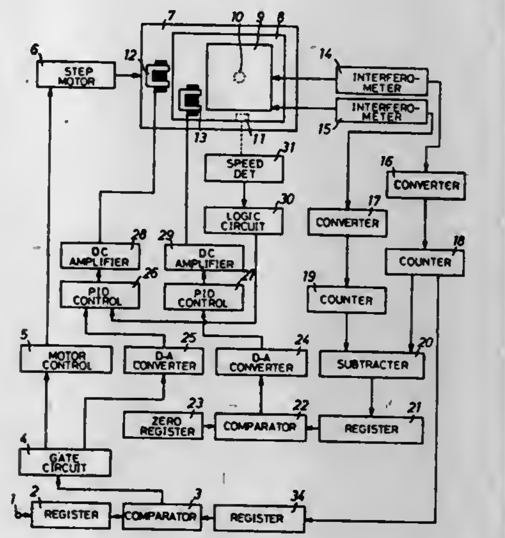


1. Means to assist a person in overcoming an undesirable habit comprising a wrist band adapted to be worn on the wrist of said person, a housing secured to said wrist band, a source of power capable of inducing an electric shock, an electrical circuit within said housing connected to said source of power and including a pair of open terminals to maintain said electrical circuit normally non conducting, a pair of relatively spaced electrodes connected to said terminals, said electrodes being disposed sufficiently close to each other to be physically engaged by two fingers of the hand of said person to close said electrical circuit causing current to flow to induce an electric shock in said person whereby a person may consciously self induce an electric shock to assist himself in building up an aversion to said undesirable habit.

3,889,164
POSITION CONTROL SYSTEM USING MAGNETIC FORCES FOR CORRECTING THE INCLINATION OF A CONTROLLED MEMBER INCLUDING A TORSIONAL MOUNTING

Junichi Nishizawa, Sendai, and Wasaburo Ichinose, Tachikawa, both of Japan, assignors to Handotai Kenkyu Shinkokai, Japan and Kokusai Denki Kabushiki Kaisha, Japan

Filed Jan. 24, 1973, Ser. No. 326,187
Int. Cl. G05b *1/06*
U.S. Cl. 318—640 **4 Claims**



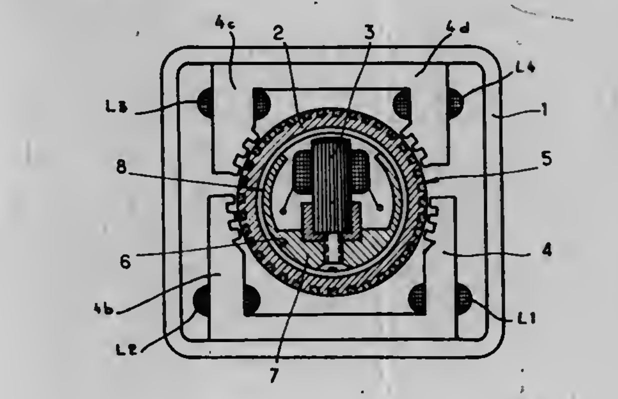
1. A position control system using magnetic forces for correcting the position and inclination of a controlled member relative to a reference position comprising:
a first controlled member, at least a part of which is composed of a magnetic substance;
a first electromagnet having at least one pole opposed to the magnetic substance of said first controlled member with a first air gap therebetween, the magnetic substance, the

first air gap and the electromaget defining a electromagnet magnetic circuit;
presetting means for presetting the width of the first air gap to a width greater than a predetermined width;
first supporting means including at least one spring for moveably supporting said first controlled member so as to be moveable along a line of action of a first magnetic force developed between the first electromagnet and the magnetic substance;
first control means coupled to said first electromagnet for controlling a control current flowing through said first electromagnet to adjust said magnetic force and to adjust the width of said first air gap so as to obtain the desired position of said first controlled member along said line of action of said first magnetic force, said magnetic circuit being saturated at a condition where said first air gap reaches said predetermined width, an elastic force developed by said spring being balanced by said first magnetic force within the elastic region of the spring at said conditon;
a second controlled member, at least a part of which is composed of a magnetic substance;
second supporting means comprising a torsion spring for rotatably supporting said second controlled member on said first controlled member;
a correcting electromagnet having at least one pole opposed to the magnetic substance of said second controlled member at a point along a line of action of a force developed by said correcting electromagnet remote from said second supporting means and a second air gap between said correcting electromagnet and said second supporting means, the magnetic substance of said second supporting means, the second air gap and the correcting electromagnet defining a second magnetic circuit;
detection means comprising a pair of interferrometers for detecting the inclination of said second controlled member relative to its position prior to the application of said first magnetic force to said first controlled member by use of two light beams; and
correcting control means coupled to said correcting electromagnet and said detection means for controlling a second control current flowing through said correcting electromagnet so as to rotate said second controlled member to eliminate said inclination of said second controlled member.

3,889,165
LINEAR AND ROTARY ACTUATOR

Trong Nguyen Van, La-Celle-Saint-Cloud, France, assignor to La Telemecanique Electrique, Nanterre, France

Continuation-in-part of Ser. No. 292,427, Sept. 21, 1972, abandoned. This application Jan. 31, 1974, Ser. No. 438,474
Claims priority, application France, Sept. 28, 1971, 71.34793
Int. Cl. H02k *41/00*
U.S. Cl. 318—115 **5 Claims**

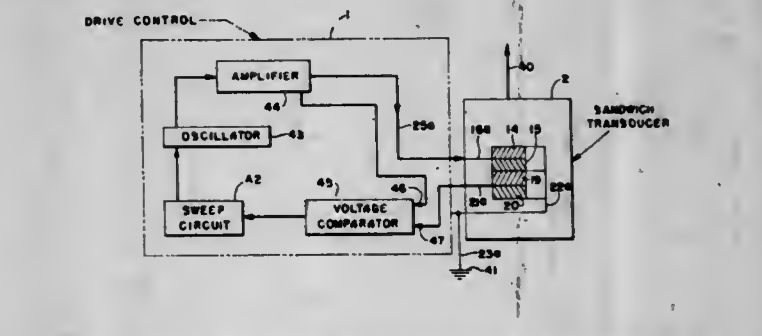


1. Actuator device having a movable component adapted for moving in rotation about an axis and in translation along said axis, said movable component being made of a magnetic material and having on a first portion of its surface a first series of elongated channels substantially perpendicular to the said axis and, on a second portion of its surface, a second series of elongated channels substantially parallel to the said axis, first and second sets of magnetic pole pieces respectively equipped with first and second sets of coils and comprising teeth whose pitch corresponds to that of the channels being arranged opposite said respective first and second surface portions and supply means for separately energizing said first and second sets of coils, said supply means being adapted for sequentially energizing the coils of each set and for simultaneously energizing the coils of each set.

3,889,166
AUTOMATIC FREQUENCY CONTROL FOR A SANDWICH TRANSDUCER USING VOLTAGE FEEDBACK

Lawrence D. Scurlock, Elyria, Ohio, assignor to Quintron, Inc., Columbus, Ohio

Filed Jan. 15, 1974, Ser. No. 433,575
Int. Cl. H02n *3/00, 5/00, 7/00*
U.S. Cl. 318—116 **11 Claims**

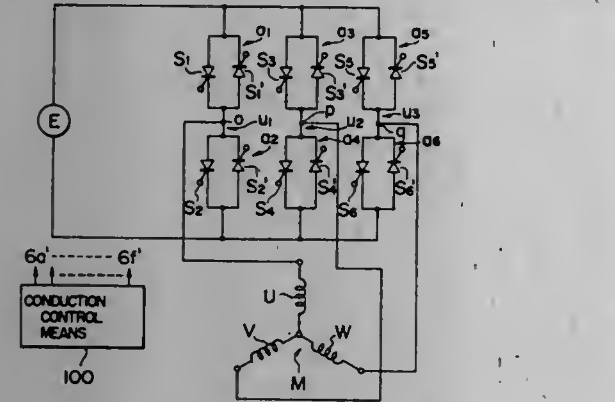


1. An automatic drive circuit for driving a mechanical displacement device or the like at resonance, comprising in combination:
a. variable frequency oscillator means for generating an AC signal at a frequency determined by an input signal thereto and in a range including the resonant frequency of such device;
b. amplifier means responsive to such AC signal for producing a drive signal for said mechanical displacement device to effect displacement in the same;
c. feedback means mounted to said device and responsive to such displacement for producing a feedback voltage proportionally representative of said displacement;
comparator means for comparing the voltage of such drive signal and such feedback voltage, said comparator means producing a first sweep control output signal when said drive signal voltage exceeds such feedback voltage, and producing a second sweep control output signal when said feedback signal exceeds said drive signal;
e. sweep circuit means having an input connected to the output of said comparator means and responsive to such sweep control output signal for generating a sweep signal as a periodcially varying voltage signal in response to said first sweep control output signal, when such drive signal voltage exceeds such feedback voltage, and for generating a fixed voltage output signal, when such feedback voltage equals or exceeds such drive signal voltage, said sweep circuit means having an output coupled to said variable frequency oscillator means to provide such sweep signal as such input signal to said variable frequency oscillator;
whereby said voltage comparator means locks said sweep circuit means to produce a fixed voltage output signal at a magnitude to effect operation of said variable frequency oscillator means and amplifier means at a fixed frequency to provide a drive signal to the mechanical displacement device for driving the same at resonance when such feedback voltage equals or exceeds such drive signal voltage and whereby said voltage comparator unlocks said sweep

circuit means to produce said periodically varying voltage signal to drive said variable frequency oscillator as a sweep frequency oscillator when said drive signal voltage exceeds said feedback voltage.

3,889,167
DEVICE FOR CONTROLLING SPEED OF THREE-PHASE INDUCTION MOTOR

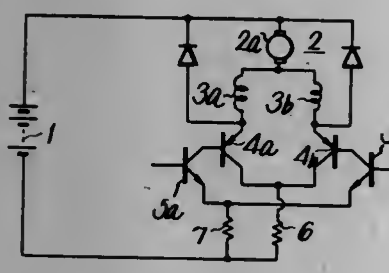
Tsuyoshi Tanaka, Chiba, and Hisakazu Ninomiya, Narashino, both of Japan, assignors to Hitachi, Ltd., Japan
Filed Nov. 26, 1973, Ser. No. 418,808
Claims priority, application Japan, Nov. 29, 1972, 47-119019; Jan. 24, 1973, 48-9532; Apr. 4, 1973, 48-37807
Int. Cl. H02p *5/40*
U.S. Cl. 318—227 **2 Claims**



1. A device for controlling the speed of a three-phase induction motor, comprising six arms, each consisting of two thyristors arranged in inverse parallel connection, wherein three units are formed, each consisting of two arms connected in series with each other; said units are connected in parallel with each other between two of the three phases of a three-phase a.c. power source; and the junction points of said arms connected in series are connected with the primary winding of said motor.

3,889,168
ON-OFF CONTROL CIRCUIT

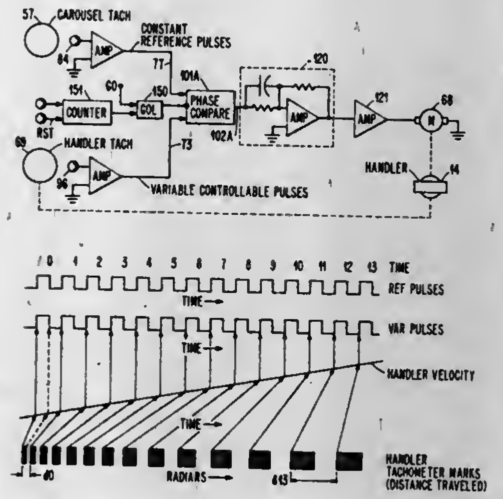
Kazutoshi Onishi; Tsuneo Awano, both of Yokohama, and Isao Masuzawa, Kuki, all of Japan, assignors to Kabushikikaisha Tokyo Keiki, Tokyo, Japan
Filed May 23, 1973, Ser. No. 363,172
Claims priority, application Japan, May 25, 1972, 47-52064
Int. Cl. H02p *5/16*
U.S. Cl. 318—341 **6 Claims**



1. An ON-OFF control circuit for a load requiring large DC electrical power comprising: a DC electrical power source, first and second transistors, first and second resistors, a first current path composed of said first transistor and said first resistor, and a second current path composed of said second transistor and said second resistor, the first current path being connected at its one end to one terminal of the DC electrical power source through said load and at its other terminal to the other terminal of the DC electrical power source, the second current path being connected at its one end to the base electrode of the first transistor and its other end to the other terminal of the DC electrical power source and the base electrode of said second transistor being supplied with an ON-OFF control input signal and said first and second current paths passing through said load.

3,889,169
POSITION AND VELOCITY SERVO CONTROL FOR MOTOR CONTROLLED ARTICLE CARRIER AND HANDLER

Joel A. Hirschman, San Jose, Calif., and Howard E. Van Winkle, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 11, 1973, Ser. No. 405,611
Int. Cl. G05b *13/00*
U.S. Cl. 318—571 **9 Claims**



1. For an article storage and retrieval apparatus for handling a plurality of articles having a predetermined shape and one given dimension,

a continuously moving article carrier having a plurality of article retaining means disposed about its outer periphery and traveling along a given travel path at a given speed; a transfer station adjacent said outer periphery and interposable into said travel path and including intermittently moved article engaging means for selectively transferring articles to and from an article storing location without stopping or altering the speed of said article carrier and including speed control means for matching speed of said article engaging means to that of the article retaining means during said selective article transfer;

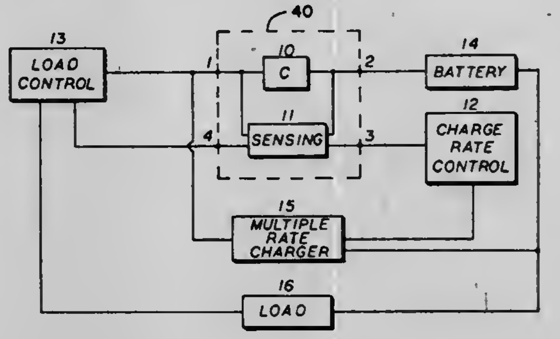
an improved control apparatus, including in combination:

a tachometer element in said transfer station and mounted for movement with said article engaging means, said tachometer element having tachometer marks spaced in accordance with a predetermined velocity profile for said engaging means, spacing between predetermined adjacent ones of said tachometer marks being inversely related to desired speed of said engaging means with successively adjacent spacings varying in length for indicating acceleration/deceleration speed change, means for supplying tachometer signals in response to movement of said tachometer element; and

control means receiving said tachometer signals and having means operatively associated with said continuously moving article carrier for measuring said given speed, motor control means in said central means jointly responsive to said measured given speed and said tachometer signals to synchronize the speed of said engaging means to said article carrier during said selective article exchange and to accelerate and decelerate said engaging means to and from said given speed in accordance with said velocity profile indicated on said tachometer element by said variably spaced marks.

3,889,170
BATTERY CHARGE RATE CONTROL

Robert I. Sarbacher, and Robert E. Mauch, both of Santa Monica, Calif., assignors to John C. Bogue, Santa Monica, Calif.
Continuation of Ser. No. 289,534, Sept. 15, 1972, abandoned. This application Aug. 1, 1973, Ser. No. 384,418.
Int. Cl. H02j *7/04*
U.S. Cl. 320—14 **12 Claims**

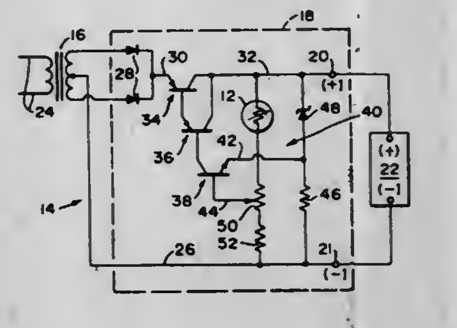


1. Apparatus for charging a battery comprising:
a battery having first and second terminals;
a load circuit having first and second terminals;
a load control circuit for automatically uncoupling and coupling said battery from said load circuit, said load control circuit having first, second and third terminals;
a coulometer having first and second terminals; means to couple said first terminal of said battery to said first terminal of said load circuit;
means to couple said second terminal of said load circuit to said first terminal of said load control circuit;
means to couple said second terminal of said battery to said second terminal of said coulometer;
means to couple said first terminal of said coulometer to said second terminal of said load control circuit;
a multiple rate charger having a first terminal coupled to said first terminal of said load circuit and said first terminal of said battery, a second terminal coupled to said first terminal of said coulometer and said second terminal of said load control circuit and a third terminal;
a charge rate control circuit having a first terminal coupled to said third terminal of said multiple rate charger and a second terminal; and
a sensing circuit including a first transistor having an emitter electrode coupled to second terminal of said coulometer and said second terminal of said battery, a base electrode coupled to said first terminal of said coulometer and said second terminal of said load control circuit and a collector electrode coupled to said second terminal of said charge rate control circuit, and a second transistor having an emitter electrode coupled to said base electrode of said first transistor, a base electrode coupled to said emitter electrode of said first transistor and a collector electrode coupled to said third terminal of said load control circuit.

3,889,171
BATTERY CHARGER

Thomas C. Hunter, Jr., Winchester, Mass., assignor to Standby Systems, Inc., Medford, Mass.
Continuation of Ser. No. 258,815, June 1, 1972, abandoned, which is a continuation of Ser. No. 60,255, Aug. 3, 1970, abandoned. This application Oct. 12, 1973, Ser. No. 405,844
Int. Cl. H02j *7/04, 7/16*
U.S. Cl. 320—31 **11 Claims**

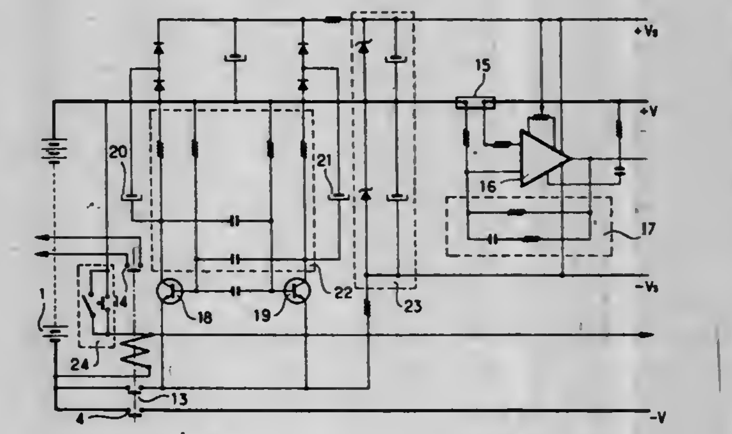
1. A battery charging circuit having, in combination,
a direct current source,
terminals for a battery having a predetermined float potential to be charged,
a circuit connecting said source and terminals including a first variable impedance connected in series therewith,
and control means including a thermally variable impedance varying as a continuous function of temperature and heat retaining and conducting means in position to transfer heat produced by current flowing in said first variable impedance to said thermally variable impedance, said control means being continuously responsive to increases



in the temperature of said thermally variable impedance to produce corresponding decreases in the magnitude of said first variable impedance, said control means being continuously responsive to decreases in said current resulting from the charged state of the battery to produce corresponding increases in the magnitude of said first variable impedance continuously until said float potential is reached at said terminals.

3,889,172
METHOD AND APPARATUS FOR LIMITING CHARGE OF A STORAGE BATTERY CHARGED AT A CONSTANT VOLTAGE

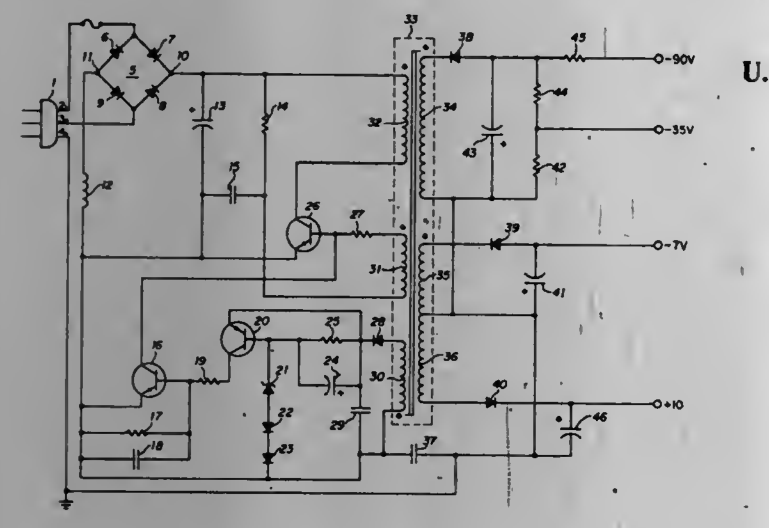
Daniel Lelaidier, Clamart, and Jean Quobex, Paris, both of France, assignors to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France
Filed Oct. 11, 1973, Ser. No. 405,636
Claims priority, application France, Oct. 13, 1972, 72.36372
Int. Cl. H02j *7/00;* **H02h** *3/08*
U.S. Cl. 320—39 **34 Claims**



1. Method for limiting the charge of a storage battery comprising charging the battery at a constant voltage, measuring the derivative of the current with respect to time and limiting charge of the battery in response to said derivative upon said derivative reaching a predetermined positive value.

3,889,173
SWITCHING REGULATOR POWER SUPPLY

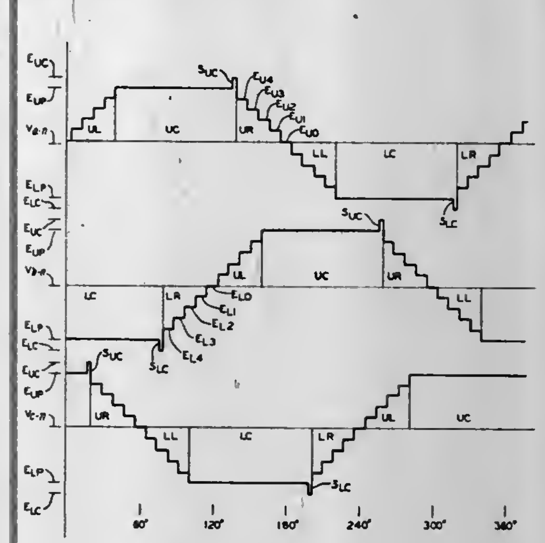
Donald L. Klusmann, Plano; Jin Y. Soh, Dallas, and Roger B. Whitaker, Garland, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 7, 1973, Ser. No. 422,626
Int. Cl. H02m *7/20*
U.S. Cl. 321—2 **3 Claims**



1. A regulated power supply circuit of varied input and constant output capability which comprises:
  a. a full-wave rectifier to produce DC output voltages from input voltages of varied magnitude and frequency;
  b. a blocking oscillator containing an oscillating transistor connected to said rectifier;
  c. a toroidal transformer connected to said oscillator to store output energy from said oscillator;
  d. a rectifier and a capacitor connected to a secondary winding of said transformer to charge said capacitor in dependence upon the turns of secondary winding and the repetition rate of said oscillator to provide an output voltage across said capacitor;
  e. feedback means including first and second signal transistors coupled to a winding of said transformer for turning said oscillator on and off to maintain said output voltage at a predetermined level;
said feedback means further includes:
  f. a first diode whose anode is connected in series to the top terminal of said winding and whose cathode is connected to the emitter of said first signal transistor;
  g. a first resistor connected to the base of said first signal transistor and to the cathode of said first diode;
  h. a first capacitor connected in parallel with said resistor;
  i. a second capacitor whose first terminal is connected to the emitter of said first signal transistor and which is connected in parallel to the serial circuit of said first diode and said winding;
  j. a Zener diode whose cathode is connected to the base of said first signal transistor;
  k. a second diode whose anode is connected to the anode of said Zener diode;
  l. a third diode whose anode is connected to the cathode of said second diode and whose cathode is connected to the emitter of said second signal transistor, to the second terminal of said second capacitor, and to the bottom terminal of said winding;
  m. a second resistor connected to the collector of said first signal transistor, and to the base of said second signal transistor;
  n. a third resistor connected to the base and the emitter of said second signal transistor;
  o. a third capacitor connected in parallel to said third resistor, and across the base-emitter junction of said second signal transistor;
  p. and a common connection of the collector of said second signal transistor with the base of the oscillating transistor of said blocking oscillator.

3,889,174
APPARATUS FOR GENERATING THREE-PHASE SINUSOIDAL VOLTAGES

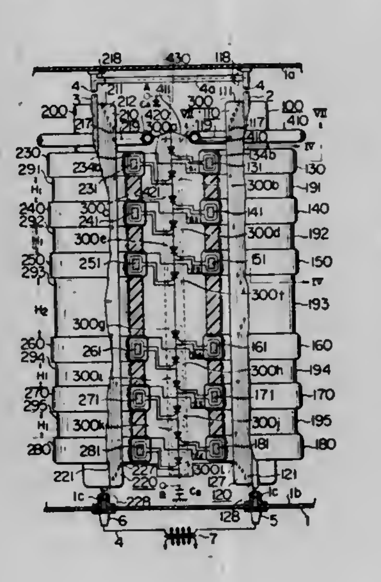
Thomas M. Corry, Goleta, Calif., assignor to General Motors Corporation, Detroit, Mich.
Filed July 3, 1974, Ser. No. 485,435
Int. Cl. H02m *7/52*
U.S. Cl. 321—9 R **2 Claims**



1. A three-phase inverter for generating sine-wave voltages at a preselected frequency across a set of three-phase line conductors from a unidirectional voltage source having a center tap coupled to a reference potential comprising: a first inverter connected between the source and the line conductors for producing flat-topped output voltage segments alternating between an upper potential above a reference potential and a lower potential below the reference potential at a rate three times the desired frequency and developing three-phase, full-wave, flat-top voltages on the conductors at the desired frequencies, each segment extending over an interval greater than 60 electrical degrees and being terminated by a first commutating voltage on the respective line conductor; a second inverter connected to the source and operating in synchronism with the first inverter for producing at its output signal-phase, flat-top voltages alternating between the upper and lower potential at a rate three times the desired frequency, each half cycle of the singal-phase, flat-top voltage being terminated by a second commutating voltage applied to the output of the second inverter; an inductor having an input tap connected to the output of the second inverter, a low voltage tap connected to the reference potential and a plurality of intermediate voltage taps between the low voltage tap and the input tap, whereby alternating flat-top voltage excitation is applied across the input and low voltage taps, the inductor further having a step-up tap in voltage multiplying position in relation to the flat-top voltage; a voltage distributor including a first channel having an input and means for selectively coupling said input to the line conductors in synchronism with the first inverter and a second channel having an input and means for coupling said input to the line conductors in synchronism with the first inverter; means or connecting the low voltage and intermediate taps to the inputs of each of the first and second channels during the period said channels are coupled to a respective line conductor in ascending and descending order in synchronism with the first inverter to approximate on the line conductors, in relation to the reference potential, a balanced and symmetrical voltage; means for momentarily coupling the step-up tap to the inputs of each channel, respectively, at the beginning of the period said channels are coupled to a respective line conductor to supply the first commutating voltage to commutate the first inverter; and means for momentarily coupling a respective one of the line conductors having a flat-top voltage segment thereon to one of the intermediate taps of the inductor at the end of each half cycle of the single-phase, flat-top voltage to generate the second commutating voltage at the input tap of the inductor for commutating the second inverter.

3,889,175
DRIVING DEVICE FOR THYRISTOR TYPE AC-DC CONVERTER

Tokio Isogai; Eiichi Isikawa; Keiji Fukushi; Hisao Amano; Fumio Ogata, and Norio Ikemoto, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan
Filed Oct. 10, 1973, Ser. No. 404,871
Claims priority, application Japan, Oct. 12, 1972, 47-102471
Int. Cl. H02m *1/08, 7/24*
U.S. Cl. 321—27 R **17 Claims**

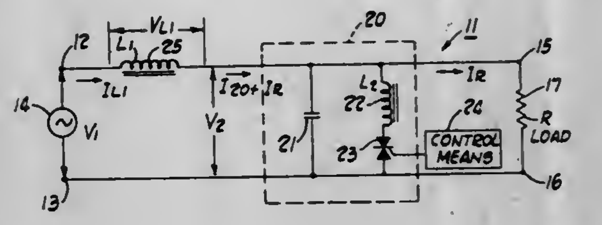


1. A driving device for a thyristor type AC-DC converter, comprising
  at least one insulating cylinder having a plurality of conductive layers constituting a capacitor formed therein and near at least one end thereof disposed nearer the high voltage terminal of said device, the innermost one of said conductive layers being extended midway of said cylinder;
  a primary conductor passing through said insulating cylinder at the center thereof and connected with a pulse generator; and
  a plurality of transformer units stacked one upon another and arranged in skewered condition on said insulating cylinder, each said unit having a magnetic core with a plurality of secondary windings wound thereabout which windings supply gating voltages for the gates of thyristors connected in series,
  wherein said innermost conductive layer is electrically insulated from said primary conductor and grounded toward said high voltage terminal.

3,889,176
REACTIVE REGULATOR

Ronald Harold Randall, Cuba, N.Y. assignor to ACME Electric Corporation, Cuba, N.Y.
Filed Oct. 10, 1973, Ser. No. 405,020
Int. Cl. G05f *1/12, 1/46*
U.S. Cl. 323—8 **21 Claims**

1. A regulator circuit comprising, in combination, first and second input terminals adapted to be energized from an alternating voltage source,
  first and second output terminals adapted to be connected to a load,
  first and second reactive means of opposite reactive sign,
  first means to connect said first reactive means effectively in circuit with said input and output terminals,
  switch means to connect said second reactive means effectively in circuit with said input and output terminals,
  said second reactive means being in the order of one-half the impedance of said first reactive means,



  and means to control the percentage of a complete cycle that said switch means is conducting to control the reactive current through said second reactive means to combine with the current through said first reactive means to make the total effective reactive current for each complete cycle either inductive or capacitive to control the output of said regulator circuit.

3,889,177
POWER SUPPLY HAVING SUBSTANTIALLY CONSTANT OUTPUT DURING LOAD SWITCHING

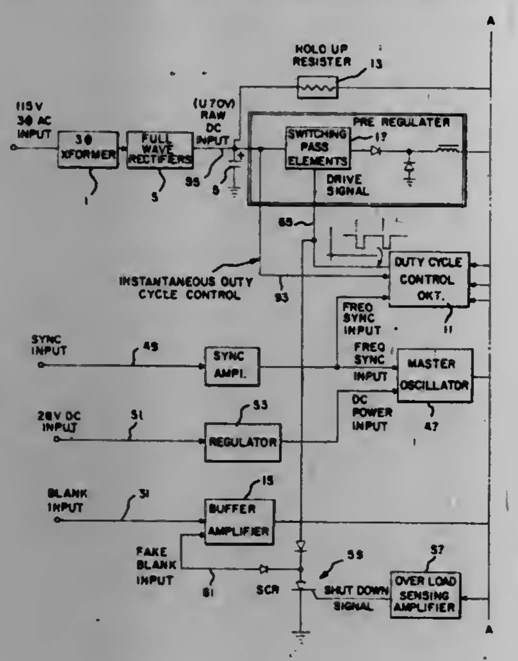
Charles Nelson Fendrich, Jr., Elizabethtown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Continuation of Ser. No. 264,090, June 15, 1972, abandoned. This application Sept. 24, 1973, Ser. No. 400,436
Int. Cl. H02m *7/20*
U.S. Cl. 323—17 **6 Claims**

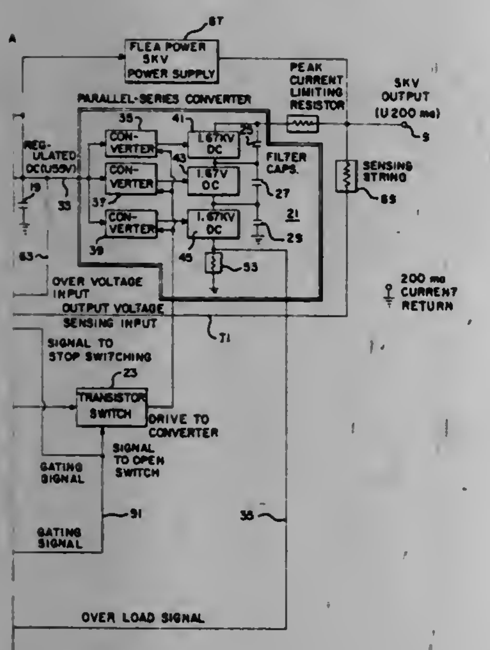
1. A power supply comprising an input source of unregulated D.C. voltage,
  means coupling the input source to an output including,
  switching means between the input source and the output,
    a source of regularly recurrent pulses,
  means responsive to said pulses for rendering the switching means operative to connect the input source to the output for a time depending on the width of each pulse,
  said source of regularly recurrent pulses being jointly responsive to the instantaneous voltage amplitude of the input source and the voltage amplitude at the output for adjusting the width of the pulses for regulating the output voltage,
  wherein the source of regularly recurrent pulses includes a sawtooth waveform generator with the slope of the waves dependent on the instantaneous voltage of the input,
  means for sensing the voltage at the output,
  means for providing an error voltage having an amplitude dependent upon variations from a predetermined voltage at the output,
  and means for comparing the sawtooth waves with the error voltage to produce said regularly recurrent pulses,

wherein the means coupling the input source to the output comprises a plurality of driven voltage converters with their inputs connected in parallel to the switching means and their outputs connected in series voltage adding relation,

a source of oscillations,

and means controlled by said source of oscillations for driving said converters in synchronism.





3,889,178

WELDING CONTROL CIRCUIT AND METHOD

Robert V. Jackson, Los Angeles, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Continuation of Ser. No. 177,613, Sept. 3, 1971, abandoned. This application July 23, 1973, Ser. No. 381,473

Int. Cl. G05f *1/44;* **B23k** *9/06*

U.S. Cl. 323—22 SC **20 Claims**

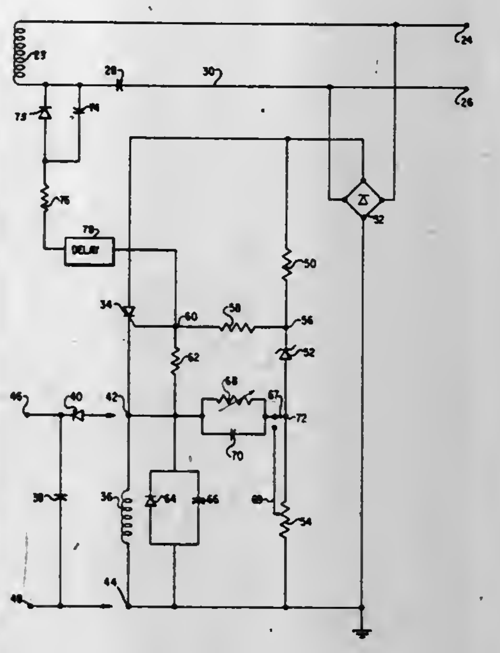
1. A voltage regulator comprising:

a variable voltage source of current pulses;

switch means and a load impedance connected in series with said source;

means for sensing the voltage across said load impedance; and,

means for maintaining load voltage at a substantially constant value notwithstanding variations in the voltage of said source of current pulses by normally biasing said switch means into conduction for a predetermined portion of all of said pulses at the terminal end thereof and by opposing the biasing of said switch means sufficient to thereby bias said switch means out of conduction for said predetermined portion of less than all of said pulses in response to said sensing means.



3,889,179

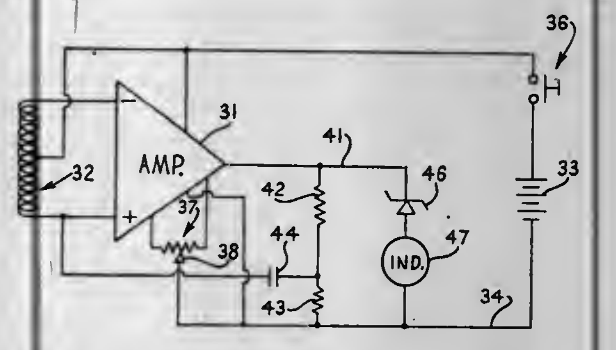
DIRECTIONAL PICKUP COIL AND OSCILLATOR APPARATUS FOR THE LOCATION OF BURIED ELECTRICALLY CONDUCTING ELEMENTS

Percy H. Cutler, Menlo Park, Calif., assignor to Cranleigh Electro-Thermal, Inc., Menlo Park, Calif.

Filed Jan. 21, 1974, Ser. No. 434,919

Int. Cl. G01v *3/08;* **H03b** *5/00*

U.S. Cl. 324—3 **2 Claims**



1. A locator for a buried conductor having alternating current passing there-through, comprising

a directional pickup coil having a center tap,

an operational amplifier having negative and positive input terminals connected across said pickup coil, an output terminal, offset voltage terminals and a first and a second amplifier power terminal,

a power supply having first and second power supply terminals, said first or positive power supply terminal connected to said first amplifier power terminal and to said center tap, said second or negative power supply terminal connected to said second amplifier power terminal,

a first resistor connected to said output terminal,

a second resistor connected between said first resistor and said second power supply terminal,

a capacitor having one side connected to the juncture between said resistors and another side connected to said positive input terminal,

said resistors and said capacitor comprising a feedback circuit for said amplifier for establishing a one-shot multivibrator amplifier output dependent on coil signal input of said coil created by the alternating current through said conductor, the frequency of said one-shot multivibrator amplifier output increasing with closer proximity of said coil to the magnetic field of said conductor,

an offset voltage potentiometer across said offset voltage terminals and having a movable contact,

said movable contact connected to said second power supply terminal, movement of said movable contact adjusting the threshold sensitivity of said amplifier,

an indicator connected to said output terminal and to said second power supply terminal for producing observable indications of the frequency of said one-shot multivibrator amplifier outputs,

and a casing enclosing all of the foregoing elements except said conductor.

3,889,180

AIR POLLUTION MEASURING EQUIPMENT

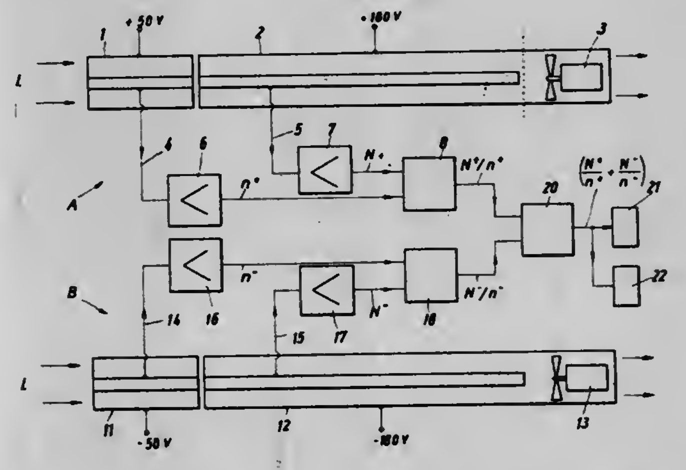
Joseph Eichmeier, Munich, Germany, assignor to Constantin Graf Von Berckheim, Weinheim an der Bergstrasse, Germany

Filed Dec. 12, 1973, Ser. No. 426,628

Claims priority, application Germany, Dec. 16, 1972, 2261792

Int. Cl. G01n *27/00*

U.S. Cl. 324—33 **8 Claims**



1. Equipment for measuring air pollution, comprising, in combination, first measurement means for measuring the concentration of small ions of a predetermined sign in said air and furnishing a corresponding first measurement signal; second measurement means for measuring the concentration of large ions of the same sign in said air and furnishing a corresponding second measurement signal; and first dividing circuit means having a first input connected to said first measurement means, a second input connected to said second measurement means and a first dividing circuit output, for furnishing a first output signal corresponding to the ratio of said signals at said first and second inputs at said first dividing circuit output, said first output signal constituting a measure of said air pollution.

3,889,181

MAGNETIC SYSTEM FOR DISCRIMINATING BETWEEN VEHICLES AND PERSONNEL BASED UPON THEIR CHARACTERISTIC FREQUENCY SIGNATURES

Charles B. Greer, Clifton, Va., assignor to United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 8, 1974, Ser. No. 449,429

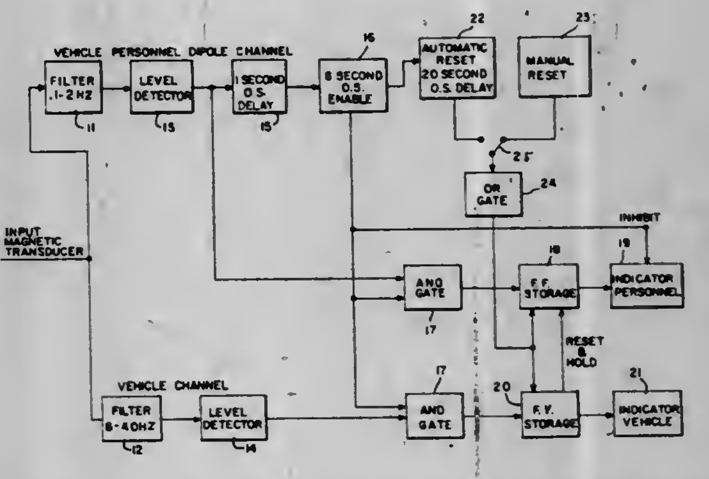
Int. Cl. G01r *33/00*

U.S. Cl. 324—41 **3 Claims**

1. A moving object detector and discriminating system which indicates the presence of vehicles and persons and differentiates therebetween comprising:

a first channel means for indicating the presence of a moving vehicle including first bandpass filter input means adapted to pass an input signal having a frequency within a first selected frequency range; a first level detector electrically connected to said first bandpass filter input means, said first level detector having a selected threshold level and adapted to block signals of lesser amplitude and to pass signals having an amplitude at said threshold level and above; a moving vehicle presence indicator; and first channel interconnection means adapted to interconnect the output of said first level detector to said moving vehicle presence indicator to activate same;

a second channel means for indicating the presence of a moving person including second bandpass filter input means adapted to pass an input signal having a frequency within a second selected frequency range; a second level detector electrically connected to said second bandpass filter input means, said second level detector having a selected threshold level and adapted to block signals of lesser amplitude and to pass signals at said threshold level and above; a moving person presence indicator and second channel interconnection means adapted to interconnect the output of said second level detector to said moving person presence indicator to activate same;



means for simultaneously applying an input signal, having frequency characteristics representative of the presence of moving objects of the vehicle and person variety, to said first and second channel means;

and channel interrupter means adapted to block passage of the output signal of said second level detector to said moving person presence indicator, said channel interrupter means being responsive to the simultaneous occurence of output signals from said first and second level detectors.

3,889,182

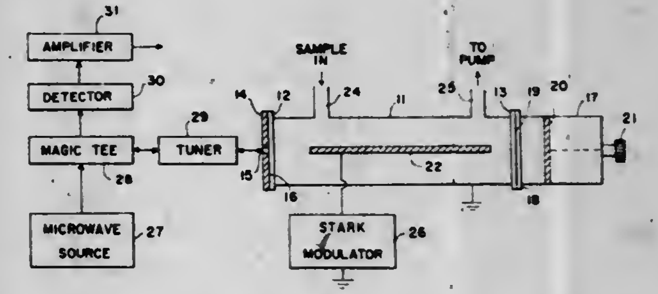
RESONANT WAVEGUIDE STARK CELL

Wesley C. Easley; William F. White, both of Hampton, and George A. Wingfield, Newport News, all of Va., assignors to The United States of America as represented by the United States National Aeronautics and Spaced Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Apr. 10, 1974, Ser. No. 459,736

Int. Cl. G01r *27/04*

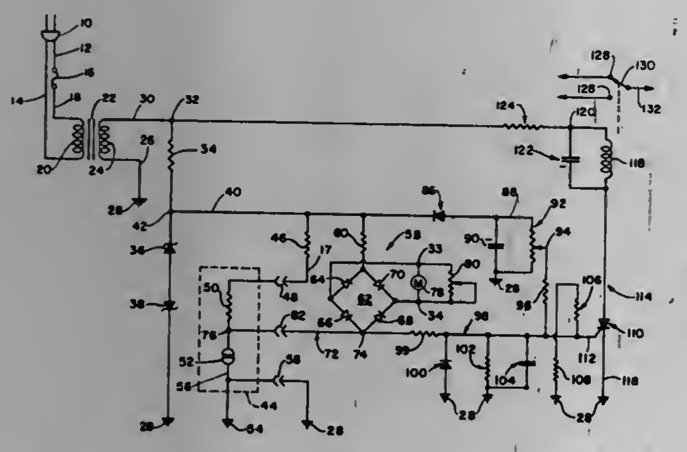
U.S. Cl. 324—58.5 A **7 Claims**



1. A resonant waveguide Stark cell for use in a Stark modulated microwave spectrometer comprising:

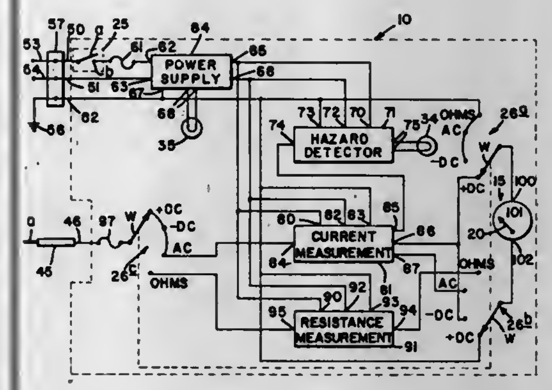
a waveguide cavity whose sides are made from an electrically conductive material, said sides forming a first electrode for said Stark cell;
a first microwave reflector located at one end of said cavity; a small coupling iris in said first microwave reflector for allowing microwave energy to flow into and out of said cavity;
a second microwave reflector located at the other end of said cavity;
means for maintaining a gas-tight compartment within said cavity without appreciably interferring with the flow of the microwave energy; and
ports in said sides of said cavity for allowing sample gas to flow into and out of said compartment.

3,889,183
CONDUCTIVITY MEASURING CIRCUIT
Horace A. Teass, Jr., 73 Remsen St., Brooklyn, N.Y. 11201
Filed Dec. 27, 1973, Ser. No. 428,842
Int. Cl. G01n *27/42*
U.S. Cl. 324—30 R **6 Claims**



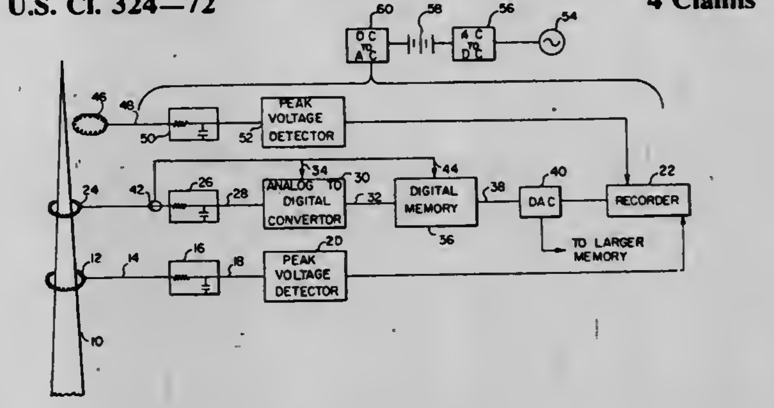
1. A circuit for monitoring the conductivity of a solution comprising:
a negative temperature coefficient thermistor;
a conductivity cell connected in series with said thermistor, whereby at the cell output junction formed between said thermistor and said cell there appears an AC signal voltage whose magnitude is proportional to the true conductivity of the solution to be monitored;
a meter network connected in parallel with said thermistor and in series with said cell for indicating the true conductivity of the monitored solution;
a control element connected in parallel with said cell and in series with said thermistor, whereby said control element receives said AC signal voltage and detects the true conductivity of the monitored solution,
regulated AC voltage means for supplying energy to said thermistor, cell, meter network and control element;
a control element input connecting said control element to said cell output junction;
a reference voltage generating network connected between said AC voltage means and said control element input for generating a negative reference voltage at said control element input;
and a voltage summing network connected between said cell output junction and said control element input for deriving a positive signal voltage from said AC signal voltage, summing said positive signal voltage and said negative reference voltage and feeding the resultant voltage to said control element input.

3,889,184
ELECTRONIC HAZARD TESTER FOR MEDICAL FACILITIES
John M. Bass, 13533 Larkin Dr., Minnetonka, Minn. 55343
Filed Mar. 25, 1974, Ser. No. 454,328
Int. Cl. G01r *27/02*
U.S. Cl. 324—62 **14 Claims**



1. An electronic test instrument for measuring electrical parameters within an electrically susceptible patient location (ESPL), said ESPL having a patient ground and a plurality of electrically conductive surfaces therein, comprising:
a. a chassis;
b. probe means connected to and operatively extendable from said chassis to each of said conductive surfaces for sensing electrical parametric conditions of said surfaces when in electrical contact therewith; and
c. electronic circuit means mounted to said chassis for measuring and for determining hazardous electrical conditions within said ESPL, said circuit means comprising:
i. a signal input operatively connected with said probe means for receiving said sensed electrical conditions therefrom;
ii. reference means operatively connecting circuits within said electronic circuit means with said patient ground for electrically referencing the circuits thereto;
iii. current measurement means operatively connected with said signal input to receive said sensed electrical conditions therefrom, for measuring electrical current flow potentially available through an electrically susceptible patient from said conductive surface probed by said probe means to said patient ground;
iv. hazard detector means operatively connected with said current measurement means for providing a warning output signal when the magnitude of said measured electrical current flow exceeds a predetermined microshock hazard level; and
v. resistance measurement means in circuit with said signal input for measuring the electrical resistance between said patient ground and any of said electrically conductive surfaces operatively contacted by said probe means, by causing current flow through that conductive surface in contact with said probe means to said patient ground, and by analyzing electrical characteristics of such caused current flow, said resistance measurement means further having means for variably limiting the magnitude of said caused current to levels predetermined as non-hazardous to an electrically susceptible patient within the ESPL.

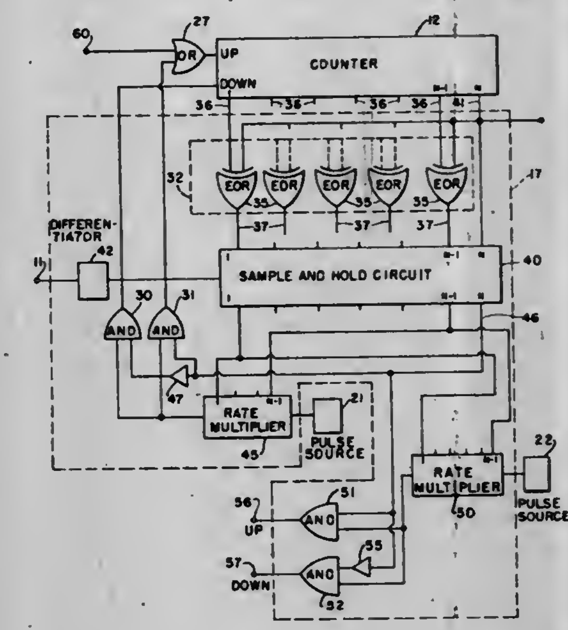
3,889,185
LIGHTNING CURRENT MEASURING SYSTEMS
Ronald J. Wojtasinski, Cocoa Beach; James H. Jones, Titusville, and Raymond V. Lisle, Indialantic, all of Fla., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Office of General Counsel-Code GP, Washington, D.C.
Filed Apr. 15, 1974, Ser. No. 461,073
Int. Cl. G01r *31/02*
U.S. Cl. 324—72 **4 Claims**



1. An apparatus for monitoring and analyzing electrical currents produced by lightning strikes comprising:
a. an electrically conductive mast having currents produced therein responsive to lightning strikes,
b. a first circuit means coupled to said mast for generating a voltage proportional to a peak current generated in said mast by each lightning strike,
c. said first circuit means including:
i. a first coil encircling said mast for sensing the flux change produced by said current flowing through said mast and generating a voltage responsive thereto,
ii. an integrator coupled to said first coil for generating an integrated voltage proportional to said flux change sensed by said first coil,
iii. a peak voltage detector coupled to said integrator for generating a voltage having an amplitude proportional to the peak of said integrated voltage,
d. a second circuit means coupled to said mast for generating a digital signal representative of the wave shape of said current generated in said mast by each lightning strike,
e. said second circuit means including:
i. a second coil encircling said mast for sensing the flux change produced by said current flowing through said mast caused by a lightning strike and generating a voltage responsive thereto,
ii. a second integrator coupled to said second coil for generating an integrated voltage directly proportional to the amplitude of said current flowing in said lightning mast,
iii. an analog to digital convertor coupled to said second integrator for sampling said integrated voltage at a predetermined rate and generating digital signals corresponding to said integrated voltage, and
f. means for recording said voltage generated by said first circuit and said digital signals produced by said second circuit for producing a record representing the wave shape of said current produced in said mast by said lightning strike and the peak current produced.

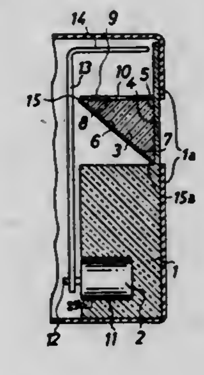
3,889,186
ALL DIGITAL PHASE DETECTOR AND CORRECTOR
Robin J. Larson, Norcross, Ga., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Nov. 27, 1973, Ser. No. 419,329
Int. Cl.² G01R *25/00*; H03D *13/00*
U.S. Cl. 324—83 D **6 Claims**

1. An apparatus for detecting and correcting phase error comprising:
a frequency source;
a binary counter coupled to said frequency source and incrementing at a rate controlled by said frequency source;
a source of input pulses;
means coupled to said pulse source for detecting a transition in said input pulses;
means responsive to said transition-detecting means and coupled to said counter for detecting the error, at the



instant of said transition, between the value in said counter and a predetermined value and for converting the value in said counter to a value representing magnitude and direction of phase error when compared with the phase of said input pulse; and
means responsive to said error-detecting means and coupled to said counter for varying said counter incrementing rate at a rate proportional to said error, thereby correcting said error.

3,889,187
INDICATING INSTRUMENT
Willy Kisselmann, Grunwald; Fritz Rumpelein, Munich, and Paul Kopf, Unterhaching, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed Sept. 14, 1970, Ser. No. 71,918
Claims priority, application Germany, Sept. 13, 1969, 1946507; Nov. 5, 1969, 1955609; Nov. 5, 1969, 1955610; Nov. 5, 1969, 1955608
Int. Cl. G01r *15/00*, *1/08*
U.S. Cl. 324—114 **42 Claims**



1. An indicating instrument, comprising a housing; a prism installed in said housing and having at least one mirrored

light-reflecting surface and a plurality of additional surfaces including an exposed surface and a second additional surface, said surfaces meeting each other along a plurality of elongated edges, at least said mirrored ligh-reflecting surface being a plane surface; a pointer mounted in said housing for pivotal movement about a predetermined axis, said pointer having an elongated terminal which is adjacent to said prism, at least substantially parallel to said axis and to said second additional surface and at least substantially normal to said edges in each position of said pointer; means for pivoting said pointer; and stationary scale means provided in said housing in such a position so as to be observable, with at least a portion of said terminal, by looking through said exposed surface of said prism at which the image of said scale means will have a rectilinear configuration with the image of said terminal of said pointer moving parallel to itself along said rectilinear image of said scale means.

3,889,188

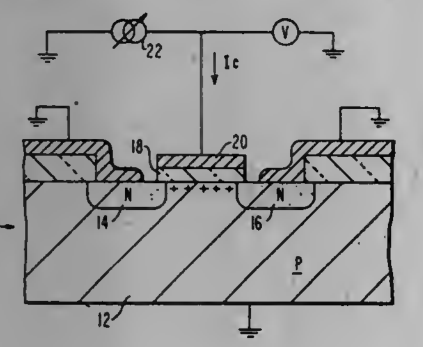
TIME ZERO DETERMINATION OF FET RELIABILITY

David Charles Trindade, Essex Junction, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 30, 1973, Ser. No. 383,857

Int. Cl. G01r *31/22*

U.S. Cl. 324—158 T **10 Claims**



1. The method for predicting the failure rate of metal-insulator-semiconductor devices caused by variations in manufacturing process parameters, comprising the steps of:

- A. applying for a relatively short period of time, a first current limited voltage across the insulator of a first portion of a group of substantially identical metal-insulator-semiconductor devices, said voltage having a magnitude substantially equal to the saturation voltage of said semiconductor device;
- B. determining the average percentage of said first portion of said devices which exhibit metal-to-semiconductor voltage breakdown under said first voltage at the end of said short period of time;
- C. applying for an extended period of time a second voltage across the insulator of at least a second portion of said group of devices, said second voltage having a magnitude substantially lower than said first voltage;
- D. determining the average percentage of said second portion of said devices which exhibit metal-to-semiconductor voltage breakdown under said second voltage at the end of said extended period of time;
- E. correlating the percentage of devices exhibiting voltage breakdown in said short and extended periods of time to determine the specific relationship between said percentages; and
- F. predicting the average percentage of devices expected to exhibit voltage-to-semiconductor breakdown at said extended period of time for a different group of metal-insulator-semiconductor devices manufactured under different manufacturing process parameters by determining the average percentage of at least a portion of said different group of devices exhibiting voltage breakdown after applying said first voltage for said relatively short period of time and determining the expected average percentage of devices to exhibit breakdown at said extended period of time by applying the specific relationship determined in step E to said average percentage of devices exhibiting voltage breakdown in said portion of said group of different devices.

3,889,189

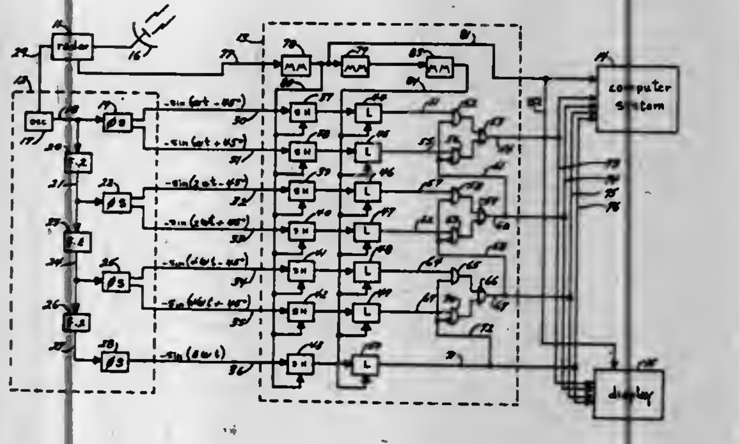
DIGITAL TIME MEASUREMENT SYSTEM

Tenny D. Lode, 3270 Cherryridge Rd., Cherry Hills Village, Colo. 80110

Filed Feb. 21, 1974, Ser. No. 444,562

Int. Cl. G04f *9/00;* G01s *9/04*

U.S. Cl. 324—186 **24 Claims**



1. A digital time measurement system including a source of a plurality of different related periodic signals, a source of a time signal whose time is to be measured, means for sampling the values of said plurality of periodic signals in response to a signal from said time signal source and generating a plurality of logical signals from the sampled values of said plurality of periodic signals, said plurality of logical signals comprising an intermediate code representation of a digital data value corresponding to the measured time such that not more than one of said logical signals need change between any two adjacent digital data values, digital data receiving means, and means connecting said plurality of logical signals to said digital data receiving means.

3,889,190

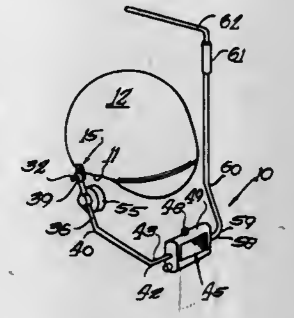
COMMUNICATIONS TRANSCEIVER ADAPTED FOR MOUNTING ON A HELMET

Charles Palmer, 1370 N.E. 171st St., North Miami Beach, Fla. 33162

Filed June 18, 1974, Ser. No. 480,470

Int. Cl. H04b *1/38*

U.S. Cl. 325—16 **3 Claims**



1. A communications transceiver apparatus adapted for mounting on a helmet type of headgear comprising a clamp mechanism adapted to be detachably attached to a bottom side edge of said helmet in a position normally overlying an individual's ear when the helmet is worn by the individual; tubular rod having one end pivotally attached to said clamp mechanism with the opposite end projecting downwardly and outwardly therefrom to a position substantially below and in front of said helmet adjacent an individual's mouth; means adjustably selecting the position of said tubular rod about said clamp mechanism; a transceiver device mounted on said terminal end of said tubular rod in a position substantially in front of an individual's mouth, said transceiver including a control switch projecting from a surface thereof and adapted to activate and de-activate said transceiver; said transceiver including a channel selector knob projecting from a surface thereof and adapted to be operated by an individual to select one of a plurality number of available channels for the transmitting and receiving of communications on the transceiver device; an earphone mounted on said tubular rod in close proximity to said clamp mechanism and in position to overlie an adjacent individual's ear; electrical conducting means interconnecting said earphone and said transceiver device; an elongated antenna rod having one end projecting outwardly of a side surface of said transceiver device, said antenna rod projecting from said transceiver device in a direction upwardly and rearwardly toward said helmet and terminating in a position spaced above said helmet; a coil housing affixed to said terminal end of said antenna rod an in electrical connection therewith; and a second antenna rod having one end affixed to the opposite end of said coil housing with the second antenna rod projecting outwardly therefrom in a generally horizontal direction to overlie said top of said helmet when said transceiver device is in position in front of said individual's mouth.

3,889,191

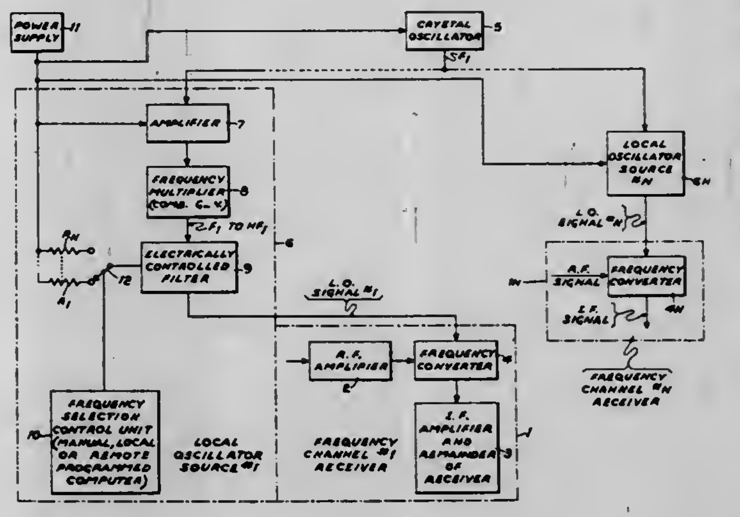
GENERATOR FOR LOCAL OSCILLATOR SIGNALS

David E. Hershberg, Ridgewood; Arthur H. Chaplin, Wayne, and Joseph E. Dewland, Secaucus, all of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Division of Ser. No. 306,469, Nov. 14, 1972, Pat. No. 3,810,083. This application Oct. 12, 1973, Ser. No. 405,952

Int. Cl. H04b *7/08*

U.S. Cl. 325—307 **4 Claims**


POWER SUPPLY
CRYSTAL OSCILLATOR
AMPLIFIER
FREQUENCY MULTIPLIER
ELECTRICALLY CONTROLLED FILTER
LOCAL OSCILLATOR SOURCE #N
R.F. SIGNAL
FREQUENCY CONVERTER
I.F. SIGNAL
FREQUENCY CHANNEL #N RECEIVER
R.F. AMPLIFIER
FREQUENCY CONVERTER
I.F. AMPLIFIER AND REMAINDER OF RECEIVER
FREQUENCY SELECTION CONTROL UNIT (MANUAL, LOCAL OR REMOTE PROGRAMMED COMPUTER)
LOCAL OSCILLATOR SOURCE #1
FREQUENCY CHANNEL #1 RECEIVER

1. An arrangement to provide a different local oscillator signal for each of N receivers contained in a station, where N is equal to an integer greater than one, each of said N receivers receiving a different one of N frequency channels, adjacent ones of said N frequency channels being spaced from each other by a given frequency value, said arrangement comprising:

a highly stable oscillator having an output to provide a signal having a frequency equal to said given frequency value;

first means having an output and an input coupled to the output of said oscillator, said first means generating N signals, each of said N signals having a different frequency related to said given frequency value, adjacent ones of said different frequencies being spaced by said given frequency value;

N filters each having an output and an input coupled to the output of said first means, each of said N filters being tuned to a different one of said N signals;

an N × N matrix having N outputs each coupled to a different one of said N receivers, N signal inputs each coupled to the output of a different one of said N filters and N control inputs; and

second means having N outputs each coupled to a different one of the N control inputs of said matrix for control thereof to provide simultaneously a different local oscillator signal for each of said N receivers.

3,889,192

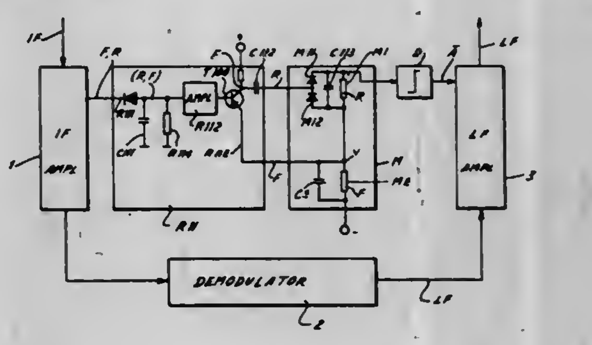
ARRANGEMENT FOR SUPPRESSING NOISE IN AN FM RECEIVER

Heinz Schiebelhuth, Frankfurt am Main, and Herbert Bauer, Offenbach am Main, both of Germany, assignors to Braun AG, Frankfurt am Main, Germany

Filed Oct. 16, 1973, Ser. No. 406,781

Int. Cl. H04b *1/10*

U.S. Cl. 325—348 **8 Claims**



1. In an FM receiver having an intermediate frequency stage and a low frequency stage, a noise suppression arrangement, comprising, in combination, first circuit means connected to said intermediate frequency stage for furnishing a field strength signal;

noise measuring means connected to said intermediate frequency stage for furnishing a noise signal corresponding to AM signals, if present, in said intermediate frequency stage; and switching means connected to said first circuit means and said noise measuring means, for furnishing an enabling signal for enabling said low frequency stage only in the simultaneous presence of said field strength signal and absence of said noise signal.

3,889,193

AUTOMATIC FREQUENCY CONTROL CIRCUIT

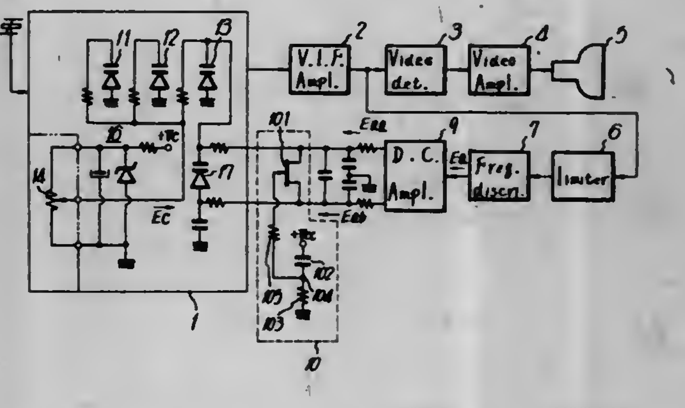
Tadao Sasaki; Yasuji Kato, and Toshiaki Meguro, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 16, 1974, Ser. No. 433,796

Claims priority, application Japan, Jan. 23, 1973, 48-9685

Int. Cl. H04b *1/16*

U.S. Cl. 325—419 **1 Claim**



1. An automatic frequency control circuit for tuning apparatus, the tuning apparatus having an electronically variable

frequency generating means, and the automatic frequency control circuit being responsive to the output produced by a frequency discriminator supplied with IF signals, comprising: a variable capacitance diode coupled to said variable frequency generating means, the frequency generated by said variable frequency generating means being a function of the capacitance value;

a differential output DC amplifier connected to said frequency discriminator and having first and second output terminals across which said variable capacitance diode is coupled, said differential output DC amplifier providing first and second voltages at said first and second output terminals, respectively, having substantially the same magnitude and opposite polarity in accordance with the frequency of the IF signals, said variable capacitance diode exhibiting a capacitance value determined by the difference between said first and second voltages;

a field effect transistor having source and drain electrodes interconnecting said first and second output terminals and a gate electrode for selectively receiving an energizing voltage to thereby render said field effect transistor conductive; and

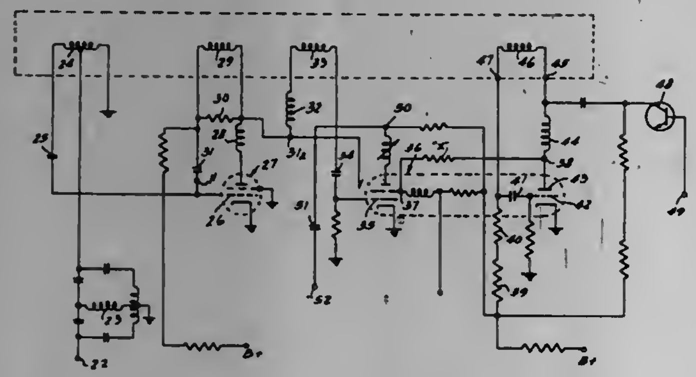
a voltage supply connected to said field effect transistor gate electrode for initially supplying said energizing voltage to said gate electrode when power is first supplied to said apparatus and for terminating said energizing voltage after a predetermined duration, said voltage supply comprising an R-C circuit connected across an operating voltage source, the junction defined by the series connected resistor and capacitor included in said R-C circuit being connected to said field effect transistor gate electrode, such that when said power is first supplied, the operating voltage provided by said operating voltage source is applied to said junction through said capacitor, the junction voltage decreasing as said capacitor is charged.

3,889,194

TELEVISION TUNER TO REDUCE HARMONIC RADIATION INTERFERENCE

Suhas Prataprao Bagwe, Forest Park, Ill., assignor to Admiral Corporation, Chicago, Ill.

Filed Oct. 2, 1972, Ser. No. 294,101
Int. Cl. H04b *1/26*
U.S. Cl. 325—436 6 Claims



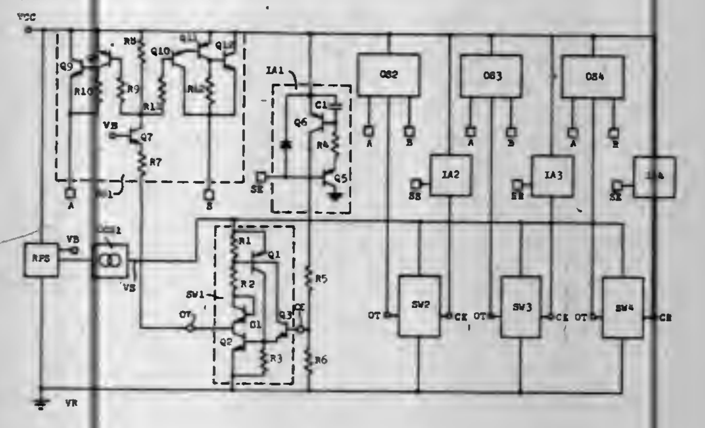
1. In a television tuner, a VHF oscillator, a VHF mixer, means for developing an oscillator injection voltage from said VHF oscillator, means for coupling said oscillator injection voltage to said VHF mixer, means for selectively varying the frequency of said VHF mixer, means for selectively varying the frequency of said VHF oscillator for the purpose of selecting one of a plurality of channels, including Channels 6 and 8, and said means for selectively varying the frequency of said VHF oscillator including means for causing a selective reduction in said injection voltage when said VHF oscillator is set for one of Channels 6 and 8 reception, said means for selectively varying the frequency of said VHF oscillator comprising switching means for switching one of the circuit elements of the oscillator out of the oscillator circuit and for switching into the oscillator circuit another circuit element having a different oscillation parameter from said one element, said circuit elements comprising inductance coils, each of said inductance coils being designed to produce specific oscillation frequencies when coupled into said oscillator for the purpose of channel selection and said inductance coil associated with the selection of one of Channels 6 and 8 has a resistance value selected for the purpose of reducing Channel 6 or 8 radiation interference, the resistance value of said inductance coil being substantially higher than the average resistance value of the inductance coils associated with selection of other channels.

3,889,195

INTERLOCKED PLURAL CHANNEL SWITCHES AND CONTROLLABLE SWITCH DEVICES FOR USE THEREIN

Karl Elshuber, Schnotting near Gemeinde Kirchdorf, Germany, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 12, 1973, Ser. No. 331,411
Int. Cl. H04b *1/16*
U.S. Cl. 325—464 11 Claims



11. A plural channel interlocked semiconductor switch including first and second energization potential supply lines and electric current source means connected to said supply lines; each said channel including:

a. a controllable semiconductor switch device of the latching type switchable between ON and OFF conditions, and having supply terminals connected to respective ones of said energization potential supply lines, a control terminal, and an output terminal;

b. said switch device adapted to have first and second conductive states such that current flow from said current source through said switch device when in said first conductive state establishes a voltage drop between said supply lines lower than a predetermined holding voltage when said switch device is in said second conductive state corresponding to said ON condition;

c. means for selectively applying actuating signals to the control terminals of said switch devices to switch a selected switch device to said first conductive state initially to establish a voltage drop between said supply line lower than said predetermined holding voltage and upon termination of said actuating signal to latch said selected switch device in said second conductive state;

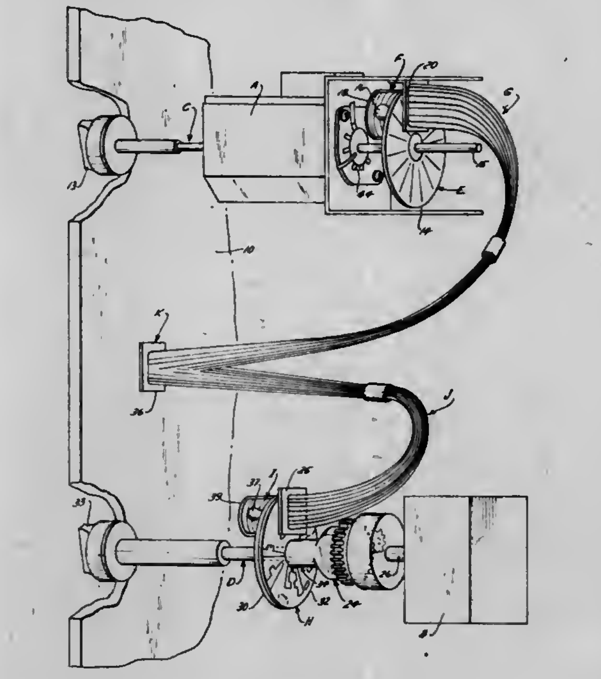
d. and wherein the output terminal of each switch device is connected to the input of a respective transistor amplifier for producing an output signal when said switch device is in said ON condition.

3,889,196

VHF AND UHF FIBER OPTIC CHANNEL INDICIA DISPLAY HAVING A COMMON DISPLAY AREA

Richard D. Gibson, Wilbraham, and Robert D. Whelan, W. Springfield, both of Mass., assignors to General Instrument Corporation, Clifton, N.J.

Filed Mar. 29, 1974, Ser. No. 455,985
Int. Cl. G08b *5/36*; H04b *1/06*
U.S. Cl. 325—455 16 Claims



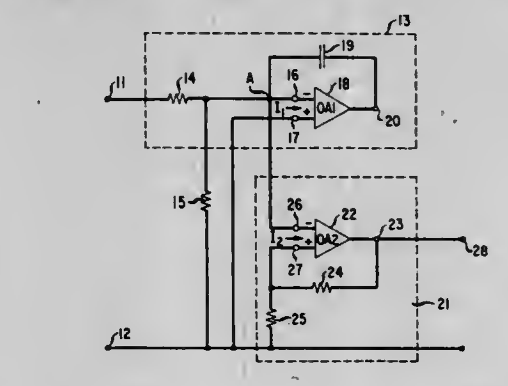
1. A channel indicia display for television receivers or the like having first and second frequency band tuners and separate movable control shafts adapted to respectively condition the tuners, the display comprising first and second movable indicia carrying elements each of which is operably connected to a different one of said control shafts to be driven thereby, a display window, first light transfer means for optically connecting said first indicia carrying element with said display window and second light transfer means for optically connecting said second indicia carrying element with said display window, each of said first and said second light transfer means having an output end adjacent said display window, said output ends of said means being integrated at said display window so as to form a single display.

3,889,197

TIMER APPARATUS UTILIZING OPERATIONAL AMPLIFIER INTEGRATING MEANS

Thomas Guy Duff, Shrewsbury, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 12, 1974, Ser. No. 460,348
Int. Cl. H03k *5/159*, *17/26*
U.S. Cl. 328—55 16 Claims



1. A circuit for developing an output signal a predetermined time after the application of an applied input signal comprising:

integration means, responsive to said applied signal, having a predetermined linear range of integration in which said integrator develops a signal representative of the mathematical integral of said applied signal, said integration means developing a signal at a terminal thereof which is at virtual ground only when said integration means is within said linear range of integration; and

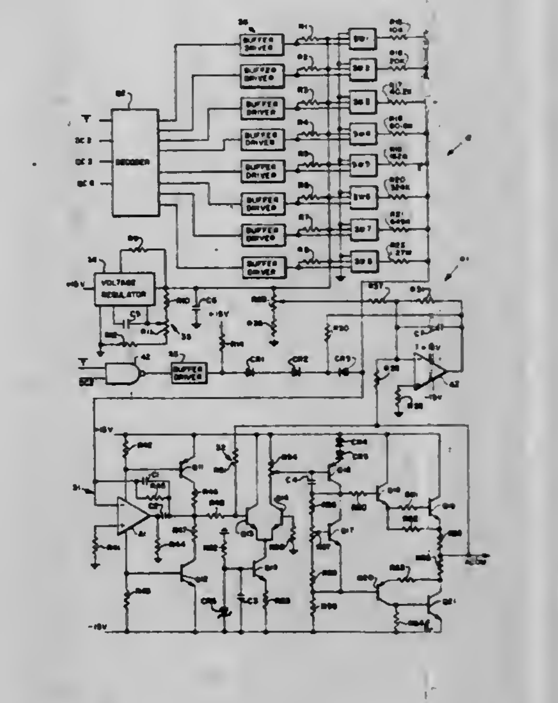
comparator means responsive to the difference between said signal at said terminal and an applied reference signal for developing said output signal.

3,889,198

VOLTAGE WAVEFORM GENERATOR INCLUDING FEEDBACK ARRANGEMENT FOR RESTORING VOLTAGE TO INITIAL CONDITION

John T. Lighthall, Brockville, Ontario, and Robert W. Thomas, Maitland, Ontario, both of Canada, assignors to GTE Automatic Electric (Canada) Ltd., Brockville, Ontario, Canada

Filed Feb. 22, 1974, Ser. No. 444,888
Int. Cl.² H03K *3/04*, *5/00*; G06G *7/12*
U.S. Cl. 328—59 11 Claims



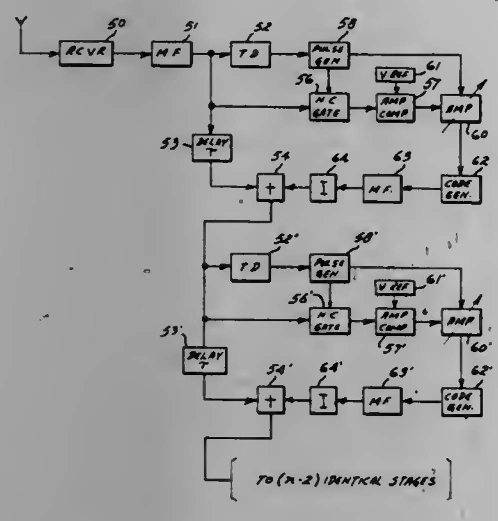
1. Waveform generating apparatus comprising
integrating means having an input connection and an output connection;
a source of reference potential;
a plurality of switch means;
a like plurality of resistances;
a like plurality of series circuits each connected between said source of reference potential and the input connection of the integrating means, each series circuit including one of the switch means and one of the resistances in series;
said integrating means being operable to produce an output voltage at its output connection which varies at a rate determined by the combination of the voltage applied at its input connection through a resistance and the value of the resistance;
control means coupled to said plurality of switch means and operable to close and open the switch means of said plurality in a predetermined sequence whereby the value of resistance between the source of reference potential and the input connection of the integrating means is varied; and
restoring means coupled to the output connection and to the input connection of the integrating means for producing a predetermined condition at the input connection which causes the integrating means to produce a predetermined voltage at its output connection.

3,889,199

METHOD AND APPARATUS FOR ADAPTIVELY SUPPRESSING UNWANTED LOBES IN A COMPRESSED CODED RADAR SIGNAL

Frank S. Gutleber, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 22, 1974, Ser. No. 472,323
Int. Cl. H03b *1/04*
U.S. Cl. 328—163 9 Claims



1. A method of adaptively eliminating unwanted lobes in a compressed, coded signal, comprising the steps of:

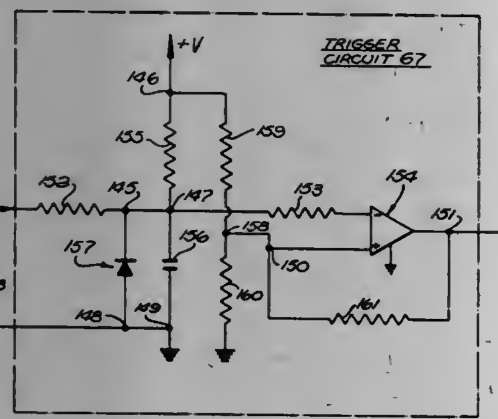
a. generating a train of pulses corresponding in amplitude and phase to the peak amplitude of the main lobes in said coded signal;
b. encoding each of the pulses in said train by the use of the same coding scheme employed to generate said coded signal;
c. compressing said now encoded pulses in a matched filter; and then
d. subtracting said compressed pulses from said coded signal, thereby to cancel from said coded signal the lobes which correspond to the lobes generated by the components of said coded signal contributing said peak amplitude signal.

3,889,200

TRIGGER CIRCUIT FOR BALL PROVER OR THE LIKE

Walter Fah Min Tyau, Orange, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 304,997, Nov. 9, 1972, Pat. No. 3,832,883. This application Jan. 21, 1974, Ser. No. 435,258
Int. Cl. H03b *1/00;* **H03k** *5/00*
U.S. Cl. 328—163 2 Claims



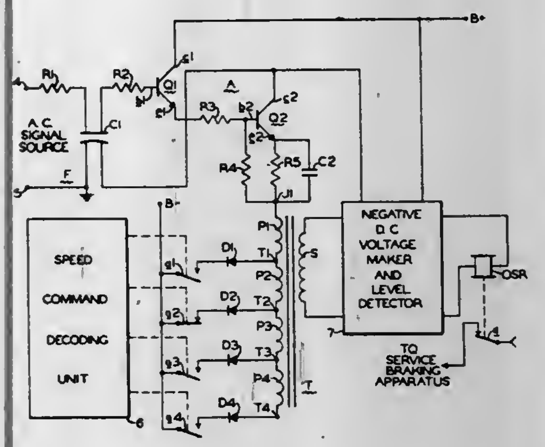
1. A trigger circuit comprising: first and second input leads; two switches connected in parallel between said leads; and a regenerative amplifier connected from said leads, said first lead being connected to a first junction, a D. C. source of potential, a first resistor connected from said first junction to said source, a second junction, a second resistor connected from said source to said second junction, said second lead being connected to a point of reference potential, a third resistor connected from said second junctionn to said point of reference potential, said regenerative amplifier including a differential amplifier having inverting and noninverting inputs and an output, a fourth positive feedback resistor connected between said noninverting input and said output, said second junction being connected to said noninverting input, and means connecting said first junction to said inverting input.

3,889,201

FAIL-SAFE CIRCUIT ARRANGEMENT

Reed H. Grundy, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Aug. 15, 1973, Ser. No. 388,378
Int. Cl. H03f *3/04*
U.S. Cl. 330—21 10 Claims


B+
R1
R2
Q1
c1
b1
e1
A
c2
R3
b2
Q2
e2
A.C. SIGNAL SOURCE
C1
R4
R5
C2
F
5
J1
B+
SPEED COMMAND DECODING UNIT
P1
D1
T1
g1
P2
D2
T2
g2
P3
D3
T3
g3
P4
D4
T4
g4
6
S
T
NEGATIVE D.C. VOLTAGE MAKER AND LEVEL DETECTOR
7
OSR
4
TO SERVICE BRAKING APPARATUS

1. A fail-safe circuit arrangement comprising, a source of a.c. signals, a low-pass filter connected to said a.c. signal source, an amplifier, said amplifier having an input and an output, said input of said amplifier connected to said low-pass filter, a turns-ratio device, said output of said amplifier connected to said turns-ratio device, a load, a turns-ratio control device, said turns-ratio device connected to said load, and said turns-ratio control device selectively varying the turns-ratio of said turns-ratio device.

3,889,202

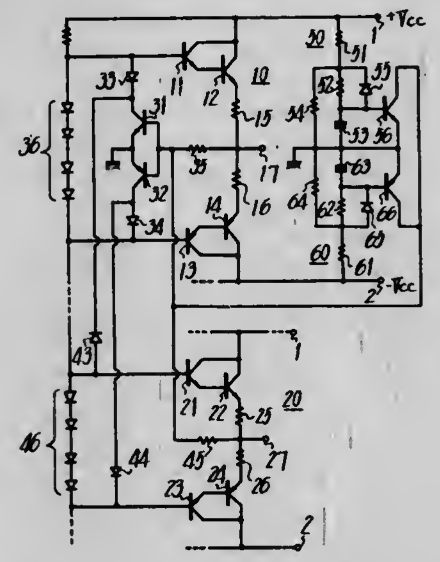
MUTING CIRCUIT

Tadao Suzuki, 3-22-22 Kamineguro, Meguro-ku, Tokyo, Japan

Filed Nov. 14, 1973, Ser. No. 415,740.
Claims priority, application Japan, Nov. 20, 1972, 47-133529
Int. Cl. H03g *3/30*
U.S. Cl. 330—51 8 Claims

1. A muting circuit comprising:

a. first and second voltage sources;
b. a pre-amplifier connected across the first voltage source;
c. voltage detecting means for the first voltage source;
d. a power amplifier having an input terminal and first and second output transistors whose collector and emitter are connected in series to each other across the second voltage source, the connection point between said first and second transistors being connected to an output terminal;
e. first switching means connected to the bases of the first and second transistors, the output terminal and a reference point, and operative to clamp the base of the first and second transistors into a predetermined DC voltage in response to an output signal of the voltage detecting means; and
f. second switching means connected between the input terminal and the reference point, and operative to attenuate a drive signal of the power amplifier in response to the output signal of the voltage detecting means.

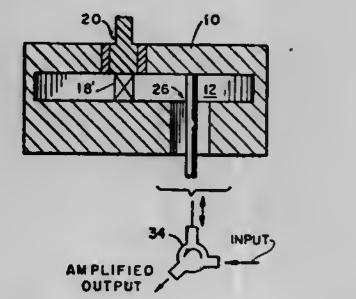


3,889,203

MULTI-AXIS CAVITIES FOR GUNN EFFECT AMPLIFIERS

Lester F. Eastman, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Division of Ser. No. 249,274, May 1, 1972. This application Aug. 15, 1974, Ser. No. 497,579
Int. Cl. H03f *3/60, 3/10*
U.S. Cl. 330—56 3 Claims



1. A Gunn effect amplifier circuit, comprising electrically conductive means for defining an elliptical cavity bounded by two parallel elliptical planar surface and an elliptical ringlike surface joining the two planar surfaces at their respective peripheries, a doped Gunn effect device coaxially mounted in said cavity at one of the focus lines associated with the elliptical ringlike surface, means for applying DC bias voltage to said device, coaxial transmission line means coaxially located at the other focus line associated with said cavity serving as a conduit for input and output signals, and connector means external to said cavity coupled to said transmission line means for introducing an input microwave signal into said cavity and for simultaneously extracting an amplified microwave output signal therefrom.

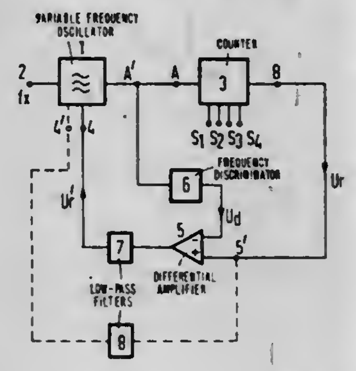
3,889,204

DIGITAL CIRCUIT FOR THE CONTROL OF A VARIABLE FREQUENCY OSCILLATOR

Karl Schlosser, Planegg, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 15, 1972, Ser. No. 315,503
Claims priority, application Germany, Dec. 23, 1971, 2164175
Int. Cl. H03b *3/04*
U.S. Cl. 331—1 A 5 Claims

1. In apparatus for controlling the frequency of a variable frequency oscillator including a counter for counting the cycles of said oscillator and producing a first d.c. control voltage in response to the difference between the number of cycles thus counted during a predetermined time interval and the number corresponding to operation of said oscillator at a desired frequency, the combination comprising a frequency discriminator for deriving a second d.c. voltage in response to the instantaneous frequency of said oscillator, and means for simultaneously connecting said first and second control voltages to said variable frequency oscillator for controlling the frequency thereof.

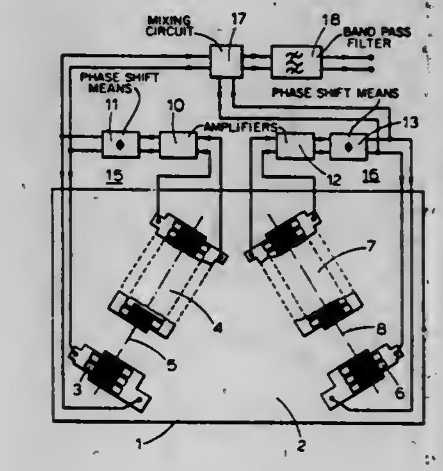


3,889,205

TEMPERATURE COMPENSATED ACOUSTIC SURFACE WAVE OSCILLATOR

Richard Frank Mitchell, Kingston, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,833
Claims priority, application United Kingdom, Apr. 9, 1973, 16917/73
Int. Cl. H03b *3/04, 21/00*
U.S. Cl. 331—41 9 Claims

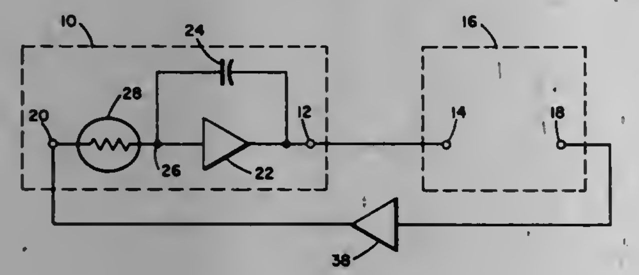


1. An oscillator comprising a piezoelectric body having an acoustic surface wave propagation surface formed thereon, a first and a second pair of interdigital transducers, each said pair comprising a launching and a receiving transducer arranged on said acoustic surface wave propagation surface respectively to launch and receive acoustic surface waves in corresponding first and second acoustic surface wave propagation directions over said acoustic surface wave propagation surface, amplifying means connected respectively to amplify the output of the receiving transducer of each said transducer pair and to feed said amplified output to the corresponding said launching transducer to maintain a respective component oscillation in said pair, said first and second acoustic surface wave propagation directions being selected so that the corresponding temperature coefficients of the frequency of the respective component oscillation are of a significantly different non-zero value each of which is substantially constant with respect to normal manufacturing variations in the orientations of said transducers with respect to the crystallographic axes of said body, and output means for deriving an output oscillation whose frequency is either the sum or the difference of said

component oscillations, the respective frequencies of said component oscillations being selected in relation to their temperature coefficients of oscillation frequency so that the temperature coefficient of said output oscillation is substantially zero.

3,889,206
TWO AND THREE-PHASE OSCILLATORS WITH ALL-PASS NETWORK HAVING AMPLITUDE RESPONSIVE TIME CONSTANT

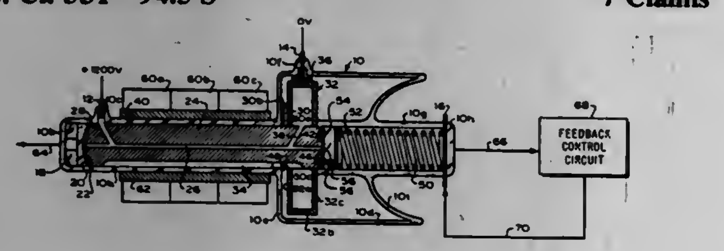
Arthur Mayer, Kew Gardens, N.Y., assignor to Astrosystems Inc., Lake Success, N.Y.
Continuation-in-part of Ser. No. 332,759, Feb. 15, 1973. This application Apr. 17, 1974, Ser. No. 461,733
Int. Cl. H03b *5/20, 27/00*
U.S. Cl. 331—45 **4 Claims**



1. An electronic oscillator comprising:
- a. an integrator having input and output terminals,
- b. an all-pass network having an input terminal coupled to the output terminal of said integrator and an output terminal, said all-pass network comprising a voltage inverter having an input coupled to the input terminal of said all-pass network, a capacitor coupled between the output of said voltage inverter and the output terminal of said all-pass network, and a variable resistive means coupled between the input and output terminals of said all-pass network, said variable resistive means adjusting the time constant of said all-pass network as a function of the amplitude of an oscillating voltage generated by said oscillator, and
- c. an amplifier having a gain equal to 3 and input and output terminals, the input terminal of said amplifier being coupled to the output terminal of said all-pass network and the output terminal of said amplifier being coupled to the input terminal of said integrator; said oscillator generating voltages at the output terminal of said integrator, the output of said voltage inverter and the output terminal of said amplifier which ar precisely 120° out-of-phase and precisely matched in amplitude.

3,889,207
FREQUENCY STABILIZED GAS LASER

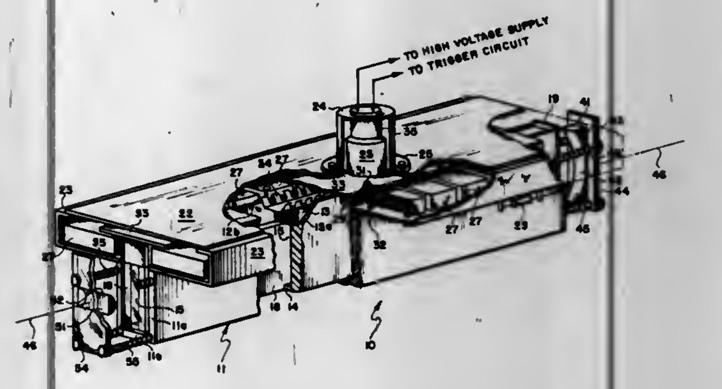
Glenn M. Burgwald, Mountain View; William P. Kruger, and Donald L. Hammond, both of Los Altos Hills, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Division of Ser. No. 13,285, Feb. 24, 1970, Pat. No. 3,771,066. This application May 7, 1973, Ser. No. 357,752
Int. Cl. H01s *3/10, 3/22*
U.S. Cl. 331—94.5 S **7 Claims**



1. A gas laser comprising:
means for enclosing a gas laser medium;
a rod of insulating material having a thermal coefficient of expansion in the range between +2 and −2 parts in 10^7 per degree centigrade and having a channel formed therein to define a gas discharge path in said gas laser medium, said channel having a pair of oppositely facing openings communicating with opposite ends of said rod;
a pair of electrodes supported in communication with opposite end portions of said channel and insulated from each other for operation at different potentials to excite said gas laser medium to produce a population inversion therein;
a pair of optical elements supported adjacent to the oppositely facing openings of said channel for at least partially reflecting said radiation produced by the population inverted medium in said channel to produce a coherent radiation beam;
a tuning element supported between one end of said rod and one of said optical elements for controlling the spacing between said optical elements, said tuning element having a length in the axial direction between said optical elements equal to less than ten percent of the spacing between said optical elements; and
means for energizing said tuning element.

3,889,208
SUPERFLUORESCENT LASER WITH IMPROVED BEAM DIVERGENCE AND SPACIAL BRIGHTNESS

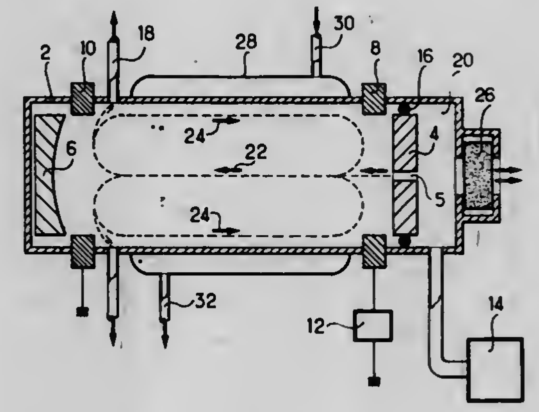
Irving Itzkan, Boston, Mass., assignor to Avco Everett Research Laboratory, Inc., Everett, Mass.
Filed Dec. 26, 1973, Ser. No. 427,441
Int. Cl. H01s *3/08*
U.S. Cl. 331—94.5 G **13 Claims**



1. In a pulsed superfluorescent laser device having short pulse output pulses of light energy, the combination comprising:
- a. means defining an elongated unstable optically resonant cavity having a longitudinal axis and a predetermined length;
- b. means for supplying to said cavity a gaseous lasing medium having at least two energy levels above the ground energy level in which the net excitation rate for the higher of the two upper levels is greater than the net excitation rate for the lower of the two energy levels by an amount sufficient to provide superfluorescence during electric discharge in said medium;
- c. first and second oppositely disposed electrode means communicating with said cavity for applying an electric field across said cavity normal to and along said longitudinal axis; and
- d. pulse circuit means coupled to said electrode means and adapted to be coupled to a pulsed source of high voltage electrical power for sequentially providing discrete pulses of said electric field in said cavity and sequentially providing discrete superfluorescent inversions between the said two energy levels of said gas, said inversions having a pulse width that is short compared to the transit time of light for several said cavity lengths.

3,889,209
GASEOUS FLUX LASER OSCILLATOR

Bernard Lavarini, Paris, France, assignor to Compagnie Generale d'Electricite, Paris, France
Filed Aug. 27, 1974, Ser. No. 501,108
Claims priority, application France, Sept. 6, 1973, 73.32156
Int. Cl. H01s *3/22*
U.S. Cl. 331—94.5 G **5 Claims**

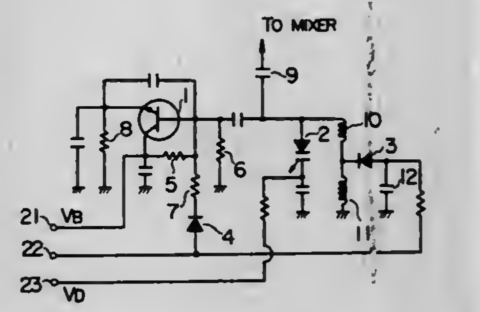


1. In a gaseous flux laser oscillator comprising:
an elongated enclosure suitable for containing a gas capable of being excited by an electrical discharge so as to produce a population inversion therein;
first and second electrodes arranged in the said enclosure and connected to a source of electric current so as to cause and maintain the said electrical discharge within the said gas;
first and second mirrors arranged in the vicinity of the first and second ends of the said enclosure respectively, so as to constitute an optical resonant cavity suitable for generating a laser oscillation within the said gas when it is excited by the said electrical discharge;
said first mirror being arranged inside said enclosure and drilled with a hole so as to enable a light beam resulting from the said laser oscillation to leave the said optical cavity therethrough;
said enclosure being provided at its first end with a transparent port enabling said light beam leaving the optical cavity to leave that enclosure also;
means for inserting and extracting said gas into and out of said enclosure, the improvement wherein:
the edges of the said mirror are connected together in a fluid-tight manner to the walls of said enclosure so as to constitute an insertion chamber within that enclosure and comprising said port; and
said insertion means comprises a source of said gas to supply gas to said insertion chamber under pressure, conduit means connecting the gas source and insertion chamber for admitting the gas to said optical cavity through said hole drilled in the first mirror, and for forming a swirling flow in the space subjected to the said electrical discharge.

3,889,210
LOCAL OSCILLATION CIRCUIT FOR REDUCING OSCILLATION VOLTAGE VARIATIONS BETWEEN HIGH AND LOW FREQUENCY BANDS

Shigeo Matsuura, Ayasemachi; Takeshi Saitoh, and Hiroshi Miyamoto, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan
Filed Sept. 26, 1973, Ser. No. 400,923
Claims priority, application Japan, Sept. 29, 1972, 47-97073
Int. Cl. H03b *3/02, 5/12*
U.S. Cl. 331—109 **3 Claims**

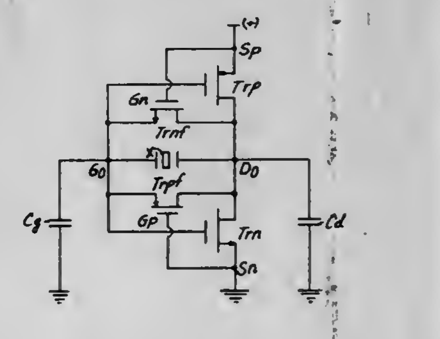
1. A local oscillation circuit used in a tuner of a receiver whose reception frequency is variable, comprising
a resonance circuit including a variable capacitance diode to change the resonance frequency of the circuit and tuning coils for low and high frequency bands;
an oscillating transistor connected with said resonance circuit;
a first switching diode;
first biasing means for selectively supplying said first switching diode with a bias voltage to render said switching diode on and off alternatively according to said high and low bands of reception frequencies;
means for changing over said tuning coils of said resonance circuit according to the conduction and cut-off of said first switching diode;



second biasing means for supplying said transistor with a bias voltage so as to start the oscillation operation of said transistor;
a second switching diode provided in said second biasing means and adapted to be rendered on and off alternatively according to the value of said bias voltage supplied from said first biasing means; and
means for changing the collector current of said transistor according to the conduction and cut-off of said second switching diode so as to increase the collector current during reception of a signal of said high frequency band.

3,889,211
MOS FIELD EFFECT TRANSISTOR CRYSTAL OSCILLATOR

Shinji Morozumi, Shimosuwa-machi, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan
Filed Aug. 28, 1973, Ser. No. 392,407
Claims priority, application Japan, Aug. 28, 1972; 47-85270
Int. Cl. H03b *5/36*
U.S. Cl. 331—116 R **6 Claims**



1. A quartz crystal oscillator circuit comprising a cascaded inverter circuit said cascade circuit including *n* complementary inverter stages connected in cascade, where *n* is an odd integer, and having an output terminal at the output of a last stage and an input terminal at the input of a first stage, a quartz crystal vibrator coupled between said last stage output and said first stage input to form a feed-back circuit therebetween, and biasing means in said feed-back circuit for setting the operating point of said oscillator circuit, said biasing means including two complementary parallel coupled integrated circuit field effect transistors, the source electrodes thereof being coupled to said input terminal and the drain electrodes thereof being coupled to said output terminal.

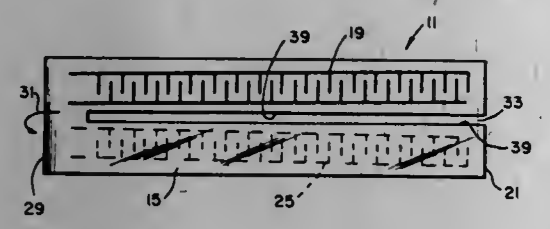
3,889,212
CIRCULATIVE SURFACE ACOUSTIC WAVE DEVICE

Joseph Burnsweig, and Steven H. Arneson, both of Los Angeles, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 13, 1974, Ser. No. 470,110

Int. Cl. H03h *9/30, 9/26, 9/32*

U.S. Cl. 333—30 R **10 Claims**



1. A circulative surface acoustic wave device, comprising: an elongated substrate of material capable of supporting the propagation of surface acoustic wave energy, said substrate having two generally planar surfaces along the length thereof, and also having at least one curved end surface portion capable of supporting the propagation of said acoustic energy from one of said surfaces to the other;

at least one electro-acoustic transducer disposed on each of said planar surfaces, said transducers being oriented to direct and receive said surface acoustic wave energy along said planar surfaces from one to the other around said curved end surface portion of said substrate;

isolation means including a gap in said material extending at least between said transducers for attenuating both electrical and mechanical coupling between said transducers.

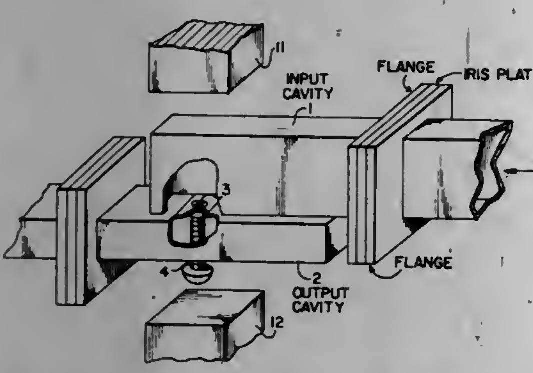
3,889,213
DOUBLE-CAVITY MICROWAVE FILTER

Carmine Vittoria, Bowie; Joseph Pasternak, and Howard Lessoff, both of Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 25, 1974, Ser. No. 464,024

Int. Cl. H01p *1/20, 7/06*

U.S. Cl. 333—73 W **11 Claims**



11. A magnetically tunable band-pass filter comprising:

a first microwave input portion for receiving microwave energy;

a second microwave output portion for transmitting microwave energy, said first and second portions being mounted adjacent to one another and connected by an opening therebetween;

a ferrimagnetic resonator positioned in said opening and comprising a substrate having opposed parallel surfaces with a ferrimagnetic material deposited uniformly over said opposed surfaces, said resonator being positioned such that one of said surfaces extends into said input portion and the other into the output portion; and

magnetic means for applying a variable magnitude magnetic field to said resonator.

3,889,214
PASS-BAND FILTER HAVING ELECTRONICALLY ADJUSTABLE MIDFREQUENCY

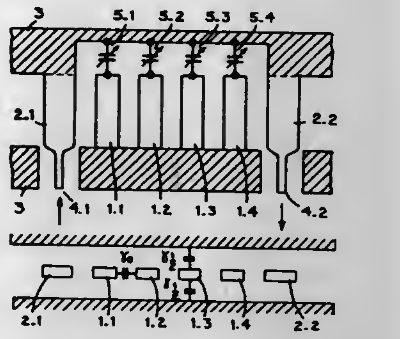
Christian H. Petitjean, Fontenay-aux-Roses; Maurice E. L. Marchand, Sevran, and Marcel Denis, Paris, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 6, 1974, Ser. No. 467,045

Claims priority, application France, May 18, 1975, 73.18092

Int. Cl. H01p *1/20, 7/10*

U.S. Cl. 333—73 R **4 Claims**



1. An improved midfrequency bandpass comb filter of the type having a casing consisting of a pair of opposing side walls, a plurality of parallel strips, and a number of first capacitors, each of said strips directly connected at one end to one of the side walls, and serially connected at the other end to the other of said side walls by means of each of said first capacitors wherein the improvement comprises:

a plurality of varactor diodes having first and second terminals, each of said varactor diodes in common connection with each of said first capacitors by means of said first terminals; and

a first source of variable bias voltage, each of said varactor diodes in common connection with said first bias voltage by means of said second terminals, whereby the midfrequency is displaced in response to variations in bias voltage causing variations in capacitance to occur therein said varactor diodes.

3,889,215
CIRCUIT BREAKER

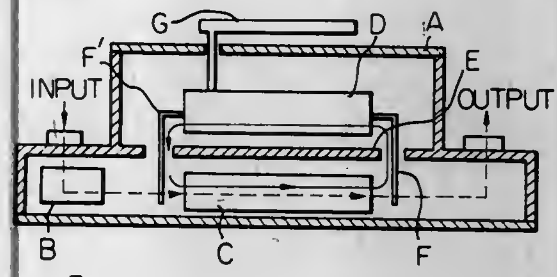
Akira Yoshino, and Hitoshi Imanishi, both of Seto, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Apr. 3, 1974, Ser. No. 457,423

Claims priority, application Japan, Apr. 5, 1973, 48-38934; Apr. 6, 1973, 48-39932

Int. Cl. H01h *9/34*

U.S. Cl. 335—6 **4 Claims**



1. A circuit breaker comprising an input terminal part, a switching contact part electrically connected with said input terminal part, an excess current detecting part electrically connected with said switching contact part, an output terminal part electrically connected with said excess current detecting part, an operating part for operating said switching contact part in response to an electric output of said excess current detecting part, means for converting said electric output of the excess current detecting part into a mechanical motion to transmit said motion to said operating part, means for transmitting motions of the operating part to the switching contact part, and a chassis made of an electrically insulative material for housing all said parts and elements,

said housing chassis comprising a main body having an intermediate partition wall defining on opposite sides thereof separated first and second chambers which are open in opposing directions with respect to said partition wall, said partition wall being provided with a pair of small apertures to permit communication between said first and second chambers, and lid members for closing the opening of said first and second chambers,

said switching contact part and excess current detecting part being housed in said first chamber and operatively fixed to one surface of said partition wall,

said operating part being housed in said second chamber and operatively fixed to the other surface of the partition wall,

said converting means extending through one of said pair of apertures in the partition wall to operatively couple the excess current detecting part with the operating part, and said transmitting means extending through the other aperture to operatively couple the operating part with the switching contact part.

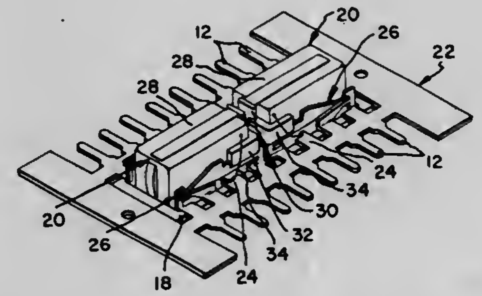
3,889,216
ELECTROMAGNETIC RELAY ASSEMBLY

Kemper Martel Hammell, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 13, 1972, Ser. No. 306,114

Int. Cl. H01h *45/14*

U.S. Cl. 335—106 **4 Claims**



1. An electrically-driven mechanical device for switching an electrical current from one circuit to another, which comprises:

a. an insulating housing;

b. switching assemblies stamped from a single coplanar sheet of conductor material and formed to provide:

- i. a plurality of posts spaced apart and formed into two parallel rows, each row depending downwardly from a side of the housing and adapted for insertion into a printed citcuit board receptacles for engagement with electrical circuits thereon,
- ii. a pair of adjacent contact members each being an integral continuation of one of adjacent posts and projecting into said housing, the first member having a portion defining a first fixed contact and the second member having a lateral projection overlapping and spaced from the first fixed contact and defining a second fixed contact,
- iii. a third contact member being an integral continuation of one of said posts positioned in the same row as the aforementioned pair of adjacent posts and projecting into the housing, said member having an elongated, laterally flexible arm with the free end thereof extending in between the first and second fixed contacts; and
- c. electro-magnetic means for moving the flexible arm on the third contact member into electrical contact with either the first or second fixed contacts thereby switching an electrical current which may flow thru the third contact member from one to the other fixed contact member.

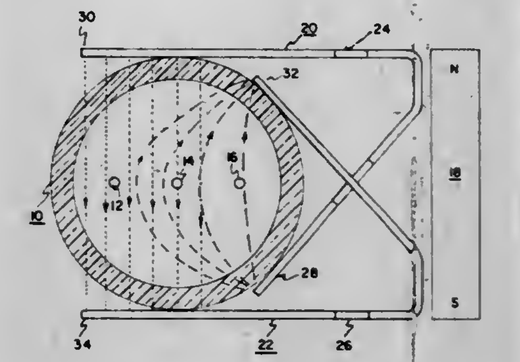
3,889,217
CONVERGENCE MEANS FOR INLINE-TYPE CATHODE RAY TUBE

Gary A. Martin, and John W. Lister, both of Portsmouth, Va., assignors to General Electric Company, Portsmouth, Va.

Continuation of Ser. No. 336,514, Feb. 28, 1973, abandoned. This application June 19, 1974, Ser. No. 480,715

Int. Cl. H01f *1/00*

U.S. Cl. 335—212 **19 Claims**



1. Static convergence means for use with a cathode ray tube having a plurality of electron beams disposed in a predetermined array and extending therein, comprising:

permanent magnetic means having at least a pair of poles;

a first plurality of pole piece means extending from said poles for supporting a first magnetic field which traverses the beam array in a first direction;

a second plurality of pole piece means extending from said poles for supporting a second magnetic field which traverses the beam array in a direction opposite said first direction;

said second magnetic field substantially offsetting the effect of said first magnetic field upon predetermined ones of the electron beams.

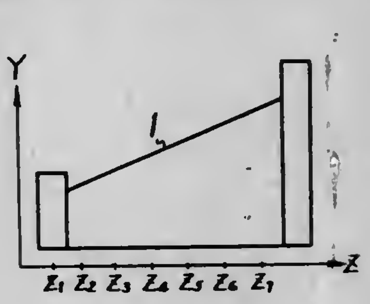
3,889,218
SADDLE SHAPED DEFLECTION COIL

Yoji Ishikawa, Saitama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 6, 1974, Ser. No. 495,293

Int. Cl. H01f *5/00*

U.S. Cl. 335—213 **4 Claims**



1. A saddle type deflection coil for a cathode ray tube having cross-sections in planes perpendicular to a first axis corresponding to the longitudinal central axis of said cathode ray tube and each of which consists of a pair of half sectional portions substantially symmetrical with reference to a second axis lying in the respective plane and being perpendicular to said first axis, each of said half sectional portions of each cross-section including:

a. an outer curved margin defined by an arc of a circle with a center at a point on said first axis;

b. an inner margin having a curved part formed by an arc of another circle with a center at said point on said first axis and a straight part extending parallel with said second axis from said curved part; and

c. a pair of connecting margins between the adjacent ends of said outer and inner margins.

3,889,219
SOLENOID ACTUATOR WITH MAGNETIC LATCHING

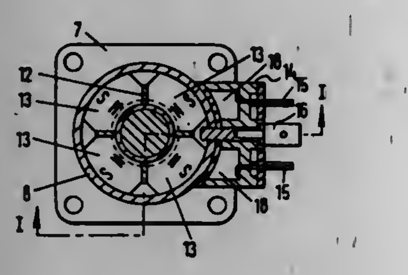
Donald Alexander Larner, Kingston-upon-Thames, Surrey, England, assignor to Fluid Devices Limited, Kingston-upon-Thames, Surrey, England

Filed Nov. 1, 1973, Ser. No. 412,012

Claims priority, application United Kingdom, Nov. 2, 1972, 50624/72

Int. Cl. H01f *7/08*

U.S. Cl. 335—234 **9 Claims**



1. An electromagnetic actuator comprising:

an armature displaceable between first and second axially spaced positions;

a pair of spaced pole-pieces defining said first and second axial positions to which said armature is displaceable, each of said pair of spaced pole-pieces being disposed at one of said first and second axially spaced positions to limit the axial displacement of said armature, said armature and one of said pair of spaced pole-pieces forming a low reluctance magnetic path at each of said first and second axially spaced positions;

winding means for developing, when energized, lines of flux in said axial direction for displacing said armature between said first and second axially spaced positions; and a plurality of permanent magnet means forming an annular array for latching said armature in said first and second axially spaced positions, each of said plurality of permanent magnet means being disposed in a plane which is transverse to said axial direction and exhibiting a magnetic polarity which is transverse to said axial direction, and each of said plurality of permanent magnet means being separated from an adjacent one of said plurality of permanent magnet means by a plane along said axial direction and extending radially outward therefrom.

3,889,220
STACKED MAGNETIC ARRANGEMENT

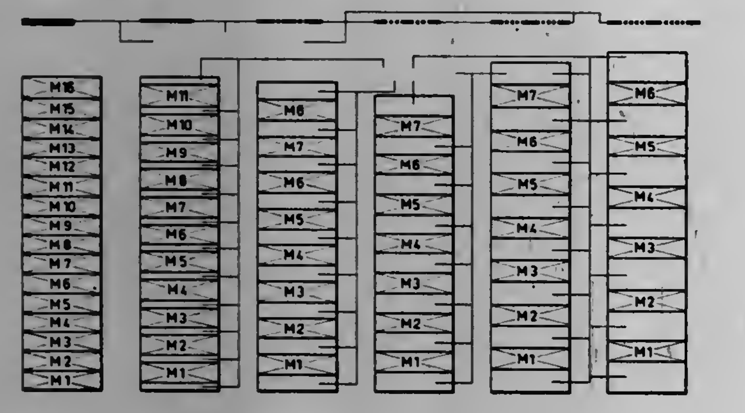
Heinrich Spodig, Netteberge 84, 4711 Bork, Germany

Filed June 26, 1973, Ser. No. 372,707

Claims priority, application Germany, July 3, 1972, 2232613

Int. Cl. H01f *7/02*

U.S. Cl. 335—306 **26 Claims**



1. A magnet arrangement comprising, in combination, a stack of parts including at least two permanent magnet parts having respective first end faces of the same magnetic polarity and respective second end faces of the same magnetic polarity, said first end faces having a magnetic polarity opposite to the magnetic polarity of said second end faces, and an intermediate part made of a magnetic material having a magnetic permeability higher than the permeability of said permanent magnet parts and sandwiched between said permanent magnet parts and having a first end face juxtaposed with the first end face of one of said permanent magnet parts and an opposite second end face juxtaposed with the second end face of the other of said permanent magnet parts.

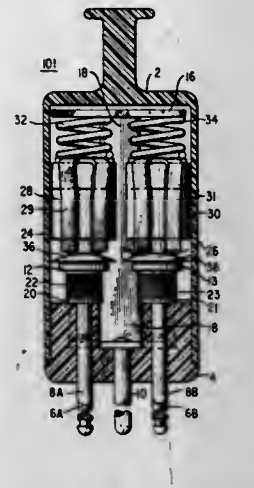
3,889,221
PROTECTOR UNIT

Robert Frederick Heisinger, Parsippany-Troy Hills Township, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 4, 1974, Ser. No. 447,587

Int. Cl. H01h *61/00*

U.S. Cl. 337—15 **7 Claims**



1. A protector unit comprising an input terminal, an output terminal, a ground terminal, a carbon block means for shunting voltages exceeding a preselected voltage level on said input terminal to said ground terminal, and a cage of conductive material about said carbon block means in electrical contact with said ground terminal and adapted for providing a current path between said input terminal and said ground terminal, said path normally being in an open condition, CHARACTERIZED IN THAT:

said unit includes a bimetallic disk in electrical contact with said input terminal and responsive to currents through said input terminal in excess of a preselected current level to deflect into engagement with said cage to close said path.

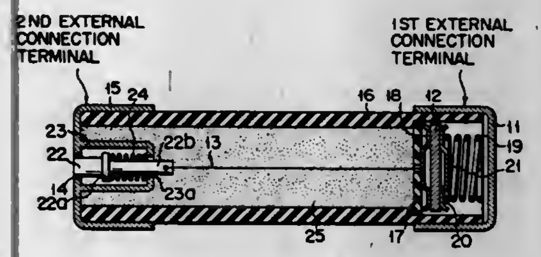
3,889,222
SURGE VOLTAGE ABSORBER

Ikuo Takano; Yasutaka Imajyo, and Akira Tanimoto, all of Tokyo, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Nov. 7, 1973, Ser. No. 413,576

Int. Cl. H01h *85/30*

U.S. Cl. 337—244 **7 Claims**


2ND EXTERNAL CONNECTION TERMINAL
1ST EXTERNAL CONNECTION TERMINAL
15
24
16
18
12
23
22
22D
13
14
220
230
25
17
20
11
19
21

1. A surge voltage absorber which comprises a holding structure;

a first external connection terminal provided at one end of said holding structure;

a second external connection terminal having a penetrating hole and provided at the other end of said holding structure;

at least one nonlinear resistance element made of metal oxide and provided within said holding structure so as to be electrically connected to said first external connection terminal at its one end;

a first fusible element arranged so as to be electrically connected at its one end to the other end of said nonlinear resistance element;

a display member disposed in a recess of said second external terminal, connected to the other end of said fusible element and displaceable to the outside through said penetrating hole; and

a biasing device which electrically contacts said second external connection terminal and said display member and causes said display member to project through said penetrating hole when said fusible element is melted away.

3,889,223
RESISTOR TRIMMING TECHNIQUE

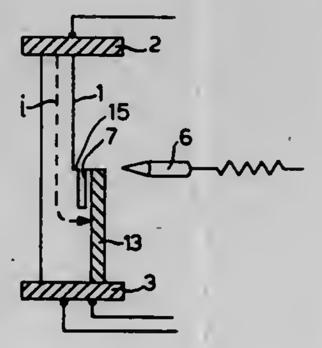
Lino Sella, Banchette, and Claudio Dalmasso, Ivrea, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Torino, Italy

Continuation of Ser. No. 310,729, Nov. 30, 1972, abandoned. This application Aug. 5, 1974, Ser. No. 494,660

Claims priority, application Italy, Dec. 2, 1971, 70956/71

Int. Cl. H01c *9/00*

U.S. Cl. 338—195 **5 Claims**



1. A resistor trimming arrangement comprising:

a resistor pattern having a first and second end with an initial resistance between these ends, said pattern including a first portion of relatively resistive material and a second portion of relatively conductive material so that an electrical current passing through said pattern from said first to said second end will pass through a first length of said resistive material and a second length of said conductive material;

electrically operable means for removing an amount of said resistive material; and

circuit means electrically connected to said removing means and electrically connected to the second end of the resistor pattern for operating said removing means to effect the removal of an amount of resistive material to increase the length of resistive material through which an electrical current passing between said ends passes to a length of said resistive material which is greater than said first length and to decrease the length of conductive material through which the electrical current passes to a length of said conductive material which is shorter than said second length, thereby causing the resistance between said ends to be increased.

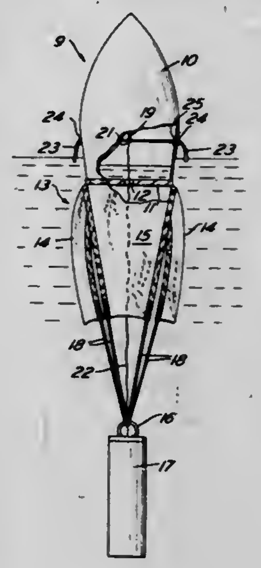
3,889,224
CROWN FLOAT/DECELERATOR

Edgar A. Reed, Ambler, and E. Russell Combos, Churchville, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 8, 1974, Ser. No. 449,295

Int. Cl. B63b *21/52*

U.S. Cl. 340—2 **6 Claims**



1. An entrapped air floatation device for deployment of a non-buoyant object from an elevated position in air into a body of water, comprising in combination:

an inflatable member formed to dependingly support the object and having an orifice positioned therein for restricting fluid flow out of said member, for allowing sufficient air into said member during descent from the elevated position to provide adequate buoyancy for the object, and for allowing water into said member thereafter, said orifice being positioned below the airwater interface after the device reaches a floating position in the water;

whereby the air pressure attained in said member is prevented from escaping through said orifice in high sea states by the water above said orifice.

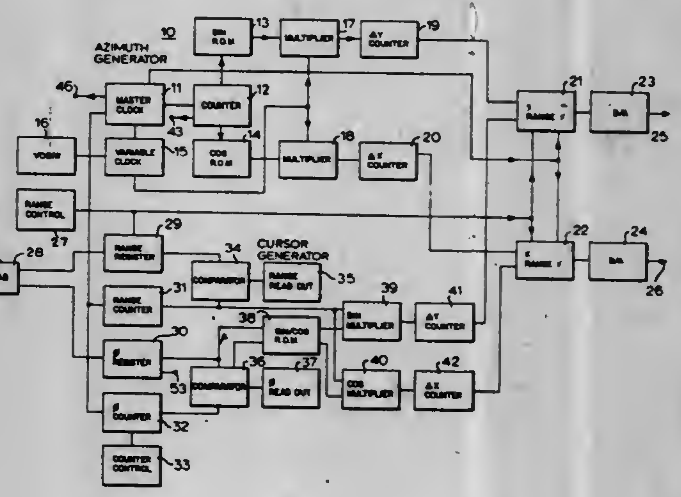
3,889,225
SONAR DISPLAY

George J. McKenzie, Milton, Ontario, and Heinz W. Ruther, Mount Hope, Ontario, both of Canada, assignors to Westinghouse Canada Limited, Hamilton, Ontario, Canada

Filed Aug. 9, 1973, Ser. No. 386,881

Int. Cl. G01s *7/56, 7/62*

U.S. Cl. 340—3 C **2 Claims**



1. In a plan position information display system, a master clock source of pulses of a fixed frequency, a variable clock

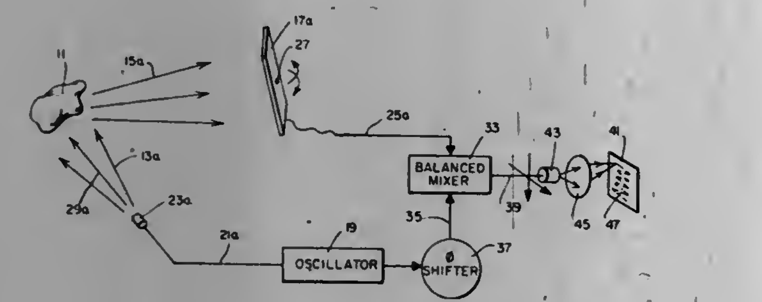
source of pulses of a frequency adjustable in accordance with a variable ambient condition, a read only memory for producing a cyclically variable digital output function when driven by the count of the pulses from said master clock, a digital multiplier for multiplying the digital output from said read only memory with the digital value of the pulses produced by said variable clock and a digital to analogue converter which converts the digital output from said multiplier into an analogue value for deflecting the beam of a cathode ray tube in accordance with the digital output from said multiplier.

3,889,226
SCANNED HOLOGRAPHY BY SECTOR SCANNING
Bernard P. Hildebrand, Richland, Wash., assignor to Battelle Development Corporation, Richland, Wash.

Continuation-in-part of Ser. No. 166,944, July 28, 1971, Pat. No. 3,760,344. This application Sept. 12, 1973, Ser. No. 396,414

Int. Cl. G01s *9/66*

U.S. Cl. 340—5 H **15 Claims**



1. A method of producing holographic information of an object scene, comprising the steps of:

illuminating the object scene with a coherent radiation beam that is generated by a substantially point radiation source fixed relative to the object,

positioning an extended radiation receiver of finite size in two dimensions relative to the object scene to detect radiation from said beam after modification by the object scene,

rotating said extended radiation receiver about a point fixed with respect to the object scene in a manner that the modified beam from the object scene is scanned over said extended radiation receiver, and

mixing a reference signal with the object modified radiation striking the extended radiation receiver, said reference signal being mutually coherent with said object scene illuminating beam, thereby producing a holographic information signal of the object scene.

3,889,227
ULTRASONIC WAVE RECEIVING APPARATUS
Kinya Takamizawa, and Kazuhiro Iinuma, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Sept. 18, 1973, Ser. No. 398,314

Claims priority, application Japan, Feb. 13, 1973, 48-17114

Int. Cl. G01s *3/80*

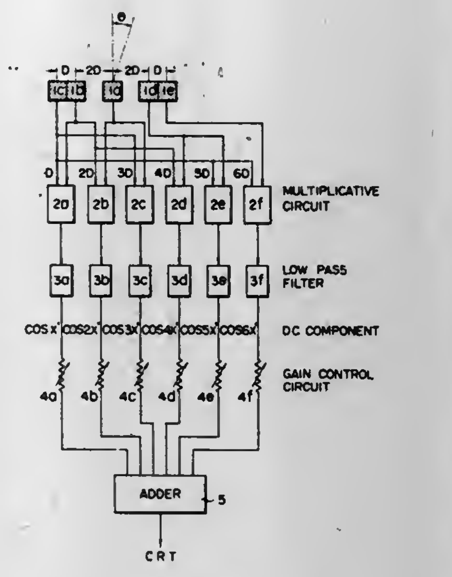
U.S. Cl. 340—6 R **5 Claims**

1. An ultrasonic wave receiving apparatus comprising:

an electroacoustic transducer array including a plurality of transducer elements arranged in the same plane so that any two adjacent transducer elements are spacially arranged at an integral multiple of a distance, said distance being determined from the equation $D/\lambda \sin \theta_1 = 1$ in which D represents said distance, λ the wave length of the receiving ultrasonic wave and θ_1 the spacial angle between a main lobe and a grating lobe adjacent to said main lobe, said distance also being selected so as to cause said grating lobe to be outside of a predetermined scanning range which limits the maximum incident angle of said ultrasonic wave into said plane, and said main lobe and grating lobe together with said spacial angle being factors for determining a receiving directionality pattern of said apparatus; and

signal processing means which includes a multiplicative circuit,

an extracting circuit for extracting the D.C. component of an output from said multiplicative circuit,



a gain control circuit for setting gains of the outputs from said transducer array, and

an adder, and

means for processing an output signal from each transducer element so as to cause the subject apparatus to indicate a receiving directionality pattern approximating a preset receiving directionality pattern; wherein the gain of said gain control circuit is set corresponding to the levels of the coefficients of the Fourier series into which said preset receiving directionality pattern is expanded as a function of the incident angle of the ultrasonic waves brought to said electroacoustic transducer array so as to approximate said receiving directionality patterns to said preset receiving directionality pattern, thereby sharpening said main lobe and reducing the levels of side lobes generating between said main lobe and grating lobe.

3,889,228
TWO-WAY ACOUSTIC TELEMETERING SYSTEM
Elbert N. Shawhan, West Chester, Pa., assignor to Sun Oil Co., Saint Davids, Pa. 19087

Filed Nov. 16, 1973, Ser. No. 416,467

Int. Cl. G01v *1/40*

U.S. Cl. 340—18 FM **13 Claims**

1. In a system for transmitting acoustic signals in either direction along a string of drill pipe; a plurality of repeaters

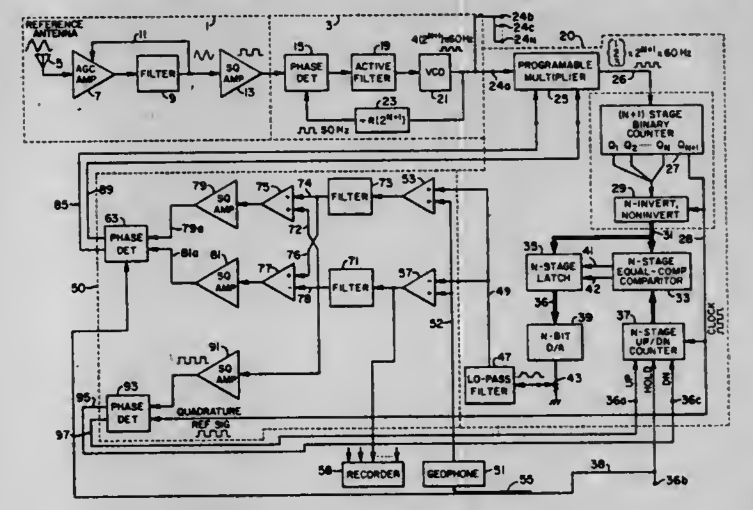
distributed along said pipe, each repeater having means acoustically coupled to said pipe for receiving acoustic energy of a plurality of nominal frequencies therefrom; means acoustically coupled to said pipe for retransmitting acoustic energy of a plurality of nominal frequencies along said pipe; and means operating in dependence upon the nominal frequency of the energy received for selecting for retransmission from said plurality of nominal frequencies a signal having a nominal frequency different from the nominal frequency received by the same repeater and different from the nominal frequency transmitted by a next repeater along said string in the direction of transmission to avoid interference between signals received at a repeater from adjacent repeaters above and below that same repeater.

3,889,229
SYSTEM FOR ELIMINATING MONOCHROMATIC SIGNALS FROM DATA RECORDS
Richard J. Kostelnicek; Curtis B. Herbert, both of Houston, Tex., and Thomas H. Crawford, Dhahran, Saudi Arabia, assignors to Exxon Production Research Company, Houston, Tex.

Filed Dec. 3, 1973, Ser. No. 421,384

Int. Cl. H03b *1/04;* **H04b** *15/04*

U.S. Cl. 340—15.5 CP **20 Claims**



1. Signal processing apparatus for eliminating a substantially monochromatic signal from an electrical signal that may include a data signal and said substantially monochromatic signal, said apparatus comprising:

first means for producing a substantially sinusoidal nulling signal having the same frequency as the substantially monochromatic signal;

second means for subtracting said nulling signal from said electrical signal thereby producing a residual signal;

circuit means for filtering the residual signal to eliminate signals having frequencies other than the frequency of the said substantially monochromatic signal thereby producing a filtered residual signal; and

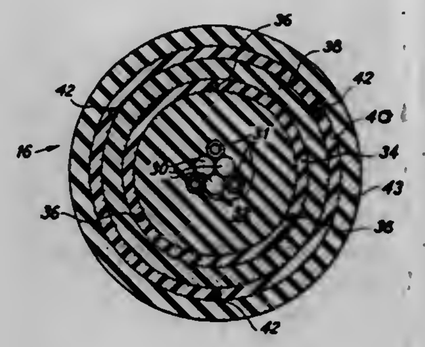
third means responsive to the phase difference between the nulling signal and the substantially monochromatic signal to reduce the phase difference between the nulling signal and the substantially monochromatic signal and responsive to the phase of said filtered residual signal relative to a reference signal to reduce the amplitude of said residual signal.

3,889,230
CAPACITIVE TRANSDUCER AND METHOD OF USING THE SAME
Sydney T. Knott, Barnstable; Frederick R. Hess, Waquoit, and Richard T. Nowak, North Falmouth, all of Mass., assignors to Woods Hole Oceanographic Institution, Woods Hole, Mass.

Filed Sept. 2, 1966, Ser. No. 576,979

Int. Cl. G01v *1/38*

U.S. Cl. 340—17 **9 Claims**



1. A capacitive line transducer system including a line transducer and an amplifier, said line transducer having, in concentric formation,

an inner electrically conductive first member having a cylindrical surface area,

a uniform substantially compressible cellular dielectric layer entirely covering the first member,

an outer radially flexible electrically conductive third member over the dielectric layer and having a hollow cylindrical configuration and

an insulating layer surrounding the third member,

said amplifier being connected between said electrically conductive members and adapted to produce a signal varying with fluctuations in the capacity therebetween.

3,889,231
ELEVATOR SIGNALLING SYSTEM
Lawrence Tosato, Millburn; Leon A. Abel, Little Silver, and Clyde M. Mullis, Glen Rock, all of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 26, 1973, Ser. No. 410,153

Int. Cl. B66b *3/02*

U.S. Cl. 340—21 **2 Claims**

1. An elevator system, comprising:

a structure having a plurality of floors and a hoistway,

an elevator car,

means mounting said elevator car for movement in said hoistway to serve at least certain of said floors,

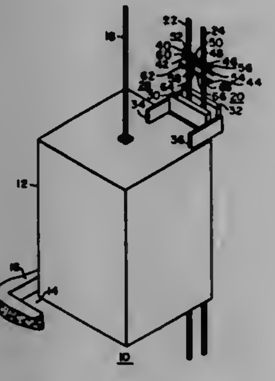
and control means for indicating when said elevator car is at a predetermined location in said hoistway, including elongated control element means disposed in said hoistway which extend in the direction of travel of said elevator car,

said elongated control element means including first and second spaced control elements,

first and second permanent magnets, a magnetically responsive switch, means mounting said first and second permanent magnets with like orientation on said elongated control elements means,

means mounting said magnetically responsive switch on said elevator car in predetermined spaced relation from said elongated control element means,

said means mounting the first and second permanent magnets including first and second universal mounting brackets, respectively, which are selectively connectable to said first and second control elements with a first orientation which places a predetermined surface of an attached permanent magnet in a first vertical plane, and with a second orientation which places the predetermined surface in a second vertical plane, spaced from and parallel to the first vertical plane, with said first and second universal mounting brackets being mounted on said first and second spaced control elements with like orientation,



said magnetically responsive switch being normally in a first condition and being actuated from the first condition to a second condition when subjected to a magnetic field, said first and second permanent magnets being spaced on said elongated control element means in the direction of travel of said elevator car such that when the magnetically responsive switch enters the magnetic field of either said first or second permanent magnet due to movement of said elevator car, the magnetically responsive switch will be actuated to its second condition and maintained in its second condition by the spaced first and second permanent magnets for a period of time which exceeds that possible due to magnetic coaction between only one of said permanent magnets and said magnetically responsive switch.

3,889,232

SENSOR ASSEMBLY FOR USE IN A VEHICLE EQUIPPED WITH A GAS BAG RESTRAINT SYSTEM

Lon E. Bell, Altadena, Calif., assignor to Technar Incorporated, Arcadia, Calif.

Continuation-in-part of Ser. No. 175,528, Aug. 27, 1971, abandoned. This application Aug. 13, 1973, Ser. No. 387,720

Int. Cl. G08b ***19/00***

U.S. Cl. 340—52 H **13 Claims**

1. A crash sensor assembly disposed in a vehicle comprising: an electrical signal generating means;

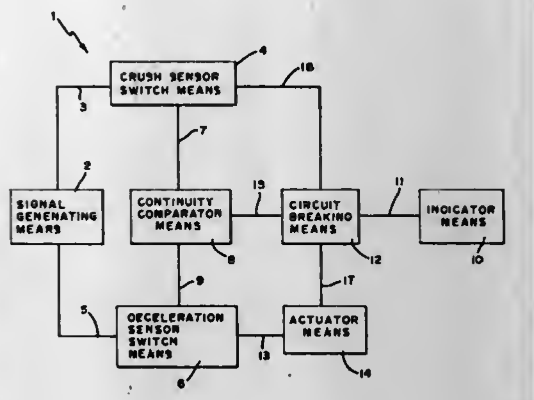
a deceleration sensor switch means in electrical communication with said signal generating means;

a second sensor switch means in electrical communication with said signal generating means;

an actuating means, in electrical communication with said second sensor switch means and said deceleration sensor switch means, to activate a gas bag restraint system disposed in said vehicle upon closing of both said second and said deceleration switch means;

a continuity comparator means, in electrical communication with said second sensor switch means and said deceleration sensor switch means, the comparator means including means to electrically sense and generate an output signal when one of said switch means is closed for longer than a predetermined time interval before the other switch means closes; and

a circuit breaking means, disposed in electrical communication with said continuity comparator means responsive to said output signal for deactivating said crash sensor assembly upon receipt of said output signal sent to it by said continuity comparator means.



3,889,233

CHARACTER COINCIDENCE DETECTOR FOR OPTICAL INFORMATION RETRIEVAL SYSTEMS

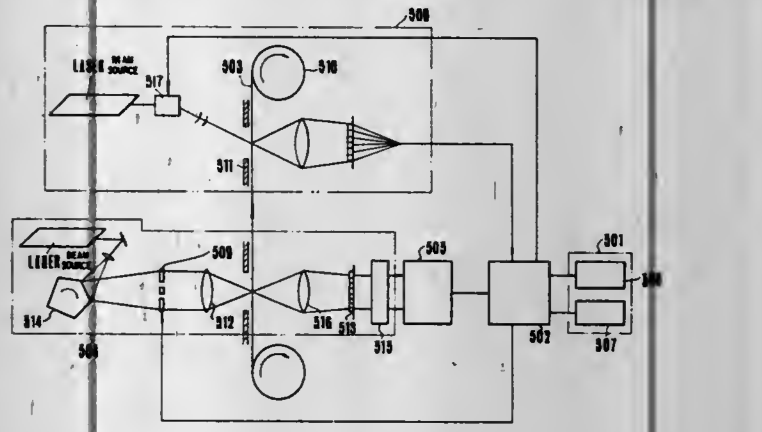
Haruo Ogiwara, Tokorozawa, Japan, assignor to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Aug. 29, 1973, Ser. No. 392,803

Claims priority, application Japan, Sept. 4, 1972, 47-89944

Int. Cl. G06g ***9/00;*** **G11c** ***11/42***

U.S. Cl. 340--146.3 F **4 Claims**



1. A character coincidence detector for use in an optical information retrieval system for collating the coincidence between an information to be retrieved that has been stored as a hologram and an interrogation information which comprises an input-output unit, a central control device, a word coincidence detecting circuit, and a readout unit, said character coincidence detector comprising:

a laser beam source generating a coherent light beam,

a rotary mirror receiving the coherent light beam emanated from said laser beam source for continuously deflecting the light beam in the horizontal direction;

an interrogation spatial light modulator for forming a desired interrogation information code pattern in response to a command from said central control device, said interrogation spatial light modulator receiving the deflected light beam and including a plurality of one-dimensional shutter arrays which are juxtaposed in a direction perpendicular to the horizontal deflection of said light beam, each one shutter of each shutter array being opened whereas the other shutters are closed so as to encode the interrogation information in response to the command from said central control device, and a plurality of cylindrical lens arrays disposed in front of said plurality of juxtaposed one-dimensional shutter arrays, each of said cylindrical lenses being disposed at the opening of each shutter;

a first convex lens for effecting a two-dimensional Fourier transformation;

a storage medium in the form of a hologram that has been recorded with an information to be retrieved by means of a recording spatial light modulator, said hologram storage medium being disposed behind said first convex lens, movable in the horizontal direction and scanned with the deflected light beam from said rotary mirror, said deflected light beam being spatially modulated by said interrogation spatial light modulator;

a second convex lens for effecting a two-dimensional Fourier transformation disposed on the back of said hologram storage medium;

an aperture plate for transmitting necessary light beams alone disposed on the back of said second convex lens and provided with a plurality of pin holes having a spacing corresponding to the distance between the centers of the shutters of the recording spatial light modulator;

a one-dimensional convex lens array, for focusing a correlation image from respective holograms of said hologram storage medium disposed corresponding to said pin holes of said aperture plate;

a plurality of photodiode arrays for photoelectrically detecting the correlation image;

a signal processing electronic circuit for receiving an electrical signal from respective elements of said plurality of photodiode arrays, said signal processing electronic circuit including at least one narrow bandpass filter, at least one threshold element (Schmitt trigger circuit) and a single AND gate connected to its output whereby when said hologram storage medium recorded with an information to be retrieved is scanned with the deflected light beam corresponding to the interrogation information code pattern, where a coincidence exists the photoelectrically detected signal of the reproduced hologram image takes the form of a narrow bandwidth signal having a definite center frequency independent of the interrogation information code pattern, but where no coincidence exists a zero output of a lowband signal is produced.

3,889,234

FEATURE EXTRACTOR OF CHARACTER AND FIGURE

Hiroshi Makihara, Kodaira; Toshihiro Hananoi, Matsudo, and Yoshiji Fujimoto, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 4, 1973, Ser. No. 403,391

Claims priority, application Japan, Oct. 6, 1972, 47-99805; Feb. 28, 1973, 48-23165; Apr. 9, 1973, 48-39457

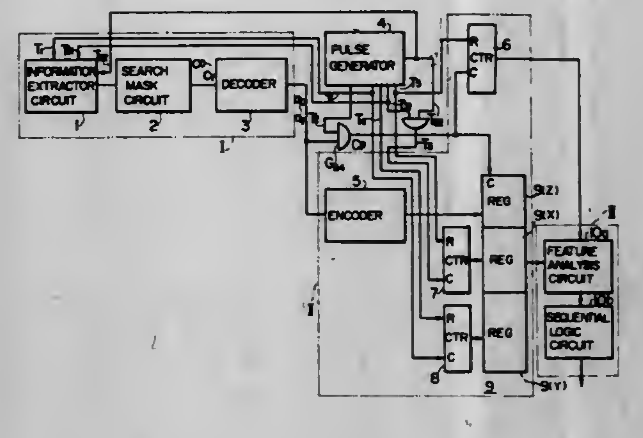
Int. Cl. G06k ***9/12***

U.S. Cl. 340—146.3 MA **9 Claims**

1. A feature extractor of character and figure comprising: first register means for storing a thinned, two-valued pattern of the character and figure;

information extractor means including n second register means for receiving from said first register means information along n consecutive predetermined scanning lines in said pattern of the character and figure, address signal generator means for generating address signals which address m positions in each of said predetermined scanning lines, and data selector means for receiving information from said second register means and said address signal generator means to simultaneously generate information of *n* by *m*, where n and m are integers;

search mask circuit means for searching coincidence of information extracted by said information extractor means with patterns of search masks each having a predetermined pattern representative of the feature after comparison therewith;



counter means for counting the number of feature signals searched by said search mask circuit means to obtain the total number of the features;

third register means for storing signals representative of the variety of the signal searched by said search mask circuit means; and

fourth register means for storing signals representative of the coordinate on the character and figure of the feature signals searched by said search mask circuit means.

3,889,235

METHOD OF SAFEGUARDING THE TRANSMISSION OF THE CONTINUOUS POLARITY IN DATA TRANSMISSION SYSTEMS TRANSFERRING A POLARITY REVERSAL IN CODED FORM

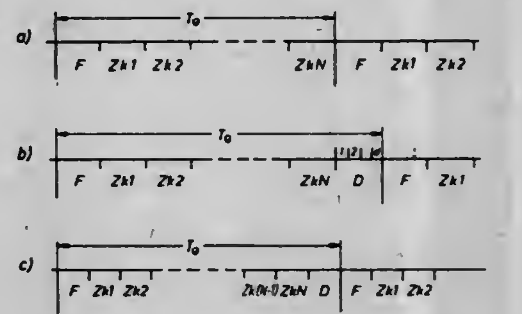
Ulf E. Assmus; Willy Bartel, and Horst Hessenmüller, all of Darmstadt, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 11, 1973, Ser. No. 404,628

Claims priority, application Germany, Oct. 11, 1972, 2249637

Int. Cl. H03k ***13/34;*** **H04b** ***3/46***

U.S. Cl. 340—146.1 R **7 Claims**



1. In a telecommunication switching system normally transferring the polarity reversals occurring in asynchronous form

on sending terminals of k parallel transmitting lines via a time division multiplex system, the transmission being carried out in synchronous serial form to a receiving terminal in time frames, each of said time frames comprising a plurality of time slots, a method for safeguarding the correct transmission of a continuous polarity signal occurring on any of said k transmitting lines by additional cyclic interrogation of said transmitting lines and forming an additional information about the polarity on each of said k transmitting lines comprising the steps of:

transmitting said additional information formed concerning each said transmitting lines in the form of *c* 2 bits in at least one additional time slot (D) in one of said time frames within said time division multiplex system,

where *c* is the number of bits representing the polarity on one of said transmitting lines,

receiving said additional information at said receiving terminal,

testing the *c* bits of said received additional information for correct transmission thereof,

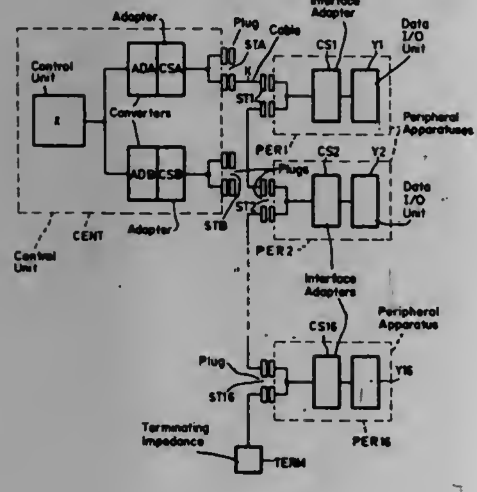
comparing said received additional information with said polarity reversal transmitted during a normal transmission via the time division multiplex system to determine non-correspondence,

and replacing the polarity reversal information provided by said normal transmission with said additional information in response to establishing non-correspondence by said testing.

3,889,236
INTERFACE SYSTEM WITH TWO CONNECTING LINES

Horst Herger, and Helmut Hasso Schulz, both of Bremen, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 9, 1973, Ser. No. 404,343
Claims priority, application Germany, Oct. 11, 1972, 2249725; Oct. 11, 1972, 2249737
Int. Cl. G06f *3/04*
U.S. Cl. 340—172.5 7 Claims

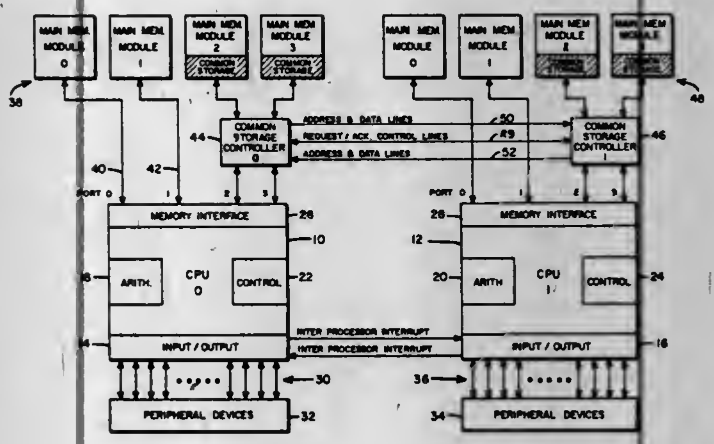


1. A serially-operating interface adapter for data input and output apparatus, comprising a modulator, a demodulator and a transport line via which blocks of information and clock signals can be transported, furthermore comprising a control unit which is connected to the transport conduit and which generates connect command signals and receives status signals, said transport conduit comprising a pair of lines consisting of a clock line and an information line, said modulator including means for generating bit pairs of signal elements having an even and an odd state, said pairs of signal elements being of alternating parity and being generated on a clock line and an information line respectively, said generating means being connected to clock inputs and information inputs activated under the control of a block start signal from said control unit, said generating means also being switchable between said states under the control of clock signals, said signal on the clock line corresponding to the inverted information signal in the case of odd parity and to the non-inverted information signal in the case of even parity means for halting, said switching under the control of a block stop signal, bits on different lines and occurring at the same time having the same parity being produced as frame signals, the demodulator which is connected to a clock line and an information line comprising a four-bit-parity detector for recovering block start signals and block stop signals.

3,889,237
COMMON STORAGE CONTROLLER FOR DUAL PROCESSOR SYSTEM

Merwin H. Alferness, New Brighton, and John A. Miller, Roseville, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 16, 1973, Ser. No. 416,699
Int. Cl. G06f *15/16*
U.S. Cl. 340—172.5 12 Claims



1. A digital data processing system comprising in combination:

a. first and second central processor units;

b. first and second memory banks coupled to said first and second central processor units respectively, for storing information at addressable locations therein,

1. said first and second memory banks each having substantially identical cycle times and a predetermined range of addresses therein set aside for storing identical information;

c. first and second controller means connected intermediate said first central processor unit and said first memory bank and said second central processor unit and said second memory bank, respectively, said first controller means including,

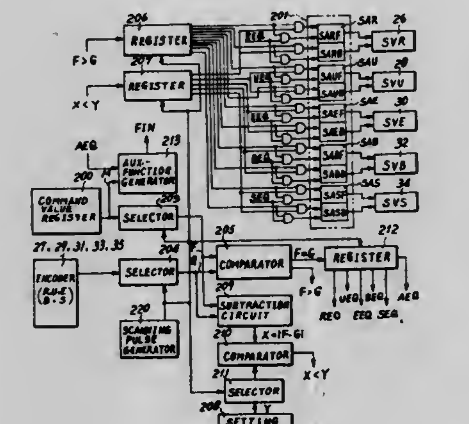
1. means for detecting when said first central processor unit is writing new information into said first memory bank at an address within said predetermined range of addresses, and

2. means responsive to said detecting means for transferring said new information and said address to said second controller means for causing the same new information to be stored at said address in said range of addresses in said second memory bank.

3,889,238
CONTROL DEVICE FOR MULTI-AXIS SERVO-ACTUATORS

Itaru Sakurai, Nagoya, Japan, assignor to Toyoda-Koki Kabushiki Kaisha, Aichi-ken, Japan

Filed Feb. 27, 1974, Ser. No. 446,409
Claims priority, application Japan, Feb. 28, 1973, 48-24597
Int. Cl. G06f *15/46;* **B25j** *9/00*
U.S. Cl. 340—172.5 8 Claims



1. Control device for multi-axis servo-actuators serving to control a position and a posture of a controlled object having a plurality of degrees of freedom in a three-dimensional space, comprising:

command value register means for setting a plurality of command values for respective axes;

present position detecting means for detecting the present position of each of said servo-actuators and for generating present values for said respective axes in response to said present positions;

a first selector connected to said command value register and serving to sequentially select and output of said command values in accordance with scanning signals;

a second selector connected to said present position detecting means and serving to sequentially select and output one of said present values in accordance with said scanning signals;

scanning signal generating means for generating said scanning signals;

a first comparator connected to said first and second selectors and serving to sequentially compare said present value with said command value for each axis and for generating a first control signal and a second control signal, said first control signal representing an inequality between said command value and said present value, and said second signal indicating a coincidence between said command value and said present value;

a second comparator serving to generate a third signal when the difference between said command value and said present value becomes smaller than a predetermined setting value;

first register means serving to generate an actuation and direction indication signal for each axis in response to said first and third signals supplied from said first and second comparators in accordance with said scanning signals out of said scanning signal generating means;

second register means serving to memorize said coincidence signal for each exis in response to said second signal supplied from said first comparator in accordance with said scanning signals supplied thereto and to generate an actuation stop signal for each axis based upon said coincidence signal, said actuation and direction indicating signal and said actuation stop signal being switching or on-off signals.

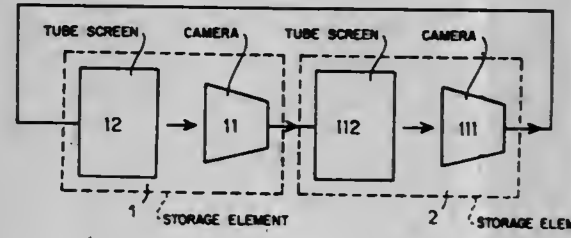
a plurality of servo-amplifiers provided for said respective axes and connected to said first and second register means so as to be supplied with said actuation and direction signal and said actuation stop signal, and respectively generating a predetermined output in response to said actuation and direction signal and said actuation stop signal; and,

a plurality of servo-valves connected to said servo-amplifiers and serving to control the actuations of said servo-actuators in accordance with said predetermined output out of said servo-amplifier for each axis.

3,889,239
SELECTIVE STORAGE SYSTEMS

Johannes Jacobus Gillissen, Leimuiden, Netherlands, assignor to Societe Honeywell Bull (Societe Anonyme), Paris, France

Filed Feb. 13, 1973, Ser. No. 331,742
Claims priority, application France, Feb. 16, 1972, 05210/72
Int. Cl. G11c *11/32, 21/00;* **H04n** *5/80*
U.S. Cl. 340—172.5 5 Claims



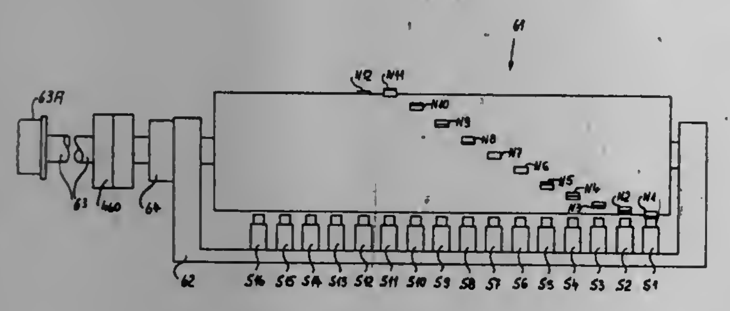
1. In a data storage system, the combination of:

at least a pair of data storage assemblies forming a data storage loop, each assembly including a data storage member inherently possessing only a limited storage time capability and having a face at which an array of stored data is displayed, and a television camera focussed on said face optically to read selected data of said array;

means connecting the television camera of one assembly to the data storage member of the other assembly for transferring said selected data read by the television camera of said one assembly to the data storage member of said other assembly; and

means connecting the television camera of said other assembly to the data storage member of said one assembly for transferring said selected data back to said data storage member of said one assembly whereby periodically to re-store data in said data storage member of said one assembly within said limited storage time capability thereof.

3,889,240
SYSTEM FOR PROGRAMMING THE STARTING AND STOPPAGE OF APPARATUS FOR THE PRODUCTION AND/OR PROCESSING OF CIGARETTES OR THE LIKE
Joachim Buchegger, Hamburg, Germany, assignor to Hauni-Werke Körber & Co. KG, Hamburg, Germany
Filed Apr. 28, 1972, Ser. No. 248,674
Claims priority, application Germany, Apr. 29, 1971, 2121044; Dec. 11, 1971, 2161611
Int. Cl. G06f *9/00;* **A24b** *7/14;* **A24c** *5/34*
U.S. Cl. 340—172.5 **22 Claims**



1. In an apparatus for the production and/or processing of cigarettes or analogous rod-shaped articles which constitute or form part of smokers' products, a combination comprising a plurality of article producing and processing first subassemblies arranged to operate in synchronism with each other; a plurality of second subassemblies arranged to be activated and/or deactivated in a predetermined sequence during starting and/or stoppage of the apparatus; a plurality of signal generating operating means each operatively connected with at least one of said second assemblies and actuatable to thereby activate and/or deactivate the respective second subassemblies; programming means at least a portion of which is movable between plural positions, said programming means being operable to actuate said operating means in a predetermined sequence; prime mover means for driving at least one of said first subassemblies; and motion transmitting means for moving said portion of said programming means in synchronism with said one of said first subassemblies.

3,889,241
SHIFT REGISTER BUFFER APPARATUS
Vincent A. Cordi, Vestal, and Chester S. Gurski, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 2, 1973, Ser. No. 329,272
Int. Cl. G06f *7/22, 15/40;* **G11c** *19/00*
U.S. Cl. 340—172.5 **10 Claims**

1. Buffer apparatus adapted for connection to sources of read and write requests and to input means supplying variable length record data, said apparatus comprising

a shift register store having an input and an output and adapted to be initialized with a unique code entry and blank code entries stored therein,

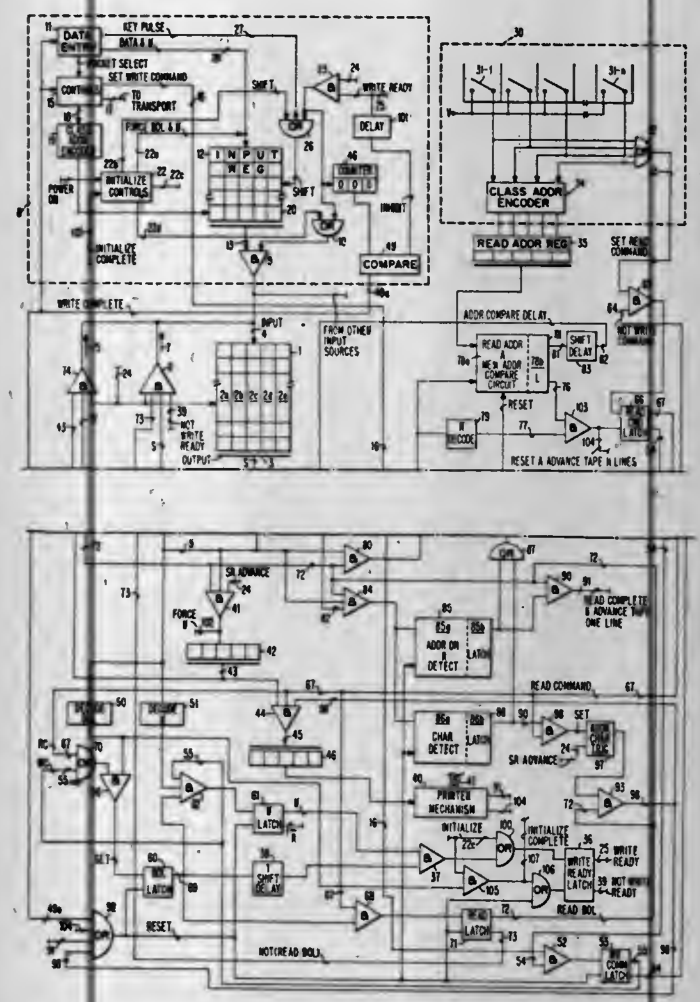
means forming a first path from the output to the input normally effective for recirculating entries in the store,

means forming a second path from the output to the input and including storage means for extending the effective length of the store,

means for detecting the unique code entry,

means for detecting the first blank code entry following the unique code entry,

means controlled by the unique code entry detecting means and the blank code entry detecting means when a write request occurs for storing input record data entries into the store starting at the position of said first blank entry and including means for rendering said first path ineffective during said storing, and



means controlled by the unique code entry detecting means when read requests occur for rendering the second path effective and the first path ineffective to insert blank code entries into the store preceding the unique code and for rendering the first path effective and the second path ineffective to remove data entries, equal in number to the inserted blank code entries, from the store in a sequence related to the order in which the record data was stored, whereby record data entries are maintained in the store immediately following the unique code entry and free of blank code entries therebetween.

3,889,242
MODIFIABLE COMPUTER FUNCTION DECODER
Michael M. Malmer, Jr., Livonia, Mich., assignor to Burroughs Corporation, Detroit, Mich.
Continuation of Ser. No. 186,275, Oct. 4, 1971, abandoned. This application Aug. 29, 1973, Ser. No. 392,510
Int. Cl. G06f *1/00*
U.S. Cl. 340—172.5 **5 Claims**

1. In a digital computer having a relatively large set of microinstructions and a relatively smaller set of N-function codes, many of said microinstructions requiring one of said set of N-function codes for its implementation, a modifiable function decoder comprising:

a fixed-length microinstruction storage register having a first register section of *n* storage locations quasi-dedicated to the storage of function code and a second register section of *m* storage locations;

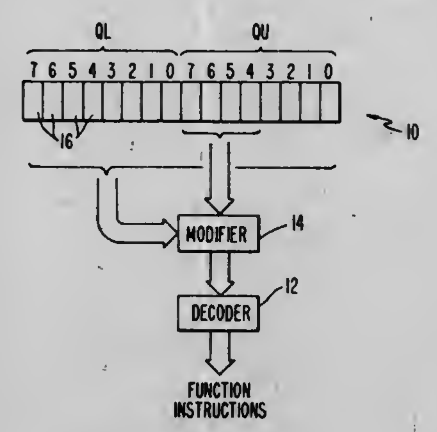
means coupled to said second register section and responsive to particular combinations of signals stored in one or more of said *m* storage locations for identifying a particular microinstruction requiring a particular function code, said identified particular microinstruction being structured such that said required particular function code cannot be stored in said *n* quasi-dedicated storage locations, and for generating one or more modifier signals in response thereto;

modifier means including:

first input means coupled to said first register section for receiving signals from said *n* storage locations;

second input means coupled to said means for generating modifier signals; and

logic means coupled to said first and second input means, said logic means responsive to one or more of said



modifier signals for altering the signals stored in said *n* storage locations to force the generation of said particular function code required for the implementation of said identified particular microinstruction and responsive to the absence of one or more of said modifier signals for allowing the unaltered contents of said *n* storage locations to operate as an unmodified function code; and

decoder means coupled to said logic means of said modifier means for decoding said modified and unmodified function codes as if said *n* storage locations of the first section of said microinstruction register had been initially dedicated solely to the storage of said required set of N-function codes.

3,889,243
STACK MECHANISM FOR A DATA PROCESSOR
Edward G. Drimak, Johnson City, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 18, 1973, Ser. No. 407,688
Int. Cl. G06f *13/00*
U.S. Cl. 340—172.5 **5 Claims**

1. In a data processing system, the combination comprising a stack having a plurality of addressable entry registers having sequential addresses between a predetermined low and high values,

means including a first pointer register for storing entries of a first type in the entry registers in ascending address order from said low value,

means including a second pointer register for storing entries of a second type in the entry registers in descending address order from said high value,

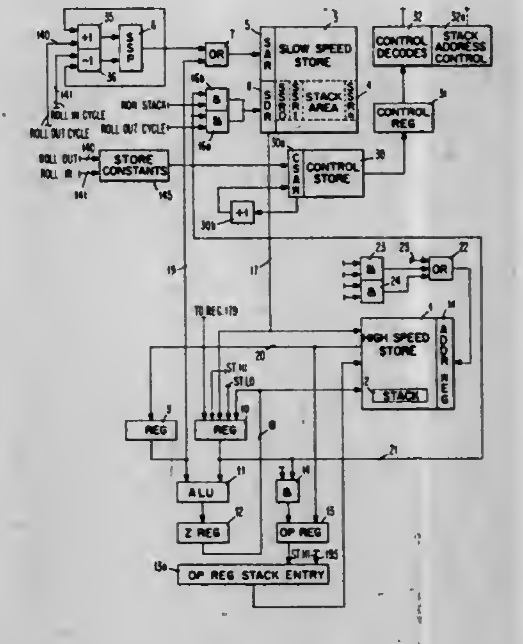
means for removing the entries of each type from the stack for processing in a last-in-first-out order,

a store slower in speed than the stack for storing overflow entries from the stack when the latter is full,

means responsive to the pointer values during the storing of an entry on the stack when the values of the pointers bear a predetermined numeric relationship indicative of a full stack condition for rolling out stack entries and the current first and second pointer values to the slower speed store,

means initializing the pointers to said predetermined low and high values after each roll out,

means responsive to the pointer values during the attempted removal of an entry from the stack, when the value of one of the pointers indicates that there is no corresponding entry on the stack, for rolling in needed entries and the

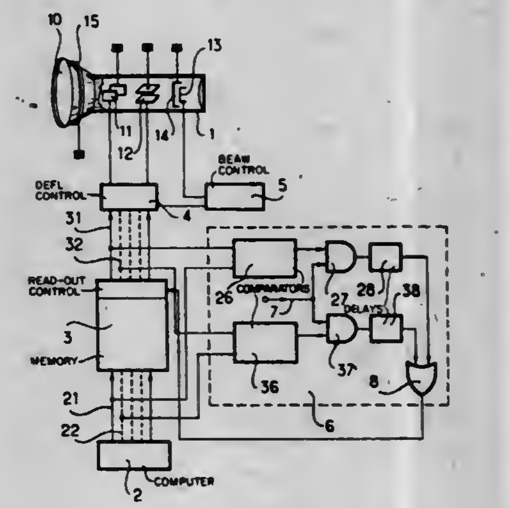


pointer values from the store to the stack and pointer registers respectively,

means for reserving a directly addressable area in the stack for storing one of the last mentioned types of entries,

means for directly addressing any one of a plurality of entry registers in said reserved area when the respective pointer value points to the top of said reserved area.

3,889,244
GRAPHIC DATA DISPLAY SYSTEM WITH MULTIPLE DISPLAY INHIBIT DELAY TIMES
Dusan Sinobad, Paris, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France
Filed Sept. 21, 1973, Ser. No. 399,477
Claims priority, application France, Sept. 21, 1972, 72.33399
Int. Cl. G11c *11/26, 7/06*
U.S. Cl. 340—173 CR **7 Claims**



1. A graphic data display system for effecting controlled traces on the screen of a cathode ray tube, comprising a memory capable of storing a sequence of data signals in binary form representing at least one data item relating to a portion of a tracing to be effected, control means connected to said memory for controlling the electron beam of the cathode ray tube on the basis of said data signals in binary form received

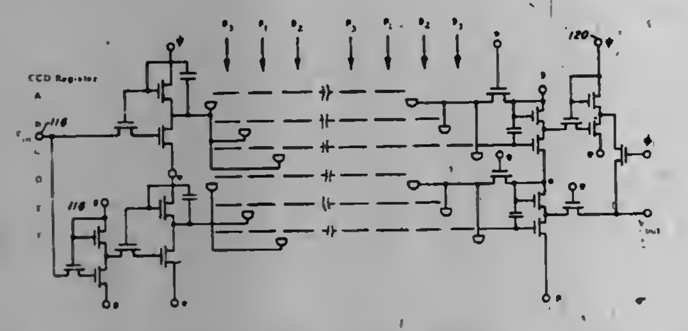
from said memory and capable of affecting the beam for the displaying of the corresponding trace, detection means connected to the input and the output of said memory means for detecting the extent of changes in said data signals, and inhibiting means connected to said memory for inhibiting the application of data signals to said control means for selected delay periods in response to the output of said detection means representing different ranges of change in said data signals.

3,889,245

METAL-INSULATOR-SEMICONDUCTOR COMPATIBLE CHARGE TRANSFER DEVICE MEMORY SYSTEM

William Milton Gosney, Jr., Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 2, 1973, Ser. No. 375,554
Int. Cl. G11c *19/00;* H01l *11/14;* G11c *21/00*
U.S. Cl. 340—173 RC **18 Claims**



1. A charge transfer device digital data processing system comprising in combination on a semiconductor chip:

charge transfer device shift register means having an output diode for entering data therein and an output diode charge sink;

first clock pulse operable insulated gate field-effect transistor ratioless inverter circuit means selectively connected to said input diode for operating said input diode to enter charge into said shift register responsive to voltages corresponding to digital logic input signal levels;

second clock pulse operable insulated gate field-effect transistor ratioless inverter circuit means connected to said output diode, said second inverter circuit means including a first insulated gate field-effect transistor means for precharging said output diode to a reference potential, said output diode responsive to absence of charge corresponding to a logic 0 in the last bit of said shift register to discharge to a second voltage level, said output diode further responsive to presence of charge corresponding to a logic 1 in the last bit of the shift register to remain charged substantially at said reference voltage, said second inverter circuit means adapted to respond to said discharged and charged conditions of said output diode to produce respectively a logic 0 or a logic 1 output signal level.

9. In a digital data metal insulator semiconductor processing system operable in responsive to a master synchronization clock of a preselected frequency, a charge transfer device memory configuration having a data rate equal to said master synchronization clock and operably responsive thereto, comprising in combination on a single semiconductor chip;

first clock generating means for receiving said master clock and generating, responsive thereto, first and second nonoverlapping clocks respectively having a frequency of one-half that of said master clock;

second clock generating means for receiving said first clock and generating, responsive thereto, an *n*-phase overlapping clock system suitable for controlling charge transfer device shift registers, each phase thereof having a frequency of 1/2*n* the frequency of said master clock, wherein *n* is an integer; and

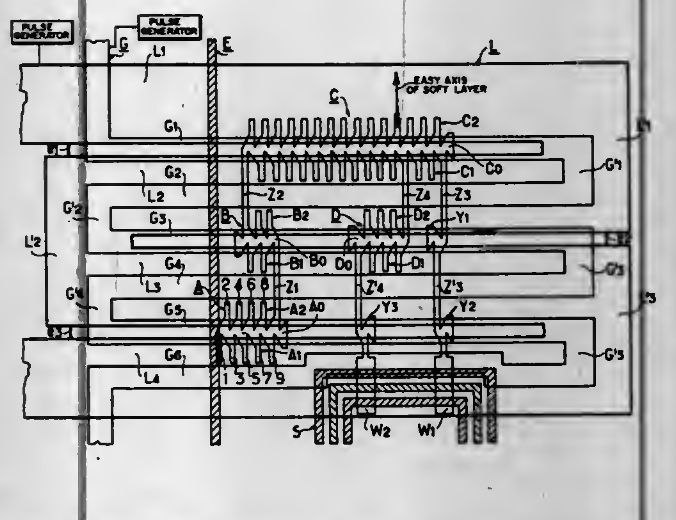
a plurality of parallel charge transfer device shift register units on said chip, each shift register unit having first and second sets of parallel shift registers of n shift registers each, each shift register unit having ratioless dynamic input means on said chip for multiplexing input data onto said first and second sets of shift registers, and output ratioless dynamic detector means on said chip for sequentially detecting the charge at the output of each shift register of said first and second sets of said shift register unit and demultiplexing said data to provide a voltage corresponding to the binary logic level of detected charge, whereby the effective clock rate of said shift register unit is the same as the clock rate of said master clock.

3,889,246

PROPAGATION REGISTER FOR MAGNETIC DOMAINS

Claude Battarel, Magagnosc, France, assignor to Techniques et Systemes Informatiques, Courbevoie, France

Filed June 22, 1973, Ser. No. 372,866
Claims priority, application France, June 6, 1972, 72.22962
Int. Cl. G11c *19/00, 11/14*
U.S. Cl. 340—174 ZB **10 Claims**



1. In a propagation register device including at least one register for magnetic domains in a soft zone formed by a magnetic layer of low coercivity and uniaxial anisotropy perpendicularly to the propagation direction and surrounded by hard zones having a greater coercivity; the improvement comprising: for each register, a plurality of advance components in alignment with the propagation direction, each component having a central soft zone and a first and second lateral soft zone with inclined edges between the central and the lateral zones such that a domain which passes from the first lateral zone to the second is slightly deviated perpendicularly to the easy magnetic axis at an edge and that the domain when returning to the central zone is again deviated in the same direction and enters into the first lateral zone of an adjacent advance component, a first sinous lateral conductor, having at least two parallel turns, including a first turn covering a plurality of the said first lateral zones and a second turn covering the corresponding second lateral zones, and a second sinous central conductor having a first turn which covers approximatively the interspace between the two turns of the lateral conductor in which are located the central zones of the advance components.

3,889,247

DEVICE FOR DETECTING THE PRESENCE OF LIQUIDS

Walter Voll, 8728 Hassfurt, Germany

Filed Dec. 17, 1973, Ser. No. 425,656
Claims priority, application Germany, Dec. 21, 1972, 2262559
Int. Cl. G08b *21/00*
U.S. Cl. 340—244 C **9 Claims**

1. A detector device for detecting the presence of liquids, the device comprising in combination:

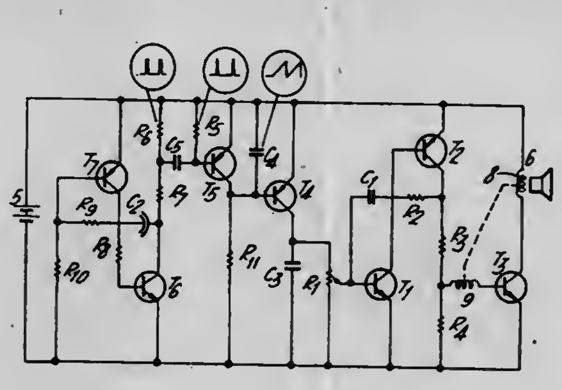
a housing;

electro-acoustic transducer means supported in said housing;

at least two mutually spaced electrodes supported on an exterior surface portion of said housing to be exposed to contact by liquid to be detected;

electrical circuit means including said electrodes and responsive to a change in impedence therebetween to generate a signal condition;

electrical generator means in said housing and electrically connected to said circuit means to generate an electrical signal to operate said transducer in response to said signal condition, said generator means comprising a first pulse generator connected to said electrical circuit means, a



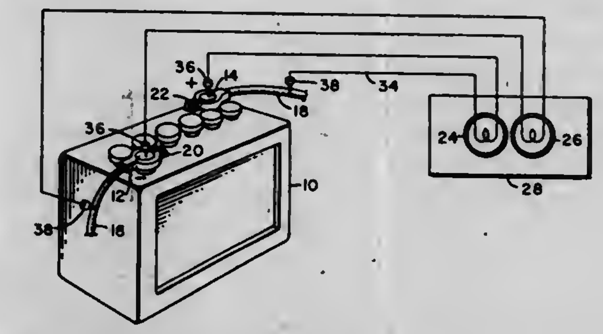
second pulse generator, and a blocking oscillator having input means connected to output means of said second pulse generator, said first pulse generator generating a train of pulses of which the pulse repetition frequency is responsive to said signal condition, said pulse train being applied to input means of said second pulse generator to cause the latter to generate an electrical pulse to trigger said blocking oscillator and thereby to provide said electrical signal to operate said transducer when and only when said pulse repetition frequency is less than a predetermined value; whereby said transducer provides an audible indication of the presence of such liquid at said electrodes.

3,889,248

FAULTY BATTERY CONNECTION INDICATOR

Herbert W. Ritter, Alamo, Calif., assignor to Esther Ritter, Santa Clara, Calif.

Continuation of Ser. No. 6,442, Jan. 28, 1970, abandoned. This application May 21, 1973, Ser. No. 361,864
Int. Cl. G08b *21/00*
U.S. Cl. 340—249 **4 Claims**



1. The combination comprising:

an automobile-type wet cell battery having first and second terminal posts;

first and second insulated cables, one for each of said first and second posts, respectively;

first and second clamps, said first clamp being electrically connected to said first cable and being clamped to said first post, said second clamp being electrically connected to said second cable and being clamped to said second post, whereby first and second normally low impedance electrical connections between said first cable and said first post, and between said second cable and said second post are completed;

first and second two-terminal indicators, one for each of said first and second low impedance electrical connections, respectively, for indicating the condition of each of said first and second normally low impedance electrical connections;

first connecting means for connecting said first two-terminal indicator in parallel with said first normally low impedance electrical connection, said first means comprising a first electrical connection connected directly between one terminal of said first indicator and said first terminal post, and a second electrical connector connected directly between the other terminal of said indicator and said first cable;

second connecting means for connecting said second two-terminal indicator in parallel with said second normally low impedance electrical connection, said second means comprising a first electrical connector connected directly between one terminal of said second indicator and said second terminal post and a second electrical connector connected directly between the other terminal of said indicator and said second cable;

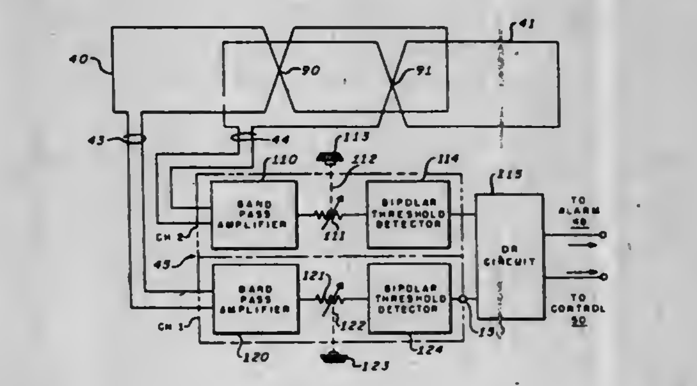
whereby said first and second indicators are short-circuited by the normally low impedances of the respective normally low impedance electrical connection, said indicators being in the current path of said battery when the normally low impedance of the respective electrical connections increase, the change of state of said indicator due to current flow therethrough indicating said increase in impedance.

3,889,249

STATIC MAGNETIC FIELD METAL DETECTOR

Clarence L. Bennett, Jr., Groton; Joseph D. De Lorenzo, Sudbury, and Hubert P. Durling, Jr., Lancaster, all of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Division of Ser. No. 193,846, Oct. 29, 1971. This application Apr. 23, 1973, Ser. No. 353,853
Int. Cl. G08b *21/00*
U.S. Cl. 340—258 R **16 Claims**



1. Apparatus for detecting relative motion of a metal object comprising:

means for generating a substantially uniform unidirectional magnetic field,

multiple conductor magnetic field pick up coil means disposed in stationary relation in said unidirectional magnetic field and having output conductor means,

said coil means having first and second sections symmetrically located about a mid-plane of said coil means,

cross over conductor means for connecting opposite conductors of said first and second sections at said mid-plane for providing detection signal on said output conductor means in the presence of said object adjacent said first or said second sections while affording substantial cancellation of spurious magnetic field responses,

threshold detector means coupled to said output conductor means, and

utilization means responsive to said threshold means.

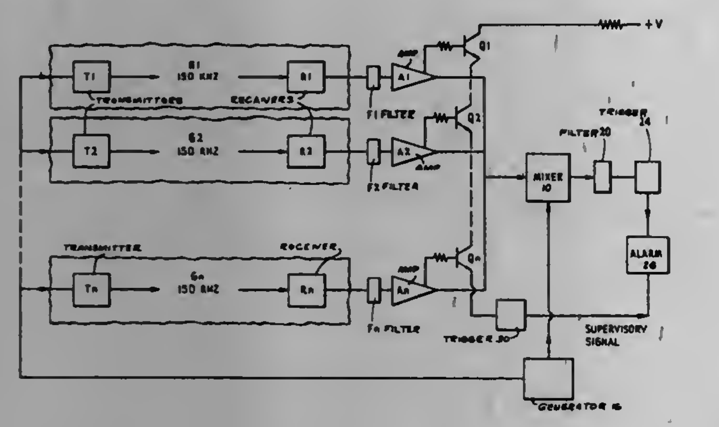
3,889,250
ACTIVE FREQUENCY-RESPONSIVE GLASS BREAKAGE DETECTOR

Elias E. Solomon, Duxbury, Mass., assignor to Gulf & Western Manufacturing Company, New York, N.Y.

Filed Oct. 15, 1973, Ser. No. 406,490

Int. Cl. G08b *13/04*

U.S. Cl. 340—274 **18 Claims**



1. A system for detecting breakage of a solid material, said system comprising;

a transmitter transducer disposed at one area of said material for establishing a signal of first frequency,

said material creating a signal of second frequency when broken,

a receiver transducer disposed at another area of said material for receiving a control signal which is said first frequency signal when no breakage occurs and a composite of the first and second frequency signals when breakage occurs,

means for mixing said control signal with said first frequency signal to provide at least a third frequency signal when breakage occurs,

and means for indicating an alarm condition upon detection of said third frequency signal.

3,889,251
PHOTO ELECTRIC AMBIANT LIGHT OPERATED SURVEILLANCE DEVICE

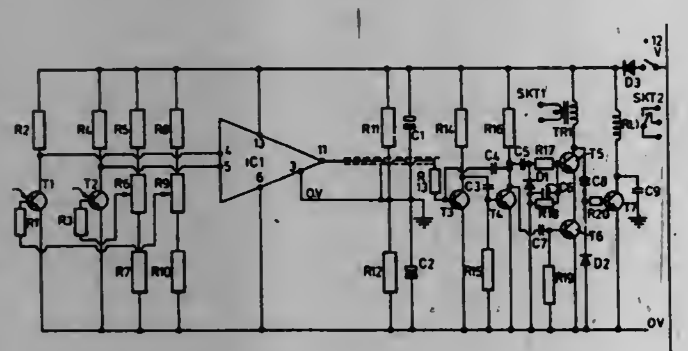
Mitchel Litman, Panorama House, Marine Parade, Canvey Island, England

Filed Aug. 1, 1973, Ser. No. 384,600

Claims priority, application United Kingdom, May 8, 1972, 21435/72

Int. Cl. G08b *21/00*

U.S. Cl. 340—279 **6 Claims**



1. A surveillance device comprising two photosensitive devices arranged to receive ambient light reflected respectively from an eye of the person under survey and from an area of skin adjacent to the eye, means for comparing signals generated by the photo-sensitive devices, and a device providing an alarm when the signals generated by the photo-sensitive devices are equal.

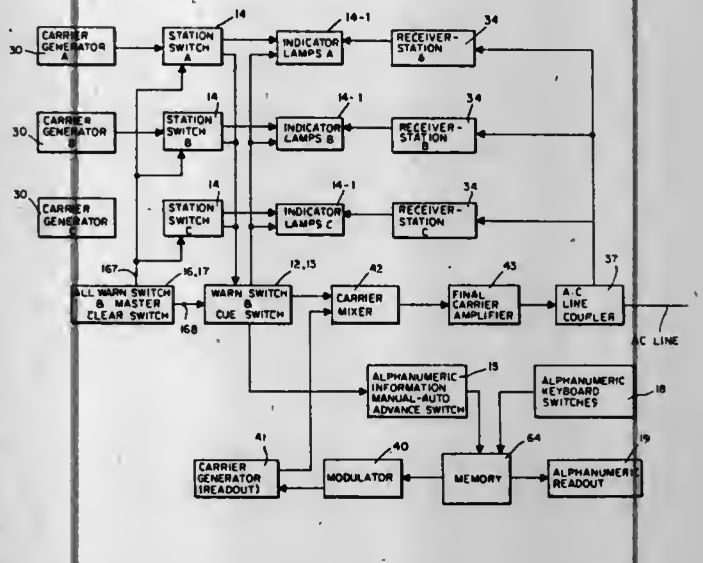
3,889,252
METHOD AND SYSTEM FOR TRANSMITTING SIGNALS IN THEATRES

Charles H. Cox, III, Arlington, Mass., and Albin M. Aukerlund, Philadelphia, Pa., assignors to Charles H. Cox, III, Arlington, Mass.

Filed Oct. 25, 1972, Ser. No. 300,664

Int. Cl. H04b *3/00*

U.S. Cl. 340—313 **6 Claims**



1. A system for simultaneous communication between a central control station in a theatre and a plurality of remote stations, such theatre having installed therein a medium which links said central control station and said plurality of remote stations, comprising:

a. carrier generator means in said central control station, having a plurality of carrier generators each producing an output signal of a different respective frequency, and each corresponding to one of said plurality of remote stations;

b. switch means in said central control station, adapted to be placed in different states, for passing said output signals when in a first state and blocking said output signals when in a second state;

c. selective coupling means in said central control station, having a plurality of station switches each corresponding to a respective one of said carrier generators, for simultaneously switchably coupling selected output signals of said carrier generators to said switch means;

d. mixing and amplifying means in said central control station, operatively connected to the output of said switch means, for mixing and amplifying signals passed through said switch means;

e. remote station means, comprising a plurality of remote stations, said stations communicating simultaneously with said central control station in selective response to said output signals each unit having circuitry for receiving and processing respective signals originating in respective ones of said carrier generators; said carrier generator means, switch means, coupling means, and mixing and amplifying means cooperating to form a theatre central control means, said central control means producing theatre operation signals individually to communicate with corresponding individual remote stations in any desired relative time sequences;

f. transmission means, comprising said medium for coupling signals from said mixing and amplifying means to said plurality of remote stations; and

g. each such remote station having means for processing the received signals, and indicator means for indicating the state of the system as represented in the information carried on the processed signals.

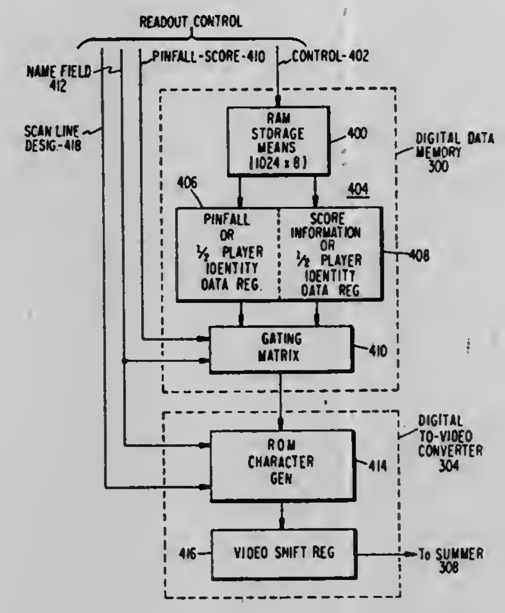
3,889,253
RASTER-SCAN DISPLAY SYSTEM HAVING IMPROVED MEANS FOR READING OUT STORED GAME-SCORE INFORMATION

Walter Lee Ross, Simi, Calif., assignor to RCA Corporation, New York, N.Y.

Filed June 22, 1973, Ser. No. 372,645

Int. Cl. G06f *3/14*

U.S. Cl. 340—323 **6 Claims**



1. In a raster-scan display system incorporating storage means, and readout means coupled to said storage means for use in electronically displaying stored game-score data of a given kind of game in a standardized format on a video-signal display device while the game is progressing, said format including an individual strip region thereof devoted to any given player with a first predetermined portion of said strip region having displayed therein a single line of characters identifying said given player and with a second predetermined portion of said strip region having displayed therein *k* lines of characters defining score information of said given player, *k* being a first plural integer, wherein a binary word having at least *n* bits is required to uniquely distinguish each character of a given alphabet of player-identifying characters, *n* being a second plural integer, and wherein the number of bits m_i of a binary word required to uniquely distinguish each character of a preselected alphabet for the *i*th respective ordinal one of said *k* lines of score-information is sufficiently smaller than *n* so that

$$n \geqq \sum_{i=1}^{i=k} m_i ;$$

the improvement wherein:

said readout means includes digital-to-video converter means responsive to digital addresses sequentially applied thereto in synchronism with said raster-scan display for defining a raster-scan video signal of characters manifested by said digital addresses; time generating means for synchronizing said raster-scan display; first means for reading out from said storage means successive binary words each having the same given number of bits, said given number being at least as large as *n*; second means coupled to said first means and said time generating means and responsive to each readout binary word while said first portion of a strip region is being scanned for digitally addressing said digital-to-video converter with a single *n*-bit binary word to thereby provide the raster-scan display of said single line of characters identifying said given player, said second means being further responsive to each readout binary word while said second portion of a strip region is being scanned for dividing said readout binary word into *k* separate m_i-bit binary words, each ordinal one of which corresponds to a character of a different ordinal one of said *k* lines of score-information, and digitally addressing said digital-to-video converter in sequence with each ordinal one of said separate m_i-bit binary words to thereby provide the display of all of said *k* score-information lines of said given player.

3,889,254
MEASURING APPARATUS

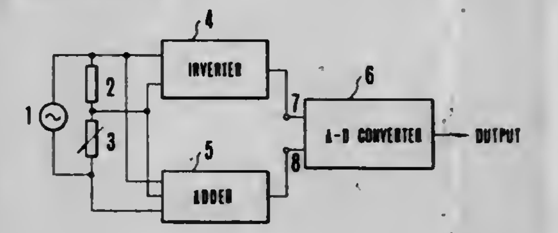
Goro Kobayashi, Oisomachi, Japan, assignor to Oki Electric Industry Co., Ltd. and Japan Society for the Promotion of Machine Industry, both of Minato-ku, Tokyo, Japan

Filed July 20, 1973, Ser. No. 381,236

Claims priority, application Japan, July 24, 1972, 47-73456; Dec. 28, 1972, 47-130209

Int. Cl. H03k *13/02*

U.S. Cl. 340—347 NT **7 Claims**



1. In a measuring system in which a digital output representative of a measured analogue quantity is provided by using an analogue voltage responsive circuit and an analogue-digital converter, the improvement wherein said responsive circuit comprises a source of voltage, a fixed impedance, a variable impedance which varies its impedance in accordance with a measured quantity, said fixed and variable impedances being connected in series across said source; means to apply the terminal voltage across said fixed impedance to said analogue-digital converter to act as the internal reference voltage of said analogue-digital converter; and means to apply the sum of the terminal voltages across said fixed and variable impedances to said analogue-digital converter to act an an input thereto.

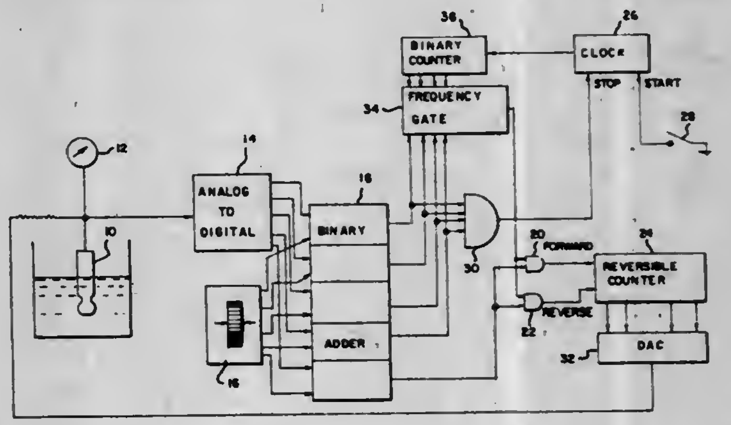
3,889,255
DIGITAL CALIBRATION SYSTEM FOR AN ELECTRONIC INSTRUMENT

Aage Pettersen, North Reading, Mass., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 22, 1974, Ser. No. 453,794

Int. Cl. H03k *13/02*

U.S. Cl. 340—347 CC **4 Claims**



1. An automatic calibration system for an electronic instrument which produces a measurement votlage and which produces a calibrating voltage in response to a standard during a calibration mode of operation comprising:

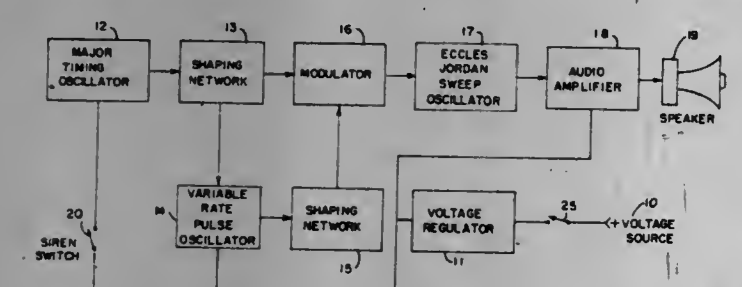
- means for converting said calibrating voltage to a binary coded digital signal,
- manually settable switch means producing a binary coded digital signal representing the magnitude of said standard, a binary adder, the binary coded digital signals from said means for converting and from said manually settable switch means being applied to said binary adder, said binary adder producing a multiple bit digital output representing the difference between the applied digital signals,
- a digital counter,
- a source of clock pulses,
- gating means, said multiple bit digital output being connected to said gating means, said clock pulses being applied through said gating means to said counter, said gating means being connected to stop the application of pulses to said counter when said difference is zero so that said counter counts a number of pulses related to said difference, and
- a digital-to-analog converter responsive to the outputs of said counter to produce an analog output voltage related to said difference, said analog output voltage controlling said instrument to produce a calibrated measurement voltage.

3,889,256

AUTOMATIC CONTROL FOR AUDIBLE ELECTRONIC WARNING SYSTEM

Richard F. Cieslak, Algonquin, and John V. Balding, Palatine, both of Ill., assignors to Industrial Electronics Service Co., Schaumburg, Ill.

Filed July 9, 1973, Ser. No. 377,644
Int. Cl. G08b *3/00*
U.S. Cl. 340—384 E 6 Claims



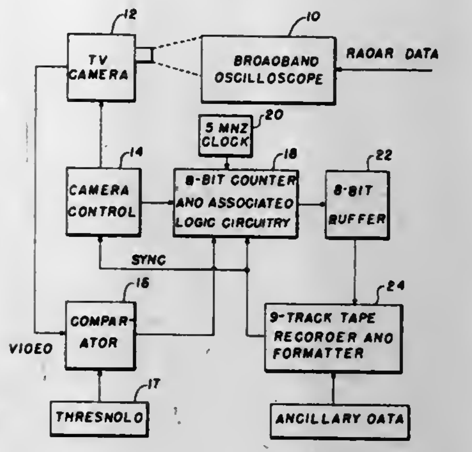
1. An electronic siren including an audio speaker and an amplifier for producing sound at continual maximum audio output from said speaker in response to frequency variations transmitted to said amplifier, including frequency responsive amplifying means for an audio speaker, a voltage controlled sweep oscillator circuit for supplying a variable frequency to said amplifying means to provide frequencies distinguished from ambient sounds, modulating means for supplying a variable control voltage to said oscillator circuit, a timing oscillator circuit, said timing oscillator circuit including variable and settable means for supplying a pulsating voltage, a shaping network for changing the pulsating voltage of said oscillator circuit into a slowly rising and falling voltage which repeats in a cyclic manner, a variable rate pulse oscillator controlled by the output of said shaping network, a second shaping network for shaping the output of said variable rate pulse oscillator circuit means for imposing a varying cyclic voltage from said second shaping network on the voltage wave form supplied by said first shaping network in said modulating means to thereby produce a number of periodically rising and falling minor voltage variation on the main voltage wave supplied to said sweep oscillator circuit to thereby produce an amplifier control frequency having the characteristic of a cyclically recurring, slowly rising and falling main frequency of sound occurring over a preselected interval of time and a number of rising and falling minor frequencies occurring within said major frequency variation during each cycle of said main frequency while it is at maximum continual level.

3,889,257

BROADBAND RADAR SIGNAL SAMPLER UTILIZING TELEVISION SCANNING

George M. Dillard, San Diego, Calif., assignor to The United States of Amercia as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 1, 1974, Ser. No. 457,147
Int. Cl. G01s *7/42, 9/02*
U.S. Cl. 343—6 TV 5 Claims



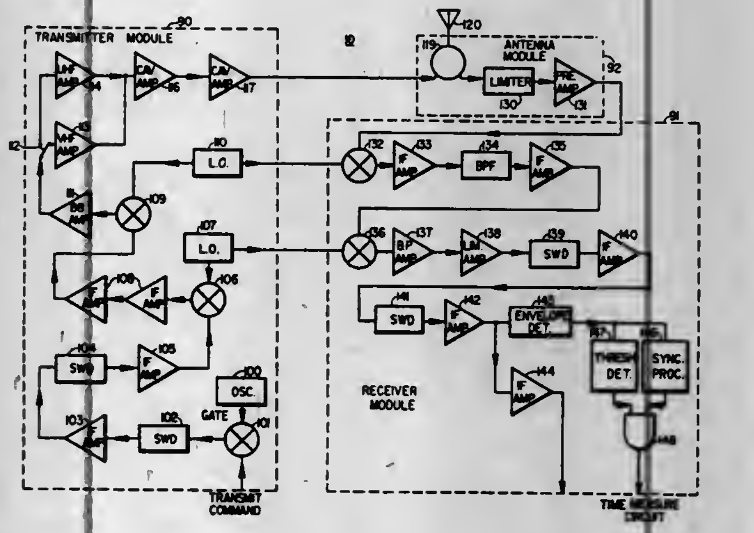
5. A method for reconstructing high-resolution radar signatures comprising the steps of displaying incoming radar data, viewing said displayed data by means of a TV camera rotated 90° from its normal position relative to said means for displaying said radar data, scanning said camera so that interlacing of vertical scans is eliminated to produce video representations of said data, converting said representations into digital counts every horizontal sweep period.

3,889,258

NAVIGATION RANGING SYNCHRONIZATION

Jerry D. Holmes, Dallas, and Samuel D. Moore, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 22, 1973, Ser. No. 390,633
Int. Cl. G01s *9/56*
U.S. Cl. 343—6.5 LC 12 Claims



1. A radio ranging system comprising:

a. means periodically to transmit from a mobile station a short time sequence of pulse position sync codes including one code uniquely tailored for receipt only by each one of a plurality of base stations,

b. means operative in the interval between sync code sequences for transmitting a long train of uniformly time spaced range interrogation pulses,

c. transponder means to transmit a sync reply code upon receipt by each base station of the sync code tailored thereto where said reply code is the same as from all base stations but time delayed dependent upon range from said mobile station,

d. means to generate a train of receive time gates, one for each base station in response to receipt of a sync reply code from each base station with the time gates synchronized with said range interrogation pulses and of phase determined by the arrival time of a sync reply code from each base station,

e. transponder means to transmit from each base station a range reply pulse in response to receipt of said range interrogation pulses, and

f. measuring means at said mobile station for measuring the time interval between transmission of range interrogation pulses and reception of range reply pulses detected at said mobile station within a receive time gate for each said base station,

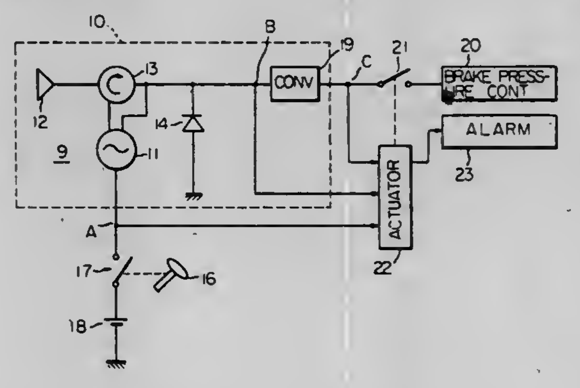
whereby reponses to range reply pulses are limited to pulses falling within said gates the phases of which automatically are adjusted for change in range due to motion of said mobile station by the periodic repetition of said sync code sequence.

3,889,259

VEHICLE SPEED SENSOR FOR SKID CONTROL SYSTEM

Yukitsugu Fukumori, Yokohama, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Jan. 21, 1974, Ser. No. 435,014
Claims priority, application Japan, Jan. 22, 1973, 48-8564
Int. Cl. G01s *9/44;* B60t *7/00*
U.S. Cl. 343—7 ED 7 Claims



1. A vehicle speed sensor for a skid control system for a wheeled vehicle having a source of electrical power and a brake pedal, comprising;

- a doppler radar system operatively mounted on the vehicle to produce an electrical speed signal having a voltage analogous to the speed of the vehicle when connected to the source; and
- a first switch operative to connect said doppler radar system to the source when the brake pedal is depressed.

3,889,260

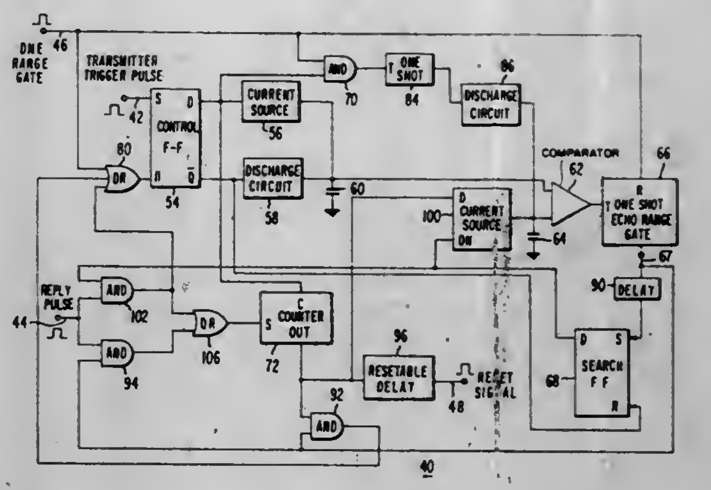
ANALOG ECHO PROTECTION CIRCUIT FOR DME

Earl Harris Griffin, Los Angeles, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 2, 1974, Ser. No. 430,212
Int. Cl. G01s *9/56*
U.S. Cl. 343—7.3 5 Claims

1. In a distance measuring system of the type which transmits a series of interrogation pulses toward a remote beacon and receives a stream of pulses from said beacon including reply pulses synchronized with said interrogation pulses; the improvement comprises the combination therewith of apparatus for determining, within a given range interval, the position of a set of synchronized reply pulses; said apparatus comprising:

a. first means including a first timer initially set to a time t_1, where t_1 has a given value corresponding to a certain range within said given range interval, for determining and storing, in response to solely a first single interrogation pulse, a measure of the time t_2 corresponding to the range of the first received reply pulse which occurs after time t_1;



b. second means including a second timer for determining in response to at least one interrogation pulse subsequent to said first interrogation pulse whether reply pulses continue to occur substantially at time t_2; and

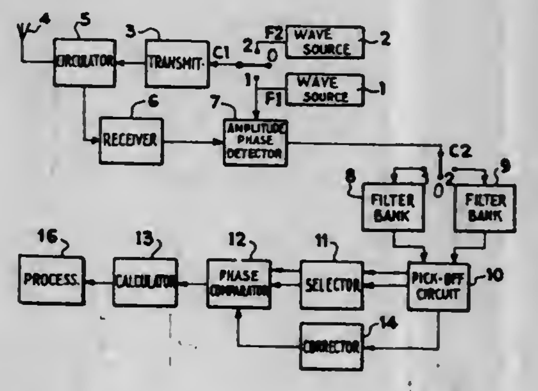
c. third means coupled to said first and second means and responsive to the failure of said reply pulses to continue to occur for causing said first means to determine and store in response to solely the next following single interrogation pulse a measure of the time t_3 corresponding to the range of the first received reply pulse which occurs after time t_2, said third means being responsive only to the continuation of occurrence of said reply pulses for deriving an output signal indicating that said reply pulses which continue to occur are reply pulses synchronized with said interrogation pulses.

3,889,261

RANGE MEASUREMENT PULSE RADAR SYSTEM

Jacques Sirven, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sept. 20, 1973, Ser. No. 399,271
Claims priority, application France, Sept. 26, 1972, 72.34001
Int. Cl. G01s *9/24*
U.S. Cl. 343—14 8 Claims



1. A pulse radar system designed to provide range data, comprising a transmitter for transmitting at least two series of pulses of the same recurrence periodicity but having different carrier frequencies and a receiver comprising:

means for demodulating all the received signals by a single reference signal, in order to yield Doppler signals;

at least one bank of *n* Doppler filters each receiving said Doppler signals and supplying at *n* separate outputs, separate signals depending upon their particular Doppler frequencies, the interval between the centre frequencies of the filters in each bank being constant and equal to a sub-multiple of each difference between two emitted frequencies;

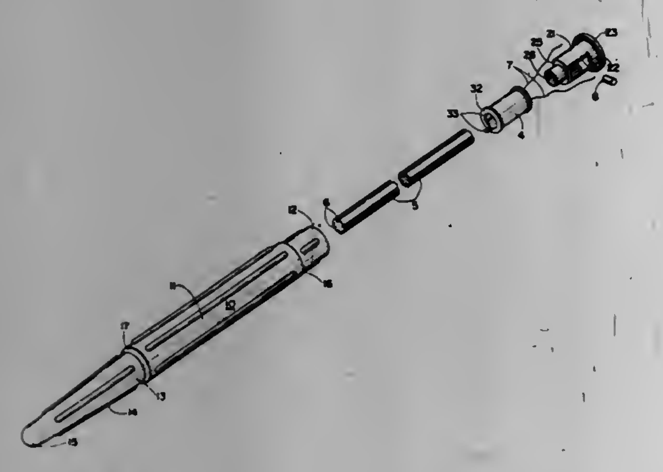
switching means respectively connected to each of the filter outputs, in order to succesively pick off pairs of signals to pairs of outputs whose Doppler frequency difference is equal to the difference between two of said transmitted frequencies;

and a phase-comparator for comparing the signals of each pair picked off and producing said range data.

3,889,262
ELECTROMAGNETICALLY RESONANT DEVICE

Detlef Zimmermann, Ottawa, Ontario; James Hugh Lougheed, Kanata, Ontario, and Eric John Crompton, Montreal West, Quebec, all of Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Mar. 7, 1974, Ser. No. 448,876
Int. Cl. G01s *15/14*
U.S. Cl. 343—18 B 5 Claims



1. A self contained electromagnetically resonant device, excitable solely by exposure to an electromagnetic or magnetic field having a suitable frequency component, the device comprising:

a rigid hollow casing;

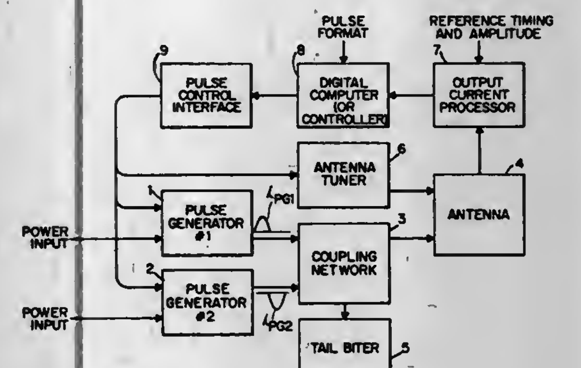
a resonant circuit assembly having, an elongated core of sintered magnetically soft material, a coil of conductive material encircling a portion of the core, and a capacitor connected across the coil, the capacitor being spaced from the core to reduce magnetic flux velocity through the plates of the capacitor, the assembly residing within the casing, spaced adjacent the wall thereof;

an elastomeric filler within the casing, surrounding said assembly, contiguous therewith and with the walls of the casing, the elastomeric filler co-acting with the casing to substantially retain the core in its original form and dimension, in the event of core breakage, so that the resonant frequency and quality of the resonant circuit assembly is substantially maintained.

3,889,263
RADIO-FREQUENCY PULSE GENERATION SYSTEM AND METHOD

Paul R. Johannessen, Lexington, Mass., assignor to Megapulse Incorporated, Bedford, Mass.

Filed Nov. 15, 1973, Ser. No. 415,970
Int. Cl. G01s *1/20*
U.S. Cl. 343—103 20 Claims

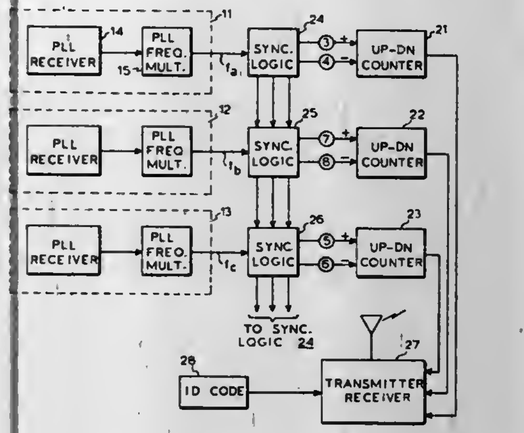


1. A method of generating radio-frequency pulses of predetermined pulse shape, that comprises, generating one of a positive and negative half-cycle of radio-frequency current, generating the opposite half-cycle of such radio-frequency current, adjusting the timing of such generating and combining said half-cycles to produce a resultant complete cycle of said radio-frequency, applying said complete cycle to impulse-excite a network coupled to a load, and adjusting the network and load to provide a resultant transfer function characteristic yielding upon excitation by a cycle of said radio-frequency current a load pulse of substantially the predetermined pulse shape, the said complete cycle controlling the first half cycles of the leading edge of the load pulse current and the said network and load characteristic controlling the remaining half cycles thereof.

3,889,264
VEHICLE LOCATING SYSTEM UTILIZING AM BROADCASTING STATION CARRIERS

James C. Fletcher, Administrator of the National Aeronautics and Spaced Administration, with respect to an invention of George R. Hansen, Jr., Arcadia, Calif.

Filed May 21, 1973, Ser. No. 362,145
Int. Cl. G01s *1/32*
U.S. Cl. 343—105 R 10 Claims



5. In a radio position finding system of the hyperbolic isophase line type in which a plurality of signals are received and compared as to phase in pairs, thereby effectively providing a family of isophase lines from each pair, lines from one pair crossing lines of other pairs to provide a grid covering a geographic area, three spaced apart and unsynchronized AM broadcasting stations, each transmitting at a different frequency, and a receiver carried by said vehicle as it moves about in said area, said receiver comprising

three receiver channels, each tuned to a different station and each having means for multiplying the signal received to a predetermined frequency, the output signal of each channel at said predetermined frequency being in phase with the signal received from a broadcast station,

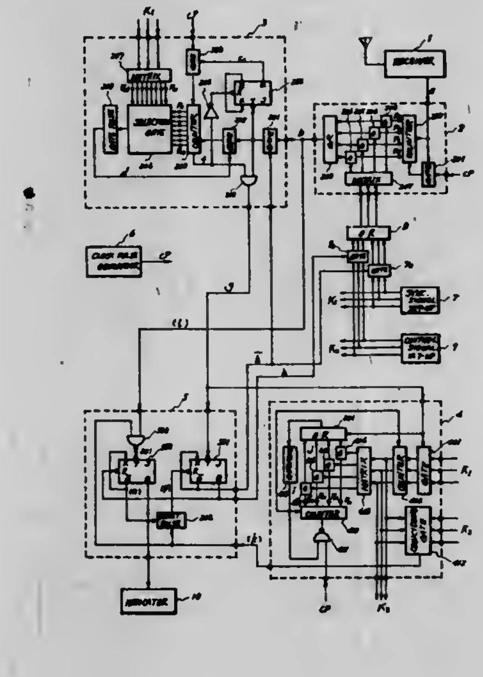
three up-down counters, each for comparing the phase of a different pair of channel output signals by counting up cycles of one channel output signal, and counting down cycles of another channel output signal of the pair being compared, and

means for coupling said channel output signals to said counters in pairs.

3,889,265
STATION DISTINGUISHING SYSTEM IN OMEGA RECEIVER

Hideki Tanaka; Kazutaka Ishida, both of Osaka; Mikio Watanabe, Kobe; Mitsuhiro Inouchi, Nishinomiya; Shigeru Yoshioka, Kobe; Minoru Handa, Ikoma, and Asao Kitabatake, Kakogawa, all of Japan, assignors to Furuno Electric Company, Limited, Japan

Filed Apr. 12, 1974, Ser. No. 460,365
Int. Cl. G01s *1/30*
U.S. Cl. 343—105 R 6 Claims

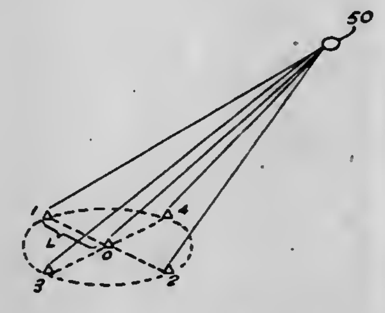


1. A station distinguishing system for selecting a signal of a required transmitting station from the omega signals transmitted by the omega transmitting stations in time division fashion, comprising means for receiving said omega signals and producing a first train of envelope waveforms of said omega signals in the order of reception, means for selecting a pair of envelope waveforms having a duration corresponding to said required station out of said envelope waveforms and producing a pair of selection signals corresponding to said pair of envelope waveforms, and means for distinguishing one of said selection signals which corresponds to said required station and producing a reference signal which corresponds to said required station.

3,889,266
MULTIPLE CORRELATION METHOD AND APPARATUS FOR MEASURING AND SUMMING TIME DIFFERENCES

James F. Bartram, Darien, Conn., assignor to The Dewey Electronics Corporation, Paramus, N.J.

Filed Jan. 22, 1959, Ser. No. 788,463
Int. Cl. G01s *11/00*
U.S. Cl. 343—112 R 16 Claims

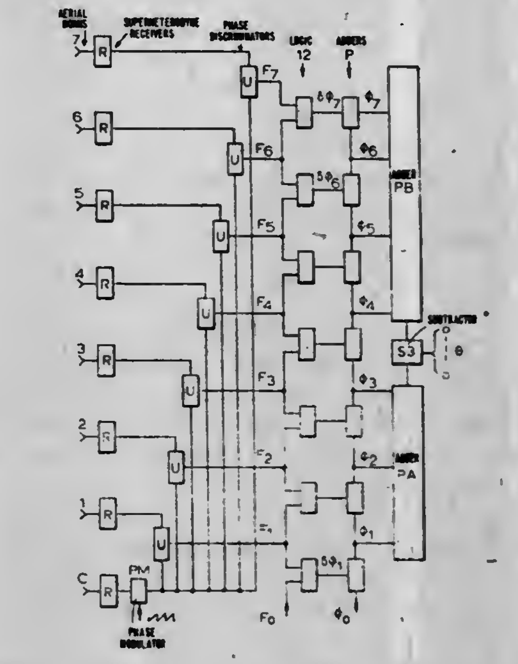


1. A method of measuring the time differences of a plurality of electrical signals comprising the steps of deriving frequency components of two of said signals, multiplying each frequency component of one of said signals by a frequency component of the other of said two signals, selecting from each product of the multiplied components a component having a frequency equal to the sum of their frequencies, subjecting a third signal to a time delay, multiplying said delayed third signal with said sum frequency components, selecting the substantially zero frequency components of said last multiplication, and measuring said substantially zero frequency component for different amounts of said time delay.

3,889,267
RADIO INTERFEROMETER

David Adrian Lucas, and Richard Paul Vincent, both of Salfords, near Redhill, England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 11, 1973, Ser. No. 359,227
Claims priority, application United Kingdom, May 17, 1972, 23110/72
Int. Cl. G01s *3/48*
U.S. Cl. 343—113 R 9 Claims



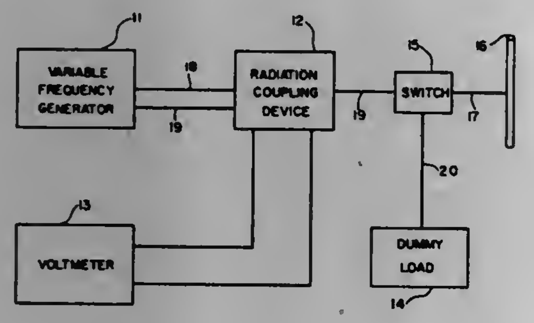
1. A vertical radio interferometer system comprising a vertically-extending rectilinear array of equally-spaced aerial elements forming between a common element and each of the other elements respectively a plurality of interferometer pairs of which the spacing increases in arithmetical progression, a series of phase discriminators each associated with a respective interferometer pair to derive therefrom a respective

phase-difference measurement in digital form and digital logic means to derive from the series of respective measurements an average phase measurement representative of the vertical angle θ of radiation incident on the aerial array.

3,889,268
METHOD OF ANTENNA TUNING

Carl I. Peters, Vista, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 1, 1974, Ser. No. 447,175
Int. Cl. G01r
U.S. Cl. 343—703 **3 Claims**



1. An antenna tuning system for adjusting the physical dimensions of an antenna to an electrically resonant length at a predetermined frequency comprising:

a frequency generator means for supplying a variable radio frequency output in the range of frequencies at which the antenna will resonate;

means responsive to radio frequency radiation coupled to said generator output for supplying a direct current voltage output in proportion to the output of said radio frequency generator;

measuring means electrically coupled to said radiation responsive means for providing an indication of direct current voltage output;

load means electrically coupled to receive a radio frequency output from said radio frequency radiation responsive means; and

switch means electrically coupled to said radio frequency radiation responsive means and operable for selectively switching radio frequency energy between said antenna and said load means;

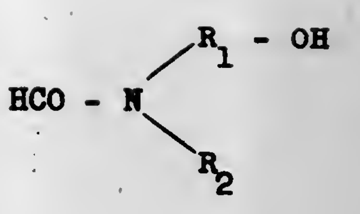
whereby the frequency generator is adjusted to give an output indication on measuring means at the resonant frequency of the antenna for tuning the antenna by comparing the indication on the indicating means as the switch means is operated between the antenna and the dummy load.

3,889,269
AQUEOUS INK FOR USE IN THE INK JET PROCESS

Rudolf Meyer; Klaus Hoffmann; Karl-Heinz Freytag, all of Leverkusen, and Hans Vetter, Cologne, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Nov. 27, 1973, Ser. No. 419,260
Claims priority, application Germany, Dec. 1, 1972, 2258835
Int. Cl. C01d *15/16, 15/18, 15/20*
U.S. Cl. 346—1 **4 Claims**

1. In a process for producing an image on a surface by the application of an ink the steps comprising moving a surface on a support, forming a jet of ink containing water soluble dye in an aqueous solution, directing the ink in the form of a jet onto the moving surface, modulating the applied ink jet by electrical signals, said signals being related to the image wherein the improvement comprises the ink in addition contains as a substance that prevents drying a compound of the formula



$$\mathrm{HCO}-\mathrm{N}<\begin{matrix}\mathrm{R_1-OH}\\ \mathrm{R_2}\end{matrix}$$

in which
- R_1 is an alkylene group containing up to 4 carbon atoms, and
- R_2 is a hydrogen atom or an alkyl group containing up to 4 carbon atoms.

3,889,270
INK JET RECORDING MATERIAL

Klaus Hoffmann; Hans-Dieter König, and Rudolf Meyer, all of Leverkusen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed July 10, 1973, Ser. No. 378,014
Claims priority, application Germany, July 15, 1972, 2234823
Int. Cl. G01d *15/18, 15/20*
U.S. Cl. 346—1 **8 Claims**

1. In a process for information recording comprising producing a fine jet of colored liquid, directing the jet of colored liquid onto a recording medium, modulating the density of the applied jet by an electric field in accordance with the information to be recorded, the improvement comprising the recording medium consisting of a support with an image-receiving layer, wherein the image-receiving layer is a molecular or colloidal disperse substance, which is wetted by the colored liquid and into which the colored liquid penetrates to a depth in the order of a few microns.

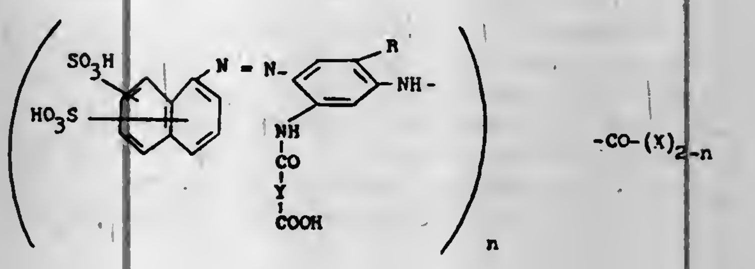
3,889,271
INK JET PROCESS UTILIZING NOVEL DYES

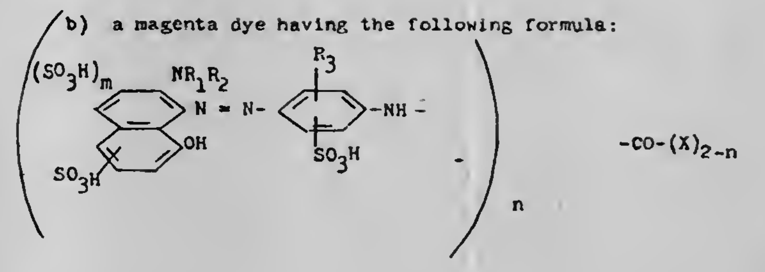
Karl-Heinz Freytag; Rudolf Meyer, and Klaus Hoffman, all of Leverkusen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Nov. 27, 1973, Ser. No. 419,259
Claims priority, application Germany, Dec. 1, 1972, 2258836; Dec. 1, 1972, 2258837; Dec. 1, 1972, 2258804
Int. Cl. G01d *5/46, 15/16, 15/18*
U.S. Cl. 346—1 **2 Claims**

1. A process for the production of an image on a support, wherein a jet of ink is imagewise modulated by electrical signals and is directed at a support having a component of movement perpendicular to the direction of the ink jet, wherein the improvement comprises containing in the ink an aqueous dye solution including one or more dyes selected from the group consisting of the following:

a. a yellow dye having the following formula:





b) a magenta dye having the following formula:

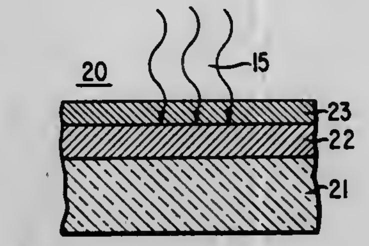
in which formulae
- X is an alkyl or alkylamino group
- Y is a divalent saturated or unsaturated aliphatic group which may be interrupted by an oxygen atom
- R is hydrogen or an alkyl or alkoxy group
- R_1 is hydrogen or an alkyl group
- R_2 is hydrogen or an alkyl group
- *m* is 0 or 1
- *n* is 1 or 2 and
- c. a cyan dye which is a copper phthalocyanine containing sulfo groups

said included dye or dyes being present in an amount effective in providing in the ink the property of light absorption in the spectral range related to the respective dye.

3,889,272
METAL FILM RECORDING MEDIA FOR LASER WRITING

David Yuan Kong Lou, Chatham, and Ronald Howard Willens, Warren, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 30, 1974, Ser. No. 474,715
Int. Cl. G01d *15/34*
U.S. Cl. 346—1 **12 Claims**



1. A method for recording information in a metal film recording medium by selectively removing portions of a thin metal radiation-absorbing film supported on a flexible transparent substrate, the method comprising exposing the metal radiation-absorbing film to modulated coherent radiation of sufficient power and duration to remove the portions, CHARACTERIZED IN THAT the film comprises a first layer of fine-grain crystallites of the metal and a second layer of coarse-grain crystallites of the metal.

3,889,273
APPARATUS FOR DIAGNOSING A TECHNICAL OBJECT, ESPECIALLY A MOTOR VEHICLE

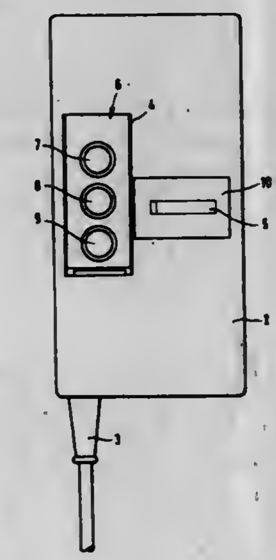
Hans-Dieter Deiss, Gifhorn; Erich Spengler, and Gerard Georges, both of Wolfsburg, all of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Continuation of Ser. No. 167,287, July 29, 1971, abandoned. This application Oct. 4, 1973, Ser. No. 403,478
Claims priority, application Germany, July 29, 1970, 2037531
Int. Cl. G01d *1/00*
U.S. Cl. 346—33 R **7 Claims**

1. An apparatus for performing the diagnostic checking of a technical object, such as a motor vehicle, according to a predetermined checking program formed by a sequence of checking points, comprising

a manually operable portable control device having a housing formed in the shape of a box adapted to be held by a single hand, at least a pair of signal keys associated with a state of the instantaneously performed checking point disposed on the same housing side of said control device, an information storage device remotely displaced from said control device and adapted to store checking result data for said checking points,

information channels for said checking result data between said control device and said information storage device, electrical contact means arranged in said housing and operable by said signal keys, said contact means lying in electrical circuits for delivering electrical signals representing said checking result data to said information channels upon actuation of one of said signal keys,



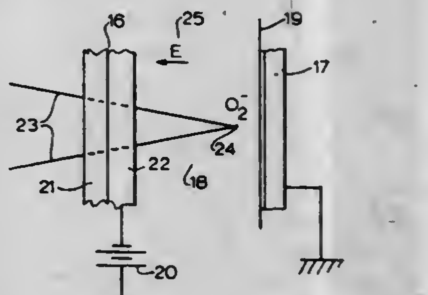
checking point identification means in said control device comprising a printed tape carrying checking point identifications on lines running transversely with respect to the longitudinal dimension thereof, means for stepwise advancing said tape, and a window provided in the housing on said same side thereof and adapted to show one line of said tape,

said means for advancing including movable means connected to all of said signal keys, such that actuation of any of said signal keys causes operation of only the associated one of said contact means as well as advancing said tape to identify the checking point to be performed next in conformity with said sequence.

3,889,274
ELECTROSTATIC PRINTING APPARATUS AND METHOD EMPLOYING OPTICAL CHARGE DEPOSITION

Rudolph A. Cola, Malvern, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed June 7, 1973, Ser. No. 367,736
Int. Cl. G01d *15/06*
U.S. Cl. 346—74 J **2 Claims**



1. An electrostatic printer for recording a charge image on the first of two surfaces of a printing medium in response to signals representing said image in terms of a plurality of posi-

tions on said first surface and the desired presence or absence of charge at each of said positions comprising:

a printing station including an electromagnetic radiation transmissive electrode disposed opposite said first surface and a second electrode disposed adjacent said second surface; a source of coherent electromagnetic radiation disposed

outside of said printing station;

means for modulating said radiation in accordance with said signals;

means for focusing and selectively deflecting said radiation in response to said signals through said radiation transmissive electrode to selectively form a point source of charge above said first surface; and

means for applying a voltage across said electrodes for attracting said charge to said first surface to form said image.

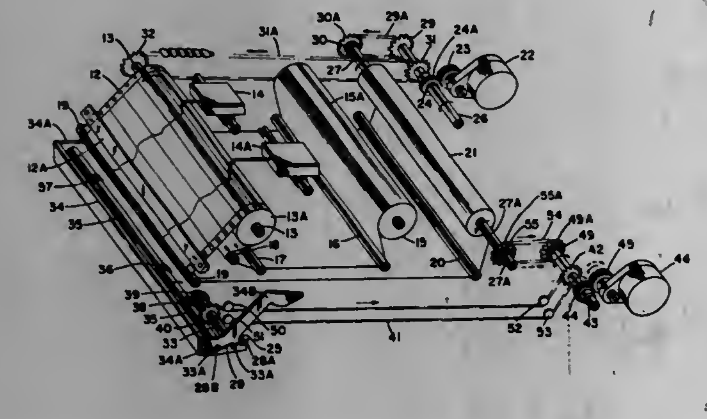
3,889,275
STRIP CHART RECORDER

Roger L. Miller, Lansdale, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed June 17, 1974, Ser. No. 479,940

Int. Cl.² G01D *15/24*

U.S. Cl. 346—136 **7 Claims**



1. A strip chart recorder comprising unidirectional chart driving means for moving chart from a chart supply, past means for recording on said chart to means for storing said chart after application of a record thereon, and independently operable reversible chart driving means operable in one direction for moving chart from said means for storing said chart to a location for review of said record thereon and operable in a second direction for moving said chart from said location for review back to said means for storing said chart.

3,889,276
ELECTRONIC SHUTTER CONTROL DEVICE FOR CAMERAS

Osamu Shirai, Nakano, Japan, assignor to Kabushiki Kaisha Cosina, Nakano-shi, Japan

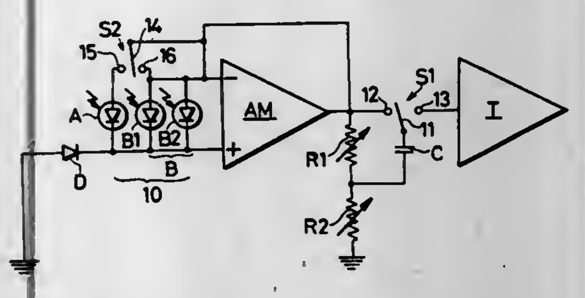
Filed Jan. 2, 1974, Ser. No. 429,585

Claims priority, application Japan, Dec. 29, 1972, 48-2514

Int. Cl. G03b *7/00*

U.S. Cl. 354—31 **6 Claims**

1. In an electronic shutter control device having a shutter movable between opened and closed positions, and a shutter controlling circuit that automatically controls exposure time depending on the brightness of an object to be photographed; the improvement comprising light measuring means for measuring the brightness of light from an object that enters through the objective lens, said light measuring means measuring the light incident to the central portion of the image plane before the shutter is opened and measuring the light incident to the peripheral portion of the image plane after the shutter is opened, means to weight the information obtained by said measuring means, memorizing means to memorize said weighted information, and means for supplying to said shutter controlling circuit the information memorized in said memorizing means before the shutter is opened, in overlapping relation with the information after the shutter is opened.



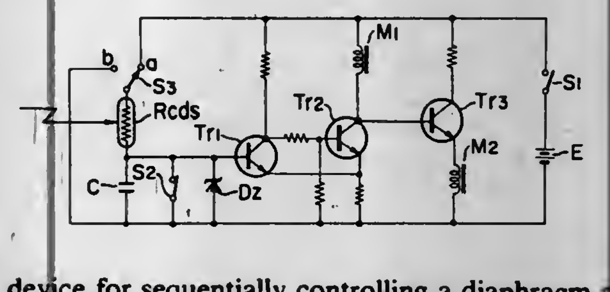
3,889,277
DEVICE FOR CONTROLLING EXPOSURE FACTORS IN CAMERAS

Mitsutoshi Ogiso, and Tetsuya Taguchi, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 225,854, Feb. 14, 1972, abandoned. This application Aug. 30, 1973, Ser. No. 392,969

Int. Cl. G03b *7/08*

U.S. Cl. 354—36 **13 Claims**



1. A device for sequentially controlling a diaphragm aperture means and a shutter means comprising in combination:

a power source;

a first switching means having a capacitor across its input and arranged to be switched from a first to a second condition when said capacitor charges up past a first predetermined voltage and to be switched from said second to said first condition when said capacitor discharges past a second lower predetermined voltage;

diaphragm aperture control means connected to said first switching means and said diaphragm aperture means, said control means comprising:

aperture varying means connected with said diaphragm aperture means for varying diaphragm aperture in accordance with the length of a time period defined by said first switching means while said capacitor charges, and

electrically controlled means connected with said aperture varying means and said first switching means for controlling said varying means to define the aperture of said diaphragm aperture means;

shutter control means connected to said first switching means and said shutter means to define the open time of said shutter means by said first switching means while said capacitor discharges;

an input circuit for said first switching means including said capacitor and determining its rate of charge and its rate of discharge and including:

a first and second variable resistor means,

a second switching means having two conditions such that in one of said conditions, and then only, said first variable resistor means is placed in a charging path for said capacitor and in the other of said conditions, and then only, said second variable resistor means is placed in a discharge path for said capacitor, and

circuit means associated with said input circuit for limiting the voltage to which said capacitor is charged at a constant level above said first predetermined voltage, which level is not subject to variation for any photographing condition, said circuit means including a transistor having a predetermined constant voltage applied to its base electrode and having another of its electrodes connected to said capacitor for overflowing current therefrom when the voltage of the charged capacitor passes a constant voltage level lower than the voltage of said power source.

3,889,278
ELECTRIC SHUTTER CONTROL CIRCUIT

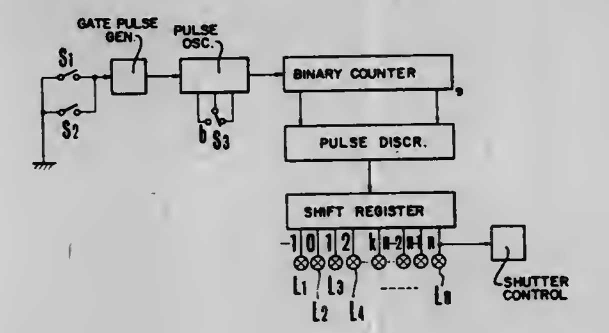
Hisatoshi Takahata, and Kohji Tanikawa, both of Shimosuwamachi, Japan, assignors to Yashika Co., Ltd., Tokyo, Japan

Filed May 13, 1973, Ser. No. 365,427

Claims priority, application Japan, June 6, 1972, 47-56329

Int. Cl. G03b *7/08*

U.S. Cl. 354—50 **4 Claims**



1. An electric shutter control circuit comprising a first pulse oscillator means for producing a train of pulses at a pulse frequency corresponding to the illumination intensity of the scene to be photographed, control means for establishing a time interval in accordance with exposure parameters other than scene brightness, a multi-stage counting and memorizing means operable prior to an exposure for counting and memorizing the number of pulses produced from said first pulse oscillator means during said interval, a second pluse oscillator means for producing a train of pulses at a predetermined pulse frequency and operable after said interval for shifting the content of the counting and memorizing means to the last stage thereof, and a shutter circuit receiving the last stage output of said counting and memorizing means including means responsive to the time required for shifting the content of said counting and memorizing means to the last stage thereof for controlling the open time of a shutter.

3,889,279
ELECTROMAGNETICALLY OPERATED PHOTOGRAPHIC SHUTTER IN MICROPHOTOGRAPHIC MECHANISMS

Heinrich Klemann, Burgsolms, and Herbert Leiter, Wetzlar, both of Germany, assignors to Ernst Leitz GmbH

Continuation of Ser. No. 172,003, Dec. 6, 1972, abandoned. This application Jan. 8, 1973, Ser. No. 321,950

Claims priority, application Germany, Sept. 6, 1970, 2044646

Int. Cl. G02b *21/36;* **G03b** *9/14*

U.S. Cl. 354—79 **5 Claims**

1. A compound lens system having an optical axis, a photographic image recorder along said optical axis, and means for optically viewing through said lens system located to one side of said optical axis, the improvement comprising an electromagnetically operated shutter having electromagnets for said recorder comprising:

a light passage aperture along said optical axis;

first shutter blade means having a first blade and a second blade extending from a first apex at an angle to one another;

second shutter blade means having a third blade and a fourth blade extending from a second apex at an angle to one another;

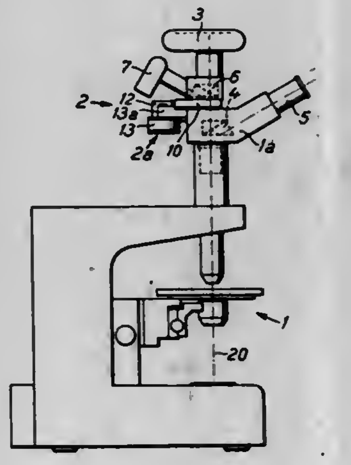
said first and second shutter blade means located between said means for viewing and said photographic image recorder;

said first and second shutter blade means having means for rotatably mounting at said first and second apex, said means for rotatably mounting having second and third axes parallel to said optical axis;

said second and third axes disposed to the opposite side of said optical axis from said means for optically viewing;

said first and third blades cooperating to cover said aperture in the closed position; and

said second and fourth blades actuated by said electromagnets having magnetic cores and said electromagnets and magnetic cores disposed on one side of said optical axis opposite said means for optically viewing.



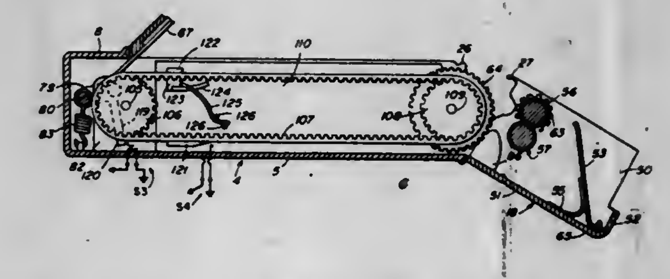
3,889,280
BELT DRIVEN AUTOMATIC REFLEX CAMERA

Conrad H. Biber, Needham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 20, 1973, Ser. No. 426,948

Int. Cl. G03b *17/50, 19/12*

U.S. Cl. 354—86 **8 Claims**



3. In a camera, means forming a housing, motor means mounted in a first end of said housing, film processing means mounted in a second end of said housing opposite said first end and drivable to process a film unit advanced into engagement therewith, means forming a compartment in said housing between said motor means and said film processing means for receiving a supply of film units, means forming a framing aperture in said compartment to facilitate the successive exposure of film units in said compartment, mirror means, means mounting said mirror means for movement between first and second positions relative to said framing aperture, means comprising an endless flexible timing belt drivingly connecting said motor means to said processing means, an actuating element on said timing belt, means operated by said actuating element for moving said mirror means from its first to its second position, and means operated by said actuating element for advancing a film unit exposed in said framing aperture into engagement with said processing means.

3,889,281
CAMERA INCORPORATING DATA RECORDING DEVICE

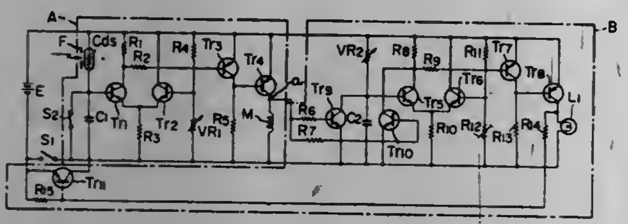
Tetsuya Taguchi, Kawasaki; Mutsunobu Yazaki, and Mutsuhide Matsuda, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 6, 1973, Ser. No. 394,651

Claims priority, application Japan, Sept. 11, 1972, 47-91091

Int. Cl. G03b *17/24*

U.S. Cl. 354—109 **2 Claims**



1. A camera incorporating a data recording device, comprising:

- a power source on-off switch adapted to be opened and closed in response to the depression of a shutter release button;
- a shutter control circuit including a first time constant circuit comprising a photoelectric element and a capacitor, a switching circuit, an electromagnet for controlling a shutter closure member, and a circuit for activating said electromagnet;
- a data carrier;
- an optical system;
- a data recording circuit including a light source for exposing data recorded on said carrier, a second time constant circuit for controlling an illumination time duration of said light source, and a switching circuit for intermittently illuminating said light source; and
- a power source battery connected to both said shutter control and data recording circuits;
- wherein an output terminal of said electromagnet activating circuit in said shutter control circuit is connected to said switching circuit in said data recording circuit, and upon the depression of the shutter release button, said electromagnet is energized to hold the shutter closure member during a time determined by said first time constant circuit, and thereafter upon the deenergization of said electromagnet, said shutter closure member is released thereby completing shutter operation and a signal is applied from the output terminal of said electromagnet activating circuit to said switching circuit of said data recording circuit, in response to which signal said light source is illuminated for a duration determined by said second time constant circuit whereby the data is recorded on a film to be recorded.

3,889,282
ZOOM LENS STRUCTURE

Shigeru Hashimoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 14, 1973, Ser. No. 369,832

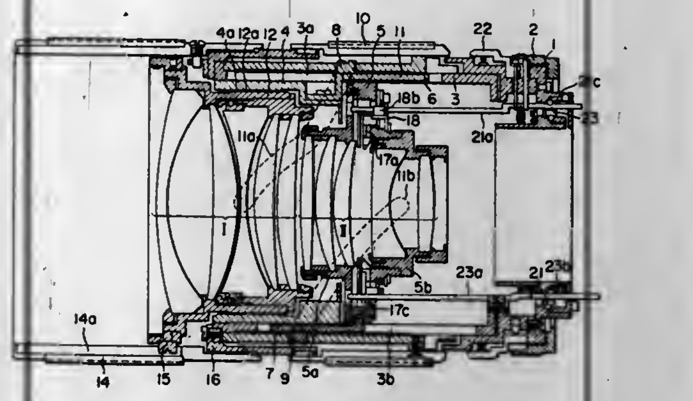
Claims priority, application Japan, June 26, 1972, 47-63810; June 26, 1972, 47-75229; June 26, 1972, 47-75230

Int. Cl. G03b *7/20*

U.S. Cl. 354—196 **8 Claims**

1. A zoom lens structure comprising:

- first and second optical systems;
- a first lens carrier for holding said first optical system;
- a second lens carrier for holding said second optical system, said second carrier including adjustable aperture means including an aperture setting ring and aperture preset means operable by said aperture setting ring;
- zoom operation means for moving said two optical systems relatively to each other to effect varifocal action;
- focusing means for moving one of said first and second optical systems independently of the other;
- aperture driving means for stopping down the adjustable aperture from a maximum open value to a preset value, set by said preset means through said aperture setting ring, and
- correcting means operable by said zoom operation means for superimposing a corrective displacement upon the adjustment of said aperture preset means effected by the position of said aperture setting ring.



8. A zoom lens structure according to claim 1, wherein said focusing means comprises means for moving said first optical system independently of said second optical system.

3,889,283
PHOTOGRAPHIC DIAPHRAGM CONTROL MEANS

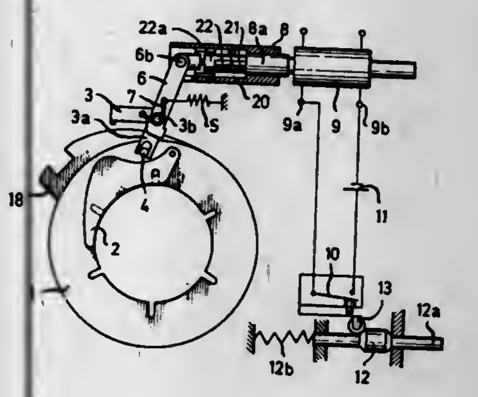
Dieter Rossmann, Aalen, Germany, assignor to Carl Zeiss Stiftung, Oberkochen, Germany

Filed Mar. 8, 1974, Ser. No. 449,399

Claims priority, application Germany, Mar. 14, 1973, 7309629

Int. Cl. G03b *9/02*

U.S. Cl. 354—272 **6 Claims**



1. Photographic diagram control mechanism comprising an adjustable diaphragm movable between a fully open position and a preselected aperture position, spring means biasing said diaphragm toward one of said positions, an electromagnetic actuator including an electric coil and a plunger movable in one direction upon momentary flow of current through said coil, and alternate stroke detent mechanism operatively connecting said plunger to said diaphragm, said detent mechanism constituting means effective upon a first stroke of said plunger in said direction to move said diaphragm to one of its said positions against the force of said spring biasing means and to hold said diaphragm in such position notwithstanding discontinuance of flow of current through said coil, and effective upon a second stroke of said plunger in the same direction to release said diaphragm for return to the other of its said positions under the influence of said spring biasing means.

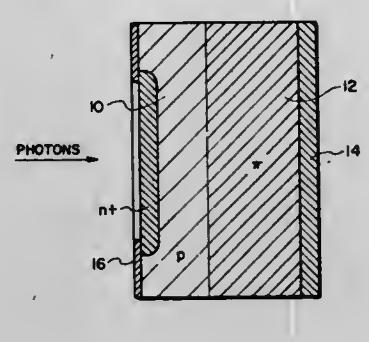
3,889,284
AVALANCHE PHOTODIODE WITH VARYING BANDGAP

Ernst J. Schiel, Ocean, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 15, 1974, Ser. No. 433,585

Int. Cl. H01l *15/00*

U.S. Cl. 357—30 **7 Claims**



1. A photodetector for radiation in the 1.0 to 2.5 micrometer region, said photodetector comprising a photodiode including two adjacent regions of two different semiconductor materials, one of said regions comprising a photon absorption material selected from the group consisting of GaInAs and InAsP and the other of said regions comprising a material selected from the group consisting of GaAs, InAs, and InSb and containing an n-p junction biased in the avalanche mode.

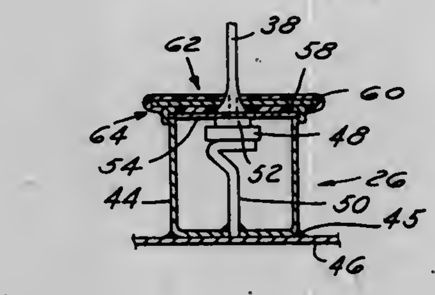
3,889,285
CANISTER DIODE HAVING IMPROVED ENVIRONMENT PROTECTIVE INSULATION

Marcel F. Milewski, Allen Park, and Curtis E. Weiser, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 20, 1974, Ser. No. 444,199

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 357—72 **5 Claims**



1. In combination with a solid state electronic device of the type having a body of semiconductor pn junction material retained with a canister housing, at least two electrically distinct terminals in electrical communication with different regions of the semiconductor body, and an insulating means disposed within the canister housing, forming a wall thereof, to seal the semiconductor body within the housing while electrically insulating the terminals, the improvement comprising: heat flowable environmentally protective insulating material disposed across the exterior surface of the insulating means and sealingly engaging the electrical terminals and arranged to increase the direct distance path between the terminals whereby the time period required for the accumulation of foreign matter on the surface of the insulating means to short out the device may be extended, and

- a stiffener member embedded within the heat flowable material operative to retain substantial quantities of heat flowable material, when heated, in proximity to the electrodes.

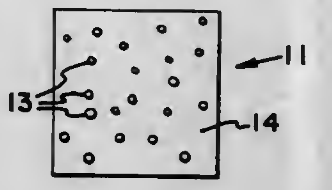
3,889,286
TRANSPARENT MULTIPLE CONTACT FOR SEMICONDUCTOR LIGHT CONVERSION ELEMENTS

John R. Debesis, Richmond Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 26, 1973, Ser. No. 427,934

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 357—67 **7 Claims**



1. A transparent contact construction for a solid state light conversion element, comprising a plurality of individual electrical contact areas distributed over and attached to a surface of said light conversion element, a layer of transparent electrically conductive material disposed over said surface and in contact with said contact areas, and a conductor member electrically connected to said layer of transparent electrically conductive material.

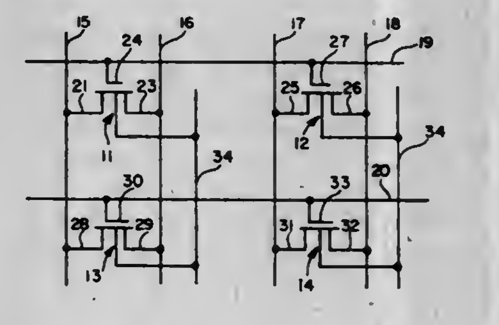
3,889,287
MNOS MEMORY MATRIX

Michael W. Powell, Mesa, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Dec. 6, 1973, Ser. No. 422,377

Int. Cl. H01l *11/00, 15/00*

U.S. Cl. 357—23 **4 Claims**



1. A monolithic array of memory devices comprising a plurality of spaced parallel silicon structures on an insulating substrate, each of said structures having therein a plurality of spaced openings therein exposing the insulating substrate and thereby defining a plurality of parallel ladder-like structures having side pieces and rungs, rows of composite dielectric layers overlying aligned silicon regions, each row extending across a corresponding pair of openings and overlying the rungs and portions of the side pieces of the ladder structures, the side pieces of the ladder-like structures forming column conductors for the memory device and the rungs forming channels for the active device.

3,889,288
SYMMETRICALLY ENCODED LINE SEQUENTIAL COLOR SIGNALS

John L. Rennick, Elmwood Park, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Feb. 28, 1973, Ser. No. 336,841

Int. Cl. H04n *9/36*

U.S. Cl. 358—11 **16 Claims**

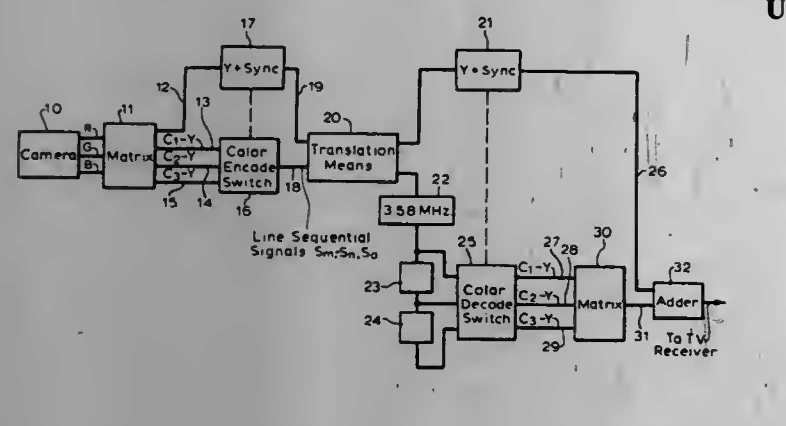
1. A system comprising a source of three primary color television signals said system comprising:

- encoding means coupled to said source for composing a luminance signal Y representative of the brightness of a scene and three phase and amplitude balanced color-difference signals representative of the chromaticity of the scene, said color-difference signals being equivalent to a resolution of an NTSC signal onto three equally spaced axes;

switch means for changing said color-difference signals into three line sequential signals of the form

$$S_a=Y+0.877\cos\phi(R-Y)-0.493\sin\phi(B-Y),$$

$$S_b=Y+0.877\cos(120°+\phi)\quad(R-Y)-0.493\sin(120°+\phi)\quad(B-Y),$$



$$S_c=Y+0.877\cos(240°+\phi)\quad(R-Y)-0.493\sin(240°+\phi)\quad(B-Y),$$

where ϕ represents the angle between one of said line sequential signals and the R−Y axis; and means responsive to the output of said switch means for converting the line sequential encoded signals into color-difference signals of a type suitable for application to a color television receiver.

3,889,289

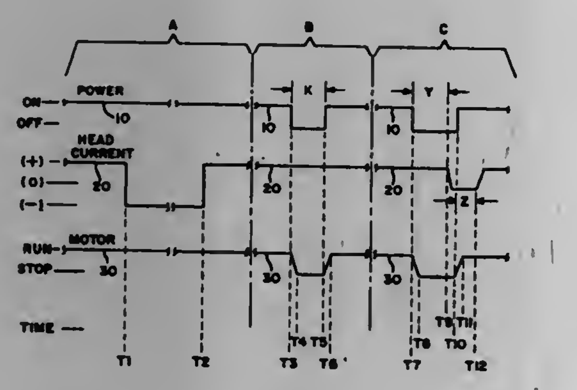
METHOD AND APPARATUS FOR RECORDING PULSES REPRESENTING POWER OUTAGES OF GREATER THAN A PREDETERMINED DURATION ON A TIMING TRACK OF A BILLING TAPE RECORDER

Reinhold W. Kubach, Dayton, Ohio, assignor to Dayton Electronic Products Company, Dayton, Ohio

Filed Mar. 29, 1974, Ser. No. 456,273

Int. Cl. G11b *5/00, 5/09;* **G01r** *13/16*

U.S. Cl. 360—6 **6 Claims**



1. A method for recording a pulse on a magnetic tape in response to a power outage condition exceeding a predetermined time interval comprising the steps of

maintaining current flow through a recording head associated with said magnetic tape after a power outage for said predetermined time interval,

thereafter terminating current flow through the recording head, and

inhibiting the resumption of recording head current for a period of time sufficient for said tape to move a distance at least equal to the gap width of the recording head upon the return to power.

3,889,290

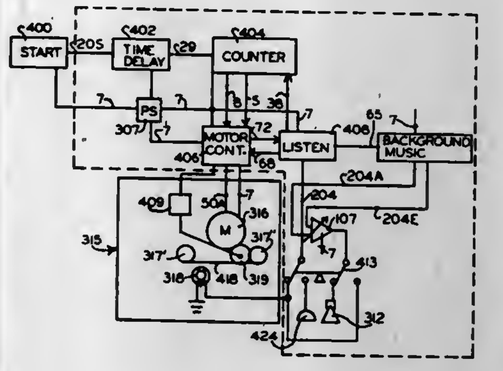
PROCESS OF PREPARING AND DELIVERING PLURALITY OF AUDIBLE MESSAGES AND APPARATUSES THEREFOR

William J. Seaton, Kearns, Utah, assignor to George B. Cree, Jr., Pampa, Tex.

Filed Aug. 27, 1973, Ser. No. 392,056

Int. Cl. G11b *15/02, 15/06*

U.S. Cl. 360—12 **5 Claims**



1. A message and background music sound producing apparatus comprising, in operative combination, a tape recorder deck, an audience sensing means, electric power voltage source, motor control circuit, a listening circuit, a background music source, a switching circuit, an amplifier and a loudspeaker in operative combination;

a. said tape recorder deck comprising a motorboard supporting an electromagnetic tape head, a tape reel support and an electric motor, said motor having an input terminal and an output terminal and said motor operatively connected to said tape reel support in driving relation therewith; said motor control circuit connecting said motor to electric power means therefor, an electrical output means on said electromagnetic tape head operatively connected to a first signal input means of said switching circuit and, in parallel therewith, to an input of said listening circuit, said first signal input means of said switching circuit operatively connected to an output terminal of said switching circuit through a transistor switching unit when the switching circuit is in tape broadcast mode and disconnected from said output terminal when the switching circuit is in background music broadcast mode; a trigger signal input terminal in said switching circuit operatively connected to said transistor switching unit in said switching circuit whereby to change the mode of said switching circuit from broadcast music mode to tape broadcast mode;

b. said background music source having an electrical output signal terminal operatively connected in series with a second signal input of said switching circuit and through said transistorized switching unit in said switching circuit to the signal output of said switching circuit when said switching circuit is in its background music mode; said switching circuit output operatively connected to the signal input of said amplifier, said amplifier having a signal output means operatively connected to the signal input of said loudspeaker;

c. audience sensing means operatively connected to switch means completing circuit connection to ground from said motor on said tape deck to said voltage source;

d. said listening circuit comprising

1. An input conductor connected to the output of said tape head on said motorboard a plate of one polarity of a capacitator directly connected to said input, the plate of opposite polarity of said capacitator being connected to the negative terminal of a first diode and the positive terminal of a second diode, the negative terminal of which second diode is grounded;

2. A first NPN transistor to the base of which are attached the positive terminal of the first diode and one end of a first bleeding resistor, the other end of which first bleeding resistor is attached to a positive voltage and the emitter of which first transistor is grounded;

3. A second NPN transistor, the emitter of which is grounded and the collector of which connects to said positive voltage through a second load resistor and which collector is also attached to one plate of one polarity of a second capacitator, another plate of opposite polarity of which capacitator is connected to the base of said first transistor, and

4. the collector of said first transistor is connected to

   i. base of a third NPN transistor the emitter of which is grounded and the collector of which is connected through a load resistor to said positive voltage and said collector of said third transistor is connected to a trigger signal line which is operatively connected to the trigger signal input terminal of said first switching circuit whereby to cut off the background music signal between said first input of the switching circuit and the output thereof on cessation of audio signal to the input of said listening circuit and a time lapse controlled by said second capacitator and said bleeding resistor, and also

   ii. the collector of the first transistor also is connected to the base of said second transistor, and

   iii. the collector of the first transistor is connected to said positive voltage through a first transistor load resistor and the emitter of said first transistor is grounded.

3,889,291

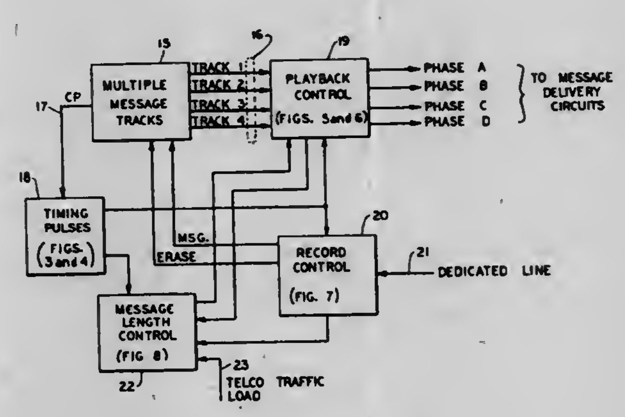
MESSAGE ANNOUNCEMENT APPARATUS AND METHOD

Walter P. Walker, Atlanta, Ga., assignor to The Audichron Company, Atlanta, Ga.

Filed Apr. 18, 1974, Ser. No. 461,894

Int. Cl. G11b *13/02, 23/18*

U.S. Cl. 360—12 **20 Claims**



1. Method of recording and delivering a message in plural segments, comprising the steps of:

recording a first message segment of certain duration and having a final portion;

recording a second message segment having an initial portion which is identical both in content and in time of occurrence with said final portion of said first message segment;

delivering a composite message comprising serially reproduced first and second message segments with synchronized concurrent reproduction of said final portion of the first message segment and said initial portion of the second message segment; and

transferring message segment delivery to said second message segment at a time during said synchronized concurrent reproduction.

3,889,292

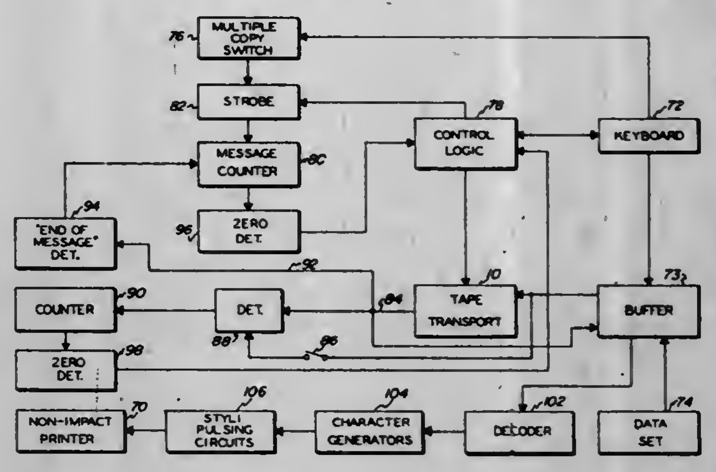
APPARATUS FOR MAKING MULTIPLE ALPHANUMERIC COPIES OF A BINAPY CODED MESSAGE

Robert P. Bocek, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 21, 1970, Ser. No. 73,817

Int. Cl. G11b *5/86, 5/18, 31/00*

U.S. Cl. 360—15 **4 Claims**



1. Apparatus for making multiple alphanumeric copies of a binary coded message contained on a magnetic recording medium, said apparatus comprising:

means including means for reading said binary coded message;

means for moving the message portion of said magnetic recording medium past said reading means;

means for conditioning said last-mentioned means for cycling said message path said reading means a predetermined number of times;

recording means responsive to said means including reading means for forming alphanumeric characters on a recording web each time said message moves past said reading means;

means responsive to said conditioning means for transporting said record medium between the beginning and end of said message and past said reading means to thereby produce multiple copies of said message in accordance with said conditioning of said apparatus;

means for writing binary codes on said magnetic recording medium, said means comprising controls for dividing messages of a predetermined length into data blocks and providing a code at the end of each data block followed by a space; and

said transporting means comprising means for sensing the number of said codes and said spaces to thereby control the transporting of said record medium between the beginning and end of message.

3,889,293

RADAR RECORDING AND REPRODUCING SYSTEM WITH PULSE MODULATION AND TIME DIVISION MULTIPLEXING

Paul F. Muraco, Turnersville, and James S. Griffin, Medford, both of N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

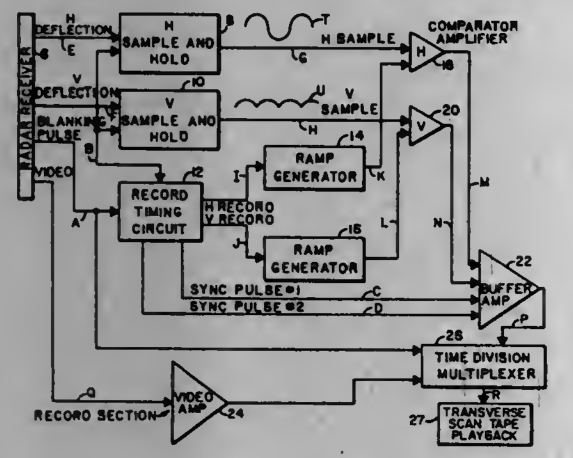
Filed Mar. 5, 1973, Ser. No. 338,120

Int. Cl. G11b *5/02*

U.S. Cl. 360—18 **11 Claims**

1. In a single track magnetic tape recording/reproducing system, a signal processor for combining and separating CRT information including video, horizontal and vertical deflection signals, and blanking pulse, comprising:

combining means for receiving the CRT information wherein the horizontal and vertical deflection signals are encoded in pulse width modulation form during the blanking period and time-multiplexed with the video during the nonblanking period to form a composite output signal for recording on the single track tape; and

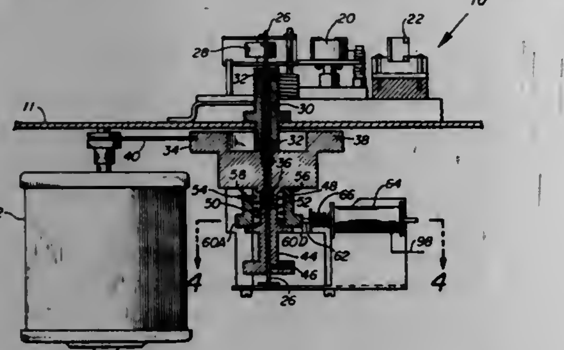


separating means connected to receive the composite output signal on the tape for recovering the blanking pulse, deflection and video signals.

3,889,294
MEANS FOR RECORDING MULTI-BIT CHARACTER DATA

Richard S. Anderson; Robert L. Crafts; John A. Murphy; Irvin L. Patterson, and Harold P. Schultz, all of Tulsa, Okla., assignors to Midwestern Instruments, Inc., Tulsa, Okla.

Filed Sept. 2, 1970, Ser. No. 69,036
Int. Cl. G11b *5/09*
U.S. Cl. 360—52 4 Claims



1. A recording means for recording multi-bit character data on tape at a given character-per-second rate and playing back such data at the same or a different character-per-second rate comprising:

a write head and a read head;

a rotatable capstan shaft against which tape is pressed, the rotation of the capstan shaft serving to advance the tape past the write head and read head;

a continuously rotated flywheel supported coaxially about said capstan shaft, said flywheel having, at one end thereof, a reduced diameter shoulder portion coaxial with said capstan shaft;

a drive collar affixed to said capstan shaft and having a reduced diameter shoulder portion coaxial with said capstan shaft, said flywheel shoulder and drive collar shoulder being of substantially the same diameter and adjacent each other;

a coiled spring coaxially received about said capstan shoulder and said drive collar shoulder, the normal internal diameter of the spring being slightly smaller than the external diameter of said flywheel shoulder and said drive collar shoulder, the direction of rotation of said flywheel tending to tighten said spring about said flywheel shoulder and said drive collar shoulder, said spring having a radially extending tang at the end thereof received on said flywheel shoulder;

a tubular ratchet member coaxially received about and externally of said spring, the interior diameter of said ratchet member being slightly larger than the external diameter of said spring, said ratchet member having a slot therein receiving said tang of said spring whereby said spring and said ratchet member are rotationally interlocked;

a ratchet release bar movably supported adjacent said ratchet member and movable between a first and a second position, and arranged such that in said first position said release bar engages said ratchet member preventing the rotation thereof and causing said spring to tend to unwind to thereby decouple said flywheel from said drive collar, and in said second position said release bar is removed from said ratchet member and permits the rotation of said ratchet member;

means of moving said ratchet release bar from said first to said second position for a uniform preselected time duration coincident with the receipt of each data character on said write head whereby the data character is recorded on the tape as the tape is incrementally advanced;

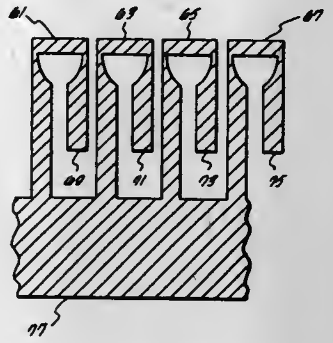
means of rewinding the tape; and

means of moving and holding said ratchet release bar from said first to said second position for continuously advancing the tape having data recorded thereon past said read head.

3,889,295
SINGLE-TURN CONDUCTOR PATTERN FOR MICROMINIATURE CORE ASSEMBLIES IN A MULTITRANSDUCER HEAD

Shahbuddin A. Billawala, Thousand Oaks, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 9, 1973, Ser. No. 404,804
Int. Cl. G11b *5/20*
U.S. Cl. 360—123 4 Claims



1. In a multitransducer head assembly having a laminate structure of a substrate supporting a first layer of paramagnetic material, a layer of conducting material insulated from said first layer of paramagnetic material by a first layer of insulating material between said first layer of paramagnetic material and said layer of conducting material, a second layer of paramagnetic material insulated from said layer of conducting material by a second layer of insulating material between said layer of conducting material and said second layer of paramagnetic material, said second layer of paramagnetic material contacting said first layer of paramagnetic material at spaced locations thereof so as to form a plurality of individual magnetic cores in a straight line, said layer of conducting material formed to provide an improved single-turn conductor pattern for a plurality of individual transducers in said head, said conductor pattern comprising:

a plurality of single-turn electron paths disposed in a straight line, in the same plane, each said path defining a transducing gap and having a first and a second end;

one terminal pad connected to the first end of each of said plurality of electron paths; and

a plurality of terminal pads, equal in number to said plurality of single-turn electron paths, one terminal pad connected to the second end of each one of said plurality of single-turn electron paths.

DESIGN PATENTS

GRANTED JUNE 10, 1975

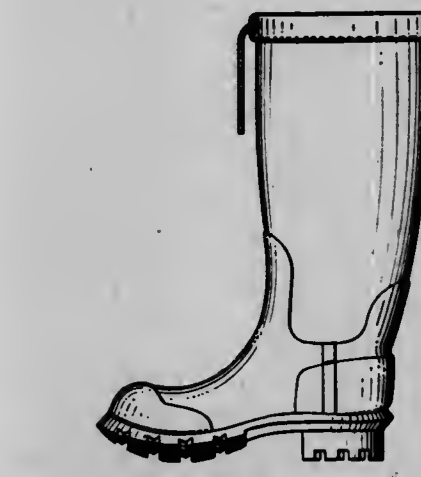
ERRATA

For CLASS	See PATENT NO.
010–078	235,321
092–015	235,338
035–003 A	235,364
027–036	235,368
010–066	235,375

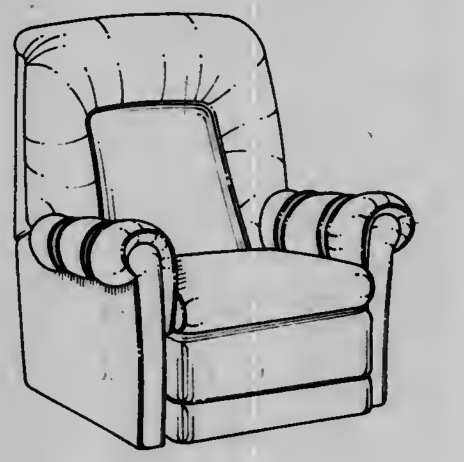
DESIGNS

GRANTED JUNE 10, 1975

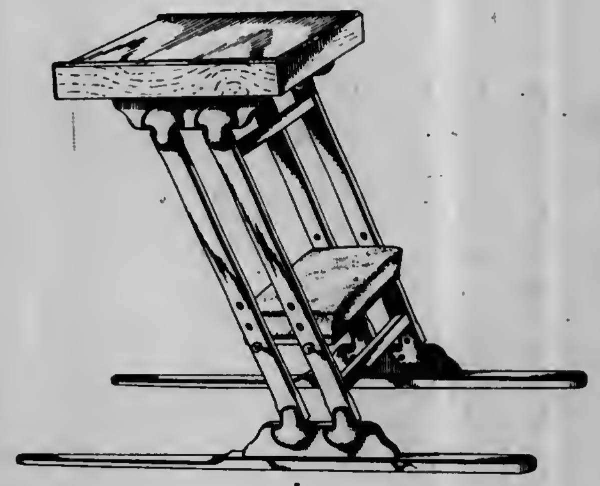
235,283
KNEE BOOT
Young Ku Lee, Seoul, Korea, assignor to Kyung Sung Rubber Co., Ltd., Jun San, Korea
Filed Nov. 7, 1973, Ser. No. 413,686
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—275



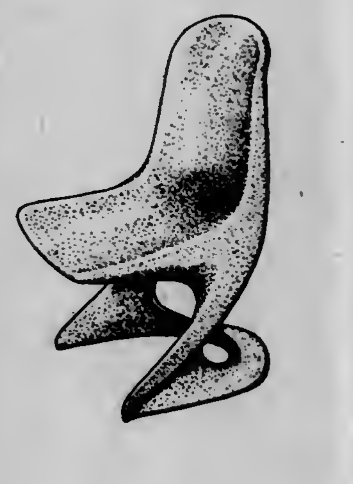
235,284
CHAIR
Don Ray Gill, Westville, Ind., assignor to Futorian Corporation, Amsterdam, N.Y.
Filed Sept. 11, 1973, Ser. No. 396,340
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—37



235,285
COMBINED DESK AND FOOTREST UNIT
Henry W. Dawson, 338 10th St. NW., Charlottesville, Va. 22901
Filed Sept. 17, 1973, Ser. No. 397,628
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—42

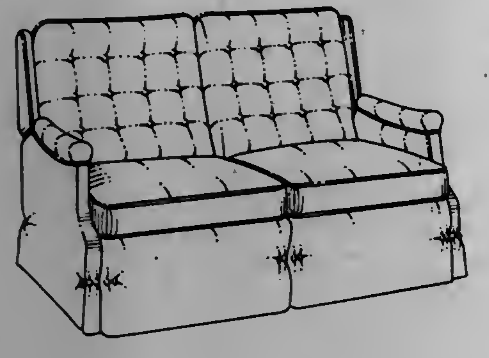


235,286
CHAIR
Arnold C. Martinelli, Lake Shore Drive, Rawdon, Quebec, Canada
Filed July 12, 1973, Ser. No. 378,612
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56



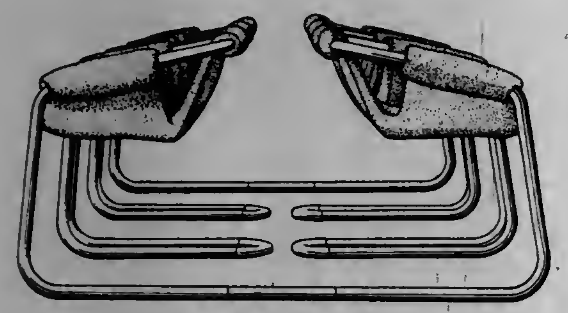
235,287
SETTEE OR SIMILAR ARTICLE

Morris F. Fisher, Carmel, Ind., assignor to Futorian Corporation, Amsterdam, N.Y.
Filed Jan. 12, 1973, Ser. No. 323,162
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—59



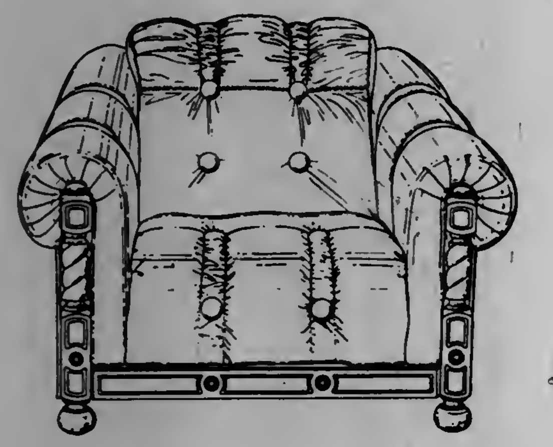
235,288
MULTIPLE SEATING UNIT

William H. Sullivan, Dallas, Tex., assignor to The Vecta Group, Inc., Dallas, Tex.
Filed July 16, 1973, Ser. No. 379,810
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—59



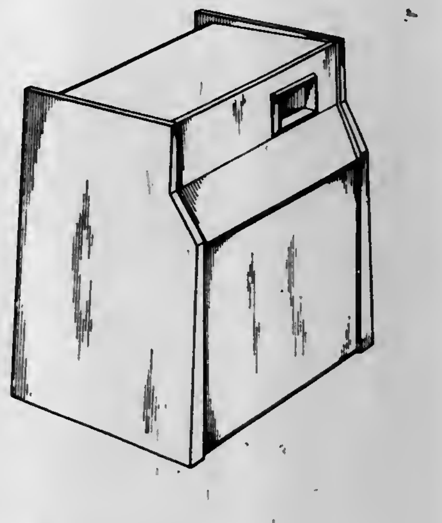
235,289
CHAIR

Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Nov. 28, 1972, Ser. No. 310,018
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71



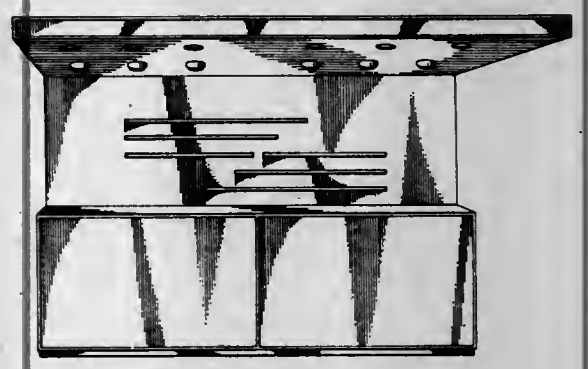
235,290
DISPENSER FOR USE WITH AEROSOL CONTAINERS

C. James Corris, Camden, S.C., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed July 2, 1973, Ser. No. 375,564
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D6—95



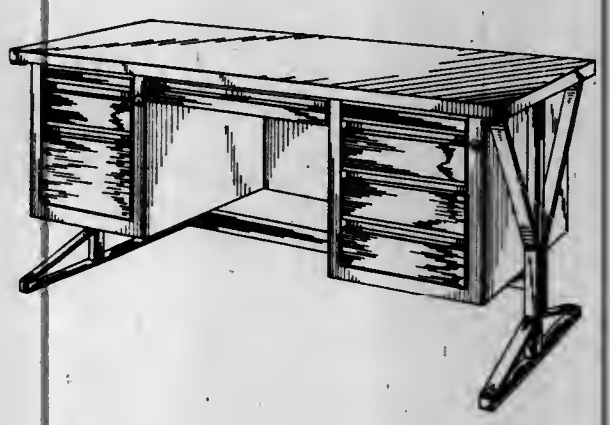
235,291
DISPLAY CASE

Jerry Shaw, 50 W. Fairlawn Blvd., and Samuel G. Solitt, 2121 Brookshire Road, both of Akron, Ohio 44313
Filed July 3, 1973, Ser. No. 376,138
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—127



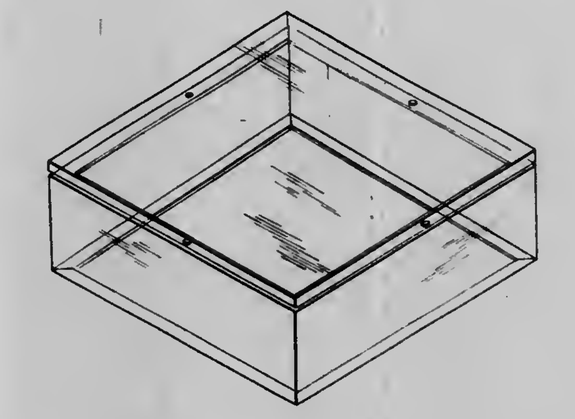
235,292
DESK

George W. Podell, Newburgh, N.Y., assignor to Monarch Metal Products, Inc., New Windsor, N.Y.
Filed Aug. 6, 1973, Ser. No. 385,953
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161



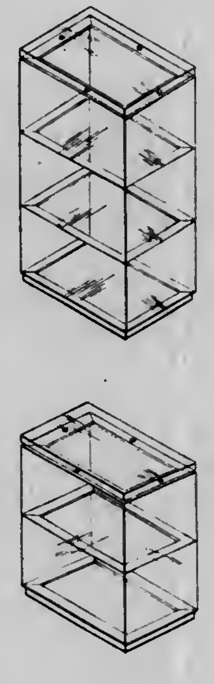
235,293
COFFEE TABLE

Simon V. Waitzman, 195 Hicks St., Brooklyn, N.Y. 11201
Filed May 9, 1973, Ser. No. 358,715
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175



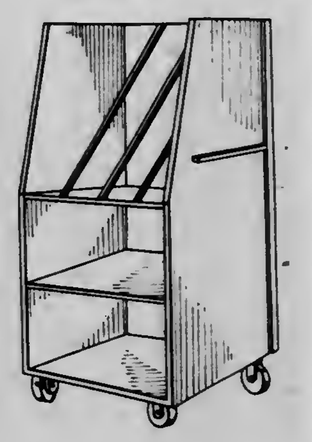
235,294
LAMP TABLE OR PEDESTAL

Simon V. Waitzman, 195 Hicks St., Brooklyn, N.Y. 11201
Filed May 9, 1973, Ser. No. 358,717
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175



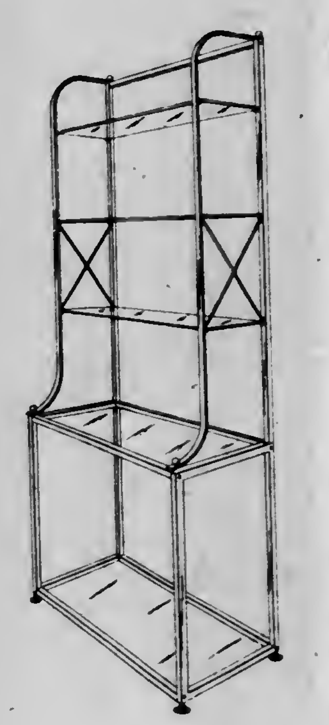
235,295
BOOK CART OR SIMILAR ARTICLE

Melville E. Junion, 104 Gregor Court, Appleton, Wis. 54911
Filed Aug. 28, 1973, Ser. No. 392,274
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—184



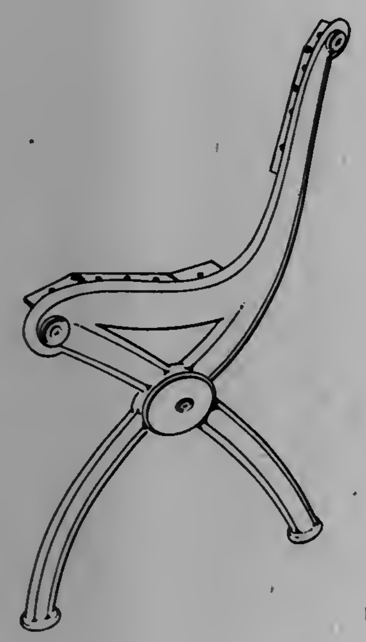
235,296
BAKERS RACK OR SIMILAR ARTICLE

Jonathan Ginat, New York, N.Y. (% A.C.I. Industries, Inc., 38—60 Review Ave., Long Island City, N.Y. 11100)
Filed Oct. 16, 1973, Ser. No. 406,823
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186



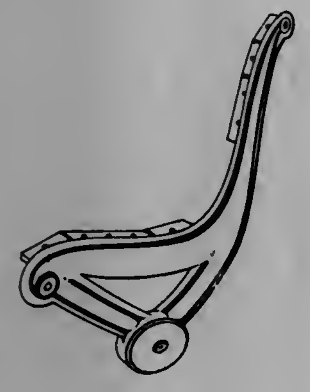
235,297
END STANDARD FOR A FURNITURE SEAT

Roger S. Schuyler, San Francisco, Calif.
(1031–B, E. Duane, Sunnyvale, Calif. 94086)
Filed Apr. 6, 1973, Ser. No. 348,482
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—194



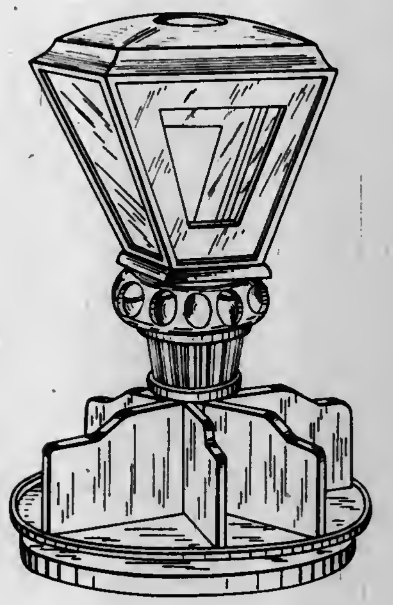
235,298
END STANDARD FOR A FURNITURE SEAT

Roger S. Schuyler, San Francisco, Calif.
(1031–B, E. Duane, Sunnyvale, Calif. 94086)
Filed Apr. 6, 1973, Ser. No. 348,483
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—194



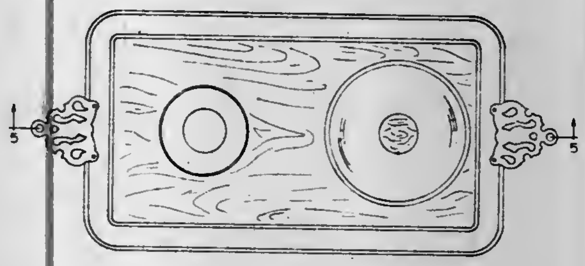
235,299
COMBINED REVOLVING CONDIMENT SERVER AND CANDLE HOLDER OR THE LIKE

Lawrence W. Keating, 1609 Shawnee Road, Apt. 309, Lima, Ohio 45805
Filed Aug. 21, 1973, Ser. No. 390,300
Term of patent 14 years
Int. Cl. D7—*99;* D26—*01*
U.S. Cl. D7—2



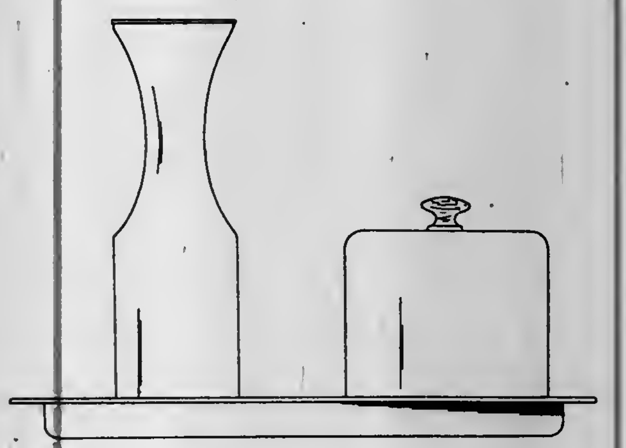
235,300
FOOD AND BEVERAGE SERVING SET

Maurice G. Mountain, Jr., and William S. Ripley, York, Pa., assignors to Susquehanna Broadcasting Co., York, Pa.
Filed Sept. 18, 1973, Ser. No. 398,475
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—3



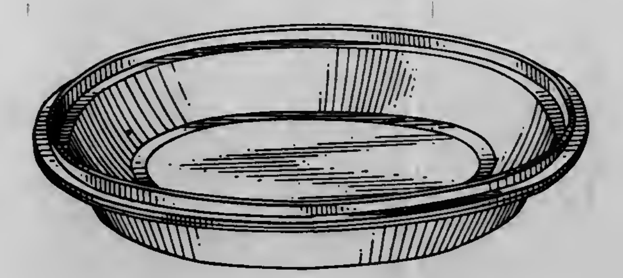
235,301
FOOD AND BEVERAGE SERVING SET

Maurice G. Mountain, Jr., and William S. Ripley, York, Pa., assignors to Susquehanna Broadcasting Co., York, Pa.
Filed Sept. 18, 1973, Ser. No. 398,476
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—3



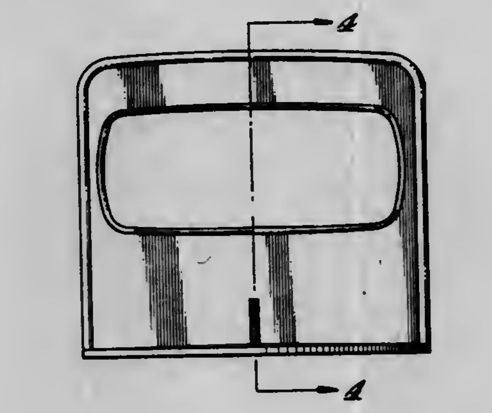
235,302
DISH

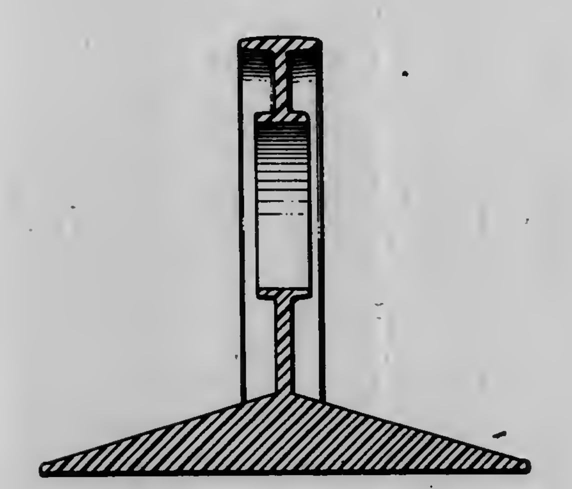
Richard W. Lanigan, 214 W. Fremont, Arlington Heights, Ill. 60004, and Oleg Szymber, 808 Roppolo, Elk Grove, Ill. 60007
Filed Mar. 28, 1973, Ser. No. 346,307
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—23



235,303
PATTY PRESS

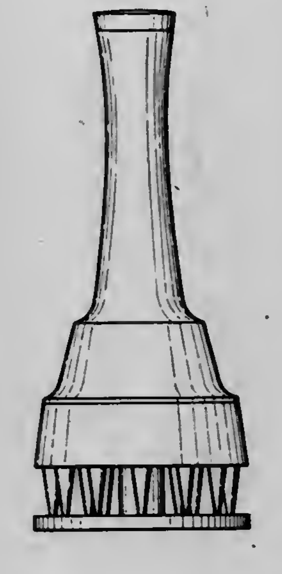
Richard A. Boucher, 263 Davis St., Northboro, Mass. 01581
Filed Aug. 16, 1973, Ser. No. 388,873
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—43





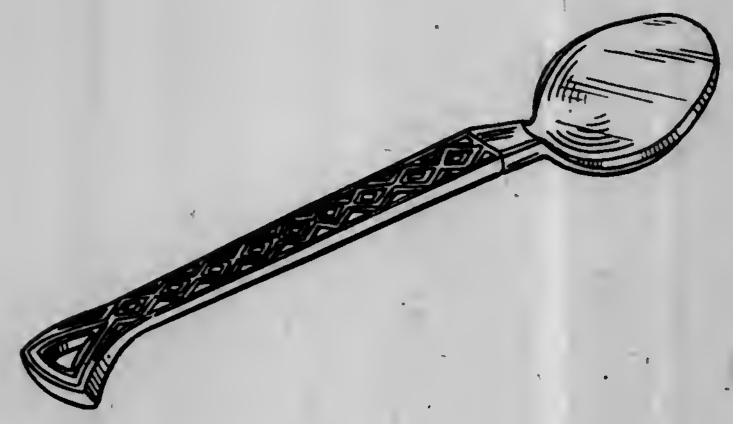
235,304
MEAT TENDERIZER

Sylvan Greenberg, 111 E. 85th St., New York, N.Y. 10028
Filed Aug. 30, 1973, Ser. No. 392,979
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—101



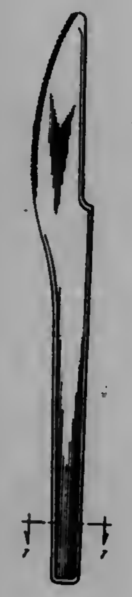
235,305
ARTICLE OF FLATWARE

Augusto Salviato, Corso Mario Abbiate, 110, Vercelli, Italy
Filed June 11, 1973, Ser. No. 369,027
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137



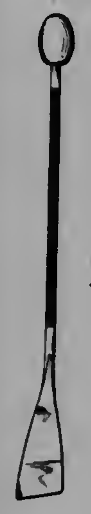
235,306
PLASTIC KNIFE

Hubert E. Christian, 4019 E. Fairmount, 85018, and David W. Lee, 1606 E. Borghese Place, 85016, both of Phoenix, Ariz.
Filed May 21, 1973, Ser. No. 362,356
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—138



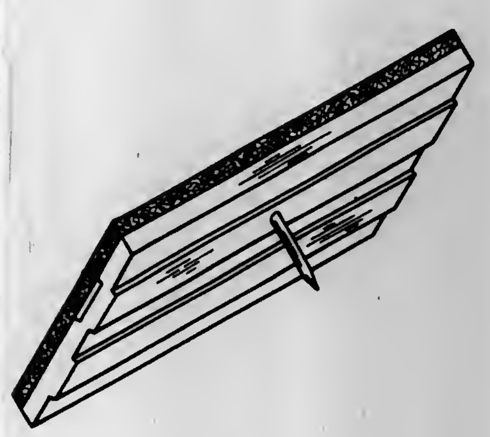
235,307
COMBINED HONEY SPOON AND SPREADER

Rita Shoemaker, 800 NE. 12th Ave., I-144, Homestead, Fla. 33030
Filed Dec. 7, 1973, Ser. No. 422,765
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—149



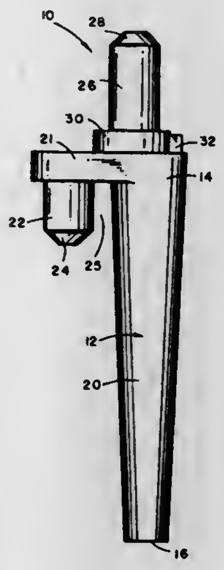
235,308
PICTURE HANGER STABILIZER

Edwin R. Clarke, 129 S. Belmont, Wichita, Kans. 67218
Filed Oct. 17, 1973, Ser. No. 407,304
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—257



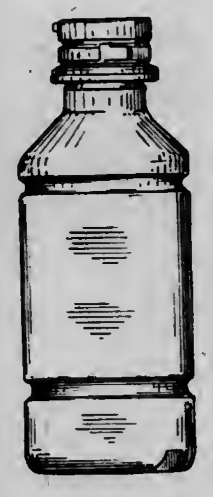
235,309
AEROSOL CONTAINER

Carol Schafer, 1627 Pontius, Los Angeles, Calif. 90005
Filed Dec. 22, 1969, Ser. No. 20,586
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—8



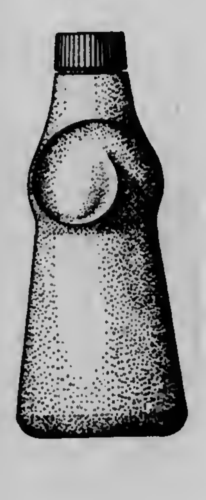
235,310
BOTTLE

Harold Anthony Betka, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Aug. 2, 1973, Ser. No. 385,022
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—10



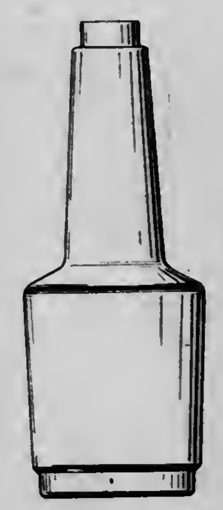
235,311
COMBINED BOTTLE AND CAP THEREFOR

Ronald G. Cramer, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Jan. 12, 1973, Ser. No. 323,029
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—107



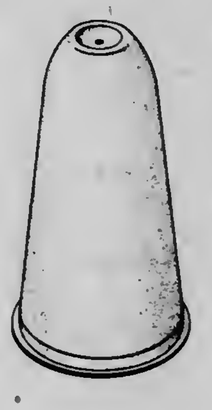
235,312
BOTTLE

Edward J. Kretz, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed July 19, 1973, Ser. No. 380,604
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—127



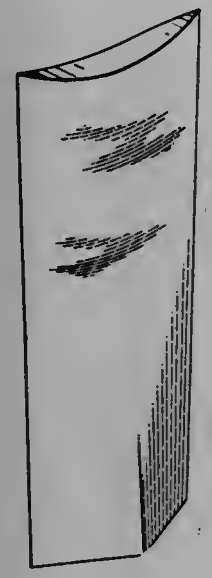
235,313
PLASTIC PREFORM CONTAINER OR THE LIKE

Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Continuation-in-part of design application Ser. No. 247,913, Apr. 26, 1972. This application June 29, 1973, Ser. No. 363,470
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—171



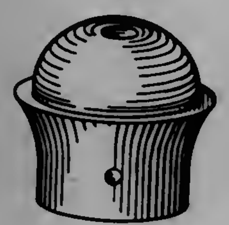
235,314
CARTON

Ronald Frederick Cramphorn, Marlow, England, assignor to Aspro Nicholas, Ltd., Slough, England
Filed Dec. 14, 1971, Ser. No. 208,052
Claims priority, application Great Britain June 26, 1971
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—222



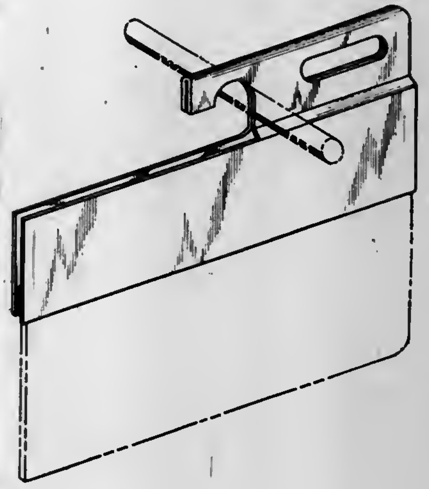
235,315
VALVE ACTUATOR AND DISPENSING HEAD FOR A PRESSURIZED CONTAINER

Paul M. Kotuby, Naugatuck, Conn., assignor to The Risdon Manufacturing Company, Naugatuck, Conn.
Filed Mar. 5, 1973, Ser. No. 338,159
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—258



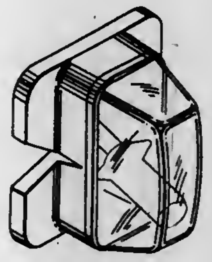
235,316
COMBINED PACKAGING CARD AND HANGER FOR AN ARTICLE OF MERCHANDISE

Charles A. Wells, Coshocton, Ohio, assignor to Pretty Products, Inc., Coshocton, Ohio
Filed Oct. 19, 1973, Ser. No. 407,799
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—291



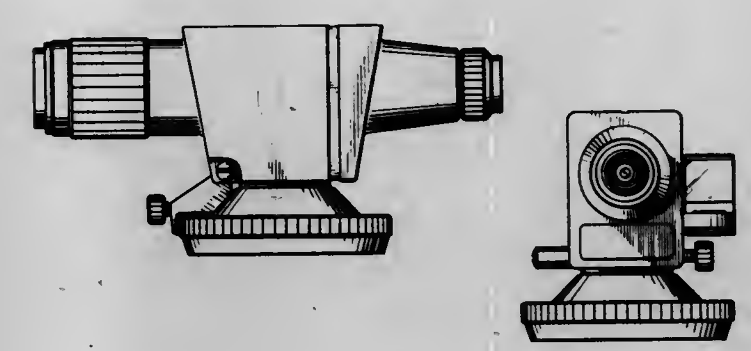
235,317
STUD FINDER

Laird F. Covey, Easton, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Feb. 26, 1973, Ser. No. 335,650
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—46



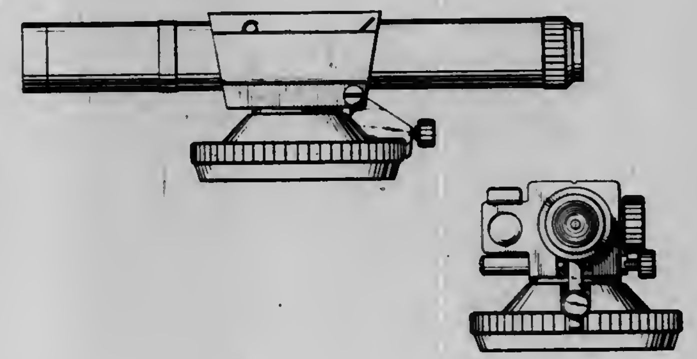
235,318
AUTOMATIC OPTICAL BUILDERS' LEVEL OR THE LIKE

J. Peter E. Kooi, Succasunna, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.
Filed July 30, 1973, Ser. No. 383,924
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—66



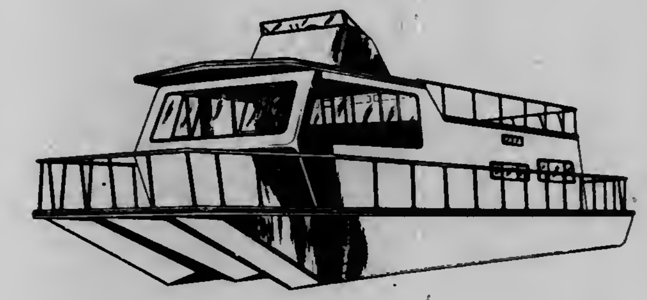
235,319
OPTICAL BUILDERS' LEVEL OR THE LIKE

J. Peter E. Kooi, Succasunna, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.
Filed Aug. 10, 1973, Ser. No. 387,562
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—66



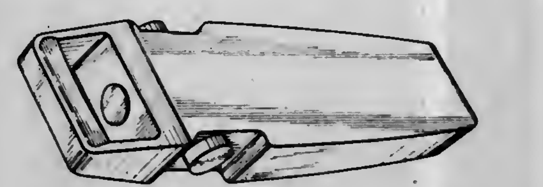
235,320
HOUSEBOAT OR THE LIKE

Richard E. Klingler, Elkhart, Ind., assignor to Holiday Rambler Corp.
Filed June 4, 1973, Ser. No. 366,725
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—67



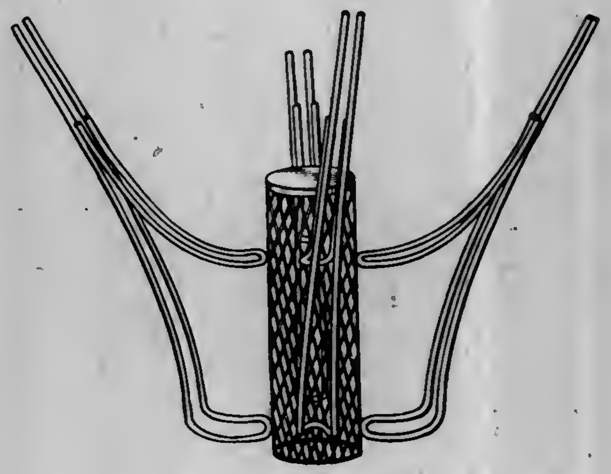
235,321
INSTRUMENT FOR DETECTING ELECTROMAGNETIC RESONANT DEVICES

John A. Mahan, James William M. Bee, and John F. Tyson, Ottawa, Ontario, Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada
Filed July 31, 1973, Ser. No. 384,248
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—78



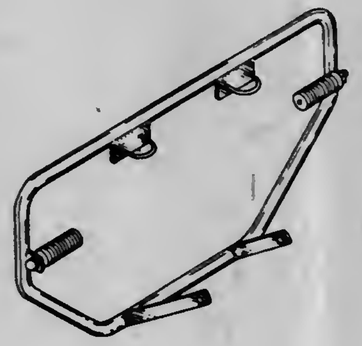
235,322
BICYCLE RACK

Robert E. Sill, 429 15th Ave. SW., Rochester, Minn. 55901
Filed Oct. 26, 1973, Ser. No. 409,952
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D12—115



235,323
COMBINED MOTORCYCLE SAFETY BAR AND FOOT RESTS

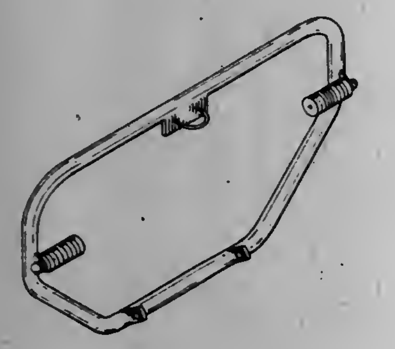
Kenneth E. Higginbotham, 12236 SE. 200th, Kent, Wash. 98031
Filed June 15, 1973, Ser. No. 370,304
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—114



235,324

COMBINED MOTORCYCLE SAFETY BAR AND FOOT RESTS

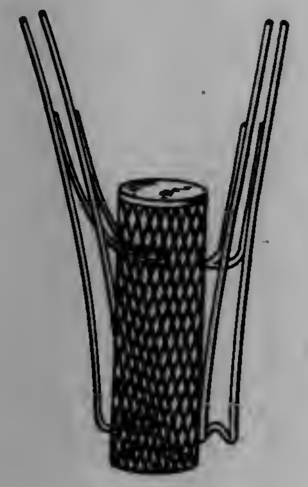
Kenneth E. Higginbotham, 12236 SE. 200th,
Kent, Wash. 98031
Filed June 15, 1973, Ser. No. 370,306
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—114



235,325

BICYCLE RACK

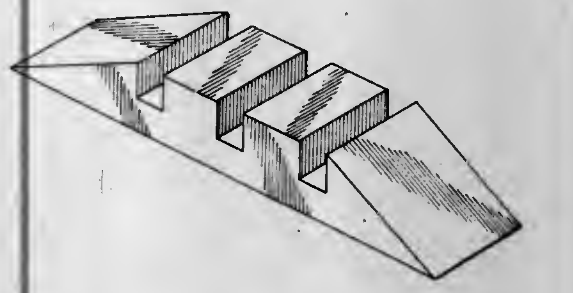
Robert E. Sill, 429 15th Ave. SW.,
Rochester, Minn. 55901
Filed Oct. 26, 1973, Ser. No. 409,955
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D12—115



235,326

VEHICLE TIRE CHAIN APPLICATOR

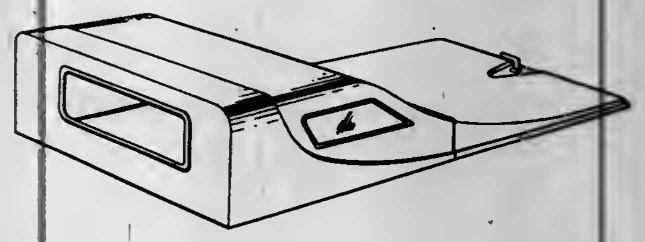
Serge A. Couttet, Box 561, Georgetown, Colo. 80444
Filed Jan. 2, 1973, Ser. No. 319,976
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155



235,327

PICK-UP TRUCK CANOPY

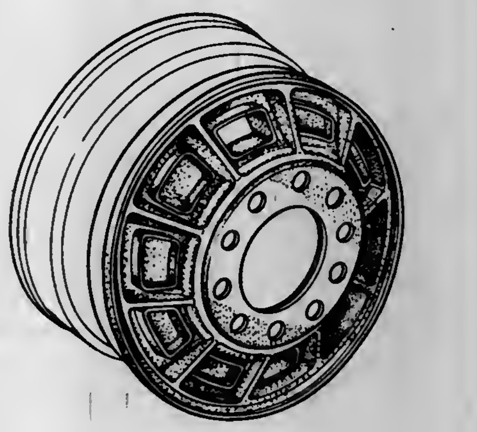
Arthur L. Morris, 3406 Austin Court,
Orange, Calif. 92669
Filed Apr. 1, 1974, Ser. No. 456,764
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



235,328

WHEEL

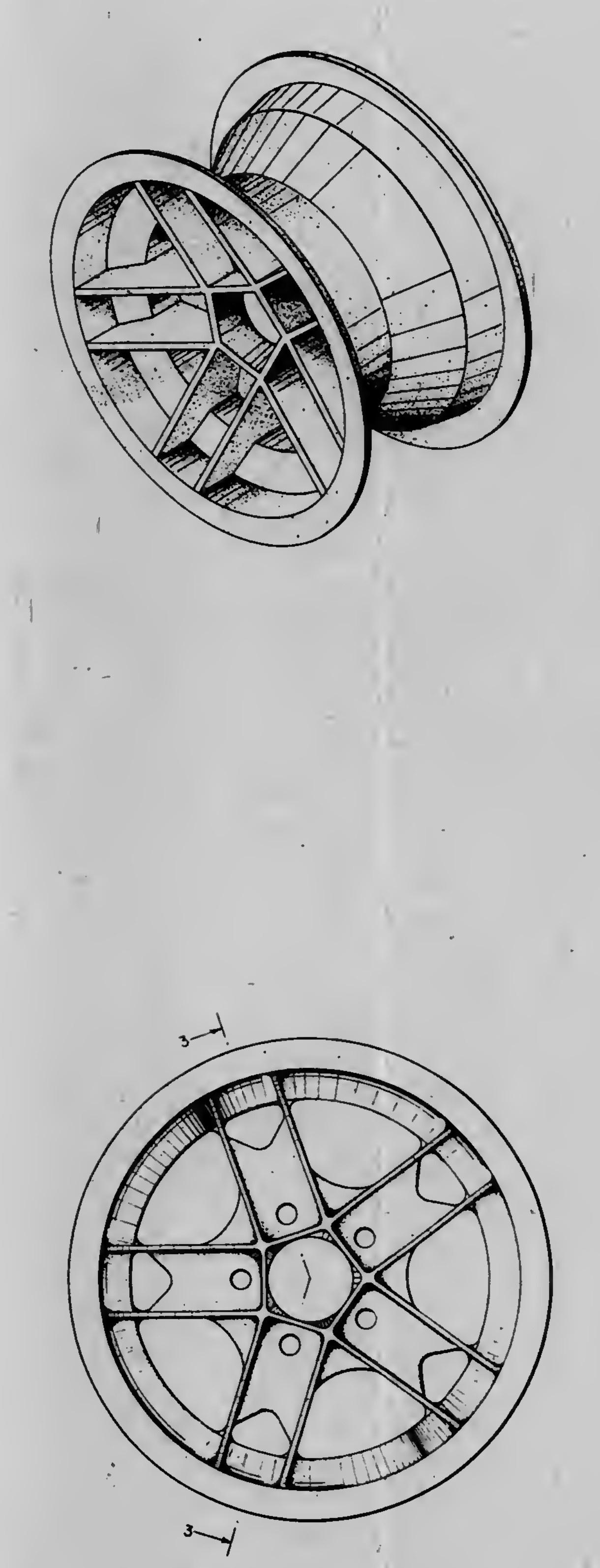
Donald M. Scraver, Madison Heights, Mich., assignor to
The Budd Company, Troy, Mich.
Filed Sept. 4, 1973, Ser. No. 393,860
Term of patent 7 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



235,329

WHEEL

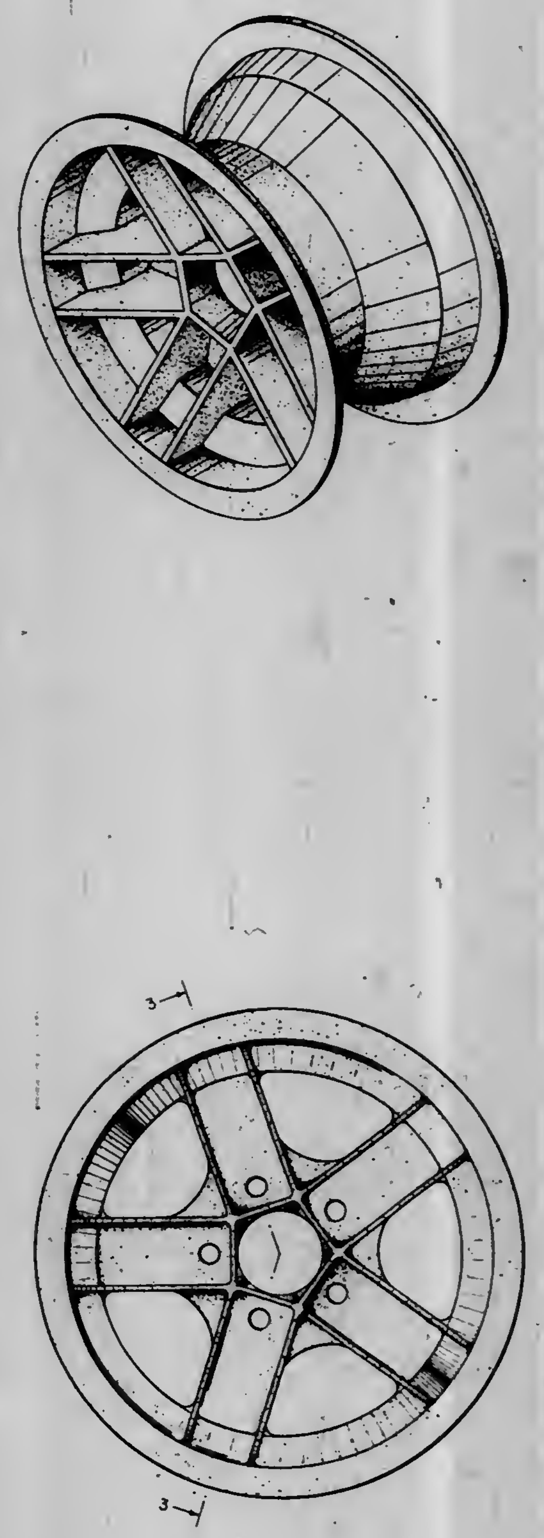
Steven Douglas Gageby, St. Paul, Minn., assignor to
Janet Kay Gageby, St. Paul, Minn.
Filed Aug. 20, 1973, Ser. No. 390,085
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209



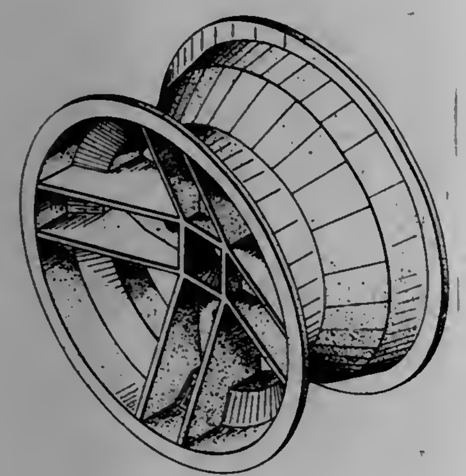
235,330

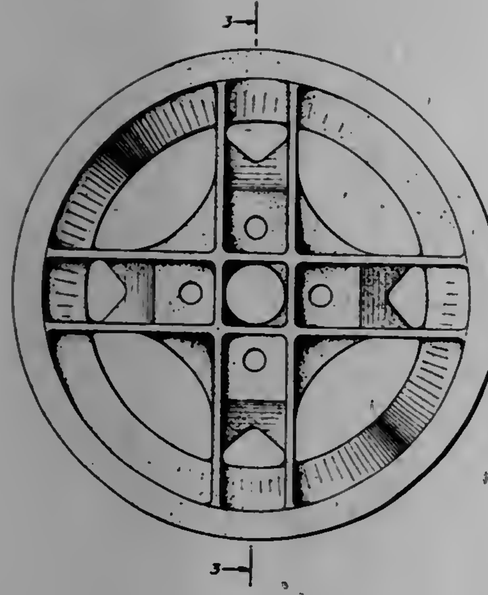
WHEEL

Steven Douglas Gageby, St. Paul, Minn., assignor to
Janet Kay Gageby, St. Paul, Minn.
Filed Aug. 20, 1973, Ser. No. 390,086
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209

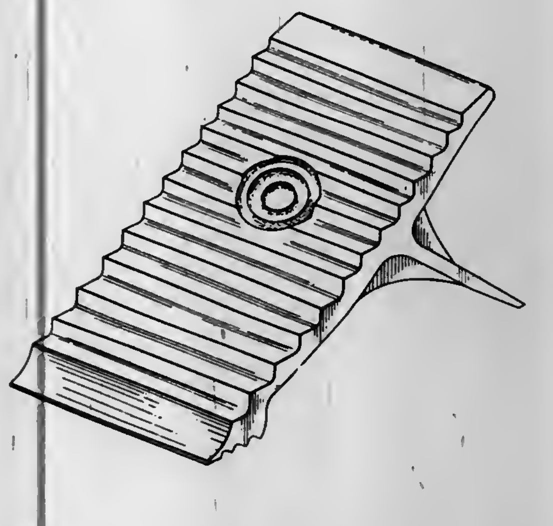


235,331
WHEEL
Steven Douglas Gageby, St. Paul, Minn., assignor to Janet Kay Gageby, St. Paul, Minn.
Filed Aug. 20, 1973, Ser. No. 390,087
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209

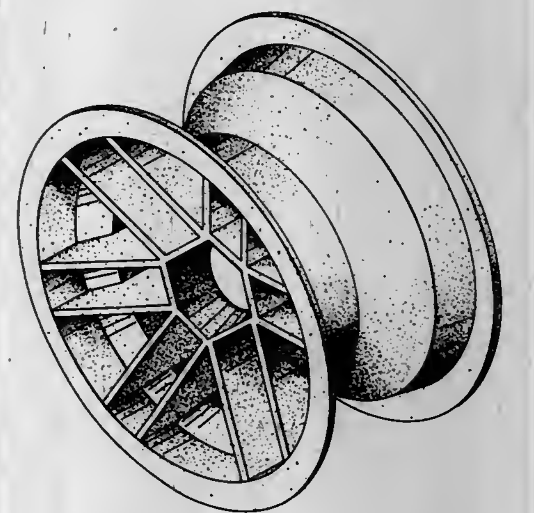


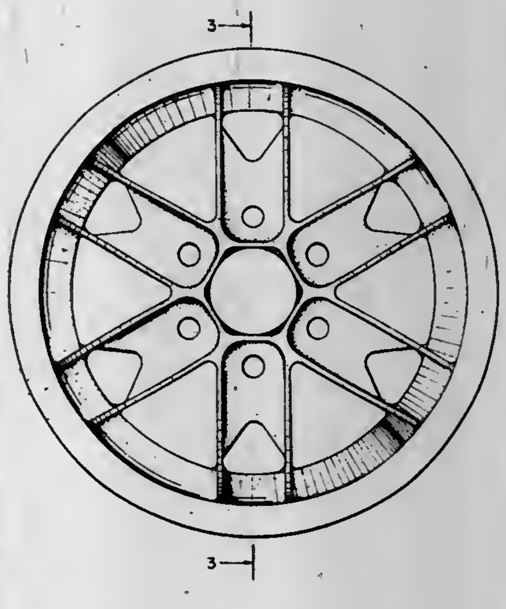


235,332
WHEEL CHOCK
Vincent J. Richilano, Lakewood, Ohio, assignor to Zephyr Industries, Inc., Ashland, Ohio
Filed Sept. 17, 1973, Ser. No. 397,987
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—217

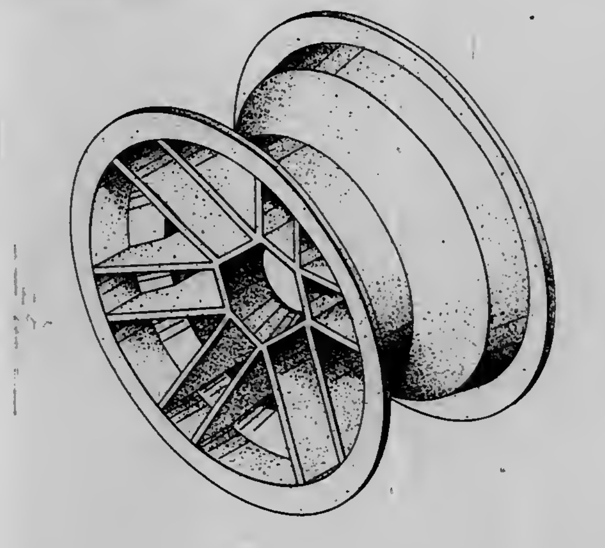


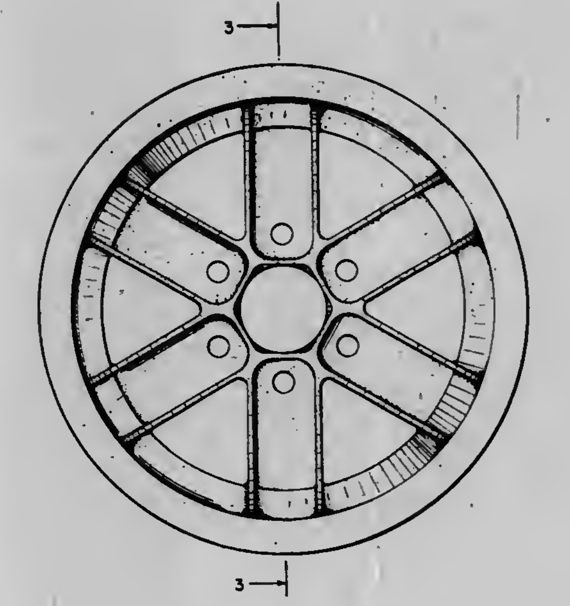
235,333
WHEEL
Steven Douglas Gageby, St. Paul, Minn., assignor to Janet Kay Gageby, St. Paul, Minn.
Filed Aug. 20, 1973, Ser. No. 390,088
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



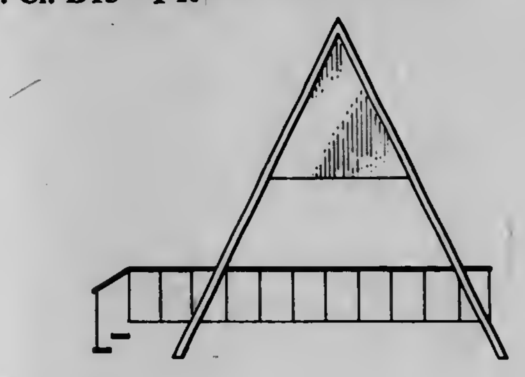


235,334
WHEEL
Steven Douglas Gageby, St. Paul, Minn., assignor to Janet Kay Gageby, St. Paul, Minn.
Filed Aug. 20, 1973, Ser. No. 390,089
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211

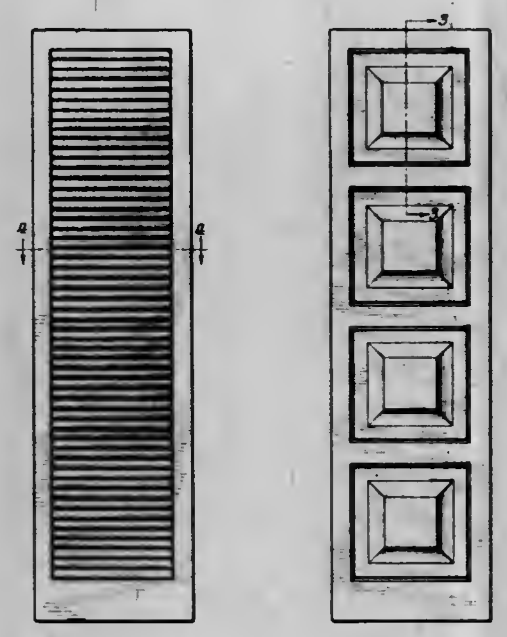




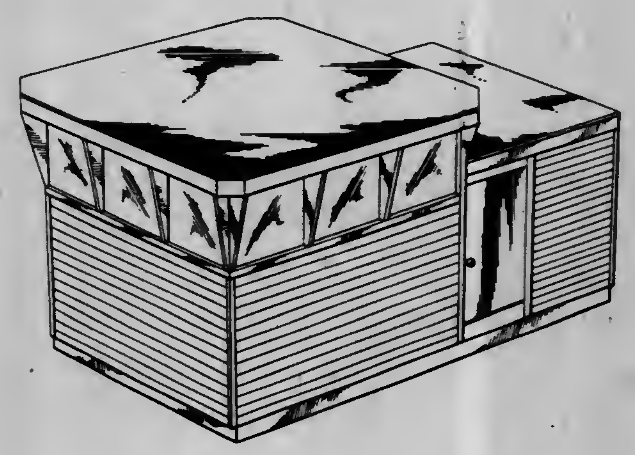
235,335
COMBINED A-FRAME AND DECK FOR MOBILE HOMES
Leon R. Engle, P.O. Box 94, Jefferson, Md. 21755
Filed Jan. 22, 1973, Ser. No. 325,323
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1 R



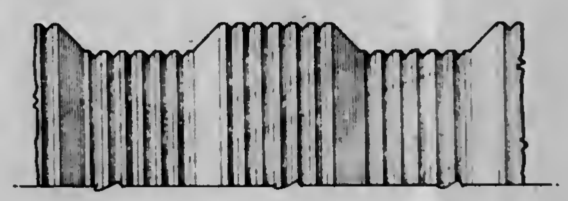
235,336
REVERSIBLE SHUTTER
Albert M. Lee, Peoria, Ill., assignor to HC Products Co., Princeville, Ill.
Filed Nov. 1, 1973, Ser. No. 411,709
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1 M



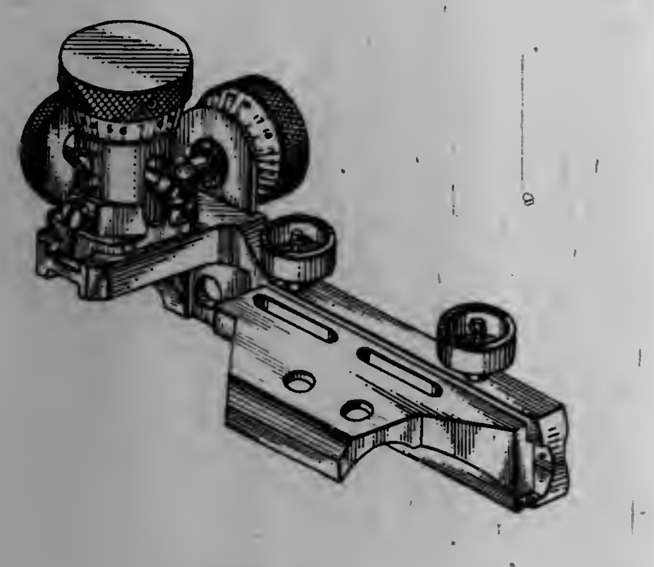
235,337
CONTROL HOUSE OR SIMILAR ARTICLE
Erbie G. Mize and W. Norman Smith, Chattanooga, Tenn., assignors to Astec Industries, Inc., Chattanooga, Tenn.
Filed Dec. 4, 1972, Ser. No. 312,052
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 R



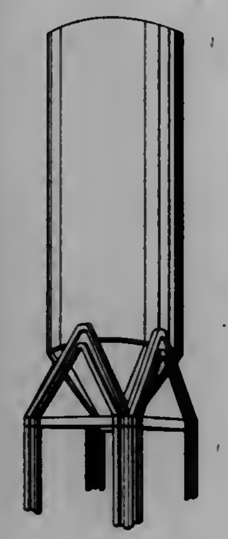
235,338
TEXTILE BOBBIN
Arthur C. Hamilton, 53 Fenley Drive, Weston, Ontario, Canada
Filed Feb. 14, 1973, Ser. No. 332,357
Term of patent 14 years
Int. Cl. 15—*06*
U.S. Cl. D19—15



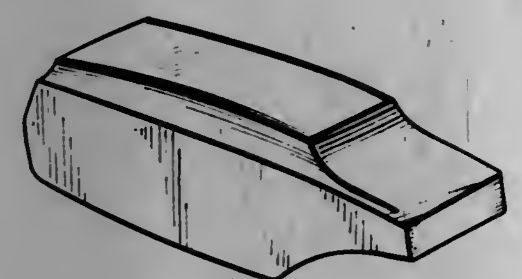
235,339
GUNSIGHT
Olle Edstrom, Langgatan 18, 82700,
Ljusdal, Sweden
Filed Oct. 5, 1973, Ser. No. 403,902
Claims priority, application Sweden, Apr. 10, 1973
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D22—8



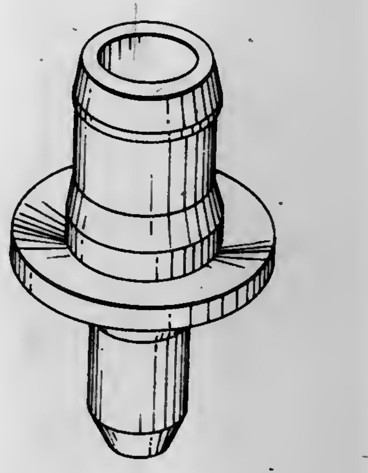
235,340
STORAGE BIN OR SIMILAR ARTICLE
Erbie Gail Mize, Chattanooga, Tenn., assignor to
Astec Industries, Inc., Chattanooga, Tenn.
Filed Nov. 19, 1973, Ser. No. 417,479
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D23—2



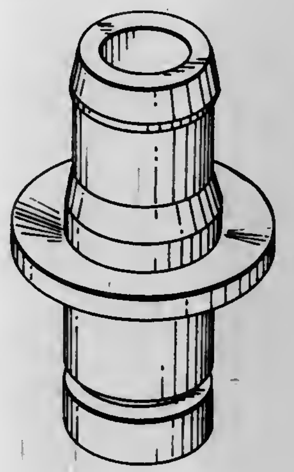
235,341
HANDLE FOR WATER CLOSETS OR THE LIKE
Stanley F. Korol, 457 Shepard Road,
Mansfield, Ohio 44907
Filed Dec. 26, 1973, Ser. No. 428,293
Term of patent 14 years
Int. Cl. D23—*01*; D8—*06*
U.S. Cl. D23—29



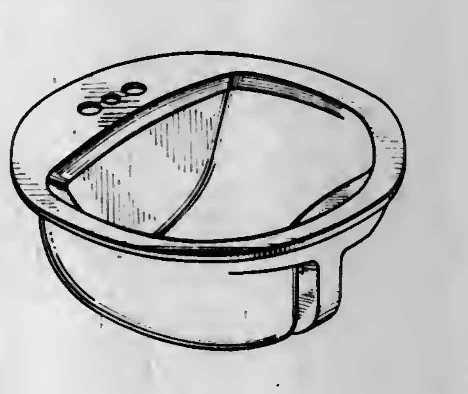
235,342
FILTER TUBE CAP
Walter Otto, Wantagh, N.Y., assignor to Sethco
Manufacturing Corp., Freeport, N.Y.
Filed Aug. 24, 1973, Ser. No. 391,438
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—41



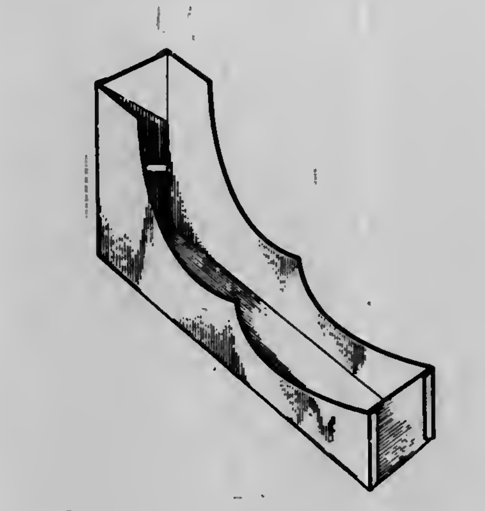
235,343
FILTER TUBE CONNECTOR
Walter Otto, Wantagh, N.Y., assignor to Sethco
Manufacturing Corp., Freeport, N.Y.
Filed Aug. 24, 1973, Ser. No. 391,439
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—43



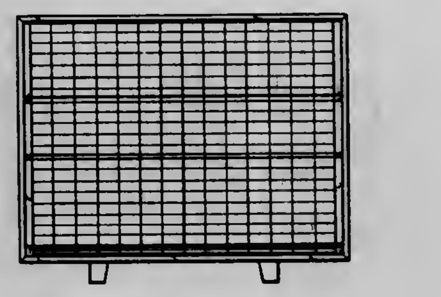
235,344
LAVATORY
Stanley F. Korol, 457 Shepard Road,
Mansfield, Ohio 44907
Filed Dec. 28, 1973, Ser. No. 429,320
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—58



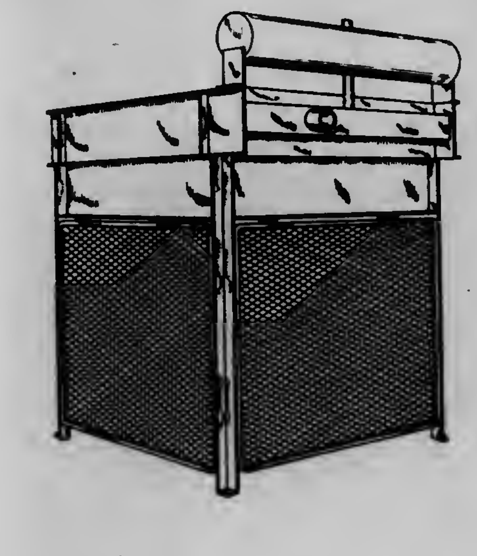
235,345
HOLDER FOR BURNING INCENSE
Joseph Fields, 140—19 Linden Blvd.,
Jamaica, N.Y. 11436
Filed July 5, 1974, Ser. No. 486,107
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D23—78



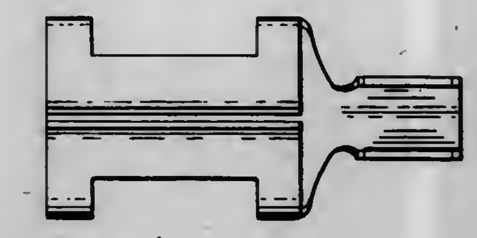
235,346
PORTABLE HEATER OR SIMILAR ARTICLE
Raymond E. Benson, Oak Park, Ill., assignor to
Olin Corporation, New Haven, Conn.
Filed Oct. 15, 1973, Ser. No. 406,513
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—122



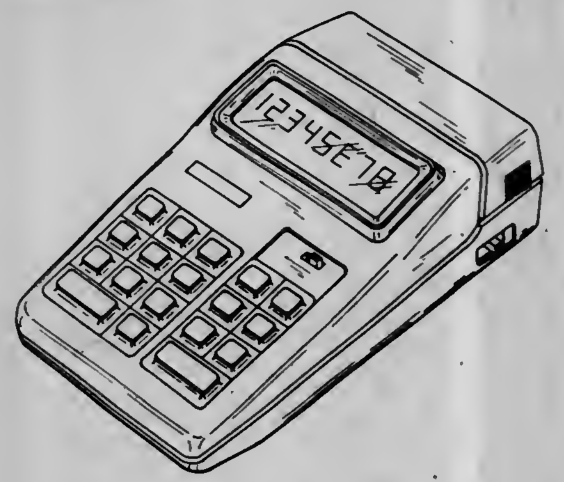
235,347
INDUSTRIAL RADIATOR FOR USE IN LOW PRESSURE WATER COOLING SYSTEMS
Fred M. Young, Racine, Wis., assignor to Young
Radiator Company, Racine, Wis.
Filed May 16, 1974, Ser. No. 470,397
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—139



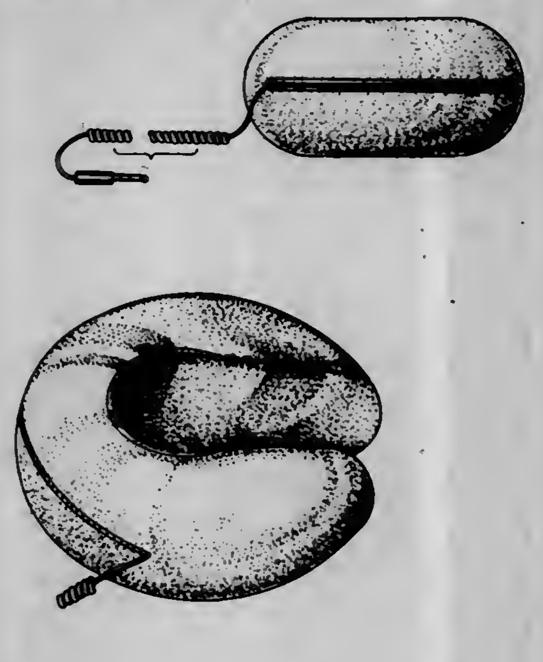
235,348
ELECTRICAL TAB RECEPTACLE
William Vito Pauza, Palmyra, and Wilmer Lee Sheesley,
Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Jan. 7, 1974, Ser. No. 431,178
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A



235,349
ELECTRONIC CALCULATING MACHINE
Shigeru Kurozumi, Osaka, Japan, assignor to Sharp
Kabushiki Kaisha, Osaka, Japan
Filed Jan. 30, 1974, Ser. No. 437,922
Claims priority, application Japan Aug. 1, 1973
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C



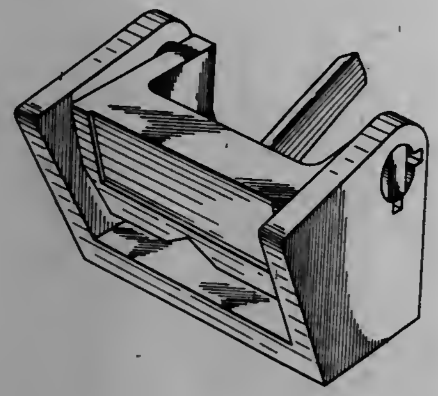
235,350
HEADPHONES OR THE LIKE
Stephen C. Hanson, Chicago, Ill.
(4504 Bryan Place, Downers Grove, Ill. 60515)
Filed Feb. 2, 1973, Ser. No. 329,224
Term of patent 14 years
Int. Cl. D14—*01*; D6—*09*
U.S. Cl. D26—14 G



235,351

PHONOGRAPH STYLUS

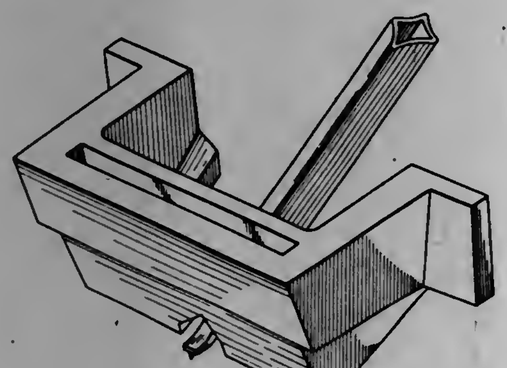
Robert L. Deschamps, Wheaton, Ill., assignor to Shure Brothers Incorporated, Evanston, Ill.
Filed Dec. 12, 1973, Ser. No. 424,185
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 D



235,352

PHONOGRAPH STYLUS

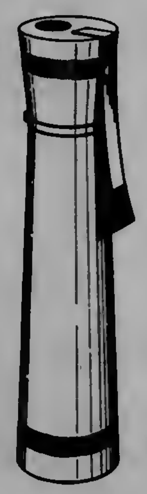
Robert L. Deschamps, Wheaton, Ill., assignor to Shure Brothers Incorporated, Evanston, Ill.
Filed Dec. 12, 1973, Ser. No. 424,186
Term of patent 14 years
Int. Cl. D14—*01;* D14—*99*
U.S. Cl. D26—14 D



235,353

CIGARETTE LIGHTER

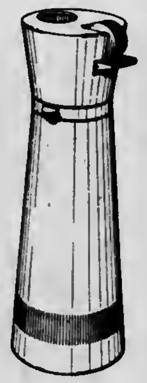
George L. Schick, Trumbull, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed July 1, 1974, Ser. No. 484,642
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—39



235,354

CIGARETTE LIGHTER

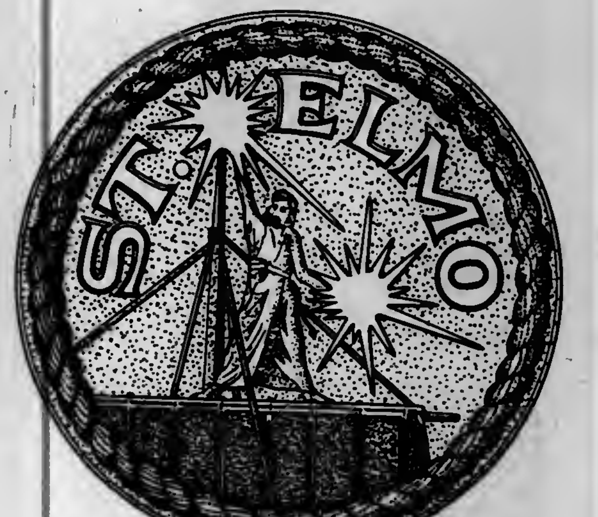
George L. Schick, Trumbull, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed July 1, 1974, Ser. No. 484,643
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—39



235,355

MEDALLION

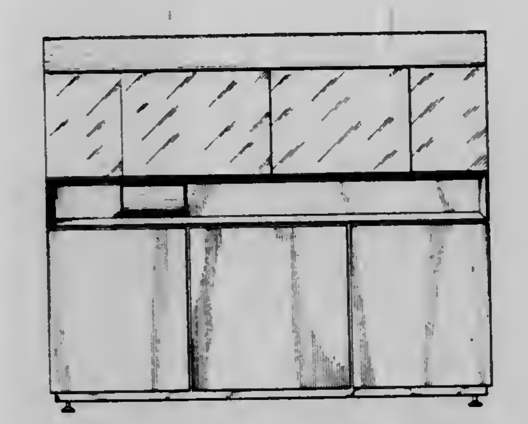
Henry K. Rigg, 18 West St.,
Annapolis, Md. 21404
Filed Nov. 5, 1973, Ser. No. 412,543
Term of patent 3½ years
Int. Cl. D11—*02*
U.S. Cl. D29—19 R



235,356

CHEMICAL VAPOR DEPOSITION REACTOR OR SIMILAR ARTICLE

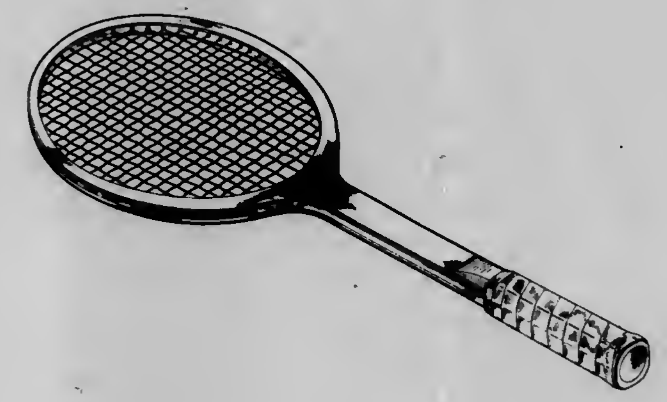
William George Faraco, Jr., 13561 Howen Drive,
Saratoga, Calif. 95070
Filed Nov. 1, 1973, Ser. No. 411,728
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D32—2



235,357

TENNIS RACKET

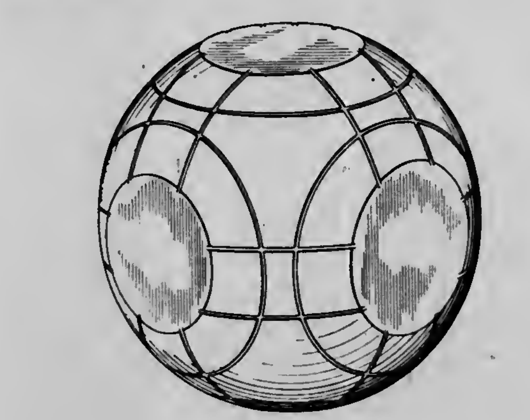
William H. Schaefer and Richard E. Bender, San Diego, Calif., assignors to General Dynamics Corporation, San Diego, Calif.
Filed Feb. 16, 1973, Ser. No. 333,429
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST



235,358

FACETED GAME BALL

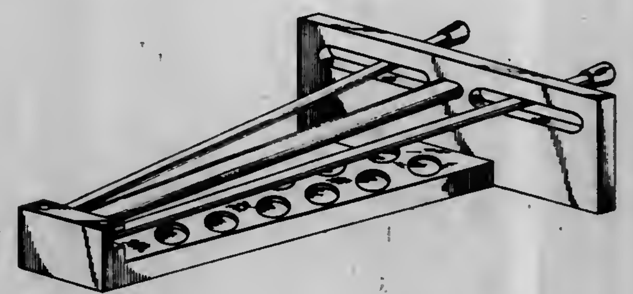
André Dufaud, 20, Rue de la Republique
Privas, France
Filed May 4, 1973, Ser. No. 357,517
Claims priority, application France Nov. 15, 1972
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 GP



235,359

BALL GAME BOARD OF THE HAND MANIPULATING TYPE

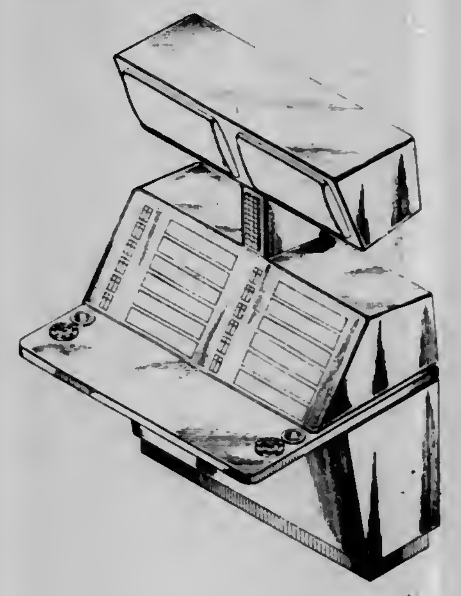
Stanley Sharpless Smith, Jr., P.O. Box 194,
New Canaan, Conn. 06840
Filed June 28, 1973, Ser. No. 374,495
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



235,360

BOWLING SCORER

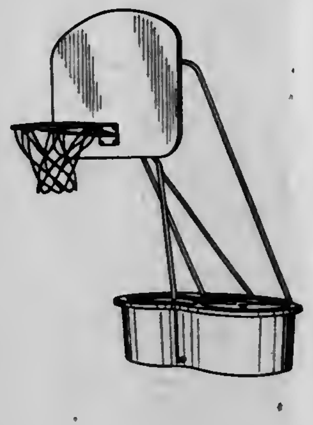
Stephen F. Brucker, Dayton, Ohio, assignor to AMF Incorporated
Filed Sept. 13, 1973, Ser. No. 396,880
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 DD



235,361

POOL BASKETBALL GOAL

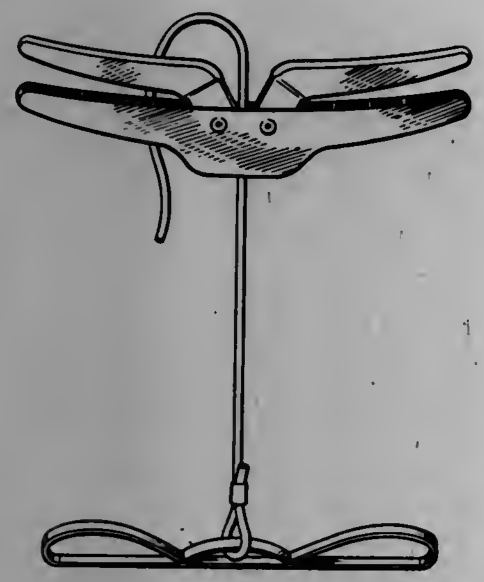
William R. Benton, 3434 Diversion Drive,
Spring Valley, Calif. 92077
Filed Nov. 12, 1973, Ser. No. 414,638
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 VV



235,362

EXERCISER

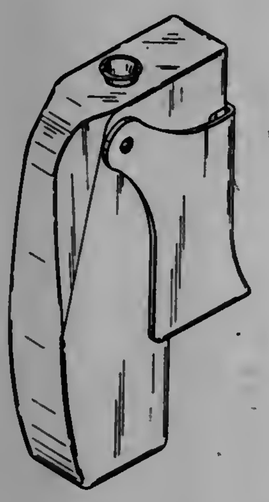
Richard H. Pray, 5156 Via Valverde,
Santa Barbara, Calif. 93111
Filed Dec. 19, 1973, Ser. No. 426,303
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 K



235,363

TOY WATER GUN

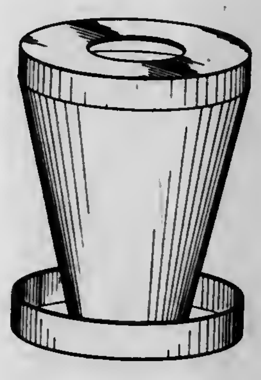
Francis M. L. Barthropp, West Vancouver, British Columbia, Canada, assignor to Barton of Canada Ltd., Burnaby, British Columbia, Canada
Filed Oct. 1, 1973, Ser. No. 402,122
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 VV



235,364

PLANT FEEDER

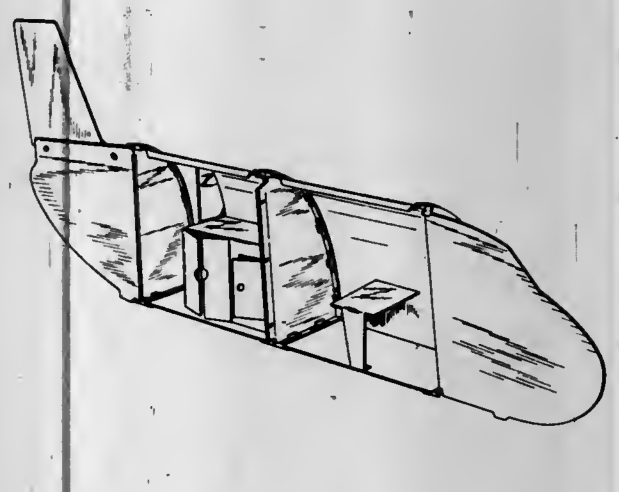
Arthur L. Fassauer, Canyon, Tex., assignor to Fassauer Industries, Inc., Canyon, Tex.
Filed May 7, 1973, Ser. No. 357,874
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 A



235,365

COMBINED CARRYING CASE AND PLAY SCENE FOR DOLLS

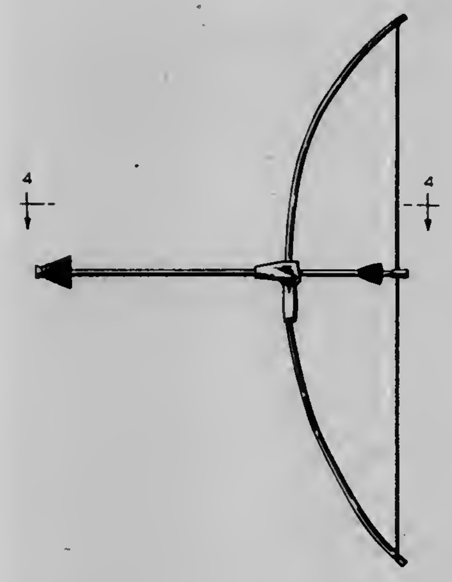
Derek J. Gay, Palos Verdes Peninsula, William H. Smedley, and Aaron G. Cohen, Los Angeles, and Michael W. Nuttall, South Pasadena, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Nov. 15, 1973, Ser. No. 416,147
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 A



235,366

COMBINED ARCHERY GAME PROJECTOR AND SHUTTLECOCK PROJECTILE

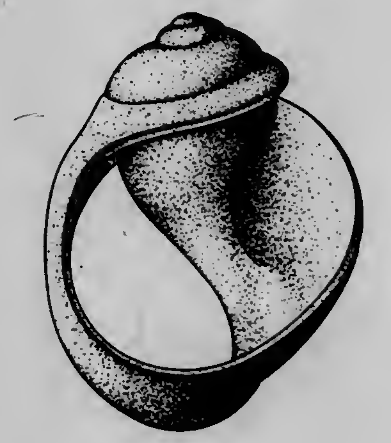
Alexander Imatt, 1595 N. Calle La Cumbre, and Derek A. Brand, 2132 Lyndhurst Ave., both of Camarillo, Calif., 93010
Filed Dec. 6, 1973, Ser. No. 422,328
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15.22



235,367

FINGER RING

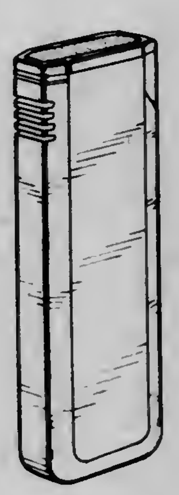
George J. Yevick, 536 Nordhoff Drive,
Leonia, N.J. 07605
Filed Nov. 27, 1973, Ser. No. 419,191
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10 A



235,368

LIGHTER

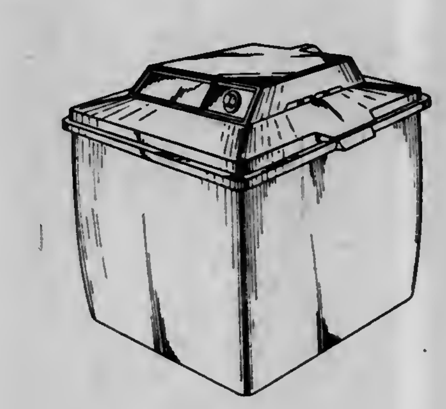
Franz Alban Stuetzer, Muhlheim am Main, Germany, assignor to Rowenta-Werke GmbH
Filed Nov. 20, 1973, Ser. No. 417,700
Claims priority, application Germany, May 21, 1973
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36



235,369

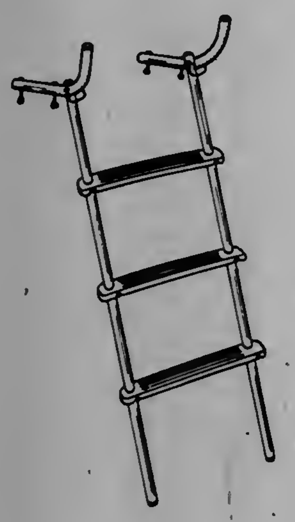
PORTABLE ELECTRIC WASHER

Downer P. Dykes, Lawrence, Kans., assignor to Rival Manufacturing Company, Kansas City, Mo.
Filed Dec. 5, 1973, Ser. No. 421,935
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D49—1 A



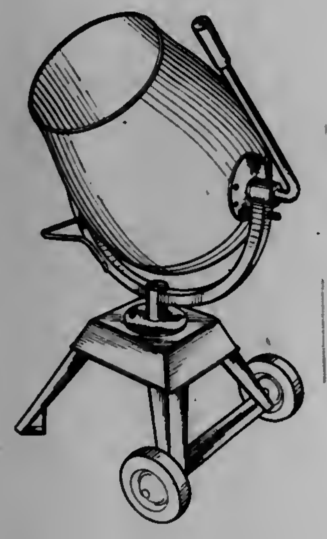
235,370
SAFETY LADDER FOR SWIMMING POOL PLATFORM

Peter F. Gannon, Troy, Mich., assignor to Vinyl-Fab Industries, Ferndale, Mich.
Filed Aug. 15, 1973, Ser. No. 388,581
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D54—1 A



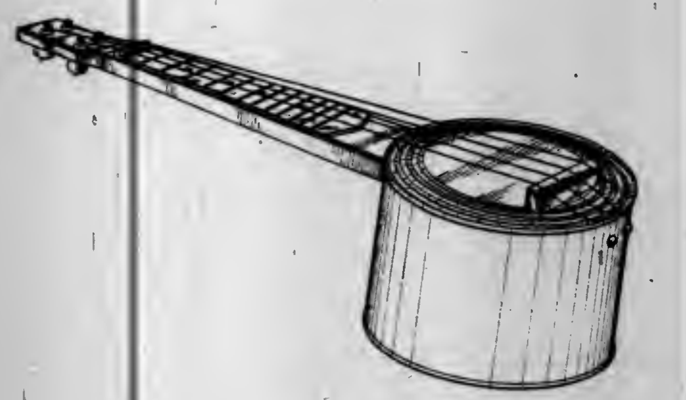
235,371
CEMENT MIXER

Jack L. Ponkey, and William H. Armstrong, Troy, Mich., assignors to The J. B. Foote Foundry Co., Fredericktown, Ohio
Filed Aug. 3, 1972, Ser. No. 277,631
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D55—1 D



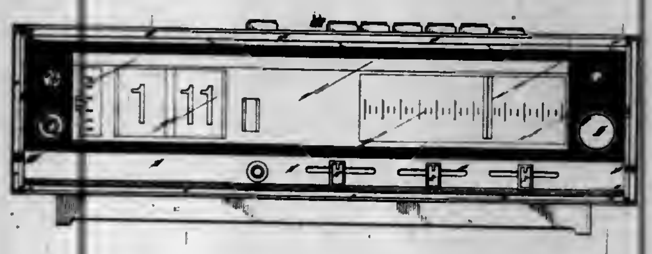
235,372
STRINGED MUSICAL INSTRUMENT

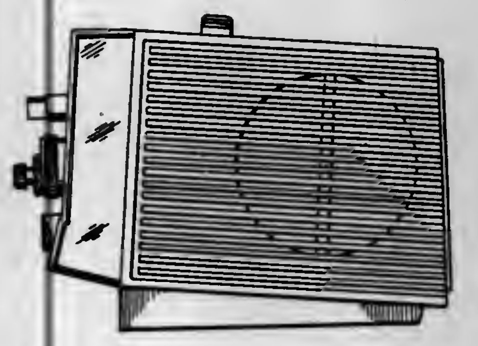
Frank M. Hebbert, 4599 Highland Drive, Salt Lake City, Utah 84117
Filed Nov. 13, 1972, Ser. No. 305,782
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A



235,373
DIGITAL CLOCK RADIO

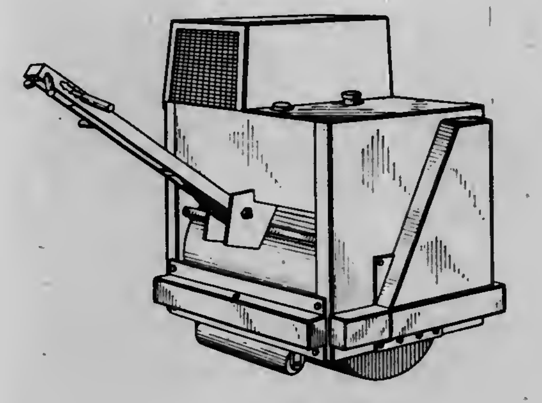
Minol Araki, Tokyo, Japan, assignor to Lloyd's Electronics Inc., Compton, Calif.
Filed Sept. 21, 1973, Ser. No. 399,283
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B





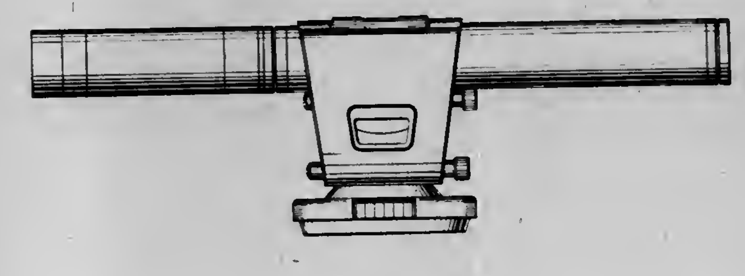
235,374
COMPACTOR

Salvatore F. Aiello, Racine, Wis., assignor to Loed Corporation, Wausau, Wis.
Filed Oct. 30, 1972, Ser. No. 302,137
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D60—1



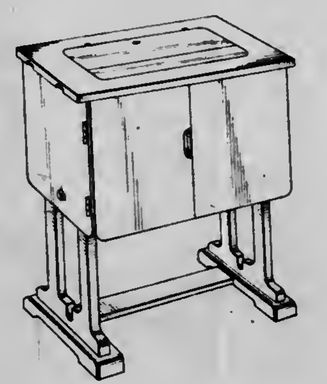
235,375
LASER GRADING TRANSIT OR THE LIKE

J. Peter E. Kooi, Succasunna, and Allister L. Baker, Denville, N.J., assignors to Keuffel & Esser Company, Morristown, N.J.
Filed Aug. 17, 1973, Ser. No. 389,074
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—66



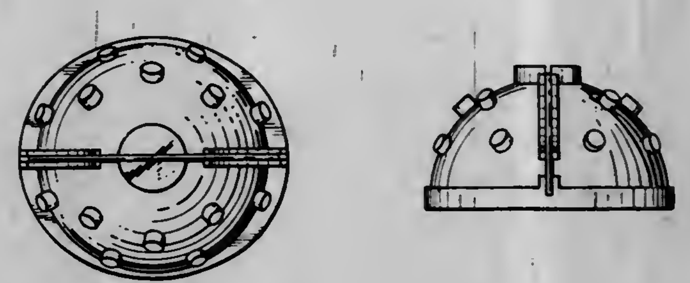
235,376
VERTICALLY ADJUSTABLE SEWING MACHINE CABINET

Robert S. Peets, Watchung, N.J., assignor to The Singer Company
Filed No. 12, 1973, Ser. No. 415,283
Term of patent 14 years
Int. Cl. D15—*06*
U.S .Cl. D70—1



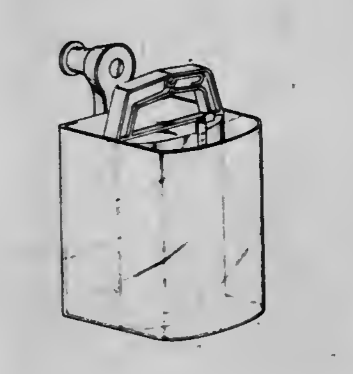
235,377
ACETABULAR CUP

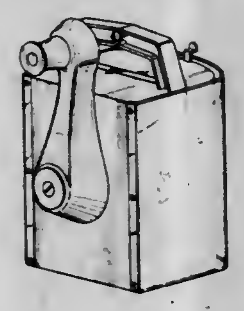
Samuel Medcraft, 6 Barnfield Road, Swindon, England
Filed Mar. 23, 1973, Ser. No. 344,281
Claims priority, application Great Britain Jan. 24, 1973
Term of patent 7 years
Int. Cl. D24—*99*
U.S. Cl. D83—1 E



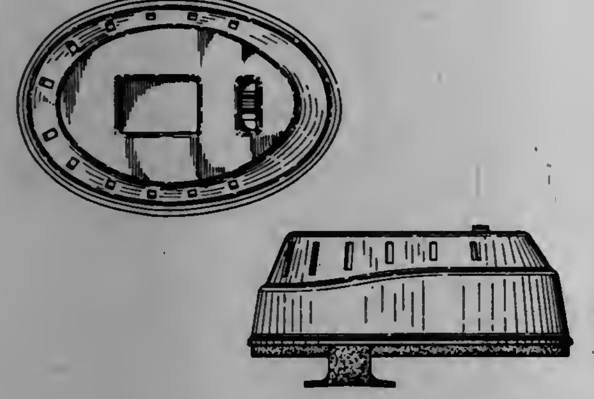
235,378
PRESSURE BLOOD INFUSER

Joseph E. Mason, Melville, N.Y., assignor to New Dimensions Research Corporation, Old Bethpage, N.Y.
Filed May 25, 1973, Ser. No. 363,862
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 F

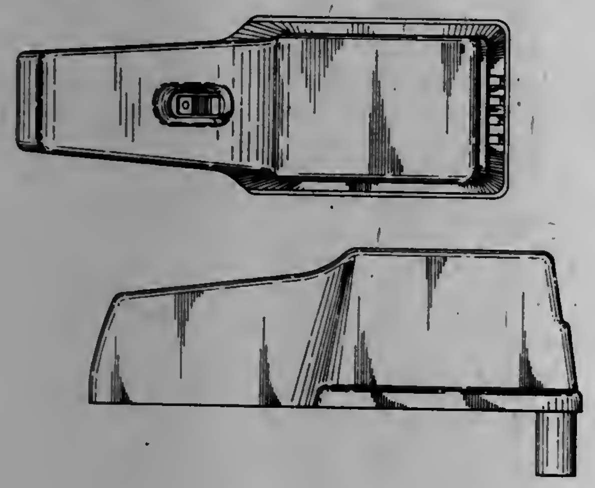




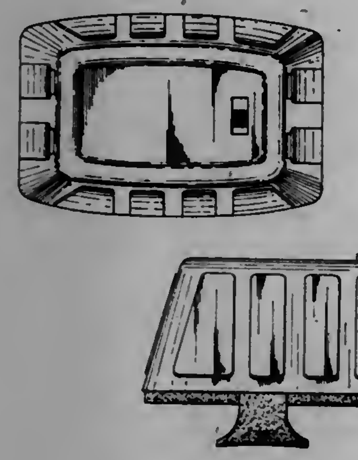
235,379
HAND MOUNTED ELECTRICAL MASSAGER
Samuel L. McNair, Overland Park, Kans., assignor to Dazey Products Co., Kansas City, Mo.
Filed Aug. 28, 1973, Ser. No. 392,260
Term of patent 14 years
Int. Cl. D28—*03;* D24—*99*
U.S. Cl. D83—1 T



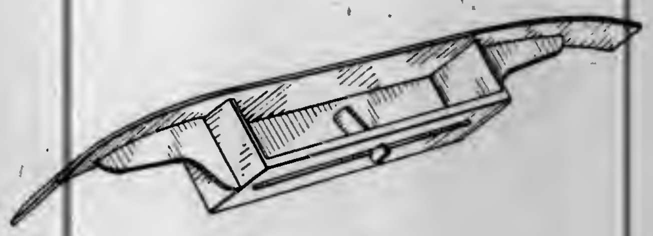
235,380
HAND HELD POWER UNIT FOR MASSAGING DEVICES
Samuel L. McNair, Overland Park, Kans., assignor to Dazey Products Co., Kansas City, Mo.
Filed Aug. 28, 1973, Ser. No. 392,261
Term of patent 14 years
Int. Cl. D28—*03;* D24—*99*
U.S. Cl. D83—1 T



235,381
HAND SUPPORTED ELECTRICAL MASSAGER
Samuel L. McNair, Overland Park, Kans., assignor to Dazey Products Co., Kansas City, Mo.
Filed Oct. 24, 1973, Ser. No. 409,280
Term of patent 14 years
Int. Cl. D28—*03;* D24—*99*
U.S. Cl. D83—1 T



235,382
TAPE STORAGE RACK
Robert P. McInnes, 1108 Fairway Drive, Linden, Mich. 48451
Filed Feb. 26, 1973, Ser. No. 335,529
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1 D



235,383
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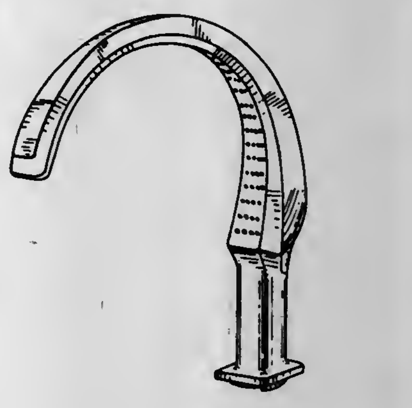
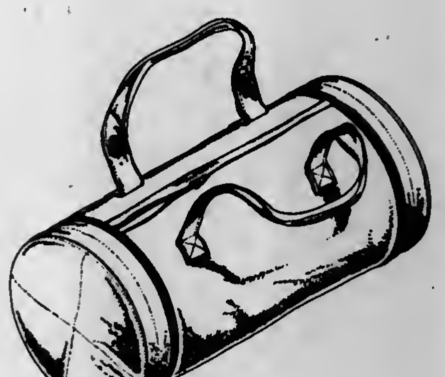
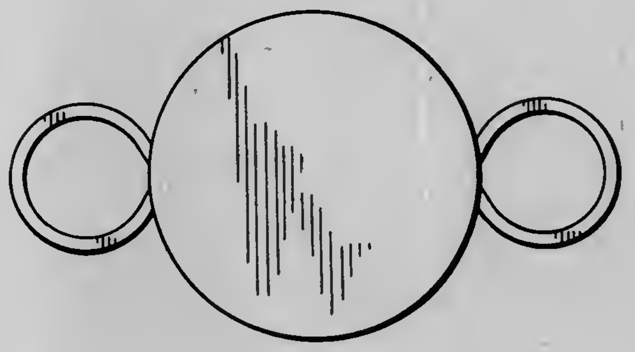
Samuel L. McNair, Overland Park, Kans., assignor to Dazey Products Co., Kansas City, Mo.
Filed Nov. 19, 1973, Ser. No. 416,749
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F



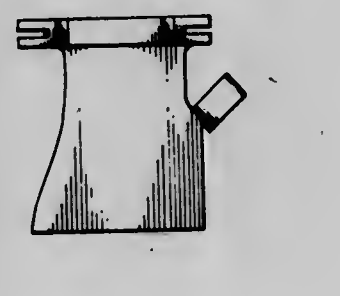
235,384
DUFFEL BAG
Dorothy M. Theilkas, 2046 W. Windsor Ave. Phoenix, Ariz. 85009
Filed May 23, 1973, Ser. No. 362,889
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 G



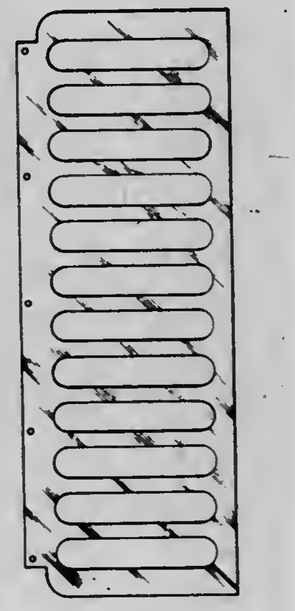
235,385
KEY HOLDER
James A. Smyth, R.D. 1, Wilcox, Pa. 15870
Filed June 14, 1973, Ser. No. 369,813
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—8



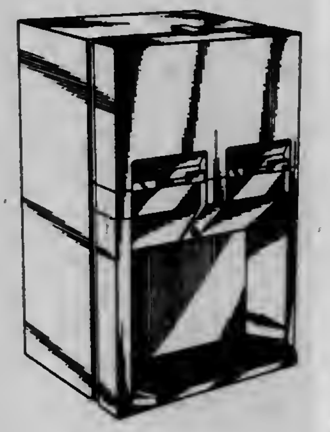
235,386
UMBRELLA RUNNER WITH LEVER
Heinz Weber, Hilden, Germany, assignor to Telesco Brophey Limited, Montreal, Quebec, Canada
Continuation of abandoned design application Ser. No. 24,599, Aug. 20, 1970. This application Aug. 10, 1971, Ser. No. 170,676
Claims priority, application Germany Feb. 20, 1970
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D88—3 A



235,387
SAFETY SHIELD FOR A TEXTILE COMBING MACHINE
Philip B. Tarbox, Clemson, and Carey A. Glazener, Easley, S.C., assignors to Maremont Corporation
Filed Jan. 18, 1973, Ser. No. 324,883
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D92—15



235,388
COMBINED BEVERAGE COOLER AND DISPENSER
William Taylor, Columbus, Ohio, assignor to Ebco Manufacturing Company, Columbus, Ohio
Filed Nov. 2, 1973, Ser. No. 412,448
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D94—3 B



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF JUNE, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. O. Smith-Inland, Inc.: *See—*
  - Fiser, James T.; Jackman, Robert M.; and James, Ray R., 3,888,714.
- A.P.V. Company Limited, The: *See—*
  - Starkie, Granville Lewis, 3,888,167.
- A.R.D. Anstalt: *See—*
  - Gabr, Saad Zaghoul Mohamed, 3,889,058.
- A. Schild S.A.: *See—*
  - Zaugg, Roland; and Fluck, Josef, 3,888,076.
- AB Motala Verkstad: *See—*
  - Wessman, Bo Henry, 3,889,078.
- Abe, Hidetoshi: *See—*
  - Toriyama, Kazuhisa; Nakano, Fumio; Sato, Mikio; Abe, Hidetoshi; and Kanazaki, Mikio, 3,888,566.
- Abel, Leon A.: *See—*
  - Tosato, Lawrence; Abel, Leon A.; and Mullis, Clyde M., 3,889,231.
- Abele, Werner; and Schneider, Rudolf, to du Pont de Nemours, E. I., and Company. Silver halide photographic material containing antifog agent with protected mercapto group. 3,888,677, Cl. 96-76.00R.
- Abramitis, Walter W., to Akzona Incorporated. Tobacco sucker control. 3,888,654, Cl. 71-78.000.
- ACME Electric Corporation: *See—*
  - Randall, Ronald Harold, 3,889,176.
- Action Communication Systems, Inc.: *See—*
  - Epstein, Barry M., 3,889,062.
- Adams, Carl: *See—*
  - Adams, Edward, Jr.; Adams, Carl; and Adams, Ronald, 3,888,481.
- Adams, David O., Jr.; and Skaggs, John H., to AMF Incorporated. Verification means for shear wave ultrasonic inspection system. 3,888,114, Cl. 73-67.80R.
- Adams, Edward, Jr.; Adams, Carl; and Adams, Ronald. Training and practicing apparatus for wrestling. 3,888,481, Cl. 272-83.00R.
- Adams, Ronald: *See—*
  - Adams, Edward, Jr.; Adams, Carl; and Adams, Ronald, 3,888,481.
- Adickes, Fred; Livesey, James R.; Weir, George; Bailey, Dennis; and Mehelich, John J., to Wolverine Toy Company. Bowling game. 3,888,483, Cl. 273-38.000.
- Admiral Corporation: *See—*
  - Bagwe, Suhas Prataprao, 3,889,194.
- Aerjet-General Corporation: *See—*
  - Eggington, Wilfred J.; and Douglas, Owen, 3,888,330.
- Aero Industries, Inc.: *See—*
  - Smith, Philip L., 3,889,104.
- African Explosives and Chemical Industries Limited: *See—*
  - Hughes, David Owen, 3,888,792.
- Agfa-Gevaert Aktiengesellschaft: *See—*
  - Freytag, Karl-Heinz; Meyer, Rudolf; and Hoffman, Klaus, 3,889,271.
  - Hoffmann, Klaus; Konig, Hans-Dieter; and Meyer, Rudolf, 3,889,270.
  - Kisselmann, Willy; Rumpelein, Fritz; and Kopf, Paul, 3,889,187.
  - Meyer, Rudolf; Hoffmann, Klaus; Freytag, Karl-Heinz; and Vetter, Hans, 3,889,269.
- Ahlen, Karl Gustav, to S.R.M. Hydromekanik Aktiebolag. Modulating arrangement for servo-motor actuated disc brake. 3,888,141, Cl. 74-730.000.
- Ahrens, Claude W. Stair unit for a stairway. 3,888,058, Cl. 52-191.000.
- Ajinomoto Co., Inc.: *See—*
  - Ishizaki, Ayaaki; Morinaga, Yasushi; Sakakibara, Hiroyuki; and Horiuchi, Masao, 3,888,740.
- Akiyama, Masanori: *See—*
  - Suzuki, Takeshi; Takenaka, Shigeo; Tanaka, Hiroshi; and Akiyama, Masanori, 3,888,673.
- Akiyama, Taichiro. Drain for the eardrum and apparatus for introducing the same. 3,888,258, Cl. 128-305.000.
- Akiyoshi, Katsumi; Terui, Yukimasa; Kirigaya, Hitoshi; and Koyama, Haruo, to Bridgestone Tire Company Ltd. Method for producing fiberglass reinforced plastic composite pipes. 3,888,712, Cl. 156-171.000.
- Akturk, Nuri Uygun; and Ashdown, Ronald Arthur, to Foster Wheeler Corporation. Boilers. 3,888,213, Cl. 122-478.000.
- Akzo N.V.: *See—*
  - Brouwer, Anton H. J., 3,889,010.
- Akzona Incorporated: *See—*
  - Abramitis, Walter W., 3,888,654.
- Albin, Max D., to Koehring Company. Mobile concrete batch plant and dual shiftable mobile mixers therefor. 3,888,468, Cl. 259-171.000.
- Alcan Research and Development Limited: *See—*
  - Williams, Merlyn Morris, 3,888,621.
- Alderfer, Sterling W., to Steelastic Company, The. Method for producing reinforced fabric. 3,888,713, Cl. 156-93.000.
- Alderman, Albert D., Jr.; and Cherian, Gabriel B., to Sperry Rand Corporation. Sheet limiter. 3,888,478, Cl. 271-8.00R.
- Alferness, Merwin H.; and Miller, John A., to Sperry Rand Corporation. Common storage controller for dual processor system. 3,889,237, Cl. 340-172.500.
- Allcock, Harry Rex, to Firestone Tire & Rubber Company, The. Preparation of phosphazene polymers. 3,888,800, Cl. 260-2.00P.
- Allegheny Ludlum Industries, Inc.: *See—*
  - Ferree, Joseph A., Jr., 3,888,659.
- Allen, George Rodger, Jr.; and McEvoy, Francis Joseph, to American Cyanamid Company. Process of preparing 3-alkyl-3-(benzoyl)propionitriles. 3,888,901, Cl. 260-465.00R.
- Allen, Jeral D., to Watertite Industries, Inc. Metal stud and track former. 3,888,099, Cl. 72-129.000.
- Allen, John A. Poultry raising system and process. 3,888,211, Cl. 119-18.000.
- Allen, William Douglas; and Morris, Michael, to United Kingdom Atomic Energy Authority. Electrostatic generator. 3,889,138, Cl. 310-6.000.
- Allergan Pharmaceuticals: *See—*
  - Boghosian, Malcolm P.; and Blanco, Milagros V., 3,888,782.
- Allied Chemical Corporation: *See—*
  - Crescentini, Lamberto; and Wells, Rodney Lee, 3,888,944.
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  - Gilleo, Kenneth B.; Evans, Francis E.; and Sogn, Allen W., 3,888,822.
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- Alliston, William H.; and Johnson, Steven J., to Westinghouse Electric Corporation. Method and system for nuclear power plant synchroscope simulation for operator training. 3,889,106, Cl. 235-151.210.
- Allmanna Svenska Elektriska Aktiebolaget: *See—*
  - Berglund, Ake; Suvanto, Antti; and Tomblom, Lars, 3,888,732.
- Alsup, James M., to United States of America, Navy. Acoustic devices for time-multiplexed communication. 3,889,065, Cl. 179-15.0BC.
- Alt, Gerhard H., to Monsanto Company. N-nitroso-N-phosphonomethyl glycine compounds and herbicidal use thereof. 3,888,915, Cl. 260-501.210.
- Alza Corporation: *See—*
  - Higuchi, Takeru; and Uekama, Kaneto, 3,888,848.
  - Ramwell, Peter W., 3,888,975.
- Amano, Hisao: *See—*
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- Amano, Tadashi; and Andoh, Ryuichi, to Konishiroku Photo Industry Co., Ltd. Process of and system for printing in color photography. 3,888,580, Cl. 355-38.000.
- Amchem Products, Inc.: *See—*
  - Rodzewich, Edward A., 3,888,783.
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  - Pierce, Edwin F.; Roberts, Larry W.; and Maddox, Leland D., 3,888,069.
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- American Chain Cable Company, Inc.: *See—*
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  - Sellstedt, John H.; Guinosso, Charles J.; and Bell, Stanley C., 3,888,858.
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Kemmetmueller, Roland, 3,888,742.

Ames, Robert G., to Ulysses Stanley Ames. Recess filling mastic applicator having four point contact with surface and novel tool-steering means. 3,888,611, Cl. 425-87.000.

Amex Systems, Inc.: *See—*

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Anderson, E. Eugene: *See—*

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Anderson, Edward J. Hanger assembly for attaching a form to a structural beam. 3,888,452, Cl. 249-23.000.

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Anderson, James J.; and Camacho, Vasco G., to Mobil Oil Corporation. Preparation of tris (2-chloroethyl) phosphite. 3,888,953, Cl. 260-977.000.

Anderson, Paul L., to Sandoz, Inc. 4-Hydroxyethyl-biphenylylbutadienols. 3,888,933, Cl. 260-618.00R.

Anderson, Paul L., to Sandoz, Inc. Biphenylene-substituted-butadienols. 3,888,934, Cl. 260-618.00F.

Anderson, Richard S.; Crafts, Robert L.; Murphy, John A.; Patterson, Irvin L.; and Schultz, Harold P., to Midwestern Instruments, Inc. Means for recording multi-bit character data. 3,889,294, Cl. 360-52.000.

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Andersson, Per-Erik; and Horntvedt, Einar, to Svenska Cellulosa Aktiebolaget. Method and apparatus for oxidizing sulphide-containing aqueous solutions. 3,888,967, Cl. 423-206.000.

Ando, Reijiro; and Iwai, Shigeru, to Kabushiki Kaisha Daini Seikosha. Industrial robot. 3,888,360, Cl. 214-1.0BB.

Ando, Takuji: *See—*

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Arden, Richard J.; and Schweriner, Harold A., to Simco Company, Inc., The. Contact printing apparatus with electrostatic hold-down. 3,888,586, Cl. 355-78.000.

Arey, William F., Jr.; and Sawyer, Willard H., to Exxon Research and Engineering Company. Rare earth chrysotile catalysts. 3,888,793, Cl. 252-454.000.

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Arnaudin, Edwin H., Jr.; Christiansen, Wilbert W.; and Hazelett, Robert I., Jr., to Anaconda Company, The. Apparatus for applying a dual extrusion over a cable conductor. 3,888,718, Cl. 156-356.000.

Arndt, Peter Joseph; Pennewiss, Horst; Plainer, Hermann; Krall, Wilhelm; Masanek, Juergen; and Mueller, Manfred, to Rohm GmbH. Method for preparing polymers in solid particulate form. 3,888,945, Cl. 260-876.00R.

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Arpe, Hans-Jurgen, to Hoechst Aktiengesellschaft. Process for the preparation of pivalolactone. 3,888,884, Cl. 260-343.900.

Arrandale, Roy S.; Walding, Wayne A.; and Daugherty, Barney R., to Dart Industries Inc. Method of coating glass article and improved coated glassware product. 3,889,030, Cl. 428-215.000.

Arthur D. Little, Inc.: *See—*

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Pars, Harry G.; and Razdan, Raj K., 3,888,946.

Artzer, Paul J., to Appleton Electric Company. Machine for assembling a gasket assembly. 3,888,723, Cl. 156-499.000.

Arya, Manohar L., to Warwick Electronics Inc. Double tuned retrace driven horizontal deflection circuit. 3,889,156, Cl. 315-408.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*

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Akturk, Nuri Uygun; and Ashdown, Ronald Arthur, 3,888,213.

Ashton, George. Container filler apparatus. 3,888,285, Cl. 141-168.000.

Asinger, Friedrich; Gluzek, Karl-Heinz; and Offermanns, Heribert, to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler. Process of making penicillamine. 3,888,923, Cl. 260-534.00S.

Asselman, George Albert Apolonia; and Dirne, Adrianus Petrus, to U.S. Philips Corporation. Electric soldering iron delivering heat by change of state of a liquid heat transporting medium. 3,889,096, Cl. 219-229.000.

Assmus, Ulf E.; Bartel, Willy; and Hessenmuller, Horst, to Siemens Aktiengesellschaft. Method of safeguarding the transmission of the continuous polarity in data transmission systems transferring a polarity reversal in coded form. 3,889,235, Cl. 340-146.10R.

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Atsukawa, Masumi; Shinoda, Naoharu; and Kuwubara, Haruo, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of separating impurities for removal in desulfurization of effluent gas in a wet lime-gypsum process. 3,888,968, Cl. 423-242.000.

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Automatisme et Technique: *See—*

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Avital, Shlomo; Silbermann, Menahem; and Elson, David. Plural-sample filter device. 3,888,770, Cl. 210-238.000.

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Azzarello, Joseph A.; and Di Vita, Fosco L., to International Harvester Company. Tractor hitch sway limiting device. 3,888,316, Cl. 172-450.000.

B. V. Nederlandse Kraanbouw Maatschappij: *See—*

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Back, Frank G. Navigation and surveillance system. 3,889,052, Cl. 178-6.000.

Baclit, Paul S. Combined cigarette package holder and ashtray compartment. 3,888,264, Cl. 131-235.00R.

Bacso, Imre, to Sandoz, Inc. 17α-substituted-allene-bearing steroids. 3,888,849, Cl. 260-239.500.

Bader, Henry; and Rickter, Donald O., to Polaroid Corporation. Novel processes for photographic products. 3,888,875, Cl. 260-314.500.

Bader, Henry; and Boag, Alexander, to Polaroid Corporation. Novel processes for photographic products. 3,888,876, Cl. 260-314.500.

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Baermann, Max, to Max Baermann, Firma. Induction brake or clutch. 3,889,140, Cl. 310-103.000.

Baetz, Jacques L. E., to Seperic. Derivatives of thiazolino-pyrimidin-6-ones, in inducing analgesia. 3,888,983, Cl. 424-251.000.

Bagozzi, Ottaviano Clerici. Apparatus for loading a magnetic tape into a cassette. 3,888,480, Cl. 242-56.00R.

Bagshawe, Kenneth Dawson. Performance of chemical or biological reactions within an absorbent matrix pad. 3,888,629, Cl. 23-230.00B.

Bagwe, Suhas Prataprao, to Admiral Corporation. Television tuner to reduce harmonic radiation interference. 3,889,194, Cl. 325-436.000.

Bagwell, Dennis P., to Tomorrow Enterprises, Inc. Cutting tool. 3,888,005, Cl. 30-286.000.

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Bailey, William J., Jr.; Houle, James F.; and Van Norman, Gilden R., to Eastman Kodak Company. Method for adjusting triboelectric charging characteristics of materials. 3,888,678, Cl. 96-87.00A.

Bain, Peter James Stratford; and McCall, Ernest Bryson, to Monsanto Chemicals Limited. Thermally reversible polymer compositions prepared from polyisothiocyanates. 3,888,964, Cl. 264-236.000.

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Bannier, David William: *See—*

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Bardet, Gerard, to Automatisme et Technique. Machine for the production of foundry cores and moulds. 3,888,299, Cl. 164-228.000.

Barnett, Louis H. Apparatus for forming multiple passageway conduit. 3,888,617, Cl. 425-296.000.

Barrows, Franklin H.: *See—*

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Bartel, Willy: *See—*

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Bartholomew, Donald D., to Merit Plastics, Inc. Non-threaded tubing connector. 3,888,523, Cl. 285-382.000.

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Barton, Glen B. Adjustable angle double cutting mitre cut-off saw. 3,888,152, Cl. 83-471.300.

Barton, Glen B. Variable degree vice. 3,888,476, Cl. 269-41.000.

Bartram, James F., to Dewey Electronics Corporation, The. Multiple correlation method and apparatus for measuring and summing time differences. 3,889,266, Cl. 343-112.00R.

Basey, Otis, to Cosco, Inc. Cart-leg connection. 3,888,192, Cl. 108-156.000.

BASF Aktiengesellschaft: *See—*

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Basham, Jack K., to TRW Inc. Tunnel diode digital data sample, decision and hold circuit. 3,889,134, Cl. 307-268.000.

Bashark, Larry Thomas, to Whirlpool Corporation. Control system for dishwasher. 3,888,269, Cl. 134-57.00D.

Basile, Peter A., to Amerace Corporation. Multiple grip length mounting bolt. 3,888,064, Cl. 52-758.00F.

Bass, John M. Electronic hazard tester for medical facilities. 3,889,184, Cl. 324-62.000.

Bass, Merlyn Duane; and Gerhardt, Ralph August, to Deere & Company. Method of loading agricultural machines on a railroad. 3,888,189, Cl. 105-367.00R.

Bastian, Jean-Michel; and Hasspacher, Klaus, to Sandoz, Inc. N,N′-bis[3-hydroxy-2-(3,4-dihydroxy-phenyl)-1-propyl]-aliphatic-diamines. 3,888,829, Cl. 260-570.600.

Battaerd, Hendrik Adriaan Jacobus: *See—*

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Battarel, Claude, to Techniques et Systemes Informatiques. Propagation register for magnetic domains. 3,889,246, Cl. 340-174.0ZB.

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Battle Creek Equipment Company: *See—*

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Bauch, Ernst, to Neumunstersche Maschinen-und Apparatebau Ges. mbH. Crimping of synthetic plastic filaments. 3,887,972, Cl. 28-1.400.

Baudermann, Adolf, to Cross Europa-Werk GmbH. Cutting process and device for producing parallel-flanked grooves. 3,888,161, Cl. 90-11.00C.

Bauer, Andreas: *See—*

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Bauer, Ralph L.; and Simpson, Fred E., to Caterpillar Tractor Co. Swing bearing with bolt-on segmented gear. 3,888,357, Cl. 212-68.000.

Bauer, Wilhelm; and Stahlschmitt, Horst, to Pfaff Industriemaschinen GmbH. Thread cutter device on chain stitch sewing machine. 3,888,198, Cl. 112-252.000.

Baumann, Hans-Peter; and Keller, Robert-Christian, to Sandoz, Inc. Novel cyclic sulphones and derivatives thereof. 3,888,913, Cl. 260-501.190.

Baxter Laboratories, Inc.: *See—*

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Bayer Aktiengesellschaft: *See—*

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Wank, Joachim; Reese, Eckart; Rohrbach, Josef; and Bruck, Rolf, 3,889,040.

Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., to Rohm and Haas Company. Herbicidal 4-trifluoromethyl-4-nitrodiphenyl ethers. 3,888,932, Cl. 260-612.00R.

Beatrice Foods Co.: *See—*

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Beaver-Advance Corporation: *See—*

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Bechtold, James H.: *See—*

Shoupp, William E.; and Bechtold, James H., 3,888,658.

Becker, John L.; Hohnecker, Otto; and Dunne, Maurice J., to Unimation, Inc. Programmed manipulator arrangement for continuously moving conveyor. 3,888,361, Cl. 214-1.0BH.

Beckerer, Frank S.; and Beckerer, Frank S., Jr. Cutting apparatus for strip stock. 3,888,151, Cl. 83-411.00A.

Beckerer, Frank S., Jr.: *See—*

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Beckwith, Merton; and Hsu, Grace F. Bright dip composition for tin/-lead. 3,888,778, Cl. 252-79.300.

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Perreault, Donald A.; Bedzyk, Victor Lee; Matthews, Larry Richard; Rivers, Roy Wilben; Shuey, David Rolling; and Torpie, John David, 3,889,057.

Beecham Group Limited: *See—*

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Bell & Howell Co.: *See—*

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Bell, Lon E., to Technar Incorporated. Sensor assembly for use in a vehicle equipped with a gas bag restraint system. 3,889,232, Cl. 340-52.00H.

Bell, Stanley C.: *See—*

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Bellina, Russell Frank, to du Pont de Nemours, E. I., and Company. n-Alkoxy-n-alkylamino substituted dithiazolium salts. 3,888,872, Cl. 260-306.80R.

Belthle, Heinz, to Fortuna Werke Maschinenfabrik AG. Control of the motion of a work tool carriage. 3,888,051, Cl. 51-165.770.

Bencini, Roberto. Mechanism for speed reduction and stopping the film drive for use in cinematographic projectors. 3,888,574, Cl. 352-194.000.

Bendix Corporation, The: *See—*

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Bennett, Clarence L., Jr.; De Lorenzo, Joseph D.; and Durling, Hubert P., Jr., to Sperry Rand Corporation. Static magnetic field metal detector. 3,889,249, Cl. 340-258.00R.

Bennett, John D., to Sun Oil Company. System for chipping and moving ice. 3,888,544, Cl. 299-25.000.
Benoit, Lucien E. Device for determining the position and outline of openings to be made in sheet materials. 3,888,013, Cl. 33-174.00G.
Berghausen, Jakob, to International Harvester Company. Vehicle ballast weight assembly. 3,888,507, Cl. 280-150.00E.
Berglund, Ake; Suvanto, Antti; and Tornblom, Lars, to Allmanna Svenska Elektriska Aktiebolaget. Inlet for fuel assembly having finger control rods. 3,888,732, Cl. 176-50.000.
Bergsland, Jon, to Oivind Lorentzen Activities, Inc. Foundation wall protective sheet. 3,888,087, Cl. 61-11.000.
Bergwerksverband GmbH: *See—*
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Beriger, Ernst, to Ciba-Geigy Corporation. Control of pests with O-ethyl-S-(N)-propyl-S-carbamoylalkyl dithiophosphates. 3,888,979, Cl. 424-211.000.
Berkley & Company, Inc.: *See—*
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Berntson, E. Boyd; and Lemmons, Douglas. Weighted surgical belt. 3,888,245, Cl. 128-78.000.
Berry, Ronald: *See—*
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Bert, Silas E., to du Pont de Nemours, E. I., and Company. Toggle crimper. 3,888,105, Cl. 72-410.000.
Bessmer, Stanley J.; and Lampe, Warren R., to General Electric Company. Self-bonding two-package room temperature vulcanizable silicone rubber compositions. 3,888,815, Cl. 260-37.0SB.
BFG Glassgroup: *See—*
  Groth, Rolf, 3,889,026.
Biber, Conrad H., to Polaroid Corporation. Belt driven automatic reflex camera. 3,889,280, Cl. 354-86.000.
Bidlack, Harvey D., to Dow Chemical Company, The. Chemical tree-pruning method. 3,888,656, Cl. 71-94.000.
Biedermann, Kurt: *See—*
  Bigalke, Erhard; Radmann, Dietrich; Klein, Erwin; Melichar, Rainer; and Biedermann, Kurt, 3,888,220.
Biensan, Michael; and Potin, Philippe, to Societe Aquitaine-Total Organico. Process for obtaining polyamides. 3,888,832, Cl. 260-78.00L.
Bigalke, Erhard; Radmann, Dietrich; Klein, Erwin; Melichar, Rainer; and Biedermann, Kurt, to Volkswagenwerk Aktiengesellschaft. Internal combustion engine performance control system. 3,888,220, Cl. 123-117.00R.
Bigge, Henry W. Tiedown lug. 3,888,190, Cl. 105-475.000.
Bigorajski, Gunter; and Ellerkamp, Joachim, to Vereinigte Schmirgel- und Maschinenfabriken AG. Coating for flexible abrasive bands. 3,888,640, Cl. 51-298.000.
Billawala, Shahbuddin A., to Burroughs Corporation. Single-turn conductor pattern for microminiature core assemblies in a multitransducer head. 3,889,295, Cl. 360-123.000.
Bio-Degradable Plastics, Inc.: *See—*
  Swanholm, Carl E.; and Caldwell, Robert G., 3,888,804.
Bio-Reagents & Diagnostics, Inc.: *See—*
  Whetzel, Lawrence C.; and Townsend, Margaret E., 3,888,739.
Birkin, Michael S., to British Railways Board. Vehicle control systems. 3,888,437, Cl. 246-63.00A.
Bixler, William L., to Gates Rubber Company, The. Belt measuring device. 3,888,014, Cl. 33-174.00R.
Black, Harold D., to United States of America, Navy. Method and apparatus for obtaining the fine scale structure of the earth's gravity field. 3,888,122, Cl. 73-382.000.
Black, Sivalls & Bryson, Inc.: *See—*
  Holland, Robert F.; and Peterson, Adrian J., 3,888,644.
Blackwell, John; Gumprecht, William H.; and Starn, Roy Emerson, Jr., to du Pont de Nemours, E. I., and Company. Process for dyeing water swellable cellulosic materials with polypropylene glycols. 3,888,624, Cl. 8-21.00C.
Blair, Penn B.; and Demand, John W., to Brackett Stripping Machine, Inc. Back liner applying apparatus. 3,888,722, Cl. 156-477.00B.
Blanchard, Gordon W., to Blanchard, Gordon W. Moisture free pipe stem mouthpiece. 3,888,263, Cl. 131-201.000.
Blanchette, Leon. Rotation responsive variable diameter pulley. 3,888,130, Cl. 74-230.17E.
Blanco, Milagros V.: *See—*
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Blaszczak, Joseph W. Composition and method for treating virus infections. 3,888,989, Cl. 424-280.000.
Blecherman, Sol S.; Bala, Mitchell J.; Evans, Dennis J.; and Ulion, Nicholas E., to United Aircraft Corporation. Vapor randomization in vacuum deposition of coatings. 3,889,019, Cl. 427-251.000.
Blessin, Ronald W., to Honeywell Information Systems Inc. Data communications subchannel having self-testing apparatus. 3,889,109, Cl. 235-153.0AK.
Blood, Alden E.: *See—*
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Blumhardt, Harold, to Blumhardt Manufacturing, Inc. Filter cap construction. 3,888,382, Cl. 220-202.000.
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Bodine, Richard Hill, Jr.; and Rosiak, Marion, to Litton Systems, Inc.; and Bodine Co., Inc. Starting and operating ballast for high pressure sodium lamps. 3,889,152, Cl. 315-205.000.
Boeckeler, Benjamin Clark, to Kennametal Inc. Method of centrifugally compacting granular material using a destructible mold. 3,888,662, Cl. 75-203.000.
Boehringer Ingelheim GmbH: *See—*
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Boghosian, Malcolm P.; and Blanco, Milagros V., to Allergan Pharmaceuticals. Soft contact lens preserving solution. 3,888,782, Cl. 252-106.000.
Bogue, John C.: *See—*
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Bolduc, Leo J. Automatic signal newspaper receptacle. 3,888,409, Cl. 232-1.00C.
Bolgar, Francis; and Fraser, John James. Film projectors. 3,888,576, Cl. 353-76.000.
Bolk, Fredrik Willem, to Veco Zeefplatenfabriek B.V. Precision or micro sieve structure. 3,888,765, Cl. 209-352.000.
Bolz, Gunner: *See—*
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Bonewitz, Everett D., to Victor Plastics, Inc. Compression release for motorcycle engines. 3,888,218, Cl. 123-97.00B.
Bonn, Clifford; and Wilson, Kenneth R. A., to Irvin Industries Inc. Vehicle safety device. 3,888,504, Cl. 280-150.0AB.
Boots Co., Ltd., The: *See—*
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Boots, Edmund R. Artificial reef. 3,888,209, Cl. 119-1.000.
Borden, Inc.: *See—*
  Erekson, Arthur B., 3,888,363.
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Bornand, Robert M., to Valinor Anstalt. Ballistic set including a projectile and its launching device. 3,888,031, Cl. 42-1.00F.
Boschetti, Eugene; Molho, Darius; and Fontaine, Louis, to Lipha, Lyonnaise Industrielle Pharmaceutique. Pharmaceutical composition containing amino alcohols derived from ortho-trans-hydroxycinnamic acids, their esters and their amides. 3,888,993, Cl. 424-309.000.
Bose, Ajit Kumar: *See—*
  Saint Eve, Daniel R.; and Bose, Ajit Kumar, 3,888,609.
Bossen, David A., to Measurex Corporation. Apparatus for measuring the weight per unit area of a manufactured sheet product consisting of a reinforcing material surrounded by a bulk material. 3,889,121, Cl. 250-359.000.
Bosshard, Ernst, to Sulzer Brothers Ltd. Irradiation plant for flowable material. 3,889,123, Cl. 250-437.000.
Bourne, Henri Jacques. Root-ball wrappings for the plantation of plants and methods for their manufacture. 3,888,042, Cl. 47-37.000.
Bourne, Henry A., Jr.; and Schroeder, Rondon L., to Continental Oil Company. Control system for a drilling apparatus. 3,888,319, Cl. 175-76.000.
Bowater Packaging Limited: *See—*
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BP Chemicals International Limited: *See—*
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Brackmann, Warren A.; and Diianni, Daniel, to Rothmans of Pall Mall Canada Limited. Formation of polymeric fibres. 3,888,610, Cl. 425-72.000.

Bradt, Gordon E. Kinetic sculpture. 3,888,030, Cl. 40-126.00R.
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Brammer, Klaus-Rudiger; and Wieske, Theophil, to Lever Brothers Company. Emulsifier system. 3,889,005, Cl. 426-585.000.
Brands, Frank W. Pavement testing apparatus. 3,888,108, Cl. 73-12.000.
Braun AG: *See—*
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Brecher, Lee E.; and Wu, Christopher K., to Westinghouse Electric Corporation. Electrolytic decomposition of water. 3,888,750, Cl. 204-129.000.
Breckenridge, Roger A.: *See—*
  United States of America, National Aeronautics and Space Administration; Tyagi, Ramesh C.; Debnam, William J., Jr.; McNear, Maxwell F.; Crouch, Roger K.; and Breckenridge, Roger A., 3,888,705.
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Breed, David S., to Breed Corporation. Mass in liquid vehicular crash sensor. 3,889,130, Cl. 307-121.000.
Breeden, Donald H.; and Bowles, John M., to Maul Bros. Inc. Air cooled annular parison blank mold. 3,888,647, Cl. 65-29.000.
Breitner, Wilhelm. Method of applying metal filaments to surfaces. 3,888,711, Cl. 156-93.000.
Brennan, James H., to Pittsburgh Brass Manufacturing Company. Lance supporting coupling. 3,888,520, Cl. 285-310.000.
Brennecke, Henry M., to du Pont de Nemours, E. I., and Company. Recovery of metal values from ore concentrates. 3,888,748, Cl. 204-108.000.
Brennenstuhl, Hugo: *See—*
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Brieten, Charles Henry. Differential drive mechanism. 3,888,137, Cl. 74-650.000.
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Broll, Arno; and Mann, Herbert, to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler. Inorganic pigments and process for their production. 3,888,688, Cl. 106-308.00B.
Bron, Dan, to Unitrol Water Saving Products Ltd. Quick-acting water-tap. 3,888,461, Cl. 251-351.000.
Brossi, Arnold; and Pecherer, Benjamin, to Hoffmann-La Roche Inc. Lower alkyl esters of 2-(3,4-dimethoxyphenyl)-4,6-dioxocyclohexane carboxylic acid. 3,888,907, Cl. 260-473.00R.
Brouwer, Anton H. J., to Akzo N.V. Process for the preparation of a protein food product. 3,889,010, Cl. 426-276.000.
Brown, Cicero C. Well drilling apparatus. 3,888,318, Cl. 173-149.000.
Brown, Frank R. Power handle for pivotally interconnected lever tools. 3,888,003, Cl. 30-180.000.
Brown, Hazel E.: *See—*
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Brown, Melancthon S., deceased (Kohn, Gustave, administrator), to Chevron Research Company. Nematocidal n-polyhalovinylthioformamides. 3,888,992, Cl. 424-298.000.
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Bubniak, William C., to General Motors Corporation. Flow control valve. 3,888,459, Cl. 251-208.000.
Buchegger, Joachim, to Hauni-Werke Korber & Co. KG. System for programming the starting and stoppage of apparatus for the production and/or processing of cigarettes or the like. 3,889,240, Cl. 340-172.500.
Buide, Norma F.; Lugay, Joaquin C.; and Sims, Rex J., to General Foods Corporation. Hydrolyzed protein in non-dairy whipped topping. 3,889,001, Cl. 426-565.000.
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Burguette, Mario D., to Minnesota Mining and Manufacturing Company. Process for making beta-acryloyloxypropanoic acid. 3,888,912, Cl. 260-486.00R.
Burgwald, Glenn M.; Kruger, William P.; and Hammond, Donald L., to Hewlett-Packard Company. Frequency stabilized gas laser. 3,889,207, Cl. 331-94.50S.
Burk, George A.: *See—*
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Burt, George A., Jr.; and Neill, William M., to International Paper Company. Machine for handling sheet material. 3,888,395, Cl. 223-1.000.
Buss, Keen W., to Marine Protein Corporation. Fish husbandry system utilizing at least partial recirculation of water. 3,888,210, Cl. 119-3.000.
Butts, Edward E., to Clark Equipment Company. Air distribution means for a refrigerated meat case. 3,888,091, Cl. 62-256.000.
Cabot, Nat. Golf putter with true stroke checking device. 3,888,492, Cl. 273-186.00A.
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- Carlson, Lee A.; and Miekka, Richard G., to Dennison Manufacturing Company. Electrophotographic printing. 3,888,664, Cl. 96-1.400.
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- Carlsson, Rolf Gottfrid. Motor-driven washing apparatus. 3,887,954, Cl. 15-50.00C.
- Carmien, Joseph Allen; Davis, Elbert; and Cervi, Roger G., to Nupla Corporation. Apparatus for attaching fiberglass handles. 3,888,721, Cl. 156-423.000.
- Carr, Albert Anthony, to Richardson-Merrell Inc. 4-[4-(Alpha-hydroxybenzyl)piperidino]4'-fluorobutyrophenone derivatives. 3,888,867, Cl. 260-293.800.
- Carroll, Alexander A.: *See—*
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- Carver, David, to Lockheed Aircraft Corporation. Sealing and moisture-proofing of electrical joints. 3,889,047, Cl. 174-84.00R.
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- Catherino, Henry A., to General Electric Company. Rechargeable cell having improved cadmium negative electrode and method of producing same. 3,888,695, Cl. 136-24.000.
- Cauffiel, Ford B. Method and apparatus for removing scale from metal sheets. 3,888,048, Cl. 51-39.000.
- Cauffiel, Ford B. Tapered pole made of variable width metal strips. 3,888,283, Cl. 138-150.000.
- Cazaux, Michel; and Cros, Jean, to Societe Cortial. Quercetin derivatives. 3,888,842, Cl. 260-210.00F.
- Celanese Corporation: *See—*
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  - Manning, Andrew J.; and Ram, Michael J., 3,888,895.
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- Cericola, Robert F., to United States of America, America. Axial component force transmitting arrangement. 3,888,475, Cl. 267-174.000.
- Cervi, Roger G.: *See—*
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- Chalex, Paul; and Mather, Selwyn R., to Richardson Company, The. Rubber compositions with improved performance at sub-zero temperatures. 3,888,814, Cl. 260-33.6AQ.
- Chao, Tsai Hsiang, to American Cyanamid Company. Flame retardant composition containing tetrakis (hydroxymethyl) phosphonium oxalate. 3,888,779, Cl. 252-8.100.
- Chaplin, Arthur H.: *See—*
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- Chas. Taylor's Sons Co., The: *See—*
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- Chay, Dong Myung, to du Pont de Nemours, E. I., and Company. Process for preparing a catalytically active ceramic coatings. 3,888,790, Cl. 252-432.000.
- Chem Systems Inc.: *See—*
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- Chersky, Nikolai Vasilievich; Klimenko, Alexandr Petrovich; Bokserman, July Izrailevich; Kalina, Alexandr Isaevich; and Karimov, Farit Abdrakhmanovich. Method of pipeline transportation of natural gas. 3,888,434, Cl. 243-38.000.
- Chevron Research Company: *See—*
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  - Ebert, Wayne A., 3,888,760.
  - Edwards, Laroy H., 3,888,879.
  - Guenther, Lloyd M., 3,887,971.
- Chikaraishi, Takayo, to Nissan Motor Company Limited. Window regulator for motor vehicle. 3,888,047, Cl. 49-351.000.
- Child, Edward T.; and Robin, Allen M., to Texaco Inc. Production of methane. 3,888,043, Cl. 48-197.00R.
- Chisso Corporation: *See—*
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- Chisum, Finis L. Auto body and frame straightening devices. 3,888,100, Cl. 72-305.000.
- Chittenden, Donald F. Orthodontic face bow. 3,888,007, Cl. 32-14.00D.
- Chong, Victor M., to Sun Research and Development Co. Electrolytic separation of oxygen from air. 3,888,749, Cl. 204-129.000.
- Chow, Ho, to Beatrice Foods Co. Gun type fluid control device. 3,888,421, Cl. 239-456.000.
- Christensen, Nils J.; and Symon, Ted, to Universal Oil Products Company. Production of coumarin. 3,888,883, Cl. 260-343.20R.
- Christiansen, Wilbert W.: *See—*
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- Chupp, John Paul, to Monsanto Company. Phenyl-N-(1-alkenyl)-N-methylcarbamates. 3,888,903, Cl. 260-468.00E.
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  - Dawes, Dag; Meyer, Willy; and Bohner, Beat, 3,888,874.
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- Cieslak, Richard F.; and Balding, John V., to Industrial Electronics Service Co. Automatic control for audible electronic warning system. 3,889,256, Cl. 340-384.00E.
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- Clark, Anthony John. Apparatus for the determination of the thermal conductivity of gases. 3,888,110, Cl. 73-27.000.
- Clark Equipment Company: *See—*
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- Clark, Samuel S. Urethrogram device. 3,888,234, Cl. 128-2.00R.
- Clarke, Wallace Eugene: *See—*
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- Clausi, Adolph Scott; Glicksman, Martin; and Farkas, Elizabeth, to General Foods Corporation. Spoonable frozen gelatin dessert concentrate. 3,889,002, Cl. 426-576.000.
- Clauss, Gunter: *See—*
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- Cleeland, Roy, Jr.; and Hager, Hans Jacob, to Hoffmann-La Roche Inc. Amino lower alkyl ether derivatives of opium alkaloids. 3,888,864, Cl. 260-285.000.
- Clements, George W.: *See—*
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- Clipner, George R. Easily openable envelope. 3,888,408, Cl. 229-85.000.
- Closmann, Philip J., to Shell Oil Company. Heating through fractures to expand a shale oil pyrolyzing cavern. 3,888,307, Cl. 166-272.000.
- Cobarg, Claus Christian, to Braun Aktiengesellschaft. Spark-producing arrangement for a lighter with a battery. 3,889,160, Cl. 317-96.000.
- Coca-Cola Company, The: *See—*
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- Coch, Lester, to Waldes Kohinoor, Inc. Apparatus for thermally transforming metal parts. 3,888,471, Cl. 266-4.00A.
- Coded Signatures, Inc.: *See—*
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- Coghill, William W.; and Rotramel, William J., to Ozark-Mahoning Company. Agglomerating sodium sulfate. 3,888,635, Cl. 23-313.000.
- Cogliano, Gregory P.: *See—*
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- Cola, Rudolph A., to Burroughs Corporation. Electrostatic printing apparatus and method employing optical charge deposition. 3,889,274, Cl. 346-74.00J.
- Coleman, Donald Jackson. Ultrasonically vibrated surgical cutting instrument. 3,888,004, Cl. 30-272.00A.
- Colgate-Palmolive Company: *See—*
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  - Schnettler, Richard A.; and Suh, John T., 3,888,860.
  - Schnettler, Richard A.; and Suh, John T., 3,888,861.
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- Cook, Roy G.; and Jackson, James P., to Parke, Davis & Company. Disposable absorbent articles. 3,888,257, Cl. 128-296.000.
- Cooke, Carl W., to CWC Industries. Safety closure cap for containers. 3,888,376, Cl. 215-217.000.
- Cooke, Claude E., Jr., to Exxon Production Research Company. Hydraulic fracturing method. 3,888,311, Cl. 166-280.000.
- Cooley, Kenton Parkes; and Jago, Edward John, to Foseco International Limited. Production of ingots. 3,888,298, Cl. 164-137.000.
- Coon, James A. Disposable combination file and handle. 3,887,973, Cl. 29-78.000.
- Cooper, Michael T., to United States of America, Navy. Vapor pressure regulator. 3,888,089, Cl. 62-50.000.
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- Cordi, Vincent A.; and Gurski, Chester S., to International Business Machines Corporation. Shift register buffer apparatus. 3,889,241, Cl. 340-172.500.
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- Corrigan, Richard A., to Bell & Howell Co. Single film light-protected photosensitive element. 3,888,675, Cl. 96-67.000.
- Corry, Thomas M., to General Motors Corporation. Apparatus for generating three-phase sinusoidal voltages. 3,889,174, Cl. 321-9.00R.
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- Costello, Anthony C.; and Shaffer, Leon L., to Loopco Industries, Inc. Control system for a strip accumulator. 3,888,430, Cl. 242-55.000.
- Courbat, Pierre; and Valenza, Andre, to ZYMA S.A. Medicaments containing epicatechin-2-sulfonic acids and salts thereof. 3,888,990, Cl. 424-283.000.
- Cox, Charles H., III; and Aukerlund, Albin M., to Cox, Charles H., III. Method and system for transmitting signals in theatres. 3,889,252, Cl. 340-313.000.
- Cox, William F. Boat trailer. 3,888,367, Cl. 214-84.000.
- Crafts, Robert L.: *See—*
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- Craig, Gale M., to General Motors Corporation. Sealed beam headlamp unit leak detection system. 3,888,111, Cl. 73-40.700.
- Cranleigh Electro-Thermal, Inc.: *See—*
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- Crapet, Jean, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Automatic device for surface treatment. 3,888,270, Cl. 134-57.00R.
- Crawford, Ralph W.: *See—*
  - Snyder, Paul D.; and Crawford, Ralph W., 3,888,039.
- Crawford, Thomas H.: *See—*
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- Cree, George B., Jr.: *See—*
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- Crees, Silas Ray. Cable bender. 3,888,101, Cl. 72-388.000.
- Crescentini, Lamberto; and Wells, Rodney Lee, to Allied Chemical Corporation. Antistatic fiber containing chain-extended tetrols based on diamines. 3,888,944, Cl. 260-857.0PG.
- Crompton, Eric John: *See—*
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- Cross, David Edward, to Smiths Industries Limited. Liquid measuring apparatus. 3,888,126, Cl. 73-426.000.
- Cross Europa-Werk GmbH: *See—*
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- Cross, James M.; Hudson, George A.; and Hixenbaugh, Joseph C., to Mobay Chemical Corporation. Polyester polyols. 3,888,908, Cl. 260-475.00P.
- Cross, Radley; and Laessig, John, to Gilbreth Company. Banding machine. 3,888,067, Cl. 53-292.000.
- Cross, Thomas R., to Xerox Corporation. Semi-automatic document handler. 3,888,585, Cl. 355-75.000.
- Crouch, Roger K.: *See—*
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- Cutler, Percy H., to Cranleigh Electro-Thermal, Inc. Directional pickup coil and oscillator apparatus for the location of buried electrically conducting elements. 3,889,179, Cl. 324-3.000.
- CWC Industries: *See—*
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- Daimler-Benz Aktiengesellschaft: *See—*
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- D'Alelio, Gaetano F. Halogenated esters of phosphorus-containing acids (II). 3,888,844, Cl. 260-214.000.
- Dalmasso, Claudio: *See—*
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- D'Amato, Salvatore F.; and Foote, Chauncey P., Jr., to American Bank Note Company. Intaglio printing press with web wiping apparatus having supply and take-up reels outside frame. 3,888,172, Cl. 101-156.000.
- Daniels, Peter J. L.: *See—*
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- D'Aragon, Paul. Sewage treatment tank. 3,888,767, Cl. 210-151.000.
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  - Arrandale, Roy S.; Walding, Wayne A.; and Daugherty, Barney R., 3,889,030.
  - Loughry, Don J., 3,888,385.
- Dassler, Adolf. Running sole for sports shoe. 3,888,026, Cl. 36-25.00R.
- Datta, Arthur S., to International Harvester Company. Retaining assembly. 3,888,597, Cl. 403-326.000.
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- Davies, Barry J., to Canron Limited. Method of producing ferrous castings with cast-in ferrous inserts. 3,888,297, Cl. 164-100.000.
- Davies, Robert William, to Molins Limited. Packets. 3,888,407, Cl. 229-44.0CB.
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- Davis, John E.; and Bulgrin, Wayne E., to Lockheed Aircraft Corporation. Handset cradle. 3,889,071, Cl. 179-100.00R.
- Dawes, Dag; Meyer, Willy; and Bohner, Beat, to Ciba-Geigy Corporation. Phosphorus esters of 5-amino-1,2,4-triazol-3-ol. 3,888,874, Cl. 260-308.0DR.
- Dawson, Timothy Leslie: *See—*
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- Dawson, William Orval, to Chemtan Company. Method of chrome-retanning leather. 3,888,625, Cl. 8-94.270.
- Dayco Corporation: *See—*
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- Dayton Electronic Products Company: *See—*
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- Deblandre, Claude; and Guyaux, Jean, to Solvay & Cie. Thermal stabilization of vinyl resins with derivatives of alpha-phenylindole. 3,888,818, Cl. 260-45.80N.
- Debnam, William J., Jr.: *See—*
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Droz, Rene, to Les Fabriques d'Assortiments Reunies. Instrument for the simultaneous transmission of the movements of a feeler to at least two reading means. 3,888,012, Cl. 33-174.00L.
Drummond, Warren W., to PPG Industries, Inc. Method of producing crimped fiber glass. 3,887,970, Cl. 28-72.100.
Dryer, Eldon O., to W. S. Shamban & Co. Captive seal with retainers loaded against non-parallel surfaces. 3,888,496, Cl. 277-117.000.
Duchemin, Michel, to Ressorts du Nord S.A. Resiliently yieldable rail fastening. 3,888,414, Cl. 238-349.000.
Duff, Thomas Guy, to Bell Telephone Laboratories, Incorporated. Timer apparatus utilizing operational amplifier integrating means. 3,889,197, Cl. 328-55.000.
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Ebert, Wayne A., to Chevron Research Company. Avoiding heat exchanger fouling after crude oil desalting. 3,888,760, Cl. 208-48.000.
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Eisenhauer, Leigh E. Raft adapted for use as a water rescue or recovery litter. 3,887,953, Cl. 9-11.00R.
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Elm, Donald C., to Timesavers, Inc. Method of and apparatus for rapidly and simultaneously abrading metal workpieces in preselected plural numbers. 3,888,050, Cl. 51-135.00R.
Elmore, Lester C.; and Broxholm, Thomas M., to Pulsepower Systems, Inc. Liquid propellant weapon. 3,888,159, Cl. 89-7.000.
Elshuber, Karl, to Texas Instruments Incorporated. Interlocked plural channel switches and controllable switch devices for use therein. 3,889,195, Cl. 325-464.000.
Elson, David; and Avital, Shlomo, to Yeda Research & Development Co., Ltd. Flat plate electrophoresis. 3,888,759, Cl. 204-299.000.
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Emmerich, Werner S.; and Holmes, Francis Alan, to Westinghouse Electric Corporation. Vacuum interrupter shield protector. 3,889,080, Cl. 200-144.00B.
English, William P., to Electrostatic Equipment Corporation. Coating method with cleaning. 3,889,015, Cl. 427-21.000.
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Epstein, Barry M., to Action Communication Systems, Inc. System and method for coupling remote data terminals via telephone lines. 3,889,062, Cl. 179-2.0DP.
Erekson, Arthur B., to Borden, Inc. Indexing stacker. 3,888,363, Cl. 214-6.00D.
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Evans, Francis E.; and Gilleo, Kenneth B., to Allied Chemical Corporation. Compositions comprising sulfamide for increasing flame resistance of polymers. 3,888,819, Cl. 260-45.80N.

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Evans Products Company: *See—*
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Evans & Sutherland Computer Corporation: *See—*
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Evans, Warren William, to du Pont de Nemours, E. I., and Company. Silver halide films with wide exposure latitude and low gradient. 3,888,676, Cl. 96-68.000.
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Exxon Production Research Company: *See—*
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Gale, Walter W.; Ashcraft, Thomas L., Jr.; and Saunders, Rhoderick K., 3,888,308.
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Faber, Ruth: *See—*
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Fabrici, Edward. Bolt guards for door. 3,888,530, Cl. 292-340.000.
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Failli, Amedeo; Nelson, Verner R.; Immer, Hans U.; and Gotz, Manfred K., to American Home Products Corporation. Novel hydrazinocarboxamide derivatives and preparation thereof. 3,888,840, Cl. 260-112.500.
Fancher, Llewellyn W., to Stauffer Chemical Company. Ortho-carbamyloxy-benzamide bactericides. 3,888,906, Cl. 260-472.000.
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Farris, Richard C., to Halliburton Company. Coupling assembly. 3,888,358, Cl. 213-69.000.
Fastner, Thorwald; Niedermayr, Alois; and Bachner, Ernst, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Method of continuously casting steel. 3,888,294, Cl. 164-66.000.
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Faulkner, Albert A., to Geometric Data Corporation. Automatic blood smear device with vibration damping means. 3,888,206, Cl. 118-100.000.
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Felsen, Karl H. Independent jacking system for vehicles and the like. 3,888,464, Cl. 254-86.00R.
Felzer, Bertold; Brunk, Klaus; and Kraemer, Friedhelm, to General Motors Corporation. Energy absorber components for use in vehicles particularly motor vehicles. 3,888,502, Cl. 280-106.00R.
Fendrich, Charles Nelson, Jr., to AMP Incorporated. Power supply having substantially constant output during load switching. 3,889,177, Cl. 323-17.000.
Fentress, Denton C.; and Robinson, Kent W., to Marathon Oil Company. Organic sulfonate extraction process. 3,888,917, Cl. 260-504.00R.
Fergesen, David: *See—*
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Fickel, R. Gene, to Universal Oil Products Company. Distillation column reboiler section with internal flow sensing means. 3,888,743, Cl. 202-158.000.
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Fima, Raoul. Anchor bolt construction. 3,888,156, Cl. 85-71.000.
Finch, Lester M.; and Anthony, Andy J., to United States of America, Energy Research and Development Administration. Modular core component support for nuclear reactor. 3,888,731, Cl. 176-50.000.
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Willey, Ronald Albert, 3,888,509.
Fischell, Robert E., to John Hopkins University, The. Rechargeable demand inhibited cardiac pacer and tissue stimulator. 3,888,260, Cl. 128-419.0PG.
Fischer, Adolf, to Badische Anilin- Soda-Fabrik Aktiengesellschaft. Synergistic herbicidal mixture. 3,888,655, Cl. 71-91.000.
Fischer, Earl L., to Victor Comptometer Corporation. Air gun with rotatable ammunition loading door. 3,888,229, Cl. 124-49.000.
Fischer, Peter Augustus, to Martin Engineering Co. Method of settling fluent and like material in a form. 3,888,960, Cl. 264-71.000.
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Fischer, William L. Massage device. 3,888,241, Cl. 128-24.300.
Fiser, James T.; Jackman, Robert M.; and James, Ray R., to A. O. Smith-Inland, Inc. Fiber reinforced tubular article having abrasion resistant liner. 3,888,714, Cl. 156-171.000.
Fish, Leonard A., to Bank Computer Network Corporation. Disposable carriers for pneumatic conveyors. 3,888,433, Cl. 243-1.000.
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Flaig, Manfred, to Daimler-Benz Aktiengesellschaft. Gear oil pump, especially for motor vehicle internal combustion engines. 3,888,607, Cl. 418-206.000.
Flanigen, Cameron D. Support stand for puzzle blocks or other items. 3,888,443, Cl. 248-152.000.
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Foldes, Andre; and Delmar, Geza, to Delmar Chemicals, Limited. Novel chemical compounds, processes for making them and pharmaceutical compositions containing them. 3,888,914, Cl. 260-501.160.
Folk, Kenneth Foster: *See—*
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Fontaine, John G., to Fail Safe Brake Corporation. Auxiliary operating apparatus for vehicle service brake. 3,888,552, Cl. 303-84.00R.
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Foster, William R.; Sen, Durgacharan; and Skinner, Stanley J., to Monsanto Chemicals Limited. Apparatus for producing a foamed resin sheet in a curved diverging expansion zone. 3,888,614, Cl. 425-224.000.
Fowler, John T., to Arthur D. Little, Inc. Digital compass. 3,888,016, Cl. 33-346.000.

Frank Speno Railroad Ballast Cleaning Co., Inc.: *See—*
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Frantz, Robert Houston, to AMP Incorporated. Fastenings and corner joints. 3,888,063, Cl. 52-753.00D.
Franz, Helmut; and Lecoco, David E., to PPG Industries, Inc. Chemical filming solution and process for plating therewith. 3,889,017, Cl. 427-160.000.
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Freake, Ronald; Kuo, Mau H.; and Mehta, Devendra Vaikunthlal, to Miles Laboratories, Inc. Culturing means and test kit. 3,888,741, Cl. 195-139.000.
Freedman, Jules, to Colgate-Palmolive Company. 4H(1)benzothiopyrano(3,4-d)-isoxazoles. 3,888,873, Cl. 260-307.00H.
Freeman, Carvie Thomas, to Factory Mutual Research Corporation. Discharge head and fire protection system utilizing said head. 3,888,313, Cl. 169-16.000.
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Frey, Raymond C., to Anchor Hocking Corporation. Package for tumblers and the like. 3,888,348, Cl. 206-427.000.
Freytag, Karl-Heinz; Meyer, Rudolf; and Hoffman, Klaus, to Agfa-Gevaert Aktiengesellschaft. Ink jet process utilizing novel dyes. 3,889,271, Cl. 346-1.000.
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Fritz, Jack J.; and Lucas, Theodore W., Jr., to Andco Incorporated. Combustion chamber. 3,888,632, Cl. 23-277.00C.
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Fujiwhara, Mitsuto; Kasai, Keiji; Satoh, Ryosuke; Nakagawa, Yoshinobu; and Tanigawa, Tuneo; to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide color photographic material containing bis-pyrazolone couplers. 3,888,680, Cl. 96-100.000.
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Galluzzo, Daniel T.; Galluzzo, Christopher G.; and Galluzzo, Vincent. Fireplace for heat conservation and distribution. 3,888,231, Cl. 126-120.000.
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Gamblin, William E. S. Ball retrieval system. 3,888,370, Cl. 214-356.000.
Ganiaris, Neophytos, to Struthers Scientific. Spray nozzle for fluidized bed apparatus. 3,888,423, Cl. 239-567.000.
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Gauthier, Armand J. Position indicating device for attachment to a ski boot. 3,888,500, Cl. 280-11.37E.
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Gaynor, Joseph, to Bell & Howell Co. Information reproduction utilizing electret material. 3,888,174, Cl. 101-467.000.
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Gell, Philip Anthony Maunsell; and Hann, Douglas Graeme, to Elemelt Limited. Glass melting furnaces. 3,888,650, Cl. 65-125.000.
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- Gertsch, Ernst; and Gertsch, Ulrich, to Gertsch AG. Releasable ski binding. 3,888,499, Cl. 280-11.35K.
- Gertsch, Ulrich; and Balass, Valentin, to Gertsch AG. Releasable ski binding. 3,888,498, Cl. 280-11.35T.
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- Geul, Herman Robert, to Sun Electric Corporation. Apparatus for measuring wheel angles of vehicles, particularly motor vehicles. 3,888,592, Cl. 356-155.000.
- Geyer, Paul, to Uniroyal, Inc. Extrusion mill. 3,888,469, Cl. 259-191.000.
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- Gibson, Richard D.; and Whelan, Robert D., to General Instrument Corporation. VHF and UHF fiber optic channel indicia display having a common display area. 3,889,196, Cl. 325-455.000.
- Gilbart-Smith, David Mervyn. Adjustable cutter for cakes and pies. 3,888,001, Cl. 30-114.000.
- Gilbreth Company: *See—*
  - Cross, Radley; and Laessig, John, 3,888,067.
- Gilleo, Kenneth B.; Evans, Francis E.; and Sogn, Allen W., to Allied Chemical Corporation. Process for increasing flame resistance of nylon and resulting flame resistant nylon composition. 3,888,822, Cl. 260-45.8NT.
- Gilleo, Kenneth B.: *See—*
  - Evans, Francis E.; and Gilleo, Kenneth B., 3,888,819.
- Gillissen, Johannes Jacobus, to Societe Honeywell Bull (Societe Anonyme). Selective storage systems. 3,889,239, Cl. 340-172.500.
- Gingello, Anthony D.: *See—*
  - Terwilliger, James P.; Gingello, Anthony D.; and Tinney, John R., 3,888,465.
- Glassburn, Larry Earl, to General Electric Company. Turbomachine with balancing means. 3,888,601, Cl. 416-144.000.
- Glenn, William E. Dispensing and hood assembly for rotary tiller. 3,888,196, Cl. 111-10.000.
- Gley, Paul R., to Rexnord Inc. Heavy duty tension latch. 3,887,966, Cl. 24-68.0CD.
- Glicksman, Martin: *See—*
  - Clausi, Adolph Scott; Glicksman, Martin; and Farkas, Elizabeth, 3,889,002.
- Gluzek, Karl-Heinz: *See—*
  - Asinger, Friedrich; Gluzek, Karl-Heinz; and Offermanns, Heribert, 3,888,923.
- Goering, Lowell J., to Hesston Corporation. Control for steering, speed and direction. 3,888,135, Cl. 74-496.000.
- Gogarty, William B.: *See—*
  - Rhudy, John S.; and Gogarty, William B., 3,888,309.
- Goodwin, Robert J.: *See—*
  - Amundsen, Joseph; Wetzel, William H.; Naimy, Norma; and Goodwin, Robert J., 3,889,020.
- Goralski, Christian T.: *See—*
  - Pews, R. Garth; Goralski, Christian T.; and Burk, George A., 3,888,869.
- Gorby, Oliver L.; and Rice, Dennis A., to Dynamic Industries, Inc. Front end loader device. 3,888,372, Cl. 214-776.000.
- Gosney, William Milton, Jr., to Texas Instruments Incorporated. Metal-insulator-semiconductor compatible charge transfer device memory system. 3,889,245, Cl. 340-173.0RC.
- Goto, Toshiyuki; Kido, Kouichi; and Yamada, Akitoshi, to Matsushita Electric Industrial Co., Ltd. Feedback amplifier distortion-cancelling circuit. 3,889,060, Cl. 179-1.00F.
- Gotz, Manfred K.: *See—*
  - Failli, Amedeo; Nelson, Verner R.; Immer, Hans U.; and Gotz, Manfred K., 3,888,840.
  - Immer, Hans U.; Nelson, Verner R.; and Gotz, Manfred K., 3,888,838.
- Gough, Robert G., to Cincinnati Milacron Inc. Methoxy carboxylic acid ester ultraviolet stabilizers for polymers. 3,888,823, Cl. 260-45.80A.
- Gowers, Jonathan Paul, to U.S. Philips Corporation. Photocathode manufacture. 3,889,143, Cl. 313-94.000.
- Gowler, John Edward, to Non-Impact Surfaces Limited. Road planing machines. 3,888,542, Cl. 299-1.000.
- Grabowski, James P.: *See—*
  - Hartleroad, Ronald J.; and Grabowski, James P., 3,887,996.
  - Hartleroad, Ronald J.; and Grabowski, James P., 3,887,998.
- Graeff, Norwood Claude, to AMP Incorporated. Electromagnetic relay. 3,889,087, Cl. 200-246.000.
- Graham, J. Wallace. Analytical method and apparatus. 3,888,628, Cl. 23-230.00B.
- Graham, James Joseph, to Stanley Works, The. Utility knife. 3,888,002, Cl. 30-162.000.
- Granqvist, Carl-Erik. Instrument for measuring distance. 3,888,588, Cl. 356-5.000.
- Grant, John: *See—*
  - Strong, Robert Edmund; Boyle, Kenneth; and Grant, John, 3,888,556.
- Grau, Theodore H., to Toledo Stamping & Manufacturing Company. Apparatus for metering particulate material. 3,888,390, Cl. 222-28.000.
- Gray, James R.: *See—*
  - Last, Bernard; Weinberger, Eugene M.; Gray, James R.; Clements, George W.; and Deffenbaugh, Ralph E., 3,888,106.
- Graybill, Paul J. Oil rectifier, apparatus with process. 3,888,768, Cl. 210-223.000.
- Greaney, John E. Method and apparatus for determining flow characteristics in a pipeline or the like. 3,889,120, Cl. 250-356.000.
- Green, Raymond J.; and Stevenson, Paul D., to General Motors Corporation. Engine oil tank. 3,888,227, Cl. 123-196.00R.
- Greene, Clifford E.: *See—*
  - Simokat, Frank L.; and Greene, Clifford E., 3,889,066.
- Greenwald, Richard B.: *See—*
  - Shen, Tsung-Ying; Greenwald, Richard B.; Jones, Howard; Linn, Bruce O.; and Witzel, Bruce E., 3,888,902.
- Greenwood, Arthur R., to Universal Oil Products Company. Catalyst purging technique in an on-stream catalyst regeneration process. 3,888,764, Cl. 208-140.000.
- Greer, Charles B., to United States of America, Army. Magnetic system for discriminating between vehicles and personnel based upon their characteristic frequency signatures. 3,889,181, Cl. 324-41.000.
- Gregord, Thomas; Filipich, Bernard; and Jancosko, William, to Vulcan Engineering Company. Work tower for relining metallurgical vessels. 3,888,062, Cl. 52-749.000.
- Greune, Christian; and Hackl, Friedrich, to Motoren-und Turbinen-Union Munchen GmbH. Governing device for a gas turbine system exemplified by a vehicular or aircraft engine. 3,888,078, Cl. 60-39.28R.
- Greve, Heinz Gunter; and Resag, Klaus, to Cassella Farbwerke Mainkur Akt. Cyanoalkylamino-amido benzophenones. 3,888,899, Cl. 260-465.00D.
- Gribens, Joel A.; and Cogliano, Gregory P., to W. R. Grace & Co. Polyepichlorohydrin aerosol gaskets. 3,888,380, Cl. 220-81.00R.

- Griffin, Earl Harris, to RCA Corporation. Analog echo protection circuit for DME. 3,889,260, Cl. 343-7.300.
- Griffin, James S.: *See—*
  - Muraco, Paul F.; and Griffin, James S., 3,889,293.
- Grill, Helmut: *See—*
  - Wagner, Josef; and Grill, Helmut, 3,888,994.
- Grimmett, Earl S.; and Kunze, Jay F., to United States of America, Energy Research and Development Administration. Fluidized-bed nuclear reactor. 3,888,733, Cl. 176-52.000.
- Griswold, Augustus W., to Xerox Corporation. Semi-automatic document handler. 3,888,582, Cl. 355-69.000.
- Grosboll, Martin P.; and Edison, Robert R., to Atlantic Richfield Company. Chemical reactor having means for removing impurities from a fluid stream. 3,888,633, Cl. 23-284.000.
- Gross, Franz. Transit time amplifier tube having an attenuated delay line. 3,889,148, Cl. 315-3.500.
- Grosseau, Albert, to S.A. Automobiles Citroen. Devices for controlling the braking of vehicle wheels. 3,888,549, Cl. 303-21.0EB.
- Grossmann, Max; Faber, Ruth; and Uhrig, Heinz, to Hoechst Aktiengesellschaft. Sulfosuccinic acid semi-esters of oxyalkylated polynuclear alkyl-phenols. 3,888,828, Cl. 260-49.000.
- Groth, John Elmer, to Erico Products, Inc. Electrical connector and clip therefor having barbs to ensure proper preassembly. 3,889,048, Cl. 174-94.00R.
- Groth, Rolf, to BFG Glassgroup. Heat-reflecting pane. 3,889,026, Cl. 428-34.000.
- Groves, Henry Tobin, to Litton Systems, Inc. Light emitting diode module. 3,889,147, Cl. 313-500.000.
- Grun Mar Industries Inc.: *See—*
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- Grundy, Reed H., to Westinghouse Air Brake Company. Fail-safe circuit arrangement. 3,889,201, Cl. 330-21.000.
- Grunstein, Michael: *See—*
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- GTE Automatic Electric (Canada) Ltd.: *See—*
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  - Thompson, Wallace T., 3,889,050.
- Guaglione, Giovanni Paolo; McCloud, James R.; and Aumayer, Hansruedi, to I-T-E Imperial Corporation. Gas circuit breaker insulating tube support and high pressure vessel. 3,889,083, Cl. 200-148.00B.
- Guenther, Lloyd M., to Chevron Research Company. Outlet means in a thermoplastic yarn rebound texturizing apparatus. 3,887,971, Cl. 28-1.400.
- Guibert, Raul. Method and apparatus for processing dough. 3,888,997, Cl. 426-27.000.
- Guichard, Claude; and Soret, Jean-Claude, to Societe Anonyme: Societe Industrielle de Combustible Nucleaire. Apparatus for the continuous casting of metals and the like under vacuum. 3,888,300, Cl. 164-256.000.
- Guinosso, Charles J.: *See—*
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- Gulf States Paper Corporation: *See—*
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  - Seith, Robert T.; and Bundy, Otto M., 3,888,197.
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- Gumprecht, William H.: *See—*
  - Blackwell, John; Gumprecht, William H.; and Starn, Roy Emerson, Jr., 3,888,624.
- Gunter, Gordon; and Venkataramaiah, Amaraneni, to Ocean Food Inc. Aquatic animal food composition. 3,889,007, Cl. 426-74.000.
- Gurski, Chester S.: *See—*
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- Gustav Hessmert K.G.: *See—*
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- Gutleber, Frank S., to United States of America, Army. Method and apparatus for adaptively suppressing unwanted lobes in a compressed coded radar signal. 3,889,199, Cl. 328-163.000.
- Guyaux, Jean: *See—*
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- H. T. Golde GmbH: *See—*
  - Hattass, Rainer; and Kouth, Herbert, 3,888,165.
- Haacke, Gottfried Christian; and Tracey, Donald John, Jr., to American Cyanamid Company. Electrochromic voltage indicator. 3,888,565, Cl. 350-160.000.
- Haagenson, Orville W.: *See—*
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- Haas, Larry A.; Khalafalla, Sanaa E.; and McCormick, Thomas H., to United States of America, Interior. Double layer catalyst bed for removing SO_2 from waste gases. 3,888,970, Cl. 423-244.000.
- Haas, Ronald H., to General Motors Corporation. Occupant knee restraint. 3,888,506, Cl. 280-150.00B.
- Habert, William C., to Uniroyal, Inc. Tire building machine having a variable diameter tire building drum. 3,888,720, Cl. 156-414.000.
- Habi-chek Corporation: *See—*
  - Symmes, Eliot Norman, 3,889,163.
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- Haener, Juan. Construction assembly and method including interlocking blocks. 3,888,060, Cl. 52-286.000.
- Hager, Hans Jacob: *See—*
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- Haide, Karl, to Motoren-und-Turbinen-Union Friedrichshafen GmbH. Hydrodynamic torque converter. 3,888,082, Cl. 60-361.000.
- Haisler, Melvin Roger. Gate latch. 3,888,527, Cl. 292-213.000.
- Hakata, Masayuki, to Casio Computer Co., Ltd. Data storing system having single storage device. 3,889,110, Cl. 235-176.000.
- Hall, Barnes R.; and Hanna, Ralph W. Lineman's tool-holding fixture. 3,888,534, Cl. 294-19.00R.
- Hallet, Jack M.: *See—*
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- Halliburton Company: *See—*
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- Hamakawa, Hiroshi; Kobari, Sadami; Shimizu, Takeshi; Fujimoto, Kentaro; Hayano, Kazuo; and Matsuda, Tetsuo, to Toyo Jozo Kabushiki Kaisha. Anti-inflammatory N,N'-disubstituted amidines. 3,888,927, Cl. 260-564.00R.
- Hamilton, Brian K., to Allied Chemical Corporation. Limiting of continuous extent of inflatable restraint. 3,888,503, Cl. 280-150.0AB.
- Hammann, Ingeborg: *See—*
  - Hoffmann, Hellmut; Hammann, Ingeborg; and Homeyer, Bernhard, 3,888,951.
- Hammell, Kemper Martel, to AMP Incorporated. Electromagnetic relay assembly. 3,889,216, Cl. 335-106.000.
- Hammond, Donald L.: *See—*
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- Hanak, Joseph John; and Southgate, Peter David, to RCA Corporation. Energizing technique for electroluminescent devices. 3,889,151, Cl. 315-170.000.
- Hananoi, Toshihiro: *See—*
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- Handa, Minoru: *See—*
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- Hanke, Hans, to Daimler-Benz Aktiengesellschaft. Hydrodynamic retarder for vehicles, especially for motor vehicles. 3,888,335, Cl. 188-290.000.
- Hanks, James V., to Horton Manufacturing Co. Inc. Thermal-magnetic snap action valve. 3,888,278, Cl. 137-625.650.
- Hann, Douglas Graeme: *See—*
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- Hansen, Kenneth R., to Colgate-Palmolive Company. Liquid detergent composition. 3,888,798, Cl. 252-545.000.
- Hanson, Walter J.; and Parups, Eriks, to Pitney-Bowes, Inc. Bursting apparatus. 3,888,399, Cl. 225-106.000.
- Harada, Yoshitugu: *See—*
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- Harken, Russell D.; and Morgan, F. Wyman, to Monsanto Company. 3-Hydroxy-p-dioxane-2-methanol. 3,888,881, Cl. 260-340.600.
- Harmon, Al. Variable water volume sprinkler. 3,888,417, Cl. 239-97.000.
- Harmon, James E.; Watrous, Stephen R.; and Diamond, Herrick R., to SCM Corporation. Control knob assembly. 3,887,963, Cl. 16-121.000.
- Harris, Stephen W.; and Praye, Clyde A. Compression massage boot. 3,888,242, Cl. 128-64.000.
- Harrison, Kenneth, to Lawrence Peska Assoc. Opthalmic dispensing device. 3,888,251, Cl. 128-233.000.
- Harry Major Machine & Tool Co.: *See—*
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- Harsco Corporation: *See—*
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- Hartleroad, Ronald J.; and Grabowski, James P., to General Motors Corporation. Semiconductor loading apparatus for bonding. 3,887,996, Cl. 29-583.000.
- Hartleroad, Ronald J.; Krajewski, James C.; and Rayon, Ronald G., to General Motors Corporation. Magnetic alignment for semiconductor device bonding. 3,887,997, Cl. 29-589.000.
- Hartleroad, Ronald J.; and Grabowski, James P., to General Motors Corporation. Air-biased probe for semiconductor device bonding. 3,887,998, Cl. 29-589.000.
- Hartman, Ronald L.: *See—*
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- Hasspacher, Klaus: *See—*
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- Hastings, Myron L.; and Roberts, Joseph P., to Teledyne Electro-Mechanisms. Method for connecting printed circuits. 3,888,639, Cl. 29-626.000.

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Hawkins, Wallace H. Wrecker attachment. 3,888,368, Cl. 214-86.00A.

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Heaton, James W.; and Fawcett, William E., to Kennametal Inc. Method and apparatus for removing tread material from vehicle tires. 3,888,145, Cl. 82-1.00C.

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Hein, Kurt; and Zimmer, Erich, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method of producing ball-shaped metallic oxide or metallic carbide particles. 3,888,787, Cl. 252-301.10S.

Heisinger, Robert Frederick, to Bell Telephone Laboratories, Incorporated. Protector unit. 3,889,221, Cl. 337-15.000.

Heisler, Raymond A. Apparatus and method for automatically positioning and inserting plastic plugs in a container top. 3,888,065, Cl. 53-43.000.

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Hershberg, David E.; Chaplin, Arthur H.; and Dewland, Joseph E., to International Telephone and Telegraph Corporation. Generator for local oscillator signals. 3,889,191, Cl. 325-307.000.

Herst, Richard J., to Car Tapes Inc. Container having disappearing front panel. 3,888,494, Cl. 274-2.000.

Herzlich, Harold J.; and Fitzgerald, Paul F., to Armstrong Rubber Company, The. Molded or cast tires and methods of manufacture. 3,888,291, Cl. 152-330.00R.

Hess, Daniel E.; and Bannier, David William, to American Chain Cable Company, Inc. Tire chain tightener. 3,888,290, Cl. 152-217.000.

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Hickle, Jerry J.; and Sherbourne, Robert D., to R. L. Kuss & Co., Inc. Silo breather bag. 3,888,288, Cl. 150-1.000.

Hiersig, Heinz M., to Mannesmann-Meer Aktiengesellschaft. Planetary drive system for rolls in a mill. 3,888,138, Cl. 74-665.00G.

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Higuchi, Takeru; and Uekama, Kaneto, to Alza Corporation. Ampicillin-chloral hydrate complex. 3,888,848, Cl. 260-239.100.

Hildebrand, Bernard P., to Battelle Development Corporation. Scanned holography by sector scanning. 3,889,226, Cl. 340-5.00H.

Hiler, Albert R., to Sandoz, Inc. Fluidic selector valve. 3,888,279, Cl. 137-627.000.

Hill, John B., to Becton, Dickinson and Company. Disposable hemoperfusion assembly for detoxification of blood and method therefor. 3,888,250, Cl. 128-214.00R.

Himsl, Ernst G., to Sunar Limited. Lock and interlock mechanism. 3,888,558, Cl. 312-216.000.

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Hirschman, Joel A.; and Van Winkle, Howard E., to International Business Machines Corporation. Position and velocity servo control for motor controlled article carrier and handler. 3,889,169, Cl. 318-571.000.

Hisserich, Charles A. Camshaft belt drive for variable valve timing. 3,888,217, Cl. 123-90.310.

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Hoffman, Paul R., to Burroughs Corporation. Variable pitch tapeless format control system for line printers. 3,888,340, Cl. 197-133.00R.

Hoffmann, Hellmut; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. O-aryl-thiono alkanephosphonic acid ester-formamidines. 3,888,951, Cl. 260-945.000.

Hoffmann, Klaus; Konig, Hans-Dieter; and Meyer, Rudolf, to Agfa-Gevaert Aktiengesellschaft. Ink jet recording material. 3,889,270, Cl. 346-1.000.

Hoffmann, Klaus: *See—*

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Metlesics, Werner; and Sternbach, Leo Henryk, 3,888,846.

Hofmann, A. J., to General Tire & Rubber Company, The. Suspension insert for a two-headed resilient bushing. 3,888,472, Cl. 267-57.10R.

Hohmann, Robert C., to S. J. a/k/a Agnew Environmental Products. Apparatus for cutting off sections of an elongated member. 3,888,149, Cl. 83-291.000.

Hohnecker, Otto: *See—*

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Hojyo, Tetsuya. Continuous and partial plating process of strip metal. 3,888,745, Cl. 204-18.00R.

Holl, Norbert, to BASF Aktiengesellschaft. Apparatus for the continuous manufacture of endless foams. 3,888,608, Cl. 425-4.00C.

Holland, Robert F.; and Peterson, Adrian J., to Black, Sivalls & Bryson, Inc. Filter-separator apparatus. 3,888,644, Cl. 55-318.000.

Hollenton, Frank; and Park, William P., to AMF Incorporated. Method and apparatus for finishing the ends of cigars. 3,888,262, Cl. 131-29.000.

Hollingsworth, Ashley J.: *See—*

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Holmes, Francis Alan: *See—*

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Holmes, Jerry D.; and Moore, Samuel D., to Texas Instruments Incorporated. Navigation ranging synchronization. 3,889,258, Cl. 343-6.5LC.

Holmes, Ralph John; Wylie, Alan Wilson; and McCracken, Kenneth Gordon, to Commonwealth Scientific and Industrial Research Organization. Method and apparatus for measuring the concentration of water, iron and aluminum in iron ore by neutron radiation. 3,889,112, Cl. 250-265.000.

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Mandusky, Jack C.; and Janko, George F., 3,888,474.

Hoppough, Richard Scott; and Walker, Herbert Bryant, to Bell Telephone Laboratories, Incorporated. Detection of series-resonant circuits connected across transmission paths. 3,889,073, Cl. 179-175.20B.

Horai, John C., Jr.; and Little, David C., to GAF Corporation. Algicidal post treated roofing granules. 3,888,176, Cl. 106-15.0AF.

Horai, John C., Jr.; and Little, David C., to GAF Corporation. Novel algicidal post treated roofing granules. 3,888,683, Cl. 106-15.0AF.

Horie, Ikutaro; and Nagao, Kameji, to Fuji Photo Film Co., Ltd. Process for the rapid hardening of gelatin. 3,888,681, Cl. 96-111.000.

Horiuchi, Masao: *See—*

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Howell, Barbara J. Fishing hook remover. 3,888,038, Cl. 43-53.500.

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Hughes, Gordon F., to Xerox Corporation. Linear motor actuator. 3,889,139, Cl. 310-13.000.

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Hunter, Byron A.; and Barrows, Franklin H., to Uniroyal, Inc. Gas-expanding polymers using hydrazodicarboxylates. 3,888,801, Cl. 260-2.50R.

Hunter, Byron A., to Uniroyal, Inc. Oxalylbis(sulfonyl hydrazides), used as blowing agents for gas-expandable polymeric material. 3,888,802, Cl. 260-2.50R.

Hunter, Thomas C., Jr., to Standby Systems, Inc. Battery Charger. 3,889,171, Cl. 320-31.000.

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I-T-E Corporation: *See—*

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Immer, Hans U.: *See—*

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- Ishihara, Shinya; and Suzuki, Yoshihiro, to Nippondenso Co., Ltd. Air pump. 3,889,126, Cl. 290-1.000.
- Ishikawa, Teruo, to Tokyo Shibaura Electric Co., Ltd. Electronic oven with a cooking time setting mechanism and a remaining time indication mechanism. 3,889,091, Cl. 219-10.55E.
- Ishikawa, Yoji, to Sony Corporation. Saddle shaped deflection coil. 3,889,218, Cl. 335-213.000.
- Ishizaki, Ayaaki; Morinaga, Yasushi; Sakakibara, Hiroyuki; and Horiuchi, Masao, to Ajinomoto Co., Inc. Method for culturing hydrogen oxidizing bacterium. 3,888,740, Cl. 195-109.000.
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- Isogai, Tokio; Isikawa, Eiichi; Fukushi, Keiji; Amano, Hisao; Ogata, Fumio; and Ikemoto, Norio, to Hitachi, Ltd. Driving device for thyristor type ac-dc converter. 3,889,175, Cl. 321-27.00R.
- Isuge, Masami; Uematsu, Shinichi; Ono, Yotsuo; Eiga, Shokichi; and Makita, Minoru, to Asahi Kasei Kogyo Kabushiki Kaisha. Hollow fibers of cuprammonium cellulose and a process of the manufacture of same. 3,888,771, Cl. 210-500.00M.
- Itagaki, Tadasi, to Pioneer Electronic Corporation. Head phone unit. 3,889,074, Cl. 179-182.00R.
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- Ito, Akira; Matsuzaki, Kazuhiro; and Morimoto, Yoshio, to Mitsui Toatsu Chemicals, Incorporated. Method for the polymerization of copolymerization of ethylene. 3,888,835, Cl. 260-88.20R.
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- Ito, Ryosuke; and Takahashi, Susumu, to Sansui Electric Co., Ltd. Four-channel reproducing system. 3,889,061, Cl. 179-1.0GQ.
- Ito, Shoji, to Nittan Limited Company. Method of erasing smoke. 3,888,641, Cl. 55-84.000.
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- Jackson, Larry L.; Seifert, Walter F.; and Collins, Daniel E., to Dow Chemical Company, The. Heat transfer agents. 3,888,777, Cl. 252-73.000.
- Jackson, Robert V., to McCulloch Corporation. Welding control circuit and method. 3,889,178, Cl. 323-22.0SC.
- Jackson, Thomas E., to Sandoz, Inc. 2-Sulfinyl-thiazoles and oxazoles. 3,888,870, Cl. 260-302.00S.
- Jago, Edward John: *See—*
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- James, Ray R.: *See—*
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- Jarvinen, Uro Tapio. Headlight wiper. 3,887,955, Cl. 15-250.220.
- Jarvinen, Uro Tapio; and Salminen, Olli Olavi. Headlight wiper. 3,887,957, Cl. 15-250.160.
- Jean Ducros, Emile Paul Jules. Earthing joint for shielding chambers electrically and electromagnetically. 3,889,043, Cl. 174-35.0GC.
- Jeffreys, Lyman Wood, to AMSTED Industries Incorporated. Top block stop for applying a longitudinal force to the top block of a pressure casting mold. 3,888,453, Cl. 249-82.000.
- Jentzsch, David P.; Anderson, Hyrum T.; and Olsen, Lee J., to Rubber Engineering, Inc. High strength portable cable crossover for high tonnage earth moving vehicles. 3,888,186, Cl. 104-275.000.
- Jericijo, Boris, to von Tell Trading Co. AB. Hatch battening device. 3,888,528, Cl. 292-256.500.
- Jirkovsky, Ivo L., to American Home Products Corporation. Derivatives of 3-amino-2-halo-2-cyclohexen-1-one. 3,888,887, Cl. 260-347.700.
- Johannessen, Paul R., to Megapulse Incorporated. Radio-frequency pulse generation system and method. 3,889,263, Cl. 343-103.000.
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- Johns, Robert W. Method for mining oil shales, tar sands, and other minerals. 3,888,543, Cl. 299-11.000.
- Johnson, Earl Clinton, to Deere & Company. Blade for tree shear having vertically swingable blade support arms. 3,888,287, Cl. 144-34.00E.
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- Jones, Everett E., to Boeing Company, The. Apparatus for die forming strip material. 3,888,618, Cl. 425-389.000.
- Jones, Gary V.; Pereira, John A.; and Rehman, Warren C., to General Foods Corporation. Coffee percolator packages and method. 3,888,999, Cl. 426-77.000.
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  - Schevey, William Russell; Jones, Harold Freeman; and Spielman, Burton A., 3,888,693.
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- Jones, James H.: *See—*
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- Jones, Thaddeus M.; Kiwalle, Jozef; and Ruder, Ernest J., to Production Technology Inc. Quality control apparatus for inertial welding. 3,888,405, Cl. 228-2.000.
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- Juric, Slavko I., to Babcock Wilcox Company, The. Compact nuclear reactor. 3,888,734, Cl. 176-61.000.
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- Kaes, Hans-Herbert, to Ernst Leitz GmbH. Sensitized, silver-activated, phosphorus pentoxide-containing radio-photoluminescent glass and process of making same. 3,888,685, Cl. 106-47.00R.
- Kahr, Olof. Component part of laminated board and a process for manufacturing such component part. 3,888,061, Cl. 52-589.000.
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- Kasberg, Alvin H., to Atlantic Richfield Company. Uh$_3$ cermet. 3,888,795, Cl. 252-478.000.
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Kishigami, Kunio; Kobayashi, Hiroshi; Sente, Toru; and Sugiyama, Koichi, to Babcock-Hitachi K.K. Method for incinerating industrial wastage. 3,888,194, Cl. 110-8.00F.

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Klimenko, Alexandr Petrovich: *See*—
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Klingman, Edwin E., III, to United States of America, National Aeronautics and Space Administration. Apparatus for calibrating an image dissector tube. 3,889,155, Cl. 315-369.000.

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Knight, Robert F., to International Imaging Systems. Optical method and apparatus for the area measurement of opaque objects. 3,889,055, Cl. 178-6.800.

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Koelsch, Lester Max. Foamed plastic sheet material and system for its manufacture. 3,889,032, Cl. 428-218.000.

Koff, Irwin; and Finnegan, William G., to United States of America, Navy. Particle vaporizer. 3,888,415, Cl. 239-2.00R.

Kogon, Irving Charles, to du Pont de Nemours, E. I., and Company. Curing with complexes of selected diamines and alkali metal salts. 3,888,831, Cl. 260-77.5AM.

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Koizumi, Kihachiro; Izumida, Yukihiro; and Miyata, Yoshihiko, to Hitachi, Ltd. Electron gun assemblies for use in colour picture tubes. 3,889,146, Cl. 313-414.000.

Koizumi, Yukimichi; Kobayashi, Yoshihiro; Murase, Yasuhiro; and Kondo, Takamitsu, to Teijin Limited. Oil composition for synthetic staple fibers. 3,888,775, Cl. 252-8.800.

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Kolombos, Alexander John; McCain, Colin Christopher; and Porter, Eric Andrew, to BP Chemicals International Limited. Process for propylene oxide. 3,888,889, Cl. 260-348.500.

Komatsu, Hajime; and Mukai, Seio, to Konishiroku Photo Industry Co., Ltd.; and Chisso Corporation. Polypropylene support for photographic use. 3,888,679, Cl. 96-87.00R.

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Kossow, Robert G. Electric vehicle. 3,888,324, Cl. 180-21.000.

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Kubicek, Donald H., to Phillips Petroleum Company. Steam-activated olefin disproportionation catalysts. 3,888,940, Cl. 260-683.00D.

Kucharski, Leonard J., to I-T-E Corporation. Contact for high voltage gas blast circuit breaker with time-delayed opening. 3,889,084, Cl. 200-148.00R.

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Kurita, Masahiro, to Kabushiki Kaisha Suwa Seikosha. Construction to facilitate assembly of a timepiece. 3,888,073, Cl. 58-7.000.

Kuriyama, Takayuki; and Yagi, Motohiko, to Fuji Photo Film Co., Ltd. Process for producing special filter. 3,888,646, Cl. 65-18.000.

Kurtz, Robert L., to United States of America, National Aeronautics and Space Administration. Real time, large volume, moving scene holographic camera system. 3,888,561, Cl. 350-3.500.

Kustova, Galina Lvovna: *See*—
Kiselev, Andrei Vladimirovich; Kustova, Galina Lvovna; Lipkind, Boris Alexandrovich; and Nikitin, Jury Stepanovich, 3,888,972.

Kuwabara, Seishi: *See*—
Tsumita, Toru; and Kuwabara, Seishi, 3,888,837.

Kuwayama, Shigeo, to Fuji Photo Film Co., Ltd. Flint optical glass. 3,888,692, Cl. 106-53.000.

Kuwayama, Shigeo; and Yagi, Motohiko, to Fuji Photo Film Co., Ltd. Method of making top plates for range. 3,889,021, Cl. 427-376.000.

Kuwubara, Haruo: *See*—
Atsukawa, Masumi; Shinoda, Naoharu; and Kuwubara, Haruo, 3,888,968.

Kwolek, Stephanie Louise, to du Pont de Nemours, E. I., and Company. Method of increasing the initial modulus and reducing the orientation angle of undrawn poly (para-benzamide) fibers. 3,888,965, Cl. 264-342.0RE.

Kyriacou, Demetrios, to Dow Chemical Company, The. Preparation of chloropyridylsulfone-n-oxides. 3,888,868, Cl. 260-294.80F.

La Citrique Belge, N.V.: *See*—
Smeets, Fred, 3,888,910.

La Salle Machine Tool, Inc.: *See*—
Konkal, John; and Egbert, James, 3,888,341.

La Telemecanique Electrique: *See*—
Nguyen Van, Trong, 3,889,165.

Labana, Santokh S.; and Theodore, Ares N., to Ford Motor Company. Powder coating compositions comprising a blend of coreactive polymers - I. 3,888,943, Cl. 260-836.000.

Lacey, Robert R., to Universal Oil Products Company. Vehicle seats. 3,888,451, Cl. 248-399.000.

Ladlow, Frank Willows. Fruit and vegetable cutting devices. 3,888,000, Cl. 30-114.000.

Laessig, John: *See*—
Cross, Radley; and Laessig, John, 3,888,067.

Lafond, Gerard L. Carriers for pirns and other articles. 3,888,537, Cl. 294-93.000.

Laforet, Henry A.; and Zusack, Michael J., to American Motors Corporation. Method of making a foundry core. 3,888,293, Cl. 164-16.000.

Lahrman, Frank H.: *See*—
Kingry, Gary W.; and Lahrman, Frank H., 3,888,781.

Laine, Michel. Removable interchangeable holder device for a recorder tape. 3,888,431, Cl. 242-194.000.

Laing, Graham Stirling: *See*—
Morrell, Ronald Joseph; Gumb, Beverley William; and Laing, Graham Stirling, 3,889,075.

Laing, Nikolaus. Temperature-control system using thermosipon effect. 3,888,304, Cl. 165-86.000.

Laird, Robert A.: *See*—
Anderson, Clarence A. F.; and Laird, Robert A., 3,888,557.

Lake, Charles C.; and Jaremus, Boubene M., to American Hospital Supply Corporation. Handpiece and chuck wrench therefor. 3,888,008, Cl. 32-27.000.

Lakszner, Katalin: *See—*
Szantay, Csaba; Szabo, Lajos; Kreidl, Janos; Kalaus, Gyorgy; Keve, Tibor; Turczanyi, Peter; Polgar, Istvan; Farkas nee Kirjak, Maria; and Lakszner, Katalin, 3,888,865.

Lampe, Warren R.: *See—*
Bessmer, Stanley J.; and Lampe, Warren R., 3,888,815.

Lancaster, Raymond L., to Lanson Industries, Inc. Container for suspending a bomb-like member. 3,888,346, Cl. 206-3.000.

Landler, Josef: *See—*
Spietschka, Ernst; and Landler, Josef, 3,888,841.

Landsberg, Ernst, to Walther & Cie Aktiengesellschaft. Sprinkler system. 3,888,314, Cl. 169-20.000.

Lang, Gunter Anton: *See—*
Willis, Donald; Battaerd, Hendrik Adriaan Jacobus; Lang, Gunter Anton; and Weiss, Donald Eric, 3,888,928.

Langer, Horst G.; and Ayers, Earl D., to Dow Chemical Company, The. Differential thermal analysis cell assembly. 3,888,107, Cl. 73-15.00B.

Lanson Industries, Inc.: *See—*
Lancaster, Raymond L., 3,888,346.

Lapeyre, Fernand S. Adjustable pedal and crank system for foot propelled vehicles. 3,888,136, Cl. 74-594.100.

Larner, Donald Alexander, to Fluid Devices Limited. Solenoid actuator with magnetic latching. 3,889,219, Cl. 335-234.000.

Larrimer, Walter H., Jr.; and Duncan, Donald L., to Boeing Company, The. Liquid metal core transpactor elements for electromagnetic forming tools. 3,888,098, Cl. 72-56.000.

Larsen, Duane M., to ESB Incorporated. Absorbent separator for an electric battery. 3,888,700, Cl. 136-146.000.

Larson, Robin J., to United States of America, Army. All digital phase detector and corrector. 3,889,186, Cl. 324-83.00D.

Larsonneur, Jean-Francois, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Pyrotechnical jacks. 3,888,085, Cl. 60-635.000.

Larsson, Sten Herbert. Actuation device for the weft inserter rod of a loom having two parallel loom bodies. 3,888,272, Cl. 139-123.000.

Laskin, Hyman: *See—*
Laskin, Sondra; and Laskin, Hyman, 3,887,946.

Laskin, Sondra; and Laskin, Hyman. Foot covering. 3,887,946, Cl. 2-239.000.

Last, Bernard; Weinberger, Eugene M.; Gray, James R.; Clements, George W.; and Deffenbaugh, Ralph E., to Rockwell International Corporation. Testing apparatus for flow measuring devices. 3,888,106, Cl. 73-3.000.

Lauer, William, to Johnson & Johnson. Anti-fog surgical face mask. 3,888,246, Cl. 128-146.200.

Laursen, Bente Lissy: *See—*
Stephenson, Ronald Arthur; Laursen, Bente Lissy; and Mattsson, Ove Henning, 3,888,947.

Lavarini, Bernard, to Compagnie Generale d'Electricite. Gaseous flux laser oscillator. 3,889,209, Cl. 331-94.50G.

Lawrence Peska Assoc.: *See—*
Harrison, Kenneth, 3,888,251.

Lebold, Steve. Means for supporting a limb in relaxed position. 3,888,244, Cl. 128-77.000.

Lebow, Marvin E. Viewing system providing compatability between two dimensional pictures and three dimensional viewing thereof. 3,888,564, Cl. 350-138.000.

Le Brun, Clarence A. Fireplace shutoff. 3,888,232, Cl. 126-140.000.

Leco Corporation: *See—*
Wiiki, Leroy E.; and Sitek, George J., 3,888,321.

Leco Industries Limited: *See—*
Saint Eve, Daniel R.; and Bose, Ajit Kumar, 3,888,609.

Lecoco, David E.: *See—*
Franz, Helmut; and Lecoco, David E., 3,889,017.

Leder, Lewis B., to Xerox Corporation. Liquid crystalline compounds. 3,888,892, Cl. 260-397.200.

Ledex, Inc.: *See—*
Myers, John L., 3,889,162.

Lednicer, Daniel; and Nishizawa, Edward E., to Upjohn Company, The. Method for binding antithrombotic or anticlotting substances to a susceptible material involving the use of an aromatic sulfonyl nitrene. 3,888,833, Cl. 260-79.30R.

Lee, Lieng Huang, to Xerox Corporation. Heterophase adhesive compositions containing polysulfone for metal-selenium composites. 3,888,667, Cl. 96-1.500.

Lee, Poy. Winter emergency brake system. 3,888,524, Cl. 291-15.000.

Lee, Shung-Yan Luke, to du Pont de Nemours, E. I., and Company. Photopolymerizable process capable of yielding a reverse image. 3,888,672, Cl. 96-35.100.

Leeds & Northrup Company: *See—*
Miller, Roger L., 3,889,275.

Legg, Leo V.; and Tijunelis, Donatas. Submersible cable. 3,889,049, Cl. 174-102.00R.

Legler, Ernst, to Robert Bosch Fernsehanlagen G.m.b.H. Method and system for transmitting signals from a selected one of a plurality of video sources in a central apparatus room and the associated audio and control signals to at least one television studio. 3,889,051, Cl. 178-5.600.

Lehn, Jean-Marie, to Schering Corporation. Macrocyclic compounds and complexes thereof. 3,888,877, Cl. 260-327.00R.

Leiber, Heinz, to Teldix GmbH. Arrangement for compensating yawing moments. 3,888,328, Cl. 180-79.20R.

Leifheit, Gunter, to Leifheit International Gunter Leifheit GmbH. Stand for storage of shoes. 3,888,353, Cl. 211-37.000.

Leifheit International Gunter Leifheit GmbH: *See—*
Leifheit, Gunter, 3,888,353.

Leisenberg, Wolfgang, to Manfred Leisenberg KG Industrifeuerungen. Method and apparatus for automatically regulating the plasticity of ceramic material. 3,888,470, Cl. 259-191.000.

Leiter, Herbert: *See—*
Klemann, Heinrich; and Leiter, Herbert, 3,889,279.

Lelaidier, Daniel; and Quobex, Jean, to Saft-Societe des Accumulateurs Fixes et de Traction. Method and apparatus for limiting charge of a storage battery charged at a constant voltage. 3,889,172, Cl. 320-39.000.

Lemieux, George E.: *See—*
Kolehmainen, Jack A.; and Lemieux, George E., 3,888,143.

Lemmens, Nicolas: *See—*
Kuntziger, Ernest P.; and Lemmens, Nicolas, 3,888,123.

Lemmons, Douglas: *See—*
Berntson, E. Boyd; and Lemmons, Douglas, 3,888,245.

Lenards, Gerhard; and Bahren, Walter, to Kuhn Vierhaus & Cie. AG. Chenille yarn and method of making same. 3,889,034, Cl. 428-372.000.

Leonard, Richard J.: *See—*
Ponzoni, George B.; and Leonard, Richard J., 3,888,859.

Leonard, Verna M. Finger pattern indicator. 3,888,155, Cl. 84-471.000.

Les Fabriques d'Assortiments Reunies: *See—*
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Lescoa, Inc.: *See—*
Wind, Harold, 3,887,956.

Lessoff, Howard: *See—*
Vittoria, Carmine; Pasternak, Joseph; and Lessoff, Howard, 3,889,213.

Leute, Richard K.; and Bolz, Gunner, to Syva Company. Nitrogen derivatives of benzoyl ecgonine. 3,888,866, Cl. 260-292.000.

Lever Brothers Company: *See—*
Brammer, Klaus-Rudiger; and Wieske, Theophil, 3,889,005.
Read, Colin Barrington, 3,889,011.
Schmidt, Heinrich Gottlieb; Strauss, Kunc Gustav; and Tennikat, Josef, 3,889,004.

Levitt, Albert P.; and Di Cesare, Eugene, to United States of America, Army. Production of graphite fiber reinforced metal matrix composites. 3,888,661, Cl. 75-201.000.

Levy, Leon B.; and Fisher, Gene J., to Celanese Corporation. Stabilizing acrylic acid with alkylated phenols. 3,888,922, Cl. 260-526.00N.

Lewis, Gerald F.: *See—*
Totten, Ralph P.; and Lewis, Gerald F., 3,888,035.

Lewis, Warren F., to Minnesota Mining and Manufacturing Company. Pressure sensor and instrument utilizing same. 3,888,117, Cl. 73-141.00A.

Ley, Gordon S.: *See—*
Rushing, Frank C.; and Ley, Gordon S., 3,888,562.

Licentia-Patent-Verwaltungs-G.m.b.H.: *See—*
Bogus, Klaus; and Mattes, Siegfried, 3,888,697.

Liddall, Jack Anthony, to Linac Systems International Ltd. Service columns. 3,888,282, Cl. 138-106.000.

Liebrecht, Francis M., heir: *See—*
Liebrecht, Lawrence S., deceased; and Liebrecht, Francis M., heir, 3,888,396.

Liebrecht, Lawrence S., deceased; and by Liebrecht, Francis M., heir. Sewing machine needle threader. 3,888,396, Cl. 223-99.000.

Liegois, William A.: *See—*
Colwell, Robert E.; Liegois, William A.; Wilks, Gerald W.; and Vrcelj, Mihailo J., 3,888,973.

Lightfoot, Robert Oscar: *See—*
White, Robert Eric; and Lightfoot, Robert Oscar, 3,888,070.

Lighthall, John T.; and Thomas, Robert W., to GTE Automatic Electric (Canada) Ltd. Voltage waveform generator including feedback arrangement for restoring voltage to initial condition. 3,889,198, Cl. 328-59.000.

Lilly Industries Limited: *See—*
Hughes, Peter Graham; and Verge, John Pomfret, 3,888,984.

Lin, A. Oscar. Scented writing instrument. 3,888,416, Cl. 239-34.000.

Linac Systems International Ltd.: *See—*
Liddall, Jack Anthony, 3,888,282.

Lindemann, Klaus: *See—*
Reinecke, Erich; Isernhagen, Fritz; Klatt, Alfred; Weise, Lutz; Schlamann, Wilhelm; and Lindemann, Klaus, 3,888,550.

Lindmayer, Joseph; Curtin, Denis John; Haynos, Joseph Gabriel; and Meulenberg, Andrew, Jr., to Communications Satellite Corporation. Infrared-transparent solar cell. 3,888,698, Cl. 136-89.000.

Lindo, Herbert, to Kenilworth Research & Development Corporation. Apparatus for heating the fluid in a windshield washer system. 3,888,412, Cl. 237-12.30B.

Lindstedt, Per Olof, to Olof Lindstedt & Co. AB. Methods of treating hardening oil before use by adding a mixture of ethoxylated acyclic compounds and film-forming acyclic compounds. 3,888,704, Cl. 148-29.000.

Lines, William G.: *See—*
White, Berta A. I.; and Lines, William G., 3,888,009.

Link, Timothy H. Fender guard. 3,888,532, Cl. 293-62.000.

Linn, Bruce O.: *See—*
Shen, Tsung-Ying; Greenwald, Richard B.; Jones, Howard; Linn, Bruce O.; and Witzel, Bruce E., 3,888,902.

Lipha, Lyonnaise Industrielle Pharmaceutique: *See—*
Boschetti, Eugene; Molho, Darius; and Fontaine, Louis, 3,888,993.

Lipkind, Boris Alexandrovich: *See—*
Kiselev, Andrei Vladimirovich; Kustova, Galina Lvovna; Lipkind, Boris Alexandrovich; and Nikitin, Jury Stepanovich, 3,888,972.

Lipoma, Samuel P. Method for continuous electromagnetic sterilization of food in a pressure zone. 3,889,009, Cl. 426-234.000.

Lippmann, Wilbur, to Ayerst McKenna and Harrison Ltd. Method and composition for lowering intraocular pressure. 3,888,985, Cl. 424-275.000.

Lippmann, Wilbur, to Ayerst McKenna and Harrison Ltd. Method and composition for lowering intraocular pressure. 3,888,991, Cl. 424-285.000.

Lisle, Raymond V.: *See—*
Wojtasinski, Ronald J.; Jones, James H.; and Lisle, Raymond V., 3,889,185.

Lister, John W.: *See—*
Martin, Gary A.; and Lister, John W., 3,889,217.

Litman, Mitchel. Photo electric ambiant light operated surveillance device. 3,889,251, Cl. 340-279.000.

Little, David C., to GAF Corporation. Algicidal roofing granules. 3,888,684, Cl. 106-15.0AF.

Little, David C.: *See—*
Horai, John C., Jr.; and Little, David C., 3,888,176.
Horai, John C., Jr.; and Little, David C., 3,888,683.

Litton Systems, Inc.: *See—*
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Groves, Henry Tobin, 3,889,147.

Livesey, James R.: *See—*
Adickes, Fred; Livesey, James R.; Weir, George; Bailey, Dennis; and Mehelich, John J., 3,888,483.

Lloyd, Raymond A.; and Hrybyk, William L., to Westinghouse Electric Corporation. Contactless test system. 3,889,053, Cl. 178-6.000.

Lobeck, Walter G., Jr.: *See—*
Wu, Yao Hua; and Lobeck, Walter G., Jr., 3,888,852.

Lockard, Joseph Larue, to AMP Incorporated. Slide switch with retraction features. 3,888,807, Cl. 200-16.00R.

Lockard, Joseph LaRue, to AMP Incorporated. Rest mechanism for manually operated number wheels carrying indicia tape. 3,889,085, Cl. 200-153.00R.

Lockheed Aircraft Corporation: *See—*
Carver, David, 3,889,047.
Davis, John E.; and Bulgrin, Wayne E., 3,889,071.
Villani, Vincent; and Topp, Ronald L., 3,888,691.

Lode, Tenny D. Digital time measurement system. 3,889,189, Cl. 324-186.000.

Logsdon, John. Securing of service lines in hollow boat masts. 3,889,045, Cl. 174-70.00R.

Lohse, Lawrence L., to Kiekhaefer Aeromarine Motors, Inc. Stern drive for boats. 3,888,203, Cl. 115-41.0HT.

Lonati, Francesco, to Construzioni Meccaniche Lonati di Lonati Francesco & Figli (Ettore, Fausto, Tiberio)S.n.c. Drive unit for operating and cutting out the additional thread supplies and associated thread guides on dual cylinder circular knitting machines. 3,888,094, Cl. 66-138.000.

Long, John W.: *See—*
Yates, Jack; and Long, John W., 3,887,980.

Long, William R. Bulk tobacco rack. 3,888,533, Cl. 294-5.500.

Longenecker, Levi S. Panelized suspended basic furnace roof. 3,888,195, Cl. 110-99.00R.

Loopco Industries, Inc.: *See—*
Costello, Anthony C.; and Shaffer, Leon L., 3,888,430.

Lorenz, Dieter: *See—*
Olsen, Willi; Lorenz, Dieter; and Beer, Heinz, 3,889,076.

Lou, David Yuan Kong; and Willens, Ronald Howard, to Bell Telephone Laboratories, Incorporated. Metal film recording media for laser writing. 3,889,272, Cl. 346-1.000.

Lougheed, James Hugh: *See—*
Zimmermann, Detlef; Lougheed, James Hugh; and Crompton, Eric John, 3,889,262.

Loughry, Don J., to Dart Industries Inc. Vertical synchronization time base error corrector. 3,888,385, Cl. 360-11.000.

Lowe, James L., to Boots Co., Ltd., The. Process for the preparation of 4-chloro-2-hydroxybenzothiazole. 3,888,871, Cl. 260-304.000.

Lu, Brun & Associes S.A.: *See—*
Riviere, Jacques; and Simon, Raymond, 3,889,012.

Lucas, David Adrian; and Vincent, Richard Paul, to U.S. Philips Corporation. Radio interferometer. 3,889,267, Cl. 343-113.00R.

Lucas, Theodore W., Jr.: *See—*
Fritz, Jack J.; and Lucas, Theodore W., Jr., 3,888,632.

Lucian, Arsene N. Transducers utilizing electrocapillary action. 3,889,086, Cl. 200-192.000.

Lugay, Joaquin C.: *See—*
Buide, Norma F.; Lugay, Joaquin C.; and Sims, Rex J., 3,889,001.

Luhdorff, Dieter, to Westinghouse Bremsen-und Apparatebau GmbH. Variable threshold electronic rate detection system for wheel skid control. 3,889,128, Cl. 307-9.000.

Lukacs, George J.: *See—*
Drelich, Arthur H.; and Lukacs, George J., 3,889,024.

Lundquist, Jerry R.: *See—*
Stromatt, Robert W.; and Lundquist, Jerry R., 3,888,744.

Lynam, John Edward, to Automatic Braiding Co. (Nottingham) Ltd. Composite elastic band for use with a garment. 3,887,968, Cl. 24-266.000.

Lynch Corporation: *See—*
James, Richard, 3,888,651.

Lystad, Leonard A., to General Motors Corporation. Folding stabilizer linkage for vehicle window. 3,888,044, Cl. 49-227.000.

MacFarland, Raymond W., Jr. Display package. 3,888,349, Cl. 206-457.000.

Mack, Bernard. Endless loop magnetic tape cartridge with removable tape guide insert. 3,888,429, Cl. 242-55.19A.

Mack, Richard B. Bicycle pedal-actuated brake and freewheel system. 3,888,334, Cl. 188-24.000.

Mackelvie, Philip A., to Multi-Point Tool Co., Inc. Indexing turret. 3,888,140, Cl. 74-826.000.

Mackenzie, Raymond W., to Westinghouse Electric Corporation. Induction heat cooking apparatus. 3,889,090, Cl. 219-10.490.

MacLennan, Clayton; and Haagenson, Orville W. Partition wall construction. 3,888,059, Cl. 52-241.000.

MacSween, George. Apparatus for grinding rock bit inserts. 3,888,049, Cl. 51-54.000.

Maddox, Leland D.: *See—*
Pierce, Edwin F.; Roberts, Larry W.; and Maddox, Leland D., 3,888,069.

Maeda, Kazuo, to Mitsui Shipbuilding and Engineering Co., Ltd. Turntable. 3,888,184, Cl. 104-37.000.

Maekawa, Yukio; Miyano, Shizuo; Yazawa, Kenichiro; and Kondo, Asaji, to Fuji Photo Film Co., Ltd. Aqueous printing ink containing perfume-containing microcapsules. 3,888,689, Cl. 106-24.000.

Maenner, Paul. Apparatus for generating proportional cams from a master cam. 3,888,162, Cl. 90-13.100.

Mahoney, Francis E., to Ingersoll-Rand Company. Apparatus and methods for controlling injection rams. 3,888,388, Cl. 222-1.000.

Maier, Paul E. Fuel-air mixture control. 3,888,215, Cl. 123-32.0EA.

Major, Harry, to Harry Major Machine & Tool Co. Accumulating conveyor with article position sensors and article movement sensors controlling the pusher member. 3,888,344, Cl. 198-219.000.

Makihara, Hiroshi; Hananoi, Toshihiro; and Fujimoto, Yoshiji, to Hitachi, Ltd. Feature extractor of character and figure. 3,889,234, Cl. 340-146.3MA.

Makita, Minoru: *See—*
Isuge, Masami; Uematsu, Shinichi; Ono, Yotsuo; Eiga, Shokichi; and Makita, Minoru, 3,888,771.

Malanka, Douglas Peter: *See—*
Pighin, Albert; and Malanka, Douglas Peter, 3,888,784.

Malmer, Michael M., Jr., to Burroughs Corporation. Modifiable computer function decoder. 3,889,242, Cl. 340-172.500.

Mandusky, Jack C.; and Riddle, Neville L., to Hoover Ball and Bearing Company. Seat spring assembly. 3,888,473, Cl. 267-102.000.

Mandusky, Jack C.; and Janko, George F., to Hoover Ball and Bearing Company. Frame and spring assembly for furniture and the like. 3,888,474, Cl. 267-110.000.

Manfred Leisenberg KG Industrifeuerungen: *See—*
Leisenberg, Wolfgang, 3,888,470.

Manigault, Edward L., to Chas. Taylor's Sons Co., The. Alumina-chrome refractory. 3,888,687, Cl. 106-66.000.

Mann, Herbert: *See—*
Broll, Arno; and Mann, Herbert, 3,888,688.

Mannesmann-Meer Aktiengesellschaft: *See—*
Hiersig, Heinz M., 3,888,138.

Manning, Andrew J.; and Ram, Michael J., to Celanese Corporation. Production of titanium acetylacetonate bis(dimethylamine). 3,888,895, Cl. 260-429.500.

Manning, Robert E., to Sandoz, Inc. 1,2,5,6-Tetrahydropyridines. 3,888,853, Cl. 260-247.10M.

Marathon Oil Company: *See—*
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Rhudy, John S.; and Gogarty, William B., 3,888,309.

Marchand, Maurice E. L.: *See—*
Petitjean, Christian H.; Marchand, Maurice E. L.; and Denis, Marcel, 3,889,214.

Margolin, Efraim; and Grunstein, Michael, to Grun Mar Industries Inc. Adjustable bracket assembly. 3,888,354, Cl. 211-110.000.

Marine Protein Corporation: *See—*
Buss, Keen W., 3,888,210.

Marling Industries Limited: *See—*
Jakes, John Harry, 3,889,035.

Mars, William T., to McNeil Corporation. Electronic indexing system. 3,888,338, Cl. 192-142.000.

Martin, Elmore Louis, to du Pont de Nemours, E. I., and Company. Cyano-and cyanomethyl-benzensulfonamides. 3,888,897, Cl. 260-465.00E.

Martin Engineering Co.: *See—*
Fischer, Peter Augustus, 3,888,960.

Martin, Gary A.; and Lister, John W., to General Electric Company. Convergence means for inline-type cathode ray tube. 3,889,217, Cl. 335-212.000.

Maruko, Saburo. Connection device. 3,888,955, Cl. 261-99.000.

Marumo, Hideo, to Carapus Company, Limited. Detergent composition. 3,888,797, Cl. 252-527.000.

Marx, Gunter. Apparatus for measuring a quanity of urine. 3,888,236, Cl. 128-2.00F.

Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Treatment of glass fibers. 3,888,645, Cl. 65-3.000.

Masanek, Juergen: *See—*
Arndt, Peter Joseph; Pennewiss, Horst; Plainer, Hermann; Krall, Wilhelm; Masanek, Juergen; and Mueller, Manfred, 3,888,945.

Mase, Shunzo; and Watanabe, Tetsuo, to NGK Insulators Ltd. Multilayer metallized beryllia ceramics and a method for producing the same. 3,889,041, Cl. 428-472.000.
Maselli, Nicholas F., to Western Electric Company, Incorporated. Method for abrasive cutting in a liquid. 3,888,054, Cl. 51-319.000.
Maske, Robert L. Step for motor vehicle. 3,888,510, Cl. 280-166.000.
Massa, Andrew Leo: *See—*
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Massachusetts Institute of Technology: *See—*
  Spinella, Rinaldo A., 3,888,116.
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Massey-Ferguson Inc.: *See—*
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Masuzawa, Isao: *See—*
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Mather, Selwyn R.: *See—*
  Chalex, Paul; and Mather, Selwyn R., 3,888,814.
Matsuda, Mutsuhide: *See—*
  Taguchi, Tetsuya; Yazaki, Mutsunobu; and Matsuda, Mutsuhide, 3,889,281.
Matsuda, Tetsuo: *See—*
  Hamakawa, Hiroshi; Kobari, Sadami; Shimizu, Takeshi; Fujimoto, Kentaro; Hayano, Kazuo; and Matsuda, Tetsuo, 3,888,927.
  Mizuno, Kimio; Ando, Takuji; Tsujino, Masatoshi; Takada, Masaki; Yoshizawa, Munetoshi; Matsuda, Tetsuo; and Hayashi, Mitsuo, 3,888,843.
Matsui, Yutaka: *See—*
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Matsumoto, Seiji; and Tamai, Vasuo, to Rank Xerox, Limited. Reversal developing method using photoconductive developing electrode. 3,888,666, Cl. 96-1.00R.
Matsuo, Susumu. Apparatus for separation of air and dust. 3,887,959, Cl. 15-347.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
  Goto, Toshiyuki; Kido, Kouichi; and Yamada, Akitoshi, 3,889,060.
  Oka, Shunzo; and Minami, Shunji, 3,889,133.
  Yamamoto, Osamu; Takenaga, Mutsuo; and Tsujimoto, Yoshinobu, 3,889,124.
  Yoshikawa, Hiromi; Sawada, Katsuo; Asanari, Shigeyuki; Kajikawa, Saburo; and Kodama, Takao, 3,888,643.
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Matsuura, Shigeo; Saitoh, Takeshi; and Miyamoto, Hiroshi, to Hitachi, Ltd. Local oscillation circuit for reducing oscillation voltage variations between high and low frequency bands. 3,889,210, Cl. 331-109.000.
Matsuzaki, Kazuhiro: *See—*
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Mattes, Siegfried: *See—*
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  Perreault, Donald A.; Bedzyk, Victor Lee; Matthews, Larry Richard; Rivers, Roy Wilben; Shuey, David Rolling; and Torpie, John David, 3,889,057.
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Matueda, Kanji; Niino, Hideki; and Nakano, Yoshitomo, to Permachem Asia Co. Ltd.; and Mitsubishi Petrochemical Co. Ltd. 1,2-Epoxy resin compositions containing aminimide compounds. 3,888,827, Cl. 260-47.0EC.
Mauch, Robert E.: *See—*
  Sarbacher, Robert I.; and Mauch, Robert E., 3,889,170.
Maul Bros. Inc.: *See—*
  Breeden, Donald H.; and Bowles, John M., 3,888,647.
Maulding, Donald Roy, to American Cyanamid Company. Chlorinated bis(phenylethynyl)anthracenes as fluorescers in chemiluminescent systems. 3,888,786, Cl. 252-188.3CL.
Maurer, Donald D., to Medtronic, Inc. Time shared stimulator. 3,888,261, Cl. 128-420.000.
Mauritz, Frank A. Rear door lock for trucks and trailers. 3,888,529, Cl. 292-259.000.
Max Baermann, Firma: *See—*
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Maxwell, Richard D., to Tri-M Tool Corporation. Core drill. 3,888,320, Cl. 175-394.000.
May, Edwin A.; Salkin, Burton; and McDonald, Harold Paul, Jr., to International Paper Company. Catheterization kit. 3,888,235, Cl. 128-2.00F.
Mayer, Arthur, to Astrosystems Inc. Two and three-phase oscillators with all-pass network having amplitude responsive time constant. 3,889,206, Cl. 331-45.000.
Mayer, Ehrhard. Dual-cooled slide ring seal. 3,888,495, Cl. 277-3.000.
Mayer, George L., Jr.; and Dobbins, David L., to Coded Signatures, Inc. Video signature decoder and comparator and method. 3,889,056, Cl. 178-6.800.
Maynard, Wade. Bearing puller device. 3,887,989, Cl. 29-427.000.
Mazzeo, Charles F.; and Santos, Anthony J., to Amerace Corporation. Installation tool for wire connectors. 3,887,981, Cl. 29-203.00H.
McBride, David A., to Hercules Incorporated. Method for preparation of fine particle size inorganic oxidizers. 3,888,017, Cl. 34-5.000.
McCain, Colin Christopher: *See—*
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McCall, Ernest Bryson: *See—*
  Bain, Peter James Stratford; and McCall, Ernest Bryson, 3,888,964.
McChesney, Vernon H. Hand truck and wheel-barrow combination. 3,888,501, Cl. 280-47.180.
McCloskey, Albert R., to Rockwell International Corporation. Self lubricating spherical bearing assembly. 3,888,554, Cl. 308-72.000.
McCloud, James R.: *See—*
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McConnel, Ronald J.: *See—*
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McCullough, Edward E.; and Anderson, E. Eugene, to Thiokol Corporation. Spike nozzle for rockets. 3,888,419, Cl. 239-265.190.
McCurdy, James P. Firing control system. 3,888,021, Cl. 35-25.000.
McDonald, Bernard: *See—*
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McDonald, Harold Paul, Jr.: *See—*
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McEvoy, Francis Joseph: *See—*
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McFarland, George L., to General Electric Company. High voltage contactor. 3,889,082, Cl. 200-146.00R.
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McGee, James Dwyer, to Electron Physics Limited. Image intensifier tube. 3,889,144, Cl. 313-99.000.
McGuire, Kenneth H. Adjustable fishing pole holder. 3,888,034, Cl. 43-17.000.
McKee, Charles W., to United States of America, General Counsel-Code GP. Fluid control apparatus and method. 3,888,410, Cl. 233-6.000.
McKenzie, George J.; and Ruther, Heinz W., to Westinghouse Canada Limited. Sonar display. 3,889,225, Cl. 340-3.00C.
McKinney, Lee R. Apparatus and method for cleaning air filter elements by vertical reciprocation. 3,888,694, Cl. 134-32.000.
McLander, Lance E.: *See—*
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McNear, Maxwell F.: *See—*
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Mead Johnson & Company: *See—*
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Measurex Corporation: *See—*
  Bossen, David A., 3,889,121.
Medtronic, Inc.: *See—*
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Megapulse Incorporated: *See—*
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Meindl, James D.; and Hottinger, Charles F., to Stanford University. Ultrasonic blood vessel imaging system and method. 3,888,238, Cl. 128-2.00V.

Meininger, Fritz; and Kohlhaas, Folker, to Hoechst Aktiengesellschaft. Water-soluble reactive xanthene dyestuffs and process for preparing them. 3,888,862, Cl. 260-281.000.
Meisterheim, Richard A., to Kawneer Company, Inc. Automatic astragal. 3,888,046, Cl. 49-319.000.
Melichar, Rainer: *See—*
  Bigalke, Erhard; Radmann, Dietrich; Klein, Erwin; Melichar, Rainer; and Biedermann, Kurt, 3,888,220.
Mende, David T.: *See—*
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Menell, Hans; and Rach Heinz-Dieter, to Continental Gummi-Werke Aktiengesellschaft. Pneumatic vehicle tire. 3,888,292, Cl. 152-362.000.
Menn, Julius J.: *See—*
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Merriam, Frank R., to Ford Motor Company. Six pole permanent magnet motor. 3,889,141, Cl. 310-154.000.
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Messineo, Joseph R.: *See—*
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Metlesics, Werner; and Sternbach, Leo Henryk, to Hoffmann-La Roche Inc. Process for 2[2-(1,3-diazacycloalk-2-enyl)]benzophenone derivatives and 1,3-diazacycloalkenyl[2,1-a]isoindole derivatives. 3,888,846, Cl. 260-239.0BC.
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Meyer, Edwin A., to Xerox Corporation. Apparatus for packaging and subsequently installing a belt onto a roller assembly. 3,888,577, Cl. 355-3.00R.
Meyer, Eric A., to Repco Products Corporation. Air conditioning apparatus. 3,888,090, Cl. 62-240.000.
Meyer, Rudolf; Hoffmann, Klaus; Freytag, Karl-Heinz; and Vetter, Hans, to Agfa-Gevaert Aktiengesellschaft. Aqueous ink for use in the ink jet process. 3,889,269, Cl. 346-1.000.
Meyer, Rudolf: *See—*
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Milewski, Marcel F.; and Weiser, Curtis E., to Ford Motor Company. Canister diode having improved environment protective insulation. 3,889,285, Cl. 357-72.000.
Miley, Robert C. Hypothermia system. 3,888,259, Cl. 128-400.000.
Milford, George Noel, Jr., to du Pont de Nemours, E. I., and Company. Aromatic polyamide fibers containing ultraviolet light screeners. 3,888,821, Cl. 260-45.8NT.
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Miller, David James, to Freeport Minerals Company. Enhanced cobalt recovery from ammoniacally leached reduced ores using cyanide, hydrazine, or hydroxylamine compounds. 3,888,966, Cl. 423-150.000.
Miller, John A.: *See—*
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Mills, Roy. Sliding sash closer. 3,887,962, Cl. 16-72.000.
Minall, Anthony William; and Palmer, Edmond Thomas, to J. Evans & Son (Portsmouth) Limited. Filament feeding apparatus. 3,888,401, Cl. 226-109.000.
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Minnesota Mining and Manufacturing Company: *See—*
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Miranda, Eduardo V., to Baxter Laboratories, Inc. Reagent Tube and Stopper Assembly. 3,888,113, Cl. 73-64.100.
Miranda, Lawrence Thomas. Eccentric shaft mounting apparatus. 3,888,134, Cl. 74-405.000.
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Mitchell, Laymon. Conveyor belt cleaner. 3,888,345, Cl. 198-230.000.
Mitchell, Richard Frank, to U.S. Philips Corporation. Temperature compensated acoustic surface wave oscillator. 3,889,205, Cl. 331-41.000.
Mitchell, Wallace F., to Ammco Tools, Inc. Wheel balancing system. 3,888,128, Cl. 73-484.000.
Mitchell, William A.; Stahl, Howard D.; and Seidel, William C., to General Foods Corporation. Fixed volatile flavors and method for making same. 3,889,008, Cl. 426-534.000.
Mitsubishi Chemical Industries Ltd.: *See—*
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  Yamaguchi, Kazuo; Kanoh, Natsuki; Ito, Isao; and Enokido, Nobuo, 3,888,834.
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Mizelle, Ned W. Disposable Christmas tree stand. 3,888,438, Cl. 248-48.000.
Mizuno, Kimio; Ando, Takuji; Tsujino, Masatoshi; Takada, Masaki; Yoshizawa, Munetoshi; Matsuda, Tetsuo; and Hayashi, Mitsuo, to Toyo Jozo Kabushiki Kaisha. 4-Carbamoyl-1-β-D-ribofuranosylimidazolium-5-olate. 3,888,843, Cl. 260-211.50R.
Mlkvy, William P.; and Tucci, Raymond J. Zinc and strontium ion containing effervescent mouthwash tablet. 3,888,976, Cl. 424-44.000.
Mobay Chemical Corporation: *See—*
  Cross, James M.; Hudson, George A.; and Hixenbaugh, Joseph C., 3,888,908.
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  Nnadi, John C.; and Heilweil, Israel Joel, 3,888,773.
  Young, Lewis B.; Weinstein, Benjamin; and Jurewicz, Anthony T., 3,888,886.
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Mondt, James R., to General Motors Corporation. Carburetor enrichment system. 3,888,223, Cl. 123-136.000.
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Moore, Francis C.; and Perkinson, Leon R., to Moore-Perk Corporation. Abdominal pad or surgical dressing. 3,888,248, Cl. 128-156.000.
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Moreiras, Luis, to Weatherhead Company, The. Flareless fitting. 3,888,522, Cl. 285-341.000.
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Morrell, Ronald Joseph; Gumb, Beverley William; and Laing, Graham Stirling, to Northern Electric Company Limited. Interconnector latch assembly for plural banks of multiple pushbutton switches. 3,889,075, Cl. 200-5.00E.
Morris, Michael: *See—*
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Morse, Donald B., to Kemlite Corporation. Preparation of resin impregnated glass fiber sheets. 3,888,716, Cl. 156-276.000.
Mortlock, Walter John. Method of producing furniture. 3,887,988, Cl. 29-416.000.
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Muraco, Paul F.; and Griffin, James S., to United States of America, Navy. Radar recording and reproducing system with pulse modulation and time division multiplexing. 3,889,293, Cl. 360-18.000.
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Murphy, Joseph A., to National-Southwire Aluminum Co. Method of and apparatus for producing metal. 3,888,747, Cl. 204-67.000.
Muzyczko, Thaddeus M.; and Jones, Thomas H., to Richardson Company, The. Photoreactive compositions and products made therewith. 3,888,671, Cl. 96-33.000.
Myers, John L., to Ledex, Inc. Solenoid driving means. 3,889,162, Cl. 317-148.50R.
Myers, John L.: *See—*
  Flachbarth, Charles T.; and Myers, John L., 3,889,044.
Nadelson, Jeffrey: *See—*
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Nagao, Kameji: *See—*
  Horie, Ikutaro; and Nagao, Kameji, 3,888,681.
Nagasao, Toshiie: *See—*
  Teshima, Toru; Nagasao, Toshiie; Tanaka, Minoru; Ariga, Kazuo; and Inoue, Kiyoshi, 3,888,756.
Nagasawa, Taro; Ono, Joji; Kudo, Tutomu; and Harada, Yoshitugu, to Morinaga Milk Industry Co. Ltd. An animal feed of high digestibility. 3,889,006, Cl. 426-656.000.
Nagase, Minoru, to Nippon Air Brake Company, The. Compressor governor. 3,888,603, Cl. 417-25.000.
Nagel, Robert H.; and Saylor, Richard, to IDR, Inc. Row grabbing system. 3,889,054, Cl. 178-6.800.
Naimy, Norma: *See—*
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Nakai, Hiroshi: *See—*
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Nakamura, Yoshio: *See—*
  Watanabe, Kiyoshi; Hirakawa, Tamotsu; Takahara, Kenji; Nakamura, Yoshio; Iwasaki, Sueo; and Tanaka, Tutomu, 3,888,737.
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Nakano, Yoshitomo: *See—*
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Nakashio, Seizo; Sekine, Noriyuki; Toyota, Nobuhiro; and Fujita, Fumio, to Sumitomo Chemical Co., Ltd.; and Hayashibara Biochemical Laboratories, Inc. Paint containing pullulan. 3,888,809, Cl. 260-17.4ST.
Namiki, Teruo: *See—*
  Kawamoto, Kensuke; Tsuno, Tomoaki; and Namiki, Teruo, 3,888,969.
Narang, Saran A.; Dheer, Surinder K.; and Wightman, Robert H., to Canadian Patents and Development Limited. Arylmercaptoethyl phosphates. 3,888,950, Cl. 260-933.000.
Narr, Berthold; Roch, Josef; Muller, Erich; and Nickl, Josef, to Boehringer Ingelheim GmbH. 2,4-Diamino-substituted thieno(3,2-d)pyrimidines and salts thereof. 3,888,851, Cl. 260-243.00R.
Naruchi, Tatsuyuki: *See—*
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National Advertising Company: *See—*
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National Starch and Chemical Corporation: *See—*
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  Sirota, Jilius; Forsyth, Robert S.; and Fergesen, David, 3,888,811.
Naubereit, Hans: *See—*
  Pinten, Peter; Naubereit, Hans; and Trautvetter, Werner, 3,888,948.
Needham, James C., to Welding Institute, The. Resistance welding. 3,889,094, Cl. 219-89.000.
Neill, William M.: *See—*
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Neiman, Herbert M.: *See—*
  Katz, Martin; and Neiman, Herbert M., 3,888,995.
Nelson, Arnold S., to GAF Corporation. Algicidal post treated roofing granules. 3,888,682, Cl. 106-15.0AF.
Nelson, Verner R.: *See—*
  Failli, Amedeo; Nelson, Verner R.; Immer, Hans U.; and Gotz, Manfred K., 3,888,840.
  Immer, Hans U.; Nelson, Verner R.; and Gotz, Manfred K., 3,888,838.
Netting, David I., to Philadelphia Quartz Company. Method of making hollow spheres by spray drying. 3,888,957, Cl. 264-13.000.
Neumeier, Leander A.: *See—*
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Neuner, James A., to Westinghouse Electric Corporation. Communication between redundant protection and safeguards logic systems within nuclear reactor power plants by means of light. 3,888,772, Cl. 250-199.000.
Neves, Antonio Maria Castello Brancoe. Apparatus for controlling the actuation of the brakes of a motor vehicle. 3,888,551, Cl. 303-84.00A.
New England Merchant Natl. Bank, executor: *See—*
  Worthen, Eugene P., deceased; and New England Merchant Natl. Bank, executor, 3,888,337.
Newell, Jon Albert; Seeley, Robert Dudley; and Robbins, Ernest Aleck, to Anheuser-Busch, Incorporated. Isolated yeast protein product with intact rna and a process for making same. 3,888,839, Cl. 260-112.00R.
NGK Insulators Ltd.: *See—*
  Mase, Shunzo; and Watanabe, Tetsuo, 3,889,041.
Nguyen Van, Trong, to La Telemecanique Electrique. Linear and rotary actuator. 3,889,165, Cl. 318-115.000.
Nichols, Arnold Douglas; and Sundt, Cornelius Vickers, to United Aircraft Corporation. Stress restraining ring for compressor rotors. 3,888,602, Cl. 416-198.000.
Nichols, Douglas Alan: *See—*
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Nickl, Josef: *See—*
  Narr, Berthold; Roch, Josef; Muller, Erich; and Nickl, Josef, 3,888,851.
Nicoll, Frank S., Jr. Modular constructed fiberglass reinforced paperboard boat. 3,887,952, Cl. 9-6.000.
Niedermayr, Alois: *See—*
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Niessner, Robert A. Self-contained kitchen unit for a van type vehicle. 3,888,539, Cl. 296-23.00D.
Nigido, Salvatore A. Swedger apparatus. 3,888,102, Cl. 72-393.000.
Nigol, Olaf. Semiconductive glaze compositions. 3,888,796, Cl. 252-518.000.
Niino, Hideki: *See—*
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Nikitin, Jury Stepanovich: *See—*
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Nims, Jerry R., to Soiltest, Inc. Method and apparatus for determining road roughness. 3,888,118, Cl. 73-105.000.
Ninomiya, Hisakazu: *See—*
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Nippes, J. Timothy. Trash disposal apparatus. 3,888,406, Cl. 229-14.00R.
Nippon Air Brake Company, The: *See—*
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Nippon Electric Company, Limited: *See—*
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  Yamaguchi, Kiminori, 3,888,333.
Nippon Oil Co., Ltd.: *See—*
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  Shinomura, Toshihiko, 3,888,810.
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Nishizawa, Junichi; and Ichinose, Wasaburo, to Handotai Kenkyu Shinkokai; and Kokusai Denki Kabushiki Kaisha. Position control system using magnetic forces for correcting the inclination of a controlled member including a torsional mounting. 3,889,164, Cl. 318-640.000.
Nissan Motor Company Limited: *See—*
  Chikaraishi, Takayo, 3,888,047.
  Fukasawa, Noburu; Kitagawa, Takanori; and Inoue, Naohiko, 3,887,958.
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Nnadi, John C.; and Heilweil, Israel Joel, to Mobil Oil Corporation. Nitrogen compounds linked to a heterocyclic ring as multifunctional additives in fuel and lubricant compositions. 3,888,773, Cl. 252-37.200.
Noble, Peter M., to Westinghouse Air Brake Company. Control system for suppressing wheel squealing noise produced by railroad car retarders. 3,888,183, Cl. 104-26.00A.
Nohira, Hidetaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Air flow control valve. 3,888,080, Cl. 60-290.000.
Nomiya, Kosei; Hatsukano, Yoshikazu; and Minorikawa, Kazuo, to Hitachi, Ltd. Bootstrap circuit employing insulated gate transistors. 3,889,135, Cl. 307-270.000.
Non-Impact Surfaces Limited: *See—*
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Nooker, Eugene L., to United States of America, Navy. Rod warhead. 3,888,180, Cl. 102-67.000.
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Nord, Kermit; and Wallenhorst, Francis C., to United States of America, Army. Initiator for incendiary pellet. 3,888,179, Cl. 102-66.000.
Norris, Philip R.; and Rubinstein, Leon, to Polaroid Corporation. Multi-element lens assembly. 3,888,568, Cl. 350-252.000.
Northern Electric Company Limited: *See—*
  Morrell, Ronald Joseph; Gumb, Beverley William; and Laing, Graham Stirling, 3,889,075.
  Pighin, Albert; and Malanka, Douglas Peter, 3,888,784.
  Thompson, James Lawrence Earl; Clarke, Wallace Eugene; and Gale, James, 3,889,059.
  Zimmermann, Detlef; Lougheed, James Hugh; and Crompton, Eric John, 3,889,262.
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Novak, Raymond F.: *See—*
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Nowak, Gerald; and Decker, Herbert, to Triumph Werke Nurnberg A. G. Impression control mechanism for a typewriter or similar machine. 3,888,339, Cl. 197-55.000.
Nowak, Richard T.: *See—*
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Nupla Corporation: *See—*
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Nuss, James J., to General Electric Company. Door cooling system. 3,889,099, Cl. 219-393.000.
Nygaard, James L., to Texas Instruments Incorporated. Automatic slice processing. 3,888,674, Cl. 96-36.000.
Oatis, Melvin Neal; and McNulty, Henry V., to Telephonic Equipment Company. Tone detecting telephone connection monitor. 3,889,070, Cl. 179-18.00F.
Obenchain, Irving R., Jr.: *See—*
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Obinson, Bruce R.: *See—*
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O'Brien, Dennis H.; and Havranek, Dennis D., to Valmont Industries Inc. Pole mounting bracket attachment. 3,888,446, Cl. 248-231.000.
O'Brien, Robert A.; and Peterson, Manuel. Self-leveling hoist for wheel chairs. 3,888,463, Cl. 254-10.00C.
Ocean Food Inc.: *See—*
  Gunter, Gordon; and Venkataramaiah, Amaraneni, 3,889,007.
Oetiker, Hans, to Gebruder Buhler AG. Flow controller for flowing products, more particularly, bulk materials. 3,888,389, Cl. 222-23.000.
Offermanns, Heribert: *See—*
  Asinger, Friedrich; Gluzek, Karl-Heinz; and Offermanns, Heribert, 3,888,923.
Ogasawara, Makoto; Suzuki, Kazuyoshi; Urasaki, Takanori; Shima, Takeo; Kurisu, Shizuka; and Hirabayashi, Yasuji, to Teijin Limited. Process for obtaining 2,6-dimethylnaphthalene-rich or 2,7-dimethylnaphthalene-rich product. 3,888,938, Cl. 260-668.00A.
Ogasawara, Takahisa; Senzaki, Yoshimichi; Kato, Hiroyuki; and Tatemichi, Hidemaro, to Toagosei Chemical Industrial Co., Ltd. Curable compositions. 3,888,830, Cl. 260-76.000.
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Ogiso, Mitsutoshi; and Taguchi, Tetsuya, to Canon Kabushiki Kaisha. Device for controlling exposure factors in cameras. 3,889,277, Cl. 354-36.000.
Ogiwara, Haruo, to Nippon Telegraph and Telephone Public Corporation. Character coincidence detector for optical information retrieval systems. 3,889,233, Cl. 340-146.30F.
Oiles Kogyo Kabushiki Kaisha: *See—*
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Okada, Shigetaka; and Kitahata, Sumio, to Hayashibara Kabushiki-Kaisha. Method for purifying cyclodextrin-producing enzymes. 3,888,738, Cl. 195-66.00R.
Okada, Takashi; Yamagishi, Sokichi; Kamoshida, Mototaka; Satake, Tomomitsu; and Kishi, Sadayuki, to Nippon Electric Company, Limited. Method of making an ohmic contact with a semiconductor substrate. 3,887,993, Cl. 29-571.000.
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Olsen, Willi; Lorenz, Dieter; and Beer, Heinz, to Siemens Aktiengesellschaft. Combination of a pressurized-gas insulated high-voltage switching installation and a multi-pole grounding switch device. 3,889,076, Cl. 200-48.00R.
Olympus Optical Co., Ltd.: *See—*
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Onishi, Kazutoshi; Awano, Tsuneo; and Masuzawa, Isao, to Kabushikikaisha Tokyo Keiki. On-off control circuit. 3,889,168, Cl. 318-341.000.
Ono, Joji: *See—*
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Orso, Francis L.; and Piazza, Giacomo J., to Corning Glass Works. Inline homogenizing of extrudable ceramic batch materials. 3,888,963, Cl. 264-176.00R.
Osborne, Gordon W. Automatic or manual multi-speed transmission for electrically propelled vehicles. 3,888,326, Cl. 180-65.00R.
Oshima, Ryoichiro; Suginuma, Atsushi; Kishi, Atsuo; and Kawashima, Kenichi, to Hitachi, Ltd. Compressor for a refrigerating machine. 3,888,604, Cl. 417-269.000.
Oshima, Shigenobu: *See—*
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O'Sickey, Lawrence B., to Parker-Hannifin Corporation. Tube coupling and ferrule therefor. 3,888,521, Cl. 285-341.000.
Osmond, John S. Ventilated seating for a water closet. 3,887,949, Cl. 4-217.000.
Ostertog, Robert J.; and Page, Anthony J., to Johns-Manville Corporation. Insulating product and dry process for its manufacture. 3,888,962, Cl. 264-122.000.
Owens-Corning Fiberglas Corporation: *See—*
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Page, Anthony J.: *See—*
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Pallos, Ferenc M.; and Menn, Julius J., to Stauffer Chemical Company. Insecticidal active geranyl and citronyl amine derivatives and their epoxides. 3,888,888, Cl. 260-348.00A.
Pallos, Ferenc M.; and Tseng, Chien K., to Stauffer Chemical Company. Derivatives of certain geranyl phenyl ethers and their use in controlling insects. 3,888,987, Cl. 424-278.000.
Palmer, Charles. Communications transceiver adapted for mounting on a helmet. 3,889,190, Cl. 325-16.000.
Palmer, Edmond Thomas: *See—*
Minall, Anthony William; and Palmer, Edmond Thomas, 3,888,401.
Pande, Gyan S.; and Balatoni, Julius A., to Uniroyal Inc. Method of making 5,6-dihydro-2-methyl-1,4-oxathiin-3-carboxamide 4,4-dioxides. 3,888,878, Cl. 260-327.00P.
Panella, Edward A., to United States of America, Navy. Method of assembling a safety device for rockets. 3,887,991, Cl. 29-450.000.
Panetti, Romolo, to Speno International S.A.; and Frank Speno Railroad Ballast Cleaning Co., Inc. Relating to methods for grinding rails. 3,888,052, Cl. 51-281.00R.
Panitz, Eric; and Daniels, Peter J. L., to Schering Corporation. Certain 1-(5-nitro-2-thienyl)-1-acylamidoalkanes for treating histomoniasis. 3,888,986, Cl. 424-275.000.
Pardes, Herman I.; Schwartz, Joseph R.; and Sherburne, Frederick B., to United States of America, Army. Moving target screen. 3,888,022, Cl. 35-25.000.
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Parker, Joseph D., deceased; by Parker, Dorothy C., executrix; Hergert, Richard E.; and Roerig, Arnold J. Papermaking machine headbox slice chamber containing pivotable thin rigid plates with flexible elements attached thereto. 3,888,729, Cl. 162-343.000.
Parmann, Gunnar, to Rieber & Son Plastic-Industri A/S. Process of producing a socket joint between a pair of lengths of thermo-plastic pipe. 3,887,992, Cl. 29-450.000.
Parr, Edward L.: *See—*
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Parrilla, Salvatore C. Safety device to prevent tipping a bicycle. 3,888,511, Cl. 280-239.000.
Pars, Harry G.; and Razdan, Raj K., to Arthur D. Little, Inc. Pyrano benzopyrans. 3,888,946, Cl. 260-326.50B.
Parsons, Joseph D. Screw and driver. 3,888,144, Cl. 81-71.000.
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Payne, Earl E. Ladder rack. 3,888,398, Cl. 224-42.100.
PCR, Inc.: *See—*
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Perl, Theodore. Light-proofed radiographic cassette unloader and reloader. 3,888,587, Cl. 355-112.000.
Permachem Asia Co. Ltd.: *See—*
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Perreault, Donald A.; Bedzyk, Victor Lee; Matthews, Larry Richard; Rivers, Roy Wilben; Shuey, David Rolling; and Torpie, John David, to Xerox Corporation. Fascimile communication system. 3,889,057, Cl. 178-69.50F.
Personal Products Company: *See—*
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Peterson, Adrian J.: *See—*
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Peterson, Charles A., to Westinghouse Electric Corporation. Series capacitor protection equipment with dual sparkover feature. 3,889,158, Cl. 317-12.00A.
Peterson, Donald J., to Procter & Gamble Company, The. Protective coatings. 3,889,025, Cl. 428-413.000.
Peterson, Manuel: *See—*
O'Brien, Robert A.; and Peterson, Manuel, 3,888,463.
Peterson, Walter O. Power transmission with adjustable fulcrum. 3,888,512, Cl. 280-255.000.

Petitjean, Christian H.; Marchand, Maurice E. L.; and Denis, Marcel, to International Standard Electric Corporation. Pass-band filter having electronically adjustable midfrequency. 3,88[illegible],214, Cl. 333-73.00R.
Petrik, Bruno; and Ruf, Erich, to TH Goldschmidt AG. Process for manufacturing carrier sheets treated with hardenable aminoplast resin preliminary condensates for surface coating. 3,888,728, Cl. 162-167.000.
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Redmore, Derek, 3,888,627.
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Pettit, Marshall G. Motion-responsive shutoff valve. 3,888,271, Cl. 137-45.000.
Pews, R. Garth; Goralski, Christian T.; and Burk, George A., to Dow Chemical Company, The. Bis (thiocyanomethylthio) thiadiazoles. 3,888,869, Cl. 260-302.0SD.
Pfaff Industriemaschinen GmbH: *See—*
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Pfizer Inc.: *See—*
Kadin, Saul B., 3,888,988.
Philadelphia Quartz Company: *See—*
Netting, David I., 3,888,957.
Philip, Morris. Stop motion assembly and method. 3,888,095, Cl. 66-163.000.
Phillips, Buster C. Progressive molding method. 3,888,959, Cl. 264-32.000.
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Kubicek, Donald H., 3,888,940.
Phillips, Wendell Gary, to Monsanto Company. Substituted dichlorosulfenamides. 3,888,925, Cl. 260-551.00S.
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Piegza, Henry J., to WSF Industries Inc. Construction for mounting a door of a pit mounted pressure vessel. 3,888,045, Cl. 49-255.000.
Pierce, Edwin F.; Roberts, Larry W.; and Maddox, Leland D., to Amer-O-Matic Corporation. Envelope opening machine. 3,888,069, Cl. 53-381.00R.
Pierce, John T., to Iota Engineering Inc. Power source for fluorescent lamps and the like. 3,889,153, Cl. 315-209.00R.
Pighin, Albert; and Malanka, Douglas Peter, to Northern Electric Company Limited. Electrochemical luminescent composition. 3,888,784, Cl. 252-188.3CL.
Pike, John E.; and Schneider, William P., to Upjohn Company, The. 11,15 Dimethyl PGE_1 and PGF_1 . 3,888,919, Cl. 260-514.00D.
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Pilz, Gilbert B.; and Vivian, James R., to Young Daybrook, Inc. Tractor-trailer service line coupling. 3,888,513, Cl. 280-421.000.
Pinten, Peter; Naubereit, Hans; and Trautvetter, Werner, to Dynamit Nobel AG. Polyvinyl chloride type resins. 3,888,948, Cl. 260-878.00R.
Pioneer Electronic Corporation: *See—*
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Plettner, Wolfram, to Hoechst Aktiengesellschaft. Process for the manufacture of aqueous expoxide resin emulsions. 3,888,812, Cl. 260-24.000.
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Ponzoni, George B.; and Leonard, Richard J., to General Foods Corporation. Method for a freeze dried fortified coffee having improved rate of solubility. 3,888,859, Cl. 426-262.000.
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Przybylek, George John, to Burroughs Corporation. Gaseous discharge display panel with scanning anode base plate assembly including resistive masses. 3,889,150, Cl. 315-58.000.
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- Reardon, Daniel Francis, to Eastman Kodak Company. Method of preparing indophenols and oxichromic compounds. 3,888,926, Cl. 260-559.00A.
- Rebentisch, Hugo E., to Unistrut Corporation. Support arrangement. 3,888,440, Cl. 248-73.000.
- Rebentisch, Hugo E., to Unistrut Corporation. Support arrangement. 3,888,441, Cl. 248-73.000.
- Redelfs, Hans, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method of assembling an unloading crane. 3,888,356, Cl. 212-15.000.
- Redmore, Derek, to Petrolite Corporation. Use as corrosion inhibitors: phenanthridine phosphonic compounds. 3,888,626, Cl. 21-2.50A.
- Redmore, Derek, to Petrolite Corporation. Use as corrosion inhibitors: quinoline and isoquinoline phosphonates. 3,888,627, Cl. 21-2.50A.
- Reece, Vernon N. Vehicle radiator protection device. 3,888,327, Cl. 180-68.00P.
- Reed, Edgar A.; and Combos, E. Russell, to United States of America, Navy. Crown float/decelerator. 3,889,224, Cl. 340-2.000.
- Reed, Irving S.; and Obenchain, Irving R., Jr., to Technology Service Corporation. Digital telephone switching system. 3,889,067, Cl. 179-18.00J.
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- Reid, Charles M., to Elast-O-Cor Products & Engineering Limited. Covering for belt conveyor idler rolls. 3,888,131, Cl. 74-241.000.
- Reifsnyder, Howard B., to Construction Specialties Inc. Expansion joint seal. 3,888,599, Cl. 404-69.000.
- Reimann, Herbertus; and Clauss, Gunter, to Veb Pentalon Dresden. Storage and processing apparatus for record carriers. 3,888,365, Cl. 214-16.00B.
- Reinbeck, Hans, to Robert Bosch G.m.b.H. Motor-driven vehicle with hybrid internal combustion and electrical drive. 3,888,325, Cl. 180-65.00A.
- Reinecke, Erich; Isernhagen, Fritz; Klatt, Alfred; Weise, Lutz; Schlamann, Wilhelm; and Lindemann, Klaus, to Westinghouse Bremsen-und Apparatebau GmbH. Anti-wheel skid control system providing controlled reapplication of brake pressure. 3,888,550, Cl. 303-21.00P.
- Reinhold, Herbert E., Jr.; and Toren, Richard B., to Survival Technology, Inc. Electrode assembly and methods of using the same in the respiratory and/or cardiac monitoring of an infant. 3,888,240, Cl. 128-2.06E.
- Reliance Electric Company: *See—*
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- Rheinstahl Henschel Aktiengesellschaft: *See—*
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- Richter, Sidney B.; and Krenzer, John, to Velsicol Chemical Corporation. N-alpha-haloacetyl-n-(1,3-dioxan-2-ylalkyl)anilids. 3,888,882, Cl. 260-340.700.
- Rickter, Donald O.: *See—*
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- Rodek, Victor; and Ticknor, Raymond G., to Xerox Corporation. Digital controlled document feeder. 3,888,579, Cl. 355-14.000.
- Rodzewich, Edward A., to Amchem Products, Inc. Cleaner for tin plated ferrous metal surfaces, comprising phosphate, silicate and borax. 3,888,783, Cl. 252-135.000.
- Roe, Geoffrey Ernest; and Favill, John Edward, to Norton Villiers Limited. Exhaust silencers. 3,888,332, Cl. 181-53.000.
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- Ron, Benjamin. Combined power brake and antiskid actuators. 3,888,547, Cl. 303-21.00F.
- Rosback, Donald H., to Universal Oil Products Company. Process for separating olefins by adsorption. 3,888,939, Cl. 260-677.0AD.
- Rose, Selwyn H.; and Reynard, Kennard A., to Horizons Incorporated. Fluorophosphazene polymers curable at room temperature. 3,888,799, Cl. 260-2.00P.
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- Ross, Milton Dean; Folk, Kenneth Foster; and Shatto, Walter Clifton, Jr., to Keating, William J., Esq. Method and apparatus for varying the relative length of a plurality of leads and for performing work operations on the ends of leads of differing relative length. 3,887,999, Cl. 29-628.000.
- Ross, Walter Lee, to RCA Corporation. Raster-scan display system having improved means for reading out stored game-score information. 3,889,253, Cl. 340-323.000.
- Rossmann, Dieter, to Carl Zeiss Stiftung. Photographic diaphragm control means. 3,889,283, Cl. 354-272.000.
- Rosso, Charles. Fireman's pike pole or the like. 3,888,535, Cl. 294-19.00R.
- Rothenstein, Julius, to United States of America, Navy. Flexible, self-supporting explosive composition. 3,888,707, Cl. 149-19.400.
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- Rounds, Gerald L., to Kaiser Steel Corporation. Method for removing deposits from interior surfaces of regenerative heat exchangers. 3,888,302, Cl. 165-1.000.
- Rowland, Charles A. Adjustable hanger. 3,888,448, Cl. 248-328.000.
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- Russ, Paul E., Sr., to Gates Rubber Company, The. Positive drive belt and system. 3,888,132, Cl. 74-247.000.
- Russell, Lewis B.; and Kelly, William F. Electronic timer printer. 3,889,103, Cl. 235-61.90A.
- Russell, Wayne B., Jr. Protective device for preventing withdrawal of liquid from a tank. 3,888,381, Cl. 220-86.0AT.
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- Saajos, Jaakko. Damping assemblies for doors or the like. 3,887,961, Cl. 16-56.000.
- Saeed, Sheik Arshad. Apparatus for large scale gel electrophoresis. 3,888,758, Cl. 204-299.000.
- Saft-Societe des Accumulateurs Fixes et de Traction: *See—*
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- Sakurai, Itaru, to Toyoda-Koki Kabushiki Kaisha. Control device for multi-axis servo-actuators. 3,889,238, Cl. 340-172.500.
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- Sampson, Ronald Lee; and Whyte, David Denzil, to Procter & Gamble Company, The. Beverage carbonation. 3,888,998, Cl. 426-67.000.
- Sanders, Edgar R.: *See—*
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- Sandoz, Inc.: *See—*
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- Sansui Electric Co., Ltd.: *See—*
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- Santron Corporation: *See—*
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- Sasaki, Tadao; Kato, Yasuji; and Meguro, Toshiaki, to Sony Corporation. Automatic frequency control circuit. 3,889,193, Cl. 325-419.000.
- Satake, Tadashi: *See—*
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- Satake, Tomomitsu: *See—*
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- Scheibitz, Wolfgang; Staendeke, Horst; and Burkhardt, Siegfried, to Hoechst Aktiengesellschaft. Process for the manufacture of hypophosphites. 3,888,971, Cl. 423-307.000.
- Schering Corporation: *See—*
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  - Panitz, Eric; and Daniels, Peter J. L., 3,888,986.
- Schevey, William Russell; Jones, Harold Freeman; and Spielman, Burton A., to Allied Chemical Corporation. Multi-phase rinse and recovery method. 3,888,693, Cl. 134-10.000.
- Schiebelhuth, Heinz; and Bauer, Herbert, to Braun AG. Arrangement for suppressing noise in an FM receiver. 3,889,192, Cl. 325-348.000.
- Schiel, Ernst J., to United States of America, Army. Avalanche photodiode with varying bandgap. 3,889,284, Cl. 357-30.000.
- Schievelbein, Vernon H.; and Sample, Thomas E., Jr., to Texaco Inc. Process for inhibiting scale deposition. 3,888,310, Cl. 166-279.000.
- Schillinger, David E. Method of bonding an annular band of material to an object. 3,888,295, Cl. 164-72.000.
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Schmidt, Heinrich Gottlieb; Strauss, Kunc Gustav; and Tennikat, Josef, to Lever Brothers Company. High pressure injection of a fatty in aqueous phase. 3,889,004, Cl. 426-188.000.
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Schmieder, Drucilla. Teaching game. 3,888,025, Cl. 35-35.00H.
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Schonewald, Roger L., to Ingersoll-Rand Company. Blow molding process including article cooling. 3,888,961, Cl. 264-89.000.
Schotten, Alfons; and Heimbach, Franz, to Eberhard Hoesch & Sohne. Securing device for press diaphragms in plate filter presses. 3,888,769, Cl. 210-227.000.
Schrewe, Klaus; Knipp, Ullrich; and Ravasz, Akos, to Imperial Chemical Industries Limited. Injection moulding means for forming a composite product. 3,888,612, Cl. 425-130.000.
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Seith, Robert T.; and Bundy, Otto M., to Gulf States Paper Corporation. Devices, systems and methods employing knitted fabric mulch. 3,888,197, Cl. 111-1.000.
Seith, Robert T.; and Bundy, Otto M., to Gulf States Paper Corporation. Devices, systems and methods employing knitted fabric mulch. 3,888,418, Cl. 239-145.000.
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Shibamoto, Iwao. Inflatable vehicle safety device. 3,888,505, Cl. 280-150.0AB.
Shibata, Fukuo, to Kawasaki Jukogyo Kabushiki Kaisha. Electric control system for driving an electric vehicle including first and second converters. 3,889,127, Cl. 290-14.000.
Shih, Chi-kai, to du Pont de Nemours, E. I., and Company. Blends of propylene-alpha-olefin copolymers and polypropylene. 3,888,949, Cl. 260-897.00A.
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Spietschka, Ernst; and Landler, Josef, to Hoechst Aktiengesellschaft. Process for diazotizing aromatic amines. 3,888,841, Cl. 260-141.000.

Spinella, Rinaldo A., to Massachusetts Institute of Technology. Digital torquemeter and the like. 3,888,116, Cl. 73-136.00A.

Spodig, Heinrich. Stacked magnetic arrangement. 3,889,220, Cl. 335-306.000.

Srinivasan, Subramania: *See—*

Shah, Praful H.; and Srinivasan, Subramania, 3,888,255.

Stacey, Thomas A., Jr., to General Motors Corporation. Constant speed responsive spark controller. 3,888,221, Cl. 123-117.00A.

Stadler, Reinhard. Closure cap for an infusion flask. 3,888,377, Cl. 215-249.000.

Staendeke, Horst: *See—*

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Stahl, Howard D.: *See—*

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Stahler, Gerhard: *See—*

Kleiner, Hans-Jerg; Dursch, Walter; Stahler, Gerhard; and Racky, Werner, 3,888,930.

Stahlschmitt, Horst: *See—*

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Stamper, Robin Harry. Conditioning device for deodorising and/or odourising air. 3,887,948, Cl. 4-213.000.

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Hunter, Thomas C., Jr., 3,889,171.

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Stanley Denki Kabushiki Kaisha: *See—*

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Hyde, Robert Steven; and De Jong, Maarten Cornelis, 3,888,010.

Starkie, Granville Lewis, to A.P.V. Company Limited, The. Heat treatment of particulate solid materials in continuous flow. 3,888,167, Cl. 99-467.000.

Starks, Charles M., to Continental Oil Company. Preparation of alkyl vinyl ethers. 3,888,931, Cl. 260-611.00A.

Starn, Roy Emerson, Jr.: *See—*

Blackwell, John; Gumprecht, William H.; and Starn, Roy Emerson, Jr., 3,888,624.

Starrett, Herman P.; and Bamberger, George D. Baseball pitcher's training device. 3,888,482, Cl. 273-26.00C.

Stauffer Chemical Company: *See—*

Fancher, Llewellyn W., 3,888,906.

Pallos, Ferenc M.; and Menn, Julius J., 3,888,888.

Pallos, Ferenc M.; and Tseng, Chien K., 3,888,987.

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Steelcase Inc.: *See—*

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Stegelman, Albert F.: *See—*

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Steinbrook, Seymour E.: *See—*

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Steinmetz, Anthony; and Walstra, Hidde, to U.S. Philips Corporation. Switching device having contacts of two or more layers. 3,889,098, Cl. 200-268.000.

Stella, Joseph A., to Polaroid Corporation. Film guiding playback and recording mechanism. 3,888,570, Cl. 352-29.000.

Stenvall, Carl B., to Minnesota Mining and Manufacturing Company. First aid bandage. 3,888,247, Cl. 128-155.000.

Stephenson, Robert L., to Allied Chemical Corporation. Belt locking assembly for safety belt buckle. 3,888,541, Cl. 297-388.000.

Stephenson, Ronald Arthur; Laursen, Bente Lissy; and Mattsson, Ove Henning, to Kemanord Aktiebolag. Bis-biguanides. 3,888,947, Cl. 260-501.110.

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Stevens, William H., to Atomic Energy of Canada Limited. Process for hydrogen isotope exchange and concentration between liquid water and hydrogen gas and catalyst assembly therefor. 3,888,974, Cl. 423-580.000.

Stevenson, Paul D.: *See—*

Green, Raymond J.; and Stevenson, Paul D., 3,888,227.

Stewart, Alan, to International Telephone and Telegraph Corporation. Bi-directional amplification apparatus. 3,889,072, Cl. 179-170.00R.

Stewart, Norman C., to Cities Service Research & Development Co. H-oil process. 3,888,761, Cl. 208-112.000.

Stolka, Milan, to Xerox Corporation. Imaging method. 3,888,670, Cl. 96-27.00R.

Stone, Colwyn Francis: *See—*

Jablonski, Jan; and Stone, Colwyn Francis, 3,888,449.

Stordahl, Calmer M., Jr., to General Motors Corporation. Proportioning valve system for rear braking circuit. 3,888,546, Cl. 303-6.00C.

Stottmann, Richard L., to General Electric Company. Molded plastic flue damper. 3,888,166, Cl. 98-85.000.

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Straza, George T.; and Parr, Edward L., to Straza Enterprises Ltd. Frangible shock absorbing bumper. 3,888,531, Cl. 293-1.000.

Stritt, Franz: *See—*

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Stromatt, Robert W.; and Lundquist, Jerry R., to United States of America, Energy Research and Development Administration. Method for electrodeposition of nickel-chromium alloys and coating of uranium. 3,888,744, Cl. 204-1.500.

Strong, Robert Edmund; Boyle, Kenneth; and Grant, John, to British Nuclear Fuels Limited; and United Kingdom Atomic Energy Authority. Glove boxes and similar containments. 3,888,556, Cl. 312-1.000.

Stroud, Edward John: *See—*

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Stroud Graphic Equipment Limited: *See—*

Stroud, William Felix, deceased; Stroud, Lois Evelyn, executrix; and Stroud, Edward John, 3,888,150.

Stroud, Lois Evelyn, executrix: *See—*

Stroud, William Felix, deceased; Stroud, Lois Evelyn, executrix; and Stroud, Edward John, 3,888,150.

Stroud, William Felix, deceased; by Stroud, Lois Evelyn, executrix; and Stroud, Edward John, to Stroud Graphic Equipment Limited. Bandsaw book trimmer. 3,888,150, Cl. 83-368.000.

Struthers Scientific: *See—*

Ganiaris, Neophytos, 3,888,423.

Studinger, Hans. Layered absorbant pad material. 3,888,256, Cl. 128-296.000.

Stump, Eugene C., Jr.: *See—*

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Sturgeon, Terence: *See—*

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Sturzinger, Oskar Edwin. Temperature indicator. 3,888,631, Cl. 23-253.0TP.

Stutz, Erwin; and Brennenstuhl, Hugo. Device for coating objects with pulverized or granular particles or flakes or fibres. 3,888,207, Cl. 118-621.000.

Sugimura, Yoshihiro: *See—*

Yamana, Hirosuke; Kunii, Tadashi; Furusawa, Tomotaka; Sugimura, Yoshihiro; Nakai, Hiroshi; and Hiro, Yasuo, 3,888,826.

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Survival Technology, Inc.: *See—*

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Sutherland, Ivan E., to Evans & Sutherland Computer Corporation. System of polygon sorting by dissection. 3,889,107, Cl. 235-152.000.

Sutter, Robert E.; and Mende, David T. Article receiving and collecting receptacle assembly. 3,888,486, Cl. 273-105.00R.

Suvanto, Antti: *See—*

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Suzuki, Kazuyoshi: *See—*

Ogasawara, Makoto; Suzuki, Kazuyoshi; Urasaki, Takanori; Shima, Takeo; Kurisu, Shizuka; and Hirabayashi, Yasuji, 3,888,938.

Suzuki, Tadao. Muting circuit. 3,889,202, Cl. 330-51.000.

Suzuki, Takeshi; Takenaka, Shigeo; Tanaka, Hiroshi; and Akiyama, Masanori, to Tokyo Shibaura Electric Co., Ltd. Method and apparatus for making electroluminescent screens for color cathode ray tubes. 3,888,673, Cl. 96-36.100.

Suzuki, Takeshi; Tanaka, Hiroshi; Ito, Takeo; and Komatsu, Hiroaki, to Tokyo Shibaura Electric Co., Ltd. Color cathode ray tube with phosphor strips concave toward vertical center line. 3,889,145, Cl. 313-408.000.

Suzuki, Yoshihiro: *See—*

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Svensson, Harry. Hinge-like device for caps or covers. 3,888,386, Cl. 220-335.000.

Swails, Rebecca A.: *See—*

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Swanholm, Carl E.; and Caldwell, Robert G., to Bio-Degradable Plastics, Inc. Photodegradable hydrocarbon polymers. 3,888,804, Cl. 260-2.5HB.

Swift, David William, to Pilkington P-E Limited. Reflection grating optical odometer. 3,888,589, Cl. 356-28.000.

Swithenbank, Colin: *See—*

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Symmes, Eliot Norman, to Habi-chek Corporation. Means to assist a person in overcoming habits. 3,889,163, Cl. 317-262.00S.

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Szantay, Csaba; Szabo, Lajos; Kreidl, Janos; Kalaus, Gyorgy; Keve, Tibor; Turczanyi, Peter; Polgar, Istvan; Farkas nee Kirjak, Maria; and Lakszner, Katalin, to Richter Gedeon Vgyeszeti Gyzr Rt. Process for the preparation of eburnamonines. 3,888,865, Cl. 260-288.000.

Tabernacki, Harry A., to Kraftco Corporation. Apparatus for shredding. 3,888,428, Cl. 241-92.000.

Tabur, Marcel, to G.M.T. S.A. Machine for performing longitudinal and transverse cuttings in sheets, plates and similar products. 3,888,066, Cl. 53-167.000.

Taddei, Carlo, to Seal Spout Europe S.p.A. Cardboard box conveyor. 3,888,164, Cl. 93-53.00R.

Taguchi, Kazuo; and Satake, Tadashi, to Kabushiki Kaisha Komatsu Seisakusho. Ripper point part. 3,888,637, Cl. 29-191.000.

Taguchi, Tetsuya; Yazaki, Mutsunobu; and Matsuda, Mutsuhide, to Canon Kabushiki Kaisha. Camera incorporating data recording device. 3,889,281, Cl. 354-109.000.

Taguchi, Tetsuya: *See—*

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Takada, Masaki: *See—*

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Takahashi, Susumu: *See—*

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Takahata, Hisatoshi; and Tanikawa, Kohji, to Yashika Co., Ltd. Electric shutter control circuit. 3,889,278, Cl. 354-50.000.

Takamizawa, Kinya; and Iinuma, Kazuhiro, to Tokyo Shibaura Electric Co., Ltd. Ultrasonic wave receiving apparatus. 3,889,227, Cl. 340-6.00R.

Takano, Ikuo; Imajyo, Yasutaka; and Tanimoto, Akira, to Tokyo Shibaura Electric Co., Ltd. Surge voltage absorber. 3,889,222, Cl. 337-244.000.

Takeda Chemical Industries, Ltd.: *See—*

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Tamura, Hifumi; and Kondo, Toshio, to Hitachi, Ltd. Ion microanalyzer. 3,889,115, Cl. 250-307.000.

Tanaka, Hideki; Ishida, Kazutaka; Watanabe, Mikio; Inouchi, Mitsuhiro; Yoshioka, Shigeru; Handa, Minoru; and Kitabatake, Asao, to Furuno Electric Company, Limited. Station distinguishing system in omega receiver. 3,889,265, Cl. 343-105.00R.

Tanaka, Hiroshi; Soma, Ikuo; Ito, Yoshikazu; and Kamijo, Masayasu, to Canon Kabushiki Kaisha. Transferring paper for electrophotography. 3,889,033, Cl. 428-323.000.

Tanaka, Hiroshi: *See—*

Suzuki, Takeshi; Takenaka, Shigeo; Tanaka, Hiroshi; and Akiyama, Masanori, 3,888,673.

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Tanaka, Susumu; Enoguchi, Yuji; and Kawabata, Hidetoshi, to Minolta Camera Kabushiki Kaisha. Toner dispensing device. 3,888,394, Cl. 222-230.000.

Tanaka, Tsuyoshi; and Ninomiya, Hisakazu, to Hitachi, Ltd. Device for controlling speed of three-phase induction motor. 3,889,167, Cl. 318-227.000.

Tanaka, Tutomu: *See—*

Watanabe, Kiyoshi; Hirakawa, Tamotsu; Takahara, Kenji; Nakamura, Yoshio; Iwasaki, Sueo; and Tanaka, Tutomu, 3,888,737.

Tanczyn, Harry, to Armco Steel Corporation. Process for cold-working and stress-relieving non-heat hardenable ferritic stainless steels. 3,888,119, Cl. 72-364.000.

Tanigawa, Tuneo: *See—*

Fujiwhara, Mitsuto; Kasai, Keiji; Satoh, Ryosuke; Nakagawa, Yoshinobu; and Tanigawa, Tuneo, 3,888,680.

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Tanimoto, Akira: *See—*

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Tarneja, Krishan S.; and Bartko, John, to Westinghouse Electric Corporation. Tailoring reverse recovery time and forward voltage drop characteristics of a diode by irradiation and annealing. 3,888,701, Cl. 148-1.500.

Tartaglia, Ralph W., to Rockwell International Corporation. Bidirectional pressure balanced valve. 3,888,280, Cl. 137-630.130.

Tate, John F. P. Spacing tool. 3,888,477, Cl. 269-82.000.

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Tatsumi, Testujiro; Miyamoto, Reiji; Matsui, Yutaka; Kazama, Seiji; Takemura, Tadao; and Kanayama, Hikoyoshi, to Takeda Chemical Industries, Ltd.; and Mitsui Polychemicals, Co., Ltd. Coated glass bottles. 3,889,031, Cl. 428-216.000.

Tatyrek, Alfred F.; and Werbel, Burton, to United States of America, Army. Inorganic salts as inhibitors for tetrakisdimethylamino ethylene-water chemical interaction. 3,888,785, Cl. 252-188.3CL.

Taylor, Carol O.: *See—*

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Taylor, Joseph W. High or low pressure control device. 3,888,457, Cl. 251-14.000.

Teass, Horace A., Jr. Conductivity measuring circuit. 3,889,183, Cl. 324-30.00R.

Technar Incorporated: *See—*

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Temple, Ernest E., to Mine Safety Appliances Company. Explosively actuated separable connecting device. 3,888,158, Cl. 89-1.00B.

Templeton, William E. Rotary lawn mower. 3,888,072, Cl. 56-320.200.

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Terwilliger, James P.; Gingello, Anthony D.; and Tinney, John R., to Eastman Kodak Company. Apparatus for combining chemically compatible solutions. 3,888,465, Cl. 259-4.000.

Teshima, Toru; Nagasao, Toshiie; Tanaka, Minoru; Ariga, Kazuo; and Inoue, Kiyoshi, to Stanley Denki Kabushiki Kaisha; and Kabushiki Kaisha Inoue Japax Kenkyusho. Apparatus for treating water containing impurities. 3,888,756, Cl. 204-275.000.

Texaco Inc.: *See—*
  Child, Edward T.; and Robin, Allen M., 3,888,043.
  Schievelbein, Vernon H.; and Sample, Thomas E., Jr., 3,888,310.
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Thompson, James Lawrence Earl; Clarke, Wallace Eugene; and Gale, James, to Northern Electric Company Limited. Loudspeaking communication terminal apparatus and method of operation. 3,889,059, Cl. 179-1.00P.
Thompson, Robert M., to Sun Research and Development Co. Tertiary diamides. 3,888,894, Cl. 260-404.500.
Thompson, Wallace T., to GTE Sylvania Incorporated. Subscription television system and switching station therefor. 3,889,050, Cl. 178-5.100.
Thomson-CSF: *See—*
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Thouret, Wolfgang E.; and Kaufman, Rudolph, to Duro-Test Corporation. Vibrating filament lamp with auxiliary stationary filament. 3,889,154, Cl. 315-267.000.
Ticknor, Raymond G.: *See—*
  Rodek, Victor; and Ticknor, Raymond G., 3,888,579.
Tiefenau, Helmut Karl Ernst, to Max-Planck-Gesellschaft ZUR Forderung der Wissenschaften e.V. Ozone measuring cell. 3,888,754, Cl. 204-195.00R.
Tiernan, Stanley C.; and Berry, Ronald, to Rockwell International Corporation. Loom harness mechanism. 3,888,284, Cl. 139-82.000.
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  Legg, Leo V.; and Tijunelis, Donatas, 3,889,049.
Tilman, Milton M.; Crosby, Robert L.; and Neumeier, Leander A., to United States of America, Interior. Method of producing creep resistance of Pb-Sb alloys. 3,888,703, Cl. 148-11.50R.
Timesavers, Inc.: *See—*
  Elm, Donald C., 3,888,050.
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Tokyo Shibaura Electric Co., Ltd.: *See—*
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Tomalia, Donald A.; and Giacobbe, Thomas J., to Dow Chemical Company, The. Aziridinyl haloformimides. 3,888,847, Cl. 260-239.00E.
Tomenceak, Arthur A., to Bullard Company, The. Contour machining. 3,888,146, Cl. 82-1.00C.
Tomita, Tsutomu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation. 3,888,222, Cl. 123-119.00A.
Tomlin, Allen J. Operation actuated ignition-kill device. 3,889,089, Cl. 200-334.000.
Tomorrow Enterprises, Inc.: *See—*
  Bagwell, Dennis P., 3,888,005.
Tone, John W. Variable speed dual hydrostatic drive. 3,888,083, Cl. 60-431.000.
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Tornblom, Lars: *See—*
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Torrington, Leslie Albert; and Stave, Frederick Roland, to RCA Corporation. Apparatus for inhibiting a plurality of records from being disposed on a turntable. 3,888,493, Cl. 274-1.00R.
Tosato, Lawrence; Abel, Leon A.; and Mullis, Clyde M., to Westinghouse Electric Corporation. Elevator signalling system. 3,889,231, Cl. 340-21.000.
Tosca, Alessandro. Pivotable modular hygienic-sanitary system. 3,887,947, Cl. 4-2.000.
Totten, Ralph P.; and Lewis, Gerald F. Ice fishing rod. 3,888,035, Cl. 43-17.000.
Touval, Irving; and Dunkel, Morris, to Universal Oil Products Company. Novel flame retardant compositions of matter. 3,888,820, Cl. 260-45.70R.
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Tracey, Donald John, Jr.: *See—*
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Ulmschneider, Lawrence A.; and Dowling, Edward H., to Eastman Kodak Company. Injection molding apparatus. 3,888,616, Cl. 425-246.000.
Ulmschneider, Lawrence A.; and Dowling, Edward H., to Eastman Kodak Company. Injection molding apparatus. 3,888,619, Cl. 425-436.00R.
Ulysses Stanley Ames: *See—*
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  National Aeronautics and Space Administration; administrator; with respect to an invention of:
    Anderson, Tage O. Asynchronous, multiplexing, single line transmission and recovery data system. 3,889,064, Cl. 179-15.0BS.
    Hansen, George R., Jr., to United States of America, General Counsel-Code GP. Vehicle locating system utilizing AM broadcasting station carriers. 3,889,264, Cl. 343-105.00R.
    Telfer, Thomas A. Method of determining bond quality of power transistors attached to substrates. 3,889,122, Cl. 250-359.000.
    Tyagi, Ramesh C.; Debnam, William J., Jr.; McNear, Maxwell F.; Crouch, Roger K.; and Breckenridge, Roger A. Vapor phase growth of groups III-V compounds by hydrogen chloride transport of the elements. 3,888,705, Cl. 148-175.000.
  National Aeronautics and Space Administration; deputy administrator; with respect to an invention of:
    Johnston, Alan R. Cooperative multiaxis sensor for teleoperation of article manipulating apparatus. 3,888,362, Cl. 214-1.00B.
  National Aeronautics and Space Administration: *See—*
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Urschel, Joe R.; and Sanders, Edgar R. Machine and method for comminuting products. 3,888,426, Cl. 241-5.000.
Uy, James C., to Ford Motor Company. Rotary internal combustion engine. 3,888,606, Cl. 418-179.000.
Uy, James C.; and Telang, Yeshwant P., to Ford Motor Company. Method of providing an intermediate steel layer for chrome plating on rotor housings. 3,888,746, Cl. 204-36.000.
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van den Berg, Heinz, to Dynamit Nobel Aktiengesellschaft. Multiple-layered, weldable padded element. 3,889,037, Cl. 428-302.000.
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Van Moss, John H., Jr. Dampened axle bearing mounting. 3,888,187, Cl. 105-224.100.
Van Moss, John H., Jr. Elastomeric railway car side bearing. 3,888,555, Cl. 308-138.000.
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Vittoria, Carmine; Pasternak, Joseph; and Lessoff, Howard, to United States of America, Navy. Double-cavity microwave filter. 3,889,213, Cl. 333-73.00W.
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Wagenknecht, Benno August; and Breckle, Horst Erich, to Bunker Ramo Corporation. Apparatus for clock. 3,888,074, Cl. 58-23.00R.
Wagner, Josef; and Grill, Helmut, to Chemisch-Pharmazeutische Fabrik Adolf Klinge & Co. Choleretic medicine. 3,888,994, Cl. 424-342.000.
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Walker, Walter P., to Audichron Company, The. Message announcement apparatus and method. 3,889,291, Cl. 360-12.000.
Wallace, Bruce Evans. Cylinder plating rack. 3,888,755, Cl. 204-272.000.
Wallace, Louie E., to W. F. Larson, Inc. Tree trimming apparatus. 3,888,071, Cl. 56-237.000.
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Wank, Joachim; Reese, Eckart; Rohrbach, Josef; and Bruck, Rolf, to Bayer Aktiengesellschaft. Process for the continuous coating of plastics. 3,889,040, Cl. 428-412.000.
Wannan, Ian Richard, to Wannan Industries Pty. Ltd. Water cut-off means. 3,888,276, Cl. 137-402.000.

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Wannan, Ian Richard, 3,888,276.
Ware, H. Joe, to Kamar Incorporated. Figure with simulated heartbeat. 3,888,233, Cl. 128-1.00C.
Warthen, Raymond L., to Berkley & Company, Inc. Polychroic fishing line. 3,888,037, Cl. 43-44.980.
Warwick Electronics Inc.: *See—*
Arya, Manohar L., 3,889,156.
Watanabe, Kiyoshi; Hirakawa, Tamotsu; Takahara, Kenji; Nakamura, Yoshio; Iwasaki, Sueo; and Tanaka, Tutomu, to Kanegafuchi Chemical Industries Co., Ltd. Process of producing L-lysine using mixed microorganisms. 3,888,737, Cl. 195-28.00R.
Watanabe, Masanori, to Toppan Printing Co., Ltd. Folding container for liquids. 3,888,163, Cl. 93-36.010.
Watanabe, Mikio: *See—*
Tanaka, Hideki; Ishida, Kazutaka; Watanabe, Mikio; Inouchi, Mitsuhiro; Yoshioka, Shigeru; Handa, Minoru; and Kitabatake, Asao, 3,889,265.
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Waterhouse, Harlan L., to Tonka Corporation. Miniature toy camper trailer. 3,888,040, Cl. 46-201.000.
Watertite Industries, Inc.: *See—*
Allen, Jeral D., 3,888,099.
Watrous, Stephen R.: *See—*
Harmon, James E.; Watrous, Stephen R.; and Diamond, Herrick R., 3,887,963.
Watt, Peter Ridgway; and Wilkinson, Harold George, to Beecham Group Limited. Device for administration of medicines. 3,888,253, Cl. 128-266.000.
Wean United, Inc.: *See—*
Kent, Francis Joseph; and Steinbrook, Seymour E., 3,888,168.
Weatherhead Company, The: *See—*
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Weaver, Ebon Paul, to Uniroyal, Inc. Modified ABS polymers. 3,888,941, Cl. 260-829.000.
Weaver, Elbert K.: *See—*
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Wecker, Leon S., to Topp Electronics, Inc. Electronic clock. 3,888,075, Cl. 58-38.000.
Wehde, Heinz, to Teldix GmbH. Levitated rotary magnetic device. 3,888,553, Cl. 308-10.000.
Weinberger, Eugene M.: *See—*
Last, Bernard; Weinberger, Eugene M.; Gray, James R.; Clements, George W.; and Deffenbaugh, Ralph E., 3,888,106.
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Reinecke, Erich; Isernhagen, Fritz; Klatt, Alfred; Weise, Lutz; Schlamann, Wilhelm; and Lindemann, Klaus, 3,888,550.
Weiser, Curtis E.: *See—*
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Weiss, Donald Eric: *See—*
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Weissman, Bernard. Saw blade guard. 3,888,148, Cl. 83-100.000.
Welding Institute, The: *See—*
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Weldon, Hazel W., executrix: *See—*
Weldon, Weldon K., deceased; and Weldon, Hazel W., executrix, 3,888,266.
Weldon, Weldon K., deceased; and Weldon, Hazel W., executrix, to Weldon, Hazel W., executrix. Hair curling roller. 3,888,266, Cl. 132-39.000.
Wells, Rodney Lee: *See—*
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Wendorf, Ovaldo. Ship hull construction. 3,888,200, Cl. 114-56.000.
Werbel, Burton: *See—*
Tatyrek, Alfred F.; and Werbel, Burton, 3,888,785.
Wesley, Sam, Sr. End blown free air-reed flute. 3,888,154, Cl. 84-384.000.
Wessel, Wolf, to Robert Bosch G.m.b.H. Method and system to protect electronic switching components. 3,889,159, Cl. 317-31.000.
Wessman, Bo Henry, to AB Motala Verkstad. Appliance lid interlock mechanism with lid operated switch and solenoid controlled lid latch. 3,889,078, Cl. 200-61.640.
West, Edward J.; and Giallorenzi, Thomas G., to United States of America, Navy. Method for forming an optical wave guide coupler. 3,888,648, Cl. 65-30.000.
Westcott, David Thomas; and Woodman, Geoffrey Roger, to Imperial Tobacco Group Limited. Tobacco smoke filter. 3,888,160, Cl. 93-1.00C.
Western Electric Company, Incorporated: *See—*
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Western Rock Bit Company Limited: *See—*
White, Kenneth M., 3,888,028.
Westinghouse Air Brake Company: *See—*
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Weston, William A. Air bleeding device for a pressurised liquid supply system. 3,888,274, Cl. 137-174.000.
Wetzel, Rodney J., to Dixieco, Inc. Method of and apparatus for positioning and correlating the end of remedial tubing in relation to the lower end of production tubing in a subterranean well. 3,888,306, Cl. 166-255.000.
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Gibson, Richard D.; and Whelan, Robert D., 3,889,196.
Whetzel, Lawrence C.; and Townsend, Margaret E., to Bio-Reagents & Diagnostics, Inc. Reagents and methods for determining amylase concentrations. 3,888,739, Cl. 195-99.000.
Whicker, Stephen L.; and Taylor, Carol O., to Texas Instruments Incorporated. Cryogenic cooler off-axis drive mechanism for an infrared receiver. 3,889,119, Cl. 250-352.000.
Whirlpool Corporation: *See—*
Bashark, Larry Thomas, 3,888,269.
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White, John U. Grating monochromator. 3,888,590, Cl. 356-101.000.
White, Joseph Paul; and Delpriore, Paul Joseph, to RCA Corporation. Method of shaping semiconductor workpiece. 3,888,053, Cl. 51-281.0SF.
White, Kenneth M., to Western Rock Bit Company Limited. Digger tooth. 3,888,028, Cl. 37-142.00R.
White, Michael L., to Rohm and Haas Company. Retroreflective film. 3,889,027, Cl. 428-34.000.
White Motor Corporation: *See—*
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White Polytechniques Limited: *See—*
White, Robert Eric; and Lightfoot, Robert Oscar, 3,888,070.
White, Robert Eric; and Lightfoot, Robert Oscar, to White Polytechniques Limited. Saddle trees and saddles. 3,888,070, Cl. 54-44.000.
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Whittaker, Kenneth; and Morgan, David Ronald, to Dunlop Limited. Flame retardant-composite articles. 3,889,022, Cl. 428-262.000.
Whyte, David Denzil: *See—*
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Wicenec, Leopold: *See—*
Spannknebel, Walter; and Wicenec, Leopold, 3,888,724.
Wiczer, Sol B. Coated filament and method of forming same. 3,889,038, Cl. 428-361.000.
Wiedemann, Wolfgang, to Hoechst Aktiengesellschaft. Electrophotographic recording material with quinacridones. 3,888,665, Cl. 96-1.500.
Wieske, Theophil: *See—*
Brammer, Klaus-Rudiger; and Wieske, Theophil, 3,889,005.
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Narang, Saran A.; Dheer, Surinder K.; and Wightman, Robert H., 3,888,950.
Wiig, Chester M., to F. J. Littell Machine Company. Loop control apparatus for continuous strip material. 3,888,400, Cl. 226-43.000.
Wiiki, Leroy E.; and Sitek, George J., to Leco Corporation. Electronic balance. 3,888,321, Cl. 177-165.000.
Wilhelm, Frederick C., to Universal Oil Products Company. Hydrocarbon conversion with a sulfided bimetallic catalytic composite. 3,888,763, Cl. 208-139.000.
Wilkinson, Harold George: *See—*
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Colwell, Robert E.; Liegois, William A.; Wilks, Gerald W.; and Vrcelj, Mihailo J., 3,888,973.

Willems, Antonius Gerhardus Maria, to U.S. Philips Corporation. Fungicidal 4-thiocyano quinazoline compounds. 3,888,857, Cl. 260-251.00Q.

Willens, Ronald Howard: *See—*

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Willey, Ronald Albert, to Firestone Tire & Rubber Company, The. Bifurcated shoulder and lap continuous safety harness. 3,888,509, Cl. 280-150.0SB.

Williams, Merlyn Morris, to Alcan Research and Development Limited. Monitoring and controlling kiln operation in calcination of coke. 3,888,621, Cl. 432-19.000.

Williams, Raymond H. Presetting fixture for cam actuated turret lathes. 3,888,015, Cl. 33-185.00R.

Willis, Donald; Battaerd, Hendrik Adriaan Jacobus; Lang, Gunter Anton; and Weiss, Donald Eric, to ICI Australia Limited; and Commonwealth Scientific and Industrial Research Organization. 1,4-Bis(diallylaminomethyl)-benzene. 3,888,928, Cl. 260-570.900.

Willits, Samuel P.: *See—*

Mohan, William L.; and Willits, Samuel P., 3,889,136.

Willyard, James C. Marine propulsion system. 3,888,202, Cl. 115-16.000.

Wilson, David G., to Massachusetts Institute of Technology. Automatic refuse reclamation system. 3,888,351, Cl. 209-75.000.

Wilson, Floyd Leroy. Method of securing two members together with a fastener. 3,887,990, Cl. 29-450.000.

Wilson, Kenneth R. A.: *See—*

Bonn, Clifford; and Wilson, Kenneth R. A., 3,888,504.

Wind, Harold, to Lescoa, Inc. Windshield wiper fluid dispenser. 3,887,956, Cl. 15-250.040.

Wingfield, George A.: *See—*

Easley, Wesley C.; White, William F.; and Wingfield, George A., 3,889,182.

Winslow, Lester M.; and Brown, Hazel E., to United States of America, Navy. Liquid cooled attenuator. 3,889,149, Cl. 315-3.500.

Winter, Charles M. Trailer hitch mechanism. 3,888,515, Cl. 280-476.00R.

Wise, Kensall D.; and Samaun. Method for forming regions of predetermined thickness in silicon. 3,888,708, Cl. 156-11.000.

Witzel, Bruce E.: *See—*

Shen, Tsung-Ying; Greenwald, Richard B.; Jones, Howard; Linn, Bruce O.; and Witzel, Bruce E., 3,888,902.

Wojtasinski, Ronald J.; Jones, James H.; and Lisle, Raymond V., to United States of America, General Counsel-Code GP. Lightning current measuring systems. 3,889,185, Cl. 324-72.000.

Wojtowicz, John A., to Olin Corporation. Preparation of alkali metal salts of dichloroisocyanuric acid. 3,888,856, Cl. 260-248.00C.

Wolowodiuk, Walter, to Foster Wheeler Corporation. Liquid metal steam generator. 3,888,212, Cl. 122-32.000.

Wolverine Toy Company: *See—*

Adickes, Fred; Livesey, James R.; Weir, George; Bailey, Dennis; and Mehelich, John J., 3,888,483.

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Woods Hole Oceanographic Institution: *See—*

Knott, Sydney T.; Hess, Frederick R.; and Nowak, Richard T., 3,889,230.

Woods, Thomas G., to Battle Creek Equipment Company. Moist heating pad. 3,889,101, Cl. 219-527.000.

Worthen, Eugene P., deceased; and New England Merchant Natl. Bank, executor, to United Aircraft Corporation. Reversible reduction gear system and brake for marine drive. 3,888,337, Cl. 192-4.00C.

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WSF Industries Inc.: *See—*

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Wu, Christopher K.: *See—*

Brecher, Lee E.; and Wu, Christopher K., 3,888,750.

Wu, Yao Hua; and Lobeck, Walter G., Jr., to Mead Johnson & Company. 10-Imidoylphenoxazines. 3,888,852, Cl. 260-244.00R.

Wylie, Alan Wilson: *See—*

Holmes, Ralph John; Wylie, Alan Wilson; and McCracken, Kenneth Gordon, 3,889,112.

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Cross, Thomas R., 3,888,585.

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Hughes, Gordon F., 3,889,139.

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Okada, Takashi; Yamagishi, Sokichi; Kamoshida, Mototaka; Satake, Tomomitsu; and Kishi, Sadayuki, 3,887,993.

Yamaguchi, Kazuo; Kanoh, Natsuki; Ito, Isao; and Enokido, Nobuo, to Mitsubishi Chemical Industries Ltd. Process for preparing improved ethylene copolymer. 3,888,834, Cl. 260-80.700.

Yamaguchi, Kiminori, to Nippon Gakki Seiko Kabushiki Kaisha. Tremolo generating device with multi-directionally rotating speaker. 3,888,333, Cl. 181-143.000.

Yamamoto, Kiyoshi; and Yamashita, Gentaro, to Teijin Ltd. Method for purifying 2,6-naphthalenedicarboxylic acid. 3,888,921, Cl. 260-525.000.

Yamamoto, Osamu; Takenaga, Mutsuo; and Tsujimoto, Yoshinobu, to Matsushita Electric Industrial Co., Ltd. Standard light source utilizing spontaneous radiation. 3,889,124, Cl. 250-493.000.

Yamana, Hirosuke; Kunii, Tadashi; Furusawa, Tomotaka; Sugimura, Yoshihiro; Nakai, Hiroshi; and Hiro, Yasuo, to Mitsubishi Gas Chemical Co., Inc. Process for preparing aromatic polycarbonates. 3,888,826, Cl. 260-47.0XA.

Yamashita, Gentaro: *See—*

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Yashika Co., Ltd.: *See—*

Takahata, Hisatoshi; and Tanikawa, Kohji, 3,889,278.

Yates, Jack; and Long, John W., to Exxon Nuclear Company, Inc. Nuclear fuel bundle disassembly and assembly tool. 3,887,980, Cl. 29-200.00D.

Yates, Michael Joseph; and Hurst, Kenneth James, to Pioneer Welding Company Limited. Invalid bed. 3,887,951, Cl. 5-90.000.

Yates, Paul Clifford, to du Pont de Nemours, E. I., and Company. Preparation of stannic oxide aquasols and organosols. 3,888,788, Cl. 252-309.000.

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Yeda Research & Development Co., Ltd.: *See—*

Elson, David; and Avital, Shlomo, 3,888,759.

Yie, Gene G.; Cummingham, S. J.; and Rosenberg, Robert E., to Institute of Gas Technology; and Southern California Gas Company. Irrigation engine exhaust conversion to obtain fertilizing solution. 3,888,652, Cl. 71-61.000.

Yih, Roy Y.: *See—*

Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 3,888,932.

Yindra, Leonard J.; and Karl, Robert A., to American Hospital Supply Corporation. Adjustable support column. 3,888,444, Cl. 248-188.500.

Yokohama Rubber Co., Ltd., The: *See—*

Koyama, Masao; Okada, Noboru; and Ogawa, Masahiro, 3,888,717.

Yoshida, Kenji; Sekiya, Tetsuo; and Higo, Toyokazu, to Sony Corporation. Tape drive system. 3,888,403, Cl. 226-188.000.

Yoshikawa, Hiromi; Sawada, Katsuo; Asanari, Shigeyuki; Kajikawa, Saburo; and Kodama, Takao, to Matsushita Electric Industrial Co., Ltd. Electric vacuum cleaner and stool. 3,888,643, Cl. 55-274.000.

Yoshino, Akira; and Imanishi, Hitoshi, to Matsushita Electric Works, Ltd. Circuit breaker. 3,889,215, Cl. 335-6.000.

Yoshioka, Shigeru: *See—*

Tanaka, Hideki; Ishida, Kazutaka; Watanabe, Mikio; Inouchi, Mitsuhiro; Yoshioka, Shigeru; Handa, Minoru; and Kitabatake, Asao, 3,889,265.

Yoshisato, Eishin: *See—*

Fujita, Yutaka; Naruchi, Tatsuyuki; and Yoshisato, Eishin, 3,888,845.

Yoshizawa, Munetoshi: *See—*

Mizuno, Kimio; Ando, Takuji; Tsujino, Masatoshi; Takada, Masaki; Yoshizawa, Munetoshi; Matsuda, Tetsuo; and Hayashi, Mitsuo, 3,888,843.

Young Daybrook, Inc.: *See—*

Pilz, Gilbert B.; and Vivian, James R., 3,888,513.

Young, Lewis B.; Weinstein, Benjamin; and Jurewicz, Anthony T., to Mobil Oil Corporation. Oxidation of alkanes to maleic anhydride using promoted vanadium-phosphorus catalyst. 3,888,886, Cl. 260-346.800.

Yount, Robert Eugene. Pipe holder. 3,888,265, Cl. 131-260.000.

Yourman, Maxine N. Baked product and process for preparing same. 3,889,003, Cl. 426-580.000.

Zahradka, Johann. Safety ski binding. 3,888,497, Cl. 280-11.35T.

Zajic, James. Sidewalk plug-in pole for car heaters, warmers and the like. 3,888,336, Cl. 191-1.00R.

Zaleski, Frank I.: *See—*

Sczerzenie, Francis E.; and Zaleski, Frank I., 3,888,636.

Zambrano, Damaso P. Hole cutting apparatus. 3,888,068, Cl. 30-358.000.

Zapart, Bruno J.: *See—*

Foshee, Wayne O.; and Zapart, Bruno J., 3,888,230.

Zaugg, Roland; and Fluck, Josef, to A. Schild S.A. Calender watch movement. 3,888,076, Cl. 58-58.000.

Zdanys, John; and Kelver, William L., to CTS Corporation. Electrical component with push-push switch actuator. 3,889,088, Cl. 200-330.000.

Zenith Radio Corporation: *See—*

Rennick, John L., 3,889,288.

Zenon, Raymond A., to Atlantic Richfield Company. Device for mounting and demounting guides on a carrying rod. 3,887,985, Cl. 29-267.000.

Ziegele, Heinrich H., to White Motor Corporation. Power drive dolly with two-speed drive system. 3,888,142, Cl. 74-852.000.

Zimmer, Erich: *See—*

Hein, Kurt; and Zimmer, Erich, 3,888,787.

Zimmermann, Detlef; Lougheed, James Hugh; and Crompton, Eric John, to Northern Electric Company Limited. Electromagnetically resonant device. 3,889,262, Cl. 343-18.00B.

Zitko, Henry D. Golf club. 3,888,484, Cl. 273-80.00C.

Zonneveld, Laurens; and Ehs, Eugene, to Controls Company of America. Fuel oil flow controls. 3,888,277, Cl. 137-405.000.

Zubick, Frank P., Jr. Water ski vehicle. 3,888,204, Cl. 115-70.000.

Zubke, Raymond H. Ground anchor with pivoting fluke. 3,888,057, Cl. 52-163.000.

Zundorf, Dieter: *See—*

Juntgen, Harald; Knoblauch, Karl; and Zundorf, Dieter, 3,888,958.

Zusack, Michael J.: *See—*

Laforet, Henry A.; and Zusack, Michael J., 3,888,293.

Zuvela, Bernard R., to Scientific Drilling Controls. Auto-pilot. 3,888,201, Cl. 114-144.00R.

ZYMA S.A.: *See—*

Courbat, Pierre; and Valenza, Andre, 3,888,990.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF JUNE, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Anderson, Clare C.: *See—*
Buswell, Wallace H. Re. 28,446.
Bonner, Joseph A., and H. J. Evans, to Rockwell International Corp. Service regulator with high-low pressure cut-off device. Re. 28,447, 6–10–75, Cl. 137—613.
Buswell, Wallace H., assignor of a fractional part interest to Clare C. Anderson. Eccentric acting float-controlled pinch-valve vessel filling assembly. Re. 28,446, 6–10–75, Cl. 137—1.
California Microwave Inc.: *See—*
Lance, Drew R. Re. 28,452.
Continental Oil Co.: *See—*
Edmond, Tibor O. Re. 28,449.
Deere & Co.: *See—*
Zaun, Richard D., and Hook. Re. 28,448.
Edmond, Tibor O., to Continental Oil Co. Anchoring and pressuring apparatus for a drill. Re. 28,449, 6–10–75, Cl. 175—94.
Evans, Howard J.: *See—*
Bonner, Joseph A., and Evans. Re. 28,447.
Hook, Richard W.: *See—*
Zaun, Richard D., and Hook. Re. 28,448.
Kreuser, Marvin J.: *See—*
Spleha, David J., and Kreuser. Re. 28, 451.
Lance, Drew R., to California Microwave Inc. Dual bandwidth phase lock loop. Re. 28,452, 6–10–75, Cl. 331—17.
Madland, Thorvald: *See—*
Ross, Irving D., Jr., and Madland. Re. 28,443.
Parker-Hannifin Corp.: *See—*
Spleha, David J., and Kreuser. Re. 28, 451.
Rockwell International Corp.: *See—*
Bonner, Joseph A., and Evans. Re. 28,447.
Ross, Irving D., Jr., and T. Madland, to The Youngstown Steel Door Co. Over-travel and return mechanism for door. Re. 28,443, 6–10–75, Cl. 49—220.
Saylor, Edward T., Jr. Rotary apparatus. Re. 28,444, 6–10–75, Cl. 60—39.610.
Schlumberger Technology Corp.: *See—*
Schwartz, Robert J. Re. 28,450.
Schwartz, Robert J., to Schlumberger Technology Corp. Two detector pulse neutron logging porosity technique. Re. 28,450, 6–10–75, Cl. 250—264.
Skuttle Mfg. Co.: *See—*
Stiles, Walter R. Re. 28,445.
Spleha, David J., and M. J. Kreuser, to Parker-Hannifin Corp. Radiation detecting apparatus. Re. 28,451, 6–10–75, Cl. 250—366.
Stiles, Walter R., to Skuttle Mfg. Co. Rotary humidifier drive. Re. 28,445, 6–10–75, Cl. 74—405.
Youngstown Steel Door Co., The: *See—*
Ross, Irving D., Jr., and Madland. Re. 28,443.
Zaun, Richard D., and R. W. Hook, to Deere & Co. Root crop harvesting implement. Re. 28,448, 6–10–75, Cl. 171—58.

LIST OF PLANT PATENTEES

Jackson & Perkins Co.: *See—*
Warriner, William A. 3,727.
Warriner, William A. 3,728.
Warriner, William A. 3,729.
Warriner, William A., to Jackson & Perkins Co. Rose plant. 3,727, 6–10–75, Cl. 20.
Warriner, William A., to Jackson & Perkins, Co. Rose plant. 3,728, 6–10–75, Cl. 26.
Warriner, William A., to Jackson & Perkins, Co. Rose plant. 3,729, 6–10–75, Cl. 18.

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See—*
Betka, Harold A. 235,310.
Aiello, Salvatore F., to Loed Corp. Compactor. 235,374, 6–10–75, Cl. D60—1.
AMF Inc.: *See—*
Brucker, Stephen F. 235,360.
Pauza, William V., and Sheesley. 235,348.
American Hospital Supply Corp.: *See—*
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421.5A	3,888,123
421.5R	3,888,124
423A	3,888,125
426	3,888,126
431	3,888,127
484	3,888,128
CLASS 74	
29	3,888,129
230.17E	3,888,130
241	3,888,131
247	3,888,132
254	3,888,133
405	Re.28,445
	3,888,134
496	3,888,135
594.1	3,888,136
650	3,888,137
665G	3,888,138
687	3,888,139
730	3,888,141
826	3,888,140
852	3,888,142
863	3,888,143
CLASS 75	
.5B	3,888,657
11	3,888,658
125	3,888,659
178A	3,888,660
201	3,888,661
203	3,888,662
221	3,888,663
CLASS 81	
71	3,888,144
CLASS 82	
1C	3,888,145
	3,888,146
CLASS 83	
64	3,888,147
100	3,888,148
291	3,888,149
368	3,888,150
411A	3,888,151
471.3	3,888,152
CLASS 84	
1.01	3,888,153
384	3,888,154
471	3,888,155
CLASS 85	
71	3,888,156
CLASS 89	
1B	3,888,158
1K	3,888,157
7	3,888,159
	3,888,255
CLASS 90	
11C	3,888,161
13.1	3,888,162
CLASS 93	
1C	3,888,160
36.01	3,888,163
53R	3,888,164
CLASS 96	
1R	3,888,666
1.4	3,888,664
1.5	3,888,665
	3,888,667
1.6	3,888,668
3	3,888,669
27R	3,888,670
33	3,888,671
35.1	3,888,672
36	3,888,674
36.1	3,888,673
67	3,888,675
68	3,888,676
76R	3,888,677
87A	3,888,678
87R	3,888,679
100	3,888,680
111	3,888,681
CLASS 98	
2.14	3,888,165
85	3,888,166
CLASS 99	
467	3,888,167
CLASS 100	
48	3,888,168
100	3,888,169
177	3,888,170
229A	3,888,171
CLASS 101	
156	3,888,172
350	3,888,173
467	3,888,174
CLASS 102	
4	3,888,175
31	3,888,177
34.1	3,888,178
66	3,888,179
67	3,888,180
70.2R	3,888,181
73R	3,888,182
CLASS 104	
26A	3,888,183
37	3,888,184
89	3,888,185
275	3,888,186
CLASS 105	
224.1	3,888,187
282R	3,888,188
367	3,888,189
475	3,888,190
477	3,888,191
CLASS 106	
15AF	3,888,682
	3,888,683
	3,888,684
15AT	3,888,176
24	3,888,689
38.24	3,888,690
40V	3,888,691
47R	3,888,685
53	3,888,686
	3,888,686
66	3,888,687
308B	3,888,688
CLASS 108	
156	3,888,192
CLASS 110	
8F	3,888,193
	3,888,194
99R	3,888,195
CLASS 111	
1	3,888,197
10	3,888,196
CLASS 112	
252	3,888,198
CLASS 113	
80R	3,888,199
CLASS 114	
56	3,888,200
144R	3,888,201
CLASS 115	
16	3,888,202
41HT	3,888,203
70	3,888,204
CLASS 116	
117C	3,888,205
CLASS 118	
100	3,888,206
621	3,888,207
637	3,888,208
CLASS 119	
1	3,888,209
3	3,888,210
18	3,888,211
CLASS 122	
32	3,888,212
478	3,888,213
CLASS 123	
32A	3,888,214
	3,888,215
90.15	3,888,216
90.31	3,888,217
97B	3,888,218
97R	3,888,219
117A	3,888,221
117R	3,888,220
119A	3,888,222
136	3,888,223
148E	3,888,225
195A	3,888,226
196R	3,888,227
	3,888,228
CLASS 124	
49	3,888,229
CLASS 125	
11AT	3,888,230
CLASS 126	
120	3,888,231
140	3,888,232
CLASS 128	
1C	3,888,233
2A	3,888,239
2E	3,888,237
2F	3,888,235
	3,888,236
2R	3,888,234
2V	3,888,238
2.06E	3,888,240
24.3	3,888,241
64	3,888,242
75	3,888,243
77	3,888,244
78	3,888,245
146.2	3,888,246
155	3,888,247
156	3,888,248
214R	3,888,249
	3,888,250
233	3,888,251
266	3,888,252
	3,888,253
290R	3,888,254
296	3,888,256
	3,888,257
305	3,888,258
400	3,888,259
419PG	3,888,260
420	3,888,261
CLASS 131	
29	3,888,262
201	3,888,263
235R	3,888,264
260	3,888,265
CLASS 132	
39	3,888,266
CLASS 133	
1R	3,888,267
CLASS 134	
4	3,888,268
10	3,888,693
32	3,888,694
57D	3,888,269
57R	3,888,270
CLASS 136	
24	3,888,695
83R	3,888,696
89	3,888,697
	3,888,698
107	3,888,699
146	3,888,700
CLASS 137	
1	Re.28,446
45	3,888,271
155	3,888,273
174	3,888,274
344	3,888,281
391	3,888,275
402	3,888,276
405	3,888,277
613	Re.28,447
625.65	3,888,278
627	3,888,279
630.13	3,888,280
CLASS 138	
106	3,888,282
150	3,888,283
CLASS 139	
82	3,888,284
123	3,888,272

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168 3,888,285
291 3,888,286
CLASS 144
'34E 3,888,287
CLASS 148
1.5 3,888,701
6.14R 3,888,702
11.5R 3,888,703
29 3,888,704
175 3,888,705
187 3,888,706
CLASS 149
19.4 3,888,707
CLASS 150
1 3,888,288
CLASS 151
38 3,888,289
CLASS 152
217 3,888,290
330R 3,888,291
362 3,888,292
CLASS 156
11 3,888,708
48 3,888,709
3,888,710
93 3,888,711
171 3,888,712
3,888,714
181 3,888,713
273 3,888,715
276 3,888,716
351 3,888,717
356 3,888,718
378 3,888,719
414 3,888,720
423 3,888,721
477B 3,888,722
499 3,888,723
541 3,888,724
556 3,888,725
CLASS 162
49 3,888,726
65 3,888,727
167 3,888,728
343 3,888,729
CLASS 164
16 3,888,293
66 3,888,294
72 3,888,295
97 3,888,296
100 3,888,297
137 3,888,298
228 3,888,299
256 3,888,300
341 3,888,301
CLASS 165
1 3,888,302
2 3,888,303
86 3,888,304
113 3,888,305
CLASS 166
255 3,888,306
272 3,888,307
273 3,888,308
274 3,888,309
279 3,888,310
280 3,888,311
308 3,888,312
CLASS 169
16 3,888,313
20 3,888,314
CLASS 171
58 Re.28,448
CLASS 172
7 3,888,315
450 3,888,316
CLASS 173
43 3,888,317
149 3,888,318
CLASS 174
15R 3,889,042
35GC 3,889,043
48 3,889,044
70R 3,889,045
78' 3,889,046
84R 3,889,047
94R 3,889,048
102R 3,889,049
CLASS 175
76 3,888,319
94 Re.28,449
394 3,888,320
CLASS 176
38 3,888,730
50 3,888,731
3,888,732
52 3,888,733
61 3,888,734
84 3,888,735

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165 3,888,321
CLASS 178
5.1 3,889,050
5.6 3,889,051
6 3,889,052
3,889,053
6.8 3,889,054
3,889,055
3,889,056
69.5F 3,889,057
CLASS 179
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1GQ 3,889,061
1F 3,889,060
1P 3,889,059
2DP 3,889,062
'15BC 3,889,065
15BS 3,889,064
15A 3,889,063
16F 3,889,066
18BG 3,889,068
18F 3,889,069
3,889,070
18J 3,889,067
100R 3,889,071
170R 3,889,072
175.2B 3,889,073
182R 3,889,074
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6.2 3,888,322
6.3 3,888,323
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65A 3,888,325
65R 3,888,326
68P 3,888,327
79.2R 3,888,328
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53 3,888,332
143 3,888,333
CLASS 188
24 3,888,334
290 3,888,335
CLASS 191
1R 3,888,336
CLASS 192
4C 3,888,337
142 3,888,338
CLASS 195
28R 3,888,736
3,888,737
66R 3,888,738
99 3,888,739
109 3,888,740
139 3,888,741
CLASS 197
55 3,888,339
133R 3,888,340
CLASS 198
19 3,888,341
25 3,888,342
127R 3,888,343
219 3,888,344
230 3,888,345
CLASS 200
5E 3,889,075
16R 3,888,807
48R 3,889,076
61.25 3,889,077
61.64 3,889,078
144B 3,889,079
3,889,080
3,889,081
146R 3,889,082
148B 3,889,083
148R 3,889,084
153R 3,889,085
192 3,889,086
246 3,889,087
268 3,889,098
330 3,889,088
334 3,889,089
CLASS 201
39 3,888,742
CLASS 202
158 3,888,743
CLASS 204
1.5 3,888,744
18R 3,888,745
36 3,888,746
67 3,888,747
108 3,888,748
129 3,888,749
3,888,750
152 3,888,751
159.18 3,888,752
168 3,888,753
195R 3,888,754
272 3,888,755

275 3,888,756
297R 3,888,757
299 3,888,758
3,888,759
CLASS 206
3 3,888,346
315 3,888,347
427 3,888,348
457 3,888,349
531 3,888,350
CLASS 208
48 3,888,760
112 3,888,761
120 3,888,762
139 3,888,763
140 3,888,764
CLASS 209
75 3,888,351
115 3,888,352
352 3,888,765
CLASS 210
36 3,888,766
151 3,888,767
223 3,888,768
227 3,888,769
238 3,888,770
500M 3,888,771
CLASS 211
37 3,888,353
110 3,888,354
123 3,888,355
CLASS 212
15 3,888,356
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69 3,888,358
CLASS 214
1BB 3,888,359
3,888,360
1BH 3,888,361
1B 3,888,362
6D 3,888,363
8.5A 3,888,364
16B 3,888,365
83.22 3,888,366
84 3,888,367
86A 3,888,368
3,888,369
356 3,888,370
767 3,888,371
776 3,888,372
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214 3,888,373
216 3,888,374
217 3,888,376
219 3,888,375
249 3,888,377
344 3,888,378
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10.49 3,889,090
10.55E 3,889,091
69R 3,889,092
77 3,889,093
89 3,889,094
121L 3,889,095
229 3,889,096
242 3,889,097
393 3,889,099
3,889,100
527 3,889,101
CLASS 220
4F 3,888,379
81R 3,888,380
86AT 3,888,381
202 3,888,382
265 3,888,383
268 3,888,384
335 3,888,386
CLASS 221
278 3,888,387
CLASS 222
1 3,888,388
23 3,888,389
28 3,888,390
52 3,888,391
108 3,888,392
229 3,888,393
230 3,888,394
CLASS 223
1 3,888,395
99 3,888,396
CLASS 224
35 3,888,397
42.1 3,888,398
CLASS 225
106 3,888,399
CLASS 226
43 3,888,400
109 3,888,401
157 3,888,402
188 3,888,403

CLASS 227
8 3,888,404
CLASS 228
2 3,888,405
CLASS 229
14R 3,888,406
44CB 3,888,407
85 3,888,408
CLASS 232
1C 3,888,409
CLASS 233
6 3,888,410
CLASS 235
61.7R 3,889,102
61.9A 3,889,103
150.2 3,889,104
151.11 3,889,105
151.21 3,889,106
152 3,889,107
3,889,108
153AK 3,889,109
176 3,889,110
CLASS 236
13 3,888,411
CLASS 237
12.3B 3,888,412
CLASS 238
349 3,888,413
3,888,414
CLASS 239
2R 3,888,415
34 3,888,416
97 3,888,417
145 3,888,418
265.19 3,888,419
412 3,888,420
456 3,888,421
512 3,888,422
567 3,888,423
657 3,888,424
CLASS 241
5 3,888,425
3,888,426
46.11 3,888,427
92 3,888,428
CLASS 242
55 3,888,430
55.19A 3,888,429
56R 3,888,480
194 3,888,431
201 3,888,432
CLASS 243
1 3,888,433
38 3,888,434
CLASS 244
58 3,888,435
104FP 3,888,436
CLASS 246
63A 3,888,437
CLASS 248
48 3,888,438
54R 3,888,439
73 3,888,440
3,888,441
98 3,888,442
152 3,888,443
188.5 3,888,444
225 3,888,445
231 3,888,446
235 3,888,447
328 3,888,448
358R 3,888,449
3,888,450
399 3,888,451
CLASS 249
23 3,888,452
82 3,888,453
90 3,888,454
214 3,888,455
219W 3,888,456
CLASS 250
199 3,888,772
237R 3,889,111
264 Re.28,450
265 3,889,112
272 3,889,113
306 3,889,114
307 3,889,115
320 3,889,116
332 3,889,117
341 3,889,118
352 3,889,119
356 3,889,120
359 3,889,121
3,889,122
366 Re.28,451
437 3,889,123
493 3,889,124
515 3,889,125

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118 3,888,458
208 3,888,459
315 3,888,460
351 3,888,461
CLASS 252
8.1 3,888,774
3,888,779
8.8 3,888,775
25 3,888,776
37.2 3,888,773
73 3,888,777
79.3 3,888,778
99 3,888,781
106 3,888,782
135 3,888,783
188.3CL 3,888,784
3,888,785
3,888,786
301.1S 3,888,787
309 3,888,788
429B 3,888,789
432 3,888,790
454 3,888,793
455R 3,888,791
462 3,888,792
478 3,888,794
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513 3,888,575
518 3,888,796
527 3,888,797
545 3,888,798
CLASS 254
10C 3,888,463
86R 3,888,464
CLASS 259
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148 3,888,467
171 3,888,468
191 3,888,469
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CLASS 260
2P 3,888,799
3,888,800
2.5AQ 3,888,803
2.5HB 3,888,804
2.5R 3,888,801
3,888,802
5 3,888,805
17.4BB 3,888,810
17.4ST 3,888,809
18EP 3,888,808
23R 3,888,811
24 3,888,812
29.3 3,888,813
33.6AQ 3,888,814
33.8UB 3,888,806
37SB 3,888,815
3,888,891
39R 3,888,816
45.7PH 3,888,817
45.7R 3,888,820
45.8NT 3,888,821
3,888,822
45.8A 3,888,823
45.8N 3,888,818
3,888,819
45.85B 3,888,825
45.9NC 3,888,824
47EC 3,888,827
47XA 3,888,826
49 3,888,828
76 3,888,830
77.5AM 3,888,831
78L 3,888,832
79.3R 3,888,833
:80.7 3,888,834
.88.2R 3,888,835
112R 3,888,839
112.5 3,888,836
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3,888,838
3,888,840
141 3,888,841
210F 3,888,842
211.5R 3,888,843
214 3,888,844
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239E 3,888,847
239.1 3,888,848
239.3A 3,888,845
239.5 3,888,849
240.9 3,888,850
243R 3,888,851
244R 3,888,852
247.1M 3,888,853
248CS 3,888,854
248C 3,888,855
3,888,856
251QA 3,888,858
251Q 3,888,857
268BC 3,888,860

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281 3,888,862
3,888,863
285 3,888,864
288 3,888,865
292 3,888,866
293.8 3,888,867
294.8F 3,888,868
302SD 3,888,869
302S 3,888,870
304 3,888,871
306.8R 3,888,872
307H 3,888,873
308R 3,888,874
314.5 3,888,875
3,888,876
326.5B 3,888,946
327P 3,888,878
327R 3,888,877
329S 3,888,879
340.6 3,888,880
3,888,881
340.7 3,888,882
343.2R 3,888,883
343.9 3,888,884
345.2 3,888,885
346.8 3,888,886
347.7 3,888,887
348A 3,888,888
348.5 3,888,889
369 3,888,890
397.2 3,888,892
404 3,888,893
404.5 3,888,894
429.5 3,888,895
449.5 3,888,896
465D 3,888,899
3,888,902
465E 3,888,897
3,888,898
465R 3,888,900
3,888,901
468D 3,888,904
468E 3,888,903
471A 3,888,905
472 3,888,906
473R 3,888,907
475P 3,888,908
3,888,909
479R 3,888,910
484R 3,888,911
486R 3,888,912
501.1 3,888,916
501.11 3,888,947
501.16 3,888,914
501.19 3,888,913
501.21 3,888,915
504R 3,888,917
513R 3,888,918
514D 3,888,919
515R 3,888,920
525 3,888,921
526N 3,888,922
534S 3,888,923
543F 3,888,924
551S 3,888,925
559A 3,888,926
564R 3,888,927
570.6 3,888,829
570.9 3,888,928
578 3,888,929
606.5P 3,888,930
611A 3,888,931
612R 3,888,932
618F 3,888,934
618R 3,888,933
653.6 3,888,935
659R 3,888,936
667 3,888,937
668A 3,888,938
677AD 3,888,939
683D 3,888,940
829 3,888,941
830TW 3,888,942
836 3,888,943
857PG 3,888,944
876R 3,888,945
878R 3,888,948
897A 3,888,949
933 3,888,950
945 3,888,951
951 3,888,952
977 3,888,953
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18A 3,888,954
99 3,888,955
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29 3,888,958
32 3,888,959
71 3,888,960
89 3,888,961
122 3,888,962
176R 3,888,963
236 3,888,964

342RE 3,888,965
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4A 3,888,471
CLASS 267
57.1R 3,888,472
102 3,888,473
110 3,888,474
174 3,888,475
CLASS 269
41 3,888,476
82 3,888,477
CLASS 271
8R 3,888,478
22 3,888,479
CLASS 272
83R 3,888,481
CLASS 273
26C 3,888,482
38 3,888,483
80C 3,888,484
94R 3,888,485
105R 3,888,486
130AC 3,888,487
131BA 3,888,488
134AD 3,888,490
134B 3,888,489
136A 3,888,491
186A 3,888,492
CLASS 274
1R 3,888,493
2 3,888,494
CLASS 277
3 3,888,495
117 3,888,496
CLASS 280
11.35K 3,888,499
11.35T 3,888,497
3,888,498
11.37E 3,888,500
47.18 3,888,501
106R 3,888,502
150AB 3,888,503
3,888,504
3,888,505
3,888,508
150SB 3,888,509
150B 3,888,506
150E 3,888,507
166 3,888,510
239 3,888,511
255 3,888,512
421 3,888,513
434 3,888,514
476R 3,888,515
491E 3,888,516
512 3,888,517
CLASS 285
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55 3,888,519
310 3,888,520
341 3,888,521
3,888,522
382 3,888,523
CLASS 290
1 3,889,126
14 3,889,127
CLASS 291
15 3,888,524
CLASS 292
87 3,888,525
97 3,888,526
213 3,888,527
256.5 3,888,528
259 3,888,529
340 3,888,530
CLASS 293
1 3,888,531

62 3,888,532
CLASS 294
5.5 3,888,533
19R 3,888,534
3,888,535
81SF 3,888,536
93 3,888,537
CLASS 296
3 3,888,538
23D 3,888,539
CLASS 297
384 3,888,540
388 3,888,541
CLASS 299
1 3,888,542
11 3,888,543
25 3,888,544
CLASS 301
63PW 3,888,545
CLASS 303
6C 3,888,546
21CG 3,888,548
21EB 3,888,549
21F 3,888,547
21P 3,888,550
84A 3,888,551
84R 3,888,552
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105 3,889,129
121 3,889,130
136 3,889,131
141 3,889,132
239 3,889,133
268 3,889,134
270 3,889,135
295 3,889,136
300 3,889,137
CLASS 308
10 3,888,553
72 3,888,554
138 3,888,555
CLASS 310
6 3,889,138
13 3,889,139
103 3,889,140
154 3,889,141
CLASS 312
1 3,888,556
214 3,888,557
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285 3,888,991
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358 3,888,995
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3,888,610

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D6—	37	235,284		23	235,302			235,375			235,337	D29—	19R	235,355		4B	235,373
	42	235,285		43	235,303		78	235,321	D22—	8	235,339	D32—	2	235,356	D60—	1	235,374
	56	235,286		101	235,304	D12—	67	235,320	D23—	2	235,340	D34—	5DD	235,360	D70—		235,376
	59	235,287		137	235,305		114	235,323		29	235,341		GP	235,358	D83—	E	235,377
		235,288		138	235,306			235,324		41	235,342		SS	235,359		F	235,378
	71	235,289		149	235,307		115	235,322		43	235,343		ST	235,357		T	235,379
	95	235,290	D8—	257	235,308			235,325		58	235,344		VV	235,361			235,380
	127	235,291	D9—	8	235,309		155	235,326		78	235,345		K	235,362			235,381
	161	235,292		10	235,310		156	235,327		122	235,346		15VV	235,363	D86—	10F	235,383
	175	235,293		107	235,311		209	235,329		139	235,347		ZZ	235,366	D87—	1D	235,382
		235,294		127	235,312			235,330	D26—	1A	235,348		A	235,365		5G	235,384
	184	235,295		171	235,313			235,331		5C	235,349	D35—	3	235,364		8	235,385
	186	235,296		222	235,314		211	235,328		14D	235,351	D45—	10	235,367	D88—	3A	235,386
	194	235,297		258	235,315			235,333			235,352	D49—	1	235,369	D92—	15	235,338
		235,298		291	235,316			235,334		G	235,350	D54—		235,370			235,387
D7—	2	235,299	D10—	46	235,317		217	235,332	D27—	36	235,368	D55—	D	235,371	D94—	3B	235,388
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	3,888,069		3,888,271		3,888,992		3,888,078		3,888,571		3,888,406
	3,888,179		3,888,285		3,888,995		3,888,081		3,888,695		3,888,428
	3,888,197		3,888,302		3,889,009		3,888,092		3,888,854		3,888,433
	3,888,345		3,888,330		3,889,046		3,888,146		3,888,977		3,888,453
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4 :	3,888,025		3,888,395		3,889,070		3,888,399		3,888,286		3,888,633
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5 :	3,888,229		3,888,483		3,889,121		3,888,768		3,889,291		3,888,716
	3,888,230		3,888,486		3,889,132		3,888,778	15 :	3,888,068		3,888,729
	3,888,327		3,888,488		3,889,134		3,888,801		3,888,134		3,888,738
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6 :	Re.28,452		3,888,494		3,889,147		3,888,856	16 :	3,888,191		3,888,762
	3,887,949		3,888,496		3,889,169		3,888,941		3,888,517		3,888,763
	3,887,950		3,888,501		3,889,170		3,888,988		3,888,557		3,888,764
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	3,887,991		3,888,531		3,889,179		3,889,019	17 :	Re.28,443		3,888,814
	3,888,007		3,888,534		3,889,200		3,889,032		Re.28,451		3,888,816
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	3,888,113		3,888,573		3,889,232		3,888,586		3,888,018		3,888,935
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	3,888,154		3,888,675		3,889,260		3,888,831		3,888,103		3,888,996
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	3,888,174		3,888,708		3,889,295		3,888,894		3,888,156		3,889,097
	3,888,180		3,888,715	8 :	3,888,014		3,888,897		3,888,187		3,889,136
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	3,888,218		3,888,866		3,888,309		3,888,055		3,888,316		3,887,997
	3,888,233		3,888,868		3,888,456		3,888,075		3,888,357		3,887,998
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	3,888,245		3,888,906		3,889,189		3,888,266		3,888,384		3,888,192
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	3,888,255		3,888,975		3,888,006		3,888,529		3,888,400		3,888,248

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PATENT AND TRADEMARK OFFICE NOTICES

Citation of Prior Art by Applicants

This notice supplements the notice of August 12, 1974, published in the OFFICIAL GAZETTE of September 3, 1974 (926 O.G. 1), and is in response to some of the concerns expressed by members of the patent bar. That notice set forth guidelines the following of which would result in assurance by the Office that the examiner will fully consider the prior art or other material submitted by applicants, their attorneys and agents.

One of the guidelines stated, "If the reference is not in English, a translation of its pertinent portions should be included." In recognition of the high costs of translations, that guideline is hereby modified to accept an alternative to a translation. Accordingly, in lieu of a translation, it shall be sufficient, for purposes of the notice of August 12, 1974, if an equivalent English language patent or publication is provided and identified as an equivalent.

Also, where the applicant has submitted prior art in accordance with the guidelines in a prior application, reference to the prior application and the submission therein will be sufficient for the continuing application. Of course, any change in applicant's position regarding the cited art and its relevancy to the claimed subject matter should be indicated.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

May 19, 1975.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,740,027, Budd, Stackhouse and Slough, RADIO AND TELEVISION RECEIVER COMPONENT ADAPTED ESPECIALLY FOR USE WITH PRINTED WIRING; **3,375,478**, Van Benthuysen and Barden, ELECTRICAL CONTROL AND METHOD OF MAKING THE SAME; **3,518,604**, Beaver and Van Benthuysen, ELECTRICAL COMPONENT; **3,670,285**, J. A. English, VARIABLE RESISTANCE CONTROL WITH END COLLECTOR, filed Aug. 1, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c1891, *CTS Corporation* v. *Piher Int'l Corp.* Entry of judgment of order, plaintiff is entitled to judgment of infringement by defendants of Claims 1, 2, 3, 7, 8 and 10 of 3,375,478 and Claim 5 of 2,740,027. Defendants are perpetually enjoined from further infringement of said claims of 3,375,478. Defendants are entitled to declaratory judgment of non-infringement of Claims 1, 5, 7, 8 and 10 of 3,518,604. Defendants' counterclaims for declaratory judgment of invalidity of 2,740,027, 3,518,604 and 3,670,285 are dismissed with prejudice, Sept. 26, 1974.

2,840,020, D. Wise, APPARATUS FOR JOINING FABRIC, filed Oct. 8, 1974, D.C., W.D.N.C. (Charlotte), Doc. C–C–74–215, *Daniel Wise Industries, Inc.* v. *Supreme Manufacturing Company.*

2,956,143, L. H. Schall, MICROWAVE OVENS; **3,182,164**, R. Ironfield, ELECTROMAGNETIC ENERGY SEAL, filed May 20, 1970, D.C., S.D.N.Y., Doc. 70–C–2055, *Raytheon Company* v. *Tokyo Shibaura Electric Co., Ltd., et ano.* Filed stipulation and order that action is dismissed, each party to bear its own costs, Sept. 24, 1973.

2,966,900, J. Ehrlich, PORT-CONTROLLED TWO-STROKE INTERNAL COMBUSTION ENGINES, filed Feb. 26, 1973, D.C., N.D. Ohio (Cleveland), Doc. C73–210, *Ehrlich Engineering Limited* v. *Rupp Industries, Inc.* Order dismissing the complaint, Jan. 21, 1975.

3,016,334, T. J. Lewis, SKIN CREAM CONTAINING LOW GEL STRENGTH, LOW VISCOSITY GELATIN, filed Dec. 12, 1974, D.C., S.D.N.Y., Doc. 74–C–5417, *Herbert J. Spoor, Margaret Lewis and Florence Miller* v. *Elizabeth Arden, Inc.*

3,017,323, Gordon, Stephens, Noseworthy and Teare, THERAPEUTIC COMPOSITIONS COMPRISING POLYHYDRIC ALCOHOL SOLUTIONS OF TETRACYCLINE-TYPE ANTIBIOTICS, filed Feb. 11, 1974, D.C., C.D. Calif. (Los Angeles), Doc. 74–35[illegible]–RJK, *Pfizer, Inc.* v. *International Rectifier Corp. and Rachelle Laboratories.* Filed opinion and order that pursuant to 28 U.S.C. Section 1407, the action is transferred to the U.S.D.C. for the District of Minnesota, entered Nov. 22, 1974.

3,047,196, Levine and Phillips, GARMENT HANGER filed Jan. 10, 1975, D.C., S.D.N.Y., Doc. 75–C–121, *Cut Rate Plastic Hangers, Inc.* v. *Warbern Packaging Industries.*

3,115,138, McElevenny, Snyder and Sullivan, EVACUATOR, filed Nov. 21, 1969, D.C., N.D. Indiana (South Bend), Doc. 69–S–194, *Mercantile National Bank of Chicago et al.* v. *Howmet Corporation and Wayne Pharmacal Supply Co., Inc.* Amended judgment, defendants are hereby directed and required to attend before this court, from time to time as required and to produce such relevant devices, objects, books, documents and papers as requested and to submit to examination, oral or otherwise. Plaintiffs shall recover their damages with respect to the issues raised by the defendants' challenge to the valdity of Claims 3 through 14 of said patent, Nov. 29, 1974.

3,120,158, J. M. Macchione, METHOD OF AND APPARATUS FOR PRODUCING TUBES OF POLYGONAL CROSS SECTION; **Re. 25,820**, J. M. Macchione, METHOD OF AND APPARATUS FOR PRODUCING TUBES OF POLYGONAL CROSS SECTION, filed Nov. 18, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c3333, *Precision Paper Tube Company et al.* v. *Highlander Paper Tube Company et al.*

3,128,557, J. E. Childs, REMOTE BIN LEVEL-INDICATING DEVICE, filed Jan. 20, 1975, D.C., N.D. Tex. (Fort Worth), Doc. CA 4–75–15, *Monitrol Manufacturing Company, Inc. and Monitor Manufacturing, Inc.* v. *Kodata, Inc.*

3,134,583, R. W. Wilson, APPARATUS FOR BULK CURING TOBACCO; **3,244,445**, APPARATUS FOR SUPPORTING TOBACCO LEAVES IN BULK FORM FOR CURING, filed Feb. 25, 1974, D.C., M.D. Fla. (Jacksonville), Doc. 74–124–C–J–R, *Powell Manufacturing Company, Inc.* v. *Suwannee Valley Gas, Inc.* Final judgment for plaintiff, Dec. 30, 1974.

3,182,164. (See 2,956,143.)

3,201,068, M. Long, SYSTEM FOR ELEVATING BUILDING COMPONENTS, filed Jan. 13, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c121, *Electronic Marketing, Inc. and Fidlar & Chambers, Inc.* v. *Computer Election Systems, Inc.*

3,207,342, P. J. Trojan, FRONT END LOADER, filed Jan. 27, 1975, D.C., W.D. Pa. (Pittsburgh), Doc. 75–123, *Asbury Industries, Inc.* v. *N. P. Nelson, Div. of Henry Spen and Company.*

3,210,267, Plank and Rosinski, CATALYTIC CRACKING OF HYDROCARBONS WITH THE USE OF A CRYSTALLINE ZEOLITE CATALYST CONTAINING RARE EARTHS AND A POROUS MATRIX; **3,436,357**, same, CATALYST AND CONVERSION OF ORGANIC COMPOUNDS IN THE PRESENCE THEREOF; **3,459,680**, same, CRYSTALLINE ZEOLITE COMPOSITE FOR CATALYTIC HYDROCARBON CONVERSION, filed Nov. 3, 1969, D.C., C.D. Calif. (Los Angeles), Doc. 69–633–F, *Mobil Oil Corporation* v. *Filtrol Corporation and Texaco Inc.* Judgment, plaintiff, Mobil take nothing with respect to its complaint and that said complaint is dismissed with prejudice. Counterclaimant Filtrol take nothing with respect to its antitrust counterclaim and that said counterclaim be and hereby is dismissed with prejudice. Defendant's declaratory judgment counterclaim is granted with respect to non-infringement of the claims specified, Dec. 9, 1974.

3,355,957, E. F. Peterson, ROTARY VIBRATOR AND MOUNT THEREFOR; **3,463,052**, C. G. Matson, VANE MOTOR, filed Jan. 6, 1975, D.C. Ark. (Little Rock), Doc. LR–75–C–5, *Martin Engineering Company* v. *Vibrators, Inc., Vibrators International, and Global Mfg.*

3,375,027. (See 2,740,027.)

3,399,501, W. E. Rossman, AUDITORIUM INSTALLATIONS, filed May 16, 1974, D.C. Nebr. (Omaha), Doc. CV 74–0–134, *The Macton Corporation* v. *The Board of Regents of the University of Nebraska.* Consent judgment and injunction, patent is valid. Defendant has infringed one or more of the claims of this patent and are permanently enjoined. Defendant is granted a paid-up license under the patent in suit, authorizing the construction and use of the office-classroom-auditorium building throughout the remaining term of said patent, Jan. 16, 1975.

3,415,322, S. W. Putch, EXPANDABLE BUSHING FOR WELL CASING HANGERS; **3,420,308**, same, WELL CASING HANGER, filed Oct. 9, 1974, D.C. Tex. (Houston), Doc. CA 74–H–1373, *FMC Corporation* v. *Stewart & Stevenson Services, Inc. and C. Jim Stewart and Stevenson, Inc.*

3,420,308. (See 3,415,322.)

3,436,357. (See 3,210,267.)

3,459,680. (See 3,210,267.)

3,463,052. (See 3,335,957.)

3,484,771, M. S. Falck, Jr., ALARM SYSTEM; **3,772,667**, same, EVENT SIGNAL TRANSMITTER HAVING EVENT SIGNAL DISPLAYING MEANS, filed Dec. 17, 1974, D.C. Oreg. (Portland), Doc. C–74–984, *Morse Products Mfg.* v. *Electronic Surveillance Corporation et al.*

3,518,604. (See 2,740,027.)

3,540,772, R. C. Weiler, CAMPER TIE DOWN, filed Nov. 21, 1974, D.C., C.D. Calif. (Los Angeles), Doc. 74–3422–DWW, *Raywood C. Weiler and Blackstone Manufacturing Co.* v. *L & M Products.*

3,574,332, C. C. Wetzel, TRAILER LIFTING AND DUMPING APPARATUS, filed Mar. 30, 1972, D.C., E.D. Mich. (Bay City), Doc. 3187, *Clifford C. Wetzel* v. *Frito-Lay, Inc.* Consent decree entered upon stipulation, plaintiff's patent is valid and has been infringed by defendant. Defendant is permanently enjoined from further infringement, Jan. 23, 1975.

3,596,899, J. B. Fulk, METHOD OF PRODUCING WEB UNITS, filed Sept. 12, 1974, D.C., E.D. Mo. (St. Louis), Doc. 74–638–C (4), *Paper Converting Machine Co., Inc.* v. *Stephens Press, Inc.*

3,622,487, Chand and Shaw, APPARATUS FOR MEASURING NITROGEN OXIDE CONCENTRATION; **3,622,488**, same, APPARATUS FOR MEASURING SULFUR DIOXIDE CONCENTRATIONS, filed June 12, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–1322–DWW, *Dynasciences Corporation* v. *Arnold Miller, William N. Conner and Theta Sensors, Inc.* Filed judgment invalidating patents but ordering damages to plaintiff and against all defendants on plaintiff's unfair competition claim, entered Feb. 7, 1974.

3,622,488. (See 3,622,487.)

3,670,285. (See 2,740,027.)

3,672,187, E. C. Simpson, FABRIC, filed Jan. 24, 1975, D.C., S.D.N.Y., Doc. 75–C–366 CLB, *Polylok Corporation* v. *Steinberg & Neuman, Inc.*

3,722,399, J. E. Cole, POPCORN POPPER HAVING AUTOMATIC BUTTERING MEANS, filed Apr. 16, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c979, *Scovill Manufacturing Co.* v. *National Presto Industries Inc. et al.* Stipulation of dismissal and order thereon dismissing the complaint and the counterclaim without prejudice, Dec. 10, 1974.

3,781,442, K. Sandow, HEAT AND SMOKE VENT, filed Dec. 13, 1974, D.C. Tex. (Houston), Doc. CA 74–H–1650, *Plasteco, Inc.* v. *RCA Corporation.*

3,772,667. (See 3,484,771.)

3,776,379, E. M. Harvey, LUMBER SORTER, filed Oct. 29, 1974, D.C., M.D. Ala. (Montgomery), Doc. 74–344–N, *Edward M. Harvey* v. *Conveyor-Machinery Corporation et al.*

3,783,449, R. C. Davis, BULLET-PROOF PROTECTIVE ARMOR AND METHOD OF MAKING SAME, filed Sept. 16, 1974, D.C., C.D. Calif. (Los Angeles), Doc. 74–2686–WMB, *Second Chance Body Armor, Inc.* v. *Armor of America.*

3,799,532, W. L. Schlegel, ARTICULATED COIL SPRING CONNECTOR, filed Dec. 10, 1974, D.C. Del. (Wilmington), Doc. 74–264, *Komline-Sanderson Engineering Corporation* v. *Improved Machinery Inc.*

3,816,092, Wilson and McRae, HERBICIDAL 3,4-DICHLOROANILIDES, filed June 11, 1974, D.C., S.D. Tex. (Houston), Doc. 74–H–790, *Rohm and Haas Co.* v. *Dawson Chemical Co., Inc. et al.*

3,841,932, Forler and Heins, METHOD AND APPARATUS FOR REPAIRING CRACKS IN WINDSHIELDS, filed Jan. 17, 1975, D.C. Minn. (Minneapolis), Doc. 4–75–C–26, *The Glass Doctor, Inc.* v. *Hadley-West, Inc.*

3,846,779, J. G. Martner, ULTRASONIC TRANSDUCER, filed Jan. 17, 1975, D.C., N.D. Calif. (San Francisco), Doc. C–75–116 CBR, *Charles Galloway et al* v. *Unisec, Inc. et al.*

3,861,213, R. Parker, DIGITAL THERMOMETER AND METHOD OF MANUFACTURE, filed Jan. 21, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV–75–205–LTL, *RPR, Inc.* v. *Western Magnum Corporation.*

Re. 25,820. (See 3,120,158.)

D.222,984, Heltzen and Stone, MOTORCYCLE LUGGAGE CARRIER; **D. 223,070**, same, MOTORCYCLE LUGGAGE CARRIER AND BACKREST COMBINATION, filed Oct. 15, 1974, D.C., C.D. Calif. (Los Angeles), Doc. 74–2952–FW, *John H. Heltzen et al.* v. *Circle Industries.*

D. 223,070. (See D. 222,984.)

Trademark Registration Treaty Post Conference Information

The text of the Trademark Registration Treaty (TRT), signed in 1973 for the United States and thirteen other States, was reproduced in the OFFICIAL GAZETTE of July 24, 1973. Other documents and materials concerning the treaty were published in the OFFICIAL GAZETTES of March 12, 1974, May 28, 1974, and October 14, 1974.

The World Intellectual Property Organization (WIPO) has now circulated an additional post conference document, which contains a catchword index to the articles and rules of the Trademark Registration Treaty.

In the belief that this index is not of such general interest as those which were previously published, and in lieu of its publication herein, the Office will supply a photocopy of the catchword index (TRT/PDC/7, dated April 25, 1975) to any interested person, who may request such copy.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Dated: May 23, 1975.

Certificates of Correction for the Week of June 17, 1975

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 24, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-26-74
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-22-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-24-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-3-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-1-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	11-6-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-28-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-2-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-29-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-8-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	2-4-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-15-74
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-3-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-30-74
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	8-9-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-29-74

Expiration of patents: The patents within the range of numbers indicated below expire during June 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,836,826, to 2,840,820 inclusive
Plant Patents	Numbers 1,714, to 1,721 inclusive

REISSUES

JUNE 17, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

28,453

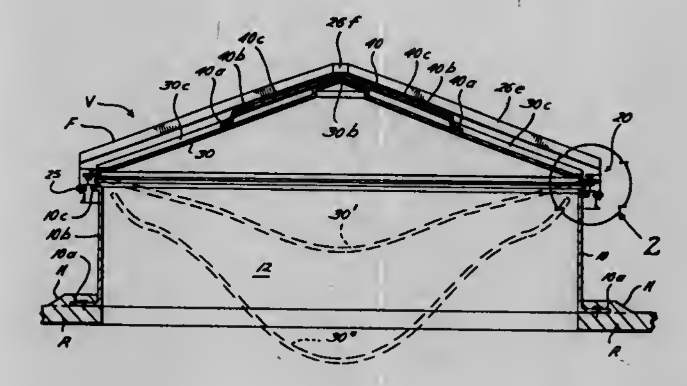
HEAT AND SMOKE VENT

Kiyoshi Sandow, Houston, Tex., assignor to Plasteco, Inc.

Original No. 3,731,442, dated May 8, 1973, Ser. No. 84,577, Oct. 28, 1970. Application for reissue Feb. 4, 1974, Ser. No. 439,054

Int. Cl. E04c *1/02;* **E04d** *1/30*

U.S. Cl. 52—232 **9 Claims**



1. A vent for heat and smoke adapted to be mounted on a roof of a building or like structure, comprising:

- a. a curb adapted to be mounted on a roof and having a vent opening therethrough;
- b. a heat softenable translucent or transparent synthetic resinous plastic vent cover means which is capable of softening and sagging when heated under predetermined conditions for sagging and dropping out of the vent opening to open same and allow heat and smoke to escape through the vent from the area in the building therebelow;
- c. mounting means for releasably mounting said vent cover means on said curb; and
- d. a shield disposed over only the central portion of said vent cover and insulating same from cooling by rain falling thereon, thereby allowing the vent cover to soften and deform under said predetermined heating conditions so as to automatically disengage said cover from said mounting means for opening the vent to allow heat and smoke to escape.

28,454

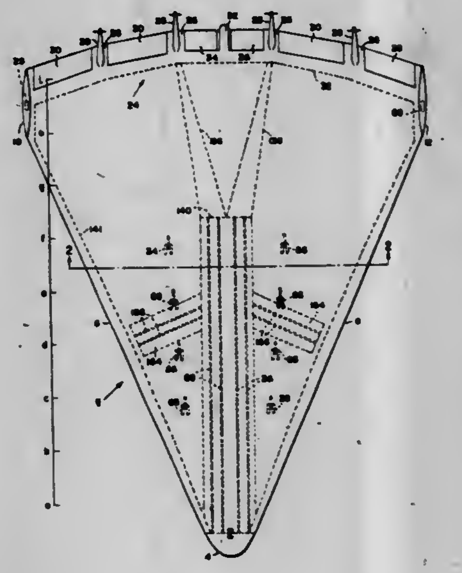
AIRSHIP

John R. Fitzpatrick, Levittown, Pa., and Juergen K. Bock, Delmenhorst, Germany, assignors to Aereon Corporation, Trenton, N.J.

Original No. 3,486,719, dated Dec. 30, 1969, Ser. No. 687,845, Dec. 4 1967. Application for reissue Dec. 23, 1971 Ser. No. 211,595

Int. Cl. B64b *1/20, 1/30*

U.S. Cl. 244—25 **8 Claims**



7. An aircraft with combined aerodynamic and aerostatic lift comprising an enclosed hull, the major volume of which is filled with a lighter-than-air gas, said hull being characterized by a delta-shaped planform substantially symmetrical about a plane extending from a narrow nose at one corner of the planform to the mid-point at the wide end of the planform opposite the nose, ellipse-like cross-sections transverse to said plane throughout substantially all of its length, a maximum height dimension in said plane perpendicular to the chord in said plane at a point spaced from said wide end and spaced from the nose, said ellipse-like cross-sections progressively increasing in width measured perpendicularly to said plane and progressively decreasing in height, measured in said plane, throughout substantially the entire distance from the cross-section at the point of maximum height toward said wide end.

PLANT PATENTS

GRANTED JUNE 17, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,730
FOUR LEAF CLOVER PLANT

Ellis H. Dearing, Tulsa, Okla., assignor of fractional part interest to Otto Duane Terrell, Norco, Calif. Substituted for abandoned plant patent application Ser. No. 843,123, Aug. 6, 1969. This application Feb. 22, 1973, Ser. No. 334,661
Int. Cl. A01h *9/00*
U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of pepperwort characterized by its ability to grow in soil of ordinary water content, and great robustness.

3,731
GLADIOLUS

Harold Vincent and Herbert J. Vincent, Rock City, Ill., assignors to Selected Glads, Inc., New Albany, Ind.
Filed Mar. 18, 1974, Ser. No. 452,289
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—85 **1 Claim**

1. A new and distinct variety of gladiolus plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its violet color.

3,732
GLADIOLUS

Carl H. Fischer, St. Charles, Minn., assignor to Selected Glads, Inc., New Albany, Ind.
Filed Mar. 18, 1974, Ser. No. 452,290
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—85 **1 Claim**

1. A new and distinct variety of gladiolus plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its unique color, which is predominantly red, and its early blooming habit.

PATENTS

GRANTED JUNE 17, 1975

ERRATA

For CLASS	See PATENT NO.
228–173	3,889,349
032–012	3,889,385
090–078	3,889,573
125–016	3,889,699
169–049	3,889,738
169–059	3,889,752
266–024	3,889,864
200–150R	3,890,258
210–104	3,890,289
210–136	3,890,290
425–242	3,890,308
250–366	3,890,355
060–431	3,890,360
310–008.3	3,890,423

PATENTS

GRANTED JUNE 17, 1975

GENERAL AND MECHANICAL

3,889,296

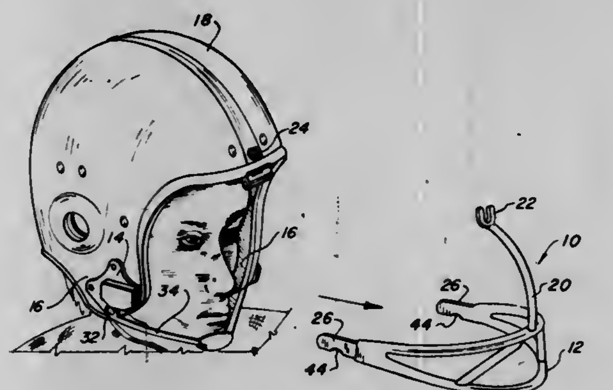
TEAR-AWAY FACE MASK SUBASSEMBLY FOR FOOTBALL HELMETS

Edwin M. Martin, Rt. 1, P.O. Box 37, Las Animas, Colo. 81054

Filed Feb. 13, 1974, Ser. No. 442,066

Int. Cl. A42b *1/08*

U.S. Cl. 2—9 **1 Claim**



1. A tear-away face mask assembly for football helmets and the like which comprises: a pair of bracket-forming members each having a channel formed therein effective when mounted in transversely-spaced opposed relation to one another upon the exterior face of the earflaps of a football helmet to cooperate therewith and define substantially parallel forwardly-opening sockets alongside thereof; a face mask having a horizontally-arched portion with the terminal ends thereof shaped to define a pair of transversely-spaced parallel tongues positioned and adapted for simultaneous insertion into the sockets in the bracket members and a vertically-disposed upwardly and rearwardly-curved arcuate strut depending from the midpoint of said arched portion terminating at the forehead-covering portion of the helmet when attached thereto, said sockets and tongues when interengaged cooperating to produce a quick-disconnect coupling therebetween operative to permit instantaneous detachment of the mask upon application of a pulling force thereto in a direction to separate same from the helmet; and, a quick-disconnect coupling connecting said terminal strut end to said helmet, said coupling comprising a pin mountable upon the forehead-covering portion of the helmet in position to receive the terminal end of the strut and an upwardly extending generally U-shaped yoke formed on said strut end positioned to receive said pin.

3,889,297

PROTECTIVE WEARING APPAREL

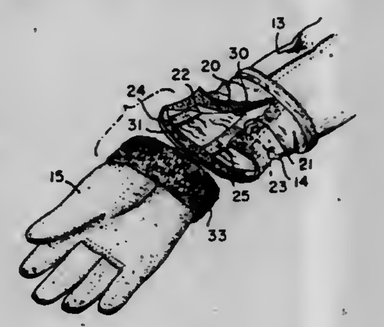
Theodore Lee Jarboe, 505 Boston Ave., Takoma Park, Md. 20012, and Connie Dean Groseclose, 7105 Decatur St., Hyattsville, Md. 20784

Filed Sept. 11, 1974, Ser. No. 504,959

Int. Cl. A41d *13/08*

U.S. Cl. 2—16 **7 Claims**

1. Protective wearing apparel comprising a two-piece combination, one of said pieces consisting of a coat, and the other of said pieces consisting of gloves for the hand, the sleeves of said coat being split longitudinally along a line extending through the cuff portion of the sleeve, the ends of said split portion, and the circumferential boundary of said cuff portion having narrow strips of Velcro material affixed thereto, the open end of said glove having affixed to the outer surface thereof a band of Velcro material completely encircling said open end.



3,889,298

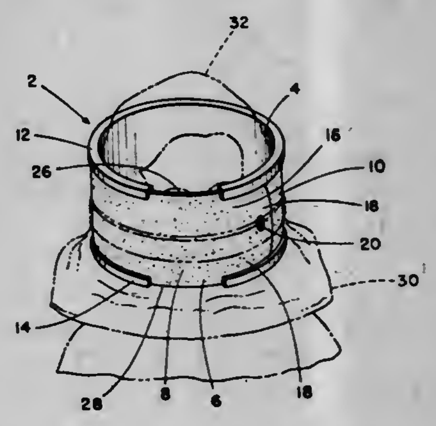
HAIR BAND PROTECTOR

Stefania Miska, 12349 S. Bishop, Calumet Park, Ill. 60643

Filed Apr. 29, 1974, Ser. No. 465,113

Int. Cl. A42b *1/24*

U.S. Cl. 2—174 **4 Claims**



1. A hair protector band comprising an elongated flat strip defining an upright wall of thin cross section, said wall having inner and outer wall surfaces, interlocking means located on the outside of said wall and at opposite end portions of the wall, said strip being encirclable upon itself to define a circle band position for encirclement about a head of hair of a user and said strip being extendable to an elongated length position for storage, said wall having a first upright wall surface on one side thereof and having a second upright surface on the other side thereof, said first wall surface in the circle band position being an inner wall surface for facing the hair and said second wall surface in the circle band position being an outer wall surface for embracement by a garment adapted to be sleeved thereabout, said interlocking means coupling the opposite end portions of the strip in the circle band position, said interlocking means comprising channel means on the outside upper and lower edges at one end portion of the wall and said other end portion of the wall having upper and lower edges spaced apart to fit between said channel means, said channel means of said one end portion telescopingly receiving the upper and lower edges of the other end portion with attendant overlap of said one end portion by said other end portion, said inner wall surface being smooth and said outer wall surface being rough, said smooth surface of said one end portion facing and opposing said rough surface in the band position of the strip whereby said surfaces are readily slidable along each other accommodating unimpeded circumferential adjustments of the band.

3,889,299
PROSTHETIC HIP JOINT DEVICES

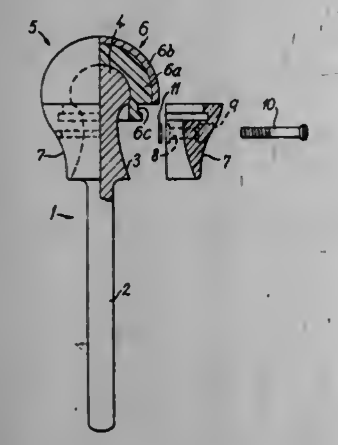
Geoffrey Vaughan Osborne, and Roger Gilbert Rowland, both of Southport, England, assignors to National Research Development Corporation, London, England

Filed Jan. 7, 1974, Ser. No. 431,553

Claims priority, application United Kingdom, Jan. 12, 1973, 1790/73

Int. Cl. A61f *1/24*

U.S. Cl. 3—1 **10 Claims**



9. A prosthetic hip joint device comprising:

a femoral head replacement component having a relatively small spherically-shaped head for use in articulating engagement with a prosthetic acetabular socket component; and a larger spherically-shaped head assembly secured concentrically around said smaller head in demountable manner to modify said femoral component for initial use in articulating engagement with the natural acetabular socket.

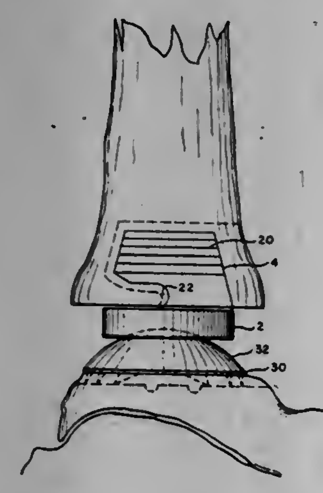
3,889,300
ARTICULATED TWO-PART PROSTHESIS REPLACING THE ANKLE JOINT

Richard C. Smith, San Pedro, Calif., assignor to Wright Manufacturing Company, Arlington, Tenn.

Filed Aug. 28, 1974, Ser. No. 501,296

Int. Cl.² A61F *1/24*

U.S. Cl. 3—1.91 **3 Claims**



1. A two-part prosthetic device for arthoplasty of the human ankle joint, comprising a tibial component for replacing at least a part of the prepared distal end of the tibia, and a talar component for replacing at least a part of the prepared proximate surface of the talus, the tibial component comprising a base part having a downwardly facing concave surface of part-spherical shape and a part extending upwardly from the base part and having spaced side walls extending in an anterior-posterior direction when implanted and having a notch in its distal posterior base to receive an osteotomy slot prepared in the distal tibia to lock the component in place, the talar component comprising a base part having an upwardly facing convex surface which is part-spherical in shape and has the same radius of curvature as that of the concave surface of the tibial component and on which the concave surface rests when the two-part prosthesis is in place, and means on the lower surface of the talar component for engaging into the bone of the talus to increase the connection of the component thereto.

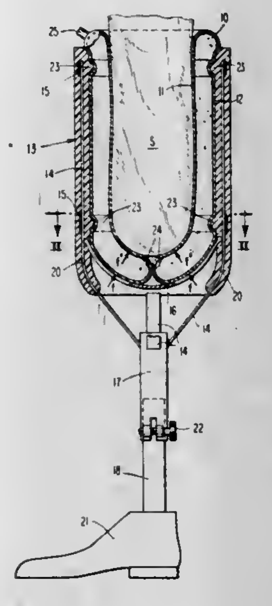
3,889,301
THERAPEUTIC STUMP TREATING AIR SAC PROSTHESIS

Francis J. Bonner, Sr., Ardmore, Pa., assignor to Marion K. Bonner, Ardmore, Pa.

Filed May 6, 1974, Ser. No. 467,095

Int. Cl. A61f *1/12*, *1/08*

U.S. Cl. 3—20 **3 Claims**



1. In a prosthetic device for therapeutic treatment of an amputative stump, the combination which comprises means providing an air sac shaped for arrangement in intimate contact with the sides and bottom of the amputative stump, said air sac being essentially empty except for said air, and being internally open and unimpeded with respect to flow of air from place to place within said sac, means for introducing air into said sac for maintenance of said air under pressure therein, said air sac having an internal and an external side wall which are shaped downwardly and inwardly in a manner to provide an air space which is adapted to wrap substantially around the distal end of the stump, means for providing a substantially rigid casing surrounding and confining said air sac, and supporting means for said casing, wherein said air sac has a sealed distal end adapted to be located in the area of the distal end of the amputative stump, and wherein a shock-absorbing resilient supporting means is provided extending under and in contact with said distal end of said air sac, and arranged to exert a force against said distal end in a direction to urge it upwardly toward and against said distal end of said stump.

3,889,302
FLUID DISCHARGE UNIT

Marta Carlota Ketterer, and Victor Garcia Ketterer, both of 704 Bush St., No. 209, San Francisco, Calif. 94108

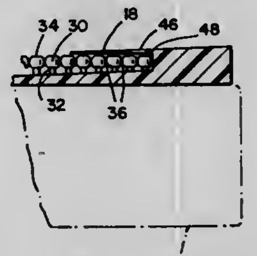
Filed May 13, 1974, Ser. No. 469,198

Int. Cl. A61g *9/00*

U.S. Cl. 4—110 **5 Claims**

1. A fluid discharge unit adapted to be placed on top of the mattress of a bed to collect fluids and discharge them into a container, said unit comprising:

a two-dimensional array of mushroom-shaped elements, each said element comprising a relatively wide head portion having a substantially circular planar section and a relatively narrow neck portion, the head portion of each element being in close abutment with the head portion of each adjacent element, said head portions each having an inwardly tapered upper section terminating in a flat upper surface so that said elements in combination provide a discontinuous upper surface adapted to support an individual lying on the bed but allow for drainage of fluids through the interstices between the elements; and



a frame member comprising a base having a flat lower surface adapted to rest on the mattress and a raised perimetral portion having an inwardly directed lip, the two-dimensional array of mushroom-shaped elements being mounted on the upper surface of the base and extending below said lip at the marginal portions of said array, the upper surface of said base having a slightly V-shaped cross-section in one transverse direction so that fluids drained through the interstices between the mushroom-elements are collected at the median of the upper surface of said base, said raised perimetral portion having fluid discharge means at said median for discharge of the fluids into the container.

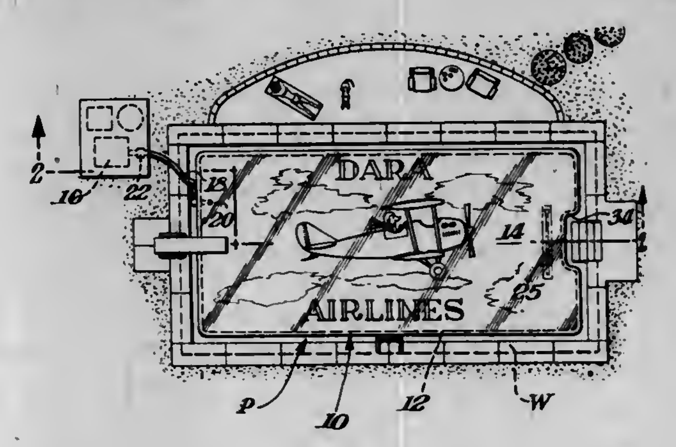
3,889,303
DISPLACEABLE SWIMMING POOL COVER

Augustus B. Kinzel, 1738 Castellana Rd., La Jolla, Calif. 92037

Filed Mar. 27, 1974, Ser. No. 455,144

Int. Cl. E04h *3/16*, *3/18*

U.S. Cl. 4—172.13 **13 Claims**



1. A displaceable covering device for a swimming pool comprising a cover sheet of a size and to fit within and cover a substantial area of the pool, said cover sheet being substantially vertically movable to and from a first position near the water surface of the pool and a second position well below the water surface, said cover sheet being substantially airtight, means for feeding air beneath said cover sheet at sufficient pressure to cause said cover sheet to rise to create a floating air bubble housing the lower portion of which is formed generally at the level of and in cooperation with the water surface, means to expel the air under said cover sheet to create a deflated condition of said cover sheet, means weighting down said cover sheet when in the deflated condition to cause said cover sheet to sink to said second position, a frame shaped to fit within and generally conforming to the shape of the pool, said cover sheet being secured to said frame, said frame being movable with said cover sheet whereby said frame and said cover sheet together comprise a covering unit, and said means for feeding air being disposed under said cover sheet at a location other than its attachment to said frame.

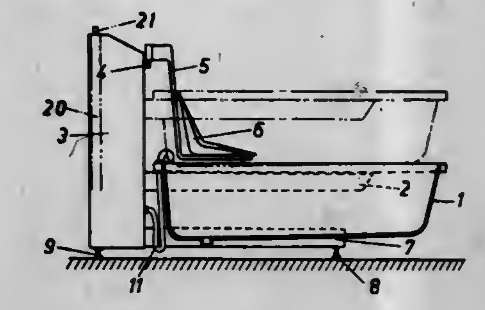
3,889,304
BATHING DEVICE FOR INVALIDED PERSONS

Jan Loren, Goteborg, Sweden, assignor to Soderberg Tollam AB, Vastra Frolunda, Sweden

Filed May 24, 1973, Ser. No. 363,408

Int. Cl. A47k *3/12*

U.S. Cl. 4—185 L **1 Claim**



1. A lifting and lowering mechanism for baths of the type intended for invalided persons and including a bath tub and a platform for carrying the person to be placed in the tub, said lifting and lowering mechanism comprising a pressure fluid operated piston and cylinder unit to be used for alternate lifting and lowering of the bath tub or the carrying platform respectively, in which there are provided two vertical guide members, two plates movable vertically along the guide members, a cross beam attached to the two plates, the piston of the piston and cylinder unit being fixedly connected to the cross beam, said plates extending sideways outside said guide members, a horizontal bracket for supporting the tub, each of the plates being provided with means for removably securing the horizontal bracket, a vertical stanchion, each of said plates having at its extended portion means for attachment of the vertical stanchion and means for removably, pivotally fitting said carrying platform to an upper part of said stanchion.

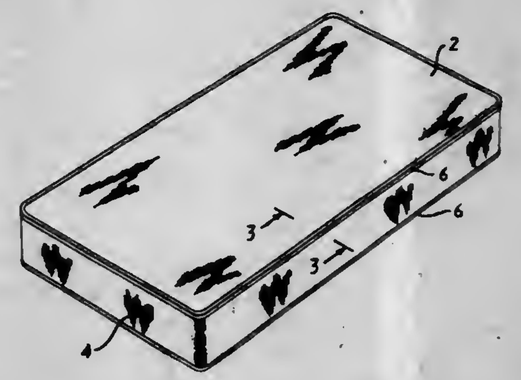
3,889,305
HEAT BARRIER TEXTILE MATERIAL

Irving Goldberg, 5 Windham Rd., Rockville Centre, N.Y. 11570

Continuation-in-part of Ser. No. 305,670, Nov. 13, 1972, abandoned. This application July 30, 1973, Ser. No. 384,049

Int. Cl.² A47C *23/00*, *27/00*

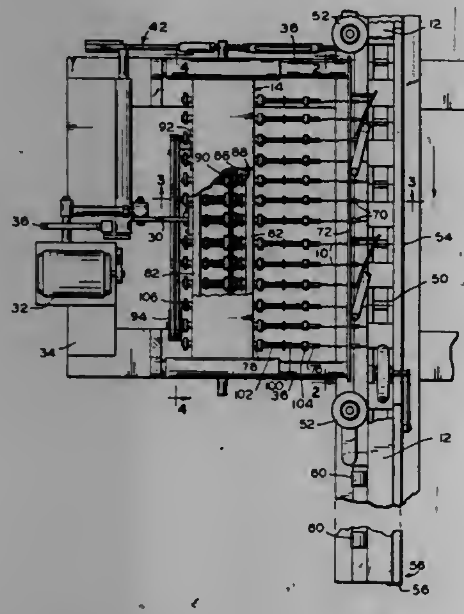
U.S. Cl. 5—345 R **10 Claims**



1. As an article of manufacture, a mattress having a vertical surface mattress ticking and a horizontal surface mattress ticking meeting to substantially form an edge, an organic heat barrier mattress tape edging adjacent said edge and joining means securing said tape edging to said edge, said tape edging being made of an organic fabric from at least about 50% by weight of at least one member of the group of mono-filaments

and filament yarn, and optionally, the balance spun yarn, said mono-filaments and filament yarn and said spun yarn being made of a synthetic fiber forming polymer selected from at least one member of the group consisting of a poly(ethyleneglycol terephthalate), polyamide, polyacrylonitrile and polyolefin, the loft of said fabric being such that the ratio of the average thickness of said fabric to the combined average thickness of said monofilaments, filament yarn or spun yarn is from about 2.5 to about 4.5:1, the weight of said fabric being from about 6 to about 20 ounces per square yard.

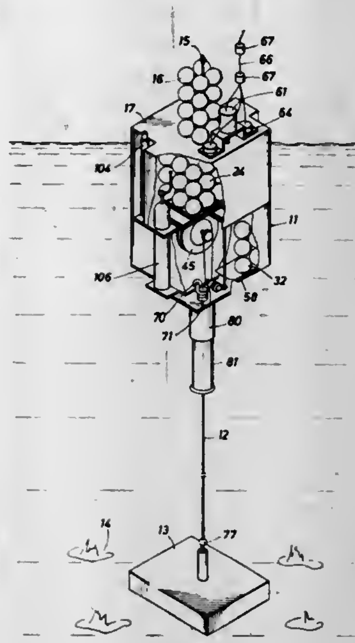
3,889,306
BEE BOARD CLEANER
Phillip W. Geertson, Rt. 1, Box 268, Homedale, Idaho 83628
Filed Apr. 22, 1974, Ser. No. 462,723
Int. Cl. A01k *51/00*
U.S. Cl. 6—12 M **15 Claims**



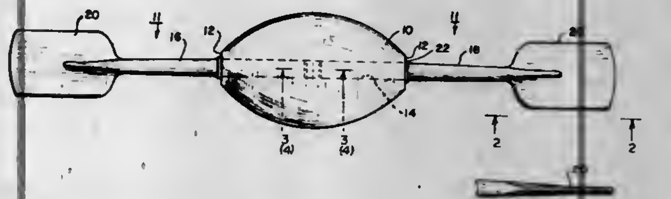
1. In a bee board cleaner,
- an elongated reamer,
- means for rotating the reamer on its longitudinal axis,
- and means for resiliently pressing the reamer to a bee board having holes therein, the reamer entering one of the holes if the forward end of the reamer is substantially aligned therewith and merely engaging the adjacent face of the bee board if not substantially aligned with said one of the holes.

3,889,307
REMOTE-CONTROLLED UNDERWATER BUOY
Georges Sylvain Houot, La Garde, France, assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed Jan. 9, 1974, Ser. No. 432,126
Claims priority, application France, Jan. 12, 1973, 73.01003
Int. Cl. B63b *21/52*
U.S. Cl. 9—8 R **17 Claims**

1. A remotely controlled buoy apparatus adapted to be submerged below the surface of a body of water, comprising: a body having thrust means for applying an upward force thereto; an anchoring element; latching means for maintaining said body in a predetermined immersed position relative to said anchoring element; remotely controlled means for releasing said latching means to allow said body to be moved upwardly to the surface of the water by said thrust means; a drum rotatably mounted and enclosed within said body; a line wound on said drum and having one end extending from said body and fixed to said anchoring element so as to unwind from said drum when said body is moving upwardly; a motor releasably attached to the exterior of said body; and transmission means connected between said motor and said drum for enabling said motor to wind said line on said drum, thereby moving said body downwardly within said water to the predetermined immersed position therein.

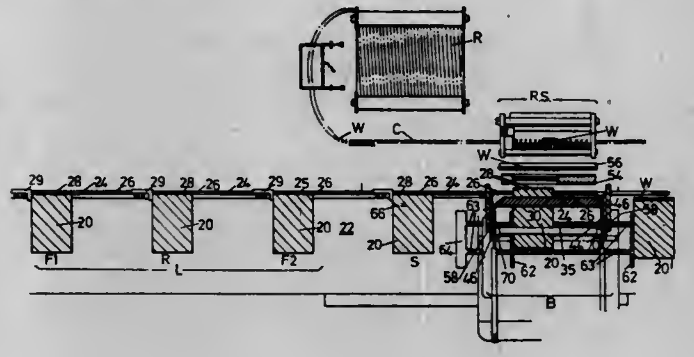


3,889,308
FLOATING PADDLE
Henry Persson, Bloomfield, N.J., assignor to Thomas W. Sibilia, Bloomfield; Montero Cariani, Nutley and Richard K. Knorr, Cedar Grove, all of, N.J.
Filed Nov. 15, 1973, Ser. No. 416,066
Int. Cl. A63b *31/06*
U.S. Cl. 9—307 **2 Claims**



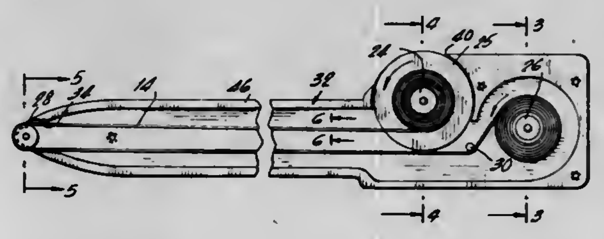
1. A floating paddle for use while swimming, boating and the like, said paddle including: (*a*) a main body member of buoyant material and formed with a through passageway; (*b*) a pair of paddle members of substantially like configuration and of buoyant material each having a shank portion whose ends and adjacent portions are sized to slidably enter and be retained in the through passageway provided in the main body member; (*c*) latching means cooperatively formed on each of the shank ends of paddles, said latching means includes a male projection portion formed on the end of one paddle shank, said male projection portion having a rectangular cross section having at least two sloped sides which taper slightly toward the distal end, the projection terminating on one side at its inner end with a formed undercut; the other paddle shank having its distal end formed with a U-shaped projection which includes one leg adapted to mate with one of the sloped sides of the male tapered projection of the shank end of the other paddle and with the other projection portion of the U-shape having a hook-like projection adapted to engage the opposite sloped side of the male tapered projection until full engagement of the ends is achieved whereat the hook-like portion enters the undercut in the other shank member end to achieve an interlock of the paddle shanks within the through passageway of the paddle body member, and (*d*) retaining means cooperatively formed on said shank portions of the paddles and the main body to establish and maintain said body at a determined linear position on said shank portions as and after the paddles are brought into interlocked condition.

3,889,309
MACHINES FOR BINDING PACKETS OF PERFORATED SHEETS
Sidney George William Adams, Walton-on-Thames, and Edgar Horace Galliford, Esher, both of England, assignors to James Burn Bindings Limited, Surrey, England
Filed Jan. 21, 1974, Ser. No. 434,990
Claims priority, application United Kingdom, Jan. 23, 1973, 3498/73
Int. Cl. B42c *19/08*
U.S. Cl. 11—1 A **4 Claims**



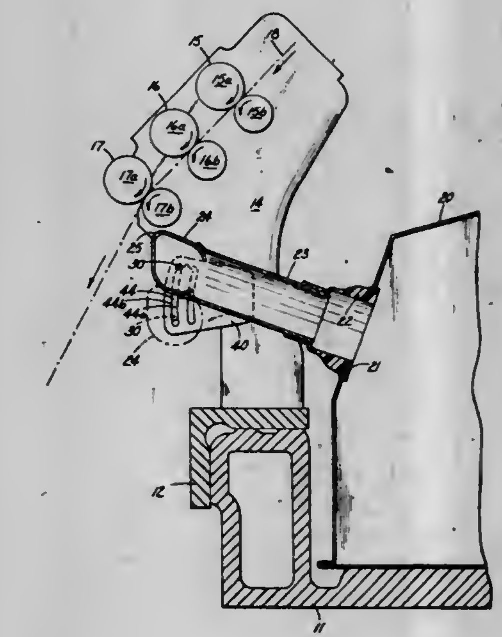
1. A machine for binding a packet of perforated sheets into book form, said packet being so bound by a wire binding element closed through the perforations in said packet, said machine including
- an endless chain movable between a loading station and a binding station, said endless chain having projections adapted to engage the perforations of the sheets of said packet,
- a closing device located adjacent to said binding station, said closing device being adapted to bind the sheets of said packet with said wire binding element, and
- lift means located at said binding station, said lift means being operable to remove said packet from the projections of said chain, and said lift means being movable to present said packet into operative relation with said closing device.

3,889,310
TYPEWRITER CORRECTION DEVICE EMPLOYING AN ADHESIVE RIBBON
Victor Barouh, 935 Plum Tree Rd. W., Westbury, N.Y. 11568, and Robert Glenn, 70-20 108th St., Forest Hills, N.Y. 11375
Filed Nov. 23, 1973, Ser. No. 418,423
Int. Cl. B41j *29/26*; B43l *19/00*
U.S. Cl. 15—210 R **2 Claims**



1. Typewriter correction device adapted to be hand held comprising an elongated casing having a broad end and a tapered end, rotatable cylindrical rollers in said broad end comprising a winding roller and storage roller mounted on parallel axes, said winding roller being positioned forwardly of said storage roller toward the tapered end of said casing, a portion of said winding roller extending outwardly of said casing through an opening therein, an opening in the tapered end of said casing, an applicator roller rotatably mounted in said opening and extending partially outward of said opening and a correction ribbon having an adhesive coating facing outwardly, said ribbon being entrained on said rollers in such manner so that the winding end storage rollers rotate in the same direction for winding and guiding said ribbon into said tapered end opening, said device including guide means for positioning said ribbon in horizontal alignment with said applicator roller.

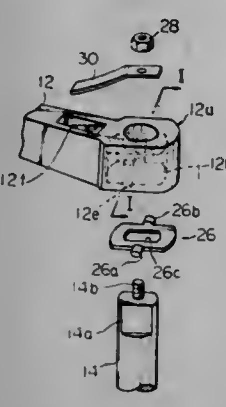
3,889,311
FLUTE SUSPENSION PLATE
John P. Kieronski, and Richard F. Keon, both of Charlotte, N.C., assignors to Whitin Machine Works, Incorporated, Whitinsville, Mass.
Filed Sept. 24, 1973, Ser. No. 399,686
Int. Cl. A47l *5/38*
U.S. Cl. 15—306 A **10 Claims**



1. A textile machine comprising a frame, a vacuum source, a plurality of longitudinally spaced pairs of rolls disposed on said frame and having an inlet side and a discharge side, a longitudinally extending suction flute operatively connected to said vacuum source for removing broken fibers and lint from said rolls, mounting means mounting said suction flute on said frame for movement along a predetermined path between an operating position adjacent said discharge side of said rolls and a retracted position spaced from said rolls, said mounting means including a stud carried by said suction flute and movable with said suction flute between said operating position and said retracted position and a suspension plate rigidly secured to said frame, said suspension plate being a one piece flat plate of hard resilient material and having an inverted U-shaped opening defining a movable cantilever tongue portion having a fixed end and a free end, said inverted U-shaped opening extending completely through said suspension plate and including a first leg portion and a second leg portion and a bight portion extending between said leg portions, said first leg of said inverted U-shaped opening slidably receiving said stud and defining said path, said free end of said movable tongue portion being resiliently movable between a first position and a second position when said stud is moved between said operating position and said retracted position, and said free end of said tongue portion being displaced into said second leg portion when said tongue is in one of said tongue positions.

3,889,312
HEADLAMP WIPER ASSEMBLY

Noboru Fukasawa, Kamakura, and Kyoji Kobayashi, Chigasaki, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan
Filed June 27, 1973, Ser. No. 374,124
Int. Cl. B60s *1/34*
U.S. Cl. 15—250.34 **1 Claim**



1. In a headlamp wiper, assembly,

a wiper arm having an integral block said block having a cavity extending therethrough paralleled to an axis about which said wiper arm is movable, the cavity being reduced in diameter near the top of said block and thus forming therein a shoulder, said block having two grooves formed in inner wall of said cavity, said grooves extending and being spaced opposite to each other about the vertical axis of said cavity from the bottom of said block to portions adjacent to but downwardly spaced from said shoulders;

a hinge plate having an opening formed therethrough and projections extending outwardly therefrom in opposite directions, said hinge plate being fitable in said cavity with its projections engaging in said grooves so that said hinge plate can move until it abuts on said shoulder;

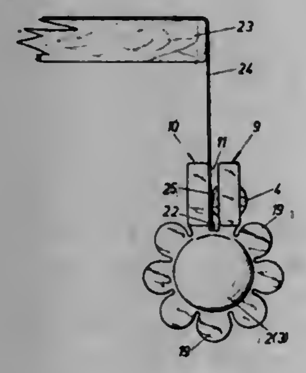
a spindle being fit in the opening of said hinge plate so that upon rotation of the spindle the wiper arm will be rotated by said hinge plate in the same direction;

a plate spring strip bridging over the opening in the top of said block, at which said reduced bore portion terminates, said plate spring engaging the wiper arm; and

means for fastening said plate spring strip to said top of said spindle such that said plate spring urges said wiper arm to effect a blade bias force.

3,889,313
CLOTH WEIGHT

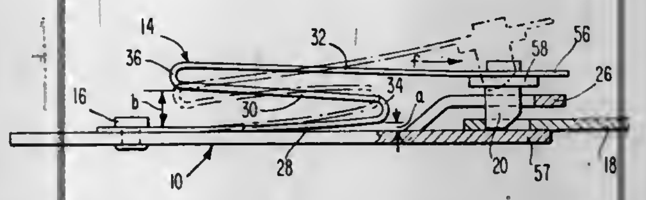
Martin Henry Hulthen, Helsingborg, Sweden, assignor to Aktiebolaget Henry Hulthen, Halsningborg, Sweden
Filed Oct. 16, 1974, Ser. No. 515,215
Int. Cl. A47g *1/10;* **E05b** *1/00;* **E05f** *1/00, 7/00*
U.S. Cl. 16—1 **4 Claims**



1. An improved cloth weight for attachment to the edge of that part of a cloth that hangs down from the table, the improvement comprising two hollow semispherical members, a ball-shaped weight, said two semisphere members enclosing said weight, a pair of projecting arms on each semisphere member, a gap formed between said arms, a clamping wheel rotationally mounted in one of said arms, trunnions arranged in eccentric relationship on said wheel, a portion of the periphery of said clamping wheel extending into said space between said arms.

3,889,314
HEAT ACTUATED LINK

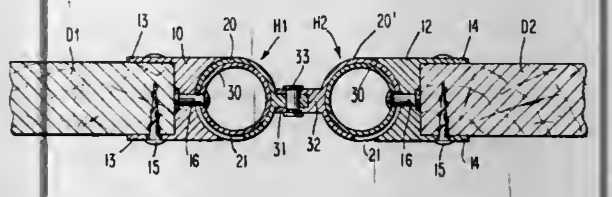
Francis J. McCabe, Apt. A-4, North and East Sts., Doylestown, Pa. 18901
Filed Aug. 30, 1974, Ser. No. 501,867
Int. Cl.^{2} E05F *15/20*
U.S. Cl. 16—48.5 **12 Claims**



12. A releasable fire link comprising a releasable member and a gripping means for normally engaging said releasable member and for releasing said releasable member in response to the heating of said gripping means, said gripping means comprising a serpentine bimetallic element and a mounting element, said bimetallic element having a base portion connected to said mounting element, a mid-portion extending back over at least a part of said base portion, an end portion extending back over said mid-portion, and a tip portion comprising a substantially planar extension of said end portion and having a pin protruding therefrom which in the normal position coacts with said mounting element to directly engage said releasable member, and wherein the axis of said pin is substantially perpendicular to the plane of said tip portion, and wherein the plane of said tip portion and the plane of said mounting element in the normal position converge slightly towards said releasable member wherein the plane of said tip portion and the plane of said mounting element in the heated position are non-convergent towards said releasable member and wherein said bimetallic element is formed from a bimetallic strip having a maximum width at the point of connection between said base portion and said first element and a minimum width at said tip and wherein said bimetallic strip is tapered uniformly along its length.

3,889,315
SAFETY DOOR HINGE

Wilfred Stouffer, 4127 Claridge St., Philadelphia, Pa. 19124
Filed Apr. 15, 1974, Ser. No. 461,255
Int. Cl. E05d *1/04*
U.S. Cl. 16—178 **9 Claims**

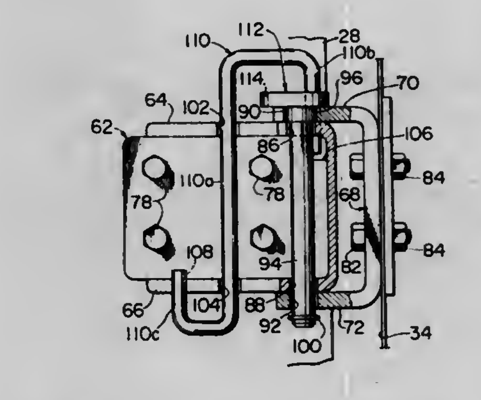


1. A door hinge comprising:

a. an elongated vertical stationary tubular connector having horizontal slots at spaced intervals along the length of said connector;
b. an elongated cylindrical insert pivotal within said stationary connector;
c. an elongated vertical support casing having means along one edge for receiving an edge of door panel and having means along its opposite edge for receiving said stationary tubular connector;
d. fastening means extending through said slots in said stationary tubular connector for fastening said casing to said pivotal cylindrical insert;
e. elongated flange means extending radially from said stationary tubular connector for securing said connector to an adjacent stationary support.

3,889,316
HINGE ASSEMBLY FOR A VEHICLE DOOR

Shyouichi Koike, Tokyo, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan
Filed June 24, 1974, Ser. No. 482,626
Claims priority, application Japan, June 25, 1973, 48-75423
Int. Cl. E05d *11/10*
U.S. Cl. 16—145 **10 Claims**

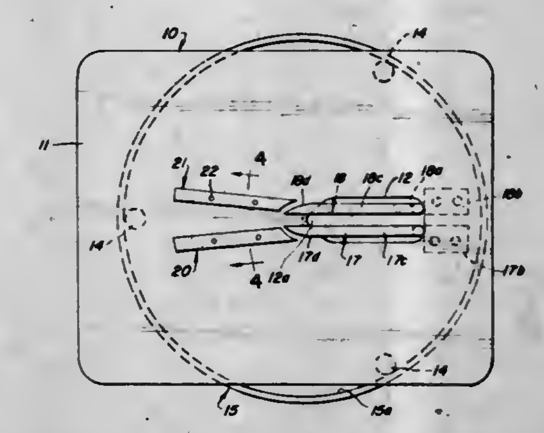


1. A two-stage checking hinge assembly for a door structure of an automotive vehicle comprising, in combination, a body-side hinge bracket fixedly mounted on a vehicle body structure defining an opening for the door structure, a door-side hinge bracket fixedly mounted on the door structure and positioned in association with the body-side hinge bracket, a hinge pin fixedly mounted on the door-side hinge bracket and pivotally supported on the body-side hinge bracket for permitting the door-side hinge bracket and the door structure to turn about an axis of the hinge pin, a cam member fast on the hinge pin and having first, second and third recessed flanks which correspond respectively with closed, half-open and fully-open positions of the door structure, and a torsion spring which is anchored at one end to the body-side hinge bracket and at the other end to the door-side hinge bracket and which is engageable with the first, second and third recessed flanks of the cam member for biasing the door structure into any of the closed, half-open and fully-open positions depending upon the rotational position of the hinge pin relative to the body-side hinge bracket.

3,889,317
APPARATUS FOR REMOVING A STERNUM FROM A CHICKEN CARCASS

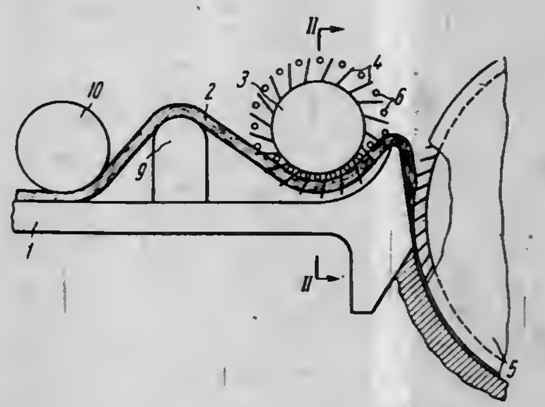
Roy W. Boyd, Jr., Elmhurst, Ill., assignor to Irving Rosen, Lincolnwood and Gerald J. Rosen, Morton Grove, both of, Ill.
Filed Nov. 29, 1973, Ser. No. 419,937
Int. Cl. A22b *3/08*
U.S. Cl. 17—11 **9 Claims**

1. An apparatus for removing only a sternum from an eviscerated, uncooked chicken carcass which has been slit longitudinally, spread apart and disposed in an inverted position so as to expose the sternum, ribs and adjacent portions of the carcass, said apparatus comprising a fixed supporting surface on which the inverted spread apart carcass is adapted to be slidably mounted, said surface being provided with a single elongated opening sized to permit passage therethrough of the sternum subsequent to being separated from the remainder of the carcass while the integrity of the latter is preserved; and an elongated fixedly mounted element protruding from a first end of said opening and curving upwardly therefrom towards an opposite second end of the opening and terminating adjacent thereto whereby a substantial portion of said element is exposed and is disposed in overlying spaced registered relation with respect to said surface opening, the end of said element adjacent said opening second end being tapered and provided with an elongated open end slot whereby segments of said slotted end are adapted to simultaneously engage spaced portions of the exposed end of the sternum and separate the latter from the remainder of the carcass, the integrity of which is preserved as the carcass is moved across the surface longitudinally of the opening in a direction from the second end to the first end of the opening.



3,889,318
DEVICE FOR FEEDING LAP OF FIBRES TO CARDING MEMBER OF RINGLESS SPINNING APPARATUS

Albert Arturovich Leinek, ulitsa Sovetskaya, 111, kv. 39; Igor Stepanovich Khomyakov, ulitsa Sovetskaya, 125, kv. 23, both of Kostroma; Igor Serafimovich Privalov, ulitsa Karla Marxa, 12, kv. 18, Penza, and Galina Pavlovna Filaretova, ulitsa Sovetskaya, 111, kv. 31, Kostroma, all of U.S.S.R.
Filed Jan. 25, 1974, Ser. No. 436,729
Int. Cl. D01g *15/40*
U.S. Cl. 19—105 **3 Claims**



1. A device for feeding a lap of fibres to the carding member of an apparatus for ringless spinning of fibres, comprising: a feed plate adapted to support thereon a tensioned lap of fibres; a driven roller with needles, arranged above said feed plate and defining therewith a feed-in couple, said needles being adapted for cooperation with said lap to feed said lap at rotation of said feed roller toward said carding member; a plurality of resilient rods arranged adjacent to the external surface of said feed roller, extending along the generatrix thereof intermediate of said needles; a pair of supports mounted on said feed roller and supporting said resilient rods therebetween; each said rod having one end thereof rigidly secured in one of said supports and having the other end thereof supported by the other one of said supports for free displacement thereof along the generatrix of said feed roller, to provide for gradual resilient bending in of said rod upon engagement thereof with said lap, whereby there is produced

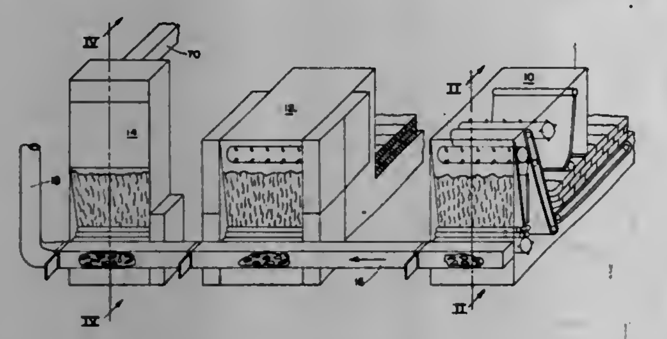
an effort tending to move said lap off said needles of said feed roller.

3,889,319

METHOD AND SYSTEM FOR PRODUCING BLENDED TEXTILE FIBROUS MATERIALS

James H. Roberson, Greenville, S.C., assignor to Crompton & Knowles Corporation, Worchester, Mass.

Filed Oct. 23, 1973, Ser. No. 408,951
Int. Cl. D01g *13/00*
U.S. Cl. 19—145.5 **8 Claims**



1. A system for producing blended textile fibrous materials comprising:

I. an elongated duct having a first side opening and a second side opening spaced from said first opening lengthwise of said duct;

II. a first opening and blending line for a first fiber including:

a. means for forming a first fibrous batt;

b. means for feeding a first fiber to said first batt forming means;

c. means for measuring the density of the batt as it is being formed and for controlling the density of fiber between said first batt forming means and said first feeding means, whereby a substantially uniform first batt is formed; and

d. beater means located outside of said duct adjacent said first opening and said first batt forming means for pulling tufts from said first batt and propelling them into said duct through said first opening;

III. a second opening and blending line for a second fiber including:

a. means for forming a second fibrous batt;

b. means for feeding a second fiber to said second batt forming means;

c. means for measuring the density of the batt as it is being formed and for controlling the density of fiber between said second batt forming means and said second feeding means, whereby a substantially uniform second batt is formed;

d. beater means located outside of said duct adjacent said second opening and said second batt forming means for pulling tufts from said second batt and propelling them into said duct through said second opening; and

IV. means for creating a negative pressure in said duct to create an air flow from said first opening to said second opening, whereby tufts of fibers from said first batt are blended with tufts of fibers from said second batt.

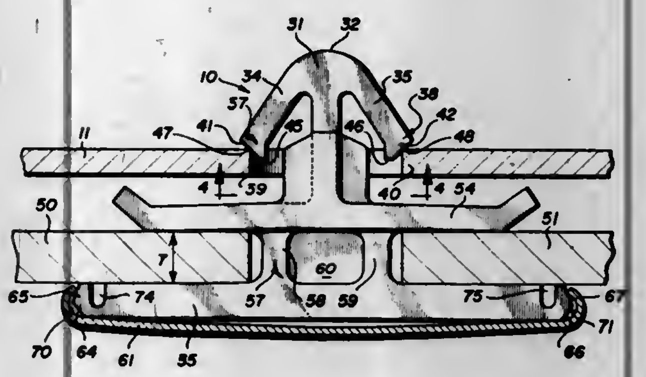
3,889,320

HEADLINER/MOLDING RETAINER AND METHOD OF INSTALLING SAME

Richard Allen Koscik, Richton Park, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Apr. 1, 1974, Ser. No. 456,818
Int. Cl.² A44B *21/00;* **F16B** *19/00*
U.S. Cl. 24—73 PM **11 Claims**

1. A one-piece headliner retainer adapted to be applied to an aperture-defining structure such as an auto roof, the aperture being symmetrical about two mutually perpendicular axes, the retainer including a bi-ended spacer adapted to extend along a first aperture axis, each spacer end adapted to abut aperture-defining structure adjacent the first aperture axis, a stem projecting from the spacer, at least one wing extending away from the stem and having a free end adapted to abut aperture-defining structure adjacent a second axis, a rectangular, laterally extending leaf extending the length of the spacer and carried in substantially fixed relation to the spacer on a side opposite the stem, a rectangular shoe oriented substantially parallel to the leaf, but spaced apart therefrom, molding member retention means formed on two opposite sides of the rectangular shoe to receive and retain a molding member thereover, an extension interposed between the leaf and shoe of a height substantially equal to the thickness of a headliner member to be pinched between the leaf and the shoe, and recess structure interposed between the leaf and the spacer to locate the leaf at a position spaced apart from the auto roof, whereby flexibility between the leaf, the auto roof and the spacer is provided.

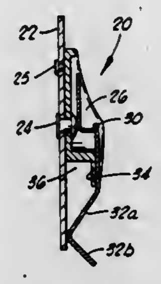


3,889,321

TIE DOWN BRACKETS FOR SECURING BIGHTS OF FLEXIBLE MEMBERS

Willard W. Moser, Box 1503, Guymon, Okla. 73942

Filed Jan. 7, 1974, Ser. No. 431,205
Int. Cl. A43c *3/0;* **B21d** *53/46;* **A44b** *13/02*
U.S. Cl. 24—146 **4 Claims**



4. A tie down bracket for engaging a bight in a flexible member comprising:

a base plate;

a spring supporting body secured to said base plate and including:

a flat back surface bearing flatly against said base plate; a dished-out central portion on the side of the body opposite said flat back surface formes in part by side walls;

a retainer finger projecting from said central portion as a cantilever, and spaced from, and extending substantially parallel to the planes of said flat back surface and said base plate, said finger defining with said base plate an opening to the space between the finger and base plate;

a retainer pin extending through said side walls and across said dished-out central portion;

spring means mounted on said body and including:

a load bearing portion bearing against said body;

an intermediate portion of said spring means being positioned underneath said retainer pin so that said spring means is retained on said body by said retainer pin;

a projecting portion extending from the body across said opening into contact with the base plate, said projecting portion having a guide toe extending out from said base plate at an acute angle to guide the bight of a flexible member between said spring means and the base plate and into said space; and

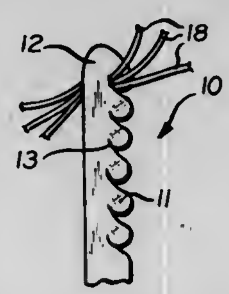
a portion between said projecting portion and said load bearing portion cooperating with the retainer finger of said spring supporting body to prevent lateral movement of said spring means transversely of said retainer finger.

3,889,322

MULTI-ELEMENT SELF-GRIPPING DEVICE

George C. Brumlik, Montclair, N.J., assignor to Ingrip Fasteners Inc., Montclair, N.J.

Continuation of Ser. No. 191,686, Oct. 22, 1971, abandoned. This application July 12, 1973, Ser. No. 378,489
Int. Cl. A44b *17/00*
U.S. Cl. 24—204 **9 Claims**



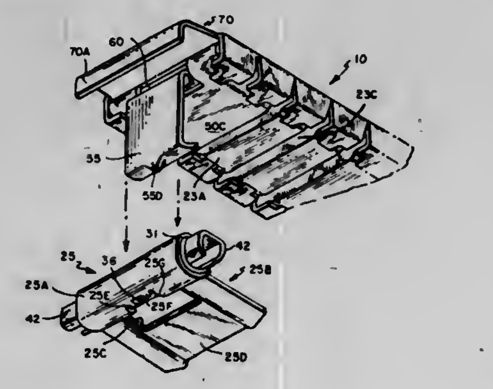
1. Self-gripping device comprising a plurality of upright gripping elements stiffly attached to a base, each of said gripping elements comprising an elongated member having at least one flat longitudinal edge section with at least one integral askewed wedge defined by a cut in the edge of said flat section with the portion of said flat section above the cut being rounded and bent out of plane from said flat section, said gripping elements being adapted to penetrate and become lodged in a receiving material.

3,889,323

END ATTACHMENT FOR WATCH BANDS

Kurt A. Reith, West Warwick, R.I., assignor to Textron Inc., Providence, R.I.

Filed Aug. 23, 1974, Ser. No. 500,045
Int. Cl.² A44C *5/18*
U.S. Cl. 24—265 B **16 Claims**



1. An end attachment for watch bands adapted to be mounted between spaced lugs of a wrist watch comprising,

an adaptor which comprises a generally tubular member adapted to receive a spring pin of a wrist watch, a plate-like member having one end integral with said generally tubular member, said plate-like member comprising a transverse generally rectangular opening substantially parallel to and adjacent to said generally tubular member,

a clasp-supporting member having at least a portion thereof adapted to be positioned in engagement with at least a portion of said plate-like member,

means for securing said clasp-supporting member to a watch band,

clasp means, and

pivot means for connecting one end of said clasp means to a portion of said clasp-supporting member which is adjacent to said generally tubular member,

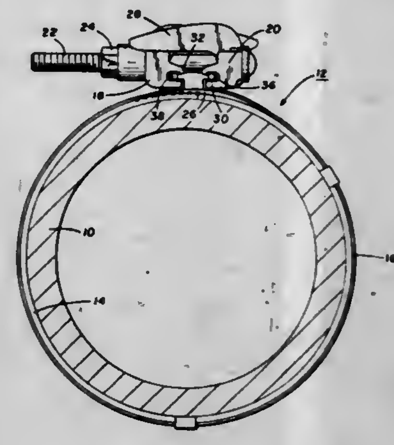
siad clasp means comprising a resilient flange, said resilient flange and the part of the clasp means which extends outwardly from said pivot means being passed through said generally rectangular opening to close and open the clasp means and, when the clasp means is in closed position, at least a portion of the upper surface of the clasp means being in engagement with at least a portion of the lower surface of said plate-like member and said resilient flange forming a snap fit with a portion of said clasp-supporting member, thereby detachably to secure the clasp-supporting member to the adaptor when the clasp means is in closed position.

3,889,324

BAND ATTACHMENT FOR PIPE REPAIR CLAMP

Charles J. Glover, Bradford, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 12, 1973, Ser. No. 405,948
Int. Cl. B01j *6/00*
U.S. Cl. 24—279 **8 Claims**



1. In a pipe repair clamp, the combination comprising:

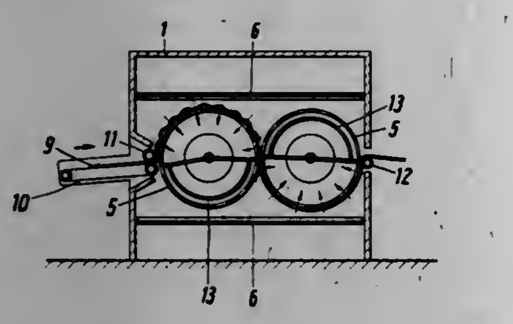
a. a flexible band adapted to generally encircle a pipe on which repair is to be made;

b. adjustable lug means for drawing said band into tight fitting installation engagement against the encircled pipe; and

c. anchor means for securing an end of said band to said lug means, said anchor means including bar means supported extending within a looped wrap of said band end and responsive to draw forces increasingly imposed on said band by installation adjustment of said lug means to effect a rotational interlock between said band and said lug means that operatively increases the gripping force therebetween in correlation to the draw forces increasingly imposed on said band.

3,889,325
PROCESS FOR SHRINKING NON-WOVEN WEBS

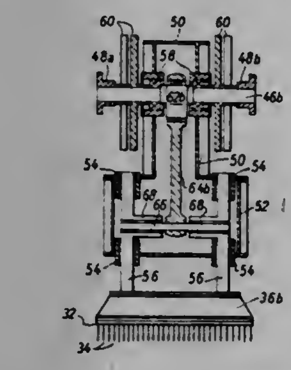
Heinz Fleissner, Egelsbach near Frankfurt am Main, Germany, assignor to VEPA AG, Switzerland
Continuation of Ser. No. 850,549, Aug. 5, 1969, abandoned. This application Jan. 24, 1973, Ser. No. 326,559
Claims priority, application Germany, Aug. 17, 1968, 1785165The portion of the term of this patent subsequent to Mar. 31, 1987, has been disclaimed.
Int. Cl. D06c *1/08, 27/00*
U.S. Cl. 26—18.5 **10 Claims**



1. A continuous process for the production of felts by shrinking a continuous random web of textile material which comprises overfeeding a web of textile material to a perforated surface of at least one sieve drum means subjected to a suction draft, conveying said web of textile material on said perforated surface, said web being retained on said perforated surface only by said suction draft, heating the textile material to a shrinking temperature by drawing a heated treatment medium through the web of material while the web is being conveyed on the perforated surface, the differential pressure across the web of material on said perforated surface being lower than about 40 mm. water column which is less than the shrinkage forces acting on said web of textile material whereby a uniform shrinkage of the web of material is obtained on said perforated surface, and further heating the web of shrunk textile material on a perforated surface of at least one other sieve drum means subjected to a suction draft to effect heat-setting of said textile material while said web is in a smoothed-out condition.

3,889,326
NEEDLE LOOMS

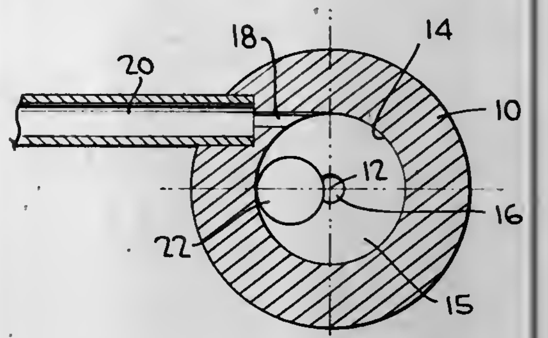
Trevor Tyas, Monk Bretton, England, assignor to Weldstow Limited, England
Filed Aug. 3, 1973, Ser. No. 385,249
Claims priority, application United Kingdom, Apr. 6, 1973, 16553/73
Int. Cl. D04h *18/00*
U.S. Cl. 28—4 R **11 Claims**



1. For use in a needle loom, a needle board assembly comprising a needle board; a pair of drive rods spaced apart longitudinally of said needle board and attached to said needle board for movement therewith; first and second bearings for each of said drive rods, said first and second bearings of each said drive rod being spaced apart axially with respect to their associated drive rods, said first and second bearings constraining their respective drive rod to follow a rectilinear axial path; a rotary driving shaft; a connecting rod; a mechanism for producing reciprocation of said connecting rod from rotation of said driving shaft, and coupling means coupling said connecting rod to parts of said drive rods located between said first and second bearings.

3,889,327
METHOD FOR INTERLACING STRANDS OF A TEXTILE YARN

Jean Joly, Craponne, and Silvio Sangalli, Clauire, both of France, assignors to Rhone-Poulenc-Textile, Paris, France
Filed May 24, 1973, Ser. No. 363,561
Claims priority, application France, May 26, 1972, 72.19404
Int. Cl. D02g *1/16*
U.S. Cl. 28—72.12 **11 Claims**



1. A method for interlacing strands of a textile yarn, comprising the steps of:
advancing the yarn while under slight tension through an interlacing zone;
introducing at least one constant fluid current into the interlacing zone;
disturbing the constant fluid current randomly by impinging the fluid current on at least one movable object disposed in said interlacing zone to generate a fluctuating fluid current; and
impinging said fluctuating fluid current on the yarn to interlace the strands of the yarn.

3,889,328
PREPARATION OF COTTON YARNS FROM SLIVERS AND ROVINGS

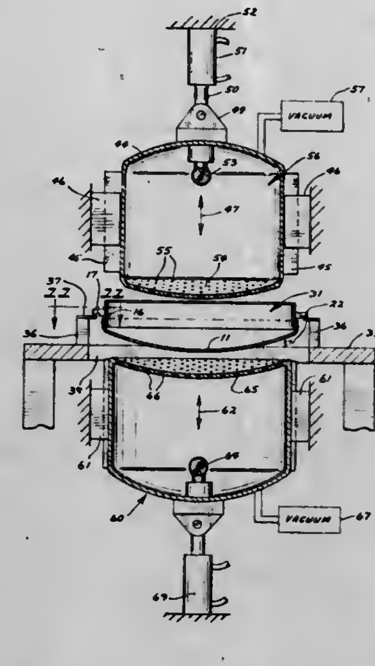
Jan J. De Boer, Pijnacker, and Herman Borsten, Voorschoten, both of Netherlands, assignors to Nederlandse Organisatie Voor Toegepast-Natuurweten-Schappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel En Verkeer, Netherlands
Division of Ser. No. 221,762, Jan. 28, 1972, Pat. No. 3,822,994. This application Nov. 21, 1973, Ser. No. 418,048
Claims priority, application United Kingdom, Feb. 19, 1971, 4982/71
Int. Cl. D06m *1/10*
U.S. Cl. 28—76 R **8 Claims**

1. A process for preparing a cotton yarn with improved tensile strength retaining properties comprising:
a. selecting a material from the group consisting of cotton fibres, slivers, and rovings:
b. soaking the unrestrained material in a swelling agent to transform the material into Cellulose II;
c. stretching the material, in the presence of the swelling agent, to a length between 95% to 110% of the original length of the material before the soaking step, the stretched length being continuously maintained during the remaining steps of the process;
d. rinsing the material while in the stretched condition to remove the swelling agent;

e. drying the material while in the stretched condition at a temperature in excess of 70°C in order to set the improved tensile strength properties obtained; and
f. spinning the material into a yarn.

3,889,329
PROCESS FOR MAKING COLOR TELEVISION MASKS

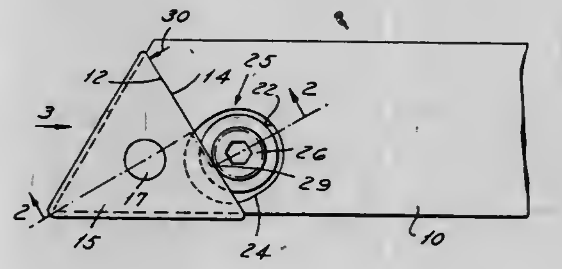
Fazal A. Fazlin, 902 W. County Rd., Apt. 116, New Brighton, Minn. 55110
Filed May 16, 1973, Ser. No. 360,643
Int. Cl. H01j *9/00*
U.S. Cl. 29—25.14 **8 Claims**



1. A method of manufacturing shadow-mask types of color cathode ray tubes having a face panel, and a shadow mask mounted adjacent said panel comprising the steps of:
forming a mask and support means assembly with said mask having an imperforate, curved surface; providing at least one surface of said mask in which apertures are to be formed with a coating of a sensitized resist; supporting said one surface of said mask adjacent a master exposing die formed to correspond to the desired curved shape of said mask, and exposing portions of the resist coating on said one surface of said mask while said one surface is supported; developing and etching said mask to create an aperture pattern in the exposed areas; and mounting said mask in a cathode ray tube face panel having means to provide repeatable positioning for any mask with respect to preselected portions of said cathode ray face panel.

3,889,330
LATERAL LOCK INDEXABLE INSERT CUTTING TOOL

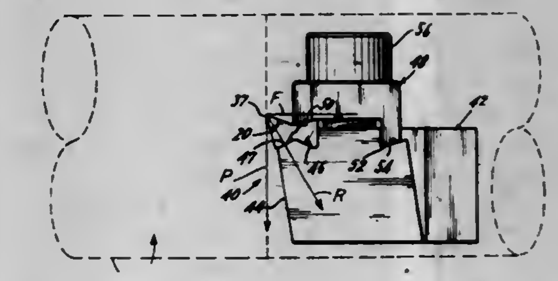
Raymond Tibor Zweekly, Royal Oak, Mich., assignor to The Valeron Corporation, Detroit (Oak Park), Mich.
Filed June 19, 1974, Ser. No. 480,975
Int. Cl. B26d *1/00*
U.S. Cl. 29—96 **8 Claims**



1. A cutting tool holder for supporting a removeable cutting insert having an aperture therethrough, said holder comprising;
a body member,
a fixed reaction surface for engaging a side wall of the insert,
a bottom seat surface for supporting the insert,
pin means extending from said bottom seat surface positioned to extend into the aperture in the insert,
insert locking means including a threaded hole in said body adjacent a side wall of said insert and spaced from said reaction surface, headed clamp screw means engaging said threaded hole, interengaging reaction surfaces in said body and screw acting in a plane normal to said adjacent side wall and adapted to laterally displace the head of said clamp screw in said plane and against said adjacent side wall upon rotative actuation of said clamp screw and thereby pivotally displace the insert against said fixed reaction surface to lock the insert in said holder, the principal three lines of force at said fixed reaction surface, pin, and screw head being substantially interspaced relative to each other to provide a leveraged side wall interaction about said pin as a fulcrum pivot.

3,889,331
MACHINE TOOL BIT AND HOLDER

Josef David Grungras, 726 Gerald Ct., Brooklyn, N.Y. 11235
Continuation-in-part of Ser. No. 311,429, Dec. 1, 1972, abandoned. This application Oct. 9, 1974, Ser. No. 513,455
Int. Cl. B26d *1/00*
U.S. Cl. 29—96 **5 Claims**



1. A tool bit and tool bit holder combination, said tool bit comprising a longitudinally extending cutting section having a lower wall, a side wall and a top wall, said cutting section side wall and said cutting section top wall intersecting to form a longitudinally extending cutting edge, said tool bit further including a clamping section having a lower wall to side wall and a top wall, said cutting section and said clamping section being longitudinally cojoined thereby forming a longitudinally extending bow-tie shaped tool bit axis, a tool bit holder including a main holder body having longitudinally extending receiving means constructed and arranged for receiving said cutting section lower wall and being further constructed and arranged for receiving said clamping section lower wall and side wall, clamping means including receiving means constructed and arranged for receiving said clamping section top wall and means removably fixing said clamping means to said main holder body to removably fix said tool bit to said tool bit holder, said tool bit cutting section lower wall being generally normal with respect to said cutting edge.

3,889,332
DEVICE FOR ATTACHING AN INSERT TO A TOOLHOLDER

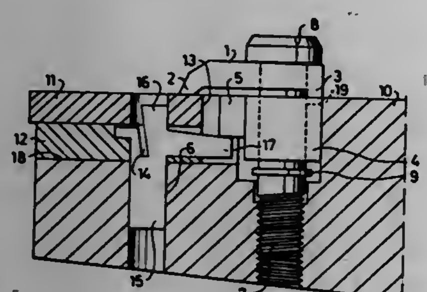
Wlajko Mihic, Tegnervagen 9, 802 28 Gavle, Sweden
Filed Apr. 2, 1974, Ser. No. 457,323
Claims priority, application Sweden, Apr. 2, 1973, 7304579
Int. Cl. B26d *1/00*
U.S. Cl. 29—96 **9 Claims**

1. A device for removably attaching an insert to a toolholder having a recessed portion with a shoulder for engage-

ment with said insert and a plurality of bores through its thickness, said device comprising:

a. a support member in said recess having one edge in alignment with the periphery of a first bore in said toolholder,

b. an insert on top of said support member, said insert having a hole therethrough in alignment with said first bore through the toolholder, one edge of said insert abutting said shoulder,



c. a first lever in said first bore through said toolholder engaging the inner surface of said hole through said insert, said first lever having an extension passing through said shoulder into a second bore through said toolholder,

d. a sleeve disposed in said second bore engaging said extension of said first lever,

e. a second lever engaging said insert and said sleeve, and

f. means to move said second lever toward said toolholder such movement exerting a force on said insert tending to hold it against said shoulder.

3,889,333
FAST EXCHANGE CLAMPING DEVICE FOR ROTARY TOOLS

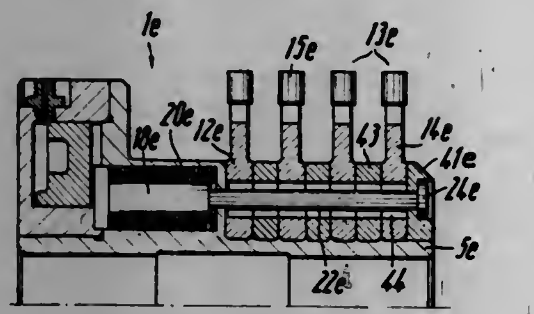
Otto Katz, Bildechingen, and Heinrich Tischinger, Unterer Augsbaum, both of Germany, assignors to Ledermann & Co., Horb, Germany

Filed Apr. 22, 1974, Ser. No. 462,640

Claims priority, application Germany, Apr. 25, 1973, 2320919

Int. Cl. B26d *1/12;* **B23c** *1/00;* **B27g** *13/00*

U.S. Cl. 29—104 **21 Claims**



1. In a quick exchange chucking device for rotary tools; a support means having a central axis and adapted for being driven in rotation on said axis, said support means having a surface perpendicular to said axis for engaging a tool, clamping means on said support means protruding axially through said surface and axially moveable on said support means, said clamping means having clamp surface means thereon facing said surface on said support means whereby a tool disposed between said surface on said support means and said clamp surface means on said clamping means can be clamped to said support means by axial movement of said clamping means on said support means, spring means in said support means biasing said clamping means in tool clamping direction, means for moving said clamping means in tool releasing position, and cooperating elements of a disengageable connection on said tool and said clamping means to permit removal of the tool when said clamping means are moved into tool releasing position.

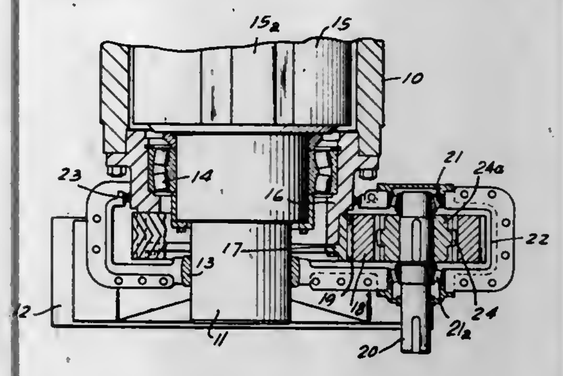
3,889,334
CONTROLLED DEFLECTION ROLL DRIVE

Edgar J. Justus, and Arnold J. Roerig, both of Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed Aug. 1, 1972, Ser. No. 277,110

Int. Cl. B60b *15/16*

U.S. Cl. 29—115 **11 Claims**



1. A driven roll construction comprising in combination,
a roll shell,
support bearing means positioning the roll for rotation,
an annular ring driving gear on one end of the roll shell for driving the shell in rotation,
a drive pinion radially of the ring gear in driving mesh therewith,
said pinion and said ring gear having drive aligning teeth therebetween holding the pinion in alignment with the ring gear,
a drive shaft,
and a flexible drive connected directly between the shaft and the pinion.

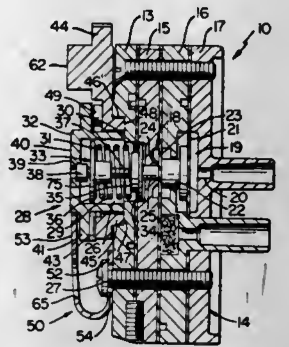
3,889,335
PRESSURE REGULATOR CONSTRUCTION AND METHOD OF MAKING THE SAME

Harold G. Brakebill; Jay L. Lewis, both of Concord, and Walter J. Berleyoung, Knoxville, all of Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 308,118, Nov. 20, 1972, Pat. No. 3,791,405. This application Nov. 29, 1973, Ser. No. 419,984

Int. Cl. B21d *53/00*

U.S. Cl. 29—157.1 R **11 Claims**



1. A method for making a pressure regulator construction provided with a housing means having a control chamber interconnected to an exhaust chamber by a valve seat and with a movable valve member means for opening and closing said valve seat comprising the steps of disposing a spring means in said housing means so as to have one end thereof effectively act on said valve member means to tend to move said valve member means in one direction relative to said valve seat, disposing a spring retainer to be movably carried by said housing means and have the other end of said spring means effectively act against the same, disposing cam means to be movably carried by said housing means and be operatively associated with said spring retainer to adjust the same relative to said housing means and thus vary the force of said spring means whereby the set point of said regulator construction can be selectively set, securing said cam means and said spring retainer to said housing means with a mounting means that includes a single fastening member securing said spring retainer and said cam means to said housing means while permitting said movement therebetween, said spring retainer being axially movable along a longitudinal axis thereof relative to said housing means, said cam means being rotatable about said longitudinal axis, forming an annular flange means on said spring retainer, and forming cam surface means on said cam means so as to be disposed between said housing means and said flange means to act on said flange means to axially adjust said spring retainer relative to said housing means.

3,889,336
APPARATUS FOR ASSEMBLING COMPONENTS

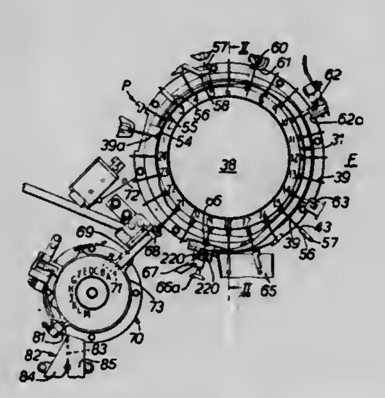
John Brown Buchanan, Crookham; Stanley William Stephens, Lightwater, and Julian Pascoe Grenfell, Pyrford, all of England, assignors to Badalex Limited, Weybridge, England

Filed Dec. 28, 1973, Ser. No. 429,159

Claims priority, application United Kingdom, Jan. 9, 1973, 1087/73

Int. Cl. H05k *13/00*

U.S. Cl. 29—203 P **25 Claims**



1. Apparatus for assembling a plurality of components on a common elongate element, the apparatus including turret means provided with a plurality of elongate guides for elongate elements, means to index the turret means to offer each guide sequentially to a plurality of stations, component feed means at a plurality of stations each operable to apply a component to a guide and component positioning means at at least one station operable to position a component relative to an element in a guide and thereby establish the components relative to the element and to the turret means.

3,889,337
LOCATOR FOR APPLICATORS ADAPTED TO APPLY ELECTRICAL CONNECTORS TO PRINTED CIRCUIT BOARDS

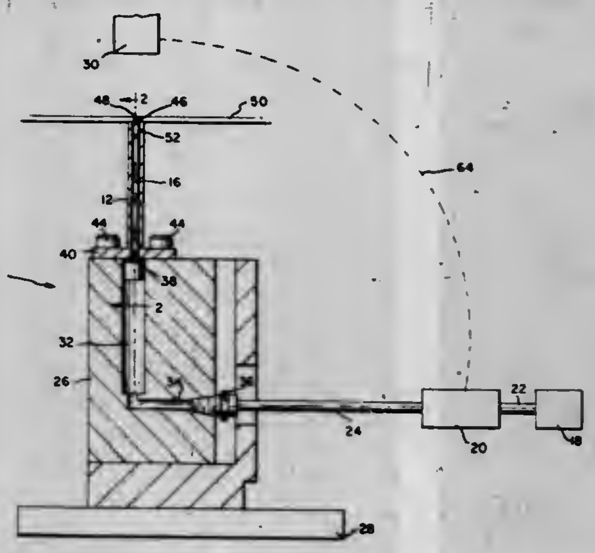
Mervin Leonard Shughart, Carlisle, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 17, 1974, Ser. No. 471,075

Int. Cl. H05k *13/04*

U.S. Cl. 29—203 B **12 Claims**

1. In combination with an applicator adapted to apply electrical connectors or the like to a printed circuit board, said connectors or the like having a portion which is adapted to extend through and beyond an aperture in said printed circuit board, the combination therewith of locator means adapted to locate an aperture in said printed circuit board with respect to said applicator; said locator means comprising:
a support member provided with an elongated vertically extending aperture;
pin means slidable within said aperture between a lowered position and a raised locating position wherein an end portion of said pin means extends above said support member to facilitate locating an aperture in the printed circuit board relative to said applicator, there being clearance between said pin means and the side walls of the aperture to permit air to flow therebetween;
a source of compressed air; and
interconnecting means for interconnecting the source of compressed air with said aperture;
the parts being so arranged and constructed that the compressed air when interconnected with said aperture will normally bias the pin means into its raised locating position, a portion of the compressed air flowing through the clearance between the pin means and the side walls of the aperture to blow any undesirable matter out of said aperture, one end of the portion of the connector or the like which is adapted to extend through and beyond the aperture in the printed circuit board contacting the end portion of the pin means to force it within the aperture against substantially constant pressure as the connector is applied, the side walls of the aperture in the support member also serving to support said portion of the connector or the like as it is applied.



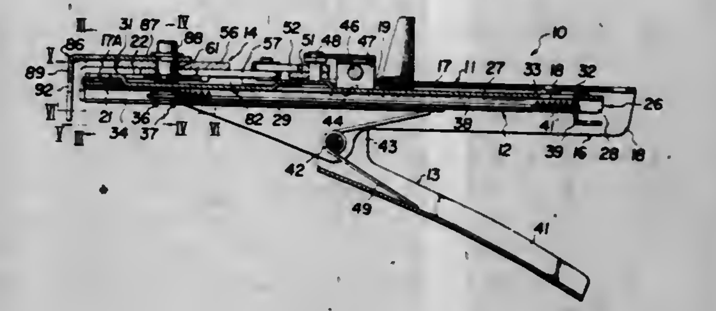
3,889,338
BINDER

Hideo Hosaka, Takasaki, Japan, assignor to Max Kabushiki Kaisha, Tokyo, Japan

Filed June 17, 1974, Ser. No. 479,606

Int. Cl. B23p *11/00*

U.S. Cl. 29—243.56 **10 Claims**



1. A binder for securing a substantially channel-shaped clip in surrounding relationship to an object, comprising:
a housing;
jaw means mounted on said housing and coacting with a clip for deforming same into a loop, said jaw means including a pair of jaw members pivotally mounted on said housing and swingably movable about a first axis between open and closed positions, each jaw member having a jaw portion associated therewith and positioned for engaging said clip for deforming same;

an operating handle pivotally mounted on said housing for swinging movement about a second axis which is substantially perpendicular to said first axis; and

connecting means operatively coupled between said jaw members and said operating handle for causing swinging movement of said jaw members in response to swinging movement of said operating handle.

3,889,339

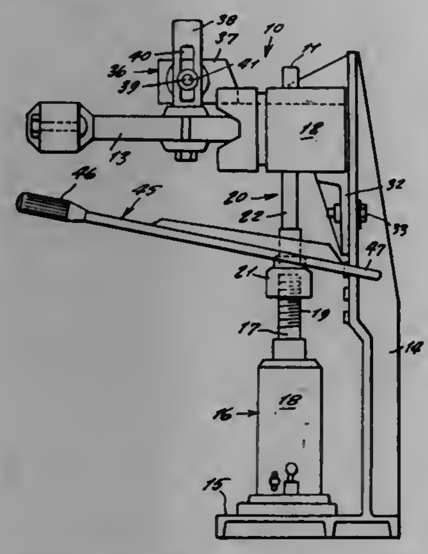
PRESS FOR HOME REMOVAL OF PISTON PINS

Johnny A. Pollock, and George Spector, both of c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Mar. 5, 1974, Ser. No. 448,346

Int. Cl. B23p *19/02*

U.S. Cl. 29—252 **3 Claims**



1. In a piston pin press, the combination of an upright frame, a platform at a lower end of said frame, a jack mounted upon said platform, said jack including a hydraulic cylinder from the upper end of which a vertically movable piston rod extends, and a press pin on an upper end of said rod serving to push a piston pin out of a head of a piston, wherein stationary lugs are at an upper end of said frame and an adjustable bracket having lugs is supported on said frame so to hold said piston between said stationery lugs and said lugs on said adjustable bracket.

3,889,340

HYDRAULIC PRESSURE INTENSIFIER SYSTEM

William Jennings Dixon, Jr., Charlotte, N.C., assignor to R. H. Bouligny, Inc., Charlotte, N.C.

Filed Feb. 21, 1974, Ser. No. 444,356

Int. Cl. B21f *15/00*

U.S. Cl. 29—203 DT **11 Claims**

1. A hydraulic pressure intensifier system for use with hydraulically operated tool means and the like, said system including:

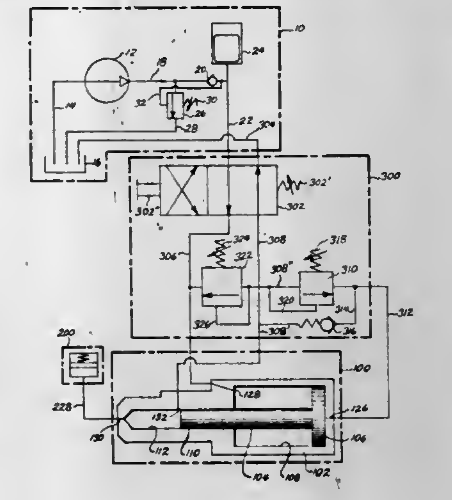
a. a source of low pressure hydraulic fluid;

b. pressure intensifying means including a reciprocating member provided with a relatively large operating piston movable in an operating chamber and connected with a relatively small intensifier piston movable in an intensifier cylinder, said reciprocating member being selectively movable by said low pressure source fluid from a starting position in a first direction to cause the pressure of the fluid in said intensifier cylinder to be intensified and being selectively movable in a second direction to return said reciprocating member to said starting position thereof, said intensifier cylinder having an inlet port located adjacent the leading end of said intensifier piston at said starting position thereof and an outlet spaced from said inlet port, said inlet port being closed by said intensifier piston as it moves across said inlet port during movement of said reciprocating member; and

c. a hydraulic circuit including conduit means connecting said source to said pressure intensifying means and including selectively operable control means for sequentially:

i. admitting said low pressure source fluid solely to said pressure intensifying means outlet for supplying said tool means;

ii. then admitting said low pressure source fluid to said pressure intensifying means operating chamber when



the fluid pressure at said outlet increases to a predetermined level to move said reciprocating member in said first direction thereof and cause fluid at an increased pressure to be discharged through said outlet to said tool;

iii. then admitting said low pressure source fluid to said operating chamber to move said reciprocating member in said second direction thereof to cause fluid to be withdrawn from said tool through said outlet; and

iv. then venting said outlet to atmospheric pressure.

3,889,341

APPARATUS FOR APPLYING SLIDERS TO A SLIDE FASTENER CHAIN

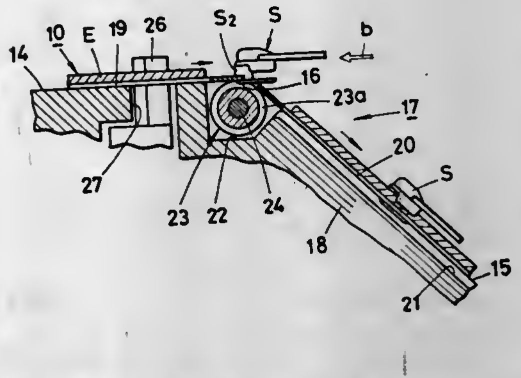
Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 426,927, Dec. 20, 1973. This application Oct. 9, 1974, Ser. No. 513,321

Claims priority, application Japan, Dec. 27, 1972, 47-1526

Int. Cl. B23p *19/04*

U.S. Cl. 29—207.5 SL **2 Claims**



1. An apparatus for applying sliders to a slide fastener chain having a pair of opposed stringer tapes carrying rows of fastener elements along their respective inner longitudinal edges and provided with transverse slits formed across said longitudinal edges at spaced locations along the fastener chain, which apparatus comprises:

a. a guide block having a first or horizontal guide surface and a second guide surface extending at an angle downwardly inclined relative to said first guide surface, along with surfaces the fastener chain is transported intermittently and a guide groove extending longitudinally along said first and second guide surfaces for receiving sliders slidably therein;

b. means for splitting open the transverse slits in the fastener chain so that the upper edge of each of said slits is aligned with an entrance end of a slider, said means being located at a point interconnecting the lines of extension of said first and second guide surfaces;

c. separating means vertically movable into and away from the path of the fastener chain along said first guide surface adjacent said splitting means for separating the two opposed stringer tapes prior to arrival of the fastener chain at said splitting means; and

d. a slider holder movable towards and away from said splitting means and adapted to release sliders one at a time onto the fastener chain at a point slightly beyond said splitting means by threading the slider through said transverse slit.

3,889,342

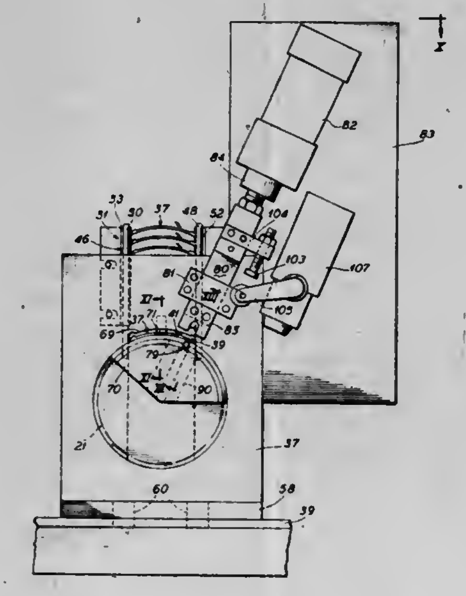
APPARATUS FOR ASSEMBLING PISTON RING END GUIDES

Jack E. Mulligan, Ferguson, Mo., assignor to Ramsey Corporation, St. Louis, Mo.

Filed Sept. 12, 1973, Ser. No. 396,500

Int. Cl. B23q *7/10*

U.S. Cl. 29—211 D **16 Claims**



1. Apparatus for assembling end guides with split piston rings of channel shape, comprising:

means for mounting a split piston ring in position to receive an end guide in assembly therewith and including means for properly locating the gap between ends of the ring at the ring gap;

means for positioning an end guide adjacent to the ring across the gap and aligned with the ring channel; and

inserting means for thrusting the end guide laterally into the ring channel across the gap.

3,889,343

AUTOMATIC COLLET HINGE/SCREW PLACEMENT MACHINE

Leslie R. Miller, Phoenix, Ariz., and John D. McKenney, South Laguna, Calif., assignors to Royal Industries, Inc., Pasadena, Calif.

Filed Oct. 5, 1973, Ser. No. 403,747

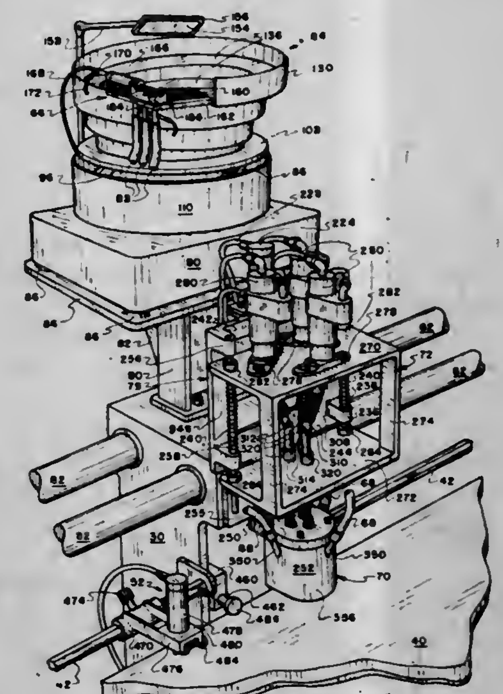
Int. Cl.² B23Q *7/10*

U.S. Cl. 29—211 D **5 Claims**

5. In a hinge applicator machine, a head for simultaneously receiving, simultaneously holding and simultaneously inserting a plurality of screws through openings in a hinge into a door, said head comprising:

channels for delivering said plurality of screws to an equal number of insertion sites;

hollow means for receiving and holding each screw erect, including means for releasing each screw from the hollow means when each screw is set in the door;



power screw driver means rotatably and reciprocably disposed within each hollow means to simultaneously engage, rotate and advance the held screws through openings in a hinge into the door.

3,889,344

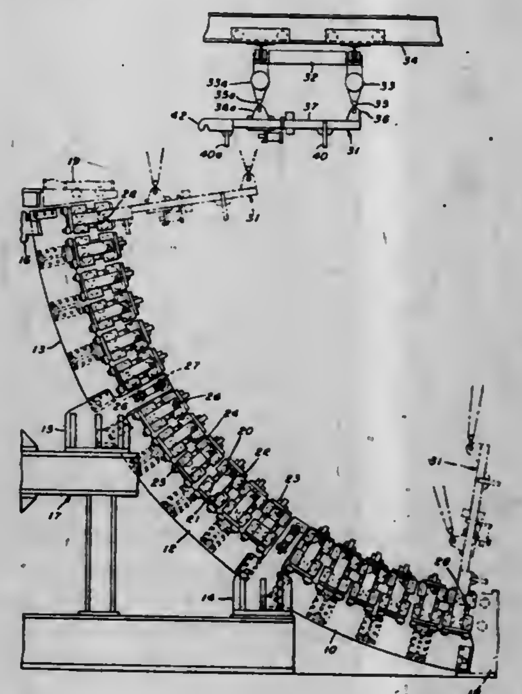
EXTRACTOR FOR GUIDE ROLLS

Charles H. Bode, Jr., Bethel Park Borough; Carlton E. Craig, Mt. Pleasant Twp., Washington County; Donald L. Friend, McCandless Twp., Allegheny County; Louis G. Lazzaretti, Harmony Twp., Beaver County, and George J. Wagner, Jr., North Fayette Twp., Allegheny County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 26, 1973, Ser. No. 428,566

Int. Cl. B23p *19/04*

U.S. Cl. 29—252 **15 Claims**



1. An extractor for removing or inserting the rolls of a continuous-casting machine, said extractor comprising a portable frame, means on said frame to be engaged for lifting and

positioning the frame with respect to the machine, means on one end of said frame for removably engaging fixed parts of the machine at any of a plurality of locations to afford a purchase of the frame on the machine at a location corresponding with any roll to be removed or inserted, an extensible and retractable carriage carried by said frame, motive means carried by said frame and operatively connected with said carriage, roll-handling means carried by said carriage, and operating means on said carriage for connecting the handling means to a roll and disconnecting it therefrom.

3,889,345
METHOD AND APPARATUS FOR MANUFACTURE OF FLOOR GRATINGS

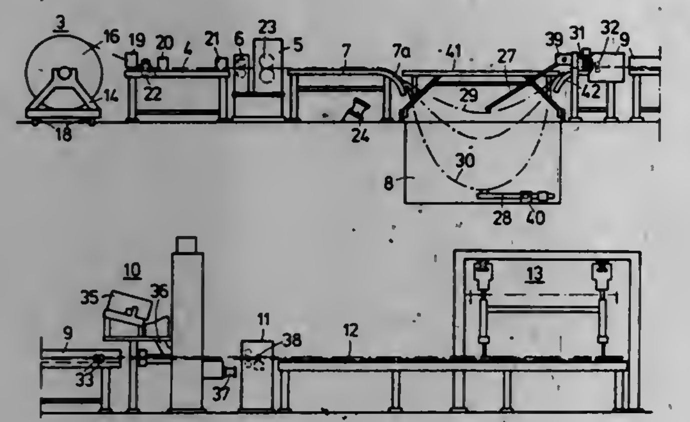
Walter Ivar Hirschberg, Laxa, Sweden, assignor to Elektriska Svetsningsaktiebolaget, Goteborg, Sweden

Filed Oct. 15, 1973, Ser. No. 406,149

Claims priority, application Sweden, Oct. 16, 1972, 13308/72

Int. Cl. B23p *17/00*

U.S. Cl. 29—412 **5 Claims**



1. In the manufacture of floor gratings composed of longitudinal strips standing on edge with respect to the plane of the grating and crossbars welded to said longitudinal strips, the method of supplying the longitudinal strips to a welding station which comprises the steps of

advancing all of the strips jointly as a continuous mat of strips of the flat sides of which are parallel to the plane of the mat,

during said advancement gradually twisting each of the strips into on-edge position with respect to the plane of the mat, and,

feeding the mat of strips standing on edge into the welding station.

4. In a plant for the manufacture of welded floor gratings composed of longitudinal strips standing on edge with respect to the plane of the grating and crossbars welded to said longitudinal strips, apparatus for supplying the longitudinal strips to a welding station which comprises

means for advancing all of the strips jointly as a continuous mat of strips the flat sides of which are parallel to the plane of the mat, and,

guide means for progressively twisting each of the strips into on-edge position with respect to the plane of the mat and for directing the mat of strips standing on edge into the welding station.

3,889,346
METHOD OF REPAIRING A WORN BALL ON THE YOKE OF AN UNIVERSAL JOINT ASSEMBLY

Don A. Horwitz, 9024 Karlov Ave., Skokie, Ill. 60076

Division of Ser. No. 377,788, July 9, 1973, Pat. No. 3,841,178. This application July 24, 1974, Ser. No. 491,234

Int. Cl. B23p *7/00*

U.S. Cl. 29—401 **3 Claims**

1. The method of repairing a worn ball of a ball coupling on a yoke of a universal joint assembly in which the ball is secured to and extends from an outer wall of the yoke opposed to a wall thereof from which a drive shaft extends, which method comprises:

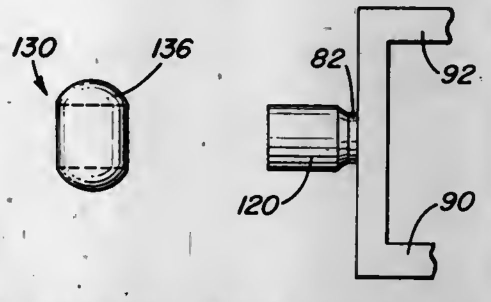
separating a cross element of the universal joint assembly from the yoke to expose a pair of opposed through openings in the yoke in corresponding opposed walls therof normal to the wall to which the drive shaft is secured, a line connecting centers of the openings defining an axis extending normal to a longitudinal axis of the drive shaft secured to the yoke,

providing a fixture including a base and a threaded shaft supported thereon to extend upwardly therefrom,

fastening the base of said fixture on the bed of a lathe so that said threaded shaft extends upwardly therefrom and normally thereto, said shaft being sized to pass through the pair of opposed openings in the yoke,

positioning said yoke on said fixture with said shaft projecting upwardly through said openings and with the worn ball on said yoke projecting toward a tool-carrying head of said lathe,

securing said yoke at a selectable height on said shaft to establish said worn ball on a live center line of said lathe,



presenting a lathe-head-carried cutting tool to said worn ball and rotating said tool to cut said ball annularly about said center line thereby to remove peripheral portions of said ball to transform said ball into a stub shaft extending normally to an axis defined by a line connecting the radial centers of the openings in the yoke,

axially sliding onto and fixedly securing to said stub shaft a superimposing sleeve having an opening contoured and sized for contiguous contact with a mating annular peripheral wall of said stub shaft, an outer bounding surface of at least a portion of said sleeve being spherically shaped and having a radius corresponding substantially to a radius of the ball as originally carried by said yoke,

whereby, functionally, the equivalent of a new ball has been substituted for the worn ball on said yoke of the universal joint assembly.

3,889,347
METHOD OF MAKING COMBUSTIBLE METAL FLASHLAMP CHARGES

Gerard J. Villani, Needham, and Ronald P. Fedora, Marlboro, both of Mass., assignors to Norton Company, Worcester, Mass.

Filed Aug. 7, 1972, Ser. No. 278,469

Int. Cl. B23p *17/04*

U.S. Cl. 29—417 **11 Claims**

1. Process for making combustible metal fuel charges, comprising the steps of,

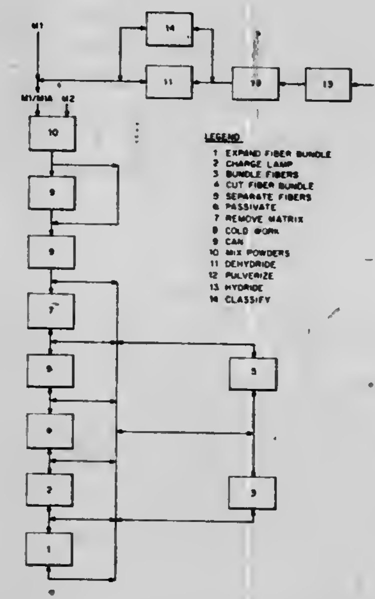
distributing powders of a first metal selected from the group consisting of hafnium, yttrium, tungsten, uranium, vanadium lanthanum, cerium, scandium, tantalum, zirconium, niobium and titanium, in a matrix of a powder of a second material which can transmit cold work stresses to the first metal to elongate its powder components to fibers, the two materials being a homogeneous mixture containig the first metal as at least 20 volume per cent thereof,

forming said mixed first metal and second material into a workable compact,

consolidating the compact through cold work,

further cold working the compact into an elongated member through the application of compressive forces thereto to work the component powders of first metal therein into a porous bundle of primarily, mechanically interlocked fibers and carrying the cold working to a degree that first metal fibers with surface to volume ratio characteristic less than a one mil diameter fiber and at least 5 to 1 longitudinal aspect ratio are formed,

the compact as a whole being similarly formed into an elongated member of at least 5 to 1 longitudinal aspect ratio,



removing the matrix phase of second material from the porous bundle,

passivating the resultant bundle to inhibit premature combustion of the fibers of the first metal,

and feeding the bundle to a charging plant for cutting to discrete charges.

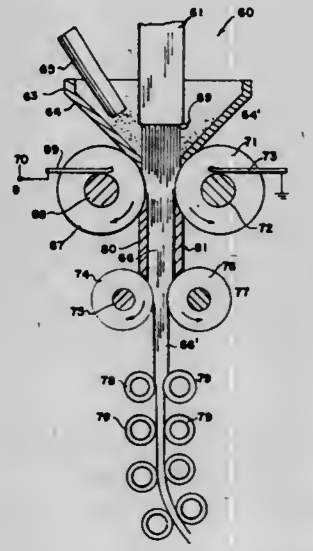
3,889,348
FIBER REINFORCED COMPOSITE MATERIAL AND METHOD OF MAKING SAME

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 814,885, March 27, 1969, Pat. No. 3,608,183, which is a continuation-in-part of Ser. No. 573,148, July 26, 1966, Pat. No. 3,437,783, which is a continuation-in-part of Ser. No. 239, 034, Nov. 20, 1962, Pat. No. 3,734,597. This application Sept. 27, 1971, Ser. No. 184,044

Int. Cl. B23p *17/00*

U.S. Cl. 29—419 R **13 Claims**



1. A method of forming a composite article comprising:

forming a composite mixture of elongated filmanets into a discrete matte formation of space-separated filaments defining a plurality of layers of filamentary material with the individual filaments generally aligned within each layer wherein said matte formation defines interstices between adjacent filaments,

disposing said matte formation in the cavity of a mold,

admitting a molding material in a moldable condition to said mold cavity and causing said molding material to completely fill the interstices between the filaments of said matte formation and said mold, and,

forming a solid composite article by causing said molding material to form a solid mass in situ between the filaments of said matte formation so as to encapsulate said filaments within said solidified molding material.

9. A method of forming a composite material comprising:

continuously forming a first material into a plurality of filaments and feeding said filaments to a movable forming means,

flowing a second material to said movable forming means and causing said second material to surround the filaments being fed to said movable forming means,

solidifying said second material as it is operated on by said movable forming means to form a composite material composed of said filaments encapsulated within said second material.

13. A composite structure comprising: a matrix forming the major portion of said structure,

filamentary material disposed within said matrix as a plurality of layers of filaments having a matte-like configuration with the individual filaments generally aligned within each layer,

said matrix being selected from the group of metals including aluminum, magnesium, titanium, tungsten, and steel and alloys of such metals,

said filamentary material being selected from the group comprising boron, boron nitride, silicon nitride, silicon carbide, aluminum oxide, titanium carbide, tungsten carbide and pyrolitic graphite.

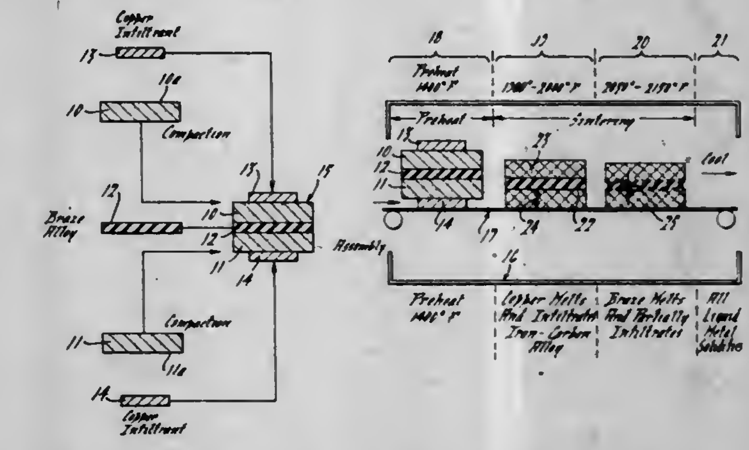
3,889,349
BRAZING METAL ALLOYS

Sydney M. Kaufman, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed June 8, 1973, Ser. No. 368,394

Int. Cl. B22f *3/16*

U.S. Cl. 228—173 **14 Claims**



1. A method of brazing porous ferruginous material, comprising:

a. compacting iron base powder to form a pair of mating article portions,

b. arranging an iron base powder infiltrant having a melting temperature substantially lower than high carbon-iron materials, said arrangement placing said infiltrant adjacent a surface of said article portions,

c. arranging a brazing material for interconnecting said mating portions, said brazing material having a weaker capillary attraction with said infiltrant than with said iron base powder,

d. subjecting said contiguously arranged article portions, brazing material and infiltrant to a stepped sintering operation whereby said infiltrant is first permitted to melt and migrate into said article portions in a controlled manner short of said brazing material, said brazing material then melting to infiltrate said article portions only closely adjacent to said mating surfaces thereby providing a durable bond between said article portions on cooling to ambient conditions.

3,889,350
METHOD OF PRODUCING A FORGED ARTICLE FROM PREALLOYED WATER-ATOMIZED FERROUS ALLOY POWDER

Stanislaw Mocarski, Windsor, Canada, assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 129,146, March 29, 1971, abandoned. This application Oct. 9, 1973, Ser. No. 404,556

Int. Cl. B22f *3/24*

U.S. Cl. 29—420.5 **5 Claims**

1. A process for forging an article having high impact strength from a metal powder comprising
   water atomizing a charge of molten ferrous alloy metal to a prealloyed iron metal powder consisting essentially of about 0.25 – 0.6 weight percent manganese, 0.2 – 1.0 weight percent nickel, and 0.2 – 0.8 weight percent molybdenum, said prealloyed powder containing minimal amounts of carbon and oxygen the balance being substantially iron,
   mixing said powder with an effective amount of graphite to provide for desired hardenability, and
   forging said powder and graphite mixture into the shape of the article.

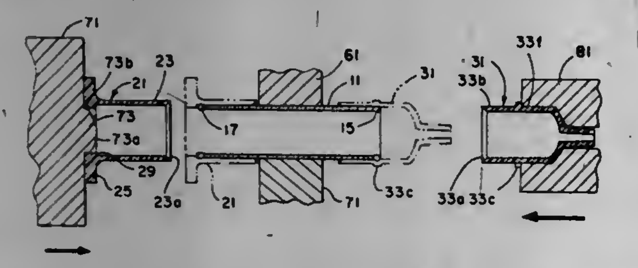
3,889,351
METHOD OF ASSEMBLING A GLASS TUBE AND THERMOPLASTIC RESIN, FINGER GRIP AND NOSE SLEEVE SYRINGE BODY ASSEMBLY

Edward A. Tischlinger, Des Plaines, Ill., assignor to MPL, Inc., Chicago, Ill.

Continuation of Ser. No. 197,718, Nov. 11, 1971, abandoned. This application Mar. 18, 1974, Ser. No. 451,926

Int. Cl. B23p *11/02*

U.S. Cl. 29—447 **13 Claims**



1. The method of assembly of a glass tube, a non-glass finger grip member and a non-glass nose-forming member to form a unitary pharmaceutical packaging subassembly, comprising
   axially aligning and effecting relative axial movement of a glass tube and two opposing sleeves of thermoplastic resin, one of which sleeves has a tubular sheath section and a laterally extending finger grip thereon, and the other of which sleeves is a nose-forming sleeve having a tubular sheath section and a reduced diameter dispensing section, each of said sleeves being disposed with its sheath extending toward a respective open end of said glass tube, and effecting axial motion of each of said sleeves toward and relative to said respective open ends and into coaxial engagement therewith to a point where said sleeve sheaths effectively encompass a substantial longitudinal wall extent at each respective end of said tube, and lie in intimate intersurface contiguity thereabove,
   said thermoplastic resin sleeve sheath sections each having an internal relaxed diamter prior to assembly and when at normal room temperatures of approximately 70°F, of less diameter than the effective outer diameter of the respective end of said glass tube,
   and camming said sleeve sheath sections to a larger stretch-fit and effective inner diameter through sequential incremental outward camming action on said sleeve sheaths at each successive incremental zone of axial interengagement between each of said sleeve sheath and the respective end of said glass tube,
   said camming action at each end of said glass tube being effected by camming interaction between a sloped annular cam surface formed on one of the initially interfacing ends of said tube and said thermoplastic resin sleeve,
   heating said sleeves prior to assembly with said glass tube, assembling said sleeves and glass tube while said sleeves are in an elevated temperature condition,
   and enabling cooling of said sleeves in situ on said glass tube.

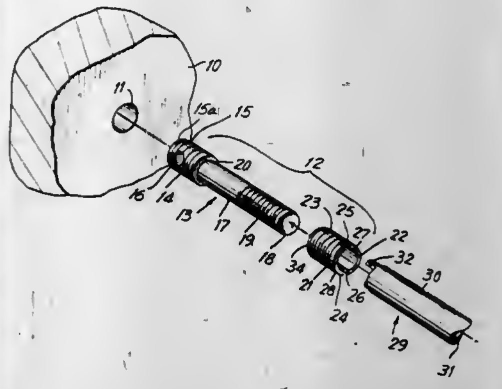
3,889,352
METHOD OF MOUNTING LOCKING, SELF-TAPPING THREADED STUD INSERT ASSEMBLY

Robert W. Bosse, Englewood Cliffs, N.J., assignor to Groov-Pin Corporation, Ridgefield, N.J.

Division of Ser. No. 336,872, Feb. 28, 1973. This application Oct. 17, 1974, Ser. No. 515,656

Int. Cl. B23p *11/00*

U.S. Cl. 29—432 **2 Claims**



1. The method of mounting a self-tapping threaded stud assembly in a cylindrical opening formed in a material relatively softer than the material of said stud, said stud including an enlarged cylindrical inner end including a tapping thread and a reduced diameter shank including a holding thread, said enlarged and reduced portions being separated by an annular shoulder, and a tubular locking sleeve having an internal bore slidable over said reduced diameter portion of said stud, the external circumference of said sleeve being threaded to match the threading of said tapping thread, said sleeve, in addition, including drive means at the trailing end thereof, which comprises the steps of forcibly rotating said shank while said threaded inner end is engaged in said opening, thereby to thread said inner end into said opening and tap a thread in said opening, sliding said sleeve over said threaded-in stud, thereafter rotating said sleeve by torque applied to said drive means to cause said external thread portion of said sleeve to enter the threads tapped by said inner end of said stud, and continuing to rotate said sleeve until the lead end portion thereof engages tightly against said annular shoulder of said stud.

3,889,353
METHOD OF MAKING A COMPOSITE METAL AND PLASTIC LEVEL

Mike A. Provi, Rockford, Ill., assignor to Pro Products, Inc., Rockford, Ill.

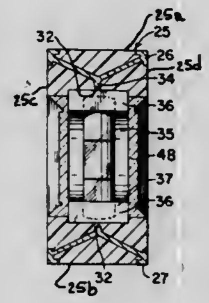
Continuation-in-part of Ser. No. 363,978, May 25, 1973, abandoned. This application May 31, 1974, Ser. No. 474,936

Int. Cl. B23p *3/00, 25/00*

U.S. Cl. 29—458 **15 Claims**

1. A method of making a spirit level having an elongated level body of generally rectangular cross section with a pair of relatively parallel edge faces and a pair of relatively parallel side faces comprising: forming an elongated metal frame having four relatively parallel rails arranged in a transversely

rectangular array to extend along the four lengthwise extending corners of the level body and internal web portions rigidly interconnecting the rail portions and spaced inwardly of the rectangular array to define a longitudinal channel at each of the four sides of the array, providing a first pair of mold members having opposed edge face forming surfaces and relatively moving the first pair of mold members in a direction laterally of one pair of relatively parallel sides of the array until the edge face forming surfaces are firmly pressed against the rails at said one pair of relatively parallel sides of the rectangular array and close the outer side of channels thereat, providing a second pair of mold members having opposed side face forming surfaces and relatively moving said second pair of mold members in a direction laterally of the other pair of relatively parallel sides of the rectangular array until the side face forming surfaces are firmly pressed against the rails at said other pair of relatively parallel sides of the rectangular array and close the outer sides of channels thereat and form a mold cavity around the frame, introducing a flowable plastic material into the channels of the type hardenable to form a rigid plastic body, allowing the plastic material to harden in the channels to form a rigid plastic body on the metal frame, and separating the mold members from the composite metal frame and rigid plastic body to provide an elongated level body with the outer faces of the four rails exposed at its four lengthwise corners to provide accurate level surfaces, and mounting level vials on said level body.



3,889,354
METHOD OF FORMING A CRIMPED TUBE JOINT

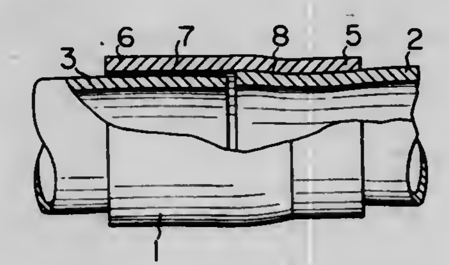
Sunao Nishi; Shojiro Ikeda, both of Nagasaki, and Asao Kawazoe, Tokyo, all of Japan, assignors to Shinto Kogyo Kabushiki Kaisha, Nagasaki, Japan

Continuation of Ser. No. 142,803, May 12, 1971, abandoned, which is a continuation of Ser. No. 809,653, March 24, 1969, abandoned. This application Feb. 8, 1974, Ser. No. 440,747

Claims priority, application Japan, Mar. 29, 1968, 43-20080

Int. Cl. B21d *39/00;* **B23p** *11/00*

U.S. Cl. 29—516 **2 Claims**



1. A method of forming a leak-proof joint between end parts of first and second pipes by means of a sleeve having opposite ends in which said first and second pipes and sleeve have both elasticity and plasticity, with the inner diameter of the sleeve being approximately equal to the outer diameter of the first and second pipes, comprising the steps of inserting the end part of the first pipe into one end of the sleeve, inserting the end part of the second pipe into the other end of the sleeve, placing a portion of each of the overlapped end parts of the first and second pipes and sleeve between opposed semicircular concave faces of two diametrically opposed jaw members and having the same radius, the length of the faces being equal to a compressing distance of the overlapped parts extending from the end edge of the sleeve but short of the telescoped pipe end, the radius being equal to the desired outer radius of each overlapped portion of the sleeve after crimping, and then applying a crimping force to both jaw members from diametrically opposite sides in a direction perpendicular to the axial direction of the pipes to plastically deform the sleeve and pipe inwardly at each overlapped portion respectively, said inwardly deformed portion extending from the end edge of the sleeve to a location short of the telescoped pipe end, thereby causing uniform contact pressure between the surfaces thus contacted.

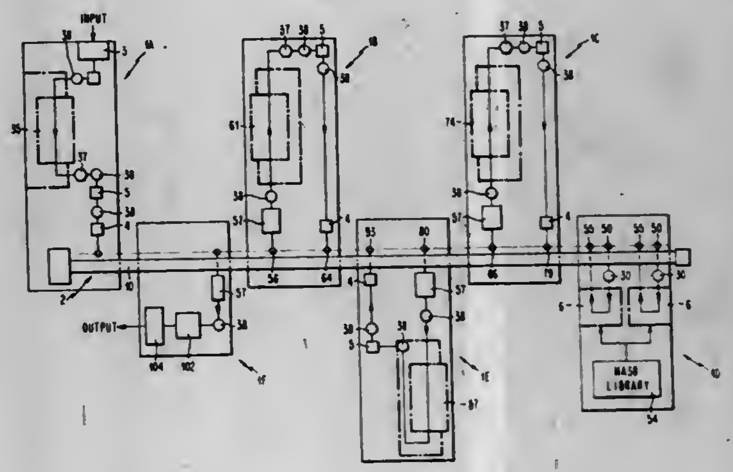
3,889,355
CONTINUOUS PROCESSING SYSTEM

Jesse Aronstein, and William E. Harding, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 5, 1973, Ser. No. 329,920

Int. Cl. B01j *17/00*

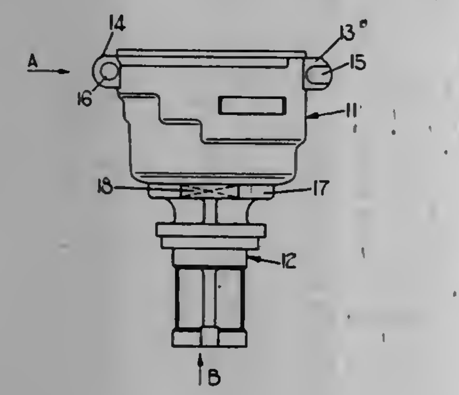
U.S. Cl. 29—569 **10 Claims**



1. A manufacturing system for processing semiconductor substrates comprising:
   A. a plurality of processing stations having loading and unloading positions, each of said stations having means for performing a plurality of different fixed semiconductor device fabricating operations on a said substrate, wherein
      a. one of said operations in at least one of said stations includes means for application of a coating of photoresist on a surface of individual ones of said substrates;
   B. a conveyor means for detachably supporting and transporting individual ones of said substrates between and at any one of said work stations;
   C. means for detaching individual ones of said substrates from said conveyor means and transferring said individual ones of said substrates between said conveyor and said stations at their said loading and unloading positions; and
   D. control means for said conveyor and transfer means for routing said substrates individually between any prescribed sequence of said stations for a corresponding prescribed series of processing operations.

3,889,356
METHOD OF SUPPORTING DISTRIBUTOR BLANK FOR MACHINING

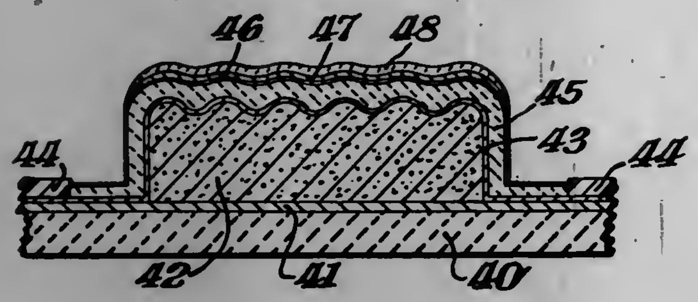
Brian William Cleaver, Walsall, and Alfred Rees, Birmingham, both of England, assignors to Joseph Lucas (Electrical) Limited, Birmingham, England
Division of Ser. No. 323,386, Jan. 15, 1973. This application July 5, 1974, Ser. No. 485,892
Claims priority, application United Kingdom, Jan. 15, 1972, 2043/72
Int. Cl. B23q *7/00*
U.S. Cl. 29—559 **2 Claims**



1. A method of manufacturing an ignition distributor including starting with a casing blank having a hollow cup shaped body portion and an integral hollow shank portion, and supporting the blank for a machining operation by engaging clamping devices with each of a pair of generally diametrically opposed lugs on the casing body portion.

3,889,357
SCREEN PRINTED SOLID ELECTROLYTIC CAPACITOR

Richard J. Millard, Kennebunk, and David R. Poat, Wells, both of Maine, assignors to Sprague Electric Company, North Adams, Mass.
Filed July 5, 1973, Ser. No. 376,499
Int. Cl. H01g *13/00;* **B44d** *1/18*
U.S. Cl. 29—570 **7 Claims**

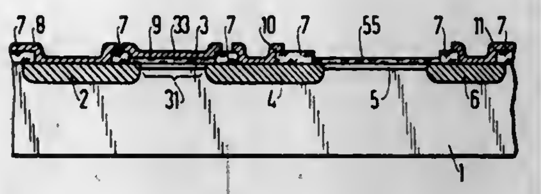


1. A method for manufacturing a solid electrolytic capacitor having a high volt-microfarad product per unit volume comprising:

a. preparing a mixture comprising finely divided valve metal powder, and a binder to achieve an ink exhibiting essentially no flow in horizontal thick film form under conditions of zero agitation;
b. screen printing successive layers forming a composite layer of said mixture on a substrate so that said composite layer has a rough outer surface reflecting the pattern of said screen, said substrate having at least one face made of said valve metal and said valve metal face comprising the anode connective means for said capacitor;
c. heating to solidify each said screened layer after each said screening step;
d. sintering said screened composite layer at a temperature between 1550°C and 2000°C, thereby transforming said composite layer into a porous valve metal pad being sinter bonded to said valve metal face;
e. forming by an electrolytic process, a valve metal oxide film over all exposed regions of said valve metal face and said porous valve metal pad;
f. dipping said substrate and said valve metal pad into an aqueous solution of manganous salt;
g. removing said substrate from said salt solution;
h. heating said pad and said salt solution adhering thereto to cause said salt to permeate said porous pad and to transform said salt into manganese dioxide by pyrolysis;
i. applying a conductive counterelectrode over said composite layer to form a cathode connection.

3,889,358
PROCESS FOR THE PRODUCTION OF HIGH VALUE OHMIC LOAD RESISTORS AND MOS TRANSISTORS HAVING A LOW STARTING VOLTAGE

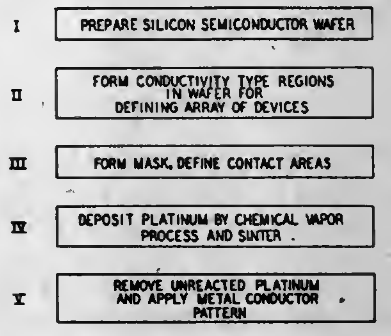
Hartwig Bierhenke, Zorneding, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Sept. 14, 1973, Ser. No. 397,402
Claims priority, application Germany, Sept. 26, 1972, 2247183
Int. Cl. B01j *17/00*
U.S. Cl. 29—571 **7 Claims**



1. A process for the production of circuits having at least one field effect transistor with a source, a drain, and a gate, and having a resistor, on a common substrate, which process begins with a substrate body having at least one field effect transistor with source, drain and connection zones formed by diffusion, comprising the steps of: implanting ions adjacent the field effect transistor to produce a resistor, and simultaneously implanting ions in the channel zone of the field effect transistor to decrease the starting voltage of the field effect transistor and form an enhancement type field effect transistor, the simultaneous ion implantation comprising an ion implantation of a predetermined ion type with a predetermined ion energy and within a predetermined ion dosage range, the resistor possessing a value which is high in comparison to the forward resistance of the conductive field effect transistor and low in comparison to the reverse resistance of the field effect transistor.

3,889,359
OHMIC CONTACTS TO SILICON

Myron Joel Rand, Bethlehem, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 10, 1973, Ser. No. 422,996
Int. Cl. B01j *17/00*
U.S. Cl. 29—578 **5 Claims**

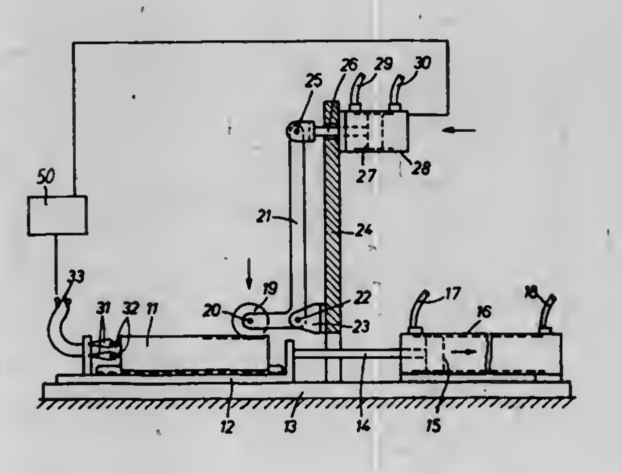

I
PREPARE SILICON SEMICONDUCTOR WAFER
II
FORM CONDUCTIVITY TYPE REGIONS IN WAFER FOR DEFINING ARRAY OF DEVICES
III
FORM MASK, DEFINE CONTACT AREAS
IV
DEPOSIT PLATINUM BY CHEMICAL VAPOR PROCESS AND SINTER.
V
REMOVE UNREACTED PLATINUM AND APPLY METAL CONDUCTOR PATTERN

1. In the fabrication of a silicon semiconductor device which includes the step of introducing into a portion of a p-

type conductivity silicon semiconductor body an n-type impurity to convert the conductivity type of said portion to an n-type conductivity zone, the further steps of forming a silicon oxide mask on the surface of said portion to define a contact area thereto and proceeding directly as a next step to deposit on said masked surface portion by the process of chemical vapor deposition a thin layer of platinum, said process comprising exposing said masked surface portion to a gaseous ambient containing a vapor of a phosphorous compound of platinum while said semiconductor body is at a temperature of between 100° and 500° C., followed by heating said body at a temperature of from about 675° C. to 750° C. for a period of from 5 to 10 minutes.

3,889,360
METHOD FOR FABRICATING A CHOKE WITH ADJUSTABLE AIR GAP AND CHOKE PRODUCED THEREBY

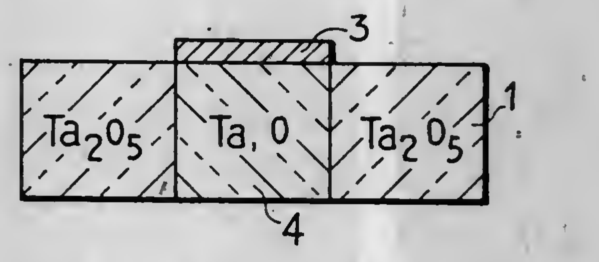
Ernst Meili, Uster, Switzerland, assignor to F. Knobel Elektro-Apparatebau AG, Ennenda, Switzerland
Filed June 8, 1973, Ser. No. 368,123
Claims priority, application Switzerland, June 9, 1972, 8668/72; Jan. 18, 1973, 698/73
Int. Cl. G01r *27/16*
U.S. Cl. 29—593 **6 Claims**



1. A method for fabricating a ballast wherein the air gap provided with an insert can be adjusted by core portions displaceable with respect to one another, the improvement comprising the steps of: clamping the relatively displaceable core portions between a floor provided with upstanding side edges and a resilient hood having side walls and which hood can be displaceable in the direction of such floor, adjusting a desired air gap, fastening the side walls of the hood with the side edges of the floor, so that the air gap insert is continuously maintained under a substantially constant stress, the fastening step including welding the side walls of the hood with the side edges of the floor, inserting the ballast into a tuning device after adjustment of the air gap and welding of the side walls of the hood with the side edges of the floor, applying a roller of the tuning device so as to act upon the ballast with adjustable pressure, effecting relative displacement between the roller and the ballast in the lengthwise direction of the ballast, to thereby continuously squeeze together the insert by the rolling motion of the roller at the ballast, and controlling the pressure at the roller by an impedance measuring device connected with the ballast such that upon attaining a rated impedance the pressure acting at the roller is diminished and thereby obtaining an exact fine tuning of the ballast.

3,889,361
SHORT WAVELENGTH WAVEGUIDES

Michel Croset, and Gonzalo Velasco, both of Paris, France, assignors to Thomson-CSF, Paris, France
Division of Ser. No. 279,360, Aug. 10, 1972, Pat. No. 3,820,871. This application Feb. 28, 1974, Ser. No. 447,054
Claims priority, application France, Sept. 16, 1971, 71.33390
Int. Cl. H01p *11/00*
U.S. Cl. 29—600 **3 Claims**

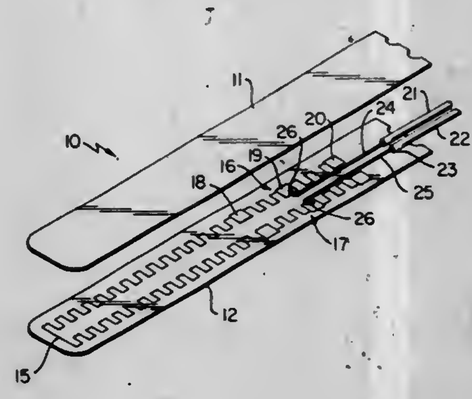


1. A method of manufacturing a waveguide for supra high frequency comprising the following steps:

a. the production under vacuo of a stream of particles of a metal, in the presence of particles of a second body, said gaseous element being insufficient in quantity to produce a predetermined chemical, combination, and the deposition of the resultant compound upon a substrate, in order to obtain a thin film of a complex compound;
b. the deposition upon the free face of said film of a protective mask following a predetermined pattern;
c. the subjecting of the assembly to a chemical treatment designed to convert the unmasked portions into said chemical combination.

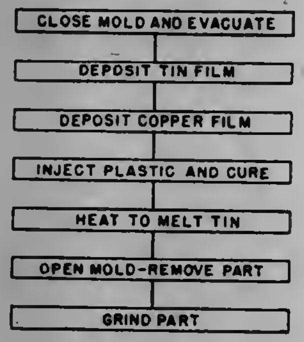
3,889,362
METHOD OF MAKING ELECTRICAL RESISTANCE ELEMENT

Hugh J. Tyler, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.
Division of Ser. No. 410,539, Oct. 29, 1973, Pat. No. 3,852,570. This application Sept. 25, 1974, Ser. No. 509,075
Int. Cl. H01c *1/14, 17/00*
U.S. Cl. 29—619 **10 Claims**



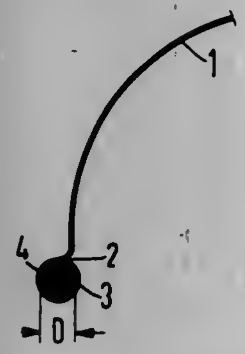
1. A method of making an electrical element comprising the steps of providing a conductor having a pair of lead attaching ends, forming each lead attaching end with a plurality of spaced and predetermined lead attaching parts therealong, attaching a pair of leads respectively to one preselected lead attaching part of each end of said conductor so that a desired electrical resistance is provided through said conductor between said leads, and completely covering said conductor and part of said leads with an encasing structure whereby the remainder of said leads extend from said encasing structure.

3,889,363
METHOD OF MAKING PRINTED CIRCUIT BOARDS
Richard P. Davis, Sanbornton, N.H. 03269
Continuation of Ser. No. 115,408, Feb. 16, 1971, abandoned. This application Jan. 10, 1973, Ser. No. 322,463
Int. Cl. H05k *3/02*
U.S. Cl. 29—625 **9 Claims**



1. The method of making a printed circuit board in a mold having a cavity with oppositely disposed first and second walls which comprises; forming a first layer of solder-like material of low melting point on said first wall; forming a second layer of conductive material, of a type adapted to make a completed printed type circuit, on said first layer said layers being formed in a desired circuit pattern limited to selected portions of said first wall; forming paths of said type of conductive material extending from said first wall to said second wall and connected to said pattern; molding insulating material in said cavity to form a board bonded to said circuit pattern and including said paths; and melting said layer of solder-like material to simultaneously release the board from the mold and bond with and thereby tin said conductive material.

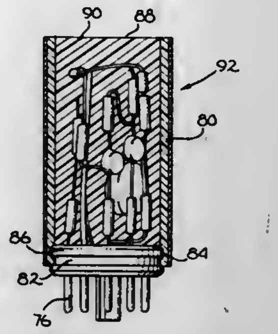
3,889,364
METHOD OF MAKING SOLDERED ELECTRICAL CONNECTIONS
Ekkehard Krueger, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed June 4, 1973, Ser. No. 366,518
Claims priority, application Germany, June 2, 1972, 2226958
Int. Cl. H01r *43/02*
U.S. Cl. 29—628 **14 Claims**



1. A method of metering solder for use in a soldered connection between an electrical conductor and a conductive element, comprising the steps of: forming a loop of capillary size in said conductor, exposing said loop to a bath of molten solder, withdrawing said loop from said bath and permitting the solder acquired by said loop to solidify, whereby a predetermined amount of solder is acquired by said loop by capillary action, said solder solidifying into a membrane closing said loop.

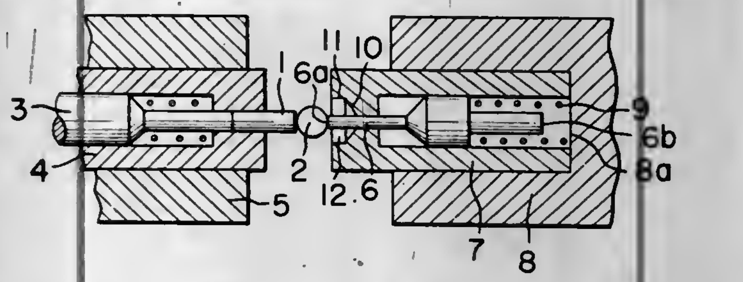
9. A method of making a soldered connection between an electrical conductor and a conductive element, comprising the steps of; forming a loop of capillary size in said conductor, exposing said loop to a bath of molten solder, whereby a predetermined amount of solder is acquired by said loop by capillary action and solidified into a membrane closing said loop, juxtaposing said loop with said conductive element, and applying heat to said membrane to melt said solder and allow said solder to form said connection.

3,889,365
ELECTRONIC MODULE AND METHOD OF FABRICATING SAME
Gordon L. Brock, 7652 Garfield Ave., Space No. 28, Huntington Beach, Calif. 92648
Division of Ser. No. 170,200, Aug. 9, 1971, abandoned. This application Aug. 15, 1973, Ser. No. 388,444
Int. Cl. H05k *3/32*
U.S. Cl. 29—627 **4 Claims**



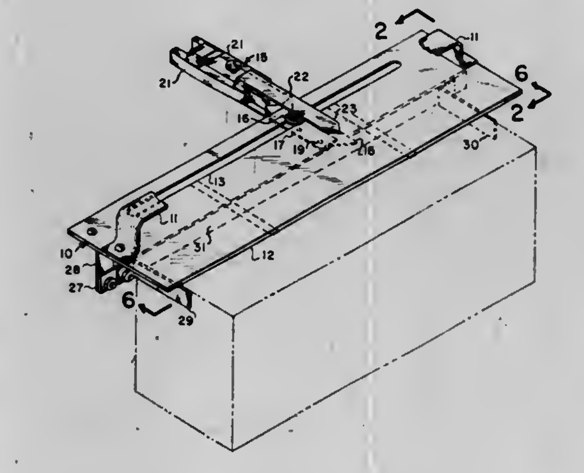
1. a method of packaging an electronic circuit having a plurality of electronic components comprising:
- a. fabricating a reuseable board with a plurality of means for receiving and restraining said components in a predetermined relative disposition;
- b. cutting and bending the leads of said components and disposing said components in their respective positions on said board so that said leads are disposed adjacent each other at points where circuit connections are to be made, and are disposed to form circuit leads projecting in a first direction from said circuit;
- c. joining said leads where said leads are adjacent each other to form said circuit connections and to provide a self supporting circuit structure;
- d. removing said circuit and circuit leads from said board and coiling said circuit about an axis parallel to said first direction;
- e. connecting said circuit leads to a connector;
- f. providing an open-ended cover over said circuit mating with said connector; and
- g. potting said circuit by pouring a potting compound into said open-ended cover.

3,889,366
METHOD FOR PRODUCING ELECTRIC CONTACTS MADE OF INTERNALLY OXIDIZED SILVER ALLOY
Akira Shibata, Yokohama, Japan, assignor to Chugai Denkikogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 27, 1973, Ser. No. 419,277
Claims priority, application Japan, Nov. 28, 1972, 47-119216
Int. Cl. H01r *9/00*
U.S. Cl. 29—630 C **1 Claim**



1. A method of producing electric contacts, which comprises the steps of
- a. forming intermediate pieces of generally spherical shape and of constant diameter from a silver alloy containing solute-metal, in which alloy the concentration of solute-metal is constant throughout;
- b. applying internal oxidation process to said generally spherical pieces whereby to precipitate throughout said pieces an oxide of said solute-metal of constant solute-metal oxide content;
- c. cleaning the surfaces of the pieces obtained according to step *b*; and
- d. bonding the cleaned pieces to pieces of base metal by cold welding whereby to form composite electric contacts.

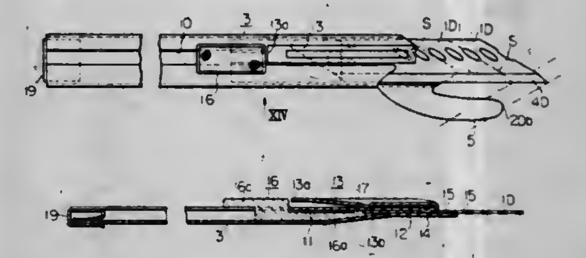
3,889,367
CARTON OPENER
Fred M. Walker, 407 E. Hathaway, San Antonio, Tex. 73209
Filed Mar. 1, 1974, Ser. No. 447,297
Int. Cl. B67b *7/30*
U.S. Cl. 30—2 **10 Claims**



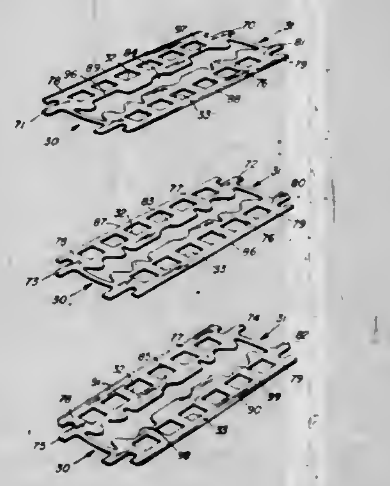
1. A carton opening device comprising:
- a. an elongated carton top plate having a top side and a bottom side,
- b. a handle secured to the top side of said carton top plate, said handle adapted to be hand-held and stabilizes said carton top plate in contact with a surface,
- c. a carton side support securely affixed to said top plate and projecting substantially normal to the bottom side of said carton top plate, said carton side support adapted to contact the side of a carton,
- d. an elongated guide slot formed in said carton top plate and projecting substantially the length of said carton top plate,
- e. attaching means slidably secured in said elongated guide slot,
- f. a blade arm flexibly secured to said attaching means,
- g. a blade means including a cutting edge secured to said blade arm, and
- h. a blade oscillating slot constructed in said blade arm at said blade arm's point of engagement of said attaching means, said oscillating slot extending in a plane parallel to the cutting edge of said blade permitting oscillation of said blade in a reciprocal action.

3,889,368
KNIFE FOR CUTTING IN SLIDING CONTACT WITH RULER EDGE
Shohachi Himeno, Tokyo, Japan, assignor to Conde Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 3, 1973, Ser. No. 421,486
Claims priority, application Japan, June 26, 1973, 48-75863
Int. Cl. B26b *1/08*
U.S. Cl. 30—162 **4 Claims**

1. A knife comprising in combination: a hollow blade holder of tubular form provided with a longitudinal slit therealong; an elongated knife blade slidably mounted in said blade holder and having a longitudinal cutting edge with a forward tip part and a sliding flank face provided near said tip part for sliding along a ruler edge thereby to enable the tip part to advance in a controlled path in cutting a material lying under the ruler edge, said knife blade being of a break-off type and having longitudinally equally spaced grooves disposed at a specific angle relative to the cutting edge of the blade and dividing the blade into a plurality of successively disposable blade units, said knife blade being provided with engagement holes disposed at intervals along the length of the blade; a guide member rigidly secured to said blade holder at a position spaced apart from and in front of said tip part in said path of cutting advance; a manually operable slider engaging in said slit in the blade holder for guided sliding movement along the slit, said slider being connected to said knife blade, whereby the blade can be adjustably moved longitudinally by manually moving the slider; and knife bladle locking means for preventing said blade from moving longitudinally relative to said blade holder, said locking means comprising a tongue-like member extending from said blade holder longitudinally and forwardly and having an elastically deflectable property, a locking projection on the forward end of said tongue-like member for disengageably engaging any one of said engagement holes, a lever member integrally connected to said forward end of the tongue-like member and extending rearwardly along the same, and a projection on said lever member midway between the ends thereof and engaging with said blade holder to function as a fulcrum for said lever member, whereby when the free end of the lever member is manually depressed, the forward end of the tongue-like member is raised to disengage said locking projection from the hole with which it has been in engagement, thus allowing longitudinal movement of the knife blade.



3,889,369
SHAVING UNIT FOR SAFETY RAZOR
Frank A. Ferraro, Trumbull, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Dec. 13, 1974, Ser. No. 532,429
Int. Cl.^{2} B26B *21/54, 21/22*
U.S. Cl. 30—346.58 **10 Claims**



1. A shaving unit for a double edge safety razor, said shaving unit comprising:
- a. a first flexible member including a pair of transversely extending opposite sides, each one of the first member opposite sides having a cutting edge;

b. a second flexible member including a pair of transversely extending opposite sides, each one of the second member opposite sides having a cutting edge, said second member being located above said first member with the cutting edges of said second member being positioned upwardly and inwardly of the cutting edges of said first member;

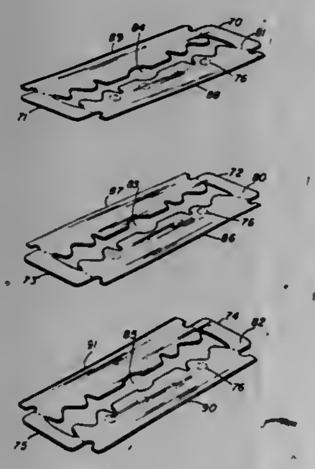
c. flexible means between said first member and said second member for spacing said second member from said first member;

d. a transversely elongated aperture extending through said first member, said spacing means and said second member between the cutting edges of said first member and said second member for locating said shaving unit in said safety razor;

e. first means between said aperture and the cutting edges to one side only of said aperture for permanently connecting said first member to said spacing means; and

f. second means between said aperture and the cutting edges to the other side only of said aperture for permanently connecting said second member to said spacing means.

3,889,370
SHAVING UNIT FOR SAFETY RAZOR
George W. Hale, III, Plymouth, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Dec. 13, 1974, Ser. No. 532,428
Int. Cl.² B26B *21/54, 21/22*
U.S. Cl. 30—346.58 **15 Claims**



1. A shaving unit for a double edge safety razor, said shaving unit comprising:

a. a first flexible member including a pair of transversely extending opposite sides, each one of the first member opposite sides having a cutting edge, and a pair of spaced end tabs, each one of said tabs extending outwardly from an opposite end of said first member;

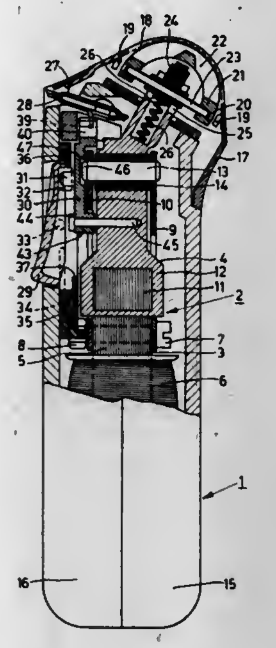
b. a second flexible member including a pair of transversely extending opposite sides, each one of the second member opposite sides having a cutting edge, and a pair of spaced end tabs, each one of said tabs extending outwardly from an opposite end of said second member, said second member being positioned above said first member with the cutting edges of said second member being positioned upwardly and inwardly of the cutting edges of said first member;

c. a transversely elongated aperture between said tabs of said first member and said second member and vertically extending through said shaving unit for locating said shaving unit in said safety razor; and

d. means between said aperture and the cutting edges to one side only of said aperture for permanently connecting said first member and said second member together;

e. the cutting edges to said one side of said aperture being spaced apart a predetermined distance, and the cutting edges to the other side of said aperture being spaced apart a distance less than said predetermined distance when said first and second members are in an unflexed state.

3,889,371
ELECTRIC DRY SHAVER
Jan de Boer, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 29, 1973, Ser. No. 420,114
Claims priority, application Netherlands, Dec. 22, 1972, 7217485
Int. Cl. B26b *19/10*
U.S. Cl. 30—34.1 **8 Claims**

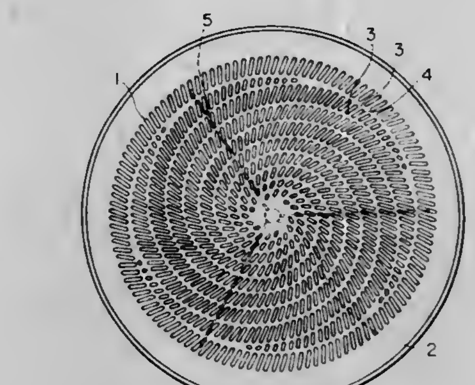


1. In an electric dry-shaver including in a housing a motor with a reciprocally movable armature and a reciprocal cutter of a long hair clipper, the improvement in combination therewith of coupling means for driving said cutter, comprising a drive lever having a lower end pivotally engaged to said armature, an upper end pivotally engaged to said cutter, and intermediate said ends first pivot means, an actuating member mounted on said housing and movable between a first operative position and a second in-operative position, this member having a second pivot means generally adjacent said first pivot means of said drive lever, said actuating member, when moved to its first position having its second pivot means engaged to said first pivot means in a pivot connection, said drive lever with its lower end driven reciprocally by said armature, pivots about said pivot connection and has its upper end and said engaged cutter being reciprocally driven, and said actuating member when moved to its second position rendering said first and second pivot means dis-engaged and said cutter in operative, with said drive lever having its lower end reciprocally driven while its upper end becomes a pivot point.

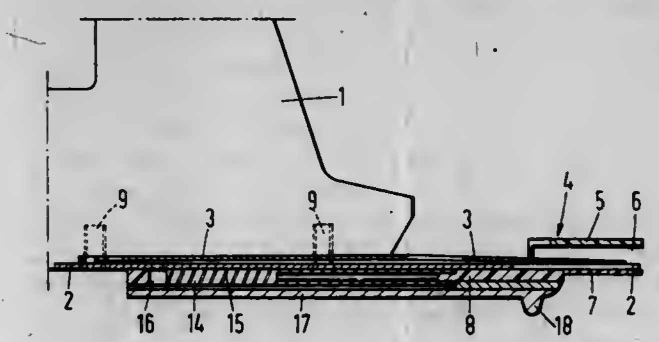
3,889,372
ELECTRIC DRY SHAVER BLADE ASSEMBLY
Satoshi Sakai, Hirakata; Norio Shimizu, Neyagawa, and Junji Nomura, Takatsuki, all of Japan, assignors to Matsushita Electric Works, Ltd., Japan
Filed Aug. 30, 1973, Ser. No. 393,177
Claims priority, application Japan, Aug. 30, 1972, 47-86949; Nov. 9, 1972, 47-129080
Int. Cl. B26b *19/14, 21/54*
U.S. Cl. 30—43.6 **5 Claims**

1. A cutting blade assembly for an electric dry shaver including a circular stationary blade in the form of a metallic membrane having an apertured field and a rotating blade having a generally radially oriented cutting edge rotating concentrically against the stationary blade, the stationary blade having a pattern of smoothly continuous spaced ribs each lying in an arcuate locus, the ribs being interfittingly

spiralled and uniformly spaced from one another in generally parallel relation, adjacent ribs having formed between them a plurality of elongated hair inlet openings spaced adjacent to one another in generally parallel relation with the longitudinal dimension of each opening spanning the space between adjacent ribs, the openings being spaced closely to one another with a latteral spacing which is of the same order of magnitude as the width dimensions of both the openings and the ribs throughout the pattern, the hair inlet openings being oriented in a generally radial direction but so angled with respect to the cutting edge of the blade that the cutting edge progresses along the length of each of the hair inlet openings at a substantially constant shearing angle.



3,889,373
GRASS SHEARS WITH AN ELECTRIC MOTOR DRIVE
Dieter Achenbach, Betzdorf, and Joswig Siegfried, Kausen, both of Germany, assignors to Wolf-Gerate GmbH, Germany
Filed Mar. 1, 1974, Ser. No. 447,274
Claims priority, application Germany, Apr. 16, 1973, 2319219
Int. Cl. B26b *19/38*
U.S. Cl. 30—233 **12 Claims**

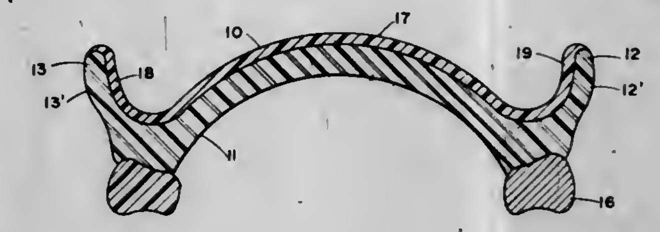


1. A motorized grass shears with two generally flat, overlaid blades; each said blade having a plurality of teeth extending in the same first direction; means for moving one said blade with respect to the other said blade in a manner such that neighboring said teeth, one on each said blade, cooperate to cut and wherein a blade gap is defined as a first distance in from the free ends of said teeth, wherein neighboring said teeth are spaced apart;

blade protective means extending across said blade gap and comprising an upper cover plate above the upper said blade and a lower cover plate beneath the lower said blade;

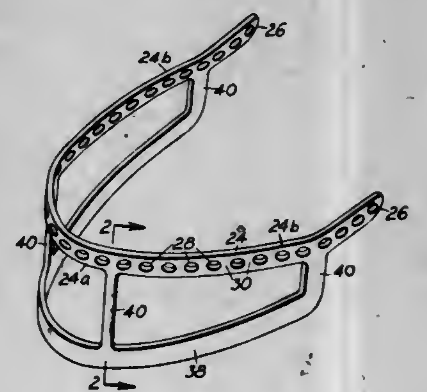
means for guiding said protective means from a first position covering said blade gap, along a path away from said free ends of said teeth to a second position exposing said blade gap; biasing means for biasing said protective means to its said first position; said cover plates being shaped to be unbroken and in said first position they completely cover said blade gap.

3,889,374
DENTAL PROSTHETIC APPLIANCE
Jacob A. Saffir, Los Angeles, Calif., assignor to Dentsply Research & Development Corporation, Milford, Del.
Filed Jan. 29, 1971, Ser. No. 110,939
Int. Cl. A61c *13/00*
U.S. Cl. 32—2 **7 Claims**



1. A dental prosthetic appliance comprising artificial teeth attached to a denture base material wherein substantially all of the exposed surfaces of said denture base material thereof contains laminated thereto a layer of a polymerized fluorocarbon resin selected from the group consisting of fluorinated polyolefins and fluorinated polyvinylidene.

3,889,375
ONE PIECE PERMANENT SUPPORT FRAME FOR UPPER DENTURES AND PROCESS OF MOUNTING THE SAME
Harold Devere Roberts, 2717 N.E. Knott St., Portland, Oreg. 97212
Filed Jan. 2, 1974, Ser. No. 430,248
Int. Cl. A61c *13/00*
U.S. Cl. 32—10 A **11 Claims**



1. A permanent implant support frame for an upper denture comprising

a. a frame portion having forward and rearward ends,

b. said rearward end including an extended shank portion,

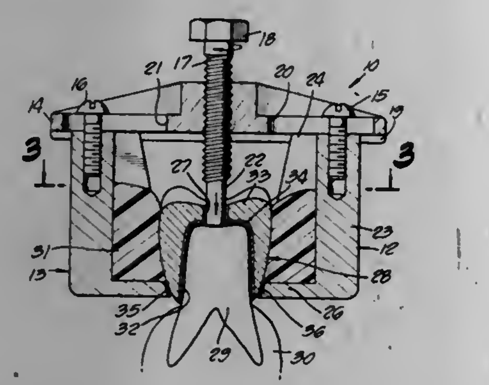
c. said frame portion forward of said extended shank portion being shaped longitudinally so as to be insertable in a channel cut longitudinally in the alveolar ridge of the upper jaw and said shank portion being of a length to extend through an aperture cut longitudinally in the pterygoid bone to accomplish a permanent implant mounting in the jaw,

d. and depending support means on said frame portion arranged for connection thereto of artificial denture means.

3,889,376
CROWN REMOVING DEVICE
Allen M. Zatkin, 5351-1/2 Topanga Canyon Blvd., Woodland Hills, Calif. 91364
Filed May 6, 1974, Ser. No. 466,987
Int. Cl. A61c *3/00*
U.S. Cl. 32—41 **7 Claims**

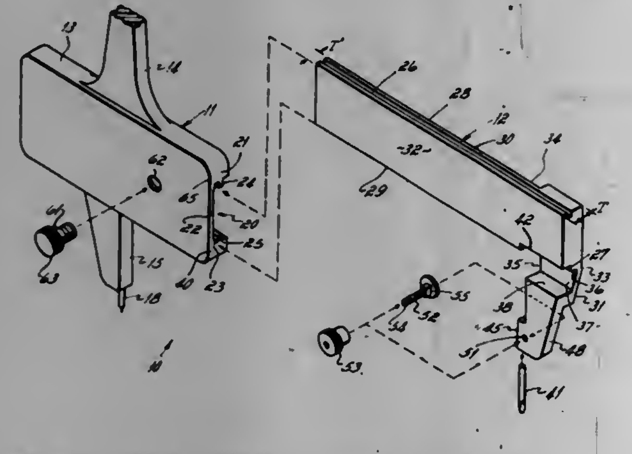
1. Crown removing apparatus, comprising: a pair of jaws for being received about the crown;

a material carried by the jaws and having a surface for contactingly gripping the crown, said surface being contoured to substantially the same shape as that of the crown being gripped; and



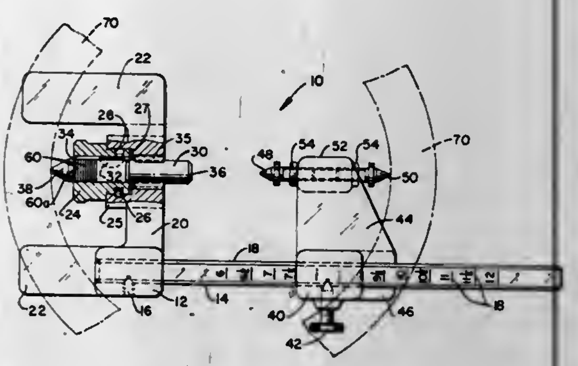
means interconnected with said jaws for exerting a force on said jaws in such direction as to remove said crown.

3,889,377
SLIDE COMPASS
Warren D. Novak, 325 Douglas Rd., Chappaqua, N.Y. 10514
Filed Jan. 9, 1974, Ser. No. 431,844
Int. Cl. B43l *9/04*
U.S. Cl. 33—27 C **16 Claims**



1. A direct reading slide compass comprising
an integral molded body having a generally flat central section, a horizontal slideway formed in the front face of said central section, said slideway having at least one vertical lip extending upwardly into said slideway and at least one vertical lip extending downwardly into said slideway, a rotation post section upstanding from said central section and terminating in an end cap adapted to be rotated between a person's thumb and one finger, a body foot section depending downwardly from said central section and having molded therein at least a portion of a means to receive a center needle, said means to receive said center needle being coaxial with a vertical axis through said rotation post,
a center needle mounted within said center needle receiving means of said body foot section,
an integral molded slide comprising a transverse slide bar adjustably mounted within said slideway and having a marking foot section depending from one end thereof, said slide bar having means cooperable with said lips of said horizontal slideway to hold said slide within said slideway, said marking foot section having molded therein at least a portion of a means to receive a marking element, the upper portion of said marking foot section of said slide being located forwardly of the front face of said central section of said body and having a section extending rearwardly beneath the bottom wall of the central section of said body so as to define a channel in said slide adjacent said slide bar, said channel enabling the lower portion of said central section of said body to pass through said channel without interference between said marking foot section of said slide and said central section of said body so as to maximize the range of adjustment of said slide in said body,
a marking element mounted within said marking element receiving means of said marking foot, said marking element being parallel to said vertical axis through said rotation post,
at least one indicia scale located on the front face of one of said slide bar or said central section of said body, and
an index mark on the front face of the other of said slide bar or said central section of said body.

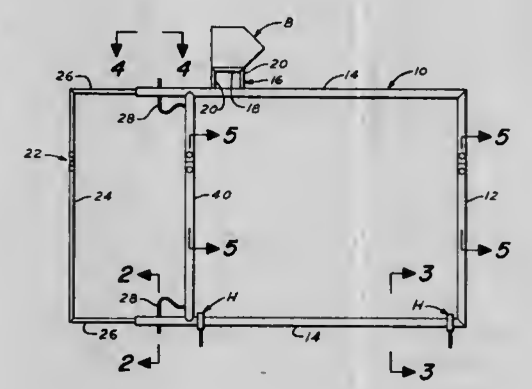
3,889,378
BRAKE DRUM AND DISC MICROMETER
William J. Senecal, Monson, Mass., assignor to Gulf & Western Manufacturing Company, New York, N.Y.
Filed June 28, 1973, Ser. No. 374,684
Int. Cl. G01b *5/02*
U.S. Cl. 33—143 R **5 Claims**



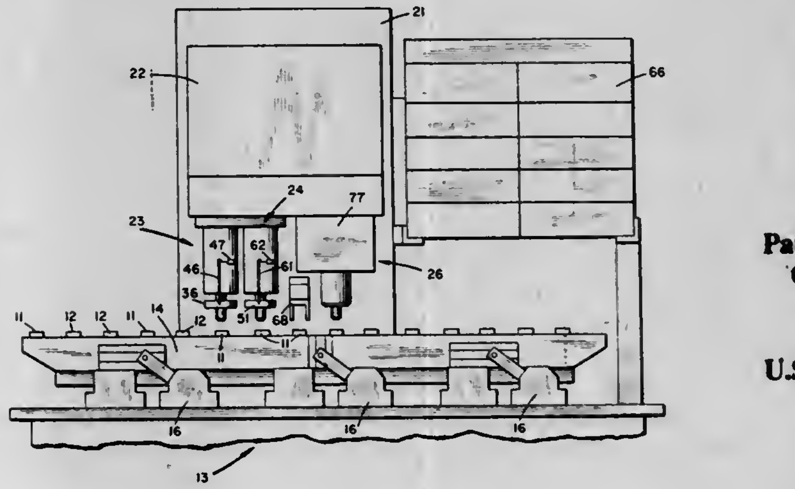
1. A brake drum and disc micrometer comprising an elongated rod, means fixedly secured to said rod and having an arm extending therefrom, first contact pin means movably supported in said arm parallel to said rod and having an outer end for engaging the inner surface of a brake drum and an inner end for engaging the outer surface of a brake disc, calibrated means for axially adjusting said pin means in said arm and for indicating the extent of movement thereof from a normal or "zero" position relative to the arm, a sleeve supported on said rod for movement thereon to predetermined fixed positions and having an arm extending therefrom, second contact pin means fixedly secured to the last mentioned arm in axial alignment with the first pin means and also having outer and inner ends for contacting the inner and outer surfaces of brake drums and discs respectively, the total length of said two contact pin means being known, the said rod is provided with a pair of calibrated scales along its length for reading brake disc thickness and brake drum inside diameter respectively with reference to the position of the sleeve on the rod, the disc thickness scale having a starting calibration indicative of the predetermined distance apart of the inner ends of the two contact pin means at one predetermined fixed position of the sleeve and with the first contact pin means set at its calibrated "zero" position, and the drum diameter scale having a coincident starting calibration which is larger than the starting calibration on the disc scale by the said known total length of said contact pin means.

3,889,379
AID FOR MAKING A BASEBALL BATTERS' BOX
Lee R. Cline, 156 Locust Ln., Cadiz, Ohio 43907
Filed Feb. 6, 1974, Ser. No. 440,259
Int. Cl. A63c *19/06*
U.S. Cl. 33—174 G **5 Claims**

1. A transportable device for use in making a baseball batters' box outline comprising: a U-shaped base frame having a pair of generally parallel legs connected by an end cross member, a pair of spaced apart pins hinged to one leg of said base frame, a gauge bar generally parallel to said legs and spaced to the side of said other leg opposite from said one leg, means connecting said gauge bar to said other leg, a U-shaped closure frame having a pair of generally parallel legs connected by an end cross member, said frames being positioned with their legs extending towards each other's base, and means slidably connecting said legs of said closure frame to respective legs of said base frame.

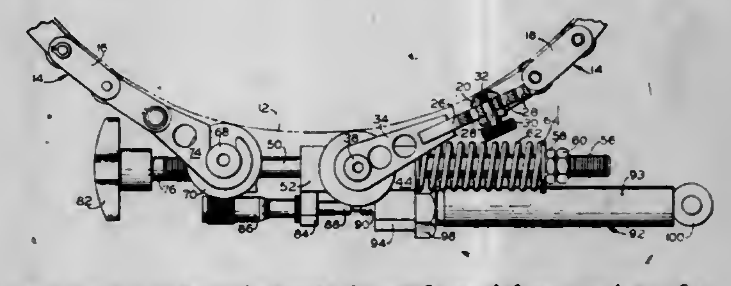


3,889,380
AUTOMATIC MEASURING MACHINE FOR CHECKING SIMILAR WORKPIECES WITH AT LEAST ONE DIMENSION DIFFERENT
Gastone Albertazzi, Bologna, Italy, assignor to Finike Italiana Marposs, Soc. In Accomandita Semplice di Mario Possati & C., Bentivoglio (BO), Italy
Filed Feb. 28, 1973, Ser. No. 336,831
Claims priority, application Italy, Mar. 3, 1972, 3354/72
Int. Cl. G01b *7/12*
U.S. Cl. 33—174 L **14 Claims**



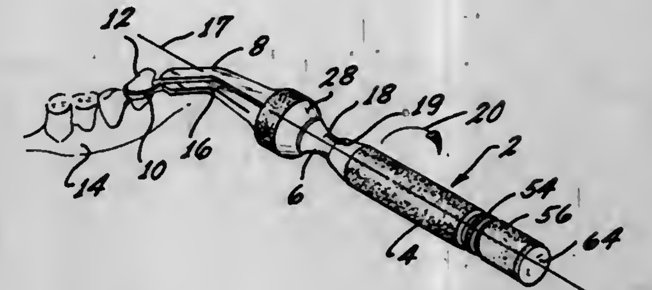
1. An automatic measuring machine for checking a series of similar workpieces of a plurality of types differing for at least one nominal dimension comprising pre-checking means adapted to identify the type; a measuring unit having adjustable measuring means; and control means coupled to said pre-checking means and to said measuring unit to adjust said measuring means for carrying out, measurements on said plurality of types of workpieces.

3,889,381
GAGE FOR MEASURING THE CIRCUMFERENTIAL EXPANSION OF INTERNALLY PRESSURIZED TUBES
Bruce B. Brown, Latham, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Apr. 10, 1974, Ser. No. 459,767
Int. Cl. G01b *5/08*
U.S. Cl. 33—179 **7 Claims**



1. A gage for measuring the circumferential expansion of a tubular member subjected to internal stressing, comprising,
a pair of rods transversely spaced in parallel relation,
first and second blocks slidably mounted on said rods at spaced-apart locations thereon,
a reference block having an adjustable reference surface thereon and fixedly mounted on said rods intermediate said first and second blocks,
spring means mounted on said rods in position to normally urge said second block into mating contact with said reference block,
a roller chain having the ends thereof respectively secured to said first and second blocks to permit circumferential engagement with the exterior periphery of the tubular member at any point along the length thereof,
a measuring device having a housing secured to said second block in parallel alignment with said rods and a spring-biased plunger slidably disposed in said housing to extend therefrom into contact with said adjustable reference surface on said reference block, and
an actuating screw threadably engaged in said first block to project therefrom into rotatable retention with said fixed reference block whereby clockwise rotation of said screw initially advances said first block toward said reference block to take up the slack in said roller chain and thereafter actuates said first block along said rods to transmit corresponding slidable movement to second block for compressing said spring means to impart a desired preload thereto prior to the operation of said measuring device in response to circumferential expansion of the tubular member.

3,889,382
MICROMETER TOOTH MEASURING APPARATUS
Paul R. Husted, 201 Calle Miramar, and Felix Galan, 1935 Condon Ave., both of Redondo Beach, Calif. 90278
Filed Mar. 25, 1974, Ser. No. 454,756
Int. Cl. G01b *3/10, 3/18*
U.S. Cl. 33—179 **12 Claims**

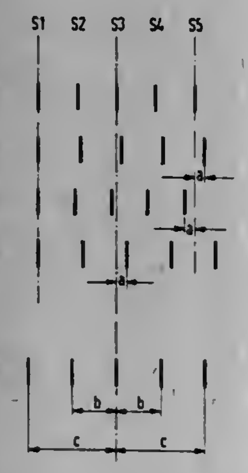


1. An apparatus for measuring the circumference of a tooth, said apparatus comprising:

a barrel;
a sleeve rotatably positioned about said barrel and in threaded engagement therewith;
guide means positioned at a forward end of said barrel;
a doubled band slidably positioned within said guide means; said guide means including an opening with the portions of said doubled band which extend beyond the opening forming a closed loop;
means connecting said band and said sleeve to transmit axial movement of said sleeve to said band without transmitting rotational movement of said sleeve to said band;
indicia on said barrel and sleeve to denote the axial and rotational position of said sleeve with respect to said barrel;
the movement of said sleeve in a forward axial direction toward said guide means enlarging said closed loop while movement of said sleeve in a rearward axial direction away from said guide means contracts said closed loop, and
said indicia having an increasing numerical designation as said sleeve is moved in a forward axial direction toward said guide means and a decreasing numerical designation as said sleeve is moved in a rearward direction away from said guide means with the numerical designation of said indicia corresponding to the enlargement and the contraction of said loop in response to movement of said sleeve,
whereby the size of said closed loop may be varied by rotation of said sleeve with respect to said barrel with the size of said loop being indicated by said indicia which denote the axial and rotational position of said sleeve with respect to said barrel.

3,889,383
METHOD OF MACHINING PRINTED-CIRCUIT BOARDS AND/OR WORKING PATTERNS FOR SUCH PRINTED-CIRCUIT BOARDS

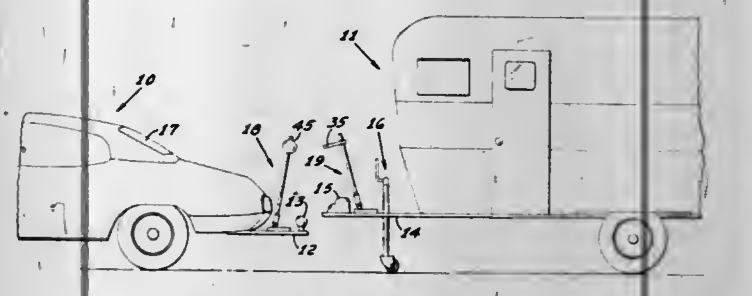
Alfred Jahn, Munich, Germany, assignor to Siemens Aktiengesellschaft, Germany
Filed Sept. 25, 1973, Ser. No. 400,530
Claims priority, application Germany, Sept. 28, 1972, 2247831
Int. Cl. G01b *5/24*
U.S. Cl. 33—180 R **3 Claims**



1. A method of machining printed circuit boards wherein each desired site of a machining operation is located on one of a plurality of fixed points in an actual machining pattern, said fixed point being located with respect to a theoretical grid crossing point of a reference grid system established for each said printed circuit board, said board reference grid being initially congruent with the reference placement grid of a machining device on which are to be located the actual sites of the machining operations of said device, comprising
determining the deviation in terms of direction and numerical value in one coordinate direction of each desired machining pattern site in a row with respect to a row of said theoretical reference crossing points on said printed circuit board reference grid;
selecting one of said desired points as the basic reference point for locating said machining operation relative to said machining device reference placement grid,
shifting said selected basic reference point and the corresponding crossing point of said printed circuit reference grid relative to said machining device tool placement grid to minimize the variation between each of said desired points to be adopted as a machining site and the corresponding grid row crossing point of said machining device reference placement grid.

3,889,384
TRAILER HITCH GUIDE

Max A. White, 12 E. Minnesota, Indianapolis, Ind. 46225
Continuation of Ser. No. 143,556, May 14, 1971. This application June 14, 1973, Ser. No. 369,887
Int. Cl. G01c *5/00*
U.S. Cl. 33—264 **8 Claims**



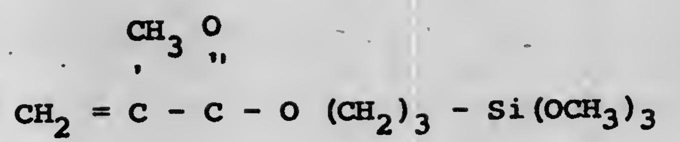
2. The guide of claim 1 wherein each of said ridges is V-shaped and has an inside diameter less than the diameter of said hollow center.

3,889,385
LIQUID DENTAL OPAQUER AND METHOD

Emery W. Dougherty, 123 School Ln., Milford, Del. 19963
Division of Ser. No. 225,657, Feb. 11, 1972, abandoned. This application Oct. 31, 1973, Ser. No. 411,535
Int. Cl. A61c *5/08*
U.S. Cl. 32—12 **3 Claims**

1. Dental work comprising in combination a metal substrate selected from the group consisting of a dental base metal alloy, a nobel metal or a nobel metal alloy; a dental opaquing composition overlying said metal substrate and comprising a copolymer of from about 20 to about 60 parts by weight of acrylonitrile and from about 40 to about 80 parts by weight of methyl methacrylate, and a dental crown and bridge resin comprising metayl methacrylate overlying said dental opaquing composition.

2. A method of preparing crown and bridge prosthesis comprising the steps of opaquing prepared dental base metal alloy, nobel metal, or nobel metal alloy dental work by applying a solution having dissolved therein methacrylic acid, a copolymer of from about 20 to about 60 parts by weight of acrylonitrile and from about 40 to about 80 parts by weight of methyl methacrylate, and an adhesion promoting compound selected from the group consiting of carbethoxy propyl methyl diethoxy silane, diphenyl diethoxy silane, dimethyl dichloro silane, and gamma-methacryloxypropyltrimethoxysliane having the formula

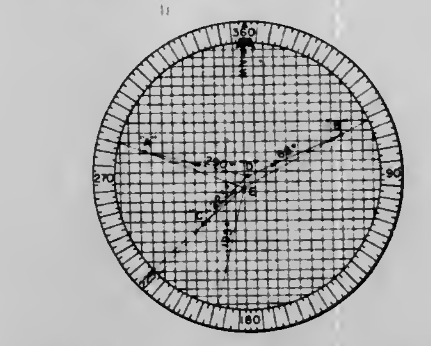


$$CH_2 = \overset{CH_3}{C} - \overset{O}{\overset{\|}{C}} - O\ (CH_2)_3 - Si(OCH_3)_3$$

and having dispersed therein a sufficient quantity of opaquing pigment to permit complete masking of the dental metal work, evaporating the solvent and applying a crown and bridge dental resin in methyl methacrylate monomer vehicle to the opaqued surface to complete the dental work.

3,889,386
METHOD AND APPARATUS FOR OUTDOOR POSITION LOCATING INCLUDING DEVELOPMENT OF AN AREA MAP BY RELATIVE BEARINGS OF VISIBLE LANDMARKS

Leslie A. Hurd, 2616 Columbus, Moskogee, Okla. 74401
Continuation-in-part of Ser. No. 341,802, March 16, 1973, abandoned. This application Mar. 6, 1974, Ser. No. 448,784
Int. Cl.² G01C *15/00*
U.S. Cl. 33—228 **3 Claims**

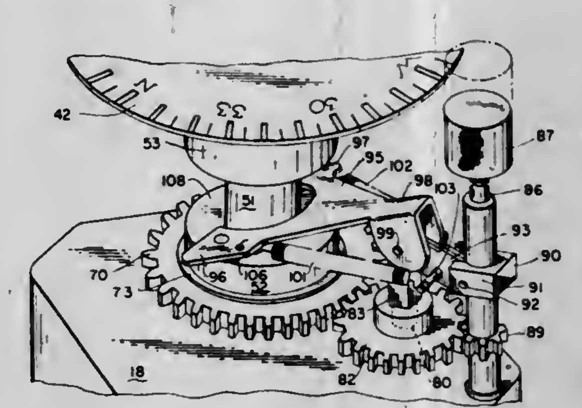


1. The method of establishing outdoor locations by plotting relatively known positions on a chart, together with the relative positions of surrounding landmarks to create a map with fixed locations thereon and determining another position or course and distance therefrom to another position on the map, comprising:

A. establishing as a base a first field outdoor location and plotting the position thereof as a first fixed position on a circular chart, having thereon distance coordinates and a cooperative 360° protractor with angular bearing markings;
B. sighting the angular disposition of a plurality of distant landmarks from and with respect to said base location, and plotting the sighted angles as projected lines of position on the chart to establish by a fix of the lines of position on the chart the base location and relative angular disposition of said landmarks;
C. establishing a second fixed field outdoor location at a known pre-determined distance and direction from said first fixed location, and plotting the so established second fixed field location on said circular chart, wherein the second fixed field outdoor location is established by placing markers 46 feet apart at said first fixed location and moving outwardly, in a direction which is both perpendicular to a line connecting said markers and along a line of fixed degree, to a third point where these markers show to be exactly one degree apart, said third point thereby being known to be one mile distant from said first location.
D. determining angular bearings from said second fixed location to at least two of the same said distant landmarks;
E. plotting the so last determined respective angular bearings from the distant landmarks to said second fixed location as projected lines therefrom on the chart;
F. plotting as fixes at the intersections of the lines from the two respective fixed locations to the respective landmarks the locations of the landmarks on the chart which thereupon constitutes a map; and
G. determining from the map the direction and distance to a desired position on the map.

3,889,387
DIRECTIONAL GYROSCOPE

Frederick J. Owens, Butler, N.J.; Jerry B. Bishop, Wichita, Kans., and David Fidelman, Denver, Colo., assignors to Aerosonic Corporation, Clearwater, Fla.
Filed July 7, 1971, Ser. No. 160,334
Int. Cl. G01c *19/32, 19/34*
U.S. Cl. 33—318 **2 Claims**



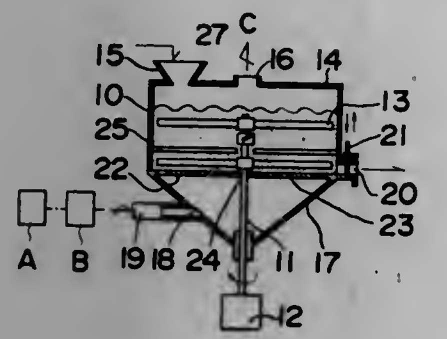
1. In a directional gyroscope having a driving gear and a driven gear, a dial shaft secured to the driven gear and carrying a dial hub slidably journaled thereon and having clutch means fixed on the shaft normally engaged with said dial hub to rotate therewith, and a dial secured to the dial hub, dial reset mechanism comprising a
clutch gear rotatable on the dial shaft and positioned to be engageable by the dial hub, and
means for disengaging the dial hub from the dial shaft and for engaging the dial hub with the clutch gear, said disengaging and engaging means comprising a stub shaft and a dial reset shaft parallel to said dial shaft, an idler gear and a pinion gear on said stub shaft and said reset shaft, respectively, an actuating arm pivotably connected to the stub shaft and having winged portions engageable with said dial hub, a linkage member connected at one end to the stub shaft-actuating arm pivotal connection and at the other end to the dial reset shaft, said linkage member including a lost-motion connection therein, the pinion gear being connected for rotating the idler gear, and, in turn, the clutch gear and the dial upon contact of the actuating arm winged portions with the dial hub and upon contact of the dial hub with the clutch gear, and a pair of springs connected to the actuating arm winged portions and to the linkage member for moving the end of the linkage member connected to the dial reset shaft in overcenter relationship with respect to the arm and stub shaft pivotal connection upon depression of said dial reset shaft to slidably move said dial hub into engagement with said clutch gear for resetting the dial separate from the driving and driven gears and the dial shaft.

3,889,388
METHOD OF AND DEVICE FOR DRYING SMALL SOLIDS

Eizo Oguri, Kobe; Hiroshi Ogawa, Hyogo; Koki Date, Hyogo, and Kanji Takeba, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
Continuation-in-part of Ser. No. 162,457, July 14, 1971, abandoned. This application Jan. 4, 1974, Ser. No. 430,928
Claims priority, application Japan, July 17, 1970, 45-62965
Int. Cl. F26b *3/08*
U.S. Cl. 34—10 **5 Claims**

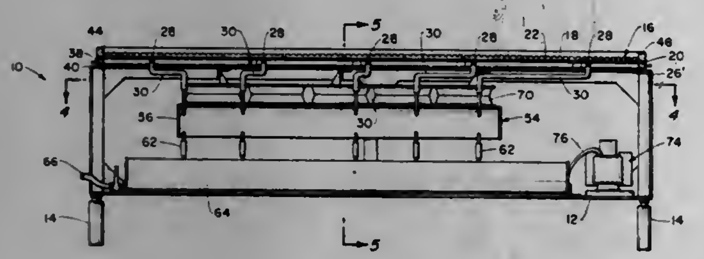
1. A method of drying granular or crystalline particles which initially have a relatively high moisture content as compared to the moisture content after they are dried and which particles tend to stick together to form lumps during the dry-

ing thereof, and which particles are delicate and subject to damage by striking the parts of a dryer apparatus at high velocities, said method comprising the steps of feeding the proper amount of undried particles into a shell of a drier to form a bed of particles in the shell, the drier having therein means for stirring the bed of particles thus fed by applying a horizontal fluidized bed shearing force to the bed of particles, actuating said means for applying a horizontal fluidized bed shearing force to the fluidized bed at a speed for giving a gentle motion to said bed of said particles and insufficient for carryover of said particles which may cause a portion of said particles to splash on the inner surface of said shell of said drier, and simultaneously with said application of said horizontal fluidized bed shearing force, feeding gaseous drying medium upwardly from the bottom of said bed of particles through the interstices among said particles at a velocity which is less than the minimum fluidizing velocity for an undisturbed bed of such particles when the particles have a moisture content from just above the critical moisture content to a moisture content just below the critical moisture content, the critical moisture content being the moisture content at which the particles tend to stick to each other, and a velocity which is greater than one half said minimum fluidizing velocity.



3,889,389
PARACHUTE DRYING APPARATUS

Alfred Serup, 1244 Nedra Dr., Granada Hills, Calif. 91344
Filed May 13, 1974, Ser. No. 469,059
Int. Cl. F26b *5/04*
U.S. Cl. 34—15 **20 Claims**

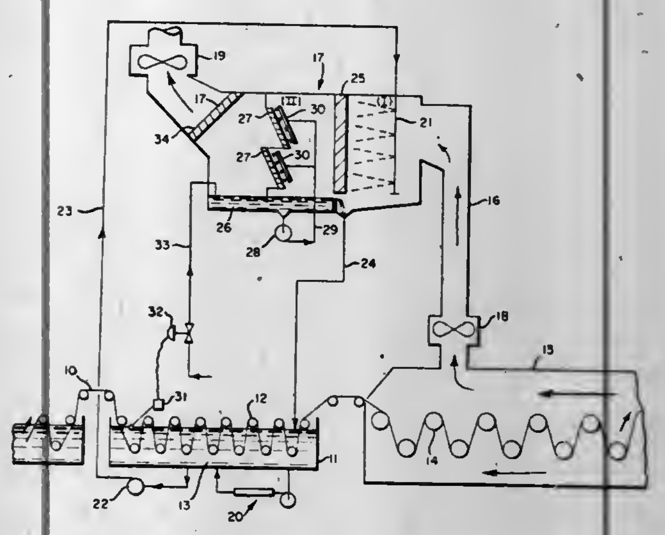


1. The method of drying a parachute comprising the steps of:

placing the parachute within a confined area;
applying heat to the confined area;
subjecting the confined area to a vacuum thereby causing moisture within the parachute to be vaporized;
causing the vaporized moisture to move within a minimized volume;
applying heat to the minimized volume expanding the vaporized moisture; and
removing the vaporized moisture from the minimized volume into an enlarged cooler volume due to the natural action of the expanding vaporized moisture to exceed the boundaries of the minimized volume.

3,889,390
REGENERATED CELLULOSE SOFTENER RECOVERY METHOD AND APPARATUS

Robert John Klare, Clinton, Iowa, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.
Filed Oct. 18, 1974, Ser. No. 515,965
Int. Cl. F26b *3/00*
U.S. Cl. 34—23 **8 Claims**



1. In a process for reclaiming a portion of a softening agent used in treating regenerated cellulose film which process includes the steps of:

a. treating gel regenerated cellulose film by moving said film through an aqueous solution of softening agent;
b. drying the film from said treating step (a) by moving said film counter current to an air stream thereby transferring excess water and softening agent from said film to said air stream;
c. absorbing softening agent from the air stream of the drying step (b) by contacting said air stream with a mist of the aqueous solution of softening agent from said treating step (a) and evaporating water from said aqueous solution into said air stream;
d. returning the aqueous solution from said absorbing step (c) to the aqueous solution of said treating step (a);

the improvement of increasing the removal of said softening agent which consists in the additional steps of:

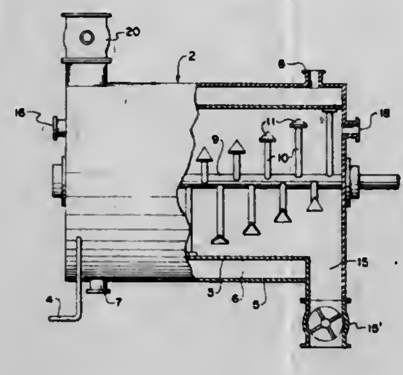
1. removing entrained droplets of aqueous solution and solid contaminants from the air stream of the absorption step (c);
2. further absorbing softening agent from the air stream of the preceding step by contacting said air stream with a mist of a separate, dilute aqueous solution of softening agent; and
3. adding water to said dilute aqueous solution of softening agent to replace process water losses.

3,889,391
METHOD OF AND APPARATUS FOR DRYING PARTICULATE MINERALS FOR AGGLOMERATION

Donald B. Malcolm, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.
Filed Feb. 28, 1974, Ser. No. 446,715
Int. Cl.² F26B *3/00*
U.S. Cl. 34—33 **5 Claims**

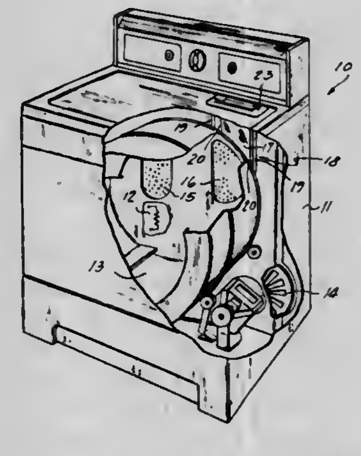
1. Apparatus for reducing the moisture content in filter cake comprising:

a. a high intensity mixer having a horizontally-extending drum with a charging opening at one end and a discharge opening at the other end, the drum having a smooth interior surface and having an axial shaft therein with radial arms arranged therealong and spaced thereabout, the arms having plows that have a working clearance with the interior of the drum, the drum having means about the exterior thereof for heating the interior walls thereof,
b. feeder means for introducing material to be dried at a controlled rate into one end of the drum while excluding the free influx of outflow of air, and means adjacent the bottom of the drum for discharging material which has been at least partially dried at a controlled rate from the other end of the drum while also preventing the free influx or outflow of air therethrough whereby controlled flow into and out of the drum may be effected, and
c. the drum having means for controlling the circulation of air therethrough including an air inlet at the end of the drum into which material is charged and an outlet at the opposite end of the drum.



3,889,392
SELF-ALIGNING INTEGRAL LINT SCREEN HANDLE AND LID FOR A DRYER

Rodney L. Davis, Stevensville; Don Ray Cronk, Benton Harbor, and Carl C. Hansen, Watervliet, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Oct. 9, 1974, Ser. No. 513,309
Int. Cl. F26b *21/06*
U.S. Cl. 34—82 **7 Claims**



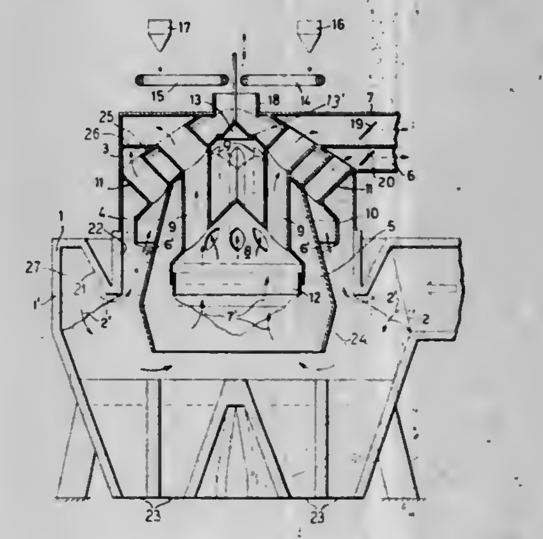
1. A removable lint screen assembly for use in a dryer having a chute for receiving the lint screen assembly through an opening in the dryer cabinet, said lint screen assembly comprising:

a first part including a lint screen and attached lint screen frame;
a second part including a handle and lid member having a hand grip portion and a cover portion for covering said cabinet opening; and
attachment means for providing a limited-travel ball-joint connection between said first and second parts and including,
  a projection extending between said first and second parts and having opposite first and second end portions with a shank portion therebetween, and
  an aperture defined in one of said parts loosely encompassing said shank portion,
  said first end portion of said projection rigidly affixed to the other of said parts,
  said second end portion of said projection defining a hook for loosely engaging said other of said parts adjacent said aperture,

whereby the limited-travel ball-joint attachment between said first and second parts ensures a proper alignment between said handle and lid member and said cabinet when said lint screen assembly is in place in said dryer.

3,889,393
DEVICE FOR THERMICALLY TREATING GRANULAR AND/OR LUMPY MATERIALS

Hans Peter Thomas, Dornap, and Heinrich Buchner, Niederkassel, both of Germany, assignors to Klöckner-Humboldt-Deutz AG, Germany
Filed Mar. 20, 1974, Ser. No. 453,058
Claims priority, application Germany, Apr. 5, 1973, 2317056
Int. Cl. F26b *17/14*
U.S. Cl. 34—167 **10 Claims**



1. A device for thermically treating a granular and lumpy material such as calcite, limestone, dolomite and magnesite by passing a gaseous medium therethrough, said device comprising in combination a chamber having an upper end with a flanged opening and a lower end with at least one discharge opening, said chamber having at least one wall extending between said ends with at least one opening in the wall for admitting a gaseous medium into the chamber; and means mounted on the upper end of the chamber and aligned with the flanged opening for supplying material to the chamber and for removing the gaseous medium therefrom, said means for supplying material including at least two separate gas discharge conduits disposed in an upper portion thereof, first means for coacting with the flanged opening of the chamber to provide at least two coaxially extending material supply channels which project into the chamber to different depths, and a collection hood disposed in the innermost coaxially extending supply channel, said hood being provided with a plurality of first gas exhaust pipes communicating with one of the separate gas discharge conduits, said means for supplying having second means for separately connecting the remaining supply channels to the other of the separate gas discharge conduits.

3,889,394
HEAT SHRINK APPARATUS

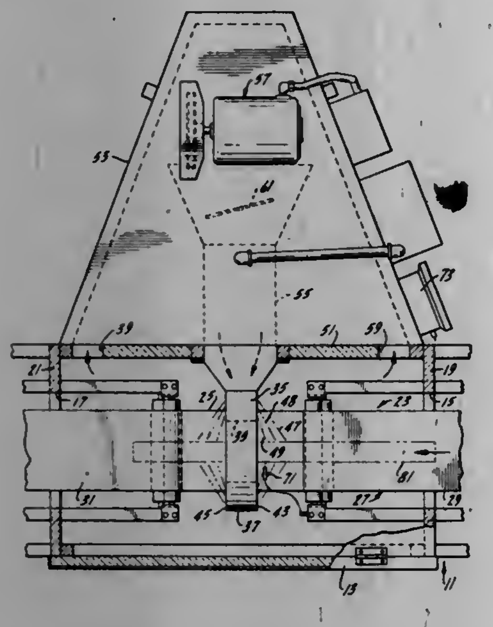
Kenneth J. Fischer, Henderson, Ky., assignor to Fox Valley Corporation, Appleton, Wis.
Filed June 4, 1973, Ser. No. 366,496
Int. Cl. F26b *19/00*
U.S. Cl. 34—225 **10 Claims**

1. Apparatus for heat shrinking a plastic film enclosing an elongated object,

said apparatus including:

means to move an elongated object loosely enclosed in a shrinkable plastic film along a defined path which path is generally coincidental with the longitudinal axis of said elongated object,

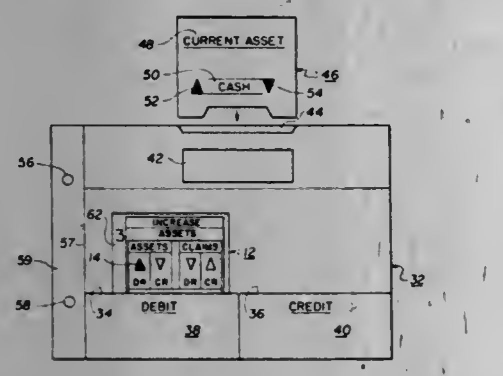
a plurality of nozzles encircling a portion of said path and arranged to discharge heated fluid against a peripheral band of said film as said object moves along said path and past said nozzles,



said nozzles being arranged in at least one ring with the nozzles of a ring each being spaced generally uniformly around said ring and each being positioned approximately an equal distance from said film to thereby discharge heated fluid against said peripheral band of film at temperatures and pressures which are generally uniform over the area of the peripheral band,

said nozzles being arranged to discharge said heated fluid against said film enclosing said elongated object with said heated fluid discharging in a direction opposite and obliquely to the path of movement of said film enclosed object.

3,889,395
TEACHING AID FOR ACCOUNTING
Snyder M Zegel, 108 Monell Ave., Islip, N.Y. 11751
Filed Apr. 19, 1974, Ser. No. 462,439
Int. Cl. G09b *19/18*
U.S. Cl. 35—24 R **11 Claims**



1. A teaching device useful as an aid in teaching the rudimentary principles of accounting comprising:

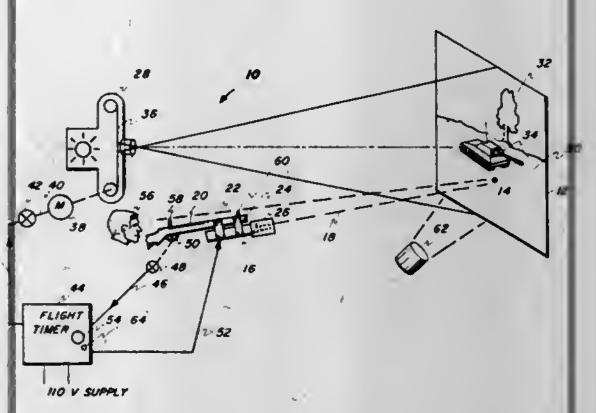
a. a plurality of rectangular transaction cards, each card bearing accounting indicia;

b. a plurality of ledger pages, each page including, in juxtaposition, a left debit pocket and a right credit pocket for receiving appropriate transaction cards;

c. a plurality of account title tags; and

d. a slot at the top of each ledger page for receiving and displaying said title tag.

3,889,396
DIRECT FIRE WEAPONS SIMULATOR
Moses Aronson, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Aug. 19, 1974, Ser. No. 498,696
Int. Cl. F41g *3/26*
U.S. Cl. 35—25 **4 Claims**



1. An improved direct fire weapons simulator comprising

a trainee controlled trigger fire weapon having an "on-off" switching circuit operated from said trigger and a projectile barrel,

a projection screen coated with photochromic material,

a motion picture projector for displaying on said screen a background and a moving target,

an illuminator selected to project a beam of wave length less than 480 nanometers and affixed to said weapon to direct said beam parallel to the barrel of said weapon in the direction said weapon is aimed,

a flight timer having instructor operable adjustment means to set the timer for delayed time outputs corresponding to the equations of flight for the specific cartridge or round and weapon to be simulated in flight time to the target,

said timer being connected to said trigger operated switching circuit for activation responsive to firing said weapon and to said illuminator to cause said delayed time output signals to activate said illuminator and produce a darkened hit spot on said screen at a point in relation to said moving target dependent upon the accuracy of aiming of said weapon.

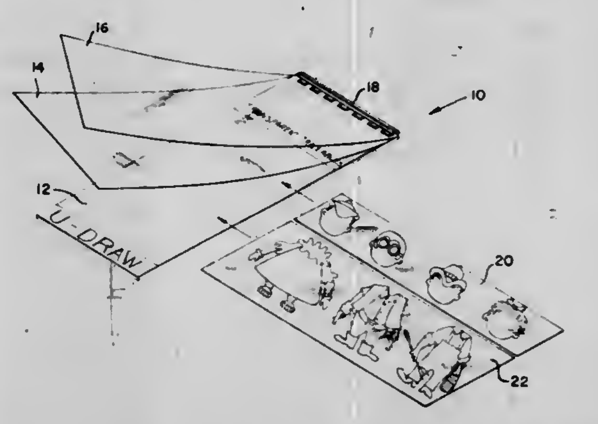
3,889,397
DEVICE FOR COMPOSING TRACEABLE FORMS
Janet M. Flood, 323 Medford Ave., Hayward, Calif. 94541
Filed Sept. 23, 1974, Ser. No. 508,688
Int. Cl. G09b *11/04*
U.S. Cl. 35—26 **4 Claims**

1. A device for composing designs, characters, forms and the like traceable with tracing paper composing:

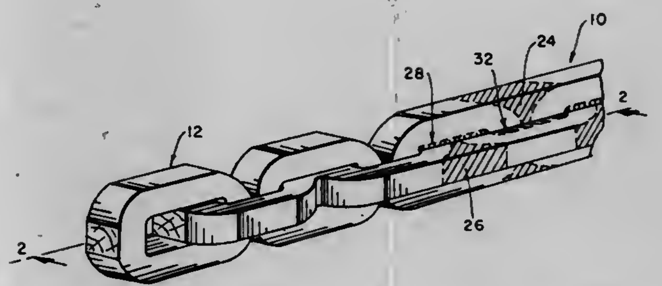
a. A pad

b. A plurality of substantially transparent tabs having segments of the design, characters, form and the like imprinted thereon.

c. A plurality of transparent sheets, said tabs interposed said pad and said transparent sheets such that the segments of said tabs are visible when viewed through said sheets to said pad permitting tracing of the segments with the tracing paper.



3,889,398
COLOR CODED WOOD CARVING STOCK AND METHOD
Stanley P. Orzel, 3320 Birney Ave., Scranton, Pa. 18503
Filed Dec. 19, 1973, Ser. No. 426,132
Int. Cl.^{2} G09B *19/00*
U.S. Cl. 35—26 **3 Claims**

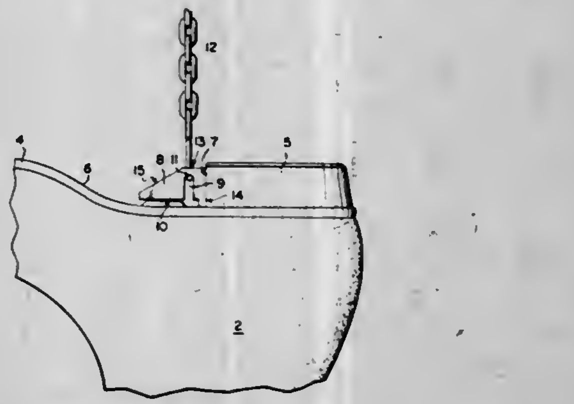


1. For use in teaching the carving of a chain formed by integral links from solid material, an elongated stock of predetermined cross-section perpendicular to a longitudinal axis having a plurality of external planar surfaces parallel to said axis and means for guiding removal of material from said stock to substantially form said chain, comprising markings on said planar surfaces of the stock defining two different groups of volumetric sections longitudinally spaced along the stock, said markings being color coded to render the two groups of volumetric sections visually distinguishable from each other, one of said groups of volumetric sections being completely defined substantially by the markings on all of said planar surfaces, the other of the groups of volumetric sections extending internally through the stock between markings on less than all of said planar surfaces and when removed from the stock forming pairs of parallel slots in the stock aligned with planes transverse to each other, said integral links of the chain being disposed parallel to said transverse planes.

3,889,399
BOOT HANGING DEVICE
Roy P. Emrich, San Francisco, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed Sept. 3, 1974, Ser. No. 502,457
Int. Cl. A43b *00/00*; A43d *3/00*
U.S. Cl. 36—1 **3 Claims**

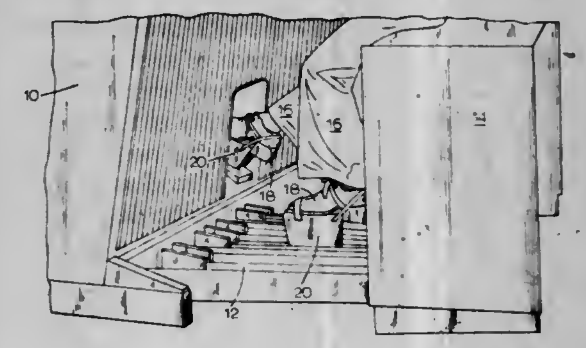
1. A boot hanging device for hanging a boot upside down from an external projection to air out and dry, the boot having a sole, a heel and an arch area therebetween with the heel having a substantially planar front surface at substantially right angles with the sole and defining the arch area with the sole, said boot hanging device comprising

a block type member affixed to the boot in the arch area thereof and abutting the front surface of the heel, the block type member having a slot formed therein opening from a surface thereof affixed to the boot in a manner



whereby the slot releasably accommodates an external hook therein for hanging the boot from an external projection.

3,889,400
SHOE ATTACHMENT FOR OPERATING ORGAN PEDALS
Mary T. Atzinger, 932 Wabank St., Lancaster, Pa. 17603
Filed Sept. 9, 1974, Ser. No. 504,568
Int. Cl.^{2} A43B *3/12*
U.S. Cl. 36—7.5 **4 Claims**



1. A non-walking attachment for shoes for use by children and adults of short stature to lengthen the effective length of their legs to enable them to reach the lower pedals of an organ and actuate the same, said attachment means comprising a substantially non-compressible block-like member of material lighter in weight than leather and of substantially uniform and appreciable thickness much greater than the thickness of the sole of a shoe to which it is attached and in plan view being substantially as wide as the sole of the shoe of the wearer and only as long as the sole of such shoe from the front tip thereof to the forward face of the heel and substantially complementary to the shape of the sole and instep portion of the shoe to which it is to be attached, the forward end of said block-like member also being rounded to correspond to the rounded forward end of the sole of the shoe to which the attachment is to be connected and the sides and ends of said member tapering inward and downward from the upper surface thereof to provide a lower surface adapted to engage individual pedals of an organ without interference with adjacent pedals while the wider and longer upper surface of said block-like member affords firm flat abutment with the shoe of the wearer, thereby to resist twisting movement of said member laterally sidewise relative to such shoe while operating the pedals of an organ, the rearward upper end of said member also being adapted to abut at least part of the forward face of the heel of such shoe to resist rearward movement of said member relative to said shoe, band-like attaching means connected to the forward portion of said member and adapted to extend over the toe of the shoe of the wearer, and additional attaching means adjacent the rear end of said member adapted to engage the rear and instep portions of such shoe to attach said member to such

shoe and maintain the rear end of the attachment against said forward face of the heel of the shoe of the wearer.

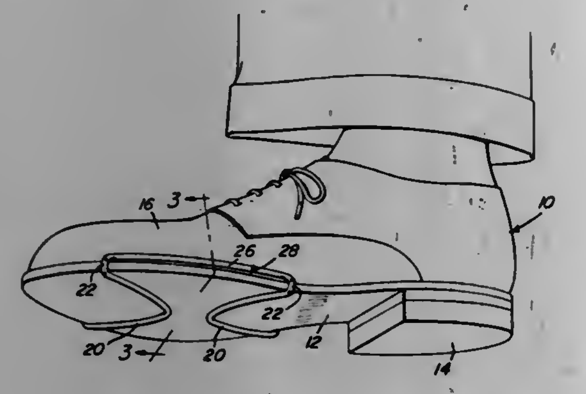
3,889,401
ANTI-SLIP SHOE ATTACHMENT

Dion C. McDonnold, 1140 S.W. 6th St., Cooper, Tex. 75432

Filed May 14, 1974, Ser. No. 469,909

Int. Cl. A43b *3/10*

U.S. Cl. 36—7.6 **9 Claims**



1. A shoe sole attachable traction aid, said aid including a pair of generally horizontal elongated generally parallel support members at least slightly arcuate in shape and opening toward each other, the opposite ends of each of said members including outturned ends terminating outwardly in downturned portions terminating downwardly in inturned ends, and elongated traction members extending and connected between corresponding inturned ends of said support members, said support members being adapted to be disposed alongside the forward mid-portions of the upper of a shoe with said outturned ends, downturned portions and inturned ends embracingly gripping adjacent sole portions of said shoe and said traction members clamped to and extending across the undersurface of the sole of said shoe.

3,889,402
SHRUB BALLER WITH ARTICULATED DIGGER SUPPORT MEMBERS

Robert P. Wheeler, Rt. 3, Box 516, Estacada, Oreg.; Jeffrey P. Wheeler, 1200 E. Powell, Gresham, Oreg. 97030, and Henry D. Wheeler, 209 Taylor, Apt. 21, Moscow, Idaho 83843

Filed Sept. 25, 1973, Ser. No. 400,536

Int. Cl. A01g *23/04*

U.S. Cl. 37—2 R **10 Claims**

1. A mobile machine for digging and balling nursery shrubs comprising:

a. a mobile straddle carrier frame comprising a pair of transversely spaced vertical side frame members joined at their tops by a horizontal cross member so as to define an interior space within said members extending throughout the length of said frame and being open on both ends and at the bottom;

b. a pair of transversely spaced support members, each mounted on a respective one of said side frame members on either side of said interior space;

c. power means mounted on said frame for vertically reciprocating said transversely spaced support members in unison with respect to said frame;

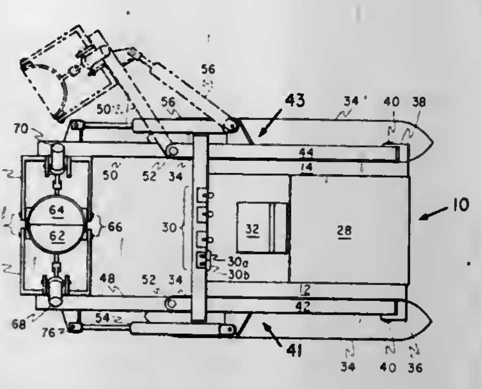
d. a pair of complementary digging members, each depending from a respective one of said transversely spaced support members; and

e. second power means mounted on each of said transversely spaced support members for selectively moving said support members toward or away from one another.

4. A mobile machine for digging and balling nursery shrubs comprising:

a. a mobile frame;

b. a pair of transversely spaced opposed support members mounted for vertical movement with respect to said frame;



c. first mechanical power means for selectively raising and lowering said support members with respect to said frame;

d. a pair of opposed complementary digging members, each pivotally depending from one of said support members sp as to rotate about a respective pivot axis toward one another, and each including a wall means which is not concentric about said pivot axis for retaining substantially all of the soil in the path of each said digging member as said members rotate toward one another and compacting said retained soil between said digging members;

e. second mechanical power means mounted on each of said transversely spaced support members for moving said support members toward or away from one another; and

f. third mechanical power means mounted on each of said support members for selectively rotating the bottom edges of said respective digging members about said respective pivot axes toward one another.

6. A mobile machine for digging and balling nursery shrubs comprising:

a. a mobile straddle carrier frame comprising a pair of transversely spaced vertical side frame members joined at their tops by a horizontal cross member so as to define an interior space within said members extending throughout the length of said frame and being open on both ends and at the bottom;

b. a pair of transversely spaced, forwardly extending arms mounted along either side of said frame and pivotally connected thereto for rotation about a common transverse pivot axis;

c. first power means interacting between said frame and said arms for selectively raising or lowering said forwardly extending arms in unison aboaut said pivot axis;

d. a pair of transversely spaced arm extension sections extending forwardly in front of said frame, each pivotally mounted to the forward end of a respective one of said arms so as to rotate transversely inwardly and outwardly with respect to the longitudinal centerline of said machine so as to form, in combination with said arms, a pair of transversely articulated support members extending along either side of said frame;

e. second power means connected to said respective extension sections for selectively pivoting said extension sections inwardly or outwardly; and

f. a pair of complementary digging means, each mounted on the forward end of a respective one of said extension sections, for digging into the ground at opposed locations to one another.

3,889,403
METHOD AND APPARATUS FOR CONTINUOUS UNDERWATER MINING USING PLURAL SHIPS

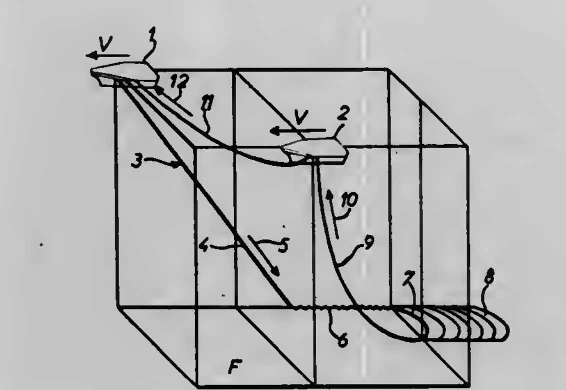
Michel Gauthier, Renan; Marcel Tessier; Daniel Fleruy, and Michel Jegousse, all of Nantes, France, assignors to Centre National pour l'Exploitation des Oceans and Le Nickel, both of Paris, France, part interest to each

Filed May 15, 1973, Ser. No. 360,594

Claims priority, application France, May 25, 1972, 72.18636

Int. Cl. E02f *5/00*

U.S. Cl. 37—69 **8 Claims**



1. A method for the continuous extraction of solid products from a sea bed using at least one endless dredging line having buckets attached thereto, comprising lowering said endless line down to the sea bed from a first ship, causing said buckets to dredge the surface of said sea bed, raising said line upwardly to a second ship traveling along a generally parallel course to said first ship after dredging the surface of said sea bed, returning said line from said second ship to said first ship along a return path which is at least partially submerged and varying the curvature of said line returning to said first ship to control a dredging parameter.

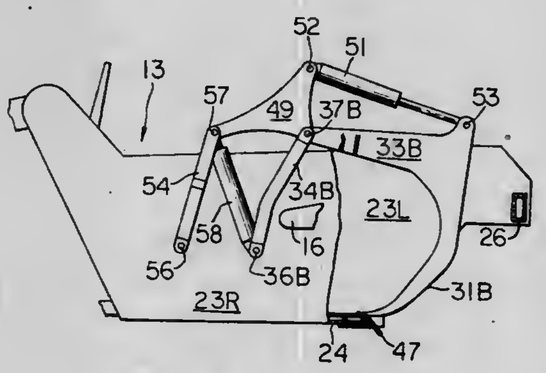
3,889,404
HOEING APRON MECHANISM

Larry G. Eftefield, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 20, 1973, Ser. No. 398,989

Int. Cl. E02f *3/62, 3/64*

U.S. Cl. 37—126 AD **8 Claims**



1. In a scraper having a bowl with sidewalls and an open forward end for receiving material to be loaded, a hoeing mechanism for assisting the movement of material into said bowl comprising:

an apron member disposed transversely in the forward portion of said bowl, said apron member having a pair of arms rigidly fastened thereto and extending rearwardly therefrom at opposite sides thereof,

a pair of forward links each having a lower end coupled to a separate one of said bowl sidewalls by first pivot means enabling the upper ends of said forward links to be swung forward and backward,

second pivot means coupling the upper end of each of said forward links to the adjacent one of said apron member arms,

first motor means for selectively swinging said upper ends of said forward links in a forward and backward direction to shift said apron member forwardly and backwardly relative to said bowl,

a pair of rear links, each having a lower end coupled to a separate one of said bowl sidewalls by third pivot means situated rearwardly from the first pivot means and each having an upper end coupled to the adjacent one of said arms through means including at least fourth pivot means situated rearwardly from said second pivot means to cause said arms and apron members to turn about said second pivot means as said first motor means swings said forward links, the spacing between said first and third pair of pivots being constant and the spacing between said second and fourth pivots being constant, whereby actuation of said first motor means alone drives said apron in a nonarcuate path, and

second motor means for selectively pivoting said apron member about said second pivot means.

3,889,405
EXCAVATOR WITH TEETH COUPLED FOR PIVOTAL MOVEMENT IN OPPOSITE SENSES

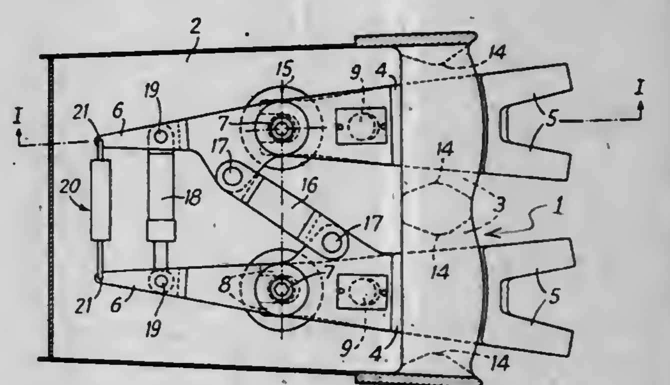
Daniel G. Ranini, Varreddes, France, assignor to Poclain, Oise, France

Filed Apr. 23, 1974, Ser. No. 463,395

Claims priority, application France, May 15, 1973, 73.17566

Int. Cl. E02f *3/40, 9/28*

U.S. Cl. 37—141 R **7 Claims**



1. In a ground penetration working tool,

a blade intended to penetrate a mass of material,

at least two teeth,

means pivotally securing each of said teeth to the blade about an axis extending perpendicularly to the plane of the blade so that each tooth projects from the blade,

coupling means for coupling the two teeth for synchronized pivotal movement in opposite senses,

actuating means connected to the teeth and operable to cause the teeth to pivot towards and away from one another,

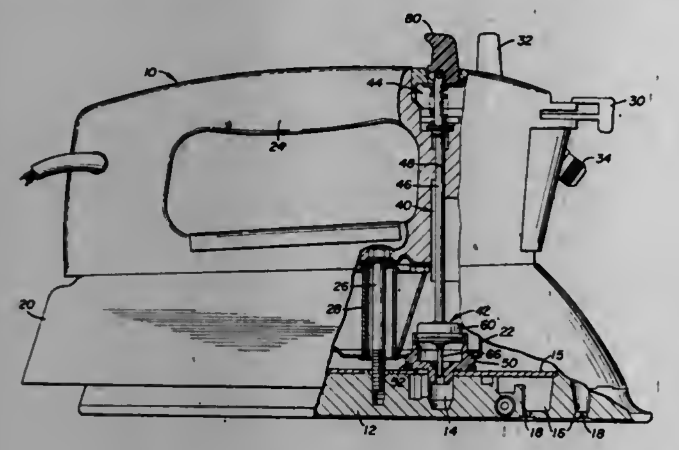
said actuating means includes a single driving element coupled to the said two teeth at points lying on the same side of a common plane containing the said pivotal axes of the two teeth, and wherein the coupling means comprises

a rod of constant length pivotally coupled to the two teeth at two points lying on opposite sides of said plane.

3,889,406
STEAM IRON WATER VALVE AND MANUAL OPERATING MECHANISM THEREFOR

James R. Chivers, North Canton, and William C. Pound, Canton, both of Ohio, assignors to The Hoover Company, North Canton, Ohio

Filed Oct. 7, 1974, Ser. No. 512,467
Int. Cl.² D06F *75/06*
U.S. Cl. 38—77.83 **6 Claims**



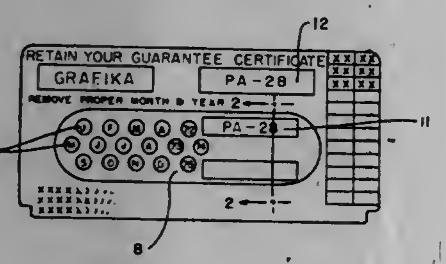
1. In a steam-dry iron having a soleplate with at least one steam discharge port, a water reservoir located above said soleplate, a steam generating chamber in fluid communication with said water reservoir, and a steam distribution passageway interconnecting said steam generating chamber and said steam discharge port, the improvement comprising,

- a valve member regulating the fluid communication between said water reservoir and said steam generating chamber and having at least three colinear spaced positions consisting of a dry position, a limited flow position and a maximum flow position so as to regulate flow of water from said water reservoir to said steam generating chamber,
- a valve operating member interconnected to said valve member, said valve operating member being adapted to be linearly moved to place said valve member in one of said positions and being adapted to be manually biased to place said valve member in another of said positions, whereby said valve member can be selectively moved between said three relative positions by manual operation.

3,889,407
WARRANTY PLAQUE

Bernard J. Elzer, West Reading, Pa., assignor to Grafika Commercial Arts, Inc., Wyomissing, Pa.

Filed Oct. 26, 1973, Ser. No. 410,028
Int. Cl. A44c *3/00*
U.S. Cl. 40—2 R **5 Claims**



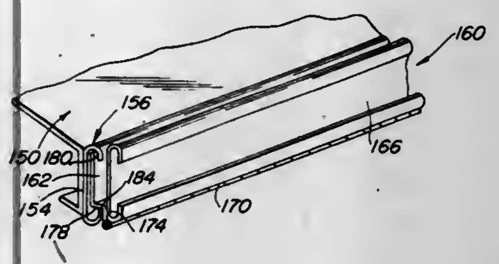
1. A warranty plaque comprising a base layer, an intermediate layer and a cover layer;

- the base layer comprising an opaque plastic film having a pressure-sensitive adhesive on its lower surface;
- the intermediate layer being comprised of a transparent plastic film having its lower surface adhered to the upper surface of the base layer and carrying printed intelligence on its upper surface;
- the upper layer being a protective transparent plastic film adhered to the upper surface of the intermediate layer; and
- a central portion of the intermediate layer and a corresponding central portion of the overlying cover layer bearing die cut lines that permit detachment of the central portion of the intermediate layer and the corresponding central portion of the overlying cover layer from the base layer and the surrounding portions of the intermediate and the upper layers.

3,889,408
STOCK SHELF LAYOUT INDICATORS

Burton E. Offner, 3023 St. Clair, Racine, Wis. 53402

Filed Aug. 11, 1971, Ser. No. 170,928
Int. Cl. G09f *3/18*
U.S. Cl. 40—10 R **12 Claims**



1. Shelf stock layout indicia means adapted for use to present a diagrammatic representation of a predetermined linear pattern of items to be stocked on a shelf,

- said indicia means comprising:
- strip means having at least one face receptive to application of visual data thereon,
- indicia means shielding means selectively shiftable between a position in which said indicia means is visually obstructed and a position in which said indicia means is visually exposed,
- product information displayed on said face of said strip means,
- said product information defining a linear array of stock items along the length of said strip means,
- items depicted in said array being spaced along said strip means to correspond with lineal placement positions of correlated actual items to be stocked along said shelf,
- whereby in checking inventory and in stocking said shelf, reference may be made to said product information displayed on said strip means to facilitate inventory procedures, preparation of stock orders, and the restocking of shelves.

3,889,409
DISPLAY STANDARD

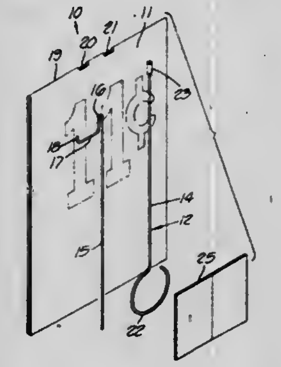
Robert E. Thomas, Los Angeles, Calif., assignor to John Graves and Associates Incorporated, Los Angeles, Calif.

Filed May 20, 1974, Ser. No. 471,353
Int. Cl. G09f *03/14*
U.S. Cl. 40—11 A **1 Claim**

1. A display standard, comprising:

- a first rodlike element having an end portion bent back along itself to form a loop with the terminal end portion formed to extend at substantially 90° to the remainder of the rodlike element;
- a cross-brace formed by said terminal end portion extension;
- a second rodlike element having an end portion bent into a loop;
- a hollow tube received on the unbent end portions of said first and second rodlike elements removably interconnecting them together;

- a sheetlike panel folded onto itself along a fold line, said panel including a pair of openings on said fold line located at equal distances from the fold line midpoint;

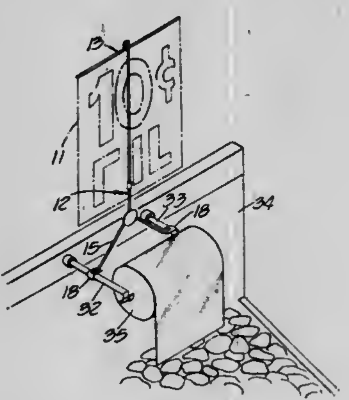


- said sheetlike panel having one of its openings being received on the loop of said first rodlike element and otherwise supported for generally vertical hanging by the cross-brace; and
- an adhesive coated member received onto the second rodlike element loop for securing the same to a surface.

3,889,410
DISPLAY STANDARD

Robert E. Thomas, Los Angeles, Calif., assignor to John Graves and Associates Incorporated, Los Angeles, Calif.

Filed May 20, 1974, Ser. No. 471,354
Int. Cl. G09f *03/14*
U.S. Cl. 40—11 A **1 Claim**



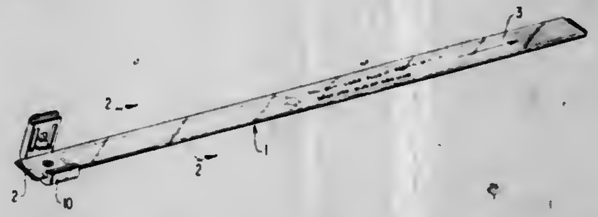
1. A standard for displaying a sheetlike item having an opening therein, comprising:

- an elongated member shaped about substantially its midpoint into a triangle;
- a U-shaped mounting foot attached to each member end portion with the open end of said feet facing each other, said feet being adapted for receipt onto spaced mounting means;
- a first rodlike element having one end portion bent back along itself, said element bent portion being affixed to the elongated member such that the remainder of the element extends in a direction away from the member feet and substantially normal to a straight line interconnecting said feet;
- a second rodlike element having an end portion formed back along itself into a loop;
- a cross-brace affixed to the loop on said second rodlike element and arranged normally with respect to said second rodlike element and a portion of said loop extending beyond said cross-brace;
- a hollow tube being received on the end portions of said first and second rodlike elements removably interconnecting them together;
- said sheetlike item to be displayed having its opening being received on the loop of said second rodlike element and otherwise supported for generally vertical hanging by the cross-brace.

3,889,411
IDENTIFICATION BAND

Lorene Laugherty, and James R. Laugherty, both of Knoxville, Tenn., assignors to Laugherty Incorporated, Knoxville, Tenn.

Continuation-in-part of Ser. No. 240,139, March 31, 1972, Pat. No. 3,800,450. This application Jan. 10, 1974, Ser. No. 432,415
Int. Cl. G09f *3/14*
U.S. Cl. 40—21 C **3 Claims**

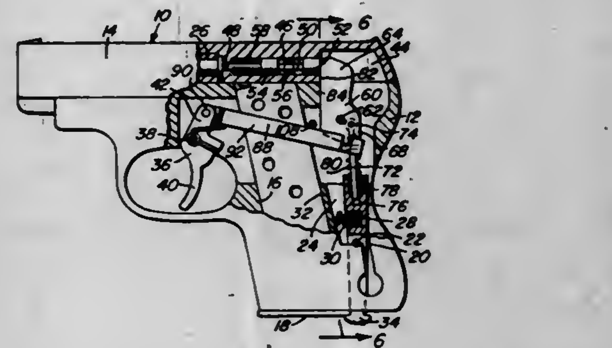


1. A kit for assembling an identification band, comprising an elongated transparent tube of a length to encircle a body member and to have the ends thereof folded over one another, means at one end of the tube for securing the folded over ends together, an elongated strip of material formed in one integral piece, said strip of material including a card portion at one end thereof, an intermediate pusher portion and a hand-hold portion at the opposite end of the strip from the card portion, means for separating the card portion from the pusher portion, said strip of material being of sufficient length when inserted in the tube to dispose one end of the card portion adjacent the securing means and with the opposite end of the pusher portion at the outer end of the tube and with the hand-hold portion projecting outwardly from the outer end of the tube, and indicia on the strip of material intermediate the pusher portion and the hand-hold portion for indicating the extent of insertion of the card into the tube.

3,889,412
DOUBLE ACTION TRIGGER MECHANISM FOR SEMI-AUTOMATIC PISTOL

Joseph E. Filecci, 7330 Bellemeade Blvd., Miami, Fla. 33138

Filed Nov. 26, 1973, Ser. No. 419,120
Int. Cl. F41c *19/00*
U.S. Cl. 42—69 B **7 Claims**



1. A firearm of the double action type, said firearm comprising a frame, a trigger pivotally supported in said frame, said trigger including a lower finger engageable portion below the trigger pivot and an upper portion above the trigger pivot, a drawbar having a forward end pivotally anchored to said upper portion, a hammer pivotable in said frame for movement between cocked and firing positions and including upper and lower portions above and below the hammer pivot, the rear end of said drawbar being vertically swingable below said hammer lower portion, said rear end of said drawbar and the lower hammer portion including first coacting engageable

portions for moving said hammer lower portion forward to a predetermined forward position with said hammer in said cocked position in response to forward shifting of said drawbar and subsequently releasing said hammer for movement to the firing position thereof in response to further forward movement of said drawbar, means yieldingly urging said hammer toward said firing position, spring means connected between said trigger and drawbar yieldingly urging inverse pivotal movement of said trigger and drawbar to swing the lower portion of the trigger forwardly and the rear end of said drawbar upwardly, and the rear end of said drawbar and the lower portion of said hammer including second coacting portions operable to cam the rear end of said drawbar downwardly beneath the lower end of the hammer when the lower end of the trigger is swung to its forwardmost position and the drawbar is shifted rearwardly, whereby the rear end and lower portions of said drawbar and hammer may again be engaged with each other for subsequent forward shifting of the drawbar and movement of the hammer toward the cocked position thereof, said frame defining a downwardly opening passage in which to upwardly telescopingly receive a load clip, said drawbar comprising a rearwardly opening forked member whose opposite side arms extend along opposite sides of and embrace said passage, the rear ends of said arms, rearward of said passage, being directed toward each other and defining said rear end of said drawbar.

3,889,413

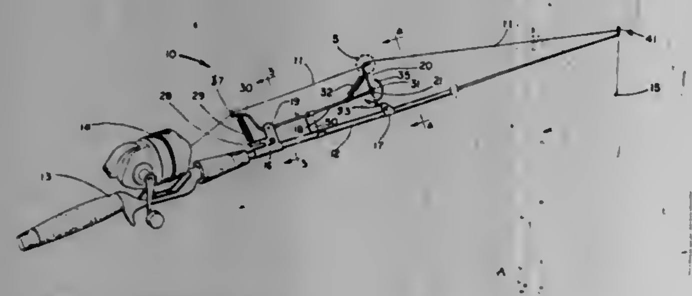
FISHING LINE JERKING DEVICE

Robert T. Snider, 1452 English, Indianapolis, Ind. 46201, and Jessie G. Zimmerman, 1742 N. Rural, Indianapolis, Ind. 46218

Filed Jan. 4, 1974, Ser. No. 430,680

Int. Cl. A01k *97/00*

U.S. Cl. 43—15 **2 Claims**



1. The combination of:

a fishing pole including a handled end with reel mounted thereon and an opposite eyelet end, said reel having fishing line wrapped thereon and extending therefrom;

a bracket mounted on said pole;

a catch mounted on said pole between said bracket and said eyelet end of said pole;

a first elongated element pivotally mounted about a first pivot axis on said bracket, said first elongated element having a distal end located between said first pivot axis and said eyelet end of said pole and further having a rearward portion extending between said handled end and said first pivot axis;

a second elongated element pivotally mounted about a second pivot axis to said distal end of said first elongated element and having a bottom hook end engageable with said catch and further having a top end with an open eyelet formed thereon slidably receiving said line, said second elongated element being mounted to said first elongated element intermediate said top end of said second elongated element and said bottom hook end of said second elongated element;

a first helical spring having a bottom end attached to said bracket between said first pivot axis and said handled end and further having a top end attached to said rearward portion of said first elongated element normally urging said rearward portion downwardly and said distal end and said second elongated element upwardly;

a second helical spring with a bottom end attached to said first elongated element between said first pivot axis and said distal end and further having a top end attached to said second elongated element between said second pivot axis and said top end of said second elongated element, said second helical spring normally biasing said bottom hook end against said catch located between said bottom hook end and said eyelet end of said pole but yieldable to allow said second elongated element to pivot about said second pivot axis when said line extending through said eyelet of said second elongated element is pulled by a fish forcing said bottom hook end away from said catch and toward said bracket.

3,889,414

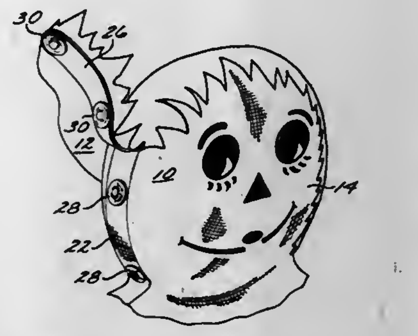
DOLL WITH REMOVABLE WIG

Grace Eva Whetzel, 5549 Langport, No. 1, Long Beach, Calif. 90805

Filed Oct. 31, 1973, Ser. No. 411,476

Int. Cl. A63h *3/44*

U.S. Cl. 46—172 **2 Claims**



1. A rag doll comprising:

a padded head including an outer covering having a pair of fabric sections terminating in opposed margins extending up the sides and across the top of said head, each of said margins being turned under to define a seam allowance, said head further including an elongated tape made of fabric which is of heavy-duty construction highly resistant to tearing as compared to the fabric of said fabric sections, said tape being interposed between said margins with its edges turned under and stitched to said seam allowances to form an integral part of said head;

a wig for covering said head and including an elongated tape made of fabric which is of said heavy-duty construction and arranged in overlying relation to said tape of said head; and

attachment means carried by said tapes and operative to detachably connect said tapes together whereby said wig can be readily attached to and separated from said head without tearing the fabric of said outer covering of said head.

3,889,415

CONTROL SYSTEM FOR PERIODICALLY FEEDING NUTRIENT SOLUTIONS TO HYDROPONIC PLANT BEDS

Floyd W. Holmes, 7302 Rolliston St., Jacksonville, Fla. 32208

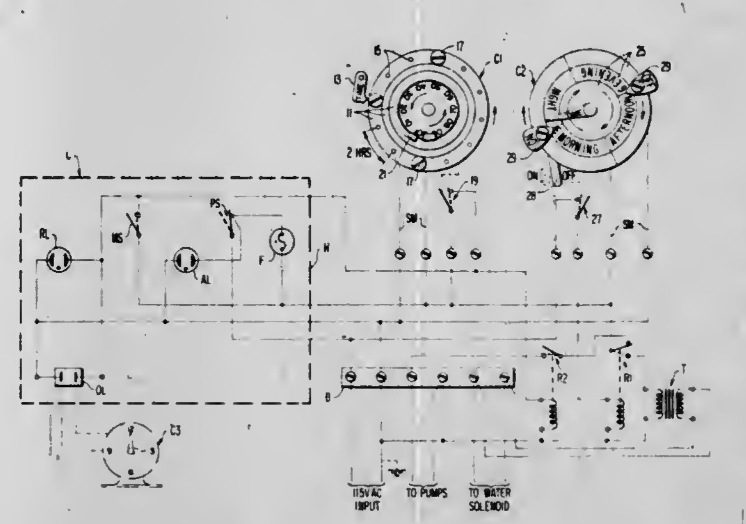
Filed Jan. 29, 1974, Ser. No. 437,661

Int. Cl. A01g *31/00*

U.S. Cl. 47—1.2 **8 Claims**

1. In a hydroponic system comprising at least one plant bed and a storage vat means, electric pump means connected between said plant bed and said storage vat means for pumping nutrient solution to said plant bed from said storage vat means, means connected to said vat means for replenishing lost water to said vat means and including a solenoid-operated valve, the improvement comprising: a first clock switch means electrically connected to said pump means for periodically

energizing said pump means, said first clock means being adjustable as to the time and the duration of each pumping cycle, a second clock switch means electrically connected to said first clock switch means and adapted to disable said first clock switch means adjustably between near sunset and near sunrise times, said second clock switch means being further augmented by means for permitting opening of said solenoid valve only during the time said first clock switch means is disabled by said second clock switch means, whereby said storage vat means is protected against possible overflowing by back drainage from a recently flooded bed into an already full vat means.



3,889,416

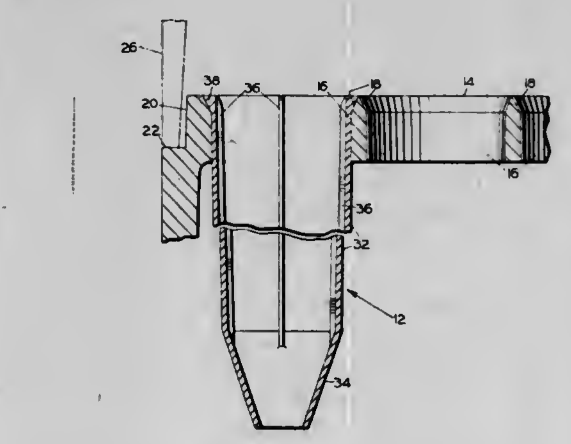
SEEDLING TREE GROWING APPARATUS

Duncan G. Bergeron, Rt. 2, Box 706, Beaverton, Oreg. 97005, and Ray E. Leach, Rt. 2, Box 20, Aurora, Oreg. 97002

Filed Dec. 10, 1973, Ser. No. 423,386

Int. Cl. A01g *9/02*; A47b *71/00*

U.S. Cl. 47—34.13 **4 Claims**



1. Seedling tree growing apparatus comprising, in combination:

- a. a tray comprising
  - 1. a horizontally arranged support plate,
  - 2. a plurality of spaced openings vertically through the plate, and
  - 3. a plurality of spaced legs extending downwardly from the underside of the plate for supporting the same on a supporting surface, and
- b. a plurality of seedling tree growth cells each comprising a tube open at both ends and arranged to removably contain a quantity of tree growth media,
- c. the tubes being removably contained one in each of the support plate openings with the bottom ends of the tubes spaced upwardly from the plane of the bottom edges of the legs, whereby the bottom open ends of the tubes are spaced above a supporting surface to afford access of air for air pruning the roots of seedling trees planted in the tubes,
- d. the support plate openings being provided with recessed margins and the upper margins of the tubes being provided with outwardly extending circumferential flanges dimensioned to seat in the recesses with the upper surfaces of the tubes and flanges being on a horizontal plane not substantially higher that the horizontal plane of the upper surface of the support plate, and each of the tubes being provided with a plurality of radially spaced, longitudinally extending interior root-guiding ribs.

3,889,417

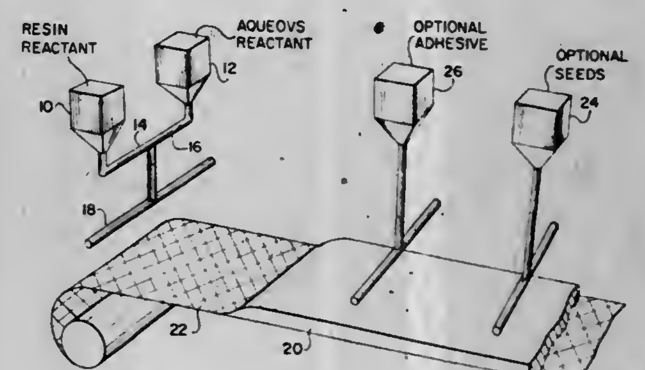
METHOD FOR PREPARING HORTICULTURAL FOAM STRUCTURES

Louis Leonard Wood, Rockville, Md., and Kurt Charles Frisch, Grosse Ile, Mich., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 279,403, Aug. 10, 1972, Pat. No. 3,812,619, which is a continuation-in-part of Ser. No. 250,012, May 3, 1972, abandoned. This application May 16, 1974, Ser. No. 470,492The portion of the term of this patent subsequent to May 28, 1991, has been disclaimed.

Int. Cl. A01g *9/10*

U.S. Cl. 47—58 **21 Claims**



1. A method for preparing improved crosslinked hydrophilic foam structure said method comprising reacting as a continuous sheet, a first component comprising isocyanate capped polyoxyethylene polyol having a reaction functionality greater than two, with a second component comprising aqueous reactant in the presence of a horticultural material, the ratio of moles H_2O/moles NCO groups being about 6.5 to about 390 in said second and first components respectively.

3,889,418

HIGH DENSITY TREATMENT PRODUCT

Kenneth E. Porter, Mesa, and Perry L. Nelson, Phoenix, both of Ariz., assignors to American Bioculture, Inc., Plumsteadville, Pa.

Continuation of Ser. No. 337,395, March 2, 1974, abandoned. This application Apr. 25, 1974, Ser. No. 464,689

Int. Cl. C02c *1/00*; A01h *13/00*

U.S. Cl. 47—58 **10 Claims**

1. A method of producing algal products having properties useful for the treatment of material such as soil and waste water which comprises culturing green algae in an aqueous nutrient medium in the presence of light and carbon dioxide and at a temperature of between about 20°C and about 30°C, harvesting the culture before the end of logarithmic growth after the population density of the cells is at least 10^5 cells per milliliter and applying the harvested culture to the material to be treated.

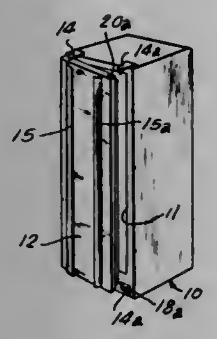
3,889,419
TWO-WAY OPENING DOOR FOR HOUSEHOLD REFRIGERATOR

Leroy Robert Maleck, Galesburg, Ill., assignor to Admiral Corporation, Chicago, Ill.

Filed Aug. 29, 1973, Ser. No. 392,744

Int. Cl. E05d *15/50*

U.S. Cl. 49—193 **11 Claims**



1. In a cabinet for a home appliance having a door mounted for pivotable movement on a set of hinge pins disposed on one side of an opening, and means for holding the door in a position closing the opening, the improvement comprising a first set of hinge pins mounted on the cabinet adjacent one side of the opening, a second set of hinge pins mounted on the cabinet adjacent a second side of the opening opposite said first side, each of said sets of hinge pins includes an upper pin and a lower pin, engagement means disposed on the door for coacting with a set of hinge pins to form a hinge mounting for the door, said engagement means includes a pair of bolt members mounted for sliding movement in the door with one bolt member arranged to move from a position coacting with an upper pin the first set to a second position coacting with an upper pin of the second set and the other bolt member being movable from a position coacting with a lower pin of the first set to a position coacting with the lower pin of the second set, and means disposed on the door for selectively shifting the engagement means between the first and second sets of hinge pins by acting on both bolt members in the same direction to coact with the upper and lower pins respectively of one of the pair of sets so that the hinge mounting of the door can be shifted between the first and second side of the opening to enable the door in either of two directions.

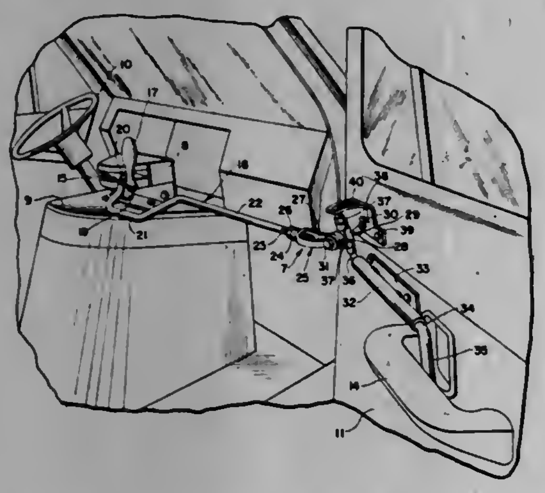
3,889,420
VEHICLE DOOR OPERATOR

Clinton L. Hildebrand, 1139 N. Baltimore, Derby, Kans. 67037

Filed Dec. 19, 1973, Ser. No. 426,350

Int. Cl. E05f *11/22*

U.S. Cl. 49—302 **6 Claims**



1. A vehicle door operator comprising a lever, means pivotally mounting said lever adjacent one end thereof for swinging movement in a direction crosswise of a vehicle, a rigid rod having one end pivotally connected to said lever at a point spaced from said pivot means, a bearing sleeve mounted on the inner side and crosswise of a passenger access door of the vehicle, a shaft journaled in said sleeve, said shaft having terminal portions forming cranks disposed beyond the ends of said bearing and between the side edges of the door, a first one of said cranks extending downwardly from the shaft and being disposed to engage a door latch actuating lever of said door, the other second crank extending upwardly from the shaft, a guide secured to the door and having a slot in which a part of the second crank is swingably confined, and means swingably connecting the other end of said rod to said second crank whereby when said lever is swung about its pivot means in a direction toward the door said rod will exert an initial thrust on the second crank for causing the first crank to engage and move the latch operating lever to a position for unlatching the door after which the thrust on said rod will swing the door to an open position.

3,889,421
DOOR ARRANGEMENT

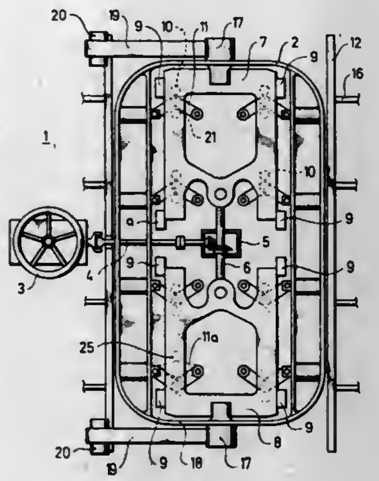
Aarre Ahonen, Lahderanta, Finland, assignor to Oy Wartsila AB, Helsinki, Finland

Filed Aug. 28, 1973, Ser. No. 392,342

Claims priority, application Finland, Sept. 1, 1972, 2411/72

Int. Cl.² E05C *9/00*

U.S. Cl. 49—395 **5 Claims**



1. A door arrangement comprising a movable door having greater length than width, a stationary wall and a bolt device comprising movable bolts in said door arranged in two groups each forming one half of a substantially symmetrical configuration and bolt receiving members at said wall, said bolt device further including a driving means for moving said bolts and pressing said door hermetically against said wall, said driving means comprising a driving member, a motion transmission system connected to said driving member, and including an axially slightly movable through-going, two-ended secondary shaft, upper and lower slides respectively connected to one of the ends of the shaft, at least one toggle joint mechanism for each slide connected at one end to the door and at the other end to a bolt of the respective group, and axially spaced drive elements on said slides engaging the joint of a respective said toggle joint mechanism for projecting or retracting the associated bolt, one drive element in each pair being on one side of the joint of the associated toggle joint mechanism and the other drive element of the same pair being on the other side of the joint of the associated toggle joint mechanism, each toggle joint mechanism moving to an over-center locked position in going from the retracted to the projected position, stop means on said door for engaging each toggle joint mechanism to limit the over-center movement thereof, and guide means on said door engaging said slides for guiding the same in axial displacement.

3,889,422
WOODEN DOOR BLADES

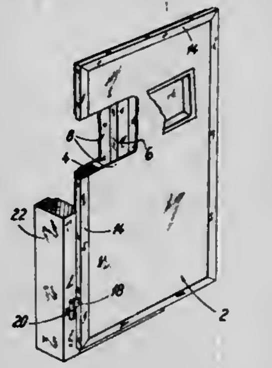
Jorgen Carsten Nielsen, Ostergade 14, 8620 Kjellerup, Denmark

Filed Feb. 22, 1973, Ser. No. 334,850

Claims priority, application United Kingdom, Feb. 28, 1972, 9014/72

Int. Cl. E06b *3/08*

U.S. Cl. 49—501 **9 Claims**



1. A door blade of the insulating builtup type comprising
an internal framework means including a wooden peripheral edge frame, said peripheral edge frame extending peripherally of the door blade, and said peripheral edge frame having a peripheral recess at one side thereof,
at least two panel plate means for covering said internal framework means, each of said two panel plate means secured to opposite sides of said internal framework means, thereby forming opposite surfaces of a door blade, and
reinforcing frame means for reinforcing the resulting structure of said panel plate means covering said internal framework means, said reinforcing frame means being formed of profiled beams of a rigid metal material with said profiled beams being rigidly joined at corners of said reinforcing frame means, said profiled beams having a hollow cross-sectional configuration, and
said profiled beams of said reinforcing frame means being rigidly secured in said peripheral recess of said wooden peripheral edge frame for extending along the periphery of said resulting structure only at one side of said resulting structure such that said reinforcing frame means is spaced from the panel plate means at the opposite side of said resulting structure.

3,889,423
REVERSIBLE DOOR FRAME

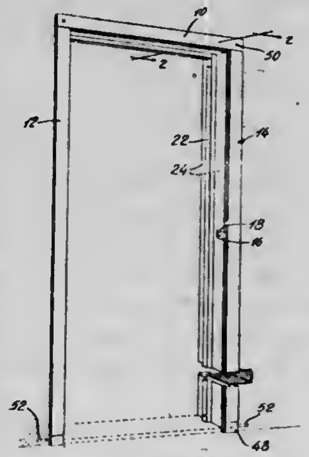
Claude Begin, 380 De La Rive, Quebec 2, Province of Quebec, Canada

Filed Dec. 17, 1973, Ser. No. 425,625

Claims priority, application Canada, Dec. 18, 1972, 159253

Int. Cl. E06b *2/14*

U.S. Cl. 49—504 **1 Claim**



1. A door frame of metal section members of identical shape and dimensions comprising a lintel, a hinge post with provisions for connections of hinges, and a latch post with a latch element therein, said lintel and said posts having matching joint configurations at the ends thereof whereby either end of said posts may be joined to said lintel to define a frame having continuous flush opposed outer surfaces, said lintel and said posts being symmetrical in respect of said hinge connections, said latch and said joint configurations about a central plane perpendicular to the longitudinal extent of said lintel and said posts,
said frame members comprising separate identical wings and a separate door stopper, said wings having grooves at their inner edges, said door stopper having tongues at its outer edges seated in said wing grooves, and resilient snaps holding said tongues in said grooves.

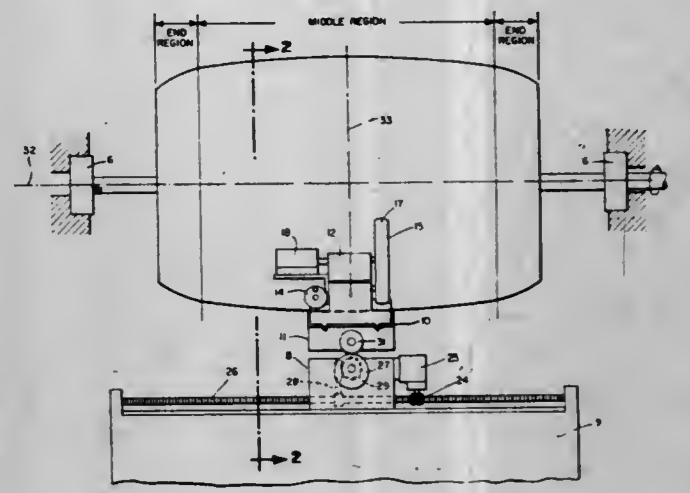
3,889,424
APPARATUS FOR RESURFACING THE CYLINDRICAL FACE OF LARGE DRIER DRUMS

Eric S. Buhayar, Swarthmore, Del., and Gordon F. Gerstenkorn, Springfield, Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. No. 179,691, Sept. 13, 1971, abandoned. This application May 20, 1974, Ser. No. 469,738

Int. Cl. B24b *5/16, 51/00*

U.S. Cl. 51—49 **9 Claims**



1. Apparatus for forming predetermined complex crown contours on the exterior surface of a large creping and drier drum, whereon the contour of the end regions differs from the contour of the middle region of the drum, comprising:
a carriage;
means for traversing said carriage from end to end of said drier drum;
grinder means rotatable on its axis for forming said crown contours, said grinder means being movably mounted on said carriage and spaced from the axis of said drier drum, said grinder means having an abrasive surface on which the center of the area of contact of the abrasive surface and the drum surface varies across the width of the abrasive surface for different traverse positions of said carriage and the center point of the abrasive surface periphery is spaced from the exterior surface of the drum by distance which varies for different traverse positions of said carriage; and
cam means for causing movement of said grinder means with respect to said carriage to vary said spacing between said grinder means and said axis of said drier drum, said cam means including a cam contoured in a predetermined relationship to the predetermined crown contours to be formed on the end regions and the middle region of the surface of said drier drum and contoured to compensate for the change in distance between the center point of the abrasive surface periphery and the exterior surface of the drum resulting from the contour of the exterior surface of the drum.

3,889,425
MICROTOME KNIFE SHARPENING MACHINE

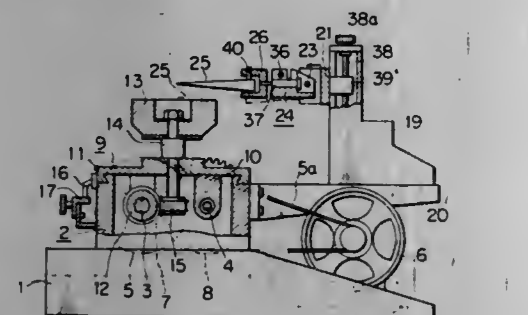
Naomichi Miyamoto, 75-5, Oaza-Imojiya, Koshoku-shi, Nagano-ken, Japan

Filed Aug. 14, 1974, Ser. No. 497,502

Claims priority, application Japan, Aug. 15, 1973, 48-95876; Aug. 15, 1973, 48-95877

Int. Cl. B24b *7/00, 9/00*

U.S. Cl. 51—56 **8 Claims**



1. In a microtome knife sharpening machine comprising a base structure, a grinding wheel rotatable about an axis and having a planar grinding surface, means for driving said grinding wheel in rotation, microtome knife carrier means, and support means mounted on said base structure to be swingable about a pivot axis and supporting said knife carrier means, whereby a microtome knife held by the carrier means is capable of being angularly adjustable with respect to said grinding surface, the improvement which comprises:

- rod means rotatably supported by said support means and being rotatable with said microtome knife carrier means about said pivot axis with respect to said support means;
- slidable means so mounted on said rod means that the same is not allowed to rotate relative to said rod means but is allowed to move axially relative to said rod means;
- first engaging means disposed on said slidable means;
- at least two second engaging means disposed on said base structure, said first engaging means being adapted to engage selectively with one of said second engaging means thereby to enable said microtome knife carrier means to take at least two angular positions selectively; and
- resilient means urging said slidable means and hence said first engaging means toward said second engaging means thereby to provide a tendency of said first engaging means to move into engagement with said second engaging means.

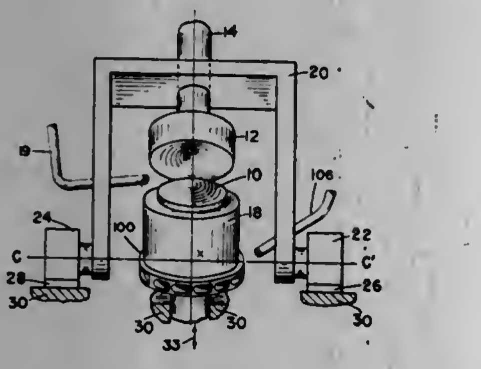
3,889,426
OPTICAL LENS GENERATING MACHINE HAVING AN AIR ROTATABLE SPHERICAL BEARING WORKPIECE HOLDER

Raymond T. Blum, Pittsford, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,536

Int. Cl. B24b *9/14, 7/00*

U.S. Cl. 51—55 **5 Claims**



1. An optical lens surfacing machine for operation upon a refractive surface of an optical lens material, comprising:

- an optical lens surface operation tool for operating upon the refractive surface of the lens material;
- means for rotatably carrying said operation tool about an axis of rotation;
- support means for carrying the lens material in relatively free rotation about an optical axis of the lens material; and
- pneumatic system means for applying a rotation force to said support means for a predetermined duration.

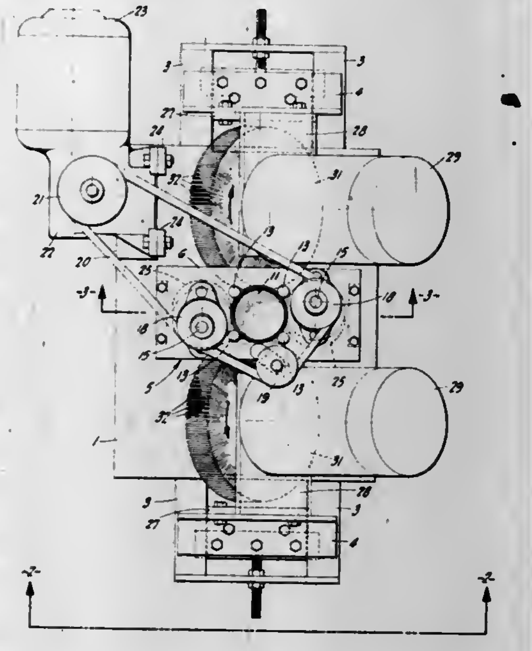
3,889,427
METAL CUP ABRADING MACHINE

Thomas A. McCoy, Stockton, Calif., assignor to Carando Machine Works, Stockton, Calif.

Filed Apr. 25, 1974, Ser. No. 464,117

Int. Cl. B24b *5/38*

U.S. Cl. 51—80 A **9 Claims**



9. A machine—adapted for use in the manufacture of sheet metal cans—operative to prepare, by abrading, the exterior of the circumferential sidewall of pre-formed sheet metal cups for the reception and retention of a lubricant as requisite to proper die-forming of such cups into a can configuration; said machine comprising—on a supporting structure—a guideway arranged to guide the cups for movement through a predetermined abrading zone, power-driven means to so move the cups, and power means operative to abrade the circumferential sidewall of each individual cup as moved through such abrading zone; the cup-moving means comprising a pair of driven, spaced-apart, friction rollers positioned to engage opposite sides of the circumferential sidewall of each such individual cup; and the cup-abrading means comprising a pair of driven, spaced-apart, abrading wheels positioned to engage the circumferential sidewall of each such cup at opposite points thereon intermediate and simultaneously with the rollers.

3,889,428
SURFACE GRINDING MACHINE INCLUDING WORK FEED, DELIVERY, AND MEASUREMENT MEANS

Hans Steinegger; Walter Glauser; Jean-Pierre Rossier, all of Morges; Rene Crausaz, Bremblens, and Pierre Andere Matthey-Doret, Morges, all of Switzerland, assignors to Establissments Sim S.A., Switzerland

Filed Aug. 24, 1973, Ser. No. 391,131

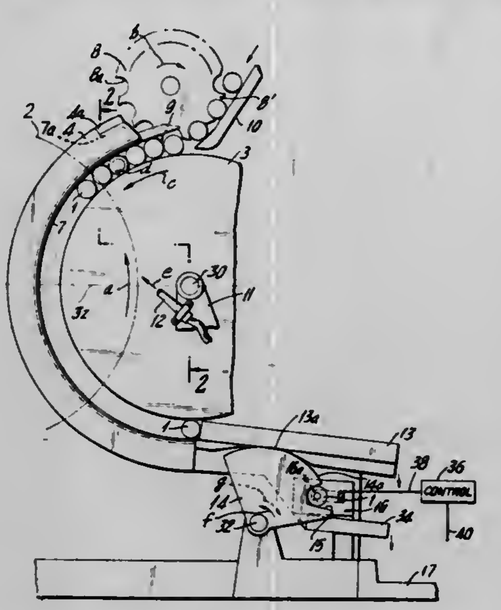
Claims priority, application Switzerland, Aug. 28, 1972, 12670/72

Int. Cl. B24b *7/16, 49/04*

U.S. Cl. 51—112 **6 Claims**

1. A surface grinding machine particularly for grinding workpieces having surfaces of revolution, for example rollers, comprising a guide disk having a curved peripheral surface

over which the workpieces are moved, a stationary ring overlying at least a portion of said curved spherical surface and spaced therefrom by an amount to define a workpiece operational path to accommodate the workpieces therebetween, the respective opposite ends of said ring defining an inlet and an outlet with said guide disk at the respective ends, means for feeding workpieces into the space between said ring and said guide disk peripheral surface at said inlet of said ring segment, a cylindrical grinding disk on each side of said guide disk having a periphery overlapping the periphery of said guide disk on respective sides thereof so as to be in a position to contact and grind the end surfaces of the workpieces moving over the peripheral surface of said guide disk along said operational path, delivery means at said outlet end of said ring for feeding said workpieces out of said operational path, an elastic pressure element held by said ring segment and adapted to bear inwardly against the workpieces, said delivery means including a member engaging each workpiece in succession, and measuring means adjacent said delivery means for measuring the width of the workpiece, said grinding disk being movable toward and away from each other to change the spacing therebetween in accordance with the measurement obtained by said measuring means, said delivery means including an oscillatable segment member having an outer curved surface with a recess adjacent one end of a size to accommodate a workpiece, a delivery trough connected to said operational path and having an opening therein for a workpiece overlying the curved surface of said segment, said segment being oscillatable to periodically present the recess therein below the opening in said trough to receive a workpiece and being oscillatable in a reverse direction to present the workpiece at a delivery station, said measuring means being located at said delivery station, said measuring means comprising a feeler arm on each side of the workpiece engageable with said workpiece and holding it in the recess until it is measured.



3,889,429
RESIDUE REMOVAL SYSTEM FOR BELT ABRADER

Warren H. Zuercher, Cottage Grove, Oreg., assignor to Kimwood Corporation, Cottage Grove, Oreg.

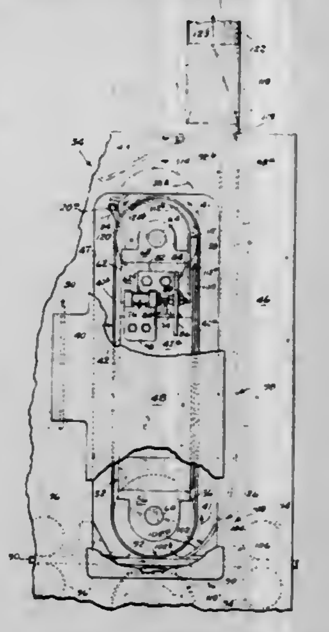
Filed Nov. 1, 1973, Ser. No. 411,915

Int. Cl. B24b *21/18, 55/06*

U.S. Cl. 51—135 R **6 Claims**

2. In combination with a flexible belt abrader including an endless belt with an abrasive material-removing outer face and roll support for such belt comprising a pair of spaced rolls having the belt trained thereover,

- means for guiding a workpiece against said belt in a zone where such is supported by one of said rolls with the belt curving about said one roll in regions on opposite sides of said zone,
- power drive means for rotating the roll support for the belt whereby the belt travels from said zone about the curvature of said one roll and thence toward the other of said rolls in an outgoing reach of the belt,
- residue removal ductwork comprising an elongate duct expanse including a wall portion extending the length of said outgoing reach in spaced opposition to the outer face of the belt in said reach, and duct wall structure extending between the lateral margins of said duct expanse and adjacent margins of said belt where it extends in said outgoing reach and including a wall portion facing the rear of said belt where it extends in said outgoing reach, whereby a substantially enclosed elongate course is defined which parallels and includes said reach of the belt, said residue removal ductwork having an opening for air to travel into said course adjacent said zone and another opening in a region adjacent said other roll to accommodate additional flow of air into the ductwork, said ductwork further including an adjustable baffle which controls the size of said other opening, and
- air mover means for producing a current of air through said course with such air moving in the direction of belt travel.



3,889,430
ABRASIVE TOOLS

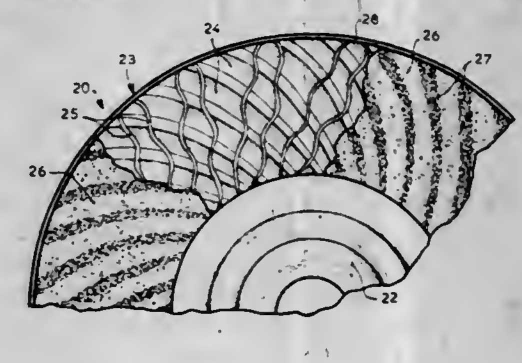
Lazare Scandaletos, Paris, France, assignor to S.P.A.M., Ville D'Avray, France

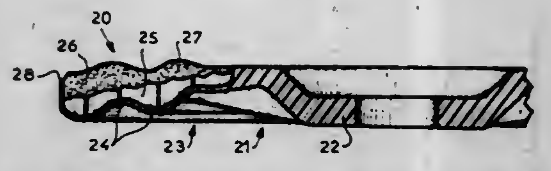
Filed May 16, 1973, Ser. No. 360,802

Claims priority, application France, May 17, 1972, 72.17665; May 8, 1973, 73.16577

Int. Cl. B24d *5/04, 5/14, 7/04*

U.S. Cl. 51—206 NF **15 Claims**





1. In an abrasive tool adapted to be mounted endwise of the shaft of a grinding machine rotatable at a high speed which tool includes a central support section of discoidal shape adapted to be centered upon and secured to said shaft and a

peripheral section carrying on one of the side faces thereof a coating of abrasive granular material bonded by an adhesive presenting a generally radially extending working surface, the improvement comprising said peripheral section of said support being a relatively thin radially extending web having a thickness in the axial direction substantially less than that of said central support section, the region between said web and said central support section defined by the thickness difference of said web and support being covered by said coating of abrasive material, at least a portion of said surface of said web having undulations of amplitude greater than the thickness of said web to provide an increase in surface area, and anchoring faces for increased retention of said coating of abrasive material, said undulations also serving to provide reinforcement of said coating against centrifugal and tangential forces which develop during operation of said machine.

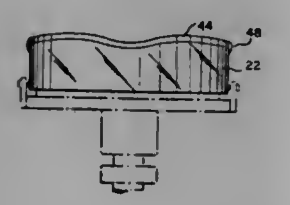
3,889,431
METHOD FOR MAKING SCHMIDT CORRECTOR LENSES

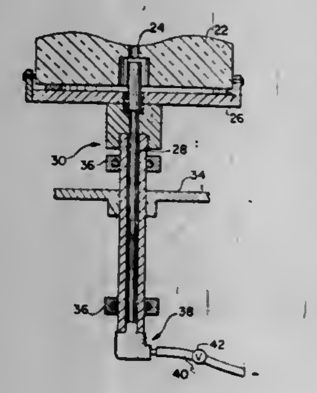
Thomas J. Johnson, Palos Verdes Estates, Calif., assignor to Celestron Pacific, Torrance, Calif.

Continuation-in-part of Ser. No. 393,846, Sept. 24, 1974, Pat. No. 3,837,125. This application Sept. 23, 1974, Ser. No. 508,794

Int. Cl.² B24B *1/00, 13/00*

U.S. Cl. 51—284 **5 Claims**





1. A method for forming a master glass template used in making Schmidt correctors, comprising:

A. cutting a thin test piece of glass so as to form shallow grooves in the surface thereof in a cartwheel pattern;
B. mounting said test piece upon a previously ground master glass template contour block having a bore therethrough and being mounted upon a grinding machine backing plate having a hollow spindle through which a vacuum may be drawn, such that the test piece grooves interface with said glass template block and intersect said bore;
C. drawing a vacuum through said grooves and between said block and test piece, so as to deform the test piece to the curve on the contour block as previously ground, vacuum forming an intimate glass-to-glass contact between block and test piece;
D. grinding the exposed surface of the test piece to a uniform accurate flatness;
E. removing and testing the test piece for accuracy of the desired inverse curve of the block;
F. marking excess glass on said test piece; and
G. further grinding and polishing said testpiece so as to remove residual errors in the contour surface thereof.

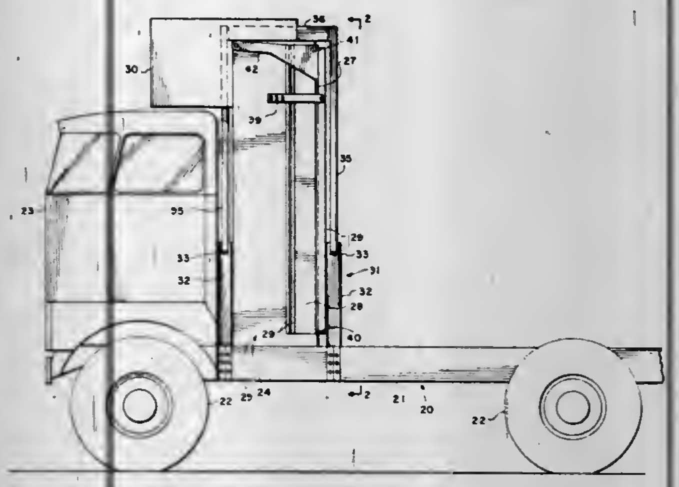
3,889,432
FOLDABLE MODULAR SHELTER UNIT REMOVABLY SECURED TO A VEHICLE

Jerry L. Geihl, 4606 Cedar Springs Rd., Dallas, Tex. 75219

Division of Ser. No. 283,829, Aug. 25, 1972, Pat. No. 3,827,198. This application Dec. 26, 1973, Ser. No. 427,444

Int. Cl. E04h *1/12*; B60p *3/34*

U.S. Cl. 52—69 **6 Claims**



1. A foldable and expandable modular shelter unit for a transportation vehicle comprising: a generally rectangular upright backwall unit; means establishing a roof, a floor, sidewalls and a frontwall; means hingedly connecting said roof, floor and sidewalls to said backwall unit for displacing said roof; floor, sidewalls and frontwall away from said backwall unit to form an expanded generally prismatic shelter room and toward said backwall unit to form a compact package; support means for said backwall unit, said support means comprising frame members of the transportation vehicle; means for releasably securing said backwall unit to said support means; linkage means connected at one end to said support means and at an opposite end to a top section of said backwall unit; and expansion means connected to said linkage means for raising said backwall unit upwardly from said support means, outwardly therefrom and downwardly upon a ground surface adjacent to the transportation vehicle.

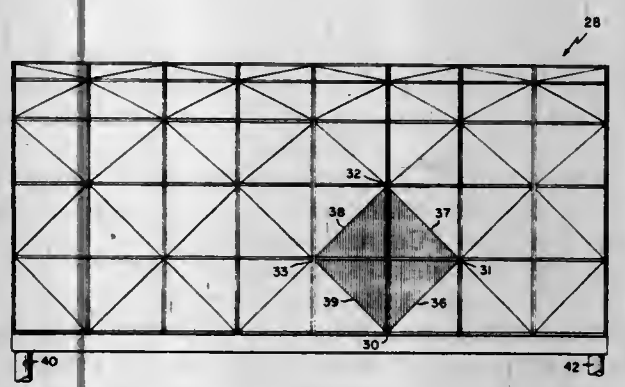
3,889,433
STRUCTURAL FRAME

Joseph P. Eubank, Jr., P.O. Box 582, 44 Laurel View Ave., Inverness, Calif. 94937

Filed July 5, 1974, Ser. No. 485,813

Int. Cl. E04b *1/32*

U.S. Cl. 52—86 **13 Claims**



1. A structural frame of an extended generally arcuate configuration comprising a plurality of frame units joined together in repeating arrangement and comprised of first strut means for taking compression forces along a pair of perpendicular axes in a plane, second strut means for taking compression forces along an axis perpendicular to said plane of said first strut means, said second strut means being spaced from one of said axes of said first strut means and intersecting the other axis of said first strut means whereby said other axis extends between said second strut means axis and said one axis of said first strut means, and means connected in tension between end portions of said second strut means and end portions of said first strut means at said one axis thereof for taking the tensile forces of said unit.

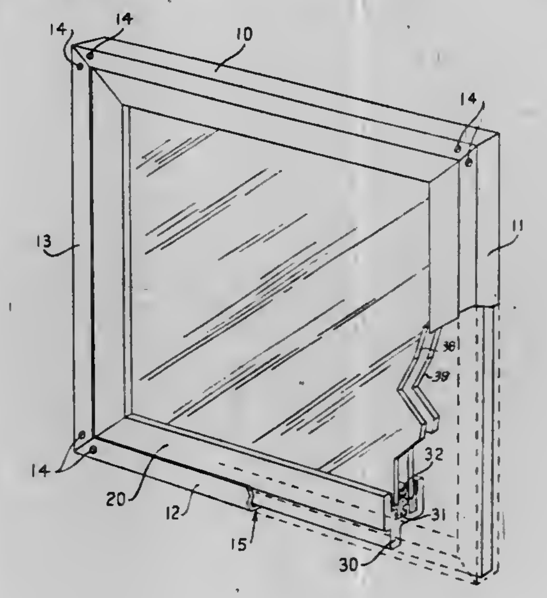
3,889,434
THERMAL GLASS STRUCTURAL DEVICE

Lyle N. Shelver, 5020 Ambrose Dr., Reno, Nev. 89502

Filed Apr. 12, 1974, Ser. No. 460,277

Int. Cl. E06b *3/28*

U.S. Cl. 52—172 **4 Claims**



1. The combination with a frame for holding a single pane of glass of: An adaptive element comprising an elongated base member having an elongated rail depending from one side thereof and perpendicular to the plane thereof, said rail being inserted in said frame in lieu of glass, a pair of elongated guides — one adjacent each edge of said base — depending from said base in the opposite direction from said rail and at a perpendicular relationship to the base, said guides being provided with serrations on their surfaces facing one another, and a pair of L-shaped projections depending from said base in the same direction as said side members, with the bases of said L-shaped members facing one another in a mirror image of such manner as to form a T-shaped cavity intermediate said members; mastic material partially filling the space between said side members; two panes of glass within said side members, one side of each pane of glass being adjacent the said serrations, the other sides of said panes of glass being at a spaced relationship from one another; an elongated hollow member containing a desicant extending the length of said panes of glass and adjacent their edges in contact with said mastic.

3,889,435
HOLD-DOWN STRUCTURE FOR ACCESSIBLE CEILING PANEL ASSEMBLY

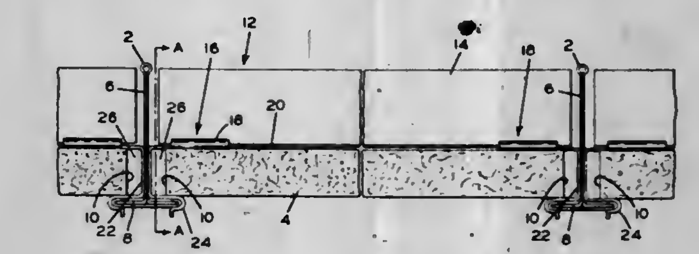
James C. Ollinger, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Oct. 26, 1973, Ser. No. 409,817

Int. Cl. E04b *5/54*

U.S. Cl. 52—489 **4 Claims**

1. A suspended ceiling system wherein there is provided at least two main runner structures of inverted T shape having a web portion and a horizontal flange portion, a ceiling panel resting upon the horizontal flanges of two adjacent main runner structures, said ceiling panel having a front side, a back side and four ends, the improvement comprising a hold-down means positioned on the back side of the ceiling panel opposite from the front side of the ceiling panel resting upon the horizontal flanges of the main runner structures, said hold-down means not providing support to the ceiling panel ends, said hold-down means having clips on the ends thereof and being locked to the main runner structures to secure the hold-down means from movement so that the ceiling panel is held in position against the horizontal flanges of the main runner structures, and means of releasing the locking relationship of the clips of the holddown means to the main runner structures so that the hold-down means and ceiling panel may be removed from the horizontal flanges of the main runner structures, and said means releasing the locking relationship being actuated from a position on the front side of the ceiling panel which rests upon the main runner horizontal flanges.



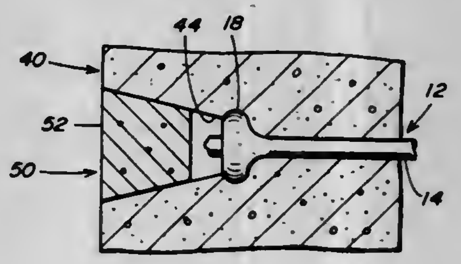
3,889,436
FINISHING PLUG

James Madison Elliott, 3509 Matador, Garland, Tex. 75042

Division of Ser. No. 365,711, May 31, 1973, which is a division of Ser. No. 264,013, June 6, 1972, Pat. No. 3,827,208. This application Oct. 21, 1974, Ser. No. 516,593

Int. Cl. E04g *23/02*

U.S. Cl. 52—514 **1 Claim**



1. In combination:

a concrete wall of the type formed by positioning assemblies including tie rods having opposed shoulders and plastic cones mounted on the opposite sides of the shoulders between forms with the plastic cones engaging the forms and the shoulders of the tie rods to maintain a spaced relationship between the forms, pouring concrete into the space between the forms, setting the concrete to form a wall, and then removing the forms and the plastic cones to expose at least one wall surface having a plurality of conical holes therein each corresponding to a removed plastic cone;

each of said conical holes in the exposed wall surface having a predetermined diameter at the wall surface, a predetermined conical taper and a predetermined depth; and

a plurality of precast concrete plugs each filling one of the conical holes in the wall surface to provide an entirely flush exposed wall surface of the concrete wall;

each of said precast concrete plugs having a flat circular end surface positioned flush with the exposed wall surface of the concrete wall and being substantially equal in diameter to the diameter of the conical holes in the wall at the wall surface, having a conical taper substantially equal to the conical taper of the conical holes in the wall, and being substantially shorter than the conical holes in the wall and thereby accommodating tie rod portions extending beyond the shoulders into the conical holes in the wall.

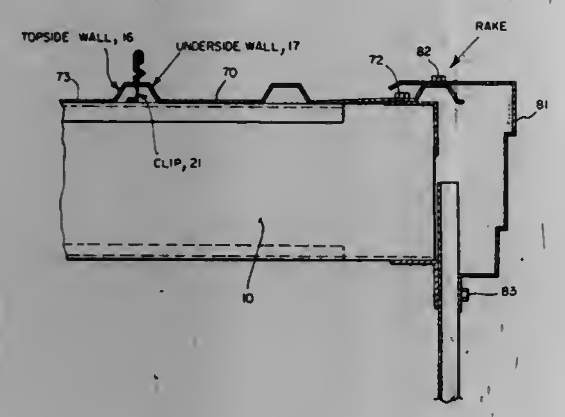
3,889,437
METAL ROOF

Donald L. Day, Guysville, Ohio; Charles H. Halstead, Poca, W. Va., and Neil F. Huck, Lowell, Ohio, assignors to Textron Inc., Providence, R.I.

Division of Ser. No. 313,754, Dec. 11, 1972. This application July 17, 1974, Ser. No. 489,135

Int. Cl.^{2} E04D *1/00*

U.S. Cl. 52—520 **10 Claims**



1. A standing seam connecting an adjacent pair of panels together, the seam being formed by interfitting topside and underside walls on the respective panels,

the first panel including an underside wall having:

a. an underside rib to be disposed adjacent to the support structure for the roof;

b. an underside leg connected to and extending upwardly from the underside rib;

c. an underside lower V-flange connected to the underside leg and extending outwardly at an oblique angle thereto;

d. an underside upper V-flange connected to the underside lower V-flange and extending outwardly and over the underside lower V-flange at an acute angle thereto;

e. an underside sealing flange having a riser section connected to the underside upper V-flange and extending upwardly therefrom and also having a crimping section connected to the riser section and extending outwardly at an acute angle thereto;

the second panel including a topside wall having:

a. a topside rib to be disposed adjacent to the supporting structure for the roof;

b. a topside leg connected to and extending upwardly from the rib and generally parallel to and substantially engaged with the underside leg;

c. a topside lower V-flange connected to the topside leg and extending outwardly at an oblique angle thereto and being substantially engaged with the underside lower V-flange;

d. a topside upper V-flange connected to the topside lower V-flange and extending outwardly and over the topside lower V-flange and at an acute angle thereto and being substantially engaged with the underside upper V-flange;

e. a topside sealing flange having a riser section connected to the topside upper V-flange and extending upwardly therefrom and being in substantial engagement with the underside riser section and also having a crimping section bent back on and in substantial firm engagement with the underside crimping section, the riser section and crimping section of the topside sealing flange forming a cover over the underside sealing flange and thereby sealing the seam against entry of water.

3,889,438
LATTICE CONSTRUCTION

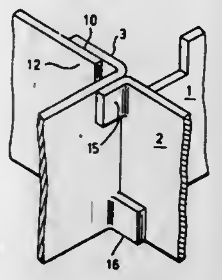
Gijsbrecht Gerhardus Piepers, Heiloo, and Christiaan Gustaaf Adolf Scholtus, Alkmaar, both of Netherlands, assignors to Reactor Centrum Nederland, The Hague, Netherlands

Filed Mar. 27, 1972, Ser. No. 238,286

Claims priority, application Netherlands, Mar. 26, 1971, 7104076

Int. Cl. E04c *2/42*

U.S. Cl. 52—668 **7 Claims**



1. A lattice, specially adapted to support a bunch of elongated components participating in a heat-exchange process, wherein said lattice comprises comb-like strips which form compartments surrounded by intersecting strips, said strips having comb-like incisions adapted to engage said strips in an intersecting manner, wherein the edges of said strips are provided on both sides with fixing lips which are bent into the plane of the lattice and are also stamped out of the edge of the strip, wherein at each incision of each strip of the lattice there is a first lip on the same edge as the incision and a second lip on the edge opposite said incision, and at each intersection of the strips said second lip of one strip extends through the incision of a second intersecting strip and is secured to said intersecting strip on the side opposite the position at which said first lip is secured.

3,889,439
DEVICE FOR HOLDING FRONT WALL OR INSIDE WALL FACINGS AS WELL AS INSIDE OR OUTSIDE FACINGS OF A CEILING IN A PRE-SET DISTANCE FROM A SUPPORTING WALL RESPECTIVELY A CEILING

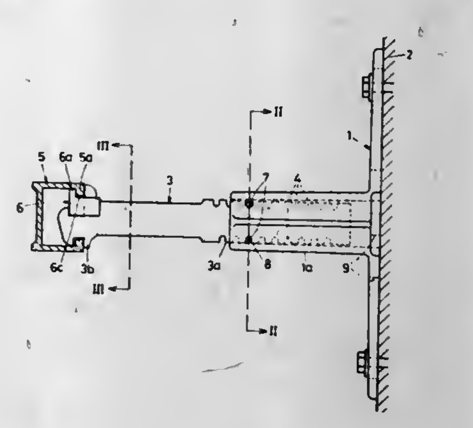
Hans Kaspar, Beinwil am See, Switzerland, assignor to Neomat AG, Switzerland

Filed June 27, 1974, Ser. No. 483,895

Claims priority, application Switzerland, June 29, 1973, 9569/73

Int. Cl. E04b *1/38*

U.S. Cl. 52—709 **5 Claims**



1. In a device for holding front or inside wall facings at a pre-set distance from a supporting wall, or for holding inside or outside facings of a ceiling at a pre-set distance from the ceiling, and of the type including a bracket fastened ot the supporting wall or the ceiling, the improvement comprising, in combination, a tube-like receiving member forming part of said bracket and arranged to extend perpendicularly outwardly from the supporting wall or ceiling on which said bracket is fastened; a compensating element having an inserting neck at one end and a bearer head at its opposite end, said inserting neck being constructed for insertion into said tube-like receiving member; said inserting neck having grooves on a pair of opposite sides thereof cooperable with means for anchoring the inserting neck in said tube-like receiving member; a U-shaped girder formed with parallel flanges having inturned lips at their outer ends; said bearer head having at least one groove therein cooperable with an inturned lip; and a wedge-like clamping bolt engageable in a groove of the bearing head and formed with a holding leg engaging the inner surface of an inturned lip of said U-shaped girder.

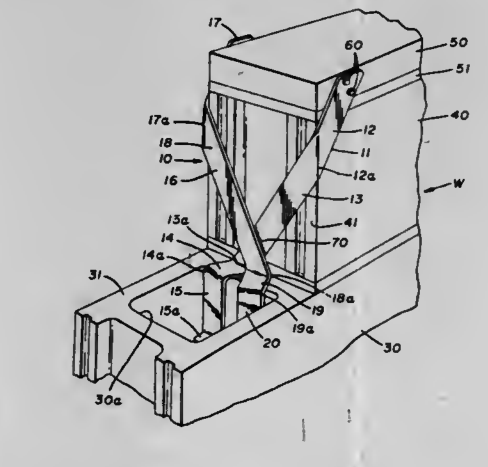
3,889,440
SILL ANCHORING MEANS

Melville B. Sutter, One Cromwell Ter., Akron, Ohio 44313

Filed Mar. 7, 1974, Ser. No. 448,813

Int. Cl. E04b *1/41*

U.S. Cl. 52—714 **6 Claims**



1. Anchoring means for securing sill plates to a brick, concrete block, or masonry wall structure comprising;

A. a first elongate rigid strap having first and second end portions;

B. a second elongate rigid strap having first and second end portions;

C. said first and second straps being immovably secured to each other in overlapping fashion intermediate their ends to form an anchoring means that is X-shaped in elevation;

D. means for securing said first end portions of said straps to the edges of the sill plate; and

E. means for securing said second end portions to the wall structure.

3,889,441
MUDSILL TIEDOWN

Eugene A. Fortine, San Leandro, Calif., assignor to Simpson Manufacturing Co., Inc., San Leandro, Calif.

Filed Apr. 22, 1974, Ser. No. 462,809

Int. Cl.^{2} E04B *1/41*

U.S. Cl. 52—715 **8 Claims**

1. A mudsill tiedown for anchorage in a concrete foundation comprising:

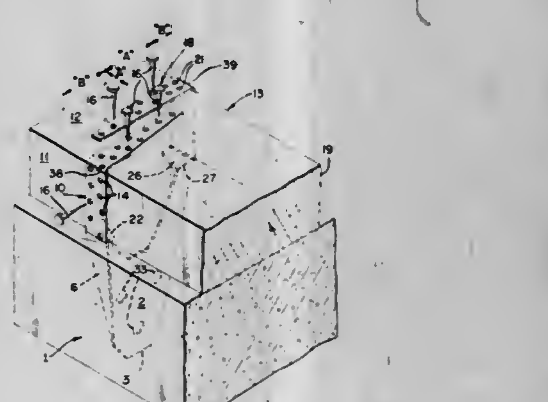
a. an integral web member having a face presented at right angles to the longitudinal axis of the mud sill tapering to a blunt pointed leading edge for embedment in said concrete foundation and presenting outer first and second diverging edges;

b. a first embedded side for embedment in said concrete foundation and integrally and angularly connected to said first edge of said web extending from adjacent said leading edge along substantially said entire diverging first web edge and having a width tapering in dimension toward said pointed edge of said web;

c. a second embedded side for embedment in said concrete foundation and integrally and angularly connected to said second edge of said web extending from adjacent said leading edge along substantially said entire diverging second web edge and having a width tapering in dimension toward said pointed edge of said web;

d. said first and second sides being in spaced diverging relation to one another:

e. a first tie member disposed at right angles to said web member and extending from said first side a distance adapted for engaging the side and a substantial portion of the top face of said mudsill in a flat face to face relationship and being formed with a plurality of spaced apertures adapted for receiving nails or other fasteners therethrough, said tie member being constructed from a malleable material to permit bending of said tie around said side edges of said mudsill;



f. a second tie member disposed at right angles to said web member and extending from said second side a distance adapted for engaging the other side and a substantial portion of the top face of said mudsill in a flat face to face relationship and being formed with a plurality of spaced apertures adapted for receiving nails or other fasteners therethrough, said tie member being constructed from a malleable material to permit bending of said tie around said other side edges of said mudsill; and

g. said web member having a width at its upper end subtantially greater than the widths of said tie members and a length equal to a substantial portion of the length of said device which is embedded in said foundation for joining said two embedded sides for a substantial portion of their respective lengths.

3,889,442
METHOD OF AND DEVICE FOR REMOVING A SHRINKABLE PLASTIC WRAPPING FROM A NUMBER OF UNITS, E.G. BOTTLES, FORMING A SUBSTANTIALLY PARALLELEPIPEDICAL BODY

Per Herbert Grahn, Hoganas, and Karl Gustav Eugen Hakansson, Odakra, both of Sweden, assignors to Aktiebolaget Platmanufaktur, Malmo, Sweden

Filed Mar. 7, 1973, Ser. No. 338,819

Claims priority, application Sweden, Mar. 13, 1972, 3154/72

Int. Cl. B65b *43/38*

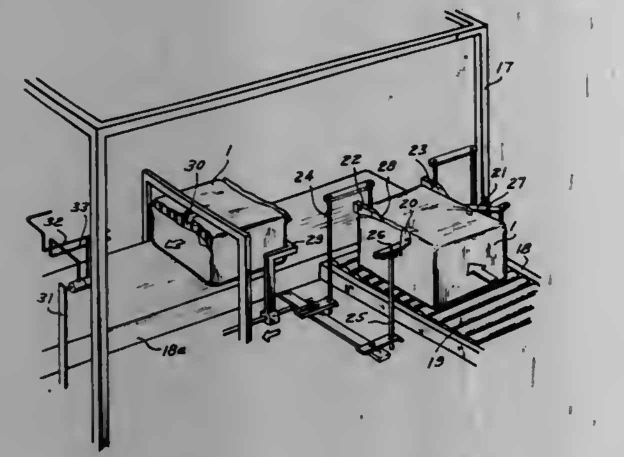
U.S. Cl. 53—3 **11 Claims**

1. A method of partly removing a wrapping of shrinkable plastics material shrunk about a plurality of units arranged in the form of a substantially rectangular package, said method comprising the steps of:

first making intermediate the top wall and the bottom wall of the wrapping in each of two opposite side walls a horizontal first cut extending the entire length of the respective two side walls and parallel to the top and bottom wall of the wrapping;

then making along each of the four corners of the wrapping a second cut extending from the top of each corner to the horizontal cuts in the side walls; and

finally making a third cut across the top wall about midway between the other two uncut side walls and continued to said side wall cuts crosswise thereto thereby dividing the top wall of the wrapping into two flaps each continued by a portion of said two opposite side walls and a wall portion of the side wall from which it extends;



whereby upon folding back of said flaps and said wall portions the upper part of the units is exposed.

3,889,443

METHOD OF FORMING A CONTAINER WITH LID FOR LIQUIDS, ESPECIALLY CARBONIZED BEVERAGES

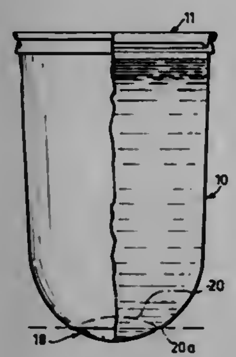
Uno Wingårdh, Morarp, Sweden, assignor to Sprinter Pack AB, Laholmsvagen, Halmstad, Sweden

Division of Ser. No. 73,298, Sept. 18, 1970, Pat. No. 3,717,274. This application Oct. 24, 1972, Ser. No. 299,873

Claims priority, application Sweden, Sept. 30, 1969, 13453/69

Int. Cl. B65d *23/00;* **B65b** *3/02, 61/00*

U.S. Cl. 53—14 **2 Claims**



1. A method for forming a container for carbonated beverages comprising the steps of:
- molding a plastic sheet to form a thin-walled conically tapered continuous side wall open at its upper widened end;
- forming a thin-walled hemispherical shaped closure portion integrally joined to the narrow lower end of said side wall to define a convex exterior bottom end;
- forming a ring-shaped deformation in said hemispherical shaped bottom portion which surrounds the central portion of said hemispherical shaped closure portion to serve as a surface for supporting said container during either filling or use;
- the thickness of said central portion being selected to enable said central portion to be pressed inwardly to form a concave exterior surface surrounded by said ring-shaped deformation and to be pressed outwardly when filled to collectively define said convex bottom end with the remaining portion of the hemispherical shaped closure portion surrounding said ring shaped deformation.

3,889,444

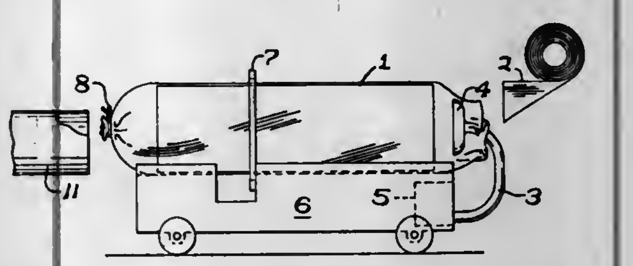
METHOD FOR PACKAGING FIBER GLASS INSULATION

Frank H. Davis, Bethel Park, Pa.; Homer O. Wolfe, Jr., Shelby, N.C., and Billy D. Clapp, Shelbyville, Ind., assignors to Certain-teed Products Corporation, Valley Forge, Pa.

Continuation of Ser. No. 322,658, Jan. 11, 1973, abandoned. This application Apr. 8, 1974, Ser. No. 463,650

Int. Cl. B65b *63/02*

U.S. Cl. 53—24 **4 Claims**



1. A method of packaging a fiberglass sheet of insulation comprising the steps of
- a. forming a fiberglass sheet of insulation into a spiral roll,
- b. positioning an airtight bag over said roll.
- c. providing a cone-like chamber within said bag against the open end of said roll, said chamber having a diameter in the range of one-fifth to one-third of the diameter of said roll,
- d. applying a vacuum from said chamber to the interior of said roll, to evacuate air therefrom to compress said spiral layer of insulation sufficient to reduce the size of said roll and insufficient to produce a permanent deformation in the insulation thickness
- e. and then restraining said roll at the compressed size whereby the thickness recovery of said restrained sheet of insulation is substantially equal to the thickness recovery of a standard non vacuum packaged roll of a sheet of insulation.

3,889,445

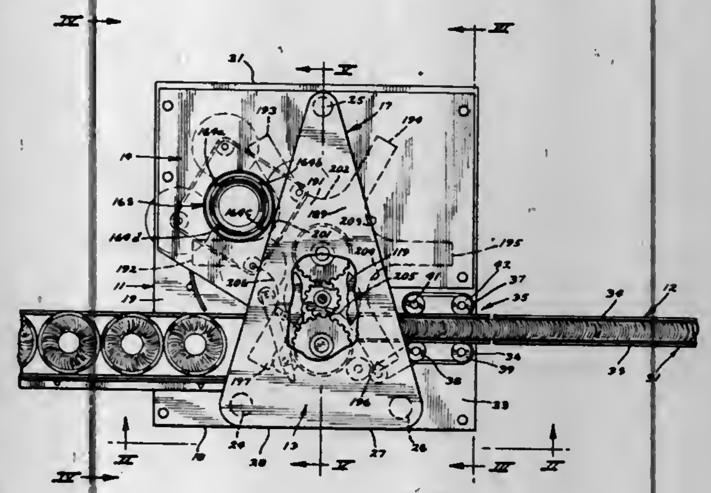
WAGON WHEEL PACKAGE LOADER

Douglas J. Brash, Minneapolis, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed June 3, 1974, Ser. No. 475,378

Int. Cl. B65b *35/44*

U.S. Cl. 53—26 **10 Claims**



10. A method for packaging chip-type snacks in a loop array package, said method comprising:
- nesting uniformly shaped chips to form a column of chips;
- moving said column of chips into a loop array;
- sequentially separating the loop array into a plurality of loop array segments; and
- sequentially inserting said segments into a container to form a loop array in said package.

3,889,446

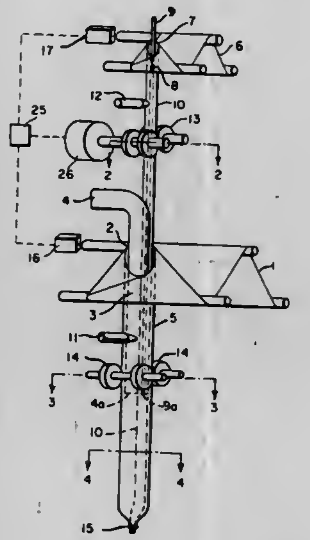
PROCESS FOR FORMING PARTITIONED FILM PACKAGES AND APPARATUS FOR USE THEREIN

Walter John Simmons, Martinsburg, and Frank Marsden Willis, Hedgeville, both of W. Va., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed June 18, 1974, Ser. No. 480,410

Int. Cl. B65b *9/12*

U.S. Cl. 53—28 **11 Claims**



1. A process for forming a series of partitioned film packages comprising:
- a. drawing a web of pliable film material into a cylindrical forming member so as to bring the web's edges together in overlapping relationship and thereby form said web into a tube, and advancing said tube through and past said forming member;
- b. feeding a layer of pliable film material through said forming member and advancing said layer within said advancing tube at a rate substantially equal to the rate of advancement of said tube;
- c. bringing said advancing tube into a confronting relationship with sealing means adapted to produce a seal between facing surface zones of said web adjacent the overlapping edges thereof in a manner such as to form, as the tube advances, a continuous linear juncture adjacent the edges of said web substantially parallel to the longitudinal axis of said tube;
- d. discharging two streams of fluent material into said advancing tube on opposite sides of said advancing layer of pliable film material, the material discharged on one side of said layer being different in composition from that discharged on the other;
- e. bringing the filled portion of said advancing tube into periodic engagement with constricting and sealing means which constricts said tube around said layer of pliable film material at spaced intervals and applies a pair of successive encircling closure means to said tube in each constricted area; and
- f. severing said tube in the constricted areas between each pair of closure means.

3,889,447

QUALITY CONTROL MONITOR FOR MEDICINAL CAPSULE PACKAGING APPARATUS

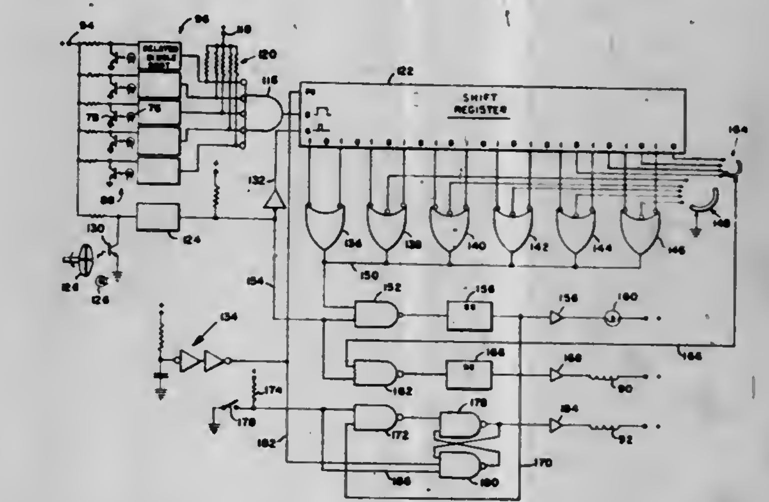
Charles R. Garris, Stratford, N.J., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 363,346, May 24, 1973. This application June 7, 1974, Ser. No. 477,195

Int. Cl. B65b *57/00*

U.S. Cl. 53—53 **3 Claims**

1. A medicinal capsule packaging apparatus comprising:
- means normally transporting packaged groups of capsules to a delivery location,
- means for inspecting the capsules in said groups and producing a signal as a group passes the inspecting means if the capsules in the group do not meet predetermined criteria,
- means, located between said inspecting means and said delivery location, and actuable by a signal to divert groups of capsules from said transporting means to a reject location,
- a multiple-state shift register connected to receive signals produced by said inspecting means and delivering said signals after a predetermined delay to said diverting



means, whereby the actuation of the diverting means is delayed for a time sufficient to allow a group of capsules which does not meet the predetermined criteria to travel from the location of the inspecting means to the location of the diverting means before the diverting means is actuated, so that acceptable groups of capsules can immediately precede an unacceptable group without being diverted and

means responsive to a predetermined set of conditions in the stages of said shift register for effecting halting of the operation of the packaging apparatus.

3,889,448

APPARATUS FOR PACKAGING EXTRUDABLE MATERIAL

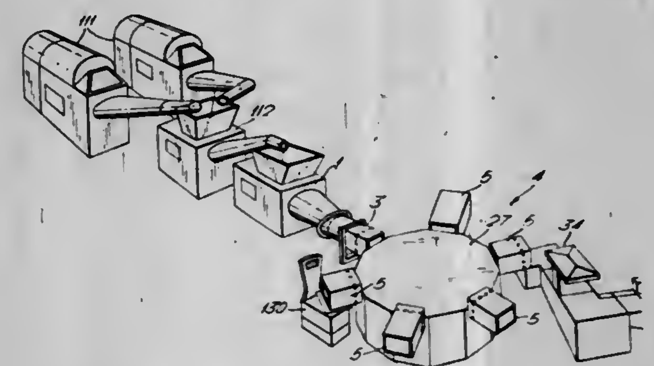
Ronald William Russell, Palmerson North, New Zealand, assignor to New Zealand Dairy Research Institute and New Zealand Dairy Board, both of Wellington, New Zealand

Filed May 23, 1973, Ser. No. 363,101

Claims priority, application New Zealand, May 23, 1972, 167261

Int. Cl. B65b *3/08*

U.S. Cl. 53—122 **12 Claims**



1. Packaging apparatus for bulk extrudable material comprising an extruding apparatus adapted to extrude a bar of extrudable material to be packaged, molding means comprising a series of molds adapted, in use, to be presented to the extruding apparatus in sequence so that the bar of material is extruded into each mold in turn as the mold is presented to the extruding apparatus, a cut-off knife adapted to cut off a block of the material being packaged from the bar, indexing means adapted to index movement of the molds so that when a mold has been filled with material, the mold will be moved to a next station where the article to be packaged is covered with a covering selected from an envelope, bag or tube, and ejecting means at a next station adapted to eject the covered block of material from the mold for sealing of the cover about the article.

3,889,449

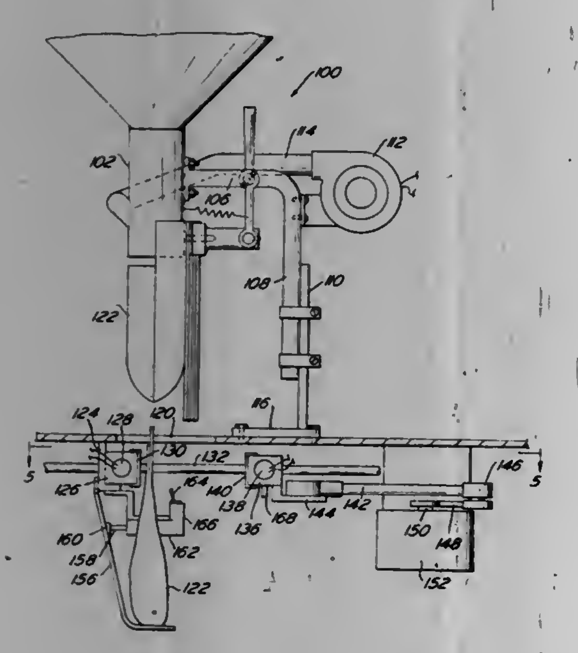
OPENING, FILLING AND SEALING DEVICE FOR THERMOPLASTIC BAGS

Hercules Membrino, 1934 Arch St., Philadelphia, Pa. 19103

Filed Sept. 10, 1973, Ser. No. 395,542

Int. Cl. B65b *1/06, 7/02, 43/33*

U.S. Cl. 53—189 **7 Claims**



1. A filling device for open-mouthed bags having a lip defining a portion of the mouth and an extending rear wall portion which extends beyond said lip, said device comprising a hollow chute having an inlet end and an outlet end, and having a predetermined cross-sectional contour, a bag support means connected to one wall portion of said chute adjacent the outlet end thereof and extending laterally outward from said one wall portion, said bag support means being constructed and arranged to support at least one of said open-mouthed bags, adjacent the extending rear wall portion thereof, in such a manner that the lip thereof is spaced from said outlet end of said chute, a clamping means outside said chute, said clamping means being movable laterally of said one wall portion of said chute and being constructed and arranged to clamp a portion of said bag, while said bag is supported by said bag support means, against said one wall portion in a manner to conform said portion of said bag to the cross-sectional contour of said one wall portion, a fluid inlet means being constructed and arranged to propel a gaseous fluid through said chute and into said bag over the lip of said bag while said portion of said bag is held against said one wall portion by said clamping means, and gaseous fluid supply means operatively connected to said fluid inlet means, said fluid inlet means comprising a channel in a second wall portion of said chute, said channel having an inlet portion connected to a conduit means extending into said second wall portion of said chute and an outlet extending laterally from said channel through a corresponding aperture in said second wall portion, said conduit means being connected to said gaseous fluid supply means.

3,889,450

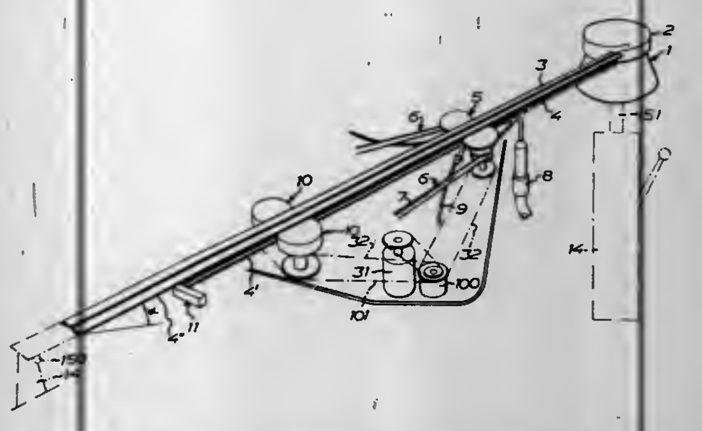
METHODS AND APPARATUSES FOR MAKING STRIPS OF NAILS FOR USE IN NAIL DRIVING TOOLS

Claes Otto Sigfrid Danielson, Malmo; Claes-Göran Staffan Andersson, Raa, and Hans-Äke Christian Gram, Helsingborg, all of Sweden, assignors to Helsingborgs Spikfabriks AB, Helsingborg, Sweden

Filed Nov. 10, 1972, Ser. No. 305,419

Int. Cl. B65b *27/10*

U.S. Cl. 53—198 R **10 Claims**



1. Apparatus for continuously producing strips of spaced fasteners, comprising in combination first guide means, means for continuously aligning individual fasteners in a row with the fasteners extending generally parallel to and spaced from each other, means for moving said aligned fasteners along a path determined by said first guide means tape applying and securing means for applying tape means in engagement with said aligned fasteners in the longitudinal direction of the row and for securing together said tape means and aligned fasteners for producing a web of fasteners fixed in space relationship by said tape means, means for moving said web along a path from said tape applying and securing means, to a cutting means, said cutting means cutting said moving web into individual strips, second means for moving said individual strips to a stacking station, the apparatus further comprising strip catching and stacking means located at said stacking station for catching each of said strips received from said second means and stacking it in a stack at said stacking station, said strip catching and stacking means being adapted to selectively release said strips and turn each released strip around an axis parallel with the longitudinal axis of said strip to stack every second strip on its right side and the other strips on their left side in said stack, wherein said strip catching and stacking means includes second guide means receiving said strips from said second means moving said strips, said second guide means being movably mounted to move between a first position supporting said strips within said second guide means and a second position wherein said strips are released to fall by gravity from said second guide means, and third means actuated by a one of said strips received in said second guide means and moving said second guide means respectively between first and second positions.

3,889,451

CAPPING SPINDLE FOR SECURING CLOSURES ON CONTAINERS

Daniel J. Burkhardt, Richmond, Ind., assignor to Aluminum Company of America, Alcoa Center, Pa.

Filed June 5, 1974, Ser. No. 476,480

Int. Cl. B65b *7/28;* **B67b** *3/12, 3/26*

U.S. Cl. 53—342 **10 Claims**

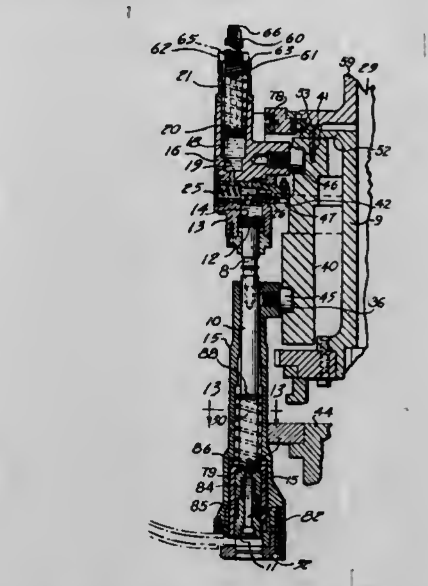
1. Apparatus for securing a closure on a container having a finish thereon comprising:

a draw die adapted to be moved upwardly with respect to a closure having an outwardly projecting protuberance on its skirt for constructing the protuberance inwardly toward a container finish to secure the closure on the container,

means for moving the draw die upwardly and downwardly with respect to a closure on a container,

a pressure block,

means for resiliently pressing said pressure block against a closure on a container, and



means for locking the pressure block in position against the closure on the container as the draw die is moved upwardly with respect to the container to secure the closure on the container.

3,889,452

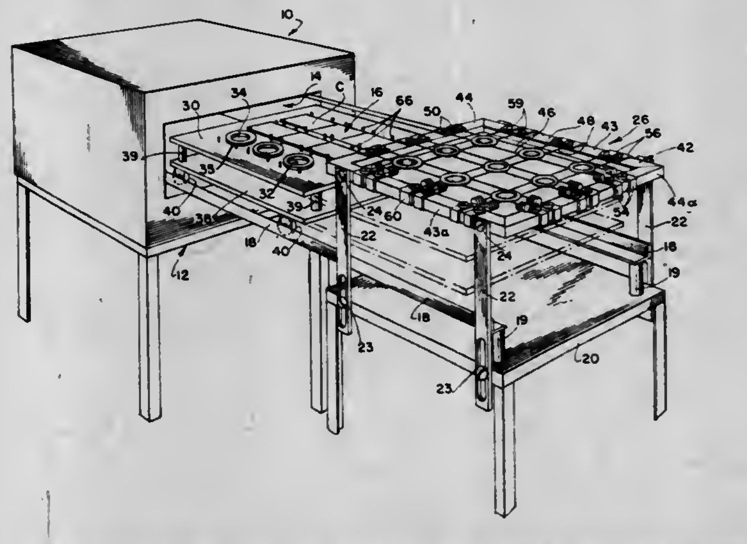
APPARATUS FOR PRELOADING A TRAY AND TRANSFERRING THE PRELOADED MATERIAL TO A SEALING FIXTURE FOR HEAT SEALING

Robert L. Loeffler, Chicago, and Ronald D. Winsor, Downers Grove, both of Ill., assignors to Package-King, Inc., Chicago, Ill.

Filed Apr. 18, 1973, Ser. No. 352,103

Int. Cl. B67b *67/00, 67/02*

U.S. Cl. 53—390 **7 Claims**



1. A preloading tray for supporting flanged bubbles for use in connection with a heat sealing apparatus and a slidably supported sealing fixture, said preloading tray positioned in spaced relation to said heat sealing apparatus with said sealing fixture between said heat sealing apparatus and said preloading tray and slidably movable into and out of said heat sealing apparatus and also under said preloading tray, said preloading tray including a frame member having a plurality of resiliently mounted spaced members connected to said frame and providing open spaces between said members, with the flanges of the bubbles positionable to rest on said spaced members with the bubble extending therebelow and adapted to support a product therein, means for mounting said sealing fixture slidably directly under said preloading tray to permit transfer of said bubble and product to said sealing fixture by moving said bubble downwardly so that the flange of the bubble passes between the spaced members so that said preloading tray remains free for subsequent preloading as said sealing fixture is moved into and out of said heat sealing apparatus.

3,889,453

MEANS FOR OPENING TUBULAR NET CUT END FOR NET BAG PACKAGING

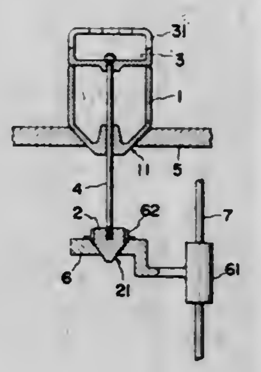
Akira Hirai, 1413 Nobidome, Niiza-shi, Saitama-ken, Japan

Filed Jan. 28, 1974, Ser. No. 437,276

Claims priority, application Japan, Jan. 29, 1973, 48-11734

Int. Cl. B65b *67/02*

U.S. Cl. 53—390 **3 Claims**



1. Means for opening tubular net cut end for net bag packaging device which comprises a guide block having in one body a main block, a lower block and an upper block, said main block being substantially cylindrical and having a conical wall face facing downwardly at the bottom portion thereof, said lower block having also a conical wall face facing downwardly at the bottom portion thereof, and said upper block being substantially cylindrical and having a diameter similar to that of said main block so that said upper block can be seated on and supported by said main block, said lower and upper blocks being connected to each other with a rod extending therebetween and through said main block slideably, a fixed arm for supporting said main block having a seat portion for engaging said conical wall face of said main block through the medium of a tubular net texture, and a movable arm for supporting said lower block having a seat portion for engaging said conical wall face of said lower block through the medium of said net texture, said movable arm being provided for running at a predetermined stroke between a lower dead point which corresponds to a position of said upper block in which is seated said upper block on said main block and an upper dead point which corresponds to a position of said upper block in which is held the net cut end open.

3,889,454

GRAPE AND JUICE RECOVERING DEVICE TO BE FITTED TO A GRAPE-GATHERING MACHINE

Alain Bruel, Domaine du Petit Chaumont, Aigues Mortes, France

Filed June 7, 1973, Ser. No. 367,904

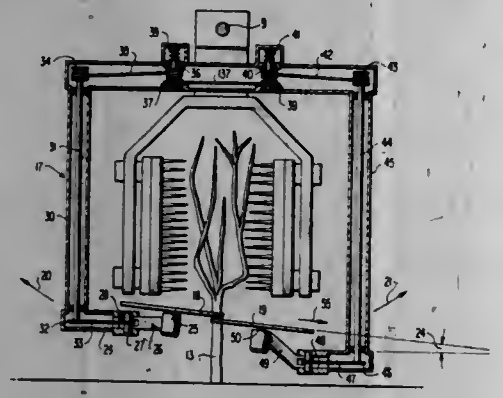
Claims priority, application France, June 7, 1972, 72.21141

Int. Cl. A01g *19/00*

U.S. Cl. 56—330 **8 Claims**

1. A grape and juice recovering device for a grape gathering machine comprising support means extending in the longitudinal direction of movement of said machine, at least one inverted U-shaped frame pivotally mounted on said support means for transverse movement with the lower ends of the two arms of the inverted U extending downwardly for disposition on opposite sides of a vine stock, a vertical pivot pin rotatably mounted on the lower end of each arm, a lever mounted on each pin at one end thereof, a freely rotatable disk mounted on the opposite end of each lever, said disks being disposed in overlapping relationship parallel to a common plane which is

disposed at a slight inclination with respect to the horizontal, each of said disks having a plurality of peripheral notches for



engaging a vine stock and transmission means interconnecting said levers for simultaneous movement in the same direction.

3,889,455

METHOD AND APPARATUS FOR IMPREGNATING STRANDED WIRES DURING STRANDING THEREOF

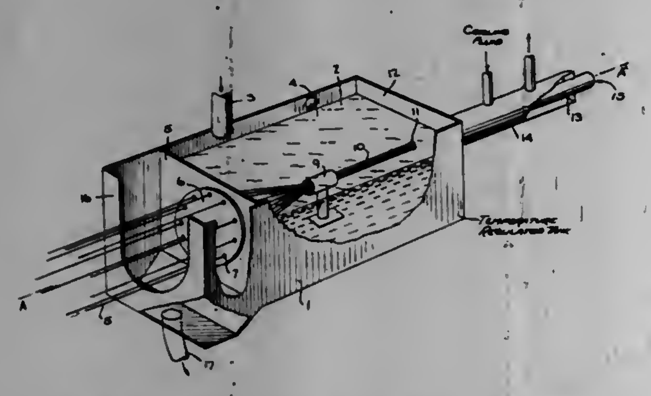
Antonio Portinari, Sesto San Giovanni, and Giovanni Alimenti, Milan, both of Italy, assignors to Industrie Pirelli Societa per Azioni, Milan, Italy

Filed July 24, 1973, Ser. No. 382,274

Claims priority, application Italy, Aug. 2, 1972, 27778/72

Int. Cl. B65h *81/08;* **H01b** *3/42, 13/24*

U.S. Cl. 57—7 **7 Claims**



4. Apparatus for cooling and filling the spaces within a strand of elongated conductive components with a water-impermeable and electrically insulating filling medium having a predetermined dropping point temperature during the twisting of the components forming said strand comprising at least one temperature regulated tank for receiving said filling medium and maintaining said medium at a temperature above said dropping point temperature and at a predetermined level, said tank having a first wall at one end of said tank and a second wall at the opposite end of said tank, said first wall having a plate portion with a plurality of holes therethrough, one for each of said components, disposed in spaced relation to each other around the center of a circle, said holes being located below said level of said medium, said second wall having a hole therethrough approximately equal but greater in size than the periphery of said strand and said hole being located below said level of said medium, at least one stranding die in said tank between said plate and said hole for receiving said components and guiding them as they are stranded at said die, said die being located below said level of said medium, a tube connected at one end to said hole and located exteriorly of said tank for receiving and guiding said strand as it leaves said tank, said tube having an internal size approximately equal to but greater in size than the periphery of said strand for smoothing and shaping the medium on said strand, and means for cooling said tube to a temperature below said dropping point temperature.

3,889,456

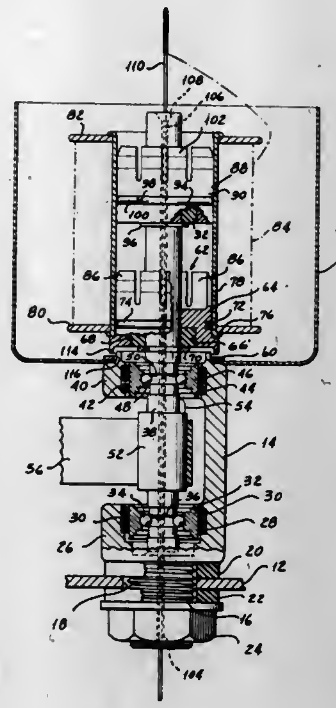
YARN COVERING SPINDLE

Lewis W. McKee, Westlake Village, Calif.; William E. Donner, Brookfield Center, Conn.; Victor B. Oliva, Danbury, Conn.; Harold R. Berglund, Newtown, Conn., and John C. Morrison, Brookfield, Conn., assignors to The Barden Corporation, Danbury, Conn.

Filed May 30, 1974, Ser. No. 474,534

Int. Cl. D01h *7/12*

U.S. Cl. 57—18 **17 Claims**



1. Apparatus for applying a covering yarn from a spool having a hub to a core yarn including in combination, a shaft having an axial bore extending therethrough for receiving said core yarn, means supporting said shaft for rotary movement, centrifugal clutch means carried by said shaft for receiving the hub of said spool, and means for driving said shaft to cause said centrifugal clutch means to couple said spool to said shaft for rotation therewith.

3,889,457

MACROFILAMENTARY YARNS

Derek Kenyon, and Donald James Wilson, both of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 6, 1969, Ser. No. 863,872

Claims priority, application United Kingdom, Oct. 11, 1968, 48328/68; Oct. 14, 1968, 48620/68; Nov. 5, 1968, 52417/68

Int. Cl. D02g *3/48*

U.S. Cl. 57—140 R **8 Claims**

1. A synthetic filamentary cord comprising a plurality of individually twisted synthetic macrofilaments which are also twisted together, each macrofilament being a monofilament having a denier in the range of 400 to 600, and wherein the twist level in the cord is between 2 and 12 turns per inch and the denier of the cord is in the range of 1,000 to 10,000.

3,889,458

ELECTRONIC CLOCK DEVICES

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co. Ltd., Tokyo, Japan

Filed Mar. 15, 1973, Ser. No. 341,583

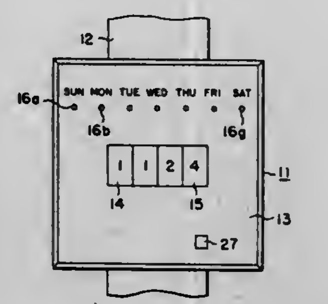
Claims priority, application Japan, Mar. 15, 1972, 47-26381; Apr. 21, 1972, 47-40086

Int. Cl. G04b *19/24, 19/30*

U.S. Cl. 58—4 A **5 Claims**

1. An electronic clock device comprising:

a clock signal generator for generating a clock signal having a highly stable frequency;
first counter means responsive to said clock signals for counting the six values of units of ten-seconds obtained from the clock signal of said clock signal generator at an interval of ten seconds, for generating outputs corresponding to said six values and for generating a stepping output every 60 seconds;
second counter means for counting units of minutes which is operated stepwisely by the stepping output of said first counter means and for generating a stepping output every 60 minutes;
third counter means for counting units of hours which is operated stepwisely by the stepping output of said second counter means and for generating a stepping output every 24 hours;



fourth counter means for counting the seven valves of the days of a week which is operated stepwisely by the stepping output of said third counter means and for generating seven output values which correspond to the respective 7 days of the week;
first display means coupled to and displaying the contents of said second and third counter means;
second to eighth display means coupled to said fourth counter means providing respective unique displays corresponding to the seven output values of the output of said fourth counter means; and
display switching means for displaying the six values of the output of said first counter means by using six display means of said second to eighth display means.

3,[illegible]

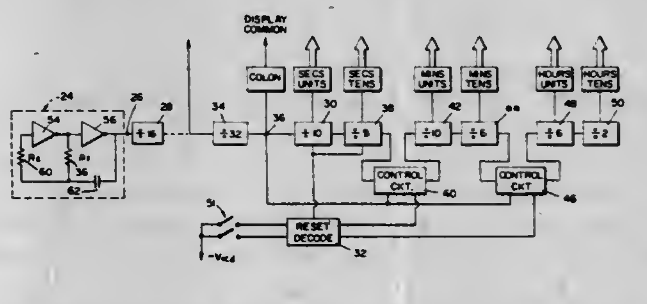
ELECTRONIC TIMEPIECE AND METHOD OF MAKING THE SAME

Sun Lu, 3 Elm St., East Setauket, N.Y. 11733

Filed June 1, 1973, Ser. No. 366,012

Int. Cl. G04c *3/00;* **G04b** *19/30*

U.S. Cl. 58—23 AC **9 Claims**



1. An electronic timepiece comprising display means for displaying time in digital readout form, a resistor-capacitor oscillator time base generator operative to produce a first train of output pulses having a preselected pulse repetition frequency, and logic circuit means connected to the output of said time base generator and operative to count down said first time base pulse train to provide second and third pulse trains having pulse repetition frequencies of one pulse per hour and one pulse per minute respectively, said time base generator and said logic circuit means being in the form of an integrated circuit mounted on said display means, said time base generator including a timing resistor comprising first and second resistors the resistance value of said first resistor being at least several times as large as the resistance value of said second resistor.

3,889,460

METHOD AND APPARATUS FOR CORRECTING TIME IN AN ELECTRONIC WRISTWATCH

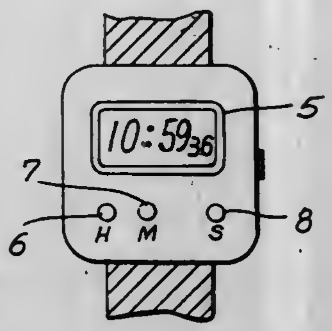
Hideaki Yasukawa, and Okito Naito, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed June 18, 1973, Ser. No. 371,084

Claims priority, application Japan, June 19, 1972, 47-61101

Int. Cl. G04c *3/00;* **G04b** *19/38, 27/00*

U.S. Cl. 58—23 R **6 Claims**



1. An electronic timepiece comprising oscillator means for producing a high frequency time standard signal, divider means for producing low frequency timing signals from said high frequency time standard signals including a plurality of series-connected divider stages, certain of said divider stages corresponding to seconds display, means for the digital display of time in response to said timing signals, said digital display means displaying at least seconds and minutes, said seconds divider stages providing a substantially square-wave output signal having a period of 1 minute to the next divider stage, and correction means for applying a reset signal to said certain divider stages which correspond to the incorrect time displayed, said correction means being adapted to set the second digital display to zero without affecting the minute digital display when said reset signal is applied to said certain dividers during the first half cycle of said output signal when the seconds digital display means is 30 or less and to set the second digital display to zero and increase the minute digital display by one when said reset signal is applied to said certain dividers during the second half cycle of said output signal when said seconds digital display read more than 30.

2. An electronic timepiece as claimed in claim 1, wherein said certain divider stages are a 1/6 divider stage corresponding to a 1-second display and ⅕ and ½ divider stages corresponding to a 10-second display.

3,889,461

MASTER CLOCK WITH ELECTRONIC MEMORY

Raymond Marti, Meyrin, Geneva, and Olivier Chanson, Avully, Geneva, both of Switzerland, assignors to Patek Philippe S.A., Geneva, Switzerland

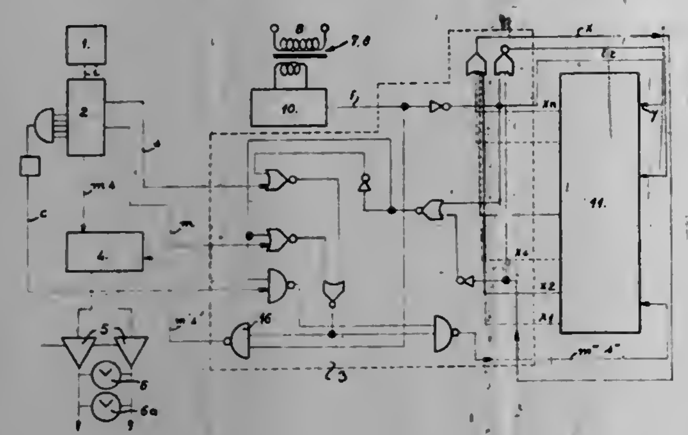
Filed Oct. 19, 1973, Ser. No. 407,963

Int. Cl. G04b *1/00*

U.S. Cl. 58—25 **2 Claims**

1. In a master clock comprising an oscillator, a divider connected to the output of said oscillator, a signal shaper, an output amplifier receiving signals from said signal shaper, and means to supply power to the clock from a power circuit through a battery to said oscillator and divider and shaper and directly to the rest of the clock; the improvement comprising a voltage detector for said circuit, a memory and a logic device receiving signals from the voltage detector and transmitting signals to said signal shaper, said logic device having means switching the output of the divider from the signal shaper to the memory when the circuit voltage falls below a predetermined value, said logic device also having means

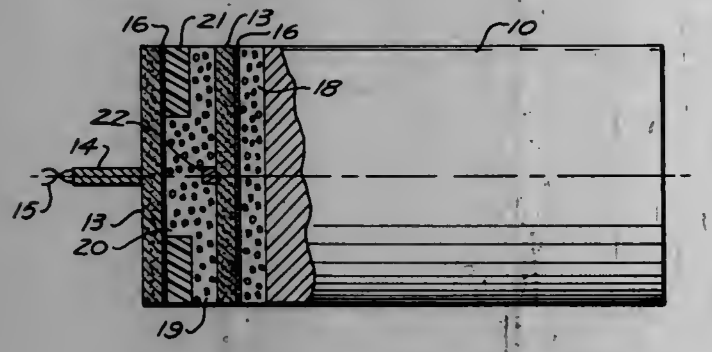
responsive to re-establishment of voltage in said circuit above said predetermined value to feed out signals stored in said memory to said signal shaper at a faster rate than their rate of storage.



3,889,462
CONSUMABLE DETONATION REACTION ENGINE AND SYSTEM

Rudi Beichel, Sacramento, and Charles J. O'Brien, Citrus Heights, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed Apr. 22, 1971, Ser. No. 136,368
Int. Cl. F02k *9/04, 9/06*
U.S. Cl. 60—250 **14 Claims**

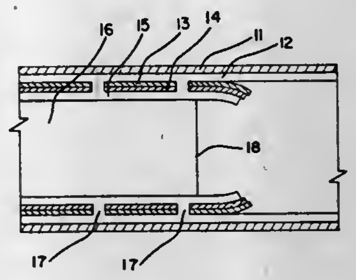


1. A consumable detonation-reaction engine adapted to be mounted on the end of a payload, said engine comprising a plurality of stages arranged in tandem along an axis extending in the direction of forward impulse, each said stage comprising:
- an explosive member;
- means adapted to said explosive member for detonating the explosive;
- a flame-front-filtering means in front of the explosive member for restricting propagation of the flame front through it in the forward direction; and
- a shock-wave-attenuating means in front of the filtering means and comprising a structure of air impregnated foam material having a predetermined compressibility substantially mismatching the compressibility of the explosive member, and the flame front filtering means for reducing the impulse of the shock wave passing forwardly through it and more evenly planarly distributing said impulse.

3,889,463
STRESS RELIEVING LINER

Anthony San Miguel, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 27, 1974, Ser. No. 483,595
Int. Cl. F02k *9/04*
U.S. Cl. 60—255 **5 Claims**

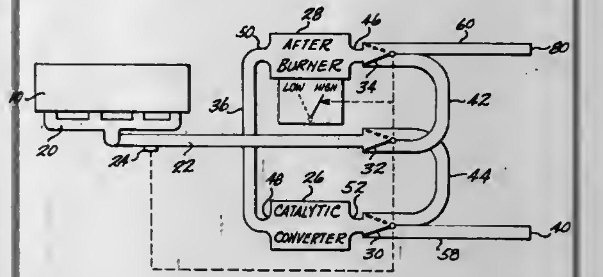


1. In a stress relieving liner for a rocket motor comprising: an insulator layer adjacent to the motor casing and bonded thereto;
- a perforated release layer inside of the insulator layer;
- an inhibitor layer inside of and adjacent to the release layer and columns extending through the perforations in the perforated release layer bonding the insulator layer and inhibitor layer to one another;
- the improvement residing in a perforated layer of heat shrinkable material between and adjacent to the insulator layer and release layer;
- the perforations in said perforated layer of heat shrinkable material corresponding to the perforations in the perforated release layer so that the columns which bond the insulator layer and inhibitor layer together can extend through both the layer of heat shrinkable material and the release layer.

3,889,464
EXHAUST EMISSION CONTROL SYSTEMS AND DEVICES

Conrad O. Gardner, 22905 108th West, Edmonds, Wash. 98020

Filed Dec. 20, 1973, Ser. No. 426,516
Int. Cl. F01n *3/14*
U.S. Cl. 60—286 **2 Claims**



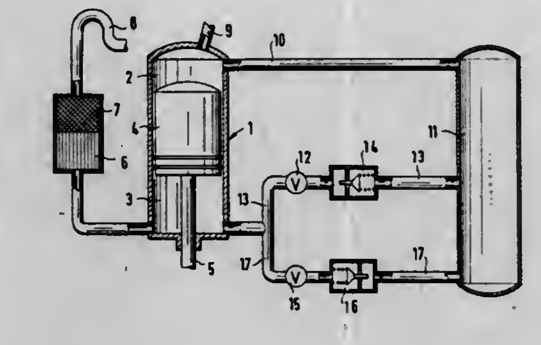
1. In combination in an internal combustion engine power plant having a combustion chamber, exhaust manifold, and an exhaust passage for exhaust gas flow from said exhaust manifold to the atmosphere:
- a catalytic converter coupled in series with said exhaust passage effective to cause reaction of exhaust gas constituents flowing therethrough when the temperature of said catalytic converter is above a predetermined temperature level to thereby prevent emission of said constituents to the atmosphere;
- an exhaust gas afterburner coupled in series with said exhaust passage downstream from said catalytic converter;
- means coupled to said afterburner for heating exhaust gas in said exhaust passage upstream from said catalytic converter to a temperature level greater than said predetermined temperature; and,

- said means coupled to said afterburner comprising;
  - temperature sensing means responsive to the temperature of exhaust gas in said exhaust passage upstream from said catalytic converter; and,
  - duct means responsive to said temperature sensing means for coupling said afterburner in said exhaust passage upstream from said catalytic converter when the temperature sensed by said temperature sensing means is below said predetermined temperature, said duct means including means for reversing the exhaust flow path through said exhaust gas afterburner and said catalytic converter; and,
- means for switching said afterburner to a lower temperature when the temperature sensed is below said predetermined temperature and switching said afterburner to a higher temperature in response to detection of exhaust gas temperature above said predetermined temperature.

3,889,465
APPARATUS FOR CONTROLLING THE POWER OF A HOT-GAS PISTON ENGINE

Falk Gartner, Mannheim, Germany, assignor to Motoren-Werke Mannheim AG

Filed June 24, 1974, Ser. No. 482,162
Claims priority, application Germany, June 25, 1973, 2332192
Int. Cl. F03g *7/06;* **F25b** *9/00*
U.S. Cl. 60—521 **9 Claims**

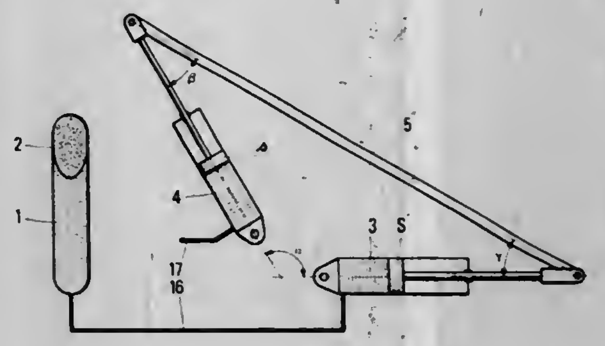


1. An apparatus for controlling the power of a hot-gas piston engine having a hot chamber and a separate cold chamber per cylinder; a piston displaceable in said cylinder for selectively and alternately increasing and reducing in size said chambers; a flow path for selectively connecting said hot chamber with said cold chamber of the same engine cylinder, and with another cylinder operating in a phase-displaced manner; said flow path including in succession a heater, a regenerator and a cooling device; a container operatively connected with said chambers; a flow-restricting conduit for connecting said hot chamber with said container; and two non-return valves for selectively connecting the interior of said container with said cold chamber; whereby the engine power is increased by connecting said interior with said cold chamber by way of one of said valves, which allows flow from said hot chamber by way of said container into said cold chamber, whereas the power is reduced when said interior is connected with said cold chamber by way of the other one of said valves, which allows flow from said cold chamber by way of said container into said hot chamber.

3,889,466
DEVICE FOR MAINTAINING A WORKING FLUID UNDER A PREDETERMINED PRESSURE

Andre Castela, Le Mesnil Le Roi, and Philippe Joubert, Meudon La Foret, both of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, France

Filed May 2, 1973, Ser. No. 356,435
Claims priority, application France, May 2, 1972, 72.16071; June 23, 1972, 72.22953; June 23, 1972, 72.22954
Int. Cl. F15b *7/00*
U.S. Cl. 60—533 **18 Claims**

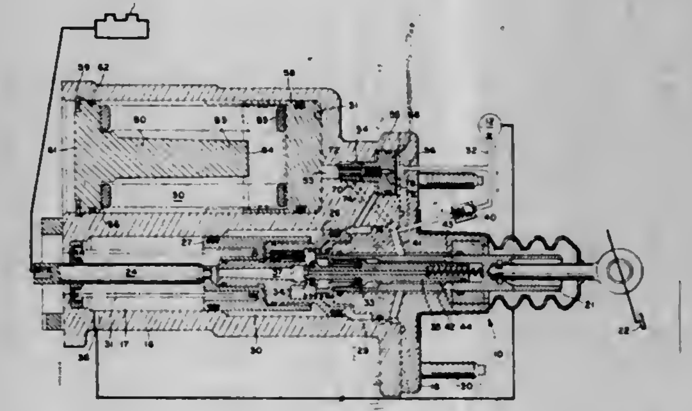


1. A device for maintaining a working fluid in a pipe under a determined pressure, making use of a source of pressurized auxiliary fluid in communication with a chamber of variable volume, in which the pressure of the auxiliary fluid varies in inverse proportion with respect to the volume of the chamber, said said comprising an assembly of at least two jacks, each of said two jacks being disposed at an angle with respect to one another, and each of said two jacks comprising two elements, said two elements including a cylinder and a piston rod; and at least one rigid connecting rod joining at least respective first elements of said two elements of each of fsaid two jacks of said assembly, the cylinder of a first jack of said two jacks of said assembly being connected to the source of pressurized auxiliary fluid and forming the chamber of variable volume, and the cylinder of a second jack of said two jacks of said assembly supplying a pipe with working fluid.

3,889,467
ACCUMULATOR ARRANGEMENT FOR A BOOSTER BRAKE MECHANISM

Herman M. Huffman, Owosso; Kenneth B. Swanson, Bannister, and Kenneth D. Jensen, Owosso, all of Mich., assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed June 24, 1974, Ser. No. 482,482
Int. Cl. F15b *7/00*
U.S. Cl. 60—548 **13 Claims**



1. A booster mechanism operable by a source of fluid capable of supplying minimum pressure and a higher operating pressure to the booster mechanism, said mechanism comprising:
- a housing having a longitudinally extending cavity therein, an input member extending into said cavity at one end

thereof and an output member extending from said cavity at its opposite end;

piston means between said input and output members for moving said output member in response to movement of said input member, said piston means including a power chamber at one side thereof;

inlet and outlet valve means associated with said input member within said cavity and operable upon inward movement of said input member to provide fluid communication between said source at operating pressure and said power chamber for actuating said piston means;

accumulator chamber means associated with said housing operable to store a predetermined volume of fluid;

dump valve means interposed between said accumulator chamber means and said source of pressure and check valve means associated with said dump valve means;

said check valve means operable to provide fluid communication between said source and said accumulator chamber means for charging said accumulator chamber when said source is at operating pressure while preventing fluid communication between said accumulator chamber means and said source when the fluid within accumulator chamber means is at a pressure greater than said minimum pressure of said source,

said dump valve means operably biased by the pressure from the fluid within said accumulator chamber means towards a first position and operably biased by the pressure from said source

towards a second position; and

first passage means within said housing providing fluid communication between said inlet and outlet valving means and said accumulator chamber means when said dump valve means is in its first position while preventing communication therebetween when said dump valve means is in its second position.

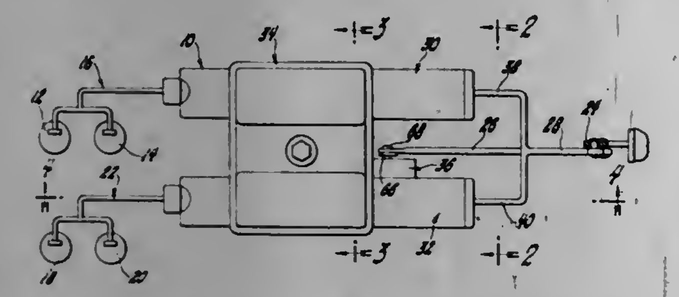
3,889,468
POWER BOOSTER AND MASTER CYLINDER ASSEMBLY

Larry D. Blumer, Gaines, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 4, 1974, Ser. No. 447,737

Int. Cl. F15b *7/00*

U.S. Cl. 60—548 **3 Claims**



1. A booster and master cylinder assembly comprising:

a housing having axially extending bore means therein, first piston means reciprocably received in said bore means and defining therewith fluid pressurizing chamber means; second piston means reciprocably received in said bore means in force transmitting relation with said first piston means and defining with said bore means fluid power chamber means;

said housing further having a cylindrical valve chamber formed therein with the axis thereof skew to said axially extending bore means, a power pressure inlet port and an outlet port and a fluid passage communicating with said cylindrical valve chamber in circumferentially spaced relation, said fluid passage also communicating with said fluid power chamber means;

and a rotary valve member mounted in said valve chamber for controlled rotational movement about the chamber axis to selectively and controllably fluid connect said passage to one of or neither of said ports to deliver and modulate and remove power pressure to and from said fluid power chamber means to move said second piston means and said first piston means to selectively pressurize and modulate and reduce fluid pressure in said fluid pressurizing chamber means;

said valve member having an axially extending chamber positioned centrally thereof; circumferentially spaced peripheral chamber walls cooperating with said valve chamber to define first, second, and third peripherally spaced chambers respectively associated with said inlet port, said outlet port, and said fluid passage; and first, second and third valve passages therein respectively providing continuous fluid communication between said axially extending chamber and said first, second and third peripherally spaced chambers; the lateral chamber walls of said second and third peripherally spaced chamber converging to define said second and third peripherally spaced chambers as variable restrictions to fluid flow therethrough with rotary valve movements in the brake apply and release directions modifying the restrictions to fluid flow in cooperation with said outlet port and said fluid passage.

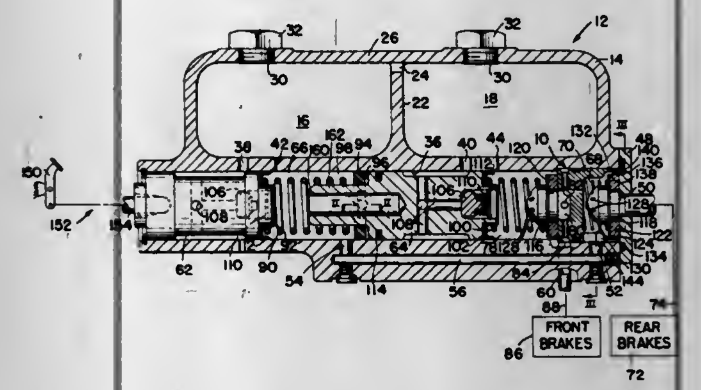
3,889,469
TANDEM MASTER CYLINDER WITH IN-LINE CHECK VALVES

John R. Cryder, Joliet, and Lowell R. Hall, Manhattan, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 21, 1974, Ser. No. 434,778

Int. Cl. F15b *7/00*

U.S. Cl. 60—562 **10 Claims**



1. A tandem master cylinder assembly for a dual brake system, said assembly comprising:

a housing having an elongated cylindrical bore formed therein, said bore having a first end and a second end;

a fluid reservoir adjacent said bore and communicating therewith;

first and second pistons axially reciprocably mounted in said bore for movement in a forward direction toward said first end and a rearward direction toward said second end and operative upon movement in said forward direction to pressurize fluid within said cylinder ahead of said respective pistons, said pistons dividing said bore into first and second chambers;

first and second outlet means for separately communicating pressurized fluid from each of said first and second chambers; and,

first and second check valve means disposed along the axis of said bore at said first end for separately controlling said outlets.

3,889,470
METHOD OF IMPROVING THE POWER CYCLE EFFICIENCY OF A STEAM TURBINE FOR SUPERCRITICAL STEAM CONDITIONS

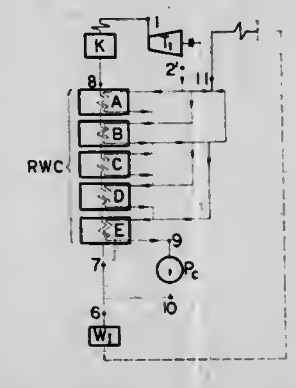
Robert Szewalski, Gdansk-Wrzeszcz, Poland, assignor to Polska Akademia Nauk Instytut Maszyn Przeplywowych, Gdansk, Poland

Filed June 8, 1973, Ser. No. 368,122

Claims priority, application Poland, June 10, 1972, 155928

Int. Cl. F01k *7/40*

U.S. Cl. 60—647 **4 Claims**



1. A method of improving the efficiency of the power cycle of a steam turbine for initial supercritical steam conditions comprising the steps of expanding the working fluid from the initial supercritical steam conditions to a lower pressure which is higher than the critical pressure; dividing the working fluid into two streams; cooling one stream in a high temperature regenerative heat exchanger as a heating stream for yielding its heat to a feed water stream passing through the heat exchanger and constituting a heated stream; further expanding the other of said two streams in the turbine; mixing thereafter said one stream after it has passed through the exchanger with said other stream after it has been further expanded to constitute the feed water stream entering the regenerative heat exchanger;

the high temperature regenerative heat exchanger being divided into a number of successive sections and varying the ratio of the mass flow rates of the heated stream to the heating stream in successive sections in said heat exchanger in stepped manner to provide substantially constant temperature differences between the two streams in the sections of the heat exchanger by selectively dividing a part of one of the streams from one section of the heat exchanger to another.

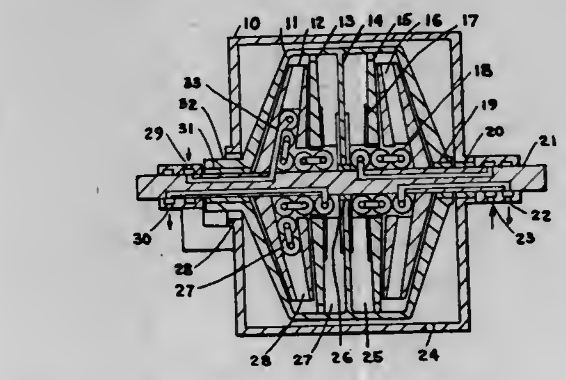
3,889,471
DUAL ROTOR DUAL FLUID TURBINE

Michael Eskell, 7994-41 Locke Lee, Houston, Tex. 77042

Filed Nov. 6, 1973, Ser. No. 413,258

Int. Cl. F01k *25/00, 23/02*

U.S. Cl. 60—655 **3 Claims**



3. A method for generating power comprising:

a. passing two gaseous fluids in heat exchange relationship with each other during and after compression within a rotating centrifuge; with one of said fluids receiving heat the other fluid having heat removed;

b. expanding both fluids within a second rotor with extraction of work;

c. adding heat to one of said fluids in a heat exchanger during and after expansion by circulating a heat exchange fluid within said heat exchanger for adding said heat; said heat exchange fluid being the fluid releasing heat to said other fluid during said compression.

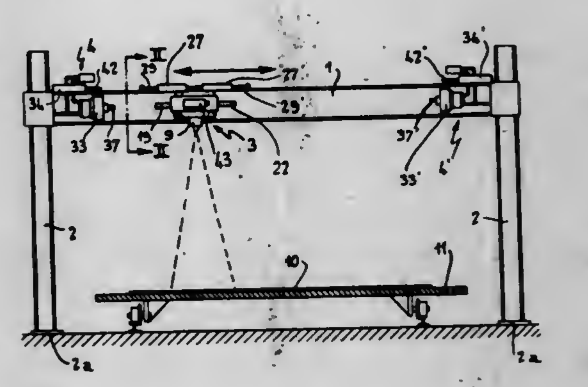
3,889,472
RECIPROCATING APPARATUS

Michel Guillaud, Grenoble, France, assignor to Secmer, S.A., Isere, France

Filed June 18, 1973, Ser. No. 370,639

Int. Cl. F01b *7/02*

U.S. Cl. 60—698 **6 Claims**



1. Apparatus for reciprocating a carriage which is mounted to move freely to and fro between two extreme positions upon a traverse girder, said apparatus comprising:

a. a source of fluid under pressure;

b. on the girder at each of said extreme positions a fluid impulse mechanism operative to deliver thrust to said carriage when it reaches the extreme position to cause it to travel by inertia to the opposite extreme position; and valve means coupled between said source and each impulse mechanism and operative when actuated to deliver fluid pressure to the impulse mechanism;

c. on said carriage arm means located to actuate the valve means when the carriage reaches each of said extreme positions thereby to pressurize the adjacent impulse mechanism, and said carriage comprising a body having a bore extending therethrough and aligned with said fluid impulse mechanism, a pair of axially aligned gudgeon pins extending from both sides of the body and reciprocably captivated in the bore and disposed respectively to receive the thrust from one of said impulse mechanisms, and spring means in the bore urging the pins outwardly thereof, whereby the pins cushion the impact of the impulse mechanisms.

3,889,473
GEOTHERMAL CHANNEL AND HARBOR ICE CONTROL SYSTEM

Allen T. Van Huisen, 29456 Indian Valley Rd., Rolling Hills Estates, Calif. 90274

Division of Ser. No. 220,801, Jan. 26, 1972, Pat. No. 3,807,491. This application Mar. 8, 1974, Ser. No. 449,351

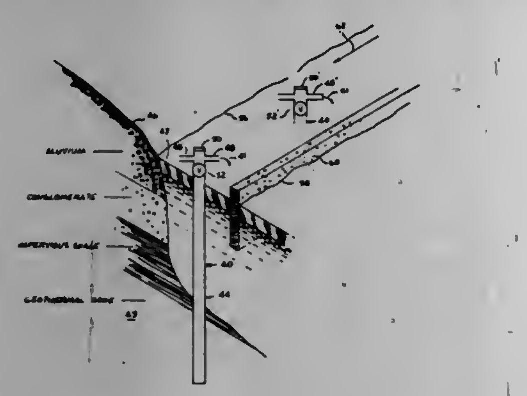
Int. Cl. E02b *5/04, 3/00*

U.S. Cl. 61—1 R **9 Claims**

1. A method of forming an open shipping channel between two navigable bodies of water separated by a frozen ice barrier comprising the steps of:

drilling a plurality of geothermal wells through the surface of the earth lying beneath the ice and water into a deep, hot rock geothermal subsurface strata spaced along a route joining the bodies of water;

transferring heated fluid at a temperature of at least 100°F from the lower hot end of each well to a surface of the frozen ice barrier in an amount sufficient to melt the frozen ice barrier until the frozen ice barrier melts to form a water filled channel joining the wells and the bodies of water into a continuous open, navigable shipping channel at least 80 feet in width; and lining at least one side of the channel with a wall of thermal insulating material, extending above the wave and water line.



3,889,474

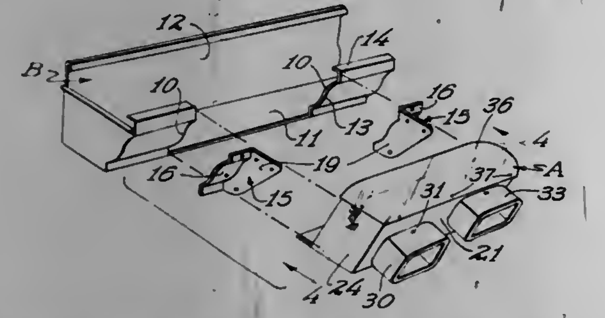
RAIN GUTTER ATTACHMENTS

Alvin W. Frangmeler, 1042 Jenks, St. Paul, Minn. 55104

Filed Aug. 27, 1973, Ser. No. 391,788

Int. Cl. E02b *9/04;* **E04d** *13/06*

U.S. Cl. 61—14 **9 Claims**



1. A rain gutter attachment for use in conjunction with a rain gutter having a rear wall, a bottom wall, and a front wall, a portion of said front wall being cut away to provide a notch, angular clips including one flange having a contour to fit the contour of said front wall of said gutter, and a second right angularly extending flange extending forwardly from the front wall of said gutter, an enclosure having a rear wall, a front wall, and a parallel end wall connecting each of the ends of said front and rear walls of said enclosure, means securing the end walls of said enclosure to the second flanges of said clips, said rear wall of said enclosure including a lower inlet opening, the lower edge of which is adjacent to the bottom wall of said gutter, said rear wall of said enclosure communicating with the rain gutter, said rear wall having an upper inlet opening therethrough near the upper extremity of said rear wall, conduit means within said enclosure communicative with each of said upper and lower inlet openings, and means for connecting each said conduit means to a downspout.

3,889,475

MINE ROOF SUPPORTS

Archelaius Dawson Allen, Leyland, England, assignor to Gullick Dobson Limited, Lancashire, England

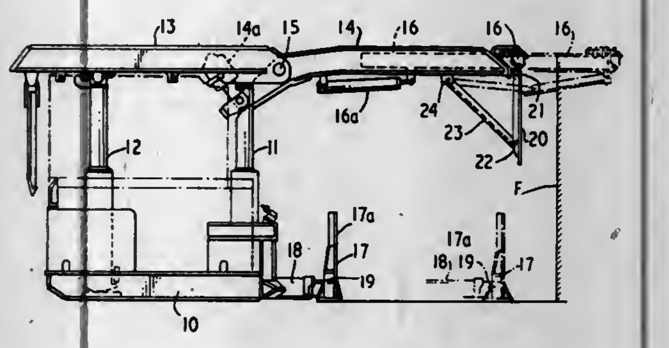
Filed Dec. 28, 1973, Ser. No. 429,674

Claims priority, application United Kingdom, Jan. 26, 1973, 3974/73

Int. Cl. E21d *15/44*

U.S. Cl. 61—45 D **5 Claims**

1. A mine roof support having a first roof-engaging structure, a second roof-engaging structure slidable with respect to said first roof-engaging structure to form an extension thereof, pressure-fluid-operated ram means connected to said second roof-engaging structure for effecting sliding movement thereof with respect to said first roof-engaging structure and an anti-spalling baffle pivotally connected to said second roof-engaging structure, a link arrangement pivotally connected at one end to said first roof-engaging structure and at its opposite end to a point on said baffle spaced from the pivotal connection of said baffle to said second roof-engaging structure whereby upon operation of said ram means to retract said second roof-engaging structure from extended state said baffle is pivoted into an operative position in which it depends substantially vertically from said second roof-engaging structure and upon operation of said ram means to extend said second roof-engaging structure said baffle is pivoted into a stowed position in which it lies along said second roof-engaging structure.



3,889,476

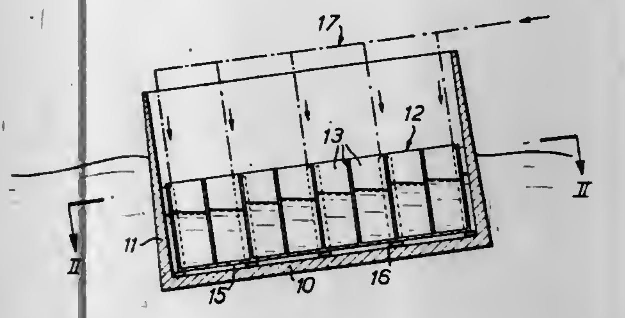
SUBMERSIBLE CAISSONS AND THEIR APPLICATIONS

Gerald Gerin, 41 Avenue Egle, Maisons-Lafitte, France (78600)

Filed Feb. 2, 1973, Ser. No. 329,087

Int. Cl. E02d *5/00, 23/02*

U.S. Cl. 61—46 **19 Claims**



1. An offshore caisson of prestressed reinforced concrete for use in the construction of sea or river works, comprising a sea-worthy structure including a bottom, at least one lateral wall, and means for dividing up liquid ballast in the caisson comprising, in section substantially parallel to the bottom, a cellular structure independent of said wall and said bottom, and means supporting said cellular structure in spaced relation from said wall and said bottom.

3,889,477

CRUDE OIL OFFSHORE STORAGE VESSEL

William A. Tam, Warrenville, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Jan. 28, 1974, Ser. No. 436,905

Int. Cl.² B65G *5/00;* **B65D** *89/10*

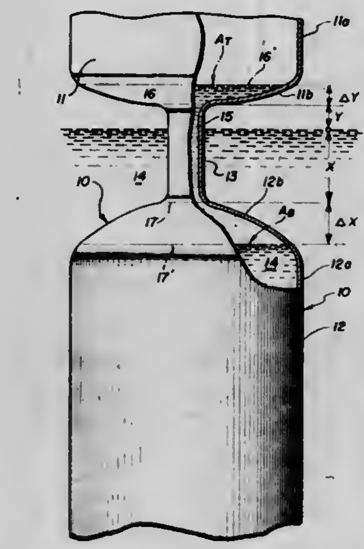
U.S. Cl. 61—46.5 **10 Claims**

1. A self-ballasting offshore storage tank of the water-displacement type for the storage of a liquid lighter than and immiscible with water comprising:

a vertically elongaged continuous enclosure open at the bottom for ingress and egress of water;

means for positioning said tank at a substantially fixed level relative to the surface of a body of water in which said tank is situated, when said tank contains only water filling the lower portion of said enclosure up to the level of the surrounding body of water;

said continuous enclosure having an upper section which extends above the surface of said body of water and a lower section which is always submerged;



said enclosure having a cross-sectional area which has a minimum value at the junction between said upper and lower sections, each of said sections having a respective maximum cross-sectional area larger than said minimum value, said area varying above and below said junction in a manner such that the upper and lower interfacial surfaces of a body of said liquid stored in said enclosure remain substantially equal regardless of the quantity of said liquid.

3,889,478

VEHICLE GUIDANCE

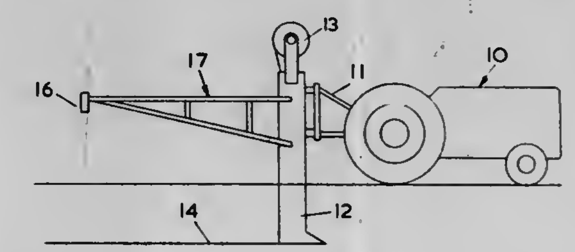
Leonard Marshall, Fleet, England, assignor to C.A.V. Limited, Birmingham, England

Filed Dec. 28, 1973, Ser. No. 431,324

Claims priority, application United Kingdom, Dec. 29, 1972, 59997/72

Int. Cl. F16l *1/00;* **G08b** *21/00*

U.S. Cl. 61—72.6 **15 Claims**



1. A method of laying a guidance conductor of the kind intended to be used in a vehicle guidance system comprises first laying a short length of conductor to a high degree of accuracy, passing an electric current through the conductor, laying the remaining length of conductor using a wire laying vehicle and guiding the path followed by the wire laying vehicle using a guidance system including a sensing head on the vehicle and disposed to provide guidance signals generated by the current flowing in said short length of conductor and in the conductor subsequently laid by the wire laying vehicle.

3,889,479

MEANS FOR DISPLACING STRUCTURES

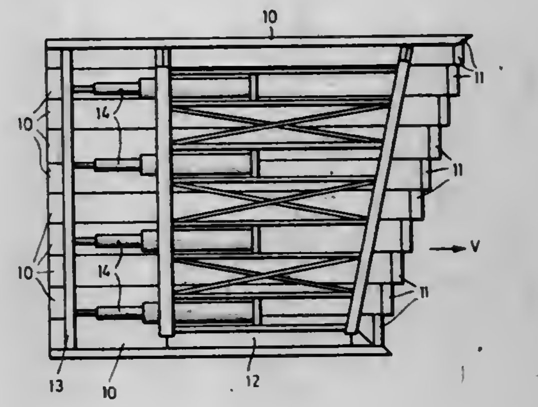
Rolf Trott, Selm, Germany, assignor to Gewerkschaft Eisenhutte Westphalia, Westfalia, Germany

Filed June 21, 1973, Ser. No. 372,351

Claims priority, application Germany, Aug. 11, 1972, 2239565

Int. Cl. E01g *3/00*

U.S. Cl. 61—85 **9 Claims**



1. In combination, a tunnel driving shield comprising an anchor frame and a driving frame interconnected for relative movement longitudinally of the frames, a plurality of elongate, sharp ended shield elements connectable selectively to each of said frames, and hydraulic means including a plurality of hydraulic jacks connected between said frames, said jacks being arranged in at least three groups, each of which groups is associated with a hydraulic system comprising a pump, a control valve, a pressure line extending between the pump and the control valve, a return line extending between the control line and a tank from which hydraulic fluid is drawn by the pump, a first supply line connecting the control valve and a first chamber of each of the jacks and a second supply line connecting the control valve and a second chamber of each of the jacks, the control valve being positionable to connect the pressure line to either of the said supply lines and the return line to the other supply line, to extend or retract the jacks as required, the resultant forces pertaining to each group of jacks acting along a line located at a position intermediate the endmost jacks in each group, the lines of force applied by the at least three groups of jacks being equally spaced around said shield.

3,889,480

PROCESS OF, AND A PLANT FOR, CONSTRUCTING TUNNELS

Armin Lobbe, Oberaden, and Wolf-Rudiger Von Schenck Zu Schweinsberg, Borstel near Winson, Luhe, both of Germany, assignors to Gewerkschaft Eisenhutte Westphalia, Westfalia, Germany

Division of Ser. No. 292,470, Sept. 26, 1972, Pat. No. 3,834,170. This application May 1, 1974, Ser. No. 465,942

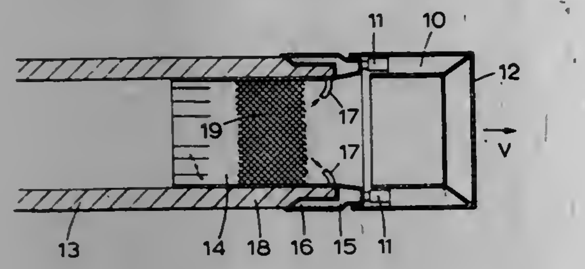
Claims priority, application Spain, Sept. 26, 1971, 395457; Nov. 12, 1971, 396949

Int. Cl. E01g *5/08*

U.S. Cl. 61—85 **4 Claims**

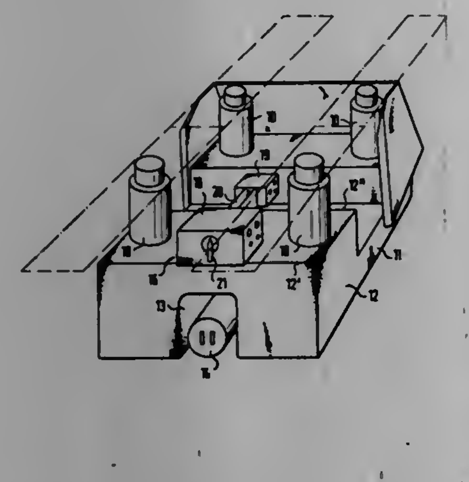
1. In a process of constructing an underground tunnel including the steps of operating a plurality of rams to advance a movable drive shield into a working face, introducing fluid concrete into a confining chamber rearwardly of the shield relative to the working face to form a lining for supporting the tunnel wall, and utilizing said fluid concrete as an abutment for the rams during the advancement of the drive shield, the

improvement comprising: removing water from the fluid concrete used to form the lining through filter means, whereby the water passes out from the chamber to thereby accelerate the setting of the concrete.



3,889,481
MINE ROOF SUPPORT CHOCKS

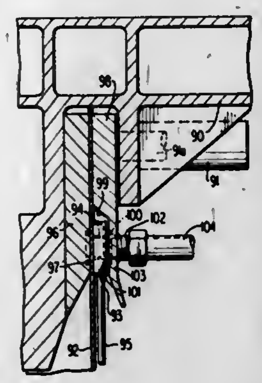
Walter Weirich, Dortmund, and Harry Rosenberg, Ludinghausen, both of Germany, assignors to Gewerkschaft Eisenhutte Westphalia, Westfalia, Germany
Filed Sept. 11, 1973, Ser. No. 396,262
Claims priority, application Germany, Sept. 14, 1972, 7233815[U]
Int. Cl. E21d *15/44*
U.S. Cl. 61—45 D **13 Claims**



1. A mine roof support chock composed of hydraulically operated props, a transverse beam connecting the props, which are in use disposed adjacent a mineral face, the beam having front and rear opposing walls facing outwardly and inwardly of the chock and an hydraulic control device for effecting operation of the chock; wherein the device is disposed on one of the front and rear walls of the beam and has a manually operable lever movable about an axis extending substantially perpendicular to the beam and laterally of the chock, the device has a maximum dimension extending in the direction of said axis so that a part of the device projects from the wall on which the device is disposed into a space between the front and rear walls, which part is connected to conduits located in said space, and the lever is spaced from and adjacent that one of the front and rear walls of the beam upon which the device is disposed.

3,889,482
JET SHEET AND CIRCULAR PILE WITH WATER HAMMER ASSIST

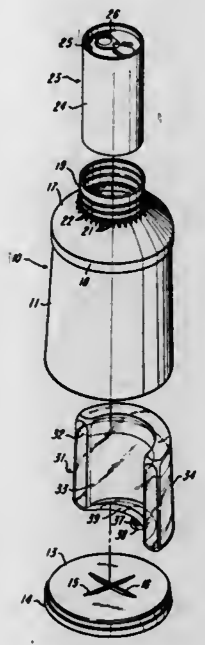
Leonard Long Frederick, 15 Crestview Ter., Whippany, N.J. 07981
Division of Ser. No. 293,444, Sept. 29, 1972, Pat. No. 3,822,557. This application May 10, 1974, Ser. No. 469,026
Int. Cl.² E02D *7/18, 5/16*
U.S. Cl. 61—53.5 **8 Claims**



1. A method of driving a pile comprising vibrating said piling and simultaneously intermittently blocking a column of liquid to set up a water hammer effect which cooperates with the vibratory effect to drive said piling.

3,889,483
HEAT TRANSFER PACKAGE WITH SHAPED FRANGIBLE AMPULE

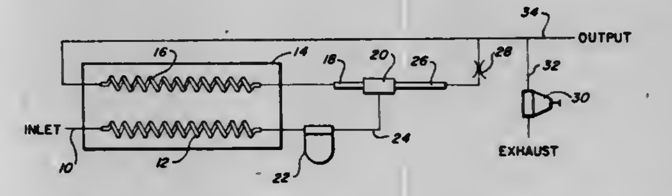
William R. Donnelly, Piqua, Ohio, assignor to Readi Temp, Inc., Piqua, Ohio
Filed Apr. 30, 1973, Ser. No. 355,924
Int. Cl. F25d *5/00*
U.S. Cl. 62—4 **12 Claims**



1. A heat transfer package comprising a receptacle including a base and, projecting therefrom, a self stabilizing upstanding wall structure, a first container adapted to pass heat to the contents which are to be subjected to heat transfer, said first container being mounted to have a portion thereof depend within and define with said wall structure a relatively sealed chamber, a portion of which chamber is defined by a spaced between the dependent extremity of said first container and said base, a second container, one portion of said second container positioned between a side portion of said first container and said wall structure, said space between the dependent extremity of said first container and said base and said second container respectively containing materials characterized by being in an inactive state when separated by said second container but adapted, on contact, to interact and produce a heat transfer effect with respect to the contents of said first container, said second container being frangible and said wall structure embodying means to break said second container on said side portion of said first container whereby to produce, in said chamber, a heat transfer effect, as a result of which the temperature of the contents of said first container is charged.

3,889,484
GAS DRYING METHOD AND APPARATUS

John Vander Horst, Lakewood; Robert F. Hounshell, Sedalia, and Myron Dunn, Littleton, all of Colo., assignors to Wilkerson Corporation, Englewood, Colo.
Filed Jan. 30, 1974, Ser. No. 437,862
Int. Cl. F25b *9/02*
U.S. Cl. 62—5 **4 Claims**



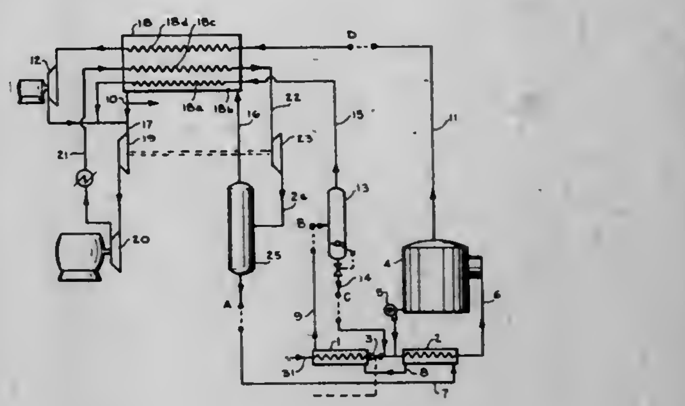
1. The gas drying apparatus which comprises: a double-pass heat exchanger having the inlet to its first pass connectable to a high pressure supply of wet gas, a separator effective to collect the condensate removed by the heat exchanger connected to receive the relatively cooler partially dried gas issuing from the first pass thereof, a vortex tube operative to split an incoming stream of gas into a relatively colder fraction and a relatively hotter fraction connected to receive the partially dried gas from the separator and deliver the colder fraction thereof to the second pass of the heat exchanger for movement therein in heat exchange relation to the gas moving through the first pass thereof preparatory to recombining said colder and hotter fractions, a flow constrictor connected to restrict the flow of the relatively warmer fraction issuing from the vortex tube operative to effectively control division of flow within the latter, and a pressure relief valve connected to receive the recombined fractions, said relief valve being automatically operative to maintain a working pressure at a level substantially less than the supply pressure by bleeding off excessive air to the atmosphere while at the same time maintaining a near maximum pressure differential across the vortex tube within the available limits.

3,889,485
PROCESS AND APPARATUS FOR LOW TEMPERATURE REFRIGERATION

Judson S. Swearingen, 2235 Carmelina Ave., Los Angeles, Calif. 90064
Filed Dec. 10, 1973, Ser. No. 423,089
Int. Cl. F17c *13/12*
U.S. Cl. 62—54 **21 Claims**

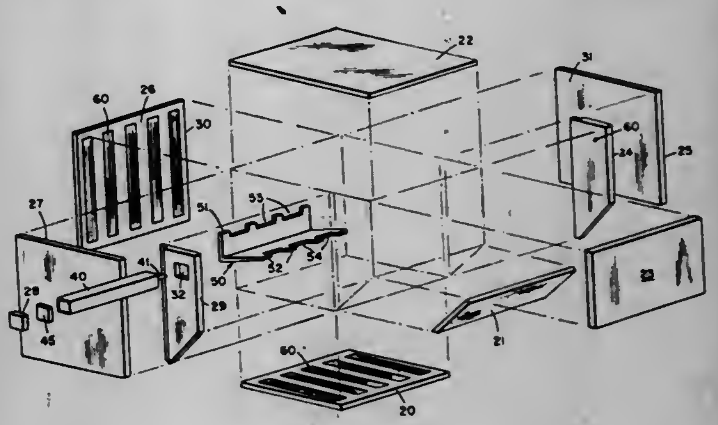
1. A low temperature refrigeration process employing a working fluid having at least two components comprising the steps of

a. compressing said working fluid;
b. countercurrently passing the compressed working fluid in indirect contact heat exchange relationship with at least one returning stream having a lower temperature, whereby said working fluid is cooled;
c. substantially isentropically expanding said cooled working fluid to provide a vapor-liquid mixed working fluid;
d. separating the uncondensed vapor fraction from the condensed liquid fraction of said mixed working fluid;
e. returning the separated uncondensed vapor fraction to said heat exchange step and passing said vapor fraction countercurrently with the working fluid, as one of said returning streams;
f. delivering the separated condensed liquid fraction to an evaporating zone and evaporating said liquid fraction to deliver refrigeration;
g. returning the evaporated liquid fraction to said heat exchange step and passing said evaporated fraction countercurrently with the working fluid, as one of said returning streams; and
h. combining the returned evaporated fraction with the returned separated vapor fraction of step (e) to comprise said working fluid.



3,889,486
REFRIGERATION SYSTEM FOR AIR CARGO CONTAINERS

Grayson W. Hinckley, Menlo Park, and George Ikeda, San Francisco, both of Calif., assignors to Pax Systems, Inc., Sunnyvale, Calif.
Continuation of Ser. No. 252,267, May 11, 1972, abandoned. This application Jan. 23, 1974, Ser. No. 435,826
Int. Cl. F25d *25/05*
U.S. Cl. 62—62 **3 Claims**



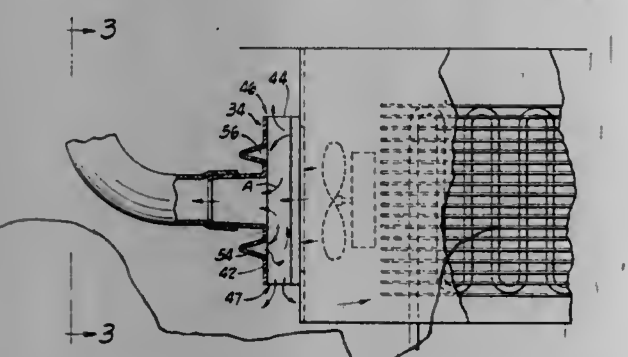
1. A method of transporting perishable cargo in an enclosed air cargo container having an access door comprising the steps of

removably lining the interior walls and the access door of the air cargo container with rigid insulation panels which mutually support each other and which together define an enclosed space for containing the cargo;
lining those of the insulation panels against which the cargo will rest with raised slats to provide a flowpath for refrigerated air around the cargo;
refrigerating the enclosed space by installing a box adjacent the top of the enclosed space, insulating the box on at least two sides facing the enclosed space, and placing a frozen coolant within the box; and
forcibly closing the access door against the resistance of the insulating panels to cause them to seal against each other.

3,889,487
COOLING SYSTEM FOR BEVERAGE COOLERS

Sandor Frankfurt, 20550 University Blvd., Shaker Heights, Ohio 44122

Filed May 18, 1972, Ser. No. 254,743
Int. Cl. F25d *17/02*
U.S. Cl. 62—99 **20 Claims**

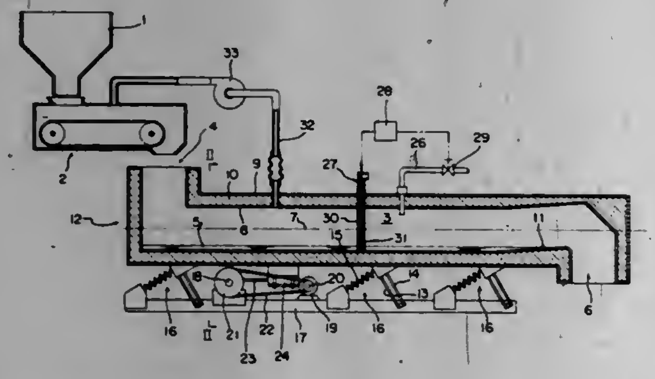


18. In a method of cooling a beverage dispensing faucet and adjacent conduit carried by a hollow faucet standard that communicates with a refrigerated chamber having a heat exchanger and a fan or blower associated with the heat exchanger for moving air thereacross, the steps comprising blocking air moved across the heat exchanger by the fan, causing the air to circulate within a confined zone a major part to discharge under pressure created by the fan through a conduit leading from said zone to the faucet standard and a minor part to discharge directly to the chamber, and allowing the air to escape from the conduit into the faucet standard and then return to the chamber.

3,889,488
REFRIGERATING APPARATUS

Hiroyuki Maeda, Nishinomiya, and Takuma Matsuda, Kobe, both of Japan, assignors to Osaka Gas Kabushiki Kaisha, Osaka, Japan

Filed Dec. 26, 1973, Ser. No. 427,685
Claims priority, application Japan, Dec. 27, 1972, 48-940
Int. Cl. F25b *41/04*
U.S. Cl. 62—218 **6 Claims**



1. A refrigerating apparatus comprising, in combination:

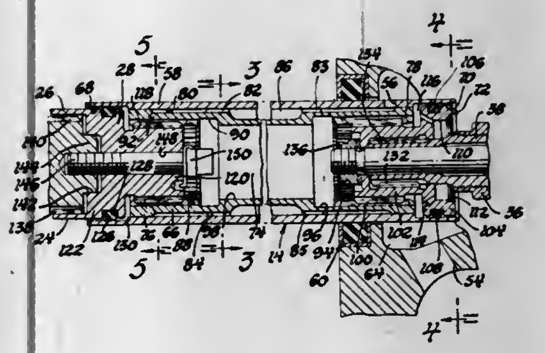
a. a tank for containing liquefied gas for refrigerating articles, said tank having an inlet end and an outlet end; and
b. means for advancing articles as placed in the liquefied gas within said tank from said inlet end to said outlet end to remove advanced articles from the liquefied gas, said means for advancing articles including
  1. an article carrying member disposed at least partially beneath said liquefied gas in said tank and having a conveying surface for conveying such articles as may be placed thereon, said conveying surface extending substantially over the entire length of the distance between said inlet end and said outlet end and having at least a portion toward said outlet end gradually rising above a level of the liquefied gas within said tank, and
  2. vibrating means moving said tank from outside thereof to move said conveying surface back and forth along a path, which is inclined upwardly toward said outlet end, for flinging the articles upwardly and toward said outlet end;

whereby articles introduced into the tank at the inlet end are moved toward the outlet end in a series of motions of the conveying surface which flings the articles upwardly out of the liquefied gas and forwardly toward the outlet end a number of times and finally to the outlet end.

3,889,489
LUBRICATED SPLINE COUPLING

John W. Casey, Mooresville; Sydney E. Easley, Indianapolis; Melvin O. Gough, Brownsburg, and William F. Jones, Indianapolis, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 23, 1974, Ser. No. 500,126
Int. Cl. F16d *3/06*
U.S. Cl. 64—9 R **3 Claims**

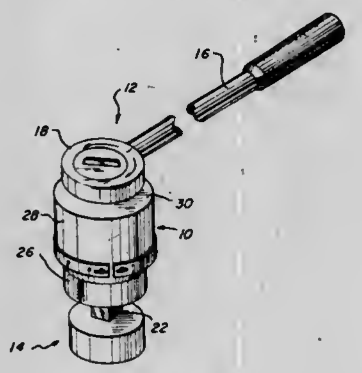


1. A spline drive coupling for maintaining alignment between first and second horizontal shafts arranged colinearly of one another comprising: an inner tubular member having a bore therethrough with spline surfaces at opposite ends of said bore, a plurality of grooves formed longitudinally of the outer surface of said inner tubular member, an open ended outer tubular member telescoped over said inner tubular member having spaced portions thereon secured to the outer circumferential surface of the opposite ends of said inner tubular member to close each of said grooves to define a lubricant return path therethrough, a first closure member slidably fit within one end of said outer tubular member and including an externally splined extension thereon interconnected within the spline surface on one end of said inner tubular member to define a first spline connection, a second closure member slidably fit within the opposite end of said outer tubular member and including an externally splined surface thereon interconnected with the spline surface at the opposite end of said inner tubular member to define a second spline connection, means forming an annular lubricant pickup on one end of said first closure member, an oil inlet hole through said first closure member for communicating said pick-up with said first spline connection, said bore having a pair of spaced, parallel circumferential grooves formed therein for defining lubricant pockets from which lubricant is centrifuged during rotation of said coupling, one of said pockets being in communication with said first spline connection and the other of said pockets being in communication with the second of said spline connections, a plurality of inclined holes formed in said opposite end of said inner tubular member to direct lubricant flow through said first and second spline connections into said return path grooves, said outer tubular member including a plurality of circumferentially spaced holes therein in communication with said grooves for defining an outlet therefrom, each of said outlet holes being located at the same end of said outer tubular member as the inlet hole thereto.

3,889,490
TORQUE CONTROL ADAPTOR FOR RATCHET WRENCH

Felix J. Nadolny, P.O. Box 323, Candler, N.C. 28715

Filed May 16, 1974, Ser. No. 470,594
Int. Cl.² F16D *3/56*
U.S. Cl. 64—29 **1 Claim**



1. A torque adaptor for a ratchet driven socket wrench comprising, in combination:

a housing having inner and outer cylindrical members threadably joined for selected axial movement, each of said inner and outer members having one end wall and one open end to define an enclosed chamber therebetween, the end wall of said outer member having an opening therethrough and the end wall of the inner member having an outwardly directed non-circular centrally located axial extension output shaft, and a set screw threadably received in an opening in the in the cylindrical wall of said outer member, said set screw being adapted to be tightened against the cylindrical wall of said inner member to selectively fix the axial relationship of said inner and outer members,

a friction disc anchored to the inner surface of the end wall of the inner housing member, said friction disc having a surface of wave form configuration along a peripheral area on the face of the disc which is exposed to said enclosed chamber, said friction disc having an outer diameter substantially equal to the inner diameter of the inner housing member, and said friction disc having a central cup-shaped recess defined therein,

a drive element having a drive disc slidably mounted thereon at one end in abutting relationship with said friction disc and a reduced diameter shaft portion at the opposite end thereof protruding into the opening in the end wall of said outer housing member, the end of said shaft portion which protrudes into the opening in the end wall of the outer housing member having a recess of square cross-section adapted to releasably receive a square shaft on a ratchet driven wrench,

spline means operatively coupling said drive disc and said drive element, said drive disc having a surface of wave form configuration along a peripheral area on the face thereof which abuts the friction disc so that the wave form surfaces on the friction disc and drive disc are in abutting face-to-face relationship,

the end of said drive element adjacent said drive disc having a terminal end sized for bearing reception in the central cup-shaped recess in said friction disc for transmitting axial forces directly between said drive element and said axial extension shaft,

a compression spring surrounding the shaft portion of the drive element in concentric relationship therewith, said compression spring abutting said drive disc at one end and the end wall of said outer housing member at the opposite end to bias said drive disc against said friction disc whereby rotative torque movement applied to said drive element effects corresponding rotative torque movement of the axial extension shaft on the housing until the torque applied to said drive element overcomes the spring compression thereby allowing the drive disc and friction disc to rotate relative to each other,

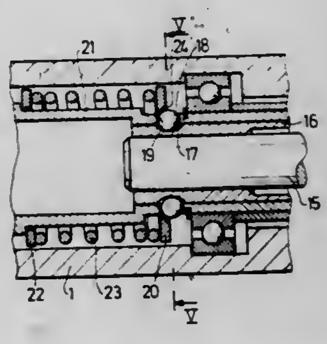
means rotatably securing said drive element terminal end within said friction disc central recess for preventing axial separation of said drive element terminal end from said friction disc while permitting relative rotation therebetween, and

a calibrated scale on a external surface of said outer housing member and a calibrated scale on an external surface of said inner housing member, said calibrated scales being adapted to cooperate in visually displaying the relative relationship of the inner and outer housing members whereby the compression spring can be adjusted selectively to determine the desired rotative torque between said friction disc and said drive disc independently of axial forces applied between said drive element and said axial extension output shaft.

3,889,491
TORQUE-TRANSMITTING SAFETY COUPLING

Karl Wanner, Echterdingen; Hubertus Karl, Bernhausen; Gernot Hansel, Stuttgart-Plieningen; Manfred Bleicher, Leinfelden, and Wolfgang Schmid, Plattenhardt, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed June 26, 1973, Ser. No. 373,666
Claims priority, application Germany, July 6, 1972, 2233130
Int. Cl. F16d *3/56*
U.S. Cl. 64—29 **13 Claims**



1. A torque-transmitting safety coupling, comprising a driven coupling component; a driving coupling component; cooperating coupling portions on said components and so configurated as to be engageable with one another in only a single relative angular position of said components, and to be disengageable in response to the torque transmitted between said components exceeding a predetermined level; and biasing means acting upon said components and urging said coupling portions into engagement.

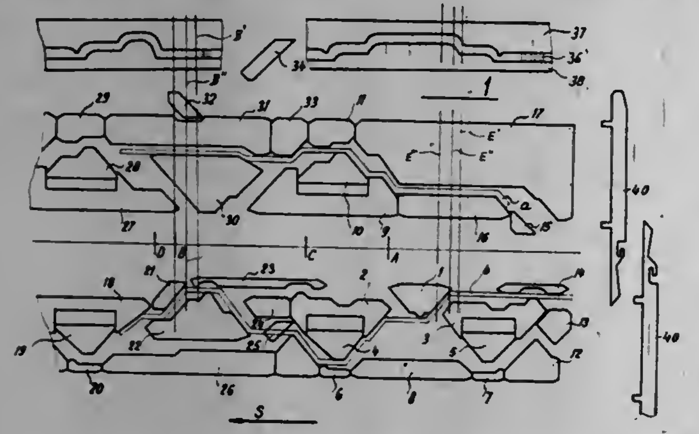
3,889,492
METHOD OF SECURING COURSES ON DOUBLE CYLINDER KNITTING MACHINES

Pavel Zahradka, Trebic; Milan Petranek, Starec, and Jiří Hrábanek, Nova Ves, all of Czechoslovakia, assignors to Elitex, Zavody textilniho strojirenstvi, generalni reditelstvi, Liberec, Czechoslovakia

Filed June 9, 1972, Ser. No. 261,548
Claims priority, application Czechoslovakia, June 14, 1971, 4348-71
Int. Cl. D04b *9/10*
U.S. Cl. 66—14 **4 Claims**

1. A method of knitting on a two cylinder circular knitting machine so as to secure a first yarn which has been caught on the empty needles of a first of said cylinders before and during the laying of a second yarn into the hooks of said needles for the formation of a succeeding course, comprising holding said first yarn on the shafts of said needles during rotation of said cylinders and while said needles are in operative position,

continuing the holding of said first yarn on said needle shafts during the transition from their closing to laying positions below the latches of said needles by means of knocking-over bits held in their rear position, simultaneously catching said first yarn on the hooks of the needles of the second cylinder which are at such time in their inoperative position, said second yarn then being laid into the hooks of such needles as are in their operative position.



3,889,493

YARN FLOAT CONTROLLER MEANS FOR CIRCULAR KNITTING MACHINES

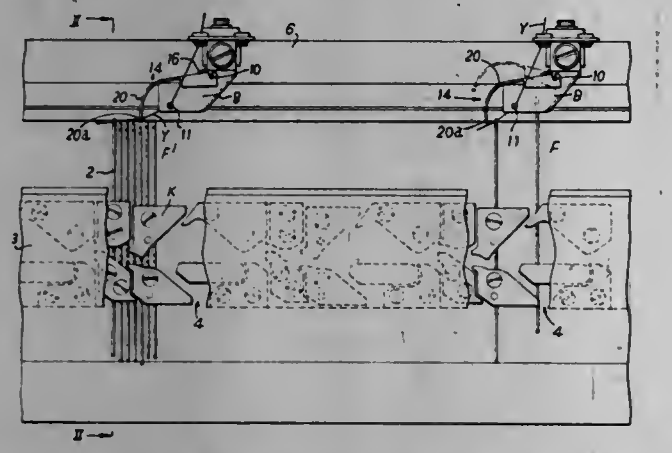
Ernest Leonard Farmer, Leicester, and Osmond Herbert Ecob, Blaby, both of England, assignors to Wildt Mellor Bromley Limited, Leicester, England

Claims priority, application United Kingdom, Jan. 16, 1973, 2169/73

Filed Dec. 11, 1973, Ser. No. 423,787

Int. Cl.² D04B *15/54*

U.S. Cl. 66—19 **9 Claims**



1. A multi-feed circular knitting machine of the type comprising a needle cylinder, a cylinder cam box, a needle dial and a dial plate, said machine being set up to produce floated yarn effects in the knitted fabric and wherein there is provided at each feed a stitch cam and at at least some feeds a float controller including an element adapted to be spring loaded in an operative position in which it is so arranged that, in normal working conditions when the needles are knitting, the yarn being knitted runs clear of the said element whereas where the said yarn is missed by the needles the resulting float engages the element in such a way that the required angular relationship between the yarn and the stitch cam at the feed is maintained, characterized in that each said float controller is mounted directly upon a corresponding yarn guide plate secured upon the dial cam plate at its feed and is not itself adapted to funtion as a detector of an electrical stop motion and wherein each said float controller is so pivotally mounted upon its corresponding yarn guide plate as to be readily disengageable therefrom, and spring means are provided between each yarn guide plate and its respective controller for normally holding the latter in its operative position but enabling the controller to safely yield upwardly against the spring influence if it is contacted and displaced by a faulty needle or a slub of yarn.

3,889,494

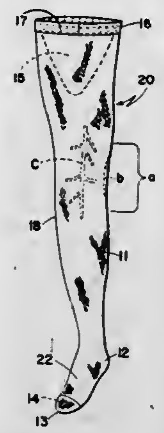
STOCKING WITH COMPENSATED KNEE PRESSURE

Donald Patience, Barrington; Edward G. Hartigan, and Herbert Knohl, both of Schaumberg, all of Ill., assignors to The Kendall Company, Walpole, Mass.

Continuation of Ser. No. 91,799, Nov. 23, 1970, abandoned, which is a division of Ser. No. 293,844, Oct. 2, 1972, abandoned. This application Apr. 12, 1973, Ser. No. 350,533

Int. Cl. D04b *9/52*

U.S. Cl. 66—178 A **6 Claims**



1. In a properly fitted full length stocking including a boot portion, said stocking being of knitted fabric including elastomeric yarn which in said boot portion exerts a compressive pressure on the wearer's leg normally gradually decreasing from the ankle to a point well above the knee,

that improvement wherein

in the knee area the compressive pressure is reduced to provide an area of reduced but still substantial pressure support in the zone including the knee to a level of pressure less than the pressure below the knee area so that a reduced pressure is exerted on the knee area to avoid restricting pressures on the veins in the sensitive popliteal space,

the compressive pressure being increased again above the knee area and thereafter gradually being decreased to the top of the stocking boot.

3,889,495

ROLLER-LOCK

Hans-Ulrich von der Eltz, Frankfurt am Main; Franz Lappe, Hofheim, Taunus, and Albert Reuther, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

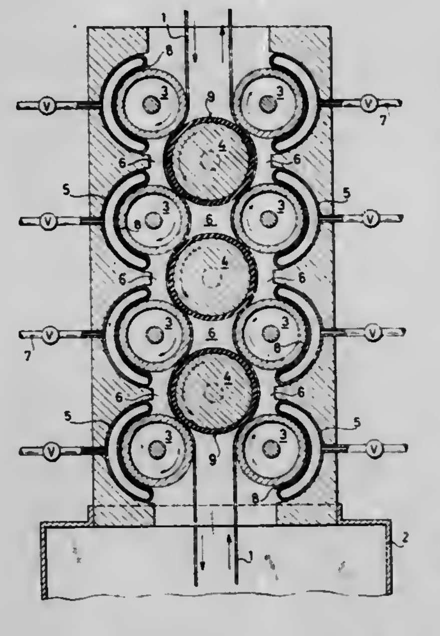
Filed Oct. 4, 1973, Ser. No. 403,647

Claims priority, application Germany, Oct. 7, 1972, 2249333

Int. Cl. D06c *1/10*

U.S. Cl. 68—5 E **6 Claims**

6. A sealing device for sealing the common inlet and outlet opening of a high pressure chamber in which textile fabric webs are treated; said device comprising a housing mounted on said chamber in communication therewith and having a series of staged pressure chambers formed therein for providing a graduated pressure drop between one end of the housing adjacent the high pressure chamber and the opposite end of the housing; said housing having a pair of end walls, and said staged pressure chambers being formed between said end walls and a plurality of rollers rotatably mounted therebetween in sealing relation and in contact with each other to form gas and pressure tight nips therebetween to define said staged chambers; said rollers including a series of groups of rollers each of which includes at least one pair of laterally spaced hard rollers, and a roller covered with an elastic material positioned between the hard rollers in contact therewith on opposite sides thereby to form pressure tight nips on opposite sides of the elastic covered rollers for respectively engaging fabric moving into and out of said high pressure chamber and for sealing adjacent staged pressure chambers from one another.



3,889,496

PULLEY DRIVE FOR A SIDE-LOADED DRUM TYPE WASHING MACHINE

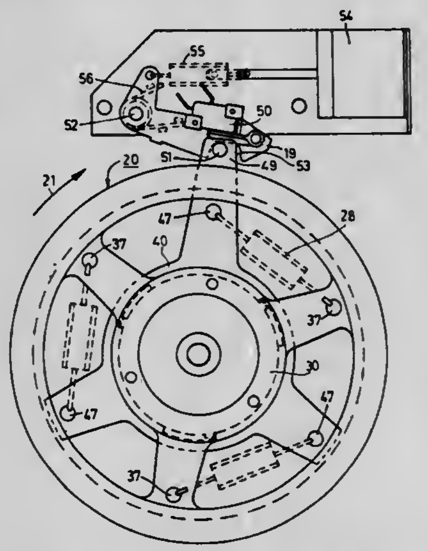
Anton Heyne, Berlin, Germany, assignor to Siemens Electrogerate GmbH, Munich, Germany

Filed Mar. 5, 1974, Ser. No. 448,300

Claims priority, application Germany, Mar. 8, 1973, 2311956

Int. Cl. D06f *37/30*

U.S. Cl. 68—140 **5 Claims**



1. In a drum type washing machine which is loaded through a loading opening provided in the side surface thereof, said drum being mounted on a rotatable shaft within the machine housing and being driven by a drive motor coupled thereto by a pulley belt drive arrangement, and including means for stopping the drum with the loading opening therein aligned with respect to a loading opening provided in the machine housing, an improved pulley drive, comprising:

a first annular pulley part fixed to said drum shaft for coupling said pulley drive arrangement to said drum shaft;

an annular rim, mounted on said first pulley part in concentric disposition with respect thereto, and including a plurality of lug members extending radially outwardly from the periphery thereof;

a second pulley part including a ring-shaped body portion having a radially inner edge adapted for slidable disposal over said rim, and a plurality of radially outwardly extending lug members, including at least one stopping lug member of greater axial length than the others of said lug members, said radially inner edge including a plurality of circumferentially spaced apart recesses disposed in said body portion for receiving said annular rim lug members; and

resilient tension means, coupled to said first and second pulley parts, for absorbing the rotational momentum of the drum during stopping and for aligning said drum and machine housing loading openings subsequent to the stopping of said drum.

3,889,497

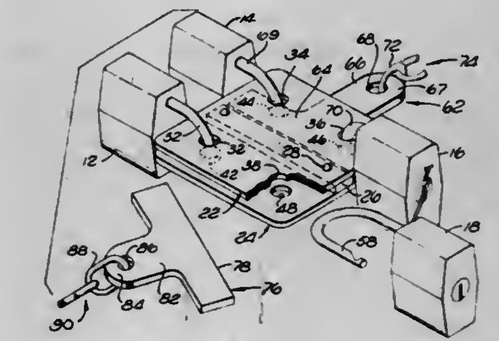
MULTIPLE-LOCK SECURING SYSTEM

Herman L. Tuttle, 12167 San Fernando Rd., Sylmar, Calif. 91342

Filed July 3, 1973, Ser. No. 376,253

Int. Cl. E05b *73/00*

U.S. Cl. 70—14 **1 Claim**



1. A multiple-lock securing system for providing access to a secured area by releasing one of a plurality of locks comprising:

first and second locking plates defining openings therein for positioning said plurality of locks in said openings;

bar means having a base and an arm extending therefrom, said base being positioned adjacent to two of said openings, each of which may receive one of said locks therein, the length of said base being greater than the distance between said openings;

means for interconnecting said first locking plate to said second locking plate comprising an integrally formed member having a pair of bars, one of said bars being secured to said first locking plate, and the other of said bars being secured to said second locking plate; and

means formed on said locking plates for enabling said bars to be fastened to said locking plates when said locks are positioned in said openings and removed therefrom when one of said locks is removed from its respective opening.

3,889,498

KICK-PROOF ACCESS CONTROL HANDLE

Bob G. Harrell, St. Louis, Mo., assignor to Jackes-Evans Manufacturing Company, St. Louis, Mo.

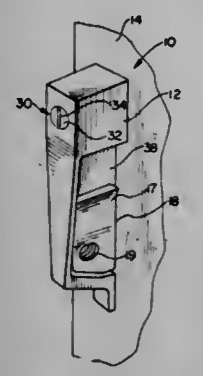
Filed July 14, 1972, Ser. No. 271,648

Int. Cl. E05b *65/44*

U.S. Cl. 70—78 **8 Claims**

1. A locker assembly including a frame, a door mounted on said frame, a kick-proof handle means mounted on said door, latching means for cooperative engagement with a catch means on said locker assembly to maintain said door in a latched condition when said door is in a closed position, obstructing means carried in said handle means, primary locking means cooperating with said obstructing means and being operative to prevent movement of said latching means relative to said handle and said door and thereby prevent release of

said latching means from engagement with said catch means and prevent opening of said door, and access locking means carried on said locker assembly, said access locking means including means to bypass said primary locking means to allow said obstructing means and said latching means to be moved relative to said handle means and said door when said primary locking means is in locked condition thereby to disengage said latching means from said catch means to permit opening of said door, said means to bypass said primary locking means including means mounted in said handle means and movable relative to said handle means to allow said obstructing means to be moved with respect to said door and said handle means thereby permitting said primary locking means to be moved unitarily relative to said handle means and said door to shift said latching means cooperating with said catch means to permit opening of said door.

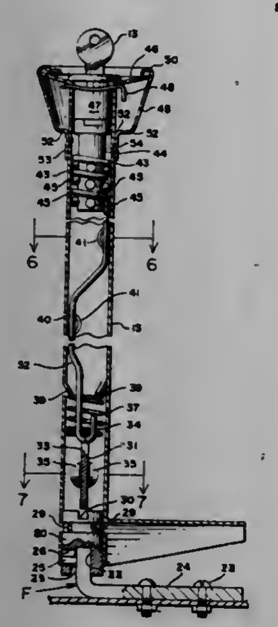


3,889,499
AUTOMOBILE ACCELERATOR LOCKING DEVICE

William H. Cramer, 1598 N.E. 104th St., Miami Shores, Fla. 33138

Filed Nov. 1, 1974, Ser. No. 520,110
Int. Cl.² B60R *25/04*

U.S. Cl. 70—202 **4 Claims**



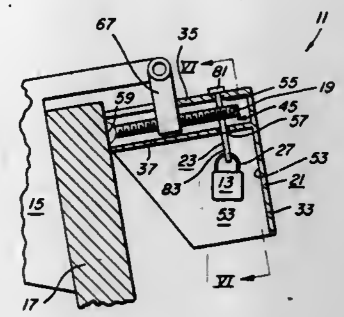
1. An automobile accelerator locking device comprising a tubular member, a foot member rotatably mounted at one end of said tubular member and adapted to be fastened to the floor of an automobile beneath the accelerator, an accelerator locking member secured to said one end of said tubular member adjacent said foot member, handle means mounted at the other end of said tubular member, a key operated lock device mounted at said other end of said tubular member and inter-connecting means extending between said lock device and said foot member whereby upon swinging said locking member to a position beneath the accelerator and locking said lock device said inter-connecting means is actuated to connect said handle means and said foot member to prevent the operation of said accelerator.

3,889,500
ANTI-THEFT DEVICE FOR OUTBOARD MOTORS

Donald E. Hix, Box 547, and Robert S. Dyer, Hays St., both of Clarendon, Ark. 72029

Filed Feb. 5, 1974, Ser. No. 439,707
Int. Cl.² F16B *41/00*

U.S. Cl. 70—232 **9 Claims**



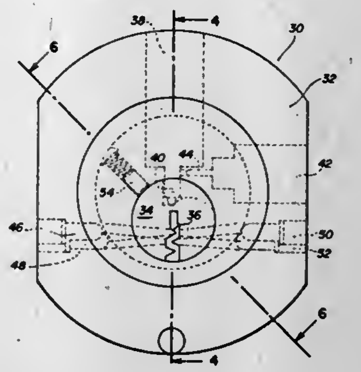
1. In combination with an outboard motor having clamp means for removably attaching said motor to a boat, and a padlock for securing said motor to said boat, the improvement which comprises anti-theft means engaging said clamp means and said padlock for preventing unwarranted removal of said motor from said boat, said anti-theft means including boxlike means disposed about said padlock for providing a barrier against access to said padlock by a tamperer, and locking means slidably and removably engaging said boxlike means and said clamp means for shackling said boxlike means to said clamp means, said locking means being provided with a hole for receiving the shackle of said padlock, said boxlike means including a first compartment for enveloping at least a portion of said clamp means thus denying tampering access thereto and including a second compartment for enveloping said padlock thus denying tampering access thereto.

3,889,501
COMBINATION ELECTRICAL AND MECHANICAL LOCK SYSTEM

Charles P. Fort, P.O. Box 38547, Dallas, Tex. 75238

Filed Aug. 14, 1973, Ser. No. 388,094
Int. Cl. E05b *47/06*

U.S. Cl. 70—283 **11 Claims**



1. A lock system comprising:

a lock having a lock cylinder and a key slug rotatable within said cylinder,

a pin contacting a surface on said key slug for normally preventing said lock from being opened,

electrical means adapted for movement of said pin,

a key having first and second series of discrete coded portions formed therein, said first series being laterally offset relative to said second series,

means in said lock, for detecting the passage of said coded portions upon insertion of said key and for generating first and second electrical signals in response thereto,

said first electrical signals comprising a series of data pulses spaced apart according to a predetermined configuration and said second electrical signals comprising a series of clock pulses spaced apart by a common interval, one edge of said clock pulses occurring concurrently with ones of said data pulses,

means for sampling said data pulses in response to said one edge of said clock pulses, and

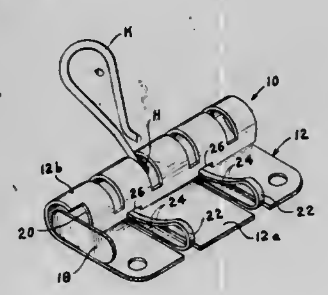
means responsive to a predetermined sampled sequence of said data pulses for activating said electrical means for movement of said pin to permit opening said lock.

3,889,502
KEY HANGER SUPPORT FOR KEY CASES

James B. Kruger, Oxford, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Aug. 29, 1973, Ser. No. 392,490
Int. Cl.² A44B *15/00; 150/40*

U.S. Cl. 70—456 **1 Claim**



1. A key hanger support for key cases which comprises a plate member having an edge portion bent to form a tube, the tube having longitudinally spaced notches at the extreme of said edge, said tube being provided with at least one transverse hanger-retaining slot terminating in an enlarged opening, a portion of said opening being offset from the slot, a locking member slidably mounted in the tube and having a projection positioned to close that portion only of the opening which is in alignment with the slot and bar the entrance from the slot to the opening in one position of the locking member and to clear said opening and its entrance in a second position of the locking member, a spring means normally holding said locking member in said first position, a finger piece carried by the locking member at that end toward which the offset portion of said opening is directed, for moving said locking member to said second position, the spring means including a pair of spaced U-shaped strips integral with the plate and locking member and each disposed in planes generally perpendicular to the direction of movement of the locking member, each U-shaped strip having a pair of legs connected by a bight and one of the legs being cut out of the plate member, the cut-out being ample on either side of each leg to permit lateral movement of the leg, and said other legs being received through the notches into the tube respectively whereat the ends of the other legs remote from the bight are connected to the locking member.

3,889,503
SAFETY INDICATOR SYSTEM AND METHOD FOR METAL FORMING MACHINES

Kurt K. Luenser, De Soto, Tex., assignor to Verson Allsteel Press Company, Dallas, Tex.

Filed July 1, 1974, Ser. No. 484,670
Int. Cl.² B21J *9/20*

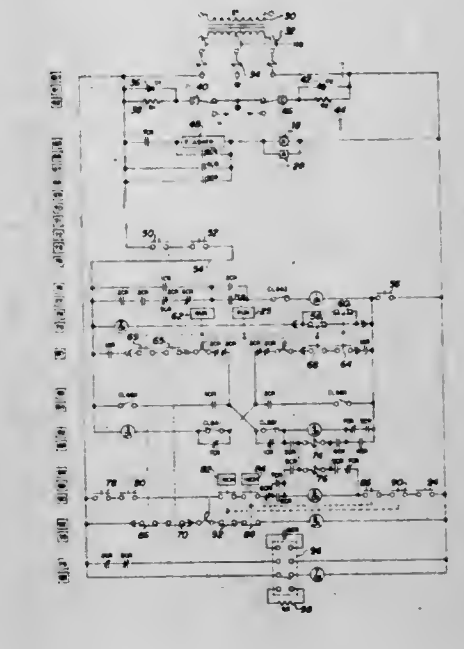
U.S. Cl. 72—6 **17 Claims**

1. A safety system for a press having a plurality of start switches comprising:

indicator means having first, second and third states,

means for placing said indicator means in said first state when the press is ready to be energized,

means responsive to actuation of one of the start switches for placing said indicator means in said second state for a predetermined time interval, and



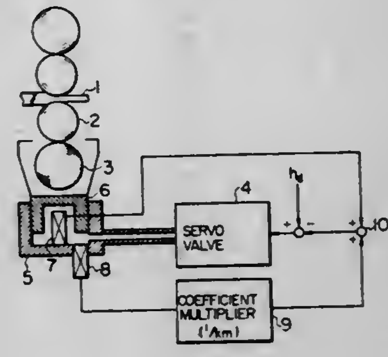
means responsive to the actuation of the remainder of the start switches during said predetermined time interval for placing said indicator means in said first state to indicate operation of the press.

3,889,504
THICKNESS CONTROL DEVICE FOR ROLLING MILL

Ken Ichiryu, Mito; Masayuki Shigeta, Katsuta, and Toshiyuki Kajiwara, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 9, 1974, Ser. No. 496,209
Claims priority, application Japan, Aug. 22, 1973, 48-93342
Int. Cl. B21b *37/02*

U.S. Cl. 72—8 **4 Claims**



1. In a gagemeter type automatic thickness control system in a rolling mill consisting of rolls for rolling a strip, hydraulic jack for imparting a rolling pressure to said rolls, a flow rate control valve for adjusting a roll gap by adjusting the amount of oil in said hydraulic jack, a valve control device, a setting device for feeding a desired thickness command to said control device, and a position detector for detecting the roll gap and feeding back the detected value to said valve control device; a thickness control device, comprising

means for detecting an input side thickness and an output side thickness of said strip;

a computing device for obtaining the respective power spectra $\phi h1$, $\phi h2$, $\phi h3$ from the autocorrelation functions $Rh1$ and $Rh2$ and the cross-correlation function $Rh1h2$ and then for obtaining from said power spectra the roll eccentricity based on the coherence defined by $(\phi^2 h1\ h2)/\phi h1 \cdot \phi h2$); and

means for feeding as a command value the roll eccentricity obtained from said computing device, to said plate thickness control device.

3,889,505

PROCESS AND AN APPARATUS FOR REGULATING THE DRIVE OR DECELERATION OF POWER DRIVEN OR DECELERATED ROLLERS IN DRAWING AND STRAIGHTENING INSTALLATIONS

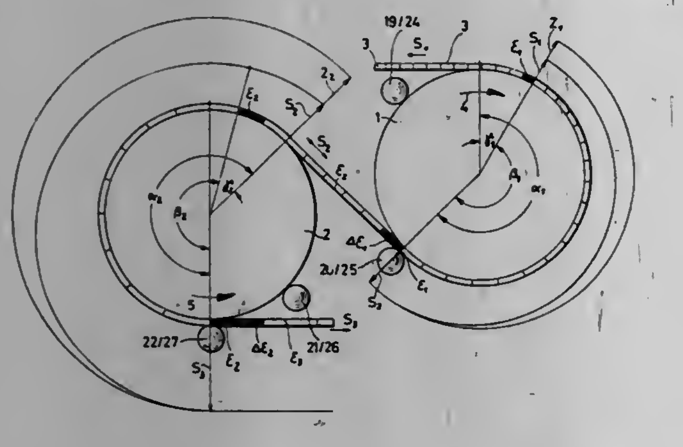
Josef Ihle, Pforzheim, Germany, assignor to Irma Ungerer, Pforzheim, Germany

Filed Jan. 28, 1974, Ser. No. 436,920

Claims priority, application Germany, Feb. 7, 1973, 2305777

Int. Cl. B21b *37/06, 39/08*

U.S. Cl. 72—17 **6 Claims**



1. A process for regulating the drive or deceleration of power driven or decelerated rollers in installations in which a strip of material, preferably a metal strip, is passed across a plurality of rollers under a stretching tension, more particularly in drawing and straightening installations, comprising the steps of: measuring the variation in elongation to which the strip is subjected during its passage across a single roller; electrically comparing the variation in elongation with preset nominal values; and utilizing the result of the comparison for the electrical influencing of the power drive or deceleration of at least this one roller.

3,889,506

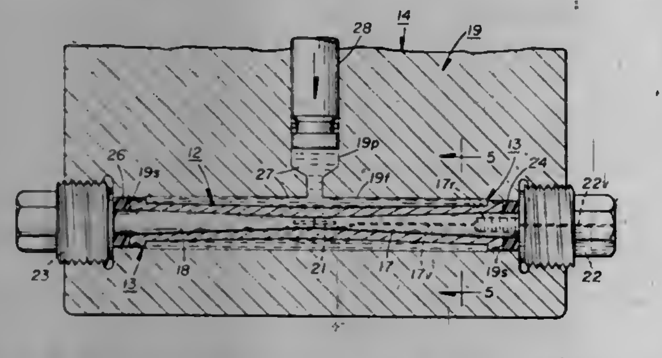
METHOD AND APPARATUS FOR FORMING A TUBULAR BILLET ABOUT A MANDREL USING MULTI-DIRECTIONAL STRESS

John Richard Shaffer, Ewing Twp., Mercer County, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,648

Int. Cl. B21d *26/02*

U.S. Cl. 72—60 **11 Claims**



1. A method of forming a tubular metal member to a configuration in which internal and external surfaces of the member are concave inward as viewed in longitudinal section and at least the internal surfaces are symmetrical on opposite sides of the transverse centerline of the member, which comprises:

forming a tubular metal billet having an external surface of uniform diameter and an internal surface of uniform diameter;

forming the tubular metal billet with substantially identical temporary integral end flanges having an external diameter greater than the external diameter of the billet between the end flanges and substantially corresponding to a diameter of cylindrical interior surfaces of a hydrostatic forming device, and having opposed annular bearing surfaces intersecting the external surface of the billet to provide hydrostatic seals at their respective intersections and of sufficient cross-sectional area such that when the bearing surfaces and the peripheral portion of the billet therebetween subsequently are subjected to hydrostatic pressure in a forming operation, the end flanges are retained against any substantial inward longitudinal movement and the billet is stressed longitudinally in tension;

forming each temporary integral end flange of the tubular billet with a circumferential seal-receiving portion;

positioning annular hydrostatic seals in engagement with the circumferential seal-receiving portions;

positioning the tubular billet in the hydrostatic forming device with the temporary integral end flanges confined against transverse movement by the cylindrical interior surfaces of the forming device, and with the seals in sealing engagement with the cylindrical interior surfaces;

positioning a split mandrel having an external configuration conforming to the desired internal concave configuration of the tubular member, within the tubular billet with opposed inner ends of the mandrel in aligned engagement and spaced relationship to the interior of the billet;

subjecting the opposite outer ends of the split mandrel to opposing forces to preclude longitudinal movement of the mandrel and separation of the engaged inner ends of the mandrel during the forming of the billet inwardly about the mandrel;

simultaneously applying hydrostatic pressure to the opposed annular bearing surfaces of the temporary integral end flanges and to the peripheral portion of the tubular billet therebetween, to retain the end flanges against any substantial inward longitudinal movement and to stress the billet longitudinally in tension, while compressively stressing the billet inward into inwardly concave symmetrical engagement with the mandrel; and

removing selected portions of the temporary integral end flanges not required in the tubular metal member after the stress-forming of the billet.

3,889,507

APPARATUS FOR COOLING A STEEL MEMBER WHILE BEING ROLLED ON A CONTINUOUS HOT-ROLLING MILL

Helmut Kranenberg, and Michael Sawitz, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Nov. 15, 1973, Ser. No. 416,310

Int. Cl. B21b *45/02*

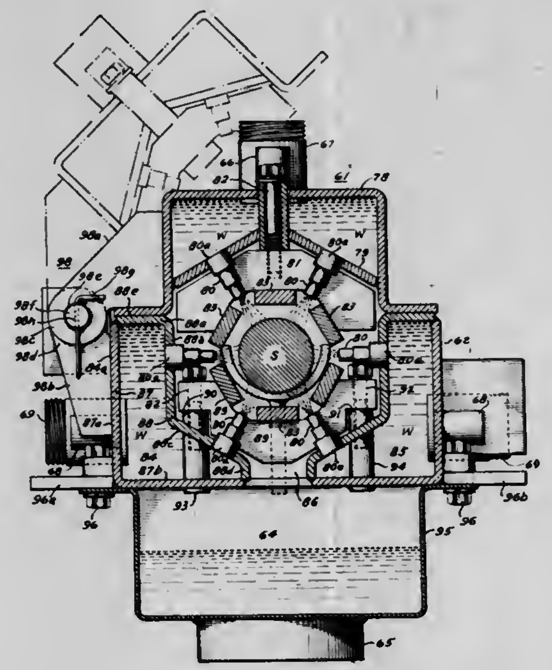
U.S. Cl. 72—201 **8 Claims**

1. In a continuous hot-rolling mill having a plurality of roll stands for advancing a solid steel workpiece in a predetermined substantially horizontal pass line, the improvement comprising:

a. at least one spray unit comprising a pair of spaced coolant spray chambers, aligned longitudinally in tandem, positioned between two of said roll stands in said mill and surrounding a portion of said pass line,

b. a plurality of spray means in each of said spray chambers for spraying water onto the surface of said steel workpiece as said steel workpiece is advancing along said pass line, and

c. elongated guard means in each of said spray chambers to guard said spray means from contact with said steel workpiece said guard means in each of said spray chambers comprising a plurality of spaced elongated metallic bars generally rectangular in cross section extending longitudinally substantially the length of each of said spray chambers, the space between said guard means providing access for spray water from said spray means to impinge on the surface of said advancing steel workpiece.



3,889,508

POLE BENDING APPARATUS

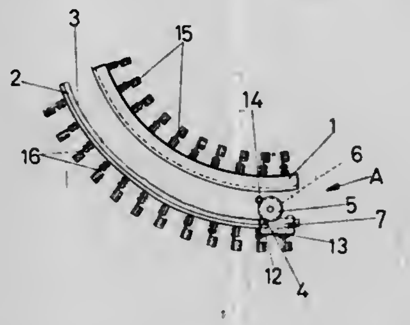
Toshio Sugita, Sakura, Japan, assignor to Sanyu Kosan Kabushiki Kaisha, Chiba, Japan

Filed June 10, 1974, Ser. No. 477,570

Claims priority, application Japan, June 25, 1973, 48-70799

Int. Cl. B21d *7/02*

U.S. Cl. 72—215 **4 Claims**



1. Pole bending apparatus comprising an inner guide member having a concave groove along its outer face and forming an elongated curve to which a pipe is to be bent, an outer rail member formed into a curve spaced from and paralleling that of the guide member and having a rack extending along its length, a movable truck member mounted on the outer rail member and having gear means engaging the rack on the rail member, a bending roller mounted on the truck and having a concave groove facing the concave groove on the inner guide member and forming therewith an approximately round opening for receiving and clamping the pipe to be bent, and means for driving the truck gear means causing the truck to move along the rail member whereby a pipe inserted into the round opening is bent into a curve conforming to that of the inner guide member.

3,889,509

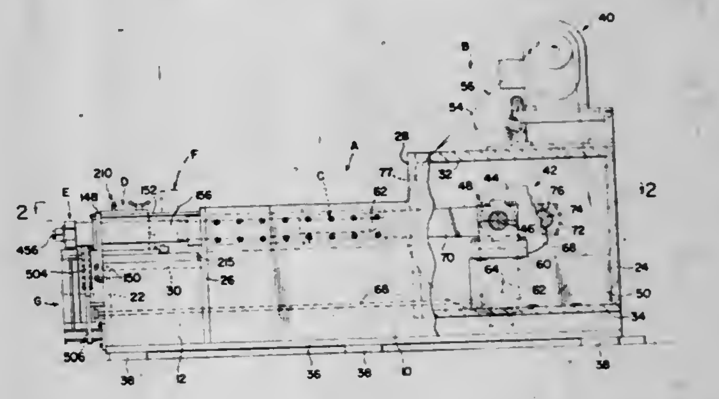
HORIZONTAL CAN IRONING PRESS

Stanley J. Miller, and Bernard Hook, both of Hastings, Mich., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Apr. 8, 1974, Ser. No. 458,392

Int. Cl. B21d *22/30*

U.S. Cl. 72—349 **27 Claims**



1. In a machine for forming a can body having a closed end and a peripheral side wall extending therefrom and which machine includes a frame, punch means supported by said frame for reciprocation between first and second positions along a linear path, ironing ring means coaxial with said punch means and supported by said frame between said first and second positions, said punch means receiving a can blank in said first position and being cooperable with said ironing ring means to form said blank upon movement of said punch means to said second position, and means to reciprocate said punch means between said first and second positions, the improvement comprising: said punch means including slide means reciprocable along said path, said slide means having spaced apart horizontally parallel sides, opposed guide channel means on said frame receiving a corresponding one of said slide sides, each said guide channel means including horizontally extending vertically spaced parallel planar guide surfaces and a vertically extending planar guide surface therebetween and perpendicular thereto, each of said slide sides including corresponding follower surfaces slidably engaging said horizontally and vertically extending guide surfaces, said slide sides each including bar means having first and second end portions, said follower surfaces being on said first end portions, each said guide channel means having an end in the direction from said first position toward said second position, said second end portions of said bar means extending from said first end portions in said dirsction, and apertured bearing means fixed relative to said frame adjacent said ends of said guide channel means receiving and slidably supporting said second end portions of said bar means.

3,889,510

HOT FORGING PROCESS

Noboru Yamakoshi; Toshihiro Minami, and Sinitiro Somekawa, all of Kobe, Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Nov. 8, 1973, Ser. No. 413,759

Claims priority, application Japan, Nov. 8, 1972, 47-111944

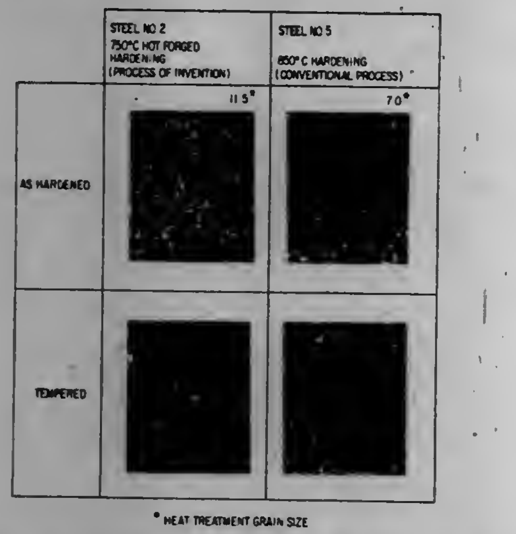
Int. Cl. B21j *1/06*

U.S. Cl. 72—364 **5 Claims**

1. A process of hot forging a carbon or low alloy steel, which comprises the steps of:

working a steel;

hardening said worked steel at a temperature of at least the Ac_1 transformation point of the steel; and


STEEL NO 2
750°C HOT FORGED HARDENING (PROCESS OF INVENTION)
STEEL NO 5
850°C HARDENING (CONVENTIONAL PROCESS)
11.5*
7.0*
AS HARDENED
TEMPERED

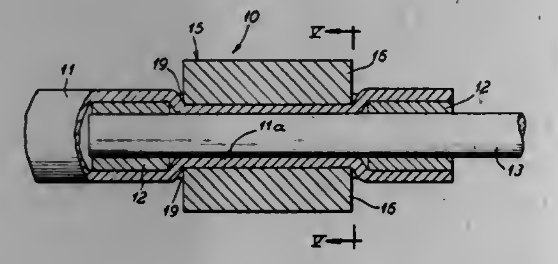
* HEAT TREATMENT GRAIN SIZE

hot forging said steel at a temperature in the range from 450°C to the Ac_1 transformation point of the steel.

3,889,511
METHOD OF MAKING A CONTROLLED TORQUE CONNECTING MEMBER

Robert Vincent Bayle, Ecquevilly, France, assignor to Gemmer-France, France

Filed Mar. 2, 1973, Ser. No. 337,721
Claims priority, application France, Mar. 15, 1972, 72.09039
Int. Cl. B21k *21/08*
U.S. Cl. 72—370 **9 Claims**



1. The method of making a connection member for controlled torque assembly with an inserted member which comprises inserting a mandrel in a tube of greater diameter than the mandrel, concentrically spacing the tube around the mandrel, radially contracting at least a portion of the length of the tube into the space between the the tube and mandrel to engage the tube substantially continuously around the mandrel, simultaneously raising circumferentially spaced outturned radial closed folds of tube material along the length of the contracting portion, shaping the interior of the contracted portion into conformity with the outer periphery of the mandrel, and withdrawing the mandrel.

3,889,512
STEERING KNUCKLES AND METHOD OF FORMING THE SAME

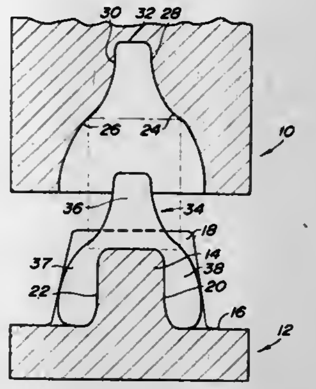
Ralph D. Delio, 4615 Holland Sylvania Rd, Toledo, Ohio 43620

Filed Mar. 13, 1974, Ser. No. 450,731
Int. Cl. B21k *1/74*
U.S. Cl. 72—377 **2 Claims**

1. A method of press forging steering knuckles comprising the procedural combination of steps of:

orienting one end of a heated elongated steel billet adjacent a narrow tapered central web portion projecting from a base of a first one of a first pair of dies such that said billet extends laterally beyond each side of said web over pockets defined by each of the sides of said web, said base and generally transverse walls at either end of said web, said one end extending generally parallel to said base;

pressing said billet axially in a direction generally perpendicular to said one end and said base by means of shallower surfaces defining the cavity of the second mating die of said pair to split the end portion of said billet and cause the web relatively to move axially and longitudinally into said billet as steel of the billet simultaneously flows into said pockets and to said base in one direction and in the opposite direction toward and to the deeper surfaces defining the cavity of said second mating die to form a saddle-shaped blank having one leg in each pocket and an oppositely extending boss ending at the deepest surface of said mating die;



removing the saddle-shaped blank from said first pair of dies and orienting said blank on its side in one die of a second pair of mating dies;

pressing said blank in said second set of mating dies in a direction normal to said first axial pressing to block out said steering knuckle and to move excess steel laterally to form a surrounding integral flashing;

removing said blocked out steering knuckle from said second set of dies and orienting it on its side in one die of at least a third pair of mating dies which define a cavity substantially the shape and dimension of the desired finished steering knuckle forging;

pressing said third set of dies together to press forge the blocked out steering knuckle to proper size;

removing from the forging any flashing remaining and thereby providing a steering knuckle forging of the desired size, shape and grain structure.

3,889,513
APPARATUS FOR BENDING A STEEL PLATE

Yasuhiro Iwasaki; Hiroshi Shiota, and Seido Seko, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 428,302
Int. Cl. B21d *13/02*
U.S. Cl. 72—385 **10 Claims**

1. Apparatus for bending a steel plate to provide complex curvature thereof, comprising:

means for intermittantly advancing a steel plate along a longitudinal path through a bending station;

a first punch group including a plurality of individual punches disposed of in at least three longitudinally spaced, transversally extending rows at the bending station, all of the punches in the first punch group being oriented for contact with one face of the steel plate to be bent;

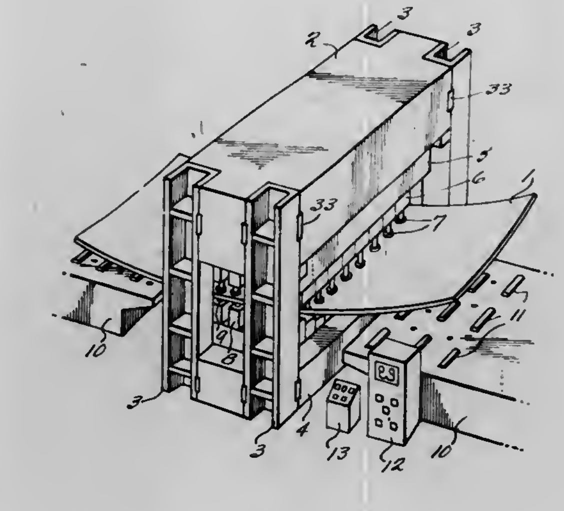
a second punch group including a plurality of individual punches disposed in at least three longitudinally spaced, transversally extending rows at the bending station, all of the punches in the second punch group being oriented for contact with the opposite face of the steel plate to be bent, in direct opposition to corresponding ones of the punches in the first punch group;

frame means and means mounting the first and second punch group on the frame means at the bending station;

the mounting means for at least one of the two recited punch groups including an adjustment device between each punch and the frame means, and remotely operable control means for operating each adjustment device to change the proximity of each individual punch to the path of the steel plate through the bending station;

the mounting means for at least the other of the two recited punch groups including means for advancing each punch of said other punch group this is within the width of the increment of the steel plate that is within the bending station into such forceful contact with that increment that said increment is engaged by punches of the one punch group on a first face thereof and by punches of the other punch group on the second face thereof, in opposed pairs, separated by the thickness of the steel plate; and means for retracting the punches of said other punch group once the steel plate of that increment has been bent by said forceful contact,

whereby, the steel plates may be intermittantly advanced by an increment and progressively bent by increments, with the control means being operated to change the proximity of the individual punches of the first punch group to the path of the steel plate through the bending station between each bending operation of the two recited punch groups in which the curvature planned for the next increment of the steel plate to be bent differs from the curvature applied to the steel plate increment just bent.

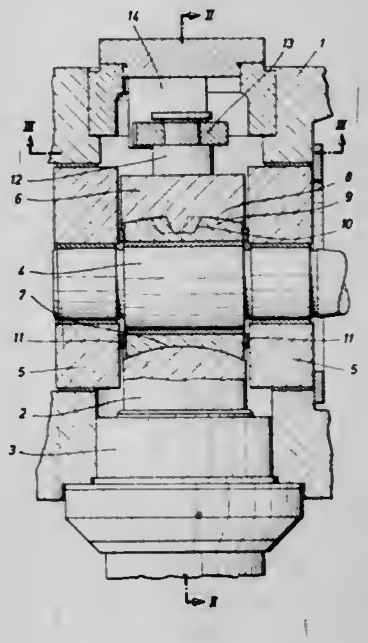


3,889,514
SWAGING MACHINE

Bruno Kralowetz, and Gottfried Blaimschein, both of Steyr, Austria, assignors to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft, Steyr, Austria

Filed Dec. 28, 1973, Ser. No. 429,689
Claims priority, application Austria, Oct. 10, 1973, 176/73
Int. Cl. B21j *7/16, 7/20*
U.S. Cl. 72—402 **3 Claims**

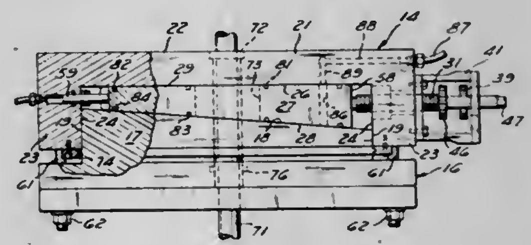
1. In a swaging machine which comprises means defining a path of travel for a workpiece to be fed in the direction of the path and to be swaged, a plurality of hammers, and drive means operable to impart to the hammers a reciprocating motion toward and away from the path for swaging said workpiece and an oscillating motion for feeding said workpiece, the improvement of the drive means being arranged to impart to the hammers an oscillating motion in a plane which extends transversely to the direction of the path of travel.



3,889,515
WEDGING STRUCTURE FOR PRESSES OR THE LIKE

Walter J. Grombka, Tiffin, Ohio, assignor to The National Machinery Company, Tiffin, Ohio

Filed July 22, 1974, Ser. No. 490,270
Int. Cl. B21j *13/02*
U.S. Cl. 72—448 **17 Claims**



1. A press or the like comprising a frame providing a die bed, a slide reciprocable in said frame toward and away from said die bed, and a wedge system on said die bed operable to adjustably position stationary dies in said press, said wedge system including a laterally movable wedge formed with a locking taper, and hydraulic means operable to supply a liquid under pressure to the interface between said wedge and the mating surfaces of said wedge system with sufficient pressure to release said wedge for lateral movement even when said slide is jammed in a dead center position.

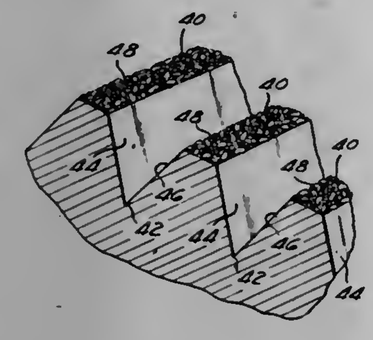
3,889,516
HARDENING COATING FOR THREAD ROLLING DIES

Herbert L. Yankee, North Royalton, and Robert J. Hlavaty, Avon Lake, both of Ohio, assignors to Colt Industries Operating Corp., W. Hartford, Conn.

Filed Dec. 3, 1973, Ser. No. 421,055
Int. Cl. B21d *17/00*
U.S. Cl. 72—469 **5 Claims**

1. A thread rolling die for use with a corresponding thread rolling die in forming a threaded screw from a blank, said die including thread-forming means comprising a tool steel body

formed with a projecting flattened thread root-forming portion, a recessed thread crest-forming portion, and thread side-forming portions joining the root and crest-forming portions, said projecting flattened root-forming portion having a

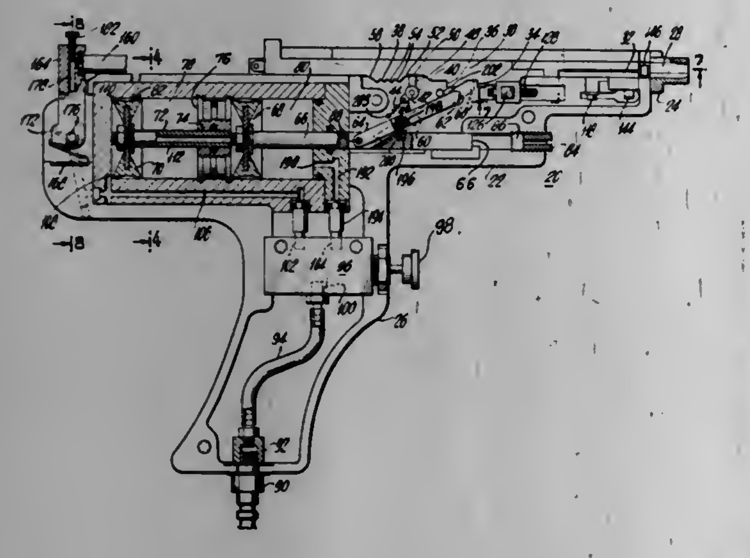


nodularized surface of droplet-shaped nodules in which the nodules are formed of a material in a group including hard metal and metal carbides, and the surface of said crest and thread side-forming portions being substantially free of nodularized surface.

3,889,517
EXTRUSION TOOL

Daniel Eppler, Old Bridge, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Sept. 23, 1974, Ser. No. 508,035
Int. Cl.^{2} B21C *33/00;* B21D *39/04*
U.S. Cl. 72—270 24 Claims

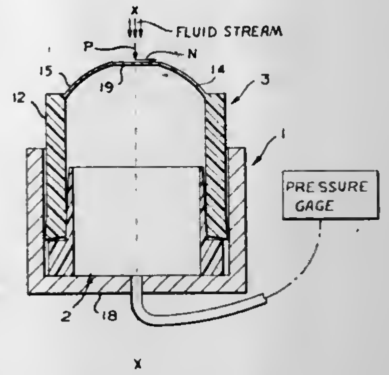


1. An extrusion tool comprising: a tool body having a nose portion and a grip portion; plunger means reciprocatingly movable in said tool body and having a first end movable towards and away from said nose portion; pneumatic drive means located within said tool body for selectively moving said plunger means towards said nose portion; cam means selectively coupling said drive means to said plunger means in one direction to provide stepped movement of said plunger means towards said nose portion; an inlet located in said grip portion for coupling a source of pneumatic pressure thereto; and valve means located in said grip portion for selectively directing a source of pneumatic pressure from said inlet to said drive means to control the direction of movement of said drive means; said nose portion having a tapered orifice extending therethrough, said orifice being arranged to receive said plunger means first end therein for extruding a workpiece therethrough.

3,889,518
DEVICE FOR CONSISTENT RESPONSE TO A FLUID PULSE AND METHOD AND APPARATUS FOR VERIFYING INSTRUMENTS UTILIZING FLUID PULSES

Pieter J. Denouter, Marlboro, and Bernard Grolman, Worcester, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Dec. 26, 1973, Ser. No. 428,477
Int. Cl.^{2} G01L *27/00*
U.S. Cl. 73—4 R 11 Claims



1. A device which is consistently responsive to a fluid pulse comprising:

a mounting means including a resilient base having a generally ring-shaped cross-section and an external surface tapering inwardly toward one end thereof,

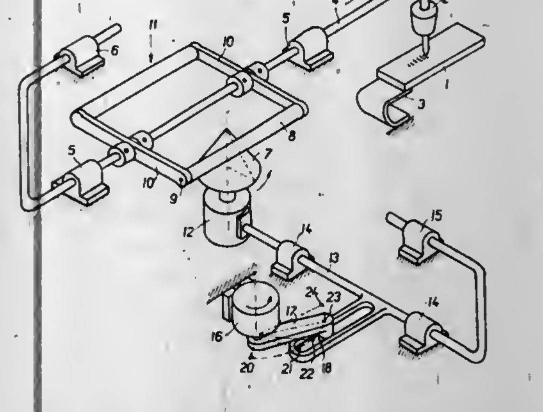
a resilient simulator adapted to be held by said base, said simulator having a body of a generally ring-shaped cross-section and a responder closing one end of said body, said responder having a chosen thickness and a convex substantially spherical exterior surface, said body having an internal diameter less than the maximum diameter of said external surface of the base,

said simulator being mounted with the tapering external surface of said base at least partially within the other end of said body, said external tapering surface having a taper chosen to provide sufficient frictional engagement to hold said simulator such that said responder flexes in a consistent manner under the pressure of a fluid pulse applied to the surface thereo. thereof.

3,889,519
METHOD AND APPARATUS FOR TESTING THE FUSION WELDABILITY OF METALLIC MATERIALS

Josef Nemec, Prague, Czechoslovakia, assignor to Ceske vysoke uceni technicke, Prague, Czechoslovakia

Filed July 9, 1973, Ser. No. 377,416
Int. Cl. G01h *25/72*
U.S. Cl. 73—15 R 8 Claims



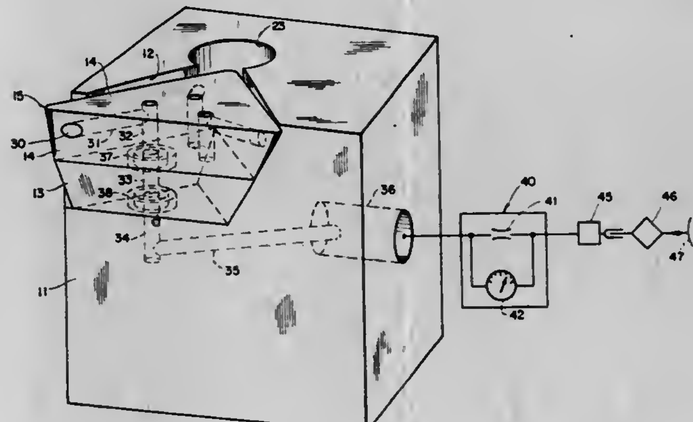
1. A method testing the weldability of metallic materials based on the criterion of hot cracking tendency in the process of welding, comprising employing a test body with a smooth

surface with no joints to be welded, melting the test body during the test by means of a heat source in such a way as to form a weld bead, and intentionally changing the welding speed during the formation of the weld bead while maintaining the heat output of the heat source unchanged examing the thus-formed weld bead for cracking.

3,889,520
FLUIDIC SYSTEM FOR MONITORING MACHINE TOOL WEAR DURING A MACHINING OPERATION

Theodor Stoferle, Weinbergstrasse 29, D-6101, Seeheim, and Bernhard Bellmann, Moselstrasse 7, D-6102, Pfungstadt, both of Germany

Filed Aug. 8, 1973, Ser. No. 386,783
Claims priority, application Germany, Feb. 13, 1973, 2307046
Int. Cl. G01b *13/12*
U.S. Cl. 73—37.5 17 Claims



1. In a machining apparatus of the type including machine tool operable to perform a machining operation on a workpiece, the improvement of a system for monitoring relative movement of the tool toward and away from the workpiece, comprising:

a. a fluid supply system including:
  i. a fluid nozzle formed in the tool for movement therewith relatively toward and away from the workpiece;
  ii. conduit means communicating with said nozzle and adapted for connection to a source of pressurized fluid for supplying fluid under pressure to said nozzle; and,
  b. pressure monitoring means communicating with said fluid supply system for sensing changes in fluid pressure as an indication in changes in the distance between said nozzle and the workpiece.

3,889,521
STATIC GAS PRESSURE MEASURING DEVICE

Christopher C. Jakimowicz, Detroit, Mich., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed May 15, 1974, Ser. No. 470,117
Int. Cl. G01n *15/08*
U.S. Cl. 73—38 7 Claims

1. An apparatus for measuring the permeability of a porous layer of material comprising

a. conduit means having two open ends,

gas pressure measuring means connected to one open end of the conduit means,

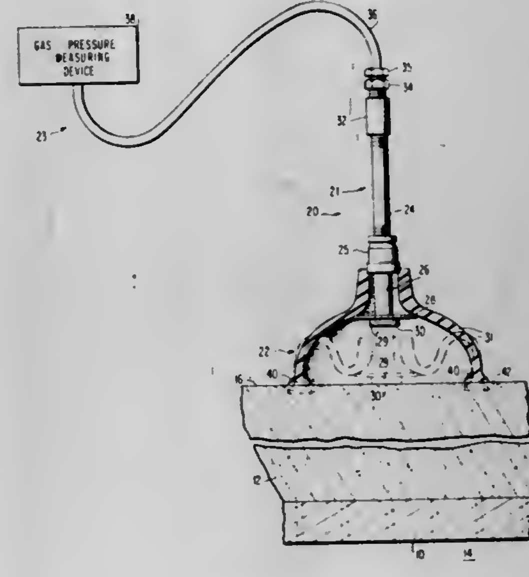
c. chamber means having imperforate wall means, the chamber means being carried by and in gas-tight connection with the conduit means,

d. margins on the wall means forming a large opening into the chamber means, the large opening being spaced from the chamber means connection with the conduit means,

e. the margins of the wall means forming the opening in the chamber means having a continuous edge completely surrounding the opening, the continuous edge throughout its entire length lying in a single plane,

f. porous layer contacting means having tubular wall means carried by the conduit means and in gas-tight connection with the other open end of the conduit means, the porous layer contacting means projecting into the chamber,

g. margins on tubular wall means of the porous layer contacting means forming an opening facing in the same general direction as the large opening in the chamber means, the opening of the porous layer contacting means being small compared to the opening of the chamber means and the edge surrounding the porous layer contacting means opening being spaced inwardly of the edge surrounding the chamber means opening in a direction away from the plane of the edge of the opening of the chamber means,



h. the margins on the wall means forming the opening in the porous layer contacting means having a continuous edge completely surrounding the opening, the continuous edge throughout its entire length lying in a single plane, and

i. means acting between the margins of the wall means of the chamber means and the margins of the wall means of the conduit means providing for relative movement of the edge of the opening of the porous layer contacting means toward the edge of the opening of the chamber means to bring the edge of the opening of the chamber means and the edge of the opening of the porous layer contacting means into simultaneous contact with the surface of a porous layer of material for measuring the permeability thereof with the edges of the two openings approximately concentric and each of the edges of the two openings in continuous contact with the surface of the porous layer throughout the entire length of the edge.

3,889,522
PIPELINE CONDITION ANALYZER

Kenneth E. Mayo, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Aug. 21, 1972, Ser. No. 282,318
Int. Cl. G01m *3/08*
U.S. Cl. 73—40.5 R 6 Claims

1. A pipeline condition analyzer comprising

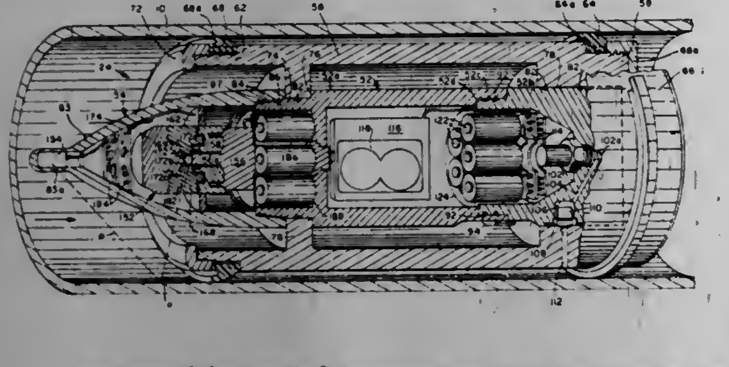
A. pigging apparatus for isolating a segment of pipe as it moves through the pipe,

B. a pressure detector on board the pig for sending the pressure in the isolated pipe segment and developing an electrical signal proportional thereto,

C. and means on board the pig for continuously recording the pressure signal on a recording medium so as to develop a pressure profile for the pipeline,

D. said pigging apparatus including
  1. a capsule containing the pressure detector and recorder and whose cross section is smaller than the smallest pipe whose condition is to be analyzed, and

2. a removable sleeve encircling the capsule, the opposite ends of the sleeve having outwardly projecting seals arranged for sealing engagement with the interior wall of the pipe whose condition is to be analyzed.



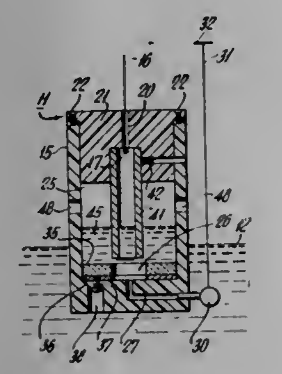
3,889,523
LEAK-DETECTION APPARATUS AND LIQUID LEVEL VARIATIONS DETECTOR

David G. Nolte, Richmond, Va., assignor to Texaco Inc., New York, N.Y.

Filed Mar. 8, 1974, Ser. No. 449,414

Int. Cl. G01f *23/28*

U.S. Cl. 73—49.2 **13 Claims**



1. Liquid level variation detector, comprising in combination

submerged means for transmitting acoustic energy into said liquid,

signal-transducer means immersed in said liquid a variable amount depending upon the said liquid level,

said transducer means having a geometric configuration for producing a resonant condition at a predetermined amount of immersion, and

electric circuit means including said transducer means for indicating said liquid level variation.

3,889,524
ARRANGEMENT FOR CHECKING STABILITY OF SELF-SUPPORTED OBJECTS

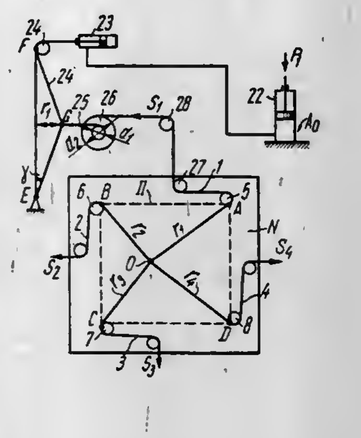
Mikhail Fedorovich Glushko, prospekt Shevchenko, 15/5, kv. 17; Mikhail Pavlovich Nikitinsky, ulitsa Perekopskoi Divizii, 14a, kv. 48; Ilya Fedorovich Pakhomov, ulitsa Lenina, 44/46, kv. 55, and Oleg Fedorovich Kurgansky, prospekt Shevchenko, 10, kv. 30, all of Odessa, U.S.S.R.

Filed Feb. 1, 1974, Ser. No. 438,777

Int. Cl. G01m *1/00*

U.S. Cl. 73—65 **9 Claims**

1. An arrangement for checking stability of a self-supported object having sensors of the values of normal support reactions of the object, comprising, in combination: guide members mounted at the vertexes of a master contour which is geometrically similar to a support contour of the object formed by the lines interconnecting its support points; pull elements extending through said guide members, one end of each pull element being connected to the corresponding ends of the other pull elements inside the master contour so as to form a freely displaceable junction; transducers, each being connected to one of said sensors and to the other end of the respective pull element, whereby a moment, which is directly proportional to the value of the respective support reaction and to the length of said pull element, is transmitted to said pull element, and the junction interconnecting said pull elements takes the position inside said master contour which coincides with the position of the point of application of the resultant force of the normal support reactions of the object.



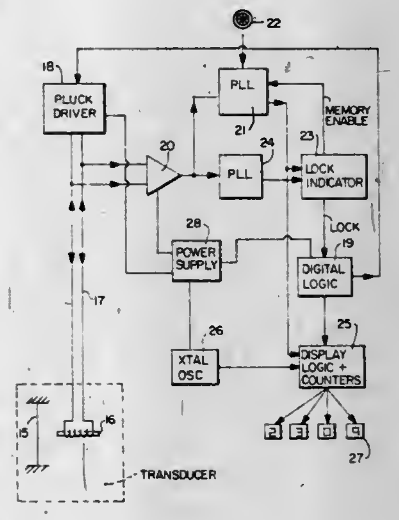
3,889,525
VIBRATING WIRE METER

William V. Bailey, Lebanon, N.H., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Aug. 7, 1974, Ser. No. 495,347

Int. Cl. G01l *1/10*

U.S. Cl. 73—67.2 **13 Claims**



10. A device for measuring the natural frequency of a wire under tension comprising:

means for magnetically plucking said wire;

means for detecting mechanical vibration of said wire;

a phase lock loop circuit connected to said vibration detecting means for tracking mechanical vibration in a given frequency band about a selected frequency;

a voltage controlled oscillator;

means connected to said voltage controlled oscillator for connecting said voltage controlled oscillator to said plucking means during a first period and for connecting said voltage controlled oscillator to said phase lock loop circuit for tracking during a second period; and

means connected to said voltage controlled oscillator for indicating the tracked frequency.

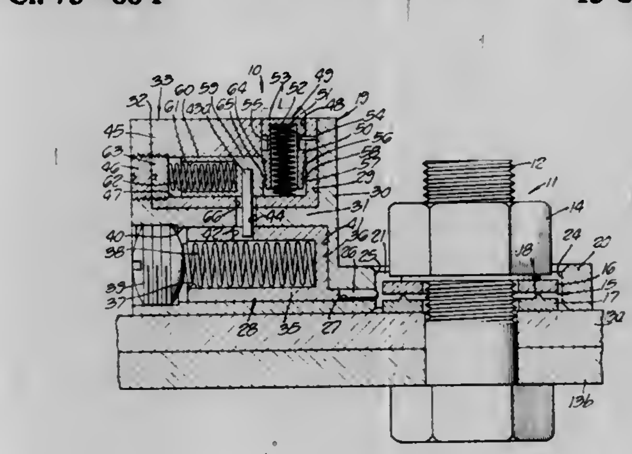
3,889,526
MECHANISM FOR INDICATING LOAD TENSION ON A FASTENING DEVICE

Edwin C. Elsner, deceased, late of Kanosh, Utah, and Viola Hazel Elsner, executrix, Kanosh, Utah, assignors to Max Fink and Floyd G. Hahn, both of Beverly Hills, Calif., part interest to each

Filed Oct. 23, 1973, Ser. No. 408,399

Int. Cl. G01d *21/00;* G01b *5/08*

U.S. Cl. 73—88 F **15 Claims**



1. Mechanism for indicating the load tension force applied to a threaded member during tightening and setting up of an associated nut, and in which the load tension is effective to radially expand an annular member as a function of the load tension forces, said mechanism comprising a hollow body having an integral, laterally extending projection on one side thereof of reduced height relative to the body, said projection having an opening therethrough defining an inner annular wall, said opening having a size such as to receive the nut and the annular member therein and the height of the projection being such that at least a portion of the nut received in said opening is exposed above said projection for engagement with a suitable tool, sensing means in said hollow body including a movable elongate sensing member extending through an opening in said wall into said opening at one side of said annular member and engagable by and axially movable in response to radial expansion of the annular member, and visual indicating means carried by said body and operatively connected with said sensing member to be activated in response to movement of said sensing member.

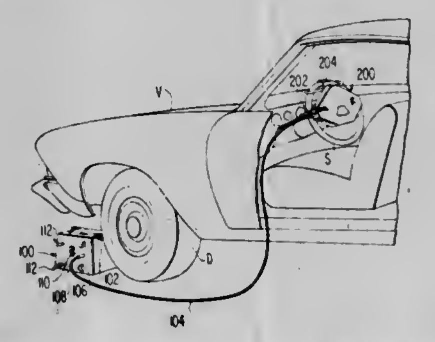
3,889,527
STEERING LINKAGE TESTING APPARATUS

Virgil T. Wallace, Box 831, Gladewater, Tex. 75647

Filed Apr. 4, 1974, Ser. No. 458,057

Int. Cl. G01m *17/06*

U.S. Cl. 73—118 **17 Claims**



1. Apparatus for use in testing play in the mechanism connecting the steering wheel and the steerable road wheels of a vehicle, comprising a support to be disposed on the road wheel supporting surface adjacent one of the road wheels, sensing means movably supported by said support and engagable with the respective road wheel for sensing movement by the wheel, circuit means in said support responsive to said sensing means for producing a signal, steering wheel movement indicating means mountable at least on the steering wheel for indicating steering wheel travel, and indicator means on said steering wheel movement indicating means connected to said circuit means for generating an alarm in response to said signal upon initial movement of said sensing means by the road wheel.

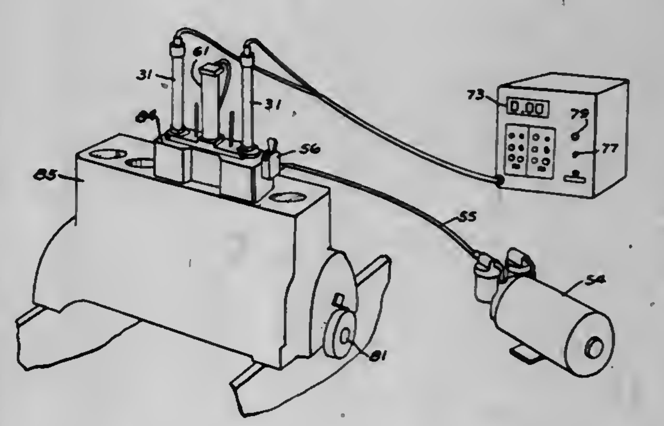
3,889,528
METHOD AND APPARATUS FOR DETERMINING TOP DEAD CENTER IN INTERNAL COMBUSTION ENGINES

Henry W. Grikscheit, Bloomfield Hills, and Vernon G. Converse, III, Franklin, both of Mich., assignors to Scans Associates, Inc., Livonia, Mich.

Continuation-in-part of Ser. No. 252,594, May 12, 1972, Pat. No. 3,820,386. This application Apr. 18, 1974, Ser. No. 461,993

Int. Cl. G01m *15/00*

U.S. Cl. 73—119 R **26 Claims**



1. A method for determining the top dead center position of a selected piston in an internal combustion engine having at least three cylinders based on the position of one other piston other than said selected piston, said method including positioning said other selected piston at the uppermost point in its stroke, measuring the distance from the top of said other piston's respective cylinder bore to the head of said one other piston, positioning said one other piston at the lowermost position in its stroke, again measuring the distance from the top of said cylinder bore to the head of said one other piston, determining from said measurements the stroke of said one other piston, and thereby determining the throw of the crankshaft of said internal combustion engine, determining from the type of internal combustion engine being operated upon, the angle which the journal corresponding to said one other piston must be set at, measured from the center line plane of the engine's cylinder bore, such that the selected piston will be at its top dead center position, determining from said angle, said crankshaft throw, and the length of said connecting rod corresponding to said one other piston, the distance measured from the top of the cylinder bore of said one other cylinder which said one other piston must be placed at to insure said selected piston is at its top dead center position, placing the head of said one other piston at said distance measured from the top of the cylinder bore, and marking the position of said selected piston as being in the position of top dead center.

3,889,529
RECTANGULAR HYDRAULIC LOAD CELL

Chester D. Bradley, Darien, Conn., assignor to The A. H. Emery Company, New Canaan, Conn.

Filed Apr. 17, 1974, Ser. No. 461,587

Int. Cl. G01l *1/02;* G01g *5/04*

U.S. Cl. 73—141 R **6 Claims**

1. A hydraulic load cell comprising, in combination:

A. a base member

  1. having means forming a rectangular fluid reservoir therein,

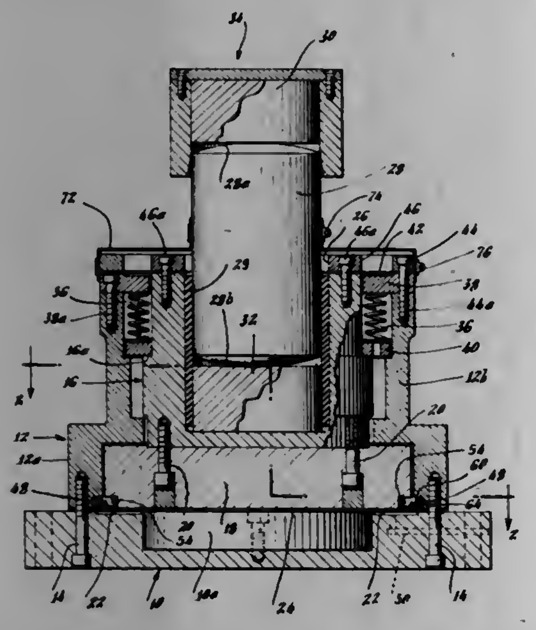
2. and having outlet means connectable to a pressure transducer;

B. a thin flexible diaphragm overlaying said fluid reservoir means;

C. means for securing said diaphragm to said base to contain fluid under pressure;

D. a column positioned over said diaphragm,
  1. said column having a lower portion adjacent said diaphragm of rectangular configuration and generally conforming to the shape of said fluid reservoir means,
  2. said lower column portion having means forming an extending portion to form shoulders around the periphery of said lower portion, said shoulders having a substantially vertical and a substantially horizontal surface;

E. a casing surrounding said lower column portion,



  1. said casing being of a rectangular configuration,
  2. and having shoulders around its lower end in substantially horizontal alignment with said column shoulders, said shoulders having substantially vertical and substantially horizontal surfaces;

F. four elongated bridging members positioned around said column between the shoulders of said column and the shoulders of said casing ring,
  1. said bridging members each having 45° angles at their ends to provide essentially continuous bridging in a rectangular configuration between said casing and said column; and

G. low friction pivot means between said horizontal surfaces of said column shoulders and said bridging members and between said horizontal surfaces of said casing shoulders and said bridging members.

3,889,530
FLUID PRESSURE TESTING APPARATUS

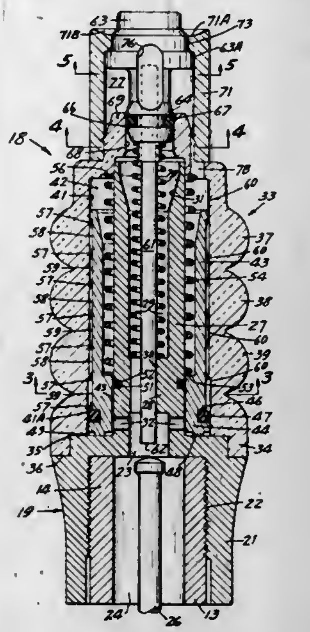
Gary R. Bluem, 7980 Wynnwood Rd., Minneapolis, Minn. 55427

Continuation-in-part of Ser. No. 366,682, June 4, 1973, Pat. No. 3,866,563. This application June 10, 1974, Ser. No. 477,699

Int. Cl. B60c *23/02*

U.S. Cl. 73—146.8 **49 Claims**

1. A fluid pressure testing apparatus for indicating the pressure of a fluid in a container having a normally closed valve connected to the container comprising: body means having a passage in communication with the valve, housing means mounted on the body means, said housing means having a viewing section, said body means and housing means defining a chamber, piston means located in said chamber, first information means on one portion of the piston means and second information means on another portion of the piston means, biasing means yieldably holding the piston means in a first position wherein said first information means is visually observable through the viewing section, plunger means extended through said passage of the body means, said plunger means having a portion located outside of the housing means that is manually engaged to move the plunger means from a first position to a second position to open the valve whereby fluid under pressure from the container exerts a force on the piston means, when said force on the piston means is greater than the force of the biasing means that piston means moves to a second position wherein said second information means is visually observable through the viewing section.



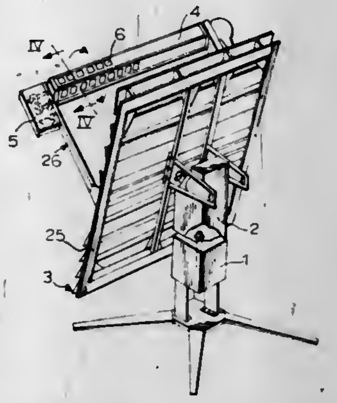
3,889,531
WEATHERING TEST APPARATUS

Nagaichi Suga, No. 2, Toyamacho, Shinjuku-ku, Tokyo, Japan

Filed Apr. 5, 1974, Ser. No. 458,451

Int. Cl. G01n *17/00;* **G02b** *27/32*

U.S. Cl. 73—150 R **4 Claims**



1. An improved weather test apparatus including a reflecting mirror support frame, reflecting mirrors mounted thereon for condensing sunlight toward a test piece, and a support member for positioning the test piece for receiving the condensed sunlight thereupon, wherein the improvement comprises:

a rotary test piece support member comprised of a pair of multisided end plates, a plurality of transverse members, each connecting a respective corner of said end plates for rigid separation thereof, a plurality of test piece adaptor plates connected between said end plates at locations corresponding to each of the sides of said end plates and having test pieces supported thereon, said test piece adaptor plates defining air flow passages between adjacent adaptor plates, a plurality of air flow adjusting plates, at least one mounted on each of said transverse members for slidable movement laterally of said transverse member, a first shaft fixedly coupled to one of said end plates, said first shaft adapted for rotating said test piece support member, a second shaft, one end thereof being slidably coupled to and extending through the other of said end plates into the interior of the said rotary test piece support member and the other end being rigidly mounted to said support member, said second shaft being hollow and said one end being open within the interior of said test piece support member, and an arcuate wind direction plate positioned over said second shaft and downwardly extending thereabout;

means for rotating said first shaft, operatively coupled thereto and to said support member, and

air blowing means coupled to said second shaft.

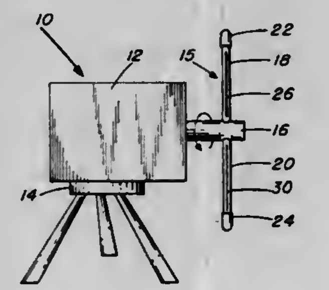
3,889,532
FOG WATER COLLECTOR

Roland J. Pilie, Williamsville, and Eugene J. Mack, Alden, both of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 28, 1974, Ser. No. 501,306

Int. Cl.² G01W *1/00*

U.S. Cl. 73—170 R **6 Claims**



1. A fog water collector comprising:

at least one hollow elongated tube having a slotted opening formed along a substantial portion of the length of said tube;

means for rotating said tube in a direction such that said fog water passes through said slotted opening and impacts on the back wall of said tube; and

removable container means for each said tube, said container means receiving the fog water impacted on said tube as it moves to the ends of said tube under the influence of the centrifugal rotational force.

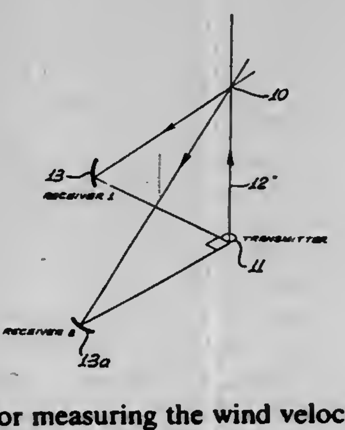
3,889,533
ACOUSTIC WIND SENSOR

Martin Balser, Covina, Calif., assignor to Xonics, Inc., Van Nuys, Calif.

Filed July 19, 1973, Ser. No. 380,897

Int. Cl. G01w *1/06;* **G01s** *9/66*

U.S. Cl. 73—189 **14 Claims**



1. In a system for measuring the wind velocity at a specific location, the combination of:

an acoustic echo system transmitter for directing a beam of acoustic energy toward a zone spaced from said transmitter;

a plurality of receivers for said transmitter and spaced from each other and from said transmitter, with each receiver directed toward said zone for receiving acoustic energy of said transmitter scattered by wind in said zone and providing a receiver output signal having a doppler frequency component; and

signal processor means having the receiver output signals as inputs for generating a processor output signal varying as a function of the vector velocity of the wind in said zone.

3,889,534
FLOWMETERS

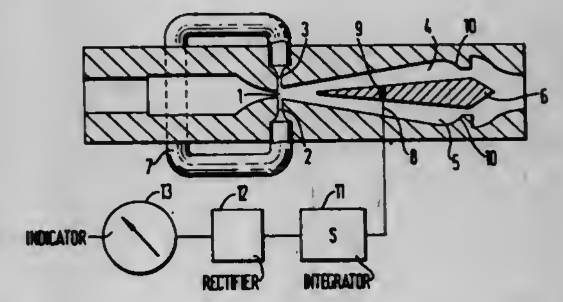
John Grant, Warrington, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 14, 1973, Ser. No. 341,080

Claims priority, application United Kingdom, Mar. 24, 1972, 14130/72

Int. Cl. G01f *5/00*

U.S. Cl. 73—194 B **4 Claims**



1. A method of measuring mass fluid flow, the method comprising the steps of passing the fluid flow through a fluidic oscillator of the wall attachment type whereby pressure changes caused by the flow are substantially proportional to the square of the fluid velocity, sensing pressure changes in the fluid flow through the oscillator, converting the sensed pressure changes to a signal representative of the amplitude and frequency of the pressure change, integrating the signal and determining the value of the integrated signal.

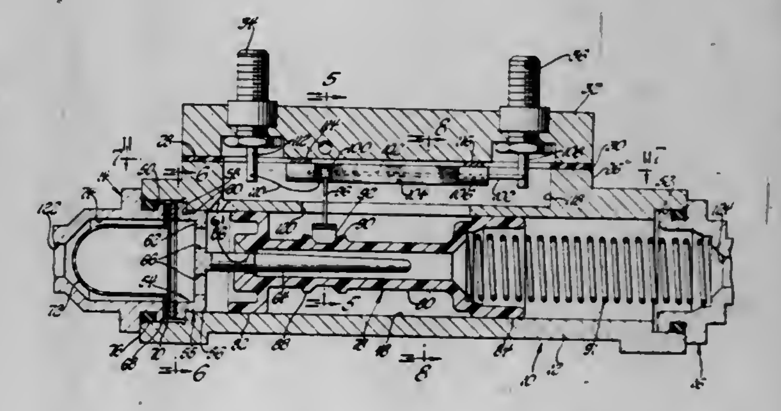
3,889,535
FLOW SENSOR AND SYSTEM

David W. Bull, and Gerald K. Miller, both of Hersey, Mich., assignors to Nartron Corporation, Reed City, Mich.

Filed Jan. 30, 1974, Ser. No. 437,925

Int. Cl. G01f *1/00*

U.S. Cl. 73—208 **9 Claims**



1. A fluid flow sensor, comprising housing means, movable wall means resiliently urged by resilient means in a first direction, variable orifice means, inlet means effective for communicating with said variable orifice means, outlet means effective for communicating with said variable orifice means, said movable wall means being effective when acted upon by a fluid admitted through said inlet means to move in a second direction opposite to said first direction and in so doing to vary the effective flow area of said variable orifice means, addi-

tional means operatively connected to said movable wall means effective for producing an output signal indicative of the distance traveled by said movable wall means in said second direction, a cylindrical passage formed in said housing means, said movable wall means comprising a piston closely received and axially movable in said cylindrical passage, said piston comprising first and second axially spaced piston-like cylindrical portions respectively defining first and second axially spaced outer cylindrical land surfaces slidably engageable with said cylindrical passage, said first and second axially spaced piston-like cylindrical portions and said first and second axially spaced cylindrical land surfaces being respectively spaced from each other by and integrally formed with an intermediate necked-down portion as to thereby define a generally annular space as between said cylindrical passage and said intermediate necked-down portion, a first wall portion integrally formed with and carried by said first piston-like cylindrical portion as to extend generally transversely to the axis of said first cylindrical land surface as to prevent flow therethrough, said variable orifice means comprising an orifice of fixed dimension formed through said first wall portion, a second passage formed through said intermediate necked-down portion and said second piston-like cylindrical portion as to be in communication with said outlet means and at least at times in communication with said orifice, said variable orifice means also comprising a valving element of fixed but contoured configuration, said valving element being supported generally between said inlet means and said first wall portion, said valving element being adapted to be received in and through said orifice to thereby define therebetween said effective flow area, said valving element also extending into said second passage as to be effective to vary said effective flow area as said piston and said first wall portion are axially moved toward and away from said inlet means by the action of said fluid against said first wall portion, said additional means comprising variable electrical resistance means, said resistance means comprising a generally elongated resistance element carried by said housing means, said elongated resistance element being situated as to have its longitudinal axis generally parallel to but spaced from the axis of said cylindrical passage as to result in said elongated resistance element being situated without said cylindrical passage, and electrical contact means carried by said intermediate necked-down portion and operatively slidingly engaging said elongated resistance element to complete an electrical circuit therethrough.

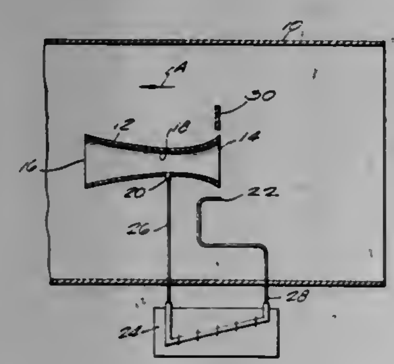
3,889,536
FLOW MEASURING AND MONITORING APPARATUS

Gordon C. Sylvester, Verona, Wis., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Mar. 29, 1973, Ser. No. 345,864

Int. Cl. G01f *1/00*

U.S. Cl. 73—212 **4 Claims**



1. In combination

means defining a main flow passage,

walls defining a restricted passage in said main flow passage having a longitudinal axis extending generally parallel to the direction of flow through said passage, the outer surfaces of said walls being exposed directly to the interior of said main flow passage and said restricted passage characterized by upstream and downstream ends exposed directly to the interior of said main flow passage, a reduced diameter throat area spaced inwardly from said downstream end, and said walls flaring outwardly from said throat area to said downstream end,

means defining a first pressure sensing tap in said restricted passage at said throat area so that the pressure sensed by said first tap corresponds to the pressure condition at said throat area,

means defining a second pressure sensing tap in said main flow passage spaced from said restricted passage so that the pressure sensed by said second tap corresponds to the total pressure condition in said flow passage,

output means operable in response to pressure differential, conduits connecting said first and second taps to said output means so that said output means operates in response to the pressure differential sensed by said first and second taps as a medium flows through said passage,

and an annular flange attached to said walls defining said restricted passage and projecting laterally therefrom, said annular flange being located, with reference to flow through said main flow passage, adjacent at least one of said upstream and downstream ends of said restricted passage to amplify the pressure differential sensed by said first and second taps.

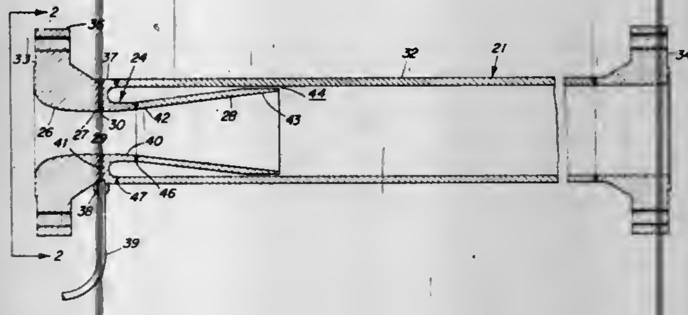
3,889,537
VENTURI ARRANGEMENT

Kamel Ahmad Khuzaie, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Oct. 11, 1973, Ser. No. 405,266

Int. Cl. G01f *1/00*

U.S. Cl. 73—213 **6 Claims**



1. For use in a pipe line for conducting a flow of fluid, a flanged section of pipe for removable connection in said pipe line and a venturi formed in said section of pipe comprising: a convergent inlet section and a throat section of said venturi formed integrally with a flange, said flange having an outside diameter greater than the outside diameter of said pipe and an inside diameter substantially equal to the inside diameter of said pipe, said throat section having an inside diameter less than the inside diameter of said pipe, said flange being welded to an upstream end of said section of pipe; a pressure tap formed in the inner surface of said throat section and connected by a passage through said flange to an exterior surface of said flange; and a divergent diffuser section having a small-diameter inlet end welded to said throat section and having a larger diameter outlet end spaced from an inner surface of said pipe at a given ambient temperature, said diffuser section being formed of a metal having a higher thermal coefficient of expansion than the metal of which said pipe is formed whereby at an operating temperature greater than said ambient temperature said outlet end of said diffuser section contacts said inner surface of said pipe.

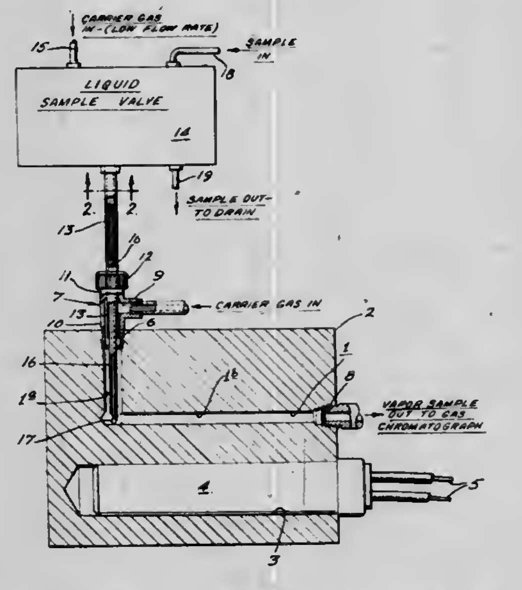
3,889,538
SAMPLE VAPORIZER FOR GAS CHROMATOGRAPHY

Alfred A. Fingerle, Newtown Square, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed June 5, 1974, Ser. No. 476,626

Int. Cl. G01n *1/00*

U.S. Cl. 73—422 GC **10 Claims**



1. An apparatus for introducing a small sample of a volatile liquid into a chromatographic carrier gas stream which comprises: a block of heat-conducting metal, said block having a continuous carrier-gas transmitting conduit extending through the interior thereof with an inlet end and an outlet end both opening into the outer surface of the block; heater means for heating said block to an elevated temperature with respect to the ambient, a sample-liquid transmitting conduit of oleophobic material extending through said conduit inlet end into communication with said continuous conduit at a point in the interior of said block, and means providing for connection of said conduit outlet end to a chromatographic column.

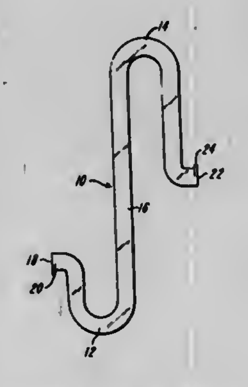
3,889,539
DIP TYPE MEASURING DISPENSER

Owen A. Miller, 4732 E. National Rd., Springfield, Ohio 45505

Filed Mar. 29, 1973, Ser. No. 346,105

Int. Cl. G01n *1/12*

U.S. Cl. 73—425.4 R **10 Claims**



1. A dip type measuring dispenser consisting of a tubular structure, said structure including an intermediate straight segment of tubing having extensions to either end the remote end portion of each of which is formed into a hook shaped configuration to provide a chamber to either end thereof an opening to which is formed at the adjacent projected end of said tubular structure, said chambers thereby providing a measuring segment of said tubular structure to either end thereof, each said chamber being composed of two branches connected by a base portion the contents of which will have a prescribed volume and an opening to which chamber is provided by the open end of the hook shaped end portion to provide thereby that the introduction of a hook shaped end portion of said structure into a body of fluid will inherently introduce therein a prescribed volume of said fluid.

3,889,540
APPARATUS FOR CONTROLLING THE FEELER DISPLACEMENT OF AN ELECTRONIC DIMENSIONAL

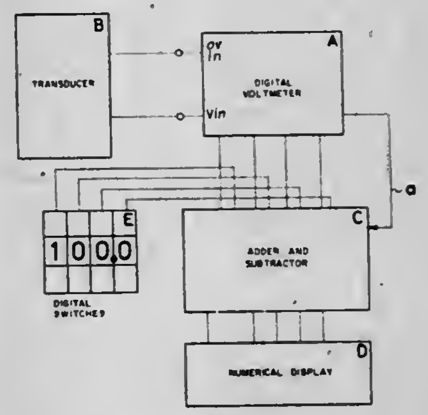
Werner Widmer, Chatelaine-Geneva, Switzerland, assignor to Societe Genevoise d'Instruments de Physique, Geneva, Switzerland

Filed Mar. 5, 1973, Ser. No. 337,908

Claims priority, application Switzerland, Apr. 6, 1972, 5081/72

Int. Cl.^{2} G01B *3/00*

U.S. Cl. 73—432 A **2 Claims**



1. In an electronic dimensional sensor having a displaceable feeler that bears against a surface to measure a dimension corresponding to the position of said surface, and a micro-indicator display of feeler displacement; the improvement comprising means for adding to or subtracting from the displayed displacement a value equal to the value of feeler displacement corresponding to a predetermined force between said feeler and said surface, and means to detect the sign of the measurement and to effect said addition or subtraction according to said sign, said adding or subtracting means comprising, connected to the output of a digital voltmeter, an adder and subtracter controlled both by the sign of the measurement and by control switches, said adder and subtracter feeding a numerical display means.

3,889,541
BALANCE APPARATUS

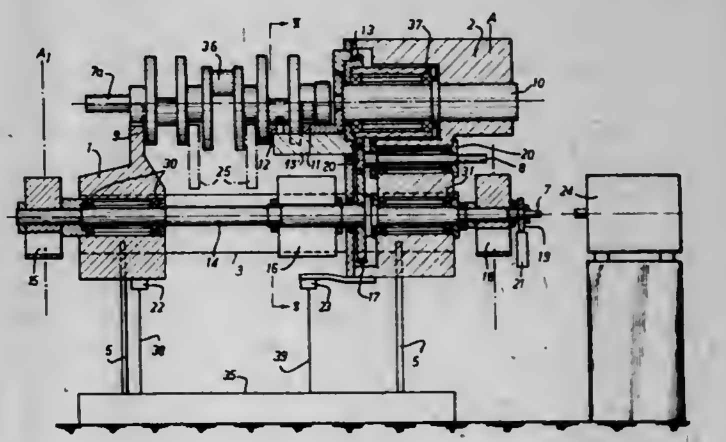
Christian Langlois, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt, France

Filed May 18, 1973, Ser. No. 361,438

Claims priority, application France, June 1, 1972, 72.19778

Int. Cl. G01m *1/20*, *1/16*

U.S. Cl. 73—460 **9 Claims**



1. An apparatus for comparing the dynamic want of balance of a workpiece having an axis of rotation about which it can

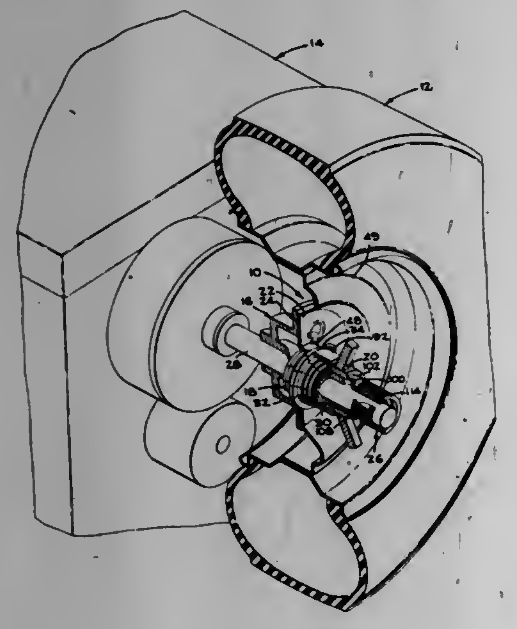
rotate to a dynamic reference want of balance and for dynamically balancing rotating workpieces of which it is desired to preserve a given residual want of balance comprising,

a fixed base;
at least two vertical flexible elements extending from said base;
a frame supported by said flexible elements;
means on said frame defining a first reference axis having a shaft rotatably mounted on said frame;
a pair of want-of-balance inertia weights spaced from each other on said shaft to create a moment equal to the desired residual want-of-balance and graduations on said shaft to accurately position said weights;
workpiece holding means on said frame defining a second axis of rotation parallel to said shaft capable of rotating a rotary workpiece with its axis of rotation coincident with said second axis of rotation;
a member rotating about said second axis and capable of fastening to said rotating workpiece for rotation of said workpiece;
means for rotating said shaft and said workpiece at the same angular velocity; and
sensor means for measuring the characteristics of the horizontal movement of said frame during said workpiece rotation.

3,889,542
WHEEL MOUNTING APPARATUS

Tracy Carrigan, Lansing, Mich., assignor to FMC Corporation, San Jose, Calif.

Filed Nov. 9, 1973, Ser. No. 414,474
Int. Cl. G01m *1/02*
U.S. Cl. 73—460 **20 Claims**

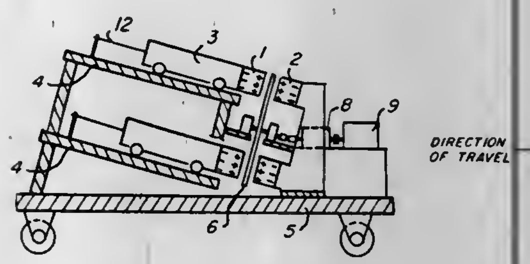


1. A wheel mounting apparatus for centering a wheel and tire assembly having a center hole relative to the axis of a shaft and for rigidly clamping the assembly to the shaft including, an adapter slidably received on the shaft and including a tubular portion and a flange disposed normal to the axis of the tube, a centering device slidably received on the tube for engaging the center hole in the wheel, clamping means for firmly forcing the centering device into the center hole and for clamping the wheel against the flange, and shaft engaging means for locking the centered wheel and tire assembly on the shaft; the improvement which comprises means defining a plurality of steps on the outer surface of the centering device having cylindrical surfaces of different diameters, and means defining a plurality of axially elongated evenly spaced resilient fingers on said centering device separated by tube engaging segments, said resilient fingers being bent outwardly relative to the outer surfaces of said segments for engaging and being compressed by the inner surface of the center hole when in wheel centering position.

3,889,543
PROPULSION SYSTEM

Oscar Mast, 24 Sunshine Dr., Dollard des ormeaux 980, Quebec, Canada

Filed Apr. 16, 1973, Ser. No. 351,329
Int. Cl. B60k *9/00*
U.S. Cl. 74—88 **4 Claims**



1. A vehicle propulsion system comprising:
a substantially horizontal base member;
a plurality of wheels supporting said base member above the ground,
an inclined surface mounted on said base member,
said inclined surface having a negative slope in the direction of travel of the propulsion system,
a stationary permanent magnet mounted on the horizontal base member,
a reciprocating assembly operatively mounted on the inclined surface
said reciprocating assembly containing at least one permanent magnet facing said stationary magnet,
means for alternately establishing and cancelling the magnetic field between the two magnets, whereby the establishment of the magnetic field causes the reciprocating assembly to move up the inclined surface and, upon cancellation of the field, to return to its original position under the influence of gravity to thereby impart a continuous reciprocation of the reciprocating assembly,
said reciprocating assembly generating forces which are transmitted to the wheels to thereby propel the system in a predetermined direction of travel.

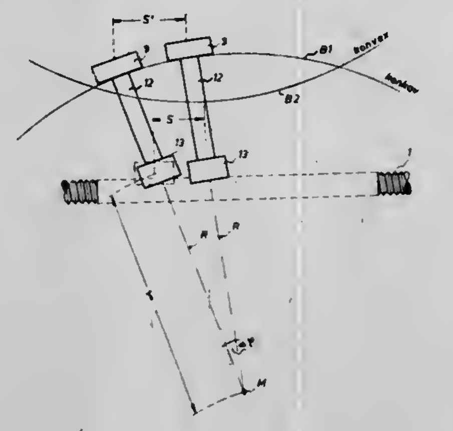
3,889,544
LEAD-SCREW-FINE ADJUSTMENT DRIVE FOR A SLIDE

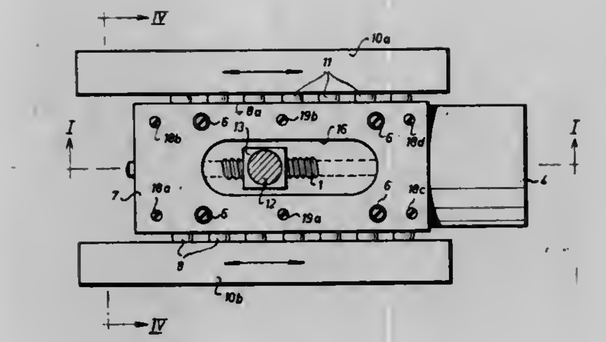
Winfried Suss, Unterhaching, Germany, assignor to Karl Suss KG, Garching, Germany

Filed May 8, 1974, Ser. No. 467,920
Claims priority, application Germany, May 19, 1973, 2325612
Int. Cl. F16h *27/02*
U.S. Cl. 74—89.15 **10 Claims**

1. In a lead screw-fine adjustment drive for a slide reciprocably movable in essentially a straight line manner within an associated guideway, the slide being movable along a plane parallel to a lead screw by means of a nut engaging into the threads of the lead screw, with the plane of the nut running essentially perpendicular to the lead screw axis, and being slightly tiltable, and with an entrainment member rigidly joining the nut with the slide, said drive being characterized in that

means are provided for bowing the guideway convexly toward or concavely away from the lead screw as a function of effectively slightly lengthening or shortening of the lead screw by means of transversely disposed adjustment members.

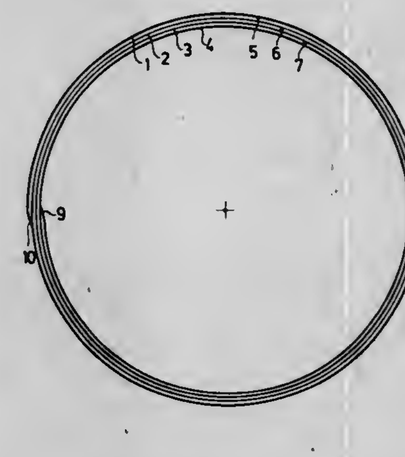


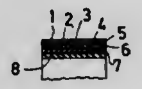


3,889,545
TRANSMISSION BELT

Mikas Baublys, and Eugen Siegloch, both of Freiligrathstr. 23 7000-50, Stuttgart, Germany

Filed Jan. 17, 1973, Ser. No. 324,086
Claims priority, application Germany, Jan. 17, 1972, 2202041
Int. Cl. F16g *1/20*
U.S. Cl. 74—231 M **7 Claims**



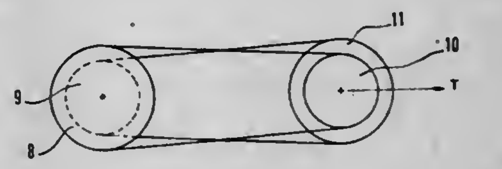


1. A transmission belt comprising an endless band arranged for driving engagement over a pair of pulleys, said band consisting of a single length of a thin flexible metal strip disposed in a helically wound structure formed of a plurality of superimposed layers, and elastic connection means intermediate said layers elastically connecting said layers together for integrated assembly but allowing a desired longitudinally movability therebetween to provide for the necessary bending stresses as the belt moves around a pulley.

3,889,546
PRODUCTION OF V-TYPE TRANSMISSION BELTS

Charles Houdret, and Jacques Marchand, both of Saint-Leger-des-Vignes, France, assignors to Pneumatiques, Caoutchouc Manufacture and Plastiques Kleber-Colombes, France

Filed July 30, 1973, Ser. No. 383,467
Claims priority, application France, July 28, 1972, 72.27212
Int. Cl. F16g *5/00*; **B29h** *7/22*
U.S. Cl. 74—234 **18 Claims**

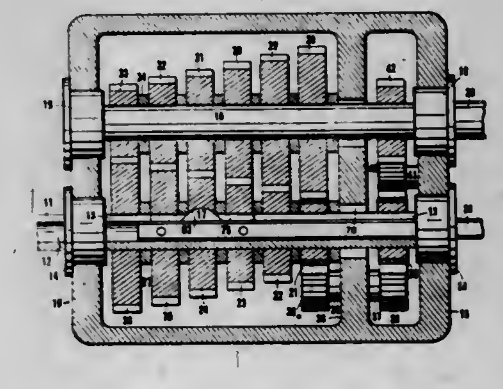


1. A V-type belt having a base portion, said base portion comprising a vulcanized rubbery mixture containing at least one elastomer and a polyolefin having a high molecular weight, said mixture having been brought at least once to a temperature higher than the melting temperature of the polyolefin, and at least by the time of vulcanization.

3,889,547
HYDRAULICALLY SELECTABLE GEAR TRANSMISSION

Jun-Kai Sun, 516 Dufferin St., and Lian-Sheng Lo, 182 Ossington Ave., both of Toronto, Ontario, Canada

Filed Sept. 13, 1973, Ser. No. 397,134
Int. Cl. F16h *5/60*, *3/08*
U.S. Cl. 74—336 **8 Claims**

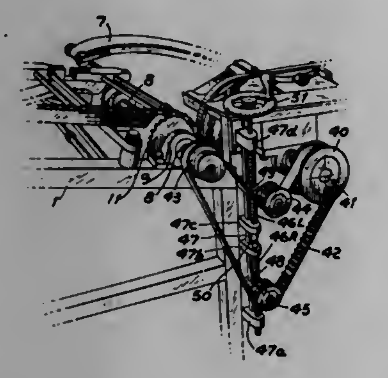


1. In a gear transmission having drive and driven shafts in parallel spaced apart relationship in a housing and gear pairs of different drive ratios for transmitting drive from said drive shaft through a selected pair of gears to said driven shaft, the combination for hydraulically selecting a gear pair ratio comprising: means on said drive and driven shafts rotatably mounting the gears thereof in predetermined non-shiftable spaced apart positions thereon in meshing relationship of each gear pair, the gears on said drive shaft at least being freely rotatable thereon; a selector movable longitudinally of said drive shaft and having an actuator rod coaxially connected thereto said selector when positioned at a drive gear being adapted to establish a mechanical drive relationship between the drive shaft and said drive gear; an hydraulic cylinder having an inlet chamber and an outlet chamber separated by a piston and a piston rod extending therefrom to position said actuator rod and the selector of said transmission drive shaft; a compressible gas containing accumulator for said outlet chamber; a fluid pump and means for driving same responsive to the speed of said drive shaft; an hydraulic fluid sump connected to said pump; an outlet line for said pump delivering pumped fluid to the inlet chamber of said cylinder; means returning fluid from said outlet line to said sump and limiting the pressure in said outlet line and said inlet chamber to a predetermined maximum equal to the pressure in said accumulator thereby to define a thus selected position of said

piston together with said selector; means for returning fluid from said outlet line to said sump, each of said means limiting the pressure in said outlet line to different predetermined value; and a manually operable selector valve selectively connecting any one of said fluid returning means to said sump thereby defining the drive ratio of said transmission by the gear pair position of said selector.

3,889,548
CHANNELING CONVEYOR

Hubert E. Tobey, Milltown; John W. Hood, East Brunswick, and Dee L. Irvin, Moonachie, all of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.
Division of Ser. No. 248,570, April 28, 1972. This application July 16, 1973, Ser. No. 379,868
Int. Cl. F16h *35/06*
U.S. Cl. 74—395 **3 Claims**

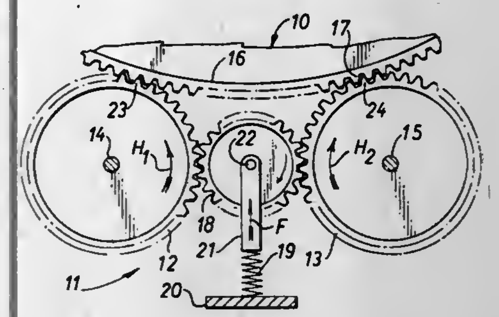


1. Speed control means comprising in combination:
an input speed pulley;
an output speed pulley;
a timing belt engaging said input and output pulleys within a closed loop;
a shaft having a right hand thread portion and a left hand thread portion;
first means for mounting a first tension pulley on said right hand portion and second means for mounting a second tension pulley to said left hand portions;
means mounting said shaft and detachably coupling said right and left portions, so that said first pulley engages said timing belt within said closed loop, and said second tension pulley engages said timing belt outside said closed loop; and
means for selectively turning said shaft to cause said first and second means to move axially toward each other and said output speed pulley to move faster than said input speed pulley when said shaft is moved in a first direction, and slower when said shaft is moved in a second direction and said first and second means to move axially away from each other.

3,889,549
REVERSIBLE-OUTPUT ROTARY GEAR DEVICE

Jean Henri Fieuzal, Rueil Malmaison; Louis Bourgine, Chambourcy, and Rene Pierre Benzoni, Ornesson, all of France, assignors to Etat Francais, France
Filed Feb. 22, 1974, Ser. No. 445,291
Claims priority, application France, Mar. 14, 1973, 73.09022
Int. Cl. F16h *55/18*
U.S. Cl. 74—409 **9 Claims**

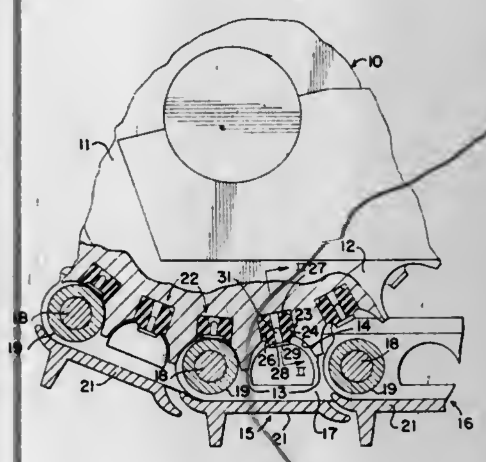
1. A reversible-output rotary gear device for applying rotation in either direction to a rotatable member and comprising:
a gear, means to mount the same member;
first and second drive gears, means to mount the same with a space therebetween and each coupled with the first driven gear for relative rotation therebetween, means to drive one drive gear in one direction to cause rotation of the first gear in one direction with the other drive gear idle, and means to drive said other drive gear in an opposite direction to cause rotation of the first gear in the opposite direction with said one drive gear idle;
an intermediate gear coupled with the first and second drive gears and moveable in a first plane in said space between the drive gears, said first plane extending transversely of a second plane containing the axes of rotation of the drive gears;



resilient means applying a bias in said first plane to the intermediate gear whereby the teeth of the intermediate gear apply biasing torque to each drive gear, when idle, to take up any play between said drive gear and said first gear, said rotatable member being at least a part of one of said mounting means.

3,889,550
IMPACT ABSORBING NOISE SUPPRESSION DEVICE

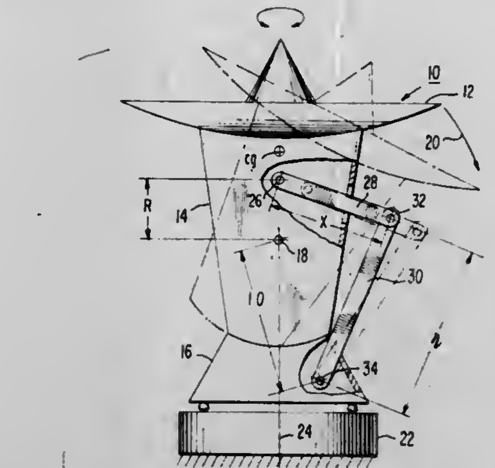
Roger L. Boggs, East Peoria, and Harold L. Reinsma, Dunlap, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Nov. 19, 1973, Ser. No. 416,828
Int. Cl. F16h *55/14, 55/30*
U.S. Cl. 74—443 **6 Claims**



1. In a drive sprocket of the type used to drive an endless track assembly on a track-type vehicle, said drive sprocket having teeth and notches alternately disposed about the circumference of said sprocket, and said notches defining root areas between said teeth, the improvement comprising impact absorbing means for absorbing the impact energy of notch engaging assembly components as they engage the sprocket, said impact absorbing means including impact absorbing members comprising elastomeric plugs disposed within cavities formed in said root areas and extending outwardly into said notches sufficiently to contact said notch engaging components prior to contact between said components and said root areas, said plugs being reinforced by wear plates secured to the outer ends thereof, and wherein said wear plates are secured to said plugs by coaction of a rod secured to each of said wear plates and a bore within each of said plugs.

3,889,551
EQUIPOISE MECHANISM

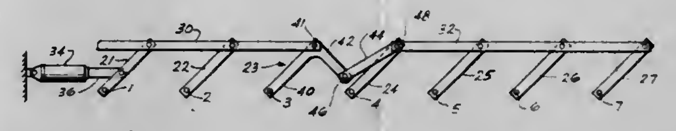
Wayne Arthur Harmening, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Dec. 27, 1973, Ser. No. 428,796
Int. Cl. G05g *1/00*
U.S. Cl. 74—469 **10 Claims**



1. An apparatus for balancing a non-linear torque produced by an offset mass rotating with respect to a support, comprising:
a four bar linkage wherein each bar is pivotally connected to two other bars of the linkage to form a quadrangle,
means for securing a first bar to said rotating mass,
means for securing said support to a second bar, and
resilient means coupled to said second bar, and a third bar for producing a linear torque on the third bar as that third bar rotates,
said bars each having a predetermined length, the length of each bar being a function of the angular displacement of the third bar with respect to the angular displacement of the rotating mass, the length of the bars being such that the linear torque at the third bar balances said non-linear torque.

3,889,552
ACTUATING DEVICE FOR MULTIPLE DAMPERS

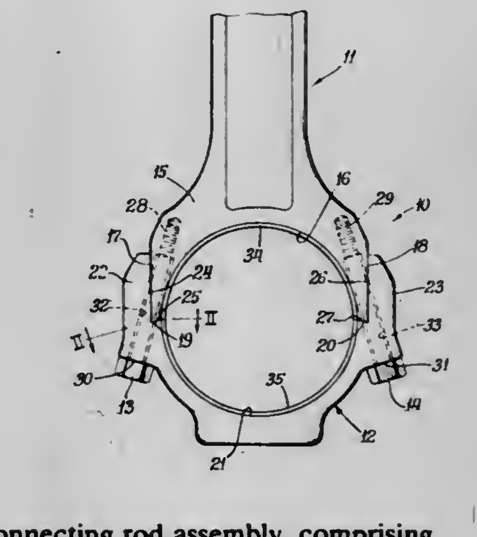
Thomas Clifton McGough, Jr., Longmeadow, Mass., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed Dec. 3, 1973, Ser. No. 421,386
Int. Cl. G05g *1/04*
U.S. Cl. 74—519 **3 Claims**



1. An actuating device for causing rotation of first and second members about first and second stationary pivot points, respectively, between first and second positions, the second positions being 90° from the first positions, said actuating device including a first link of dogleg configuration, a second link, a third link, a first leg of the first link being integral with the first member, and being rotatable about the first stationary pivot point at its outer end, the second leg of the dogleg being connected to one end of the second link by means of a first movable pivot point, the other end of the second link being connected to one end of the third link by means of a second movable pivot point, the other end of the third link being integral with the second member, and being rotatable about the second stationary pivot point, the first leg of the dogleg being parallel with the third link when the first and second members are in their first positions, means for causing 90° rotation of the first member, the length of the second leg of the dogleg, the length of the second link, and the angle included between the first and second legs of the dogleg, being so proportioned that the first leg of the dogleg and the third link will be parallel after 90° rotation of the first member, whereby during initial rotation of the first member no rotation of the second member occurs, but after 90° of rotation of the first member, the second member will also have rotated 90°.

3,889,553
CONNECTING ROD ASSEMBLY

Benny Ballheimer, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Feb. 21, 1974, Ser. No. 444,523
Int. Cl. F16c *7/02*
U.S. Cl. 74—579 R **6 Claims**



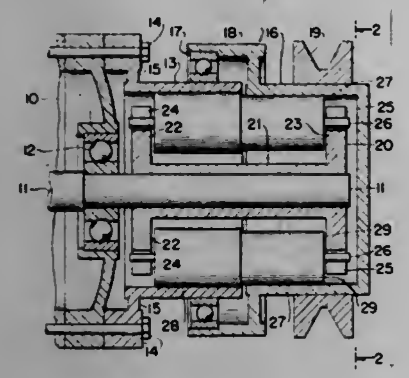
1. A connecting rod assembly, comprising
a connecting rod;
a saddle formed at the end of said connecting rod having an inner cylindric surface, a pair of outer surfaces, and a pair of end surfaces with each of said end surfaces extending between said cylindric surface and one of said outer surfaces;
a cap having an inner cylindric surface sized to match the cylindric surface in said saddle;
said cap also being formed with legs having inner surfaces adapted to provide a matching configuration with the said outer surfaces and said end surfaces of the saddle; and
a pair of connecting bolts disposed on opposite sides of said cylindric surfaces for securing the cap to the saddle;
said saddle being formed with a width slightly exceeding the diameter of said cylindric surface, whereby the saddle is small enough to allow the connecting rod to be removed through its associated cylinder, and said cap being formed with legs thicker than the width of each end surface of the saddle, whereby the saddle is strengthened at the sides adjacent the ends thereof.

3,889,554
ROLLER TRANSMISSION

Brett Jason Sinclair, 150-11 72nd Rd., Flushing, N.Y. 11367, and Harold Youngelson, 647 Academy St., New York, N.Y. 10034
Filed Jan. 9, 1974, Ser. No. 431,922
Int. Cl. F16h *13/06, 13/10*
U.S. Cl. 74—798 **1 Claim**

1. A roller transmission comprising, in combination, an input shaft, a fixed ring disposed about said shaft, a rotatably mounted ring disposed about said shaft, said rings having larger and smaller cylindrical inner surfaces, rollers each having larger and smaller cylindrical portions, said larger and smaller cylindrical portions of said rollers differing in diameter the same amount as the larger and smaller cylindrical inner surfaces of said rings, and a spider mounted on said shaft, said spider having pairs of arms containing radial slots receiving

said axles, each pair of said arms mounting one of said rollers therebetween, said spider revolving said rollers with said shaft so that on rotation of said shaft centrifugal force urges said rollers outward moving said axles in said slots, said larger cylindrical portion of each roller rolling against said larger cylindrical inner surface of a ring and said smaller cylindrical portion of each roller rolling against said smaller cylindrical inner surface of a ring driving said rotatably mounted ring as an output of said transmission.



3,889,555
INDEXING-TYPE WORK PLATFORM FOR MACHINE TOOLS

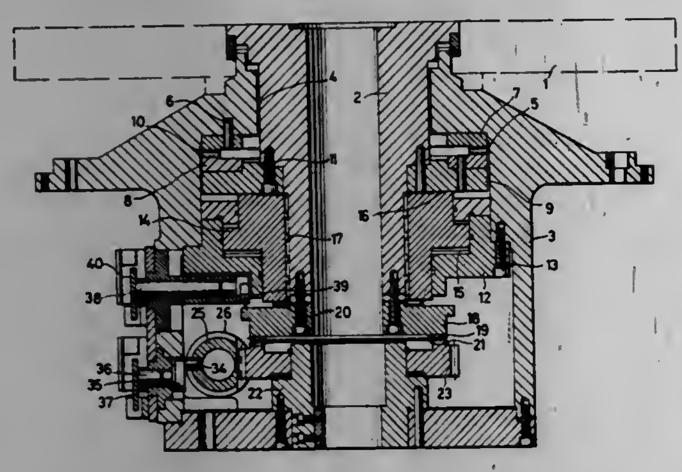
Rudolf Frank; Karl Emil Witzig, both of Leonberg, and Armin Witzig, Hofingen, all of Germany, assignors to Rudolf Frank and Karl Emil Witzig, both of Leonberg, Germany

Filed Feb. 22, 1974, Ser. No. 444,946

Claims priority, application Germany, Feb. 23, 1973, 2308984

Int. Cl. B23b *29/32*

U.S. Cl. 74—826 **14 Claims**



1. Indexing-type work table or platform (1) adapted to have work pieces secured to an upper circumference thereof comprising

a base (3);

a central column or post (2) centrally supporting the table and journalled in the base (3) to rotate about the vertical axis when the table is being indexed;

drive means (23) operatively connected to the table to rotate the table for indexing motion thereof;

and means (5) locking and angularly aligning the table with respect to the base in predetermined angular positions, characterized by

vertical operating means acting on the table to drop the table (1) with respect to the locking means (5) to disengage the locking means and release the table from locked engagement, in angular position, for indexing movement, and to raise the table, after indexing movement, and engage the locking and alignment means when the work pieces are to be engaged by machine tools.

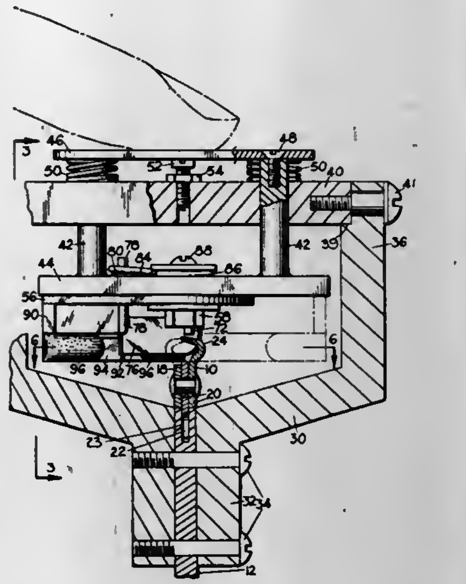
3,889,556
SAW BAR MOUNTED SHARPENER FOR CHAIN SAWS

Howard C. Bair, and Richard C. Larsen, both of 2171 S.E. 130th Ave., Portland, Oreg. 97233

Continuation-in-part of Ser. No. 323,958, Jan. 15, 1973, abandoned. This application Apr. 1, 1974, Ser. No. 456,739

Int. Cl. B23d *63/00*

U.S. Cl. 76—25 A **12 Claims**



1. A saw chain sharpener for a chain saw of the type having a saw bar and a saw chain driven around the bar and having oppositely facing cutter elements, said sharpener comprising,

a. a holder having a chain pass area therein,

b. a pair of saw sharpening elements on said holder disposed in said chain pass area,

c. and means arranged to mount said holder on the saw in a position such that the chain on the bar when operating around the bar moves through said chain pass area,

d. said pair of saw sharpening elements being arranged to have alternate engagement with oppositely facing cutter elements on the saw chain as the latter moves around the bar.

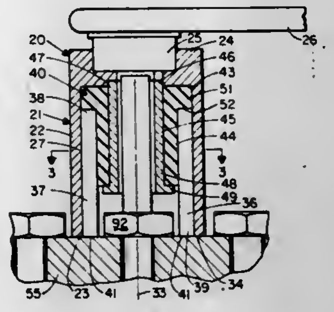
3,889,557
STUD REMOVING TOOL

Richard H. Young, 212 Andover Rd., Billerica, Mass. 01821

Filed Aug. 14, 1974, Ser. No. 497,226

Int. Cl. B25b *13/50*

U.S. Cl. 81—53.2 **17 Claims**



1. In a stud, or nut, gripper tool of the type having at least one roller, or pin, co-acting with a lobular cam face to move radially for gripping a stud or nut, the combination comprising:

an elongated, hollow tubular casing having an inner end and an outer end and having an inside elongated face with at least one axially extending lobe formed therein;

at least one elongated, axially-extending, generally cylindrical roller, having an inner end and an outer end, in rolling contact with one of said lobes to move radially while moving circumferentially relative thereto;

retaining means mouted within said casing in engagement with the inner ends of said rollers for maintaining said rollers in rolling contact with said lobular inner face;

The outer ends of each said roller being free to roll and tilt, on the outer end of said lobular face, relative to the central longitudinal axis of said casing, when the outer ends of said rollers engage and tighten on a stud during turning of said casing on said axis.

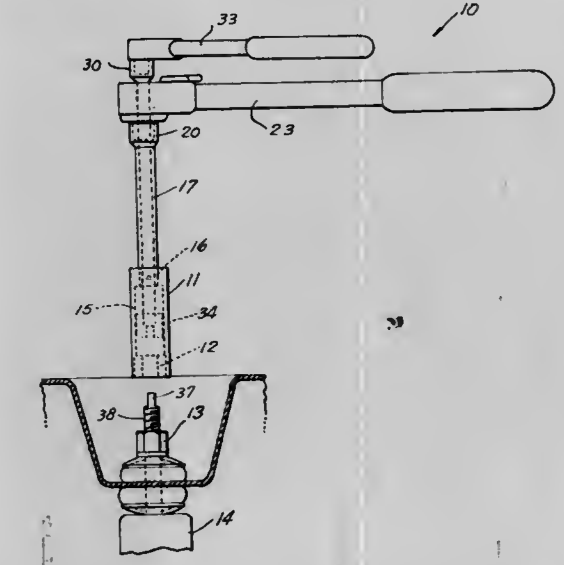
3,889,558
SHOCK ABSORBER NUT REMOVING TOOL

Gorden E. Duncan, 1505 Park Blvd., West Sacramento, Calif. 95691

Filed Feb. 19, 1974, Ser. No. 443,617

Int. Cl. B25b

U.S. Cl. 81—55 **1 Claim**



1. A shock absorber nut removing tool comprising in combination an elongate nut engaging socket member having a bore extending substantially therethrough, a square socket communicating with said bore in the upper end of said socket member, an elongate hollow drive shaft having a square end portion adapted for seating in the square socket of said socket member, a ratchet handle detachably connected to the upper end of said hollow drive shaft and having a bore extending therethrough axially aligned with a bore in said hollow drive shaft, an elongate solid drive shaft extending through the bore in said ratchet handle and said hollow drive shaft, a ratchet handle detachably connected to the upper end of said solid drive shaft, a generally cylindrical coupler member detachably connected to the lower end of said solid drive shaft with said coupler member having a transverse slot extending across the lower face thereof, said bores in said hollow drive shaft and said first named ratchet handle having a diameter slightly larger than the diameter of said solid drive shaft to guide said solid drive shaft as it is rotated with respect to said ratchet handle and said hollow drive shaft, said bore in said socket member having a diameter slightly greater than the diameter of said cylindrical coupler to guide said cylindrical coupler as it is rotated in said socket member.

3,889,559
RETRACTABLE SCOOP FOR CATCHING MACHINED PARTS

Lorin H. Scholtes, 804 N. Riverview, Bellevue, Iowa 52031

Filed June 10, 1974, Ser. No. 477,586

Int. Cl. B23b *13/00, 3/36*

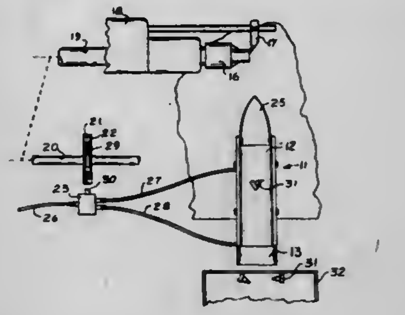
U.S. Cl. 82—2.5 **5 Claims**

1. A machine attachment for catching parts comprising:

an extensible chute adapted to be attached to an automatic machine with a cutoff tool, one end of said chute being a catching portion with an open top for catching falling parts, said chute normally being retracted outside the path to be taken by falling parts and chips,

an extensible actuator connected between the opposite ends of said extensible chute,

control means connected to said actuator and adapted to be mounted on said automatic machine, a control operator adapted to be connected to said automatic machine to move in synchronism with the operation of said cutoff tool and to engage said control means, said control means



operating in response to engagement by said control operator to extend said extensible actuator and said chute for positioning said catching portion beneath said cutoff tool for an instant at the end of each of the cutoff operations of said machine for catching a part to be conveyed along said chute, and said control means reoperating at the end of each of said cutoff operations to retract said extensible chute.

3,889,560
SAWING APPARATUS

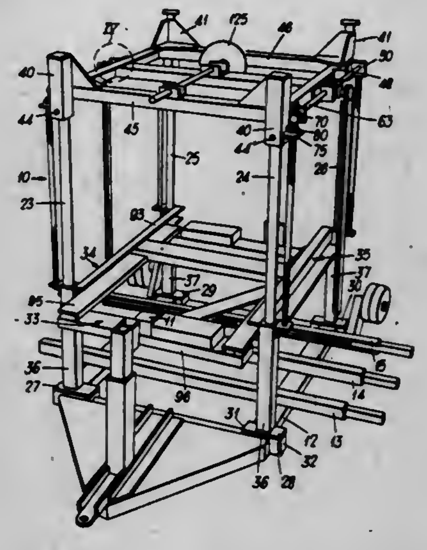
Duncan Gardner MacFadyen, Milton of Buchanan, Drymen by Glasgow, Scotland

Filed Feb. 26, 1974, Ser. No. 445,873

Claims priority, application United Kingdom, Mar. 6, 1973, 10920/73

Int. Cl. B27b *17/02, 15/02;* **B23d** *57/02*

U.S. Cl. 83—4 **10 Claims**



1. Sawing apparatus comprising a supporting base from which extend four uprights whose axes are at the vertices of a rectangle, a platform mounted for movement longitudinally of itself across said supporting base and between opposed pairs of said uprights, a cradle mounted for vertical sliding movement along said uprights and supporting in an underslung position a chain saw for sawing timber carried by said platform, and a head frame above said cradle and including tubular members dimensioned and positioned to fit slidably about said uprights, first locking means to lock said head frame relative to said uprights, said head frame mounting means for adjusting the level above said platform of said cradle and hence of said chain saw, and second locking means for locking said cradle at its adjusted level relative to said uprights.

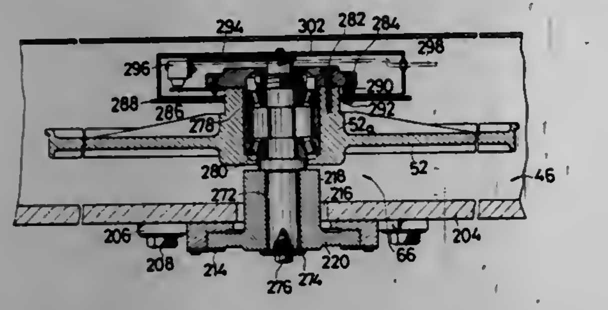
3,889,561
HORIZONTAL BAND SAW MACHINE

Masao Sato, Sagamihara; Tsuneo Aizawa, Isehara; Kenji Ohnishi, Sagamihara; Shigeo Koizumi, Hatano; Akio Fukuda, Yokohama; Shinki Kikuchi, Sagamihara, and Shichiro Kusanagi, Isehara, all of Japan, assignors to Amada Company Limited, Isehara, Japan

Division of Ser. No. 159,625, July 6, 1971, Pat. No. 3,754,490. This application June 11, 1973, Ser. No. 368,994

Int. Cl. B23d *53/00, 55/04*

U.S. Cl. 83—58 **1 Claim**



1. A horizontal band saw machine comprising at least one blade extending from one side of the outer surface of a cover mounted on a boss of a follower wheel which is rotatably mounted onto a shaft, an arm extending from one side of that portion of said shaft which extends upward through and out of said cover, a no-contact switch provided at said arm and spaced apart from said at least one blade, and a detector device connected to said switch.

3,889,562
INSTALLATION FOR PIECE-BY-PIECE THROUGHPUT OF ROLLED RUBBER SHEETS OUT OF A COOLING UNIT

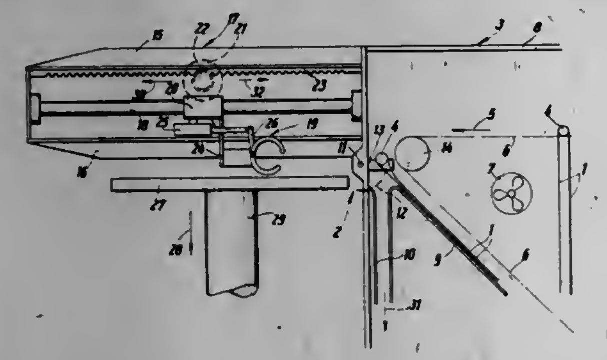
Walter Hugo Schlesser, Zurich, Switzerland, assignor to Schlesser AG, Zurich, Switzerland

Filed May 18, 1973, Ser. No. 361,837

Claims priority, application Germany, June 13, 1972, 2228728

Int. Cl. B26d *7/02;* **B65h** *35/06*

U.S. Cl. 83—94 **16 Claims**



1. In apparatus for the removal of pressed rubber sheets from a sheet cooling installation and for ultimate delivery onto a receiving station, and wherein each pressed rubber sheet is passed through said sheet cooling installation while individually folded generally mid-way upon itself and deposited onto and retained on an associated hanger bar in hairpin fashion, with both end portions depending downwardly therefrom:

a. drive chain means forming a conveyor with said conveyor having an output end, elongated hanger bars coupled to said drive chain and extending generally parallelly to one another at spaced apart intervals to effect a feed motion generally perpendicular to the elongated axis of said hanger bars;

b. gripping means extending parallel to said hanger bars and being intermittently reciprocable adjacent the output end of said conveyor and arranged to grasp pressed rubber sheets from said hanger bars at a point adjacent said top fold, said gripping means including a pair of converging clamping members forming a jaw;

c. cutting means disposed generally within the confines of said jaw and arranged to sever said pressed rubber sheet along said fold area and within said jaw; and

d. means for intermittently reciprocably opening said gripping means to deposit said severed pressed rubber sheet onto said receiving station.

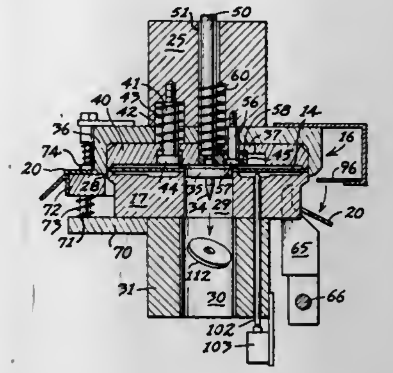
3,889,563
APPARATUS FOR TRIMMING AND REMOVING THE FLASHING FROM PHONOGRAPH RECORDS

William S. Westermann, 1400 Burton Valley Rd., Nashville, Tenn. 37215

Filed Dec. 26, 1973, Ser. No. 428,084

Int. Cl. B26d *7/06*

U.S. Cl. 83—124 **13 Claims**



1. An apparatus for trimming and removing the flashing from a pressed phonograph record, comprising:

a. a lower punch platen having a circular peripheral edge adapted to support centrally of said platen a pressed phonograph record having a flashing projecting radially beyond said peripheral edge,

b. an upper punch member having an annular rim die adapted to telescopingly receive said peripheral edge to sever the flashing from a pressed record centrally supported on said platen,

c. means for relatively moving said punch member toward and away from said punch platen,

d. hook means supported in an inoperative position within the perimeter of said peripheral edge, to permit the adjacent severed flashing portion to drop down over said hook means,

e. means for moving said hook means away from said platen so that said hook means engages the inner edge of said severed flashing to remove the flashing from said platen.

3,889,564
KNIFE EDGE ENDLESS LOOP BOOK CUTTER

Peter Aspinwall, Wheaton, Ill., and Richard H. Barbour, Jr., Milton, Mass., assignors to Comstock & Wescott, Inc., Cambridge, Mass.

Filed Jan. 23, 1974, Ser. No. 435,707

Int. Cl. B26d *1/46*

U.S. Cl. 83—174 **7 Claims**

1. Apparatus for cutting the sheets of a book comprising:

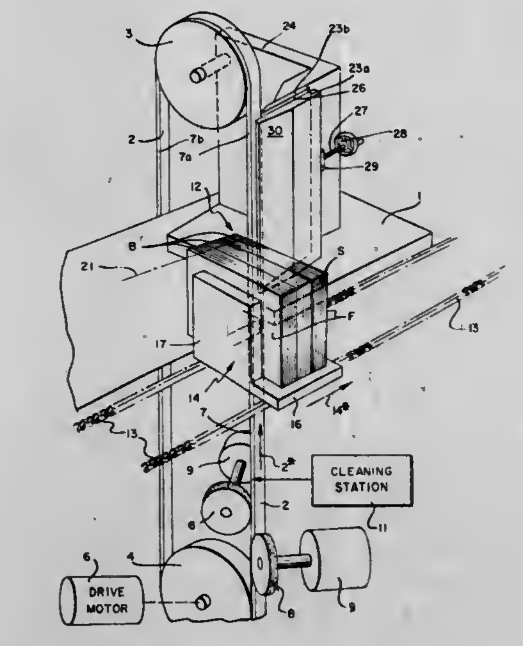
a travelling knife edge cutter including an endless loop carrying a cutting edge and means to guide the loop through a straight portion at a cutting station;

a book conveyor for moving a book through the cutting station, and

means on the conveyor for holding the book with the face of the book sheets facing substantially parallel to the cutting edge,

the cutting edge having a bevel angle and the loop guide means holding the cutting edge inclined to the face of the sheets laterally of loop travel substantially at the bevel angle and with the bevel normal to the sheet face, and

the book holding means and cutter loop guide means holding the sheet face at an angle to the straight portion convergent in the direction of cutter travel with the plane of the sheet inclined forwardly in the direction of book movement so that the cutting edge pulls on the sheets away from the uncut portion of the sheets.



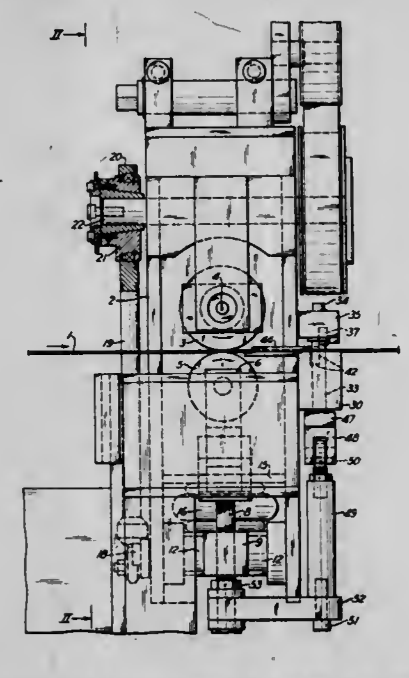
3,889,565
PUNCH PRESS SCRAP CUTTER

John C. Vecchi, Natrona Heights, Pa., assignor to Oberg Manufacturing Co., Inc., Freeport, Pa.

Filed Jan. 4, 1974, Ser. No. 430,778

Int. Cl. B26f *1/02;* **B26d** *5/26*

U.S. Cl. 83—255 **5 Claims**



1. The combination with a punch press for metal strip having a driven outbound feed roll, a lower roll movable vertically toward and away from the upper roll, and means for reciprocating the lower roll vertically to periodically press strip against the upper roll; of a scrap cutter comprising a stationary lower shear blade at the exit side of said rolls in a position to engage the bottom of punched strip as it leaves the rolls, a cooperating movable upper shear blade spaced above the lower blade while said lower roll is in its upper position, and means operated by said roll-reciprocating means for moving the upper blade downwardly toward the lower blade for cutting strip between them every time the lower roll is lowered.

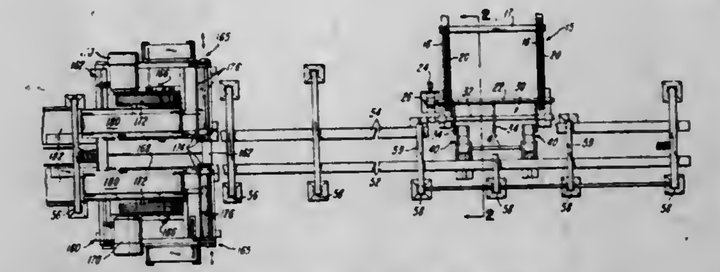
3,889,566
SAWMILL

George W. Hartzell, and Robert J. Gunnerman, both of Piqua, Ohio, assignors to Hartzell Industries, Inc., Piqua, Ohio

Continuation-in-part of Ser. No. 322,537, Jan. 10, 1973, which is a continuation-in-part of Ser. No. 152,751, June 14, 1971, Pat. No. 3,747,455. This application June 1, 1973, Ser. No. 365,859The portion of the term of this patent subsequent to July 24, 1990, has been disclaimed.

Int. Cl. B27b *7/04, 29/08*

U.S. Cl. 83—708 **9 Claims**



1. An improved sawmill adapted for efficiently cutting a successive supply of logs, comprising a set of elongated parallel spaced tracks, frame means supporting said tracks in horizontally spaced positions, a first carriage unit including a first set of wheels engaging said tracks in longitudinally spaced relation, said first set of wheels providing for independent longitudinal linear movement of said first carriage unit on said tracks, a second carriage unit including a second set of wheels also engaging said tracks in longitudinally spaced relation, said second set of wheels providing for longitudinal linear movement of said second carriage unit along said tracks independent of said first carriage unit, an elongated extensible actuator connecting said first and second carriage units and providing for changing the space between said carriage units within a predetermined range relative to said tracks, said carriage units including means supporting a set of horizontally disposed opposing dog members adapted to engage opposite ends of each log, means for adjustably connecting said actuator to one of said carriage units to provide for changing said predetermined range, drive means for moving said carriage units along said tracks as a combined unit, laterally adjustable cutter means positioned adjacent the path of said carriage units for cutting the log, and a motor on at least one of said carriage units and having a rotary shaft connected to rotate the corresponding said dog member for positioning the log at a selected cutting position.

3,889,567
HORIZONTAL BAND SAW MACHINE

Masso Sato, Sagamihara; Tsuneo Aizawa, Isehara; Kenji Ohnishi, Sagamihara; Shigeo Koizumi, Hatano; Akio Fukuda, Yokohama; Shinki Kikuchi, Sagamihara, and Shichiro Kusanagi, Isehara, all of Japan, assignors to Amada Company Limited, Isehara, Japan

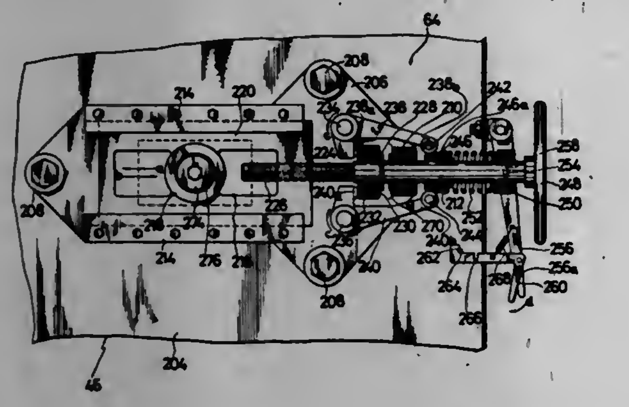
Division of Ser. No. 159,625, July 6, 1971, Pat. No. 3,754,490. This application June 11, 1973, Ser. No. 368,993

Int. Cl. B23d *53/00, 55/04*

U.S. Cl. 83—818 **1 Claim**

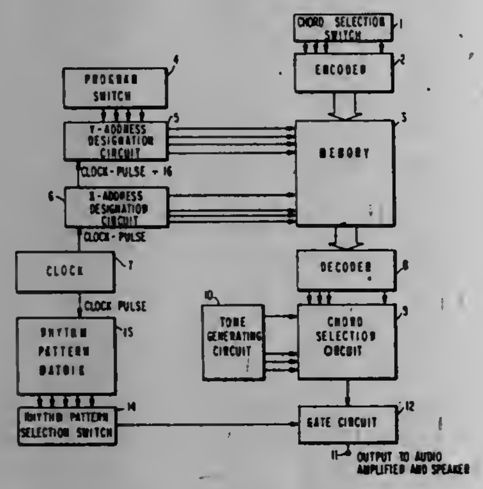
1. A horizontal band saw machine having a band saw trained in endless fashion about a driving wheel and a follower wheel, comprising a shaft movable along the axial direction of said wheels, a sliding piece acting as a supporting member for said follower wheel, a handle provided at each end of said shaft, a flange provided between said shaft ends, said shaft being provided in an interrelated manner with a ring member which abuts on one side said flange and is rotatable about said shaft, a tapered ring slidably attached to said shaft and a resilient member, said members being arranged in an interrelated manner so that said resilient member is compressed by

said tapered ring as said shaft is moved in the direction to increase the tension of the band saw, and bell cranks pivotally connected to one section of said ring member, one end of said bell cranks being arranged to contact one side of said tapered ring, and another end of said bell cranks being arranged to contact a tapered face provided at said one side of the tapered ring.



3,889,568
AUTOMATIC CHORD PERFORMANCE APPARATUS FOR A CHORD ORGAN

Toshiyuki Amaya, Tokyo, Japan, assignor to Pioneer Electric Corporation, Tokyo, Japan
Filed Jan. 31, 1974, Ser. No. 438,515
Int. Cl. G10h *1/00, 5/00*
U.S. Cl. 84—1.01 **8 Claims**

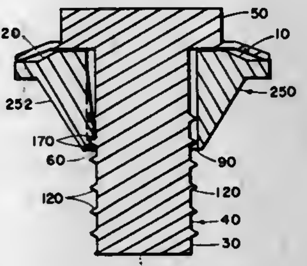


1. An automatic chord performance apparatus for a chord organ comprising:

- a. chord selection switch means on said chord organ permitting a player to preselect chord information in accordance with a musical composition to be performed, said chord information including both chord pattern and chord tone;
- b. memory means for storing said chord information as a plurality of musical phrases, each of said musical phrases comprising a plurality of bars of said musical composition;
- c. program means for storing the sequence of musical phrases to be played back in accordance with chord patterns of said musical composition;
- d. address means controlled by said program means and connected to said memory means for reading out said chord information;
- e. tone generating means; and
- f. chord selection circuit means responsive to the chord information read out of said memory means for controlling the output of said tone generating means to reproduce chord signals.

3,889,569
SEALING WASHER FOR HIGH TORQUE SPINNING BOLT-HEAD OUTDOOR USES

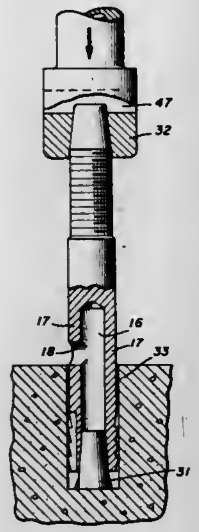
Anthony Fanciullo, 808 Fifth St., North, Bellevue, Nebr. 68005
Substitute for Ser. No. 210,676, Dec. 22, 1971, abandoned, Continuation-in-part of Ser. No. 2,117, Jan. 22, 1970, abandoned. This application Sept. 5, 1973, Ser. No. 394,466
Int. Cl. F16b *29/00, 43/00*
U.S. Cl. 85—1 JP **13 Claims**



1. A weather resistant sealing washer for outer wall or roof uses, said sealing washer being of thermoplastic material having an opening therethrough for receiving the shank of a bolt, said washer being very slick for use in application beneath a bolt-head which is spun while being tightened at a high torque, said washer material having a durometer range of 50 to 85 shore, said washer having an upper end and a lower end, said washer having an axis extending through a center of said washer opening, said washer having a lower section which has an outer surface tapering from a lower portion of lesser diameter to an upper portion of greater diameter so as to wedge into an opening in a work-piece, said washer having an upper section and having an intermediate flange section disposed between said upper and lower sections, the uppermost part of said upper section being of substantially consex configuration and of a lesser diameter than the maximum diameter of said intermediate section.

3,889,570
SELF-DRILLING ANCHOR DEVICE

Constantine D. Polos, 1955 Cheshire Ln., Wheaton, Ill. 60187
Filed Feb. 16, 1973, Ser. No. 333,162
Int. Cl. F16b *13/04*
U.S. Cl. 85—68 **1 Claim**

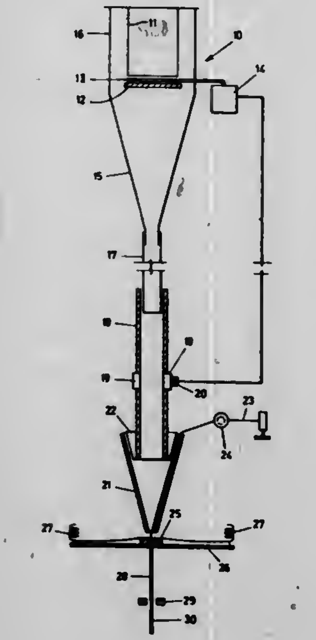


1. An anchor device comprising in combination a member having an elongated generally cylindrical body,

- a cutting head at one end of said body, said cutting head comprising a plurality of identical teeth uniformly spaced about the circumference of said body, said teeth being partially defined by a plurality of identical V-shaped radial grooves symmetrically spaced about the circumference of said cutting head, each tooth having a triangular planar end surface, all of said planar end surfaces lying in the same plane perpendicular to the longitudinal axis of said body member,
- said cutting head being provided with a plurality of longitudinal grooves in the wall of said body, permitting radial expansion of said head,
- a longitudinal bore defining a wall in said body extending from said cutting head along a portion of the length of said body, said wall being provided with a plurality of external annular teeth adjacent said cutting head,
- a solid conically tapered head at the other end of said body adapted to be received in the chuck of a hammer,
- a cylindrical opening in the wall of said body communicating with the bore thereof, said opening being located between said solid head and said external annular teeth, and
- a tapered plug adapted to be driven into the bore of said cutting head to cause radial expansion thereof.

3,889,571
MANUFACTURE OF SAFETY FUSE

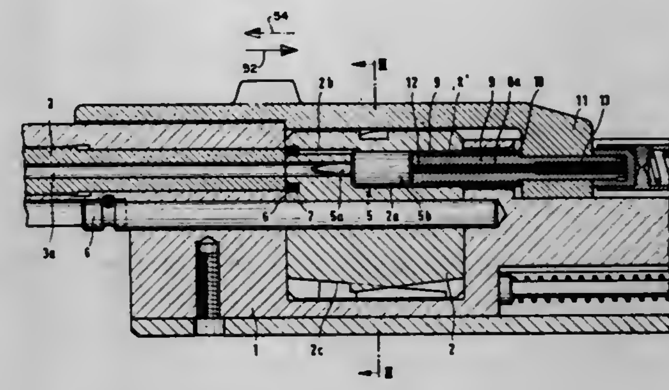
Josef Erasmus Coetzee, Edleen, South Africa, assignor to AE&CI Limited, Johannesburg, Transvaal, South Africa
Filed Dec. 4, 1973, Ser. No. 421,672
Claims priority, application South Africa, Dec. 7, 1972, 72/8668
Int. Cl. F42b *33/02*
U.S. Cl. 86—1 R **10 Claims**



1. A method of producing safety fuse having a core of incendiary powder including the steps of charging discrete quantities of incendiary powder into a tubular hopper, delivering incendiary powder from the tubular hopper into a spinning cup at a rate of flow governed by the rate of flow of incendiary powder from the spinning cup while simultaneously replenishing the mass of incendiary powder in the tubular hopper by said discrete quantities to maintain substantially a constant head of incendiary powder in the tubular hopper, passing at least one thread through the incendiary powder in the spinning cup at an angle to the vertical axis of the cup, feeding the incendiary powder and the thread from the spinning cup to a spinning die, forming a covering sheath around the incendiary powder and the thread, counter spinning the sheath with another layer of yarn to produce a semi-fuse, and finishing the semi-fuse to provide safety fuse having a core of incendiary powder.

3,889,572
FIREARM CONSTRUCTION

Ludwig Vorgrimler, and Gerhard Hupp, both of Oberndorf, Neckar, Germany, assignors to Industrie-Werke Karlsruhe Augsburg AG, Germany
Filed May 25, 1973, Ser. No. 363,795
Claims priority, application Germany, Sept. 23, 1972, 2246854
Int. Cl. F41d *7/04*
U.S. Cl. 89—155 **13 Claims**



1. A firearm, particularly a short hand firearm for firing case-less ammunition, comprising a gun housing, a gun barrel having a gun bore therethrough and supported on said housing, a rotatable cartridge drum having a plurality of angularly spaced case-less cartridge chamber bores arranged axis parallel to the bore of said gun barrel and being rotatably supported in said housing directly adjacent the end of said gun barrel with a separation joint therebetween and in a position in which each cartridge chamber bore may be successively and separately aligned with the bore of said gun barrel upon indexing movement of said cartridge drum, packing means carried by said drum sealing the separation joint between said drum and said barrel at each firing of said cartridge, a slide on said housing movable backwardly and forwardly thereon in an axial direction in relation to said gun barrel, a breech block mechanism carried by said slide including a cylindrical member movable into a cartridge chamber bore which is aligned with the bore of said gun barrel to advance a cartridge therein into the bore of said cartridge chamber and forming a seal with said cartridge chamber bore behind the cartridge, locking means defined between said slide and said drum for holding said drum in a position with a cartridge chamber bore aligned with the bore of said gun barrel for firing, and cartridge misfire ejection means carried by said slide and movable therewith to eject a blind cartridge, said breech mechanism including packing sleeve means arranged around said cylindrical member, said sleeve means having first and second ends, said first end being engaged against said slide in a neutral or rest position, said second end being opposite to said first end and being adjacent said gun barrel bore and abuts against the propellant charge of the ammunition.

3,889,573
BROACHING MACHINE

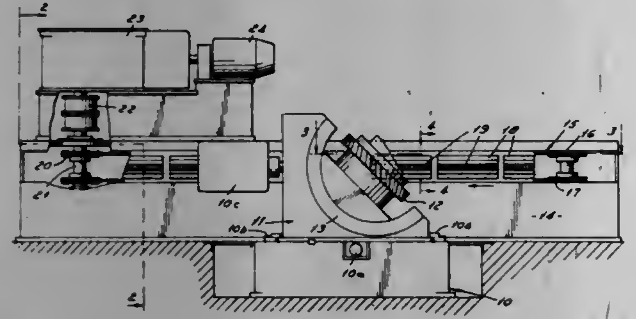
Vincent J. Girardi, Grosse Pointe, Mich., assignor to The Babcock & Wilcox Company, New York, N.Y.
Filed Sept. 4, 1973, Ser. No. 393,898
Int. Cl. B23d *37/18*
U.S. Cl. 90—78 **3 Claims**

1. In a broaching machine, the combination comprising

- a base,
- means on the base for supporting a workpiece rotatably, said means being adapted to index the workpiece about an axis for bringing successive portions of the periphery thereof in position for broaching,
- an endless broaching chain on said base mounted for movement in a plane extending substantially horizontally,

said broaching chain having carriers thereon for broaching tools,

said broaching chain having a first reach in said horizontal plane thereof that extends along the work supporting means to provide a broaching operation on the periphery of the workpiece as the tools are moved past the periphery,



said broaching machine having a second reach in said horizontal plane that extends parallel to said first reach,

bearing means along said first reach adjacent the work station for providing lateral support for the carriers to absorb the force of the broaching upon the workpiece,

and bearing means along said second reach for providing lateral support to said carriers.

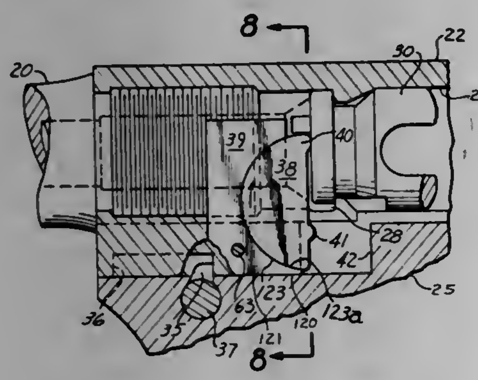
3,889,574
AUTOMATIC HAND GUN

Harry W. Sanford, Arcadia, Calif., assignor to T. D. E. Inc., El Monte, Calif.

Division of Ser. No. 145,259, May 20, 1971, Pat. No. 3,780,618. This application May 14, 1973, Ser. No. 360,159

Int. Cl. F41d *3/06*

U.S. Cl. 89—169 4 Claims



1. In an automatic pistol having a frame and a recoil-actuated bolt mounted to said frame and rotated by cam means for breech-locking with spline means, and by primary recoil energy imparted to said bolt by the recoil of a barrel and receiver assembly, having a trigger mechanism for firing, improvements which comprise:

torsion spring means, said torsion-spring means engaging the bolt and the frame of said pistol and being reacted against each of them, said torsion-spring means being preloaded by unlocking rotation of said bolt, and said torsion-spring means releasing stored energy for rotation of said bolt to breech-lock the same;

mechanical accelerator means, said mechanical accelerator means removing energy from said barrel and receiver assembly and transferring said energy by impact to said bolt, said energy transfer imparting a secondary energy input to said bolt after said breech-locking is released, said accelerator means being in the form of a segment of a disc, said disc being mounted for rotation on said movable receiver, a pair of striking faces on the accelerator means adjacent the periphery thereof, but spaced apart on opposite sides of the center of rotation thereof, one of said pair of striking faces striking a portion of said frame of said pistol at the conclusion of motion of said barrel and said receiver assembly in one direction, the other face of said pair striking said bolt at the instant of unlocking of said breech lock to impart a secondary energy transmitting impact to said bolt.

3,889,575
DEVICE FOR PROFILING THE RAIL HEAD OF VIGNOLES RAILS

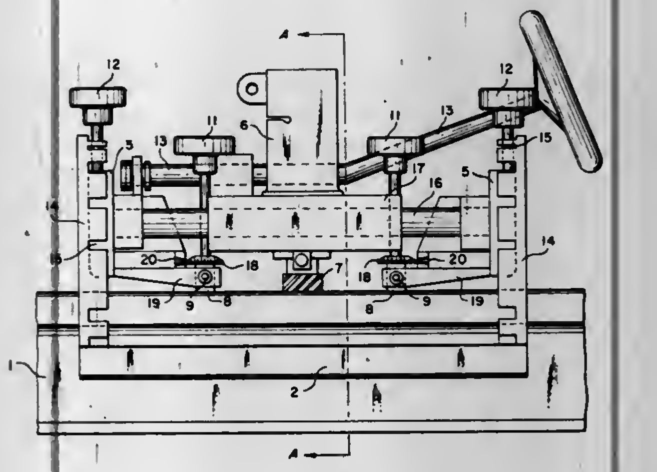
Paul Tabert, Cologne-Bayenthal, Germany, assignor to Elektro-Thermit GmbH, Germany

Filed Mar. 21, 1973, Ser. No. 343,252

Claims priority, application Germany, Apr. 7, 1972, 2216692

Int. Cl. B23c *1/20*; B24b *23/00*

U.S. Cl. 90—12 A 4 Claims



1. A device for profiling a rail head having a rail head curvature comprising

frame means adapted to be mounted on a rail,

means for securing said frame means to said rail, said frame means including

two parallel plates having rail head engaging recesses therein,

a plurality of guide slots in each of said plates, said guide slots projecting generally radially from each said recess and extending at right angles to the tangents of the rail head curvature

guide means connecting said plates, said guide means being selectively mounted in parallel guide slots of said plates profiling tool means mounted on said guide means, said tool means including a rail head contacting working surface.

a pair of feeler screw means connected to said guide means and adapted to touch said rail, whereby the touching points of said feeler screw means and the working surface of said profiling tool means are maintained coplanar,

and screw means for securing said guide means in said guide slots and for forcing said feeler screw means against the rail head.

3,889,576
LOCKING CYLINDER WITH IMPROVED LOCKING STRUCTURE

Harvey I. Sheffer, and Donald A. Selke, both of Cincinnati, Ohio, assignors to The Sheffer Corporation, Cincinnati, Ohio

Filed June 13, 1969, Ser. No. 832,958

Int. Cl. F15b *15/22*

U.S. Cl. 91—394 1 Claim

1. In a locking cylinder having a main piston slidable in a cylinder and locking means for mechanically locking said piston with respect to said cylinder, the improvement comprising,

means defining a keeper on said main piston, said keeper projecting axially from the surface of said main piston and being mounted thereto by means permitting the keeper to shift radially,

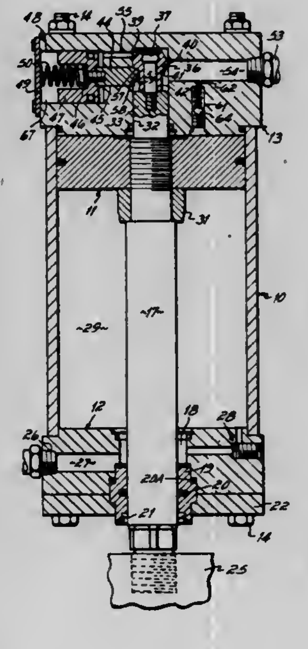
a latch engageable with said keeper at a predetermined locking position of said keeper and main piston to lock said keeper and main piston in said predetermined position, by restraining movement of said keeper therefrom, means mounting said latch for slidable movement angularly toward and away from said keeper for engagement of said latch therewith at said predetermined position,

a latch piston connected to said latch to move the latch away from said keeper in response to an unlatching pressure thereon,

means biasing said latch piston radially toward said predetermined position,

a passage for applying pressure fluid from a source to said latch piston to move the latch away from said predetermined position,

a port through which pressure fluid from said source must flow to act on the full area of said main piston,



a blocking piston mounted to said main piston, said blocking piston having a crosswise area which is substantially less than the full area of the main piston; said crosswise area exposed to pressure fluid from said source which tends to move said main piston away from said predetermined position, said blocking piston cooperating with said port when said latch is engaged with said keeper to close said port to flow therethrough, the application of pressure to the full area of the main piston being blocked until said latch has been disengaged from said keeper and said main piston has moved away from said predetermined position sufficiently that said blocking piston no longer closes said port,

said latch having an inclined cam surface which bears on a cooperating inclined cam surface provided on said keeper in said locking position, the cam surfaces being such that the unlocking camming force applied by said keeper to said latch when engaged therewith is insufficient to overcome the opposed frictional and biasing forces that restrain cammed movement of said latch, but sufficient in combination with the force of said pressure fluid on said latch piston to move said latch piston and latch radially away from said keeper.

3,889,577
PRESSURE-RESPONSIVE CONTROL BODY FOR USE IN FLUID HANDLING DEVICES

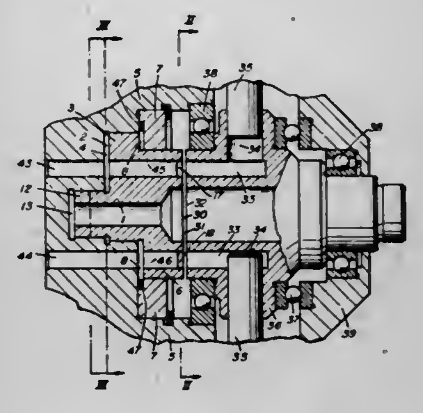
Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 239,551, March 30, 1972, Pat. No. 3,831,496. This application Jan. 8, 1973, Ser. No. 321,853

Claims priority, application Austria, Jan. 5, 1972, 57/72

Int. Cl. F01b *13/06*

U.S. Cl. 91—487 11 Claims



1. In a fluid handling device, a combination comprising a housing having inlet and outlet parts for admission and evacuation of fluid; a rotor mounted in said housing and having a first control face at one axial end thereof, a plurality of working chambers and first passages extending between said working chambers and said first control face; and a control body axially movably received in said housing and having a second control face adjacent to and defining with said first control face a narrow control clearance, said body including at least one larger-diameter first cylindrical portion coaxial with said rotor and at least one smallerdiameter second cylindrical portion which is eccentric with respect to said rotor and extends in part radially beyond at least one of said control faces, said cylindrical portions having end faces facing away from said rotor and defining with said housing two fluid-filled pressure chambers communicating with said ports whereby the fluid in at least a portion of at least one of said chambers urges said body toward said rotor, said body further having second passages alternatingly connecting said first passages with said inlet and outlet ports when said rotor rotates in said housing, said control clearance including two pressure zones each having a first gravity center and each of said pressure chambers having a second gravity center, each of said gravity center being radially spaced from the axis of said rotor and each of said second gravity centers being aligned with one of said first gravity centers.

3,889,578
AXIAL PISTON ROTARY BARREL TYPE HYDRAULIC PUMPS OR MOTORS

Robert Cecil Clerk, Edison House, Fullerton Rd., Glenrothes, Fife, Scotland

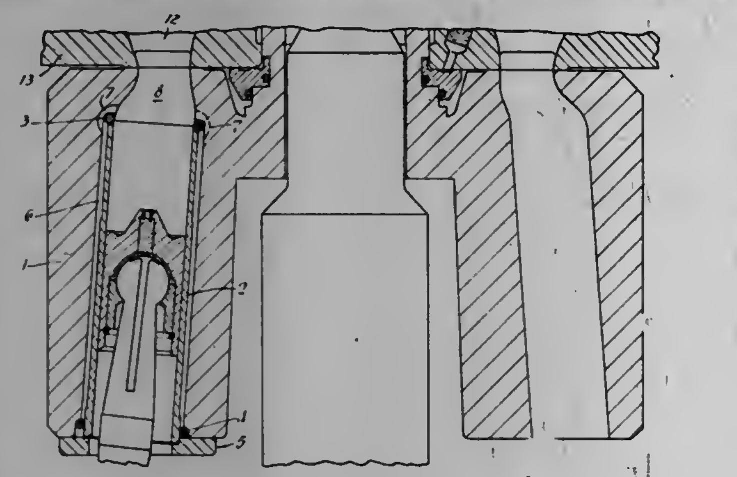
Filed June 15, 1973, Ser. No. 370,345

Int. Cl. F01b *13/04*

U.S. Cl. 91—499 4 Claims

1. An axial piston rotary barrel type hydraulic pump/motor having a cylinder barrel including a plurality of substantially axially aligned cylinder bores each of which includes a cylinder port in one end communicating with a working fluid transfer port in a stationary valve block, each of said bores being fitted with a cylinder liner sealed at both of its ends to said bore, the outer diameter of said liner being substantially less than the inner diameter of said bore, to provide a free annular space between the inner wall of the bore and outer wall of the liner, and channels connecting said annular spaces to said

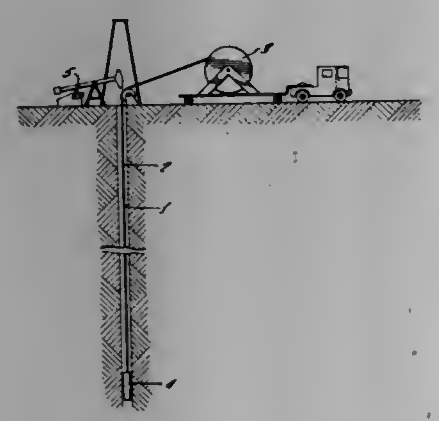
cylinder ports whereby said annular space is entirely closed except for communication with said cylinder port through said



channels, so that said spaces are flooded with and subject to the pressure of said working fluid.

3,889,579
OIL WELL PUMPING SYSTEM HAVING REINFORCED PLASTIC SUCKER ROD

Joseph W. Wiechowski, San Clemente; Delmar S. Miller, Newport Beach, and Richard C. Kostner, Orange, all of Calif., assignors to Poly-Trusions, Inc., Santa Ana, Calif.
Filed Jan. 7, 1974, Ser. No. 431,124
Int. Cl.^{2} F04B *17/00, 47/02*
U.S. Cl. 92—3 **12 Claims**

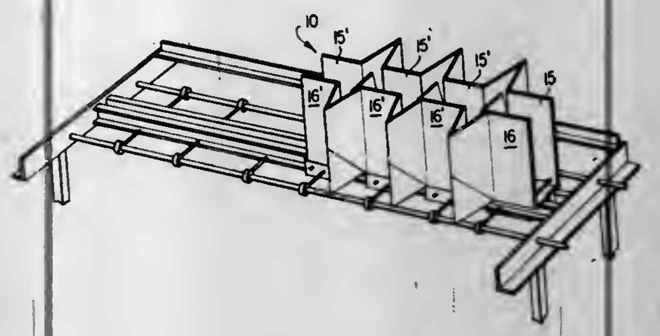


1. A pumping system for oil wells and the like which comprises a pump in a well near the bottom thereof, a pump drive near the top of the well, and a sucker rod drive connecting the drive to the pump, the improvement wherein:
- the sucker rod is of sufficient length to reach from the drive to the pump, said rod being constructed of a multiplicity of glass fibers bonded together into a semi-rigid rod by a set organic resin; and
- fittings affixed at the respective ends of the sucker rod for connection to the pump and to the drive respectively.

3,889,580
METHOD AND APPARATUS FOR AUTOMATIC FOLDING OF A SPACE DIVIDER

Frederick Garst, Boones Mill, Va., assignor to Occanneechi Orchards, Inc., Boones Mill, Va.
Filed May 14, 1974, Ser. No. 469,774
Int. Cl. B31b *1/52*
U.S. Cl. 93—37 SP **24 Claims**

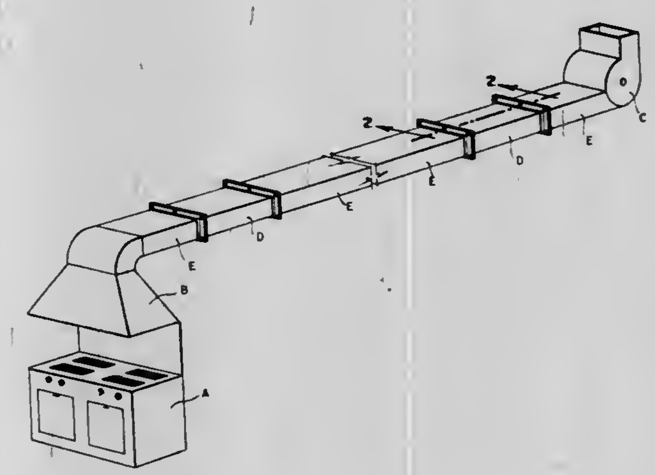
1. An apparatus for folding a generally planar blank into an erected position to form a space divider including at least two bottom panels disposed centrally of and spaced longitudinally of the blank and respectively corresponding side panels joined to each bottom panel along longitudinal fold lines, connecting panels joining corresponding successive side panels and a centrally disposed partition panel connected at its base to a second of said bottom panels and having a pair of laterally extending shoulders connected to a first foldable section of each corresponding connecting panel along diagonal fold lines, said blank being adapted to be folded into an erected position with successive bottom and associated side panels disposed in adjacent positions, separated by a corresponding central partition panel and associated connecting panels, with the shoulders of each partition panel sandwiched between the foldable sections of the associated connecting panels, comprising
- first means for engaging respectively corresponding bottom panels or a blank received on said apparatus for folding, and being movable relatively to each other from initial, displaced positions corresponding to the displacement between the bottom panels of the blank prior to folding to adjacent positions corresponding to the adjacent positions of the bottom panels in the erected divider,
- first means for moving said engaging means relatively to each other simultaneously and while maintaining uniform spacing therebetween, from said initial to closed positions,
- second means for engaging a blank received on said apparatus for folding at predetermined, displaced positions along the opposite longitudinal portions thereof for initiating folding of the blank and biasing of the panels and partitions thereof in the directions of their respective, erected positions,
- second means for moving said second engaging means from normally lowered, inoperative positions to raised positions for engaging the longitudinal portions of the blank, and
- means for selectively and automatically actuating said first and second moving means simultaneously for moving said first engaging means from said initial positions to said closed positions thereof and for raising said second engaging means, and responsive to a predetermined extent of movement of said first engaging means to actuate said second moving means to lower the second engaging means while said first moving means continues the movement of said first engaging means to the closed positions thereof.



3,889,581
DUCTED GREASE VAPOR EXHAUST SYSTEM

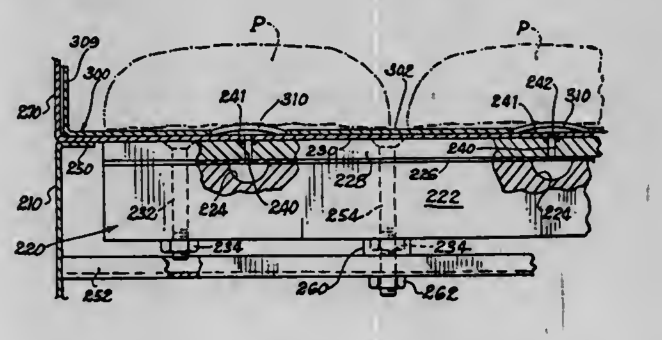
William W. Bray, Sr., 1423 Bethlehem Pk., Ambler, Pa. 19002
Filed Feb. 25, 1974, Ser. No. 445,094
Int. Cl. B01d *47/06*
U.S. Cl. 98—115 K **5 Claims**

1. A duct system for conducting grease-containing vapors from a cooking stove which comprises in combination, a hood and an essentially horizontal duct attached to said hood to permit entry of vapors, said duct being terminated by a fan to draw said vapors through said duct system, said duct consisting of sections of a double walled conduit having thermal insulation between the walls, said inner conduit being impervious to vapor leakage, and said duct consisting of removable sections interspersed between fixed non-removable sections, said removable sections abutting said non-removable sections to thereby provide access to the interior of the duct, the butted ends being fitted with a thermally insulating and grease-vapor impervious gasket to provide a fully insulated and leak-proof system.



3,889,582
STEAM INJECTOR SPATULA

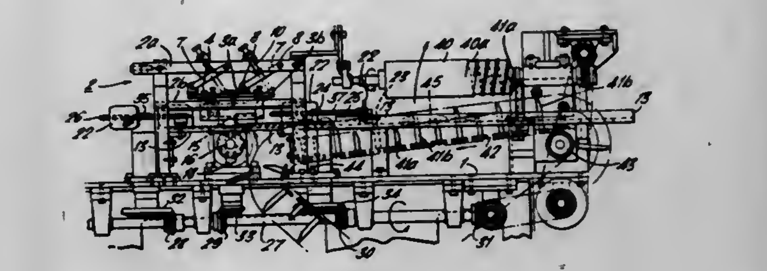
Chester J. Binks, La Grange, and Joseph M. Moser, Des Plaines, both of Ill., assignors to Restaurant Technology, Inc., Oak Brook, Ill.
Division of Ser. No. 240,348, April 3, 1972, Pat. No. 3,794,016. This application Oct. 9, 1973, Ser. No. 404,179
Int. Cl. A47j *36/20*
U.S. Cl. 99—450 **2 Claims**



1. A bun spatula adapted to be positioned in a steam injector in which steam is injected upwardly towards said spatula, said spatula comprising an expansive planar base member and a handle, said planar base member defining a plurality of steam diffusion passages which are arranged in rows and columns and which are equidistantly spaced from each other in rectilinear directions, each steam diffusion passage comprising an aperture in said planar base member, which, when viewed in plan view, comprises a pair of narrow open aperture sections spaced apart laterally by a diffuser member, said diffuser member being elongate and being integral at its ends with said base member, said diffuser member rising from its ends towards the center to provide a crowned configuration with the lower surface of said diffuser member being spaced upwardly of the lower surface of said base member, thereby to elevate bun portions centrally with respect to said planar base member, so that as steam is injected upwardly to enter an overlying bun portion, the steam may strike the diffuser member and will then diffuse laterally to pass upwardly through the adjacent aperture sections into an overlying bun portion without producing a skin effect above the steam diffusion passages.

3,889,583
CASHEW UNSHELLING APPARATUS

Nobuhiko Mizuno, Tokyo, and Hideo Wakai, Fujimi, both of Japan, assignors to Cashew Company, Ltd., Tokyo, Japan
Filed July 9, 1973, Ser. No. 377,583
Claims priority, application Japan, Mar. 26, 1973, 48-33489
Int. Cl. A23n *5/00*
U.S. Cl. 99—576 **1 Claim**



1. A cashew unshelling apparatus wherein the cashews are constantly moving during the unshelling operation, comprising:
- a horizontal elongated guide member having a groove of triangular cross-sections formed longitudinally in the upper surface thereof and a slit formed at substantially the center of the length thereof along the bottom of said triangular groove;
- upper and lower frames arranged vertically in two stages above said slit;
- a cutting blade supporting means vertically movably mounted on and extending through said lower frame with the lower portion thereof suspended from said lower frame to a level immediately above said slit;
- a spring interposed between the upper portion of said cutting blade supporting member and said upper frame for urging said supporting member downwardly; a spindle;
- a noncontinuous lower rotary cutting blade connected to said spindle arranged immediately below said slit and extending at right angles to said guide member, the cutting edge of said lower rotary cutting blade moving into and out of said slit during rotation of said spindle;
- a Y-shaped upper cutting blade connected to the lower end face of said supporting member in parallel to said guide member and with the Y-shaped bifurcated portion thereof extending downstream with respect to the moving direction of said cashews; a chain
- pushing members connected to said chain with a large separation between adjacent pushing members and carried thereby for feeding cashews to a position between said upper and lower cutting blades, said cashews being placed in said triangular groove with the convexed backs upside, said cashews being constantly moved by said pushing members during the unshelling operation;
- driving chain wheels for driving said chain and coupled thereto, said chain and said driving chain wheels constituting a guide mechanism for advancing said pusher members along the triangular groove; and
- means operatively coupled for synchronizing the time when each of said pusher members reaches said slit and the time when said lower rotary cutting blade protrudes from said slit.

3,889,584
BINDING MACHINE

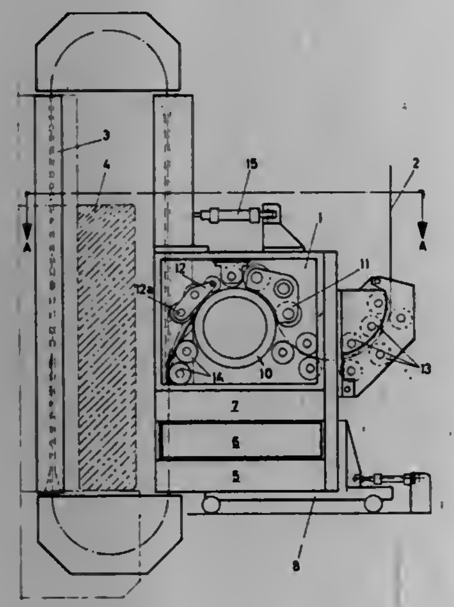
Olof Bruno Wiklund, Bergeforsen, Sweden, assignor to Sunds Aktiebolag, Sundsvall, Sweden

Filed Sept. 25, 1973, Ser. No. 400,677

Claims priority, application Sweden, Oct. 17, 1972, 13398/72

Int. Cl. B65b *13/04*

U.S. Cl. 100—26 **4 Claims**



1. A binding machine for binding bundles of wire rod material by binding with wire, comprising a device for feeding and stretching the wire, the wire being fed through assemblies arranged consecutively in series for cutting (7), twisting (6), clamping (5) and a track (3) for guiding the wire around a bundle of rods (4) to be bound, said cutting assembly (7) and said twisting assembly (6) also being adapted to guide the wire subsequent to its feed around such bundle into said clamping assembly (5) which latter is adapted to stop and clamp the free wire end, said clamping end, respectively, cutting assembly (5 and 7, respectively) comprising a pair of clamping and, respectively, cutting tools (16, 20 and, respectively 31, 34) and guide grooves (18 and, respectively, 33) for the wire, which guide grooves also serve as thrusts and for longitudinally defining the tie during the twisting of the wire in the twisting assembly (6), which comprises a rotary twisting roller (23) having a radial slot (24) for twisting the wire strands, in which organization said guide grooves (18, 33) are arranged transverse to the plane of said wire guide track (3) and have recesses (17, 32) at one end open to said bundle (4), the twisting assembly (6) besides the twisting roller (23) also including an openable wire guide cover (22) provided with wire passages, which in the wire feed are disposed directly in front of the guide grooves (18, 33), the twisting assembly being movable between a wire feed position and a twisting position, said cover (22) being adapted upon the movement of the twisting assembly to open to pass out the wire strands and upon return movement to expose the completely twisted tie by pushing it from the guide grooves (18, 33) out into the recesses (17, 32).

3,889,585
LOAD-BUNDLING AND STRAPPING APPARATUS

A. Elmo Morrow, Portland, Oreg., assignor to Mac-Fab Manufacturing, Inc., Portland, Oreg.

Filed May 8, 1974, Ser. No. 467,931

Int. Cl. B65b *13/04*

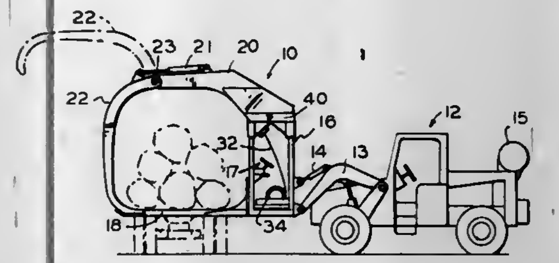
U.S. Cl. 100—26 **20 Claims**

1. An elongate load-bundling and -strapping attachment for a materials handling vehicle, said attachment comprising:

vertically extending frame means adapted for attachment to the load-handling mechanism of said vehicle rearwardly of the load,

a lower jaw means projecting forwardly from a lower portion of said frame means and adapted to extend beneath the load,

an upper jaw means projecting forwardly from an upper portion of said frame means in vertically spaced relation to said lower jaw means and adapted to extend over the load,



movable jaw means pivoted at one end thereof to a forward end portion of said upper jaw means for generally vertical pivoting movement, said movable jaw means being pivotable between a raised open position enabling positioning of said upper and lower jaw means above and below the load and a lowered closed position wherein said movable jaw means extends downwardly from said upper jaw means to said lower jaw means to contain the load,

and track means along the inner circumference of said upper, lower and movable jaw means for guiding a binding strap about the load, said track means being continuous from one said jaw means to the others when said movable jaw means is closed.

3,889,586
CONTROL FOR FLUID PRESSURE ACTUATORS

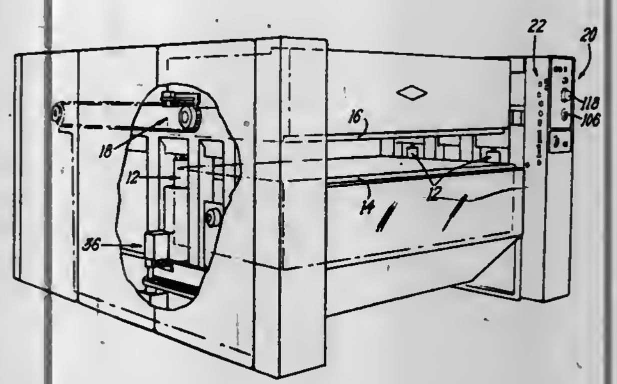
Frederick A. Pretty, Alveston, England, assignor to USM Corporation, Boston, Mass.

Filed Aug. 21, 1973, Ser. No. 390,250

Claims priority, application United Kingdom, Aug. 24, 1972, 39461/72

Int. Cl. B30b *15/16*

U.S. Cl. 100—53 **3 Claims**



1. In a press having a movable platen which is driven by fluid piston and cylinder means against a relatively fixed platen, a system for supplying and controlling fluid under pressure to the piston and cylinder means comprising:

A. a first pump connected to supply pressurized fluid to the piston and cylinder means at low pressure and high volume;
B. a second pump connected to supply pressurized fluid to the piston and cylinder means at high pressure and low volume;
C. a conduit connected to receive the pressurized fluid from both pumps and for directing said fluid to the piston and cylinder means;

D. first valve means connected to the first pump and the conduit to divert fluid from said pump away from said conduit when the pressure in the conduit reaches a predetermined value, thereby allowing further movement of the movable platen to be caused solely by the pressurized fluid from the second pump;
E. mechanically actuated second valve means associated with the piston and cylinder means to control the flow of pressurized fluid from the conduit to the piston and cylinder means;
F. a mechanical assembly operatively associated with a lead screw for actuating the second valve means, said lead screw being driven by a first fluid motor; and
G. third valve means connected to the first pump to cause said first pump to supply low pressure, high volume fluid to the first fluid motor in order to drive said lead screw, thereby actuating the second valve means.

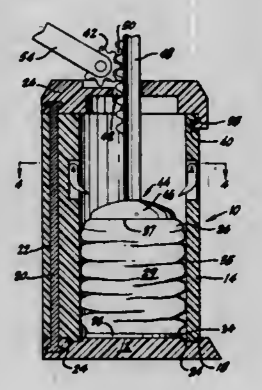
3,889,587
CAN CRUSHER

Franklin Eugene Wharton, Torrance, Calif., assignor to William F. McDonald, a part interest

Filed July 5, 1973, Ser. No. 376,439

Int. Cl.² B30B *9/00*

U.S. Cl. 100—98 R **7 Claims**



1. A device for crushing cans wherein the junctures of the top and the sidewall and the bottom and the sidewall are stronger than the sidewall which comprises:

a. a base,
b. a hollow cylinder open at both its upper and lower ends mounted at its lower end on the base and having a length greater than the can and an inside diameter slightly greater than the outside diameter of the can and having a strength sufficient to contain and restrain the can while it is being crushed:
c. at least one blade resiliently mounted in the side of the cylinder and having a cutting edge thereon extending inwardly thereof a short distance, the plane of the cutting edge of the blade comprising a radius of the cylinder, so as to longitudinally slit the sidewall of the can as it is inserted into the cylinder starting at the upper end thereof and moves past the blade;
d. A piston having a diameter such that it can pass through the cylinder without touching the blade and adapted to press down on the can within the cylinder;
e. means for moving the piston longitudinally within the cylinder from a position near the upper end to a position near the lower end so as to crush the can, the inside surface of cylinder restraining expansion of the can as it is crushed so that the can sidewall is forced to collapse inwardly, whereby there will be a minimum of exposed sharp edges on the crushed can.

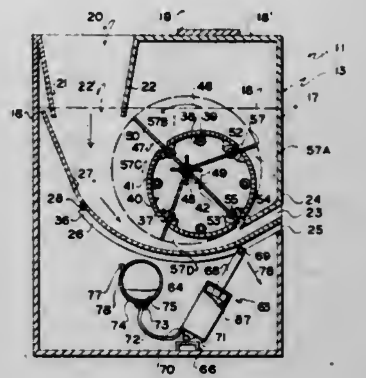
3,889,588
MATERIAL COMPACTING DEVICE

Philip Wollersheim, 3016 14th St., S.W., Calgary, Canada

Continuation-in-part of Ser. No. 235,550, March 17, 1972, abandoned. This application Oct. 5, 1973, Ser. No. 403,845

Int. Cl. B60p *1/00*

U.S. Cl. 100—177 **4 Claims**



1. A material compacting device for use in conjunction with a storage container such as a truck; comprising in combination an outer casing, an arcuately curved shroud mounted in said casing, an intake hopper in said casing and an ejector outlet in said casing, said shroud extending between said hopper and said outlet, a drum journalled for rotation transversely within said casing and being situated towards said outlet, the peripheral wall of said drum being in close proximity with the concave inner surface of said shroud, a source of power operatively connected to said drum for rotating same and a set of compression vanes, means in said casing to mount said vanes, said means being eccentric to the transverse axis of said drum, said vanes extending through the peripheral wall of said drum and extending and retracting relative to said peripheral wall of said drum as said drum rotates, adjacent vanes, the portion of said peripheral wall therebetween and said shroud defining chambers, the volume of which decreases towards said ejector outlet as said drum and vanes rotate, said shroud being pivotally mounted to said casing by one end thereof adjacent said hopper and adjustable means adjacent the other end thereof normally biassing said shroud towards said drum thereby controlling the compaction of material within said chambers, said means normally biassing said shroud towards said drum including a fluid operating piston and cylinder assembly operatively extending between said shroud and said casing and an accumulator in said casing operatively connected to the cylinder of said piston and cylinder assembly.

3,889,589
CONTAINER ADAPTER FOR REFUSE COMPACTOR

Ira J. Jackson, Overland Park; Thomas F. O'Connor, Fairway, and James H. Buckley, Overland Park, all of Kans., assignors to Trans-World Compacters, Inc., Overland Park, Kans.

Filed Apr. 25, 1974, Ser. No. 463,878

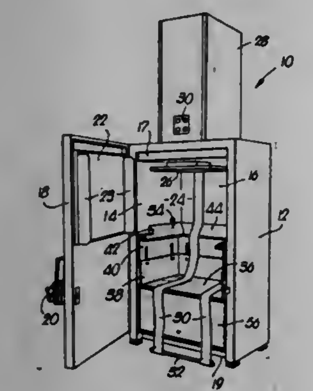
Int. Cl. B30b *15/32*

U.S. Cl. 100—218 **9 Claims**

1. A container adapter for use with a refuse compactor of the type having a compaction chamber for enclosing a relatively large refuse container, and a reciprocable platen operable to compact refuse deposited in said container, said adapter permitting use of a smaller refuse container with said compactor and comprising:

a generally horizontal seat of dimensions permitting positioning thereof within said chamber, said seat being adapted to support said smaller refuse container thereon within said chamber; and

spaced upright sidewalls connected to said seat, each of said sidewalls having inwardly extending lip structure thereon for cooperatively defining with said seat and sidewalls a compartment for said smaller refuse container,



said compartment being of dimensions precluding significant horizontal and vertical movement of said smaller refuse container when the latter is positioned therewithin.

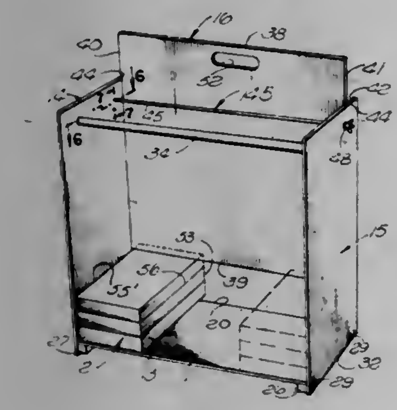
3,889,590
PADDING RACK

Robert N. Juarez; Jean Juarez, both of 1202 Tressy, Glendora, Calif. 91740, and Wesley E. Buford, 1042 Wingate, Covina, Calif. 91723

Filed May 24, 1974, Ser. No. 473,130

Int. Cl. B30b *1/04*

U.S. Cl. 100—219 **15 Claims**



1. A padding rack comprising:
a base having a surface on which a stack of paper sheets are to be supported;
a dual purpose paper contacting structure; and
means for mounting said structure selectively either in a first paper locating position relative to said base or a second adhesive applying position relative to the base;
said structure, in said first position thereof, being positioned to engage corresponding edges of the sheets of said stack and limit movement thereof in a predetermined direction in a relation aligning said edges relative to one another, but being movable out of engagement with said aligned edges in said second position of the structure to expose said aligned edges for application of adhesive thereto;
said structure, in said second position thereof, being engageable against an upper sheet of said stack in a relation clamping said stack between said structure and said base to lock the sheets in aligned positions during application of adhesive thereto.

3,889,591
METHOD AND APPARATUS FOR PRINTING INDICIA ON PRODUCTS

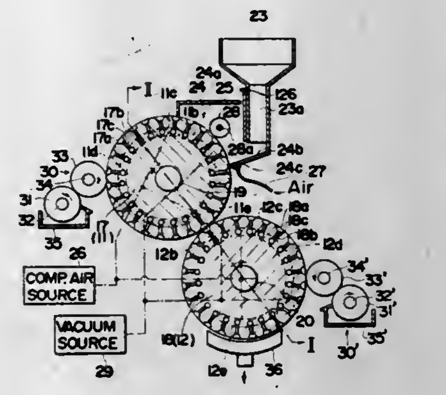
Yukihide Noguchi, Osaka, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 26, 1973, Ser. No. 419,200

Claims priority, application Japan, Nov. 28, 1972, 47-119512; Nov. 28, 1972, 47-137236

Int. Cl. B41f *17/36*

U.S. Cl. 101—37 **10 Claims**



1. A branding machine for successively reproducing indicia on a mass of products of similar shape and/or size, which comprises in combination:
a support structure;
at least one rotary drum rotatably carried by said support structure and having the peripheral surface formed with a plurality of radially inwardly recessed receptacles, some of which successively receive therein a corresponding number of the products during each rotation of said rotary drum for transference of said products from a take-in position to a take-out position, said receptacles being arranged in at least one circumferentially extending row in equally spaced relation with respect to each other; means operatively coupled for continuously driving said rotary drum in one direction;
means disposed adjacent said rotary drum at said take-in position for accommodating therein the mass of said products charged thereinto;
a source of compressed air;
a vacuum source;
first means for permitting a first group of said some of said receptacles to be communicated with said vacuum source for sucking therein a corresponding number of said products;
second means for permitting a second group of said some of said receptacles to be communicated with said compressed air source for effecting a posture correction of each of a corresponding number of said products by floating said product in air within the associated receptacle;
third means for permitting a third group of said some of said receptacles to be communicated with said vacuum source for enabling a corresponding number of said products to be printed with said indicia thereon;
fourth means for permitting the rest of said some of said receptacles to be communicated with said compressed air source for successively ejecting a corresponding number of said products onto a subsequent processing station,
said first to fourth means being operatively coupled and operated simultaneously during each rotation of said rotary drum;
means disposed adjacent said rotary drum and substantially opposed to said accommodating means for printing the indicia on one surface of each of said products, which is exposed outside the associated receptacle, during transference thereof past said third means; and
means operatively coupled for driving said printing means in a direction counter to the direction of rotation of said rotary drum and in the same peripheral velocity as that of said rotary drum.

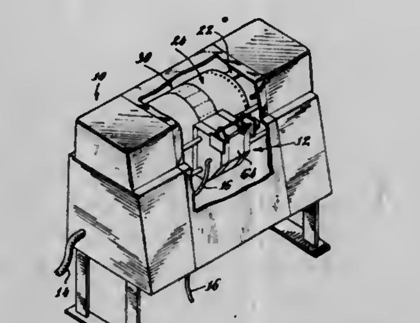
3,889,592
COMPUTER RESPONSIVE SUPPLEMENTAL PRINTER

Raymond R. Lupkas, Trumbull; Gerald C. Freeman, Norwalk, and Frank T. Check, Jr., Orange, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Division of Ser. No. 195,729, Nov. 4, 1971, Pat. No. 3,832,946. This application July 9, 1973, Ser. No. 377,234

Int. Cl. B41j *3/50, 3/02*

U.S. Cl. 101—93.47 **5 Claims**



1. A postage metering system for printing postage indicia, comprising in combination a computer output printer and a supplemental postage printer operatively connected to, and controlled by, a postage accounting means, said supplemental postage being mounted upon said computer output printer, said supplemental postage printer having a secured housing containing segmental postage printing dies each of which is individually translationally movable between a non-printing position and a printing position, each die containing on a printing surface thereof a portion of a postage insignia, and certain of said dies comprising variable numerical printing modules which are electrically controlled to vary a numerical postage printing amount to be printed, said dies acting in combination with each other during printing to form a complete postage mark containing a postage insignia and a postage amount, and drive means operatively and individually connected to each of the respective printing dies to move said postage printing dies from the non-printing position towards the printing position, said drive means moving each of said dies in a sequential relationship to provide improved print quality.

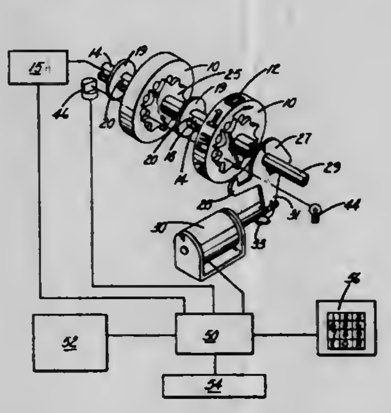
3,889,593
ELECTRIC-SET NUMBERING WHEEL

Charles W. McVey, Eastlake, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed June 26, 1973, Ser. No. 373,821

Int. Cl. B41j *5/00*

U.S. Cl. 101—110 **5 Claims**



1. A number set device for use with a controller in establishing a number series in a data printer, comprising:
at least two number wheels each having a plurality of equal angular spaced indicia in a series about the periphery thereof;
a shaft, with drive means for rotating said shaft, and each wheel journaled on said shaft;
a slip clutch for each wheel coupling said wheel to receive a drive urge from the shaft;
an energy source;
each wheel being an insulator to transmission of energy from said source with restricted areas conductive to energy from said source;
said restricted conductive areas being in an equal angular spaced series corresponding one for one to said indicia series and all wheels being identical in such spacing, whereby all transmission areas are aligned whenever a print indicia of each wheel is in the said number series positions for printing, and one or more of said wheels may rotate while others may be held fixed in position and a new complete transmission series will become aligned regardless of the number of wheels turning or stopped when the drive means rotates said shaft a rotary angle equal to the angular spacing of said conductive restricted areas;
an energy responsive means positioned to be pulsed upon alignment of a set of said restricted areas;
brake means for locking each wheel separately in any one of the number of positions of the indicia alignment;
whereby each alignment of the energy transmission areas will produce a pulse which is counted by said controller, and the brake means for any wheel to be stopped at each rotary pulse position is set by said controller to lock the selected indicia in said print alignment.

3,889,594
HAND-HELD SELF-ADHESIVE-LABEL APPLICATORS

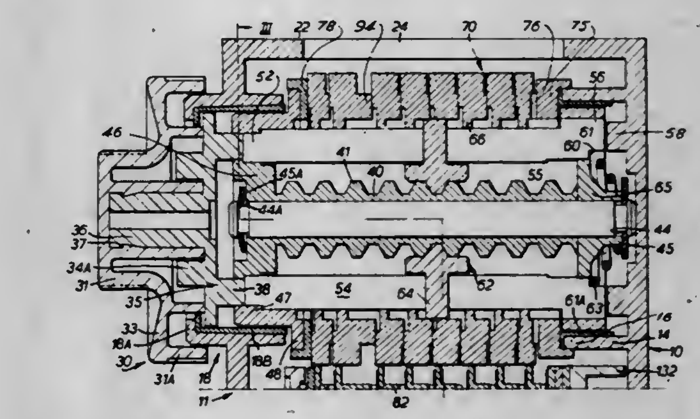
Brian Nicholson, Boston, England, assignor to Norprint Limited, England

Filed July 10, 1973, Ser. No. 378,031

Claims priority, application United Kingdom, July 11, 1972, 32321/72

Int. Cl. B41j *3/08*

U.S. Cl. 101—111 **12 Claims**

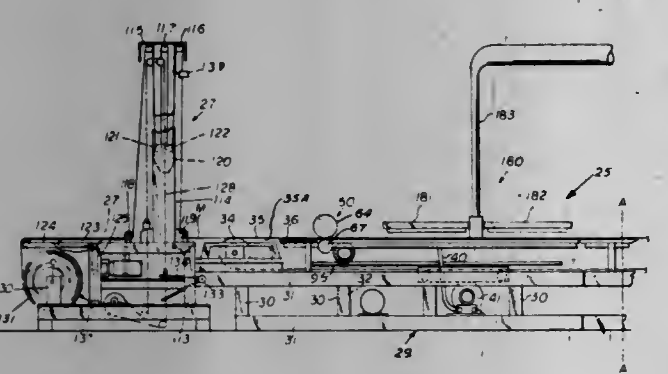


1. In an adjustable facet print mechanism, a plurality of print-facet carrying bands, each said band having a plurality of print-facets, selected ones of which are operative at any given time; a plurality of first wheels arranged on a common axis, each wheel having an internal array of projections and carrying a series of characters each corresponding to a respective print-facet of a related print band and providing an indication by display of the character corresponding to the then operative print-facet of said related print band; a plurality of second wheels arranged on a common axis parallel to the axis of the first wheels and each serving in part to support a respective print band; means supporting said bands at a position spaced from said second wheels and providing backing surfaces for the print-facets of the bands operative at any given time; means drivingly connecting corresponding first and second wheels; a screw-threaded member rotatable on a com-

mon axis of said first wheels and lying within said first wheels; stationary means rotatably supporting said screw-threaded member; a nut member carried by the screw-threaded member and having an array of projections on its periphery; a rotatable spider member coaxial with said screw-threaded member and having a plurality of arms extending axially of said screw-threaded member and interdigitating with at least some of said projections of said nut member; means operable to prevent rotation of said spider member; and a single rotatable actuating member, movable axially of said screw-threaded member over a distance substantially less than the axial length of said plurality of first wheels, operative selectively, in a first axial position, to drive said screw-threaded member with the means operable to prevent rotation of said spider member operative, whereby to move said nut member to a position whereat the projections thereof mesh with the internal projections of a selected first wheel and, in a second axial position, to drive said screw-threaded member with the means operable to prevent rotation of said spider inoperative, whereby to rotate said nut member and spider together to index the selected first wheel and associated print band to bring a required print facet to an operative position.

3,889,595
CONTINUOUS ROTARY SCREEN PRINTING METHOD AND APPARATUS

David Jaffa, Fairlawn, N.J., assignor to Precision Screen Machines Inc., Hawthorne, N.J.
Filed July 3, 1972, Ser. No. 268,522
Int. Cl. B41l *13/16;* **B41f** *15/10, 15/24*
U.S. Cl. 101—116 11 Claims



1. A rotary screen printing apparatus comprising:
a surface for supporting the material to be printed,
a rotating printing screen disposed adjacent said surface,
means for effecting a relative movement of said surface and said screen between a printing and non-printing position, means for moving said surface and material supported thereon relative to said screen in a direction of feed during the printing thereof,
drive means for rotating said screen in the printing position thereof relative to said surface to effect continuous printing of the material,
means for reversing the direction of travel of said surface and material thereon, upon the termination of a printing operation, and
means for reversing the rotation of said screen in the non-printing position thereof upon the termination of said printing operation,
wherein said means for effecting relative movement of the screen and surface between a printing and non-printing position include timing means for moving said screen into printing position onto the material whereby the screen effects engagement of said material on the trailing end portion of a print thereon in commencing a printing operation to overlap a portion of a preceeding printed portion of the material to eliminate any demarkation between successive prints on said material,

5. A rotary screen printing apparatus comprising:
a surface for supporting the material to be printed,
a rotating printing screen disposed adjacent said surface,
means for effecting a relative movement of said surface and said screen between a printing and non-printing position, means for moving said surface and material supported thereon relative to said screen in a direction of feed during the printing thereof,
drive means for rotating said screen in the printing position thereof relative to said surface to effect continuous printing of the material,
means for reversing the direction of travel of said surface and material thereon, upon the termination of a printing operation, and
means for reversing the rotation of said screen in the non-printing position thereof upon the termination of said printing operation,
an infeeding accumulator discussed adjacent said supporting surface for feeding a continuous strip of material to said surface,
said infeeding accumulator having means storing a supply of continuous material which is feed to said supporting surface for a predetermined time interval to prohibit any interruption of the printing operation during the set of a new supply of material,
said infeed accumulator includes a holding table having a vacuum chamber,
means for drawing a vacuum on said holding table to secure the trailing end portion of a continuous sheet of material to said holding table,
means adjacent said holding table for supporting the leading end of another supply roll of said material to said trailing end portion to facilitate the joining of the leading end and trailing end portions to effect an uninterrupted printing of an indefinite continuous strip of material.

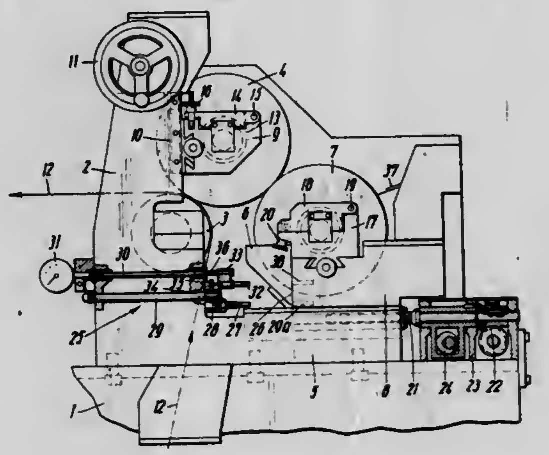
10. A method of continuously screen printing a sheet of material comprising the steps of:
positioning a rotary printing screen having a stencilled portion and an associated squeegee unto the material to be printed in rolling engagement therewith,
printing the material by simultaneously advancing the material in a direction of feed and rotating the printing screen in the printing position thereof relative to said advancing material in predetermined timed relationship,
moving said printing screen and associated squeegee to a non-printing position upon the termination of aprinting operation,
reversing the direction of travel of said material a predetermined amount upon the termination of said printing operation,
and reversing the rotation of said screen an amount corresponding to the reverse movement of said material in the non-printing position thereof,
and including the steps of effecting registration between the screen and material on successive printing operations by rotating the screen in the printing direction,
advancing the material in the direction of feed, and
lowering said rotating screen into contacting relationship with said advancing material thereby the stencilled portion of said screen coincides with a complementary trailing printed portion of the previously printed material, to effect an overprint portion between successive prints.

11. A method of continuously screen printing a sheet of material comprising the steps of:
positioning a rotary printing screen having a stencilled portion and an associated squeegee onto the material to be printed in rolling arrangement therewith,
printing the material by a simultaneously advancing the material in a direction of feed and rotating the printing screen in the printing position thereof relative to said advancing material in predetermined timed relationship,
moving said printing screen and associated squeegee to a non-printing position upon the termination of a printing operation,

reversing the direction of travel of said material a predetermined amount upon the termination of said printing operation,
and reversing the rotation of said screen an amount corresponding to the reverse movement of said material in the non-printing position thereof,
and including the step of cushioning the material at the point of contact thereof with said screen to increase the area of contact between the moving material and the screen during a printing operation.

3,889,596
PRINTING UNIT FOR SELECTIVE INDIRECT INTAGLIO AND FLEXOGRAPHIC PRINTING

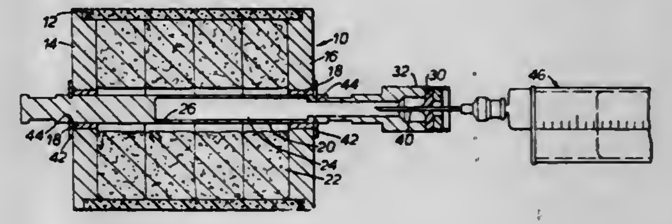
Hans Robert Thomas, and Wolfgang Eril, both of Weiden, Germany, assignors to Hueck and Cie, Germany
Filed Apr. 30, 1973, Ser. No. 355,683
Claims priority, application Germany, Apr. 29, 1972, 2221188
Int. Cl. B41f *9/00, 13/26, 31/30*
U.S. Cl. 101—154 15 Claims



1. Printing unit apparatus operable alternatively for direct intaglio printing and for flexographic printing; said apparatus comprising:
a printing unit frame,
an impression cylinder,
first cylinder supporting means for supporting said impression cylinder for rotation about a first axis of rotation,
first mounting means for mounting said first supporting means on said frame,
a transfer cylinder,
a flexographic plate cylinder,
second cylinder supporting means for selectively and exchangeably supporting one of said transfer cylinder and flexographic plate cylinder for rotation about a second axis of rotation,
second mounting means for mounting said second supporting means on said frame, said second mounting means including vertical adjusting means for adjusting the vertical position of said second axis of rotation at the beginning of each printing operation,
an intaglio plate cylinder,
a fountain cylinder,
third cylinder supporting means for selectively and exchangeably supporting one of said intaglio plate cylinder and said fountain cylinder for rotation about a third axis of rotation disposed in a common horizontal plane passing through the first and third axis of rotation,
third mounting means for mounting said third supporting means on said frame, said third mounting means including horizontal adjusting means for adjusting the horizontal position of said third axis of rotation,
an ink fountain disposed adjacent said third supporting means for supplying ink to one of said intaglio plate and fountain cylinders being supported by said third supporting means,
an oscillating doctor blade means engageable with the one of said intaglio plate and fountain cylinder being supported by said third supporting means,
a patterned surface provided on the intaglio plate cylinder and the fountain cylinder,
said first and third mounting means including means for maintaining said first and third axes of rotation in a common horizontal plane for all adjusted positions of said third axis of rotation,
said impression cylinder and fountain cylinder having the same diameter and said transfer cylinder and intaglio plate cylinder having the same diameter,
whereby flexographic printing operations can be facilitated by placing said flexographic plate cylinder in said second supporting means, by placing said fountain cylinder in said third supporting means, and by appropriately adjusting the position of said second and third axes of rotation with respect to said first axis of rotation,
and whereby indirect intaglio printing operations can be facilitated by placing said transfer cylinder in said second supporting means, by placing said intaglio plate cylinder in said third supporting means, and by appropriately adjusting the position of said second and third axes of rotation with respect to said first axis of rotation.

3,889,597
IMPREGNATED ROLLER

Paul Charlton, Boston, England, assignor to Norprint Limited, England
Filed May 2, 1973, Ser. No. 356,381
Claims priority, application United Kingdom, May 2, 1972, 20331/72; May 19, 1972, 23573/72
Int. Cl. B41f *31/22*
U.S. Cl. 101—367 6 Claims



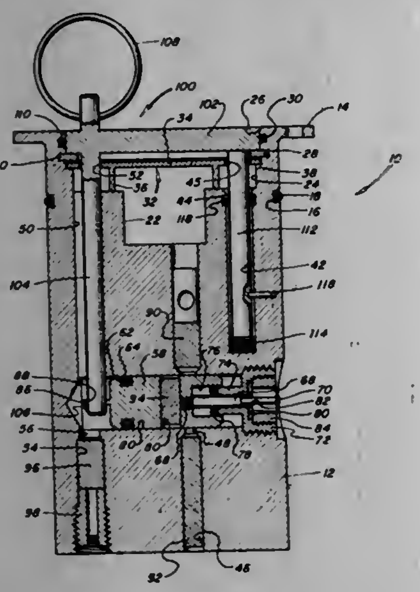
2. In an inking roller an external, porous, generally cylindrical, shell, means defining a plurality of separate, but axially adjacent, ink-absorbent rings the outer peripheries of which are in contact with the inner surface of the shell, hollow shaft means within the rings for delivering ink to the rings, and respective ink distributors disposed between axially adjacent ink-absorbent rings, each ink distributor being arranged to convey ink from the hollow shaft means to a position adjacent the outer periphery of the rings.

3,889,598
ARMING SYSTEM

Kenneth I. Belsley, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed June 18, 1968, Ser. No. 740,816
Int. Cl. F42b *22/40*
U.S. Cl. 102—16 3 Claims

1. An arming system comprising:
a block member having a first bore therein and a second bore therein, said second bore opening from the exterior surface of said block member and extending into a first extremity of said first bore providing open fluid communication between said first bore and the external environment;
an explosively laden piston member slidably positioned within said first bore in an initial position defining an expansible chamber at said first extremity of said first bore;

pressure increasing means in fluid communication with said expansible chamber operable under conditions defined solely by said second bore in said expansible chamber being filled with a predetermined amount of ambient liquid for moving said piston member from said initial position to a predetermined second position; and



means for restraining said piston member at its position of maximum movement including a retaining ring positioned within said first bore having an aperture therein and a shaft member fixed longitudinally to said piston member having a diameter slightly larger than said aperture,

whereby when said piston member moves to said second position said aperture receives said shaft member providing a frictional fit thereby preventing said piston member from returning to said initial position.

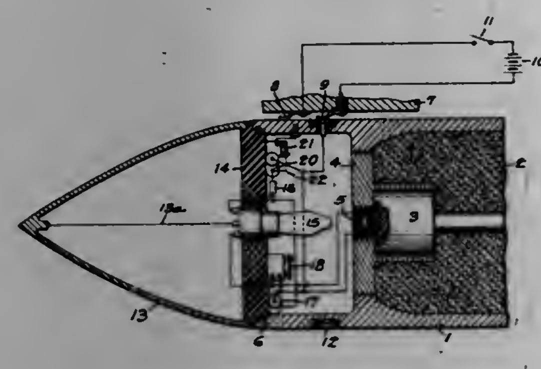
3,889,599
FUZE

Maurice Apstein, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 7, 1951, Ser. No. 209,894

Int. Cl. F42c *13/00*

U.S. Cl. 102—70.2 P **3 Claims**



1. In an explosive missile having an electrostatically charged nose and body members insulated from each other, an electrostatic fuze comprising a thyratron relaxation oscillator, the thyratron switch of said oscillator having grid, anode and cold-cathode members, said grid member connected to said nose, a detonator having a time delay switch normally closed on it in the cathode circuit of said oscillator, a capacitor in the anode circuit of the oscillator, a resistor and a second capacitor in series and shunted across the anode circuit, means for charging the said second capacitor upon firing the missile, said second capacitor discharging to cause the oscillator to initially function for a predetermined period of time, said switch opening at the termination of the initial period of time, said missile upon close proximity to the target causing a positive charge to be impressed upon the grid whereupon said oscillator again oscillates and cathode current passes through the detonator to detonate said missile.

3,889,600
1-(2-(PHENYL-LOWER-ALKYL)-AZIRIDINES MUNITION PAYLOAD

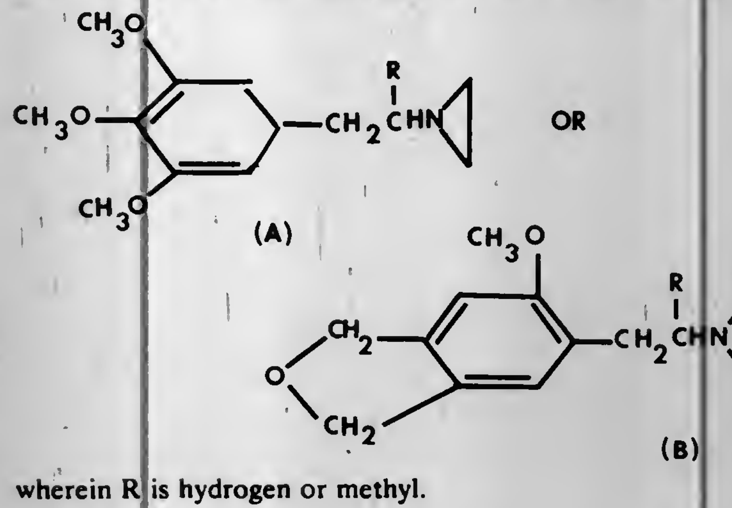
Raj K. Razdan, Belmont, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 22,668, March 25, 1970, Pat. No. 3,637,662, which is a continuation-in-part of Ser. No. 640,815, May 24, 1967. This application Aug. 17, 1971, Ser. No. 172,597

Int. Cl. F42b *11/24*

U.S. Cl. 102—90 **4 Claims**

1. A munition comprising: a means for delivery, and a payload, said payload comprising a compound of the formula



wherein R is hydrogen or methyl.

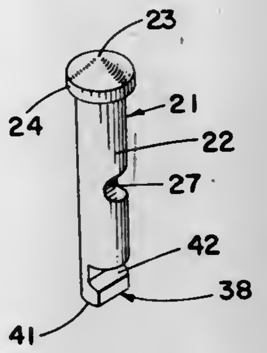
3,889,601
INCENDIARY DEVICE FOR DESTROYING IMPROPERLY HANDLED CLASSIFIED DATA AND THE LIKE

Frank J. Koehne, deceased, late of Wharton, N.J., and by Mildred M. Koehne, administratrix, 6 West Dewey Ave., Wharton, N.J. 07885

Filed Apr. 6, 1965, Ser. No. 446,485

Int. Cl. C06d *1/00*

U.S. Cl. 102—90 **4 Claims**



1. An incendiary device for destroying improperly handled classified data and the like including

a tubular member,

a spring urged clamp pivotally mounted on an upper end of said tubular member,

a container of an incendiary disposed within the upper end portion of said tubular member,

a firing assembly disposed within said tubular member,

means operatively connected to said firing assembly for actuating said firing assembly when a predetermined tension is applied thereto, and

means within said tubular member for preventing disarming of said firing assembly after said firing assembly has been armed.

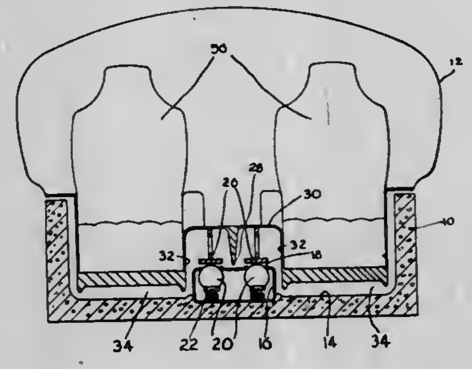
3,889,602
METHOD AND APPARATUS FOR TRANSPORTING

Gerald L. Barber, 309 Cardinal Dr., Taylor, S.C. 29687

Filed Mar. 13, 1974, Ser. No. 450,591

Int. Cl. B61b *13/08*

U.S. Cl. 104—23 FS **18 Claims**



1. In a transporting apparatus; track means, conduit means extending longitudinally along the track means in about the center thereof and adapted to be supplied with air under pressure, valve means distributed along the length of said conduit means in laterally spaced rows and normally closed, a vehicle adapted to run along said track means and to confine therewith a space with which said valves communicate and with a downwardly facing surface of the vehicle closing the top of said space, laterally spaced valve actuating means on the vehicle for opening the valve means of the respective rows which are within the longitudinal range of said space whereby compressed air in said conduit means flows into said space and supplies lifting force to the vehicle, means in said space restricting lateral flow of air therein between said rows of valve means, passage means in the vehicle leading out the rear end thereof from said space whereby compressed air in said space flows through said passage means and supplies rearwardly directed air jet means to exert propulsive force on the vehicle in the forward direction, and means for supplying air under pressure to said conduit means.

3,889,603
DOUBLE LOOP TRACK SYSTEM FOR RAILWAY FREIGHTYARD AND FREIGHT STATION

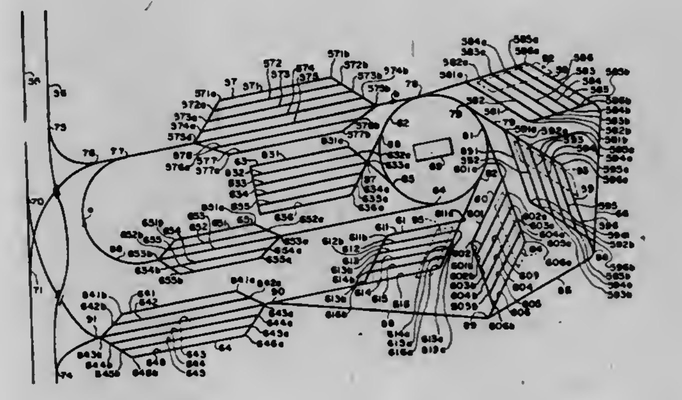
Minoru Harada, Zushi, Japan, assignor to Japanese National Railways, Tokyo, Japan

Filed Aug. 8, 1974, Ser. No. 496,284

Claims priority, application Japan, Aug. 20, 1974, 49-92426

Int. Cl. B61b *1/00*

U.S. Cl. 104—26 R **8 Claims**



1. A loop track system for a railway freightyard and freight station, comprising an arrival line connected to main lines to receive arriving trains, a departure line connected to said main lines to allow departure of made up trains, at least one divergent loop track connected to the arrival line and a convergent loop track connected to the departure line, a plurality of sorting lines connected to said divergent loop track each having a plurality of parallel connected sidings therein and extending in a diverging direction therefrom, the ends of said sorting lines in the direction of movement of railway cars through said system being coupled to said convergent loop track, whereby when railway cars received on the arrival lines are pushed toward said divergent loop track, said cars can be switched along said divergent loop track and sorted onto appropriate sidings of said sorting lines and then connected successively in the desired order in a train along said convergent loop track to the departure line.

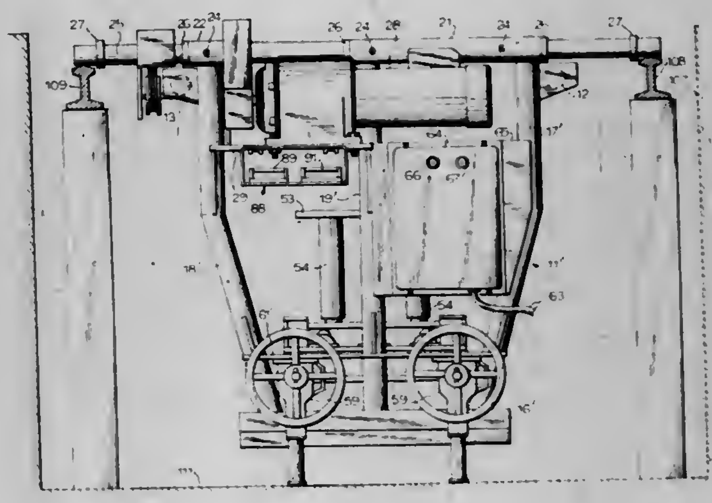
3,889,604
DRAFT GEAR HANDLING CARRIAGE

Glendon R. Lollis, 10405 Mockingbird Dr., and Leroy C. Lucke, 10878 Iowa Plaza, both of Omaha, Nebr. 68127

Filed Aug. 26, 1974, Ser. No. 500,302

Int. Cl. B60s *13/00*

U.S. Cl. 104—32 R **7 Claims**

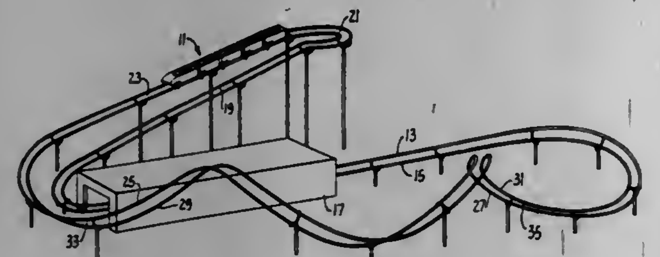


1. A draft gear handling carriage adapted to be used in a railroad maintenance pit and to be carried by the pit rails which support railway rolling stock during servicing, the carriage comprising

a. a framework,
b. means, including a pair of parallel axles carried by bearings fixed to upper portions of the framework, for supporting the carriage on the pit rails and for providing driving traction therebetween;
c. a reversible electric propulsion motor carried by the framework;
d. a drive train interconnecting the propulsion motor and the axles for transmitting driving torque to the latter;
e. an electrically operated scissors lift located within the framework and supported by a lower portion thereof, the lift having a table movable between a retracted position near the bottom of the framework and a raised position in the region of the elevation of the axles;
f. a jack pad supported and guided on the table for sliding movement in a horizontal plane;
g. a manually operated jack assembly mounted on the pad and serving to raise and lower a platform which carries draft gears; and
h. an electrical power distributor mounted on the framework and including a single inlet through which power is applied to the carriage, a reversing circuit for the propulsion motor, and power outlets connected, respectively, with the propulsion motor and the scissors lift.

3,889,605
AMUSEMENT RIDE WITH A VEHICLE TRACK PORTION FOLLOWING THE SHAPE OF A HELIX

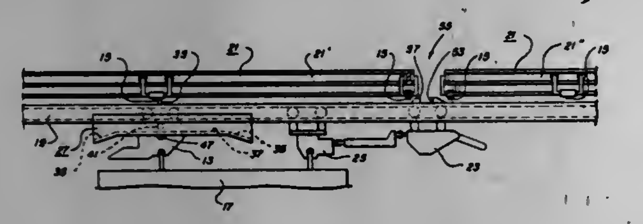
Karl W. Bacon, Mountain View, Calif., assignor to Arrow Development Co., Inc., Mountain View, Calif.
Filed Feb. 19, 1974, Ser. No. 443,814
Int. Cl. A63g *21/10*
U.S. Cl. 104—56 **12 Claims**



1. An amusement ride including a passenger carrying vehicle and means including a pair of tracks fixed with respect to the ground for carrying and guiding said vehicle over a predetermined path, said tracks comprising a portion wherein each track of said pair of tracks follows a path in space substantially conforming to a helix in shape with a common substantially horizontal axis, said helix shape extending a length sufficient for at least one full cycle and having a pitch that is greater than forty degrees, said two tracks of said pair of tracks being of the same helix shape but shifted an axial distance from one another.

3,889,606
CONVEYOR CONTROL MEANS

A. Leon Linton, Memphis, Tenn., assignor to Southern Systems, Memphis, Tenn.
Filed Mar. 18, 1974, Ser. No. 452,433
Int. Cl. B61b *13/00*
U.S. Cl. 104—172 S **8 Claims**



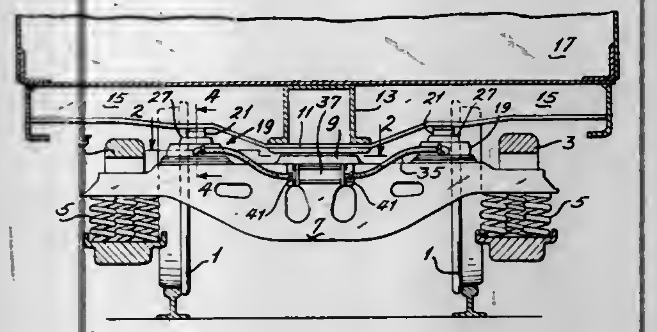
1. Control means for use with a typical conveyor system which includes a trolley member selectively driven by a pusher member to move a load from one location to another, said control means comprising:

a. cam means for fixedly mounting to the conveyor system in proximity with the trolley member, said cam means including first and second cam members for mounting to the conveyor system with one on either side of and in proximity with the trolley member; and

b. dog means for movably mounting in the trolley member, said dog means including a pin member for vertical movement between a first position out of the path of the pusher member to allow the pusher member to move without moving the trolley member and a second position in the path of the pusher member to allow the pusher member to drive the trolley member, said dog means including cam follower means mounted to said pin member for coacting with said cam means to cause said pin member to move between the first and second positions, said cam follower means of said dog means including first and second cam follower members mounted one on either side of said pin member, said first and second cam members and said first and second cam follower members coacting together to cause a stable and uniform movement of said pin member between the first and second positions.

3,889,607
CAR ROCK AND ROLL HYDRAULIC SIDE BEARING STABILIZING ARRANGEMENT

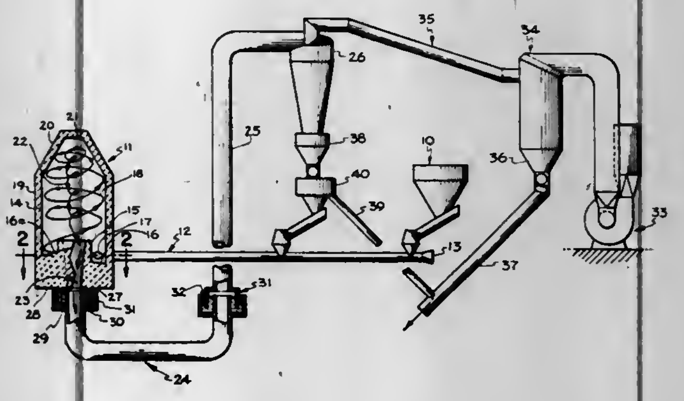
Robert L. Hassenauer, Wilmette, Ill., assignor to Evans Products Company, Des Plaines, Ill.
Filed July 5, 1974, Ser. No. 485,971
Int. Cl. B61f *5/14;* F16c *17/04;* F16f *9/10*
U.S. Cl. 105—199 CB **10 Claims**



1. A railway car side bearing system for placement between a car truck part and a car body part comprising a pair of transversely spaced bearing devices each having a sealed fluid-filled chamber with relatively vertically movable top and bottom portions, conduit means connecting said sealed chambers with each other and includinga normally closed valve device openable under rock and roll including a and responsive to fluid pressure to the compressed side bearing chamber in excess of a predetermined pressure to provide restricted passage of fluid from the compressed side bearing chamber to the other chamber.

3,889,608
APPARATUS FOR THE PREPARATION OF SILICEOUS ASHES

Norman Pitt, Los Angeles, Calif., assignor to Structural Materials, Los Angeles, Calif.
Continuation-in-part of Ser. No. 276,134, July 28, 1972, abandoned, and a continuation-in-part of Ser. No. 407,907, Oct. 19, 1973. This application Mar. 18, 1974, Ser. No. 452,003
Int. Cl. F23g *7/00*
U.S. Cl. 110—8 R **6 Claims**



1. A furnace comprising:

a. a circular base;

b. cylindrical side walls projecting upwardly from said base;

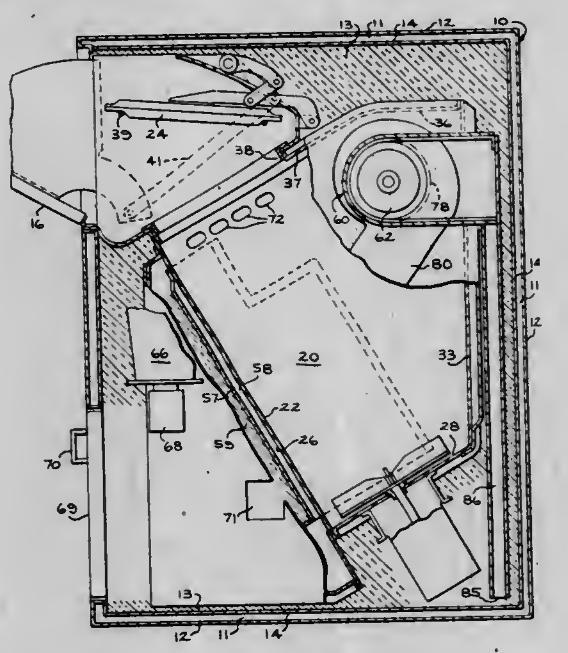
c. a top portion covering said side walls;

d. a peripheral tangential material inlet to said furnace at the bottom portion thereof for admitting material to be burned, and;

e. outlet means in said base for discharging burned material, said outlet means comprising a hollow cylinder projecting concentrically into said furnace above said base.

3,889,609
AIR-COOLED ELECTRIC TERMINALS FOR AN INCINERATOR

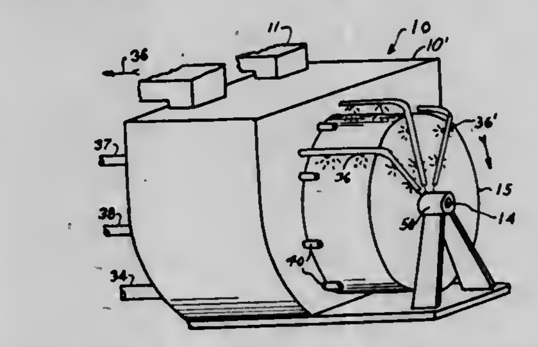
Christian A. Eff, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Apr. 12, 1974, Ser. No. 460,373
Int. Cl. F23g *5/10*
U.S. Cl. 110—8 E **2 Claims**



1. In an incinerator having a combustion chamber; a heater compartment external said combustion chamber; electrical heating means disposed in said heater compartment for causing incineration of combustibles deposited within said combustion chamber; an electric terminal extending from said heater compartment for connecting said electrical heating means to an electrical source external said incinerator for powering said heating means, said terminal further comprising an elongated clamp extending from said heater compartment to an outer portion of said incinerator, a ceramic insulator disposed within said elongated clamp, and a lead-in member disposed within said ceramic insulator; and a passageway intermediate said combustion chamber and said heater compartment for the passage of air, the improvement comprising: ducting means connecting said heater compartment and said passageway, said ducting means being disposed adjacent said clamp and ceramic insulator of said terminal to direct air flowing from said passageway against said lead-in member and into said heater compartment.

3,889,610
COMPACT ROTARY-HOUSING INCINERATOR AND STEAM GENERATOR

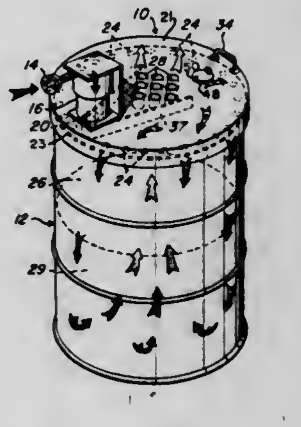
Cecil E. Williams, 274 Opihikao Way, Honolulu, Hawaii 96825
Filed July 20, 1973, Ser. No. 381,262
Int. Cl. F23g *5/06*
U.S. Cl. 110—10 **7 Claims**



1. Incinerator apparatus comprising a rotary cylindrical drum forming a combustion chamber, said drum having one open axial end and a closed second axial end, support means connected to the drum for rotatably supporting said drum, said support means including an axial bearing at the closed end, rotating means connected to the drum for rotating the drum, stationary housing means surrounding the open end of the drum, combusting means positioned within the drum for supporting combustible materials within the drum, feed means positioned within the drum for feeding combustible materials to the combusting means, air input means positioned within the drum for supplying air to combustible materials on the combusting means, ash removal means positioned within the drum for receiving ash from the combusting means and removing ash from the drum, and contilever means mounted in the housing and extending through the open end of the drum into the drum for supporting the feed means, combusting means, air input means and ash removal means within the drum, and gas withdrawal means connected to the housing for withdrawing combustion gas from the drum through the open end and from the housing.

3,889,611
TRASH BURNER CONVERSION UNIT

Herman S. Starbuck, 7720 Spirea Dr., Cincinnati, Ohio 45236
Filed Apr. 23, 1973, Ser. No. 353,338
Int. Cl. F23g *5/00*
U.S. Cl. 110—18 R **13 Claims**



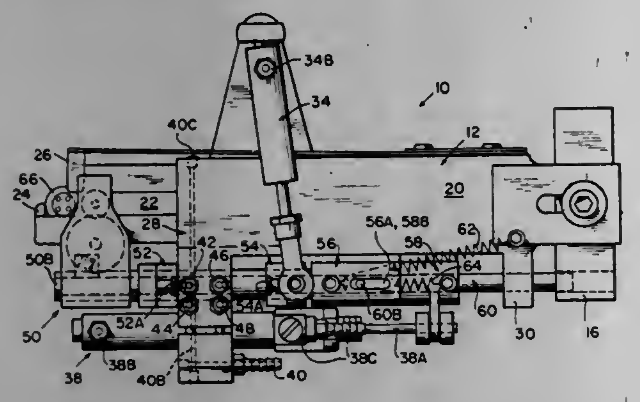
1. A manually portable lid-like device for association with the open top of a container for producing a combustion-supporting environment within the interior of said container, said device comprising a closed chamber having upper, lower and side walls, said chamber including an air inlet port and means secured to and carried by the upper wall thereof for introducing air under pressure into said air inlet port, said lower wall having a plurality of air exhaust ports therethrough wherein said exhaust ports are spaced about and disposed adjacent the periphery of said lower wall, and means for retaining said device over and in closing relationship with the open top of a container.

3,889,612
BUTTON DELIVERING APPARATUS

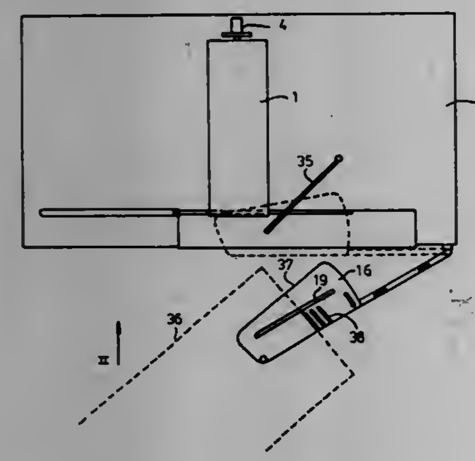
Francis H. Hughes, North Troy, and Douglas J. Crawford, Troy, both of N.Y., assignors to Cluett, Peabody & Co., Inc., New York, N.Y.
Filed Dec. 7, 1973, Ser. No. 422,707
Int. Cl. D05b *3/22*
U.S. Cl. 112—113 **11 Claims**

1. In a button delivering means of the type including a button clamp, a button delivery head for engaging and advancing buttons one at a time to the clamp, first actuator means for advancing and retracting said delivery head, and second actuator means for rocking said head for engaging and releasing buttons, the improvement characterized by a fluidic control system for said button delivery means which comprises

a. a plurality of pressure responsive fluidic control devices for controlling said actuator means,
b. a plurality of air-discharging control ports, one associated with each of said fluidic control devices,
c. means to supply air under pressure to said control ports for discharge therefrom,
d. means responsive to predetermined motions of said delivery head to effect relative opening and closing of said air-discharging ports to vary the condition of said fluidic devices, and
e. means interconnecting said fluidic control devices and said actuators, whereby to cause sequential, programmed operation of said actuators in response to sequential relative closings and openings of said ports.

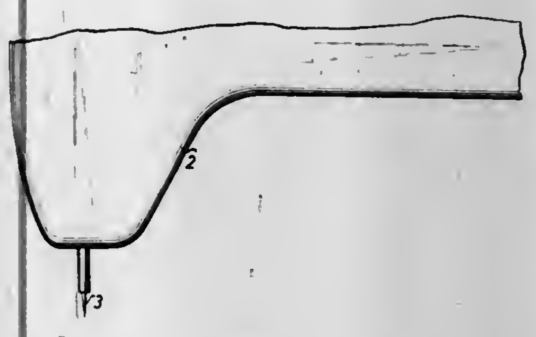


3,889,613
METHODS OF STITCHING A SEAM
Petrus Cornelius Gerardus Hofland, Jules Verneweg 22, Tilburg, Netherlands
Filed Sept. 24, 1973, Ser. No. 400,209
Int. Cl.² D05B *35/10*
U.S. Cl. 112—121.15 **16 Claims**



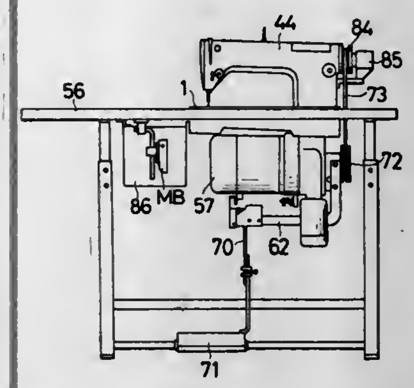
2. An apparatus for use with a sewing machine for stitching a seam in a folded-over piece of cloth comprising:
an arm,
means pivotally coupling one end of said arm to the sewing machine;
having a folding edge a plate for folding a piece of cloth;
means adjustably fastening said plate to the other end of said arm with said folding edge facing the sewing machine whereby said plate is pivotally coupled to the sewing machine for swinging toward or away from the sewing machine;
holding means engageable with said plate for holding the piece of cloth folded over said plate means;
means movably coupling said holding means to the sewing machine, whereby said holding means is movable along a predetermined path on a table top of the sewing machine;
means for withdrawing said plate by swinging said plate away from the sewing machine from the piece of cloth; and
means for moving said holding means beneath a sewing needle of the sewing machine.

3,889,614
FEED FOR SEWING MACHINE
Karl Nicolay, Bielefeld; Karl Buschmann, Brackwede, and Jesus Perez Madueno, Brake, all of Germany, assignors to Durkoppwerke GmbH, Bielefeld, Germany
Filed Aug. 22, 1974, Ser. No. 499,407
Claims priority, application Germany, Aug. 22, 1973, 2342305
Int. Cl.² D05B *35/10*
U.S. Cl. 112—153 **10 Claims**



1. A workpiece feed for a sewing machine having a pair of laterally open guides provided on a stitching surface adjacent a stitching location thereon and having a pair of guide edges offset from the stitching location and parallel to the machine stitching direction, said feed comprising:
a pair of rollers to either side of the stitching surface downstream from said stitching location and each rotatable in a roller plane intercepting said guide edges downstream of said rollers; and
a pair of axles defining respective rotation axes transverse to said direction supporting said rollers.

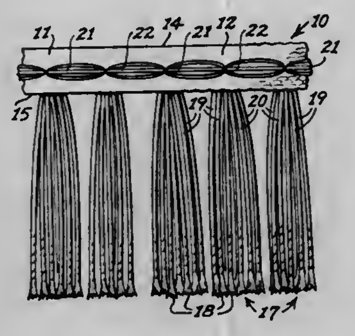
3,889,615
SAFETY DEVICE FOR A SEWING MACHINE
Seizo Uozake, Toyota, and Hitoshi Sakashita, Nukata, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan
Filed May 30, 1974, Ser. No. 474,620
Claims priority, application Japan, May 30, 1973, 48-61383
Int. Cl. D05b *65/00*
U.S. Cl. 112—252 **6 Claims**



1. A safety device for use in conjunction with the thread cutting mechanism of a sewing machine, comprising:
a main power source for actuating a main drive shaft of said machine for the performance of a stitching operation;

connecting means operable for connecting said main power source with said main drive shaft;
sensing means sensitive to the rotational condition of said main drive shaft and capable of generating a signal in response thereto;
a thread cutting device operable for holding and cutting the thread of said machine in response to said generated signal of said sensing means; and
detent means operatively connected to said connecting means for preventing the connection of said power source to said drive shaft during a thread cutting operation.

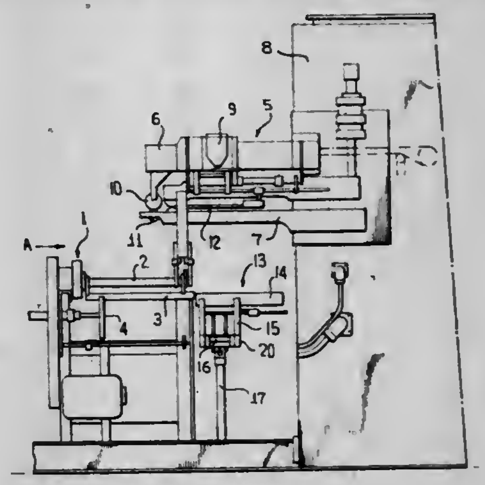
3,889,616
TUFTED FRINGE PRODUCT
William Erby Passons, 1805 Verona Ave., Chattanooga, Tenn. 37421, and Joseph Lewis Card, 1515 Edgewater Cir., Chattanooga, Tenn. 37406
Filed Mar. 18, 1974, Ser. No. 452,288
Int. Cl.² B32B *7/08*
U.S. Cl. 112—409 **6 Claims**



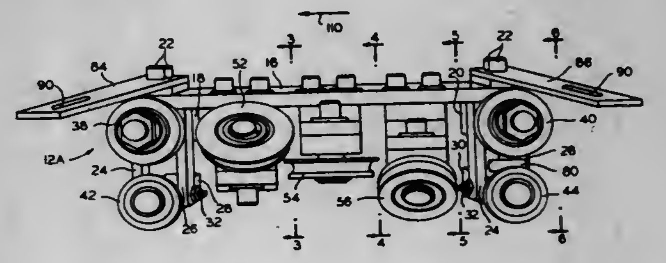
1. A fringe product comprising:
a. an elongated, flexible, pre-formed tape member having substantially flat face and back surfaces on opposite sides of said tape member,
b. a plurality of longitudinally spaced, alternating first and second fringe tufts projecting from the back surface of said tape member,
c. each of said fringe tufts comprising at least one first strand and at least one second strand extending through the thickness of said tape member,
d. a first back stitch extending longitudinally over said face surface and integrally joining said first strands in adjacent fringe tufts,
e. a second back stitch extending longitudinally over said face surface and integrally joining said second strands in adjacent fringe tufts, and
f. said first and second back stitches alternating in longitudinal alignment.

3,889,617
APPARATUS FOR FORMING TUBULAR BODIES HAVING LONGITUDINAL SIDE SEAMS
Uwe J. Lorenzen, and Harald Martens, both of Wedel, Germany, assignors to Schmalbach-Lubeca GmbH, Braunschweig, Germany
Filed Mar. 18, 1974, Ser. No. 452,046
Claims priority, application Germany, Mar. 23, 1973, 2314553
Int. Cl. B21d *51/26*
U.S. Cl. 113—8 **12 Claims**

1. In an apparatus for handling unseamed tubular bodies wherein the tubular bodies are supplied in unseamed form and the apparatus includes a guide rail having grooves therein for receiving unseamed edges of the tubular bodies, a transfer mechanism including support means for receiving unseamed tubular bodies, expanding means for expanding an unseamed tubular body seated on said support means to move unseamed edges thereof into spaced relation, and feed means for feeding an expanded unseamed tubular body towards said guide rail to a position adjacent said guide rail wherein unseamed edges of a tubular body will engage in the grooves of said guide rail.



3,889,618
ROLLING APPARATUS
Lactance A. Jarvis, Buchanan, and Ronald L. Nimtz, Berrien Springs, both of Mich., assignors to Clark Equipment Company, Buchanan, Mich.
Filed June 26, 1974, Ser. No. 483,263
Int. Cl. B21d *39/02*
U.S. Cl. 113—55 **10 Claims**



1. An apparatus for simultaneously rolling and securing, in a longitudinal direction, the transversely extending edges of an elongate sheet material along and around the underlying outer edges of opposed parallel frame members, said apparatus including first and second transversely and rigidly interconnected allochiral tool assemblies, wherein each of said assemblies comprises:
a. a carriage assembly movable along the surface of said sheet material at the outer edge of one of said frame members;
b. longitudinally spaced and vertically disposed first and second upper guide rolls, carried by said carriage assembly, for rotatably contacting a first surface of said sheet material;
c. a vertically disposed first lower guide roll carried by said carriage assembly and vertically aligned with said first upper guide roll, for rotatably contacting a lower surface of said frame member outer edge;
d. a vertically disposed second lower guide roll, carried by said carriage assembly and vertically aligned with said second upper guide roll, for rotatably contacting a second surface of said sheet material;
e. a plurality of form rolls carried by said carriage assembly, longitudinally in tandem, between said first and second upper and lower guide rolls, respectively, for progressively bending the transversely extending edge of said elongate sheet material along and substantially complete around the underlying outer edge of said one frame member; and
f. a horizontally disposed edge roller, carried by said carriage assembly between, but transversely spaced from, said vertically disposed second upper and lower guide rolls, said edge roller contacting the generally vertically

outer edge of said sheet material after it is bent around said frame outer edge by said form rolls, said edge roller coacting with said second upper and lower guide rolls to complete an about 180° bend of said sheet material, said edge roller also minimizing any undesired skewing movement of said tool assembly about an axis perpendicular to the surface of said sheet material.

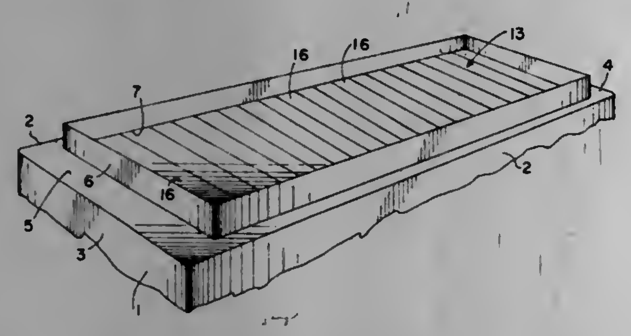
3,889,619
BARGE CONSTRUCTION

John Joseph Glassmeyer, Covington, Ky., assignor to Pullman Incorporated, Chicago, Ill.

Filed Feb. 6, 1974, Ser. No. 440,094

Int. Cl. B63b *35/28*

U.S. Cl. 114—26 **12 Claims**



1. In a barge construction a cargo hold arrangement including:

a flat top outer deck having a cargo opening and a vertical bulkhead means about and defining the opening below the top outer deck,

a plurality of vertically stacked cargo decks in the opening, each cargo deck having a plurality of removable decking sections in horizontal side by side neighboring relation to one another within the opening,

each decking section having ends and being comprised of a beaming structure and a floor for supporting cargo,

a plurality of bracket means for supporting each of the decking sections within the opening, each one of said bracket means including a vertical wall having a pair of hook means and a horizontal wall supporting the end of the decking section of a cargo deck adjacent the bulkhead means,

said bulkhead means having a plurality of pairs of apertures spaced horizontally along said bulkhead means at each level of said cargo deck, and

each one of the pairs of apertures being disposed for removably receiving the pair of hook means of a bracket means so that said bulkhead means carries the bracket means and the horizontal wall of the bracket means supports the end of the decking section of a cargo deck.

3,889,620
SYMMETRICAL SAIL ASSEMBLY

Charles Kenneth Dorland, 525 Fairway Dr., Broken Arrow, Okla. 74012

Filed Feb. 1, 1974, Ser. No. 438,876

Int. Cl. B63h *9/08*

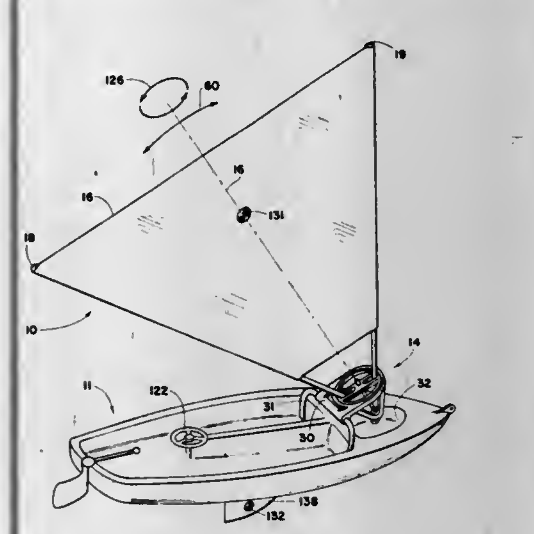
U.S. Cl. 114—39 **4 Claims**

1. In combination with a wind propelled vehicle, an assembly for carrying a sail above said wind-propelled vehicle comprising:

a turntable mounted on said vehicle,

means for rotating said turntable relative to said vehicle around an axis of symmetry passing through said turntable,

a pair of booms for carrying a sail therebetween pivotally mounted at their lower ends to said turntable and extending divergently upwardly from said turntable and defining a plane with said axis of symmetry, said booms extending symmetrically upwardly with respect to said axis of symmetry,



and means for tilting said turntable with respect to said vehicle about a substantially horizontal transverse axis whereby said axis of symmetry is movable from a substantially vertical position to a substantially horizontal position.

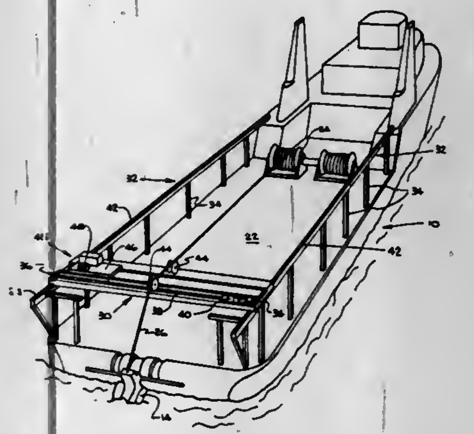
3,889,621
ANCHOR HANDLING VESSEL

Floyd T. Pease, Houston, Tex., assignor to The Offshore Company, Houston, Tex.

Filed Oct. 25, 1973, Ser. No. 409,395

Int. Cl. B63b *21/22*

U.S. Cl. 114—206 R **7 Claims**



1. An anchor handling apparatus comprising:

a buoyant vessel having a deck for receiving an anchor,

a pair of tracks disposed adjacent opposed sides of said deck and extending longitudinally of said deck,

an elevated transverse bridge structure extending between said tracks and movable longitudinally of said deck along said tracks,

a powered winch on said vessel for reeling in a line connectible to said anchor and extending generally longitudinally of said deck, and

anti-friction support means on said bridge structure intermediate said tracks for supporting said line extending generally longitudinally of said deck from said winch over said support means to said anchor,

said tracks being spaced from each other by a distance greater than the width of the anchor to be handled, so that said anchor may freely pass between said tracks, and the space between said tracks and above said deck being free of obstructions which would interfere with the movement of said anchor, whereby said anchor may be freely moved longitudinally of said deck between said tracks by said bridge structure and deposited at a desired location on said deck intermediate said tracks.

said tracks being essentially straight throughout their effective length and including a portion which is cantilevered beyond the edge of said deck during the operation of said bridge structure whereby said bridge structure may be selectively positioned outboard of said vessel.

3,889,622
MARINE PROPULSION

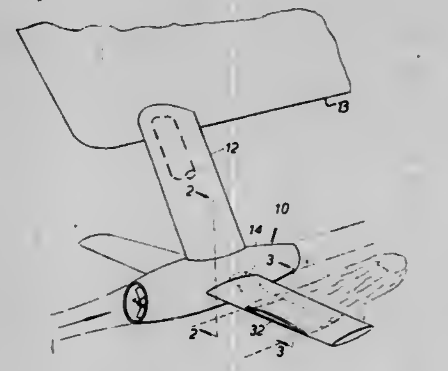
John Lanfear Scott-Scott, Bulkington, England, assignor to Rolls-Royce (1971) Limited, London SW1Y 4JR, England

Continuation-in-part of Ser. No. 329,342, Feb. 5, 1973, abandoned. This application Sept. 18, 1974, Ser. No. 507,193

Claims priority, application United Kingdom, Feb. 11, 1972, 6474/72

Int. Cl. B63h *5/00*

U.S. Cl. 115—11 **5 Claims**



1. A marine propulsion unit comprising a duct and a centerbody located within the duct, the centerbody having located within it combustion means arranged to receive fuel and compressed air from a source located remotely of the centerbody and turbine means arranged to drive an impeller located in the inlet of the duct, at least one wing-like arm extending laterally of the duct being provided, the said arm having a span-wise nozzle which extends over the whole chord of said arms, water being capable of flowing through said nozzle, the exhaust from the turbine means being arranged to flow through said arm to be mixed with water flowing through said nozzle over substantially the whole of the span-wise width of the said nozzle.

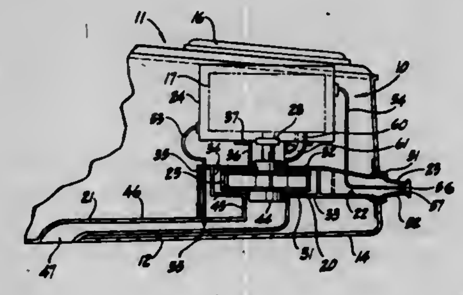
3,889,623
JET PROPULSION UNIT FOR BOATS

Robert W. Arnold, 819 Merriwether St., Cape Girardeau, Mo. 63701

Filed Jan. 31, 1974, Ser. No. 438,295

Int. Cl. B63h *11/04*

U.S. Cl. 115—16 **2 Claims**



1. In combination with a boat, a jet propulsion unit comprising:

a. a boat hull including forward and rearward ends and having an intake opening intermediate said ends and a discharge opening at the rearward end disposed below the water line,

b. a drive motor,

c. a centrifugal pump mounted between said intake and discharge openings and including:

  1. an impeller having a drive shaft, said shaft defining a substantially vertical axis of rotation and being connected to the motor in drive relation, and a coaxial inlet opening, and
  2. a housing receiving the impeller in rotatable relation,

d. a first intake passage extending longitudinally between the intake opening and the inlet opening of the pump impeller,

e. a second discharge passage extending longitudinally between the pump housing and the discharge opening,

f. a venturi unit mounted in the discharge passage, and

g. cooling means for the motor including:

  1. a water jacket disposed about said motor,
  2. a first conduit extending between the first passage and the water jacket, and
  3. a second conduit extending between the water jacket and the venturi throat to draw cooling water from the jacket by suction and thereby pick up water from the first passage through the first conduit for circulation through said jacket.

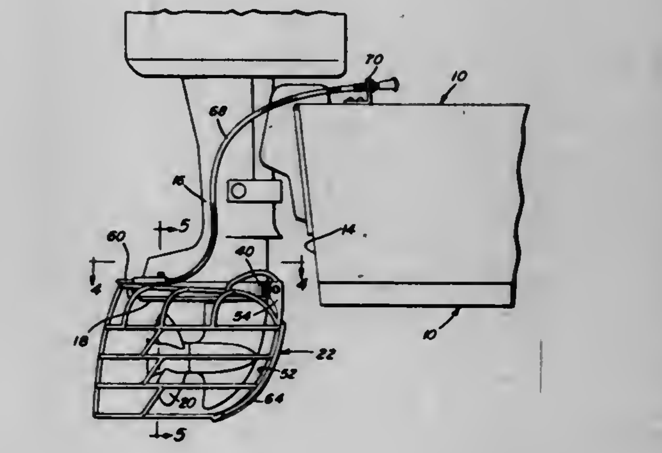
3,889,624
RETRACTABLE PROPELLER GUARD FOR OUTBOARD MOTOR OR STERN DRIVE UNIT

Donald G. Balius, 1003 Cailllavet St., Biloxi, Miss. 39530

Filed June 13, 1974, Ser. No. 479,257

Int. Cl. B63h *5/16*

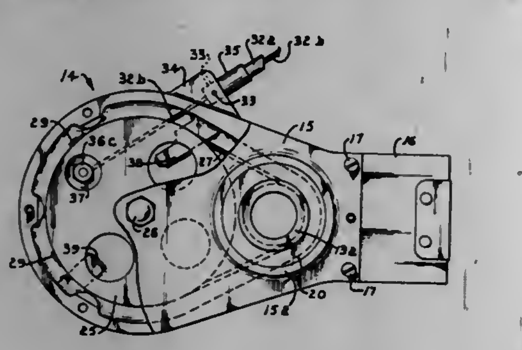
U.S. Cl. 115—42 **9 Claims**



1. A mounting bracket including means for support from the lower portion of the upstanding power leg of an outdrive marine propulsion unit of the type including a horizontal cavitation plate spaced above a marine propeller journaled from the power leg lower portion, said bracket including front and rear portions, a rod cage constructed of contoured, crossed and interconnected rod members, said cage including opposite upstanding side portions and a rear portion extending between and interconnecting the rear ends of said side portions, means pivotally supporting upper forward end portions of said side portions from the front portion of said bracket for oscillation of said cage about a horizontal transverse axis, said cage opening forwardly between the forward ends of said side portions as well as upwardly and downwardly and being swingable relative to said bracket between an operative generally horizontally disposed position opening forwardly in a horizontal direction and an inoperative rearwardly and upwardly tilted position with said cage opening forwardly in a forwardly and downwardly inclined direction.

3,889,625
CONTROL CABLE CONNECTION FOR AN ELECTRIC TROLLING MOTOR

William G. Roller, Purdy, Mo., and Emery L. West, Oklahoma City, Okla., assignors to William G. Roller, Purdy, Mo.
Filed Oct. 1, 1973, Ser. No. 402,289
Int. Cl. B63h *21/26*
U.S. Cl. 115—18 E **4 Claims**

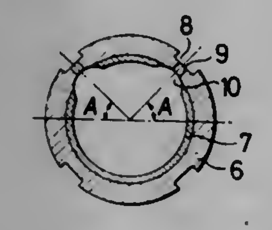


1. In a remote control unit for directionally controlling an electric trolling motor having an elongate shaft with a water submergible propulsion unit on the lower end thereof, the combination comprising:

- a housing equipped with a rotatable sleeve which receives and fixedly retains the elongate shaft of the trolling motor to correspondingly rotate said shaft with said sleeve;
- a wheel member pivotally mounted within said housing and being larger in diameter than said sleeve;
- linkage means interconnecting said wheel member and said sleeve to impart rotational movement of said wheel member to said sleeve;
- a retractable and extendable control wire partially disposed within said housing and having a bent end to form substantially an L-shaped portion on the end of said wire;
- a post-like connector pivotally installed on said wheel member outwardly from the axis of rotation thereof, said connector having a vertical slot and a bore therein to receive the end portion of said control wire with said bent end disposed within said bore and the portion of control wire immediately adjacent said bent end disposed within said slot; and
- a pin member transversely disposed within said slot and overlying said control wire to permanently but removably secure connection of said wire to said connector.

3,889,626
STERN TUBE BEARING

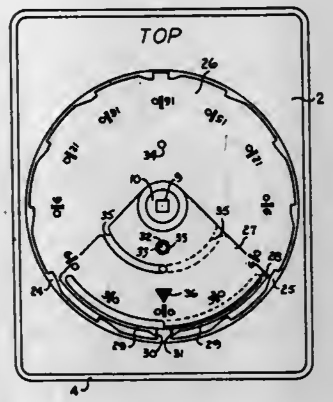
Minoru Kakihara, Okayama, Japan, assignor to Mitsui Shipbuilding & Engineering Co. Ltd., Tokyo, Japan
Filed May 8, 1973, Ser. No. 358,461
Claims priority, application Japan, May 16, 1972, 47-56873; May 17, 1972, 47-58356
Int. Cl. F16c *1/24, 3/14, 33/00, 33/66*
U.S. Cl. 115—34 R **2 Claims**



1. A stern tube bearing assembly comprising a propeller shaft subject to a lateral force in a horizontal plane at a contact position, and a bearing metal having an inside cylindrical surface positioned within the stern tube and surrounding said propeller shaft to support the same, said lateral force operable to effect relative displacement of said shaft in said bearing metal surface toward and away from said contact position, said propeller shaft having a continuous cylindrical surface coaxial with the inside cylindrical surface of the bearing metal and said bearing axis, said inside cylindrical surface being continuous and uninterrupted within and below the horizontal plane of the bearing axis, and being continuously cylindrical but interrupted by at least one oil groove extending axially on the inside cylindrical surface of the bearing metal in a position above the horizontal plane of the bearing axis, oil passage means extending axially in the outer periphery of the bearing opposite said groove, means to supply bearing oil to said passage means, and oil supply aperture means communicating said oil groove with said oil passage, said groove and said oil supply aperture means being separated from said contact position to avoid breaking of the oil film at said position and to provide a continuous uninterrupted film of oil on the portion of said inside surface which supports said propeller shaft.

3,889,627
TILT INDICATOR FOR SHIPPING CONTAINERS AND THE LIKE

Harold S. Cloyd, Erie, Pa., assignor to Nosco Plastics, Inc., Erie, Pa.
Filed July 3, 1974, Ser. No. 485,368
Int. Cl. G01d *21/00*
U.S. Cl. 116—114 AH **8 Claims**



1. An indicator for providing a positive indication that an object has been tilted comprising a body for attachment in a vertical plane in fixed relation to said object, a pendulum pivoted on said body for rotation in said plane, a unidirectional means for said pendulum permitting rotation of said pendulum in a single direction and preventing reverse rotation of said pendulum whereby said pendulum indicates the maximum tilt of said object in said plane and the direction it is permitted to rotate, and stop means for said pendulum limiting its rotation to substantially one half revolution.

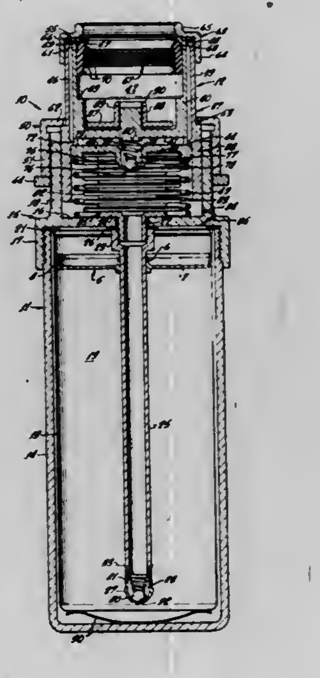
3,889,628
FLUID MATERIAL APPLICATOR

Martin A. Usab, Santa Ana, Calif., assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland
Filed Aug. 13, 1973, Ser. No. 387,645
Int. Cl. B05c *11/00, 5/00, 7/00*
U.S. Cl. 118—3 **17 Claims**

1. Apparatus for coating the/outside surface of a pipe or other cylindrical object or the inside surface of a fitting or other hollow cylindrical object with a predetermined quantity of fluid material for a predetermined distance from the end thereof comprising:

- a first body section having a first, enclosed chamber therein for containment and storage of said fluid material and a second, open-ended chamber at one end thereof;
- means in said first body section forming a first passageway interconnecting said first and second chambers to permit fluid communication therebetween;
- first one-way valve means positioned in said first passageway between said first and second chambers for permitting passage of said fluid material only from said first chamber to said second chamber;

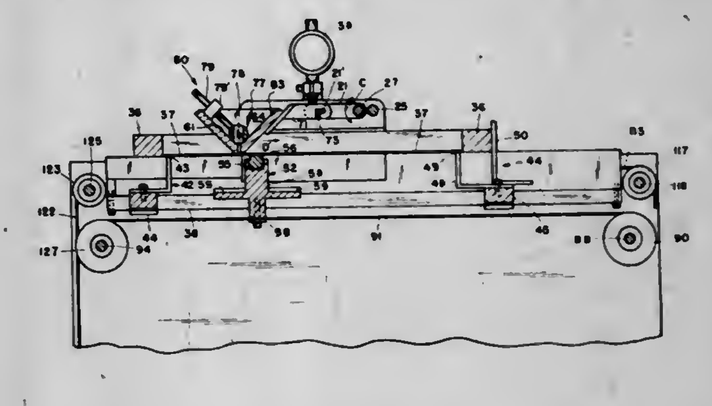
- a second body section connected to and moveable relative to said first body section, said second body section having a third, open-ended chamber at one end thereof positioned facing said second open-ended chamber in said first body section, said second and third open-ended chambers cooperating to define an enclosed, compressible, metering chamber in selective fluid communication with said first chamber via said first passageway, said second body section further including means defining an annular area adapted to surround the end of a pipe or lie within the end of a fitting;
- means in said second body section forming a second passageway interconnecting said metering chamber and said annular area to permit fluid communication therebetween;
- said one-way valve means positioned in said second passageway between said metering chamber and said annular area for permitting passage of said fluid material only from said metering chamber to said annular area, said end of said pipe or said end of said fitting being adapted to engage said second body section and to move said second body section toward said first body section by a predetermined maximum amount, movement of said second body section toward said first body section by said predetermined amount compressing said metering chamber and pumping said predetermined quantity of fluid material through said second passageway, past said second one-way valve means, to said annular area;



- means positioned between said first and second body sections for urging said second body section away from said first body section whereby movement of said pipe or fitting out of engagement with said second body section causes movement of said second body section away from said first body section, expanding said metering chamber, and pumping said fluid material from said first chamber, through said first passageway, past said first one-way valve means, into said metering chamber to refill same; and
- means in said second body section responsive to movement of said pipe or fitting out of engagement with said second body section for uniformly distributing said pumped predetermined quantity of fluid material across said outside surface of said pipe or said inside surface of said fitting.

3,889,629
STENCIL SCREEN COATING MACHINE

James A. Black, 13700 Sparta Ave., Kent City, Mich. 49330
Filed Mar. 16, 1973, Ser. No. 342,168
Int. Cl. B05c *11/04*
U.S. Cl. 118—6 **13 Claims**

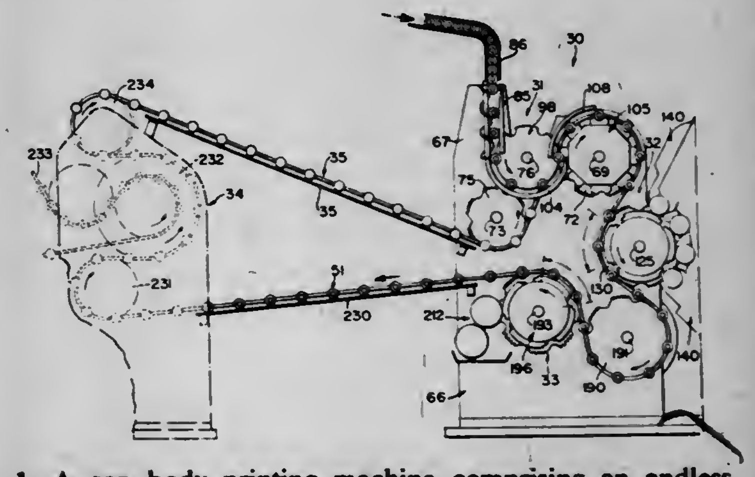


1. A machine for applying a fluid coating to the surface of planar stock comprising:

- a base including side walls;
- means on said base for supporting planar stock to be coated;
- carriage means extending between said side walls above said support means and movable in a direction generally parallel to the plane of stock supported on said support means;
- coating means detachably coupled to said carriage means for easy removal and including an adjustable pivotable coating tray for receiving a coating fluid and dispensing a coating of said fluid of predetermined thickness to the planar stock as a function of the pivot adjustment of said tray as said coating means traverses the stock in response to the movement of said carriage means; and
- drive means coupled to said carriage means for sliding said carriage means to transport said coating means across at least a portion of the planar stock.

3,889,630
HIGH SPEED CAN PRINTING MACHINE

Wesley J. Szpitalak, Palos Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Division of Ser. No. 242,110, April 7, 1972, Pat. No. 3,786,747, which is a division of Ser. No. 501,372, Oct. 22, 1965, Pat. No. 3,683,799. This application Sept. 24, 1973, Ser. No. 399,828
Int. Cl. B05c *11/00*
U.S. Cl. 118—46 **6 Claims**



1. A can body printing machine comprising an endless continuously moving conveyor chain having separately rotatable evenly spaced can body receiving mandrels projecting from one side thereof, a plurality of sprockets supporting said chain for movement about a twisting endless path, means for automatically placing can bodies on said mandrels, a printing apparatus positioned adjacent the path of said mandrels for

printing on the exteriors of can bodies while carried by said mandrels as the can bodies pass said printing apparatus in a first rotational direction, a varnishing apparatus positioned adjacent the path of said mandrels for applying a coating of varnish over printing on can bodies as the printed can bodies pass said varnishing apparatus in a second rotational direction, and means for automatically removing printed and varnished can bodies from said mandrels.

3,889,631

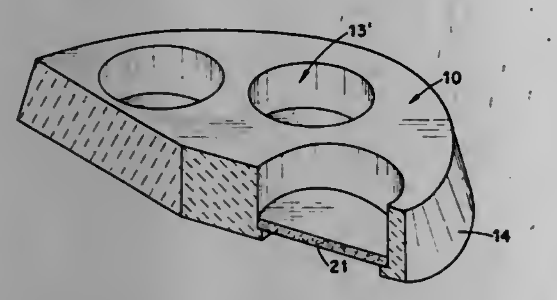
MEANS FOR EFFECTING FLUIDIZATION IN PYROLYTIC CARBON COATING PROCESSES

Walter J. Lackey, Jr., Oak Ridge, and John D. Sease, Knoxville, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 18, 1974, Ser. No. 452,166

Int. Cl. C23c *13/08*

U.S. Cl. 118—48 **1 Claim**



1. A fluidized bed coater comprising:
a coating chamber and heating means therewith;
a porous plate defining the chamber bottom wall and the upper wall of a plenum chamber;
means feeding and distributing a fluidizing gaseous stream into said plenum chamber, said gas then passing through said porous plate to effect fluidization of particulate material supported on said plate;
said porous plate being relatively thick, whereby to adequately support the particulate material in a quiessent state, and having a plurality of uniformly spaced apertures therein;
a relatively thin replaceable porous plate supported in each said aperture; and
said thin plate of a dimension whereby the passageways thereof will not clog due to decomposition products of said gaseous stream.

3,889,632

VARIABLE INCIDENCE DRIVE FOR DEPOSITION TOOLING

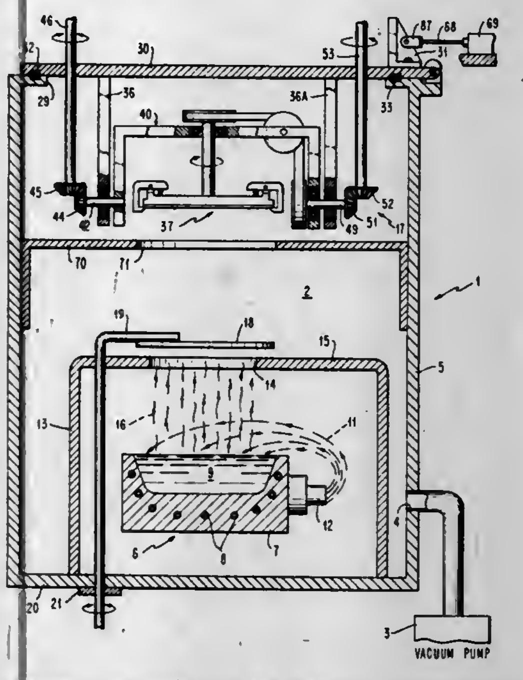
Rolf H. Brunner, Poughkeepsie, and William C. Lester, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 31, 1974, Ser. No. 475,005

Int. Cl. C23c *13/08*

U.S. Cl. 118—49.1 **1 Claim**

1. Apparatus for coating a plurality of substantially planar substrates comprising
A. a coating chamber;
B. a port in a wall of said chamber;
C. a hatch means pivotally mounted on said wall for movement into open and closed position relative to said port with said closed position securing said hatch in sealing relationship with said coating chamber; oscillatory frame means supported on the inner wall of said hatch means;
E. means supporting said frame additionally supporting means to oscillate said frame;
F. rotatable means supported within the said frame and mounting a plurality of substrate holders in a substantially common plane on a circle concentric with the axis of said rotatable means;
G. means rotating said rotatable means whereby to orbit said holders about said axis, said axis being normal to the axis of said oscillation;
H. rotary means carried on said rotatable means and operatively associated with said holders whereby to rotate each said holder about its own axis which is normal to the axis of said oscillation;



I. drive means common to each said rotary and rotatable means whereby to simultaneously effect said holder orbital and rotative movements;
J. said holder orbital and rotative and said frame oscillatory movements occurring simultaneously; and
K. coating means comprising a vapor source for evaporating and directing a stream of coating material onto said substrates.

3,889,633

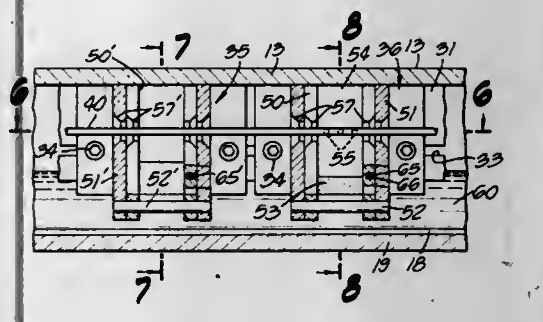
APPARATUS FOR APPLYING ONE OR MORE STRIPES TO CONDUCTORS

Glenn F. Roquemore, and Roderick B. Lacy, both of Escondido, Calif., assignors to Formulabs Industrial Inks, Inc., Escondido, Calif.

Filed May 8, 1974, Ser. No. 467,890

Int. Cl. B05c *1/06, 1/16*

U.S. Cl. 118—68 **19 Claims**



1. Apparatus for applying a coding stripe to a conductor comprising: a stripe applicator station located between conductor supply means and conductor takeup reel means, said applicator station including coding ink supply means, capillary ink feeding means in communication with said ink supply means and extending to a position of contact with a conductor while being moved therepast and onto said takeup reel means, impervious mask means positioned between the surface of the conductor and said ink feeding means, said mask means having an opening the width of which does not exceed the desired width of the stripe being applied to said conductor and into which opening said ink feeding means projects, and means for holding the conductor firmly pressed against and centered over the adjacent end of the opening in said mask whereby a stripe of coding ink is applied to the conductor as the same is advanced axially past said mask opening.

3,889,634

METHOD OF AND APPARATUS FOR PRODUCING LIQUID IMPREGNATED FIBROUS MATERIAL

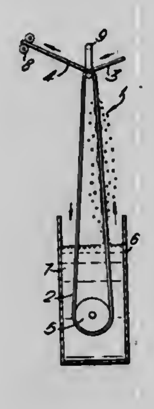
Robert McNaught Galley, and Joseph John Hurley, both of Paisley, Scotland, assignors to J. & P. Coats, Limited, Glasgow, Scotland

Division of Ser. No. 261,956, June 12, 1972, abandoned. This application Jan. 21, 1974, Ser. No. 435,269

Claims priority, application United Kingdom, June 17, 1971, 28362/71

Int. Cl. B05c *5/00*

U.S. Cl. 118—325 **9 Claims**



1. Apparatus for producing liquid-impregnated fibrous material comprising means for feeding continuously forward material from a source of supply of unimpregnated material guiding means for guiding the forwardly moving material in a path forming a loop, means for maintaining the material approaching the loop and the material receding from the loop in contact and liquid-applying means for applying impregnating liquid to the loop over a chosen extent of the loop.

3,889,635

APPARATUS FOR PRODUCING EPITAXIAL LAYERS

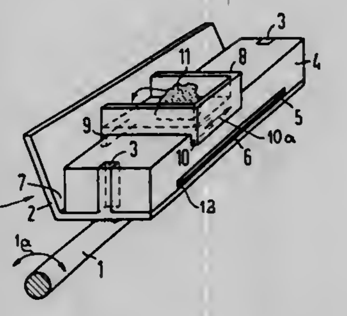
Joerg Aengenheister, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 3, 1974, Ser. No. 485,448

Claims priority, application Germany, July 5, 1973, 2334306

Int. Cl. B05c *3/18*

U.S. Cl. 118—421 **8 Claims**



1. An apparatus for the production of epitaxial layers on a substrate composed of a compound semiconductor material, comprising:
a substrate carrier having at least two adjoining surfaces;
a high-heat capacity body in contact with one of said surfaces of the substrate carrier and adjacent the other of said surfaces of the substrate carrier;
an area along contacting surfaces of said carrier and body defining a gap for receiving at least one substrate therein;
an area along non-contacting surfaces of said carrier and body defining a wedge-shaped slot in communication with said gap;
a container for holding a melt containing the material to be epitaxially deposited, said container being positioned on said high-heat capacity body and in communication with said slot; and
a selectively movable shaft attached to said substrate carrier so that upon movement of said shaft the melt is guided from said container through said slot to said gap and onto a surface of a substrate within said gap for epitaxial deposition thereon upon super-cooling of said melt.

3,889,636

COATING OF SUBSTRATES WITH PARTICLE MATERIALS

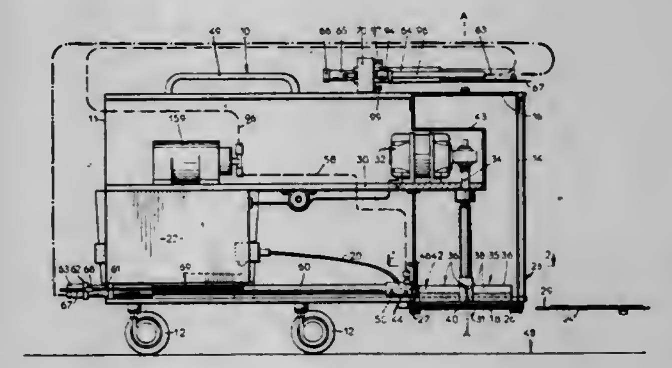
Willoughby Arthur Smith, The Mead, Sidcot, Winscombe, England

Filed Dec. 29, 1972, Ser. No. 319,381

Claims priority, application United Kingdom, Aug. 2, 1972, 36087/72

Int. Cl. B05c *5/02*

U.S. Cl. 118—621 **6 Claims**

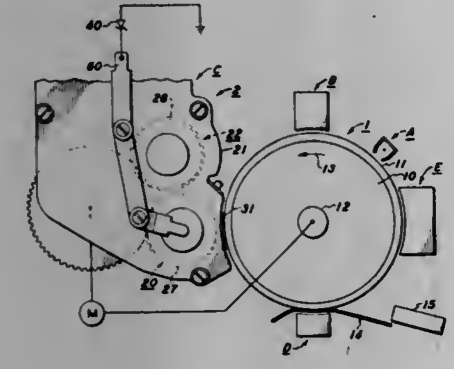


1. Apparatus for electrostatically applying a coating of a particle material to a substrate to which a settable adhesive has been applied, the apparatus comprising a container for a stock of particle material; a single metering means comprising a chamber supplied with particle material from the container and comprising a base and an upstanding peripheral wall, and a power rotatable paddle wheel having blades which are adapted to sweep the volume of the chamber on rotation of the paddle wheel and between adjacent blades there being defined compartments, each adapted to contain a predetermined amount of particle material, the paddle wheel having an axis of rotation which is disposed vertically, said chamber having two alternatively openable exits, one exit being disposed in the base and the other exit being disposed in said upstanding peripheral wall, a manually portable discharge head being provided in communication with said other exit, and said one exit constituting a downwardly directed discharge head; said single metering means serving to meter the amount of particle material supplied to the discharge heads; the apparatus further including an electrostatic generator; main electrode means electrically connected to said generator and disposed in said chamber to electrically charge the particle material therein; and subsidiary electrode means electrically connected to said generator and associated with said portable discharge head.

3,889,637
SELF-BIASED DEVELOPMENT ELECTRODE AND REPRODUCING MACHINE EMPLOYING SAME

Arthur J. North, Rochester, and Raymond W. Stover, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed June 28, 1973, Ser. No. 374,295
Int. Cl. G03g *13/06*
U.S. Cl. 118—637 **20 Claims**



1. In a developing apparatus for developing electrostatic charge patterns on a surface, including an electrically biased development electrode in close proximity to said surface, said electrode being connected to a reference potential through an impedance means so that the charge produced on the electrode during the development of said pattern provides the bias potential for said electrode, the improvement wherein, said impedance means comprises: at least one zener diode connected between said electrode and said reference potential so that the charge produced on said electrode during the development of said pattern provides a reverse bias potential across said zener diode to cause it to stabilize the bias potential on said electrode at a desired level.

3,889,638
METHOD FOR MAKING A BAIT BEDDING COMPOSITION

Patrick F. Riley, Bedford, Ohio

Filed Mar. 21, 1972, Ser. No. 236,778
Int. Cl. A01k *67/00*
U.S. Cl. 119—1 **2 Claims**

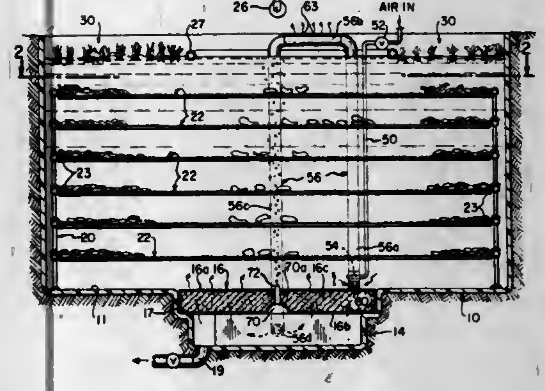
1. The method of making a bedding composition for live bait, comprising shredding newspaper, stirring the shredded newspaper until saturated in water, and adding coal tar dye to said composition for coloring said water and said composition.

3,889,639
REARING TANK FOR AQUATIC ANIMALS

John J. Day, and Paul S. Hirschman, both of Fort Lauderdale, Fla., assignors to Ocean Protein Corporation, Dania, Fla.

Filed Feb. 22, 1973, Ser. No. 334,622
Int. Cl. A01k *61/00*
U.S. Cl. 119—2 **11 Claims**

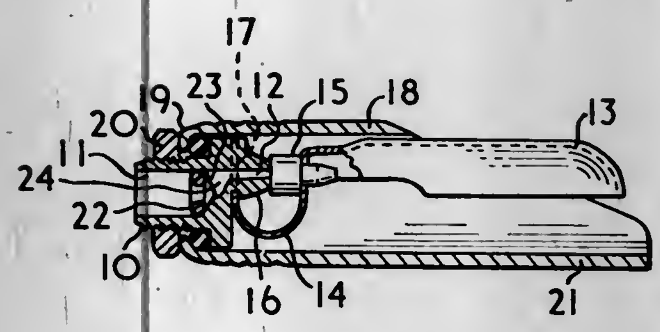
1. Apparatus for maturing movable aquatic animals comprising a liquid containing tank with a top open to the environment for holding fluid, a plurality of platforms of foraminous material located within said tank across which the animals can move unobstructed, means for stacking said platforms spaced vertically one above the other, and means located below the lowermost platform of the stack of platforms for circulating the liquid through the tank while filtering the same, the filtered liquid passing upwardly through said platforms.



3,889,640
ANIMAL OPERATED LIQUID DISPENSER

George Restall, 27 Little Aston Ln., Sutton Coldfield, England

Filed Oct. 1, 1973, Ser. No. 402,053
Claims priority, application United Kingdom, Oct. 10, 1972, 46554/72
Int. Cl. A01k *7/00*
U.S. Cl. 119—75 **10 Claims**



1. A liquid dispenser for animals comprising means of connection to a supply of liquid to be dispensed, a body member, a valve arrangement including an aperture defined in said body member, a valve closure element for closing said aperture at its downstream end, a leaf spring secured to said body member and carrying said valve closure element so as to urge said element towards its valve closing position, and an operating member arranged to move said closure element from a valve closing towards a valve opening position.

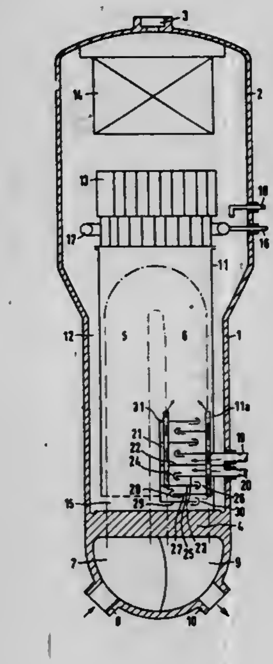
3,889,641
STEAM GENERATOR FEED-WATER PREHEATER IMPROVEMENT

Hans Mayer, Bubenreuth, and Heinz-Jurgen Schroeder, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 17, 1974, Ser. No. 434,360
Claims priority, application Germany, Jan. 25, 1073, 2303681
Int. Cl. F22b *1/06*
U.S. Cl. 122—32 **5 Claims**

1. A steam generator comprises a feed-water casing having a steam output outlet, a horizontal tube sheet enclosed by said casing, a plurality of heat-exchanger tubes having ends mounted in said tube sheet and extending upwardly therefrom, a feed-water preheater casing radially enclosing said legs and having a series of vertically interspaced transverse feed-water flow baffles through which said tubes extend and which define alternately horizontally offset flow passages, and a feed-water inlet connecting with the upper portion of said series of baffles for downward flow of feed-water deflected

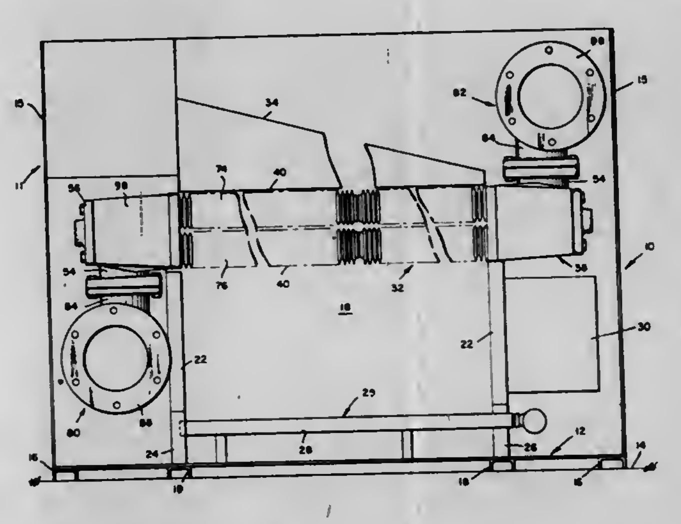
transversely alternately in opposite directions between said tubes prior to discharge into said feed-water casing; wherein the improvement comprises means for venting steam from beneath at least one of said baffles, upwardly and to a location free from said series of baffles.



3,889,642
MODULAR CAST IRON FIN TUBE BOILER

James Y. Fung, Closter, N.J., assignor to Automation Industries, Inc., Los Angeles, Calif.

Filed Aug. 31, 1973, Ser. No. 393,399
Int. Cl.² F22B *15/00*
U.S. Cl. 122—264 **10 Claims**

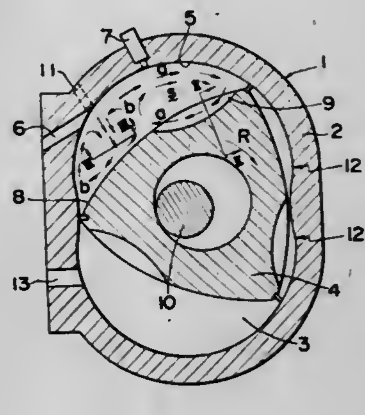


1. The combination of
a combustion chamber,
a cast iron header disposed at each end of the combustion chamber,
a plurality of openings in said headers aligned with each other,
a bundle of case iron, finned tubes disposed in the combustion chamber and extending across said combustion chamber, the opposite ends of the tubes in said bundle being disposed in said aligned openings and communicating with the headers,
the opposite ends of said tubes and said openings being tapered to form a compression seal therebetween.
a tie rod disposed inside of at least one of the tubes, said tie rod extending the full length of the tube and creating a force which compresses the headers onto the tubes and the seal between the ends of the tubes and the openings,
manifolds on the opposite ends of said combustion chamber, each of said manifolds being interconnected with the header on the respective end of the combustion chamber, and
a flue collector disposed above the tubes and enclosing the top of the combustion chamber.

3,889,643
FUEL INJECTION-TYPE ROTARY PISTON ENGINE

Masaharu Shimoji; Haruhiko Şatow, and Tetsuo Kawano, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

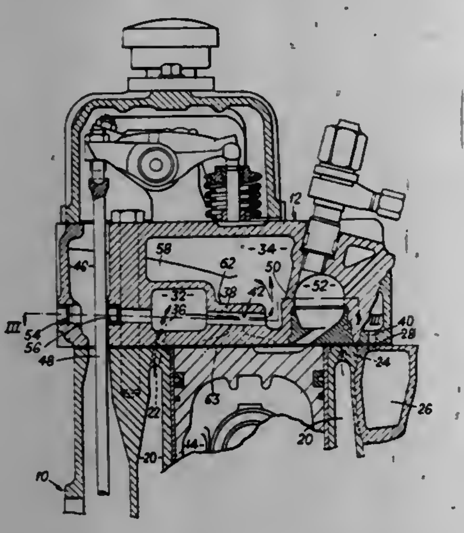
Filed Apr. 25, 1974, Ser. No. 464,616
Claims priority, application Japan, Apr. 30, 1973, 48-48680
Int. Cl. F02b *53/10*
U.S. Cl. 123—8.09 **5 Claims**



1. A fuel injection-type rotary piston engine which comprises in combination:
housing wall means including at least one peripheral wall and side walls secured to both ends of said peripheral wall;
inlet means and outlet means operatively positioned for admission of combustion air to and discharge of exhaust gases from said rotary piston engine;
a polygonal rotor means having rotor flanks and rotatably housed within said housing wall means, each of said rotor flanks having a rotor cavity formed therein, said rotor cavity located on the corresponding rotor flank at a position displaced in the direction of rotation of siad polygonal rotor means;
means operatively coupled to said polygonal rotor means for rotating said polygonal rotor means relative to said housing wall means so as to control the opening and closing of said inlet and outlet means directly by the rotary movement of said polygonal rotor means and also to effectively provide, during the rotary movement of said polygonal rotor means, a suction chamber followed by a combustion chamber in the direction of rotation of said polygonal rotor means, said inlet means being so inclined in a direction substantially parallel to the direction of rotation of said polygonal rotor means as to permit the combustion air, that is to be introduced into the suction chamber therethrough, to be directed toward the area within the suction chamber adjacent the point where an imaginary line drawn through the largest part of the interior of said housing wall means substantially intersects the inner surface of the peripheral wall;
ignition plug means in said housing wall means within the area thereof of said combustion chamber; and
injection means operatively positioned and including a fuel injection nozzle for injecting fuel into said suction chamber.

3,889,644
ENGINE COOLING SYSTEM

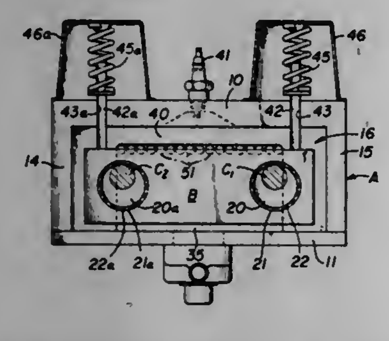
Trevor J. Moore, Bourne, England, assignor to Perkins Engines Limited, London, England
Filed Apr. 10, 1974, Ser. No. 459,843
Claims priority, application United Kingdom, Apr. 12, 1973, 17742/73
Int. Cl. F01p *3/14*
U.S. Cl. 123—41.77 **5 Claims**



1. A liquid cooled internal combustion engine incorporating a cylinder head and block, at least one air passage terminating at an inlet valve seat, at least one exhaust gas passage terminating at an exhaust valve seat, first and second coolant chambers cast in the head, the first of the chambers being in the form of a gallery extending over the length of the cylinder head, said two chambers having a coolant passage joining them arranged to pass between at least a part of each of the air and the exhaust gas passages, the arrangement being that flow of coolant in the passage acts to cool the metal of the cylinder head between the inlet and exhaust valve, third and fourth coolant chambers cast in the block, said third chamber being positioned beneath said gallery, and a plurality of paired gallery feed ports in the head and block respectively in register with each other to permit coolant to pass from the third chamber to the gallery.

3,889,645
INTERNAL COMBUSTION ENGINE

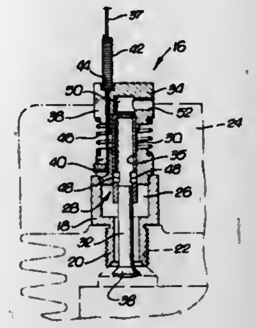
Robert W. Waters, 301 S. Harrison St., Villa Park, Ill. 60181
Filed Sept. 4, 1973, Ser. No. 394,059
Int. Cl. F02b *53/00*
U.S. Cl. 123—45 R **17 Claims**



1. In an internal combustion engine, a casing having front and back sides and providing a cavity therein, a piston block in said cavity and extending between said sides, a shaft mounted in said sides for rotating about a horizontal axis, said shaft having a cylindrical portion whose axis is displaced from the axis of said shaft, a cylindrical opening in said piston block, said cylindrical portion of said shaft entending within said opening and being rotatable therein whereby to couple rotation of said shaft about its axis with reciprocating vertical movement of said piston block, a fuel intake chamber in said cavity below said piston block whereby said intake chamber is expanded upon upward movement of said piston block, a source of fuel, and valve means permitting intake of fuel from said source into said chamber when said chamber is expanded.

3,889,646
ONE-WAY COMPRESSION AND STARTING RELEASE

Michael Ronald Harper, Cedarpines Park, and Neil David Fergus, Crestline, both of Calif., assignors to Victor Products, Inc., Hesperia, Calif.
Filed Oct. 15, 1973, Ser. No. 406,155
Int. Cl. F01l *13/08;* **F02d** *15/04*
U.S. Cl. 123—48 D **5 Claims**



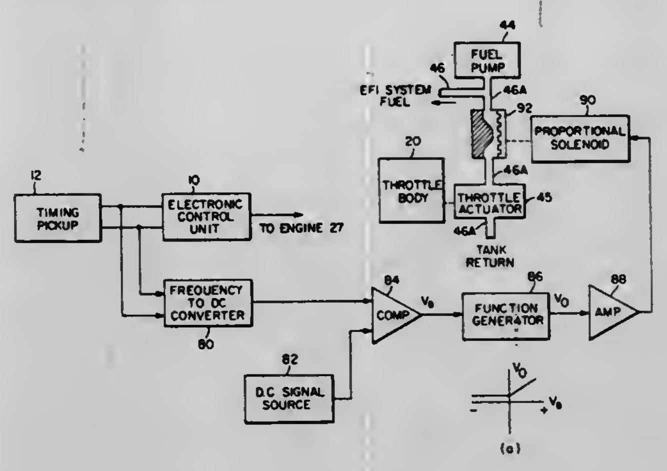
5. In a two cycle motorcycle engine having means forming a cylinder and said engine having a hole extending from the cylinder, the combination therewith of a compression control device having
a. a valve body attached at said engine hole;
b. a valve member in the body and guided for movement in a path;
c. means forming one limit to the movement of said valve member;
d. spring means urging the valve member to said one limit;
e. an actuator manually operable to move said valve member away from its said one limit;
f. means operable upon a certain amount of movement of said valve member away from its said one limit to add a predetermined incremental volume to said engine cylinder via said engine hole;
g. means operable only after a predetermined course of movement of said valve member farther away from its said limit than said certain amount to vent said engine cylinder via said engine hole.

3,889,647
SPEED GOVERNOR FOR AN ENGINE HAVING AN ELECTRONIC FUEL INJECTION SYSTEM

Todd L. Rachel, Rochester, Mich., assignor to The Bendix Corporation, Teterboro, N.J.
Filed July 2, 1973, Ser. No. 375,580
Int. Cl. B60k *31/00*
U.S. Cl. 123—102 **2 Claims**

1. In an internal combustion engine including a fuel control system of the type having sensor means including means for generating an ac. signal at a frequency corresponding to engine speed, responsive to engine conditions operative to provide signals indicative of engine generating parameters, means responsive to the sensor means signals operative to provide a fuel delivery command signal indicative of the engine fuel requirements, fuel supply means responsive to the fuel delivery command signal operative to supply the engine with pressurized fuel in relation to the fuel delivery command signal and means for controlling mixture of fuel and air to the engine, the improvement comprising:
means for providing a d.c. signal corresponding to a predetermined set point speed;

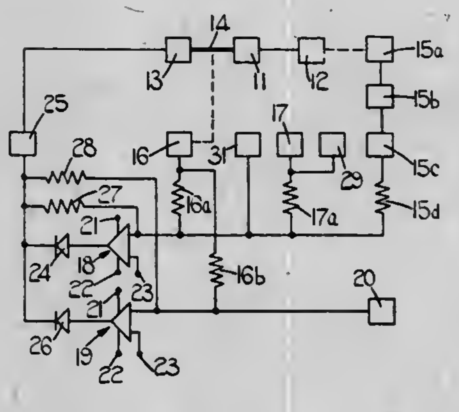
a converter connected to the a.c. signal generating means for converting the engine speed signal therefrom to a d.c. signal;
means for comparing the d.c. set point speed signal and the d.c. engine speed signal and for providing an error signal;
means connected to the error signal means for providing a signal as a function of the error signal, the function signal being at a constant level when the error signal is in one sense and increasing linearly when the error signal is in an opposite sense;



fuel regulating means connected to the function signal means and to the fuel supply and responsive to the function signal for regulating said fuel supply, said regulated fuel supply providing a force; and
actuator means connected to the fuel regulating means and to the mixture control means and responsive to said force for actuating the mixture control means to control the mixture of air and fuel to the engine to maintain the predetermined set point speed.

3,889,648
FUEL SYSTEMS FOR ENGINES

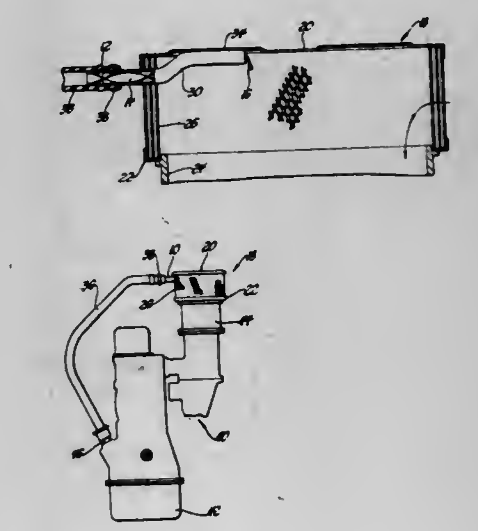
Malcolm Williams, Solihull; Geoffrey Albert Kenyon Brunt, Glastonbury, and Christopher Robin Jones, Alcester, all of England, assignors to C.A.V. Limited, London, England
Filed Apr. 4, 1973, Ser. No. 347,729
Claims priority, application United Kingdom, Apr. 4, 1972, 15341/72; Apr. 4, 1972, 15339/72
Int. Cl. F02m *39/00*
U.S. Cl. 123—139 E **13 Claims**



1. A fuel system for an engine, comprising in combination a pump supply fuel to the engine, an actuator controlling the pump, and an electronic governor for controlling the actuator, said governor receiving electrical signals representing engine speed and at least one further engine parameter, the speed signal being obtained using a transducer producing an a.c. output at a frequency proportional to engine speed, a pump circuit for converting said signal to a d.c. signal, first, second and third supply lines, an operational amplifier having an inverting input terminal and a non-inverting input terminal, said amplifier being powered by the first and second supply lines and having its non-inverting input terminal connected to the third supply line, and said pump circuit including a capacitor across which is developed a voltage proportional to the frequency of the a.c. output, said capacitor being connected across the inverting input and output terminals of said operational amplifier, a resistor across the capacitor, a second capacitor and a diode in series between an input terminal and the inverting input terminal, and a second diode coupling the junction of the second capacitor and first diode to the third supply line.

3,889,649
FEED TUBE FLAME ARRESTER

Mardy Polaner, Detroit, Mich., assignor to Barbron Corporation, Detroit, Mich.
Division of Ser. No. 177,235, Sept. 2, 1971. This application Aug. 13, 1973, Ser. No. 387,906
Int. Cl. F02m *17/00, 25/06, 29/00*
U.S. Cl. 123—142 **4 Claims**



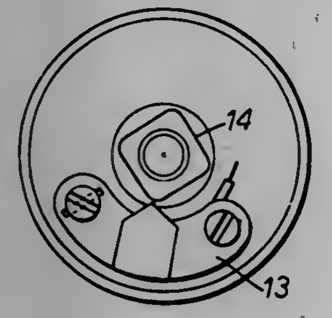
1. In a combustion engine having a carburetor for mixing air with fuel, a feed line for conveying combustible gases from a source to the carburetor including an elongated section of closed tube having one open end connected directly to the source and the other end connected to the carburetor so as to pass undiluted gases from the source directly to the carburetor, said tube having an interior flame arresting baffle formed of an elongated strip twisted about its elongated axis and having both of its longitudinal edges fixed to the interior of the tube so that the longitudinal axis of the strip coincides with the longitudinal axis of the tube and having one end terminating at the carburetor end of the tube.

3,889,650
ELECTRIC PULSE GENERATING APPARATUS

Robert Leitch Rivers, Oxted, England, assignor to Mobelec International Limited, Oxted, Surrey, England
Filed Dec. 15, 1972, Ser. No. 315,432
Claims priority, application United Kingdom, Dec. 15, 1971, 58258/71; June 8, 1972, 26783/72
Int. Cl. F02p *1/00*
U.S. Cl. 123—148 E **2 Claims**

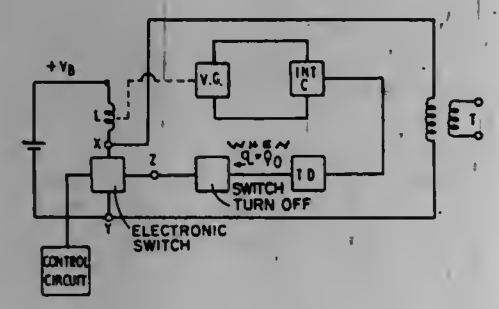
1. In combination with an internal combustion engine, an electrical ignition circuit including a cam-like member of a magnetic material operatively connected to move as a function of engine speed and apparatus for generating electric pulses, said apparatus comprising,

- a core member of a magnetic material;
- pole pieces formed by exposed faces of said core member;
  means for mounting said core member with said pole pieces adjacent said cam-like member;
- a coil wound round a portion of said core member for controlling the magnetic flux in said core member;



- circuit means operatively connected to said coil for supplying said coil with a direct current of such a magnitude that said core member is driven into and out of magnetic saturation on movement of the cam-like member past said pole pieces; and
- desaturation detection means for deriving an electric pulse when said core member is driven from a saturated to a desaturated condition.

3,889,651
ENERGY METERING CIRCUITS FOR CAPACITOR DISCHARGE AND OTHER IGNITION SYSTEMS
George Hudson, 1 Harbour Gate, 10 Wolseley Rd., Point Piper, New South Wales, Australia
Filed Feb. 5, 1974, Ser. No. 439,840
Claims priority, application Australia, Feb. 7, 1973, 2165/73
Int. Cl. F02p *3/02*
U.S. Cl. 123—148 E 2 Claims

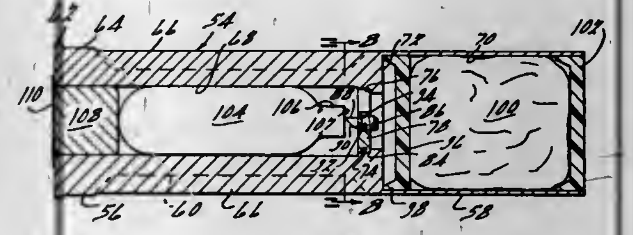


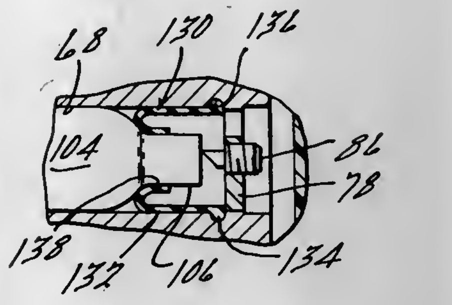
1. An energy metering circuit for an ignition system comprising: an inductor; an electronic switch coupled to said inductor and forming therewith an energy absorption circuit; a battery connected to said energy absorption circuit and connected to said inductor when said electronic switch is closed and disconnected therefrom when said electronic switch is open; control means operatively coupled to said electronic switch for closure thereof; a voltage generator adapted to produce an output nV_L for the duration of closure of said electronic switch, where n is a positive or negative number and V_L is the instantaneous terminal voltage generator and producing an output q, said output q being a repeatable continuous single valued measure of

$$\int_0^t V_L dt,$$

where t is the elapsed time after closure of said electronic switch; a threshold detector coupled to the integrator and producing an output signal whenever the output q of said integrating circuit attains a predetermined value Q_o; means coupled to said electronic switch and said threshold detector for turning off said electronic switch responsive to output from said threshold circuit; means operatively coupled to said electronic switch and to said inductor for opening said electronic switch when a selectable energy change W_o occurs in said inductor; and means operatively coupled for releasing said accumulated energy after said switch is opened.

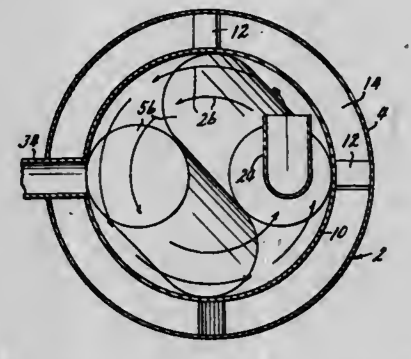
3,889,652
CARTRIDGE ASSEMBLY FOR A GAS POWERED WEAPON SYSTEM INCLUDING A PRESSURE RESPONSIVE SEAL
Herbert E. Curtis, Danville, Calif., assignor to MB Associates, San Ramon, Calif.
Division of Ser. No. 217,903, Jan. 14, 1972, Pat. No. 3,830,214. This application Apr. 20, 1973, Ser. No. 352,944
Int. Cl. F41d *9/00*
U.S. Cl. 124—41 6 Claims





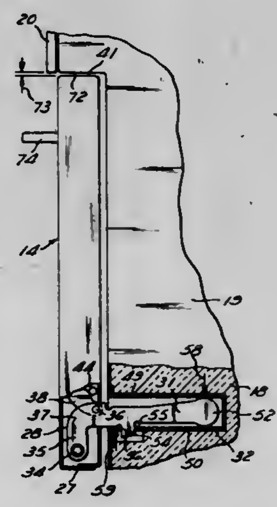
2. A cartridge assembly for a gas powered weapon system comprising:
- a cartridge case having a first cylindrically shaped passage at one end, a second passage extending between said first passage and an opposite end thereof, and a radially extending shoulder located at an inward end of said first passage;
- a first disc shaped gas check member slidably located in said first passage and seated relative to said shoulder;
- a second disc shaped gas check member located in said first passage at an outer end thereof;
- a deformable projectile located in said first passage between said first and second gas check members;
- a trasversely extending partition wall located at an inward end of said second passage, said wall including passage menas for fluidly communicating said first and second passages;
- a pressurized gas bottle slidably located in said second passage;
- means carried by said partition wall for puncturing said bottle and releasing said pressurized gas in response to displacement of said bottle in a first direction; and
- pressure responsive sealing means located in said second passge for self-sealing said second passage relative to said bottle, said last mentioned means being urged in an opposite direction relative to said first direction to a self-sealing position in response to release of said pressurized gas.

3,889,653
WOOD BURNING HEATER
Clifford A. Scogin, 427 Vassar, Sugar Creek, Mo. 64053
Filed Mar. 4, 1974, Ser. No. 447,539
Int. Cl. F24h *3/06*
U.S. Cl. 126—110 R 12 Claims



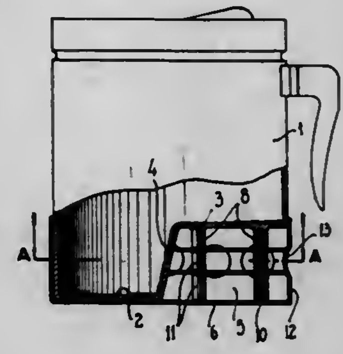
1. A heater adapted to burn wood, coal or other solid fuel, and comprising:
- a. a hollow vertically elongated combustion chamber adapted to contain said solid fuel to be burned, and having combustion air inlet and outlet openings both disposed at or closely adjacent the top thereof, but being otherwise sealed, and
- b. a blower fan operable to introduce a current of air into said combustion chamber through said inlet opening to supply oxygen for the combustion of said fuel, said fuel being initially ignited by other means.

3,889,654
SELF-LOCKING OVEN DOOR HINGE
Herbert A. Kauranen, Granville, and Alvin J. Schettl, Grand Rapids, both of Mich., assignors to Kelvinator, Inc., Grand Rapids, Mich.
Filed Dec. 26, 1973, Ser. No. 428,085
Int. Cl. F24c *15/02*
U.S. Cl. 126—194 9 Claims



1. A range comprising a cabinet assembly having an oven chamber, and a door assembly, including a lower hinge, adapted to be removably mounted on the cabinet assembly, the door assembly being in a closed position when vertically disposed and being pivotal away from the oven chamber about a horizontal hinge axis adjacent its lower edge, releasable locking means adjacent the lower door hinge for retaining the lower door hinge on the oven chamber, said releasable locking means including interengaging elements associated with said door assembly and said cabinet assembly, said releasable locking means allowing separation of said door assembly from said cabinet assembly when the lower edge of the door assembly is raised a predetermined distance from a normal locked position, door latching means operative to prevent the door from being opened when the internal temperature of the oven chamber is above normal baking temperatures, and means preventing the lower door edge from being lifted said predetermined distance when said door latching means is operative on said door assembly and allowing said lower door edge to be lifted said predetermined distance when said door latching means is not operative wherein said door lift prevention means includes a first surface fixed relative to the cabinet assembly and a second surface fixed relative to the door assembly engageable with said first surface when said door assembly is vertically disposed, said first and second surfaces being arranged relative to one another in a manner which, when in engagement, prevents said door from being lifted through said predetermined distance.

3,889,655
CONTAINER FOR BOILING MILK
David Enrique Ayora, Roque Saenz Pena 4445, Buenos Aires, Argentina
Filed Apr. 19, 1974, Ser. No. 462,571
Int. Cl. A47j *27/00*
U.S. Cl. 126—387 5 Claims

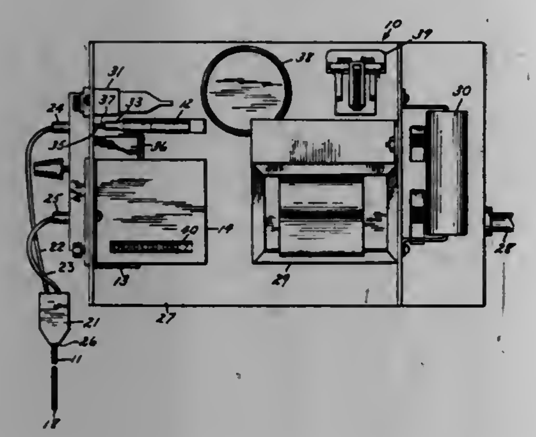


1. Apparatus for boiling milk, comprising; a container having a generally vertical, generally cylindrical wall; a lower flat base wall disposed in a lower part of the container; an upper flat base wall parallel to the lower one and in a position staggered with respect to the same; an intermediate upright wall interconnecting the lower and upper flat walls and cooperating with them to close a lower part of the container; a metal bottom disc below and in surface contact with the lower flat wall and defining with the upper flat wall a cooling space in the lower part of the container; and a plurality of cooling plates mounted in said cooling space; whereby milk can be heated for boiling through said disc and said lower flat wall while being relatively cooled by said upper flat wall and said cooling plates in said cooling space to avoid boiling over of the milk.

3,889,656
METHOD OF DETERMINING THE PRESENCE OF CALCULI IN BODY CAVITIES
Donald R. Krawitt, Rye, N.Y., assignor to Mount Sinai School of Medicine of the City University of New York, New York, N.Y.
Division of Ser. No. 223,184, Feb. 3, 1972, Pat. No. 3,809,066. This application Mar. 19, 1974, Ser. No. 452,633
Int. Cl. A61b *5/06*
U.S. Cl. 128—2 R 1 Claim

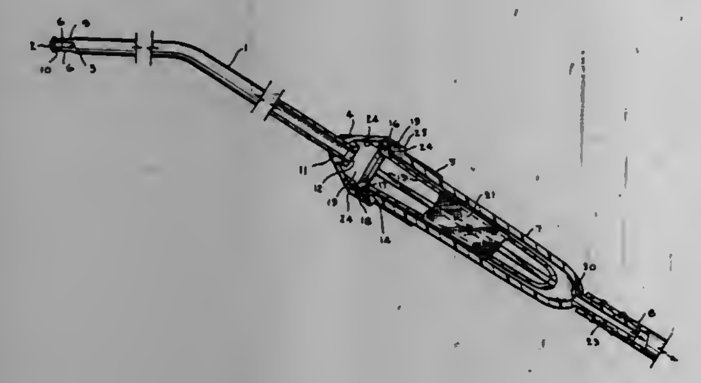
1. The method of determining the presence of agglomerated calculi in body cavities comprising the steps of: providing a light-conductive fiber optic probe having a first end suitable for insertion into said cavity, said probe having first and second groups of optical fibers having first terminals in mutually

juxtaposed position at one end of said probe, and second and third terminals in mutually spaced position at an opposite end thereof; introducing a beam of collimated light to said second terminal for conduction to said first terminal, introducing said first terminal into said cavity, manually manipulating the end of said first terminal within said cavity substantially along the axis of said probe to contact possibly present particles of calculi, and observing quantitative changes in the intensity of light reflected back through said probe at said third terminal when said first terminal contacts agglomerated calculi.



3,889,657
UTERINE ASPIRATING CURETTE

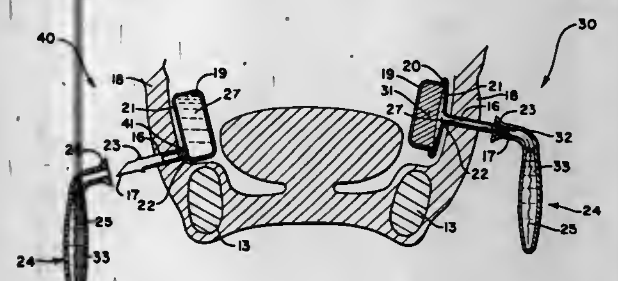
Carl B. Baumgarten, Houston, Tex., assignor to Gomco Surgical Manufacturing Corp., Buffalo, N.Y.
Filed Feb. 12, 1974, Ser. No. 441,805
Int. Cl.^{2} A61B *10/00, 17/22*
U.S. Cl. 128—2 B **11 Claims**



1. A uterine aspirating curette comprising
a tube closed on one end by a tip and having a plurality of equally spaced openings about the circumference thereof, juxtaposed to said tip, said tip having substantially the same outside diameter of said tube adjacent to said openings said tube being fixedly attached to a base, said base having a chamber therein, said tube communicating with said chamber by a passage,
a hollow handle, said base being removably mounted thereon and said chamber communicating with said hollow handle, said handle being adapted for manipulating said curette in use,
a substantially porous basket for receiving an aspirated specimen, said basket being removably mounted in said handle, juxtaposed to said chamber and in alignment with said tube, said basket having an enclosed non-porous end forming a cup, and a means for attaching said handle to a vacuum source.

3,889,658
VIVO TEMPERATURE SENSING METHOD AND APPARATUS

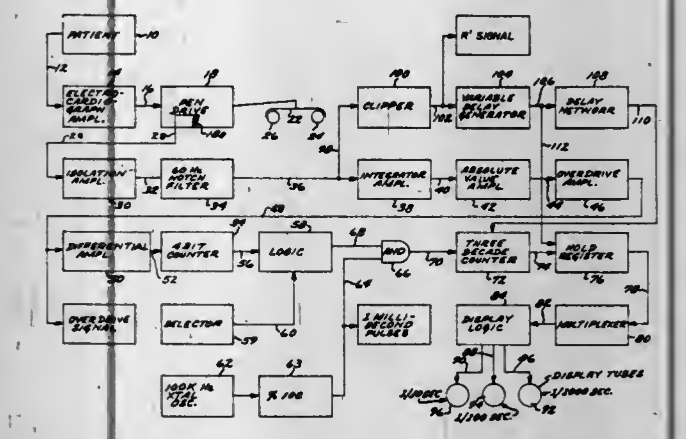
Jay H. Newhall, Bozeman, Mont. 59715
Continuation-in-part of Ser. No. 333,695, Feb. 20, 1973, abandoned. This application Apr. 8, 1974, Ser. No. 458,647
Int. Cl. A61b *5/02, 10/00*
U.S. Cl. 128—2 H **20 Claims**



1. The method of continuously monitoring an animal to determine whether the animal has experienced a body temperature in excess of a predetermined level comprising:
a. providing a reservoir and tube assembly, containing therein a first reactant and a barrier to movement of said first reactant through said tube and outwardly therefrom, said barrier being displaced upon said assembly reaching said predetermined temperature to permit said first reactant to pass outwardly therefrom;
b. inserting the tube portion of said assembly through the cheek of said animal from the inside so as to leave at least the reservoir portion of the assembly in the animal's mouth; and
c. joining an indicator tag portion including a cavity containing a second reactant so as to be in fluid communication with the end of said tube projecting outwardly from said animal so that upon said animal attaining a temperature in excess of said predetermined mimimum the barrier means is displaced and said first reactant will enter said cavity portion of said tag and react with second reactant to produce a color change.

3,889,659
DIGITAL ELECTROCARDIOGRAPH INTERPRETER

Bill N. Lutes, 3637 Pine Ave., Long Beach, Calif. 90807
Filed Dec. 5, 1973, Ser. No. 421,785
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 A **3 Claims**



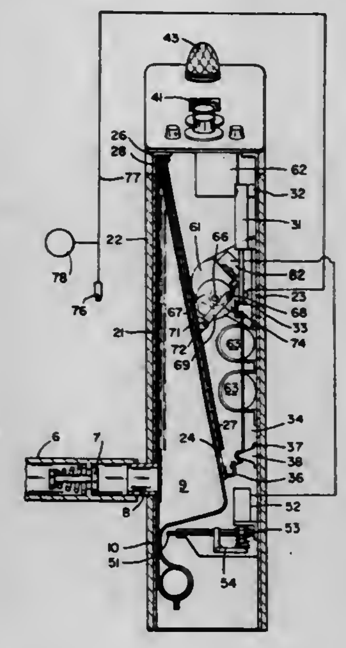
1. In combination with an electrocardiograph assembly that includes a solenoid-operated recorder pen drive coil that receives EKG electrical signals from a patient and visually records a graph thereof on an elongate strip of moving paper, a device for selectively displaying a digital form, the time interval required to form a selected wave or group of waves in said signal along the X axis thereof, said signal including P, R, T and U positive waves and Q and S negative waves, said device including:

a. an electrical conductor that receives the EKG electric signal from said solenoid that drives said recorder pen;
b. first means that includes an isolation amplifier and filter for receiving said EKG signal from said electrical conductor and which filters electric signals therefrom that originate from a source of domestic electric power;
c. second means for dividing the filtered EKG signal from said first means into first and second signal portions;
d. third means that include an integrator amplifier, absolute value amplifier and overdriven amplifier for receiving said first signal portion and thereafter sequentially removing noise from said first signal portion, inverting the Q and S waves of said first signal portion, and squaring said P, Q, R, S, T and U waves to provide an overdriven signal;
e. an and-gate having first and second inputs and an output;
f. fourth means for continuously delivering spaced electric pulses of a first polarity to said first input;
g. fifth means that include a differential amplifier, a multiple bit counter, a logic unit and manually operated signal controlled by said overdriven signal for selectively delivering an electric signal of said first polarity to said second input during the time interval a predetermined and selected portion of said EKG signal is being formed;
h. a multiple decade counter that receives said spaced electric pulses from said output of said and-gate;
i. a hold register that receives the output from said multiple decade counter;
j. a multiplexer in electrical communication with said hold register;
k. first second and third display tubes that indicate by digits thereon, thousandths, hundredths and tenths of a second;
l. sixth means in electrical communication with said multiplexer and first, second and third display tubes, said sixth means being actuated by the output from said multiplexer to actuate said display tubes to visually indicate the time duration required to form said selected portion of said EKG signal;
m. seventh means for eliminating all but said R wave from said second signal portion;
n. eighth means for storing said R wave of said second signal as an electric pulse until just prior to the forming of the P wave of the following EKG signal;
o. ninth means for using a portion of said stored electric pulse to cause the information in said counter to be transferred to said register just prior to said P wave of the following EKG signal; and
p. tenth means for using a portion of said stored electric pulse to clear said hold register prior to said information in said counter being transferred thereto.

3,889,660
SPIROMETER

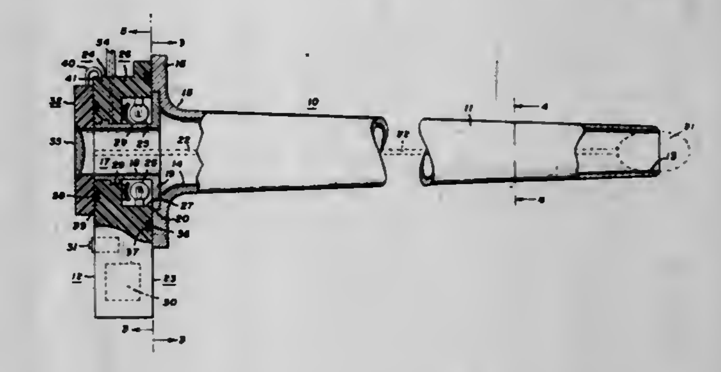
Sotiris Kitrilakis, Berkeley, Calif., assignor to Searle Cardio-Pulmonary Systems Inc., Emeryville, Calif.
Filed Oct. 4, 1973, Ser. No. 403,467
Int. Cl. A61b *5/08*
U.S. Cl. 128—2.08 **9 Claims**

7. In a spirometer, having a frame establishing a stationary surface adapted to receive an air bag thereagainst, a primary plate, means mounting said primary plate on said frame for free swinging movement toward and from said stationary surface in a predetermined path, the improvement comprising: means for indicating the position of the primary plate relative to said frame; a secondary plate, means mounting said secondary plate on said frame for swinging movement relative to said stationary surface in said predetermined path, and means for swinging said secondary plate in said predetermined path and into and away from abutment with said primary plate.



3,889,661
SPECULUM INSTRUMENT AND ISOLATED LIGHT MEANS THEREFOR

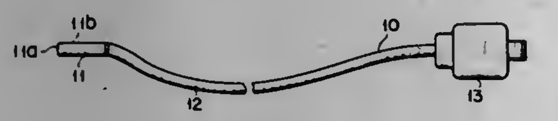
John M. Fiore, Troy, N.Y., assignor to Bio-Analytical Labs, Inc., Troy, N.Y.
Division of Ser. No. 249,110, May 1, 1972, abandoned, which is a division of Ser. No. 878,655, Nov. 21, 1969, Pat. No. 3,675,641. This application Dec. 3, 1973, Ser. No. 421,078
Int. Cl. A61b *1/06*
U.S. Cl. 128—6 **6 Claims**



1. In a speculum instrument including a speculum barrel and obturator assembly wherein said barrel includes a smaller diameter flanged sleeve means with the flange engaging said barrel and said sleeve projecting from the proximal end of said barrel and through which said obturator may be withdrawn the improvement of a handle lighting unit adapted to receive said sleeve therein comprising in combination
a. a handle part,
b. an annular lighting head part on said handle part and adapted to fit over said sleeve,
c. a concentric ring of lamps positioned in said annular lighting head and closely surrounding said sleeve to pass light directly through said flange and into the bore of said barrel,
d. releaseably securing means in said annular lighting head to releaseably secure said barrel to said annular lighting head
e. and means to sealingly engage said annular lighting head part to said barrel around said lamp ring.

3,889,662
ENDOSCOPE

Kazuhiko Mitsui, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed May 24, 1974, Ser. No. 472,988
Claims priority, application Japan, May 31, 1973, 48-64209
Int. Cl. A61b *1/06*
U.S. Cl. 128—6 **8 Claims**

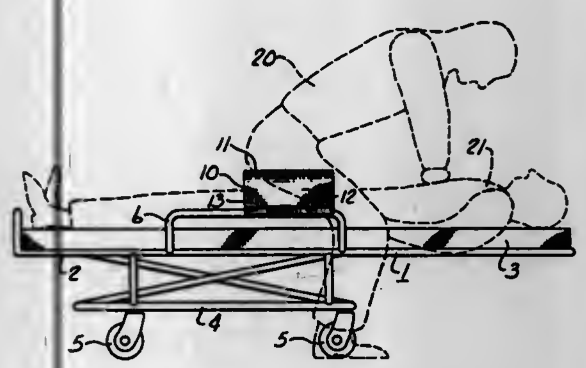


1. An endoscope having a distal end section and a front end surface and a side end surface and being adapted to be inserted into a body cavity, a flexible tube section having one end connected to the distal end section so as to facilitate guiding the distal end section into the body cavity, and a proximal end section connected to the other end of the flexible tube section so as to control the insertion of the distal end section, said endoscope comprising:
- a. first and second image guiding fiber bundles having forward ends and base end portions extending respectively from the distal end section through the flexible tube section into the proximal end section to permit images of the internal wall of the body cavity to be transmitted from the respective forward ends thereof to the respective base end portions thereof, said base end portions of the first and second fiber bundles having respective image delivering end surfaces;
- b. receiving means provided at the distal end section so as to receive the images into the distal end section;
- c. first and second optical means provided, in proximity to the respective forward ends of the first and second image guiding fiber bundles, within the distal end section to optically transmit the images from the receiving means to the respective forward ends of the first and second fiber bundles; and
- d. a single optical observing means provided within the proximal end section and optically connected to the base end portions of the first and second fiber bundles to permit both the images from the receiving means to be simultaneously observed from the outside;
- e. said receiving means including a first view window opened at the front end surface of the distal end section and a second view window opened at the side end surface of the distal end section, said first and second view windows optically leading to said first and second optical means, respectively.

3,889,663
AMBULANCE COT WITH CARDIOPULMONARY RESUSCITATION SEAT AND METHOD OF ADMINISTERING CARDIOPULMONARY RESUSCITATION

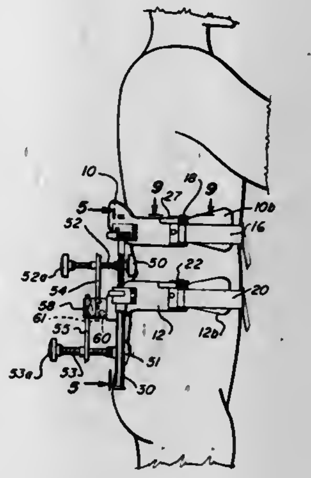
Robert B. Fryer, 723 Washington Ave., Bridgeville, Pa. 15017
Filed Jan. 24, 1974, Ser. No. 436,034
Int. Cl. A61h *31/00*
U.S. Cl. 128—28 **6 Claims**

1. In combination, an ambulance cot having side rail means on the sides thereof, and a rigid removable cardiopulmonary resuscitation seat transversely bridging said cot and supported from said side rail means, said seat adapted to support the weight of a human to administer cardiopulmonary resuscitation to a patient on said cot with means to support the administrator's feet on opposite sides of said cot.



3,889,664
AMBULATORY TRACTION TREATMENT APPARATUS

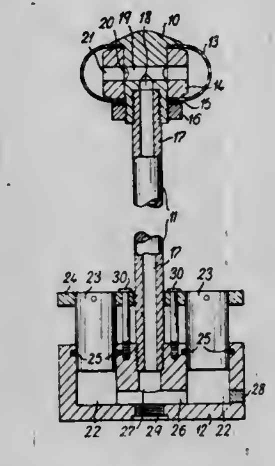
Gordon D. Heuser, 2514 Stacy Ct., Colorado Springs, Colo. 80915, and Rolla J. Pennell, 10701 Winner Rd., Independence, Mo. 64052
Filed May 13, 1974, Ser. No. 469,558
Int. Cl.² A61H *1/02*
U.S. Cl. 128—75 **3 Claims**



1. In an ambulatory traction treatment apparatus having a pair of spaced apart upper and lower torso belts tightenable on a torso by straps depending from each end of said belts, and a pair of spaced-apart tensioning jack screws therebetween for moving said belts apart, the improvement of a pair of mounting means for each said jack screw on the upper torso belt inclusive of ratchet means for rotating each said screw in opposite directions, a pair of mounting means on the lower torso belt inclusive of releasable tooth means for holding each said screw for tensioning and for immediate release of tension, and adjustable mount means on the lower belt holding a pair of spaced-apart lordosis pads, including means for applying forward pressure to said lordosis pads against vertebrae of a patient, said adjustable mount means includes a pair of passage means, an elongated holder for each lordosis pad mounted in each said passage and spring bias means in each said passage of said mount means for frictionally holding each said elongated holder at a predetermined position for prepositioning said lordosis pads.

3,889,665
APPARATUS AND METHOD FOR PRESSURIZING GAP-FILLING CEMENT TO A CONCAVELY RELIEVED SITE IN A BONE

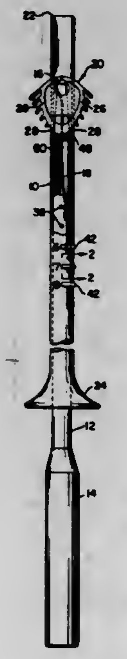
Robin Sydney Mackwood Ling, Teignmouth, and Alan John Clive Lee, Exeter, both of England, assignors to National Research Development Corporation, London, England
Filed Mar. 7, 1973, Ser. No. 338,931
Claims priority, application United Kingdom, Mar. 8, 1972, 10794/72
Int. Cl. A61f *5/00*
U.S. Cl. 128—92 R **10 Claims**



1. Apparatus for pressurizing gap-filling cement applied to a concavely relieved site in a bone, said apparatus comprising
- a. means for extruding said cement into said bone by longitudinal application thereof to said cement in one area of said site, said means comprising an elongate extrusion member having a solid end portion thereof for forcible application to said cement, and
- b. an inflatable resilient annular sealing member fixably and sealably connected around said extrusion member adjacent said solid end portion thereof to cover the remaining area of said site around said extrusion member for reducing the outward escape of cement therefrom when pressurized by application of said extrusion member.

3,889,666
METHOD OF PREPARATION FOR/AND INSERTION OF IUD PREPACKAGED IN A TUBULAR INSERTER

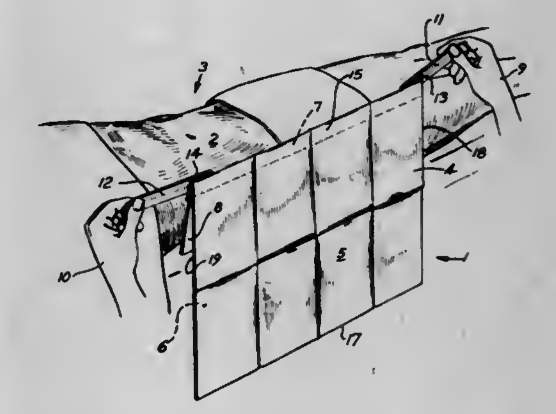
Irwin S. Lerner, Greenwich, Conn., assignor to A. H. Robins Company, Incorporated, Richmond, Va.
Division of Ser. No. 187,373, Oct. 7, 1971, abandoned. This application Sept. 10, 1973, Ser. No. 395,840
Int. Cl. A61f *5/46*
U.S. Cl. 128—127 **5 Claims**



1. A method of preparing a resilient intrauterine device for high fundal positioning in a uterine cavity comprising the steps of: partially housing said intrauterine device in an expanded, substantially undeformed configuration within a tubular inserter, rearwardly of a forward, expulsion end of said inserter; and moving said intrauterine device forwardly, toward the expulsion end of said inserter, into an elongate deformed attitude entirely within the tubular inserter.

3,889,667
SURGICAL DRAPE

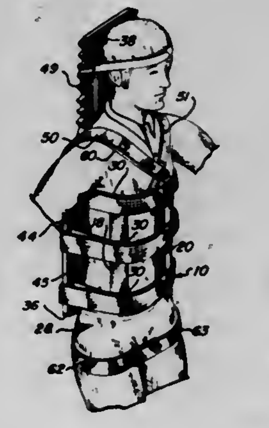
Robert F. Collins, Barrington, Ill., assignor to The Kendall Company, Walpole, Mass.
Filed Sept. 11, 1974, Ser. No. 505,017
Int. Cl. A61f *13/00*
U.S. Cl. 128—132 D **11 Claims**



1. An improved self-adhering drape for surgical or medical-type procedures, comprising
- a. a sheet of material having a plurality of edges, including at least one side edge,
- b. a first fold line disposed between said edges defining a major and a minor portion,
- c. an adhesive area on said drape disposed adjacent first fold line, and extending to said side edge,
- d. a taping releasably secured to said adhesive area,
- e. said taping having at least one tab,
- f. said tab, taping and adhesive being cooperatingly disposed so that said adhesive is revealed on the side of said drape facing the area of use upon release of said taping.

3,889,668
EMERGENCY MEDICAL HARNESS

David J. Ochs, 707 W. Magnolia St., and James D. Behrens, 1016 McHugh St., both of Fort Collins, Colo. 80521
Filed July 1, 1974, Ser. No. 484,577
Int. Cl. A61f *5/04*
U.S. Cl. 128—134 **9 Claims**



1. In an emergency medical harness in combination with a solid rigid planar back support, the improvement comprising: a plurality of elongated flexible straps each oriented in a given direction, said straps being laterally spaced successively one from the next;

an effective plurality of flexible webs disposed across the central regions of said straps, each web being oriented in a direction perpendicular to said given direction and said webs being laterally spaced successively one from the next;

the combination of said straps and webs forming a matrix of length and width to cover approximately the front upper torso of a wearer;

means fastening individual different portions of said straps to corresponding different portions of said webs at the mutual crossings of said straps and webs;

means for releasably and adjustably securing each outer end portion of each of said straps effectively back upon itself to form a loop engageable around a portion of said solid support, placed behind the wearer, to bind the wearer firmly to said support;

upper means projecting generally laterally to said straps from one end of said matrix for releasably and adjustably binding the shoulders of the wearer to said solid support; and lower means projecting generally laterally to said straps from the end of said matrix opposite said one end for releasably and adjustably binding the upper thighs of the wearer.

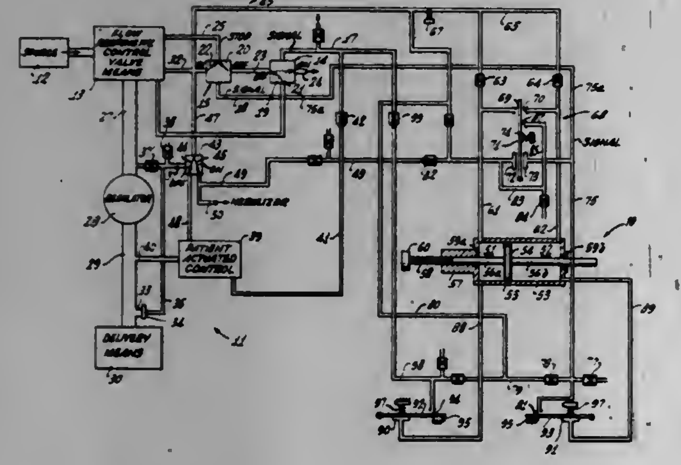
3,889,669
RESPIRATION RATE CONTROL SYSTEM

James Weigl, Santa Monica, Calif., assignor to Puritan-Bennett Corporation, Kansas City, Mo.

Filed Dec. 11, 1972, Ser. No. 313,984

Int. Cl. A61m *16/00*

U.S. Cl. 128—145.8 **19 Claims**



19. For use with a respirator apparatus for delivering gas from a source of gas under pressure cyclically to a patient through delivery means, a rate control system for timing successive breathing cycles each having an inspiration phase followed by an expiration phase, said system comprising:

timing chamber means of preselected volume for timing each breathing cycle, said timing chamber means including first and second chambers;

means for charging to a preselected pressure level said first chamber during the inspiration phase, and said second chamber during the expiration phase, with fluid entering at a preselected flow rate, thereby to time each breathing cycle;

a single rate control means for selectively adjusting the flow rate to vary the breathing cycle time;

pressure-actuated means coupled with said timing chamber means, for terminating the inspiration phase and initiating the expiration phase, and thereby dividing the breathing cycle time in a preselected ratio of inspiration time to expiration time; and

a single ratio control means for selectively varying the ratio of inspiration time to expiration time independently of the breathing cycle time, said ratio control means including a movable piston separating said first and second chambers, whereby movement of said piston changes the ratio of inspiration time to expiration time independently of the breathing cycle time, by varying the ratio of the volumes of said first and second chambers independently of their total volume.

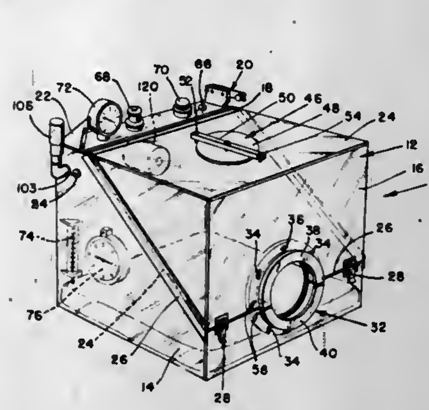
3,889,670
NON-INVASIVE HYPERBARIC VENTILATOR

Steven R. Loveland, 601-B Jersey Ave., and Roy L. Campbell, Cedar Lane Park No. 25, Old Greensboro Rd., both of Winston-Salem, N.C. 27101

Filed Jan. 2, 1974, Ser. No. 429,534

Int. Cl. A61m *16/02*

U.S. Cl. 128—204 **10 Claims**



1. A non-invasive hyperbaric ventilator comprising a rigid chamber having a base structure, rear, front, top and side walls, a hinged hood formed from portions of said front, side and top walls, means for sealing said hood in the chamber closed position, a collar assembly having an opening for receiving the neck of a patient, said collar assembly having one portion in the portion of the front wall of said hood and a cooperating portion in the other portion of said front wall, sealing means closing said opening in said collar assembly and engaging the neck of a patient and said chamber to seal the patient's head within said chamber to effect an air-tight chamber, means, including a gas inlet port, for regulating the therapeutic pressure within the chamber to a predetermined level and intermittently controlling the supply of gas to said chamber and facilitating expansion of the patient's lungs during inspiration, and adjustable expiratory pressure relief means communicating with said chamber for permitting displacement of a volume of gas from said chamber when the patient exhales.

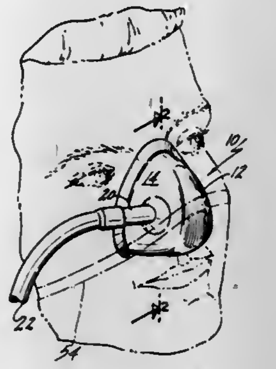
3,889,671
NASAL ADAPTER FOR ADMINISTERING ANALGESIC GAS

Alfred Baker, 153 E. Central Ave., Pearl River, N.Y. 10965

Filed Feb. 19, 1974, Ser. No. 443,715

Int. Cl. A61m *17/00*

U.S. Cl. 128—206 **10 Claims**



1. An improved nasal adapter for administering gas analgesia which comprises a nosepiece for covering the nose and means for connecting the nosepiece with a source of gaseous analgesia, said nosepiece being provided with respiratory check valves for associated air intake and expiration with each respective check valve being in turn provided with adjustable regulatory controls for air intake and expiration and sealing means being provided for said nosepiece, so that when said adapter is placed over the nose there will be allowed into said adapter the introduction of a mixture of gaseous analgesia and air and the expiration of the residue of said mixture from said adapter, in controlled amounts and wherein said nosepiece has opposing lateral sides, an underside, a closed side and an open side, the air intake respiratory check valve being located in one of said lateral sides, said source of gaseous analgesia being introduced through the other said lateral side, and the expiration respiratory check valve being located in said underside and includes means for directing the expiration of the residue of gaseous analgesia and air downwardly and towards the open side of said nosepiece.

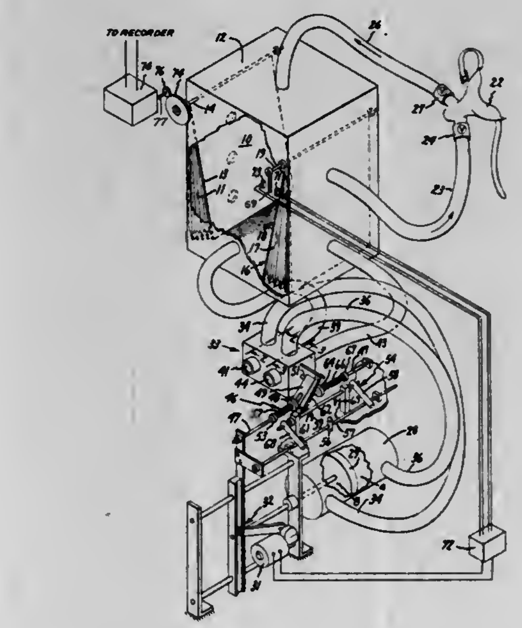
3,889,672
OPEN CIRCUIT SYSTEM FOR RESPIRATION TESTING

Sabbo Woldring, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 27, 1973, Ser. No. 391,591

Int. Cl. A61b *5/08*

U.S. Cl. 128—208 **7 Claims**



1. An open-circuit device for respiration testing comprising in combination:

a. a first enclosure of fixed dimension,

b. a spirometer connected to said enclosure so as to be actuated by changes in gas volume occurring within the confines of said first enclosure,

c. a second enclosure having expansible/contractible wall area, said second enclosure being located within said first enclosure,

d. a mouthpiece adapted to be worn by the subject to be tested, a first conduit connected between said mouthpiece and said first enclosure and a second conduit connected between said mouthpiece and said second enclosure, first valve means connected in one of said first and second conduits to provide flow only to said mouthpiece and second valve means connected in the other of said first and second conduits to provide flow only away from said mouthpiece,

e. first means for controllably displacing a gaseous volume, said volume displacing means being connected to said first enclosure,

f. a second means for controllably displacing a gaseous volume, said volume displacing means being connected to said second enclosure, said first and second volume displacement means being synchronized to simultaneously remove gas from one of said enclosures and introduce gas into the other of said enclosure with the volumetric rates of removal and introduction being substantially equal, said first and second conduits being connected to direct exhaled breath to said one of said enclosures and enable inhalation from said other of said enclosures and

g. means responsive to the expansion and contraction of said second enclosure for controlling simultaneous intermittent operation of said first and second volume displacement means.

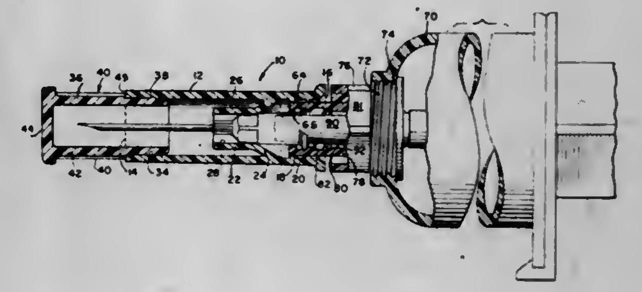
3,889,673
TIP ASSEMBLY FOR SYRINGES

Brian H. Dovey, Rockville, Md.; Elliot Bartner, Piscataway, N.J.; Sheldon Kaplan, Potomac, and Stanley J. Sarnoff, Bethesda, both of Md., assignors to Survival Technology, Inc., Bethesda, Md.

Filed Jan. 2, 1974, Ser. No. 429,850

Int. Cl. A61m *5/32*

U.S. Cl. 128—215 **2 Claims**



2. A tip assembly adapted for use in conjunction with a medicament container from which the medicaments are removed by a needle wherein the dispensing end of the container has a body portion from which extends an outer sleeve having its inner surface threaded, and an inner sleeve also extending forwardly from said body, the inner sleeve being positioned within and spaced from the outer sleeve, said inner sleeve being tapered so as to enlarge in the direction of the body and in communication with the medicament in the container, said tip assembly comprising:

a cylindrical main body, said main body having an open forward end and a partially closed back end, the inner surface of the main body adjacent the back end having circumferential sealing means extending inwardly therefrom, said sealing means being adapted to sealingly engage the outer surface of the outer sleeve on the medicament container when the tip assembly is operatively connected to said container,

an inner cylindrical body within and coaxial with the main body forwardly of the sealing means, means connecting the inner body to the main body to retain the aforesaid spaced relation, the inner surface of the inner body being hexagonal in cross section,

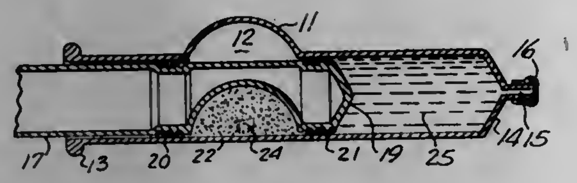
a cap fitting over the open end of the main body, said cap having a cup-shaped configuration including a bottom and a cylindrical wall extending therefrom, cooperating retaining means on the outer surface of the cap wall and the inner surface of the main body to hold the cap on the main body,

a needle assembly carried within the main body by the inner body, said needle assembly comprising a hub member having an enlarged rear portion adapted to engage the threads on the inner surface of the outer sleeve of the container, a hexagonally shaped middle portion and a forward portion of smaller diameter than the middle portion, the hub having a hole extending completely therethrough, a needle fixedly mounted in the forward portion of the hub, the rearward portion of the hub hole being sized to conformingly engage the tapered inner sleeve of the container, the hexagonal portion of the hub being sized to operatively fit into the hexagonal inner surface of the inner body whereby the needle assembly is firmly held in position within the main body, and

whereby when the tip assembly is operatively mounted on the dispensing end of the container all of the components of the tip assembly remain in fixed position during use except for the cap which is removed to expose the needle prior to use.

3,889,674
MIXING SYRINGE

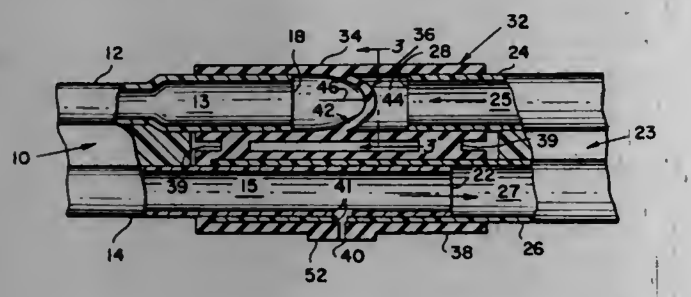
Constabile A. Cilento, 11 Grandview, Bridgeton, N.J. 08302
Filed Nov. 30, 1973, Ser. No. 420,641
Int. Cl. A61m *5/22*
U.S. Cl. 128—218 M **14 Claims**



1. A syringe capable of storing and mixing substances comprising a barrel having a nipple opening at one end, a plunger receiving opening at the other end, and a chamber formed on the surface of said barrel by the outward protrusion of a section of said surface; a plunger slidably disposed within said barrel, said plunger having seals on an upper and lower portion and between said seals a chamber formed in said plunger by the inward intrusion of a section of the surface of the plunger surface, said plunger being rotatable in said barrel to align said outward protrusion and said inward intrusion to form a single chamber for mixing of a substance contained within the syringe.

3,889,675
SUCTION-IRRIGATOR

James M. Stewart, West Palm Beach, Fla., assignor to Stewart Research, Inc., West Palm Beach, Fla.
Filed June 25, 1974, Ser. No. 482,878
Int. Cl. A61m *3/00*
U.S. Cl. 128—240 **12 Claims**



1. A suction-irrigating instrument comprising:

a. a working tip structure having first and second passages for delivering fluid and applying a vacuum respectively to a work area;

b. a supply handle structure having first and second passages for supplying fluid and vacuum from sources of supply;

c. means for connecting said passages in the handle structure to a supply of fluid and a source of vacuum; and

d. means for connecting the passages in the working tip with the passages in the working tip, said means including a valve assembly for controlling the amount of fluid delivered by the instrument, said valve assembly having at least a part of its length exposed for contact by the fingers of the operator and comprising:

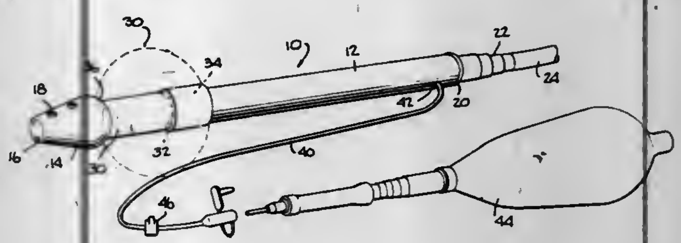
i. a resilient tubular connector having an internal bore communicating at one end with the fluid supply passage in the handle and at the other end with the fluid delivering passage in the working tip,

ii. a diaphragm integral with and mounted across the bore of the connector; and

iii. a slit in the diaphragm having sides that normally abut each other to thereby close the bore but which spread apart and permit passage of fluid upon application of and deformation of the diaphragm by pressure from the operator's fingers.

3,889,676
ENEMATA ADMINISTERING DEVICE

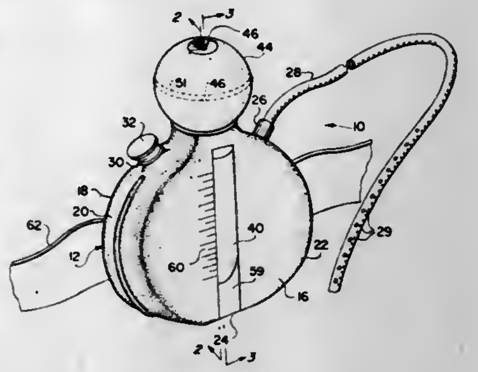
Franklin R. Greene, Flushing, N.Y., assignor to E-Z-EM Company Inc., Westbury, N.Y.
Filed Mar. 30, 1973, Ser. No. 346,614
Int. Cl. A61m *3/00*
U.S. Cl. 128—246 **4 Claims**



1. An enemata administering device comprising: a hollow stem having exit ports at a distal end thereof, an inlet at the proximal end thereof for receiving a fluid, a smooth expandable resilient cylindircal sleeve of substantially constant diameter and substantially constant wall thickness mounted on the exterior surface of said stem near said distal end of said stem, said sleeve being hermetically sealed to said stem at both ends of said sleeve, said sleeve having an unsealed section between said sealed ends, said ends of said sleeve being sealed to said stem a distance apart along said stem substantially less than the unsealed length of said sleeve when said sleeve is deflated, only the proximal end of said sleeve having a reentrant section to take up the resultant extra length of sleeve material, only a portion of said reentrant section being sealed to said stem, a substantial portion of said reentrant section being free to expand away from said stem, said sleeve conforming to said stem when deflated, and means for inflating said sleeve.

3,889,677
SELF-CONTAINED FLUID EVACUATOR

John R. Nehring, Woodcliff Lake, N.J., assignor to International Paper Company, New York, N.Y.
Filed Nov. 19, 1973, Ser. No. 417,124
Int. Cl. A61m *1/00*
U.S. Cl. 128—278 **22 Claims**



1. A self-contained fluid evacuator comprising a substantially rigid, closed container having first and second openings therethrough, said first opening being adapted to receive a conduit, an inflatable member within said container, means for inflating said inflatable member mounted on said container and being in flow communication with the interior of said inflatable member through said second opening, valve means responsive to the difference in pressure between the pressure in the inflation means and in the inflatable member such that said valve means enables fluid to enter the inflatable member from the inflating means at a higher rate than the fluid can leave the inflatable member, said valve means restricting fluid from leaving the inflatable member at a rate greater than a predetermined minimal flow rate.

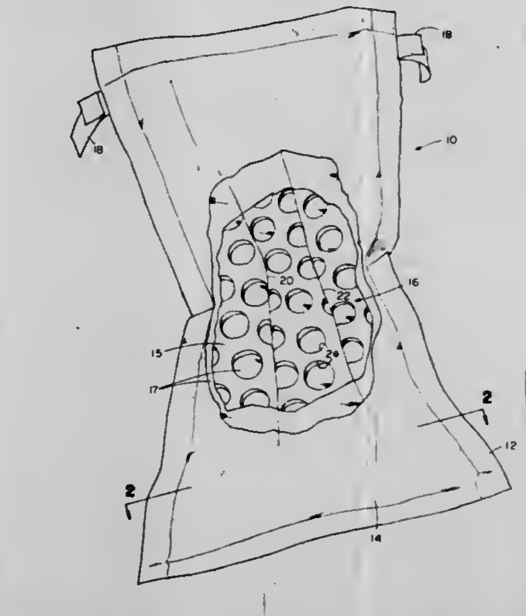
3,889,678
CELLULOSE GRAFT COPOLYMER CONTAINING NONIONIC AND IONIC POLYMER MOIETIES AS ABSORBENT MEDIA IN ABSORBENT DRESSINGS

Pronoy Kumar Chatterjee, Spotswood, and Robert Frederick Schwenker, Jr., Belle Mead, both of N.J., assignors to Personal Products Company, Milltown, N.J.
Filed Dec. 7, 1973, Ser. No. 422,627
Int. Cl. A61f *13/16*
U.S. Cl. 128—284 **12 Claims**

1. In an absorbent dressing for absorbing body fluids the improvement which comprises including therein as an absorbent media, cellulose graft copolymer in fibrous form having a backbone of cellulose and side chains of polymer moieties grafted thereto, said polymer moieties being selected from the class consisting of ionic and nonionic polymer moieties and constituting from about 10% to about 90% by weight of the total weight of the cellulose graft copolymer, some of said side chain polymer moieties being ionic polymer moieties and comprising from about 10% to about 80% by weight of the total weight of the cellulose graft copolymer, and the other of said side chain polymer moieties being nonionic polymer moieties and comprising from about 0.5% to about 60% by weight of the total weight of the cellulose graft copolymer.

3,889,679
DISPOSABLE DIAPER WITH HOLES OR WELLS

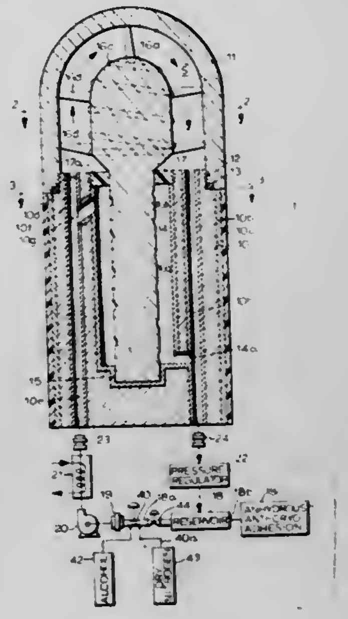
Glenn N. Taylor, Cary, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Feb. 4, 1974, Ser. No. 439,101
Int. Cl. A61f *5/44*
U.S. Cl. 128—287 **4 Claims**



1. A disposable diaper comprising an absorbent body and a flexible water impervious backing sheet, said absorbent body comprising a continuous integral mass of fibers formed into a sheet having an inner surface and having an outer surface disposed adjacent said backing sheet, said absorbent body having a multiplicity of openings therein extending therethrough defining fluid passages from said inner surface to said outer surface, whereby fluid may flow from said inner to said outer surface through said openings, said absorbent body being free of the backing sheet throughout a sufficient area intermediate the openings to permit unimpeded flow of fluid along a surface of the backing sheet to regions of the absorbent body remote the openings and absorption therein.

3,889,680
CRYOADHESION PREVENTING CRYOSURGICAL INSTRUMENTS

Thomas Anthony Armao, 1242 56th St., Brooklyn, N.Y. 11219
Filed Feb. 7, 1974, Ser. No. 440,539
Int. Cl.^{2} A61B *17/36*
U.S. Cl. 128—303.1 **16 Claims**



1. A cryosurgical instrument comprising a body of heat insulating material, a hollow sheath comprised of a good heat conducting material at least a portion of which is porous, said sheath being on one end of said body, a core of good heat conducting material projecting into said sheath from within said body having the outer surface thereof spaced from the inner surface of said sheath so as to leave a space between said core and said sheath, said body having an inlet passage therethrough opening into said space, said body having an outlet passage therethrough opening out of said space, said body having a heat exchange space along the portion of said core within said body and means for directing a flow of heat exchange fluid therethrough for exchanging heat between said core and fluid flowing in said heat exchange space, and means for supplying a heat exchange fluid to said heat exchange space.

3,889,681
CRYOSURGICAL SPRAYING APPARATUS

Jack Douglas Waller, Box 502, Sunray, Tex. 79086; Bobby Lee Limmer, 4231 Bloomdale, San Antonio, Tex. 78218, and Felix M. Sandlin, 420 Tower Dr., San Antonio, Tex. 78232
Filed Oct. 30, 1974, Ser. No. 519,245
Int. Cl.^{2} A61B *17/36*
U.S. Cl. 128—303.1 **6 Claims**

1. A cryosurgical instrument for treating skin lesions comprising:

an insulated container for holding a liquefied gas coolant;

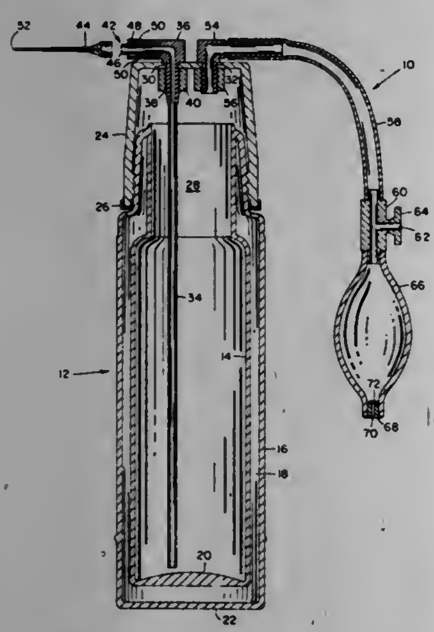
cap means for said insulated container;

a combination vent/pressure line communicating with the inside of said insulated container;

tubing means extending from near the bottom of said insulated container to the outside thereof;

nozzle means attached to said tubing means for spraying said liquefied gas coolant upon pressurization from said vent/pressure line;

said vent/pressure line being connected to atmosphere through a first opening and to a source of pressurized air



through a second opening, said first opening being covered before pressurization through said second opening.

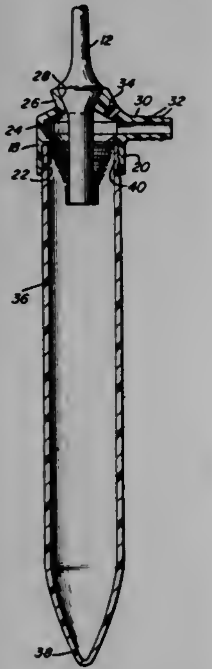
3,889,682
VACUUM CURETTAGE DEVICE

Roger Denis, 4 Shore Park Dr., Newport News, Va. 23602, and Jewell M. Barnett, Newport News, Va., assignors to said Roger Denis, by said Jewell M. Barnett

Filed Aug. 17, 1973, Ser. No. 389,189

Int. Cl. A61b *17/22;* **A61m** *1/00*

U.S. Cl. 128—304 **9 Claims**



1. A vacuum curettage device comprising a curette including an elongated tubular shank having an outer tip inlet at one end and a discharge end portion at its other end, a hollow fitting having first and second opposite sides, the discharge end portion of said shank being supported from and projecting through said first side of said fitting into the latter, said second side of said fitting having a combined inlet and outlet opening formed therein with which said discharge end portion is at least generally aligned, said fitting including a vacuum air flow outlet opening adapted to be communicated with a suitable source of vacuum, a reservoir removably supported from said fitting in communication with and closing said combined inlet and outlet opening, and a filter assembly including an outer periphery sealed relative to said combined inlet and outlet opening and a central opening formed therethrough with which said discharge end portion is registered and engaged in at least reasonably good sealed engagement therewith.

3,889,683
SURGICAL APPARATUS FOR SUTURING SOFT TISSUES

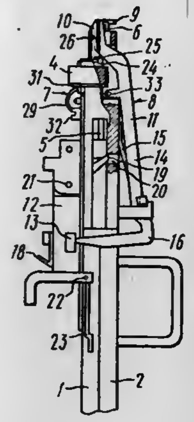
Nikolai Nikolaevich Kapitanov, ulitsa Oktyabrskogo Polya, 5, kv. 9; Natalya Petrovna Petrova, 1 Novokuzunskaya ulitsa, 4, kv. 40; Oleg Borisovich Milonov, Leninsky prospekt, 93, korpus 4, kv. 44, and Anatoly Alexandrovich Dyachikhin, Polyarnaya ulitsa, 54, korpus 1, kv. 38, all of, Moscow, U.S.S.R.

Filed May 20, 1974, Ser. No. 471,687

Claims priority, application U.S.S.R., Sept. 28, 1973, 1974605

Int. Cl. A61b *17/32, 17/04*

U.S. Cl. 128—305 **5 Claims**



1. A surgical apparatus for suturing soft tissues, comprising: two guides interhinged at one end; a tie spring between the guides which normally maintains the guides at the other end in a spaced-apart position; a magazine for storing a plurality of U-shaped suturing staples therein disposed at the free end of one of the guides; a pusher adapted to slide along said latter guide for ejecting the staples from said magazine points first; twin needleshaped dies disposed on the free ends of said guides for seizing therebetween, as the guides are brought together, the tissue to be staple-sutured; a means for controlling said magazine by displacing the magazine and feeding new staples to the working position; a means for cutting the vessels and ducts of said tissue being sutured in the area between said applied staples, said vessel-cutting means being disposed on the free ends of said guides; and a member for detaching the vessels and ducts located outside of the suturing and cutting zone, said member being disposed on the free end of one of the guides.

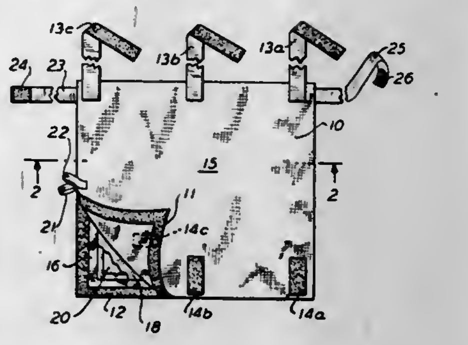
3,889,684
HOT AND COLD PACK

Steve Lebold, 45 Church St., Montclair, N.J. 07042

Filed Feb. 1, 1974, Ser. No. 438,633

Int. Cl. A61f *7/00*

U.S. Cl. 128—402 **7 Claims**



1. A pack for therapeutic heat transfer with portions of the human body which comprises a substantially fluid impervious envelope, heat transfer means enclosed therein and a porous flexible cover therefor surrounding said envelope, said cover comprising

a flat sheet member folded along a fold line to provide a pair of superimposed members, said members being detachably fastened along the edges thereof beyond the fold line to permit ready insertion and removal of the pouch, and a plurality of flexible strap means attached to said cover member having detachable fastening means at the end of each and cooperating fastening members attached to the body of the cover at points remote from said strap members to permit attachment of the heat exchange assembly to a body member.

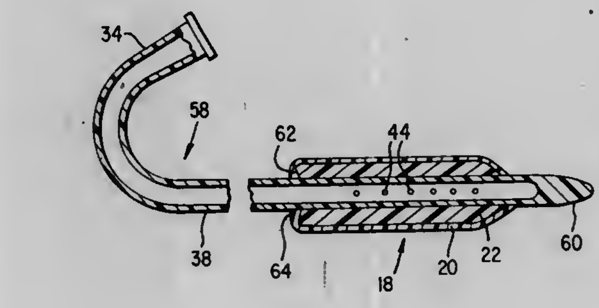
3,889,685
TUBULAR UNIT WITH VESSEL ENGAGING CUFF STRUCTURE

George E. Miller, Jr., Sacramento; Paul Kahn, San Francisco, and William C. Dabney, Oakland, all of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Nov. 2, 1973, Ser. No. 412,355

Int. Cl. A61m *25/00*

U.S. Cl. 128—348 **7 Claims**



1. A tubular unit with vessel engaging cuff structure for use within liquid conveying vessels of the body comprising a tube having an open end and a closed end, a compressible cuff surrounding said tube and mounted on said tube adjacent the closed end thereof, the tube being completely closed between said closed end thereof and a front wall of said cuff to preclude liquid from passing from said vessel into said tube and fluid from passing from said tube into said vessel, said cuff including a resilient, reticulated filler material having a network of fluid receiving interstices and a vessel engaging, flexible outer surface layer enclosing said filler material that is formed of a material which is impervious to liquids and gasses, the cuff also having a front wall adjacent the closed end of said tube which is inclined outwardly from said tube away from the closed end thereof, and a rear wall spaced from said front wall and having a substantially flat surface extending laterally from said tube, and conducting means communicating with said filler material to facilitate the withdrawal of fluid therefrom to contract said cuff inwardly toward said tube from a normal expanded configuration assumed by said cuff when said fluid receiving interstices are filled with fluid.

3,889,686
CATHETER TUBE

Stanley Francis Duturbure, Wentworthville, Australia, assignor to Vicki Lorraine Hoswell, Parramatta; Michael Roy Duturbure, Wentworthville and Ronda Lynne Walker, Blacktown, all of, Australia

Filed June 26, 1973, Ser. No. 373,729

Claims priority, application Australia, July 4, 1972, 44209/72

Int. Cl. A61m *25/00*

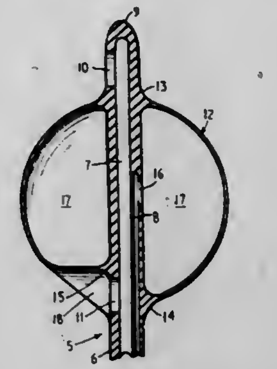
U.S. Cl. 128—349 B **2 Claims**

1. Catheter means comprising an extended flexible tube, said tube housing first and second longitudinal bore means, said first bore means extending for substantially the entire length of the catheter and terminating adjacent the leading end of the tube;

first and second aperture means in the tube communicating with said first bore means;

said first aperture means being located adjacent the leading end of said tube and said second aperture means being spaced from said first aperture means towards the following end of said tube;

thin tubular membrane means positioned around said tube substantially in the region of the tube between said first and said second aperture means and being affixed to an entirely surrounding said tube so that a junction between said membrane and said tube is not above said second aperture means except in the immediate area thereof where said junction is above said second aperture means; said second bore means extending substantially throughout the length of said catheter;



further aperture means in said tube interconnecting said second bore means and the space between said tube and said thin tubular membrane means; and

port means, through which waste matter may pass from a bladder into which that part of the catheter containing said first and said second aperture means is inserted through said second aperture means and into said first bore means, said port means positioned within the area around said second aperture at the said junctions of the membrane and tube and being formed in said thin tubular membrane means when the space between said thin tubular membrane means and said flexible tube is ballooned by the introduction of fluid into said space.

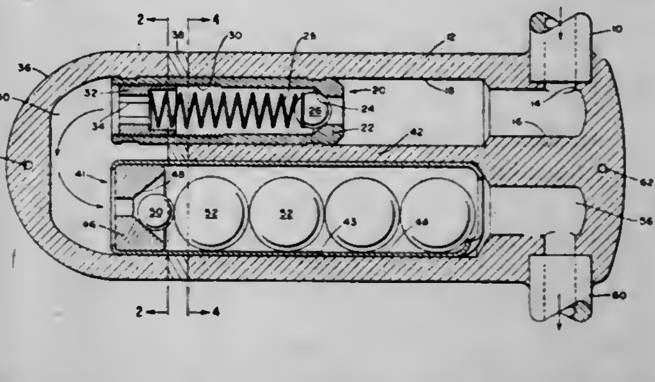
3,889,687
SHUNT SYSTEM FOR THE TRANSPORT OF CEREBROSPINAL FLUID

Donald L. Harris, 780 S. Shore Dr., Miami Beach, Fla. 33141, and Salomon Hakim, Carrera 13, N. 48-26,, Bogota, Colombia

Filed Jan. 31, 1974, Ser. No. 438,217

Int. Cl. A61m *27/00*

U.S. Cl. 128—350 V **5 Claims**



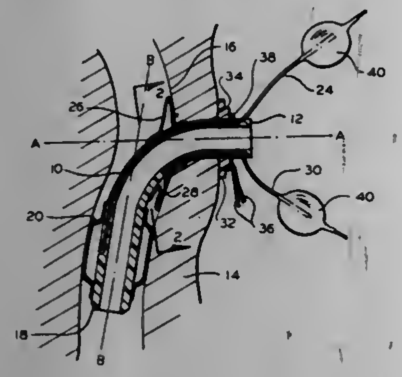
1. A shunt system for transporting cerebrospinal fluid from a source of such fluid within the body to a selected site within the body, comprising tubing for connection to the source of fluid, a pressure-operated check valve connected to said tubing, a second valve connected in series to the check valve, separate means connected with said second valve and responsive to the force of gravity for causing said second valve to open at a higher pressure when the valve is substantially verti-

cal and permitting the valve to open freely when the valve is substantially horizontal, and tubing connected in series with said second valve for connection to a site in the body to which the fluid is to be transported.

3,889,688

TRACHEOSTOMY TUBE WITH NOVEL RETAINING MEANS

Precha Eamkaow, 106 Revere Rd., Dewitt, N.Y. 13214
Filed Dec. 19, 1973, Ser. No. 426,045
Int. Cl. A61m *16/00*
U.S. Cl. 128—351 **8 Claims**



1. A tube device for introduction into the trachea to form an artificial airway through a patient's throat, said device comprising, in combination:

a. a hollow tube having open ends and a bend intermediate of said ends to form portions lying along first and second linear, intersecting axes, said tube being constructed and arranged for insertion of one end thereof through a tracheal stoma and into the tracheal lumen with said first axis disposed generally coaxial with the tracheal lumen and said second axis extending through the stoma;

b. impermeable means attached to the portion of said tube lying along said first axis and inflatable from a retracted to an extended position to effect a seal between, said tube and lumen;

c. inflatable retaining means attached to the portion of said tube lying along said second axis closely adjacent said bend, and movable with respect thereto between retracted and extended positions, said tube and retaining means having a combined dimension laterally of said second axis when retracted allowing insertion of said tube and retaining means through the stoma, and a combined dimension laterally of said second axis when extended preventing withdrawal of said tube through the stoma;

d. means for selectively inflating said impermeable means and said retaining means between said retracted and extended positions while inside the patient's trachea; and

e. a shield substantially wider than the diameter of said tube, and adjustably positionable along the length of the portion of said tube lying along said second axis outside the stoma, whereby the tissue may be engaged between said retaining means and said shield to fix the position of said tube.

3,889,689

METHOD OF TREATING TOBACCO WITH CATALASE AND HYDROGEN PEROXIDE

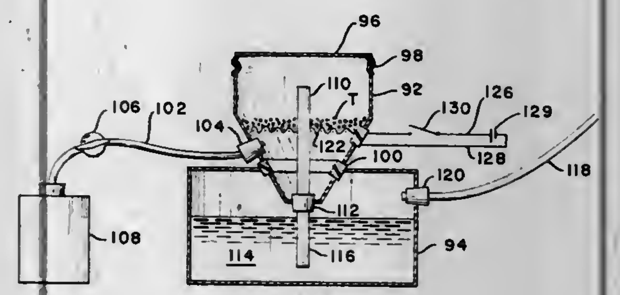
William E. Rosen, 2055 Wisteria Ln., Lafayette Hills, Pa. 19444, assignor to Rosen Enterprise, Inc., Lafayette Hills, Pa.
Continuation-in-part of Ser. No. 198,662, Dec. 20, 1971, abandoned. This application Aug. 11, 1972, Ser. No. 279,857
Int. Cl. A24b *03/18, 15/06*
U.S. Cl. 131—140 P **13 Claims**

1. A method of treating tobacco to improve its flavor and expand the tobacco, comprising the steps of substantially evenly distributing on the surface of the tobacco catalase and a liquid solution containing hydrogen peroxide, the amounts of catalase and hydrogen peroxide being sufficient to mutually decompose each other, and before significant reaction between these two components obtaining, applying physical force in the form of pressure means selected from the group comprising roller means, flat pressure means, and continuous expression means to said tobacco to cause catalase ahd hydrogen peroxide to permeate the interstices of the tobacco, whereby the catalase and hydrogen peroxide react in situ on and within the tobacco.

3,889,690

SMOKING APPLIANCE

James Guarnieri, 4809 Blackfoot Rd., College Park, Md. 20740
Filed Sept. 24, 1973, Ser. No. 400,167
Int. Cl. A24f *47/00, 1/30*
U.S. Cl. 131—185 **1 Claim**



1. A smoking appliance comprising:

a. receptacle means having a fluid passageway therein,

b. a gas permeable screen mounted within said receptacle means and positioned across said passageway,

c. said screen being adapted to support a quantity of lighted tobacco, and

d. a heat generating, electrically resistive wire woven into said screen.

3,889,691

TOBACCO SMOKE FILTER

John Emery Urbanic, Pittsburgh, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.
Filed Dec. 21, 1973, Ser. No. 427,201
Int. Cl. A24b *15/02*
U.S. Cl. 131—267 **5 Claims**

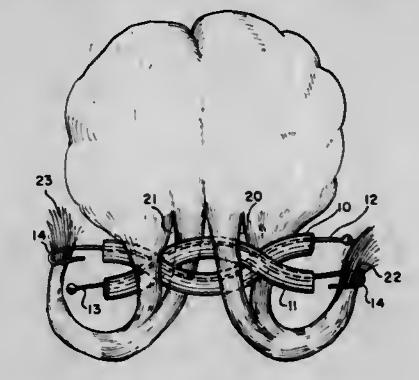
1. The method of removing HCN from tobacco smoke which comprises contacting said tobacco smoke with a tobacco smoke filtering material comprising at least about 50 milligrams of granular activated carbon impregnated with 0.5 to 15 percent by weight of cuprous chloride.

3,889,692

HAIR DRESSING METHOD AND DEVICE

Allan Raymond Redrow, 4990 Columbus Pike, Apt. 416, Arlington, Va. 22204
Filed Oct. 16, 1974, Ser. No. 515,150
Int. Cl.² A45D *7/00*
U.S. Cl. 132—7 **18 Claims**

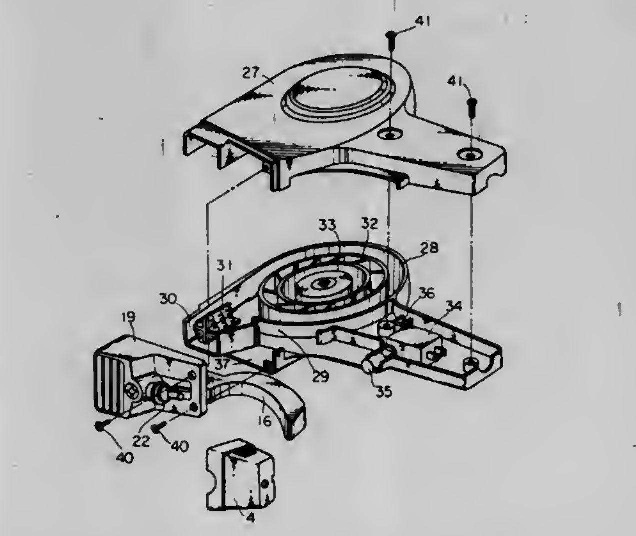
1. A method for arranging long hair on the head of a person into an intertwined pattern comprising separating that portion of the hair to be intertwined into individual strands that are attached to the head at one end with the other end of each strand being free, delivering the separate strands through individual and intertwined guides to intertwine the strands, and removing the guides from the strands to leave the hair strands intertwined.



3,889,693

ELECTRIC HAIR DRYER WITH SPRAY

Hisayuki Tanaka; Yukio Wada, and Seiichro Shiba, all of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Japan
Filed Feb. 16, 1973, Ser. No. 333,320
Claims priority, application Japan, Feb. 19, 1972, 47-20694; Feb. 19, 1972, 47-20695
Int. Cl. A45d *1/00*
U.S. Cl. 132—9 **1 Claim**



1. An electric hair dryer apparatus comprising:

a dryer unit including a pistol shaped body having a barrel portion and a handle portion disposed at an angle to said barrel portion, said body consisting of two half members that are separable from each other along a longitudinal plane of said body, said body having an air inlet and a hot-air outlet with said hot-air outlet being at the end of said barrel, an air blowing fan and a motor for driving said fan both contained within said body, an electric heater means mounted adjacent said hot-air outlet, trigger means on said handle portion for operating said fan motor and heater to effect the discharge of hot air from said outlet,

a spray unit having a pistol like configuration, said spray unit including a fluid reservoir tank, pump means and a spray nozzle disposed above said tank and respectively forming a barrel portion of said configuration, lever means for operating said pump means to cause fluid in the tank to be discharged from said nozzle and forming a handle portion of said configuration,

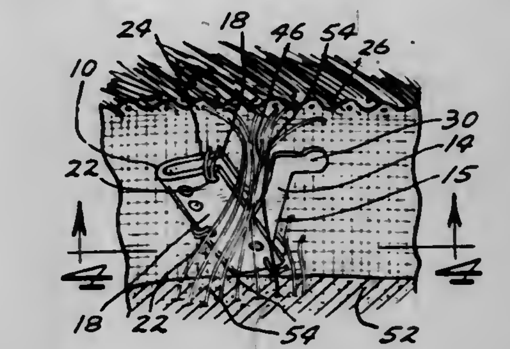
a mouthpiece removably coupling the barrel portions of said spray and dryer units with the barrel and handle portions of said spray unit in closely adjacent relation to the respective barrel and handle portions of said dryer unit, said spray unit lever means being located immediately adjacent said dryer unit trigger means, said lever means and trigger means being on a common side of said dryer unit handle portion, said sprayer unit nozzle and dryer unit outlet causing fluid spray and hot air respectively to be emitted from said apparatus in a common direction, and

said dryer unit body being formed with a pawl for resiliently engaging and supporting said reservoir tank in operative relation below said spray unit nozzle and pump means, and said tank being selectively removeable from said spray unit without uncoupling said dryer unit and said spray unit from said mouthpiece.

3,889,694

MEANS AND METHOD FOR ATTACHING A HAIR PIECE TO THE HAIR

David L. Greer, 1168 Virginia, St. Paul, Minn. 55117
Filed Aug. 14, 1974, Ser. No. 497,195
Int. Cl. A41g *3/00*
U.S. Cl. 132—53 **8 Claims**



1. A hair piece clip for attaching a hair piece to natural living hair growing on a head;

A. said clip including:

1. a generally flat, U-shaped base including a pair of flat, generally parallel, spaced apart, resilient side walls and an edge wall fixedly positioning the side walls with respect to each other, and

2. an arm pivotally mounted between said side walls at a first inner end portion of said arm, said arm being movable between a first open position wherein most of said arm is out from between said side walls and a second closed position wherein said arm is substantially entirely between said walls;

B. means for attaching said base of said clip to a hair piece;

C. the relationship of the width of the arm to the distance between said side walls being such that when said arm is moved from said first to said second position with natural living hair bridging the space between said side walls in the path of said arm, the natural hair is carried ahead of the arm and is trapped between the arm and opposed facing surfaces of said walls; and

D. releasable means for holding said arm in said second position.

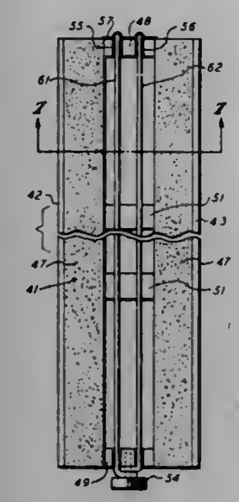
3,889,695

HAIR PIECE AND METHOD AND APPARATUS FOR MAKING SAME

Peter Anthony Incando, 8907 E. Valley Blvd., Rosemead, Calif. 91770
Filed Aug. 27, 1973, Ser. No. 392,038
Int. Cl. A41g *3/00*
U.S. Cl. 132—53 **2 Claims**

1. A hair piece for attachment to the scalp of a user and comprising a base having a plurality of polyvinylchloride plastic layers, a concave undersurface on the base, and nylon mesh cloth layers; a nylon anchor net and a multiplicity of strands of hair fixed to the anchor net, said anchor net and base being joined by the final plastic layer of the base; some of said hair strands being looped through the anchor net; and

some of said strands of hair being hair wefts each comprising a plurality of hair strands, a plasticized anchor band chemically co-soluble with the plastic layers of the base and securing



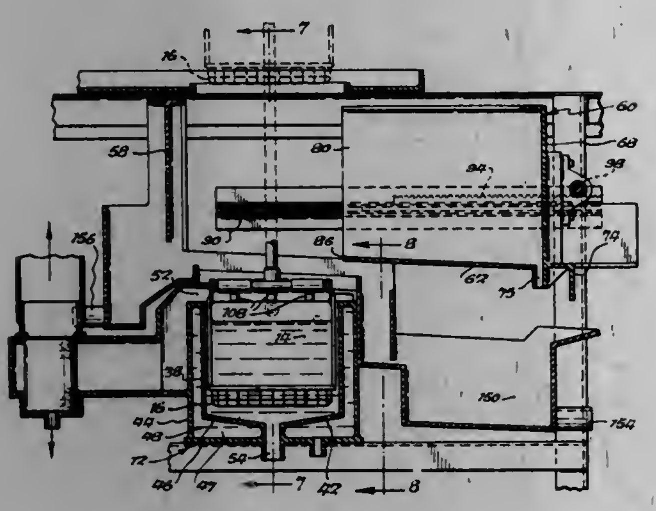
each hair strand of each weft in like orientation with respect to the extent of the anchor band, said hair wefts being solvently united with said plastic layers by reason of their compatible chemical solubility.

3,889,696
ETCHING MACHINE

David L. Oosterling, Mountain Lakes, and Harold F. Jones, Dover, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Apr. 29, 1974, Ser. No. 465,441
Int. Cl. B08b ***3/02***

U.S. Cl. 134—57 R **12 Claims**



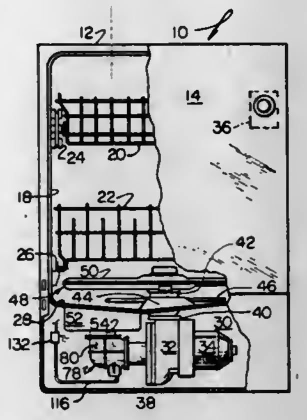
1. In an apparatus for processing an article comprising a carrier for the article, means for moving the carrier and article downwardly into a bath containing a first liquid, means for lifting the carrier and article upwardly from the bath, a spray chamber separate from the bath and means for spraying the article on the carrier with a second liquid when the carrier and article are in the spray chamber; the improvement comprising a spray chamber having a movable portion and means for moving the movable portion to position the spray chamber around the carrier and article and between the article and the bath after the carrier and article are lifted upwardly from the bath by the lifting means.

3,889,697
AERATION DRAIN PLUG FOR DISHWASHERS

Lauren W. Guth, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 17, 1973, Ser. No. 425,197
Int. Cl. B08b ***3/02***

U.S. Cl. 134—95 **9 Claims**



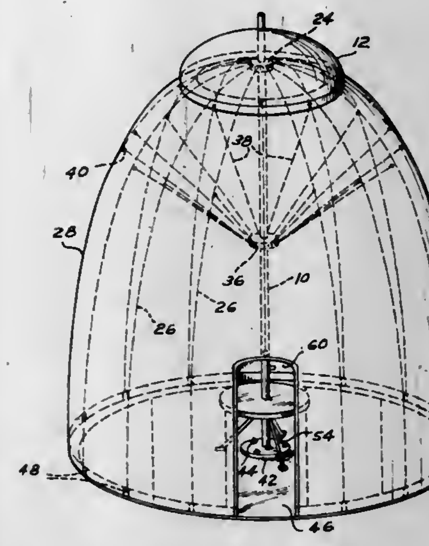
1. A dishwasher comprising
a tub and a movable door providing together a wash chamber;
a rack and means mounting the rack for movement into and at least partially out of the wash chamber;
means for spraying aerated washing liquid toward the rack including
a spray mechanism in the wash chamber,
a pump having an outlet in communication with the spray mechanism and an inlet,
a conduit providing communication between the wash chamber and the pump inlet and including a closed side wall having a single opening therethrough for alternatively receiving an imperforate plug or an aeration plug;
an aeration plug in the opening including an air passage therethrough; and
means for selectively delivering air to the passage.

3,889,698
PORTABLE SHELTER

Julius Roessl, 40 Larkin St., P.O. Box 433, Port Richmond, Staten Island, N.Y. 10302

Filed Nov. 9, 1973, Ser. No. 414,419
Int. Cl. A45f ***1/04;*** **E04b** ***1/347***

U.S. Cl. 135—2 **3 Claims**



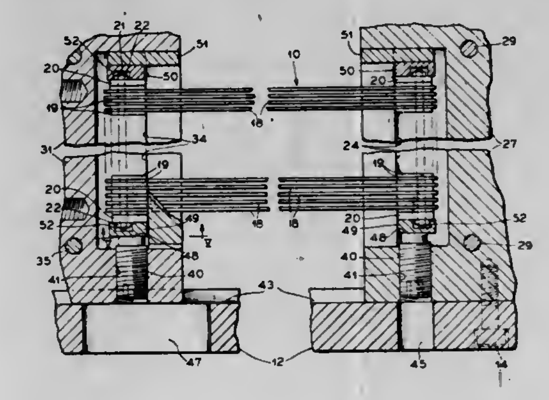
1. A portable shelter comprising a center pole, said center pole being provided with a slot extending along its length, a circular header fixed to said center pole, a plurality of outer ribs hingeably extending from said circular header, a first collar slidably movable along said center pole below said circular header, a plurality of expansion ribs hingeably extending from said collar, the other end of each of said expansion ribs being connected to a different one of said outer ribs, a pliant covering over said outer ribs and connected to the ends of said outer ribs; a dome-shaped ventilator cap, a second slidable collar connecting said dome-shaped ventilator cap to said center pole near the top thereof, a rod within said center pole having one end connected via said slot to said second slidable collar and a second end remote therefrom having an extension passing through said slot so that movement of said extension in the direction of the axis of said center pole raises or lowers said dome-shaped ventilator cap; a circular floor, means at the center of said circular floor for supporting said center pole in an upright position, and means disposed along the periphery of said circular floor for engaging the ends of said outer ribs remote from said circular header.

3,889,699
SELF-CONTAINED MULTI-BLADE PACKAGE AND ASSEMBLY UTILIZING SAME

Louis F. Ranieri, 8423 N. Clifton St., Niles, Ill. 60648

Continuation-in-part of Ser. No. 79,947, Oct. 12, 1970, Pat. No. 3,742,805. This application July 2, 1973, Ser. No. 375,389
Int. Cl.[2] B28D ***1/06***

U.S. Cl. 125—16 R **5 Claims**



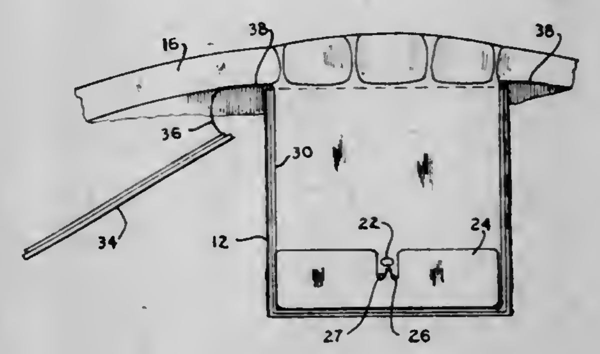
1. A self-contained, preassembled, multi-blade package for mounting in a blade head assembly of an existing wafering machine having square tensioning shoulders and wherein opposite end portions of the blades are clamped under pressure between clamping blocks for unison tensioning of the blades by said shoulders, comprising:
a plurality of substantially coextensive elongated thin flat strip blades in side-by-side assembly and having opposite end portions;
elongated rectangular spacer plates aligned with one another and disposed between aligned end portions of the blades, and having small diameter aligned holes;
elongated rectangular end plates generally coextensive with and aligned with the spacer plates at the opposite sides of the blade package and having aligned holes aligned with the holes of the spacer plates;
said spacer plates and said end plates having their longitudinal edges transverse to the longitudinal edges of the blades and extending substantially beyond the opposite planes across the edges of the blades and thereby providing square shoulders along the combined edges of the plates which face away from the adjacent ends of the blades for engagement with the square tensioning shoulders of the blade head assembly;
connecting rods extending through the aligned holes of the spacer plates and end plates;
means on the respective opposite end portions of said rods retaining the spacer plates and end plates and blades assembled with the rods so that the blade package can be handled as a self-contained unit for mounting in and removal from the blade head assembly;
said clamping blocks at each opposite side of the blade package being of elongated rectangular shape generally coextensive with and matching the size of the spacer plates and end plates, the blocks having a longitudinal axis transverse to the edges of the blades and extending substantially beyond the opposite planes across the edges of the blades the same as said spacer plates and end plates and providing square shoulders in the plane of the plate shoulders and facing away from the adjacent ends of the blades, the clamping blocks having in their faces which engage the end plates recesses just large enough to receive ends of the connecting rods and said retaining means freely and with opposite faces of the clamping blocks being unbroken to receive full thrust of the ends of compression screws of the head assembly thereagainst; and said rods and said holes in the plates and said recesses in said blocks being eccentric to the plates and blocks and being located in substantial eccentric offset clearance relation with respect to maximum available unobstructed solid frictional compression thrust areas in the aligned portions of the blades and plates and clamping blocks all the way across the blade package at each of said end portions, and which areas extend throughout the widths of the blades and extend from the shoulder edges of the plates and blocks throughout at least one half the width of the plates and blocks, for receiving maximum frictional clamping thrust value from blade head assembly compression screws driven against the clamping blocks;
whereby to enable maximum tensioning of the blades with freedom from liability of slipping and breaking of any blade in the package during said maximum tensioning, while permitting said rods to remain continuously in place in the package to maintain the benefit of the rod connection for handling of the package.

3,889,700
SELF-INFLATABLE POCKET DISPOSABLE UMBRELLA

Joseph F. Kirley, 27 Fairfield Ave., South Norwalk, Conn. 06854

Filed Feb. 20, 1973, Ser. No. 333,479
Int. Cl. A45b ***19/02, 15/00***

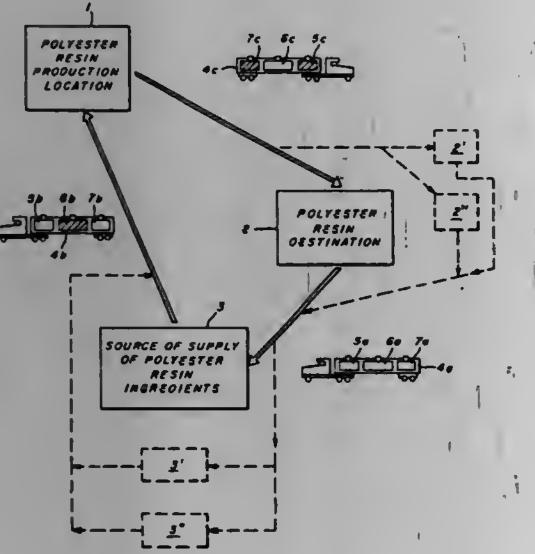
U.S. Cl. 135—19.5 **1 Claim**



1. A single-use, self-inflatable, disposable, pocket-size umbrella comprising a carrying case provided with a non-slip external gripping surface, said carrying case having a length of approximately 4 inches, a cover for said carrying case capable of being removed therefrom but remaining connected thereto, an umbrella part having interconnected inflatable rib channels, a pressure vessel provided with a frangible part, a propellant in said pressure vessel, the bottom of said case being provided with an internal projection for selectively rupturing said frangible part of the pressure vessel when said carrying case is squeezed whereby said propellant inflates said inflatable rib channels to open the umbrella, said carrying case being the handle for the umbrella, said connection between said carrying case and cover being a tab interconnection between said cover and at least one of said inflatable rib channels whereby when the tab is pulled in a predetermined direction said channel is opened and the pressurized gas in said rib channels escapes to the atmosphere permitting the umbrella to collapse to a compact form for ready disposal.

3,889,701
HIGHWAY TANKER WAGON AND METHOD OF MAKING AND DELIVERING LIQUID PRODUCTS

Noel J. Mueller, Box 28, Waubeka Village, Fredonia, Wis. 53021
Continuation of Ser. No. 71,462, Sept. 11, 1970, abandoned. This application Apr. 1, 1974, Ser. No. 456,675
Int. Cl.^{2} B60P *3/24*
U.S. Cl. 137—1 **7 Claims**


POLYESTER RESIN PRODUCTION LOCATION
POLYESTER RESIN DESTINATION
SOURCE OF SUPPLY OF POLYESTER RESIN INGREDIENTS

1. The method of producing and delivering liquid products which are prepared from liquid ingredients,
1. establishing a liquid product production location;
2. establishing a source of supply for said liquid ingredients;
3. establishing a liquid product destination;
4. establishing within a multiple-zone tanker vessel
   a. a Type I zone for receiving said liquid products; and
   b. a Type II zone for receiving said liquid ingredients;
5. filling said Type II zone with said liquid ingredients at said source of supply and delivering said vessel to said production location;
6. removing the said liquid ingredients from the said vessel at said production location;
7. filling the said Type I zone with said liquid product, at the said production location;
8. delivering said vessel to the said liquid product destination;
9. removing said liquid product from the said vessel at the said liquid product destination;
10. transporting said vessel with both said Type I zone and said Type II zone substantially empty to said supply source;

and

11. repeating steps 5 through 11 in sequence.

3,889,702
PROCESS FOR REDUCING FRICTION LOSS IN FLOWING ORGANIC FLUIDS

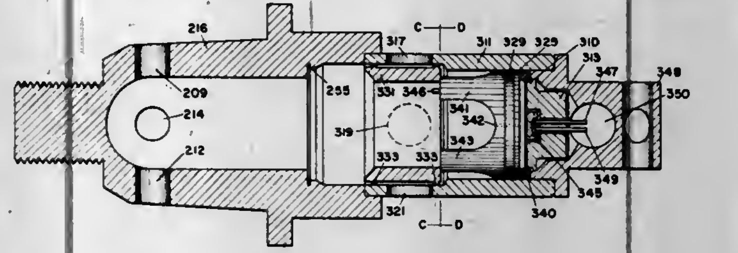
Allan P. Evans, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jan. 23, 1974, Ser. No. 435,809
Int. Cl. F17d *1/16*
U.S. Cl. 137—13 **5 Claims**

1. A method of reducing frictional drag of organic liquids in turbulent flow through conduits comprising:

adding a quantity of a dipole-dipole polymer, comprising a pentacoordinate trigonal bipyramid compound of group IV metals of the Periodic Table, to the organic liquid.

3,889,703
SLEEVE VALVE ARRANGEMENT

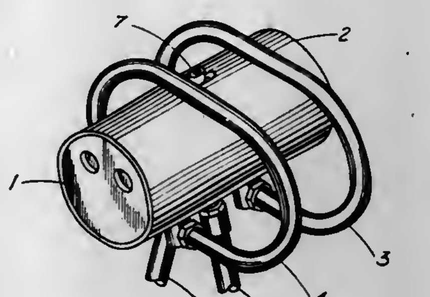
Donald P. Keathley, Middletown, Conn., assignor to ICI United States Inc., Wilmington, Del.
Continuation-in-part of Ser. No. 229,473, Feb. 25, 1973, abandoned. This application Mar. 5, 1973, Ser. No. 337,943
Int. Cl. B60r *21/08*
U.S. Cl. 137—67 **8 Claims**



1. In a sleeve valve for containing fluid under pressure comprising a shell having a plurality of ports therein, a closure across said shell, a hollow sleeve slidable in said shell into separate positions in which said ports are covered and uncovered, a piston in said shell separable from said sleeve and positioned between said sleeve and said closure, and means for exerting pressure between said closure and said piston so as to slide said sleeve, wherein said sleeve opposite said piston is provided with a thin leading edge, said shell is provided with means for flaring said leading edge upon being moved by said piston to lock said sleeve in the open position and which when said ports are uncovered permits fluid to flow through said ports and out through said sleeve.

3,889,704
VACUUM SIPHON PUMP

Vito Michael Rubino, 420 Sanhican Dr., Trenton, N.J. 08618
Filed July 12, 1974, Ser. No. 488,145
Int. Cl.^{2} F04B *10/00*; **F16L** *43/00*
U.S. Cl. 137—123 **3 Claims**



1. A siphon comprising an elongated suction pipe adapted to be inserted in a supply of liquid, valve means connected to the uppermost portion of said suction pipe, an elongated discharge pipe, said valve means connected to said discharge pipe at its uppermost portion and establishing a path of communication between said suction pipe and said discharge pipe, the lowermost portion of said discharge pipe extending to a lower level than the lowermost portion of said suction pipe; said valve means including a valve housing and a valve plunger, said housing having proximal, middle and distal pairs of holes in a lower wall thereof, said proximal pair of holes being connected externally of the housing to each other by first conduit means, said distal pair of holes being connected to each other externally of the housing by second conduit means, one of said middle pair of holes being connected to said suction pipe, the other of said middle holes being connected to said discharge pipe, said housing having first and second open ends;

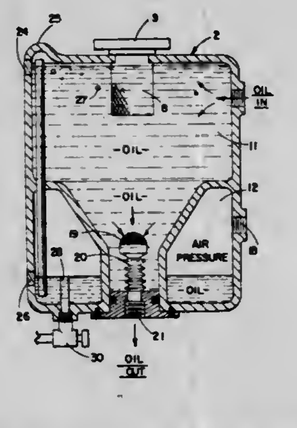
said plunger having proximal and distal pairs of bores in a lower portion thereof, each of said proximal bores communicating with corresponding distal bores via path means in the plunger,

means to reciprocate said plunger between a first and second position;

in said first position said proximal holes communicating with said proximal bores, said middle holes communicating with said distal bores and said distal holes communicating with said second open end, whereby some fluid in said second conduit flows through said second open end; in said second position said proximal holes communicating with said first open end whereby some fluid in said first conduit flows through first open end, said middle holes communicating with said proximal bores, and said distal holes communicating with said distal bores.

3,889,705
HYDRAULIC SYSTEM RESERVOIR HAVING SEPARATE OIL AND AIR-OIL CHAMBERS

Curtis M. Coderre, Torrance, Calif., assignor to Northrop Corporation, Los Angeles, Calif.
Filed Aug. 30, 1973, Ser. No. 393,219
Int. Cl. F16l *55/04*
U.S. Cl. 137—171 **6 Claims**



1. A reservoir for use in a closed loop aircraft hydraulic system wherein liquid is drawn from the reservoir and returned thereto for storage and re-use, comprising:

a. a shell having a pair of opposite end walls with a side wall therebetween, one of said end walls being at the top of said reservoir and the other end wall at the bottom when said reservoir is used in an aircraft in normal level flight;
b. baffle means extending from an intermediate region of said side wall to an intermediate region of said other end wall for dividing said shell into a main oil chamber for oil storage and re-use and an air-oil chamber for air collection and make-up oil;
c. said main oil chamber having an oil outlet adjacent to said other end wall and having an oil inlet remote from said outlet, said outlet having hollow expansible bellows means extending therefrom into said main oil chamber toward said one end wall, with a free end provided with a perforated head having sufficient weight to expand said bellows means when said reservoir is rotated toward an inverted position;
d. said air-oil chamber having an air pressurization inlet;
e. and a transfer tube interconnecting said chambers and having opposite ends adjacent to said end walls, respectively.

3,889,706
FLOAT-CONTROLLED VALVE

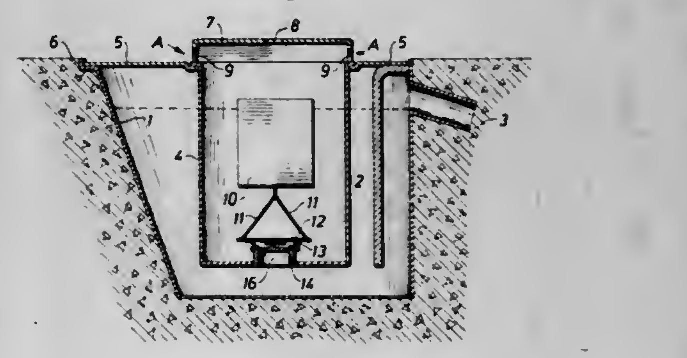
Jan Olof Wilhelm Wallin, Taby, Sweden, assignor to PX Petrocontrol AB, Taby, Sweden
Filed Jan. 23, 1974, Ser. No. 435,966
Claims priority, application Sweden, Feb. 21, 1973, 7324432
Int. Cl. F16k *31/24*
U.S. Cl. 137—172 **5 Claims**

1. In a float-controlled valve for separating a liquid, such as water, from at least one other liquid, such as oil, having a lower density than the first-mentioned liquid, wherein the valve is disposed in the lower part of a generally closed housing means, such as a tank, the valve including a valve member connected to a float the density and size of which are adapted so as to cause the valve member to open a discharge opening of the valve when the float is buoyantly supported at least partially by the heavier liquid, but to cause the valve member to close the discharge opening in other cases, the improvement wherein:

said discharge opening being defined between an outer, substantially circumferential seat face defining therein a space and an inner support plate which is positioned in said space and which is coaxially fixedly mounted with respect to said outer seat face, the outer periphery of said inner support plate extending radially to a position adjacent said outer seat face to form therebetween a generally continuous circumferential passage;

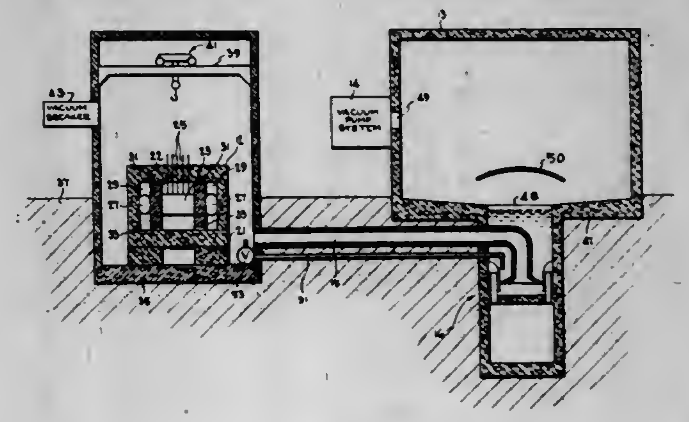
said valve member comprising a diaphragm made of a flexible material and being supported on said support plate, said diaphragm, when the valve is in the closed position, sealingly engaging with said outer seat face; and

connecting means linking said float with said diaphragm at a circumferential portion thereof, such as at least one circumferential point or line thereof, for disengaging at least a portion of the circumferential part of said diaphragm from said outer seat face to open said valve when said float is buoyantly supported at least partially by the heavier liquid.



3,889,707
PRESSURE RELIEF SYSTEM FOR A NUCLEAR REACTOR

H. Peter Fay, Solana Beach, and William S. Peck, North Shore, both of Calif., assignors to General Atomic Company, San Diego, Calif.
Filed Nov. 19, 1971, Ser. No. 200,318
Int. Cl. F16k *9/00*; **G21c** *9/00*, *13/02*
U.S. Cl. 137—251 **6 Claims**



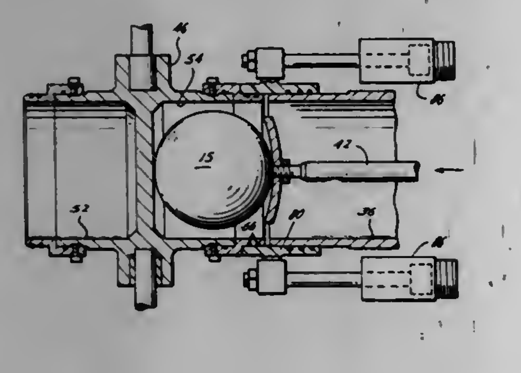
1. A pressure relief and containment system for a potential source of contaminated gas, comprising, a first containment enclosure for enclosing the potential source for receiving gas from the source, a second containment enclosure, means for producing a subatmospheric pressure in said second contain-

ment enclosure, duct means for conveying gas from said first containment enclosure to said second containment enclosure, and a pressure regulating fluid seal in said duct means for maintaining a separation between said first containment enclosure and said second containment enclosure, said fluid seal being breachable upon a rise in pressure within said first containment enclosure to a predetermined level to allow gas flow from said first containment enclosure into said second containment enclosure, said fluid seal including a main chamber in communication with said second containment enclosure, a second chamber, an overflow chamber, a wall separating said main chamber from said second chamber, a passage in said wall communicating between said main chamber and said second chamber, a weir between said second chamber and said overflow chamber and above the level of said passage, means for maintaining atmospheric pressure in said second chamber above said weir, and means for filling said main chamber with fluid to a level above that of said weir to provide a pressure head sufficient to offset the difference in pressure between said first containment enclosure and said second containment enclosure, said duct means being of a configuration to communicate with said main chamber at a discharge level both below that of said weir and above that of said passage.

3,889,708
DUAL BALL LAUNCH VALVE

Clyde H. Chronister; Cecil C. Grieger, and Alton D. Oliver, all of Houston, Tex., assignors to Chronister Development, Inc., Houston, Tex.

Filed May 17, 1974, Ser. No. 470,789
Int. Cl. F16k ***25/00***
U.S. Cl. 137—268 **7 Claims**



1. A dual ball launch valve for launching and receiving a ball in a line comprising,

a housing having an inlet and outlet for connection to the line,

a ball insertion conduit extending into the housing for inserting and removing a ball into and from the valve,

a rotatable ball launcher positioned in the housing having first and second ball receiving compartments separated by a fluid barrier, said compartments including a tubular open end positioned to be brought into alignment with the conduit, inlet and outlet on rotation of the launcher, seal means adjacent the open end of each of the compartments positioned on the outside of the compartments,

means for rotating the launcher,

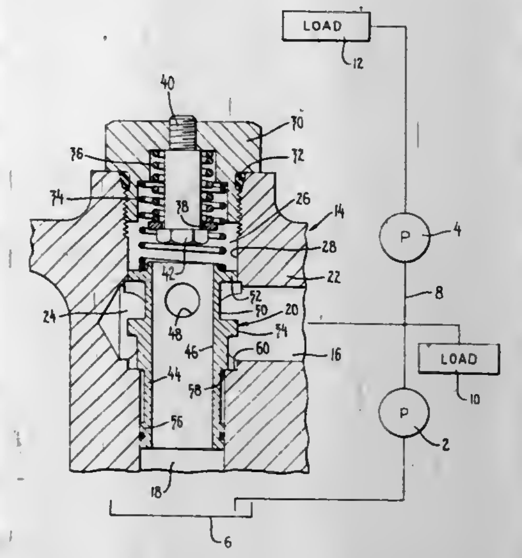
a sleeve telescopically and sealingly positioned on the outside of each of the inlet and the conduit and sized to telescopically engage the exterior of the open ends of said compartments and said seal means when a compartment is aligned with a sleeve, and

means operable from outside the housing for extending and retracting said sleeves into a telescopic engagement with the seal means on the tubular compartments of the launcher.

3,889,709
HYDRAULIC UNLOADING VALVE

Robert M. Dwyer, Livonia, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Continuation of Ser. No. 296,415, Oct. 10, 1972, abandoned. This application Mar. 25, 1974, Ser. No. 454,360
Int. Cl. F16k ***31/12***
U.S. Cl. 137—504 **5 Claims**

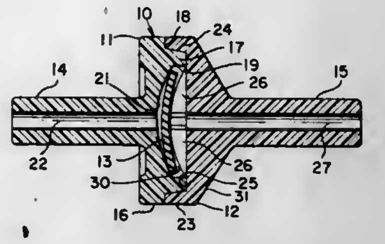


1. A hydraulic unloading valve for the diversion of hydraulic fluid flow comprising a housing; an inlet in said housing, an outlet in said housing; a chamber in said housing connected to said inlet and said outlet; a recess on opposite side of said chamber from said outlet, a member being slideably mounted in said chamber for shifting between an open position for passing fluid from said inlet to said outlet and a closed position for blocking fluid flow; means for urging said member to the open position, characterized by said member having a resultant force creating means including orifice means for automatically moving said member to the closed position over a range of viscosities of the fluid, said member having a first continuous sealing means with said recess, a second continuous sealing means with said outlet and a third sealing means between said first and second sealing means, said orifice means is between said first and third sealing means to receive fluid in the open position and to be isolated from said inlet in said closed position, said third sealing means in a non-sealing relation in said open position and in sealing relation with the recess to block flow through said orifice means thereby preventing flow of fluid through the valve.

3,889,710
CHECK VALVE WITH ELASTOMERIC VALVE ELEMENT

Julien H. Brost, 56 Sauganash Dr., Fontana, Wis. 53125

Continuation of Ser. No. 307,352, Nov. 7, 1972, abandoned. This application Jan. 11, 1974, Ser. No. 432,610
Int. Cl. F16k ***15/00***
U.S. Cl. 137—512.15 **21 Claims**



1. A check valve comprising:

a housing defining a chamber having first and second opposing ends,

an inlet passage having an opening entering the chamber through one of said opposing ends and an outlet passage having an opening entering the chamber through the other of said opposing ends,

an annular portion of said one end of the chamber immediately surrounding the inlet passage opening forming an annular concave valve seat,

an abutment means in the chamber, fluid openings being provided through the abutment means to permit fluid to flow from the inlet passage therethrough to the outlet passage, one end of the abutment means projecting towards the inlet opening,

a resilient disc which is essentially flat in its relaxed condition extending transversely across the chamber between the said one end of the abutment means and the annular valve seat, said disc being of a sufficiently large cross-section, taken in the direction transverse to the flow direction, that in its normal closed condition in the chamber, the said one end of the abutment means engages the central portion of the disc on the side thereof facing the outlet opening and flexes the disc convexly toward the inlet opening as the outer periphery of the disc sealingly engages the annular valve seat,

said fluid openings in the abutment means positioned to remain open for fluid flow from the inlet opening around the outer periphery of the disc and through the fluid openings to the outlet opening when the resilient disc has flexed toward the outlet opening as far as its outer dimensions and resilience allow when subjected to the largest possible pressure differential from the inlet opening toward the outlet opening,

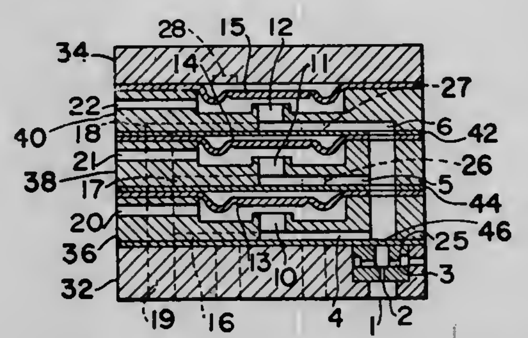
said resilient disc having sufficient resiliency and arranged to increase the area of its sealing contact with the annular concave valve seat from said initial sealingly engaging outer periphery, radially inwardly, as the fluid forces from the outlet toward the inlet increase beyond the flexing force exerted by the abutment means on the disc,

and the outer periphery of the disc, when in the said normal closed position, being spaced radially inwardly from the outer periphery of the concave valve seat, permitting at least slight transverse movement of the disc within the chamber when sealingly engaging the annular valve seat.

3,889,711
LOW PRESSURE OPERABLE, DIAPHRAGM TYPE LOGICAL ELEMENT

Toshiro Hirao, Yokohama, Japan, assignor to Meidensha Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1973, Ser. No. 346,407
Claims priority, application Japan, Apr. 1, 1972, 47-032148
Int. Cl. F15c ***3/04***
U.S. Cl. 137—599 **5 Claims**



1. A low pressure operable, diaphragm-type logical element comprising:

a base having formed therein a main supply port, a base outlet port, and a plurality of base signal ports;

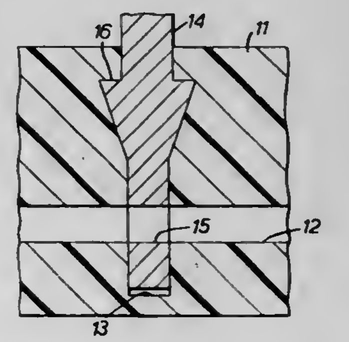
a plurality of superimposed, modular chamber defining plates vertically stacked on said base, each of said plates having formed therein a supply port to receive fluid from said main supply port, an intermediate nozzle, a relief discharge port intercommunicating with said supply port through said intermediate nozzle and a chamber signal port communicating with one of said base signal ports, at least one of said superimposed, modular chamber defining plates having formed therein an outlet port spaced from said supply port and communicating with said base outlet port;

a plurality of diaphragms disposed between adjacent chamber defining plates, each of said diaphragms facing one of said intermediate nozzles and each having a home position permitting communicating between said relief discharge ports and said supply ports through said nozzles and each of said diaphragms in conjunction with said adjacent chamber defining plates forming a plurality of signal receiving chambers into which one of said signal ports opens thereby forming a low pressure operable, diaphragm-type logical element capable of producing a signal at said base outlet when said signal receiving chambers receive a pressure signal and said diaphragms move to a position closing said nozzles, whereby the number of signal receiving chambers may be altered merely by stacking an appropriate number of pre-formed modular chamber defining plates one on top of the other.

3,889,712
VALVES

Robert E. Fields, 2-10 Regent St., Cambridge, England (CB2 1DB)

Filed Nov. 27, 1973, Ser. No. 419,300
Claims priority, application United Kingdom, Dec. 1, 1972, 55569/72
Int. Cl. F16k ***11/02***
U.S. Cl. 137—625.47 **7 Claims**



1. A valve comprising:

a body constructed of a synthetic plastic material having at least one connection bore in a first plane and a further bore in a transverse plane which extends from at least one wall of the body and intersects each connection bore; and a key fabricated of a material harder than the body and formed with at least one transverse bore for alignment with one connection bore in the body, said key including a wedged ring section formed thereon and having a knife edge on the ring section, said key being a compression fit in said transverse bore in the body so that the knife edge of said wedge ring section engages the plastic material of said body portion.

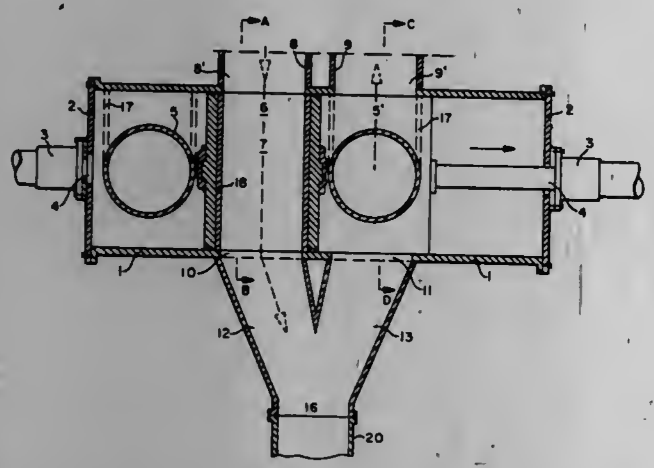
3,889,713
RECIPROCATING VALVE FOR DOUBLE PISTON CONCRETE PUMP

Horst Bender, Lintorf, Germany, assignor to WIBAU (Westdeutsche Industrie-und Strassenbaumaschinen-Gesellschaft m.b.H.), Rothenbergen, Germany

Filed July 13, 1973, Ser. No. 379,195
Claims priority, application Germany, July 20, 1972, 2235586
Int. Cl. F04b ***7/00;*** **F16k** ***11/06***
U.S. Cl. 137—625.48 **2 Claims**

1. A valving apparatus for interconnecting a double piston pump having two cylinders with conveying conduit means and with supply means; comprising a cylindrical valve housing

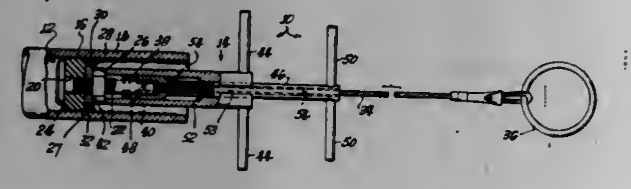
having a given length, said housing further having a first pair of aligned ports for connecting said valve housing to said two pump cylinders, a second pair of aligned ports for connecting the valve housing to conveying conduit means, and a third pair of aligned ports for connecting the valve housing to said supply means, said ports being aligned at a pair of planes extending transverse of the axis of said housing with each port of each pair of ports being aligned with a separate one of said planes, a piston valve plug mounted solely for axial movement in said cylindrical valve housing, said plug having a central plug section (6) with a straight cylindrical passageway extending diametrically through the valve housing in a direction to interconnect ports of said first and second pair in a common plane, a first outer plug section (5) with a bent cylindrical passageway, and a second outer plug section (5′) also with a bent cylindrical passageway, said first and second outer plug sections and said central plug section having together a length corresponding to about three quarters of said given length of the cylindrical valve housing, said first and second outer plug sections (5, 5′) extending on each side of said central passageway, each of said first and second bent cylindrical passageways including an angle within the range of about 75° to about 90° so as to extend.



3,889,714
PIPE CLOSURE APPARATUS

John F. Wilger; Tadao S. Uyetake, and Clifford Y. C. Lai, all of Honolulu, Hawaii, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 17, 1974, Ser. No. 434,169
Int. Cl. F16l *55/10*
U.S. Cl. 138—89 **3 Claims**

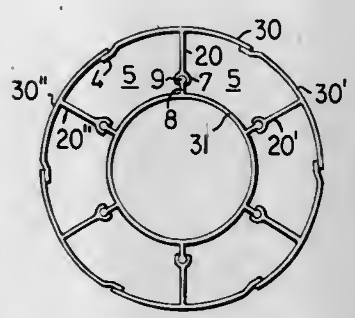


1. A pipe closure apparatus comprising:
a resilient plug;
a threaded shaft extending axially through the resilient plug; means mounted on one end of the shaft to restrain longitudinal movement of the shaft with respect to the resilient plug, and a nut threaded on the opposite end of the shaft so that upon tightening or loosening the nut the resilient plug expands or retracts respectively;
a rigid washer slidably mounted on the shaft between the nut and the resilient plug for providing bearing surfaces and a distribution of force from the nut to the resilient plug;
a cup shaped resilient ring mounted about the washer; and said ring having an exterior diameter which is greater than the resilient plug when the plug is in its retracted condition and being capable of flexing inwardly,
means for retaining the shaft and selectively tightening or loosening said nut;
the retaining, tightening, and loosening means including:
a tube which has a shaped end for engaging the nut;
a pin extending from the nut end of the shaft; and
another tube slidable within the first mentioned tube and having a shaped end for engaging said pin,
whereby a pipe can be sealed from contamination by expanding the plug therein and is wiped clean by the ring when the plug is retracted and withdrawn.

3,889,715
ARRANGEMENT IN A PIPE FOR ENCLOSING INSULATION

Lars Harry Lilja, Solhem, Aspen, and Charles Folke Sigvard Ottoson, von Holtens vag 5, both of S-443 00 Lerum, Sweden

Filed June 26, 1973, Ser. No. 373,687
Claims priority, application Sweden, Jan. 10, 1972, 213/72
Int. Cl. F16l *9/18, 59/12*
U.S. Cl. 138—117 **10 Claims**

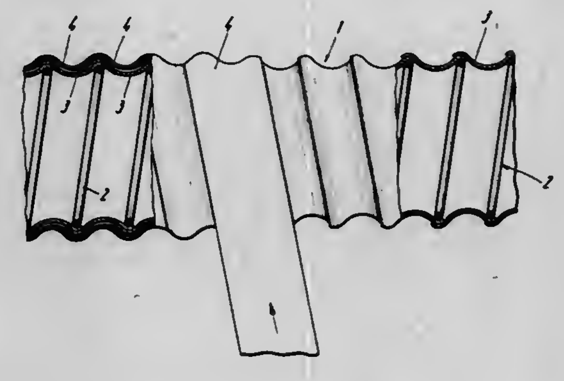


1. Means for enclosing an insulation around a pipe comprising
a. a jacket spaced from said pipe in a substantially concentric manner to define an annular space around said pipe, said jacket being divided along a plurality of longitudinally extending lines at spaced circumferential positions thereabout so as to form a plurality of jacket portions, the edges along the line of division of each pair of adjacent jacket portions maintained in overlapping and resilient abutting relationship with each other, the overlapping relationship maintained by the resiliency of the abutting jacket portions;
b. a plurality of longitudinally extending flanges, one for each jacket portion, each flange having an outer edge connected to the inner surface of the cooperating jacket portion between the edges thereof and extending in a substantially radial direction therefrom, each flange furthermore having an inner edge connected to the outer surface of said pipe, said flanges dividing the annular space into a plurality of longitudinally extending compartments, one between each pair of adjacent flanges;
c. said overlapping edges of each pair of adjacent jacket portions being resiliently separable by the pressure exerted by a means inserted therebetween for introducing insulation into said compartments.

3,889,716
REINFORCED FLEXIBLE HOSES AND THEIR MANUFACTURE

Georg Linhart, Ober-Wollstadt, Germany, assignor to Techn-Chemie Kessler & Co. GmbH, Frankfurt, Germany

Filed Sept. 21, 1973, Ser. No. 399,434
Claims priority, application Germany, Sept. 28, 1972, 2247554
Int. Cl. F16l *11/00*
U.S. Cl. 138—129 **4 Claims**

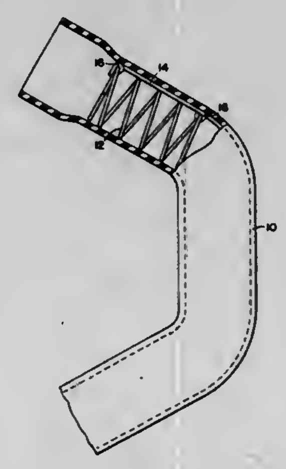


1. A reinforced flexible hose comprising:
a helically wound form-retaining flexible support coil; an inner hose layer consisting of a flexible ribbon helically wound about the convolutions of said coil, lengthwise marginal portions of said ribbon overlapping each other in juxtaposition with underlying convolutions of the coil; and an outer hose layer consisting of a second flexible ribbon helically wound about the inner layer in the same winding direction as the first ribbon, the lengthwise marginal portions of the second ribbon also overlapping each other in juxtaposition with the underlying coil convolutions, the portions of the ribbons intermediate the overlapping marginal portions thereof being disposed in substantially parallel relationship between adjacent coil convolutions, the overlapping marginal portions of the first ribbon being bonded to each other and to the underlying coil convolutions and the overlapping marginal portions of the second ribbon being bonded to each other and only to the underlying overlapping portions of the first ribbon.

3,889,717
REINFORCED FLEXIBLE TUBE

Richard Dick Obadal, Cedar Falls, and William David Loynachan, Reinbeck, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 14, 1973, Ser. No. 424,865
Int. Cl. F16l *11/00, 11/10*
U.S. Cl. 138—131 **7 Claims**

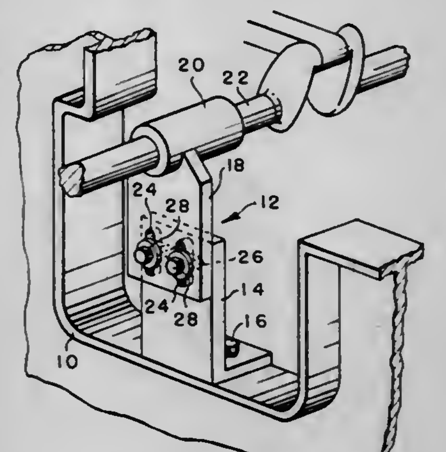


1. A tube of flexible material and a helical member disposed lengthwise within the tube and of material stiffer than the tube so as to reinforce the tube against radially inward collapse, characterized in that the member is freely disposed within the tube so as to be capable of being readily inserted into and withdrawn from the tube, and an elongated element relatively resistant to lengthwise compression and disposed within the tube and running lengthwise of the tube and member and attached to the member at lengthwise spaced-apart intervals to minimize axial migration of the member within and relative to the tube.

3,889,718
LOOM CRANKSHAFT SUPPORT

Joe T. Owings, Belton, and Sarden B. Martin, Williamstown, both of S.C., assignors to Deering Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 358,857, May 10, 1973, abandoned. This application Sept. 3, 1974, Ser. No. 502,845
Int. Cl. D03d *49/02*
U.S. Cl. 139—1 R **1 Claim**

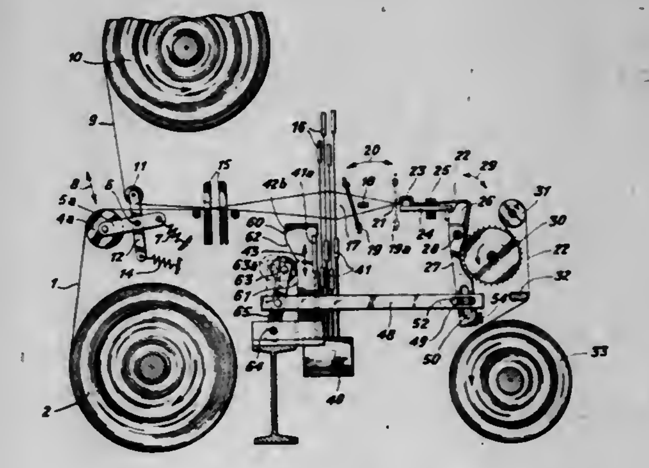


1. A loom crankshaft arrangement comprising: a loom frame, a first vertical support member having a horizontal slot and attached to said frame, a second vertical support member having a plurality of vertical slots through which it is adjustably connected to said first vertical support member at said horizontal slot, a sleeve bearing integrally connected to and supported on the top of said second vertical support member and a loom crankshaft projecting through said sleeve bearing.

3,889,719
WEAVING MACHINE FOR PRODUCING TERRY CLOTH

Eberhard Seifert, Sulz-Attikon, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed May 22, 1973, Ser. No. 362,812
Claims priority, application Switzerland, May 23, 1972, 7575/72
Int. Cl.² D03D *39/22*
U.S. Cl. 139—25 **12 Claims**



1. In a weaving machine for producing terry cloth having a plurality of shafts for forming a shed from warp yarns, a reed for beating a weft yarn with the shed into a cloth at a shed apex, first means for producing a periodic reciprocation of the cloth and shed apex between a partial beating-up position and

a full beating-up position relative to a front reversal position of said reed and an actuating means for individually moving said shafts to form a shed; a drive means connected between said actuating means and said first means for driving said first means from said actuating means, said drive means including a transmission means for selectively varying the duration of the periodic reciprocation of the cloth and shed apex relative to the motion of said shafts.

3,889,720
HEALD MACHINE

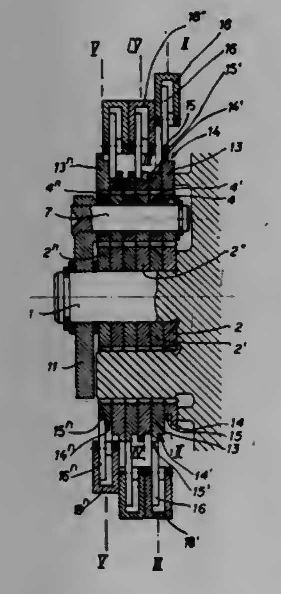
Allan William Henry Porter, Lustmuhle, Switzerland, assignor to Aktiengesellschaft Adolph Saurer, Switzerland

Filed Jan. 24, 1974, Ser. No. 436,388

Claims priority, application Switzerland, Jan. 25, 1973, 1053/73

Int. Cl.² D03C *1/00*; D03C *1/12*; D03C *5/00*

U.S. Cl. 139—66 R **6 Claims**



1. A loom dobby, for use in a loom having heald shafts, comprising, in combination, plural planetary gearings; a planet carrier; means mounting said planet carrier for oscillatory motion; means connected to said planet carrier and operable to impart oscillatory motion thereto; at least one planet gear shaft secured on said planet carrier; each planetary gearing including a respective planet gear mounted for free rotation on said planet gear shaft, a respective sun gear meshing with the associated planet gear, and a respective ring gear meshing with the associated planet gear; means mounting each sun gear and ring gear for free rotation; respective holding means operatively associated with each sun gear and its associated ring gear and selectively operable to hold one of the associated sun gear and ring gear stationary at least substantially at the same time as the direction of motion of said planet carrier is reversed; and means operatively engaged with each ring gear and operable, responsive to oscillatory motion of the associated ring gear, to impart a substantially reciprocatory motion to a respective heald shaft.

3,889,721
INTERMEDIATE CONNECTOR FOR HEDDLE SUPPORTING BEAM

Theodor Wagner, Heppstr. 149, Reutlingen-Betzingen, Germany

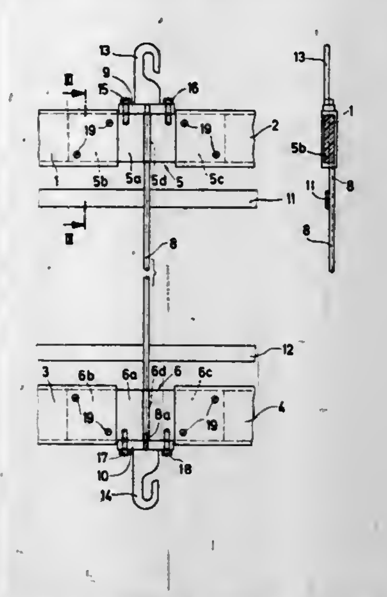
Filed Jan. 2, 1974, Ser. No. 430,035

Claims priority, application Germany, Jan. 4, 1973, 7300227

Int. Cl. D03c *9/06*

U.S. Cl. 139—91 **5 Claims**

1. In a heddle frame arrangement having two spaced parallel hollow beams connected together by end stays and by cross rods intermediate the end stays, the ends of said cross rods being connected to plate-like supporting members secured to said hollow beams, an improved connecting means comprising a stiffening and strengthening insert disposed inside at least a first one of the hollow beams at the connecting place of the associated supporting member, said supporting member being secured to the outer wall of said first beam, the associated cross rod extending completely through said first beam and said insert.



3,889,722
BRAKING AND DRIVING DEVICE FOR THE SHUTTLE OF A WEAVING LOOM

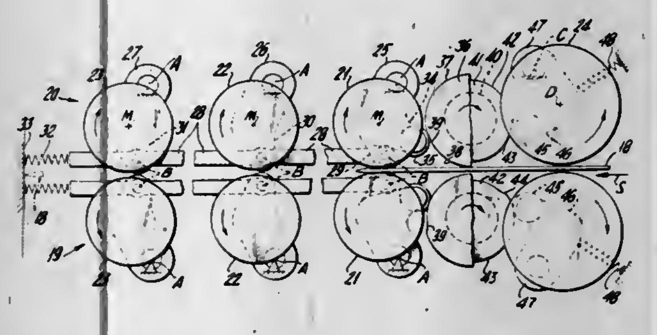
Allan William Henry Porter, Lustmuhle, Ar, Switzerland, assignor to Aktiengesellschaft Adolph Saurer, Switzerland

Continuation-in-part of Ser. No. 375,867, July 2, 1973, abandoned. This application Dec. 13, 1973, Ser. No. 424,543

Claims priority, application Switzerland, Sept. 4, 1972, 12991/72; Aug. 22, 1973, 11426/73

Int. Cl. D03d *49/24*, *49/54*

U.S. Cl. 139—142 **10 Claims**



1. In a braking and driving device, for the shuttle of a weaving loom, of the type including a plurality of driven pulleys arranged consecutively in the shuttle movement direction with at least those pulleys serving to brake the shuttle being selectively movable into a working position, in which they cooperate with a shuttle moving in a shuttle guide box, and into an inoperative position and being driven at respective peripheral speeds which decrease in the direction of shuttle movement when braked, the improvement comprising, in combination, means mounting at least those pulleys serving to brake the shuttle for conjoint displacement in a plane transverse to the pulley axes; and means biasing at least those pulleys serving to brake the shuttle toward the shuttle guide box; the respective distances between the peripheries of the braking pulleys and the shuttle path decreasing in the direction of shuttle movement when braked, with the greatest of such distances, when the peripheries of the braking pulleys are not engaged with a shuttle, being not in excess of the thickness of the shuttle, whereby said braking pulleys are successively disengaged from the shuttle solely by engagement of the shuttle with the next succeeding braking pulley.

3,889,723
WEAVING MACHINE COMPRISING SHUTTLE BRAKING MEANS

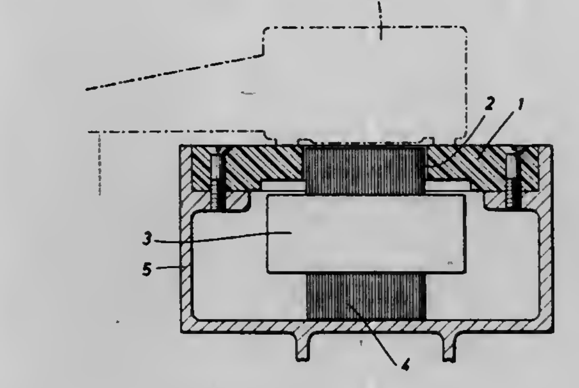
Walther Filter, Langenhagen, Germany, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Vienna, Austria and Etablissement Wanderfield & Co., Schaan, Liechtenstein

Filed June 24, 1974, Ser. No. 482,801

Claims priority, application Austria, July 6, 1973, 5956/73

Int. Cl.² D03D *49/54*

U.S. Cl. 139—186 **5 Claims**



1. A weaving machine, which comprises
a shuttle race,
a vertical guide, which opens upwardly through said race,
a shuttle consisting at least in part of ferromagnetic material and movable along said shuttle race and over said guide, and
a solenoid, which is freely slidably movable upwardly in said guide from an initial position adjacent to said shuttle race into engagement with said shuttle when disposed over said guide, and which is energizable to have a predetermined range of action, which extends above said shuttle race,
said weaving machine, except for said shuttle and solenoid, being free of ferromagnetic parts in said range of action of said solenoid.

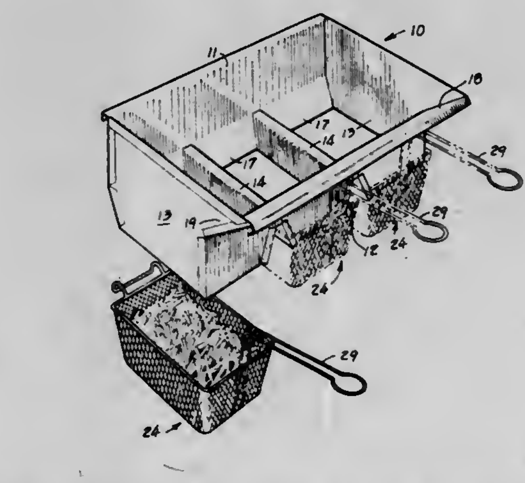
3,889,724
PLURAL APERTURE DISPENSER

Donald L. Anthony, 731 Crossbrook Dr., Moraga, Calif. 94556

Filed Oct. 3, 1973, Ser. No. 403,203

Int. Cl. B65b *1/04*

U.S. Cl. 141—1 **8 Claims**



1. Plural aperture dispensing means for dispensing frozen uncooked sliced potatoes into fry baskets disposed on a multitier french fry storage rack, comprising:
- a. a vertical, planar front panel having a lower portion inwardly converging at an angle from the vertical, thereby providing a lower angled surface for deflecting the potatoes into the corners of a plurality of fry baskets;
- b. a vertical, planar back panel having an outwardly diverging upper portion at an angle from the vertical;
- c. two vertical, planar end panels each having flanges corresponding to the outwardly diverging upper portion of said back panel, said front panel, back panel and end panels being serially joined to form the peripheral wall of said dispensing means; and,
- d. a plurality of V-shaped partitions disposed between said front panel and said back panel to form a plurality of generally rectangular compartments within said peripheral wall whereby at least one side of each compartment is inwardly converging, said V-shaped partitions being further disposed with the apex of the partition uppermost, whereby the width of the bottom of each compartment is substantially smaller than the width of the top of each compartment.

3,889,725
METHOD OF FILLING BEER CANS OR THE LIKE

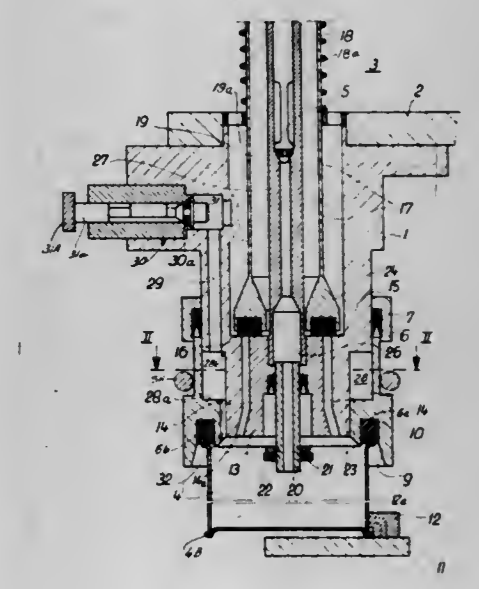
Friedrich Rademacher, Kamen; Karl Quest, Dortmund; Uwe Knabe, Dortmund-Hombruch; Dieter Unger, Waltrop; Heinz Jordan, Dortmund-Korne; Werner Heckmann, Dortmund, and Karl Plock, Dortmund-Lucklemberg, all of Germany, assignors to Holstein & Kappert Maschinenfabrik Phonix GmbH, Dortmund, Germany

Filed Jan. 8, 1974, Ser. No. 433,511

Claims priority, application Germany, Aug. 29, 1970, 2042990; Apr. 17, 1971, 7115418; Apr. 27, 1971, 2120544; May 10, 1971, 2123866; May 10, 1971, 2123865; May 22, 1971, 2126113; May 21, 1971, 2126099

Int. Cl. B65b *3/04*

U.S. Cl. 141—5 **4 Claims**



1. A method of filling cans or analogous containers with liquids, comprising the steps of placing the mouth of an empty container into sealing engagement with a gasket; raising the pressure in the thus sealed container by admitting into the container a compressed gas; introducing into the container a metered quantity of liquid by gravity flow; and thereupon raising the pressure in the filled container above the body of liquid therein to promote the separation of the mouth from the gasket.

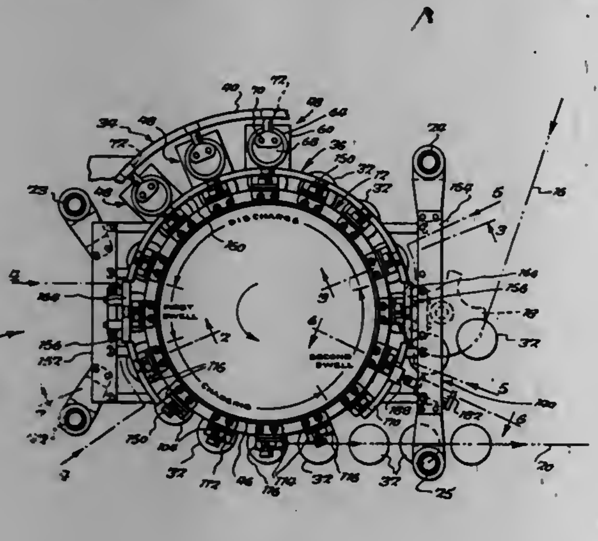
3,889,726
CONTAINER FILLING MACHINE

Joseph T. Stigler, Rochester, N.Y., assignor to Rostgo International Corporation, Tonawanda, N.Y.

Continuation-in-part of Ser. No. 358,851, May 10, 1973, Pat. No. 3,841,363, which is a continuation of Ser. No. 214,073, Dec. 30, 1971, abandoned. This application Dec. 19, 1973, Ser. No. 426,138

Int. Cl. B65b *57/02*

U.S. Cl. 141—142 **2 Claims**



1. In a rotary type container filling machine having a tank for storing flowable product to be dispensed by a plurality of dispensing units spaced annularly of said tank, each said dispensing unit including pump means, valve means and discharge means, said valve means having a first condition for placing its associated pump means in a flow communication with said tank during a pump means charging portion of the operational cycle of the machine whereby to permit said pump means to withdraw a charge of product from said tank and having a second condition for placing its associated pump means in flow communication with its associated product discharge means during a pump means discharge-container filling portion of said operational cycle whereby to permit said pump means to discharge said charge of product through said discharge means, means for moving said dispensing units in association with containers to be filled during said operational cycle, and means for disabling said valve means whereby to prevent said valve means from placing said pump means in flow communication with said product discharge means when no container is positioned for receipt of said charge of product from said discharge means during said pump means discharge-container filling portion of said operational cycle, the improvement comprising in combination:

each said valve means is mounted exteriorly of said tank and includes a valve seat portion and a valve stem portion, said valve stem portion having a lower end thereof slideably supported within said valve seat portion for free vertical reciprocating movements relative thereto between lower and upper positions in which said valve means is in said first and second conditions, respectively, an upper end of each said valve stem portion having a side opening notch;

a plurality of guide blocks spaced annularly of said tank in association one with each of said dispensing units, each of said guide blocks being fixed to said tank in a relatively spaced relationship vertically above its associated valve seat portion;

a plurality of carrier blocks associated one within each of said guide blocks and being supported thereby for free vertical reciprocating movements while being constrained against relative rotary movements relative thereto, each of said carrier blocks supporting said upper end of its associated valve stem portion for free vertical reciprocating movements while constraining said upper end against relative rotary movements relative thereto;

a plurality of latch devices carried one by each of said carrier blocks for normally coupling said upper end to its associated carrier block for conjunctive vertical movements therewith, each of said latch devices including a latch follower member, a stop lug, a shaft for mounting said latch follower member and said stop lug on said carrier block for conjunctive vertical pivotal movements about an essentially horizontally disposed pivot axis, said latch follower member having a normal constraining pivotal position wherein said stop lug is positioned within said notch of said upper end of its associated valve stem portion for coupling said upper end to its associated carrier block and having a release pivotal position wherein said stop lug is removed from within said notch for uncoupling said upper end from its associated carrier block, said latch follower member having upper and lower portions;

means for imparting vertical reciprocating movements to said carrier blocks between raised and lowered positions during each said operational cycle whereby when said upper end is coupled to its associated carrier block said lower end of said valve stem portion is forced to move between said upper and lower positions, said movement imparting means including a plurality of follower rollers fixed one to each of said carrier blocks and a stationary cam track means engageable by said follower rollers during each said operational cycle; and

said disabling means includes cam means cooperating with said upper portion of each said latch follower member for normally maintaining same in said normal constraining pivotal position during each operational cycle of said machine, and means for moving said cam means into engagement with said lower surface portion of each said latch follower member to move same into said release pivotal position only when said lower end of its associated valve stem portion is in said lower position and its associated carrier block is in said lowered position and no container is positioned for receipt of said charge of product from its associated discharge means.

3,889,727
FITTING DEVICE

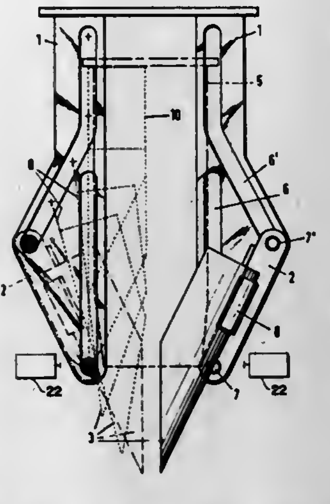
Willem Krul, Rotterdam, Netherlands, assignor to Halk B.V., Rotterdam, Netherlands

Filed Sept. 28, 1973, Ser. No. 401,713

Claims priority, application Netherlands, Sept. 29, 1972, 7213194

Int. Cl. B65b *1/04, 3/04*

U.S. Cl. 141—312 **4 Claims**



1. A filling machine for filling valve bags with quantities of materials, comprising

a vertically disposed filling tube having a nozzle piece at the lower end thereof,

a pair of guide shells disposed oppositely on either side of said nozzle piece, each guide shell partly encircling said nozzle piece, and

guide shell mounting means for guiding said guide shells in a movement that is both vertical and pivotal between a lower position wherein said shells are inclined relative to each other with their lower ends converging below said filling tube nozzle, and an upper position wherein said shells are in spaced, substantially parallel relation to each other and to said filling tube and closely encircle said tube.

3,889,728
MARINE LOADING ARM FOR BUNKERING VESSELS

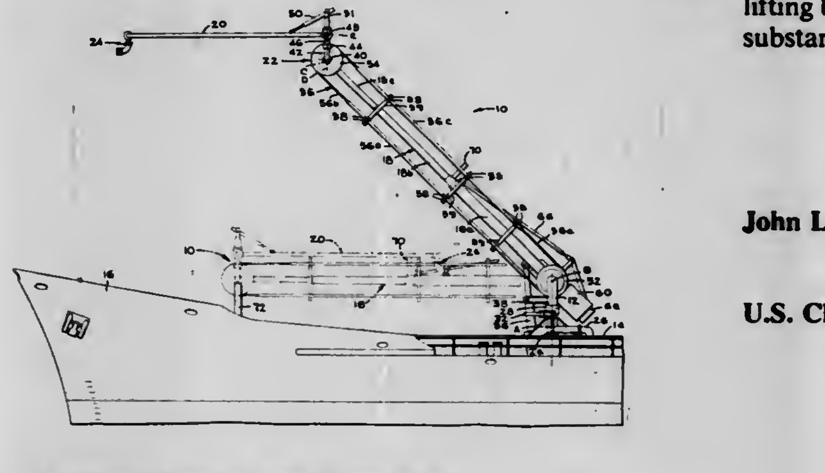
Robert M. Riche, Sens, France, assignor to Societe Technique et Commercial d'Installations Industrielles "Luceat", Sens, France

Filed Apr. 23, 1973, Ser. No. 353,843

Claims priority, application France, Apr. 28, 1972, 72.15421

Int. Cl. B65b *3/04;* **B65g** *67/00*

U.S. Cl. 141—387 **12 Claims**



1. A tubular loading arm comprising:

a riser,

an inboard arm section mounted on the riser for pivotal movement in a generally vertical plane about a generally horizontal axis through the riser,

an outboard arm section, and

means pivotally interconnecting the inboard and outboard arm sections having three pivot axes, whereby the outboard section can be pivoted with respect to the inboard section in both a generally horizontal direction and a generally vertical direction independent of movement of said inboard section, and the outboard section can be moved between a forwardly extending operational attitude and a rearwardly extending stowed attitude wherein the outboard section generally overlies the inboard section and extends toward the riser.

3,889,729
TREE HARVESTING MACHINE

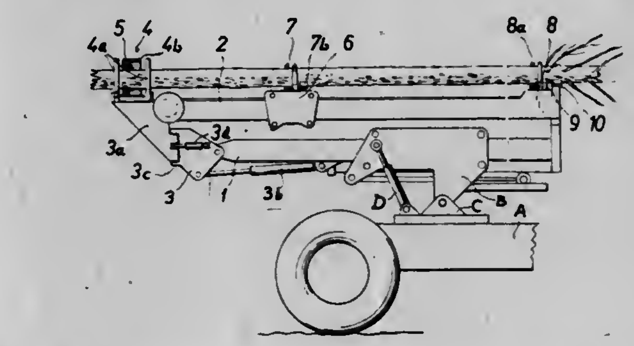
Skarl E. Pinomaki, 39160 Julkujarvi, Finland

Filed Nov. 8, 1973, Ser. No. 413,981

Claims priority, application Finland, Nov. 9, 1972, 3125/72

Int. Cl. B27c *9/00*

U.S. Cl. 144—3 D **10 Claims**



1. A tree harvesting machine, for felling and delimbing trees, cutting them into logs of fixed lengths, assorting and stacking the resulting logs; comprising, in combination: a longitudinally movable lifting and moving boom tiltably mounted on a vehicle provided with a driving machinery; a working boom articulated to one end of said lifting boom, tiltably attached and pivotable about two substantially perpendicular axes; means for gripping and cutting off a tree, including a cutting-off tool mounted transversally to the longitudinal direction of said working boom, on a support fastened as the front end of said working boom, and being in operative connection with the latter; a movable, first delimbing attachment having tools,, slidable by way of a tool carriage with guides along said working boom; said delimbing tools being arranged to clamp the tree during the movement of said carriage; a stationary, second delimbing attachment having tools, attached to the other end of one of said booms; wherein said second delimbing attachment is mounted on the other end of said lifting boom, said working boom is somewhat shorter than said lifting boom, and said second delimbing attachment is actuable on the tree when said booms are in a substantially parallel position; and support means at said other end of the lifting boom for the free end of said working boom when in the substantially parallel position.

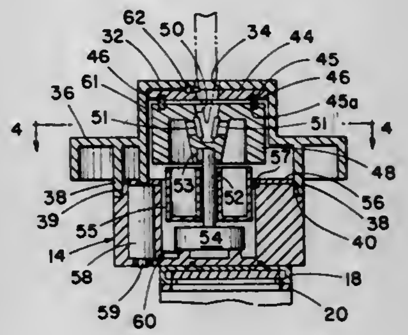
3,889,730
PENCIL SHARPENER

John L. Buc, 144 Third Ave., Des Plaines, Ill. 60018

Filed Jan. 10, 1974, Ser. No. 432,249

Int. Cl. B43l *23/02*

U.S. Cl. 144—28.5 **6 Claims**

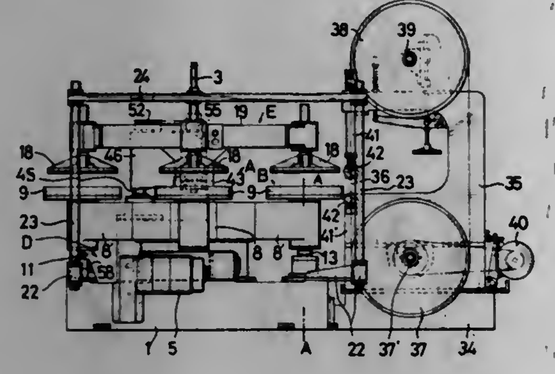


1. A pencil sharpener adapted to receive a blunted writing instrument and automatically form a sharpened point thereon, and the sharpener includes an electrically powered drive motor and power delivery means for driving said motor and said sharpener having a housing including a cover and a connected body portion, the improvement comprising:

an opening in the cover for insertion of a writing instrument and sharpening means being aligned with said opening, switch means being mounted adjacent said opening and having electrical connecting means coupled with both the power delivery means and the motor, and further, said switch means including sensing means extending into the sharpener for controlling operation of said drive motor, said sharpening means including a cutting head member comprising an outer cylindrical portion and an inner cutting portion including an aperture adapted to receive the writing instrument, a top plate between the cutting head member and said cover, said motor being mounted in said body portion and having a drive shaft coupled to said cutting member, and a ring shaped alignment bushing being positioned in aligned grooves of both the top plate and the cutting head member and thereby providing smooth concentric rotation of said cutting head member.

3,889,731
MACHINE FOR PRODUCING CIRCULAR PRODUCTS

Suzuki Sempei, Hamamatsu, Japan, assignor to Suntory Limited, Osaka, Japan
Filed Mar. 11, 1974, Ser. No. 450,150
Claims priority, application Japan, Mar. 13, 1973, 48-29246
Int. Cl. B27h *3/04*
U.S. Cl. 147—36 **8 Claims**

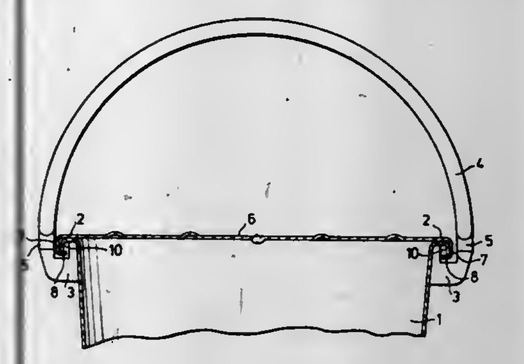


1. A machine for producing circular products comprising a base having a blank feeding station, a blank sawing station, a blank chamfering station and a blank positioning station which are positioned on said base in a circumferentially spaced relationship, a vertically extending main drive shaft intermittently rotatably mounted on said base, blank support means fixedly mounted on said main drive shaft and having a plurality of equally spaced support discs, a blank holding-down means fixedly mounted on said main drive shaft above said blank support means and having a plurality of spaced blank holding-down members in opposition to said support discs, respectively and adapted to hold blanks in cooperation with their respective associated ones of said support discs, said holding-down members and support discs being adapted to be in succession disposed in said feeding, sawing, chamfering and positioning stations, vertically movable rotation transmission means positioned in each of said sawing and chamfering stations for engaging each of said blank support discs to transfer rotation to the support disc when the support disc is disposed in each of the sawing and chamfering stations, a rotational band saw positioned in said sawing station for sawing engagement with a blank held by the holding-down member and associated support disc when the member and disc are disposed in the sawing station, a rotational chamfering cutter positioned in said chamfering position for chamfering engagement with the sawn blank from said sawing station when the holding-down member and support disc holding the sawn blank therebetween are disposed in the chamfering station and detent means positioned in said positioning station to engage the holding-down and support disc in said positioning station so as to stop the movement of said holding-down and support discs disposed in the feeding, sawing, chamfering and positioning to thereby allow said band saw and cutter to perform their sawing and chamfering operations on the blanks positioned in these stations.

3,889,732
PLASTIC CONTAINERS

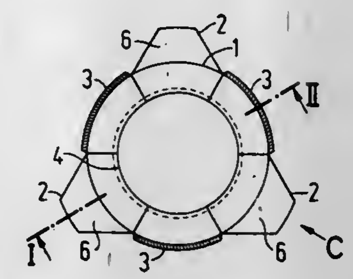
John B. Wilkins, Stenalees, St. Austell, Cornwall, England
Filed Oct. 11, 1973, Ser. No. 405,459
Claims priority, application United Kingdom, Oct. 18, 1972, 47909/72
Int. Cl. B65d *1/00*
U.S. Cl. 150—48 **6 Claims**

1. A container comprising a molded plastic body having an open end formed with an outwardly projecting peripheral lip; at least one plastic handle molded integrally with said body; integrally formed outwardly projecting lugs disposed on opposite sides of the body; plastic ligament hinge portions molded integrally with said lugs and with said at least one handle, said hinge portions being spaced outwardly from said lip, and said at least one handle having a shape conforming to part of said lip, and being movable about said hinge portions between an inoperative position at one side of the container body and an operative, carrying, position extending across the open end of the container body, and a lid having a peripheral flange which fits over the lip of the body, each handle-supporting lug being formed with a recess facing towards the open end of the container body and adapted to accommodate the flange of the container lid when the latter is fitted.



3,889,733
SCREW-THREADED FASTENING MEMBERS

Kajetan Leitner, 18 Am Winacker, Bad Tolz D-817, Germany
Filed Nov. 28, 1973, Ser. No. 419,664
Claims priority, application Austria, Dec. 1, 1972, 10250/72
Int. Cl. F16b *39/00*
U.S. Cl. 151—41.73 **6 Claims**



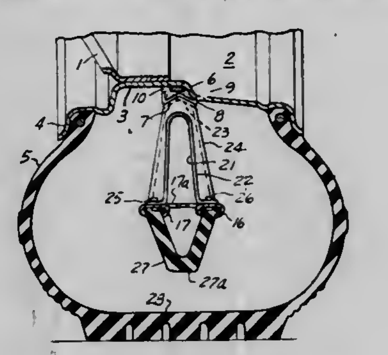
1. A screw-threaded fastening member, to be mounted in a bore in a structural part, comprising a nut having a substantially cylindrical body from one end of which is formed at least two radially extending base projections the upper surfaces of which are in a common transverse plane, a crown portion of said substantially cylindrical body projecting axially above said plane, at least two conical sectors being formed from said crown portion and alternating angularly with said base projections so as not to overlap therewith around said nut, and said conical sectors having radially projecting underledges spaced axially from said plane and forming with said upper surfaces of said base projections in effect a circumferential groove about the crown portion, the groove which has opposed side portions formed by the underledges of the conical sectors and the upper surfaces of the base projections circumferentially alternating about the groove.

3,889,734
SAFETY WHEEL

Peter Owsen, Livonia, Mich., assignor to Ridonia Wheel, Inc., Livonia, Mich.
Filed Oct. 4, 1973, Ser. No. 403,479
Int. Cl. B60c *17/04*
U.S. Cl. 152—158 **36 Claims**

1. A safety wheel for a vehicle, said wheel having a rim to mount a tubeless tire,

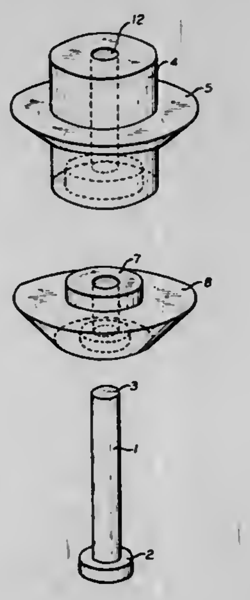
an annular track carried by said rim,
an annular ring spaced outwardly from and having an approximately concentric relationship with said track,
a plurality of spacers disposed between said track and said ring to maintain said relationship,
a radially, inner end portion of each spacer terminating in an inner end wall, said inner end wall being slidably received by said track,
a pair of opposed, spaced apart side walls extending from each said inner end wall to said ring, to help support the load on said wheel,
reinforcing means disposed between said side walls to increase the load bearing capacity of each spacer,



a radially, outer end portion of each spacer being secured to said ring,
said ring having an outer circumferential surface, and
an annular supplemental tire mounted upon said circumferential surface, so as to be within the annular chamber formed by a tubeless tire,
said supplemental tire having a circumferentially extending, load bearing surface, normally spaced from the inner surface of the tread area of an inflated tubeless tire, and being engageable upon said inner surface in free rolling contact therewith, if a tubeless tire is deflated, whereon said supplemental tire, said ring, said spacers, and said track support the load placed upon said wheel.

3,889,735
VEHICLE-TIRE STUD WITH RELATIVELY MOVABLE PARTS

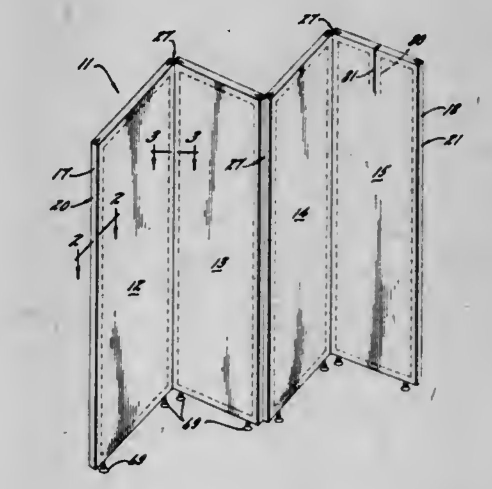
Martti Salakari, 21500 Piikkio, Finland
Filed Nov. 27, 1973, Ser. No. 419,347
Claims priority, application Finland, Nov. 28, 1972, 3354/72
Int. Cl. B60c *11/00*
U.S. Cl. 152—210 **5 Claims**



1. A stud for a vehicle-tire comprising:
a wear-resistant central member;
a pair of sleeve members surrounding said central member, said members being received in a tire, said sleeve members including an outer sleeve member flush with a wearing surface of the tire and an inner sleeve member embedded therein, said sleeve members being relatively displaceable with respect to each other and said central member being displaceable relative to said sleeve member and having a head adapted to project outwardly beyond said outer sleeve member, said inner sleeve member having a central hole receiving said central member and provided with a small and low swelling to hold said members together until said members are inserted in said tire.

3,889,736
DISPLAY SCREEN FOR EXHIBITS AND THE LIKE

Robert Firks, Deerfield, Ill., assignor to Firks Exhibitions, Inc., Chicago, Ill.
Filed May 18, 1973, Ser. No. 361,795
Int. Cl.^{2} A47G *5/00*
U.S. Cl. 160—135 **6 Claims**

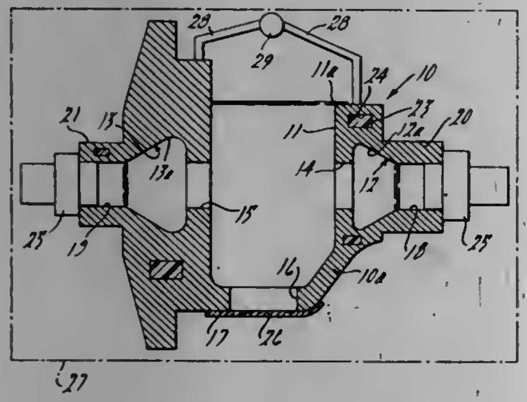


1. A multiple panel display screen comprising a plurality of panels hingedly joined together with detachable hinge strips and having moulding strips on the terminal edges of said screen, each of said panels comprising:

1. a rectangular wooden frame and a pair of thin structural sheets on the two broad opposite faces of said frame,
    a. said frame having a pair of grooves along substantially the entire length of two opposite edges of said frame,
    b. said grooves each having a shallow wide upper portion and a deep narrow portion,
2. extruded plastic retainer strips imbedded and secured in each of said grooves along substantially the entire length,
    a. said retainer strips each having a longitudinally extending access channel leading to a longitudinally extending undercut channel,
3. adjoining edges of said panels being hingedly joined together with a removeable, extruded plastic, hinge strip comprising a pair of similar hinge members each of generally T-shaped cross section,
    a. the top bar of said T being substantially the thickness of said panel, and being generally flat when said hinge strip is in said retainer strips,
    b. said members being integrally joined by a thin bridge portion along adjacent edges of the T's.
    c. each of said hinge members including a short central web and an integral bead,
    d. the webs being receivable in the access channels of said extruded plastic retainer strips and the beads being receivable in said undercut channel, and
4. removeable, extruded plastic moulding strips covering external edges of said panel,
    a. said moulding strips being of generally T-shaped cross section and including a cross-strip and a central strip,
    b. the top bar of said T being substantially the thickness of said panel,
    c. the central strip including a short central web and an integral bead, and

d. the web being receivable in said access channel and the bead being receivable in said undercut channel so that said cross strip is resiliently urged against the external edges of said panel to provide a permanent-appearing edge, said retainer strips and said moulding strip being interchangeable to provide for addition or removal of panels to said screen.

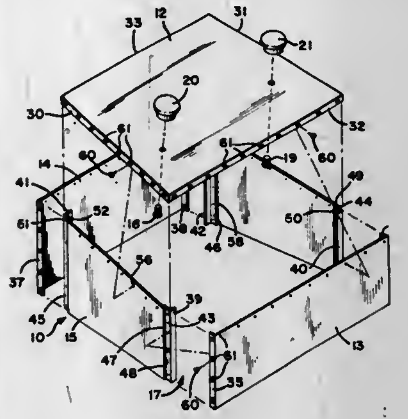
3,889,737
DRY SAND CORE PROCESS FOR USE WITH LOST FOAM MOLDING PROCESS
Ralph A. Olsen, Grosse Pointe Woods, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Jan. 4, 1974, Ser. No. 430,973
Int. Cl. B22c *9/04*
U.S. Cl. 164—34 **9 Claims**



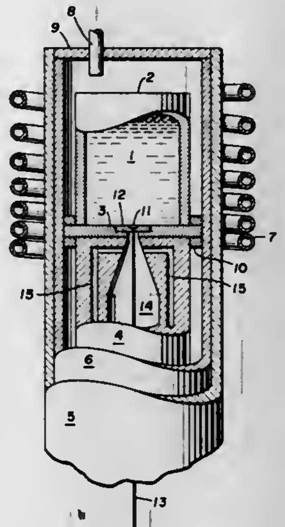
1. A method of forming metallic castings, comprising:
a. prepare a pattern from material which is combustible substantially without residue upon contact with molten metal, define said pattern with a remote internal cavity and a plurality of openings passing through the walls of said pattern to communicate with said cavity,
b. close off all except one of said openings substantially with refractory material either in the rigid form or loose particulate form supported by a thin consumable membrane,
c. locate said pattern in a molding apparatus,
d. fill said pattern with dry unbonded sand through said opening either simultaneously with filling of said apparatus with dry unbonded sand or prior to the filling of said apparatus with dry unbonded sand, compact said sand both within and about said pattern to achieve a density of at least 50–70%, and
e. introduce molten metal to pattern to displace said material.

3,889,738
FIREPLACE EXTINGUISHER
John R. Murphy, Simms Bldg., Dayton, Ohio 45402
Filed Dec. 17, 1973, Ser. No. 425,492
Int. Cl. A62c *33/00*
U.S. Cl. 169—49 **11 Claims**

1. A fire extinguisher of the type described, adapted to extinguish fires in a fireplace, including glowing embers, burning logs, and the like, comprising generally quadrilaterally shaped top, front, back and side panels, said panels possessing flange means for detachably interconnecting said panels, said front and back and said side panels being generally opposed, extending from the peripheral edges of said top panel, and forming in combination with said top panel an airtight chamber which, when placed over and enclosing a fire, prevents further combustion and extinguishes said fire, and said flanges being joined to one another by fastener means whereby said chamber is readily assembled for use and readily disassembled for storage or shipment.



3,889,739
PRESSURIZED NITROGEN TO EXTRUDE MOLTEN STEEL-SILICON ALLOY
Lawrence F. Rakestraw, Raleigh, N.C., assignor to Monsanto Company, St. Louis, Mo.
Filed Nov. 12, 1973, Ser. No. 415,030
Int. Cl. B22d *11/12*
U.S. Cl. 164—82 **2 Claims**

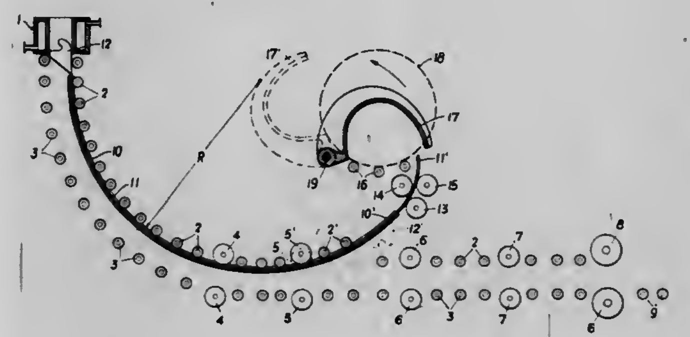


1. In the method for producing fine diameter wire from the melt of a steel-silicon alloy having a silicon concentration of from about 0.5 to 5.0 percent by weight based on the weight of the alloy, wherein a positive head pressure is provided over the melt to force the molten alloy through an orifice and into a film-forming oxygen-containing atmosphere as a free-streaming jet wherein a stabilizing film is formed about the peripheral surface of said jet, the improvement which comprises: effecting said positive head pressure over the melt by means of nitrogen gas under pressure.

3,889,740
CONTINUOUS CASTING PLANT
Bruno Tarmann, and Johann Knorr, both of Kapfenberg, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Austria
Filed July 5, 1973, Ser. No. 376,736
Claims priority, application Austria, Jan. 12, 1973, 248/73
Int. Cl. B22d *11/08*
U.S. Cl. 164—274 **8 Claims**

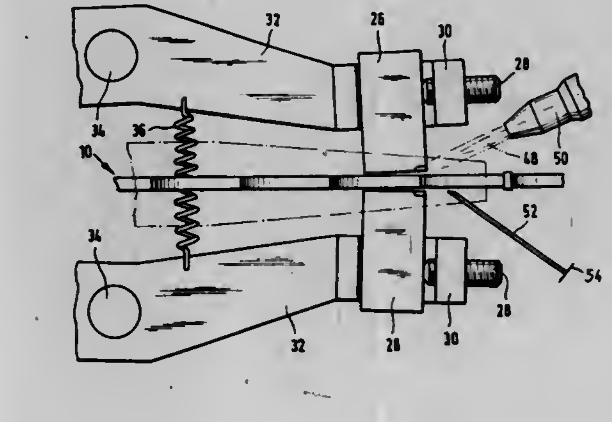
1. A continuous casting plant comprising:
a. a water-cooled mould;

b. means extending from the mould for supporting and guiding a cast bar;
c. a dummy bar adapted to be connected at one end to a dummy head that is insertable into the mould to close an end of the mould, the dummy bar being composed exclusively of a flexible, elastically shapeable steel tape without articulated joints and having a thickness that is generally



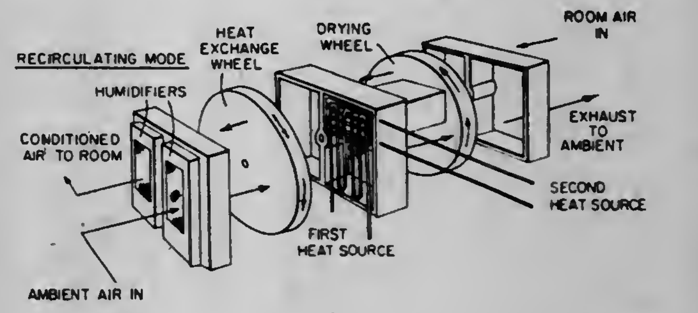
constant along the length of the dummy bar and that is substantially smaller than the thickness of the smallest continuous bar to be cast in the plant; and
d. means extending from the mould for guiding the dummy bar, the guiding means being adapted to engage side margins of the dummy bar and to enclose at least one of said side margins.

3,889,741
APPARATUS FOR HARD FACING SAW BLADE TEETH
Otto Stier, Biberach an der Riss, and Heinz Kuhn, Mettenberg, both of Germany, assignors to Vollmer Werke Maschinenfabrik GmbH, Germany
Filed Apr. 26, 1974, Ser. No. 464,316
Claims priority, application Germany, Apr. 26, 1973, 2321161
Int. Cl. B22d *19/06*
U.S. Cl. 164—332 **16 Claims**



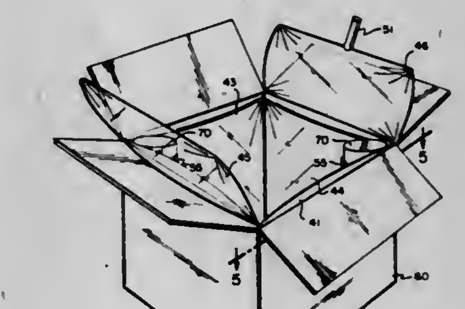
1. An apparatus for the application of a hard facing alloy to the teeth of saw blades which comprises a pair of side mold members arranged to straddle the sides of a saw blade, a movable stop member spearate from said side mold members arranged to successively engage the leading edges of saw teeth to aligh each successive tooth with the side mold members and to shape the leading edge of hard facing material deposited on the tooth, means for shifting the side mold members between open positions away from the saw blade and into closed positions forming mold cavities on opposite sides of a saw tooth to be hard faced, and said stop member having a shaping surface selectively closing the front ends of the mold cavities to cooperate therewith for shaping an alloy deposited on the tooth.

3,889,742
AIR CONDITIONING APPARATUS AND METHOD
William F. Rush, Arlington Heights; Jaroslav Wurm, North Riverside, and Raymond J. Dufour, Wheaton, all of Ill., assignors to Gas Developments Corporation, Chicago, Ill.
Filed Nov. 13, 1973, Ser. No. 415,323
Int. Cl. F23l *15/02*
U.S. Cl. 165—7 **10 Claims**



1. An open-cycle air conditioning apparatus for heating and cooling comprising:
an enclosure defining a treatment air passageway and a separate regenerative air passageway;
means for passing an air stream through each of said passageways;
a sensible heat exchanger means for transfer of thermal energy from one of said passageways to the other;
a desiccant means for transfer of moisture from the air treatment passageway to the regenerative air passageway and spaced toward the exhaust of the regenerative air stream from said heat exchanger means;
a first evaporative cooling means near the exit of the conditioned air passageway and a second evaporative cooling means near the entrance of the regenerative air passageway;
a low-temperature heater means in the regenerative air passageway between said sensible heat exchanger means and said desiccant means supplying heat to the entire regenerative air stream;
a high-temperature heater means in the regenerative air passageway between said low-temperature heater means and said desiccant means supplying regeneration heat to a portion of the regenerative air stream; and
a baffling means defining a passageway for said portion of the regenerative air stream through said high-temperature heater means and said desiccant means.

3,889,743
INFLATABLE INSULATION FOR PACKAGING
Michael C. Presnick, c/o Metatronics Manufacturing Corp. 111 Bloomingdale Rd., Hicksville, N.Y. 11801
Division of Ser. No. 124,717, March 16, 1971, Pat. No. 3,730,240. This application Jan. 2, 1973, Ser. No. 320,453
Int. Cl. F28f *7/00*
U.S. Cl. 165—46 **2 Claims**



1. A rigid package comprising

a. a rigid parallelepiped corrugated container having six planar walls;
b. a substantially inelastic liner means of thermoplastic material including a plurality of articulated inflatable insulating chambers;
c. each of said insulating chambers comprising spaced inner and outer walls joined at their edges by elongated heat seals, at least one of which seals is discontinuous for the communication of air between adjacent chambers;
d. valve means disposed in one chamber for the admission of air to all of said chambers;
e. said chambers when inflated being adapted to provide a closed, insulated storage space within the central portions of said paperboard container;
f. a heat exchange means; and
g. means supporting said heat exchange means against said liner means.

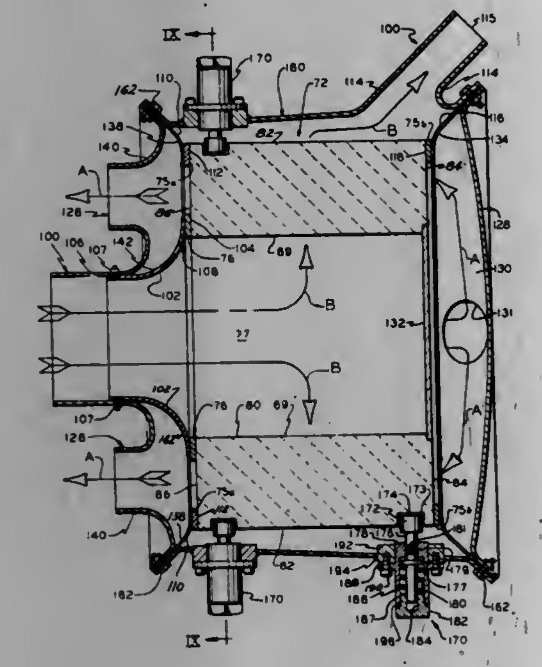
3,889,744
RECUPERATOR STRUCTURES AND METHOD OF MAKING SAME

James A. Hill, and George E. Keefer, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 20, 1972, Ser. No. 245,933

Int. Cl. F28f *21/04*

U.S. Cl. 165—83 **19 Claims**



1. Recuperator apparatus, comprising
a. A glass-ceramic heat exchanging body having an internal surface defining an inner chamber formed in said body, a peripheral surface spaced outwardly from said internal surface, and spaced end surfaces connecting said internal and peripheral surfaces;
b. said body including a portion in which a first and a second series of passageways are formed therethrough, the passageways of said first series extending and enabling passage of a first fluid between said internal and peripheral surfaces, the passageways of said second series extending and enabling passage of a second fluid between said end surfaces, the walls of said first and second series of passageways being disposed in heat transmitting relationship with each other enabling a heat exchange between first and second fluids passing through the first and second series of passageways; and
c. first ductwork means for channeling a first fluid to one of said inner chamber and peripheral surfaces and collecting said fluid as it issues from the other of said inner chamber and peripheral surfaces,
d. second ductwork means for channeling a second fluid to one of said end surfaces and collecting said second fluid as it issues from the other of said end surfaces, and
e. housing means for surrounding and supporting said heat exchanging body in a relatively stationary position during relative expansion and contraction movements of components of said apparatus to aid in maintaining inlets and outlets of said first and second series of passageways positioned for connection with said first and second ductwork means,
f. said housing means, including an outer shell disposed around and spaced from said peripheral surface of said body and a plurality of yieldable means extending between said outer shell and said body,
g. said first ductwork means including a first wall portion surrounding an inner chamber opening adjacent an end surface of said heat exchanging body and extending between a perimetrical area adjacent said chamber opening and a continuation of said first ductwork means, and means for maintaining said first wall portion in contact with said perimetrical area during expansion and contraction of said recuperator apparatus.

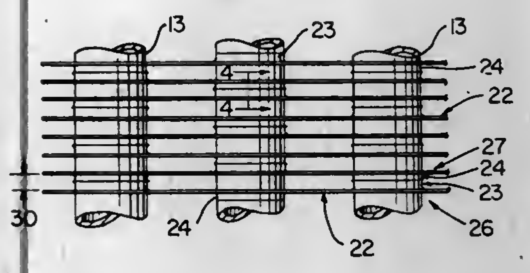
3,889,745
HEAT EXCHANGER AND METHOD OF MAKING SAME

Frederik A. Siemonsen, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Dec. 19, 1973, Ser. No. 426,320

Int. Cl. F28f *1/22*

U.S. Cl. 165—151 **6 Claims**



1. A heat exchanger core assembly comprising a plurality of tubes arranged in substantially parallel relation and a plurality of fins made of an aluminous material having an H-19 temper, each of said fins comprising a substantially planar sheet and two sets of tubular collars which are integral with said planar sheet and which engage and are supported concentrically around said tubes, one of said sets of tubular collars extending in one direction substantially perpendicular to the plane of said planar sheet and the other of said sets of collars extending in a direction opposite to said one direction, said fins being fixed against said tubes in a relation wherein the plane defined by each said planar sheet is substantially perpendicular to the longitudinal axis of each of said tubes with the said one set of collars of one said fin adjoining and cooperating with the said other set of collars of an immediately adjacent fin to provide a spacing between said one and immediately adjacent fin.

3,889,746
HEAT EXCHANGER

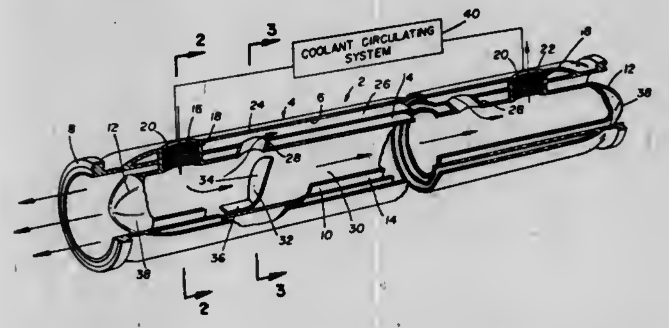
Ernest Laffranchi, P.O. Box 455, Ferndale, Calif. 95536

Filed Dec. 14, 1973, Ser. No. 425,025

Int. Cl. F28d *7/10*

U.S. Cl. 165—155 **3 Claims**

1. A heat exchanger for fluid food products comprising an outer tube having an inner diameter and a concentric inner tube having an outer diameter less than the inner diameter to define an annular product flow space between the two tubes, the outer tube including at its ends means for coupling it to a product pipe line and having an outer diameter only insignificantly larger than the pipe line diameter, the outer tube further including means defining an annular, concentric coolant flow space surrounding the product flow space and extending over a portion of the total length of the outer tube, radially oriented coolant inlet and outlet ports defined by hollow cylindrical members connected to the inner tube, extending to the exterior of the outer tube, and communicating an interior of the inner tube with the exterior of the outer tube, each member including an interior thread extending from the outer end of the member towards the other end thereof for threadably connecting the members to a coolant circulating system, and generally radially disposed, cylindrical coolant passages disposed upstream and downstream of the inlet and outlet ports, respectively, for flowing a portion of the coolant from the inner tube to the annular space in the outer tube and back to the inner tube before discharge from the heat exchanger through the outlet port.



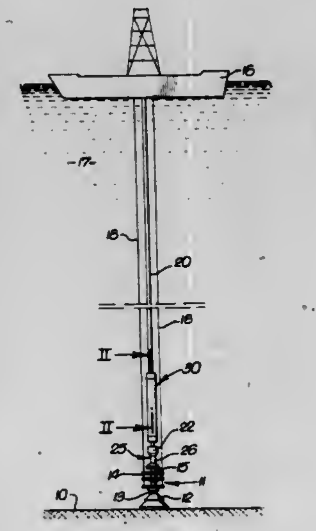
3,889,747
TELESCOPIC RISER TENSIONING APPARATUS

A. Michael Regan, Huntington Beach, and Bruce J. Watkins, Palos Verdes Estates, both of Calif., assignors to Regan Offshore International, Inc., San Pedro, Calif.

Filed July 23, 1973, Ser. No. 381,531

Int. Cl. E21b *43/01*

U.S. Cl. 166—.5 **6 Claims**



3. A telescopic riser tensioning apparatus for applying tension between upper and lower couplings of a telescopic joint in a subsea riser conduit run from a floating vessel to a subsea wellhead comprising:
a surge chamber and means for connecting said chamber in fluid communication with the interior of said riser conduit, said surge chamber comprising an annular chamber and means for mounting it about at least one of said couplings;
at least one or more piston and cylinder means connected across said joint for tensioning said upper and lower couplings toward one another upon introduction of fluid under pressure into each said piston and cylinder means; and
means for connecting said surge chamber to each said piston and cylinder means in fluid communication whereby fluid pressure within said riser conduit is transmitted via said surge chamber to said piston and cylinder means.

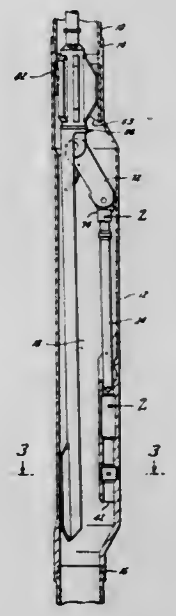
3,889,748
APPARATUS FOR INSTALLING AND REMOVING FLOW CONTROL DEVICES FROM A MANDREL HAVING ONE OR MORE POCKETS

Gilbert H. Tausch, Houston, Tex., assignor to Perry R. Bass, Inc. and Sid W. Richardson Foundation, both of Fort Worth, Tex., part interest to each

Filed Jan. 28, 1974, Ser. No. 437,236

Int. Cl. E21b *7/06*

U.S. Cl. 166—117.5 **5 Claims**



1. In a flow control handling apparatus adapted for use in placing a flow control device in or removing a flow control device from a well mandrel having a plurality of flow control device receiving pockets which are positioned side by side to each other and including an orientation sleeve having a longitudinal orientation slot positioned in a predetermined radially spaced relationship relative to said pockets, said apparatus including a support body, an orientation key pivotally connected to the body for engagement with the orientation slot, a shifting arm pivotally supported from the support body, the improvement comprising,
a flow control handling device connected to the shifting arm, said flow control handling device including a plurality of vertically directed connections which are positioned side by side to each other for supporting flow control device running and pulling tools, said connections spaced for alignment with the plurality of receiving pockets.

3,889,749
INFLATABLE PACKER

Stanley O. Hutchison, Bakersfield, Calif., assignor to Chevron Research Company, San Francisco, Calif.

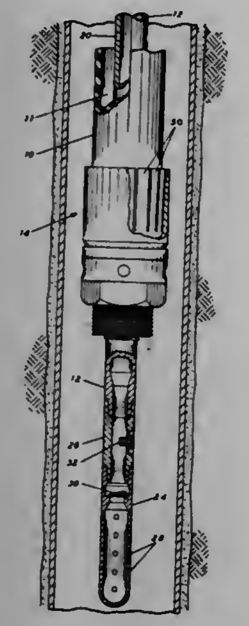
Filed June 6, 1973, Ser. No. 367,602

Int. Cl. E21b *33/127*

U.S. Cl. 166—187 **4 Claims**

1. An inflatable packer comprising a tubing section,
an elongated resilient sleeve slideably positioned over said tubing section,
clamping means including a mandril section slidably mounted in fluid-tight relationship on said tubing section disconnectably connecting the ends of said sleeve in fluid-tight relationship with said tubing section to form an annular chamber between said tubing section and said sleeve, clamping rings connectable to the exterior of said

tubing section above and below said mandril section of said clamping means to limit the movement of said clamping means on said tubing section and port means providing a passageway for flowing fluid into said annular chamber to inflate said resilient sleeve.



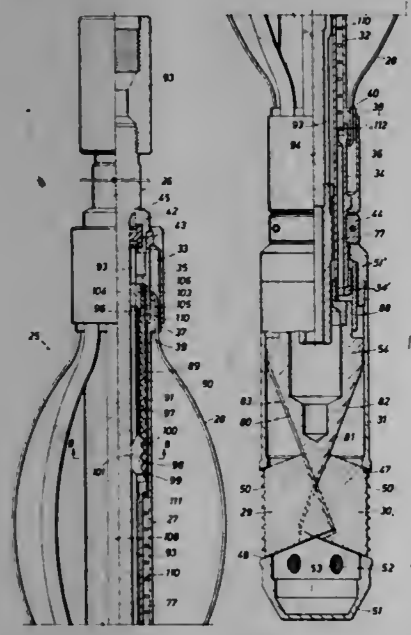
3,889,750
SETTING AND RELEASING APPARATUS FOR SIDEWALL ANCHOR

Albert A. Mullins, Boling, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed July 17, 1974, Ser. No. 489,346

Int. Cl. E21b *23/00, 33/12*

U.S. Cl. 166—217 **14 Claims**



1. Apparatus adapted for use in anchoring a well tool in a well bore, comprising: an elongated housing member carrying anchor means that are movable between retracted and extended positions; expander means movable in one longitudinal direction along said housing member for extending said anchor means into anchoring contact with a well bore wall and in the opposite longitudinal direction for enabling retraction of said anchor means; a mandrel coupled to said housing member and movable rotationally and longitudinally with respect thereto; means responsive to rotation of said mandrel for feeding said expander means in said one direction along said housing member to extend said anchor means; means responsive to longitudinal movement of said mandrel for disabling said feeding means and allowing movement of said expander means in said opposite direction; and means operable upon disengagement of said feeding means for automatically shifting said expander means in said opposite direction.

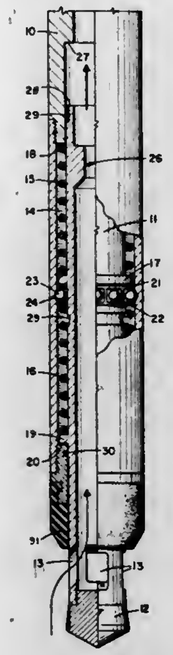
3,889,751
SUBSURFACE SAFETY VALVE

Beldon A. Peters, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Feb. 1, 1974, Ser. No. 438,889

Int. Cl. E21b *43/12*

U.S. Cl. 166—224 A **10 Claims**



1. A subsurface safety valve for use in controlling flow of well fluids through well pipe, comprising:

a valve housing connected to said well pipe;
a valve seat arranged on said valve housing;
a tubular sliding member slidable in said valve housing;
a valve element arranged on said sliding member for engagement with said valve seat, said sliding member having openings therein above said valve element to permit flow through said sliding member and said valve housing when the valve is open and to prevent flow through said sliding member and said valve housing when said valve element and said valve seat are engaged;
a plurality of spring means arranged between said sliding member and said valve housing; and
means cooperating with said spring means and said valve housing and said sliding member to cause snap action positive closure of said valve element on said valve seat, including means for urging each of said spring means independently of each other.

3,889,752
MOTOR VEHICLE FIRE EXTINGUISHER

Byron G. Dunn, 6831 Orchid Ln., Dallas, Tex. 75230

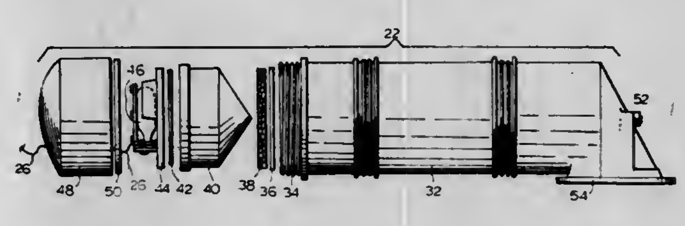
Continuation-in-part of Ser. No. 131,333, April 5, 1972, Pat. No. 3,773,111, and Ser. No. 400,623, Sept. 25, 1973, and Ser. No. 400,640, Sept. 25, 1973. This application Nov. 19, 1973, Ser. No. 416,871

Int. Cl. A62c *35/12*

U.S. Cl. 169—59 **9 Claims**

1. A fire extinguishing system for the engine compartment of a motor vehicle, comprising, a generally cylindrical container mounted on the interior of said compartment, a solid, powder-form fire extinguishing agent disposed in said container, dispersing means operatively mounted on said container to distribute said extinguishing agent throughout said compartment, propellant means in said container adapted to

generate a gas pressure sufficient to force said extinguishing agent through said distributing means and including gas-impermeable piston means mounted adjacent said extinguishing agent and in gas-tight relation with the walls of said container and flame-responsive ignition means resistant to ignition by heat generated in said compartment, operatively connected to said propellant means to actuate said propellant means and cause it to generate gas pressure and disposed about said compartment.



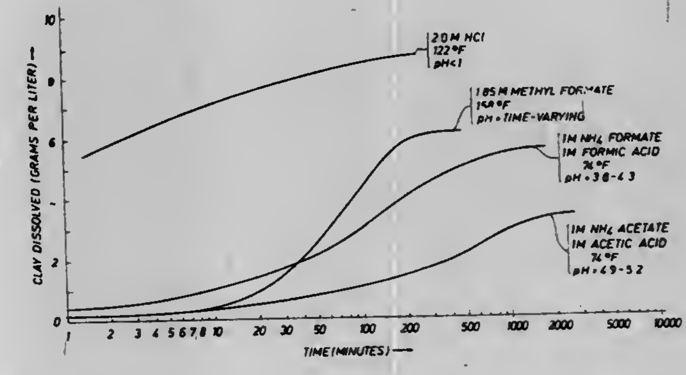
3,889,753
BUFFER REGULATED MUD ACID

Edwin A. Richardson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 21, 1974, Ser. No. 444,207

Int. Cl. E21b *43/27*

U.S. Cl. 166—307 **12 Claims**



8. A process for acidizing a siliceous material in a remote location into which a fluid can be flowed, which comprises:

flowing fluid into said remote location to contact the material to be acidized; and
including in the fluid an aqueous solution which, at the time of its inclusion, contains an amount of fluoride salt equivalent to at least an effective amount of hydrogen fluoride for acidizing a siliceous material, at least enough weak acid to convert the fluoride salt to an effective amount of hydrogen fluoride, and enough weak acid salt to provide a ratio of weak acid to weak acid salt that limits the rate of siliceous material acidization to substantially a selected rate.

3,889,754
FIRE EXTINGUISHING SYSTEM

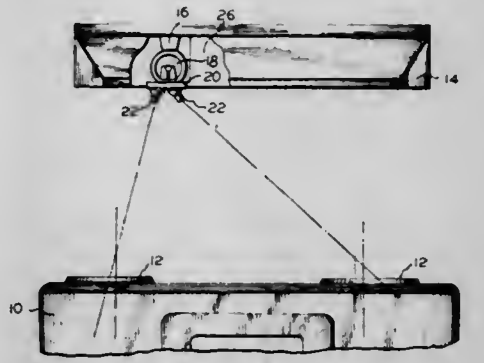
Byron G. Dunn, 6831 Orchid Ln., Dallas, Tex. 75230

Continuation-in-part of Ser. Nos. 131,333, April 5, 1971, Pat. No. 3,773,111, and Ser. No. 237,515, March 23, 1972, abandoned. This application Sept. 25, 1973, Ser. No. 400,623

Int. Cl. A62c *35/02*

U.S. Cl. 169—59 **47 Claims**

1. An improved fire extinguishing system, comprising; container means; a body of dry, powder-form fire extinguishing agent comprising a metal carbonate selected from the group consisting of alkali metal carbonates, alkali metal bicarbonates, alkaline earth metal carbonates, alkaline earth metal bicarbonates and mixtures thereof, in a major amount of about 50 to 95 percent by weight, and a synthetic metal silicate, in a minor amount of about 50 to 5 percent by weight and sufficient to form an air-impermeable coating on the burning surface to which it is applied and prevent reignition of an extinguished flame for at least 10 minutes, disposed in said container; expelling means for expelling said extinguishing agent from said container; and a flame-actuated sensor means, resistant to spontaneous ignition at temperatures normally encountered in said area to be protected, operatively connected to said expelling means to actuate said expelling means when a flame contacts said sensor means and said sensor means burns, extending from said container and freely exposed in said area to be protected.



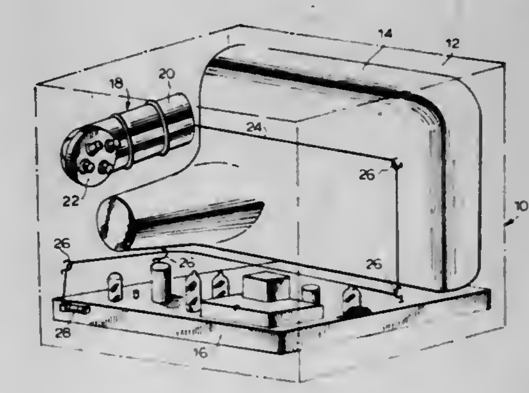
3,889,755
ELECTRICAL APPLIANCE FIRE EXTINGUISHER

Byron G. Dunn, 6831 Orchid Ln., Dallas, Tex. 75230

Continuation-in-part of Ser. Nos. 131,333, April 5, 1971, Pat. No. 3,773,111, and Ser. No. 400,623, Sept. 25, 1973, and Ser. No. 400,640, Sept. 25, 1973. This application Nov. 19, 1973, Ser. No. 416,870

Int. Cl. A62c *35/02*

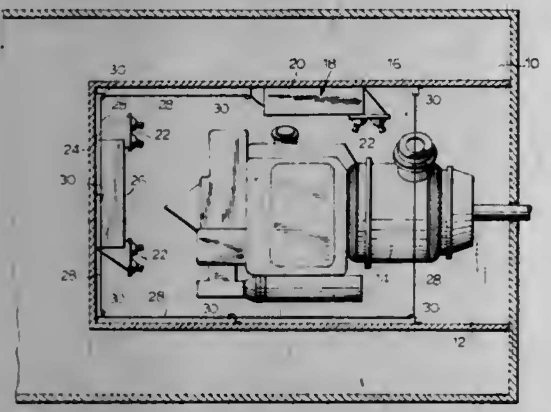
U.S. Cl. 169—59 **11 Claims**



1. A fire extinguishing system for an electrical appliance having a cabinet surrounding its working parts, comprising, a generally-cylindrical container mounted in said cabinet, a solid, powder-form fire extinguishing agent disposed in said container, dispersing means operatively mounted on said container to distribute said extinguishing agent throughout said cabinet, propellant means in said container adapted to generate a gas pressure sufficient to force said extinguishing agent through said distributing means an including gas-impermeable piston means mounted adjacent said extinguishing agent and in gas-tight relation with the walls of said container and flame-responsive ignition means resistant to ignition by heat generated in said cabinet, operatively connected to said propellant means to actuate said propellant means and cause it to generate gas pressure and disposed about said cabinet.

3,889,756
MARINE VESSEL FIRE EXTINGUISHER

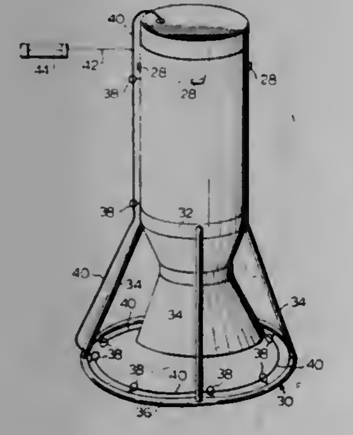
Byron G. Dunn, 6831 Orchid Ln., Dallas, Tex. 75230
Continuation-in-part of Ser. Nos. 131,333, April 5, 1971, Pat. No. 3,773,111, and Ser. No. 400,623, Sept. 25, 1973, and Ser. No. 400,640, Sept. 25, 1973. This application Nov. 19, 1973, Ser. No. 417,080
Int. Cl. A62c *35/02*
U.S. Cl. 169—59 **7 Claims**



1. A fire extinguishing system for use in a confined, enclosed compartment of a marine vessel, comprising, at least one fire extinguishing unit, including a generally-cylindrical container mounted in said compartment, a solid, powder-form fire extinguishing agent disposed in said container, dispersing means operatively mounted on said container to distribute said extinguishing agent throughout said compartment, propellant means in said container adapted to generate a gas pressure sufficient to force said extinguishing agent through said distributing means and including gas-impermeable piston means mounted adjacent said extinguishing agent and in gas-tight relation with the walls of said container and flame-responsive ignition means resistant to ignition by heat generated in said compartment, operatively connected to said propellant means to actuate said propellant means and cause it to generate gas pressure and disposed about said compartment.

3,889,757
COMMERCIAL COOKING UNIT FIRE EXTINGUISHER

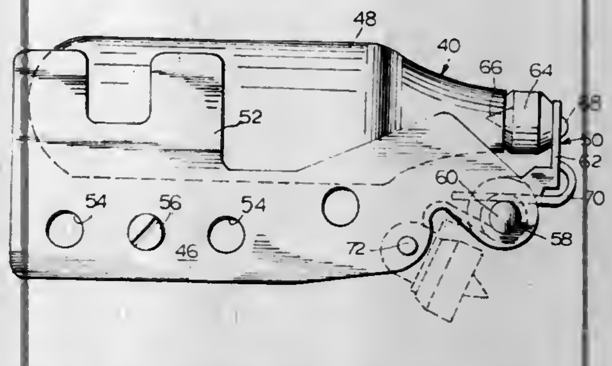
Byron G. Dunn, 6831 Orchid Ln., Dallas, Tex. 75230
Continuation-in-part of Ser. No. 131,333m April 5, 1973, Pat. No. 3,773,111, and Ser. No. 400,623, Sept. 25, 1973, and Ser. No. 400,640, Sept. 25, 1973. This application Nov. 19, 1973, Ser. No. 417,083
Int. Cl. A62c *35/02*
U.S. Cl. 169—59 **8 Claims**



1. A fire extinguishing system for a cooking complex having a plurality of individual cooking units, comprising, a plurality of individual extinguishing systems equal in number to the number of said cooking units, each of said extinguishing systems, comprising, a container, a dry, chemical extinguishing agent disposed in said container, distributing means operatively mounted on said container and adapted to distribute said extinguishing agent over the cooking unit to be protected, propellant means within said container adapted to generate a gas pressure on said extinguishing agent sufficient to force said extinguishing agent through said distributing means, an open frame structure surrounding said distributing means, and a flame-responsive ignition means resistant to spontaneous ignition at temperatures encountered above said cooking unit to be protected, operatively connected to said propellent means to actuate said propellant means and cause it to generate gas pressure and disposed about said open frame structure.

3,889,758
HAND OPERABLE FIRE EXTINGUISHER

Byron G. Dunn, 6831 Orchid Ln., Dallas, Tex. 75230
Continuation-in-part of Ser. No. 131,333, April 5, 1971, Pat. No. 3,773,111, and a continuation-in-part of Ser. No. 400,623, Sept. 25, 1973, and a continuation-in-part of Ser. No. 400,640, Sept. 25, 1973. This application Nov. 19, 1973, Ser. No. 417,082
Int. Cl. A62c *13/20*
U.S. Cl. 169—74 **9 Claims**



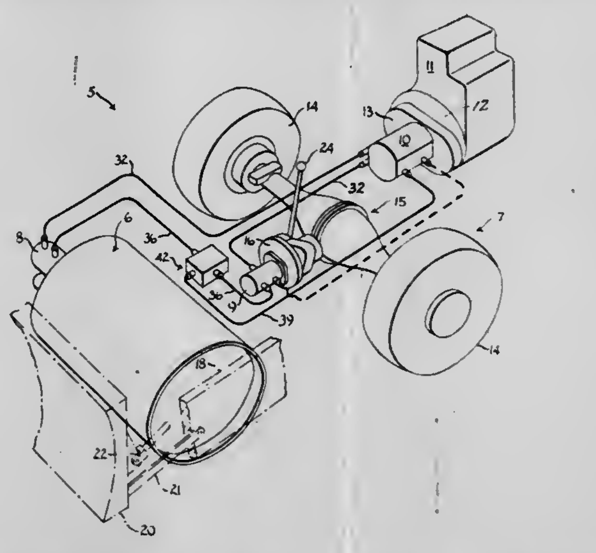
1. A portable fire extinguisher, comprising, a generally-cylindrical container, a solid, powder-form fire extinguishing agent disposed in said container, distributing means operatively mounted on said container and adapted to distribute said extinguishing agent over the area of a fire, propellant means in said container adapted to generate a gas pressure on said extinguishing agent sufficient to force said extinguishing agent through said distributing means and including a gas-impervious piston means mounted in gas-tight relation with the side walls of said container adjacent said extinguishing agent and hand-operable actuating means operatively connected to said propellant means to actuate said propellant means and cause said propellant means to generate gas pressure.

3,889,759
HYDRAULICALLY PROPELLED VEHICLE

Roger L. Larson, Waconia, Minn., assignor to Raygo, Inc., Minneapolis, Minn.
Filed Feb. 4, 1974, Ser. No. 439,528
Int. Cl. A01b *67/00;* **A01b** *49/02*
U.S. Cl. 172—3 **4 Claims**

1. In an earth working machine having traction wheels at its rear and a compacting drum and leveling blade at its front, the compacting drum being power driven to coact with the traction wheels in effecting propulsion of the machine and being rotatably connected with a yoke that projects forwardly from the chassis of the machine, and the leveling blade being mounted on said yoke ahead of the compacting drum for maximum effectiveness, said machine being characterized by an improved propulsion system which assures continued propulsion of the machine regardless of diminished traction between the drum and ground due to the inevitable upward force on the yoke resulting from loading of the leveling blade during use thereof, and which improved propulsion system comprises:

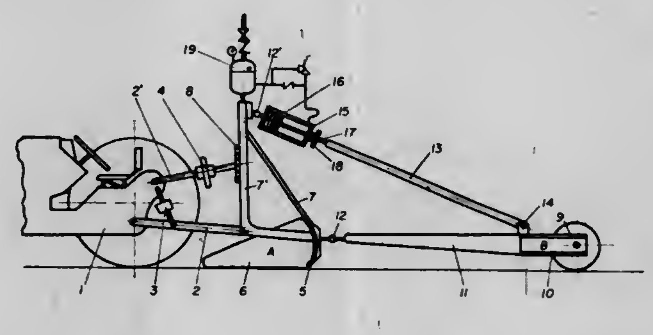
A. a power driven bidirectional hydraulic pump;
B. a reversible hydraulic motor drivingly connected with the drum;
C. a second reversible hydraulic motor drivingly connected with the traction wheels;
D. a closed loop parallel hydraulic circuit including supply lines leading to the hydraulic motors connecting the pump with the hydraulic motors and through which pressure fluid is delivered to both of said motors; and



E. an equal ratio flow divider-combiner valve mechanism connected in one side of said closed loop hydraulic circuit to divide the pressure fluid issuing from the pump and flowing to the hydraulic motors into substantially equal volumes so that reduction in the load on the hydraulic motor driving the drum and resulting from loss of traction between the drum and ground as a consequence of increased loading of the leveling blade will not diminish traction at the rear wheels of the machine.

3,889,760
COMBINED SMOOTHER AND ROLLER-PACKER

Gedalyahu Manor, Haifa, Israel, assignor to Technion Research and Development Foundation, Ltd. and Aharon Kipnis, both of Haifa, Israel
Filed July 11, 1973, Ser. No. 311,428
Int. Cl. A01b *49/02*
U.S. Cl. 172—175 **9 Claims**



1. A tractor-drawn agricultural implement for the simultaneous smoothing and packing of soil comprising

a smoother (A) having a blade (5), side shields (6), a supporting structure (7), and a three-point hitch linkage (2, 2', 4) to a tractor (5);

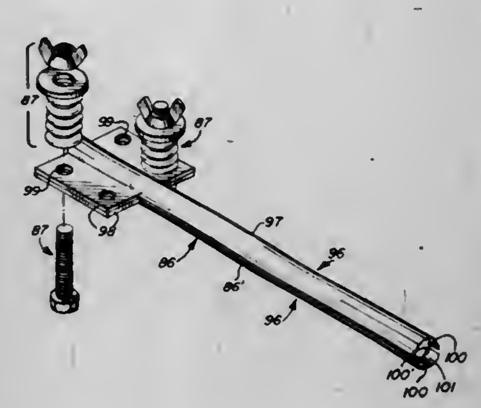
a roller-packer (B) having a frame (10), a horizontal roller (9) rotatably arranged in the frame, a draw-bar (11), and a universal joint (12) at its front end, the universal pivot joint connecting to a point substantially central with respect to the smoother blade (5);

a rigid stiffening link (13) pivoted at both ends for holding the smoother (A) and the roller-packer (B) in fixed relationship, the pivot (14) at its rear end being centrally attached to the roller frame (10), and the pivot (12') at its front end including a universal pivot joint, connected to a point on the smoother (A), central in relation to, above and remote from, the smoother blade (5);

and adjustable retaining force means interposed between the smoother (A) and the roller-packer (B) in any portion of the stiffening link (13), which force means are adjusted to hold the roller and the smoother blade in fixed relationship during normal working of the soil, and to break the said fixed relationship upon a predetermined tractive force acting on said force means, permitting the smoother blade (5) to be raised independently of vertical movement of the roller (9) of the roller-packer (B).

3,889,761
DEEP-TINE AERATING MACHINE

Roy H. Rogers, Tucson, Ariz., assignor to R & R Products, Inc., Tucson, Ariz.
Filed Apr. 4, 1974, Ser. No. 457,916
Int. Cl. A01b *15/00*
U.S. Cl. 172—706 **5 Claims**



1. A tine for penetrating turf comprising:

a pair of matching semi-circular concave elongated members which, when juxtapositioned to each other with their concave surfaces facing each other, form a hollow passageway axially therethrough,

said members being tapered along at least a part of their lengths toward one common end to aid in penetrating the turf, and

tension means attached to said members for biasing them into matching engagement with each other,

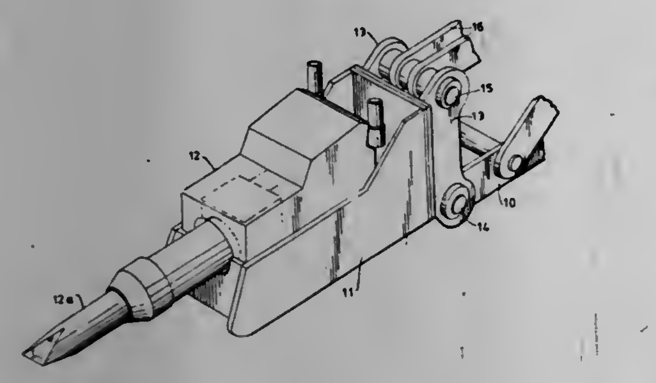
said means permitting said members to spread apart a limited amount under penetrating and withdrawl pressures exerted on the tine when used in aerating turf.

3,889,762
ROCK BREAKING MACHINE

Brian Sumner, Rainford, England, assignor to Dobson Park Industries Limited, Nottinghamshire, England
Filed Jan. 25, 1974, Ser. No. 436,635
Claims priority, application United Kingdom, Feb. 17, 1973, 7921/73
Int. Cl. E25d *17/00*
U.S. Cl. 173—139 **5 Claims**

1. In combination a reciprocating rock-breaking impact tool and means for mounting said impact tool on a rock-breaking machine, said mounting means comprising a cradle having means for attaching it to an arm of a rock-breaking machine, guide means located in and carried by said cradle and extending in the direction of reciprocation of the impact tool, a base plate, for the impact tool, slidably mounted on said guide means, a bracket on said base plate, rod means located in and carried by the cradle and extending in the direction of reciprocation of the impact tool and passing freely through said

bracket, abutment means and a series of shock absorbing cushions assembled on said rod means and held between said



abutment means and said bracket thereby to control and damp oscillation of the impact tool during operation thereof.

3,889,763

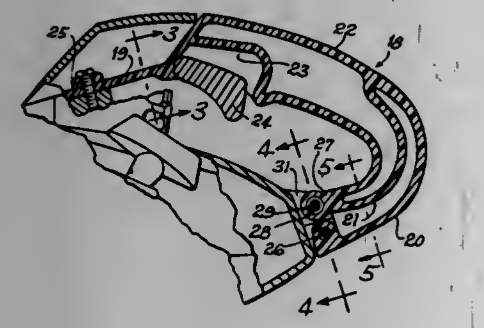
VIBRATION ISOLATION HANDLE FOR PORTABLE CHAIN SAW OR THE LIKE

William E. Dillon, Chicago, Ill., assignor to Skil Corporation, Chicago, Ill.

Filed Oct. 31, 1973, Ser. No. 411,416

Int. Cl. B27b *17/02*

U.S. Cl. 173—162 **8 Claims**



1. In a portable tool of the type which is powered by an internal combustion engine, the improvement comprising:
- a. said tool including frame means;
- b. an internal combustion engine directly and rigidly mounted on said frame means whereby upon operation of said engine said frame means vibrates at a disturbing frequency W;
- c. a handle in the form of an elongated, flexible member, said handle being of unitary, homogeneous construction such that all portions of the handle vibrate together in unison; and
- d. first and second connection means respectively, connecting opposite ends of said handle member to said frame means with at least one end of said handle member being rigidly secured to said frame means by said first connection means, said handle member, as a consequence of its material composition, of its shape and of the action of said first and second connection means, having a natural vibratory frequency Wn such that

$$\frac{W}{W_n} > \sqrt{2}$$

3,889,764

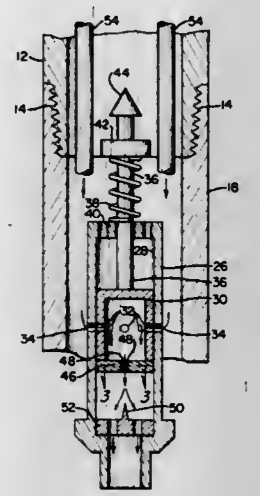
WELL DRILLING METHOD AND APPARATUS

John G. Jackson, Aurora, Colo., assignor to Leon Du Charme, Denver, Colo., a part interest

Filed Jan. 14, 1974, Ser. No. 432,817

Int. Cl.² E21B *21/04, 43/00*

U.S. Cl. 175—69 **9 Claims**



8. Method of drillling or reworking a well having a bore extending into a formation having relatively low fluid pressure and containing debris, such as sand, which it is desired to remove with a circulating foam, comprising the steps of:
- a. drilling into said debris with a conventional hollow rotatable drill string having a drill bit at its lower end adapted to produce an annulus surrounding the drill string,
- b. introducing foam producing ingredients, such as air, water and a foaming agent through the drill string for delivery at the lower end thererof,
- c. flowing the delivered ingredients through a control valve to maintain a discharge pressure less than the surrounding formation fluid pressure to obviate flow of the debris into the formation, and
- d. discharging the ingredients through an orifice adjacent the drill bit to convert the ingredients into a lighter density foam adapted to carry the debris through said annulus to the surface.

3,889,765

EARTH SAMPLING APPARATUS

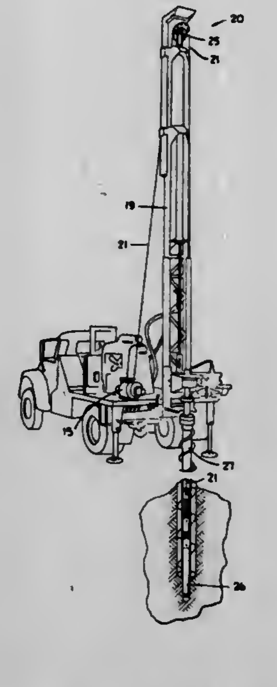
William P. Henson, Indianapolis, Ind., assignor to Mobile Drilling Company Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 260,776, June 8, 1972, abandoned. This application Nov. 29, 1973, Ser. No. 420,105

Int. Cl. E21b *11/00, 1/00*

U.S. Cl. 175—257 **22 Claims**

1. An apparatus for raising and then dropping a tool comprising:
- a frame;
- a tool;
- a drum rotatably mounted on said frame and having a line wrapped thereon connected to said tool;
- a reversible motor mounted on said frame and having an output rotatable in a first direction for lifting said tool and rotatable in a second opposite direction for allowing said tool to fall toward the earth; and,
- clutch means mounted on said frame being operable to drivingly connect said output to said drum when said output is rotated in said first direction and having means operable to disconnect said output from said drum when said output is rotated in said second direction allowing



said drum to freely rotate in said second direction by the weight of said tool and without retardation by said output.

3,889,766

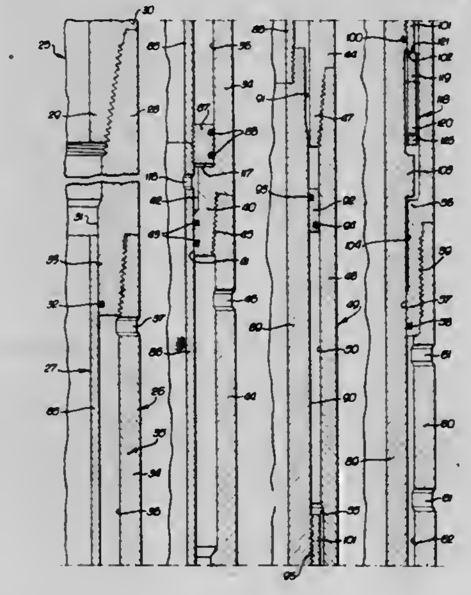
DEEP WELL DRILLING JAR

Wayne N. Sutliff, and Jim Downen, both of 2931 Pierce Rd., Bakersfield, Calif. 93308

Filed Apr. 4, 1974, Ser. No. 457,772

Int. Cl.² E21B *1/10*

U.S. Cl. 175—297 **7 Claims**



1. In a deep well drilling jar, the combination of:
- internal and external tubular mandrels telescopically related;
- means for connecting the top end of one mandrel to a drill string and the bottom end of the other mandrel to a drill; a jarring device embodied within said mandrels including delayed action means for striking an upward blow on the mandrel connected to said drill, said means also limiting said telescopic movement;
- a spline device embodied within said mandrels including male splines formed on said internal mandrel and intermeshing female splines formed on said external mandrel; and
- a spline retraction device embodied with said mandrels, said device being powered hydraulically from drilling liquid transmitted to said drill through said jar and automatically axially contracting the elements of said jar while said drill is being operated under a high liquid pressure to give said spline device maximum effectiveness in transmitting torque to said drill.

3,889,767

WEIGHING DEVICES

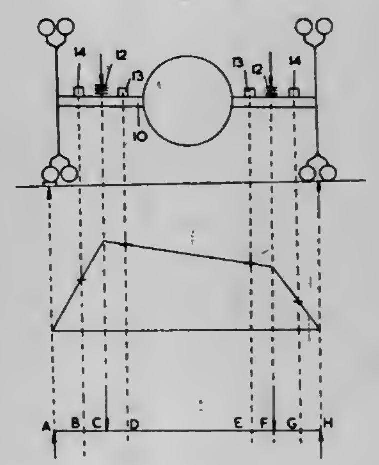
Kenneth C. Scott, London, and Alec Harry Seilly, Wembley, both of England, assignors to Simms Group Research & Development Limited, London, England

Filed Mar. 18, 1974, Ser. No. 452,072

Claims priority, application United Kingdom, Mar. 20, 1973, 13186/73

Int. Cl. G01g *19/08*

U.S. Cl. 177—136 **4 Claims**



3. A weighing device for attachment to and for providing an indication of the load applied to a vehicle axle to which the load is applied at a pair of spaced points intermediate the ends of the axle, the device comprising two pairs of sensing means for mounting on the axle, one pair of sensing means being adapted to be mounted on the axle with one of said points located between the two sensing means of the one pair, the other pair of sensing means being adapted to be mounted on the axle spaced from the first pair and having the other of said points located between the two sensing means of the other pair, each of said sensing means providing an electrical signal indicative of the bending moment at its particular position, and electrical circuit means for processing said signals to provide an indication of the total load applied to the axle substantially independent of the position of the axle with respect to the horizontal.

3,889,768

PLATFORM SCALE FOR WEIGHING A MASS INDEPENDENTLY OF THE RELATIVE POSITION OF THE MASS ON THE PLATFORM

Sid Hejzlar, Flushing, N.Y., assignor to John Chatillon & Sons, Inc., Kew Gardens, N.Y.

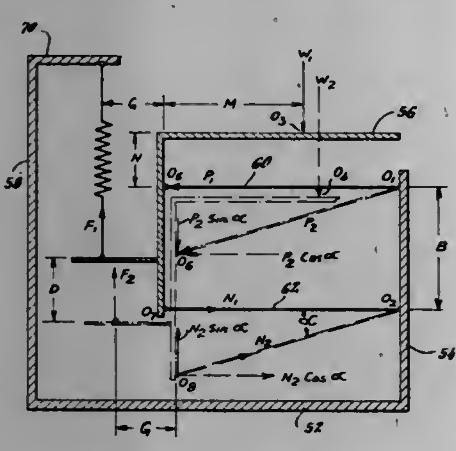
Filed Oct. 19, 1973, Ser. No. 407,930

Int. Cl. G01g *23/26*

U.S. Cl. 177—229 **6 Claims**

1. A weighing scale of the type which has a support member for supporting objects while they are being weighed which is rigidly affixed to an associated leg member which extends downward from said support member in a vertical dimension, and check links which are pivotally associated with both said leg member and an associated support structure and are substantially parallel axially to each other and in lateral direction with respect to said leg member, are all in substantially the same directional orientation with respect to said leg member whereby said support member may move downward against a resistive force means while said vertical dimension of said leg

member is substantially uniformly retained in its vertical orientation, characterized by the facts that said support member



is affixed at one of its ends to said leg member, and that said support member effectively is in substantially the same orientation with respect to said leg member as are said check links.

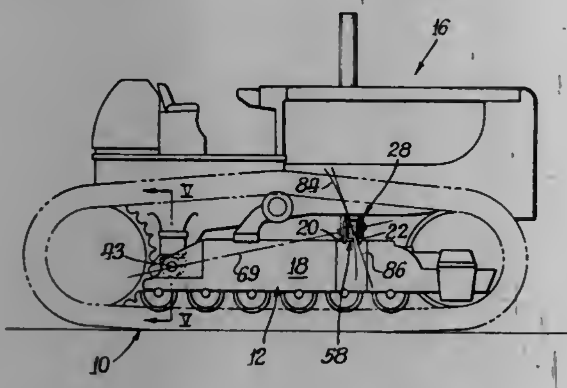
3,889,769
SUSPENSION ARRANGEMENT FOR A TRACK-TYPE VEHICLE

Gary D. Blomstrom, Waverly, Nebr.; Donald A. Piepho; Victor Randour, both of Aurora, Ill., and Lyle E. York, Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 9, 1974, Ser. No. 504,063

Int. Cl. B62d *55/10*

U.S. Cl. 180—9.5 **9 Claims**



1. A crawler tractor comprising:

main frame means;

first and second longitudinally-extending track frames on either side of the main frame means;

pivotal connecting means between the rearward ends of the track frames and the main frame means to allow pivotal movement of the track frames relative to the main frame means generally about a substantially horizontal axis;

a shaft mounted relative to the main frame means and positioned forwardly of and above the substantially horizontal axis, and having its longitudinal axis disposed in a plane in which said substantially horizontal axis lies;

a generally transversely extending equalizer bar defining adjacent its mid-portion a bore through which said shaft is disposed, the equalizer bar being pivotable about the longitudinal axis of the shaft and slidable therealong;

means pivotally connecting the respective ends of the equalizer bar with the track frames forwardly of the track frame and main frame means pivotal connecting means, such equalizer bar-track frame pivotal connections lying substantially along a straight line which intersects a line along which the longitudinal axis of the shaft lies;

the equalizer bar sliding along and pivoting about the longitudinal axis of said shaft during pivoting of the track frames relative to the main frame means generally about said substantially horizontal axis.

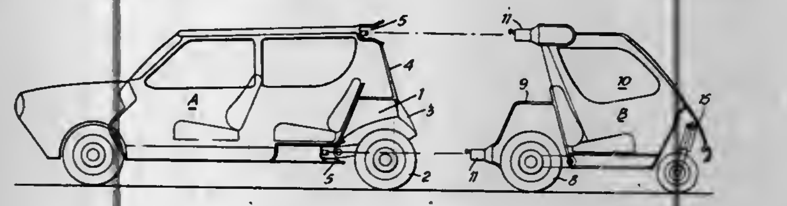
3,889,770
WHEELED VEHICLES

Hugh Grahame Herbert, 1B Limpsfield Ave., London, England

Filed June 20, 1973, Ser. No. 371,586

Int. Cl. B60d *1/00*

U.S. Cl. 180—14 R **2 Claims**



1. A composite vehicle comprising a major unit with a self-contained power unit driving the front wheels, and a minor unit with a self-contained power unit and rear wheel drive attachable to the back of the major unit with its driven wheels between and substantially axially aligned with the rear wheels of the major unit.

3,889,771
UNIVERSAL GAS TURBINE AUTOMOTIVE ENGINE

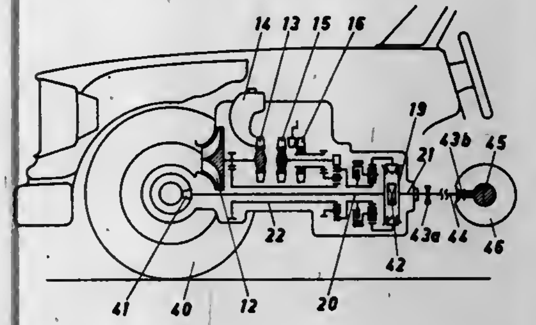
Sven Olof Kronogard, Lomma, Sweden, assignor to United Turbine AB and Co., Kommanditbolag, Malmo, Sweden

Filed May 2, 1974, Ser. No. 466,502

Claims priority, application Sweden, May 22, 1973, 7307155

Int. Cl. B60k *3/04*

U.S. Cl. 180—44 R **4 Claims**



1. In a universal automotive engine for use in driving two pairs of wheels, a gas turbine including a gas producing part and at least two rotors, transmission means for transferring power between the rotors in an integral system, a torque divider connected to said rotors and having two output shafts, at least one hollow shaft in the transmission means, and means for mounting one of said output shafts within said at least one hollow shaft, in which the torque divider is defined by a differential provided with bevel gears, one of the output shafts being displaced with respect to the geometrical axis of the adjacent pair of wheels to permit the other output shaft to pass through said hollow shaft and above the geometrical axis of said pair of wheels.

3,889,772
TAIL PIPE SYSTEM

Charles N. Kelley, Dallas, Tex., assignor to Harold Schnair, Delta Quality, Dallas, Tex.

Filed Nov. 21, 1973, Ser. No. 417,899

Int. Cl.^{2} B60K *13/04*

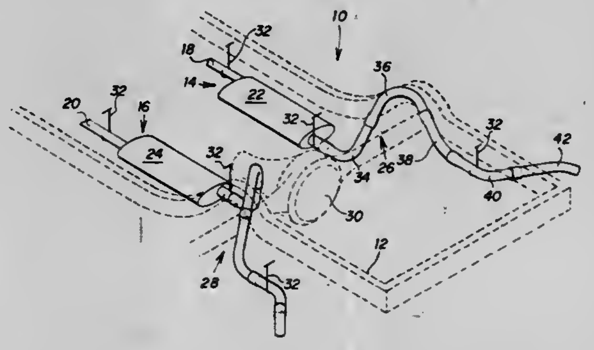
U.S. Cl. 180—64 A **8 Claims**

1. A motor vehicle tailpipe for use in conveying exhaust gases from a point located to the front of the rear axle up over and to a point to the rear of the rear axle, comprising in combination:

a first portion of curved conduit having a first end for extending from a point to the front of the rear axle and a second end extending at an obtuse angle with respect to said first end in a direction toward the rear axle;

a second portion of curved conduit for extending from the first portion vertically up over the rear axle a sufficient height to clear movement of the rear axle with respect to the frame to a point to the rear of the rear axle, said second portion having a first end for connection to said second end of said first portion with the second end of said second portion extending at an acute angle with respect to said first end of said second portion;

a third portion of curved conduit for extending to the rear of said rear axle, said third portion having a first end for connection to said second end of said second portion with the second end of said third portion extending at an obtuse angle with respect to the first end of said third portion; and



enlarged ends formed on said portions releasably connecting said second end of said first portion to said first end of said second portion in a gas-tight telescoping joint and releasably connecting said second end of said second portion to the first end of said third portion in a gas-tight telescoping joint, whereby the relative angular extension of said first end of said first portion with respect to the second end of said third portion can be selectively varied.

3,889,773
DRIVE DISCONNECT FOR MOTORIZED WHEELCHAIR

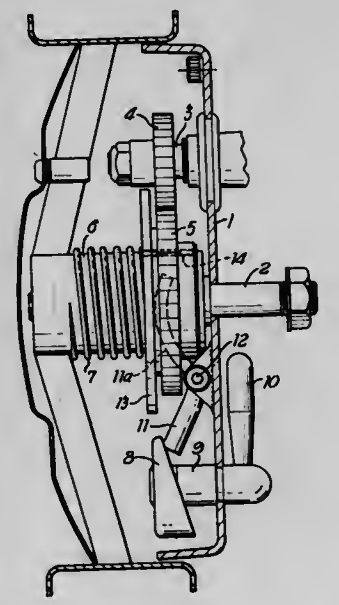
John Bernard Chant, Alton, England, assignor to Vessa Limited, Alton, England

Filed Feb. 5, 1974, Ser. No. 439,750

Claims priority, application United Kingdom, Feb. 5, 1973, 5640/73

Int. Cl. B60k *1/00*

U.S. Cl. 180—65 R **4 Claims**



1. An electrical driving unit for a wheel or a wheel chair comprising a mounting plate attached to a fixed wheel axle and carrying an electric motor whose output shaft passes through the said plate, a gear mounted on the said shaft and normally meshed with a gear axially slidable over a key in a wheel hub freely rotatable on the said axle and wherein manually operable means passing through the said plate is actuable to slide the said axially slidable gear over the said key so as to disconnect it from the gear on the said output shaft.

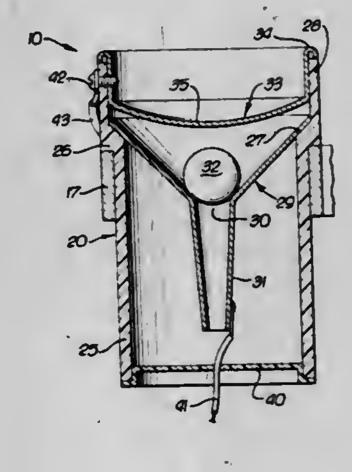
3,889,774
ACCIDENT RESPONSIVE AUTOMATIC IGNITION CUT-OFF SWITCH

George B. Schwenk, 7711 Deer Trail, Yucca Valley, Calif. 92284

Filed June 24, 1974, Ser. No. 481,998

Int. Cl. B60r *21/00;* **H01h** *35/02*

U.S. Cl. 180—104 **1 Claim**



1. A safety electric switch for shutting off the engine of an automotive vehicle in the event said vehicle is canted in any direction more than a specific maximum angle from its normal upright position, said switch comprising:

a cylindrical dielectric switch housing having a vertical bore, an upper end portion of which housing is enlarged in both its outside and inside diameters to provide an internal counter bore terminating at its lower end in an inwardly bevelled annular shoulder facing upwardly and providing an outside downwardly facing annular shoulder;

a lowr steeply conically concave metalic switch contact member the peripheral portion of which rests on and is cemented to said inwardly bevelled annular shoulder;

an upper shallowly concave metallic switch contact member, comprising the bottom of a cylindrical wall which snugly fits downwardly into said counter bore and has an external annular flange overlying and engaging the top end of said switch housing, said members being thus coaxially related with each other and with said bore; and

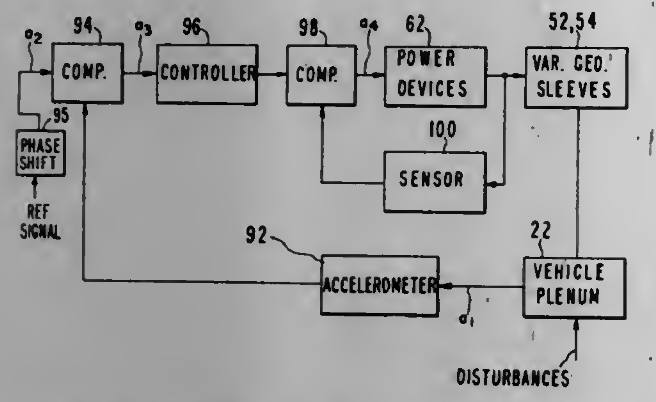
a metal ball resting normally upon and in centered relation with said lower contact member and out of contact with said second contact member, said ball automatically rolling out of its centered relation with said lower contact member and into contact with said upper contact member when said switch is canted from its normal upright position in any direction more than said specific maximum angle;

bracket means for mounting said switch up rightly upon said vehicle with the axis of said bore vertical when said vehicle is in normal upright position said means including a ring fitting the lower portion of said housing and flush with said outside annular shoulder of said housing whereby said switch is supported by said ring; and

means for interposing said switch in the igniton circuit of said engine so as to shut off said engine when said switch is closed by said ball simultaneously engaging both of said contact members.

3,889,775
SURFACE EFFECTS VEHICLE HAVING VARIABLE GEOMETRY LIFT FAN

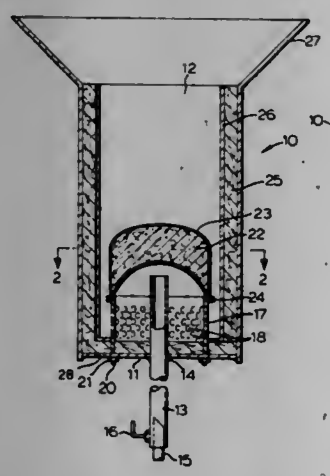
Werner P. Luscher, El Dorado Hills, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.
Filed Nov. 12, 1973, Ser. No. 415,082
Int. Cl. B60v *1/04*
U.S. Cl. 180—118 19 Claims



1. A surface effects vehicle comprising: a body having means defining an open-bottom plenum adapted to be substantially closed when the body is disposed on a surface; an actuatable, centrifugal type lift fan carried by the body and having a fluid passage adapted to direct air under pressure into said plenum to form an air cushion to support the same above said surface and to permit movement of the body over the surface; means coupled with said lift fan and movable across said fluid passage for causing a change in the volume rate of flow of air therethrough when the lift fan is actuated; and means coupled with said lift fan for actuating the same.

3,889,776
EXHAUST GAS SILENCER

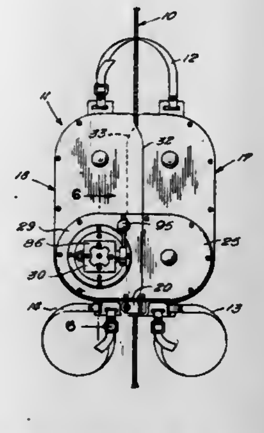
Peter Postma, Fort Saskatchewan, Canada, assignor to Sherritt Gordon Mines Limited, Toronto, Canada
Filed Aug. 21, 1973, Ser. No. 383,226
Claims priority, application Canada, June 14, 1973, 174021
Int. Cl. F01n *1/10*
U.S. Cl. 181—50 10 Claims



1. An open end gas exhaust silencer comprising an elongated hollow baffle casing having a fully open end and a closed end, an inlet conduit secured to said closed end of said baffle casing and having an end portion therein extending into said baffle casing through said closed end, said inlet conduit being operative to be connected to a noisy gas exhaust pipe having an exhausted gas releasing therefrom in a high velocity, a hollow cylinder located in said baffle casing and coaxially encircling said end portion of said inlet conduit in a spaced relation therewith, the side wall of said hollow cylinder being entirely full of perforations, a filter cap member removably mounted on said hollow cylinder and disposed transversely and directly opposite to the end opening of said inlet conduit, said filter cap in combination with said hollow cylinder defining a space considerably smaller than the remaining hollow space in said baffle casing, a porous element mounted in said filter cap member operative for dividing the exhausted gas into a plurality of random gas streams so as to reduce the velocity of the exhausted gas whereby eliminating the noise in said exhausted gas, and a lining of sound absorbing material disposed on all inside walls of said hollow baffle casing for absorbing any remaining noise in said random gas streams.

3,889,777
DESCENT ESCAPE DEVICE

Clarence E. George, 419 Reeder Rd., Kleberg, Tex. 75145
Filed Sept. 9, 1974, Ser. No. 504,268
Int. Cl. A62b *1/14*
U.S. Cl. 182—6 7 Claims



1. A personal escape device for coupling to a suspended cable comprising

a generally flat housing including two side-by-side housing parts separable along a generally vertical parting joint; said housing being hinged at one end of said parting joing, and having latch means at the other end of said parting joint for closing the housing; means on said housing for strapping said housing to the body of a person;

an endless chain of pivotally connected teeth supported in each housing part on at least two chain sprockets; each endless chain comprising teeth with convex and concave projecting tabs connected alternately in closely spaced relation;

said housing, in closed condition, providing confronting walls defining a linear upright channel at the parting joint, said channel being of a width to accommodate a cable; and said housing, in closed condition, guiding said chains to project said teeth tabs into said channel in intermeshing relation, with the confronting faces of the intermeshing tabs in spaced relation; said chain tabs defining a sinusoidal path for frictionally confining a cable; and said chains being interlocked to rotate together;

adjustable brake means mounted on at least one housing part, for controlling the rate of rotation of at least one of said chain sprockets and, therefore, the rate of drive of said endless chains.

3,889,778
PLATFORM LIFT

Gerald Dean Dotts, 41 Brentwood Dr., Stillwater, Okla. 74074
Filed July 26, 1973, Ser. No. 382,754
Int. Cl. E04g *1/22*
U.S. Cl. 182—17 15 Claims

1. A vertically adjustable work platform, comprising:

a. base structure means of rectangular configuration adapted to be used in a substantially horizontal plane;

b. top work platform means of rectangular configuration substantially parallel to said base means;

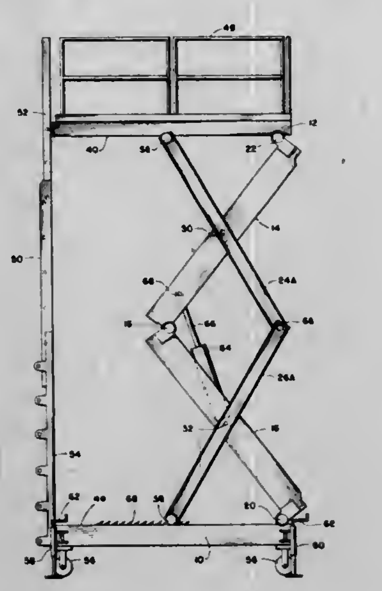
c. a pair of rectangular tubing structural members each of length L, hinged together at one end in a vertical plane,

the second end of the lower member hinged to a first end of said base means, the second end of the upper member hinged to a first end of said platform means;

d. a first pair of channel struts of length L, one on each side of said lower member, rotatable about a transverse shaft through said lower member at the midpoints of said member and said struts;

e. a second pair of channel struts of length L, one on each side of said upper member rotatable about a transverse shaft through said upper member at the midpoints of said member and said struts;

f. the first ends of each pair of struts hinged together;



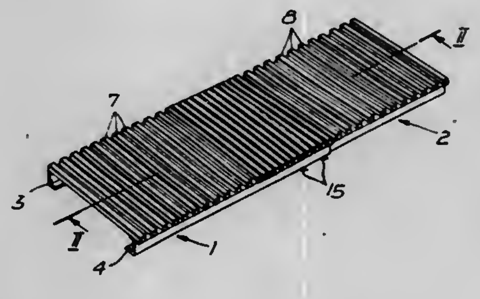
g. roller means attached to the second ends of said struts, those on the lower pair of struts adapted to roll along the top surface of said base means, and those on the upper pair of struts adapted to run on the underside of said platform means;

h. hydraulic cylinder and piston means connected between said two hinged members; and

i. ratchet means between said base means and the second ends of said lower pair of struts; and including cable means wound around pulley means on selected ones of the shafts forming the hinges for said struts, and means responsive to said cable means for operating said ratchet means to permit lowering said platform under control of said hydraulic cylinder and piston means.

3,889,779
LENGTH ADJUSTABLE PLANK

Walter Klümmerlin, In Den Fressackern 6, 7120 Bissingen, Enz, Germany
Filed Oct. 15, 1974, Ser. No. 514,769
Claims priority, application Germany, Oct. 23, 1973, 2352949; Mar. 13, 1974, 2411951
Int. Cl. E04g *5/08*
U.S. Cl. 182—223 16 Claims



1. A length adjustable plank, comprising

at least two parts, including a first part and a second part, adjustably disposed relative to each other in a longitudinal direction thereof,

each of said parts comprises two longitudinal beams constituting profile rods arranged parallel and spaced from each other, and transverse beams having upper surfaces and forming a standing surface for a user, said transverse beams covering at least partially on top of said longitudinal beams and operatively connecting the latter to each other,

said longitudinal beams of said two parts, respectively, forming cooperatively a longitudinal guide, said longitudinal beams of said second part being guided between said longitudinal beams of said first part, said longitudinal beams of said first part constituting outer disposed longitudinal beams and said longitudinal beams of said second part constituting inner disposed longitudinal beams,

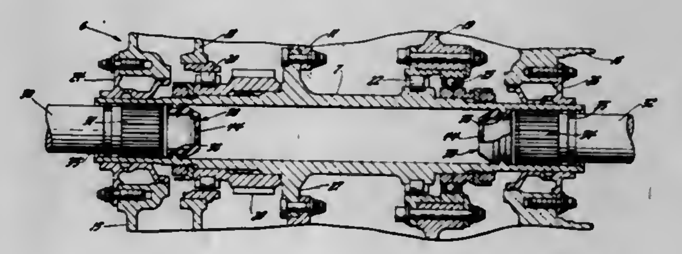
the length of said transverse beams of said first part on top of said outer disposed longitudinal beams being equal to the width of the plank,

the length of said transverse beams of said second part on top of said inner disposed longitudinal beams being a little smaller than the open spacing between said outer disposed longitudinal beams,

securing means for releaseably fixing said inner disposed longitudinal beams in position relative to said first part in a use condition of said plank such that said transverse beams, respectively, of said second and first parts, respectively, on top of said inner and outer disposed longitudinal beams, respectively, mesh with one another, in a manner that the upper surfaces of said transverse beams, respectively, lie substantially in a common plane.

3,889,780
GREASE RETAINER FOR ENGAGED SPLINES

James R. Dison, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Sept. 9, 1974, Ser. No. 504,031
Int. Cl. F01m *9/00*
U.S. Cl. 184—1 R 4 Claims



1. An accessory drive installation comprising a gear box, a hollow drive shaft mounted in the gear box for rotation about the shaft axis, an accessory device mounted on the gear box having a connecting shaft with external splines, the drive shaft having internal splines mating with the said external splines, and means for retaining grease packed in the splines comprising an elastomeric plug mounted in the shaft and having a circumferential tongue and groove locating connection with the shaft, the plug being yieldable for insertion of the plug.

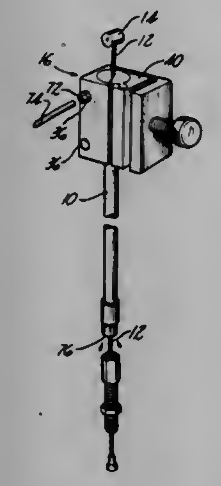
3,889,781
FIXTURE FOR CABLE LUBRICATING DEVICE

Roger A. Schott, 13559 Rutland, Detroit, Mich. 48227, and Lawrence A. Schott, 15940 Warwick, Detroit, Mich. 48223
Filed May 4, 1973, Ser. No. 357,225
Int. Cl. F16n *11/00*
U.S. Cl. 184—15 R 4 Claims

1. A fixture for a cable lubricating device which comprises:

a. a body portion formed as an extruded part having a base, a side wall, and a cap portion and an internal recess having a curved portion at the base and a relatively flat portion at the top, said recess opening at one side, and one or more locator openings extending radially from said recess,

b. a resilient insert to lie in said recess against the base having a projection to interfit with a locator opening, said insert having a central bore extending axially thereof to receive the end of a cable sheath and a cable, and an axially extending radial cleavage to said bore,



c. an axially extending rod-like, integral protrusion along one side of said insert opposite said projection,

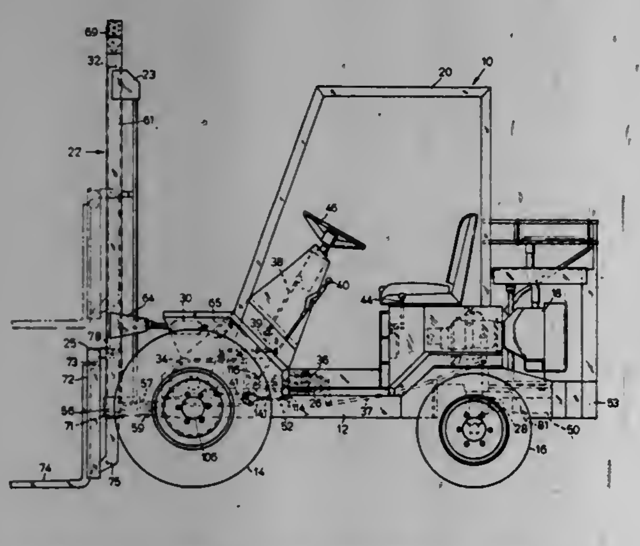
d. a clamping plate in said recess opposite said curved portion to move in said recess toward and away from said insert and having an axially extending recess to capture said rod-like protrusion, and

e. means to move said plate to compress said insert and close said insert around an encircled sheath and cable.

3,889,782
MATERIAL HANDLING VEHICLE HAVING HIGH GROUND CLEARANCE POWER TRANSMISSION AND WHEEL SUPPORT MEANS

Warren P. Geis, Port Washington, Wis., assignor to Koehring Company, Milwaukee, Wis.

Filed June 11, 1973, Ser. No. 369,008
Int. Cl.² B66B *9/20;* **B60K** *17/00*
U.S. Cl. 187—9 **11 Claims**

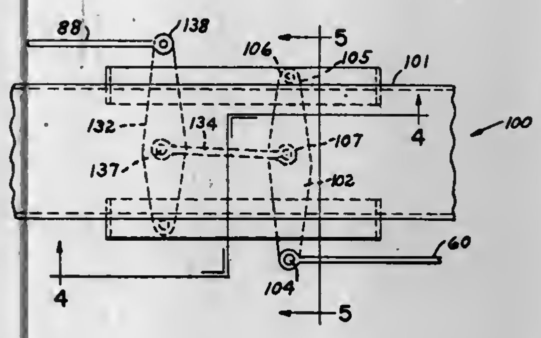


1. In a self-propelled material handling vehicle:
a chassis,
material handling apparatus mounted on said chassis and including a mast and a lift unit vertically movable on said mast, the bottom of said mast being disposed above the bottom of said chassis and said lift unit being movable into and out of a position below the bottom of said chassis,
a propulsion unit mounted on said chassis,
a pair of ground wheels located outwardly of and on opposite sides of said chassis behind said apparatus,
an axle for each ground wheel extending outwardly and beyond a side of said chassis,
and means for supporting said axles and for delivering motive power thereto from said propulsion unit, said means comprising an inverted U-shaped hollow rigid housing having an intermediate portion transversely disposed above the bottom of said chassis and a pair of end portions depending downwardly on the sides of said chassis below the bottom of said chassis, each end portion having an inner side and an outer side,
each end portion being rigidly connected on its inner side to said chassis and supporting an axle, said means further comprising power transmission means disposed within said housing for transmitting motive power from said propulsion unit to said axles.

3,889,783
BRAKE LEVER SYSTEM FOR RAILWAY CARS

Edward H. Sittner, Jr., and Robert R. Girard, both of St. Charles, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Aug. 8, 1974, Ser. No. 495,887
Int. Cl. B61h *13/20*
U.S. Cl. 188—52 **8 Claims**

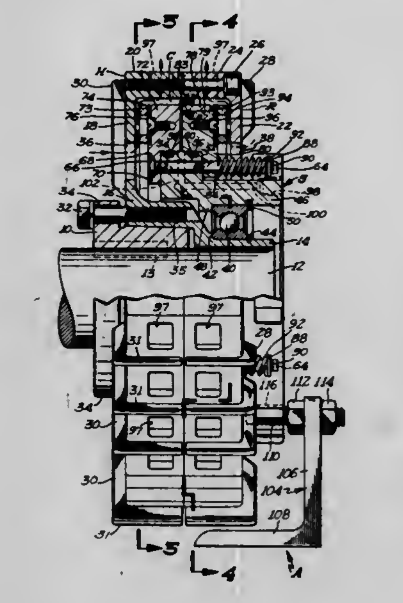


1. A railway freight car brake system comprising: a railway car having a longitudinally extending center sill; a brake cylinder mounted upon said car having a piston extending therefrom connected to a first transverse extending lever; said first transverse lever connected to a first longitudinally extending brake lever which acts to apply the brakes to a first end of said car; said first transversely extending brake lever being connected at about its midpoint to a second longitudinally extending brake lever extending in a direction opposite to said first longitudinally extending brake lever; said second longitudinally extending brake lever engaging a second transversely extending brake lever about the midpoint thereof; said second transversely extending brake lever being fulcrumed to the car body at one end thereof and the other end thereof being connected to a third longitudinally extending brake lever; said third longitudinally extending brake lever engaging a third transversely extending brake lever which passes through an opening in said center sill and which is fulcrumed to a first web of said center sill at one end thereof, said third transversely extending brake rod engaging at about the midpoint thereof a fourth longitudinally extending brake lever, said fourth longitudinally extending brake lever engaging a fourth transversely extending brake lever at about the midpoint thereof, said fourth transversely extending brake lever passing through an opening in said center sill and being fulcrumed at a first end thereof to a second and opposite web of said center sill; said fourth transversely extending brake lever at a second end portion engaging a fifth longitudinally extending brake lever, said fifth longitudinally extending brake lever acting to apply the brakes at a second end of said railway car.

3,889,784
INTERNAL CALIPER BRAKE

James V. Hanks, Minneapolis, Minn., assignor to Horton Manufacturing Co., Inc., Minneapolis, Minn.

Filed Feb. 28, 1974, Ser. No. 446,647
Int. Cl. F16d *55/04*
U.S. Cl. 188—71.4 **3 Claims**

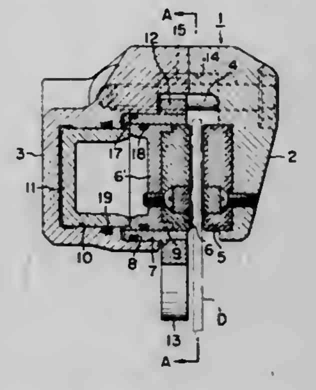


1. An internal caliper brake comprising:
a. a rotor portion including an annular support for securement to a shaft to be braked,
b. said annular support mounting an annular U-shaped housing having a radially extended first disc portion, an annular base wall and a second disc portion spaced from said first disc portion which forms
c. a U-shaped annular cavity having spaced opposed friction surfaces in the form of said first and second disc portions,
d. a stator portion including an annular base member having
e. means for mounting
f. a first annular piston within said cavity, said mounting means for the piston including an annular flange on said annular base member upon which said piston is slidable,
g. said first piston carrying an annular flange overlying said mounting means to form
h. an annular cylinder within said annular cavity,
i. a second annular piston mounted in said cylinder,
j. means for normally urging said pistons together which includes an annular flange formed on the inner annular edge of said second piston,
k. said flange of said second piston having a multiplicity of holes therethrough,
l. said first piston includes an annular flange formed on the inner annular edge,
m. said inner flange of said first piston having a multiplicity of holes,
n. said annular flange of said annular base member having a multiplicity of holes,
o. a pin mounted in the holes of said flanges of said pistons and the holes of said annular flange of said annular base member,
p. shoulder means formed on the outer end of each of said pins,
q. a coil spring mounted on each of said pins between said shoulder means and said flange of said second piston to normally thereby urge the pistons together,
r. friction means carried by each of said pistons for engagement with the opposed friction surfaces of said U-shaped cavity,
s. means rotatably mounting said rotor on said stator including a bearing mounted between said annular base member of said stator and said annular support of said rotor,
t. means for maintaining said stator stationary,
u. means for mounting said annular support of said rotor on a shaft to be braked,
v. means carried by said annular housing for dissipating heat from the brake through the annular cavity and out said annular housing including a multiplicity of holes formed in said first disc portion of said annular housing,
w. a multiplicity of holes formed in said second disc portion of said annular housing,
x. a multiplicity of holes formed in said annular base wall of said annular housing,
y. fins mounted on said first disc portion, said second disc portion and said annular base wall,
z. said friction means of said pistons having grooves therein whereby upon a braking of the device air passes inwardly of said holes in said first and second disc portions, through said grooves of said friction means and out said holes of said annular base wall of said annular housing.

3,889,785
DISC BRAKE UNIT

Toshio Hori, 1009-2 Ohoza Lokiie, Ueda, Japan

Filed Feb. 13, 1974, Ser. No. 442,149
Claims priority, application Japan, Feb. 16, 1973, 48-18345
Int. Cl. F16d *55/224, 65/02*
U.S. Cl. 188—73.3 **1 Claim**



1. A disc brake unit comprising: a brake disc secured to a rotating member; caliper means having a pair of caliper arms spaced opposite to each other and arranged in straddling relation to said brake disc, said caliper arms being interconnected at their basal ends by means of joining bolts extending parallel to an axis of said brake disc, said bolts being exposed at their medial portions to a space defined by said caliper arms; a first friction pad mounted on one of said caliper arms on the inside thereof and facing one face of said brake disc; a bearing sleeve slidably fitted in the other caliper arm on the inside thereof; a second friction pad slidably fitted in said bearing sleeve to face the other face of said brake disc; a bracket plate formed at the outer end of said bearing sleeve and integrally therewith, said bracket plate being slidably engageable with the exposed medial portions of said joining bolts; a fixed frame, said bracket being attachable to said fixed frame; and thrust means including a hydraulic cylinder bore formed within one of said caliper arms substantially in coaxial relation with said bearing sleeve, and a piston member slidably in said cylinder bore so as to drive said second friction pad into pressure engagement with said brake disc free of contact with the inner surface of said sleeve.

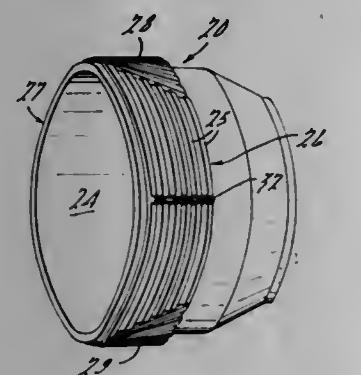
3,889,786
BRAKE DRUM COOLING STRUCTURE

Carl N. Schrader, Detroit, Mich., and Frank H. Fisher, Kenton, Ohio, assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed June 28, 1973, Ser. No. 374,326
Int. Cl. F16d *65/10*
U.S. Cl. 188—218 R **5 Claims**

1. A metal brake drum comprising a cast generally cylindrical main body portion open at one axial end thereof and

provided with means for mounting the drum to a wheel assembly at the other end, the interior of said main body portion comprising a cylindrical friction braking surface, the exterior of said main body portion having a plurality of radially extending heat radiating projections integrally cast and formed from the same metal as said main body portion adjacent the open end thereof, said radially extending projections comprising a plurality of circumferentially spaced sets of helical fins with each successive set of helical fins comprising a plurality of helically oriented radial projections disposed at a helical orientation opposite to the helical orientation of the projections comprising the preceding set and a plurality of circumferentially spaced groups of axially or circumferentially extending ribs with each set of helical fins separating a pair of circumferentially spaced groups of said ribs.



3,889,787

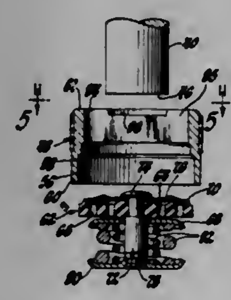
HYDRAULIC SHOCK ABSORBER UNIT

Robert B. Zehring, Dayton; Richard W. Kinninger, Arcanum, and Allan W. Miller, Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 5, 1973, Ser. No. 404,102

Int. Cl. F16f *9/19*

U.S. Cl. 188—317 **1 Claim**



1. In a piston and piston rod subassembly for disposition in a shock absorber pressure chamber filled with a hydraulic working fluid, said subassembly including a piston slidably disposed in said pressure chamber and dividing the latter into a jounce compression chamber and a rebound compression chamber, said piston having a jounce compression surface and a rebound compression surface exposed to respective ones of said jounce and said rebound compression chamber, valve means on said piston operative to control fluid flow across said piston between said jounce and said rebound compression chambers, and a cylindrical piston rod of predetermined diameter slidably disposed on said shock absorber and projecting into one of said jounce and said rebound compression chambers, the improvement comprising, means on said piston defining a slot extending between said valve means and said one of said jounce and said rebound compression chambers, said slot intersecting the corresponding one of said jounce and said rebound compression surfaces and defining thereat an elongated aperture of width less than said predetermined piston rod diameter and of length exceeding said predetermined piston rod diameter, and means rigidly connecting said piston and said piston rod at said corresponding one of said jounce and said rebound compression surfaces with the longitudinal axis of said piston rod intersecting the geometric center of said elongated aperture so that said piston rod overlaps the edges of said elongated aperture thereby to close a portion of said slot, said piston rod cooperating with said elongated aperture in defining a pair of laterally spaced flow ports on said piston.

3,889,788

OVERHEAD CURRENT SUPPLY EQUIPMENT FOR ELECTRIC RAILWAYS

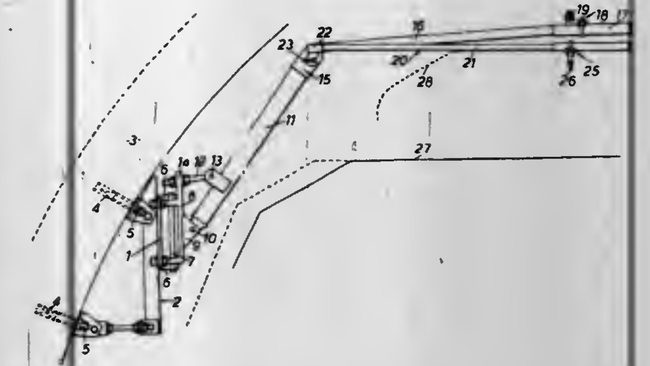
Joseph Littler, Huyton; Dennis Joseph Taylor, Ormskirk, and Kenneth James Campbell, St. Helens, all of England, assignors to British Insulated Callender's Cables Limited, London, England

Continuation-in-part of Ser. No. 139,681, May 3, 1971, abandoned. This application Apr. 9, 1973, Ser. No. 349,551

Claims priority, application Germany, May 6, 1970, 21815

Int. Cl. B60m *1/20*

U.S. Cl. 191—40 **14 Claims**



1. In overhead current supply equipment of an electric railway, comprising at least one overhead wire that passes through an overhead structure an insulating support comprising a substantially rigid base secured to said overhead structure and located to one side of the vehicle load gauge, a single simple inclined strut extending upwards and inwards to a point higher than the highest point of the load gauge and being secured to said base to inhibit rotation about a horizontal axis, a resin-bonded glass fibre beam providing insulation for the support and extending inwards from the upper end of the said strut and being secured to it to inhibit rotation about a horizontal axis, and a fitting securing said overhead wire to the free end of said beam.

3,889,789

THERMAL FUSE MECHANICAL DISCONNECT

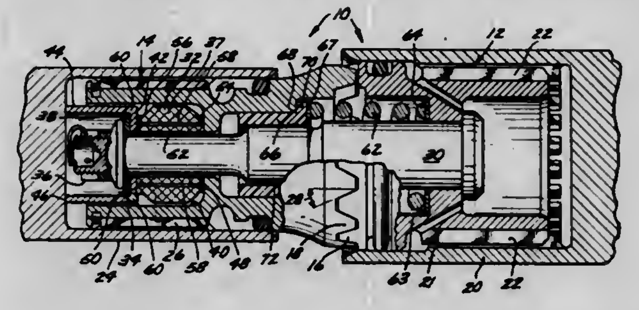
Wilfred E. Boehringer, Fullerton, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Apr. 15, 1974, Ser. No. 460,920

Int. Cl. F16d *11/00*

U.S. Cl. 192—82 T **10 Claims**

1. Torque disconnect means including:
- first means for connecting to torque supplying means;
- second means for connecting to torque receiving means; and
- third means for connecting and disconnecting said first and second means in torque transmitting relationship, said third means including bias means tending to force said first and second means to disconnect positions and a thermal fuse loaded in compression by said bias means, said thermal fuse including a body having opposite parallel abutment faces to which said bias means apply the compressive load, said thermal fuse body being constructed of fuse material which remains solid up to a predetermined temperature and a plurality of columnar supporting members which extend perpendicular to and between said abutment faces, whereby said fuse material prevents columnar bending of said supporting members until the predetermined temperature is reached, at which time the compressive load fails said supporting members in columnar bending so that said thermal fuse no longer resists said bias means, thereby allowing said bias means to disconnect said first and second means.



3,889,790

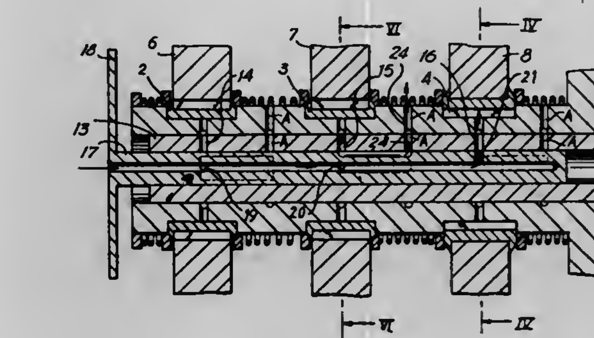
GEAR CLUTCHES WITTH SELECTOR VALVE

Norman C. Bricker, Courtenay, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Aug. 8, 1973, Ser. No. 386,760

Int. Cl. F16d *25/10*

U.S. Cl. 192—85 AT **2 Claims**



1. A transmission system, comprising
- a substantially tubular drive shaft having a plurality of spaced keys mounted thereon;
- a driven shaft in operative proximity with the drive shaft and positioned substantially in parallel therewith;
- a plurality of spaced annular drive gears coaxially freely positioned around the drive shaft, each of the drive gears being positioned in operative proximity with a corresponding one of the keys;
- a plurality of spaced driven gears mounted on the driven shaft and rotatable therewith, each of the driven gears being drivingly coupled to a corresponding one of the drive gears;
- a transmission case; and
- control means in the drive shaft for selectively moving each of the keys into and out of engagement with the corresponding drive gears, the control means comprising
- a sleeve having a plurality of valve holes formed therethrough coaxially positioned inside the drive shaft, each hole corresponding in position to a corresponding one of the keys, and a pressure tube coaxially positioned inside the sleeve, said pressure tube being affixed at one end to the transmission case and having a plurality of holes formed therethrough and oil under pressure therein, each hole of the pressure tube corresponding in position to a corresponding hole of the sleeve, and rotating means for selectively rotating the sleeve to align a desired hole of the sleeve with a desired hole of the pressure tube for selectively urging a desired one of the keys into engagement with the corresponding drive gear thereby rotating the drive gear with the drive shaft.

3,889,791

CHARGE DISTRIBUTION CHUTE

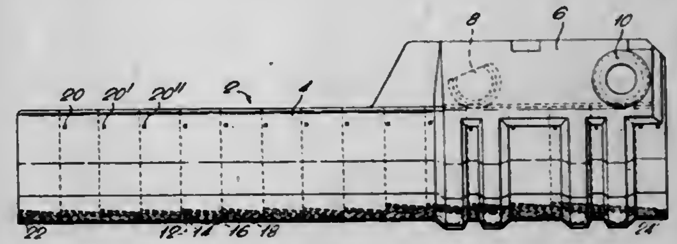
Edouard Legille, Luxembourg, and Rene N. Mahr, Howald-Hesperange, both of Luxembourg, assignors to S.A. des Anciens Etablissements Paul Wurth, Luxembourg

Filed June 27, 1973, Ser. No. 374,049

Claims priority, application Luxembourg, July 7, 1972, 65680

Int. Cl. B65g *11/16*

U.S. Cl. 193—3 **2 Claims**



1. A charge distribution chute for use within a blast furnace comprising:
- a rigid elongated support channel defining body comprised of heat resistant steel; and
- a plurality of wear-resistant members rigidly affixed to and detachable from the interior channel defining surface of said body, said wear-resistant members being individually affixed in overlapping relationship to said body only adjacent their respective upstream ends in the direction of charge material flow of said members, said wear-resistant members each including at least a first carrier plate comprised of heat-resistant steel and a layer of abrasion-resistant material affixed to the carrier plate on the material contacting side of the wear-resistant member, said wear-resistant members being shaped to define a channel at least partly commensurate in shape with the channel defined by said body whereby material flowing along the chute will be contained by and in contact with said wear-resistant members to a preselected depth, at least two of said wear-resistant members being superimposed at all points along the channel defining body located downstream of the wear-resistant member positioned at the material receiving upstream end of the chute.

3,889,792

ENERGY ABSORBING DEVICE FOR COIN HANDLING MECHANISMS AND THE LIKE

Frederick Gordon Willis, Winchester, Mass., assignor to Mars, Inc., McLean, Va.

Filed May 8, 1974, Ser. No. 468,205

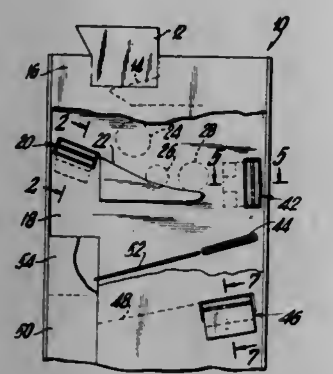
Claims priority, application United Kingdom, May 18, 1973, 23883/73

Int. Cl. G07f *3/02*

U.S. Cl. 194—1 K **8 Claims**

1. A device in a coin apparatus for abruptly stopping the motion of a coin along its path of travel comprising
- a strike plate,
- a support for the strike plate positioning the plate in the path of the coin to intercept its travel,
- a first cushion layer contiguous to and interposed between the strike plate and support to be compressed by and to

yield under impact of the coin with the strike plate, and a mounting for the support adapted to yield resiliently



under the energy of impact transmitted to it by said support.

3,889,793
MOSAIC PRINTING HEAD

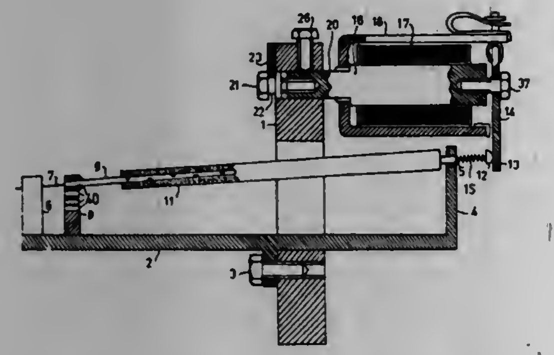
Sergio Cattaneo, Voghera, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

Filed June 14, 1973, Ser. No. 370,136

Claims priority, application Italy, June 15, 1972, 25698/72

Int. Cl. B41j *3/05*

U.S. Cl. 197—1 R **7 Claims**



1. A printing head for a mosaic printer wherein a plurality of movable needles are projected against a platen, said printing head comprising a ring-shaped structural supporting member, a bracket firmly connected to said ring-shaped member, said ring shaped member having a plurality of axial openings distributed circumferentially with respect to said bracket; a plurality of guiding members for said movable needles mounted on said bracket; a plurality of flat electromagnets, each electromagnet comprising a rotatable armature, a central core, a U-shaped yoke and a cylindrical projection coaxial to said central core and engaged in a corresponding one of said axial openings of said ring-shaped member; each cylindrical portion and its respective axial opening defining individual means for mounting a respective one of said electromagnets in axially adjusted position; individual locking means for locking each said electromagnet in the adjusted position; individual means for adjusting the air gap between said armature in rest position and said central core; and means for securing said armature to said yoke in a manner allowing a limited rotation of said armature substantially free from restoring torques.

3,889,794
TYPEWRITER PLATEN RELEASING MECHANISM HAVING AN ELASTICALLY DEFORMABLE GEAR DISC

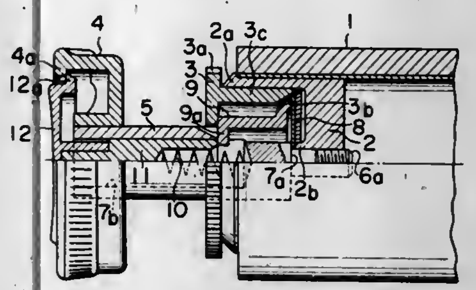
Toshikatu Terashima, Sakaki-Machi, Japan, assignor to Nakajima All Kabushiki Kaisha, Tokyo-To, Japan

Filed Nov. 28, 1973, Ser. No. 419,723

Claims priority, application Japan, Apr. 2, 1973, 48-38727[U]

Int. Cl. B41j *19/80*

U.S. Cl. 197—123 **6 Claims**



1. A releasing mechanism for a cylindrical platen of a typewriter, the typewriter further including a line changing mechanism, the releasing mechanism comprising, in combination: a boss secured in the interior of said platen at one end thereof; a platen gear rotatably and coaxially inserted in said boss and having means forming an opening with inner, first gear serrations at the axially inner end thereof, and a ratchet wheel on the outer circumference and at the axially opposite end thereof, for driven engagement with said line changing mechanism; a platen arbor having the axially inner end rigidly secured to a central portion of said boss, and the other end extended outwardly from said platen in the axial direction of said platen; a platen knob secured to the outer end of said arbor; a resilient, disc-shaped member rigidly mounted on said arbor and having second gear serrations on the outer circumference thereof for meshing engagement with said first gear serrations; a sleeve member mounted on said arbor, slidable in the axial direction of said arbor, non-rotatable relative to said arbor, and abutting a radially outer portion of said resilient member; and operating means axially slidably mounted in said arbor, having one end thereof in contact with said sleeve member, and the other end thereof manually pushable from outside; the manual pushing operation on said operating means causing said sleeve member to deform said resilient member in a manner that said second gear serrations move out of meshing engagement with said first gear serrations, whereby driving connection between said gear and said platen is broken.

3,889,795
REMOVABLE CARTRIDGE FOR THE INKED RIBBON FOR TYPEWRITERS, CALCULATING MACHINES OR OTHER OFFICE MACHINES

Sergio Garberi, and Lorenzo Bertino, both of Ivrea, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea(Torino), Italy

Filed Oct. 20, 1972, Ser. No. 299,379

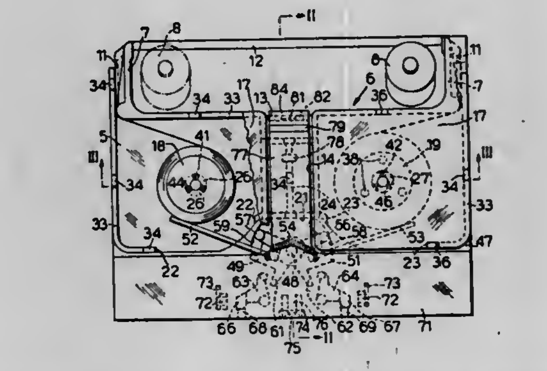
Claims priority, application Italy, Dec. 6, 1972, 70,460/71; Dec. 30, 1972, 68,360/72

Int. Cl. B41j *33/14*

U.S. Cl. 197—151 **17 Claims**

1. A removable cartridge for an inked ribbon for an office printing machine of the type including a supporting platform, two motive shafts rotatably projecting from said platform, a ribbon reversal feed mechanism including two sensing elements for rotating one or another of said two motive shafts in one predetermined sense of rotation, a closure plate including a central tongue, an engaging tongue projecting from said platform, said closure plate being fulcrumed on said platform between an inoperative location and an operative location for causing said central tongue to engage said engaging tongue in correspondance with said operative location of said closure plate, and means connecting said closure plate with said two sensing elements for moving said sensing elements from inoperative positions away from said motive shafts in correspondence with said inoperative location of said closure plate of operative positions of said sensing elements near said motive shafts, in correspondence with said operative location of said closure plate, said cartridge comprising

a. a container including a main wall, a series of side elements connected to said main wall perpendicular to said main wall, two ribbon spools, means rotatably supporting said spools in lateral spaced relation within said container about an axis perpendicular to said main wall, means for accomodating said motive shafts concentrically with said spools, and an inked ribbon having ends fixed to said spools and wound in coils on said spools, one of said side



elements defining a pair of slits for the passage of said inked ribbon from the one to the other of said spools outside said container, and said spools being provided with corresponding engaging means for engaging said motive shafts;

b. aperture means on said container for causing said sensing elements during the movement thereof from said inoperative positions to said operative positions to bear against said coils of ribbons wound on said spools, and sense the amount of coils of ribbon wound on said spools; and

c. first means defining a recess between said two spools in said main wall for cooperating with said tongue of said closure plate in correspondence with the operative location of said closure plate for fixing said container on said platform jointly to the bearing of said sensing elements against said coils.

3,889,796
HARVESTER BOOM CONTROL

Everett M. Bally, Moscow, Idaho; Donald E. Rathbone, Manhattan, Kans., and Lynn F. Johnson, Omer Falls, Idaho, assignors to Idaho Research Foundation, Inc., Moscow, Idaho

Filed Jan. 24, 1974, Ser. No. 436,201

Int. Cl. B65g *43/00*

U.S. Cl. 198—7 **6 Claims**

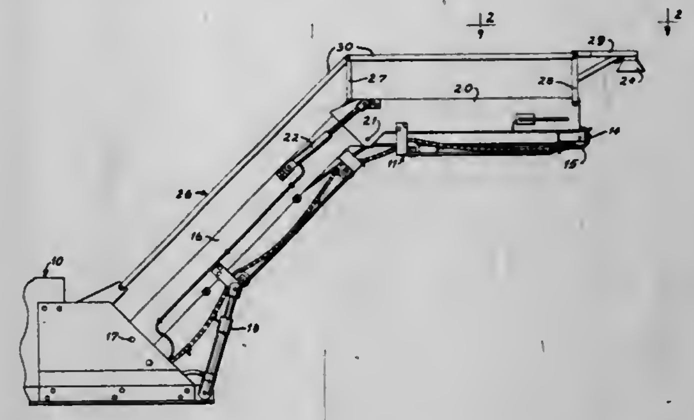
1. A control for a boom conveyor adapted to be pivoted about a horizontal axis and including a discharge end spaced from said axis for delivering material from said discharge end downward onto a receiving pile in a receptacle, comprising:

ultrasonic transducer means pivotally mounted at the discharge end of the conveyor boom for continuously monitoring the spacing between the discharge end and the upper surface of the receiving pile and for producing an output signal indicating the spacing between the discharge end and the upper surface of the pile;

drive means for raising or lowering the discharge end of the conveyor relative to the surface of said receiving pile;

output signal translating means operatively connecting said ultrasonic transducer means and said drive means, said output signal translating means being responsive to said output signal of the ultrasonic transducer means for operating said drive means to continuously maintain the spacing between the discharge end and the upper surface of said receiving pile at a preselected distance; and

means operatively interconnecting the ultrasonic transducer means and the boom conveyor for pivoting the



ultrasonic transducer means in response to pivotal movement of the boom conveyor to maintain the ultrasonic transducer means directed toward the upper surface of the pile independently of the angular orientation of the boom conveyor.

3,889,797
AUTOMATIC TRANSPORT SYSTEM

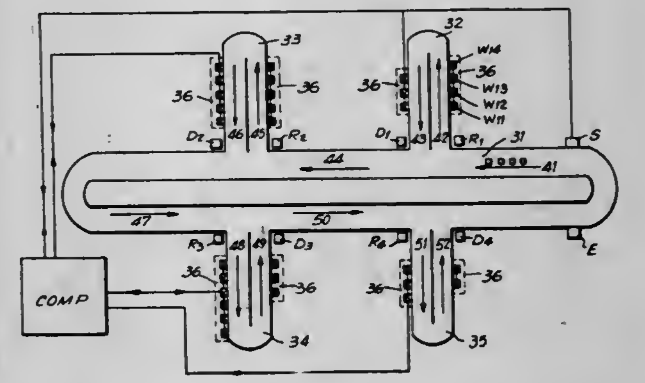
Kazuo Naito, 11, Kawada-cho, Ichigaya, Shinjuku-ku, Tokyo; Terumitsu Kondo, 8-2, Nishi-5-chome, Yachiyodai, Yachiyo-shi, Chiba-ken, and Kansuke Nakajima, 2-3, Takanedai-cho, Funabashi-shi, Chiba-ken, all of Japan

Filed Dec. 29, 1972, Ser. No. 319,858

Claims priority, application Japan, Dec. 29, 1971, 47-711

Int. Cl. B65g *59/06*

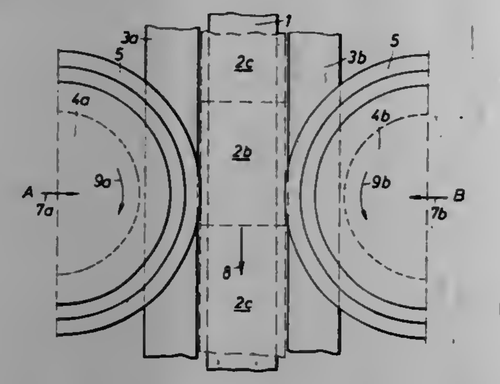
U.S. Cl. 198—35 **3 Claims**



1. An automatic transport system comprising a main conveyer for transporting containers each with a plurality of pallets stacked therein and on which are loaded workpieces to be processed, a plurality of sub-conveyers disposed along said main conveyer in predetermined spaced relation for transporting said pallets delivered from said containers at an intersection location of said two conveyers and for returning the pallets back to the main conveyer after the workpieces have been processed along said sub-conveyer, and means for transporting said pallets from main conveyer to the sub-conveyers, said means including a first positioning means for positioning and stopping said containers on the main conveyer, pushing means for pushing the pallets stacked in the containers stopped by said positioning means one by one so as to transfer the pallets to the sub-conveyers and second positioning means for effecting a stopping operation of a proceeding container at the outlet end of the sub-conveyer to stack the pallets loaded with the processed workpieces therein.

3,889,798
DEVICE FOR TRANSPORTING BARS

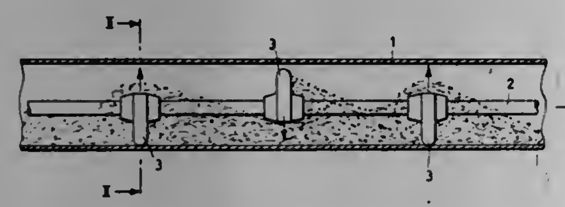
Heinz Jurgens, Unna, and Heinrich Ostendorf, Dortmund, both of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Germany
Filed Jan. 15, 1974, Ser. No. 433,521
Claims priority, application Germany, Jan. 16, 1973, 2301929
Int. Cl. B41j *13/00*
U.S. Cl. 198—127 **1 Claim**



1. Means for transporting bars or bar sections, on slideways, in their longitudinal direction comprising driven friction wheels which are arranged alongside and acting on said bars, said wheels having radial circular slots at their periphery, and means to compensate for uneven pressure of said wheels on said bars and prevent the bars from tilting, comprising lateral guide bars mounted in said slots, said guide bars being located to bear on central portions of said bars, at least one friction wheel and guide bar being located on each side alongside the bars to be transported, the surfaces of the friction wheels extending slightly beyond the surfaces of the guide bars above and below the guide bars.

3,889,799
CONVEYING APPARATUS FOR GRANULAR MATERIALS

Camillo Pirovano, Via Spluga, Cernusco Lombardone, Italy
Filed Nov. 26, 1973, Ser. No. 419,051
Claims priority, application Italy, Dec. 20, 1972, 33307/72
Int. Cl. B65q *19/08*
U.S. Cl. 198—168 **3 Claims**

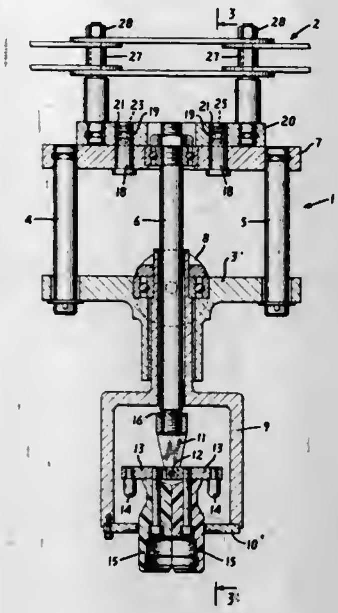


1. A conveying apparatus for granular materials comprising an enclosed guideway, a cable driven to slide within said guideway, and radially extending mutually spaced apart tab members on and normal to said cable substantially mating the peripheral outline of the guideway extending from the cable alternatingly in angularly shifted directions.

3,889,800
BOTTLE CHUCK HAVING A SNAP-ON SNAP-OFF COUPLING

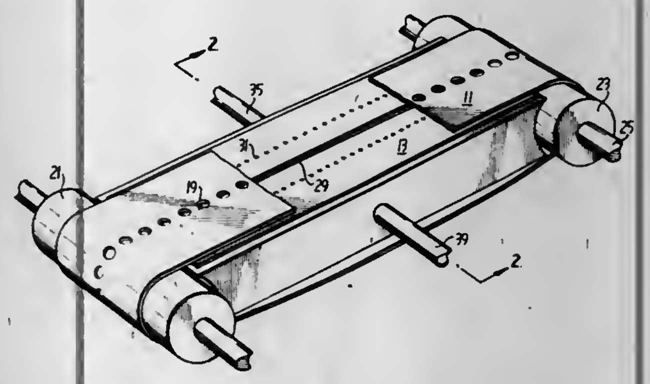
Dale George Frische, Belleville, Ill., assignor to Indian Head Inc., New York, N.Y.
Filed Jan. 10, 1974, Ser. No. 432,188
Int. Cl. B65g *17/00*
U.S. Cl. 198—179 **2 Claims**

1. In a vertically retractable rotatable bottle chuck attachable to a belt of an overhead chuck conveyor, the improvement which comprises a first support plate having at least one protruding lock pin and a recesss in its exposed periphery and a second support plate having at least one mating orifice for receiving each aligned lock pin and release means intersecting each orifice for releasably engaging a lock pin recess, one of the plates supporting the bottle chuck and the other of the plates being attachable to the belt of the overhead chuck conveyor; said release means being a protuberant spring-loaded ball housed within a chamber of a set screw.



3,889,801
VACUUM CONVEYOR BELT WITH AIR BEARING

Harold E. Boyer, Anna, Ohio, assignor to Bell & Howell Company, Sidney, Ohio
Filed Oct. 26, 1972, Ser. No. 301,120
Int. Cl. B65g *15/28;* **B65h** *5/22*
U.S. Cl. 198—184 **13 Claims**



1. A vacuum-type conveyor system for conveying an article comprising:

a conveyor belt having a first side for carrying said article and a second side opposite said first side, said conveyor belt including apertures arranged in a narrow longitudinally extending pervious zone of said conveyor belt, and said conveyor belt further including a longitudinally-extending impervious zone positioned on each side of said pervious zone, said impervious zones being substantially free of apertures and being flat on said second side;

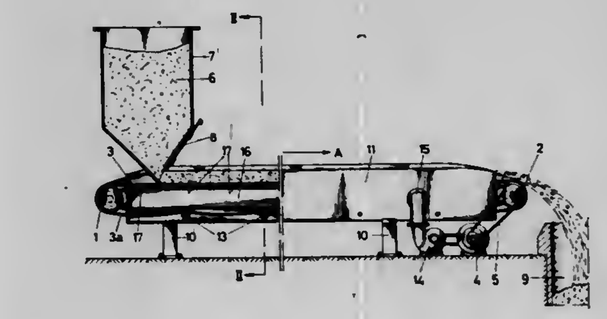
a supporting surface adjacent said second side of said conveyor belt, said supporting surface defining an elongated surface negative-pressure zone, said surface negative-pressure zone being adjacent said belt pervious zone and arranged parallel thereto, said supporting surface further defining a plurality of positive pressure apertures arranged in a plurality of elongated areas of said supporting surface, said elongated areas being parallel to, but separated from said surface negative-pressure zone and respectively lying under said impervious zones of said belt;

negative fluid-pressure means for creating fluid pressure forces at said surface negative-pressure zone which acts through said surface negative-pressure zone and said belt apertures to hold said article against said first side of said conveyor means; and

positive fluid-pressure means for creating positive fluid pressure forces at said positive-pressure apertures which act on said second side of said conveyor at said impervious zone, to create a positive pressure air bearing between said impervious zone and said supporting surface to reduce drag caused by said negative pressure.

3,889,802
BELT CONVEYOR AND METHOD FOR OPERATING SUCH A CONVEYOR

Cornelius O. Jonkers, Morshoekweg 5, Hengelo, Netherlands
Filed Sept. 12, 1973, Ser. No. 396,436
Claims priority, application Netherlands, Apr. 17, 1970, 7005538
Int. Cl. B65g *15/00*
U.S. Cl. 198—184 **6 Claims**



1. In a belt conveyor system in which the operative run moves over a perforated bed, means being present to admit somewhat viscous fluid such as air under preessure between the lower surface of this operative run and said perforated bed for supporting said operative run, said fluid being admitted through openings in said perforated bed, the improvements comprising at least 75 percent of the total flow area of said openings situated within the area of the bed corresponding with the central half of the width of the belt, said openings in the bed corresponding with said central half of the width of the belt have a total flow areaαper square meter belt surface which is larger than about 0.6cm.^{2} per square meter and smaller than about 3.5cm^2 per square meter, the mean number n of openings corresponding with said central half of the belt width per meter length of the bed being higher than about 1/B and less than about 50, and in which the following relationships are satisfied:

$$\alpha=A/BL$$

and

$$n=N/L$$

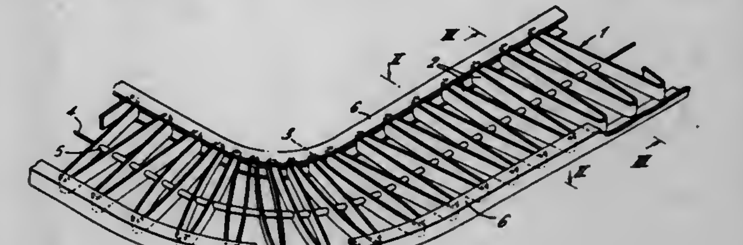
where

A=the total flow area of the openings in the bed within the area corresponding with the central half of the belt in m2;
B=the width of the belt, in m;
L=the length of the bed, in m;
N=the total number of openings within the area of the bed corresponding with the central half of the belt;

and the flow area 0 of a single opening satisfying the requirement $0.8\times10^{-6}<O/B<50\times10^{-6}$ in which O is measured in m^2 and B in m.

3,889,803
OPENWORK CONVEYOR BELTING

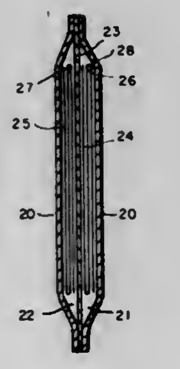
William Paul White, Ellesmere Port, England, assignor to United Kingdom Atomic Energy Authority, London, England
Continuation of Ser. No. 245,482, April 19, 1972, abandoned. This application Nov. 30, 1973, Ser. No. 420,719
Int. Cl. B65g *15/54*
U.S. Cl. 198—189 **22 Claims**



1. A conveyor having an openwork endless conveyor belt having lateral edges and comprising a series of struts, each strut extending from a transverse end at one lateral edge of the conveyor belt transverse to the direction of travel of the conveyor to a transverse end at the other lateral edge of the conveyor belt, and located in spaced relationship from each other in the direction of travel and interconnected at their said transverse ends to form a substantially zig-zag configuration each strut having a cross-section, viewed in a vertical plane parallel to the said direction of travel, which is thin in the said direction of travel and elongated perpendicular to the said direction of travel so that each strut is sufficiently spring-like to flex, between its transverse ends, to negotiate both horizontal axis curves and vertical axis curves, spacer means disposed centrally between said transverse ends between each strut and its adjacent struts for maintaining a substantially uniform spacing between each strut and its adjacent struts, a flexible inextensible means extending in the said direction of travel and located centrally between the transverse ends for comprising and locating said spacer means, guide means for receiving the interconnected ends for confining the said interconnected ends against movement perpendicular to the said direction of travel both (a) in the plane of the conveyor and (b) perpendicular to the plane of the conveyor, and drive means for driving the belt in said direction of travel.

3,889,804
DISPOSABLE TOWEL

Leonard E. Ravich, Boston, Mass., assignor to Gorham International, Inc., Gorham, Maine
Filed Mar. 14, 1973, Ser. No. 341,277
Int. Cl. B65d *81/32*
U.S. Cl. 206—223 **8 Claims**



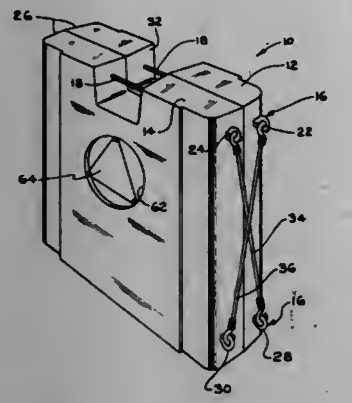
1. An article comprising an airtight pouch where said pouch is divided into two chambers, each containing a towel, the towel in one of said chambers being impregnated with a solution of oxidizing agent and the towel in the other of said chambers being impregnated with a solution of reducing agent, whereupon with rupture of said chambers, the two

towels are brought together causing mixing of said oxidizing agent and reducing agent to cause an exothermic reaction and a temperature rise in said towels above ambient temperature.

3,889,805
FISHING TACKLE RACK

Chauncey F. Korten, 2410 Vinewood, Ann Arbor, Mich. 48104

Filed Apr. 30, 1973, Ser. No. 355,545
Int. Cl. B65d *85/00;* **A01k** *97/00*
U.S. Cl. 206—223 14 Claims

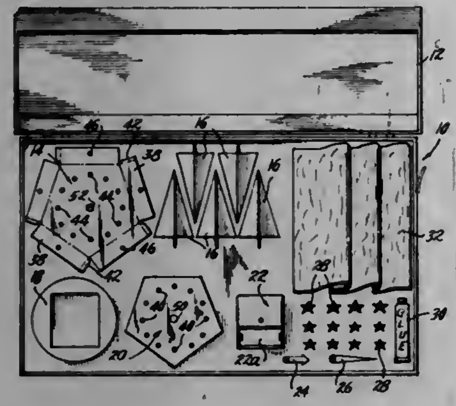


1. A fishing tackle rack comprising first and second body portions each having top and bottom edges and upright hinged and unhinged edges and a plurality of cavities therein for storing fishing tackle, and hinge means hingedly connecting said body portions, said hinge means comprising first and second stretch cords located respectively adjacent to the top and bottom edges of the body portions and each secured at one end of the unhinged edge of the first body portion and at the other end to the unhinged edge of the second body portion and each extending through both body portions and the adjacent hinged edges thereof.

3,889,806
CLOCK HOUSING AND DECORATIVE MEANS THEREFOR

Frank P. Casella, 2404 Freemansburg Ave., Easton, Pa. 18042

Filed Feb. 14, 1974, Ser. No. 442,324
Int. Cl. B65d *79/00;* **G04b** *37/00*
U.S. Cl. 206—223 4 Claims

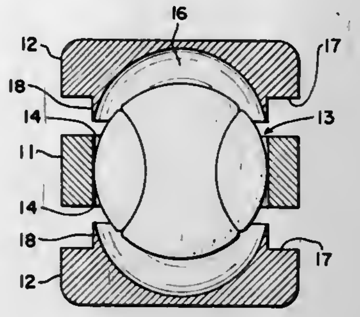


1. A clock kit comprising a container having enclosed therein, a clock housing blank, a plurality of decorative elements adapted to project from the housing, means for attaching said decorative means to said housing, a clock motor support means, a motor housing, hour and minute hands, a shaft extending from said motor housing for connecting said hour and minute hands to said motor housing, hour indicators, and means for connecting said hour indicators to said clock housing, said clock housing blank comprising a base having an opening medially located to provide access for said shaft, a plurality of circumferential tabs extending from the base, the tabs when taken together substantially extending about the circumference of the base, which tabs when folded out of the plane of said base to be perpendicular thereto provide a housing adapted to engage and hold said decorative means and said motor support.

3,889,807
MEANS FOR PRESERVING TENNIS BALLS OR THE LIKE

Robert S. Feinberg, 81 Edgemont Place, Teaneck, N.J. 07666, and David A. Selick, 76 LeRoy Street, Tenafly, N.J. 07670

Filed Apr. 2, 1973, Ser. No. 347,080
Int. Cl. B65d *85/00, 85/62*
U.S. Cl. 206—315 18 Claims

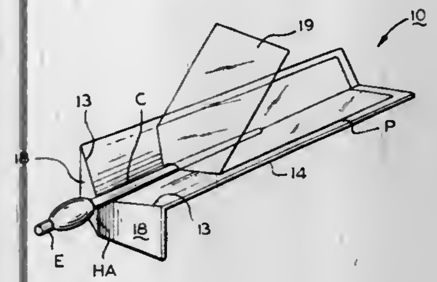


1. A storage receptacle for a gas pressurized ball having an externally unstressed predetermined outside diameter comprising first means including a first section having an interior face portion of a diameter less than said predetermined diameter for engaging and compressing said ball about a median girth thereof, and second means including a second section having a recess with a portion of spherical face of a diameter less than said predetermined diameter and not exceeding a hemisphere for closing assembly with said first means to form a substantially spherical cavity of less than said predetermined diameter to fully embrace and compress said ball, one of said means having an integrally formed annular lip portion projecting therefrom and coaxial to and matingly received within a corresponding recess in the other of said means when in closed assembly, whereby the cavity is fully closed even when the first and second means do not abut.

3,889,808
STERILE PACKAGE

Charles Robert Helms, Barto, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Apr. 11, 1974, Ser. No. 459,942
Int. Cl.² B65O *5/50;* **A61M** *25/02*
U.S. Cl. 206—364 4 Claims



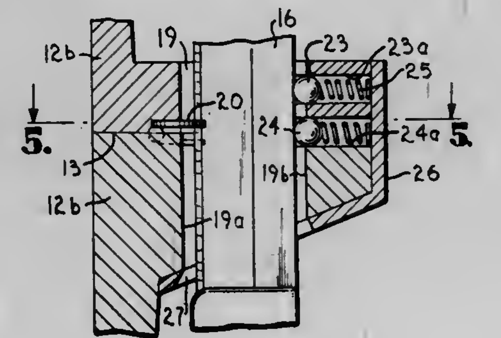
1. A sterile package for an elongated surgical article such as a catheter or the like comprising:

a. an elongated backing panel formed of a unitary blank of foldable paperboard;
b. a closing panel of flexible sheet material overlying said backing panel for enclosing said article against said backing panel;
c. said closing panel being secured to said backing panel adjacent the perimeter thereof;
d. said backing panel including a major section and a minor section separated from each other by a score line;
e. said score line extending generally transversely across said backing panel but in a direction other than straight across, so that when said minor section is folded downwardly from said major section on said score line, a longitudinally extending depression is formed in said major section to provide a trough for supporting a major portion of said article, with the remaining portion of said article extending over said score line beyond said major section, and a bow is formed in said minor section so that said minor section serves as an easel for supporting an adjacent end of said major section.

3,889,809
COMBINED STORAGE HOLDER AND SHARPENER FOR KNIVES

Samuel L. McNair, Overland Park, Kans., assignor to Dazey Products Co., Kansas City, Mo.

Filed May 29, 1973, Ser. No. 364,904
Int. Cl. B65d *85/54*
U.S. Cl. 206—372 3 Claims



1. A combined cutlery holder and sharpener comprising

a support member having a slot therethrough for reception of a blade with a cutting edge, said slot having opposed side edges,

blade sharpening means at one side edge of said slot for sliding engagement with the opposite sides of said cutting edge during insertion and removal of said blade from said slot, and

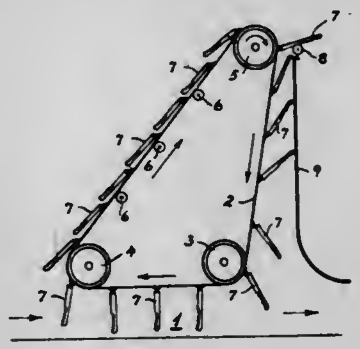
means at the other side edge of said slot resiliently biasing said blade toward and into contact with said blade sharpening means while said blade is in said slot.

3,889,810
APPARATUS FOR PICKING UP FILAMENTOUS OR LONG-FIBRED ELEMENTS FROM FLUID FLOWING THROUGH A CHUTE

Kaj Hansen, Osterbrogade 2, 4800 Nykobing Falster, Denmark

Filed Sept. 24, 1973, Ser. No. 399,704
Claims priority, application Denmark, Sept. 25, 1972, 4736/72
Int. Cl. B07c
U.S. Cl. 209—76 11 Claims

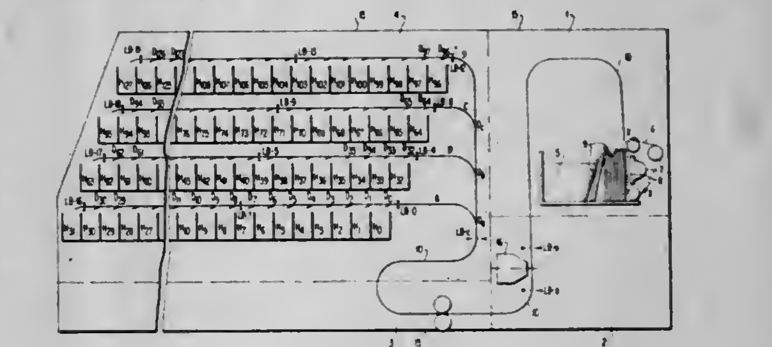
1. Apparatus for picking up filimentous or long-fiber debris from fluid flowing through a chute, comprising: an endless belt; at least two pulleys for driving the belt along a path, one portion of the path extending above and substantially parallel to the chute, the belt moving along the one portion in a direction contrary to the fluid flow through the chute, and another portion of the path extending upwardly from the first portion of the path about one pulley and downwardly about another pulley to return to the first portion of the path; a plurality of flexible scarfs at intervals along the belt; means attaching one side of the scarfs to the belt; a plurality of slat-shaped pick-up members spaced across the belt and adjacent each of the scarfs for forming rows of members across the belt at the intervals of the scarfs along the belt; means attaching the pick-up members to the other side of the scarfs for swingably suspending the pick-up members from the belt with the scarfs, the pick-up members extending from the scarfs into the fluid in the chute when the members are carried on the belt along the one portion of the path for picking up the debris from the fluid in the chute and carrying the debris to the downwardly extending portion of the path; and a stop member adjacent the other pulley at the downwardly extending portion of the path hit by the pick-up members for discharging the debris and swinging the members toward the belt for passing between the stop and the belt.



3,889,811
FLAT-ARTICLE SORTING APPARATUS FOR AN AUTOMATIC MAIL HANDLING SYSTEM AND THE LIKE

Syoichiro Yoshimura, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed June 18, 1973, Ser. No. 371,018
Claims priority, application Japan, June 19, 1972, 47-61512
Int. Cl. B07c *5/344*
U.S. Cl. 209—74 M 3 Claims



1. A flat-article sorting apparatus for an automatic mail handling system and the like, comprising:

a plurality of groups of flat-article receiving pockets;

means for detecting coded data on flat-articles to be sorted, said data identifying the pockets into which said flat articles are to be diverted and comprising a first and a second coded data identifying one of said groups and one of said pockets in said group, respectively;

first means connected to said detecting means for temporarily storing said data;

means for conveying said flat articles along a transport path, said transport path having a main path and branching paths, each branching path corresponding to one of said groups;

means installed on said transport path for detecting said flat articles and producing first shift pulses;

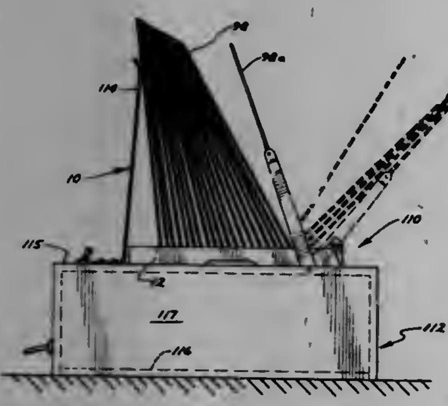
means for delaying said first shift pulses and producing second shift pulses;

second means for storing and transferring said data stored in said first storing means in response to said first and second shift pulses, said second storing means having a plurality of storing stages, said first shift pulses being applied to storing stages of said second storing means which are not adjacently positioned, said second shift pulses being applied to storing stages of said second stor-

ing means adjacent to said storing stages to which said first shift pulses are applied; and
means responsive to said data transferred in said second storing means for diverting flat-articles into branching paths and pockets within said branching paths;
said pockets being positioned so that the distances of the pockets having an identical second code from coded data detecting means are equal to each other;
said flat-article detecting means being installed at intervals equal to an integral multiple of the interval of said pockets.

3,889,812
PHONOGRAPH RECORD TILTING DISPLAY APPARATUS

Julian Gutierrez, 6233 Brookview Ave. South, Minneapolis, Minn. 55424
Filed May 24, 1974, Ser. No. 473,135
Int. Cl. A47f *3/08, 7/00;* **A47g** *29/00*
U.S. Cl. 211—1.5 **11 Claims**

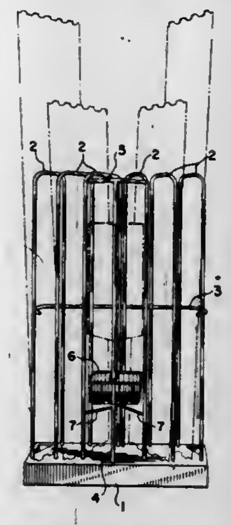


1. A phonograph record tilting display apparatus, having in combination
a rack having forwardly self-tilting records thereon, save for the first record thereof,
a housing supporting said rack,
a member carried by said housing forwardly tilting said first record,
spring means actuating said member,
a motor carried by said housing,
means driven by said motor operatively engaging said member,
said means moving said member reversely tilting said records to a rearward tilted position when said records have reached a forwardly tilted position,
said means withdrawing from operating engagement with said member upon completion of said rearward tilting of said records, and
said spring means actuating said member to forwardly tilt said first record upon said means withdrawing from operative engagement with said member.

3,889,813
MERCHANDISE DISPLAY STAND

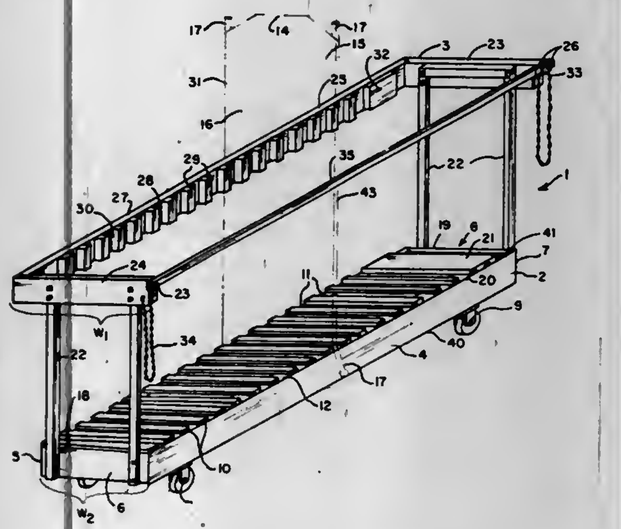
Thomas C. Wright, Huntington Beach, Calif., assignor to Vistron Corporation, Cleveland, Ohio
Filed Mar. 11, 1974, Ser. No. 450,068
Int. Cl. A47f *7/00*
U.S. Cl. 211—13 **3 Claims**

1. A merchandise display stand comprising a rectangular base bearing a plurality of vertical loops which are outwardly angled and progressively positioned toward the outward ends of the base at opposite inclination on each side from the center back of the base, said stand having a first reinforcing tube parallel to the plane of said base attached to the backside of said loops and being located about midway in the length of the loops and a vertical tubular pole secured near the front and center of said base which is connected to the fronts of the center two vertical tubular loops and at the top of said tubular pole by means of a second reinforcing tube which is parallel to the plane of the base and a basket for holding displayed items secured to said pole.



3,889,814
COT STORAGE CART

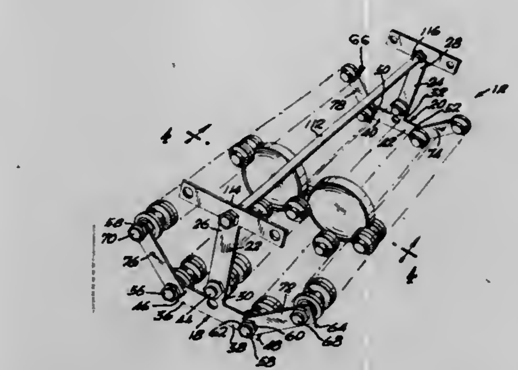
Joseph Albert Rice, 8262 Tulane, University City, Mo. 63132
Filed Nov. 28, 1973, Ser. No. 419,820
Int. Cl. A47f *7/00*
U.S. Cl. 211—27 **9 Claims**



1. A cot storage cart for storing a plurality of sleeping cots, comprising:
a base assembly, said base assembly including a supporting area having a first end and a second end, said supporting area having a plurality of spacers attached thereto, adjacent spacers defining a plurality of grooves, said base assembly having means for permitting removal of said cots, said cot removal permitting means being formed along one of said first and said second ends of said base assembly, said base assembly having a length dimension and width dimension;
support means attached to said base assembly and extending upwardly therefrom; and
an upper support assembly including a pair of end pieces extending outboardly of the width dimension of said base assembly, and a horizontal member extending between a first end of respective ones of each of said end pieces, said horizontal member having a plurality of notches formed in it, individual ones of said notch plurality of said horizontal member being aligned with individual ones of said groove plurality of said base assembly, and guard means removably mounted to said upper support assembly between a second end of respective ones of each of said end pieces.

3,889,815
LENS TRAY

Joseph Merle, 8101 Crespi Blvd., Miami Beach, Fla. 33141
Filed July 27, 1973, Ser. No. 383,345
Int. Cl. A47f *7/00*
U.S. Cl. 211—41 **5 Claims**

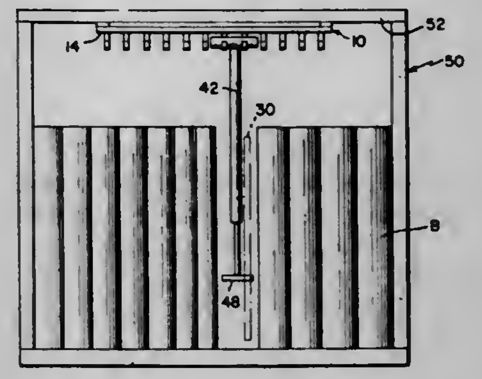


1. An adjustable lens holder tray comprising:
A. a frame including, a matching first and second end member in spaced confronting relation, each end member including a standard portion having an upper and a lower end zone, and a pair of arm portions adjacent said lower end extending laterally and oppositely from said standard portion,
B. a central elongate member extending between said end members and connecting the lower end zones of each standard portion,
C. a first elongate side member parallel to said central elongate member connecting the opposing arm portions of the first and second end members on one side of said standard portions,
D. a second elongate side member parallel to said central elongate member connecting the opposing arm portions of the first and second end members on the other side of said standard portions,
E. means to connect said elongate members to said end members,
F. a first and a second generally U-shaped member, each having a base comprising an elongate member parallel to said central elongate member and each having a pair of legs of common length,
G. pivot means connecting the terminal end of the legs of said first U-shaped member to the end members on one side of said standard portion,
H. pivot means connecting the terminal ends of the legs of said second U-shaped member to the end members on the other side of said standard portion,
I. said U-shaped members being swingable about the first and second elongate members respectively with the base portion of said U-shaped members at all times parallel to said central elongate member,
J. said elongate members and said base of each of said U-shaped members comprising a plurality of separate spaced, three point contact seats on opposite sides of said standard portion for seating circular objects,
K. said U-shaped members comprising adjustment means for adjusting the size of the seats on swinging movement of said U-shaped members.

3,889,816
BOOK HOLDER AND SEPARATOR

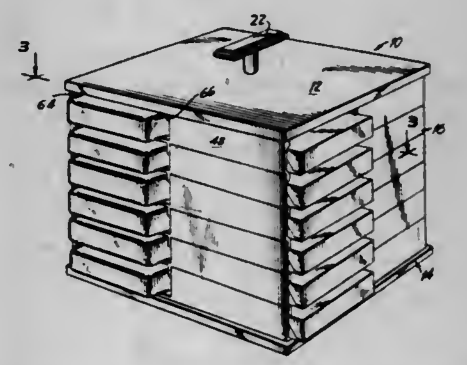
Rafael Marcelo Herryman, 121 E. Allegheny St., Martinsburg, Pa.
Filed Jan. 9, 1974, Ser. No. 431,989
Int. Cl.² A47B *65/00*
U.S. Cl. 211—43 **5 Claims**

1. A holder and separator for books in a bookcase or the like having a top shelf above the books comprising a pendulum member having a head end and a free end, said free end having a magnet member thereon and being elongated so as to be extended transversely to the swinging path of said pendulum member, means for supporting said pendulum at said head end for swinging movement between a horizontal position adjacent the top shelf of the bookcase above the books contained therein and a vertical position between two books in the bookcase for maintaining the books in a separated condition, and a magnetically attractable member affixed underneath the top shelf of the bookcase and adapted to be contacted by said magnet member when said pendulum member is in its horizontal position.



3,889,817
RACK

Joseph L. Berkman, 48 Country Rd., Mamaroneck, N.Y. 10543
Filed July 25, 1973, Ser. No. 382,302
Int. Cl. A47b *81/00*
U.S. Cl. 211—163 **5 Claims**



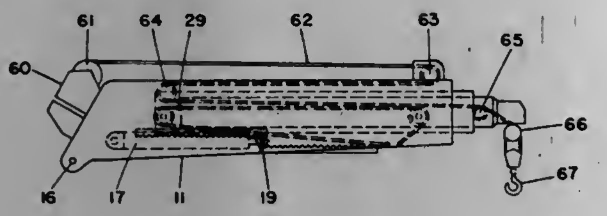
1. Rack element adapted for storing both magnetic tape cartridges and cassettes, comprising: a plate-like supporting surface of generally square configuration, four arm-like dividing walls of substantially uniform height radiating outwardly of the center generally perpendicular the edges, four edge walls of substantially similar uniform height extending along the edges of said supporting surface from the outward end of each of said dividing walls to each corner, of said supporting surface, thereby defining four similar generally open topped generally rectangular bins enclosed on two non-adjacent sides by a pair of side walls consisting of one of said dividing walls and one of said edge walls and at the back by a back wall comprising an adjacent one of said dividing walls and having a generally open and unobstructed front opening extending between a said one of said edge walls and one of said dividing walls opening outwardly along an edge of said surface; at least a pair of bosses extending generally perpendicularly of said supporting surface opposite the said walls and offset therefrom by the thickness thereof so that a plurality of such rack elements may be stacked in general alignment one above the other and be retained in such general alignment by engagement of said bosses of one rack with the side walls of the next adjacent rack element; and rib means on said rack element serving as stop means for a magnetic tape cassette box, wherein said side walls are spaced apart a distance substantially equal to the width of a magnetic tape cassette box, and

said rib means being spaced inwardly of said front opening a distance such that a cassette box abutted against said rib means projects at one side thereof from said opening of a bin a distance substantially equal the projection of a magnetic tape cartridge inserted within a bin against said backwall, thereby providing an aesthetically pleasing appearance to said rack element with said cartridges and cassettes in general projecting alignment.

3,889,818

EXTENSIBLE CRANE

Carl G. Wennerstrom, 3016 Park Pl., Evanston, Ill. 60201
Filed Sept. 21, 1973, Ser. No. 399,408
Int. Cl. B66c *23/06*
U.S. Cl. 212—55 **7 Claims**



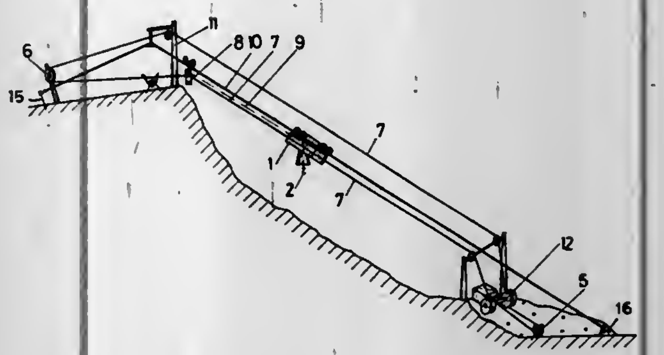
1. A crane comprising means for hoisting a load including a winch and a hoisting cable; a telescoping boom assembly carrying said hoisting cable on sheaves for compensation of free cable length upon extension and retraction, said boom assembly including a first boom and a second boom extensible from said first boom by means of a boom extending piston in a cylinder carried by said first boom, said boom extending piston carrying a pinion for cooperation with gear racks on said first and second booms to double the extension distance produced by motion of said boom extending piston; means for rotating said boom assembly with respect to a base to swing a load; means including a generally horizontally mounted boom elevating piston and cylinder assembly, the cylinder of said boom elevating assembly being pivotally mounted for limited motion with respect to the horizontal upon elevation of the boom, a linkage operatively coupling a forward end of the boom elevating piston to the boom for conversion of substantially horizontal piston motion to topping movement of the boom, said linkage comprising a crosshead carried by the boom elevating piston, a pair of generally rearwardly extending arms carried by said crosshead, a relatively short linkage pivotally connected to a rear end of each of said arms and to a part of the boom which moves down as the boom is elevated, and a relatively long, generally L-shaped link pivotally connected near the rear end of each said arm and to a fixed frame element; said hoisting, telescoping, swinging and elevating means being concurrently and independently operable for transporting a load by any combination of hoisting, telescoping, elevating and swinging.

3,889,819

OVERHEAD ROPEWAY CRAB FOR CONVEYING LOADS

Josef Koller, A-6330 Kufstein, Endach, Austria
Continuation-in-part of Ser. No. 252,835, May 12, 1972, abandoned. This application Nov. 15, 1973, Ser. No. 416,282
Claims priority, application Austria, May 17, 1971, 4254/71
Int. Cl. B66c *21/00*
U.S. Cl. 212—94 **3 Claims**

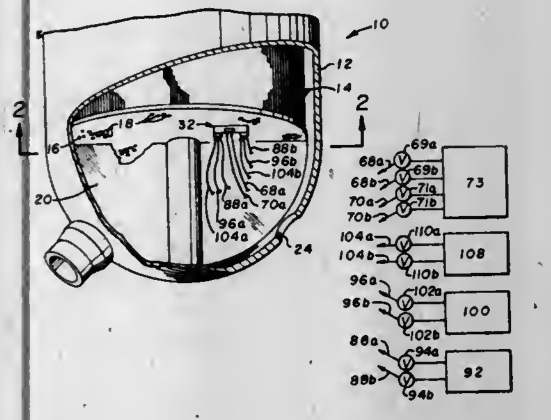
1. Load hauling apparatus comprising a substantially stationary cable, a displaceable cable separate from and displaceable along said stationary cable, a crab, coupling means to clamp said crab selectively to said stationary cable or to said displaceable cable whereby said crab is affixed to said cable or displaceable with said displaceable cable, a load lifter displaceable with the displaceable cable and extending through said crab by an amount corresponding to relative displacement between the crab and load lifter, the displaceable cable including ends, further means connecting said ends and thereby connecting the displaceable cable in a loop, means slidably supporting said further means on said stationary cable and preventing twisting of said cables, the load lifter extending through said crab and including an end connected to said further means, said further means holding the said end of the load lifter in spaced relation relative to the ends of the displaceable cable to promote the avoiding of engagement between the load lifter and displaceable cable, said load lifter including a free end, and load engaging means on the free end of the load lifter.



3,889,820

METHOD AND APPARATUS FOR SUSPENDEDLY SUPPORTING A PLATFORM

Eugene Ranger, East Ridge, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed Aug. 1, 1973, Ser. No. 384,659
Int. Cl. F28g *15/02*
U.S. Cl. 214—1 BB **22 Claims**



1. A platform for support below a member comprising:

a. a base portion;

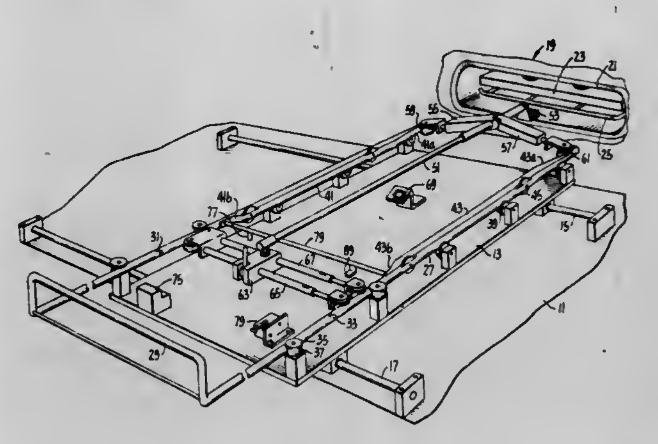
b. at least two upwardly extending support means supportingly connected to said base portion and independently reciprocable relative thereto between raised and lowered positions and including remotely actuable means therewith for grippingly engaging said member to support a portion of the weight of said platform therefrom when in said engagement; and

c. remotely controllable means for selectively applying a force to said support means relative to said base portion of a magnitude and direction to selectively move said support means either toward said raised position or said lowered position, even when said portion of platform weight is supported thereby.

3,889,821

APPARATUS FOR LOADING AND UNLOADING SUSCEPTORS FROM REACTOR

Gerald M. Bowers, Los Altos, and Norman S. Cay, Los Gatos, both of Calif., assignors to Unicorp Incorporated, Sunnyvale, Calif.
Filed Jan. 24, 1974, Ser. No. 436,339
Int. Cl. B23q *7/06*
U.S. Cl. 214—1 BB **6 Claims**



1. An apparatus for loading and unloading a susceptor from a reactor tube, comprising:

a frame,

a main carriage slidably held by said frame for movement having a direction of motion between extreme forward and rearward positions with respect thereto,

a pair of cam tracks attached to said main carriage to extend generally along said direction of motion and held generally in a horizontal plane, said cams having a varying spacing therebetween along their length with the maximum separation between the cams occurring at the ends thereof,

a lift carriage held by said main carriage in a manner to be movable therealong in said one direction,

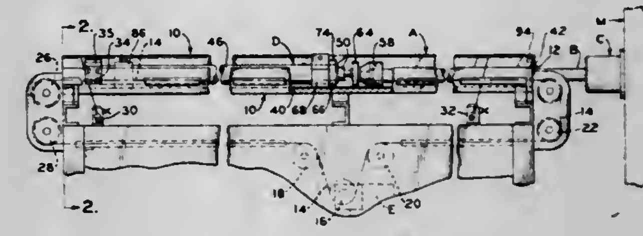
a lifting element mounted forward of said lift carriage, and means as part of said lift carriage and riding along said cam tracks on cam followers for moving said lift element upward as said cam followers contact portions of the cam tracks that are coming closer together and downward as the cam followers contact cam portions that move further apart, whereby the horizontal paths of said cams are converted into vertical motion of said lift element in response to relative movement of said lift carriage back and forth in said one direction along said main carriage.

3,889,822

BAR FEEDER

Thomas A. Ross, Mayfield Heights, Ohio, assignor to Mayfran Incorporated, Mayfield, Ohio
Filed Mar. 25, 1974, Ser. No. 454,327
Int. Cl. B23g *5/22*
U.S. Cl. 214—1.5 **17 Claims**

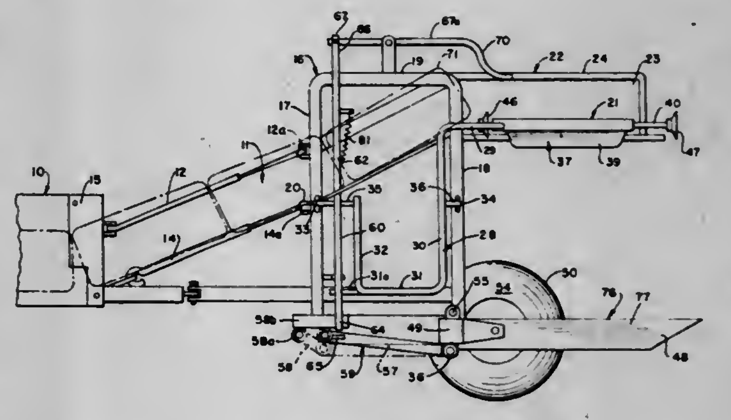
1. In a bar feeder including push rod means, means supporting said push rod means for reciprocable movement between first and second positions, said supporting means having a discharge end and a rear end, said push rod means having a leading end, said leading end in said first and second positions of said rod means being respectively between said rear and discharge ends and beyond said discharge end in the direction from said rear end toward said discharge end, and means to reciprocate said push rod means between said first and second positions, the improvement comprising; a support member releaseably interengageable with said push rod means for movement therewith, said member having a portion interposed between said push rod means and supporting means, and means adjacent said discharge end of said supporting means for releasing said member from said push rod means for said interposed portion to slidably support said push rod means during movement of said leading end between said discharge end and said second position of said push rod means.



3,889,823

AUTOMATIC BALE STOOKER

George Williamson, R.R. No. 2, Red Deer, Alberta, Canada
Filed Mar. 13, 1973, Ser. No. 340,678
Int. Cl. B65g *57/32*
U.S. Cl. 214—6 B **11 Claims**



1. A stooker for the automatic construction and deposit of a stock from bales discharged from a travelling baler comprising, in combination:

i. bale elevating means for receiving and elevating bales discharged from said baler;

ii. a bale receiving and positioning station for receiving bales from said bale elevating means and for angularly positioning thereof in a predetermined elevated deposit position, said pale receiving and positioning station comprising a pair of horizontally extending parallel bale receiving arms and bale support means on said bale support arms adapted to engage and support a bale, at least one of said bale support means being pivotably mounted upon an associated said bale support arm, and bale engaging and tripping means associated with one of said bale support arms to effect angulations of said bale within said station;

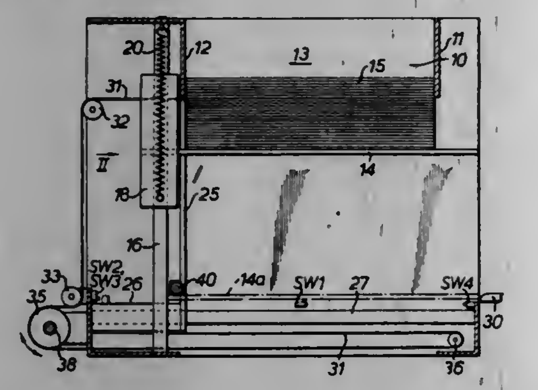
iii. bale release means for programmed release of bales from said bale receiving and positioning station whereby each of said bales is deposited at a predetermined position in a stook being formed, said bale release means comprising means for selectively locking and releasing said pivotable bale support means responsive to the position of a bale upon said pair of bale receiving arms;

iv. a stock forming platform adapted to receive bales upon release thereof by said bale release means for assembly of a stock thereon;

v. stook dump means responsive to the movement of bales into the bale receiving and positioning station and the assembly condition of the stook under construction on the stook forming platform for discharge of assembled stooks from said stook forming platform to the surface of the ground.

3,889,824
APPARATUS FOR EJECTING STACKS OF ARTICLES FROM CONTAINERS

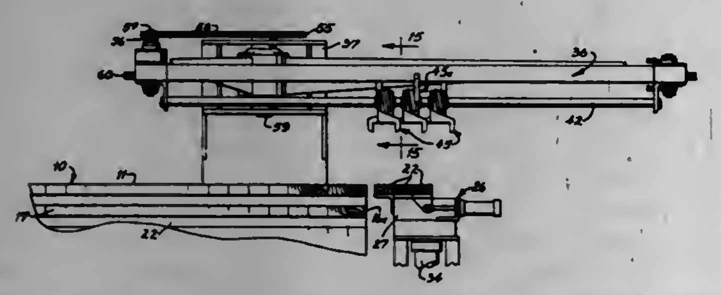
David Wood, Clevedon, England, assignor to Masson Scott Thrissell Engineering Limited, Bristol, England
Filed Nov. 28, 1972, Ser. No. 309,988
Int. Cl. B65g *59/06*
U.S. Cl. 214—6 H **5 Claims**



1. Sorting apparatus for mail, cards, or like flat articles, including a magazine for holding a stack of said articles, said magazine having a generally vertically movable platform on which the stack of articles is built up, means including a resilient spring device for controlling the vertical movements of said platform, said resilient spring device having a rate characteristic so related to the average density of the articles in the stack that the top article in the stack is maintained at a substantially constant level, a laterally movable pusher of substantial height arranged to transfer a stack off said platform, a gate device attached to said magazine and arranged to retain in the magazine any articles in excess of a predetermined stack height, and a horizontal supporting surface connected to said pusher to support said excess articles temporarily in the magazine, and wherein said sorting apparatus includes drive means for actuating said pusher comprising a power drive member clutch means for connecting said pusher to said drive member for ejector operations, and spring means for returning said pusher when the clutch is dis-engaged, and automatic control means for operating said platform and its pusher in a cycle wherein the platform descends under the weight of the stack to a predetermined level, the pusher moves horizontally to eject the stack off the platform, the said platform returns upwardly to its starting position below said magazine, and the said pusher returns horizontally to its original position.

3,889,825
LAYER SEPARATING APPARATUS FOR LUMBER STACKING MACHINES

Donald E. Mosely, Spokane, Wash., assignor to Bitco, Inc., Spokane, Wash.
Filed Sept. 24, 1973, Ser. No. 399,939
Int. Cl. B65g *57/26*
U.S. Cl. 214—6 M **10 Claims**

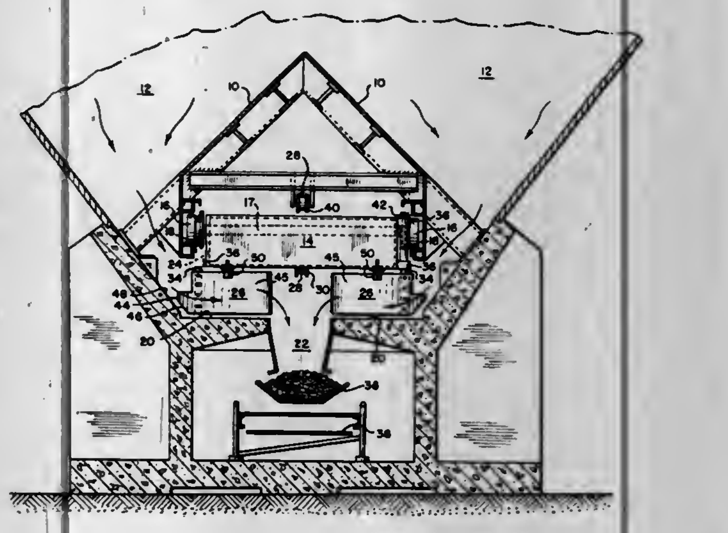


1. A layer separating apparatus for use in conjunction with a lumber stacking machine of the type utilized to form an upright stack of boards by placing successive layers of boards one on another with the boards being arranged lengthwise between ends of the stack,

said layer separating apparatus comprising:
a support table for receiving and supporting a prescribed number of layer separating boards;
a layer separating board positioning means for locating the layer separating boards at specific positions on the support table;
means for elevating the layer separating boards to an elevation above the stack;
clamp means for receiving and supporting layer separating boards from the support table;
pivot means for moving the layer separating boards held by the clamp means from the support table to positions elevationally above and transverse to the boards in the stack;
spacing means associated between the pivot means and clamp means for spacing the layer separating boards apart relative to one another along the length of the stack; and
clamp release means for releasing the layer separating boards onto the stack.

3,889,826
REVERSIBLE CAR PLOW FEEDER FOR STOCK PILE RECOVERY SYSTEMS

Robert Lee Pate, Pittsburg, Kans., assignor to The McNally Pittsburg Manufacturing Corporation, Pittsburg, Kans.
Filed Jan. 25, 1974, Ser. No. 436,614
Int. Cl. B65g *65/44*
U.S. Cl. 214—17 DA **6 Claims**

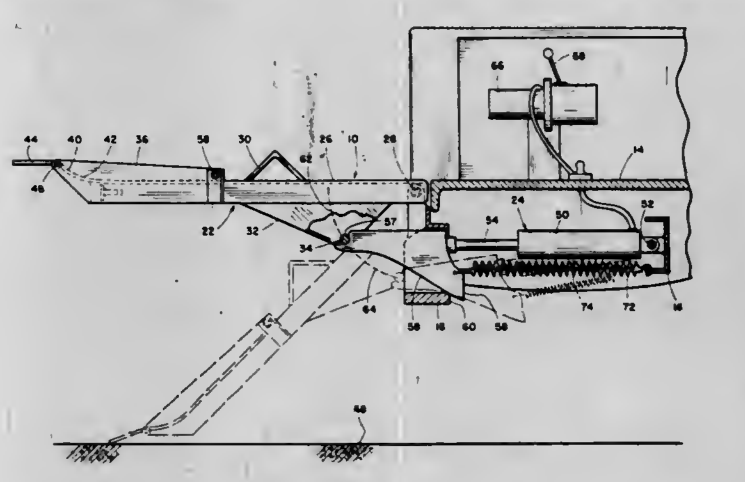


1. An apparatus for moving material such as coal flowing from a stock pile as it flows onto a pair of spaced floor sections separated by an elongated delivery chute in which movement of the material from a spaced floor section to and into the delivery chute is accomplished, the apparatus comprising

a. a reversible car moving back and forth in a direction substantially parallel to the axis of the elongated delivery chute, said car having a central portion which moves over the chute and corresponds in width to the chute and said car having a side portion which is positioned above and moves back and forth over a spaced floor section;
b. a swingable car plow on the car;
c. pivot means connected to the car and positioned to permit the car plow to swing about an axis which passes in a generally vertical plane through said side portion of the car and through the floor section;
d. two material moving surfaces on the plow, one surface for causing material to move from the spaced floor section into the delivery chute when the car is moved in one linear direction and the other surface for causing material to move from the same spaced floor section when the car is moved in the other direction, said plow swingably engaged with said pivot means at one end of said plow such that the pivot engaging end portion of the plow moves ahead of the rest of the plow as the car is moved in either direction; and
e. stop means to limit the swinging of the plow in each arcuate direction, said stop means being positioned to effect engagement with the plow surfaces in substantially vertical planes that pass through the side portion of the car.

3,889,827
TRUCK LOADING AND UNLOADING APPARATUS

Boyce Fine, 3720 E. Archer, Tulsa, Okla. 74115
Continuation-in-part of Ser. No. 160,056, July 6, 1971, abandoned. This application July 23, 1973, Ser. No. 381,726
Int. Cl. B60p *1/44*
U.S. Cl. 214—77 P **8 Claims**



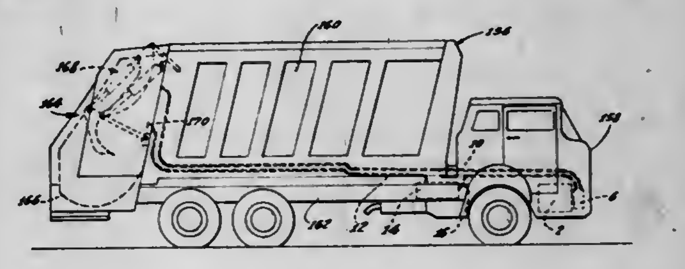
1. In a truck, having a truck bed thereon, and a tailgate section pivotally attached along one edge thereof to one edge of the truck bed, a loading ramp apparatus comprising a ramp section having one edge thereof pivotally secured along the free edge of the tailgate section, said ramp section being foldable against the tailgate section and being free to rotate 180° for extending the length of the tailgate section whereby in its lowest position said tailgate section and ramp section form an inclined ramp structure from the truck bed to the ground; bracket means secured to the outer surface of the tailgate section; movable ramp support means comprising a fluid operated cylinder having one end thereof pivotally secured beneath the truck bed, an elongated piston rod reciprocally disposed within the cylinder and having one end thereof extending outwardly from the opposite end of the cylinder, bracket support means secured to the outer end of the piston rod and said bracket support means being separate from the bracket means and engagable therewith when the tailgate section is between a substantially horizontal position and its lowest position, guide means carried by the truck bed operably connected to the bracket support means, said guide means being capable of guiding the bracket support means along a path which coincides with the path of the bracket means when the tailgate section is pivoted with respect to the truck bed.

3,889,828
NOISE REDUCTION APPARATUS AND METHOD

Fred T. Smith, Dearborn Heights, Mich., assignor to Sargent Industries, Inc., Los Angeles, Calif.
Continuation of Ser. No. 401,410, Sept. 27, 1973, abandoned, which is a division of Ser. No. 274,798, July 24, 1972. This application May 8, 1974, Ser. No. 467,858
Int. Cl. B60p *1/00*
U.S. Cl. 214—83.3 **34 Claims**

1. In combination for reducing noise from a vehicle engine in driving an auxiliary mechanism disposed on the vehicle where the mechanism is auxiliary to the operation of the vehicle and constitutes apparatus for packing refuse in refuse equipment,

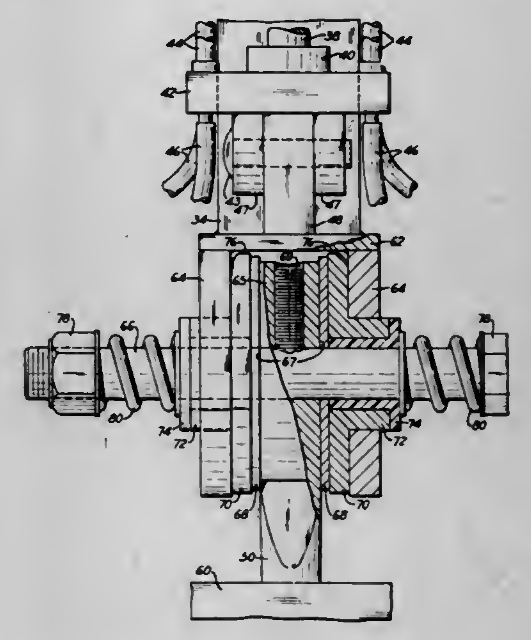
first means operable to provide for an operation of the auxiliary mechanism,
second means responsive to the operation of the first means for maintaining the vehicle engine at a speed near idling speed,



third means responsive to the operation of the vehicle engine at a speed near the idling speed for producing a flow of fluid under pressure at a controlled rate to obtain the operation of the auxiliary mechanism, and
fourth means responsive to the flow of fluid from the third means for providing for introduction of such fluid to the auxiliary mechanism to drive the auxiliary mechanism.

3,889,829
MOBILE REFUSE COLLECTION TRUCK

Glenn L. Dutton, Houston, Tex., assignor to Gulf Oil Corporation, Pittsburgh, Pa.
Filed Nov. 26, 1973, Ser. No. 418,901
Int. Cl. B66c *1/47*
U.S. Cl. 214—147 G **3 Claims**



1. In a mobile refuse collection truck having a boom mounted on and operated from the truck, an arm pivotally mounted at the outer end of the boom, a cage suspended from the outer end of the arm constructed and arranged to pick up refuse, the improvement comprising a pair of spaced flanges extending from the outer end of the boom, each of said flanges having a hole therethrough perpendicular to the boom, a shaft extending through the holes in the flanges, said arm having a disc at its upper end encircling the shaft between the flanges, means securing the disc to the shaft, a wear plate rotatable on the shaft on each side of the disc, a pressure plate slidable axially on the shaft between the wear plate and the flange, a hub extending outwardly from the pressure plate through and beyond the flange, a bushing between the pressure plate and the shaft and covering the outer end of the hub pressure plate, a helical spring encircling the shaft and bearing against the end of the bushing, and a threaded nut engaging threads on the shaft for adjustment of the force exerted by the spring to urge the pressure plate against the wear plate whereby the arm

can be rotated but friction between the wear plate and the disc prevents uncontrolled swinging of the arm.

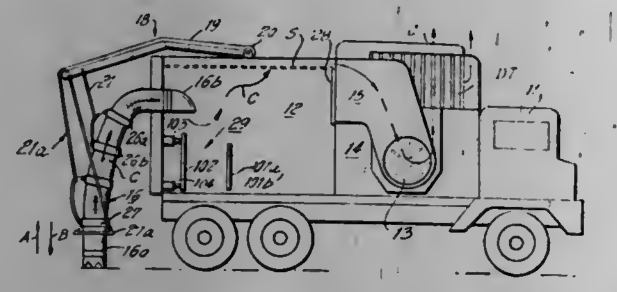
3,889,830
METHOD FOR HANDLING WASTE MATERIAL, REFUSE AND THE LIKE

Joseph F. Bauman, Trenton, and Arthur M. Elson, Hamilton Twp., Mercer County, both of N.J., assignors to Acme-Hamilton Manufacturing Corporation, Trenton, N.J.

Division of Ser. No. 286,573, Sept. 5, 1972, Pat. No. 3,819,069, which is a division of Ser. No. 121,865, March 18, 1971, Pat. No. 3,688,802. This application Nov. 12, 1973, Ser. No. 414,741

Int. Cl. B60p *1/60*

U.S. Cl. 214—152 **1 Claim**



1. A method for extracting refuse from an open-ended refuse container having a base and an air inlet opening near the base to facilitate the passage of air therethrough, comprising the steps of:

- providing a flexible vacuum hose having a flanged portion on one end thereof and spaced inwardly therefrom, whereby said one end may be sealed to a wide range of open end shapes and sizes of said refuse container;
- coupling the other end of said flexible vacuum hose to a refuse storage container;
- positioning the free end of the hose above and upon the open-ended refuse container; and
- drawing air from said refuse container to thereby cause the movement of air from the free end of the hose toward said storage container whereby the free end of the hose forms a temporary substantially airtight seal with the top of the refuse container whereby air is drawn into the inlet opening and refuse is extracted from the container, is passed through said hose and is collected in said storage container.

3,889,831
PALLET FOR LARGE COIL OF SHEET MATERIAL AND COOPERATING ROLLER STAND FOR DISPENSING SHEET MATERIAL FROM COIL

Robert L. Davis, Levittown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

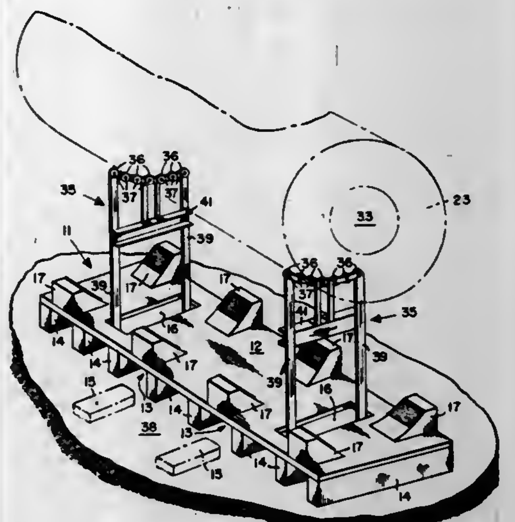
Filed Jan. 2, 1974, Ser. No. 430,350

Int. Cl. B21c *47/24*

U.S. Cl. 214—340 **4 Claims**

1. A system for delivering large coils of sheet material and for dispensing said sheet material therefrom, comprising the combination of a pallet and a roller stand, said roller stand having roller means for horizontally supporting said coil,

- said pallet comprising a rigid frame adapted to support said coil with the axis of the coil being generally horizontal, said frame having horizontal openings adapted to receive the forks of a lift truck, said frame having at least one vertical opening to allow free passage of said roller means through said pallet when said pallet is lowered over said roller stand, said roller stand receiving the load of said coil upon the lowering of the surface of said pallet below said roller means,
- said roller stand having at least one upright member carrying bearing means and said roller means rotatedly mounted at said bearing means, said roller stand adapted to horizontally support said coil with the periphery of said coil in resting contact with said roller means, whereby said sheet material is dispensed when said coil is axially rotated.



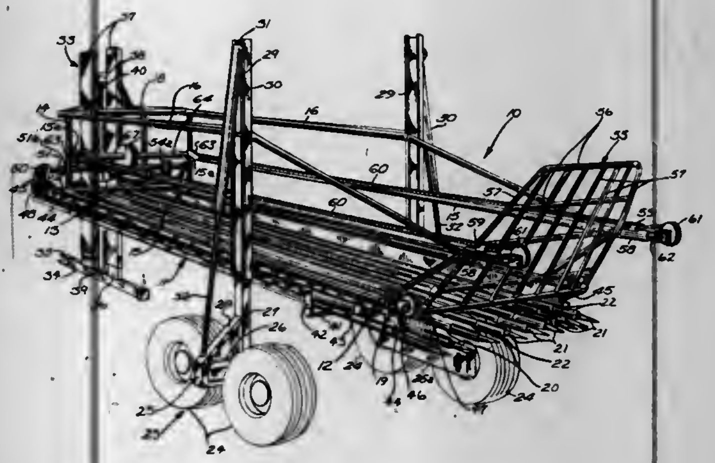
3,889,832
VEHICLE FOR TRANSPORTING HAYSTACKS AND THE LIKE

Howard G. Hanson, Box 408, 1203 Prairie Heights, Larned, Kans. 67550

Filed Dec. 6, 1973, Ser. No. 422,542

Int. Cl. B60p *1/04*

U.S. Cl. 214—514 **6 Claims**



1. A vehicle for transporting formed haystacks and the like, comprising:

- a normally horizontally oriented elongate support frame including a bed structure comprised of a plurality of laterally spaced apart elongate tines extending in a fore and aft direction,
- a hitch on said frame adjacent the front end thereof and being connectable to a prime mover,
- a pair of ground engaging wheel assemblies positioned on opposite sides of and connected with said frame intermediate the ends thereof for supporting the latter for travel over the surface of the ground, cooperating shiftable pairs of elements on said frame and on each of said ground engaging wheel assemblies to permit vertical translation of said frame relative to said ground engaging wheel assemblies between a lowered position and an elevated position, extensible power means connected between said frame and each of said wheel assemblies for elevating said frame relative to said wheel assembles, said frame when in the lowered position being positioned closely adjacent the ground and when urged rearwardly sliding below a haystack supported on the ground, said frame being maintained in a substantially horizontal position during its vertical movement,

- a substantially vertically disposed pusher member shiftably mounted on said frame and being shiftable in a front and rearward direction, longitudinally of said frame from a forward retracted position adjacent the front of said frame to a rearward position adjacent the rear of said frame, said pusher member when shifted from the retracted forward position to the rearward position, progressively unloading a haystack positioned on the frame, power means connected to said pusher member and being mounted on said frame and extending longitudinally thereof, said power means being operable for shifting said pusher member in a forward and rearward direction.

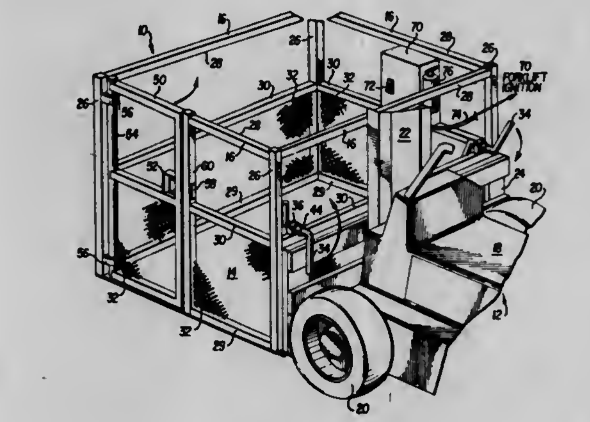
3,889,833
PERSONNEL SAFETY PLATFORM FOR FORKLIFT

Onas Leon Thomas, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Sept. 21, 1973, Ser. No. 399,485

Int. Cl.² B65G *47/00*

U.S. Cl. 214—620 **7 Claims**



1. A personnel platform for a forklift having lifting forks and an abutting plate, said platform comprising a floor and upstanding side walls, at least one door providing access into said platform, means located beneath said floor for receiving the lifting forks of a forklift, locking means secured to at least one of said side walls adapted to cooperate with the abutting plate of a forklift for releasably securing said platform on the forklift to prevent said platform from sliding off of the forks upon tilting thereof, said locking means including at least one latch means pivotably mounted on said at least one side wall and rotatable about an axis extending substantially parallel to the longitudinal axes of said forks, said latch means being adapted to be rotated upwardly in a vertical plane so as to permit the abutting plate of a forklift to be brought up against said side wall and then rotated downward behind the abutting plate in locking engagement therewith, and wherein said latch means is normally biased in the locking position thereof.

3,889,834
CONTAINER CONSTRUCTION

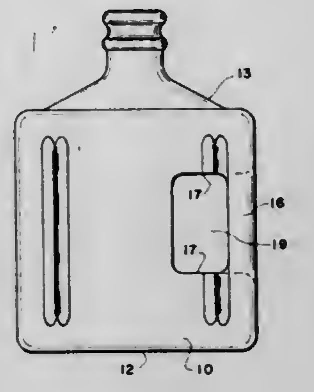
Robert M. Harris, Jr., Reseda, Calif., assignor to Foremost-McKesson, Inc., San Francisco, Calif.

Filed Oct. 25, 1973, Ser. No. 409,701

Int. Cl. B65d *21/02*

U.S. Cl. 215—10 **8 Claims**

1. A container construction suitable for stacking comprising side walls and a bottom wall, the side walls being joined together and to the bottom wall along their edges to form a container that is generally rectangular in configuration as viewed in plan, the container also including upper wall means secured to the upper edges of the side walls and provided with an access opening; and locking means upon two opposite side walls of the container for locking the container to adjacent upper and lower like containers when stacked horizontally, the locking means on each wall comprising adjacent parallel ridge and valley portions formed integral with the material of the wall, said ridge portions interfitting with the valley portions of like containers to prevent shifting movement between two adjacent stacked containers the major portions of each of the side walls being in a common plane except for said ridge and valley portions.



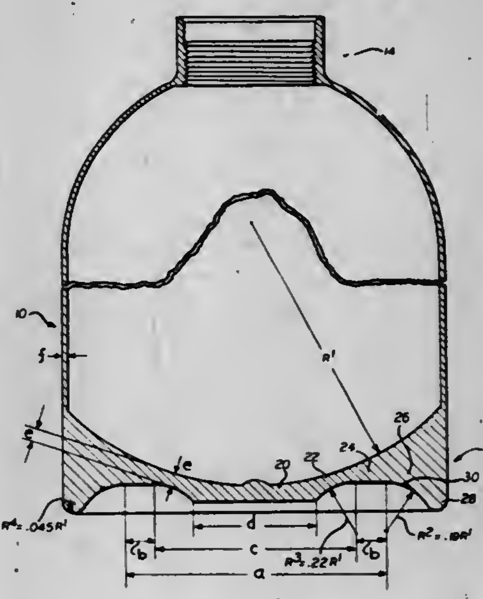
3,889,835
ONE-PIECE PRESSURE CONTAINER

Richard H. Avant, Rochester, and Peter R. Webster, Greece, both of N.Y., assignors to Bernzomatic Corporation, Rochester, N.Y.

Filed May 10, 1974, Ser. No. 468,962

Int. Cl. F17c *1/14;* **B65d** *1/16, 1/42*

U.S. Cl. 220—3 **8 Claims**



1. Pressure container comprising a generally cylindrical body and a self-standing integral bottom having a peripheral skirt portion, said bottom having an inside radius of about R^1 and an exterior configuration which, in vertical cross-section along a diameter line, includes:

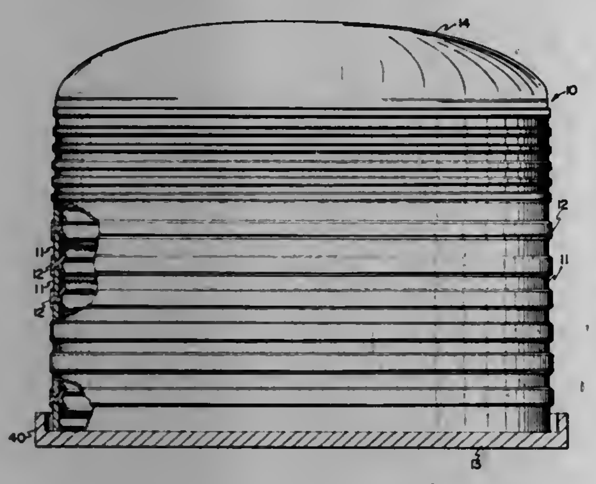
- i. a disc-like, circular central portion;
- ii. a concentric upwardly curved portion contiguous with said central portion and having a radius of about $0.22\ R^1$;
- iii. a concentric downwardly curved portion contiguous with the skirt portion and having a radius of about $0.19\ R^1$; and
- iv. a generally flat concentric portion contiguous with and between the curved portions.

3,889,836
METHOD AND MEANS FOR CONSTRUCTING LARGE TANKS

Paul E. Anderson, Torrance, Calif., assignor to Martin Marietta Aluminum, Inc., Torrance, Calif.

Filed Jan. 7, 1972, Ser. No. 216,005
Int. Cl. B65d *87/06, 7/38*

U.S. Cl. 220—5 A **3 Claims**



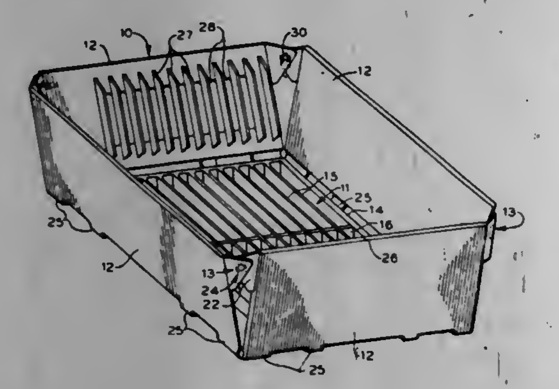
1. A stationary tank comprising a cylindrical vertical wall, a bottom, and a dome, said cylindrical wall comprising a plurality of vertical cylindrical shells comprising horizontal joints between the top and bottom edges of adjacent shells, strips of connector seal means within said joints, said seal means comprising a metal strip having in cross-section outer and inner sleeve means with neck means therebetween, said neck means disposed between said top and bottom edges of adjacent shells, said inner sleeve means comprising upper and lower leg means wherein the end of each leg means is welded circumferentially to respective inner walls of said adjacent shells, at least one of said leg means being flexible and curved thereby defining a pocket between said curved leg means and a said inner wall, and a sealing material disposed within said pocket.

3,889,837
DISH DRAINER HAVING INTEGRALLY HINGED SIDEWALLS

Michael C. Wilson, Wheaton, Ill., assignor to Pretty Products, Inc., Coshocton, Ohio

Filed Jan. 24, 1974, Ser. No. 436,115
Int. Cl. B65d *7/24*

U.S. Cl. 220—7 **10 Claims**



1. A dish drainer formed from a thermosetting synthetic resin comprising;

a base adapted for positioning on a supporting surface and having at least two adjacent peripheral side edges, said base formed with a plurality of open-topped elongated slots for receiving edge portions of dishes,

at least two sidewalls with each sidewall disposed at a respective side edge of said base, each sidewall interconnected at one edge thereof with the respective peripheral side edge of said base, one of said sidewalls formed with said base along a peripheral side edge disposed transversely to the longitudinal axis of said elongated slots, said last mentioned sidewall having a plurality of upstanding ribs formed in spaced parallel relationship on the inwardly facing surface thereof with the space between adjacent pairs of said ribs disposed in longitudinal alignment with a respective one of said slots,

hinge means integrally formed with said base and each of said sidewalls permitting relative swinging movement about a hinge axis parallel to the adjacent interconnected edges between a position in the plane of said base and a position upright thereto, and

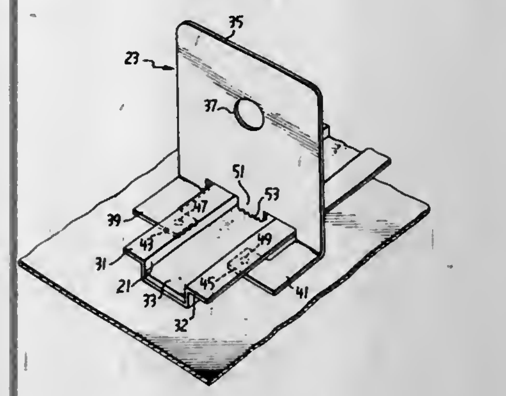
fastening means cooperatively interengaging each of said adjacent sidewalls when said sidewalls are disposed in upright relationship to secure said sidewalls together.

3,889,838
SELF-BRAKING FOLLOWER MECHANISM FOR CARD FILES AND THE LIKE

Roy E. Kanitz, Belpre, Ohio, assignor to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 7, 1973, Ser. No. 330,302
Int. Cl. B65d *1/24, 25/06*

U.S. Cl. 220—22.3 **6 Claims**



1. A file drawer self-braking follower mechanism for maintaining cards and the like generally vertically oriented one behind another, comprising:

a follower guide of generally U-shaped cross-section located at the bottom of the drawer and extending parallel to the front to rear axis of the drawer;

an elastomer strip having a surface which is even in the longitudinal direction and disposed along a trough of the U-shaped follower guide; and

a generally vertically oriented follower plate mounted on said follower guide for slideable motion along the follower guide and having a plurality of braking teeth on the bottom edge for impinging into the top even surface of the elastomer strip so that the follower plate can be secured at any position along the follower guide.

3,889,839
BLOW-MOLDED DRUM

Alvin L. Simon, and Klaus S. Butz, both of Los Angeles, Calif., assignors to Advanced Chemical Technology, Los Angeles, Calif.

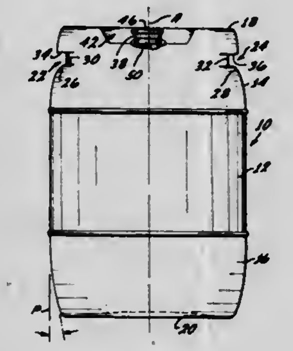
Filed May 30, 1974, Ser. No. 474,797
Int. Cl. B65d *7/42*

U.S. Cl. 220—72 **30 Claims**

1. A blow-molded drum of thermoplastic material comprising:

an extended drum body having a circumferential wall and top and bottom sections,

said circumferential wall having at least two integral overhanging brow portions positioned respectively on opposite sides of said circumferential wall of said body, each of said brow portions overhanging a corresponding clear and open volume adjacent said circumferential wall sufficiently large to permit insertion of the forks of a fork lift beneath the overhanging brows,



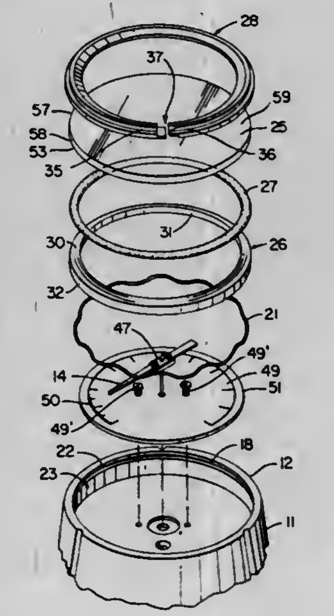
said overhanging brow portions having bottom surfaces adapted to serve as bearing and lifting surfaces for lifting and transporting of said drum by the forks of a fork lift.

3,889,840
GAGE CONSTRUCTION AND SPACING MEMBER THEREFOR OR THE LIKE

Larry V. Price, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 2, 1973, Ser. No. 402,707
Int. Cl. B65d *25/54;* **G01d** *11/26*

U.S. Cl. 220—82 A **8 Claims**



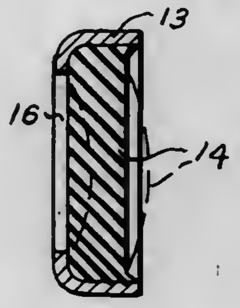
2. In combination, an instrument casing having an end wall means and an opening therein leading to said end wall means, a sealing member carried by said casing adjacent said opening thereof, a lens disposed in said opening and having one side of its outer periphery disposed against said sealing member, a lens ring means disposed against the other side of the outer periphery of said lens to hold said lens in said opening, said lens ring means having an interlocking part thereof disposed against the outer peripheral edge means of said lens between said sides thereof to lock said lens ring means to said casing, and a spacing member in said opening between said sealing member and said end wall means, said spacing member having an annular groove means therein that faces said end wall means, and a wavy spring disposed in said annular groove means and being in engagement with said end wall means to normally hold said spacing member spaced from said end wall means while permitting said spacing member to be moved toward said end wall means through the compressing of said wavy spring whereby said spring is adapted to be compressed and cause said spacing member to maintain said sealing member in sealing engagement with said one side of said lens.

3,889,841
LEAK AND CORROSION RESISTANT, YIELDABLE FREEZE PLUG

William H. Edmonds, Quanah, Tex., assignor to J. L. Quisenberry, Quanah, Tex.

Filed Nov. 28, 1972, Ser. No. 310,160
Int. Cl. B65d *35/44*

U.S. Cl. 220—200 **5 Claims**



1. In combination with a metal, cupped freeze plug,

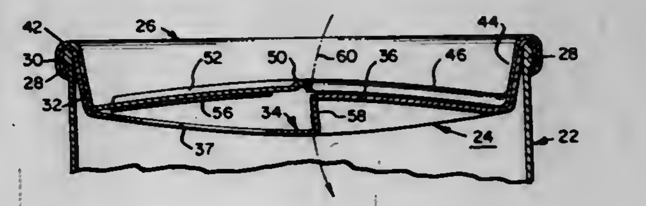
a. an elastomer material bonded within the cupped portion of the freeze plug,
  1. the cupped metal portion of the freeze plug is in the form of a disc, and
  2. the cupped portion of the disc is completely filled with an elastomer material.

3,889,842
CONTAINER CLOSURE OPENING MEANS

Robert A. Bennett, 170 Sturbridge Rd., Easton, Conn. 06425

Filed May 20, 1974, Ser. No. 471,331
Int. Cl. B65d *51/18*

U.S. Cl. 220—253 **25 Claims**



1. A closure apparatus for a container having an open end, circular in cross-section, comprising:

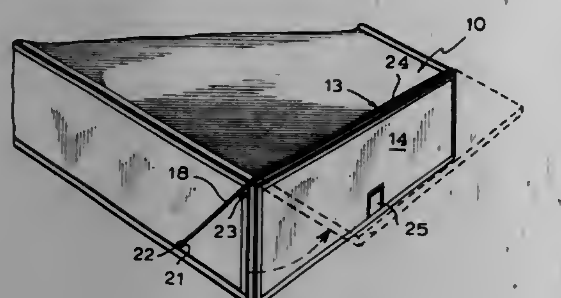
A. A first lid peripherally mounted to at least a portion of said open end and incorporating a central portion depressable from a first closed position to a second open position; said central portion incorporating;
  1. at least one orifice defining region; and
  2. a manually depressable raised button; and

B. A second lid mounted for rotation with respect to said first lid incorporating a central portion is juxtaposed relationship to the central portion of said first lid incorporating an opening with a configuration allowing the raised button of said first lid to protrude therethrough when the central portion of said first lid is in the closed position thereby preventing rotation of said second lid about said first lid; whereby the closure apparatus closes the container when the central portion of said first lid is in the closed configuration and opens the container by generating an orifice in each orifice defining region of the central portion of said first lid when said button is depressed thereby allowing rotation of said second lid about said first lid to align said opening with at least one of said orifices.

3,889,843
MULTI-POSITION DOOR AND HINGE

Matthew N. Miller, Woodland Hills, Calif., assignor to Fairchild Industries, Inc., Germantown, Md.

Filed Jan. 18, 1974, Ser. No. 434,380
Int. Cl. B65d *43/14, 51/04*
U.S. Cl. 220—332 8 Claims

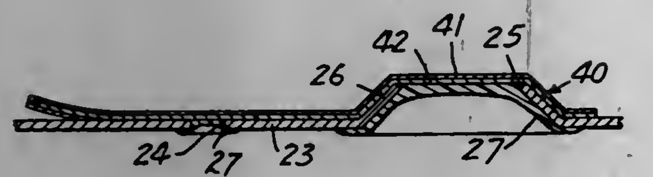


1. A receptacle with a multi-position door and hinge device comprising a receptacle having an opening to permit access to the interior thereof, a door adapted to cover the opening of said receptacle, and means operatively connected to said receptacle and to said door for permitting said door to be selectively rotated and displaced to expose the receptacle opening and for permitting the inner or the outer surfaces of said door to alternatively contact an outer surface of said receptacle when the opening of said receptacle is uncovered.

3,889,844
CAN CLOSURE

Harris W. Viker, Roseville, and William E. Kropp, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 30, 1973, Ser. No. 393,001
Int. Cl. B65d *41/00*
U.S. Cl. 220—359 6 Claims



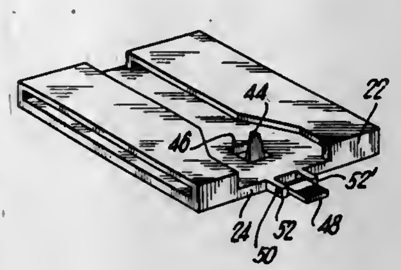
1. In a closed hollow container wherein a pour hole in the container wall is protectively covered by a tape removably adhered to the outer surface of the wall in the area immediately circumjacent to the pour hole,

the improvement which comprises contouring said area so that the wall uniformly tapers outward and the hole is thus located in a plane displaced outward with respect to the portion of the wall peripherally adjoining said area, the tape being adhered to the tapered portion of the wall, whereby, without causing the tape to loosen, the container can be subjected to substantially higher internal pressure than is possible when the hole is located in the same plane as the immediately circumjacent area.

3,889,845
MARKER STRIP DISPENSER

Louis F. Haitmanek, Florham Park, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Feb. 11, 1974, Ser. No. 441,157
Int. Cl. B65h *5/28*
U.S. Cl. 221—70 10 Claims

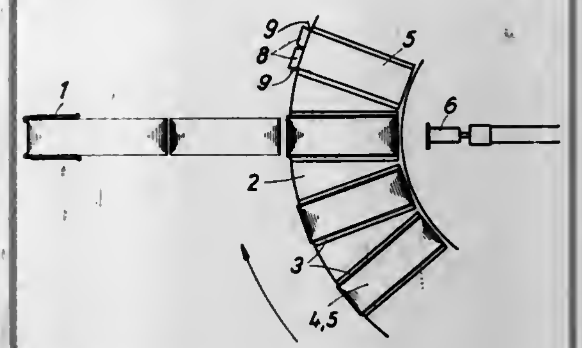


1. A device for selectively positioning a marker strip for removal from a backing web containing a plurality of such strips, comprising: a body member having web support means comprising a first portion and a second portion, said first and said second portions being arranged in selectively spaced relationship to define a web receiving passageway therebetween, a dispensing zone adapted to permit the removal of said marker strip from said web, said dispensing zone extending essentially across the width of said web receiving passageway and communicating therewith, said dispensing zone comprising an opening adapted to receive said marker strip therethrough; and a strip deflector extending selectively from said web support means first portion towards said dispensing zone to planarly deflect a selective portion of said marker strip out of the plane of said web receiving passageway and into said dispensing zone for removal of said marker strips from said web; said web support means second portion further comprising camming means for returning the deflected portion of an unremoved marker strip to its original position upon the selective advancement of said marker strip through said web receiving passageway and into engagement with said camming means.

3,889,846
LABELING MACHINE WITH CONTAINER FOR TRANSPORT OF STACKED LABELS

Hans Josef Strack, Monheim, Germany, assignor to Jagenberg Werke AG, Dusseldorf, Germany

Filed Nov. 21, 1973, Ser. No. 418,140
Int. Cl. B65g *47/82*
U.S. Cl. 221—79 6 Claims

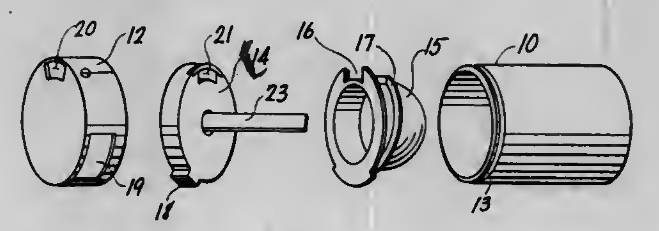


1. In a labeling machine including a magazine from which labels are dispensed for labeling, a stack of labels, means for delivering said stack of labels from a position of readiness to said magazine, and means for advancing said stack from a stand-by position to said position of readiness, the improvement which comprises a container for each stack of labels in said stand-by position, said container in part having the same shape as said label stack, having opposite ends and being provided at least at its end facing said magazine with separable end flaps, whereby upon actuation of said means for delivering said stack from said position of readiness to said magazine said separable flaps separate to permit delivery of said stack of labels which stack leaves said container while said container stays in said position of readiness, said similar shapes providing sliding guided contact of said stack relative to said container.

3,889,847
CHILD-RESISTANT PILL DISPENSER

Miroslav Uroshevich; Richard T. Powers, and Raymond L. Sperber, all of Cincinnati, Ohio, assignors to The AFA Corporation, Miami Lakes, Fla.

Filed Nov. 1, 1973, Ser. No. 411,946
Int. Cl. B65h *3/36*
U.S. Cl. 221—265 1 Claim



1. A dispenser container for tablets comprising, in combination, a container having a circular open end and a closed end, a guide plug freely rotatable in said open end and closing said open end except for a port extending through said plug and sized to permit passage therethrough of one tablet at a time, a dome on said plug extended into the interior of said container, a helical ramp on said dome leading to the port in the plug, a rotor rotatably mounted in juxtaposition to said plug and including a chamber adapted to receive a tablet, means including a thumbpiece for rotating said rotor from a first position with respect to the plug where said chamber and said port are sufficiently in register to permit passage of a tablet therebetween to a second position with respect to the plug where said chamber and port are out of register sufficiently to prevent passage of a tablet therebetween, a cap rotatably mounted to the container and covering both the plug and the rotor except for slot means in the cap through which the rotor rotating thumbpiece is extended and is free to allow movement of the rotor to the first and second positions, means preventing relative rotation between the cap and the plug, a port through said cap adapted to come into register with the chamber in the rotor only when the rotor is moved to the second position and sufficiently in register to allow passage of a tablet therebetween, and a torsion bar spring extended between the rotor and the plug and non-rotatably mounted in each of them with the spring biasing the rotor so that it returns to the said first position but allows easy rotor movement to the second position.

3,889,848
AUTOMATICALLY CONTROLLED WEIGH FEEDING APPARATUS

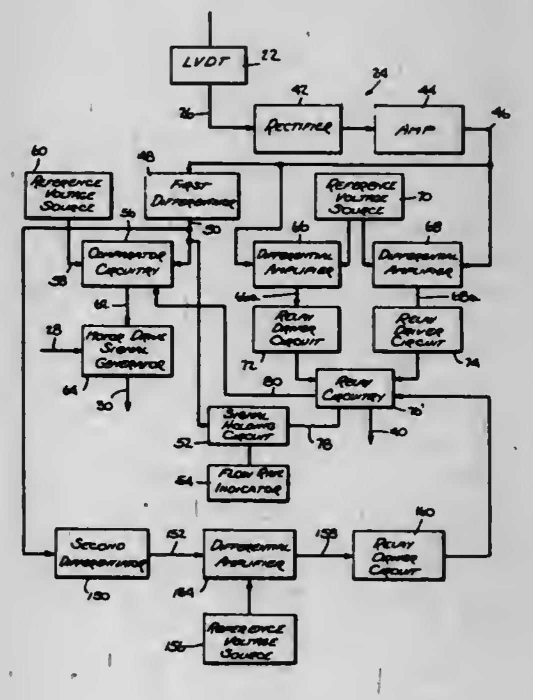
Ronald J. Ricciardi, 193 MacArthur Ave., Garfield, N.J. 07026, and Angelo Ferrara, 7 Bryn Mawr, Fairfield, N.J. 07006

Continuation-in-part of Ser. No. 274,844, July 25, 1972, abandoned. This application Mar. 28, 1973, Ser. No. 345,587
Int. Cl. G01g *11/14*
U.S. Cl. 222—58 9 Claims

1. Apparatus for feeding particulate solid material comprising, a container for a quantity of said particulate solid material, an auger type discharge device for discharging material from said container, a conduit for receiving material from said auger type discharge device, a motor, a gear-reduction device for connecting said motor to said auger type discharge device, a scale, said container and auger type discharge device and conduit and motor and gear-reduction device being mounted on said scale, means coupled to said scale for producing an electrical signal proportional in amplitude to the weight determined by said scale; differentiator circuit means having an output terminal and having an input coupled to said electrical signal means, wherein said differentiator circuit means is for differentiating said electrical signal to provide a rate signal at said output terminal which is proportional in amplitude to the discharge rate of said substance from said container; control signal generating means having an output terminal, and having an input terminal connected to said differentiator circuit means output terminal, wherein said control signal means is for generating at its output terminal a discharge control signal which is a function of the amplitude of said rate signal; and means coupled between said control signal generating means output terminal and said motor for controlling the discharge rate of said auger type discharge device in response to said discharge control signal,

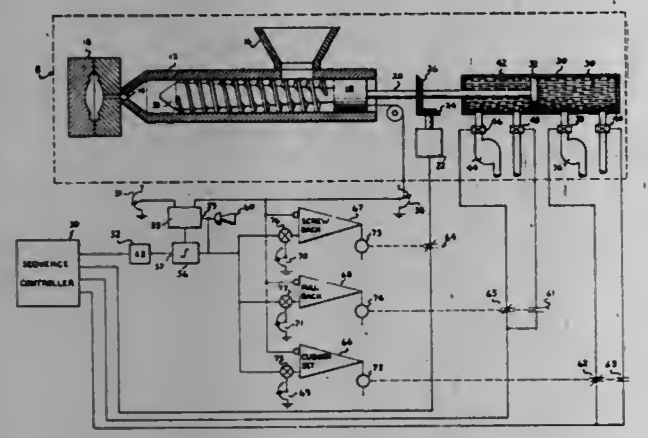
said means for producing said electrical signal being a linearly variable differential transformer, said control signal generating means including a reference signal source, a comparator having first and second inputs connected respectively to said reference signal source and said differentiator circuit means output terminal, and having an output for providing a comparison signal in response to said signals from said reference source and differentiator circuit means, and motor drive signal generating means having an input connected to said comparator output, and having an output which provides said discharge control signal for controlling the speed of said motor,

said motor comprising a DC motor; said motor drive signal generating means including rectifying bridge circuit means connected to said motor for converting an AC signal to said discharge control signal for driving said motor, said bridge circuit means including a pair of SCR's having respective gate electrodes and in which said generating means further includes pulsing circuit means having a pair of output means connected to said respective SCR gate electrodes to operate said SCR's to control said discharge control signal by controlling the rectification of said AC signal, and having an input which comprises said input for said motor drive signal generating means.



3,889,849
SHOT VOLUME AND CUSHION POINT CONTROL FOR INJECTION MOLDING APPARATUS

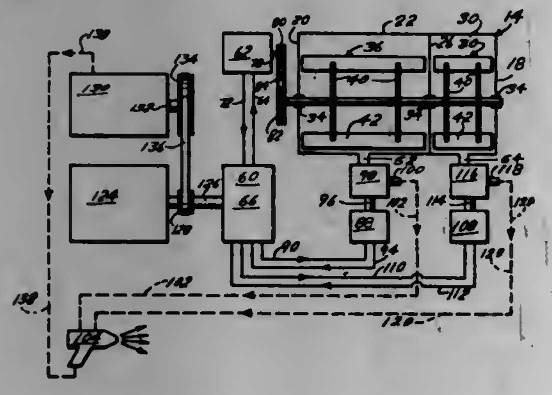
Robert F. Chandler, Jr., Roanoke, Va., assignor to General Electric Company, Salem, Va.
Filed Dec. 26, 1973, Ser. No. 427,799
Int. Cl. B29f *1/02*
U.S. Cl. 222—63 **13 Claims**



1. A control system for an injection molding machine including a ram and having drive means for rotating, and hydraulic means for advancing and withdrawing said ram, said control system comprising:
  position sensing means for producing a position signal indicative of ram position;
  reference means for producing a first position reference signal;
  circuit means connected to receive said position signal and said reference signal for producing an error signal representing the difference therebetween;
  first control means for causing pressure applied by said hydraulic means upon said ram to decline from a first, higher value to a second, lower value;
  second control means responsive to said error signal for establishing a point for termination of operation of said drive means; and
  third control means responsive to said error signal for establishing a point of maximum withdrawal of said ram.

3,889,850
TEXTURE AND ACOUSTIC SPRAYING EQUIPMENT

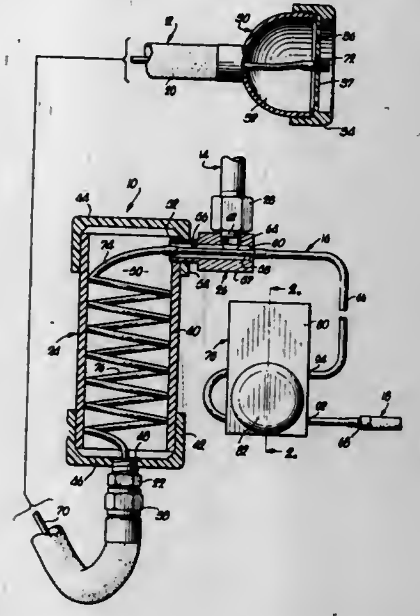
Delbert K. Whitt, Kent, Wash., assignor to Pete Whitt, Inc., Kent, Wash.
Filed Apr. 21, 1971, Ser. No. 135,859
Int. Cl. B67d *5/52*
U.S. Cl. 222—135 **4 Claims**



1. An apparatus for flowing a material comprising a liquid and a solid to a desired location, said apparatus comprising:
  a. an agitation tank;
  b. a first agitator in said tank;
  c. a first hydraulic pump;
  d. a first hydraulic motor;
  e. said pump being in a driving relationship with respect to said motor for flowing liquid from said pump to said motor;
  f. said motor being in driving relationship with said agitator;
  g. a second hydraulic motor;
  h. said first hydraulic pump connecting with said second hydraulic motor in a driving relationship for flowing liquid from said first hydraulic pump to said second hydraulic motor;
  i. a second hydraulic pump connecting with said tank to move said material with respect to said tank;
  j. said second hydraulic motor connecting with said second hydraulic pump in a driving relationship;
  k. a first control means for controlling the flow of liquid between said first hydraulic pump and said first hydraulic motor;
  l. a second control means for controlling the flow of liquid between said first hydraulic pump and said second hydraulic motor;
  m. a dispenser means for dispensing said material;
  n. said dispensing means connecting with said second hydraulic pump; and,
  o. a third control means juxtapositioned to said dispensing means for controlling the flow of liquid between said first hydraulic pump and said second hydraulic motor.

3,889,851
SHAMPOO DELIVERY ASSEMBLY

Philip Kain, 9649 Chadwick, Leawood, Kans. 66206
Filed Apr. 5, 1974, Ser. No. 458,336
Int. Cl. B67d *5/62*
U.S. Cl. 222—146 HS **6 Claims**

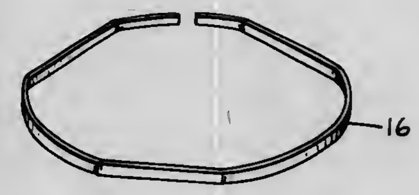


1. A shampoo dispensing system for use in beauty salons or the like, said system comprising:
  a source of liquid shampoo;
  a source of heated water;
  a unitized, selectively shiftable fluid flow directing means coupled with said shampoo source and said water source for simultaneously delivering shampoo and water to a common point of usage;
  said flow directing means including a first conduit for water and a second conduit for shampoo, there being respective nozzle means at a distal end of each conduit for discharging shampoo and water from said flow directing means in individually distinct, unmixed streams,
  said second conduit having at least a portion thereof disposed within said first conduit and surrounded by the water therein whereby the shampoo in said portion is pre-

warmed to a temperature approaching that of said water as the latter flows through said first conduit; and
  a selectively actuatable on-off control device operably coupled with said second conduit to independently control the flow of said shampoo therethrough for selectively dispensing a discrete quantity of pre-warmed shampoo at said point of usage concurrently with the delivery of a quantity of water.

3,889,852
CONTAINER SAFETY DISPENSING CLOSURE

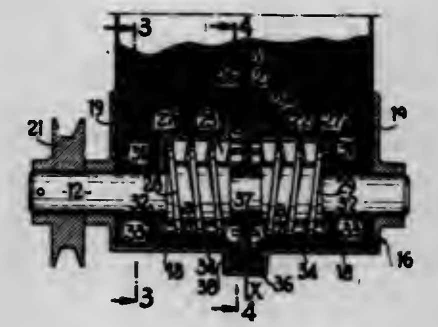
Peter Strefford, 85 South Dr., Toronto, Ontario, Canada
Filed Aug. 6, 1973, Ser. No. 385,851
Int. Cl. B67d *5/32*
U.S. Cl. 222—153 **10 Claims**



1. A container safety dispensing closure comprising:
  a. a hollow outer cap having a generally cylindrically shaped outer wall and a flat top, the wall having an inwardly opening circumferential slot on a lower portion thereof, the outer cap adapted to be securely fixed to the container by a retaining ring cooperatively received by said slot and a matching outwardly opening circumferential slot on the container, the wall having a first dispensing aperture extending therethrough substantially diametrically opposite a seat opening, the flat top having a circular central hole extending therethrough;
  b. a hollow generally cylindrically shaped inner cap rotatably received within the outer cap in sliding contact with an upper rim of the container, the inner cap having a second dispensing aperture adapted to be aligned with the first dispensing aperture in the outer cap, the inner cap having a circular seat located beneath the circular hole in the top of the outer cap, the circular seat being smaller in diameter and in eccentric alignment with the circular hole, the inner and outer caps adapted to be engaged by a separate wall mounted opening tool having a manually rotatably cylindrical shaft with a smaller diameter cylindrical boss eccentrically located on one end thereof, the said circular seat adapted to receive the said end of the shaft and the circular seat adapted to receive the eccentric boss in an engaged position wherein manual rotation of the shaft correspondingly rotates the inner cap within the outer cap whereby the inner cap may be rotated from a closed position wherein the second dispensing aperture is covered by the wall of the outer cap to an open position wherein the first and second dispensing apertures are in alignment, thereby providing a passage for dispensing of the contents of the container by tilting the container, the inner cap having a flat vertical outer segment radially opposite the second dispensing aperture;
  c. a torsional spring located between the inner and outer caps with one end engaging the inner cap and the other end engaging the other cap whereby the inner cap is subjected to a continuous rotational bias towards the closed position;
  d. a pushbutton member horizontally reciprocatingly received in the seat opening in the outer cap, the pushbutton member having a flat inner surface adapted to be brought into bearing contact with the flat outer segment of the inner cap by depressing the pushbutton member to manually retain the inner cap in the open position following disengagement of the opening tool, the torsional spring immediately returning the inner cap to the closed position upon release of the pushbutton member.

3,889,853
DISTRIBUTING APPARATUS FOR AGRICULTURAL PURPOSES

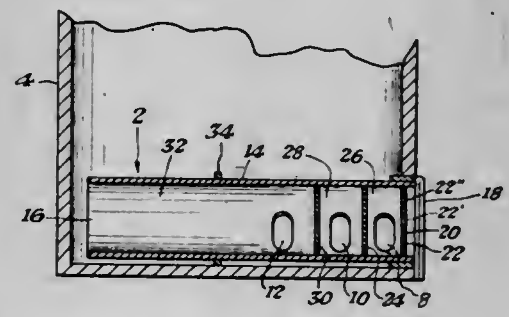
Edmond Ribouleau, Largeasse 79, 240 L'Absie, France
Filed Mar. 20, 1974, Ser. No. 453,167
Claims priority, application France, Mar. 21, 1973, 73.10071
Int. Cl. A01c *15/00*
U.S. Cl. 222—177 **14 Claims**



1. An apparatus for distributing pulverulent or granular material over a ground, comprising a hopper for the material, at least one Archimedean screw mounted to rotate about an axis in a lower part of the hopper, a distributor wheel adjacent an output end of the screw and combined with the screw, a hooding completely closing the screw and wheel off from the interior of the hopper except for a portion of the hooding which has a lower edge which defines with a bottom portion of the hopper an opening located below said axis, the hooding defining with a side portion of the hopper a passage putting the opening in communication with the interior of the hopper above the hooding, the opening being adjacent an input end of the screw opposed to said output end and allowing the material in the passage access to the wheel by way of the interior of the hooding in a region adjoining the bottom portion of the hopper, a spout for directing the material onto the ground, the spout having an input orifice communicating with the inside of the hooding and positioned to cooperate with the wheel for transferring the material from the wheel to the ground by way of the spout, and means for rotating the screw and the wheel.

3,889,854
MEASURING AND DISPENSING DEVICE

Rudolph A. Gagnon, and Ann K. Matt, both of 2 Aster Terr., Key West, Fla. 33040
Filed Feb. 19, 1974, Ser. No. 443,737
Int. Cl. G01f *11/18*
U.S. Cl. 222—284 **4 Claims**



1. A measuring and dispensing device connected to a container for sprinkling a quantity of material from a container, for pouring a measured quantity of material from the container, and for pouring an unmeasured quantity of material from the container comprising:
  a generally cylindrical body rotatably connectable to the container for reciprocal movement into and from the container along a longitudinal axis, said cylindrical body having an open lower end and including,

a first baffle connected across the upper end of said cylindrical body,

a second baffle connected across said cylindrical body spaced from and below said first baffle to enclose and form a first compartment, said second baffle forming a second compartment below said first compartment, and said cylindrical body including perimeter portions about an opening into the first and second compartments for filling and dispensing material in the container.

3,889,855

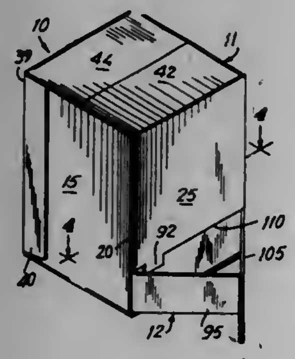
DISPENSING AND METERING PACKAGE

Richard Paul Mommer, Loveland, Colo., assignor to Balcom Chemicals, Inc., Greeley, Colo.

Filed May 30, 1973, Ser. No. 365,168

Int. Cl. G01f *11/10*

U.S. Cl. 222—355 **8 Claims**



1. A dispensing and metering package comprising a bottom wall, a side wall upstanding circumferentially about said bottom wall, there being a cutout in a lower region of said side wall, a false bottom spaced over said bottom wall above the level of said cutout and having a through opening adjacent to said cutout, strut means depending from said false bottom into bearing engagement with said bottom wall for supporting said false bottom, a closure hingedly connected by a generally vertical fold axis to said strut means and extending in closing relation across said cutout for swinging movement outwardly out of and inwardly into said closing relation, receiver means carried by said closure for movement therewith between a receiving position beneath said opening when said closure is closed and a dispensing position outwardly of said cutout when said closure is open, said receiver means comprising a first wall having one end hingedly connected by a generally vertical fold to said closure at said strut means, and a second wall extending from the other end of said first wall to said closure remote from said strut means, whereby said first and second receiver walls combined with said closure to define a generally triangular configuration for receiving contents through said opening; and a valve element carried by said receiver means for movement therewith between an open position facing said false bottom when said closure is closed and a closed position across said opening when said closure is open, whereby fluid material above said false bottom is retained by said valve element when said receiver means is extended to dispensing position and gravitationally passes to said receiver when the latter is in receiving position.

3,889,856

DISPENSING CAP FOR VALVED, PRESSURIZED CONTAINER

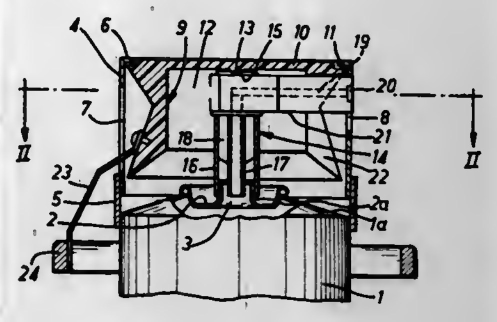
Bruno Morane, Paris, France, assignor to Societe Anonyne dite: L'Oreal, Paris, France

Filed Feb. 7, 1972, Ser. No. 223,940

Claims priority, application France, Mar. 12, 1971, 71.08656

Int. Cl. B65d *83/14*

U.S. Cl. 222—402.13 **10 Claims**



1. A cap for use with a pressurized container of the type equipped at its upper end with a dispensing valve actuated by the axial depression of an outlet tube against the resistance of resilient means, said cap comprising

a stationary cylindrical guide cylinder attached to the upper end of said container coaxially of said outlet tube,

an L-shaped dispensing member having a vertical arm comprising an outer sleeve vertically slidable on and guided by said guide cylinder and an inner duct slidable with said sleeve and positioned to engage said outlet tube to receive a product emitted therethrough, said dispensing member comprising a horizontal arm defining a horizontal duct in communication with the duct in said vertical arm,

an annular member encircling said dispensing member and attached to said container, said annular member being provided with inwardly projecting flange means, a depending lateral wall and an opening in said wall aligned with said horizontal arm,

and a cover member having peripheral portions spaced in all directions from its center which are engaged beneath said inwardly projecting flange means, said cover having its center pivotally mounted on a point on said dispensing member in alignment with the axis of said outlet tube for swinging movement about said flange means as a fulcrum toward and away from said container,

whereby depression of said cover member at any point remote from its center causes depression of the center of said cover and the vertical dispensing member arm and outlet tube therebeneath, to open said valve and dispense the contents of said container.

3,889,857

CANTILEVERED DRAPERY PROCESSING MACHINE

Vernon D. Clement, 8050 Westboro Way, Sacramento, Calif. 95823

Filed Oct. 23, 1974, Ser. No. 517,170

Int. Cl. A41h *43/00;* **D06j** *1/00*

U.S. Cl. 223—32 **12 Claims**

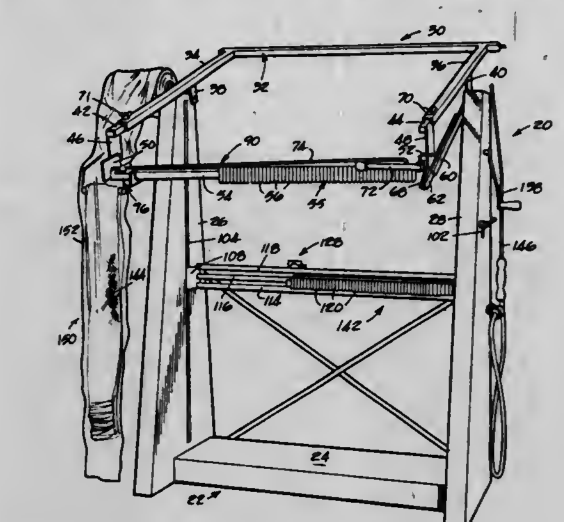
1. A drapery processing machine comprising:

a base unit having two spaced-apart members;

a frame pivotally mounted to the spaced-apart members;

drapery support means operable to secure the top folds of a drapery, said drapery support means being connected with said frame to swing generally therewith to a lower position upon pivoting of the frame in one direction, and to an upper position upon pivoting of the frame in the other direction; and

means for selectively securing the frame relative to the spaced-apart members with the drapery support means in said upper position.



3,889,858

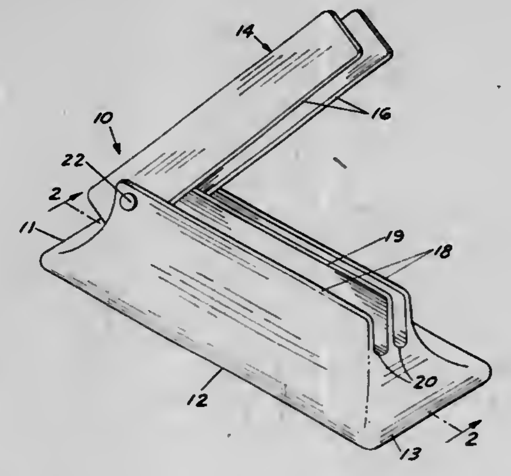
PLEAT-FORMING DEVICE

Vila L. Hack, East Detroit, Mich., assignor to Kurt & Mold & Die Co., Mt. Clemens, Mich.

Filed Oct. 4, 1971, Ser. No. 186,192

Int. Cl. A41h *43/00;* **D0bj** *1/00*

U.S. Cl. 223—35 **1 Claim**



1. A pleat-forming device comprising a rectangular base with three parallel horizontal spacers extending vertically therefrom, said spacers being of rectangular configuration, the top of the center spacer being slightly elevated above the tops of the two outward spacers, a pleater arm comprised of two connected pivotable parallel spacers, a horizontal pivot comprising a rivet extending through the rear top corners of the three lower spacers such that when lowered the upper spacers interdigitate with the lower spacers, so that fabric to be pleated is first folded over the middle lower spacer permitting accurate pleat spacing and free movement of fabric prior to making further pleats therein.

3,889,859

PACK FRAME AND SACK THEREFOR

Mark T. Joseph, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.

Filed June 14, 1973, Ser. No. 369,961

Int. Cl. A45f *3/00*

U.S. Cl. 224—8 R **3 Claims**

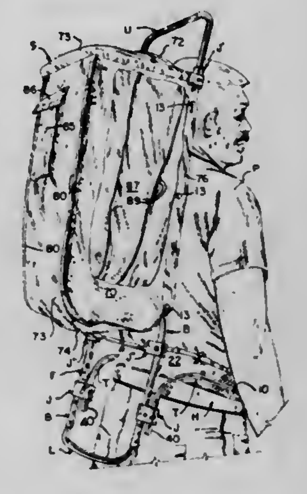
1. A pack frame comprising:

a pair of side bars and transverse bars connecting said side bars, including an upper transverse bar adapted for the attachment of the upper ends of a pair of shoulder strap means;

a forwardly extending hip member attached to each side bar at a lower position and adapted to extend forwardly to a position alongside a hip of a user, each hip member being provided with a rear post and a forwardly extending arm; means for attaching said hip member to the corresponding side bar with said post extending either upwardly or downwardly;

a pair of shoulder strap means attached at the upper ends thereof to said upper transverse bar;

a hip strap means constructed and arranged to encircle the hips of said user;



means for connecting the lower end of a shoulder strap means and one side of said hip strap means to the corresponding hip member alongside each said hip of said user;

joints for attaching each hip member to the corresponding side bar, each joint having spaced upright apertures for engaging said side bar and said post, respectively, said post having a series of vertically spaced holes at different angles to the direction of said arm and said side bar having a series of vertically spaced holes;

removable pin means for extending alternatively through said holes of said post for attaching said post to said joint at different angular positions; and

removable pin means for extending alternatively through said holes in said side bar for attaching said joint to said side bar at different vertical positions.

3,889,860

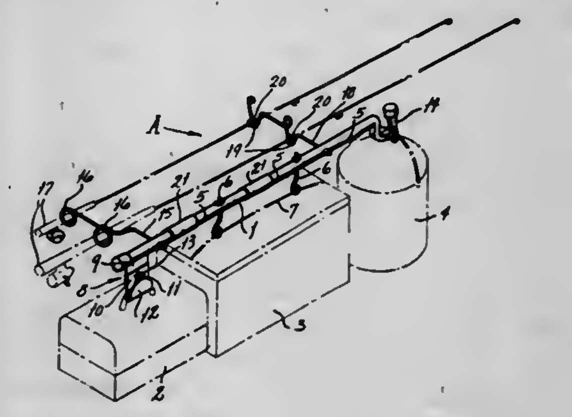
FISHING GEAR CARRIER

Albert E. Lindsey, 12 Roberta Dr., Caseyville, Ill. 62269

Filed May 25, 1973, Ser. No. 363,891

Int. Cl. A45c *13/26*

U.S. Cl. 224—45 R **10 Claims**



1. In a fishing gear carrier of the type providing for conveyance of a plurality of items of fishing accessories such as a tackle box, bait bucket, fishing rod, and the like, comprising, a rod member having a length to provide for accommodating the suspension of such gear along its length, a bracket means

provided at each end of said rod member for supporting such gear, said rod member capable of accepting additional attachment means along its length for supporting other of said fishing accessories, bracket means at least at one end including an upper portion being secured to said rod member, a lower portion of said bracket having a turned up end and being connected to said upper portion, locking means pivotally connecting with said lower portion of the bracket, said locking means provided for securing an item of fishing gear within the turned up end of the lower portion during accessory conveyance and including attachment means for supporting at least one fishing rod upon said rod member during its conveyance, said means comprising a pair of rods extending laterally from said rod member, each projecting rod having at least one loop formed therein whereby said fishing rod may be coupled adjacent to said loops and supported during conveyance of the gear carrier.

3,889,861
TRANSPORT CONTAINER FOR SKIS AND POLES

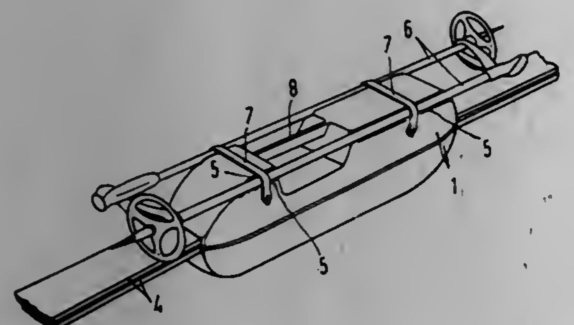
Hans Fihn, Geretsried, Germany, assignor to Weikal Plastik GmbH & Co. Kunststoffprodukte KG, Neukolbing, Germany

Filed Mar. 22, 1974, Ser. No. 453,735

Claims priority, application Germany, Mar. 23, 1973, 7311073

Int. Cl. B65d *71/00*

U.S. Cl. 224—45 S **1 Claim**



1. A device for transporting a pair of skis and ski poles, the skis having their running surfaces in abutment comprising:
- two elongated rigid shells for encompassing the central portion of the skis, wherein one of said two shells includes a carrier handle being formed by a recess in the surface of that shell between the front and heel portion of the binding of the ski, said shell having the carrier handle also including at its two upper outer edges, groove-shaped recesses for accommodating the ski poles on either side of the carrying handle and holder clips disposed in front of and behind the carrier handle and attached to the lateral surfaces of said shell so that the clips can be secured across the ski poles and the grooves,
- hinge means joining said shells together along at least one edge thereof; and,
- closing means mounted on a further longitudinal edge for encasing the skis in the area of their bindings.

3,889,862
APPARATUS FOR CUTTING GLASS AND PLASTIC SHEET

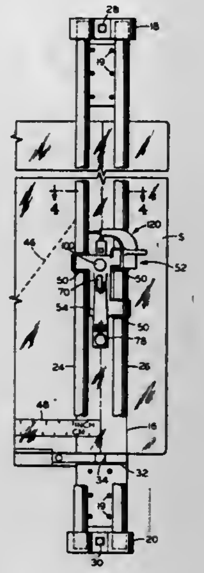
Thomas A. Insolio, Bristol; Vincent T. Kozyrski, New Britain, and Edward J. Witkoski, Burlington, all of Conn., assignors to The Fletcher-Terry Company, Farmington, Conn.

Filed Aug. 22, 1974, Ser. No. 499,457

Int. Cl. C03b *33/02, 33/10*

U.S. Cl. 225—96.5 **13 Claims**

1. Apparatus for scoring fracture sensitive sheet material comprising:
- a. support means for the sheet including a horizontally extending squaring bar adapted to engage a lower edge of the sheet to be scored,
- b. said sheet support means further including an elongated anvil which is inclined slightly to the vertical and which cooperates with said squaring bar to support a planar sheet in a plane slightly inclined with respect to the vertical,
- c. two parallel guide rails supported in spaced parallel relation to said anvil and extending from a position below said squaring bar gently upwardly and parallel said anvil,
- d. a cross head slidably mounted on said guide rails and having a handle for manually moving the head along said rails,
- e. a rocker arm pivotally mounted in said cross head intermediate its ends,



- f. scoring means adjacent one end of said rocker arm, said scoring means being received in an opening in said arm and means being provided to retain said scoring means in said rocker arm opening,
- g. biasing means for urging said one end of said rocker arm and said scoring means toward said anvil,
- h. stop means associated with the other end of said rocker arm to limit the movement of said scoring means toward said anvil, and
- i. a lever adjacent said handle and pivotally movable in said head generally toward said handle in response to a manual squeezing action, said lever including a projecting portion engageable with said arm to permit moving said scoring means away from said anvil when manually moving said head in a return direction opposite a scoring direction.

3,889,863
STRIPPING MACHINE

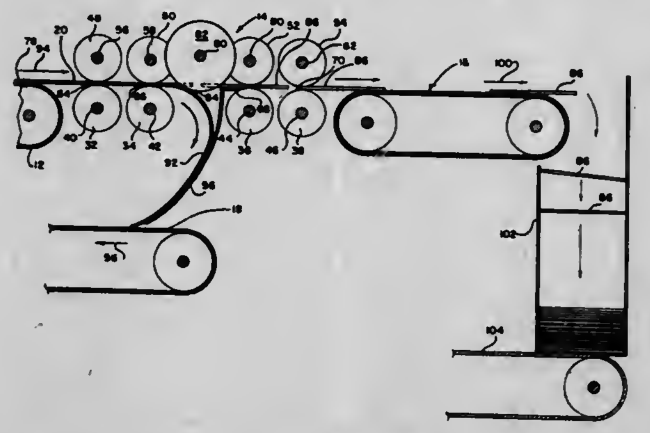
Clovis F. Deslauriers, 25-52 Borough Pl., Woodside, N.Y. 11377

Filed Mar. 30, 1973, Ser. No. 346,337

Int. Cl. B26f *3/00*

U.S. Cl. 225—99 **6 Claims**

1. In a stripping machine suitable to separate the waste material from the finished product in previously die cut sheets, the combination of
- A. feed conveyor means to carry the die cut sheets rearwardly through the machine in a generally horizontal plane;
- B. stripping means receiving the die cut sheets from the waste conveyor means to remove the waste material,
  - 1. said stripping means including roller means to convey the die cut sheets rearwardly through the machine,
    - a. said roller means having nips in alignment with the said horizontal plane,
  - 2. said stripping means comprising a rotating stripping shaft and a plurality of transversely spaced, rotating, transversely adjustable, circular stripping blades mounted upon the stripping shaft and being rotated thereby,
    - a. said stripping blades including a bottom periphery which extends below the said horizontal plane,



    - b. the said finished product being carried rearwardly by the roller means in the horizontal plane intermediate the spaced stripping blades,
    - c. the stripping machine defining an open area below the stripping blades whereby the waste material is urged downwardly through the open area to a point of disposal, and
    - d. the stripping means having no support structure positioned below the sheets to support the sheets as the waste material is separated.

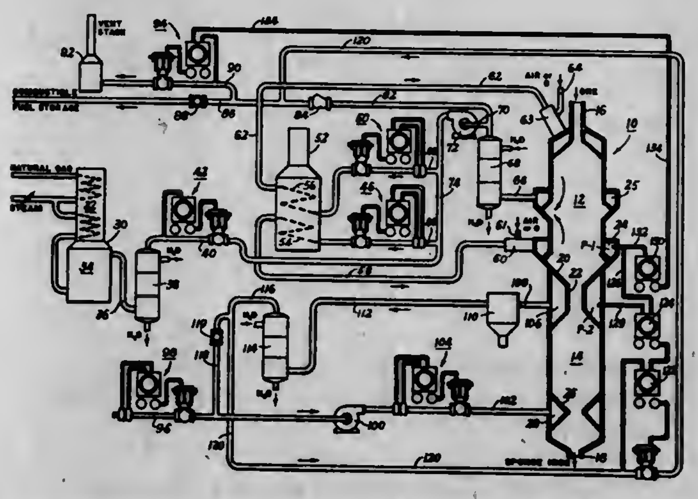
3,889,864
METHOD AND APPARATUS FOR REDUCING PARTICULATE METAL ORES TO SPONGE IRON

Juan Celada; Patrick W. MacKay, and Ramon de la Pena, all of Monterrey, Mexico, assignors to Fierro Esponja, S.A., Monterrey, Mexico

Division of Ser. No. 189,560, Oct. 15, 1971, Pat. No. 3,779,741. This application Sept. 6, 1973, Ser. No. 394,843

Int. Cl. F27b *1/00*

U.S. Cl. 266—24 **4 Claims**



1. Apparatus for reducing a particulate metal ore to metal particles in a vertical shaft, moving bed reactor having a reduction zone in which a hot reducing gas is caused to flow through a portion of said bed to reduce the metal ore thereof to metal, comprising in combination with said reactor, a first conduit connected to said reactor near the middle of said reduction zone, a second conduit connected to said reactor near the top of said reduction zone and to said first conduit at a point spaced from said reactor, a third conduit connected to said reactor near the bottom of said reduction zone and to said first conduit at a point spaced from said reactor, said first and second conduits and the upper portion of said reduction zone forming a first gas flow loop and said first and third conduits and the lower portion of said reduction zone forming a second gas flow loop, pump means in said first conduit for pumping gas therethrough, heating means in said loops for heating the gas flowing therethrough, valve means in at least one of said second and third conduits for regulating the gas flow therethrough, a source of make-up reducing gas outside said loops, conduit means connecting said make-up gas source to said first conduit on the discharge side of said pump means, and venting means connected to said first conduit on the suction side of said pump means for venting a portion of the gas flowing through said loops.

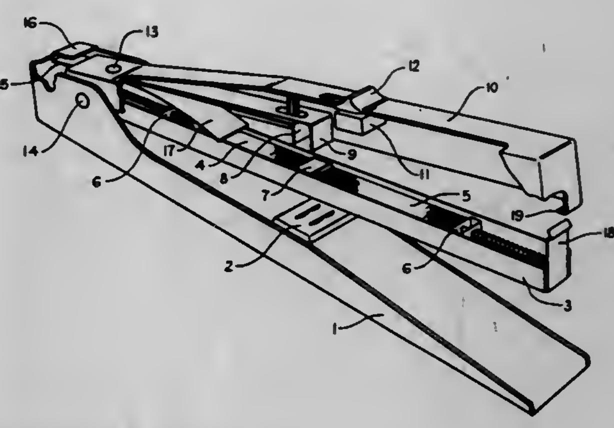
3,889,865
DUAL STAPLER

Ned Robert Kuypers, 432 Covington Rd., Los Altos, Calif. 94022

Filed Dec. 6, 1973, Ser. No. 422,571

Int. Cl. B25c *5/02*

U.S. Cl. 227—109 **15 Claims**



1. A dual stapler comprising:
- common supply means for simultaneously holding two cartridges of wire staples and feeding those cartridges along a common axis of the supply means to a pair of driving locations of the supply means to define a prescribed dual staple pattern;
- dual anvil means mounted adjacent to the supply means for clinching two wire staples driven thereagainst from the driving locations of the supply means;
- dual driver means mounted adjacent to the supply means for driving a pair of wire staples positioned at the driving locations of the supply means in the prescribed dual staple pattern against the dual anvil means to form a dual staple joint; and
- actuator means for receiving an actuation force to actuate the dual driver means.

3,889,866
CONTAINER MEANS

John Ansley Keller, Creamery, Pa., assignor to Heavy Light Mfg. Corp., Fairview Village, Pa.

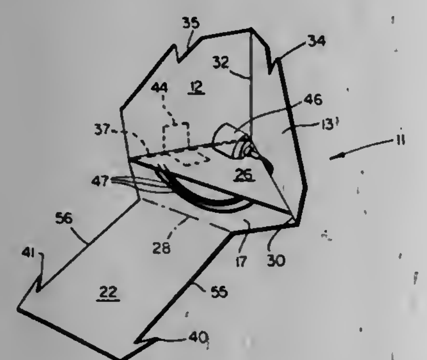
Filed May 13, 1974, Ser. No. 469,168

Int. Cl. B65d *5/00, 5/58*

U.S. Cl. 229—22 **10 Claims**

1. Unassembled container means comprising at least four sections, including:
- a. a first pentagonal section, a second pentagonal section and a third pentagonal section, in which the first and second pentagonal sections have a common side and in which the second and third pentagonal sections have a common side; and
- b. a T-shaped section, said section being connected to the first pentagonal section, wherein said T-shaped section

contains means for interconnection with the second and third pentagonal sections, respectively, such that when



the sections are folded along their respective boundaries a right angle pyramid shaped container is formed.

3,889,867

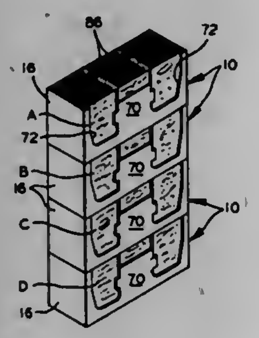
DISPLAY CARTON

Robert A. Berg, Chicago, Ill., assignor to Consolidated Packaging Corporation, Chicago, Ill.

Filed Oct. 1, 1973, Ser. No. 402,462

Int. Cl. B65d *5/48*

U.S. Cl. 229—28 R **8 Claims**



1. A folding plural-compartment carton having front and back side walls, two end walls, a bottom, and at least one partition parallel to said end walls, each said partition comprising a pair of overlapping and glued flaps cut out from said back and front walls spaced from said end walls to leave full height corners for said carton, all of said walls and partitions having at least a portion of their top edges the same maximum distance from said bottom wall.

3,889,868

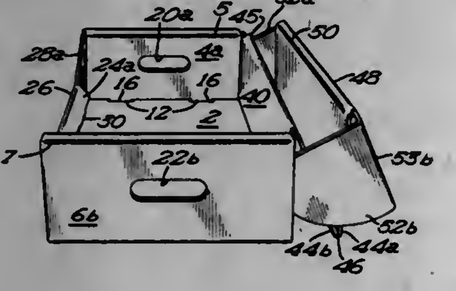
MAIL HANDLING CONTAINER

Arnold D. Bruckner, Bowie, Md., and Marlyn D. Johnson, Minneapolis, Minn., assignors to Liberty Carton Co., Minneapolis, Minn.

Filed Oct. 15, 1973, Ser. No. 406,692

Int. Cl. B65d *5/22*

U.S. Cl. 229—34 R **8 Claims**



1. A mail handling container formed from cut and scored bendable material comprising:

a bottom wall;

a pair of opposed, upright, front and rear side walls extending upwardly from fold line connections with the opposite longitudinal edges of said bottom wall;

a pair of opposed, upright end walls extending upwardly from said bottom wall at substantially right angles to said side walls and cooperating therewith to form a substantially rectangular container the top of which is defined by the upper edges of said side and end walls, each of said end walls being comprised of a single panel scored along a fold line to provide two end panel sections, one of which is an upright panel section hingedly attached to one end of said bottom wall and the other of which is folded downwardly and inwardly over said one end panel section along said end panel fold line to thereby form end walls of double wall thickness with said end panel sections defining an open ended pocket therebetween, and with said fold line defining the upper edge of said end walls;

a cover panel hingedly attached along one longitudinal edge thereof to the top edge of said rear side wall and disposed in a downwardly and forwardly folded closed position over said container top, said cover panel comprising a plurality of foldable sections interconnected with each other along fold lines extending parallel to said longitudinal hinged edge of said cover panel, said cover panel sections being foldable into a collapsed, downwardly and rearwardly extending condition in overlying relation to said rear side wall, whereby said cover panel may be opened, folded to said collapsed condition and secured in said collapsed condition by inserting said lock flaps into the rear end of said end wall pockets;

a pair of lock flaps hingedly attached to the opposite ends of said cover panel at the opposite, longitudinal free edge thereof and tucked into the front end of said end wall pockets to hold said cover panel in said closed position.

3,889,869

CARRIER-BAG

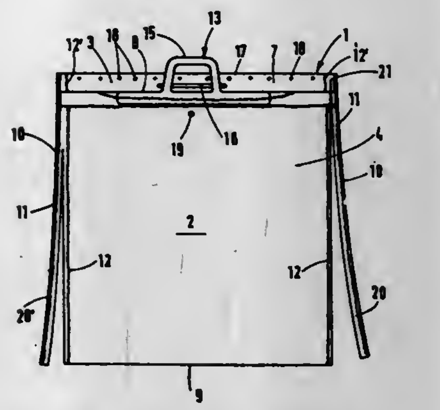
Heinrich Oggesen, Lauf and der Pegnitz, Germany, assignor to Messrs. Lakufal Kunstsloffs GmbH & Co., Lauf and der Pegnitz, Germany

Filed Jan. 11, 1974, Ser. No. 432,505

Claims priority, application Germany, Jan. 23, 1973, 2303106

Int. Cl. B65d *33/06*

U.S. Cl. 229—54 R **10 Claims**



1. A carrier bag comprising, in combination:

a. first and second web portions forming a first double wall of the bag;

b. third and fourth web portions forming a second double wall of the bag, the first and third web portions and the second and fourth web portions, respectively, being connected by a fold at the bottom of the bag, with the second and fourth web portions forming the inner walls of the two double walls, the upper edges of the first and second walls defining an opening into the interior of the carrier bag;

c. a first seam along each side edge of the bag each seam connecting at least the second and fourth web portions to one another; and

d. two second seams along each side edge of the bag, substantially parallel to and spaced inwardly from the first seam, connecting only the two web portions of each wall of the bag.

3,889,870

WELDED POLYESTER BAGS

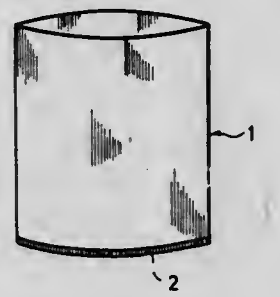
Hugo Bender, Gerolzhofen, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Dec. 5, 1972, Ser. No. 312,271

Claims priority, application Germany, Dec. 7, 1971, 2160497

Int. Cl. B65d *33/02*

U.S. Cl. 229—55 **2 Claims**



1. A welded bag of stretched polyester film, comprising a biaxially stretched tubular film with a bottom weld, in which the edge region of the bottom weld is post-stretched.

3,889,871

RECLOSEABLE FLEXIBLE BAG

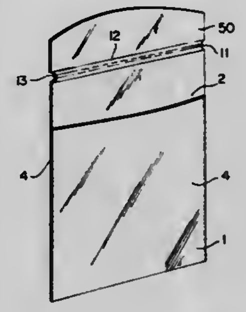
David B. White, Willowdale, Canada, assignor to E. S. & A. Robinson (Canada) Ltd., Toronto, Canada

Continuation-in-part of Ser. No. 288,434, Sept. 12, 1972, Pat. No. 3,859,895. This application Feb. 26, 1973, Ser. No. 335,796

Claims priority, application Canada, Sept. 7, 1972, 151154

Int. Cl. B65d *33/30*

U.S. Cl. 229—65 **15 Claims**



1. In a recloseable bag formed of flexible sheet material comprising at least a front wall and a rear wall at least one edge of each of said front and rear walls being sealed together, and said bag including in the surface of at least one wall thereof at least one elongate deformable member extending in a direction transverse to the common direction of said edges which are sealed together, wherein the improvement comprises that an end of said elongate member stops short of a line formed by extending the common direction of said edges which are sealed together, and none of said flexible sheet material lies in an area between said end of said deformable member and said line, said area being located between the ends of said edges which are sealed together, and said deformable member does not extend into said area.

3,889,872

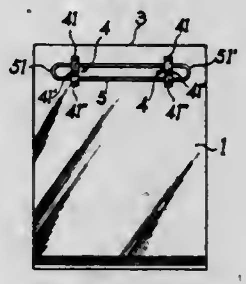
PLASTIC BAG HAVING TIGHTENING BAND

Spencer B. T. Lin, 3F, No. 5, Ln. 4, Chin Chou St., Taipei, Taiwan, China

Filed Aug. 14, 1973, Ser. No. 388,190

Int. Cl.² B65D *33/28*

U.S. Cl. 229—63 **1 Claim**



1. A plastic bag comprising a bag body, at least one retention member formed on said body at a predetermined distance from a bag opening, said retention member comprising a patch of plastic sheet or film having a length less than the entire circumference of said bag body and being hot sealed at least at three points on said bag body to define at least two passages in each retention member, and an endless band movably retained in the said passages.

3,889,873

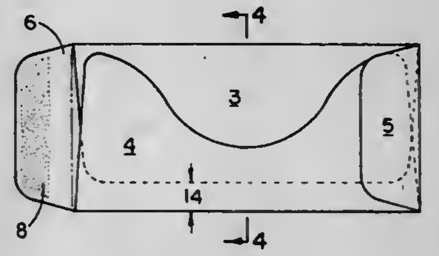
MONEY MACHINE ENVELOPE

Gary Lee Clough, Kirkland, Wash., assignor to Champion International Corporation, Hamilton, Ohio

Filed Jan. 26, 1973, Ser. No. 327,033

Int. Cl. B65d *27/08*

U.S. Cl. 229—72 **2 Claims**



1. A money machine envelope made from a single blank that comprises

a central panel of substantially rectangular shape,

an inner side panel of slightly trapezoidal shape attached to one side of said center panel and having an area at least half as great as the area encompassed by said center panel,

an outer side panel attached to the opposite side of said center panel the free edge of which has a very deep throat cutout of cosinusoidal shape in excess of one-half the center panel width,

and top and bottom flaps respectively attached to the top and bottom edges of said central panel, having adhesive areas thereon,

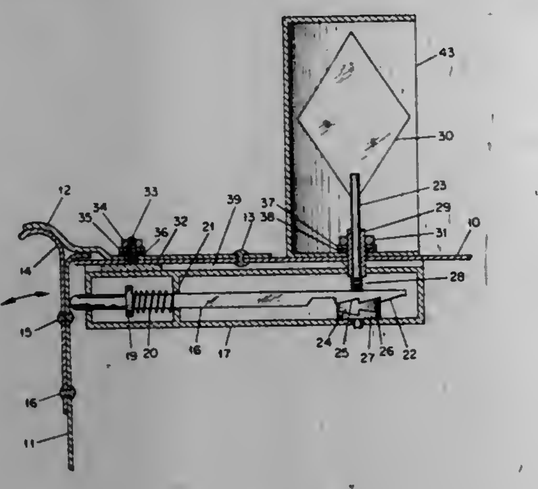
said inner side flap being folded to overlie said central panel, said outer panel being folded to overlie said inner panel and being at all times free of attachment to said inner panel whereby the inner panel is disposed between said outer and central panels and defines a divider wall between said outer and central panels, and

at least one of said top and bottom flaps being folded over and adhered only to said outer panel,

whereby a wallet type envelope is provided having inner and outer compartments in which the inner compartment can be end loaded and the outer compartment end or side loaded independently of the inner compartment, even where the other of said end flaps is adhered to said outer panel.

3,889,874
MAILBOX SIGNAL APPARATUS

Troy W. Arwood, Route No. 2, Lenoir City, Tenn. 37771
Filed Mar. 22, 1974, Ser. No. 453,944
Int. Cl.² A47G *29/12*
U.S. Cl. 232—35 **5 Claims**



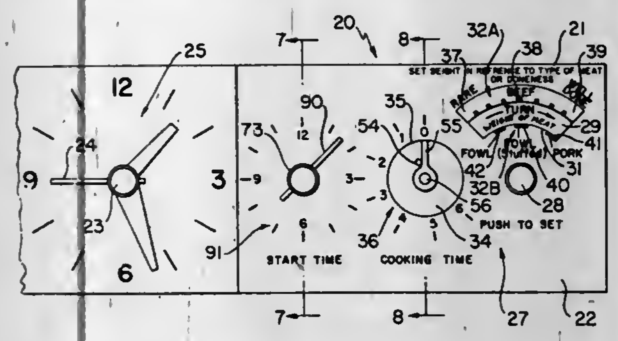
1. A signaling device of unitary construction for simple installation to indicate when a door of a front-opening mailbox has been opened, which comprises:

- an elongated frame to be mounted within the top of the mailbox with the long dimension thereof oriented perpendicular to the mailbox door, the frame being provided with an open top channel along its length;
- a non-rotatable rod mounted within the frame and axially movable therein, one end of the rod engaging the mailbox door during closure of the door;
- a coiled spring connected between the rod and the frame for normally biasing the rod toward the mailbox door;
- a rotatable shaft extending vertically from the frame for projection through the top of the mailbox;
- a visible signal flag attached to the shaft exterior to the mailbox;
- a rotatable member attached to the shaft within the frame, the rotatable member having radially-extending projections thereon;
- a notched surface on the rod normally engaged with a portion of the projections on the rotatable member whereby the rotatable member and shaft are rotated by axial movement of the rod in one direction and thereby the signal flag is moved from a first position to a second position;
- an upstanding threaded mounting stud adjustable along the top channel in the frame; and
- an externally threaded sleeve bushing engaged with the frame and surrounding a portion of the shaft between the frame and the signal flag.

3,889,875
COOKING COMPUTER MEANS

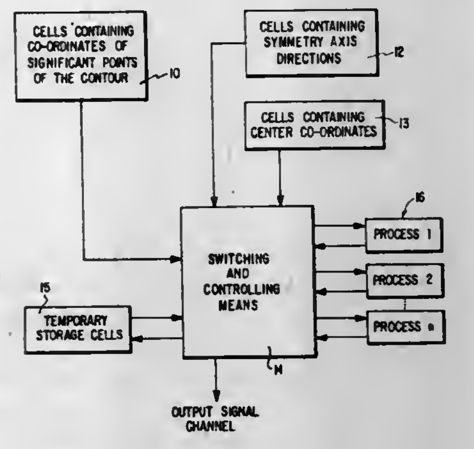
Carl J. Goodhouse, Litchfield, Conn., assignor to Robertshaw Controls Company, Richmond, Va.
Division of Ser. No. 236,753, March 21, 1972, Pat. No. 3,837,568. This application Apr. 17, 1974, Ser. No. 461,532
Int. Cl. G01c *1/00*
U.S. Cl. 235—61 A **10 Claims**

1. A cooking apparatus having a source of energy and an oven provided with heating means for heating the same when said heating means is operated by being operatively interconnected to said source of energy, said apparatus having a computer-controller device provided with controlling means for operatively interconnecting said source of energy to said heating means to operate the same for a period of cooking time as computed by said computer whereby said computer-controller device determines and controls the cooking operation of said cooking apparatus, said device having a stationary input means indicating selectable variables other than the weight of a meat item, said device having a manually settable weight input means for indicating a single selected indicated weight applicable to all meat items and corresponding to the weight of a particular meat item to be cooked, said weight input means being settable in relation to a selected variable of said stationary input means, said device having a time period output means operatively associated with both of said input means and said controlling means to provide as an output said cooking time period for said particular meat item computed as a function from the selection of both of said input means whereby said controlling means is adapted to operate said heating means for said computed cooking time period, said device having operating means for operating said time period output means and said controlling means for said computed cooking time period when said operating means is activated, both of said input means, when utilized for the computing of said cooking time period for said particular meat item, continuously indicate the selected weight and variable for said particular meat item even after the operation of said time period output means for said computed cooking time period until said input means are utilized for causing the computation of a cooking time period for another meat item where the weight and selected variable are to be different from said particular meat item.



3,889,876
APPARATUS AND METHOD FOR AUTOMATIC SPLITTING OF DIE CAVITIES

Daniel G. McFadden, Parsippany, and Richard C. Levine, Plainfield, both of N.J., assignors to DieComp, Inc., South Plainfield, N.J.
Filed Sept. 29, 1972, Ser. No. 293,314
Int. Cl. B22d *45/00;* **G06g** *7/48;* **G06f** *15/20*
U.S. Cl. 235—151.1 **34 Claims**

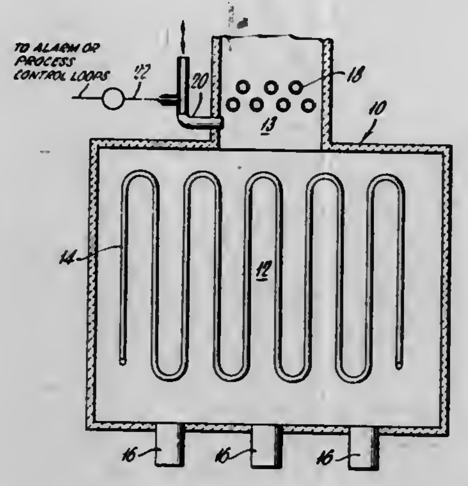

CELLS CONTAINING CO-ORDINATES OF SIGNIFICANT POINTS OF THE CONTOUR
10
CELLS CONTAINING SYMMETRY AXIS DIRECTIONS
12
CELLS CONTAINING CENTER CO-ORDINATES
13
16
PROCESS 1
PROCESS 2
PROCESS n
SWITCHING AND CONTROLLING MEANS
15
TEMPORARY STORAGE CELLS
14
OUTPUT SIGNAL CHANNEL

1. Apparatus for automatically splitting a die cavity, said apparatus comprising

- means for storing contour characteristic signals representative of significant characteristics of the contour of the die cavity; and
- means responsive to said storing means for processing the stored signals to determine the split lines for dividing said cavity into segments which can be expeditiously machined.

3,889,877
FURNACE OVER-PRESSURE PREVENTION

John A. Kivlen, Denville, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.
Filed July 16, 1973, Ser. No. 379,452
Int. Cl. F23n *5/24*
U.S. Cl. 236—15 C **3 Claims**



1. A furnace having radiant and convection sections and at a location directly below said convection section normally operating at negative pressure relative to ambient barometric pressure, including an apparatus for preventing overpressuring of said furnace when said negative pressure exceeds said ambient barometric pressure comprising:

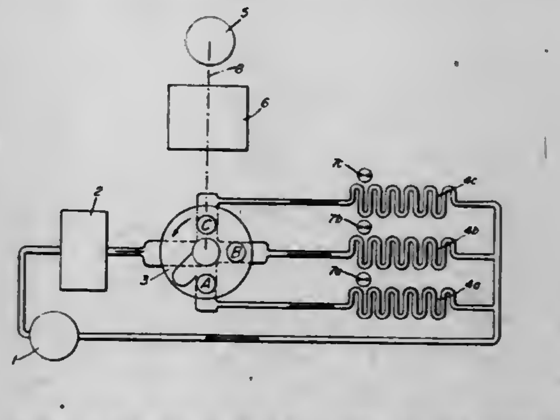
- a. an open passageway located externally of said furnace connecting the interior of said furnace adjacent and below the convection section with the surrounding atmosphere, said passageway being constructed and arranged to permit continuous substantially unobstructed flow therethrough and of uniform size such that during normal operation ambient air normally flows inwardly to said furnace in sufficiently small quantities so that normal furnace operation is undisturbed and when said furnace is at positive pressure the normal inward flow of ambient air is reversed so that combustion gases flow outward through said passageway;
- b. flow reversal detecting means operably connected with said passageway for detecting the reversal of flow in said passageway, said detecting means comprising a temperature sensing means for detecting changes in temperature in said passageway including indicating a low temperature when said ambient air flows into said furnace and a high temperature when said combustion gases flow out of said furnace; and
- c. alarm means operably connected to said flow reversal detecting means and responsive to a detected change in flow direction in said passageway for providing an alarm signal when said detecting means indicates a high temperature resulting from combustion gases passing outward through said passageway.

3,889,878
MULTI-WAY VALVE AND POSITION CONTROLLER THEREFOR

John Richard Evans, London, England, assignor to Allen West and Company, Limited, Brighton, England
Filed Feb. 16, 1973, Ser. No. 332,821
Int. Cl. F24d *3/02*
U.S. Cl. 237—8 R **16 Claims**

1. In a circulating hot fluid heating system comprising duct means defining a circuit including at least two sub-circuits in parallel with one another, a motor-driven, multi-way valve for controlling the flow of the hot fluid in said sub-circuits, said valve having a body and a movable valve member movable relative to said body and said valve defining a plurality of ways therethrough and having positions for each way and for at least one combination of said ways, motor means for driving said valve, heating means for heating said fluid, and means remote from the heating means for extracting heat from said fluid, a position controller comprising:

- sensors corresponding to positions of respective said ways through said valve, each said sensor having an open state (corresponding valve way open) and a closed state (corresponding valve way closed) and also first (corresponding valve way to be opened) and second (corresponding valve way to be closed) conditions and comprising selector switch means for switching the sensor from the open to the closed state and from the closed to the open state, control switch means for switching the sensor from the first to the second condition and from the second to the first condition, and circuit connector means interconnecting said selector switch means, said control switch means and said motor whereby said motor is energised by said sensor when said sensor is in its first condition and closed state and when said sensor is in its second condition and open state, and said motor is not energised by said sensor when said sensor is in its first condition and open state and when said sensor is in its second condition and closed state,
- and at least one selector member for moving in a fixed relationship with said movable valve member, for actuating said selector switch means to change said sensors from respective open to closed states and closed to open states.



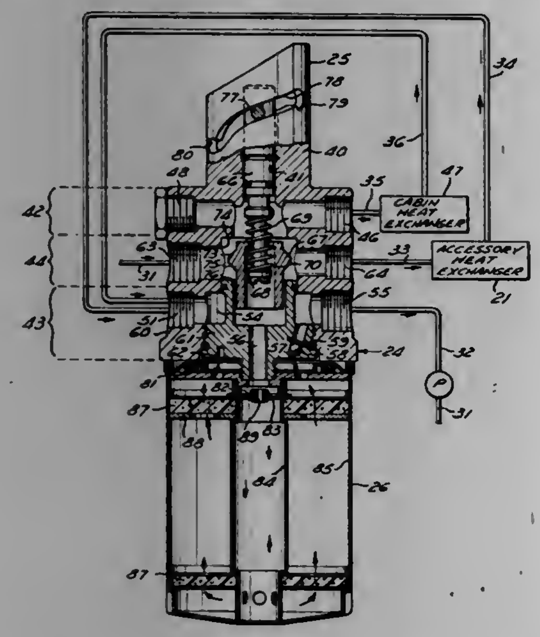
3,889,879
INTERNAL COMBUSTION ENGINE LIQUID COOLING SYSTEM

Ellis M. Wellman, Chardon, and Luis Moreiras, Northfield, both of Ohio, assignors to The Weatherhead Company, Cleveland, Ohio
Filed May 13, 1974, Ser. No. 469,250
Int. Cl. B60h *1/06*
U.S. Cl. 237—12.3 B **20 Claims**

1. A motor vehicle liquid cooling system comprising a pump having an inlet and an outlet, a radiator, a cabin heat exchanger having an inlet and an outlet, a liquid conditioner having an inlet and an outlet, and a flow control valve, said flow control valve being a multiple port valve having a cabin supply port hydraulically connected to said cabin heat exchanger inlet and a liquid conditioner supply port hydraulically connected to said liquid conditioner inlet, said flow control valve being movable to a summer position and to a winter position and to a service position, said flow control valve including valve means establishing fluid pressure communication between said pump outlet and said cabin heat exchanger inlet and establishing fluid pressure communication between said pump outlet and said liquid conditioner inlet when said flow control valve is in said winter position, said valve means closing fluid pressure communication between

said pump outlet and said cabin heat exchanger inlet and establishing fluid pressure communication between said pump outlet and said liquid conditioner inlet when said flow control valve is in said summer position, and said valve means closing fluid pressure communication between said pump outlet and said liquid conditioner inlet when said flow control valve is in said service position.

18. An internal combustion engine liquid cooling system comprising a pump having an inlet and an outlet, a radiator, a heat exchanger having an inlet and an outlet, a liquid conditioner having an inlet and an outlet, and a flow control valve, said flow control valve and liquid conditioner being combined in a single integral unit, said flow control valve being a multiple port valve having a heat exchanger supply port hydraulically connected to said heat exchanger inlet and a liquid conditioner supply port hydraulically connected to said liquid conditioner inlet, said flow control valve being movable to a first position and to a second position and to a service position, said flow control valve including valve means establishing fluid pressure communication between said pump outlet and said heat exchanger inlet and establishing fluid pressure communication between said pump outlet and said liquid conditioner inlet when said flow control valve is in said second position, said valve means closing fluid pressure communication between said pump outlet and said heat exchanger inlet and establishing fluid pressure communication between said pump outlet and said liquid conditioner inlet when said flow control valve is in said first position, and said valve means closing fluid pressure communication between said pump outlet and said liquid conditioner inlet when said flow control valve is in said service position.



3,889,880
FLOATING FOUNTAIN

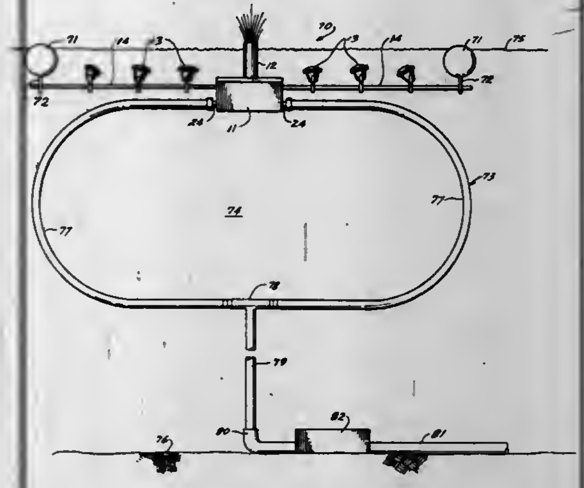
John O. Hruby, Jr., Burbank, Calif., assignor to Rain Jet Corporation, Burbank, Calif.

Division of Ser. No. 304,244, Nov. 6, 1972, Pat. No. 3,814,317, which is a continuation-in-part of Ser. No. 87,886, Nov. 9, 1970, Pat. No. 3,705,686. This application Dec. 5, 1973, Ser. No. 421,802

Int. Cl. B05b *17/08*

U.S. Cl. 239—18 **6 Claims**

1. A floating fountain assembly comprising a mounting base defining a chamber therein and a plurality of inlet openings to the chamber formed through side walls of the chamber at regularly spaced intervals around the base, a water discharge nozzle mounted to the base for receiving water from the chamber, float means coupled to the base for buoyantly supporting the base and nozzle in a body of water with at least a part of the nozzle disposed above the water surface, a flexible water supply conduit connected to each chamber inlet opening at one end thereof and extending to a fountain water source common to the other conduits and disposed at a submerged location in the body of water substantially directly



below the base, the several conduits being of substantially equal length and each having a length greater than the vertical distance between the base and the water source.

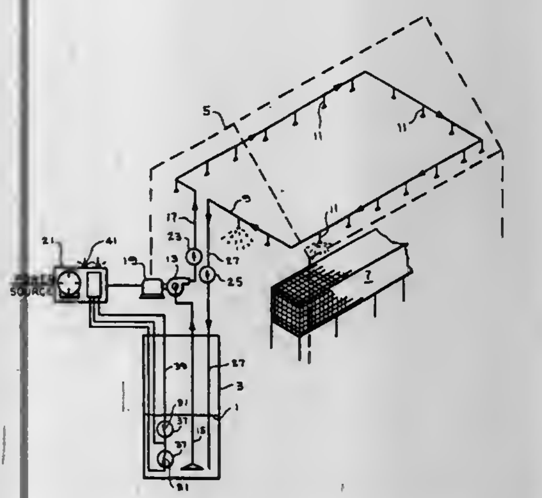
3,889,881
LIQUID DISPERSAL APPARATUS

Lonnie C. Cunningham, 26 Champions Colony, and Thomas P. Travis, 4625 Stillbrooke, both of Houston, Tex. 77000

Filed May 29, 1974, Ser. No. 474,246

Int. Cl. A01g *27/00;* **B05b** *1/30*

U.S. Cl. 239—70 **13 Claims**



1. In an insecticide distribution apparatus for automatically dispersing insecticide fluid periodically in an atomized state over a predetermined area of display substantially instantaneously upon the actuation thereof:

a conduit line for carrying the insecticide fluid,

nozzle means affixed in fluid communicating relation to said line for atomizing and dispersing the fluid that flows periodically therethrough into the surrounding atmosphere,

first fluid pressure means communicating with said line for maintaining a positive fluid pressure therein during the intervals when said nozzle means are not periodically dispersing the fluid,

second fluid pressure means communicating with said nozzle means for emitting fluid through said nozzle means only when the line pressure is above a predetermined level, such predetermined level being higher than the positive pressure maintained by said first fluid pressure means, and

intermittently actuated pumping means for supplying insecticide fluid to said conduit line, said pumping means and first and second fluid pressure means cooperating to produce an instantaneous atomized fluid dispersion at regular periods from said nozzle means and without any fluid or pressure loss in said line during the intervals therebetween when the line pressure is maintained by said first fluid pressure means.

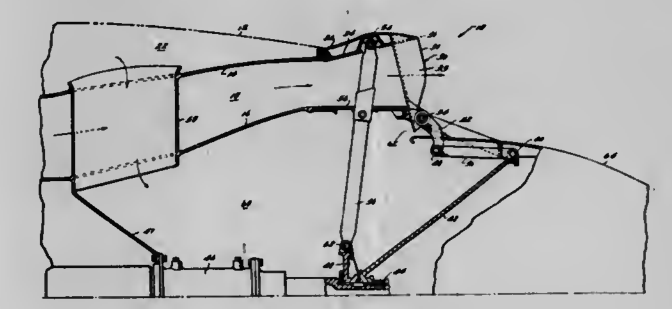
3,889,882
RETRACTABLE SOUND SUPPRESSOR FOR A GAS TURBINE ENGINE

Thomas Neil Hull, Jr.; James Leroy Nye, both of Marblehead, and William Steyer, Ipswich, all of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Mar. 25, 1974, Ser. No. 454,750

Int. Cl. B64d *33/04*

U.S. Cl. 239—127.3 **6 Claims**



1. A retractable sound suppressor for the exhaust duct of a gas turbine engine comprising:

a plurality of circumferentially spaced variable nozzle flaps disposed for rotation about the aft end of the exhaust duct to provide a variable area nozzle;

a plurality of circumferentially spaced apart divider chutes disposed for rotation about the aft end of the exhaust duct, each chute of which may be rotated between an inoperative position clear of the exhaust duct and an operative position wherein the chute radiates transversely of the duct;

single actuator means centrally disposed in the gas turbine engine for synchronously rotating the variable nozzle flaps and divider chutes such that the outer radial tips of the divider chutes engage respective nozzle flaps when the divider chutes are in the operative position to thereby substantially maintain the same effective nozzle area for the suppressed and non-suppressed modes of operation.

3,889,883
LIVE BOTTOM CHUTE FOR SPREADERS

Robert D. Anderson, Murdock, Minn., assignor to TCI, Inc., Benson, Minn.

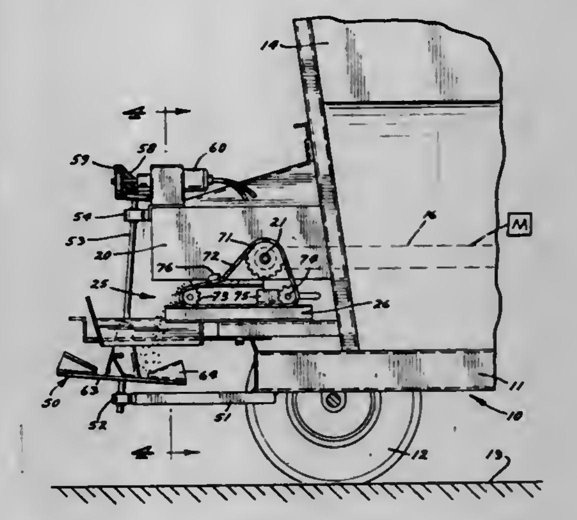
Filed Jan. 7, 1974, Ser. No. 431,390

Int. Cl. A01c *17/00*

U.S. Cl. 239—679 **14 Claims**

1. In a spreader for particulate material having a storage compartment, and means for discharging material from said storage compartment, a spreader mechanism for receiving and spreading said particulate material the spreading pattern of which is dependent on the location where material to be spread is deposited thereon, said means for discharging depositing said material in a location above said spreading mechanism, the improvement comprising a movable conveyor belt assembly positioned below said means for discharging material in position to receive material therefrom and to convey said material to said spreader mechanism, said conveyor belt having a discharge end for depositing material on said spreader mechanism, and means movably mounting said conveyor belt assembly on said spreader whereby the discharge end of said conveyor belt can be adjusted with respect to said spreader mechanism to change the location where material carried by the conveyor belt assembly is deposited on said spreader mechanism.

12. In a spreader for particulate material having a storage compartment, means for delivering the particulate material from said storage compartment, and spinner means positioned to receive material from said storage compartment and for spreading the material, said spinner means including a first member rotating in a plane about a generally upright axis, and blade means mounted on said first member, said blade means



including a planar member extending upwardly from said first member and having upper portions of said planar member rotationally trailing the lower portions of said blade member adjacent said first member, and an upper flange on said blade member, said flange rotationally leading said blade member, and extending from an inner end near said generally upright axis outwardly away from said axis and upwardly in direction away from said first member.

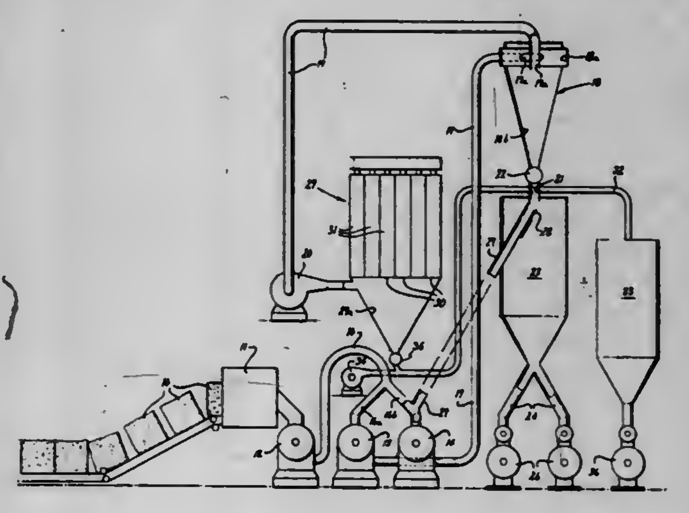
3,889,884
HAY PRODUCT AND METHOD FOR FORMING

George W. Morse, 9444 S. Wales Way, Elk Grove, Calif. 95624

Filed Feb. 9, 1973, Ser. No. 331,207

Int. Cl. B02c *19/00*

U.S. Cl. 241—24 **4 Claims**



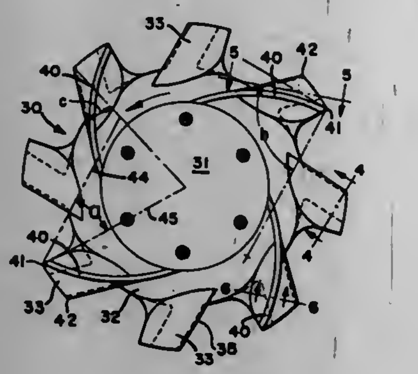
1. A method for preparing a readily pelletizable pellet from a pulverized finely divided hay powder formed of a leafy fiber containing legume and including stem particles, leaf vein particles, and deveined leaf blade particles, comprising the steps of continuously supplying said hay powder under pneumatic pressure tangentially to a centrifugal separation chamber whereby said powder is caused to rotate abouts its axis with application of centrifugal separating forces, continuously removing an overflow from a region adjacent said axis and collecting said overflow as a first product, separating the overflow solid particles and gas, continuously removing an underflow from one end of the chamber and collecting said underflow as a second product, said underflow containing

centrifugal separated particles which are heavier and larger than said overflow particles, continuously recycling at least 10 percent by weight of said underflow particles to mix with said supply of hay powder, whereby the average weight of said overflow particles is substantially increased in comparison to said overflow particles without recycling underflow particles and at least 20 percent of said overflow particles being of a size large enough for retention on a 150 standard mesh screen.

3,889,885
PULPING APPARATUS

J. Walter Couture, Dorval, P.Q., Canada, assignor to The Black Clawson Company, Middletown, Ohio

Filed Jan. 11, 1974, Ser. No. 432,576
Int. Cl. B02c *13/28*
U.S. Cl. 241—46.11 **6 Claims**



1. A rotor assembly for use in pulping apparatus of the character described for liquid slurry stock including a tub for receiving a quantity of stock and a bedplate mounted in the tub and having a working surface, comprising:

- a. a rotor body adapted to be mounted for rotation in predetermined direction in cooperative relation with the bedplate and having a plurality of defibering vanes projecting outwardly therefrom in angularly spaced relation,
- b. each of said vanes having under and upper surface portions of substantial area,
- c. means forming an essentially straight leading face on each of said vanes connecting said upper and under surfaces thereof,
- d. the outer edge of said face extending in said direction of rotation from a radius to the radially outer end thereof and defining with said radius a first angle of substantially less than 45°, and
- e. a plurality of pumping vanes each mounted on said upper surface portion of one of said defibering vanes and of such curved configuration as viewed axially of said rotor body that a second angle defined by a radius to said radially outer end thereof and a tangent to said outer end is sufficiently larger than said first angle to promote efficient vortical circulation of the liquid slurry stock.

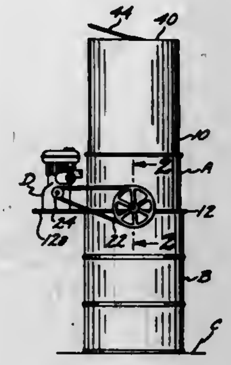
3,889,886
PORTABLE WASTE GLASS BOTTLE AND CONTAINER CRUSHING DEVICE

Jene D. Spivey, 7041 Aivlis St., Long Beach, Calif. 90815

Filed Oct. 10, 1973, Ser. No. 405,030
Int. Cl. B02c *19/12*
U.S. Cl. 241—100 **1 Claim**

1. A portable power driven glass container crushing device that may be removably mounted on a drum having an upper open end to fill said drum with crushed glass containers when said device is resting on the flat bed of a conventional truck or trailer or on the ground, said crushing device including:

- a. a rigid, cylindrical vertically disposed shell that has upper and lower open ends, with said shell having a lower end portion of such transverse cross section as to be removably insertable through said open end of said drum and extend downwardly therein;
- b. a circumferentially extending circular flange that projects outwardly from said shell adjacent said lower open end thereof, said flange acting as a stop by engaging an upper edge of said drum to support said shell therefrom, with said lower end portion of said shell extending downwardly into said drum;
- c. a plurality of rigid, parallel, laterally spaced first bars that extend transversely across the interior of said drum and intermediately disposed between said upper and lower ends thereof;
- d. diametrically opposed bearing means supported in fixed positions on said flange relative to said drum;
- e. a shaft rotatably supported in said bearing means, said shaft having a first end portion that projects outwardly from said bearing means and said shaft adjacently disposed to said first bars;
- f. an internal combustion engine assembly supported on said flange, said engine assembly including a drive shaft and a driving pulley secured to said shaft;



- g. an endless belt;
- h. a driven pulley rigidly secured to said first end of said shaft and drivingly engaged by said belt;
- i. a plurality of second parallel transversely spaced bars that are rigidly secured to said shaft intermediate the ends of said bars, said second bars being rotatable through spaces defined between said first bars, and said second bars of such length as to project upwardly a substantial distance above said first bars when said second bars are substantially normal to said first bars; and
- j. a plurality of vertically spaced baffles in the upper interior of said shell that angle downwardly and overlap, with a glass container when deposited in the upper open end of said shell dropping downwardly therein by gravity through spaces defined between said baffles to a position adjacent said first bars where said container is sequentially struck by said rotating second bars to be broken into a plurality of pieces sufficiently small as to fall downwardly through said spaces between said first bars into said drum.

3,889,887
APPARATUS TO CONTROL BOTH THE OPERATION OF A CUTTING REEL AND THE GRINDING MECHANISM OF A FORAGE HARVESTER

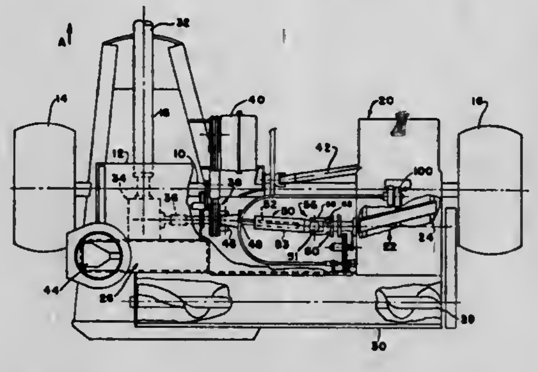
Robert A. Wagstaff, New Holland, Pa., and Poul K. Pedersen, Kerteminde, Denmark, assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Nov. 19, 1973, Ser. No. 417,461
Claims priority, application Canada, Oct. 5, 1973, 182762/73
Int. Cl.² A01D *75/08;* **B24B** *3/42*
U.S. Cl. 241—101.2 **4 Claims**

1. An apparatus to control the operation of a cutting reel and the grinding mechanism for sharpening the cutting reel of a forage harvester which comprises:

- a. a main power source,
- b. a transmission member having one end fixed to the power source,

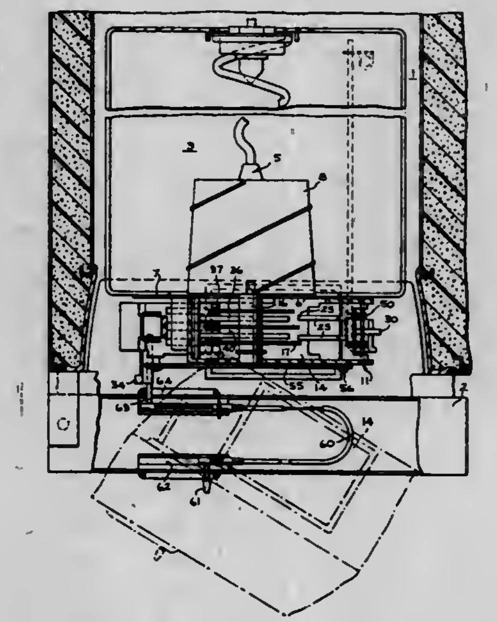
- c. a coupling assembly comprising first means for receiving the other end of the transmission member,
- d. driving means including a first rotatable shaft on which said cutting reel is mounted, a second rotatable shaft spaced a distance from said first shaft and means operably associated with said second shaft for driving said grinding mechanism,
- e. said coupling assembly further comprising second means for receiving an end of either said first or second rotatable shafts, and means for securing said second receiving means to said first rotatable shaft or to various positions on said second rotatable shaft to selectively couple said transmission member to the cutting reel and the grinding mechanism in a first driving mode in which the cutting reel is driven in a forward direction while the grinding mechanism is disengaged from said power source, a second driving mode in which said cutting reel is driven in a rearward direction while simultaneously driving said grinding mechanism, and a third driving mode in which said grinding mechanism is driven while said cutting reel is disengaged from said power source.



3,889,888
COMBINATION ICE CUBE AND CRUSHED ICE DISPENSER

Luis E. Prada, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Division of Ser. No. 348,867, April 9, 1973, Pat. No. 3,843,067. This application June 17, 1974, Ser. No. 480,040
Int. Cl. B02c *13/06*
U.S. Cl. 241—101.1 **4 Claims**



1. A combination ice cube and crushed ice dispenser comprising:

walls defining a crusher housing having an outlet at the bottom thereof;

a horizontally rotatable member carrying crusher blades in said crusher housing;

said housing including an ice inlet opening generally above and to one side of the axis of said rotatable member through which ice cubes are introduced into the rotational path of said crusher blades;

said crusher walls adjacent and opposite said opening confining the ice cubes passing downwardly through said crusher housing to said outlet to a discharge path intersecting the rotational path of said crusher blades;

means for rotating said rotatable member in a direction such that said arms move upwardly along said discharge path;

said crusher including anvil means on the opposite side of said axis from said opening for cooperating with said crusher blades to crush ice pieces conveyed to said anvil means;

said anvil means comprising a set of stationary arms spaced to provide coarse crushed ice and a set of movable arms movable to an operative position below said stationary arms and in the path of said blades for providing finely crushed ice; and

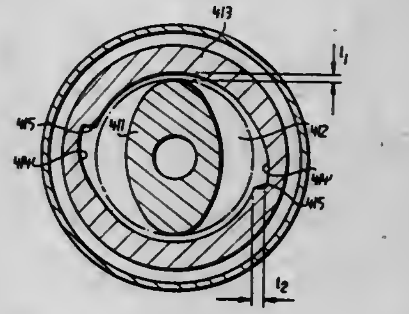
said crusher including a pivotally mounted member movable between a first position permitting said ice cubes to pass directly to said outlet and a second position in which the lower end thereof overlaps said stationary arms for intercepting the passage of said ice cubes downwardly through said passage whereby said ice cubes are picked up by said crusher arms and conveyed to said anvil means;

said movable arms engaging and supporting the lower end of said interceptor means when said movable arms are in their operative position.

3,889,889
APPARATUS FOR PULVERIZING VULCANIZED RUBBER AND RUBBER PRODUCTS

Kiyohiko Sawa, Kobe, Japan, assignor to Kobe Steel, Ltd., Kobe, Japan

Filed Apr. 2, 1973, Ser. No. 346,871
Claims priority, application Japan, Aug. 14, 1972, 47-81286; Aug. 14, 1972, 47-81287; Aug. 23, 1972, 47-84753
Int. Cl. B02c *13/02*
U.S. Cl. 241—228 **2 Claims**



1. An apparatus for pulverizing rubber materials such as vulcanized rubber and rubber products, which comprises:

a rotor having an egg-shaped cross-section;

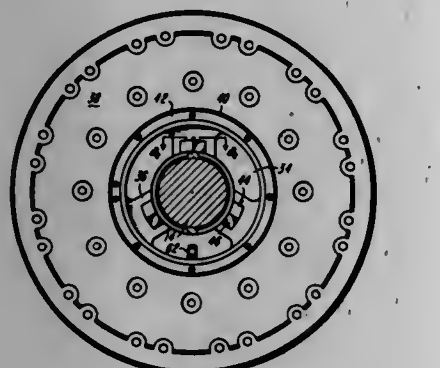
a casing surrounding said rotor;

drive means for rotating said rotor relative to said casing; and

clearance-changing means for changing the clearance formed between the outer periphery of said rotor and the inner wall of said casing as said rotor rotates, said clearance-changing means includes an inner wall of non-circular cross-section disposed within said casing.

3,889,890
REFINER DISC

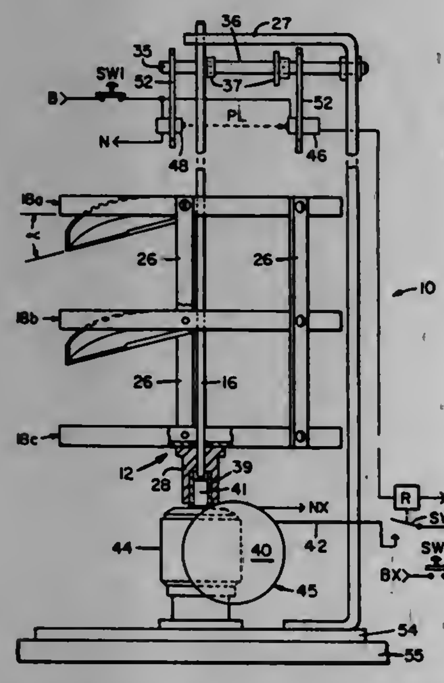
Anton J. Horstman, Springfield, Ohio, assignor to The Bauer Bros. Co., Springfield, Ohio
Filed Jan. 21, 1974, Ser. No. 435,233
Int. Cl. B02c *7/06*
U.S. Cl. 241—245 **17 Claims**



1. A feed end refining disc for use in a disc refiner comprising a plate-like body having an infeed face, an operating face, and at least one feed passage having an exit end at said operating face and an entrance end opening from said infeed face, characterized by means providing an irregular surface contour on said infeed face at least a portion of which is projected from said infeed face and arranged thereon adjacent and generally clear of said entrance end of said feed passage to inhibit material fed to said infeed face for movement through said feed passage from building up on said infeed face.

3,889,891
METHOD AND APPARATUS FOR TRANSFERRING TAPE FROM A PLURALITY OF ROLLS

Edward S. Walker, Danville, Ky., assignor to Corning Glass Works, Corning, N.Y.
Filed May 6, 1974, Ser. No. 467,452
Int. Cl. B65h *75/02*
U.S. Cl. 242—55 **8 Claims**

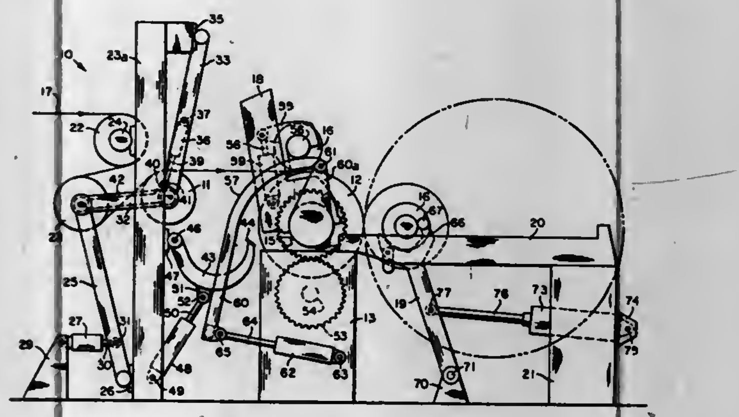


1. A device for transferring tape from a plurality of coreless rolls of tape including first and second rolls of tape, each of said rolls having innermost and outermost tape ends, with the outermost end of said first tape roll being connected to the innermost tape end of said second tape roll, thus forming a connecting tape segment, and with the innermost end of said first roll spiralling upwardly from the center of said first tape roll in response to pulling force exerted thereon, thus forming a feeding segment of tape, such device comprising

a. a plurality of vertically spaced apart horizontal platforms for coaxially supporting said plurality of coreless rolls of tape, including a first platform for supporting said first roll of tape coaxially above said second roll of tape, with said first platform having a feed slot to permit said connecting tape segment to feed therethrough upon the depletion of said first roll of tape;
b. guide means above said first tape roll for directing the transfer of said feeding segment of tape;
c. motor means for periodically rotating said plurality of platforms in a direction opposite the direction of spiralling of said feeding segment of tape;
d. means for detecting excessive spiralling of said feeding segment of tape; and
e. means for energizing said motor means in response to detection by said detection means of excessive spiralling of said feeding segment of tape resulting from the application of said pulling force on said first tape roll innermost end.

3,889,892
CENTER START SURFACE WIND REEL WITH AUTOMATIC CUT-OFF AND TRANSFER

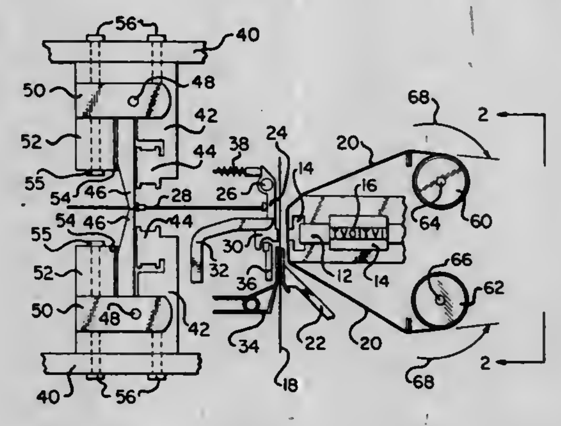
James J. Melead, Roscoe, Ill., assignor to Beloit Corporation, Beloit, Wis.
Filed Aug. 9, 1973, Ser. No. 387,122
Int. Cl. B65h *19/20, 17/08*
U.S. Cl. 242—56 R **14 Claims**



1. In an apparatus for winding a web of sheet material and transferring the web from an initial center to surface winding during the winding operation, a spool for the web, a surface winding drum, power means rotatably driving said surface winding drum at the speed of linear travel of the web, a pair of primary arms for carrying said spool for rotation about an axis parallel to and spaced radially from the surface of said surface winding drum and moving said spool about the axis of said surface winding drum into position to be wound from the surface thereof, support means supporting said spool in said primary arms out of contact with said surface winding drum and bringing said spool and the center wound web thereon into engagement with said surface winding drum, power means rotatably driving said spool, means for severing the web at the termination of a surface winding operation, a nip defining enveloper roll cooperating with said winding drum to partially envelop the spool with the web, tensioning means for the web as trained about said nip defining enveloper roll, the tensioning means including a pair of swing arms pivoted for movement about an axis spaced from the axis of said nip defining roll, means supporting said nip defining enveloper roll on said swing arms, a second pair of swing arms pivotally mounted for movement about an axis spaced beneath and at the incoming side of said nip defining enveloper roll, a tension roller supported on said second swing arms adjacent the upper ends thereof, a link pivotally connecting the adjacent ends of said swing arms to swing together, an idler freely rotatable about a fixed axis spaced on the same side of the axis of said tension roll as the axis of pivotal movement of said first-mentioned swing arms, and fluid pressure means for moving said swing arms and tension roll relative to said idler.

3,889,893
RIBBON DRIVE AND CONTROL SYSTEM

Ira Silverman, Chatsworth, Calif., and James M. Irvine, Lake Orion, Mich., assignors to Computer Peripherals, Inc., Edina, Minn.
Filed Jan. 14, 1974, Ser. No. 432,819
Int. Cl. B65h *25/26, 17/02*
U.S. Cl. 242—57.1 **17 Claims**



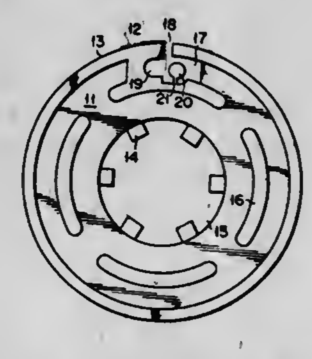
1. Ribbon drive and control mechanism comprising a pair of reels for carrying said ribbon in a path past a station for printing operations, said ribbon having conductive elements thereon, a

drive motor connected to each of said reels for driving thereof, potentiometer means connected with each of said drive motors for providing a predetermined voltage thereto, each of said motors having different voltages applied thereto for providing driving of one reel in one direction while providing drag on the other reel and in the same direction, and

switching means including a pair of spaced members positioned adjacent each of said reels and contactable by said conductive elements on said ribbon near the ends thereof for actuating said switching means thereby reversing the direction of said drive motors to alternately provide for drive and for drag of the reels.

3,889,894
CASSETTE REEL HUB FOR A TAPE RECORDER

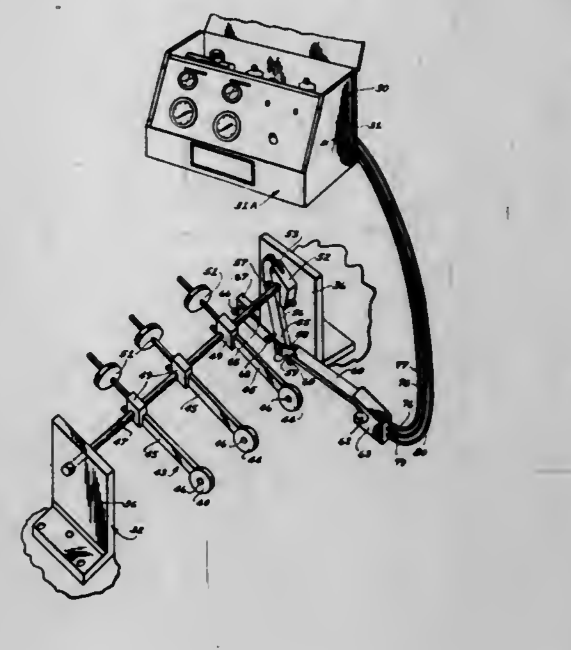
Michiyuki Deguchi, Tokyo, Japan, assignor to Ugen-Kaisha Overu Engineering, Tokyo, Japan
Filed Feb. 5, 1974, Ser. No. 439,767
Claims priority, application Japan, Feb. 7, 1973, 48-16356
Int. Cl. B65h *75/28*
U.S. Cl. 242—74 **7 Claims**



1. A reel hub for a cassette comprising a reel hub body having an outer periphery on which a tape is wound, an opening provided adjacent to the outer periphery and having an inner surface, a slit provided in the outer periphery of the reel hub body to communicate with the opening and adapted to permit the tape to be inserted therethrough, and a recess communicating with the opening; and engaging member provided in the opening, and a connecting member for connecting the engaging member to the inner surface of the opening, the connecting member being fractured to fit the engaging member into the recess thereby to fixedly secure the end of the tape between the inner surface of the recess and the engaging member.

3,889,895
WEB-TENSION SENSING AND CONTROL APPARATUS

Ferenc Edes, Bolingbrook, and Henry L. Gianatasio, River Forest, both of Ill., assignors to Air-Trol Systems, Inc., Addison, Ill.
Filed Dec. 26, 1973, Ser. No. 428,367
Int. Cl. B65h *23/08*
U.S. Cl. 242—75.43 **5 Claims**



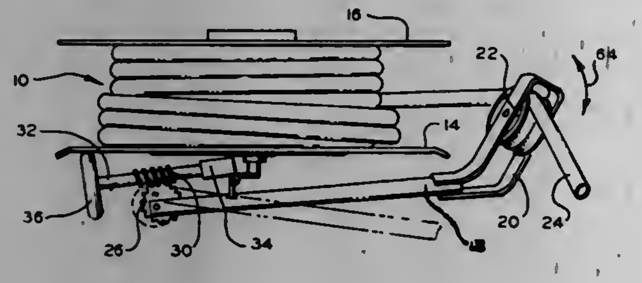
1. A web tension sensing and control apparatus for sensing and controlling the tension of a web of paper, plastic resinous film, or the like, fed from a roll thereof carried by a roll-supporting shaft, comprising:

a. supporting means;
b. web-tension sensing means movably mounted on the said supporting means and adapted to bear upon the said web above the latter;
c. pneumatically operated braking means on the said roll-supporting shaft for braking the action of said roll-supporting shaft;
d. air supply means for supplying air under pressure to the said pneumatically operated braking means;
e. first air valve control means for controlling the flow of air to said pneumatically operated braking means to actuate the latter;
f. power means for operating the said first air valve control means;
g. pneumatically controlled power transmission means for operating the said power means;
h. pneumatic control means under the control of the said web-tension sensing means for controlling the operation of the said pneumatically controlled power transmission means and including
   1 a pneumatic sensing head having therein (a) a throat portion;
   2 a sensing member operable by and responsive to movement of the said web-tension-sensing means and having a portion movable into and out of the said throat portion of the said pneumatic sensing head; and
   3 second air valve control means under the control of the said pneumatic sensing head and the said throat portion thereof and the said portion of the said sensing member

and responsive to the position of the said portion of the said sensing member in and relative to the said throat portion of the said pneumatic sensing head for controlling the operation of the said pneumatically controlled power transmission means.

3,889,896
HOSE COILING APPARATUS

Arthur C. O'Hara, 4978 Skyline Dr., Syracuse, N.Y. 13215
Filed Mar. 21, 1974, Ser. No. 453,380
Int. Cl. B65h *75/38*
U.S. Cl. 242—86 **10 Claims**



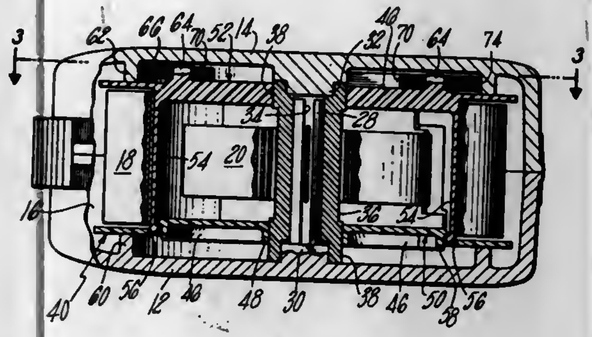
1. Apparatus for assisting in the coiling and uncoiling of an elongated, flexible element in a plurality of layers of side-by-side revolutions of the element, said apparatus comprising, in combination:

a. a fixed cylindrical element for receiving the coiled element on the outer periphery thereof;
b. an elongated arm mounted for rotation about the central axis of said cylindrical element and arranged with its own axis transverse to said central axis;
c. pulley means carried by said elongated arm and spaced radially from said outer periphery of said cylindrical element, and having an axis of rotation transverse to both said central axis and said arm axis, whereby the flexible element may extend tangentially from the coil, over said pulley means and substantially parallel to said central axis;
d. spring means constructed and arranged to be tensioned by rotation of said arm in a first direction to exert a biasing force tending to rotate said arm in the opposite direction;
e. mounting means allowing reciprocating traversing movement of said pulley means between positions radially spaced from each end of said cylindrical element; and
f. motion transfer means for imparting a predetermined increment of said traversing movement to said pulley means in response to each revolution of said arm in either direction about said central axis.

3,889,897
COILABLE TAPE MEASURING DEVICE HAVING A SELF-REGULATING SPEED CONTROL MECHANISM

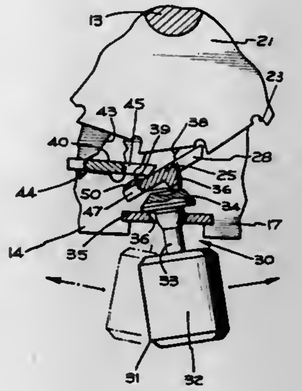
Henderik Van Zelderen, St. Avon, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Sept. 26, 1973, Ser. No. 401,044
Int. Cl. B65h *75/48*
U.S. Cl. 242—107.3 **4 Claims**

1. A tape measuring device adapted for self-regulating the recoil speed thereof comprising a casing including spaced apart side walls defining a chamber, a reel rotatably journaled within the chamber, a coiled measuring tape counted on the reel for rotation in a first rotatable direction as the tape is withdrawn from the casing and a power drive spring mounted within the chamber for driving the measuring tape in a reverse direction from said first rotatable direction into a recoiled position within the chamber, said reel including a pair of spaced apart side members in close confronting relationship with the casing side walls, said side members having an outer peripheral rim, one of said side members carrying a pivot adjacent but spaced from the peripheral rim, the casing wall confronting said pivot having an annular shoulder extending toward said reel intermediate the peripheral rim and the pivot, said annular shoulder engaging the confronting side member of the reel to alignably confine said reel within the chamber and limit transverse movement of said reel, said shoulder including an arcuate brake drum surface generally facing toward said pivot, said reel being provided with a planar weighted mass pivotably mounted on the side member at said pivot between the side member and the confronting casing wall for frictionally engaging the brake drum surface of said shoulder and bearing thereagainst in proportion to the centrifugal force applied to the reel by the power drive spring when driving the measuring tape into its recoiled position.



3,889,898
PIGGYBACK DUAL LOCK BAR

Avraham Ziv, Sepulveda, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.
Filed Apr. 10, 1974, Ser. No. 459,539
Int. Cl. A62b *35/02*
U.S. Cl. 242—107.4 **7 Claims**

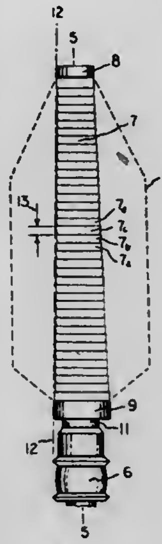


1. A fail safe locking mechanism for emergency locking safety belt retractors having a primary locking pawl for preventing belt protraction from the retractor by engaging a tooth of a ratchet wheel member having a plurality of ratchet teeth and comprising:

a fail safe pawl and means for mounting it to said retractor in position to be moved to engage with teeth of said ratchet wheel member; and
means for moveably mounting said primary locking pawl to provide for its movement against said fail safe pawl to move the latter into engagement with a ratchet tooth of said ratchet member upon a deflective movement of said primary locking pawl relative to said ratchet member, as when said locking pawl engages a tip of a ratchet tooth and is deflected away from said ratchet member.

3,889,899
INCREMENTALLY-TAPERED BOBBINS

Samuel F. Adams, Greenville, S.C., and Robert J. Guerin, Providence, R.I., assignors to American Paper Tube Company, Woonsocket, R.I.
Filed Oct. 1, 1973, Ser. No. 402,148
Int. Cl. B65h *75/10*
U.S. Cl. 242—118.32 **1 Claim**



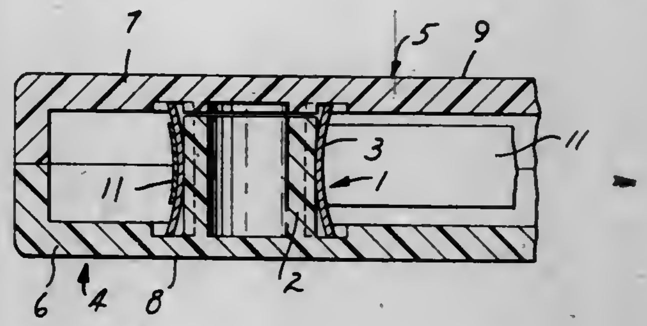
1. A bobbin for textile yarns and the like having an elongated body portion of substantially circular cross-sectional outline for collection and holding of a yarn package thereon, said body portion being of resin-impregnated paper and about ten inches in length and having an outer diameter of about one and one-eighth inches near said bottom, the exterior of said body portion being of incrementally-stepped configuration longitudinally thereof and involving a plurality of relatively short-length steps in end-to-end relationship along all of said body portion upon which yarns are intended to be wound, said body portion being tubular and following an inward taper in direction from bottom to top of said bobbin, said linear taper from bottom to top being about 0.025 inch per inch, the generatrix of each of said step surfaces being slightly sloped in relation to the longitudinal profile of said bobbin and said step surfaces being sloped in direction opposite to the direction of said taper, and the riser surfaces interconnecting adjoining ones of said step surfaces being relatively short and sloped in greater than acute-angle relationships to said step surfaces, the slope of said step surfaces being not in excess of a few degrees, the length of each of said step surfaces being substantially one-fourth inch, all the outer ends of said step surfaces being disposed along paths defining linear toward taper of said body portion from bottom to top thereof, and said riser surfaces being smoothly contoured in interconnecting said step surfaces, all of the surfaces of said body portion being substantially smooth and uninterrupted except for said stepped configuration, and the maximum height of said riser surfaces, in direction radially, of said bobbin, being of the order of a few thousandths of an inch, whereby yarn entrapments on said bobbin exterior are avoided, controlled even winding of yarn is promoted, and waste removal is facilitated by said stepped configuration.

3,889,900
CARTRIDGE TAPE GUIDE

Norman E. Nelson, Roseville, Minn., assignor to Alexander, Sell, Steldt & DeLaHunt, St. Paul, Minn.
Filed Aug. 1, 1973, Ser. No. 384,596
Int. Cl. G11b *23/10*
U.S. Cl. 242—199 **6 Claims**

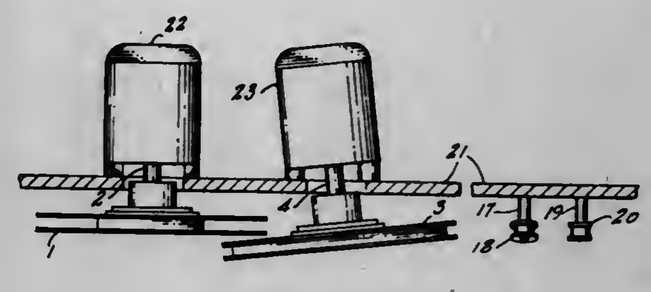
1. In a tape cartridge the combination comprising:

a case with spaced apart sidewalls;
at least one fixed mounting post protruding from an inner surface of one of said sidewalls and disposed near one peripheral edge of said case;
a sleeve formed from a low friction material and affixed on said post, said sleeve having a concave sidewall that exerts centering forces on tape that is guided by said sleeve; and
one of said post and said sleeve is out of round and the other is cylindrically shaped, and said sleeve is of such size that it is deformed from its normal shape to fit on said post with a friction fit and have a spring retention effect to securely hold the sleeve on the post.



3,889,901
COMPACT MAGNETIC TAPE DRIVE WITH OVERLAPPING TAPE REELS LYING IN DIFFERENT PLANES

Sigurd Hoyer, Glen Head, N.Y., assignor to Potter Instrument Co., Inc., Plainview, N.Y.
Filed May 8, 1974, Ser. No. 468,192
Int. Cl. G11b *15/28, 15/58*
U.S. Cl. 242—209 **7 Claims**



1. In a magnetic tape handler, the combination of;

a servo motor driven magnetic tape first reel mounted on a plate with its axis perpendicular to said plate;
a servo motor driven magnetic tape second reel mounted on said plate with its axis disposed with respect to the axis of said first reel at a distance therefrom of between 25 and 50 percent less than the diameter of said reels and tilted with respect to said first reel whereby said second reel substantially overlaps said first reel;
a motor driven capstan and read/write head mounted along the tape path between said two reels and oriented in accordance with the position of said first reel;
and two idler pulleys mounted adjacent to said second reel, one oriented in accordance with said second reel and the other oriented in accordance with said first reel for redirecting the tape as it is passed from one of said reels to the other.

3,889,902

HELICOPTER COMPRISING A PLURALITY OF LIFTING ROTORS AND AT LEAST ONE PROPELLING UNIT

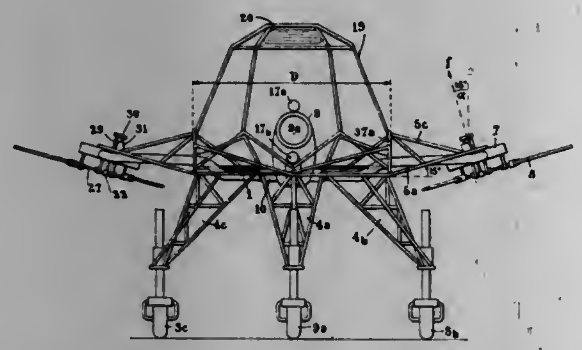
Francois Madet, 44 rue Guillaume du vair, 94290-Villeneuve le Roi, France

Filed Dec. 26, 1973, Ser. No. 427,632

Claims priority, application France, Dec. 26, 1972, 72.46176

Int. Cl. B64c *27/08*

U.S. Cl. 244—17.23 **9 Claims**



1. A multi-rotor helicopter comprising a platform of polygonal configuration having 2*n* sides and at least one median axis, a propelling jet-engine for horizontal flight, disposed along said platform median axis, a number *n* of pairs of short-bladed lift rotors having a diameter smaller than that of said platform, the two rotors of each pair rotating in opposite directions and being disposed symmetrically in relation to the axis of said platform along the periphery thereof, with a relative angular shift of 180°/*n*, the axes of each pair of rotors converging to a point located above the median axis of said platform and the centre thereof, *n* pairs of gas turbines mounted adjacent the periphery of said platform, and having corresponding rotors coupled coaxially to said 2*n* lift rotors, means for producing propelling gases and means for distributing in a controlled manner said propelling gases to said turbines.

3,889,903

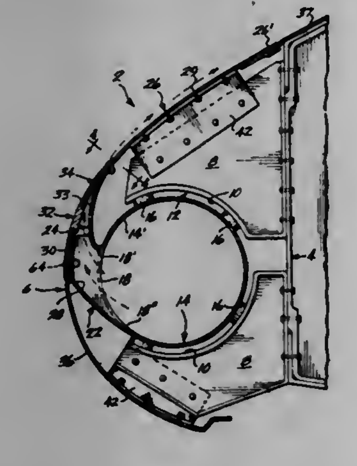
AIRFOIL LEADING EDGE STRUCTURE WITH BOUNDARY LAYER CONTROL

Noel Evan Hilby, Maple Valley, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 339,735, March 9, 1973, abandoned. This application Mar. 4, 1974, Ser. No. 448,080

Int. Cl. B64c *21/04*

U.S. Cl. 244—42 CC **10 Claims**



1. In the leading edge structure of an airfoil, a spar spanwise thereof, front opening jaws on the spar, a boundary layer control duct supported in the jaws, and having a longitudinally extending slot along the forward side thereof, which slot has coextensive, relatively upper and lower lips projecting outboard from the upper and lower edges thereof, the upper of which lips extends reentrantly upwardly and distantly away from the upper edge of the slot, and forms the overside of the leading edge of the airfoil, and the lower of which lips forms a throat with the upper lip, outboard of the slot, and has a deflector thereon which forms a convergent nozzle with the upper lip, through which the throat discharges upwardly over the outer surface of the upper lip, said duct being part cylindrical in cross section, and mounted in jaws of complementary cross section, with symmetrically radially oriented spacers interposed therebetween.

3,889,904

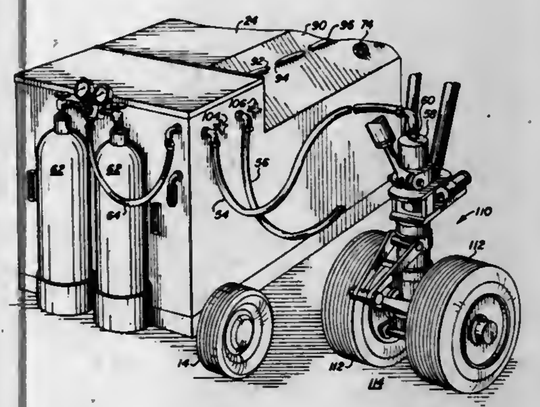
MEANS AND METHOD FOR SERVICING FLUID CUSHIONED AIRCRAFT LANDING GEAR STRUTS

Chester L. M. Jones, 2610 W. Jefferson St.; Raymond J. Yoakam, 4618 N. 71st Ave.; Mitchell M. Hazar, 3120 N. Rose Circle Dr., all of Phoenix, Ariz. 85026, and Alfred J. Dillon, 4800 W. Ocotillo, Glendale, Ariz. 85301

Filed June 20, 1973, Ser. No. 371,860

Int. Cl. B64c *25/60*

U.S. Cl. 244—104 R **7 Claims**



1. A method for servicing fluid cushioned collapsible aircraft landing gear struts comprising: allowing an aircraft to rest and bear on its landing gear with the supporting wheels thereof in contact with a floor surface such as hangar floor, runway, or any other support; then opening a fluid fitting in each respective landing gear strut while allowing the weight of the aircraft to move downward uniformly under the force of gravity thereby collapsing said struts and thereby forcing used fluid therefrom; then applying new fluid under pressure through said fitting and thereby uniformly extending said struts and uniformly elevating said aircraft while the weight of said aircraft is still supported on said struts and while the respective wheels are still engaged with said floor surface.

3,889,905

DERAILMENT RESPONSIVE BRAKE APPLYING DEVICE

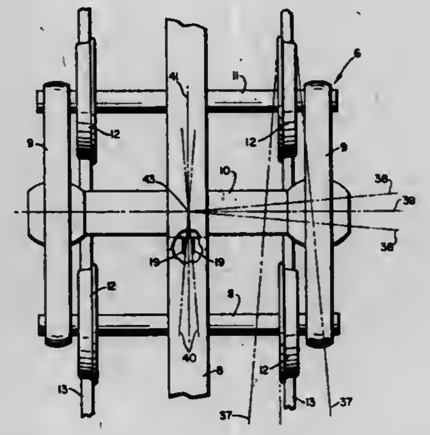
James H. Hall, Jr., 2829 Churchill, Memphis, Tenn. 38118

Filed Feb. 13, 1974, Ser. No. 442,056

Int. Cl. B61l *3/00*

U.S. Cl. 246—170 **3 Claims**

1. A derailment responsive brake applying device comprising a normally closed valve, means supporting said valve immovably on a railway car center sill, said valve including a housing having an inlet end connected to a trainline branch pipe and an outlet end opening to the atmosphere, a valve actuator connected to and extending from said housing and supported relative thereto for movement crosswise of the center sill, and a bifurcated member secured immovably to an exterior part of one side wall of a truck bolster of the railway car and having rigid furctions transversely spaced relative to the center sill and between which said valve actuator is disposed, whereby a twisting or transverse movement imparted to the bolster due to the derailment of a wheel of the truck will cause one furcation to engage and move the valve actuator to a position to open the valve to depressurize the brake line for applying the train brakes in emergency.



3,889,906

DRILL BOOM

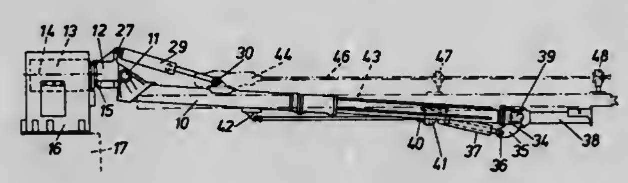
Erich Voldemar Kimber, Vendelso, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Dec. 6, 1973, Ser. No. 422,360

Claims priority, application Sweden, July 3, 1973, 7309394

Int. Cl. E21c *9/00, 5/08, 11/00*

U.S. Cl. 248—2 **10 Claims**



1. A drill boom arrangement for positioning an elongated rock drilling apparatus to different drilling positions with respect to a support comprising in combination therewith a boom bracket, a base shaft on said bracket for rotatable journalling thereof on said support about a polar axis, a first cross shaft on said bracket, a drill boom pivoted at the rear end thereof on said first cross shaft in a plane parallel with but spaced laterally from said polar axis, a second cross shaft at the forward end of said drill boom, a boom head supported on said second cross shaft for carrying said rock drilling apparatus with a free motion clearance relative to said drill boom pivotally in a plane normal to said cross shafts and passing through said polar axis, hydraulic cylinder means pivotally connected to said drill boom and further pivotally connected respectively to said boom head and to said bracket for pivoting respectively said boom head and boom, and power means for rotating said base shaft.

3,889,907

MACHINERY MOUNT

Paul L. DeSourdis, Millbury, Mass., assignor to The Felters Company, Millbury, Mass.

Filed Mar. 30, 1973, Ser. No. 346,417

Int. Cl. F16f *15/00*

U.S. Cl. 248—24 **6 Claims**

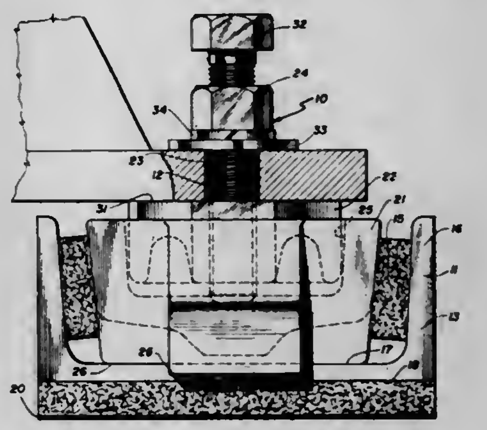
1. A machinery mount, comprising:

a. a pocket member having an upwardly-directed recess,

b. a nut member located in the recess and having a threaded central aperture,

c. a threaded jack extending through the aperture in the nut member and having a lower end engaging the bottom of the recess in the pocket member,

d. a base having spaced upwardly-directed flanges between which the pocket member resides, and



e. a side pad extending between each flange of the base and the pocket member, the pads being formed of felt, and the pocket member having flanges which extend downward from it.

3,889,908

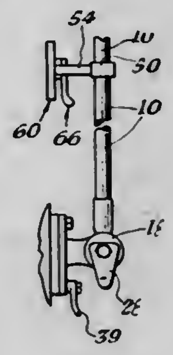
OUTRIGGER POLE HOLDER

Arvid Larson, 6560 Winfield Blvd., Margate, Fla. 33063

Filed Jan. 21, 1974, Ser. No. 435,105

Int. Cl.^{2} F16M *13/00*

U.S. Cl. 248—42 **2 Claims**



1. A pole holder, particularly useful for holding outrigger poles comprising;

a mounting base having a circular flange seat,

said flange seat used to receive a mating flange perpendicularly coupled to a bevel-toothed first crown-gear,

a clamp-ring fitting over said first crown-gear, abutting against said mating flange, and affixed to said flange seat, a second crown-gear rotatably communicating with said first crown-gear having affixed to said second crown-gear a tubular member for holding said outrigger pole root,

a circumferentially sloping cam surface on the back of said first crown-gear and a first handle with complimentary circumferentially sloping cam surfaces that abut said cam surfaces on the back of said first crown-gear,

said first handle being rotatable about the centerline of said circumferentially sloping cam surfaces and being coupled to said second crown-gear such that when said first handle rotates so that both cam surfaces closely abut, then said second crown-gear pulls toward said first crown-gear and said teeth mesh; when said first handle (is rotated) rotates such that both cam surfaces loosely abut, then said second crown-gear freely rotates about the centerline of said circumferentially sloping cam surfaces,

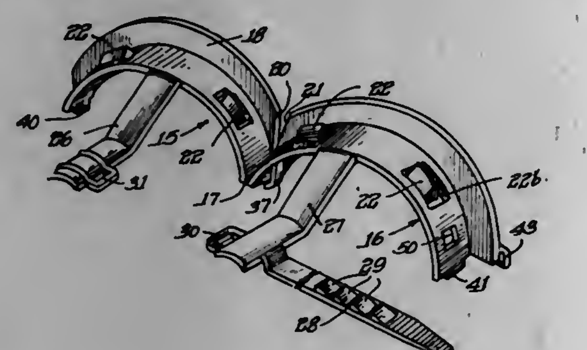
a second similar set of circumferentially sloping cam surfaces located on said clamp-ring and a second handle with a second similar set of complimentary circumferentially sloping cam surfaces,

said second handle being coupled to said mounting base and being rotatable about the centerline of said second circumferentially sloping cam surfaces such that when said second handle rotates so that both cam surfaces closely abut, said clamp ring exerts a pressure on said flange and prevents said first crown-gear from rotating about the centerline of said seat and when said second handle rotates such that both cam surfaces loosely abut, said flange freely rotates about the centerline of said seat.

3,889,909
WIRE BUNDLE CENTERING GROMMET

Richard A. Koscik, Richton Park, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed June 12, 1974, Ser. No. 478,720
Int. Cl. F16l *5/00;* **H01b** *17/26;* **H01r** *13/58*
U.S. Cl. 248—56 7 Claims

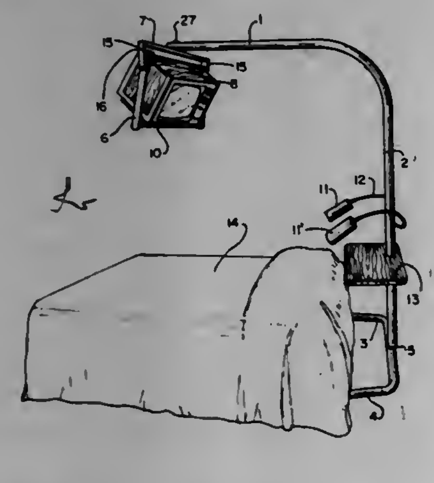


1. A wire bundle centering grommet and strain relief, comprising in combination; first and second semicircular members hinged together at mating edges to form a cylindrical body adapted to be inserted into an aperture formed in a wall panel, a flange formed at one edge of said cylindrical body to abut the peripheral margin about said aperture, tab means extending outwardly of said cylindrical body and displaced from said flange to receive the wall panel therebetween firmly to hold the cylindrical body in place, first and second arm means extending axially from said first and second semi-circular members respectively, strap means secured to said first arm means and extending transversely thereof, and fastening means formed on at least one of the said first and second arm means to receive said strap means, whereby said strap means will wrap around and be secured to a bundle of wires passing through said cylindrical body to maintain the bundle of wires centrally of said aperture in said wall panel.

3,889,910
FLOOR STAND SUPPORT AND BRACING SYSTEM

Ratus W. Walters, 5310 27th St. N.W., Washington, D.C. 20015

Filed Mar. 8, 1973, Ser. No. 339,043
Int. Cl.² A47G *27/00*
U.S. Cl. 248—122 4 Claims



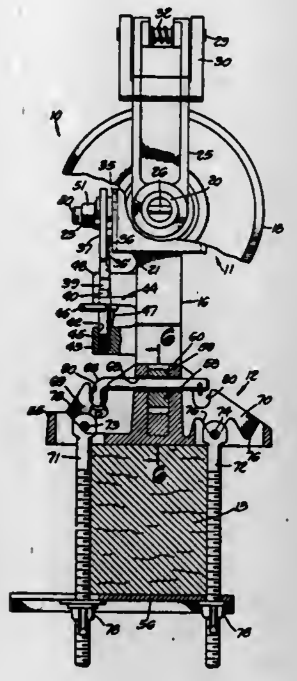
1. A floor stand support and bracing device comprising:

a. an elongate arm;
b. a vertical support element extending from the arm;
c. a base composed of first and second support means wherein the vertical support element is connected to the base; and
d. a load carrying means suspended from the elongate arm, wherein the load carrying means is a frame with an upper component with vertical elements at the ends thereof and extending downward therefrom, an angle iron component with vertical elements at the ends thereof and extending upward therefrom, an intermediate element with vertical elements at the ends thereof and extending downward therefrom with the extremities of the respective vertical elements connected to form a frame and wherein the said upper angle iron and intermediate components are substantially parallel.

3,889,911
CONVERTIBLE CONDUCTOR STRINGING ASSEMBLY FOR POWER LINE USE

L. E. Lindsey, Pasadena, and Herbert F. Sammons, Glendale, both of Calif., assignors to Lindsey Manufacturing Company, Pasadena, Calif.

Division of Ser. No. 259,315, June 2, 1972, which is a continuation of Ser. No. 55,056, July 15, 1970, abandoned. This application Nov. 23, 1973, Ser. No. 418,469
Int. Cl. A47b *96/00*
U.S. Cl. 248—228 6 Claims

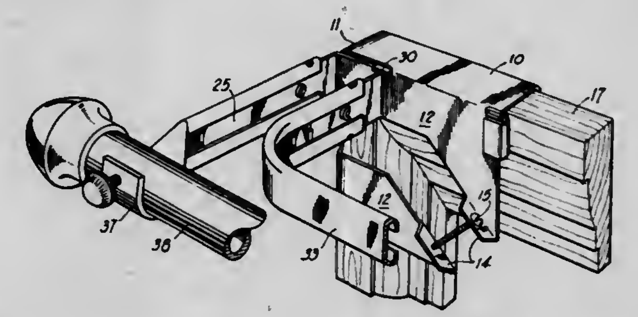


1. A support assembly clampable to a rigid four-sided member of different widths, said assembly comprising first and second clamping plates wider than the width of the four-sided member, said plates interconnected by at least two bolts, each said bolt having a shank with a radial projection adjacent one end thereof, at least one of said plates having slots formed by intersecting walls extending crosswise of the width of the four-sided member and receiving the shanks of bolts interconnecting said clamping plates, the points of intersection of said walls of said slots being spaced apart less than the width of the narrowest four-sided member to which said support assembly is to be clamped, the sides of at least one of said slots having sloping surfaces inclined relative to the adjacent side of said member and cooperating with said radial projection means on the shanks of said bolts to cam the shanks of said bolt toward the adjacent side of said four-sided member as said bolts are tightened whereby said plates and said bolts are forced into firm contact with the juxtaposed surfaces of said member.

3,889,912
CURTAIN ROD AND WINDOW SHADE BRACKET

Robert G. Ray, 1420-B N. Cliff Valley Way, Atlanta, Ga. 30319

Filed Feb. 1, 1974, Ser. No. 438,600
Int. Cl. A47h *1/10, 5/14*
U.S. Cl. 248—255 11 Claims

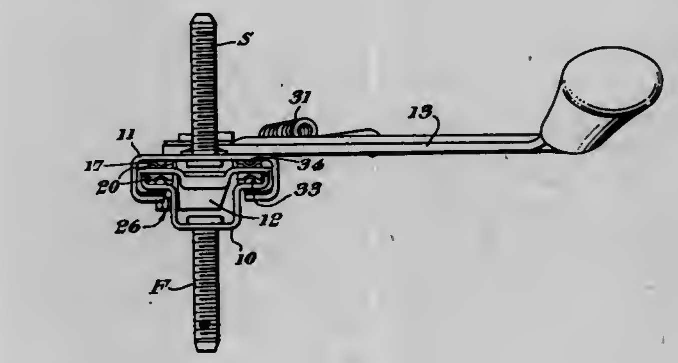


1. A curtain rod and window shade bracket comprising:
a. a sheet of metal formed to have two side portions angularly joined together at a corner adapted to be placed over corner sides of a window frame molding, two substantially coplanar face plate portions extending angularly from said two side portions adapted to be placed over the corner face of the window frame molding; and two flange portions projecting outwardly from said two face plate portions; and
b. fastening means adapted to adjustably couple together said two flange portions of said sheet of metal whereby said two side portions and said two face portions of said sheet of metal may be drawn towards one another snugly over the window frame molding corner during bracket mounting.

3,889,913
SEAT SLIDE MECHANISM

Albert John Adams, Fetcham, England, assignor to A. W. Chapman Limited, London, England

Filed May 14, 1973, Ser. No. 359,784
Claims priority, application United Kingdom, June 6, 1972, 26245/72
Int. Cl. B60m *1/08*
U.S. Cl. 248—430 4 Claims

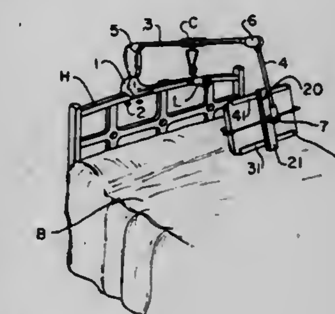


1. A seat slide mechanism comprising
a. a rail securable to a floor so as to be fixed thereto;
b. a slide securable to a seat so as to be fixed thereto, said rail and said slide being interengageable;
c. two outwardly and oppositely directed flanges on said rail, each of said flanges having a track surface, said flanges having parallel marginal portions which extend along the outer edges of said tracks and which are substantially perpendicular to said track surfaces;
d. two inwardly and oppositely directed flanges on said slide, said slide having two spaced parallel track surfaces;
e. the track surfaces on said rail flanges being in vertical register with the spaced parallel track surfaces on said slide;
f. two pairs of metal rollers in contact with said track surfaces, one of said pairs being spaced longitudinally of the rail and the slide from the other of said pairs, one roller of each pair being in contact with the track surface of one flange of said rail and with the corresponding track surface of the slide, and the other roller of each pair being in contact with the track surface of the other flange of said rail and with the other corresponding track surface of the slide;
g. two roller retainers, each of which accommodates one pair of said pairs of rollers with freedom for rotation therein as the slide is moved relative to the rail and each of which is made of a synthetic resin material having a low coefficient of friction;
h. each roller retainer comprising means defining two individual roller housings which are spaced from one another and each of which snugly accommodates and positively holds one roller of the pair associated therewith in a manner such that the roller retainer, when the seat slide mechanism is being assembled, can be held in any attitude without the rollers dropping out; and
i. each roller retainer further having parts which embrace both the flanges on said rail and the parallel marginal portions of said flanges, whereby said roller retainers position the rollers on and guide the rollers along the respective track surfaces by virtue of the accommodation of each of said rollers within the confines of its own individual housing and whereby the stability of the slide relative to the rail in directions transverse to the longitudinal axis of said rail is maintained solely by the presence of those parts of the longitudinally spaced roller retainers which are sandwiched between and are in contact with the outer faces of said parallel marginal portions of the rail flanges and the portions of the slide which are aligned therewith at any particular time.

3,889,914
BOOK SUPPORT RACK

Melvin H. Torme, 120 El Camino Dr., Beverly Hills, Calif. 90212

Filed Aug. 23, 1974, Ser. No. 500,184
Int. Cl. A47b *23/00*
U.S. Cl. 248—445 5 Claims



1. A book support comprising:
a. a base member;
b. a book supporting rack;
c. articulated arm members connected between the base member and the rack and adjustable to position the supporting rack in a desired reading position, and
d. said book supporting rack comprising an upright channel member having an intermediate point on one face connected to one of said arm members by universal joint means and opening on its other face toward the plane in which the book is to be supported; a transverse lower channel opening upwardly to support a book and the channel being fixed to said upright channel member and disposed at right angles across its other face; an upper transverse channel opening downwardly to support a book and disposed at right angles across said other face of the upright channel member and clamped thereto by slidable means so that the upper channel can be vertically

positioned thereon to accomodate different-height books; and page retaining means comprising a rod passed through horizontally aligned holes in said upright channel member and extending outwardly on each side thereof to lie between said upper and lower channels, and a helical spring having a relaxed inside diameter less than the rod diameter applied onto the rod near each of its opposed ends, and a page retaining finger extending from each of the springs and bent around to yieldably overlie and retain the pages against the book.

3,889,915

COLLAPSIBLE REAR VIEW MIRROR APPARATUS

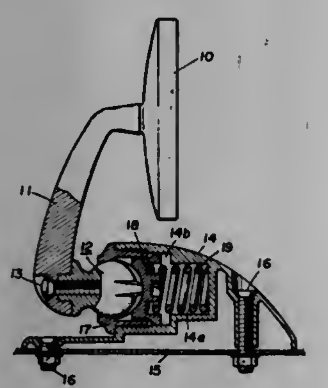
Setsuo Hashiguchi, Yamato, and Tatsuo Watanabe, Isehara, both of Japan, assignors to Ichiko Industries Limited, Tokyo, Japan

Filed July 16, 1973, Ser. No. 379,335

Claims priority, application Japan, July 19, 1972, 47-84293

Int. Cl. B60r *1/02*

U.S. Cl. 248—475 B **5 Claims**



1. A collapsible rear view mirror apparatus for an automobile, comprising:

- a rear view mirror;
- a support member adapted to be fixed to the body of the automobile;
- a ball and socket joint comprised of a ball element and at least two socket elements, one of said socket elements being fixed to said support member, a second socket element being movable with respect to said support member, said ball element having at least one substantial ridge on its spherical surface portion away from the portion thereof adjacent to said fixed socket element, said ridge having a spherical surface, the radius thereof being identical with the radius of the spherical surface of said ball element, said other movable socket element having at least one recess complementary in configuration and location to said ridge for receiving said ridge therein;
- a mirror arm arm having two ends, one end holding said rear view mirror, the other end being secured to said ball element, said mirror arm being thereby secured to said support member; and
- a coil spring provided between said support member and said movable socket element to urge both said ball element and said movable socket element toward said one fixed socket element so that said ridge is fitted in said recess, thereby holding said mirror arm in place.

3,889,916

PLASTIC THREADED INSERT FOR FORMING VOIDS IN CONCRETE PRODUCTS

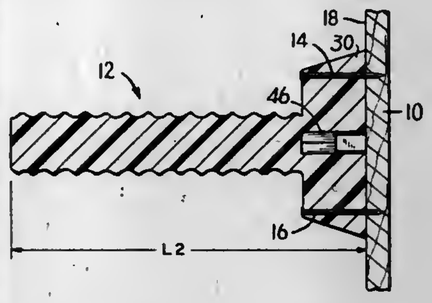
Robert John Ilukowicz, Corant, N.Y., assignor to Preco Industries, Ltd., Plainview, N.Y.

Filed Mar. 26, 1973, Ser. No. 345,183

Int. Cl. B29d *1/00*

U.S. Cl. 249—59 **8 Claims**

1. A protective plug for a concrete coil insert or the like, said plug comprising a monolithic plastic unit including a tapered head in the shape of a truncated conical form and a threaded cylindrical portion extending therefrom in concentric relation thereto, said plastic being a high density polyethylene with a density of about 0.94 to 0.97, said head being provided with diametrally spaced holes extending at least substantially through said head whereby said head can be nailed to a wooden concrete form, said head being provided with a diametral slot extending between said holes which are located symmetrically on opposite sides of the slot.



3,889,917

JIG FOR PRECAST BRICK-WALL PANELS

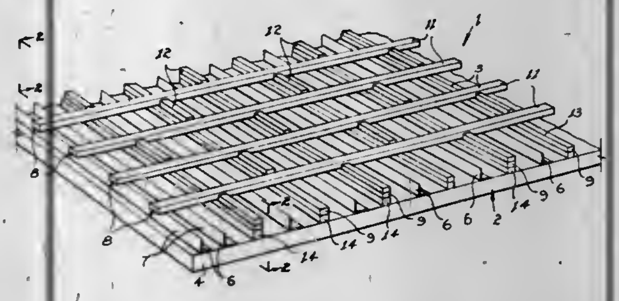
Donald J. Fraser, 32 Robert Ct., Para Hills, Australia (5096)

Filed Jan. 18, 1973, Ser. No. 324,848

Claims priority, application Australia, Jan. 24, 1972, 7763/72

Int. Cl. B28b 7/22

U.S. Cl. 249—64 **4 Claims**



1. A jig for precasting of brick wall panels said jig including a frame on which bricks can be supported on their faces in spaced adjacent relationship for the insertion of bonding material therebetween, and wherein means are provided to mould facing joints between said bricks, the jig being characterized in that said support frame comprises a base frame supporting a series of parallel members each having a supporting edge lying in a common plane, and a series of brick aligning and joint moulding members, which members are adapted, by engagement into the spaces between adjacent bricks, to align said bricks and mould the joints and then be withdrawn from the joints to leave the bonded bricks on the support frame for curing of the bonded material; and wherein the jig is further characterized in that the brick aligning and joint moulding members comprise first and second sets of members, each of the first set adapted to interlock with the members of the second set so that the sets together can form a crossed pattern with moulding faces on each of the members of both sets having a common planar relationship which lies above said common plane; and wherein the jig is further characterized in that each member of the first set of the joint aligning and moulding members includes a bar portion of constant cross section over its mould face length, and members of the second set each includes sections of lesser height whereby to allow the crossing of the members of said first set past the members of said second set, and each member of said second set is supported by a bar of constant cross section which is removably mounted for sliding from beneath the respective member, whereby the said each member of said second set can fall perpendicularly away from the joint it has moulded to a height less than that of said common plane and thereby permit the withdrawal in a horizontal direction of a formed panel.

3,889,918

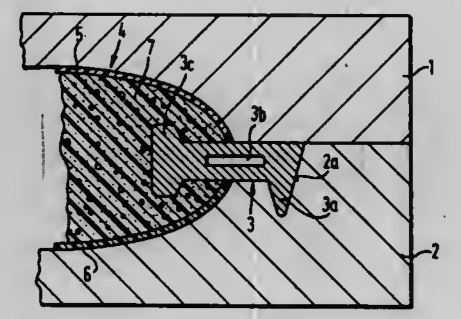
MOULDING OF SHELLS

Helmut Stoeberl, 8201 Eggstaett-Bachham, Germany

Filed Jan. 9, 1973, Ser. No. 322,098

Int. Cl. B29d *27/00*

U.S. Cl. 249—85 **1 Claim**



1. A connector for the opposed molded plastics shells of a plastics foam-filled structural member which comprises a strip of material having a first edge portion shaped to be anchored in the parting line between mold halves for the shells, a second edge portion opposite said first edge portion shaped to be anchored in plastics foam filling the shells, and an intermediate portion connecting said edge portions fitted to close the gap between the opposed shells, said first portion being severable from said intermediate portion, said intermediate portion carrying flaps for overlying adjoining edges of the shells in sealing relation therewith and said intermediate portion being hollow and providing a recess with an open outer periphery when said first portion is severed therefrom and said flaps being anchored in said recesses.

3,889,919

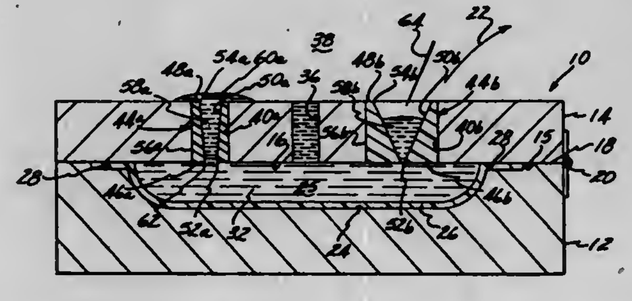
VENTING CONSTRUCTION FOR MOLDS FOR FORMING PLASTIC FOAM PARTS

Michael Ladney, Jr., 18125 E. Ten Mile Rd., East Detroit, Mich. 48021

Continuation of Ser. No. 213,299, Dec. 29, 1971, abandoned. This application Aug. 20, 1973, Ser. No. 389,708

Int. Cl. B29c *1/14*

U.S. Cl. 249—141 **3 Claims**



1. A mold for forming foamed plastic parts comprising, a base and a top cover thereon, said base and cover each having horizontally extending planar surfaces around the periphery thereof which, when the cover is located on said base, define a parting face therebetween, said base and cover cooperating to define a foam molding chamber therebetween in which a work-piece is adapted to be molded, said parting face extending horizontally around the periphery of said foam molding chamber, said cover being separable from said base at said parting face to provide access to said chamber, said cover having a circular cylindrical opening therein extending vertically downwardly from the top outer surface of the cover to said molding chamber, an insert having a circular cylindrical outer surface sized to fit said opening, said insert comprising an integral onepiece member formed of a plastic material selected from the group consisting of acetal, polyethylene and polypropylene, said insert filling said opening and extending upwardly from substantially flush with the cover surface forming the upper portion of said molding chamber to the top outer surface of the cover, said insert having a single vertical passageway of circular cross section extending axially therethrough and concentric with the vertical axis of the opening in the cover so that during the foam molding of the article the air in said chamber is vented vertically upwardly through said passageway and the plastic foam material in the chamber is permitted to expand into abutting relation with the inner end of said insert and into said passageway to form a plug which rises through said passageway to the top surface of the cover whereby to facilitate separation of said plug from foam molded article and to facilitate removal of said plug from within said insert.

3,889,920

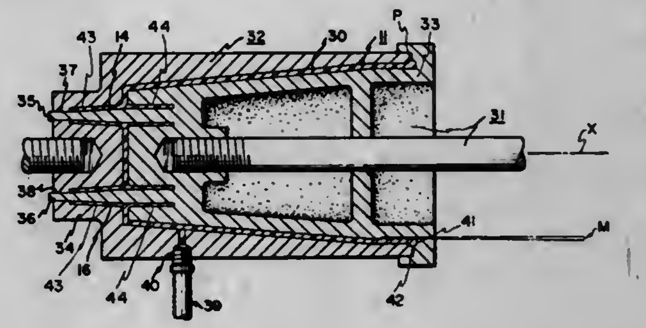
MOLD STRUCTURE FOR FABRICATING FLUID COLLECTION RECEPTACLES

Legrand K. Holbrook, Salt Lake City, Utah, assignor to Medical Development Corporation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 98,566, Dec. 16, 1970, Pat. No. 3,738,381. This application May 25, 1973, Ser. No. 363,850

Int. Cl. B22c *9/24*; B29c *1/14*

U.S. Cl. 249—151 **7 Claims**



1. A port-including container-producing mold apparatus including, in combination, unitary, elongate, positive mold means for forming the interior surface of a container and also the interior surfaces of port extensions to be integrally formed with said container; and negative mold means for forming the exterior surfaces of said container and port extensions, said positive and negative mold means being provided with intercooperating elongated pin means and guide aperture means, respectively, for constraining said positive and negative mold means to predetermined, fixed-axis axial movement, whereby to assure desired wall formation of said container, said pin means being integral with said positive mold means and extending parallel to the longitudinal axis of said positive mold means, said negative mold means being relieved about solely a portion of said pin means to form mold cavity means for said port extensions.

3,889,921

MOULD FOR ARTICLE WITH CIRCUMFERENTIAL UNDERCUT FLANGES

Christain Weber, Mutschellen; Alfred Puck, Basel, and Peter Voirol, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 22, 1974, Ser. No. 472,259

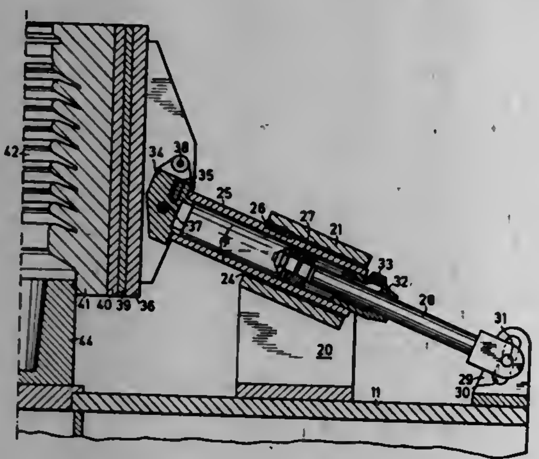
Claims priority, application Germany, May 28, 1973, 2327108

Int. Cl. B29c *7/00*

U.S. Cl. 249—161 **14 Claims**

1. A mould comprising a plurality of elements movable relative to one another in rectilinear paths to open and close the mould, the closed mould defining the surface of a mould-

ing with a plurality of circumferential constant-profile flanges all undercut in the same direction with the surface being generated by translation of a planar profile curve through a series of profile planes so that each point on the profile curve traverses a respective closed curve in a respective cross-sectional plane perpendicular to all the profile planes wherein: the direction of movement of each element is so inclined to



the cross-sectional planes that no part of that element penetrates into or through the surface of the moulding during movement, and

for each element the angle between all profile planes intersecting that element when the mould is closed and a movement plane perpendicular to the cross-sectional planes and containing the direction of movement of that element is less than 90°.

3,889,922

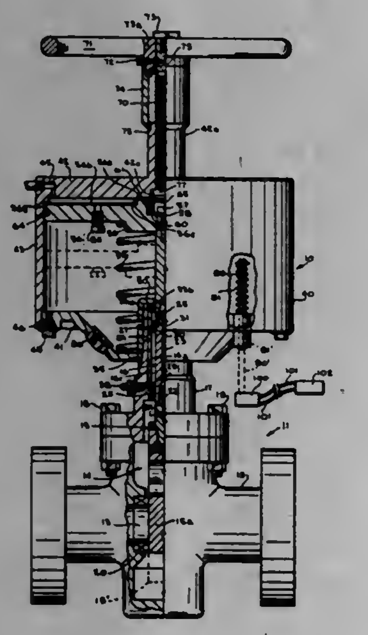
VALVE AND ACTUATOR ASSEMBLY

Clifford M. Peters, Longview, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 373,139, June 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 171,097, Aug. 12, 1971, abandoned. This application Dec. 13, 1973, Ser. No. 424,616

Int. Cl. F16k *31/14, 31/44*

U.S. Cl. 251—14 **7 Claims**



1. In a valve including a body having a transverse bore for fluid flow therethrough and having a lateral bore intersecting the transverse bore for receiving therein an element for closing and opening the transverse bore to fluid flow and a movable valve stem in the body connected to move the element in the transverse bore for opening and closing the valve, the improvement comprising:

- a. first seal means mounted in the lateral bore to close off one end thereof and sealably engaging the valve stem;
- b. second seal means mounted in the lateral bore in spaced relation to said first seal means to close off the other end thereof and sealably engaging the valve stem and being exposed to fluid from the transverse bore whereby a predetermined minimum force is exerted on the valve stem by the fluid in the transverse bore to aid in moving the element when closing the valve;
- c. third seal means mounted on the valve stem between said first and second seal means for sealably and slidably engaging the lateral bore, the cross sectional area of the valve stem and said third seal means being larger than the cross sectional area of the valve stem where it sealably engages said second seal means; and
- d. therebeing fluid passage means in the valve stem for receiving fluid pressure from the transverse bore on the upstream side of the element and discharging the fluid pressure to the lateral bore between said first and third seal means to act on said third seal means and aid in moving the element when opening the valve.

3,889,923

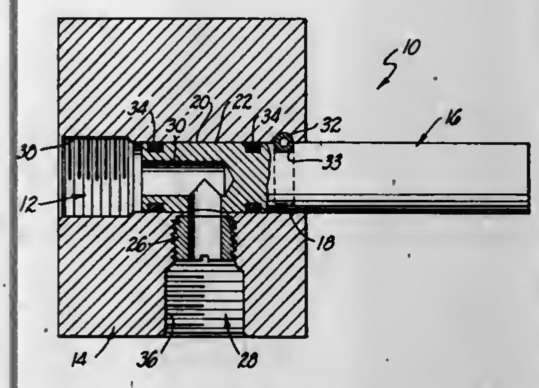
LEAKAGE RESISTANT FITTING

Eric J. Saville, Claremont, and Raymond S. Hunt, Jr., Upland, both of Calif., assignors to PneuDraulics, Inc., Montclair, Calif.

Filed May 7, 1973, Ser. No. 358,045

Int. Cl. F16k *15/08*

U.S. Cl. 251—170 **8 Claims**



1. A leakage resistant fitting for fluid handling systems comprising:

first and second relatively movable members having confronting boundary surfaces defining an intervening interfacial potential leakage space and fluid passages in said members, respectively, each opening at one end through the boundary surface of the respective member for conducting fluid through said fitting in a manner such that fluid flow occurs from one passage to the other across said leakage space,

means for retaining said members in assembled relation,

said one end of the passage in one member being reduced in diameter to form at the latter passage end a radially inwardly projecting resiliently flexible annular sealing flange formed integrally with and comprising the same material as said latter member, said flange surrounding said one end of the passage in the latter member and being bounded at one side by said boundary surface of the latter member and at the other side by a surface facing the opposite end of the latter passage, and

a compression sleeve threaded in the passage in said one member between said sealing flange and opposite passage end and engageable with said latter sealing flange surface for urging said sealing flange into fluid sealing contact with the boundary surface of the other member to block fluid leakage through said space.

3,889,924

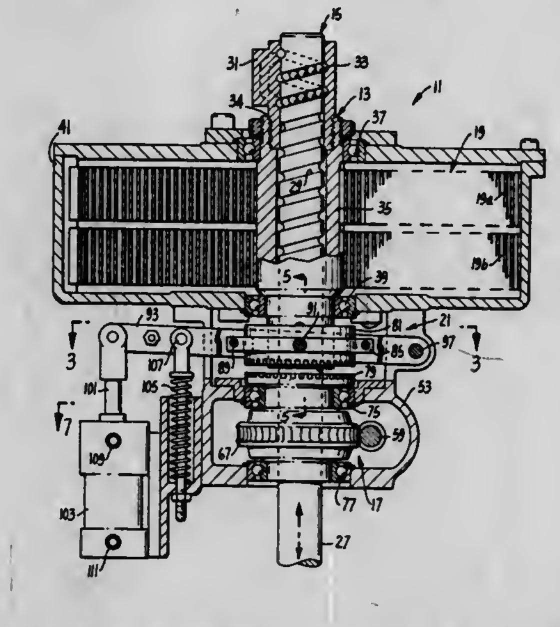
VALVE STEM OPERATOR

Anatole N. Karpenko, San Francisco, Calif., assignor to Anchor/Darling Valve Company, Hayward, Calif.

Filed Dec. 3, 1973, Ser. No. 421,146

Int. Cl. F16k *31/53*

U.S. Cl. 251—249.5 **7 Claims**



1. A fail safe valve operator, comprising: a valve body having a valve seat therein; a valve member mounted in the valve body for movement toward and away from the valve seat to closed and open positions, respectively; a valve stem connected with the valve member to move the valve member between its open and closed positions; motor means operatively connected with the valve stem to operate it to one of said positions; clutch means connected between the motor means and valve stem to selectively engage and disengage the motor means from the valve stem; and spring means connected with the valve stem so that when said valve stem is operated to its said one position energy is stored in the spring means, and when said clutch means is disengaged to disengage said motor means from the valve stem, the spring means acts on the valve stem to return the valve member to its other position.

3,889,925

GATE VALVE AND SEAL

Robert C. Brooks, Houston, Tex., assignor to Armco Steel Corporation, Middletown, Ohio

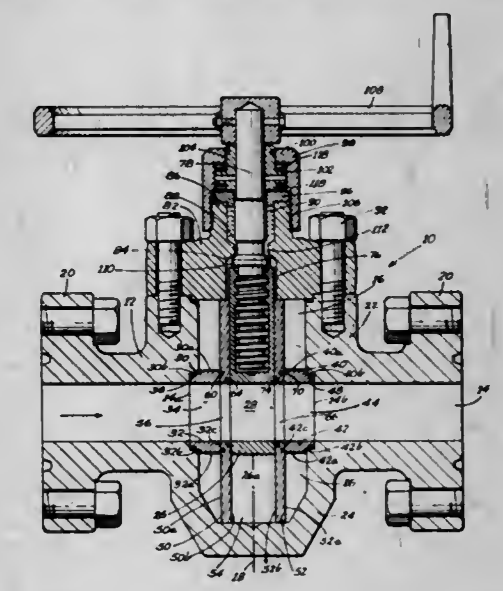
Filed Aug. 31, 1973, Ser. No. 393,614

Int. Cl. F16k *3/316*

U.S. Cl. 251—327 **26 Claims**

14. In a gate valve of the type having a valve body formed with a flow passage, a cylindrical valve chamber having a vertical axis formed in said valve body and intersecting said flow passage to define opposed inlet and outlet openings in said chamber, and a gate member movable across said valve chamber for opening and closing said flow passage, the improvement, in combination therewith, comprising:

- a. a circular recess formed in the wall of said valve chamber and encircling each said inlet and outlet opening, said circular recesses being concentric;
- b. a cylindrical, disc-like body sleeve secured in each said circular recess, each said body sleeve having an innermost planar end and an aperture therethrough in alignment with its perspective opening in said chamber; and
- c. opposed, parallel, spaced apart seat plates vertically disposed in said valve chamber to define a channel for movement of said gate member, each said seat plate having an outermost surface and being disposed between said gate member and one of said body sleeves and having an aperture therethrough in alignment with its respective aperture in its respective body sleeve and its respective opening in said chamber, each said body sleeve being disposed in its entirety between the wall of said valve chamber and one of said seat plates with the innermost planar end of said body sleeve lying in a plane abutting the outermost surface of said seat plate;



whereby said valve body, through said body sleeves, fully supports said seat plates under thrust load of pressure, maintains flatness inspite of body distortion due to pressure, line strains and temperature, and maintains circularity inspite of valve body distortion and side thrust due to gate member friction drag.

3,889,926

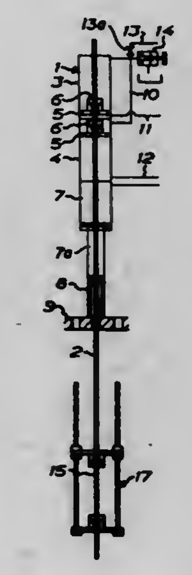
METHOD FOR SHIFTING LOADS

Nils Harald Ahlgren, Skyttevagen 22, 133 00 Saltsjobaden, Sweden

Filed Nov. 19, 1973, Ser. No. 417,141

Int. Cl. B66f *1/00*

U.S. Cl. 254—1 **6 Claims**



1. A method of producing a repeated movement of gripping elements associated with piston elements of hydraulic jacks with respect to a lifting element passed therethrough by means of alternately operating pairs of hydraulic jacks consisting of cylinder and piston elements each having both a supply side and a pressure side with respect to the piston element, including the steps of supplying the pressure sides of the jacks with pressure medium and interconnecting the pressure sides of the jacks in such a manner as to form a closed pressure medium system;

connecting the supply sides of the jacks to an external pressure source for supplying pressure medium so that said supply sides are alternately supplied with pressure medium; the pressure medium in said closed system being caused to flow between the pressure sides of the jacks when movement of the gripping elements of said hydraulic jacks is caused by supply of pressure medium to one or the other of the pressure sides thereof.

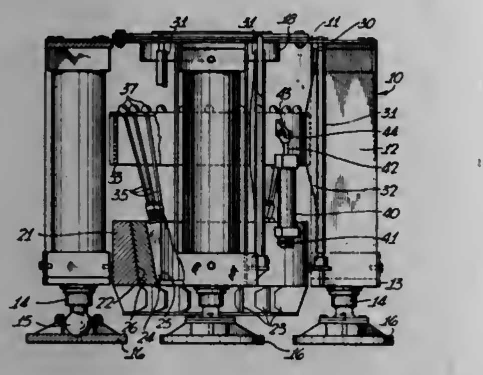
3,889,927
APPARATUS FOR PULLING DRILL PIPE

Floyd W. Becker, Calgary, Canada, assignor to Drill Systems Inc., Calgary, Canada

Filed May 8, 1974, Ser. No. 467,972

Int. Cl. B66f *1/04, 1/00*

U.S. Cl. 254—105 **7 Claims**



1. Apparatus for pulling drill pipe comprising
a frame,
- a plurality of jack means with surface-engaging feet for raising and lowering said frame with respect to said feet,
- slip bowl means mounted to said frame and having an inner surface tapering inwardly in a direction towards said feet,
- a plurality of slips having a wedge-shaped configuration mounted within said slip bowl means, said slips having one surface tapered to engage said inner surface of said slip bowl means and the other surface arranged for engagement with the outer surface of a drill pipe,
- a control member mounted for limited movement in a direction to and from said slip bowl means,
- a plurality of connecting members connecting each slip to said control member, and
- means to move said control member away from said slip bowl means to cause said slips to move along said tapered surface of said slip bowl means for effecting disengagement of said slips from a drill pipe.

3,889,928
WINCH WITH CONSTANT TENSION CABLE

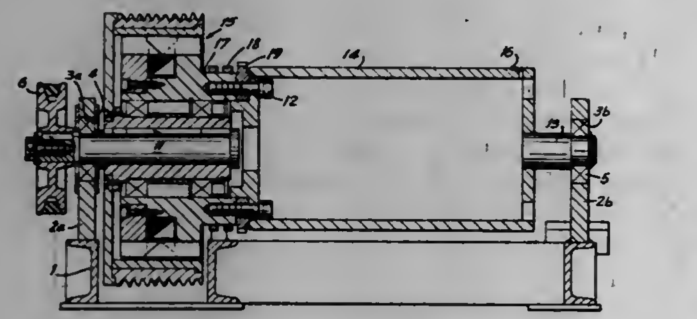
Pierre Y. David; Joel M. Charles, both of La Valette, and Robert Julien Antoine Toscano, La Seyne, Mer, all of France, assignors to Etat Francais, Paris, France

Filed Dec. 10, 1973, Ser. No. 423,528

Claims priority, application France, Dec. 11, 1972, 72.43940

Int. Cl. B66d *1/00*

U.S. Cl. 254—172 **3 Claims**



1. A constant tension winch for drawing a cable with a load comprising, in combination:
- a rotatable reel on which a cable can be wound or unwound, the tension of said cable being kept substantially constant;
- constant speed drive means comprising a drive shaft with continuous constant rotation in the same direction independent of whether the cable is wound or unwound;
- an eddy current electrobrake including a spooled rotor secured to said reel and a stator secured to said drive shaft, the rotor being supplied with current; and
- means for keeping the intensity of said current constant,
- a substantially constant torque being transmitted between said drive means and said reel over a predetermined range of relative speed between said stator and rotor.

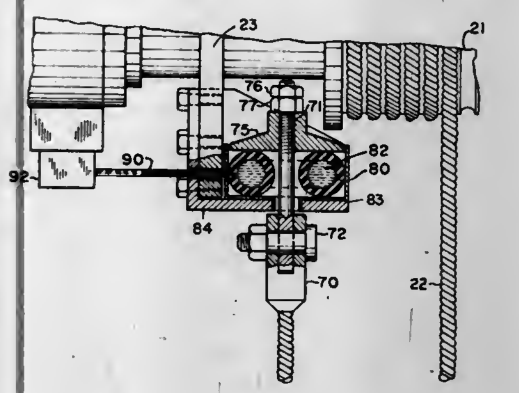
3,889,929
FORCE LIMITED POWER ACTUATED DEVICE

Karl A. Pamer, Chagrin Falls, Ohio, assignor to McNeil Corporation, Akron, Ohio

Filed June 25, 1973, Ser. No. 374,669

Int. Cl. B66d *1/48*

U.S. Cl. 254—173 B **2 Claims**



1. In a motor-driven hoist, a frame, having an upwardly facing abutment surface, a cable drum rotatably supported by said frame, an electric motor supported by said frame and connected to said cable drum for rotating said cable drum, a resilient flexible closed toroidal shaped elastomer vessel filled with fluid supported on said abutment surface, a member supported on the upper side of said closed vessel, cable means having one end connected to said cable drum and its other end connected to said member supported on the upper side of said closed vessel, a load grab connected to said cable means, and an electric control circuit for selectively operating said motor, said control circuit including a normally closed pressure responsive switch connected to said vessel and responsive to fluid pressure in said vessel in excess of a predetermined amount for preventing operation of said motor.

3,889,930
APPARATUS FOR ELIMINATION OF SURFACE WATER FROM ARTICLES

Jean-Claude Vitat, Antony; Jean-Robert Thebault, Paris, and Jean-Pierre Remond, Massy-Villaine, all of France, assignors to Rhone-Progil, Courbevoie, France

Filed Feb. 14, 1974, Ser. No. 442,373

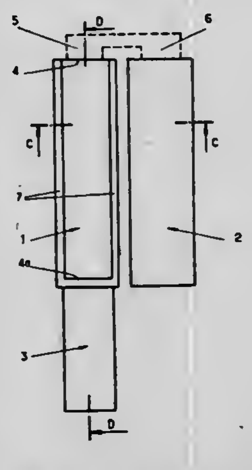
Claims priority, application France, Feb. 15, 1973, 73.05345

Int. Cl. B01f *15/06*

U.S. Cl. 259—4 **18 Claims**

1. Apparatus for removing water from the surface of an article by immersion in a liquid composition which is immiscible with water, comprising a water removal tank, a rinsing tank, a water settling tank, a recycling circuit for passing liquid composition from the water settling tank to the water removal tank, the water removal tank having a liquid inlet connected to a liquid outlet of the rinsing tank, heating means for heating liquid composition in the water removal tank, and an overflow device extending around at least 40% of the

periphery of the water removal tank, in which the water removal tank, the liquid inlet, the overflow device and the heating means possess a common vertical plane of symmetry and in which the water removal tank, the rinsing tank and the water settling tank are so disposed that at least a portion of the vertical planes perpendicular to said plane of symmetry and intersecting the water removal tank also intersect the rinsing tank, and at least a portion of the vertical planes parallel to said plane of symmetry and intersecting the water removal tank also intersect the water settling tank.



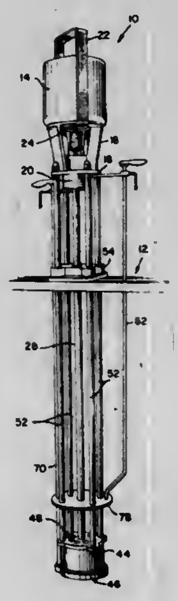
3,889,931
HOMOGENIZER-MIXER

Robert E. Adams, Topsfield, Mass., assignor to J. W. Greer, Inc., Wilmington, Mass.

Filed Apr. 12, 1974, Ser. No. 460,362

Int. Cl. B01f *5/16*

U.S. Cl. 259—96 **15 Claims**



1. A device for mixing a liquid in a vessel, said device comprising:
- a. a frame disposed along an axis, and
- b. means for producing flow patterns, said means including:
  - i. a shaft disposed for rotation along said axis within said frame, said shaft having projecting vanes disposed for rotation about said axis,
  - ii. a stator mounted to said frame and disposed about said axis, said stator having a body and a head, said body and said head axially movable with respect to each other between first and second positions, said body and said head being engaged when in said first position and disengaged when in said second position, said vanes disposed within said stator when said head and said body are in said first position, at least a portion of said vanes exposed when said head and said body are in said second position, and
  - iii. drive means mounted to said frame and operatively connected to said shaft, said drive means rotating said shaft,
- c. with said vanes rotating and said body and said head in said first position, said device produces a first flow pattern;
- d. with said vanes rotating and said body and said head in said second position, said device produces a second flow pattern, said first flow pattern distinguishable from said second flow pattern.

3,889,932
WORM THROTTLE MEANS

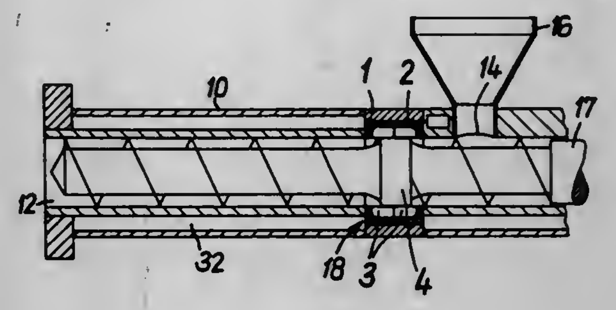
Curt Brandis, Westerhof, and Oskar Schatz, Neu-Leversen-Harburg, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Sept. 12, 1973, Ser. No. 396,996

Claims priority, application Germany, Sept. 16, 1972, 2245570

Int. Cl. B29b *1/06;* **B29f** *3/02*

U.S. Cl. 259—191 **7 Claims**



1. In a worm extruder a cylinder having a feed opening near one end and a discharge at the other end, an extrusion worm rotatable in said cylinder for advancing material from said feed opening along said cylinder to said discharge, flow restricting means in said cylinder disposed a predetermined distance downstream from said feed opening and operable to control the quantity of material advanced along said cylinder by said worm, the diameter of said worm being substantially equal to the internal diameter of said cylinder, a collar formed on said worm in the axial range of said flow restricting means and having a cylindrical inner surface substantially the same diameter as said worm, the internal diameter of said flow restricting means being substantially equal to the diameter of said collar, groove means formed radially into said flow restricting means from the inside and extending therealong from one axial side of said collar to the other to provide passage means for the flow of material past the collar, said flow restricting means comprising a pair of rings in end to end relation, a portion of said groove means being formed in each said ring, and means for adjusting said rings relatively in the angular direction thereby to vary the registration of the groove means in the respective rings and in that manner to vary the effective flow area through said flow restricting means.

3,889,933
METALLURGICAL LANCE

Louis Harold Jaquay, Pittsburgh, Pa., assignor to The International Nickel Company of Canada, Ltd., Toronto, Ontario, Canada and Dravo Corporation, Pittsburgh, Pa.

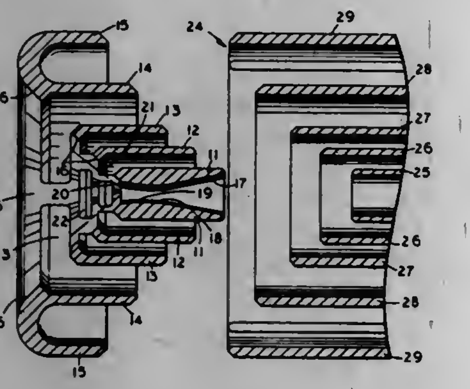
Filed Feb. 28, 1974, Ser. No. 446,688

Int. Cl. C21c *7/00*

U.S. Cl. 266—34 L **5 Claims**

1. A system for supplying heat and process oxygen to a metallurgical operation comprising:
1. a lance consisting of at least four nesting pipes spaced apart from one another,

2. means connected to one end of the lance
   a. to supply high pressure oxygen to the centermost pipe,
   b. to supply low pressure oxygen and air to at least one conduit between the nesting pipes,
   c. to supply natural gas to one other conduit between the nesting pipes,
   d. to supply and circulate water within the outermost conduit between said nesting pipes;
3. a tip affixed to the other end of said lance and enclosing said conduit carrying water, comprising a concave end



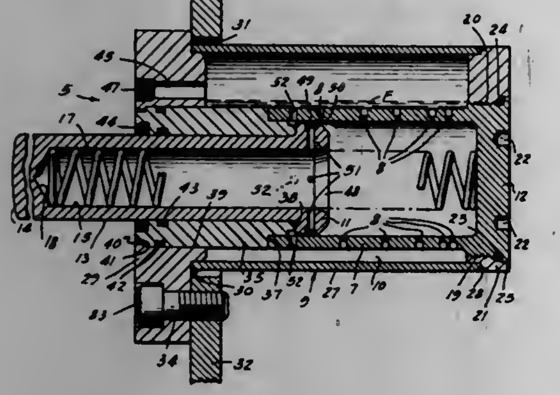
wall having at the point of greatest concavity a port comprising a nozzle for said high pressure oxygen and having arcuate sets of ports therein communicating with the conduits carrying low pressure oxygen, natural gas and air each set of ports being spaced apart from the next set of ports by a distance of about 0.75 to 1.5 inch in the axial direction and

4. means to regulate the flow of said low pressure oxygen, natural gas and low pressure air to provide at least 10% of the oxygen needed for combustion of said natural gas in the form of low pressure oxygen.

3,889,934
HYDRAULIC BUFFER

Gordon W. Kamman, Elma, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Dec. 19, 1973, Ser. No. 426,233
Int. Cl. B60g *11/56*
U.S. Cl. 267—34 1 Claim



1. A hydraulic buffer especially suitable for heavy duty uses, comprising:

a tubular housing defining a hydraulic fluid reservoir and having permanently attached opposite end closures of substantial thickness provided with concentric respective openings and with the opening in one of said closures being of larger diameter than the opening in the other of said closures;

said other closure having adjacent to the outer end of its opening an inwardly facing integral shoulder;

a tubular piston rod guide member having an end portion engaged in said other closure opening with an outwardly facing shoulder engaging said inwardly facing shoulder and said tubular member projecting inwardly from said other closure;

said tubular member having an inner end portion shoulder facing inwardly;

a one-piece generally cup-shaped combination cylinder and integral end closure having an inner end engaging said inner end portion shoulder of said member and having external threads on the periphery of said integral end closure threadedly engaging threads on said one end closure within said larger opening and by means of the thread engagement thrusting the inner end of the cylinder against the inwardly facing shoulder on said tubular member and thereby thrusting said outwardly facing shoulder on the tubular member against said inwardly facing shoulder of the other closure;

a piston reciprocably movable in said cylinder between the inner end of said tubular member and said integral cylinder end closure and having a piston rod slideably engaged in said tubular member and projecting substantially outwardly therefrom;

said piston and piston rod having a blind end bore opening inwardly and having a coiled compression biasing spring extending from the bore and seated on said integral cylinder end closure for normally biasing the piston outwardly into stopped engagement against said inner end of the tubular member;

said cylinder having a longitudinal series of metering orifices therethrough communicating the cylinder with the reservoir defined by said housing;

said piston being of smaller diameter than the surrounding wall of the cylinder and having an annular peripheral groove opening toward the cylinder wall;

a check valve ring mounted in said groove and having an outside diameter to engage in slideable sealing relation with the cylinder wall, the ring being narrower than the width of said groove;

ports in said piston effecting communication between said bore and said groove;

relief port means through said cylinder outwardly relative to the inner end of said tubular member and effecting communication between said reservoir and the cylinder at the side of said piston adjacent the tubular member; and

said check valve ring acting within said groove to block communication between said ports and said outer side of the piston during inward compression stroke movement of the piston, and the ring displacing to the opposite side of the groove and opening communication between the ports and said outer side of the piston when the piston moves outwardly in a return stroke.

3,889,935
VEHICLE BODY HEIGHT CONTROL VALVE

Walter C. Palm, Grand Rapids, Mich., and James E. Lyon, Perrysburg, Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Jan. 23, 1974, Ser. No. 435,671
Int. Cl. F16f *9/34*
U.S. Cl. 267—65 D 9 Claims

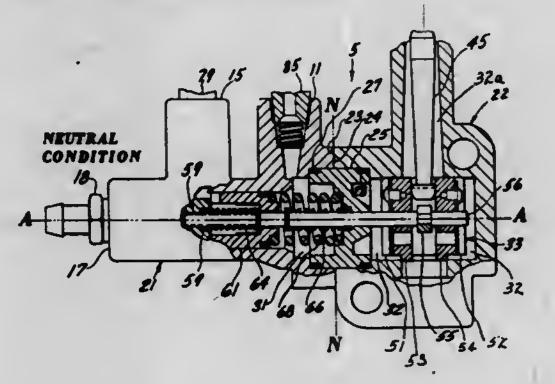
1. A height control valve adapted for mounting operatively between a sprung member and an unsprung member of a vehicle, comprising:

a housing having an inlet port for receiving a supply of fluid under pressure, an outlet port for supplying a fluid to a fluid actuated spring, an exhaust port for discharging unneeded fluid from the valve after passing therethrough from said spring;

said housing adapted for fixed connection to one of said vehicle members comprising first and second portions through which extends an elongate circular chamber concentric to an axis;

actuating mechanism housed in said first portion comprising an exterior lever adapted for connection with the other of said vehicle members, a valveactuating rod located substantially and coaxially within that part of said chamber in said first housing portion, and resilient overtravel means and lost-motion time-delay means for transmitting movements of said lever to said rod;

valve mechanism housed in said second portion comprising a valve assembly independently movable along with said rod as a unit lengthwise of said chamber, said valve mechanism being responsive to axial movement of the rod from a neutral or first position in one direction to a second position providing passage of fluid from said inlet port to said outlet port, and to a third position in the opposite axial direction enabling passage of fluid from said outlet port to said exhaust port;



spring seat means facing toward said exhaust port fixed along, and within, said chamber in spaced relation with the end of said assembly nearer said first housing portion;

spring means positioned between said seat means and said nearer end of said assembly; and

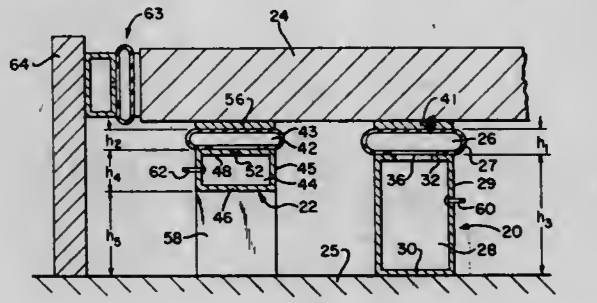
thrust means located adjacent the end of the chamber in said second portion further away from said first portion engaging the other end of said assembly and being connected with the second portion in axially adjustable relation therewith to engage said assembly and change the position thereof toward or away from said time-delay means to establish different neutral positions of said rod;

said time-delay means being arranged with respect to said rod to vary the time interval between movement of said lever and responsive movement of said rod in accordance with the neutral position of said rod.

3,889,936
COMBINED AIR MOUNTS

Kazuya Shimizu, Tokyo, Japan, assignor to Barry Wright Corporation, Watertown, Mass.

Filed Apr. 12, 1974, Ser. No. 460,343
Int. Cl. F16f *5/00*
U.S. Cl. 267.65 R 15 Claims



1. In combination with a load mounting base, at least one pneumatic assembly for dynamically supporting said base, said assembly comprising:

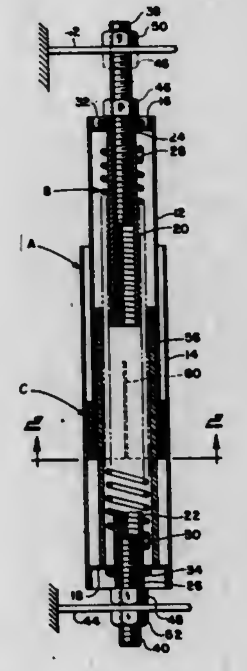
a first pneumatic spring system for supporting said load mounting base and providing isolation of relatively high frequency and relatively low amplitude vibrations, said first spring system comprising an air spring having a bellows and a tank with said bellows and tank being filled with a fluid under pressure and being connected by a relatively large opening so that fluid can flow relatively unobstructed from said bellows to said tank and vice versa;

a second pneumatic spring system for damping relatively low frequency, relatively large amplitude vibrations, said second spring system being disposed in parallel to said first spring system and comprising an air spring having a bellows and a tank with said bellows and tank being filled with a fluid and being connected by a relatively small orifice whereby flow of fluid from said bellows to said tank and vice versa is restricted by said orifice, the stiffness of said second spring system being substantially less than the stiffness of said first spring system.

3,889,937
FRICTION-TYPE SHOCK ABSORBER

Lowell E. Statler, Box 115, Bellevue, Ohio 44811

Filed Jan. 16, 1974, Ser. No. 433,870
Int. Cl. F16f *11/0*
U.S. Cl. 267—9 C 15 Claims

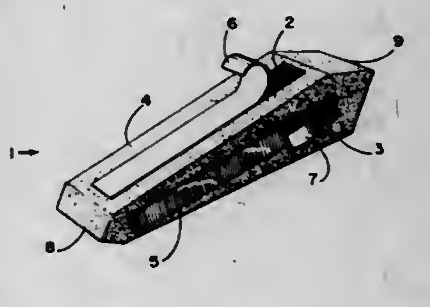


1. A shock absorber assembly including telescoped inner and outer tubes movable axially relative to one another, friction material secured to one of said tubes in compression between said tubes for resisting such relative axial movement of said tubes, said friction material having a substantially uniform static and kinetic coefficient of friction.

3,889,938
GAS PEDAL BIASING DEVICE

Robert Brand, 3568 Markam, Las Vegas, Nev. 89121

Filed Mar. 8, 1974, Ser. No. 449,216
Int. Cl. F16f *1/32*
U.S. Cl. 267—153 4 Claims



1. A device for imposing increasing resistance on a freely suspended accelerator pedal of a motor vehicle as the pedal is depressed comprising a resilient foam sponge wedge having compressibility characteristics such that the wedge is compressed to 50% of its normal thickness when the wedge is

subjected to a pressure of between about 0.25 and 0.50 psi, said wedge having the shape of an elongated four-sided figure having an increasing cross-sectional area substantially along its length and being adapted to fit between the accelerator pedal and the opposing floorboard such that the pedal is biased toward its idling position by the resiliency of the wedge when the pedal is depressed.

3,889,939

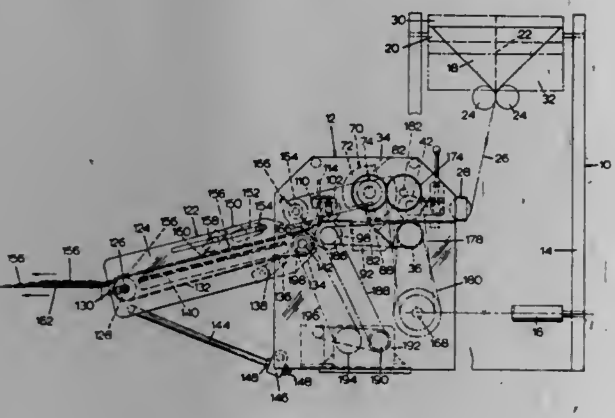
AUXILIARY CUT-OFF UNIT FOR WEB PRINTING PRESSES AND METHOD OF FORMING SEVERED PIECES

Hans G. Faltin, York, Pa., assignor to Advance Enterprises, Inc., York, Pa.

Filed Dec. 4, 1972, Ser. No. 311,627

Int. Cl.² B41F *13/56*

U.S. Cl. 270—21 **7 Claims**



1. An auxiliary in-line rotary cutoff unit adapted to be connected to and driven directly by a web printing press to provide the same with capabilities of producing from a longitudinally folded or unfolded continuous flexible web of one or more thicknesses of precise width printed pieces each having precisely uniform lengths cleanly and evenly severed on all cut edges and requiring no additional trimming, said cut-off unit comprising in combination, a frame, a pair of cooperating feed rolls supported by said frame and adapted to receive and feed a longitudinally folded or unfolded printed web directly from a web printing press, means operable to drive said feed rolls at a fixed surface speed substantially equal to the speed of the web discharged from said press, a rotary cutting member comprising a cylinder having at least one shearing blade extending longitudinally thereon and radially adjustable relative to the axis of said cylinder and said blade being engageable with said web as fed by said feed rolls, a drive shaft for said cylinder of said rotary cutting member supported by said frame, a bed knife supported stationarily by said frame adjacent said cylinder and adjustable towards and from said cylinder for precise shearing engagement with said shearing blade of said cylinder, and adjustable drive means interconnected to said drive shaft for said rotary cutting member adapted to be connected directly to drive means on said printing press, said adjustable drive means being adapted to vary the rotational speed of said rotary cutting member relative to the speed of said web fed thereto to cause said blade of said rotary cutting member to engage said stationary bed knife to sever said web transversely into precise desired uniform lengths smoothly and evenly at opposite ends of the pieces thus severed which comprise finally trimmed pieces having precise finished lengths and widths.

3,889,940

DEVICE FOR ADJUSTMENT OF OSCILLATION AMPLITUDE ON ZIGZAG FOLDING APPARATUS

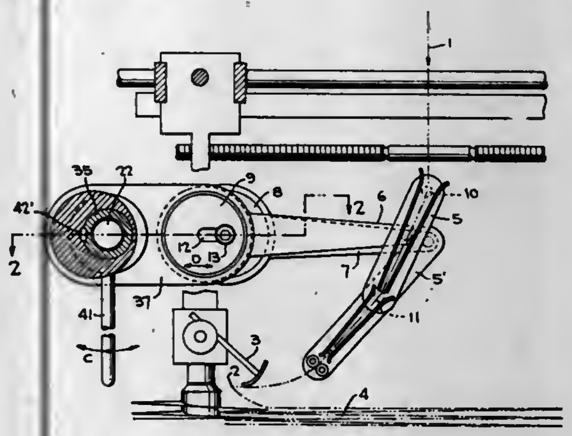
Hans Jakob, Darmstadt-Eberstadt, Germany, assignor to Maschinenfabrik Goebel GmbH, Darmstadt, Germany

Filed July 10, 1973, Ser. No. 378,009

Claims priority, application Germany, July 10, 1972, 2233879

Int. Cl. B65h *45/00*

U.S. Cl. 270—61 F **4 Claims**



1. In a folding apparatus for printing machines including reciprocating guide channel devices for delivering a web of paper or other material downwardly from a web conveyor device in zigzag folds, driving means for each guide channel device being provided at opposite side edges of the web, said driving means including rotatable cams supporting each said guide channel device for reciprocating same upon rotation of the cams, each cam being mounted on a drive shaft, gear means operatively interconnecting the drive shafts to effect synchronous rotation of the cams; drive means in operative engagement with at least one of said drive shafts; means connected with said guide channel devices for quickly and positively adjusting the oscillation amplitude thereof, each of said cams having an elongated opening extending therethrough, fastening means extending through said openings for mounting said cams to their respective drive shafts, a surface of each said cam adjoining a surface of its respective shaft when mounted thereto, the adjoining surfaces between said respective cams and said drive shafts being roughened, said surface of each of said drive shafts being provided with a groove extending parallel to said elongated openings, and each of said cams having nose portions extending into respective ones of said grooves, whereby each said cam may be shifted by actuation of said adjustment means with respect to its respective drive shaft upon a loosening of said fastening means and, upon tightening said fastening means, said roughened surfaces serve to positively maintain the adjusted position of said drive channel devices.

3,889,941

WEB FEEDING AND FOLDING APPARATUS

David Clancy, Canaan, Conn., assignor to Colgate-Palmolive Company, New York, N.Y.

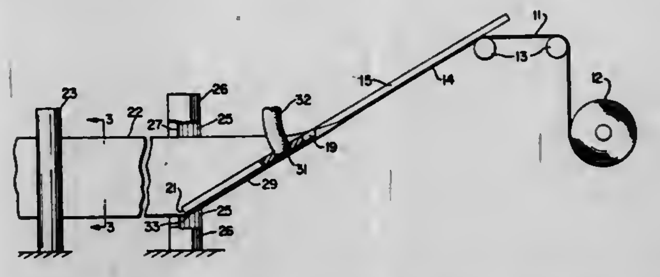
Filed June 28, 1973, Ser. No. 374,625

Int. Cl. B65h *45/00*

U.S. Cl. 270—69 **6 Claims**

1. In apparatus for feeding and folding a web of envelope forming material to an upwardly open substantially V-shape, an inclined metal forming plate having a flat, impervious, substantially triangular, planar, smooth bottom surface that is decreasingly laterally tapered toward its lower end, means for passing an initially flat web to and drawing it downwardly along said impervious surface, said impervious surface having a laterally extending zone wherein the width of the moving web becomes substantially equal to the width of said impervious surface and comprising the beginning of a forming region

extending between that zone and the lower end of said impervious surface and wherein the moving web is gradually folded to said V-shape, said plate having a through opening that is substantially centrally located laterally in said forming region and a conduit connection from a source of air under pressure to said opening at the upper surface of said plate for introducing air under relatively low pressure between said web and said bottom surface in said forming region for facilitating movement of said web as it is drawn down said bottom surface, said plate further having a portion in said forming region detachably connected to said plate member and said portion having said through opening therein.



3,889,942

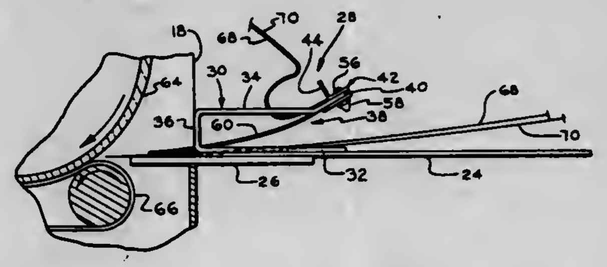
DEVICE FOR FACILITATING THE FEEDING OF SHEETS INTO A REPRODUCTION MACHINE OR THE LIKE

Wilber B. Robnolte, 920 E. Elm St., Lima, Ohio 45804

Filed Oct. 23, 1973, Ser. No. 408,475

Int. Cl.² B65H *5/38*; G03B *27/02*

U.S. Cl. 271—3 **8 Claims**



8. A device for facilitating entry of sheet material into a reproduction machine, said machine having a supporting surface adjacent an elongate entry opening of the machine, said device comprising two spaced supports to be located on said surface near opposite ends of the entry opening, a stiffening bar extending between said supports, and an entry strip affixed to said stiffening bar and having a forward edge extending toward the entry opening when said supports are on said supporting surface, each of said supports being of generally U-shaped configuration with lower and upper generally horizontally extending elongate legs positioned substantially perpendicular to said stiffening bar, and a web connecting common ends of said elongate legs spaced from said stiffening bar, each of said supports thereby forming an opening facing outwardly away from the machine toward the operator, whereby sheets to be copied can be inserted into the support opening and extend outside the support and then be moved back through the support opening toward the center of the entry opening to straighten corner portions of the sheets.

3,889,943

PLATEN TRANSPORT FOR AUTOMATIC DOCUMENT HANDLER

Harry J. Krayer, III, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 26, 1974, Ser. No. 464,394

Int. Cl. B65h *9/06*

U.S. Cl. 271—4 **5 Claims**

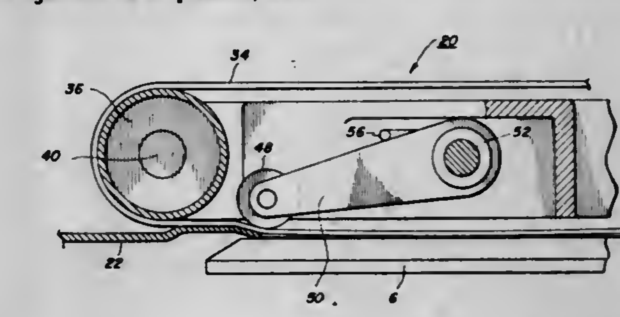
1. In a document handling apparatus for moving documents into copying position on the platen of a document copying machine, the combination of:

a flexible document transport belt;

a pair of interior support rolls about which said belt is operatively disposed, said support rolls being spaced apart to support said transport belt opposite to and extending across at least a portion of said platen;

means for rotatably supporting each of said rolls so that the surface of said transport belt therearound is spaced slightly above the plane of said platen whereby said belt operating run adjacent said rolls is spaced above and out of document driving relationship with said platen;

a register edge movable into and out of the document path adjacent said platen; and



internal pressure means adapted to force a line portion of said belt operating run downwards towards said register edge into document driving relationship with said register edge when said register edge is in the document path for positively driving documents onto said platen between said register edge and the line portion of said belt thereagainst, normal sag in said transport belt allowing said belt to contact said platen between said support rolls for moving the document across said platen while preventing contact of the platen belt with the platen glass adjacent said register edge.

3,889,944

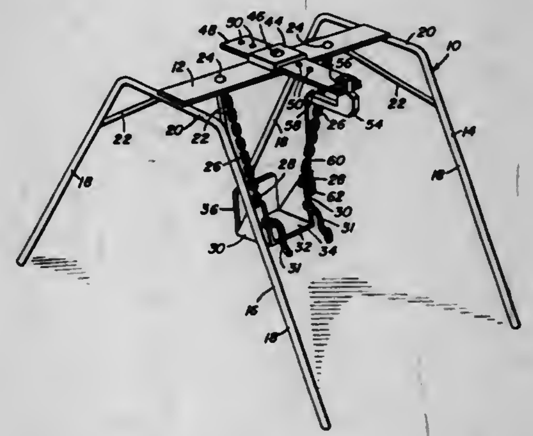
OCCUPANT PROPELLED SWING

Salvatore Sapienza, 133 Woodland St., Lawrence, Mass. 01841

Filed Jan. 2, 1974, Ser. No. 429,713

Int. Cl. A63g *9/16*

U.S. Cl. 272—90 **10 Claims**

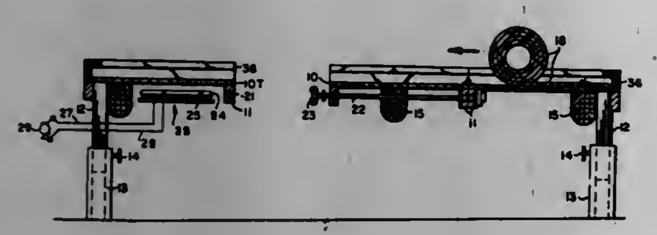


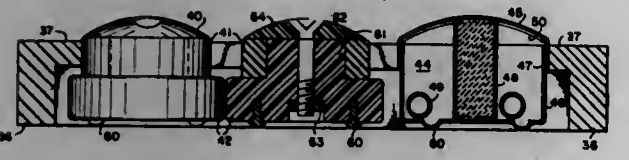
1. A swing construction including an elongated support having front and rear sides and opposite ends, said support having longitudinally spaced anchor means, a pair of depending tension members attached at their upper ends to said anchor means, a child's swing seat structure suspended from and between the lower end portions of said tension members, a depending pivot link including upper and lower anchor points, mounting means pivotally supporting the upper anchor point of said link from said support for angular displacement of said link about a horizontal axis generally paralleling and disposed substantially forward of a first vertical plane containing said spaced anchor means, an elongated upstanding flexible pull member secured at its upper end to said lower anchor point and freely depending, by gravity, from said lower anchor point with its lower end portion suspended slightly forward of

said plane, said link being of a configuration and weighted such that when said link hangs free on said upper anchor point with said pull member suspended therefrom said lower anchor point is spaced substantially rearward of a second vertical plane paralleling the first plane and passing through said upper anchor point and forward of said first plane.

3,889,945
BILLIARD TABLE WITH ACCESSORIES
Robert Ellis, 350 Lomas Santa Fe Dr., Solana Beach, Calif. 92075

Filed Apr. 19, 1973, Ser. No. 352,602
Int. Cl. A63d *15/00*
U.S. Cl. 273—6 **2 Claims**

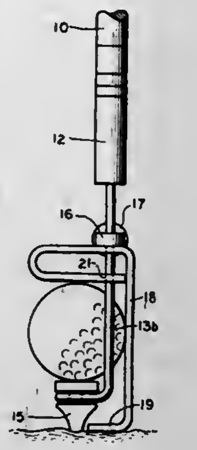




1. In a billiard table with associated accessories, a horizontally disposed level playing surface, a horizontally disposed level surface under said playing surface forming a support therefor, holes through said support surface defining pockets, said support surface and said playing surface being surrounded by a raised border, said playing surface comprising a thin integral sheet of plastic material which is adapted to be reversible on top of said support surface, holes through said sheet of material adapted to mate with the holes in said support surface, billiard balls adapted to roll across one surface of said sheet of plastic material and be propelled into said pockets when said one surface is uppermost, said one surface being pliable and sufficiently soft and roughened to gradually retard the speed of one of said billiard balls rolling thereover, the opposite surface from said roughened surface of said plastic material being considerably more smooth and slippery than said roughened surface, and gliders adapted to slide across said opposite surface and be propelled into said pockets when said opposite surface is uppermost.

2. In a billiard table with associated accessories, a horizontally disposed level playing surface, said playing surface being surrounded by a raised border of rigid material, said raised border being positioned so as to be elevated above and protruding inwardly over said playing surface by support means, the protruding portion of said raised border having an inner edge, a plurality of similarly associated gliders adapted to slide across said playing surface and to impact into said inner edge of said raised border, each gliders having a centrally upstanding rigid projection thereon with an elastic rubber ring tightly slipped over said upstanding projection, a bulbous circular projection below said rubber ring and extending radially outward therefrom, said bulbous projection being of rigid plastic material, the elevation of said rubber ring on said glider being level with the elevation of said inner edge above said playing surface such that said rubber ring will rebound from said inner edge, whereas the elevation of said circular projection above the playing surface is such that similar gliders will rebound therfrom, yet said circular projection will slide beneath said raised border.

3,889,946
PORTABLE ADJUSTABLE TEE AND BALL POSITIONING DEVICE
John C. Setecka, 1931 S. Austin Ave., Cicero, Ill. 60650
Filed July 5, 1973, Ser. No. 376,817
Int. Cl. A63b *57/00*
U.S. Cl. 273—33 **5 Claims**



4. A golf tee positioning device adapted to press tees into desired ball supporting position, comprising

an elongated grippable outwardly extending shaft;

a passaged tee holding member having an angularly bent recessed end portion in which a tee is adapted to be releasably mounted, said tee holding member being connected to one end of said shaft;

a metal angular bracket having its upper portion slidably mounted relative to said tee holding member, and having a lower bent ground engaging foot portion;

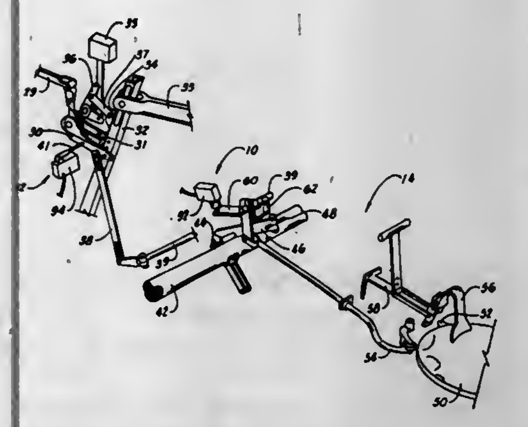
said angular bracket being adapted to releasably support a golf ball;

an adjustable collar on said tee holding member adapted to press against the angular bracket to limit the downward movement of the tee holding member relative to said bracket;

the depression of said shaft and said tee holding member being adapted to press a ball superposed on a tee, and adapted to press the tee into ground engaging position;

the transverse movement of said tee holding member being adapted to disengage same from a tee to permit a ball to be retained on said tee.

3,889,947
CONTROLLER FOR AUTOMATIC PINSETTER
John R. Short, 5316 E. Harry, Wichita, Kans. 67218
Filed Oct. 23, 1973, Ser. No. 408,612
Int. Cl. A63d *5/09*
U.S. Cl. 273—43 A **12 Claims**

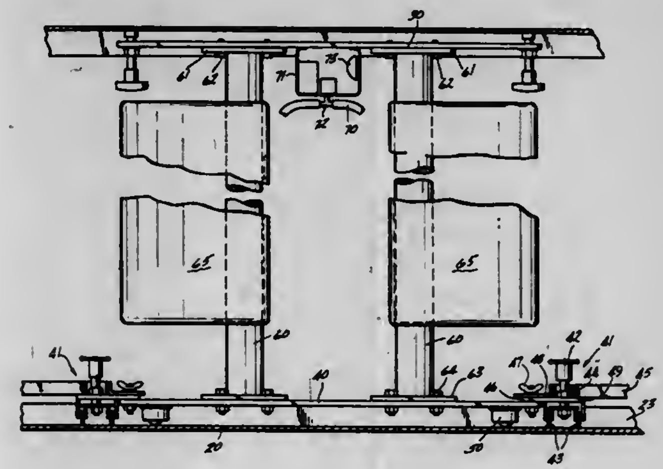


1. In an automatic bowling pinsetter having a pin distribution system powered by an electric motor, a clutch means connected to said motor, a raisable and lowerable means of said pin distribution system to receive bowling pins and set same on a bowling lane, a controller therein and therewith, comprising:

- a. a first switch means mounted with said pinsetter operable by motion of said raisable and lowerable means and electrically connected to said motor, and
- b. second switch means mounted with said pinsetter operable by motion of said clutch means and electrically connected in parallel relation to said first switch means,

said motor being controlled by said first switch means and said second switch means, said motor being operable when either said first switch means or said second switch means are in a closed relation, said motor being not operable when both said first switch means and said second switch means are in open relation, said raisable and lowerable means and said clutch means having operating cycles such as to maintain one or the other of said switch means closed only for a sufficient period of time during the cycling of the pin distribution system to enable the pin distribution system to perform the pin handling operations required of it.

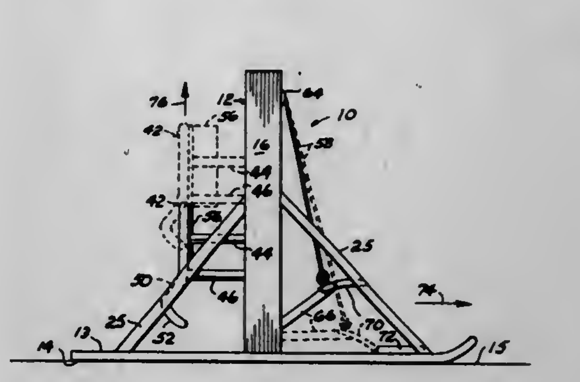
3,889,948
FOOTBALL BLOCKING TRAINING APPARATUS
John Visco, 334 Jeffer St., Ridgewood, N.J. 07450
Filed Sept. 6, 1973, Ser. No. 394,730
Int. Cl. A63b *67/00*
U.S. Cl. 273—55 A **8 Claims**



1. A football training apparatus comprising:

a generally rectangular frame member having spaced apart upright supports; upper and lower elongated guide members, said upper guide member being attached at each of its ends to said frame member and extending longitudinally therewith, said lower guide member being attached to the ground against movement relative thereto, said lower guide member also being positioned directly below in the same vertical plane with said upper guide member and being parallel therewith; upper and lower vertically spaced plates, said upper and lower plates being positioned, respectively, adjacent said upper and lower guide members and parallel therewith, said upper and lower plates being rigidly attached to each other by a pair of horizontally spaced vertical arms for maintaining said vertical spacing; friction means provided on said upper and low plates for frictionally engaging respectively, said upper and lower guide members; means provided on said lower plate for adjusting the amount of frictional engagement; a pair of flexible dummies secured to each of said arms for engagement by a player in an attempt to move said dummies against the frictional engagement of said friction means and guide members.

3,889,949
FOOTBALL BLOCKING SLED
John E. Gardner, 4840 Koelsch Dr., Oklahoma City, Okla. 73117
Filed Oct. 15, 1974, Ser. No. 514,856
Int. Cl. A63b *67/00*
U.S. Cl. 273—55 R **4 Claims**



1. A football blocking sled, comprising:

an upright frame;

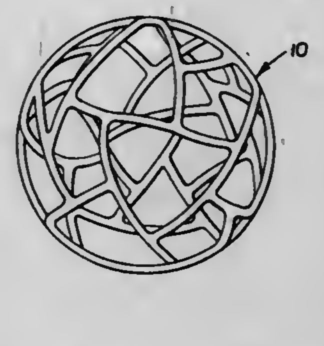
a pair of spaced-apart parallel runners transversely supporting said frame, each said runner having a flat surface adapted to engage the ground;

carriage means vertically movable within said frame;

a pair of blocking pad supports;

means mounting said blocking pad supports to said carriage; carriage moving means connected with said carriage; and, an operator's platform supported by said runners opposite the position of said blocking pad supports.

3,889,950
FLEXIBLE GEODESIC-TYPE TOYS
Peter B. Kasravi, P.O. Box 1001, Carpinteria, Calif. 93013
Filed June 19, 1974, Ser. No. 480,733
Int. Cl. A63b *39/00*, *43/02*
U.S. Cl. 273—58 D **11 Claims**



1. A throwing and spinning toy comprising:

a plurality of elongated members, each having a substantially low friction configuration, connected to form a three-dimensional structure;

each member being connected to four of the other members and being spaced from the remainder of said members;

two of the four members being connected to said each member being connected to each other and the other two of the four members being connected to said each member being connected to each other;

at each connection of said members there being a maximum of two members being joined; and

the spacing between the members being great enough so that friction on the toy is insignificant when the toy is moved freely through the air.

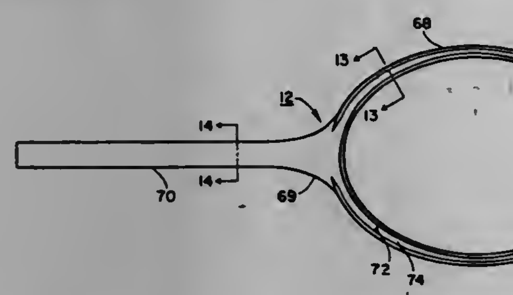
3,889,951
LAMINATED REINFORCING FACING FOR A GAME RACKET

William H. Schaefer, and Richard E. Bender, both of San Diego, Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 241,176, April 5, 1972, Pat. No. 3,840,230. This application Feb. 15, 1973, Ser. No. 332,956

Int. Cl.² A63B *49/10*

U.S. Cl. 273—73 F **15 Claims**



1. A reinforcing facing for a game racket, adapted to be bonded to the face of a racket shell; said facing having a closed loop frame area, a throat area and an elongated handle area extending away from said throat area, all of said head frame, throat and handle area lying substantially along a single plane; said facing comprising:
- a body portion having the configuration of said facing and having a first surface of predetermined configuration adapted to engage a correspondingly shaped. surface of the racket face to which the facing is to be bonded;
- said body portion having a substantially U -shaped cross-section configuration in the frame area of said facing, modified through the throat area to a substantially rectangular cross-section in the handle area;
- said body portion comprising a plurality of substantially parallel high Young's modulus fibers in a synthetic resin matrix;
- said fibers in said body portion comprising a continuous tow extending up through the handle area, through the throat area, aroung the frame area, back through the throat area and back down the handle area;
- at least one layer of cloth made up of high Young's modulus fibers in a synthetic resin matrix bonded to a second surface of said body portion opposite to said first surface; said cloth having from 0 to about 50 percent woof fibers and from 50 to 100 percent warp fibers.

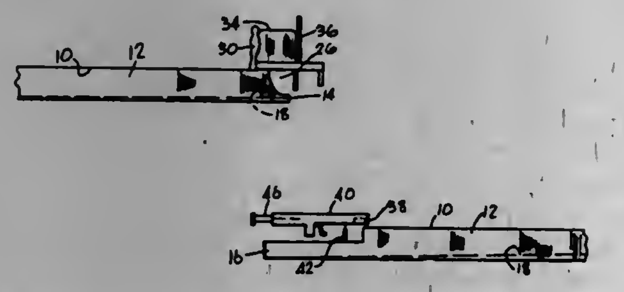
3,889,952
GAME WITH PUCK LAUNCHING MEANS AND GOAL TENDER

James T. Shiga, P.O. Box 648, Rexdale, Ontario, Canada (06880)

Filed Oct. 19, 1973, Ser. No. 408,120

Int. Cl. A63f *3/00*

U.S. Cl. 273—121 R **1 Claim**



1. A game comprising:
- a hollow rectangular game board having flat horizontal top and bottom surfaces and an inner chamber with a bottom which slopes downward from one end to the other, said other end having a vertical opening, said top surface at said one end having off center top horizontal openings whereby when a puck falls through one of the horizontal openings it slides by gravity toward the other end in the chamber for subsequent removal at the vertical opening;
- a horizontal hollow platform having a vertically disposed opening therein being centrally secured to said top surface at said one end and extending rearwardly therefrom such that a puck sliding along said top surface will enter said vertical opening in the platform;
- a movable simulated goal tender disposed at the one end between the horizontal openings in front of said vertical opening in a substantially puck blocking relationship;
- a puck; and
- manually actuated puck launching means disposed at the other end.

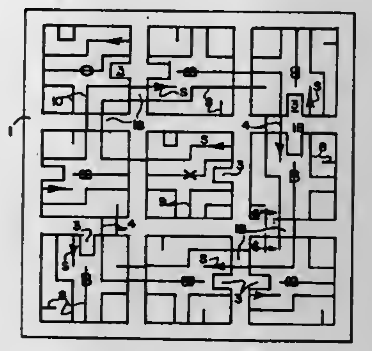
3,889,953
SOLITAIRE TIC-TAC-TOE GAME

James A. Grasham, P.O. Box 207, Eugene, Oreg. 97401

Filed July 28, 1972, Ser. No. 276,253

Int. Cl. A63f *3/00*

U.S. Cl. 273—130 B **20 Claims**



5. A game device comprising:
- a plurality of counters;
- a game board having discrete areas thereon, said board areas for receiving said counters;
- means for uniquely orienting said counters in said board areas;
- said counters having first markings thereon, said first markings being in the form of first, second, and third indicia, each counter having only one of said indicia thereon;
- said counters having second markings thereon, said second markings being in the form of pathways, the counters located in said board areas having certain pathways on different counters in communication.

3,889,954
BOARD GAME APPARATUS

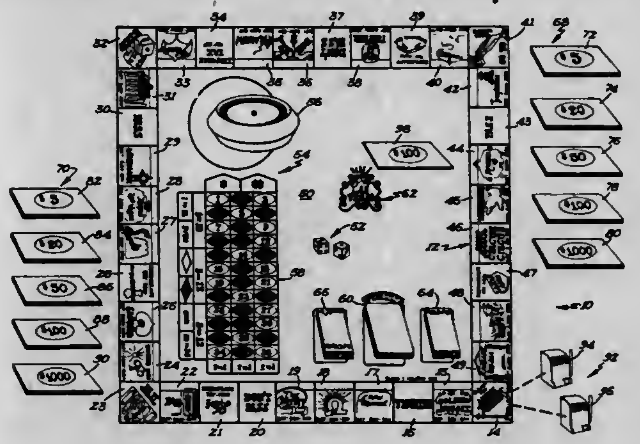
Jack T. Malisow, Minneapolis, Minn., assignor to Research & Development, Minneapolis, Minn.

Filed Feb. 12, 1973, Ser. No. 331,605

Int. Cl. A63f *3/00*

U.S. Cl. 273—134 C **8 Claims**

1. Game board apparatus, comprising in combination: a game board having marked locations constituting a path of progression about the board, with at least some of the locations being possessory locations and at least some of the locations being nonpossessory, reward/penalty locations; means for indicating ownership of the possessory locations; means for determining the reward/penalty of the reward/penalty locations; at least two playing pieces with one playing piece being associated with each player of the game; chance taking apparatus for determining the movement of the playing piece of each player along the path of progression on the board, at least a portion of the possessory locations comprising betting possessory locations, at least one additional different known chance taking apparatus, one of said chance taking apparatus being selectable by a player whose playing piece comes to rest on a betting possessory location possessed by an opposing player for determining an occupancy payment due said opposing player by betting prior to movement from the betting possessory location in a game of chance using only said one selected chance taking apparatus; means for indicating a minimum and maximum bet required for determining said occupancy payments due to an owner of a betting possessory location; and a medium of payment for satisfying certain obligations or benefits from the means for determining the reward/penalty and for satisfying occupancy payments for possessory locations.



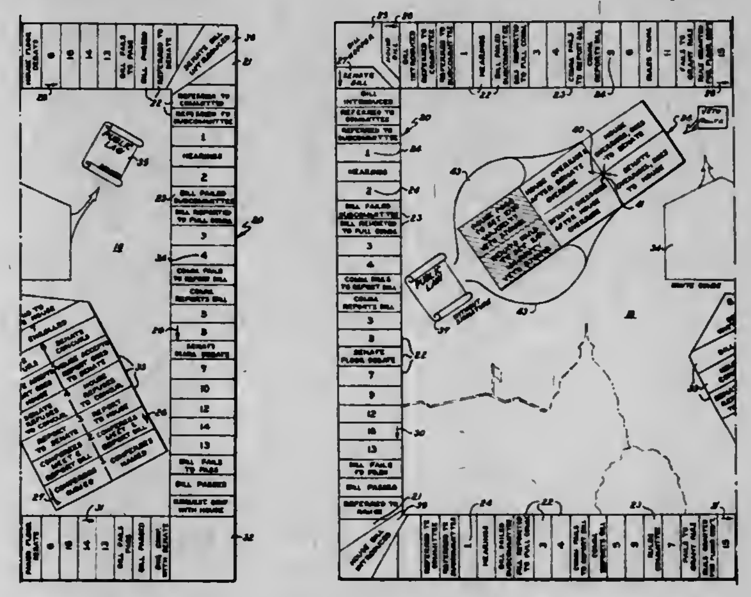
3,889,955
LEGISLATIVE BOARD GAME APPARATUS

Verlon Welch, 7709 Arlen St., Annandale, Va. 22003, and Dreama B. Hinton, 4903 Southland Ave., Alexandria, Va. 22312

Filed July 5, 1974, Ser. No. 486,253

Int. Cl. A63f *3/00*

U.S. Cl. 273—134 D **10 Claims**



6. A game adapted to increase appreciation and knowledge of procedural steps for enacting a public law, said game comprising in combination:
- a. a game board having spaces disposed thereon,
- b. a first plurality of said spaces defining alternative legislative playing paths including a common starting space,
- c. a preselected number of said first plurality of spaces having legends thereon representing sequential legislative steps and the remaining spaces being interspersed among said legended spaces and including indicia representing certain alternative parliamentary rulings,
- d. a second plurality of said spaces defining alternative conference paths leading from said alternative legislative paths to an executive review space designated "White House,"
- e. a third plurality of said spaces extending from said executive review space and defining alternative veto overriding
- f. a plurality of playing pieces adapted to indicate specific bills corresponding to each of the several players, and paths terminating in a space designated "Public Law,"
- g. means for determining by chance the path and extent of movement of each playing piece.

3,889,956
ELECTRONIC AMUSEMENT MACHINE

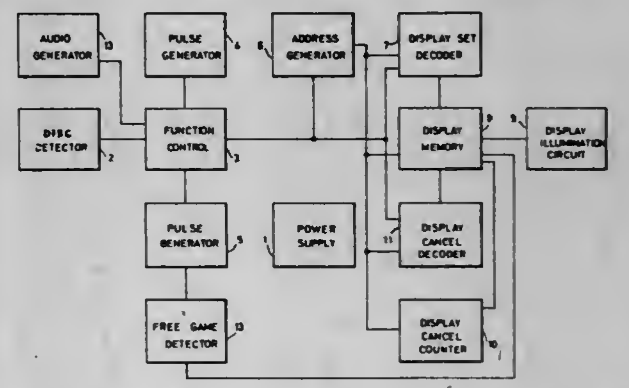
Trevor William Castle, 10 Thornton St., Eltham, Victoria, Australia (3095)

Filed Jan. 16, 1973, Ser. No. 324,212

Int. Cl. A63f *1/00*

U.S. Cl. 273—138 A **14 Claims**

1. An electronically controlled amusement apparatus adapted to play card games comprising:
- a face having a number of electronically controlled lamps producing a number of displays each bearing a card representation and being capable of illumination to provide a visual card representation,
- circuit driver means connected to each of said lamps for effecting illumination and extinguishment of the connected lamp,
- means for connecting each of said circuit driver means to memory so that, when a bit in said memory is in said set condition, at least one driver circuit is electronically operated to cause display of a card representation associated with that bit,
- said memory having a plurality of storage bits, each bit corresponding to one of said lamps of said card representations and each bit having at least a set condition associated with display of the corresponding card representation and a reset condition associated with an extinguished display of the corresponding card representation,



- manually operable first means for player operation to electronically set following manual operation thereof, one at a time, a plurality of bits in said memory,
- means connected to said memory and to said first means for setting, one at a time and at least pseudorandomly, a plurality of said bits following manual operation of said first means,
- a single player operated cancel means capable of being manually operable for a predetermined time immediately following setting of each bit for operation to cause that bit to return to its reset condition, and
- further circuit means connected to said memory and said cancel means for causing a set bit to return to its reset condition and said setting means to electronically set another bit following manual operation of said cancel switch means within said predetermined time,
- means for counting the number of manual operations of said single cancel means and disabling said further circuit means when the count reaches a preset plurality, and
- means for preventing setting of further memory bits after a predetermined number thereof have been set.

3,889,957
GOLF BALL TARGET

Robert Klabacka, Madison, Wis., assignor to Diesel Truck Drivers Training School Inc., Sun Prairie, Wis.

Filed Mar. 29, 1974, Ser. No. 456,231

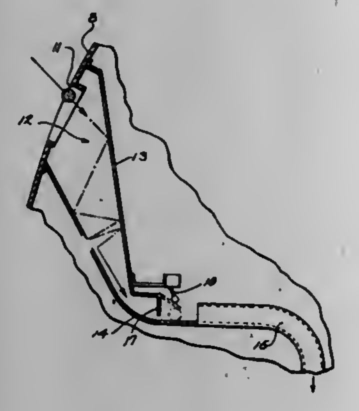
Int. Cl. A63b *69/36, 63/00*

U.S. Cl. 273—182 R **3 Claims**

1. A target device for receiving flying golf balls, comprising: a hollow, spherical target having a plurality of target holes

disposed in spaced apart relationship on the outer surface of said target, said target holes adapted to receive a flying golf ball;

a plurality of traps within said target each communicating with one of said target holes and having walls which converge downwardly from one of said target holes toward the interior of said target so that a flying golf ball entering one of said target holes will be deflected downwardly within said trap;



a ball collection point connected to an outlet of each of said traps to receive golf balls passing through said traps;

switch means mounted adjacent the outlet of each of said traps and actuated by a golf ball passing through the outlet; and

an electrical signal disposed within said target and actuated by the actuation of said switch means.

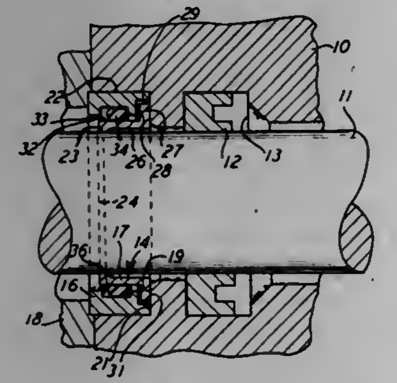
3,889,958
PISTON ROD FLOATING WIPER

Milton C. Bennett, Moline, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 15, 1974, Ser. No. 461,252

Int. Cl.² F16J *15/16*

U.S. Cl. 277—24 **5 Claims**



1. A rod floating wiper assembly comprising a housing member, a piston rod axially movably disposed in said housing member, said housing member having an annular opening encircling said piston rod, a first endless ring member fixedly disposed in said annular opening and being in snug contact with said housing member and encircling said piston rod and having a radially inner circumferential surface radially spaced from said piston rod, a second endless ring member disposed in said annular opening and being nested with said first ring member and being radially spaced from any contact with said first ring member and having a radially outer circumferential surface axially aligned with and radially spaced from said radially inner circumferential surface for radial movement of said second ring member toward and away from said first ring member, one of said ring members having an annular groove faced toward the other of said ring members, an elastomeric O-ring disposed in said annular groove between said ring members and being snug with each thereof for precluding the passage of dirt between and beyond said ring members while permitting relative radial movement therebetween, said second ring member having an inner circumferential surface extending along at least a part of the total axial length of said second ring member and disposed in endless snug contact with said piston rod for precluding the passage of dirt past said inner circumferential surface of said second ring member, and said second ring member being of a rigid material and spaced from said first ring member to move with and remain in endless snug contact with said piston rod upon deflection of said piston rod.

3,889,959
EARTH DRILLING APPARATUS

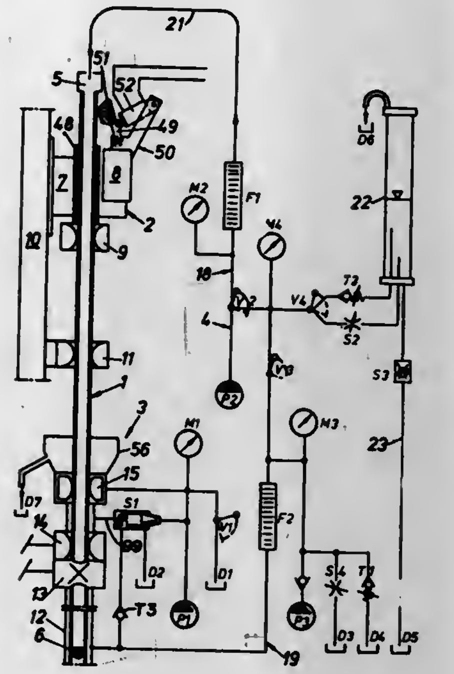
Jan Edvard Persson, Nacka, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Aug. 2, 1973, Ser. No. 384,953

Claims priority, application Sweden, Aug. 7, 1972, 10239/72

Int. Cl. E21b *33/06*

U.S. Cl. 277—27 **12 Claims**



1. Preventer unit for establishing a seal between a casing tube and a drill stem during pressure drilling through the earth, comprising an elastic packing sleeve rotatably mounted on the casing tube, the outside of said packing sleeve communicating with a pressure fluid source for applying a contact pressure upon the drill string, said preventer unit further comprising a pressure control valve which is connected to said fluid pressure source as well as to the casing tube pressure and which is arranged to automatically adapt the packing sleeve contact pressure in response to the casing tube pressure by controlling a pressure fluid source drainage.

3,889,960
COOLING SEAL

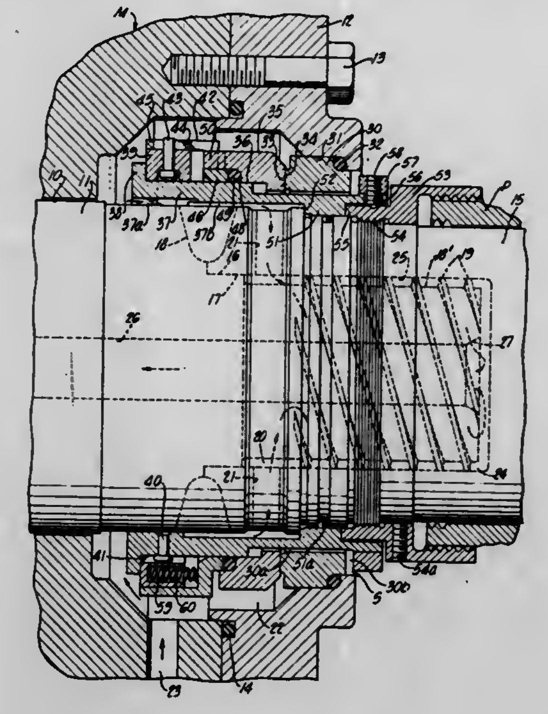
Winfred J. Wiese, Whittier, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 295,082, Oct. 4, 1972, Pat. No. 3,806,135. This application Nov. 2, 1973, Ser. No. 412,378

Int. Cl. F16j *15/34*

U.S. Cl. 277—81 **7 Claims**

1. A mechanical seal assembly for use in a seal chamber in a housing having a rotatable shaft in said chamber, comprising: an elongated sleeve adapted to be disposed on said shaft for rotation therewith, a first seal ring disposed about said sleeve and connected thereto for rotation therewith, a second seal ring disposed about said shaft and non-rotatably fixed to said housing, said seal rings having opposed radial seal faces adapted for cooperative sealing and rotative coengagement, spring means associated with one of said seal rings for biasing the latter towards the other of said seal rings, said sleeve having means defining an internal, annular, longitudinally extending space, and fluid passageway means communicating said chamber with said space, wherein said means defining said space comprise annular recess means in the inside wall of said sleeve and a radially opposite portion of the surface of said shaft, and wherein said fluid passageway means comprise elongated slot means in the inside wall of said sleeve at one end of said space and radially opposite portions of the surface of said shaft.



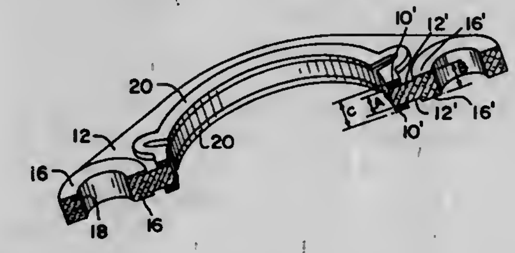
3,889,961
MOLDED TYPE HEAT INSULATING GASKET

Robert G. Farnam, New Lisbon, Wis., assignor to F. D. Farnam Co., New Lisbon, Wis.

Filed Jan. 21, 1974, Ser. No. 434,871

Int. Cl. F16j *15/10*

U.S. Cl. 277—166 **4 Claims**



1. A heat insulating gasket for use between mating flanges of an internal combustion engine conduit or the like, said gasket comprising a unitary molded core member of insulating material having a body portion of given thickness, having bolt holes and a fluid passageway therethrough, bosses coaxial with said bolt holes projecting from the surfaces of said body portion to a greater thickness than the thickness of said body portion, die-cut sheet packing material on said body portion of said core surrounding said fluid passageway projecting further from said body portion than said bosses project, the total plan area of said packing material being less than 33⅓ percent of the plan area of the core member, whereby when the gasket structure is clamped between said mating flanges, said packing material will be compressed to the level of said bosses forming a seal between said flanges and substantial air spaces will be provided between said flanges and said core member for heat insulating purposes.

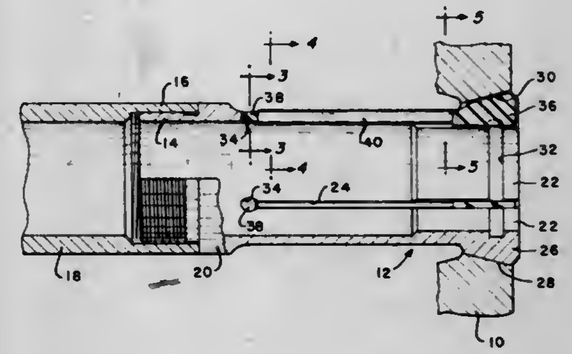
3,889,962
SEALS FOR COLLETS

Hubert J. Parsons, Horseheads, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Jan. 8, 1974, Ser. No. 431,708

Int. Cl. B23b *31/20*

U.S. Cl. 279—46 **9 Claims**



1. A machine tool collet including:

a. a cylindrical body having a longitudinal axis,

b. a collet head at the outer end of said body having a front face,

c. a plurality of slots in said body extending rearwardly from said front face and thereby forming a plurality of collet fingers,

d. seal means positioned in said slots and extending over a major portion of the length of said slots,

e. said seal means comprising an elongated resiliently deformable length of tubing, and

f. said tubing is adhesively secured in said slots.

3,889,963
CHAIR PROVIDED WITH WHEELS

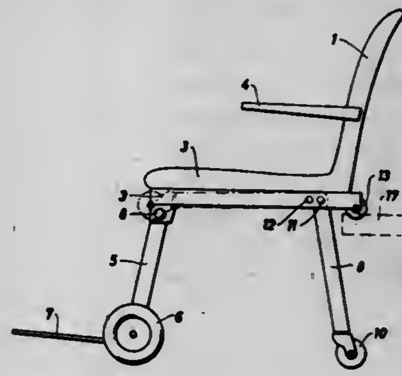
Sven-Olof Brattgard, Storangsgatan 32, Goteborg, Sweden

Filed Aug. 14, 1973, Ser. No. 388,184

Claims priority, application Sweden, Aug. 17, 1972, 10666/72; July 27, 1973, 73104184

Int. Cl. B62b *7/06*

U.S. Cl. 280—36 B **1 Claim**

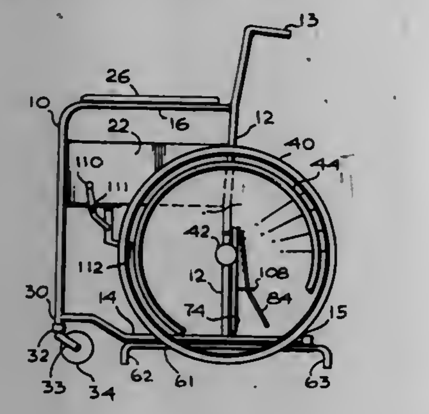


1. A chair provided with wheels comprising a seat, a frame with an upper part, a front wheel assembly and a rear wheel assembly connected to said upper part, said rear wheel assembly being displaceable from its normal position to one extending from the rear end of the underside of said frame upper part, so that the underside of the same is free from extending parts and is moveable onto an elevated supporting base, while at the same time being supported at ground level by the front wheel assembly, said rear wheel assembly being adjustable to the location of a support for the back connected to the sitting part of the seat.

3,889,964
BRAKE STAND FOR WHEELCHAIRS

Floyd B. Pitts, Jr., 1949 Rimpau Blvd., Los Angeles, Calif. 90016

Filed Nov. 19, 1973, Ser. No. 416,971
Int. Cl. B60t *1/14*
U.S. Cl. 280—43.24 **7 Claims**



1. A brake attachment for a wheel chair resting on a surface, said wheel chair of the type having a frame and seat and a pair of main wheels and a pair of forward wheels, said brake attachment means coupled to the frame of the wheel chair and adjustably moveable with respect thereto, said brake attachment means comprising:

a frame structure having:
- a pair of transversely spaced longitudinal members, each having a forward end and a rear end spaced a preselected longitudinal distance from said forward end;
- foot portions coupled to each of said forward ends and said rear ends of said longitudinal members;

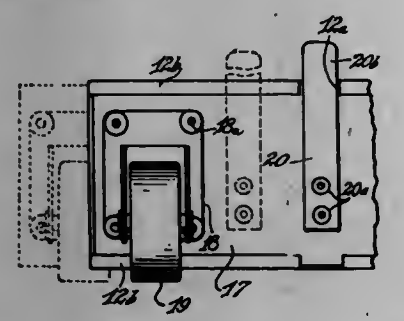
latch means operatively interconnecting said brake attachment means and said wheel chair for selectively securing said brake attachment means to said wheel chair in a plurality of positions relative thereto, and in at least a first of said plurality of positions said foot portions are free of engagement with the surface upon which said wheel chair rests to allow said main wheels and said forward wheels to engage said surface to allow movement of said wheel chair thereon, and in a second of said plurality positions said foot portions engage the surface to lift at least said main wheels free of engagement with the surface to prevent movement of said wheel chair thereon;

trigger means operatively engaging said latch means to allow selective movement of said brake attachment means between said plurality of positions thereof.

3,889,965
WHEELED ACCESSORIES FOR SUITCASES

Wolf Zeitlin, 2814 N. Gregory St., Chicago, Ill. 60625

Filed May 9, 1974, Ser. No. 468,434
Int. Cl. B62b *1/04*
U.S. Cl. 280—47.13 R **1 Claim**

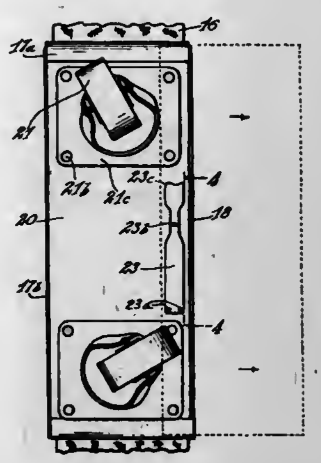


1. Wheeled support means for luggage comprising a pair of wheeled assemblies which are removably attachable to said luggage in spaced relationship to each other when attached to said luggage, each of said wheeled assemblies comprising a luggage-bearing channel plate to be fitted transversely on one side of said luggage adjacent the end of said side, a first slot extending lengthwise of said plate, the open side of said first slot facing the side of said plate opposite the side of said plate contacting said luggage side, the said first slot having opposing grooves extending laterally from the open side to form recesses, a strap slidably inserted into said recesses to hold said plate to said luggage side, a terminal buckle keeper on one end of said strap to receive the other end of said strap to lockingly couple the ends of said strap to secure the plate to said luggage side; a second slot formed in the side of the plate opposite the side of the plate contacting said luggage side and extending parallel to, but spaced from, said first slot, and second slot having opposing grooves extending laterally from the open side of said second slot to form recesses along the sides of said second slot and flanges along the open side of said plate, an insert plate having a pair of spaced caster wheels secured to one side thereof removably insertable into the recesses of said second slot, a pair of opposed recesses in said flanges midway between the ends of said channel plate, a finger latch of resilient material secured to the under side of said insert plate midway between said caster wheels and extending laterally beyond the side of said insert plate, said latch engaging one of said flange recesses when the insert plate is fitted into said second slot to secure said insert plate in said channel plate.

3,889,966
WHEELED ACCESSORY FOR SUIT CASES

Wolf Zeitlin, 2814 W. Gregory St., Chicago, Ill. 60625

Filed Nov. 26, 1973, Ser. No. 418,810
Int. Cl. B62b *1/10*
U.S. Cl. 280—47.13 R **5 Claims**



1. A wheeled accessory for a suitcase comprising one accessory unit applicable near each end of the suitcase, each unit comprising a strap for binding the unit to the suitcase, a base plate attached to the outer side portion of the strap which is fitted over the under side of the suitcase, a liner attached to the inner side of said portion of said strap thereby clamping said strap portion between the base plate and the liner, pendent wheel means slidably inserted onto each base plate, means on said base plate to receive said wheel means in sliding engagement and resilient means to lock said wheel means on each base plate.

3,889,967
PATIO SERVING CART

Elmer E. Sauer, 1520 S. Ash, Denver, Colo. 80222

Filed Mar. 4, 1974, Ser. No. 447,545
Int. Cl. B62b *3/02*
U.S. Cl. 280—47.35 **1 Claim**

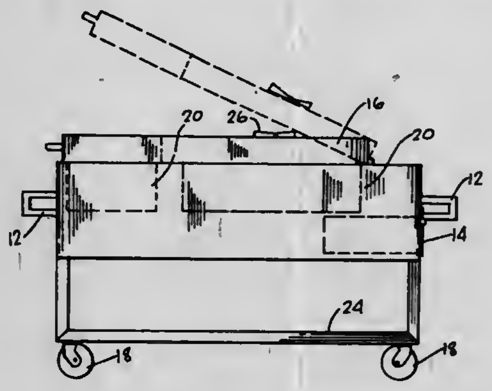
1. A serving cart comprising:

a rectangular shaped unit having a horizontal top with first and second vertical wells disposed side by side and extending downward therein, said unit having parallel vertical ends and parallel vertical sides extending at right

angles to the ends, said unit having a horizontal bottom supported on wheels;

first and second pairs of horizontally spaced handles extending at right angles to said ends, each pair being secured to and extending outwardly from a corresponding end;

horizontal drawers disposed slidably in said ends;



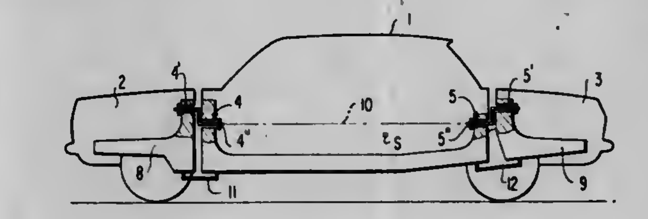
a single horizontal cover hingedly secured at one end to the top of the unit adjacent to but inward from one of the unit ends, said cover extending over the top of the unit to cover the wells and having a horizontally disposed manually operable vent; and

first and second drop leaf table tops, each table top being hingedly secured to a corresponding side of the unit adjacent the cover, each table top, when horizontally extended being level with the top of the unit.

3,889,968
MOTOR VEHICLE, ESPECIALLY PASSENGER MOTOR VEHICLE

Karl Wilfert, Gerlingen-Waldstadt, and Bela Barenyi, Maichingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 4, 1974, Ser. No. 447,816
Claims priority, application Germany, Mar. 3, 1973, 2310710
Int. Cl. B62d *31/00*
U.S. Cl. 280—111 **65 Claims**



1. A vehicle comprising:

front axle aggregate means belonging to a front vehicle section,

rear axle aggregate means belonging to a rear vehicle section, said rear axle aggregate means being spaced from the front axle aggregate means in the vehicle longitudinal direction,

vehicle body means including a passenger space,

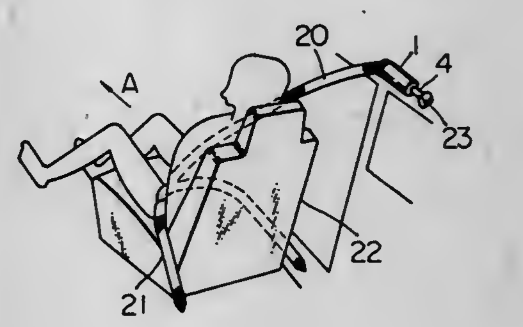
at least one crank means pivotally connecting the vehicle body means to one of said axle aggregate means; said crank means including a first pivot pin means coordinated to said one axle aggregate means and a second pivot pin means coordinated to the vehicle body means, said first and second pivot pin means being at respective different vertical heights and extending substantially in the vehicle longitudinal direction,

and at least one coupling rod means which is pivotally connected at said vehicle body means and at said one of said axle aggregate means, said coupling rod means extending in the vehicle longitudinal direction and being pivotally connected at the vehicle body means and said one of said axle aggregate means at respective pivot points disposed below the respective first and second pivot pin means.

3,889,969
LINEAR TENSION DAMPING DEVICE

Syuichi Otani, Tokyo, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Feb. 16, 1973, Ser. No. 333,348
Claims priority, application Japan, Feb. 17, 1972, 47-19697
Int. Cl. B60r *21/10*
U.S. Cl. 280—150 SB **1 Claim**



1. In a motor vehicle provided with a restraint system having a lap belt extending over and across a seat portion of the seat; a shoulder strap having one end anchored to the lap belt and having another end; a linear tension damping device comprising an elongate cylinder with an inner wall defining a bore, said elongate cylinder being closed at one end by an end plug which is anchored to said another end of said shoulder strap and said cylinder being reduced in diameter at an opposite end to provide a reduced diameter annular projection; a first piston axially slidable in said cylinder and axially dividing said bore into first and second compartments; a piston rod secured at one end to said first piston and extending from the same through said first compartment and through said reduced diameter annular projection externally of said bore, said piston rod terminating and being pivotally secured to a reinforced inner body portion of the vehicle; a second piston slidable in said second compartment and axially dividing said second compartment to provide at a side thereof opposing to said

first piston a first subcompartment and at the opposite side of said second piston a second subcompartment; an annular seal member sealingly engaging with said wall of said elongate cylinder defining said bore and sealingly and slidably engaging with said piston rod to close said first compartment; said first piston having a plurality of axial passages extending therethrough; an incompressible liquid filling said first compartment said passages of said first piston and said first subcompartment; a compressed gas filling said second subcompartment; a valve disc having an aperture and disposed in said first subcompartment, said valve disc seating on an axial end of said first piston which faces said first subcompartment to close said passages of said first piston; an adjustor extending through said aperture of said valve disc and threadedly engaging into said piston from said axial end of said first piston to bias said valve against said axial end of said piston; and at least one shearing pin extending through said reduced diameter annular projection and through said piston rod to lock movement of said piston rod relative to said elongate cylinder, said shearing pin being constructed such that relative axial movement of said piston rod relative to said cylinder is prevented unless a predetermined magnitude of tension is applied on said lap belt.

3,889,970
VEHICLE BODY WITH OCCUPANT HEAD-PROTECTIVE CURTAIN

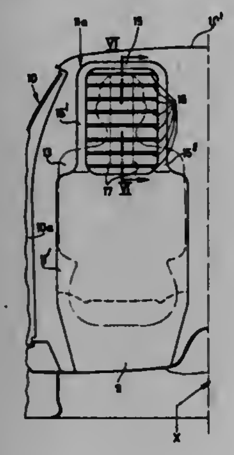
Karl Astheimer, Bischofsheim, and Karl Hug, Niedernhausen, both of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 25, 1974, Ser. No. 445,135

Claims priority, application Germany, Mar. 7, 1973, 2311160

Int. Cl. B60r *21/02*

U.S. Cl. 280—150 B **3 Claims**



1. In a vehicle body, an occupant head restraint comprising: a plurality of flat flexible straps having elongated configurations with predetermined widths, each of the straps having opposite ends formed into loops; and

attachment members mounted on the vehicle body and associated with the opposite ends of the straps, the attachment members having portions received within the loops of the straps to position the straps in a spaced relationship extending parallel to each other adjacent the head of a seated occupant of the vehicle body, and the attachment portions normally maintaining the planes of the straps in alignment with the line of sight of the occupant so as not to impair the occupant's vision and permitting the straps to rotate into a common plane as the occupant's head engages the straps so that this engagement is with the total width of the straps in an effective restraining manner.

3,889,971
SAFETY BELT APPARATUS

Kenichi Kazaoka, Nagoya; Kimiharu Hirose, Obu; Yasuo Takeshita, Toyota; Hisao Matsumoto, Chita, and Kazuo Okamoto, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisin Seiki Kabushiki Kaisha, Kariya, both of, Japan

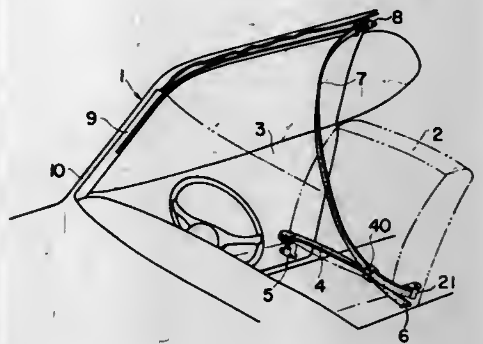
Filed Dec. 22, 1972, Ser. No. 317,699

Claims priority, application Japan, Dec. 24, 1971, 47-1409

Int. Cl. B60r *21/02*

U.S. Cl. 280—150 SB **3 Claims**

1. A seat belt device for a vehicle having at least one door, a front pillar, as well as floor and roof portions, for securing a passenger to a seat in the vehicle, the device comprising: a waist belt anchored at one end to said door, and at the other end to a portion of the vehicle opposed to said door on one of said seat and said floor portion; a shoulder belt operatively connected with said waist belt, and being anchored at one end to a side of said roof portion above said door, and at the other end to one of said seat and said floor portion; retracting means secured to at least one of said belts to vary the length thereof, to thereby selectively restrain and release the passenger to and from said seat; a guide track supported at a portion of said side of the roof portion and extending along a curvature of said side up to the lowermost end of said front pillar; guide means slidably mounted on said track and engageable with said shoulder belt for guiding the movement of the latter; and driving means operatively connected to said guide means and being actuatable for sliding the same in response to ingress and egress motions of the passenger into and out of the vehicle; wherein said guide means includes a cable in said track for connecting said driving means with said guide means; and



wherein the latter includes a pair of first and second guide members, said first guide member being proximate to said front pillar and being fastened to said cable, and said second guide member being freely slidable on said cable so that forward movement of the latter causes said second guide member to follow said first guide member in spaced relation therewith.

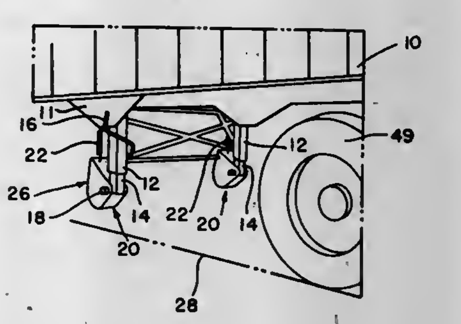
3,889,972
LANDING GEAR FOR SEMI-TRAILER

Elmer S. Bredt, 1722 E. Mayamensing Ave., Philadelphia, Pa. 19148

Filed Apr. 16, 1973, Ser. No. 351,964

Int. Cl. B60s *9/04*

U.S. Cl. 280—150.5 **9 Claims**



1. In a landing gear construction for supporting the forward end of semi-trailers above the ground surface, wherein the semi-trailer construction carries an axle at an initial height, the combination of

A. a landing pad rotatively connected to the axle and having clockwise and counter-clockwise movement about the axle,
   1 said landing pad including a front face, a rear face and a curved cam surface extending from the front face,
   2. said landing pad further including a flat support pad in spaced relation from the axle, said flat support pad being interconnected between the rear face and the curved cam surface;
B. spring means biasing between a portion of the semi-trailer construction and a portion of the landing pad,
   1. said spring means biasing the landing pad about the axle to an upper position wherein the landing pad is carried above the said ground surface and the flat support pad is positioned in angular relation to the ground surface; and
C. means to vary the height of the axle relative to the semi-trailer construction.

6. In a method of supporting the front end of a semi-trailer construction which is equipped with a landing gear axle and a jack to raise and lower the axle, the steps of

A. connecting a motor vehicle to the semi-trailer to support the front end of the semi-trailer;
B. affixing a landing pad having a cam surface and a flat support surface to the axle;
C. lowering the jack until the cam surface contacts the ground;
D. moving the semi-trailer in the direction of the flat support surface until the flat surface rests upon the groun to support the weight of the semi-trailer;
E. removing the motor vehicle from association with the semi-trailer.

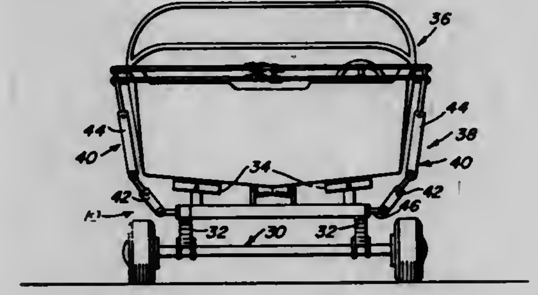
3,889,973
OPPOSITE SIDE CENTERING AND HOLD-DOWN TRAILER UPRIGHTS

Richard L. Fehseke, 621 1/2 Seventh St., Fort Madison, Iowa 52627

Filed Nov. 8, 1973, Ser. No. 414,136

Int. Cl. B62d *3/10*

U.S. Cl. 280—179 A **10 Claims**



1. An elongated trailer including opposite side portions extending longitudinally of the trailer, a load centering device for said trailer, said device including a pair of opposite side arm assemblies, each of said arm assemblies including a pair of first and second arm structures including one pair of adjacent ends and means pivotally securing said adjacent ends together for adjustable relative angular displacement of said arm structures about an axis extending transversely of said arm structures, means carried by one end of each arm assembly defining an anchor location for a tension member, a pair of mounting brackets carried by corresponding opposite side portions of said trailer, the other end of each arm assembly being pivotally supported from a corresponding mounting bracket for adjustable angular displacement relative to the mounting bracket about an axis substantially paralleling the first mentioned axis and extending longitudinally of said trailer.

3,889,974
ERGONOMIC DRIVE FOR BICYCLES AND OTHER HUMAN POWERED MACHINES

Charles A. Kallander, 7554 Lynch Rd., Sebastopol, Calif. 95472

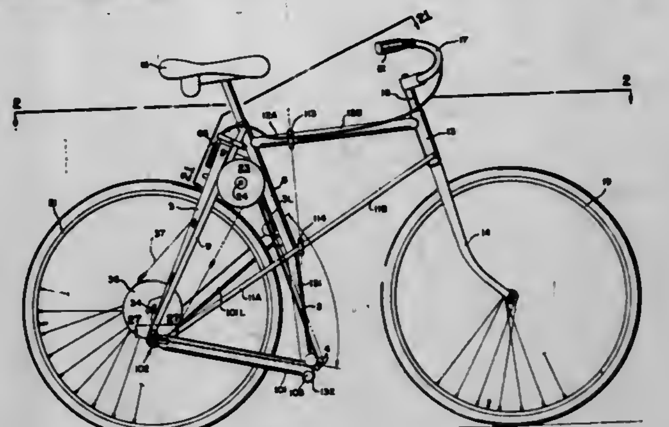
Filed Oct. 1, 1973, Ser. No. 402,141

Int. Cl. B62m *1/00*

U.S. Cl. 280—251 **18 Claims**

1. A machine for converting human powered reciprocating leg or arm motion to rotary motion comprising:

a. a frame;
b. a rotatable member mounted for rotation on said frame;
   c. a flexible stranded elongated member having a thickness substantially less than its width and having an end connected to said rotatable member and spirally wound upon itself on said rotatable member;
d. a plurality of non-compressible members of increasing thickness arranged in side by side non-connected relationship and each individually attached to said elongated member along a portion of its length forming a segmented portion of tapering thickness which increase in thickness in proportion to the distance from the end connected to said rotatable member;
e. foot or hand receiving means engaging said elongated member; and



f. means connected to said frame and said rotatable member for rewinding said elongated member upon said rotatable member.

3,889,975
FRAME FOR BICYCLES, MOTOR BICYCLES AND THE LIKE

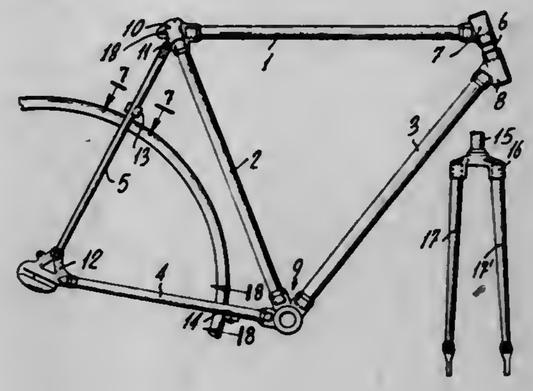
Lodovico Falconi, Via Ca Pisani, 13, Padova, Italy

Filed Mar. 28, 1974, Ser. No. 455,552

Claims priority, application Italy, Oct. 18, 1973, 41667/73

Int. Cl. B62k *11/02*

U.S. Cl. 280—281 **9 Claims**



1. A frame for bicycles, motor bicycles and the like to which a fork for a front wheel connected to a handle bar as a steering member may be pivoted, and to which a fork for a rear wheel may be made fast, said frame comprising a plurality of angle connecting elements having internal screw threads; a plurality of tubular elements having internal screw threads at each end thereof and having external screw threads at each end thereof threaded in said angle connecting elements internal screw threads in interconnecting the plurality of tubular elements together; and a plurality of inner strengthening elements screw threaded in said plurality of tubular elements internal screw threads.

3,889,976
TRACTOR UNIT FOR AN ARTICULATED VEHICLE

Ronald M. Jesswein, Berrien Springs, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

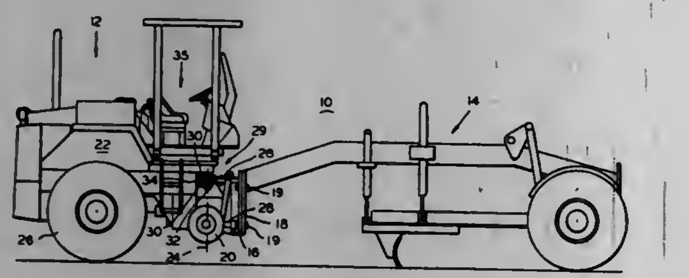
Filed Mar. 21, 1974, Ser. No. 453,230

Int. Cl. B60d *1/00*

U.S. Cl. 280—400 **3 Claims**

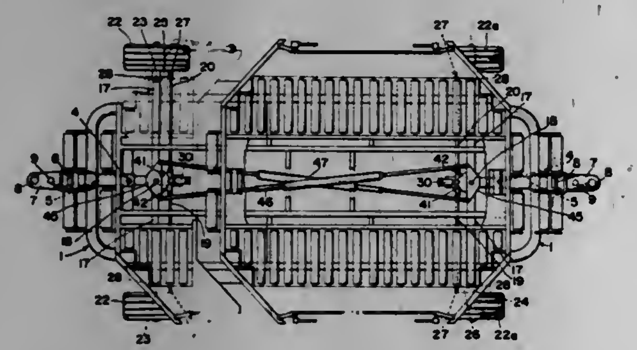
1. A tractor unit for a vehicle comprising a body portion, a pair of drive wheels supporting the said body portion, a connection portion located at one end of the said body portion and having a pivotal connection about a vertically disposed axis to the body portion, retractable auxiliary wheels on the connection portion for partially supporting the tractor unit

when it is not coupled to an implement unit, means on the said connection portion for detachably connecting an implement unit to the said tractor unit, and thus by virtue of the said pivotal connection forming an articulated vehicle, and continuously effective means for selectively providing different maximum angles of articulation for such vehicle as required for various implement units, the said means comprising stop members carried by one of the said portions and arranged to contact rigid abutments on the other said portion to limit the pivotal movement between the said portions, means for adjusting the said stop members to different positions whereby to limit the said pivotal movement to different predetermined angles from the straight ahead position, and each said stop member comprising a rigid structure detachably but rigidly secured to the said one portion.



3,889,977
TRAILERS

Yoshiharu Nakawaki, Osaka, Japan, assignor to Kabushiki Kaisha Suehiro Sharyo Seisakusho, Osaka, Japan
Filed Dec. 7, 1973, Ser. No. 423,374
Int. Cl. B62d *53/00*
U.S. Cl. 280—408 **4 Claims**



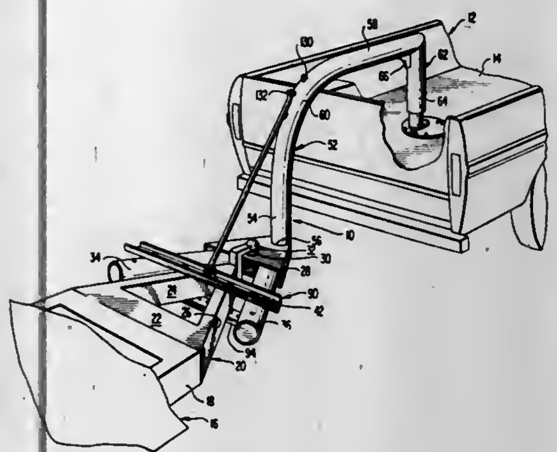
1. A trailer comprising, a frame, couplers connected rotatably in a horizontal plane to said frame, swingable members connected rotatably in a horizontal plane to said couplers respectively, axles supported by said swingable members, guide means fixed to said axles respectively and having arcuate guide surfaces, control means provided with said swingable members and each having a guide roller engaging resiliently with said arcuate guide surface to control the rotation of said couplers, and adjusting screws provided with said control means to adjust a force applied to said guide rollers.

3,889,978
REMOVABLE GOOSENECK HITCH

Jerry Albert Kann, Rte. 2, Box 470, Roswell, N. Mex. 88201
Filed May 31, 1974, Ser. No. 474,906
Int. Cl. B62d *53/04*
U.S. Cl. 280—415 B **3 Claims**

1. Hitch means for interconnection of a towed vehicle and a towing vehicle comprising:

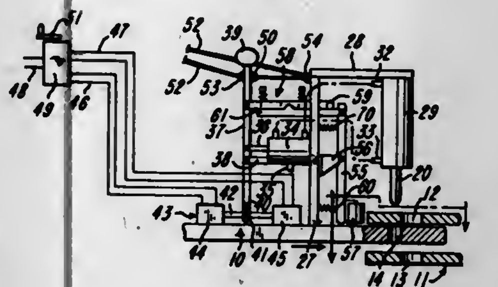
forwardly projecting tongue means on the towed vehicle, said tongue means having a first socket member thereon;
means securing a vertically extending second ball member on the towing vehicle;
a pair of hitch body portion arms, each having a forward end and being adjacent to one another at said forward ends;
mounting plate means fixedly secured over said forward ends of said body portion arms, the mounting plate means having a vertically extending first ball member thereon;
clamp means extending across said body portion arms and said tongue means and clampingly engaged thereagainst, the first socket member being engaged over the first ball member;
a gooseneck having a first upward portion extending from the mounting plate means and a second forwardly extending portion;



a vertical column assembly on the second portion of the gooseneck, said column assembly having a second socket member thereon;
the second socket member being engaged with the second ball member;
the tie rod means extending between the gooseneck and the clamp means;
the body portion arms having a series of substantially vertical openings therein;
the clamp means comprising upper and lower cross bars with a series of spaced holes formed therein; and
changeable fasteners extending through the holes in the upper cross bar and the openings in the body portion arms, and through aligned holes in the upper and lower cross bars adjacent the tongue means.

3,889,979
AUTOMATIC HITCHING DEVICE

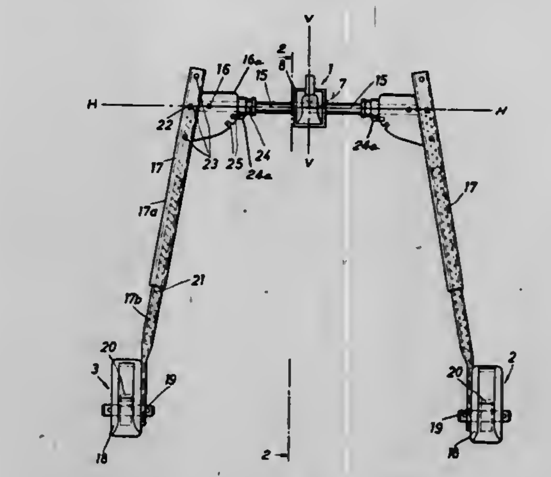
Gregory E. Schmiesing, R.R. No. 1, New Bremen, Ohio 43107
Filed Nov. 21, 1973, Ser. No. 417,820
Int. Cl. B60d *1/10*
U.S. Cl. 280—446 R **23 Claims**



1. A hitch mechanism for use in the releasable connection of one mobile unit to another comprising coupling means in connection with said one mobile unit having at least two positions of adjustment in one of which said coupling means is adapted to positively engage a portion of the other of said mobile units so that movement of one unit will induce the movement of the other, means for effecting a powered operation of said coupling means, and control means for said powered operating means including triggering means, remote from said coupling means, operable to induce a selected position of adjustment of said coupling means.

3,889,980
THREE-POINT ATTACHMENT DEVICE PARTICULARLY FOR A TRACTOR

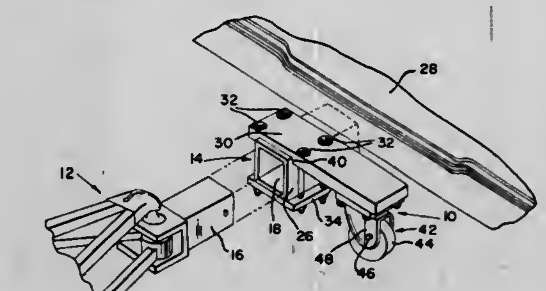
Hubert Geisthoff, Dohmar, Donrath, Germany, assignor to Jean Walterscheid GmbH, Lohmar, Rhineland, Germany
Filed Mar. 13, 1974, Ser. No. 450,876
Claims priority, application Germany, Mar. 13, 1973, 23123800
Int. Cl. B60d *1/16*
U.S. Cl. 280—461 A **18 Claims**



1. A three-point hitch for tractors comprising an upper guide member of variable length including a carrier member, cross bars mounted on said carrier member, a pair of lower guide members below said upper guide member, linkage means pivotally connected to said cross bars for interconnecting said upper and lower guide members, coupling hooks on each of said lower guide members and said carrier member, and said linkage means including means for resiliently supporting said upper guide member in spaced but relatively moveable relationship to said lower guide members.

3,889,981
TRAILER HITCH CONNECTION PROTECTOR

Grimes Westford, 1935 10th Ave., Apt. 303, Oakland, Calif. 94606
Filed Aug. 28, 1974, Ser. No. 501,289
Int. Cl. B60d *1/12;* **B60r** *19/00*
U.S. Cl. 280—507 **5 Claims**

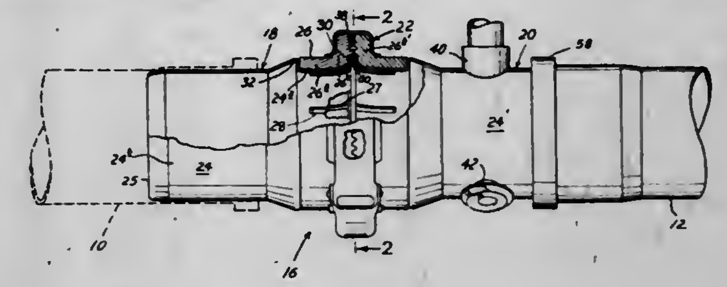


1. Vehicle trailer and trailer hitch protector preventing trailer and trailer hitch near the point of connection from touching the vehicle riding surface comprising:

a. a support member secured in the vicinity of the tractor-trailer hitch connection such that said support member does not interfere with the accomplishment of the connection and disconnection of the trailer and trailer hitch; and
b. wheel mounting means rotatably mounted on said support member for a rotation about a vertical axis and including a wheel rotatably mounted about a horizontal axis such that at least a portion of said wheel always extends below the lowest point of the vehicle trailer-trailer hitch connection.

3,889,982
PIPE COUPLER

Harold K. Trunnell, 3520 Knob Hill Ln., Eugene, Oreg. 97405
Continuation-in-part of Ser. No. 231,636, March 3, 1972, abandoned. This application Apr. 23, 1973, Ser. No. 353,593
Int. Cl. B05b *15/00*
U.S. Cl. 285—5 **4 Claims**



1. The combination of
a pair of axially aligned aluminum pipe sections,
a steel tubular member for each pipe section having one end snugly fitted within an end of its associated pipe section and an opposite end protruding outwardly from the pipe section,
a collar member mounted on each tubular member including an annular rim portion concentric with and snugly encompassing the said opposite end of the tubular member and an annular flange portion joined to the rim portion radiating outwardly from an end of said rim portion, said flange portion having a face lying in a plane normal to the axis of the rim portion with torque-transmitting elements presented thereon, said faces of the collar members for the two pipe sections being in oppositely disposed relation,
indent-detent means on each tubular member and its associated collar member mechanically securing the two for the transmission of torque between them, said indent-detent means comprising a plurality of channels provided along the inner surface of the rim portion, said channels extending axially from one end of the rim portion to a location intermediate said one end and the opposite end, and ridges formed in the tubular member fitting within said channels,
each tubular member having a turned over lip at its said opposite end turned over an end of its associated rim portion, the lips of the two tubular members being in oppositely disposed relation, each tubular member further having an annular shoulder formed therein abutting the opposite end of its associated rim portion,
and a clamp encircling the annular flanges of the two collar members detachably locking them together.

3,889,983
ROTARY FLUID JOINT

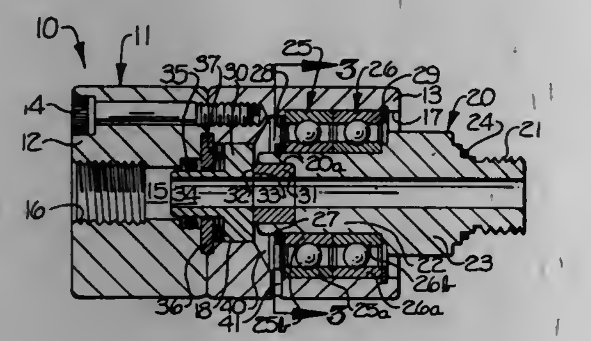
Ronny G. Freize, Gastonia, N.C., and George R. Ferguson, Clover, S.C., assignors to Duff-Norton Company, Charlotte, N.C.
Filed Apr. 15, 1974, Ser. No. 460,982
Int. Cl. F16l *55/00*
U.S. Cl. 285—13 **9 Claims**

1. A rotary fluid joint comprising
a housing having a passageway therethrough for the flow of pressurized fluid,
a conduit having an inner end portion thereof mounted within said housing in fluid communication with said passageway,
bearing means mounted in said housing and surroundingly engaging said conduit permitting rotational movement of the conduit in said housing,

sealing means positioned within said housing and cooperating with the housing and the inner end portion of said rotatable conduit preventing substantial leakage of pressurized fluid between the conduit and the housing,

substantially flat, circular disk slinger means in said housing mounted on said rotatable conduit against relative movement thereto, said slinger means surroundingly engaging and extending radially outwardly from said conduit for deflecting radially outwardly from said conduit and away from said bearing means such fluid as may leak past said sealing means to thereby protect the bearing means from contact by the fluid, and

said housing having at least one vent hole in said housing generally aligned with said circular disk slinger means receiving the radially deflected fluid and permitting drainage thereof from the housing.



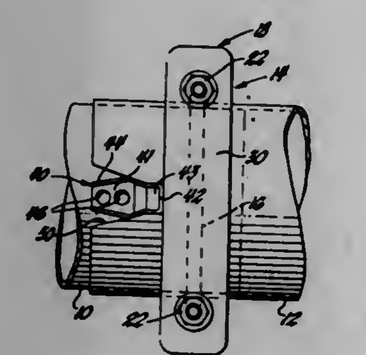
3,889,984
INTEGRAL KEY-CLAMP FOR EXHAUST PIPES

Theodore Lambiris, West Bloomfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 5, 1974, Ser. No. 494,503

Int. Cl. F16l *21/06*

U.S. Cl. 285—27 **4 Claims**



1. A male pipe, female pipe and clamp assembly including, a female pipe having a generally axially directed slot opening through the wall thereof extending from one end thereof, a male pipe having one end telescopically received in said female pipe a first predetermined axial distance, a clamp encircling the female pipe, said clamp including a U-bolt means and a saddle in engagement with said U-bolt means, a key means fixed at one end to said saddle and at its other end to said male pipe, said key means being fixed to said male pipe a second predetermined axial distance inboard of said one end of said male pipe, said key means being slidably received in said slot opening in said female pipe whereby said female pipe is fixed against rotation relative to said male pipe and fastener means associated with said U-bolt means and said saddle for constricting said clamp around said female pipe.

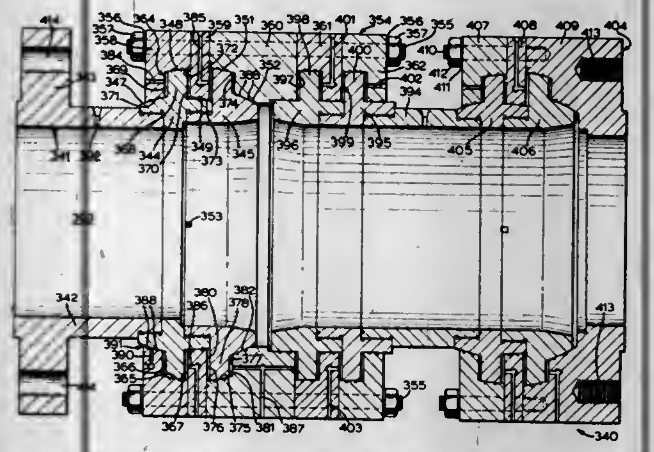
3,889,985
PRESSURE COMPENSATED EXPANSION JOINT

Hans Gartmann, Trenton, N.J., assignor to Swiss Corporation Limited, Willowdale, Canada

Continuation-in-part of Ser. No. 327,456, Jan. 29, 1973, abandoned, which is a continuation of Ser. No. 76,151, Sept. 28, 1970, abandoned. This application Feb. 2, 1973, Ser. No. 328,923

Int. Cl. F16l *27/06*

U.S. Cl. 285—95 **7 Claims**



1. A compensated expansion joint for high pressure piping comprising:

first and second fluid conductors arranged in communication with each other to provide a fluid passage,

means providing a seal permitting sliding of said conductors relative to each other in the direction of flow, but preventing the escape of fluid at the connection between them,

means providing a plurality of expansible chambers each having first and second relatively movable parts,

means providing a direct pressure relationship between said fluid passage and the interior of the chambers,

means fastening the first conductor to said first part of each of said plurality of expansible chambers and means fastening the second conductor to said second part of each of said plurality of expansible chambers so that said conductors are pulled toward each other as the expansible chambers expand.

3,889,986
HOSE COUPLING

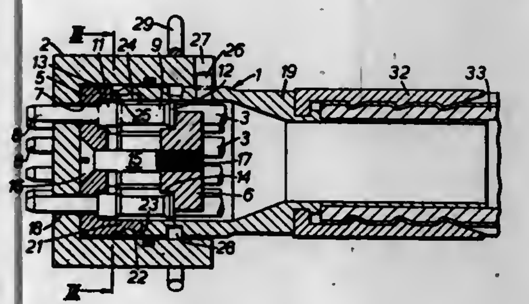
Keith Cheshir, and Peter Farr, both of Cheltenham, England, assignors to Dowty Mining Equipment Limited, Tewkesbury, England

Filed Oct. 2, 1972, Ser. No. 293,947

Claims priority, application United Kingdom, Oct. 1, 1971, 45780/71

Int. Cl. F16l *39/00*

U.S. Cl. 285—137 R **10 Claims**



1. A two part coupling, each part having a plurality of fluid carrying passageways, a plurality of joints each comprising a spigot member and a socket member, the parts being assembled together with each passageway of one part being associated and in alignment with a corresponding passageway of the other part, each passageway in one part carrying a joint member for co-operation with a joint member carried by the corresponding passageway in the other part, hoses secured to one coupling part forming extensions of the fluid carrying passageways therein, said one coupling part comprising a pair of circular flanges secured together in spaced relation and a plurality of recesses formed in each flange, said recesses receiving and retaining the hoses and ferrules attached one to each hose and located between the flanges, said ferrules locating the hoses in a predetermined arrangement about the periphery of said flanges, said joint members of said one part being directly secured to said ferrules so as to be in communication with fluid in said hoses.

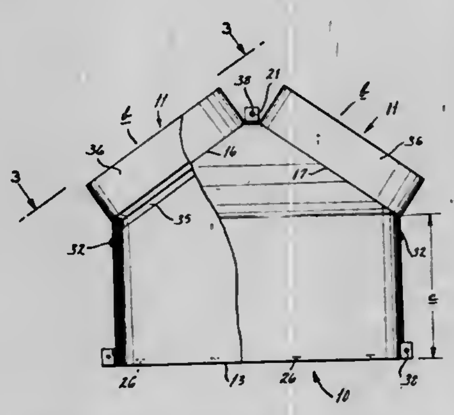
3,889,987
SHEET METAL "Y" ADAPTOR FOR DUCTS

Sadik S. Imral, St. Louis, Mo., assignor to Intertherm, Inc., St. Louis, Mo.

Filed Dec. 4, 1974, Ser. No. 529,277

Int. Cl.² F16L *41/00*

U.S. Cl. 285—155 **4 Claims**



1. A "Y" adaptor for dividing duct flow, from an entrant opening of larger cross-section to two diverging exit openings of smaller cross-section, comprising

an adaptor body having

two similar body pieces formed from bendable flat sheet metal, each being bounded by edges including

a flow entrant edge whose length equals half the perimeter of such larger opening exclusive of an overlap provision, two side edges extending from the flow entrant edge approximately at right angles, whereby to establish a length along the adaptor body side to a point of divergence,

a pair of symmetrical, concavely arcuate edges, each having a length substantially equal to half the perimeter of such exit opening,

the said arcuate edges extending from said side edges progressively further from the entrant edge and convergingly adjacent to each other to form a tab portion,

each tab portion so formed having a securement provision at its outstanding end,

the body pieces having means adjacent to their side edges to secure them overlappingly,

whereby on bending said body pieces to bring their side edges and tab portions curvedly to a common plane, and on securing the securement provisions of the tab portions to each other and securing the side edges at such plane, an adaptor body is formed having such entrant and exit openings.

3,889,988
PLASTIC ORIFICE INLET EXTENSION MEANS

Michael E. Wendt, Tyler, Tex., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 11, 1974, Ser. No. 432,496

Int. Cl. F16l *33/00*

U.S. Cl. 285—239 **3 Claims**

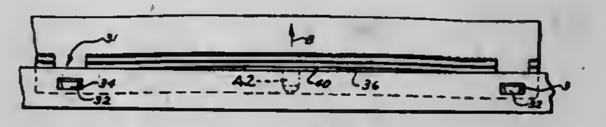
1. A fan orifice means arranged in a dividing wall comprising:

a flange member formed integral with said wall and extending axially therefrom to provide a radial surface circumferentially disposed around said orifice;

an extension member of dissimilar coefficient of expansion than said flange member including a radial wall having a portion telescopically arranged on said radial surface for axially extending said fan orifice;

a lip on one of said members defining a plane perpendicular to the central axis of said orifice engaging the other of said member thereby axially positioning said extension memkber on said flange member;

latching means including tab means spaced circumferentially on one of said members engaging slot means on the other of said members thereby maintaining the other of said members in engagement with said lip in said plane; a plurality of circumferentially spaced projections extending longitudinally from said plane on one of said members intermediate said latching means being interposed between said lip and the other of said members axially holding a portion of said extension member longitudinally out of said plane a distance sufficient to axially distort said portion of said extension member relative to said plane and place said extension member in axial tension;



a plurality of cam means spaced circumferentially on one of said members projecting between said radial wall and said radial surface radially spacing a portion of said radial wall from said radial surface a distance sufficient to cause the other portion of said radial wall into forceable contact with said radial surface thereby radially distorting said extension member relative to said flange member and placing said extension member in radial tension whereby said extension member is held in tension radially and axially relative to said flange member to maintain said latching means engaged during expansion of one of the members relative to the other.

3,889,989
PIPE COUPLINGS

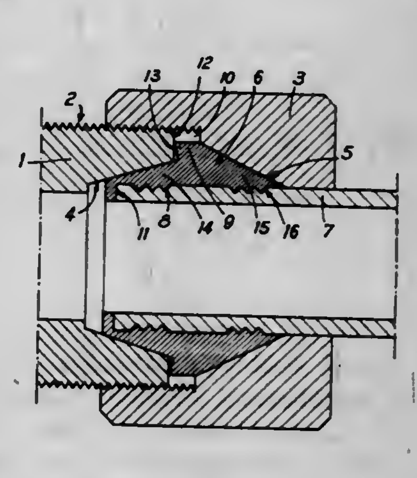
Andre Legris, St.-Maur, France, assignor to Societe d'Exploitation des Brevets OCLAUR, Nantes, France

Filed May 2, 1974, Ser. No. 466,269

Claims priority, application France, May 9, 1973, 73.16776; June 8, 1973, 73.21132

Int. Cl. F16l *19/02*

U.S. Cl. 285—341 **10 Claims**



1. In a high pressure coupling comprising:

a first rigid body having a face end and an opposite end and a bore extending from one of said ends to the other, a portion of said bore having a conical surrounding surface which tapers from a first predetermined diameter at said face end to a smaller diameter at a predetermined distance from said face end and said face end having a face surface extending radially outwardly from and around said bore,

a second rigid body for securing an end portion of a pipe having a plurality of axially spaced, peripherally continuous, peripheral grooves in said end portion to said first rigid body, said second rigid body having a face end for facing said face end of said first rigid body and an opposite end and a bore extending from said face end of said second rigid body to said opposite end thereof, a portion of said last-mentioned bore having a conical surrounding surface which increases from a first diameter substantially equal to the outer diameter of said end portion of said pipe to a second larger diameter in the direction from said opposite end of said second rigid body to said face end of the latter, and

means for securing said second rigid body to said first rigid body including means for forcing one said body toward the other,

the combination therewith of:

a sealing ring for mounting intermediate said first and second rigid bodies and sealing said bodies to said pipe, said ring having an axially extending bore of a diameter substantially equal to said first diameter of said bore of said second rigid body, having first and second, conical and oppositely tapering outer surface portions and an intermediate outer surface portion intermediate said first and second outer surface portions, said latter portions decreasing in diameter from said intermediate surface portion in directions away from the latter and the tapers of said first and second outer portions corresponding respectively to the taper of said conical surrounding surface of said first rigid body and to the taper of said conical surrounding surface of said second rigid body, said intermediate surface portion, at least at the end thereof nearer said first outer surface portion, having a diameter greater than said first predetermined diameter of said conical surrounding surface of said first rigid body and being connected at said end thereof to said first outer surface portion by a sealing lip surface which extends generally radially and around said bore of said ring, said sealing lip surface portion having an axially protruding lip which extends circumferentially of said ring and which is spaced radially outwardly from said first outer surface portion to permit said lip to contact said face surface of said first rigid body prior to any contact of the radially inward remainder of said sealing lip surface portion with said face surface, and said sealing ring being made of a malleable metal to permit the inner surface of said bore thereof to be deformed and fill said grooves in said end portion of said pipe upon forcing of one said body toward the other by said forcing means.

3,889,990

ROTARY HOOK FOR THREAD-KNOTTING MACHINES

Pietro Messa, via Manzoni, 13-Salo' (Brescia), Italy

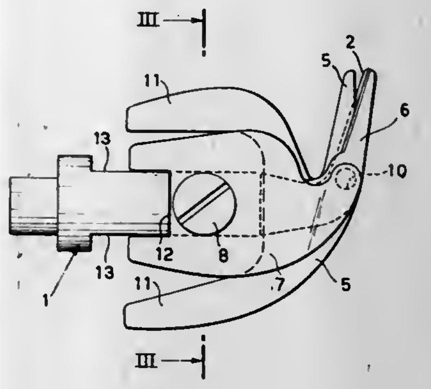
Filed June 13, 1974, Ser. No. 479,266

Claims priority, application Italy, June 15, 1973, 21671 B/73[U]

Int. Cl. B65h ***69/04***

U.S. Cl. 289—5 **5 Claims**

1. A rotary hook for thread-knotting machines, characterized in that it comprises, in combination, a stalk, integrally with which a hook portion is formed, there being a depressed portion in said stalk to give seat in succession to a spreader washer, an oscillatory blade with cam-follower rear extensions, a stationary blade and a supporting plate, fastening means being provided to put the whole assembly together



3,889,991

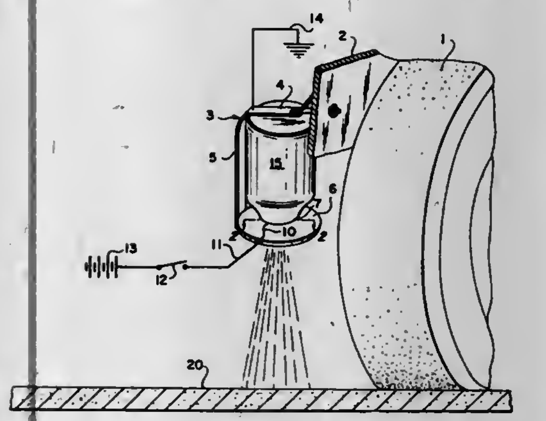
PRESSURIZED AUTOMOTIVE SANDING DEVICE

John Kent Hewitt, West Hartford, Conn., assignor to John Kent Hewitt, West Hartford, Conn.

Filed June 3, 1974, Ser. No. 475,935

Int. Cl. B60b ***39/10;*** **B61c** ***15/10;*** **B67b** ***7/00***

U.S. Cl. 291—1 **9 Claims**



1. A device for increasing the traction between a motor vehicle wheel and a driving surface, comprising; a sealed container containing therein a fluent abrasive material and means for producing a gas pressure within said sealed container substantially above that of atmospheric pressure; said sealed container having a discharge opening and a plug blocking and sealing said discharge opening; said plug being normally solid and meltable at a predetermined temperature above ambient; means for mounting said sealed container adjacent a wheel of the vehicle and for positioning the opening to direct the abrasive material toward the traction surface in front of the wheel, with respect to the normal driving direction, when the abrasive material is discharged from the opening after melting and removal of said plug; electrical heating means for rapidly heating said plug above said predetermined temperature and melting said plug so as to permit the abrasive material and high pressure gases to be dispensed through said opening when energized; and means for selectively energizing said electrical heating means.

3,889,992

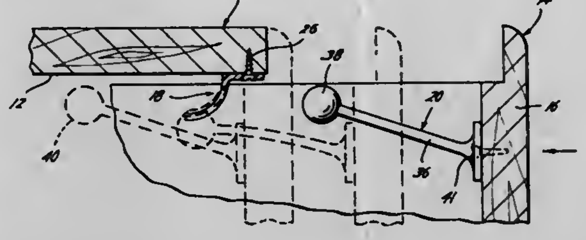
LATCH ASSEMBLY

Billy George Shelton, Hutchins, Tex., assignor to Shur-Lok Manufacturing Co., Inc., Hutchins, Tex.

Filed Nov. 23, 1973, Ser. No. 418,260

Int. Cl.² E05C ***19/06***

U.S. Cl. 292—87 **2 Claims**



1. A latch assembly for use with a receptacle member having an access opening, a closure member, and means for supporting the closure member for movement along a predetermined path toward and away from said receptacle on the exterior thereof, said latch assembly releasably preventing more than minimum movement of said closure member from a closed position toward a fully opened position, said latch assembly comprising:

a stop member and a latch member,

said stop member comprising

a base portion, and

a pair of parallel, spaced-apart arcuate, resilient abutment portions depending from said base portion and extending over an arc of from about 45° to about 90°, the space between said abutment portions being greater at their depending ends than adjacent their point of attachment to the base portion, said latch member comprising

a base portion,

a resilient arm extending upwardly at an incline from said base portion, and

a latching lug with a circular surface on the end of said arm,

the diameter of said circular surface being greater than the space between said abutment portions and the width of said arm being less than the space between said abutment portions, and the radius of said circular surface being substantially less than the radius of the arc of the abutment portion whereby upon movement of said closure member toward said receptacle member said circular surface slides on and is cammed downwardly by said abutment portions until it passes the abutment portions, at which point the resiliency of the arm moves it upwardly into the space between the abutment portions, and whereby upon movement of said closure member away from said receptacle member the circular surface engages the arcuate abutment portions to stop such movement of the closure member.

3,889,993

SAFETY LOCK FOR ENCLOSURES

William L. Bright, 0605 S.W. Curry St., Portland, Oreg. 97201

Division of Ser. No. 230,223, Feb. 29, 1972, Pat. No. 3,791,683. This application Dec. 3, 1973, Ser. No. 421,448

Int. Cl. E05c ***19/08***

U.S. Cl. 292—251 **3 Claims**

1. An enclosure with a double safety lock comprising

a. an upright support member,

b. an enclosure,

c. means supporting said enclosure on said support member,

d. said upright support member and enclosure being disposed with portions thereof in vertical overlapping relation,

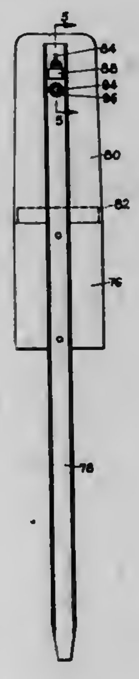
e. an outwardly extending eye member on said enclosure disposed in an overlapping portion of said support member and enclosure,

f. a slot in said support member arranged to receive said eye member therethrough,

g. said eye member in projecting through said slot being arranged to receive an exterior locking device for providing a first lock connection between said support member and enclosure,

h. and a bolt extending through said support member,

i. said bolt having head engagement with said support member and threaded engagement with said enclosure to provide a second lock connection between said support member and enclosure,



j. the head of said bolt being of non-conventional shape whereby to be capable of rotation only by a special tool and thus non-removable by unauthorized persons,

k. the said support member against which said bolt head is engaged including a protective wall portion peripherally surrounding said bolt head and open at the outer end,

l. said wall portion defining a socket which is at least as deep as the thickness of the bolt head to prevent side engagement of the bolt head by unauthorized persons and which is of greater diameter than said bolt head by unauthorized persons and which is of greater diameter than said bolt head to permit removal of the bolt by a special tool inserted through the open end of the protective wall portion.

3,889,994

REBOUND CONTROL FOR ENERGY ABSORBER UNIT

Ralph W. Edwards, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

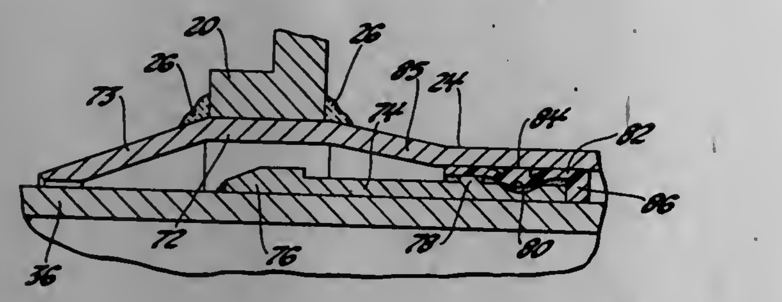
Filed Aug. 23, 1973, Ser. No. 390,751

Int. Cl. B60r ***19/06***

U.S. Cl. 293—85 **4 Claims**

3. An energy absorbing mounting unit for a bumper assembly of an automotive vehicle comprising inner and outer cylinders, support means mounting said inner cylinder for telescoping movement with respect to said outer cylinder between an extended position and a retracted position, primary control means operatively disposed in said cylinders for absorbing the energy of an impact force imparted to said bumper assembly relatively moving said cylinders from said extended toward said retracted position, motor means operatively disposed in said cylinders for relatively moving said cylinders from said retracted position to said extended position in response to the release of the impact force from said bumper assembly, stop means secured to said inner cylinder for engaging an end portion of said outer cylinder to

establish said extended position of said cylinders, annular elastic sleeve means carried by said stop means and [inner cylinder] operatively disposed between said inner and outer cylinders, said sleeve means having annular [outwardly extending] contact means extending radially outwardly therefrom, said outer cylinder having an inner wall which engages said contact means [for exerting] and exerts a deforming stress deflecting [to] said sleeve means radially inwardly in response to movement of said inner cylinder from said extended position so that the force of restitution of said sleeve means will exert a frictional drag load between said cylinders to reduce the return speed of said inner cylinder when moving from said retracted position to said extended position.



3,889,995

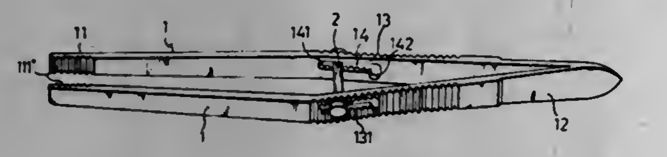
PINCHING TYPE CHOPSTICKS WITH LOCKING MEANS

Chun-Cheng Lin, Tainan, Taiwan, China, assignor to Chuan Chang Enterprise Corporation, Tainan, Taiwan, China

Filed Mar. 15, 1974, Ser. No. 451,539

Int. Cl. B25b *9/02*

U.S. Cl. 294—16 **1 Claim**



1. Pinching type chopsticks comprising two pinching members, one end of both pinching members being joined together and the other end being open, each pinching member having an inner and an outer face, L-shaped slots in each of said members, said slots having a long leg longitudinally disposed with respect to each respective member and with a short leg transversely disposed at the end of the long leg closest to the joined ends of said members, a pin slidably received within said slots and serving as a selective locking means, said pin having a diameter which is less than the slot width so that said pin can move under the influence of gravity within said slot, said pin having at each of its ends enlarged portions that are outwardly disposed with respect to the outer faces of the respective members, a zigzag formation on each of said outer faces adjacent said long legs of each slot, said formation being engageable with an associated enlarged portion of said pin as said pin is moveable within said long legs of said slots, whereby when the chopsticks are so disposed that said pin lies in said short leg the chopsticks are free for pinching and releasing movement and when the chopsticks are so disposed that said pin lies in said long leg said pin is slidable in a first direction of movement toward said open end of the chopstick to a position in said long slots as determined by the extent of the pinching movement and, at this position, said pin is restrained by the zigzag formation until there is additional pinching movement causing release of said pin and said pin is free to move, in a second direction of movement, toward said short legs.

3,889,996

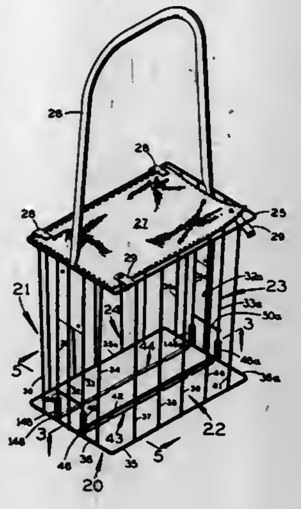
RETRIEVER

Thomas R. Campbell, 1305 Dewey St., Hollywood, Fla. 33020

Filed Jan. 17, 1974, Ser. No. 434,296

Int. Cl. A47f *13/06*

U.S. Cl. 294—19 A **16 Claims**



1. In a tennis ball pickup and storage device having a receptacle for holding a plurality of balls at one time, said receptacle having a grate-like bottom with substantially parallel, generally horizontal, substantially rigid, elongated members extending across it and spaced apart from each other by substantially less than the width of a tennis ball, the improvement wherein:

one or more of said members in the receptacle bottom is displaceable upwardly with respect to a neighboring member, when applied down against a tennis ball that is engaged between them, so as to increase its spacing from said neighboring member enough to permit said tennis ball to pass up between them into the receptacle; said upwardly displaceable member, after the passage of the tennis ball up into the receptacle, moving down to a position spaced from the neighboring member less than the width of a tennis ball so as to prevent the tennis balls in the receptacle from dropping between them out through the bottom of the receptacle,

said receptacle having opposite upstanding sides with spaced elongated members extending up from the receptacle bottom, and said one or more upwardly displaceable members being slidable upward along respective upstanding members on opposite sides of the receptacle when applied down against a tennis ball.

3,889,997

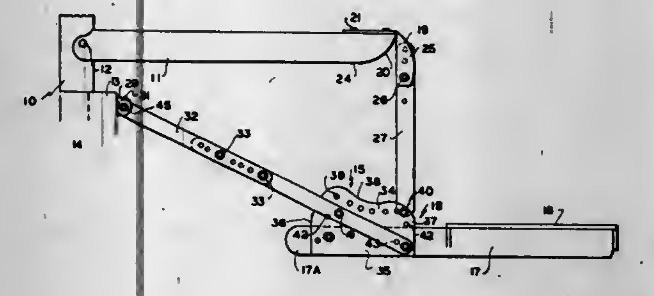
AUTOMATICALLY OPERATING TRUCK END GATE STEPS

Clarence E. Schoneck, Box 104, Gull Lake, Canada

Filed Feb. 25, 1974, Ser. No. 445,440

Int. Cl. B60r *3/02*

U.S. Cl. 296—62 **4 Claims**



1. An automatically operating step assembly for use on trucks having an end gate transversely hinged to the rear end of the truck body, by the lower transverse edge of the end gate, said truck having transverse support means below said end gate hinge; said step assembly moving from a usable position when said end gate is open, to a folded position when said end gate is closed; said step assembly comprising in combination first mounting means securable adjacent the upper edge of the end gate, second mounting means securable to said transverse support means of said truck, a transversely situated step member, plate means on each side of said step member, a pair of hanger straps each pivotally secured by one end thereof to said first mounting means and each by the other end thereof to said plate means on each side of said step member, a pair of anchor straps each pivotally secured by one end thereof to said second mounting means and secured by the other end thereof to said plate means on each side of said step member, said step member including a pair of spaced and parallel side members and a step component spanning the front portions of said side members transversely said plate means on each side of said step member comprising a plate being secured to each side of said side members rearwardly of said step component and extending upwardly therefrom, said plate having a base and an inner end extending upwardly therefrom, and an outer end also extending upwardly from said base, and a top edge extending between said inner and outer ends, said inner end being longer than said outer end, and a plurality of apertures through said plate adjacent to said top edge lying in an arc which is concave relative to said top edge, said other ends of said hanger members being pivotally secured through any one of said apertures.

3,889,998

ADJUSTABLE DENTAL CHAIR

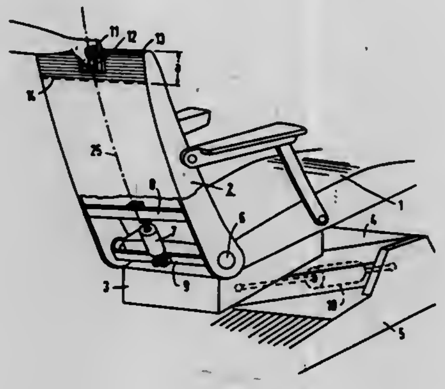
Rolf-Jürgen Welland, Lortzenbach, Furth, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 17, 1973, Ser. No. 407,259

Claims priority, application Germany, Oct. 21, 1972, 2251738; Aug. 2, 1973, 2339267

Int. Cl. A47c *1/04;* **A61g** *15/00;* **D6** *37*

U.S. Cl. 297—217 **6 Claims**



1. An adjustable dental patient's chair, comprising a seat and a back, means for adjusting said seat and said back, manually operated switching means operatively connected with said adjusting means for actuating them, said switching means comprising switch elements and actuating members connected with said switch elements for actuating them, said actuating members having substantially flat key surfaces on their actuating sides and being located in the middle part of the rear side of the upper portion of said back, which part is limited by the upper edge of said back and a limiting line located substantially by the length of 10 to 15 cm width below said upper edge.

3,889,999

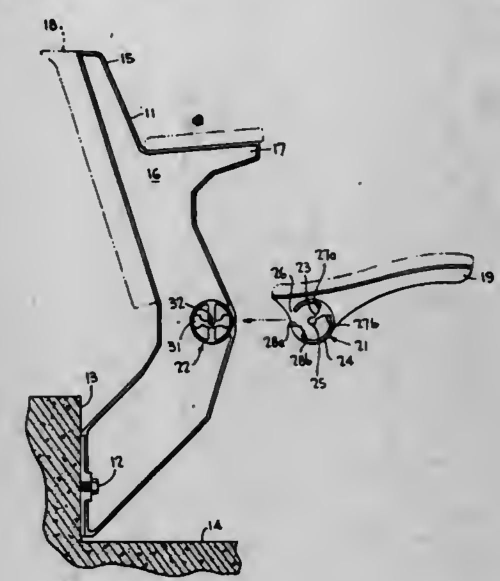
HINGED SEAT BOTTOM CONSTRUCTION

Charles Mackintosh, 3838 Oakwood Ave., Los Angeles, Calif. 90004

Filed May 29, 1974, Ser. No. 474,332

Int. Cl. A47c *1/12*

U.S. Cl. 297—248 **3 Claims**



1. A seat construction, comprising at least one pair of spaced uprights having armrests thereon and a seat back mounted thereto, a seat bottom extending between said uprights and being hingedly interconnected therewith, brackets on opposite sides of said seats, each said bracket having an opening and a pivot arm connected at one end within each said bracket, the free end of each said arm extending toward said bracket openings, a socket member on each said upright hingedly coupled with said brackets for supporting said seat bottom on said uprights, each said socket member including a bearing member having an upwardly open recess therein, cooperating stops on both said brackets and said socket members, said bracket openings permitting said seat bottom to be assembled in place between said uprights with said free ends of said pivot arms received within said recesses, and a first of said stops retaining said seat bottom in a substantial horizontal seating position while a second of said stops retains said seat bottom in a vertically raised position, said free ends of said pivot arms pivoting within said recesses between said positions.

3,890,000

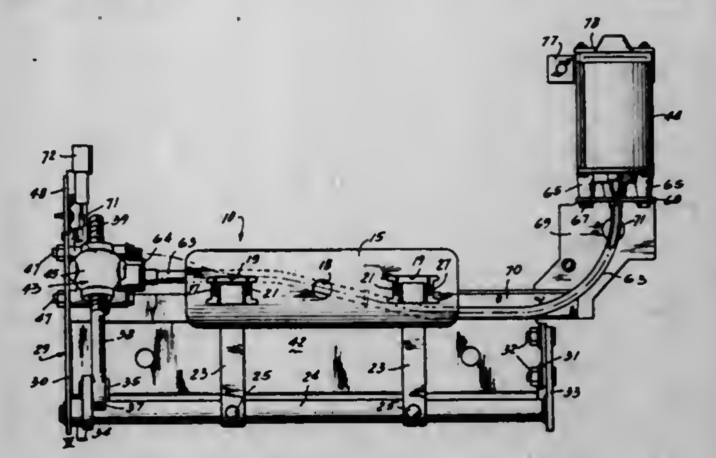
ADJUSTABLE LUMBAR AREA SUPPORT FOR VEHICLE SEATBACKS

Ronald V. Easley, Toledo, Ohio, assignor to Dura Corporation, Southfield, Mich.

Filed Dec. 3, 1973, Ser. No. 421,241

Int. Cl. A47c *3/00*

U.S. Cl. 297—284 **12 Claims**



1. In an adjustable lumbar area support for vehicle seatbacks including a frame carrying a rock shaft and arm means

connecting the shaft to a horizontally elongated lumbar support member in position at the lumbar area of a vehicle seatback in thrusting relation to and behind a flexible backrest of the seatback, the improvement comprising:

a lever arm corotatably fixed on said rock shaft;

an actuating rod pivotally but non-rotatably connected to said lever arm and projecting generally away from said backrest; and

means for selectively effecting push-pull reciprocal movement of said actuating rod, including a worm gear nut mounted in a fixed operating position on said frame and engaging threadedly with a portion of said actuating rod, there being a worm gear meshing with said nut and drivingly coupled with an electrical drive motor mounted on said frame.

3,890,001

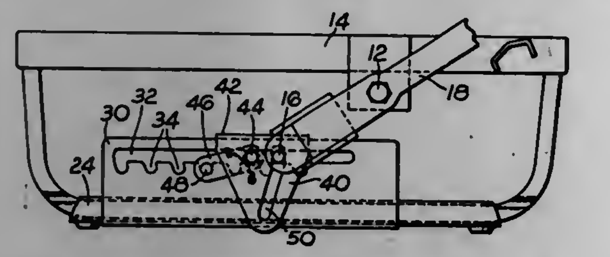
VEHICLE SEATS

Harold Roy Turner, Sutton Coldfield, England, assignor to H. R. Turner (Willenhall) Limited, Walsall, County of Stafford, England

Filed Jan. 2, 1974, Ser. No. 430,089

Int. Cl. B60n *1/02*

U.S. Cl. 297—341 **4 Claims**



1. A vehicle seat comprising a seat cushion frame mounted to slide forwardly and rearwardly in a fixed slide structure, a seat back hinged to said frame, which has an extension that projects beyond the hinge axis and carries a pivot that is mounted on said fixed structure, to cause the seat cushion frame to slide forwardly in said fixed structure when the seat back is folded forwardly from its normal position, wherein the improvement comprises an intermediate mounting plate which is provided with a single upwardly extending slot in which said pivot of the seat back extension is slidable and which is slidably mounted on said fixed structure for forward and rearward adjustment to determine the normal fore-and-aft position of the seat relative to the fixed structure.

3,890,002

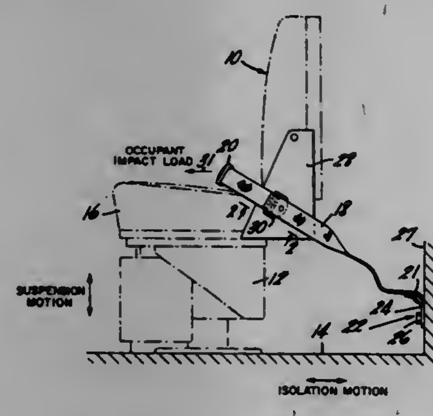
SEAT BELT ARRANGEMENT

Terry L. Warmskessel, Wescoesville, Pa., assignor to Mack Truck, Inc., Allentown, Pa.

Filed May 10, 1973, Ser. No. 359,190

Int. Cl. A62b *35/00*

U.S. Cl. 297—385 **10 Claims**



1. In a seat belt arrangement for a vehicle seat, at least a portion of which is movable relative to at least a portion of a vehicle structure, including a seat belt, and means anchoring the seat belt to the portion of the vehicle structure, the improvement comprising means releasably coupling the seat belt to the movable portion of the vehicle seat so as to provide slack in the seat belt between the anchoring means and the releasable coupling means to permit relative movement between the movable portion of the vehicle seat and the portion of the vehicle structure even when a portion of the seat belt is securely engaging an occupant of the seat, the portion of the seat belt adapted to engage an occupant of the vehicle seat being secured by the releasable coupling means to the movable portion of the seat under loads exerted on the seat belt up to a predetermined impact load, the releasable coupling means being adapted to release the occupant engaging portion of the seat belt, with the seat belt being unconstrained by any portion of the coupling means engaging the belt, in response to a load exerted on the seat belt exceeding the predetermined impact load so as to transfer the load on the seat belt from the movable portion of the vehicle seat to the anchoring means.

3,890,003

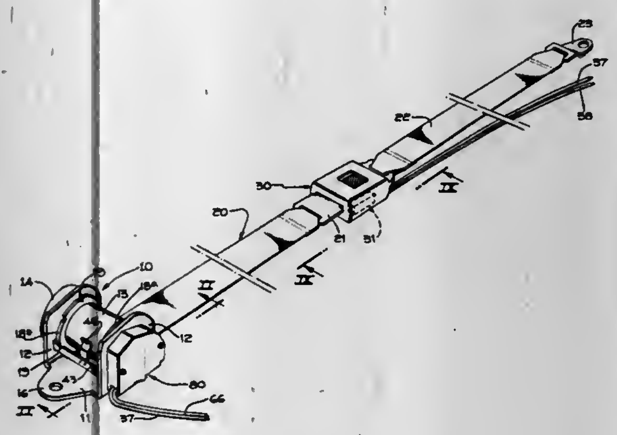
FREE PULL RETRACTOR

Albert R. Close, Sylmar, Calif., assignor to American Safety Equipment Corporation, New York, N.Y.

Filed May 9, 1974, Ser. No. 468,431

Int. Cl. A62b *35/00;* **B65h** *75/48;* **H01h** *3/16*

U.S. Cl. 297—388 **10 Claims**



1. A seat belt retractor comprising:

reel means for winding seat belt webbing therearound and reel locking pawl means movable between a first position whereby said pawl means permits unreeling of said webbing and a second position preventing unreeling;

blocking means associated with said reel movable between a blocking position whereby it prevents said locking pawl means from moving to its second position and an inactive position permitting said locking pawl means to move to its second position;

electromagnet means to hold said pawl blocking means in its blocking position on activation of said electromagnet means whereby said reel is free to reel and unreel until said seat belt is buckled, said electromagnet means when deactivated releasing said blocking means on said buckling to allow said locking pawl means to thereafter prevent unreeling of said reel; and

sensing means to sense when said seat belt is buckled and to deactivate said electromagnet.

3,890,004

BODY SUPPORT

Larry E. Rail, 1430 Wallace Ct., Pinole, Calif. 94564

Filed Jan. 16, 1974, Ser. No. 433,748

Int. Cl. A47c *7/50*

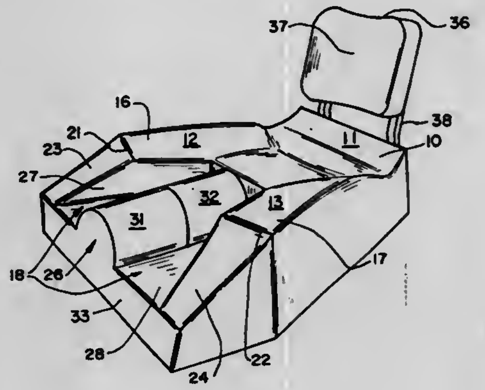
U.S. Cl. 297—423 **7 Claims**

1. A body support comprising:

a first cushion portion having a top surface formed and dimensioned to receive and support the buttocks of a person when seated thereon;

a pair of laterally spaced second cushion portions contiguous to said first portion and extending in a normally forward direction therefrom and having top supporting surfaces substantially flush with said first portion surface and being dimensioned and positioned to support the user's thighs;

said portions defining a cavity for the user's feet when the user is sitting cross-legged on said support;



a third cushion portion positioned forwardly of said first portion and medially between said second portions and dividing said cavity into a pair of recesses for receiving the user's feet when the user is seated cross-legged on said support; and

the top surface of said third portion having an elevation receiving and supporting each leg crus when the user is seated in cross-legged position with the user's feet positioned in said recesses.

3,890,005

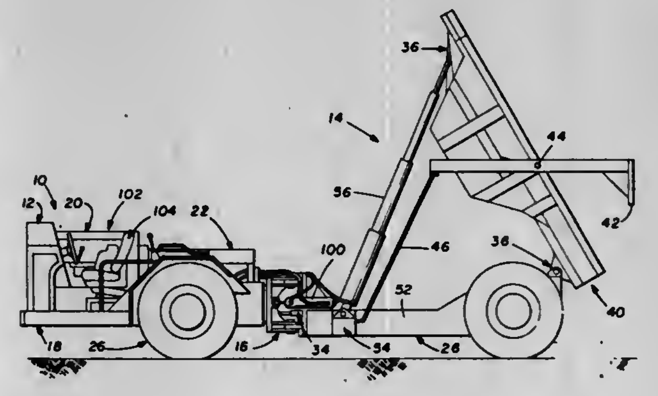
ARTICULATED FRAME MINE DUMPER

Gerald Bruce Sien, Carlsbad, N. Mex., assignor to Sien Equipment Company, Carlsbad, N. Mex.

Filed June 6, 1974, Ser. No. 476,930

Int. Cl. B62d *59/00*

U.S. Cl. 298—22 P **12 Claims**



1. An articulated frame mine dumper comprising:

a towing vehicle including a frame, an engine mounted on the frame, transmission means, and drive wheels supporting the vehicle for movement over a surface and operatively connected to the engine through the transmission means for propelling the vehicle;

a towed vehicle including a frame, wheels supporting the frame for movement over a surface, a dump body pivotally supported on the frame, and hydraulic cylinder means for selectively pivoting the dump body between material receiving and material dumping positions;

a subframe connected to the frame of the towed vehicle for pivotal movement about a vertical axis;

hydraulic cylinder means connected between a frame of the towed vehicle and the subframe and hence the frame of the towing vehicle to effect steering of the articulated frame mine dumper by selectively pivoting the frames of the towed vehicle and the towing vehicle with respect to each other about the vertical axis of pivotal movement of the subframe;

an outer pipe section secured to the frame of the towing vehicle and having a horizontal axis;

bushing receiving grooves formed in the interior of the outer pipe section at the extreme opposite ends thereof; an inner pipe section secured to the subframe and extending through the outer pipe section;

bushings received in the bushing receiving grooves of the outer pipe section for rotatably supporting the inner pipe section and for preventing relative angular displacement between the inner and the outer pipe sections;

a retaining ring secured to the exterior of the inner pipe section at the end thereof remote from the subframe for preventing relative axial displacement between the inner and outer pipe sections; and

thrust washers positioned between the subframe and the outer pipe section and between the outer pipe section and the retaining ring;

whereby the frame of the towing vehicle is permitted to pivot relative to the frame of the towed vehicle about a horizontal axis.

3,890,006

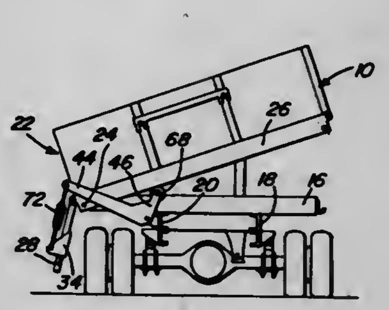
BEET DOOR OPERATOR

Orville E. Stockwell, 536 First Ave. South, Greybull, Wyo. 82426

Filed Dec. 7, 1973, Ser. No. 422,783

Int. Cl. B60j *1/04*

U.S. Cl. 298—23 D **10 Claims**



1. In combination, a side dumping vehicle of the type including a pair of opposite side longitudinal beams interconnected at points spaced therealong by means of transverse members extending therebetween, a load bed including a bottom wall interconnecting opposite side and end walls pivotally supported at opposite ends adjacent one of its side walls from corresponding ends of said transverse members for swinging of said load bed about aligned axes between an upright transport position and an inclined dumping position with the other side of said load bed elevated relative to said one side, the side wall extending along said one side of said load bed comprising a door and being pivotally supported from the latter for swinging of said door between a closed upstanding position and an open position with the upper marginal edge of said door swung outwardly and downwardly, an operator for said door, said operator including a pair of L-shaped levers including long upstanding arms and short horizontal arms, pivot means pivotally supporting said levers, at the juncture of the long and short arms thereof, from opposite end portions of the longitudinal beam adjacent said one side of said load bed for oscillation about generally aligned axes extending longitudinally of said load bed and with said short arms projecting toward the remote side of said load bed and said long upstanding arms spaced inwardly from the adjacent ends of said door, a pair of elongated tension members each having one end pivotally connected to the free end of a corre-

sponding end of said door at a point spaced above the axis of oscillation of said door and having the opposite end connected to the free end of the long arm of the lever associated therewith, the free end portions of said short arms having roller means journaled therefrom and displaced laterally outwardly therefrom to a position underlying the corresponding end marginal portion of said load bed with the upper peripheral portions of said rollers rollingly engaged with the adjacent undersurface portions of said end marginal edge portions of said load bed.

3,890,007
CHEMICAL MINING OF COPPER PORPHYRY ORES

Harold J. Heinen, Reno; Thomas G. Carnahan, Sparks, and Judith A. Eisele, Verdi, all of Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Feb. 7, 1974, Ser. No. 440,432
Int. Cl.² E21C *41/14*

U.S. Cl. 299—4 **8 Claims**

1. A process for extracting copper from a porphyry ore containing chalcopyrite which comprises:
   contacting said ore with a leach solution comprising an aqueous mixture of sulfuric acid and a salt chosen from the group consisting of sodium chloride, potassium chloride and ammonium chloride in the presence of free oxygen at a temperature above about 60°C for a time sufficient to dissolve chalcopyrite contained in said ore and to attain a pH of said leach solution of above about 0.5 but below about 3.0 thereby precipitating iron dissolved by said leach solution within the ore as a granular, crystalline jarosite having the formula $MFe_3(SO_4)_2(OH)_6$ wherein M is chosen from the group consisting of sodium, potassium and ammonium ions;
   separating spent, copper-containing leach solution from the ore, and
   recovering copper from the leach solution.

3,890,008
WHEEL RIM WITH TROUGH ACCOMMODATING BALANCING WEIGHT

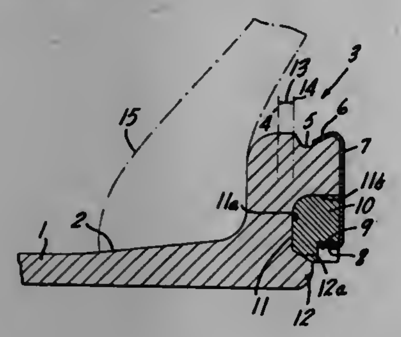
Daniel Lejeune, Clermont-Ferrand, France, assignor to Compagnie Generale des Establissements Michelin, raison sociale Michelin & Cie., Clermont-Ferrand (Puy-de-Dome), France

Filed June 17, 1974, Ser. No. 480,246

Claims priority, application France, June 20, 1973, 73.22599

Int. Cl. B60b *13/00*

U.S. Cl. 301—5 B **4 Claims**



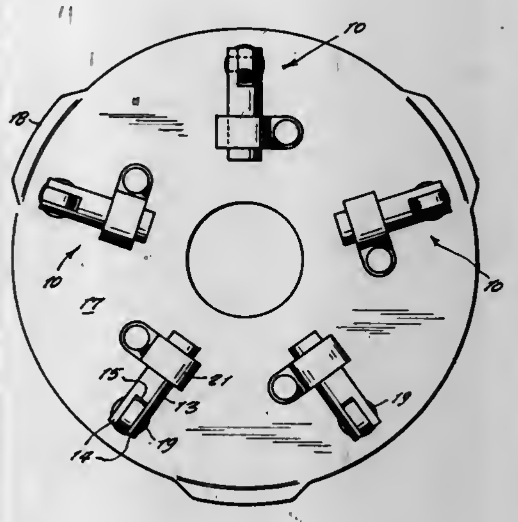
1. A wheel rim for mounting a pneumatic tire formed with tire beads and comprising a rim base extended on opposite sides by a bead seat and by a rim edge, at least one of the rim edges being intended to be equipped with a balancing weight secured by a fastener, characterized in that at least said one rim edge is widened axially and is formed on its radially outer periphery with a groove in a portion located beyond the zone of contact with the tire bead and on its axially outer periphery with a circumferential trough, the trough accommodating the weight and the groove providing anchorage for the radially outer end of the fastener.

3,890,009
EASY OFF WHEEL RETAINER

Thomas Hummel, 230 Mulberry Dr., Glenwood, Ill. 60425

Filed Oct. 3, 1973, Ser. No. 408,081
Int. Cl. B60b *3/14*

U.S. Cl. 301—9 DN **6 Claims**



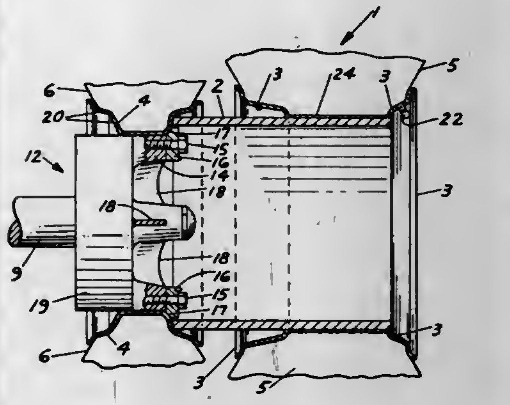
1. An easy off wheel retainer construction fixedly securing a wheel to a supporting automotive vehicle axle, the combination of a plurality of retainer means being mounted in an annular arrangement upon the end of a brake drum, said arrangement of retainer means being generally concentric with the central axis of said brake drum and the axle of the automotive vehicle, and,
   each of said retainer means including a lug secured to and projecting outwardly from said brake drum and a retainer member being pivotally attached to the end of said lug,
   said wheel including an outer rim and a wheel web extendable over each of said retainer members and lugs adjacent said brake drum,
   clamp means associated with each retainer means and mounted on said web whereby said clamp means is movable around said associated pivotal retainer member for holding same against the web to hold the wheel web on the brake drum.

3,890,010
FLOTATION/TIRE/ASSEMBLY

Curtis N. Dove, Jr., Bastrop, and Jimmie George, Merrouge, both of La., assignors to Flotation Trailer Trac, Inc., Bastrop, La.

Filed Apr. 12, 1973, Ser. No. 350,506
Int. Cl. B60b *15/26*

U.S. Cl. 301—52 **2 Claims**



1. A flotation tire assembly for removable mounting on the hub and drum assembly of a vehicle comprising:
   a. An essentially cylindrically shaped hub of fixed length;
   b. A flotation tire rim mounted on said hub;

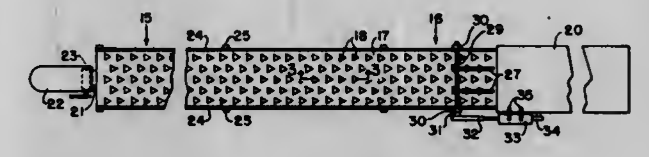
   c. A substantially low pressure flotation tire mounted on said flotation tire rim;
   d. A stabilizing tire rim mounted on said hub in essentially parallel relationship to said flotation tire rim;
   e. A substantially high pressure stabilizing tire having a smaller diameter then said flotation tire mounted on said stabilizing tire rim; and
   f. A hub assembly in cooperation with said stabilizing tire rim for releasably securing said flotation tire assembly to said hub and drum assembly.

3,890,011
SUPPLYING OBJECTS FROM AN AIR-FILM CONVEYOR RAPIDLY AND INTERMITTENTLY TO A MACHINE

Rudolph E. Futer, 1501 Park Ave., Emeryville, Calif. 94608

Filed July 10, 1972, Ser. No. 270,548
Int. Cl. B65g *51/00*

U.S. Cl. 302—31 **6 Claims**



1. An air-film conveyor for conveying articles thereon to a delivery point at the end thereof, comprising
   means defining an elongate conveyor table having a delivery end to which articles thereon are conveyed,
   means for providing a moving air film along the upper face of said conveyor table throughout the length thereof for both supporting articles thereon against gravity and continuously urging such articles in a downstream direction toward the delivery end of said conveyor table, and
   means for periodically stopping the downstream movement of articles on said conveyor table at a point adjacent said delivery end thereof,
   said elongate conveyor table including a downstream section adjacent said delivery end and extending throughout a selected length thereof upstream of said stopping means, and an upstream section extending throughout a length thereof upstream of said downstream section, and means for providing throughout said downstream section of said table a force urging articles thereon in a downstream direction greater than that of said upstream section,
   whereby the acceleration of articles from a stationary condition to a moving condition under the influence of such greater force is greater throughout said downstream section of said conveyor table than in said upstream section thereof.

3,890,012
HYDRAULIC BRAKES SYSTEM FOR MOBILE VEHICLES

Peter J. O'Toole, Newtown, Australia, assignor to International Harvester Company, Chicago, Ill.

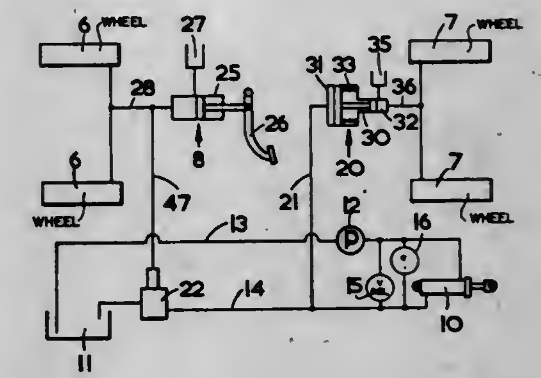
Filed Feb. 27, 1974, Ser. No. 446,173

Claims priority, application Australia, Mar. 5, 1973, 2477/73

Int. Cl.² B60T *13/16*

U.S. Cl. 303—6 R **4 Claims**

1. In a mobile vehicle having a hydraulic accessory system including a fluid return conduit; first and second pairs of vehicle supporting wheels including brakes therefor; a hydraulic pressure actuated main brake system means for operating the brakes of the first pair of wheels including operator actuated means for pressurizing the main brake system means and applying the brakes of the first pair of wheels; a hydraulic pressure actuated auxiliary brake system means for operating the brakes of the second pair of wheels including a hydraulic intensifier means having a low pressure side connected for communication to the return conduit and a high pressure side communicating with the auxiliary brake system for pressurizing same and applying the brakes of the second pair of wheels; a control valve means in the return conduit downstream of the point of connection of the intensifier means to the return conduit for varying the pressure in the return line upstream of the control valve means, the control valve means being pressure responsive and connected for communication to the main brake system means operable in response to pressurization of the main brake system means for operating the control valve to restrict the flow in the return conduit and increase the pressure in the low pressure side of the intensifier means for pressurizing the high pressure side and activating the brakes of the second pair of wheels.

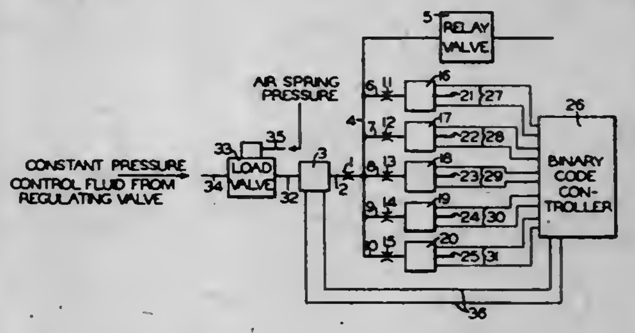


3,890,013
ELECTRICALLY CONTROLLED FLUID PRESSURE SYSTEM FOR CONVERTING DIGITAL CONTROL SIGNALS TO ANALOG SIGNALS

Ronald W. Coiner, Irwin, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Jan. 28, 1974, Ser. No. 436,851
Int. Cl. B60t *13/68*

U.S. Cl. 303—20 **12 Claims**



1. Apparatus for converting digital control pressure to analog control pressure to be transmitted to a vehicle brake control device operable responsively thereto, said apparatus comprising:
   a. a supply conduit pressurizable at a constant pressure and via which control fluid pressure may be supplied to the vehicle brake control device;
   b. a plurality of venting means connected to said supply conduit in parallel relation to each other; and
   c. operator controlled means for selectively effecting opening and closing said venting means, either singly or in any combination thereof, for establishing a desired analog control pressure in said supply conduit.

3,890,014
DIRECTIONALLY RESPONSIVE BRAKING SYSTEM

Edward J. Hayes, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed May 16, 1973, Ser. No. 360,822
Int. Cl. B60t *8/00*

U.S. Cl. 303—24 R **17 Claims**

1. A brake system including a pedal operated source of

pressurized fluid and at least one fluid operated brake on each lateral side of a vehicle,

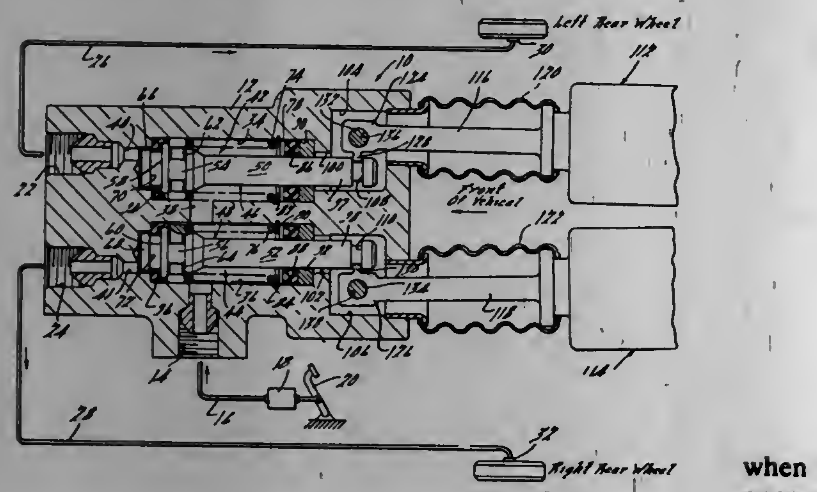
modulating valve means for performing a fluid modulating operation on the existing fluid pressure in said brake system and thereby varying the pressure to the brakes under preselected braking conditions, said modulating valve means comprising

a housing defining a fluid chamber communicable with one of said brakes and said source of pressurized fluid,

a proportioning piston reciprocally disposed in said chamber and having a first portion having the fluid pressure of said source acting thereon and a second portion having the fluid pressure of said brake acting thereon,

said piston being operable under the influence of said fluid pressure acting on said first and second portions thereof to move toward and away from a piston selectively blocking pressurized fluid from being communicated from said source thereof to said one brake, and thereby operate to modulate the fluid pressure supplied to said one brake, and

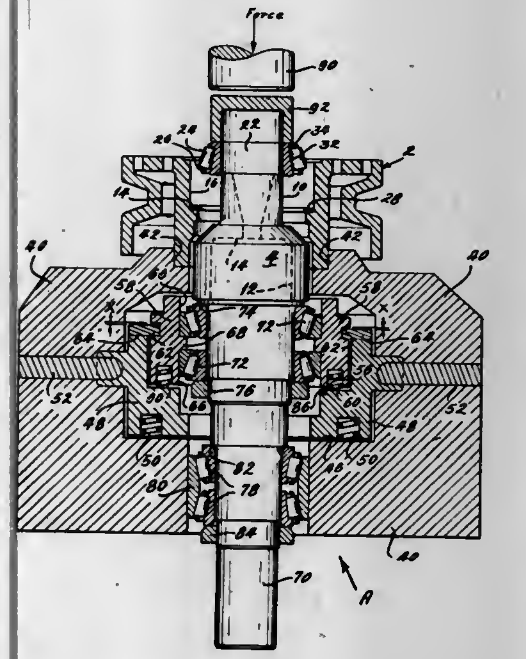
means responsive to a change in direction of the vehicle for altering the fluid modulating operation of said piston.



3,890,015
SINGLE ROW TAPERED ROLLER BEARING ASSEMBLY CAPABLE OF TAKING THRUST LOADING IN BOTH AXIAL DIRECTIONS AND METHOD OF ADJUSTING THE SAME

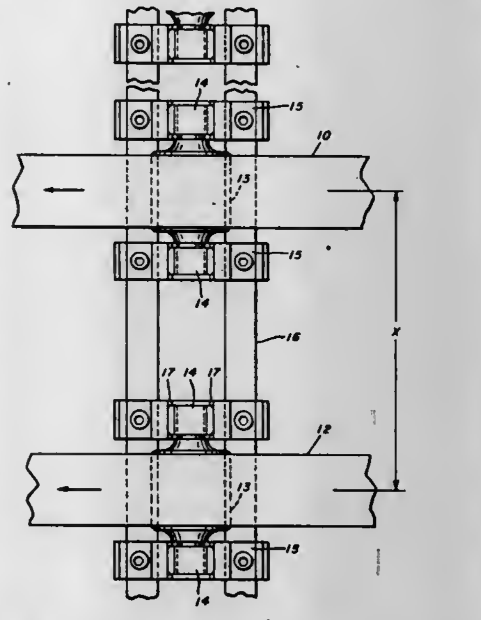
William E. Harbottle, North Canton, Ohio, assignor to The Timken Company, Canton, Ohio
Filed Jan. 16, 1974, Ser. No. 433,679
Int. Cl. F16c *29/12*
U.S. Cl. 308—1 R **10 Claims**

1. A process for adjusting a single row tapered roller bearing capable of taking thrust loading in both axial directions and including tapered rollers and inner and outer tapered confining surfaces for confining the rollers in the radial direction and end confining surfaces for confining the rollers in the axial direction, said process comprising: bringing the rollers into a condition of no end play with respect to at least one of the tapered confining surfaces and the end surface at the large diameter ends of the rollers whereby the rollers will bear firmly against those surfaces; holding one of the confining surfaces in a fixed axial position with respect to reference means located remote from the bearing; effecting movement in the axial direction between the inner tapered confining surface and the end confining surface at the large diameter ends of the rollers so as to cause the rollers to move out of the condition of no end play and into a condition of end play; thereafter moving one of the confining surfaces axially relative to another of the confining surfaces such that a force is transmitted through the rollers to cause still another of the confining surfaces to move in the axial direction relative to said another confining surface such that the relative movement brings the rollers closer to the condition of no end play, and terminating the relative movement between confining surfaces when the bearing adjustment measured at the remote reference means reaches a prescribed value.



3,890,016
BEARING CONSTRUCTION FOR IDLER ROLLS AND MAINTENANCE METHOD FOR IDLER ROLL BEARINGS

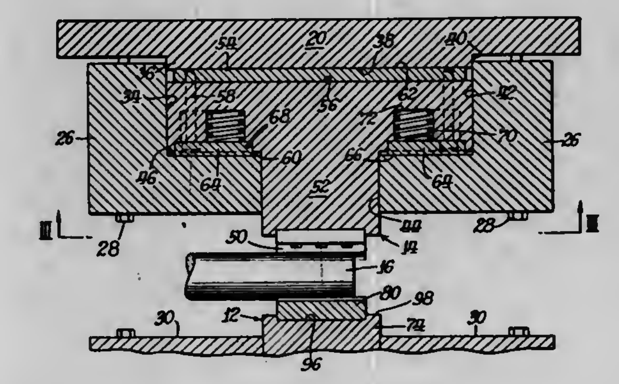
James T. Stull, Jackson Township, Butler County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.
Filed May 13, 1974, Ser. No. 469,263
Int. Cl. F16c *13/00*
U.S. Cl. 308—1 R **10 Claims**



1. In a combination which includes an idler roll, bearings having central openings in which said roll is journaled at each end, respective pillow blocks receiving said bearings, and means supporting said pillow blocks, and in which the surface of each bearing at which wear is concentrated lies within one quadrant of its central opening toward which the resultant force is applied as the roll carries a load, an improved construction in which said bearings have identical external dimensions, the exterior shape of each bearing being symmetrical with respect to horizontal and vertical planes, said pillow blocks having openings for receiving the bearings in four different positions, whereby the wear on the bearings is distributed among four areas through the life of the bearing.

3,890,017
MACHINE SLIDE ASSEMBLY

Donald F. Blue, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Division of Ser. No. 296,280, Oct. 10, 1972, Pat. No. 3,818,736. This application Feb. 1, 1974, Ser. No. 438,539
Int. Cl. F16c *29/00*
U.S. Cl. 308—3 A **1 Claim**

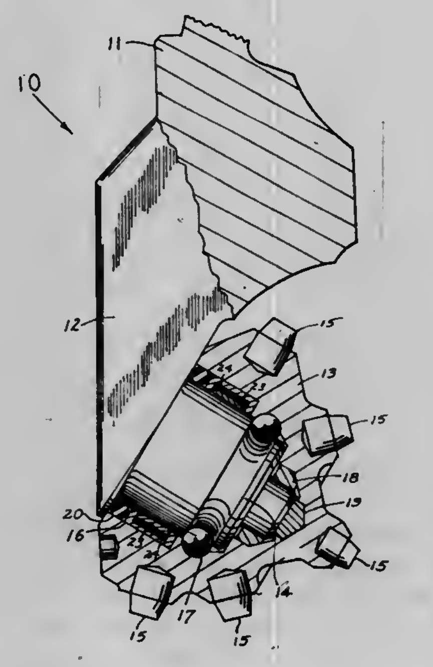


1. A machine slide assembly in a machine tool, comprising: a housing having upwardly facing spaced apart guide surface means defining a T-shaped elongated cavity,

a slide member being movable through the T-shaped cavity in suspended relation along said guide surface means, and a plurality of spring biased bearing plates interacting between the upwardly facing guide surface means and the suspended slide member to maintain alignment therebetween when upwardly directed forces act upon the slide member and tend to cant it with respect to the guide surface means.

3,890,018
ROTARY ROCK BIT WITH WIPER PAD LUBRICATION SYSTEM

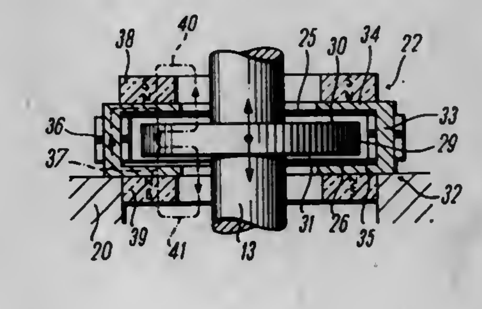
Robert Dale Clamon, Mesquite, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed July 19, 1974, Ser. No. 489,857
Int. Cl. F16c *33/66*
U.S. Cl. 308—8.2 **6 Claims**



1. A rotary rock bit comprising:
a bit body including a bearing pin;
a rotatable cutter mounted upon said bearing pin, said rotatable cutter having a cutter interior surface;
at least one wiper pad cavity in said cutter interior surface; and
a wiper pad positioned in said wiper pad cavity.

3,890,019
MAGNETIC BEARINGS

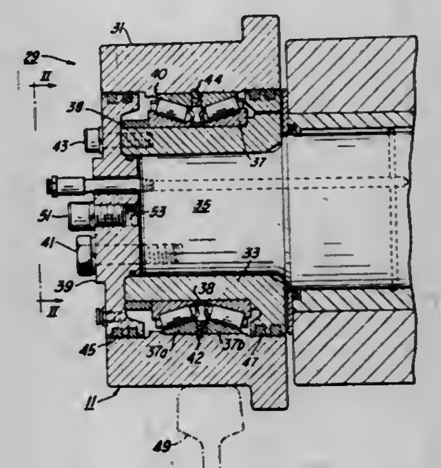
Karl Boden, Oberteuringen, and Dietrich Scheffer, Friedrichshafen, both of Germany, assignors to Padana AG, Zug, Switzerland
Filed Mar. 19, 1973, Ser. No. 342,892
Claims priority, application Germany, Mar. 20, 1972, 2213470
Int. Cl. F16c *39/06*
U.S. Cl. 308—10 **19 Claims**



1. In a magnetic bearing for a body having a ferromagnetic portion: first means defining a first flux path; at least one permanent magnet in said first flux path and producing a magnetic field therein; second means defining a second flux path; said second flux path being non-coincident with said first path for a substantial portion of its length, a ferromagnetic part in said second flux path; an electromagnet winding for producing a magnetic field in said second flux path, said ferromagnetic part offering a high permeability to the last-mentioned magnetic field; and means for controlling electric current supplied to said winding to apply a controlled magnetic field to said ferromagnetic body portion.

3,890,020
WHEEL AND BEARING ASSEMBLY

Walter B. Thomas, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.
Filed May 21, 1973, Ser. No. 361,887
Int. Cl. F16c *35/12*
U.S. Cl. 308—16 **3 Claims**

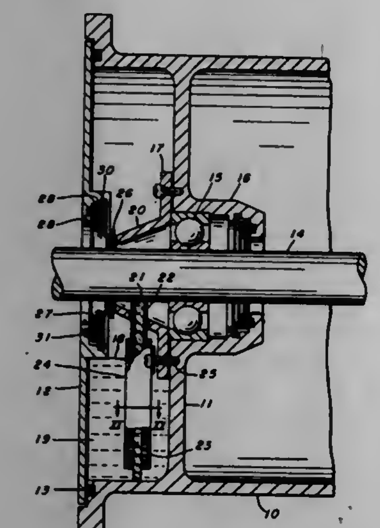


3. A wheel and bearing assembly for installation on a shaft comprising:
a. a sleeve that is adapted to fit onto said shaft;
b. a bearing mounted to said sleeve and cooperating with
c. a wheel surrounding said sleeve and cooperating with said bearing;
d. a plate secured to said sleeve for holding said wheel retatably in place on said sleeve; and
e. means on said plate for exerting an axial force against said shaft to urge said wheel and bearing said assembly off said shaft when said assembly is installed thereon.

3,890,021
BEARING LUBRICATION SYSTEM

Robert E. Smith, and Leroy C. Carter, both of Lima, Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 19, 1974, Ser. No. 443,886
Int. Cl. H01h *35/00*
U.S. Cl. 308—126 **8 Claims**

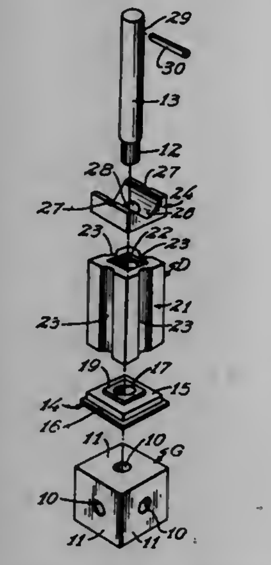


1. In combination, a rotatable shaft, bearing means for supporting said shaft, an oil reservoir below the shaft containing lubricating oil, a wick in contact with the oil, wick holder means engaging the shaft and holding the wick in position to make contact with the shaft, and resilient means urging the wick holder means against the shaft, the wick being free of said resilient means.

3,890,022
CORNER FITTING

Howard R. Moon, 42 Rockwell St., Fort Atkinson, Wis. 53538

Filed Sept. 3, 1974, Ser. No. 502,538
Int. Cl. A47f *3/00*
U.S. Cl. 312—140 **10 Claims**

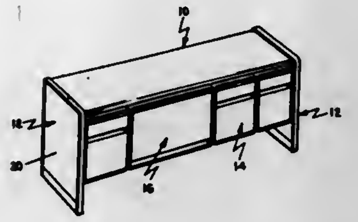


1. A corner fastener for connecting a square block and at least one square tubular member including:
- a central recess in at least one surface of said square block,
  - a first pin engaged in said recess and held from rotative or axial movement relative thereto,
- an expandable member of generally rectangular outline encircling said pin,
- a cam plate on said expandable member and rotatable therewith,
- a generally V-shaped notch in the end of said cam plate most remote from said block,
- a cross-pin extending through said first pin intersecting the axis of said pin and extending in said V-shaped notch,
- indentations in said cam plate on opposite sides of said notch,
- an end of said tubular member encircling said expandable member, whereby
- rotation of said tubular member, expandable member and cam plate will displace said cross-pin from the base of said notch into said indentations, compressing the expandable member to secure said tubular member to said block.

3,890,023
END PANEL SUPPORT SYSTEM

Robert G. Mohr, Grand Rapids; Ronald R. Hodges, Grandville; Jack Hockenberry; Douglas Scheerhorn, both of Grand Rapids, and Gale F. Wilcox, Wayland, all of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Division of Ser. No. 366,218, June 1, 1973. This application Oct. 11, 1974, Ser. No. 514,137
Int. Cl. A47b *47/04*
U.S. Cl. 312—198 **10 Claims**



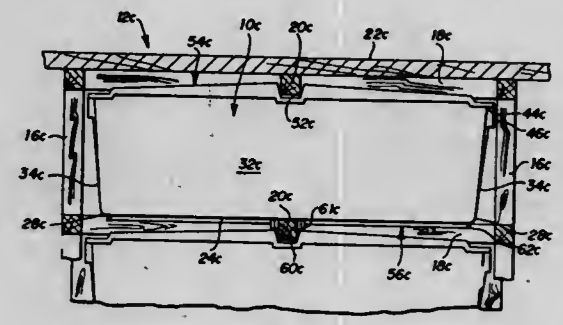
1. A system for supporting one or a number of standardized furniture components as desks, tops, cabinets or the like comprising: a supported member; end panel members adapted to support said supported member; first securing means in said end panels and said supported members for releasably securing same together; cover members for said end panels; second securing means in said cover members and said end panels for releasably securing said cover to said panel; said panel having peripheral edge; an access opening through said panel peripheral edge; a removable access closure in said peripheral edge for covering said access opening; and actuator means on said second securing means for releasing said cover member from said end panel, said actuator means being accessible through said access opening when said access closure is removed from said peripheral edge whereby said cover member may readily be removed for access to said first securing means.

3,890,024
MOLDED PLASTIC DRAWER

Thomas S. Noneman; Thomas R. Smith, and John B. Stokes, all of Bryan, Ohio, assignors to Tomco Plastic Inc., Bryan, Ohio

Continuation-in-part of Ser. No. 252,847, May 12, 1972, Pat. No. 3,796,474. This application Sept. 4, 1973, Ser. No. 393,944
Int. Cl. A47b *88/04*
U.S. Cl. 312—330 **23 Claims**

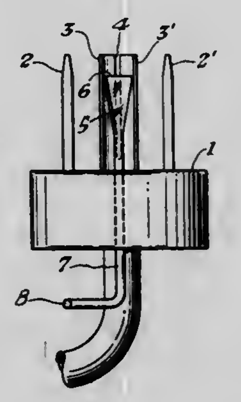
1. A molded plastic drawer for a cabinet having upper and lower guide rails which comprises a normally horizontal bottom wall including front, side and back edges; reinforcing ribs formed integrally with and disposed on the underside of the bottom wall and extending continuously from points adjacent the back edge parallel to the side edges to points adjacent the front edge and then parallel to the front edge to points adjacent the side edges, the portions of the reinforcing ribs extending parallel to the side edges being spaced apart to receive the lower guide rail of the cabinet, the portions of the reinforcing ribs extending parallel to the front edge being positioned for cooperation with the cabinet to restrain the drawer in the closed condition; back and side walls formed integrally with and rising upwardly and slightly outwardly from the back and side edges of the bottom wall; a front wall integrally formed with and rising upwardly from the front edge of the bottom wall; an outwardly extending lip on the back and side walls and formed integrally therewith, the lip of the back wall being positioned above the lips of the side walls to provide an elongate shoulder for restraining the drawer in the opened condition and including a groove for receiving the upper guide rail of the cabinet, at least the side walls each having a plurality of ribs formed integrally therewith and extending outwardly therefrom, each of said ribs extending first downwardly from the outer edge of the lip and then inwardly to define a stacking lug aligned with and spaced a predetermined distance from the corresponding portion of the lip for preventing excessive nesting of stacked drawers.



3,890,025
ELECTRICAL PLUG LOCK

Gene Louis Gray, 2833 S.W. 4th Ct., Fort Lauderdale, Fla. 33312

Filed Aug. 2, 1973, Ser. No. 385,104
Int. Cl. H01r *13/54*
U.S. Cl. 339—14 P **5 Claims**

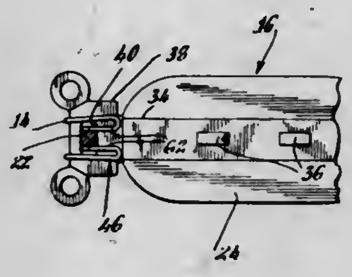


1. A positive connection means for a three-way male electrical connector that is not normally electrically connectable to a positive or negative electrical terminal comprising:
- a body,
- a male ground connector member with two projection sections, connected to said body,
- a cam means movably positioned between said sections to move said sections apart to secure said grounded connector in a locked position in a female outlet,
- a shaft connected to said cam means with a portion of said shaft positioned outside said body for easy access,
- said shaft movable directly between a plurality of positions by sliding said shaft in order to position the cam at a desired position along said sections, and
- said shaft rotatable less than three hundred and sixty degrees to move said cam into engagement with said sections to lock said connector in a female socket.

3,890,026
WIRE-FORM GROUNDING CLIP FOR ELECTRICAL FIXTURES

Albert J. Gartland, Jr., Trumbull, Conn., assignor to Harvey Hubbell, Incorporated, Bridgeport, Conn.

Filed Mar. 14, 1974, Ser. No. 451,183
Int. Cl. H01r *9/00*
U.S. Cl. 339—21 R **12 Claims**

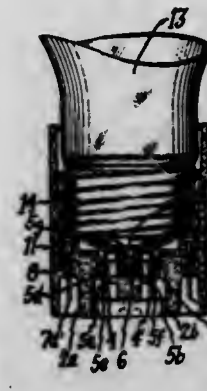


2. In combination, a grounding clip and an electrical fixture; said electrical fixture being of the type having a grounded mounting yoke with mounting slots formed therein whereby the fixture is arranged to be secured in a mounting box by mounting screws which extend through said slots; and said ground clip comprising a continuous strand of spring wire having end terminations, said strand being formed into an upper loop and a lower loop, said upper and lower loops being separated by a gap and being superposingly aligned to create a screw receiving means therebetween for engaging a mounting screw, said terminations affixingly in none mounting yoke slot when said grounding clip is disposed on the electrical fixture with the mounting yoke thereof disposed in said gap and said screw receiving means aligned through the slot, said upper and lower loops being forced to converge against the mounting yoke thereafter when the mounting screw is tightened in said screw receiving means.

3,890,027
ELECTRICAL SOCKET

Wallace H. Orr, and James L. Grindle, both of Hendersonville, N.C., assignors to General Electric Company, New York, N.Y.

Filed Nov. 1, 1973, Ser. No. 411,672
Int. Cl. H01r *17/20*
U.S. Cl. 339—64 R **9 Claims**

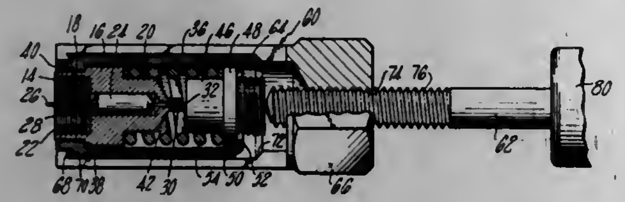


1. An electrical socket comprising, in combination, a socket housing having an open end and a transverse base portion near its other end and having a central axis, said housing base portion having a pair of spaced slots extending therethrough on opposite sides of said central axis, resilient means arranged on said housing base portion between said slots, and U-shaped conductive contact means having a pair of legs respectively extending loosely through said slots and having a web portion engaging said resilient means, said legs having electrical terminal means for making an electrical connection to said contact means, and securing means movably holding said contact means on said housing base portion with said web portion pressed in yieldable engagement against said resilient means,

said contact means being freely movable in all directions to accommodate the position of an electrical device adapted to be received in said socket housing in engagement with said contact means.

3,890,028
THEFT PROOF TERMINATOR SYSTEM FOR CABLE TV OUTLETS

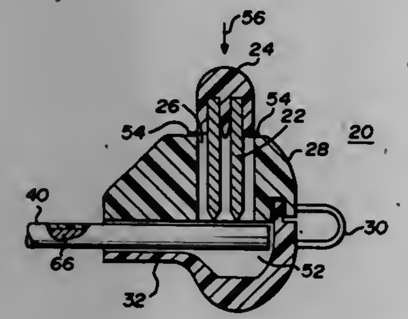
John P. Blanchenot, Agincourt, Ontario, Canada, assignor to Hi-G Incorporated, Windsor Locks, Conn.
Filed Sept. 10, 1973, Ser. No. 395,583
Int. Cl. H01r *13/54;* **H01c** *13/00*
U.S. Cl. 339—85 **11 Claims**



1. An electrical terminator system for preventing unauthorized connection to coaxial cable, tap devices and similar electrical terminals comprising an electrical terminator unit and a complementary installation tool coacting with the electrical terminator unit for rapid installation and removal thereof, said electrical terminator unit including a housing, a plug loosely mounted in the housing adjacent one end thereof for rotation relative thereto, said plug including a resistive load and having rotary connecting means for connection to a terminal being terminated, a rotary drive member mounted in the housing in spaced relationship to said plug and adapted for movement toward said one end into engagement with said plug for imparting rotary motion thereto to connect the plug to said terminal and biasing means urging said rotary drive member out of driving engagement with said plug, said installation tool including a terminator mount cooperating with said terminator housing and holding the terminator unit and a drive stem on the terminator mount operative for driving said rotary drive member toward said one end into engagement with said plug against the bias of said biasing means while the terminator unit is held by the mount.

3,890,029
PARTITIONED ELECTRICAL CONNECTOR

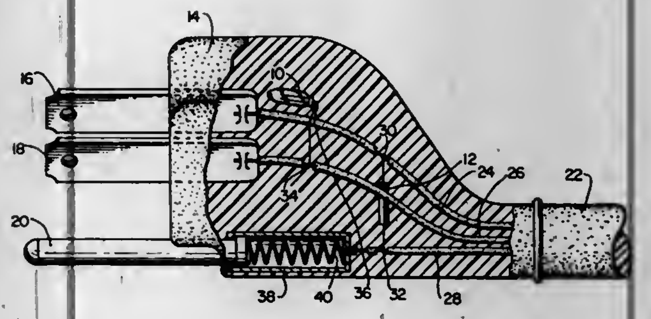
Hyman Izraeli, West Caldwell, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Feb. 19, 1974, Ser. No. 443,911
Int. Cl. H01r *13/38*
U.S. Cl. 339—98 **11 Claims**



1. An electrical connector comprising: a base portion having wire receiving channels extending therewithin, and partitions selectively spaced from one another to define said wire receiving channels; a cover portion adapted to mate with and overlie said base portion, said cover portion having a selectively formed aperture extending generally transversely therethrough; means for locking said cover portion to said base portion; contact support means selectively movable from a first position to a second position transversely within said cover portion aperture and disposed in said cover portion in said first position generally adjacent said cover portion aperture; and slotted metallic contact means fixedly disposed within said contact support means and movable therewith, said contact means being aligned to intersect said wire receiving channels when said contact support portion is depressed within said cover portion aperture and moved from said first position to said second position after said cover portion is disposed in selective overlying relationship with said base portion, whereby upon the selective placement of conductors within said base portion wire receiving channels, and the depression of said contact support means, said contact means is caused to engage such conductors to provide a connection therebetween, said connector further comprising frangible segments connecting said contact support means to said cover portion.

3,890,030
LACK OF GROUND INDICATOR

Johnny B. McDaniel, 4210 Stanby Ct., Alexandria, Va. 22312
Filed Sept. 27, 1973, Ser. No. 401,393
Int. Cl. H01r *13/66*
U.S. Cl. 339—113 L **10 Claims**

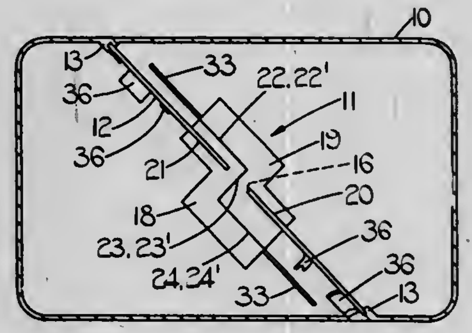


1. In an electrical plug including a body of insulated material, a first and second prong secured in said body, a ground prong in said body, said prongs being electrically insulated from each other, the improvement comprising a resistor electrically connected between said first prong and said ground prong; and said electrical plug having a single indicator means, said indicator means being electrically connected between said second prong and said ground prong whereby said first prong is connected to a positive power line, said second prong is connected to a neutral power line, and ground prong is connected to a ground line, and said indicator means is activated upon the absence of a ground.

3,890,031
BULBHOLDER ASSEMBLIES FOR LAMP UNITS

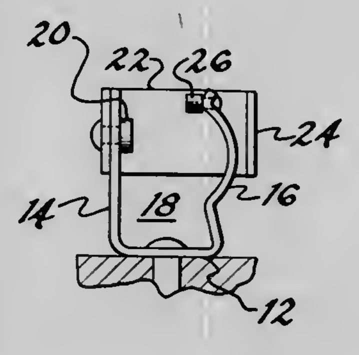
Walter Kenneth Bryant, Shirley, England, assignor to The Lucas Electrical Company Limited, Birmingham, England
Filed Dec. 27, 1973, Ser. No. 428,799
Claims priority, application United Kingdom, Jan. 9, 1973, 1208/73
Int. Cl. H01r *13/54*
U.S. Cl. 339—119 L **8 Claims**

1. A lamp unit comprising a lens element, and a bulbholder assembly, the bulbholder assembly including a plate received at its ends in recesses formed in said lens element, said plate having a pair of spaced, bulb receiving apertures therethrough and a slot between said apertures, a pair of electrically insulating members having mutually engaging surfaces, said insulating members being lodged in said slot and having recesses in the mutually engaging surfaces thereof, and a pair of contact elements disposed in said recesses in the mutually engaging surfaces and extending from said insulating members to lie respectively opposite said apertures.



3,890,032
REJECTION TYPE FUSE HOLDER

Robert S. Tillson, Terryville, Conn., assignor to General Electric Company, New York, N.Y.
Filed Jan. 16, 1974, Ser. No. 433,824
Int. Cl. H01r *13/16*
U.S. Cl. 339—258 F **2 Claims**



1. A fuse clip for accommodating the ferruled end terminal of a fuse, wherein the fuse terminal is keyed with an annular groove, said fuse clip comprising, in combination:

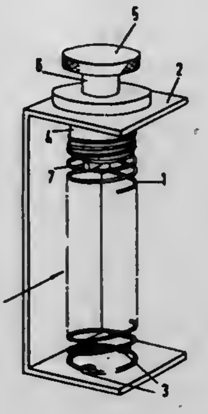
A. a pair of upstanding, spaced arms defining therebetween a pocket for the fuse terminal,
  1. one of said arms being straight sided, and
  2. the other of said arms being deflectable and having an outwardly bowed mid-portion conforming to an arcuate side portion of the fuse end terminal, the upper termination of said other arm just above said bowed mid-portion abruptly turned outward to provide a crook;

B. interference means including a first obstruction carried on an upper portion of said one arm and a rigid second obstruction carried by said other arm of said crook therein, said obstructions being transversely aligned and sized for reception in the annular groove in a fuse terminal as accommodated in said pocket; and

C. limiting means including an abutment disposed externally of said pocket in contiguous relation to the upper portion of said other arm for establishing a maximum separation between said obstructions which is less than the major transverse dimension of a fuse end terminal, said obstructions engaging the outer surface of a fuse terminal lacking the keying groove to impose a separation between said obstructions necessary for insertion in said pocket greater than permitted by said abutment, thereby to reject insertion.

3,890,033
ADJUSTABLE-SPRING ATTENUATOR FOR RADIATED BEAMS

Kevin McGee, Newcastle-upon-Tyne, England, assignor to Sir Howard Grubb Parsons & Co., Limited, Newcastle-upon-Tyne, England
Filed Feb. 13, 1974, Ser. No. 441,991
Claims priority, application United Kingdom, Feb. 13, 1973, 6961/73
Int. Cl. G02f *1/28*
U.S. Cl. 350—266 **4 Claims**



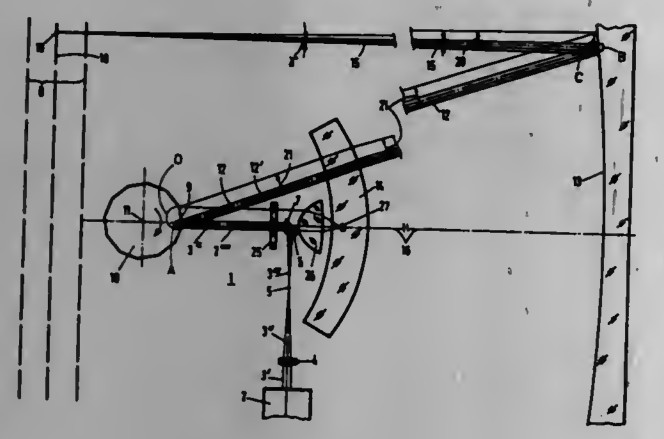
1. A variable attenuator for use in a radiated beam path comprising at least one obturating element which element is capable of varying its physical form, whereby according to the degree of such variation the element may of itself, or in combination with other elements, attenuate a radiated beam path in which it is placed to a greater or lesser degree; and control means operatively connected to said obturating element for providing gradual variation in the physical form of the element, said obturating element comprising an elongated, cylindrical helical coil spring for location with the longitudinal axis of the coil spring normal to the beam path being attenuated, the coil density of the spring in the beam path being substantially infinitely controllable within the physical distortion limits of the cylindrical, helical coil spring, the spring defining a cylinder in elevation for disposition across the full height or width of the beam to be attenuated and variations of the spring coil density causing an alteration in the number of turns of the spring met by the beam and thus altering the degree of the obscuration, said coil spring being fixedly anchored at one end, and said control means comprising a cylinder element connected axially to the other end of the coil spring, said coil spring being continuously under stress, and means for adjustably rotating the cylinder to impose torque on the individual helical coils of the spring for altering the diameter of the cylindrical coil and the spacing between adjacent helical coils of the spring.

3,890,034
OPTICAL SCANNER

Johann Ploeckl, Unterhaching, Germany, assignor to Zellweger AG, Uster, Switzerland
Filed July 20, 1973, Ser. No. 381,282
Claims priority, application Switzerland, Aug. 22, 1972, 12446/72
Int. Cl. G02b *17/00*
U.S. Cl. 350—7 **4 Claims**

1. An optical scanner comprising means for generating a bundle of scanning light rays from which there is formed a bundle of received light rays, at least one optical element conjointly associated with both said bundle of light rays, said

optical element having impingement areas for both bundle of light rays which are spatially offset with respect to one another, said impingement areas being located at a common impact surface of the optical element.



3,890,035
COMPLEX LIGHT SPATIAL MODULATOR

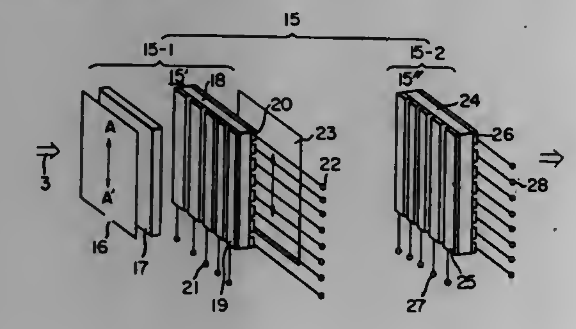
Yasutsugu Takeda, Kokubunji, Japan, assignor to Hitachi, Ltd., Japan

Filed Sept. 15, 1972, Ser. No. 289,263

Claims priority, application Japan, Sept. 17, 1971, 46-71806

Int. Cl. G02f ***1/26***

U.S. Cl. 350—150 **5 Claims**



1. A complex light spatial modulator comprising:
   two modulator means for respectively modulating an incident light wave as regards one different factor taken from three factors of the light wave, that is, the amplitude, the phase and the direction of polarization according to given three-dimensional information;
   each of said two modulator means including a plate of ferroelectric crystal with a plurality of parallel strips of transparent electrode provided on each surface of said ferroelectric plate, the direction of the strips on one surface being crosswise to those on the other surface, an electric signal representing said three-dimensional information being applied across said ferroelectric plate though said transparent electrodes, and said two modulator means being disposed in tandem with respect to the incident light.

3,890,036
ZOOM LENS SYSTEM

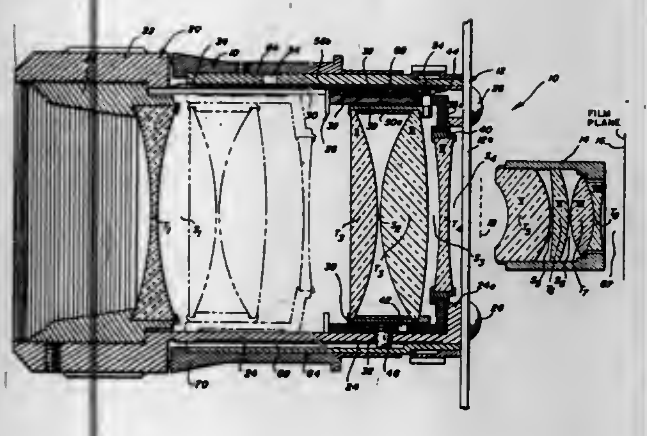
David S. Grey, Lexington, Mass., assignor to Berkey Photo, Inc., Paramus, N.J.

Filed Feb. 28, 1974, Ser. No. 446,704

Int. Cl. G02b ***15/00***

U.S. Cl. 350—184 **8 Claims**

1. A zoom lens system made substantially according to the following table:



LENS ELEMENT	RADII (mm.)	THICKNESS AND SPACING (mm.)
I	R_1—64.90	T_1=1.207
	R_2+42.190	S_1= Variable (29.612 to 4.785)
II	R_3 Plano	T_2=4.414
	R_4—36.609	S_2=0.118
III	R_5+27.589	T_3=6.602
	R_6—92.480	S_3= Variable (1.897 to 5.307)
IV	R_7—92.467	T_4=1.208
	R_8+92.467	S_4 to Stop = Variable (7.098 to 28.515)

where the lens elements are numbered from front to rear in the first column, the radii of curvature R of the lens elements are given in the second column and the spaces S between and the thickness T of the lens elements are given in the third column.

3,890,037
SPECTACLE FRAMES WITH REMOVABLE TINTED LENSES

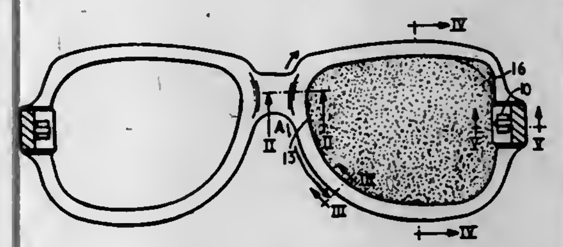
Dino Zingarelli, Darling Point, New South Wales, Australia, assignor to Martin Wells Pty. Ltd., Australia

Filed Dec. 18, 1973, Ser. No. 425,809

Claims priority, application Australia, Dec. 28, 1972, 1734/72; Feb. 7, 1973, 2164/73

Int. Cl. G02c ***9/04***

U.S. Cl. 351—47 **9 Claims**



1. A spectacle frame having permanent fixed lenses and a lens holding portion surrounding each permanent lens and provided with a pair of substantially opposed abutment means which in their entirety are integral and form one piece with said lens holding portion such that an additional tinted flexible plastic lens having an outline corresponding to said lens holding portion and provided with appropriate curvature can be engaged with one of said abutment means and thereafter snapped past the other to be retained in position on the lens holding portion between said pair of abutment means and the permanent lens, said pair of abutment means extending rearwardly from the remainder of each lens holding portion so that each additional lens is situated behind a permanent lens, said pair of abutment means respectively forming an integral part of each lens holding portion at an inner peripheral region thereof adjacent a bridge of the frame and an integral part of each lens holding portion at the region of a temple hinge of the frame, with the abutment means at the region of said temple hinge having the configuration of a boss, and both of said abutment means having inner surface regions directed inwardly toward a central part of each lens holding portion, and said surface regions being undercut for overhanging said permanent lens and an edge region of each additional lens to retain the latter temporarily in position behind each permanent lens.

3,890,038
EXPOSURE DEVICE FOR TRANSMITTING LIGHT WAVES MODULATED TO CONTAIN INFORMATION

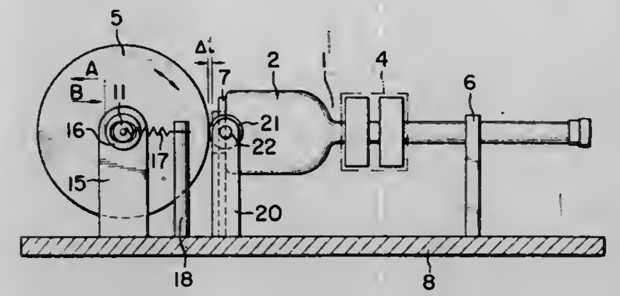
Junji Ichikawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 9, 1973, Ser. No. 358,484

Claims priority, application Japan, May 12, 1972, 47-46988; June 12, 1972, 47-58327

Int. Cl. G03b ***27/00***

U.S. Cl. 355—1 **14 Claims**



1. An exposure device for recording light waves modulated to contain information comprising:
   a photosensitive member, a source of light waves modulated to contain information, a light transmission member provided near said source; and
   means for adjusting and maintaining the degree of contact or distance between the photosensitive member and the light transmission member;
   said adjusting means retaining the light transmission member freely movable relative to the photosensitive member; whereby said modulated light waves are transmittable through said transmission member and recordable on said photosensitive member with high resolving power and clearness.

3,890,039
ELECTROGRAPHIC DEVICES FOR THE DEVELOPMENT COMPOSITION AND TRANSFER OF PARTICLES IMAGES

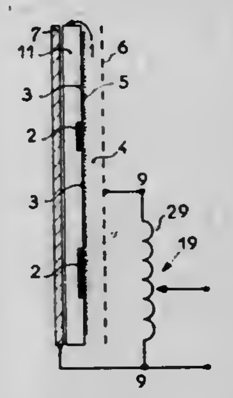
Marcus Cantarano, 47 Ave. F. Roosevelt, Thiais, France

Division of Ser. No. 870,405, Dec. 8, 1969, Pat. No. 3,741,761, which is a continuation-in-part of Ser. No. 631,792, April 8, 1967, abandoned. This application Apr. 16, 1973, Ser. No. 351,099

Int. Cl. G03g ***15/00***

U.S. Cl. 355—3 R **24 Claims**

1. A device for producing electrographic images from a conductivity pattern formed by areas having differing electric conductivity characteristics ranging from an area exhibiting maximum conductivity to an area exhibiting minimum conductivity, comprising an insulating backing member onto which said conductivity pattern is affixed, means for coating said conductivity pattern with a thin layer of developer particles capable of receiving electric charges, an insulating layer against said conductivity pattern so that said coated conductivity pattern is electrically insulated between said insulating backing member and said insulating layer, means for generating an alternatively modulated electric field of sufficient strength across said insulating backing member and said insulating layer to transfer alternating electric charges from said conductivity pattern to said particles layer and to electrically attract particles having successive opposite polarities away from said conductivity pattern whereby a portion of said particles is sufficiently charged and removed from said conductivity pattern by proceeding in the application of said electric field, and the remaining part of said particles is insufficiently charged so that it continues to coat said conductivity pattern whereby producing a stable electrographic image.



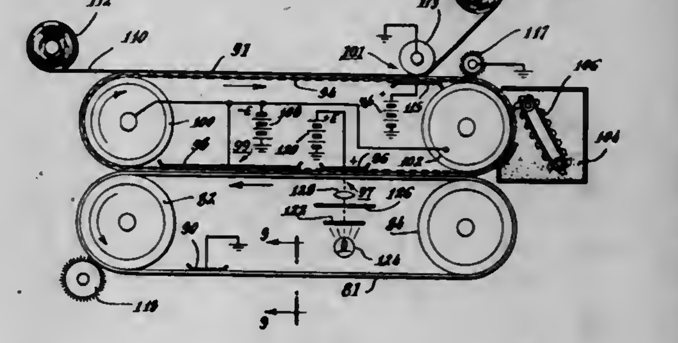
3,890,040
INDUCTION IMAGING APPARATUS

Fred W. Schmidlin, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 212,220, Dec. 27, 1971, abandoned. This application Aug. 29, 1973, Ser. No. 392,599

Int. Cl. G03g ***15/00***

U.S. Cl. 355—16 **4 Claims**



1. An imaging apparatus comprising:
   a first member including a thin layer of photoconductive material overlying a layer of material which produces an electrical charge blocking contact with said photoconductive material;
   first transport means for transporting said first member through imaging and development stations sequentially;
   a second member;
   second transport means for bringing said second member into contact with said first member, for transporting said second member through imaging and developing stations in contact with said first member and for separating said second member from said first member at a location subsequent to a development station, said second transport means including means to apply a second electrical potential to said second member at a location preceding contact between said first and second member for causing image development material to adhere to the surface of said second member and means to apply said second electrical potential to said second member at a location subsequent to a development station for causing a developed image to adhere to the surface of said second member after separation of said first and second members;
   means for depositing an image developing material including charged toner particles on said second member in a location preceding contact between said first and second members;
   an imaging station including means for exposing said photoconductive layer of said first member and means for

applying a first electrical potential between said first and second members to provide an electrostatic image on the photoconductive surface of said first member;

a development station including means for applying said second electrical potential between said first and second members, said second electrical potential having a polarity opposite to that of said first electrical potential; and

a transfer station including means for transferring a developed image from said second member to a recordingg member.

3,890,041

ARRANGEMENT FOR EXPOSING PHOTOSENSITIVE MATERIALS WITH INFORMATION DISPLAYED ON THE SCREEN OF A CATHODE RAY TUBE

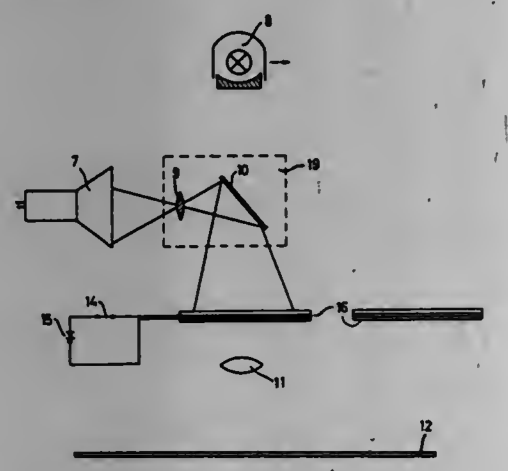
Herbert Henkler, Ludwigshafen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 19, 1973, Ser. No. 417,258

Claims priority, application Germany, Nov. 21, 1972, 2256966

Int. Cl. G03b *27/00*; G02f *1/28*, *1/36*

U.S. Cl. 355—18 **5 Claims**



1. Apparatus for exposing photosensitive material to information displayed on the screen of a cathode ray tube which comprises in combination:

a. a cathode ray tube having a screen with information thereon;

b. a plurality of coplanar juxtaposed liquid crystal cells, each of said liquid crystal cells comprising two transparent electrodes and a photoconductor layer and a liquid crystal layer interposed therebetween and having means for applying a potential across said electrodes to record information projected thereon;

c. an optical system arranged in front of said cathode ray tube whereby said information on said screen can be projected onto said liquid crystal cells; and

d. light source means for exposing said photosensitive material to said information stored in said plurality of liquid crystal cells, at least one of said cathode ray tube and said optical system being movable relative to said liquid crystal cells so as to permit selective projection onto each said cell of said information on said screen, and at least one of said light source means, said optical system and said plurality of liquid crystal cells being movable relative to said photosensitive material so as to permit said light source means to expose said photosensitive material to said stored information.

3,890,042

MECHANISM FOR MOUNTING CONTACT SCREEN IN PHOTOENGRAVING CAMERA

Yoshio Miyauchi, Hikone, and Tetsuji Okuno, Shiga-ken, both of Japan, assignors to Dainippon Screen Seizo Kabushiki-Kaisha, Kyoto, Japan

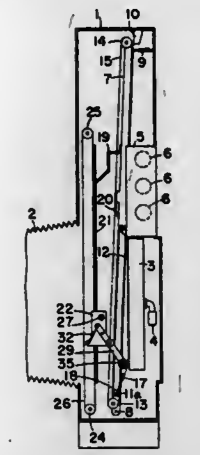
Filed Nov. 16, 1973, Ser. No. 416,365

Claims priority, application Japan, Nov. 16, 1972, 47-11427

Int. Cl. G03b *27/42*

U.S. Cl. 355—53 **10 Claims**

1. A contact screen mounting device for use in a photoengraving camera, comprising: a contact screen retaining frame adopted to retain a contact screen in front of a vacuum suction type film holder and movable to let said contact screen approach or separate from said film holder surface, and squeegee means adapted to move up and down so as to let said contact screen tightly attach to said film holder, and first guide cam means on said frame enabling said contact screen retaining frame to move toward or away from said film holder surface in accordance with vertical movement of said squeegee means.



3,890,043

ENLARGING APPARATUS FOR USE IN A BRIGHT ROOM

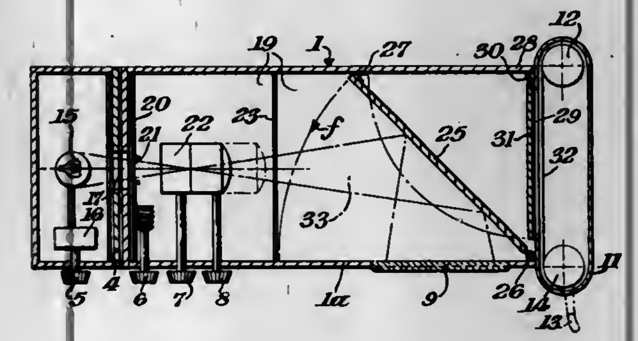
Wilmuth Pramstraller, Brixen near Bozen, Italy, assignor to Durst S.p.A. Fabbrica Macchine ed Apparecchi Fototecnici, Bolzano, Italy

Filed Sept. 20, 1973, Ser. No. 399,051

Claims priority, application Italy, Oct. 3, 1972, 30007/72

Int. Cl. G03b *27/52*

U.S. Cl. 355—62 **11 Claims**



1. An enlarging and viewing apparatus for use in a light room, comprising a rigid light-tight housing, the following components in said housing, a light source, a transparency-holding insert means for holding a transparency to be projected in front of the light source, variable projection optics which is variable in focal length, the wall of said housing opposite said light source having an opening for the projection of the picture to be copied on a projection surface disposed in said opening and having means for mounting light-sensitive photographic paper on said projection surface, an image-viewing window in a wall of said housing normally arranged to said projection surface, a swinging mirror having an axis of rotation at one side of said housing whereby it may be positioned at an angle between said projection surface and said image-viewing window screen for projecting an image on said window for adjusting it and whereby it may be swung out of the path of light projected to said projection surface for exposing said photographic paper, focal length control means on said variable projection optics for continuously varying the size and format of the picture projected on said projection surface, said opening in the path of light rays being light-tightly sealed in front of said projection surface by means of a cover, said swinging mirror being constructed and arranged to be maintained in an inclined position, for the adjustment of the apparatus for viewing the transparency and for the determination of the format to be copied, said swinging mirror being constructed and arranged to be moved toward and contiguous to said image-viewing window into a position which covers it and seals it for the exposure of said photographic paper, said swinging mirror and said cover also being constructed and arranged to permit exposure of the photographic paper, control actuating devices for said apparatus being mounted upon a control wall of said housing, said control actuating devices being operable from outside said control wall, said cover has a hinge connected on one of said walls adjacent said outlet, and the axis of rotation of said swinging mirror is mounted at said inlet upon another of said walls.

3,890,044

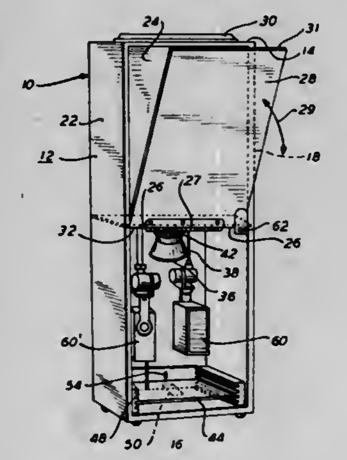
CAMERA APPARATUS

Morton Feren, Livingston, N.J., assignor to Martin H. Adler, Westfield, N.J.

Filed Mar. 13, 1974, Ser. No. 450,722

Int. Cl. G03b *27/52*

U.S. Cl. 355—62 **8 Claims**



1. Photographic apparatus for photographing jewelry displays or the like, comprising in combination:

a light-tight rigid enclosure means;

openable access means for permitting access to the interior of said enclosure;

means secured to a first wall of said enclosure for receiving a photosensitive plate to be exposed by said apparatus, said plate thereby defining the imaging plane of said apparatus;

lens means positioned within said enclosure at a plane parallel to said imaging plane, said lens means being carried by a lens-carrying plate which divides said enclosure and is permanently fixed with respect to said imaging plane and the lateral walls of said enclosure, whereby said lens means is at a fixed spacing with respect to said imaging plane;

an object-receiving tray disposed in vertically spaced relationship from said lens means, and on the side thereof opposite said imaging plane, for receiving objects thereon to be photographed;

means for moving said object-receiving tray toward or away from the fixed plane of said lens means to bring said object to a desired object distance from the said lens;

an internal wall of said enclosure carrying operator viewable indicia indicative of the field of focus in which an object on said tray should be positioned, whereby the spacing of said object with respect to said lens means may be effected by adjusting the position of said tray while observing the vertical positioning of said object as measured by said indicia;

indicia being provided on the surface of said tray indicating the periphery of the field of focus at a given vertical position of said tray, thereby enabling accurate centering of said object on said tray during photographing of said object;

at least one electronic flash exposure light means, disposed between said lens and object, for illuminating said object to be photographed; and

the space between said lens means and object-receiving tray being laterally bound by the rigid walls of said enclosure, whereby said space is variable solely in consequence of movement of said object-receiving tray, whereby the lighting characteristics of said space are substantially uniform for all positions of said object-receiving tray.

3,890,045

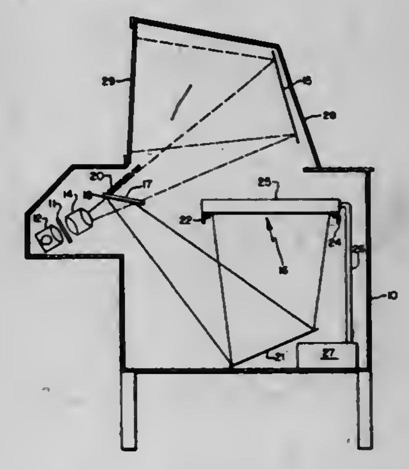
PHOTOGRAPHIC PRINTING APPARATUS

Herbert J. Bernstein, 43 Canton Ave., Amherst, Mass. 01002, and William J. Arnold, 73 Bardwell St., Florence, Mass. 01060

Filed Feb. 22, 1974, Ser. No. 444,854

Int. Cl. G03b *27/60*

U.S. Cl. 355—73 **1 Claim**



1. In a photographic printer-processor having a projector, a print exposure station, a roll-feed for providing printing paper to said exposure station and a processor for activating and stabilizing prints, the combination in said print exposure station comprising:

a. A fixed vacuum platen positioned adjacent to and above the path of travel of printing paper for supporting and holding printing paper uniformly flat during exposure;

b. a pair of edge support rails positioned below said vacuum platen providing a support surface for supporting printing paper within the pneumatic field of influence of said platen;

c. a guide plate positioned following said vacuum platen in the path of travel of said printing paper, the lower surface of said vacuum platen proximate to and overlapping the top surface of said guide plate; and,

d. a drive roller positioned above and coacting with said guide plate for driving said printing paper through said exposure station, said overlap providing vacuum pressure at the region of overlap.

3,890,046

CONDENSATION NUCLEUS DISCRIMINATOR

Edwin J. Hart, Hinsdale; Keelathur N. Vasudevan, Chicago, and Klaus H. Schmidt, Downers, all of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 9, 1974, Ser. No. 468,324

Int. Cl. G01n *1/00*

U.S. Cl. 356—37 **12 Claims**

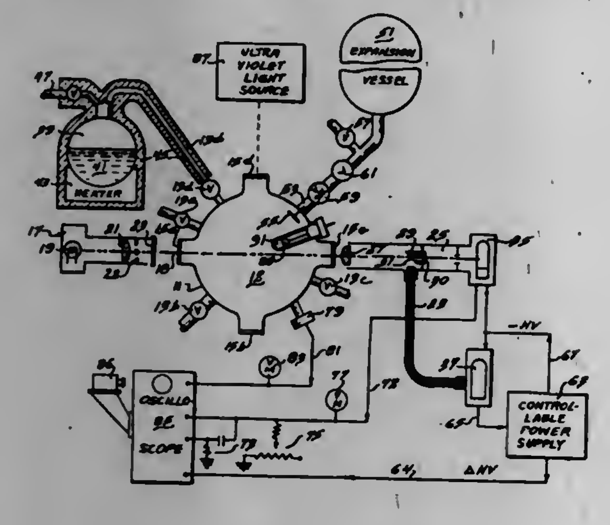
7. A method of rapidly and simultaneously determining the absolute concentration and the critical radius of condensation nuclei within a gas sample comprising:

providing said gas sample at a known temperature, pressure and humidity;

reducing the pressure of said gas sample by a monitored amount during a known time period to produce a cloud of growing condensation particles, and generating a signal representative of pressure over said time period;

passing a beam of monochromatic light through said cloud;

sensing the intensity of scattered light from said beam during said pressure reduction, and generating a signal representative of scattered light;



sensing the intensity of direct light transmitted through said cloud during said pressure reduction and generating a signal representative of direct light;

electrically generating a signal representative of light absorbance from the change in direct light intensity; and

simultaneously recording signals representative of pressure, intensity of scattered light, rate of change in scattered light, and light absorbance within said cloud during said known time period and determining the concentration and critical radius of nuclei therefrom.

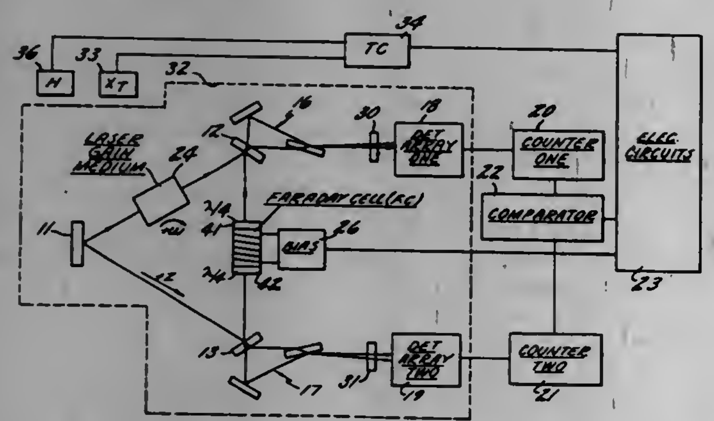
3,890,047
DIFFERENTIAL LASER GYRO EMPLOYING REFLECTION POLARIZATION ANISOTROPY

Richard T. Warner, Winsted, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 25, 1969, Ser. No. 802,014

Int. Cl. H01s *3/10*

U.S. Cl. 356—106 LR **1 Claim**



1. A differential laser gyro system comprising a ring laser optical cavity having an optical path including an odd number of mirrors and a laser gain medium disposed in said cavity;

a Faraday cell disposed in said optical path;

a pair of quarter wave plates disposed on opposite ends of said Faraday cell, said quarter wave plates and said Faraday cell comprising an optical path segment wholly between two of said mirrors, whereby the traveling waves incident upon each of said mirrors from either direction is plane polarized in mutually perpendicular planes;

the length of said optical cavity being chosen with respect to the line frequency of said laser gain medium so as to provide a cavity length including an integral number of wavelengths within the oscillation-sustaining frequency range of said laser gain medium in said optical cavity, whereby the frequency of electromagnetic radiation in one orientation of plane polarization differs from the frequency of electromagnetic radiation in a perpendicular sense of polarization, the parameters of said laser gyro system being chosen so that there is provided a pair of laser gyros operating in said cavity separated in frequency, each implemented in a polarization which is distinct from the other, each having a bias which is opposite to but substantially equal in magnitude to the bias of the other; and

differential read out means for providing an output proportional to the difference between outputs of the two laser gyros.

3,890,048
METHOD AND APPARATUS FOR MEASURING THE COLOR DENSITY OF PRINTING INKS APPLIED TO A MOVING WEB

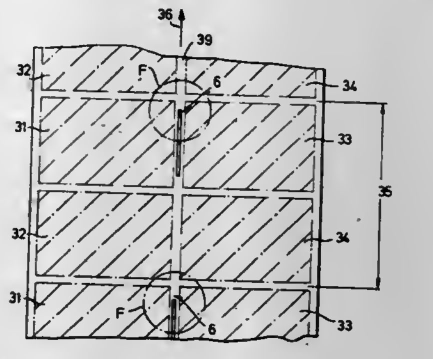
Antonio Abbondio, Lausanne, and Tino Celio, Ambri, both of Switzerland, assignors to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Oct. 30, 1972, Ser. No. 301,722

Claims priority, application Switzerland, Nov. 3, 1971, 16000/71

Int. Cl. G01n *21/18, 21/20*

U.S. Cl. 356—199 **9 Claims**



1. A method of measuring the color density of printing inks applied to a moving web of material to print multi-colored matter thereon, the method comprising;

a. printing on said web in the direction of movement thereof a plurality of colorimetric scales, each scale having a plurality of different colored zones, and each zone comprising at least three different tones of the zone color arranged in sequence on said web in the direction of web movement, a first group of synchronizing marks at one end of each said scale and a second group of synchronizing marks between zones of a scale each mark being printed in a direction transverse to the direction of web movement,

b. sensing the synchronizing marks and providing in response thereto a plurality of timing pulses each representing an incremental movement of said web, the distance between said first and second groups determining the synchronization between web travel and sensing of each of the tones in a zone,

c. sensing the color density of each tone in a zone in response to a timing pulse indicating that the zone is in a position to be sensed,

d. providing a white reference, and

e. evaluating the density of each tone of a reference zone relative to the white reference.

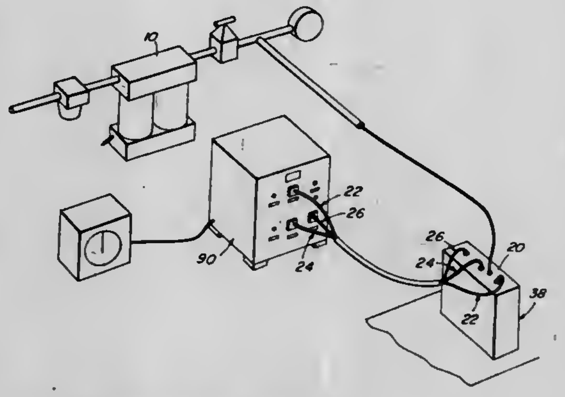
3,890,049
GLOSSMETER FOR PROVIDING A LINEAR RESPONSE CORRESPONDING TO TRUE GLOSS READINGS

Donald S. Collins, Bridgton, Maine, and Patrick J. Peoples, Intervale, N.H., assignors to Howell Laboratories, Inc., Bridgton, Maine

Filed Sept. 17, 1973, Ser. No. 397,993

Int. Cl. G01n *21/18, 21/30, 21/48*

U.S. Cl. 356—199 **25 Claims**



1. A glossmeter which comprises:

means to measure continuously the gloss of a surface of a web, and to provide a continuous electrical signal corresponding to the gloss of the measured surface;

means to define a measurement plane through which the web moves into and out of, the signals from the surface of the web corresponding to a true gloss reading when the web is in said measurement plane; and

means to select for recording only those signals of the continuously transmitted signals corresponding to the value of the gloss from the surface of the web passes through the measurement plane.

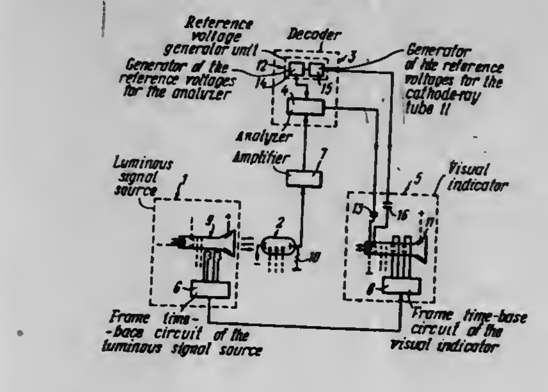
3,890,050
DEVICE FOR MEASURING NONUNIFORMITY OF PHOTOPARAMETRIC CHARACTERISTICS OF MATERIALS

Vladimir Dmitrievich Kozlov, 15 Parkovaya ulitsa, 26, korpus 3, kv. 164, and Isaak Yankelevich Breido, ulitsa Kirpichnaya, 47, kv. 53, both of Moscow, U.S.S.R.

Filed Apr. 10, 1973, Ser. No. 349,811

Int. Cl. G01n *21/32*

U.S. Cl. 356—237 **8 Claims**


Reference voltage generator unit
Decoder
Generator of the reference voltages for the analyzer
Generator of the reference voltages for the cathode-ray tube 11
Analyzer
Amplifier
Luminous signal source
Visual indicator
Frame time-base circuit of the luminous signal source
Frame time-base circuit of the visual indicator
3
12
14
4
15
2
6
5
16
11
10

1. A device for measuring the non-uniformity of a photoparametric characteristic of a material, and in particular the non-uniformity of luminous intensity of the material comprising: a luminous signal source in said material; a frame time-base circuit of said source; a photoelectric sensor disposed across the path of luminous signals from said source and transforming said luminous signals into electrical signals corresponding to the non-uniformity of luminous intensity of said source; a visual indicator connected electrically to said photoelectric sensor to display said electric signals; a decoder with input connected electrically to the output of said photoelectric sensor, the output of said decoder being connected to the input of said visual indicator; an analyzer of said decoder and connected electrically thereto, said analyzer being adapted to select, in accordance with reference electric signals generated by said decoder, signals from the plurality of signals from said photoelectric sensor which correspond to the desired level of luminous intensity of said material; a frame time-base circuit of said visual indicator synchronized with said frame time-base circuit of said luminous signal source so that when the values of the electric signals from said photoelectric sensor correspond to those of the reference signals set by said decoder, said visual indicator displays images of regions of equal values of said characteristic of said material in the form of equally bright zones whose distribution by coordinates corresponds to that of regions of equal values of the luminous intensity of said material.

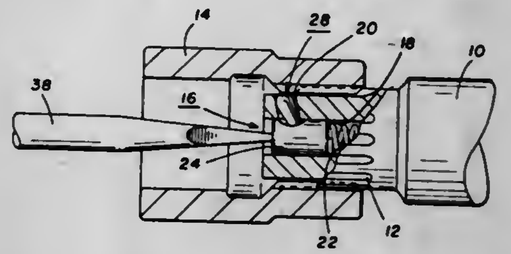
3,890,051
SOCKET RETAINER FOR ROTATABLE POWER TOOL

Paul Albert Biek, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 1, 1974, Ser. No. 447,129

Int. Cl. F16b *1/04*

U.S. Cl. 403—20 **12 Claims**



1. In a rotary operable power tool having an output drive shank adapted to support a detachable drive socket thereon, a retainer mechanism for coupling and retaining a drive socket on said shank, said retainer mechanism comprising in combination:

a. an elastomeric plunger displaceably supported in a longitudinal bore defined within said shank; and

b. a pivotally supported elongated detent means extending through a radial bore defined in said shank from a first end communicating inward of said longitudinal bore operably engageable with and retained by said plunger to a second end adapted to protrude radially outward beyond the periphery of said shank;

c. said detent means being operably pivotal by displaceable movement of said plunger and effective when said plunger is at a first location within said longitudinal bore for its said second end to protrude radially outward beyond the periphery of said shank a sufficient distance to retain a coupled socket on said shank and effective when said plunger is at a second location within said longitudinal bore for its said second end to be displaced radially inward from said retaining distance to permit coupling and uncoupling of a drive socket to and from said shank.

3,890,052
WEAR INDICATING JOINT ASSEMBLY

Edward J. Herbenar, and Sylvester S. Mazur, both of Detroit, Mich., assignors to TRW Inc., Cleveland, Ohio

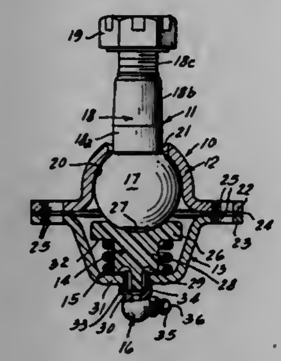
Filed Apr. 16, 1973, Ser. No. 351,601

Int. Cl. F16c *11/06*

U.S. Cl. 403—27 **7 Claims**

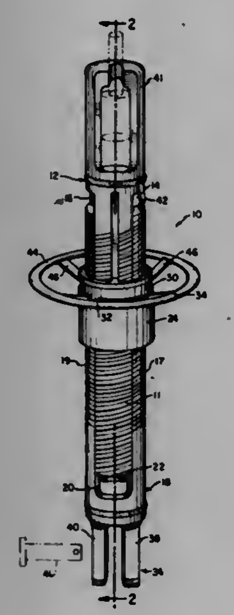
7. In a joint construction having a housing, wearable components in the housing, wear take-up means for said components, and a rigid wear indicator readable from outside of the housing, the improvement of a removable lubricant fitting threaded into the housing freely receiving the rigid wear indicator and sealing the housing while providing a lubricant passageway around the rigid wear indicator communicating

with the wearable components in the housing, and said fitting being removable from the housing to expose the rigid wear indicator for a reading of the wear conditions of the wearable components in the housing.



3,890,053
ADJUSTABLE LINK

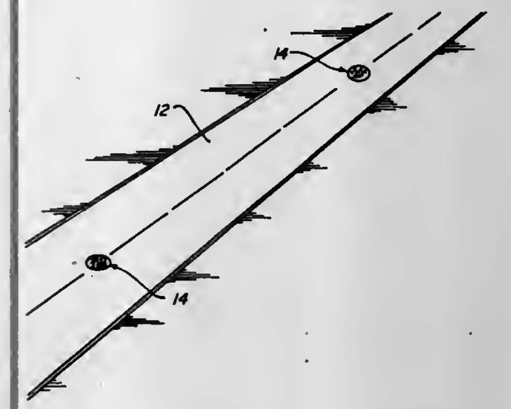
William V. Strecker, Long Island City, N.Y., assignor to Peck & Hale, Inc., West Sayville, N.Y.
Filed June 26, 1974, Ser. No. 483,402
Int. Cl. F16b *7/06*
U.S. Cl. 403—44 **11 Claims**



1. An adjustable link assembly which comprises:
a. a first elongated externally threaded member defining at least one longitudinally extending slot, said threads being multi-start threads;
b. a second elongated externally threaded member received within the first member and having at least one longitudinally extending externally threaded lug received within each slot of the first member in a manner such that portions of said members are in overlapping relation, said lug threads being multi-start threads substantially equal and opposite to the threads on the first member; and
c. an internally threaded sleeve embracing overlapping portions of said first and second members in threaded engagement therewith, said sleeve having at least two multi-start substantially equal and opposite internal threads mating respectively with the external threads of said first and second members such that rotation of said sleeve in a first direction results in movement of the first and second members toward each other and rotation of said sleeve in the opposite direction results in movement of said first and second members away from each other.

3,890,054
FLEXIBLE HIGHWAY MARKER

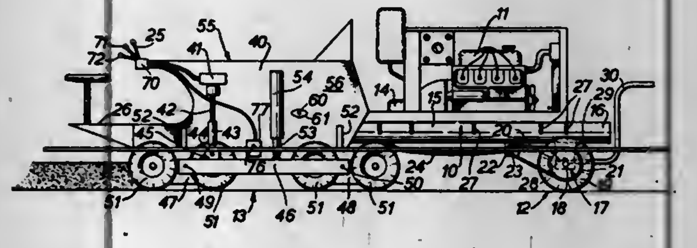
Sean E. O'Connor, 1309 Redwood Ln., Libertyville, Ill. 60048
Filed Apr. 1, 1974, Ser. No. 456,526
Int. Cl. E01f *9/00*
U.S. Cl. 404—10 **8 Claims**



1. A highway reflector for mounting in a formed highway socket, including
a base, said base having a supporting body with continuous sidewalls, at least said sidewall portions being elastomeric,
a plurality of densely grouped and relatively staggered resilient fingers extending upwardly from said supporting body, and
a reflective material associated with each of said resilient fingers.

3,890,055
CONCRETE LAYING MACHINE

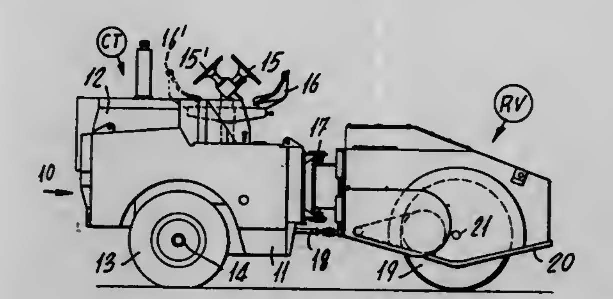
William Phillip King Rochfort, Unit 9, Riverside Gardens, Carlow Street, Kedron, Hillend Brisbane, Queensland, Australia
Continuation of Ser. No. 101,405, Dec. 24, 1970, abandoned. This application Nov. 26, 1973, Ser. No. 419,150
Int. Cl. E01c *19/52*
U.S. Cl. 404—84 **21 Claims**



1. A concrete laying machine including a body, a pair of supporting wheel assemblies, a pair of height adjusting devices each supporting a side of the body in vertically adjustable manner above one of the supporting wheel assemblies, actuating means operatively connected to each height adjusting device and each adapted to actuate the respective device to raise or lower a side of the body relative to the wheel assembly supporting it, means for propelling the machine, a chamber in the body adapted to receive concrete and discharge it rearwardly through an outlet of the chamber to a mould adapted to shape the discharged concrete to a desired cross-sectional configuration as the machine is propelled, and sensing means on the body adapted to sense an external reference line, the sensing means being further adapted upon deviation of one or both sides of the body from a predetermined vertical relationship with the external reference line to cause the or each actuating means to be operated to raise or lower the or each side of the body to return the or each side to its predetermined relationship with the external reference line.

3,890,056
COMBINED-ACTION VIBRO COMPACTING MACHINE FOR THE CONSTRUCTION OR ROADS

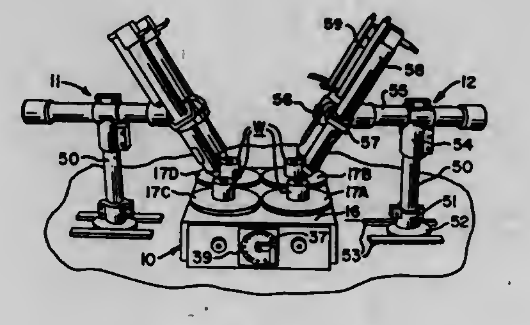
Domenico Domenighetti, via Nosetto 6, 6500 Bellinzona, Switzerland
Filed Dec. 19, 1972, Ser. No. 316,578
Claims priority, application Switzerland, Dec. 28, 1971, 19098/71
Int. Cl. E01c *19/38*
U.S. Cl. 404—117 **5 Claims**



1. A combined-action vibro-compacting machine comprising a vibrating element including a metallic drum, and a compacting element or component formed by a series of pneumatic tired wheels, said two components being connected by a steering pivot link, characterized by the combination of the following features; the distance between the axis (14) of the tired wheels (13) and the axis (21) of the vibrating drum (19) does not exceed 4 m; the weight discharged on the ground through the series of pneumatic tires (13) being about 9.2 metric tons and the weight discharged on the ground through the vibrating drum being about 5.8 metric tons; a frame (11) and means mounting the pneumatic wheels (13) on the frame for vertical movement relative to the frame and relative to each other so that each wheel follows the contour of the ground, the pneumatic wheels (13) being thus each isostatically suspended to weigh on the ground with a force equal to the total weight of the tired section of the machine divided by the number of wheels; the centrifugal force of the metallic vibration drum is larger than 30% of the total weight of the combined-action machine; the width of the metallic drum is about 1.5 meters and is larger than the width of the strip compacted by the series of parallel pneumatic wheels (13) namely so that the drum extends beyond each of the sides.

3,890,057
MULTI-STATION DRILL APPARATUS

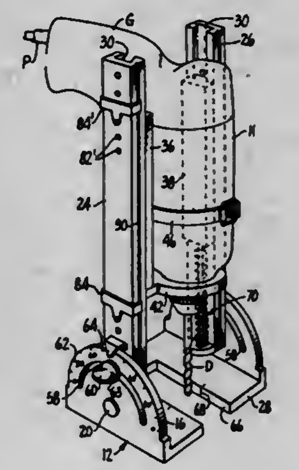
James J. Kindelan, Greensburg, Pa., assignor to Overmyer Mould Company of Pennsylvania, Greensburg, Pa.
Filed June 13, 1974, Ser. No. 478,922
Int. Cl. B23b *39/20*
U.S. Cl. 408—43 **12 Claims**



1. A multi-station apparatus for carrying out metalworking operations upon a plurality of workpieces, said apparatus comprising:
- a plurality of turntables having vertical axes of rotation for supporting workpieces;
- support means carrying said turntables for rotation at horizontally-spaced locations with said vertical axes lying within a vertical plane;
- drive means carried by said support means for rotating said turntables simultaneously about said vertical axes;
- indexing means for locking said turntables at a desired position after rotation by said drive means;
- a support column extending vertically above said turntables and horizontally spaced therefrom;
- a radial arm extending from said support column toward said vertical plane;
- tool means carried by said radial arm for each of said plurality of turntables; and
- means for displacing said tool means in a direction toward said turntables for performing spaced machining operations upon each workpiece while supported by the turntables.

3,890,058
DRILL GUIDING APPARATUS

Edgar L. Self, Fremont, and John C. Gormley, Dixon, both of Calif., assignors to Rhodes Investment Company, San Jose, Calif.
Filed Nov. 1, 1973, Ser. No. 411,690
Int. Cl. B23b *45/14*
U.S. Cl. 408—112 **7 Claims**

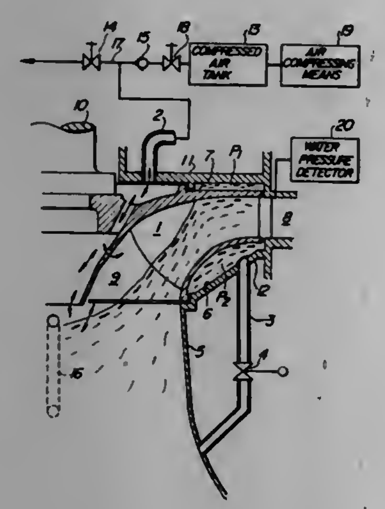


1. Apparatus for guiding a powered hand drill along a path toward and away from the surface of a work piece, said drill being of the type having a housing, a motor in the housing, and a tool gripping chuck exterior of the housing and in driven relation to the motor, the chuck being driven by the motor about a drilling axis, said apparatus comprising a base having a lower surface for contacting the surface of the work piece, first and second elongate guide bars extending upward from said base, means for mounting said guide bars to said base in parallel, spaced-apart relation on opposite sides of said path, first and second slides supported for movement along said guide bars toward and away from said base, a drill support member attached to said slides and spanning the space therebetween, said drill support member defining an opening for affording extension of said chuck therethrough, said support member having a portion bounding said opening for engaging the housing adjacent the chuck, means spaced from said support member for securing said housing at a site remote from the chuck to said slides, said support member and said securing means being adapted to mount said drill so that the drilling axis is parallel to the path, said base defining a passage therethrough in alignment with the drilling axis so as to permit a tool in the chuck to contact the work piece in response to movement of said drill along the path, means extending inward from said guide bars for defining abutments at the ends of said guide bars adjacent said guide bar mounting means, said slides having end faces confronting said abutments, a pair of compression springs for resiliently biasing said slides away from said base, one of said springs being disposed between one of said abutments and the end face of the slide confronting

said abutment and the other of said springs being disposed between the other of said abutments and the end face of the slide confronting said other abutment, a rigid rod disposed within each of said springs for supporting the spring, each said rod having a lower end secured to the abutment opposed to the spring within which the rod is disposed, said slides each having a longitudinal opening in alignment with the rod disposed in the spring opposed thereto, in which opening said rod slides in response to movement of said slides toward and away from said base.

3,890,059
HYDRAULIC TURBINE OPERATING METHOD AND APPARATUS

Mituo Takase, Mito, Japan, assignor to Hitachi, Ltd., Japan
Filed Oct. 23, 1973, Ser. No. 408,260
Claims priority, application Japan, Oct. 25, 1972, 47-106287; Mar. 7, 1973, 48-26034
Int. Cl. F01d *17/00*
U.S. Cl. 415—1 **7 Claims**



1. An method of operating a hydraulic turbine in which the operating pattern of the hydraulic turbine is switched from a normal running to a spinning reserve, the method comprising: supplying air into a runner chamber of the hydraulic turbine, discharging water leakage from guide vanes of the hydraulic turbine, and controlling the air supply and the discharging of water leakage so that the relation between thrusts on upper and lower sides of a runner of the hydraulic turbine will be substantially the same as that in the normal running condition.

3,890,060
ACOUSTIC DUCT WITH ASYMMETRIC ACOUSTICAL TREATMENT

Norman J. Lipstein, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Feb. 15, 1974, Ser. No. 442,893
Int. Cl. F01d *25/00;* **F01n** *7/00*
U.S. Cl. 415—119 **6 Claims**

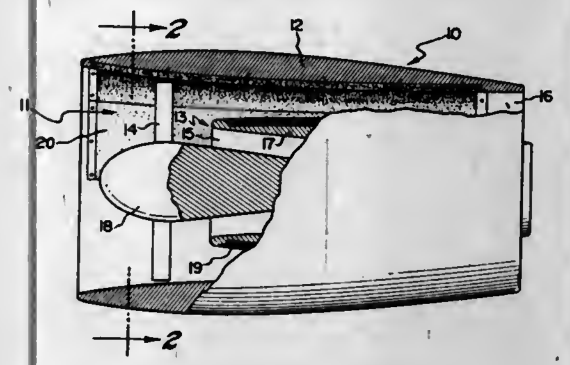
1. An improved noise-suppressing fan duct for an aircraft jet engine having a fan disposed within an annular fan duct air passage comprising

a generally streamlined rigid fan duct with a circular cross section having an asymmetric, circumferentially discontinuous acoustic lining attached to the inner surface thereof for absorbing noise which radiates within said duct,

said asymmetric acoustic lining being located on the upper portion of the circumference of said duct and being effective to alter the directivity of noise emitted from an end of said fan duct and produce an asymmetric directivity pattern characterized by preferential enhanced suppression of noise in an angular sector generally below the jet engine,

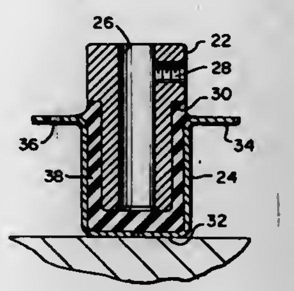
wherein said asymmetric acoustic lining is approximately semicylindrical and is continuous and uninterrupted in both the axial and circumferential directions, and

further including a second acoustic lining attached to the lower half of the circumference of said duct, said first-mentioned asymmetric acoustic lining having a higher sound absorption coefficient than said second acoustic lining.



3,890,061
RESILIENT HUB ASSEMBLY

Jacek A. Nechay, Avon, Conn., assignor to Torin Corporation, Torrington, Conn.
Filed Jan. 2, 1974, Ser. No. 429,570
Int. Cl. F04d *29/20*
U.S. Cl. 416—134 **4 Claims**



1. An air impeller comprising:

a plurality of circumaxially arranged air moving blades,

at least one generally radially extending outer blade support member connected at a radially outwardly located portion with said air moving blades and adapted at a radially inwardly located area for connection with a hub assembly,

a hub assembly comprising first and second rigid hub members respectively in driving and driven relationship with each other and the latter of which has an inner blade support member integral thereon and in the form of an annular radial flange drivingly connected at a radially outwardly located portion with said radially inwardly located area of said radially extending outer blade support member,

said driven hub member also having an annular axially extending wall integral with and extending from said flange and a radially extending end wall integral with said annular axial wall, said hub member thus taking a flanged-cup configuration,

said driving hub member being adapted to be mounted on and driven by a suitable shaft and having a first cylindrical section disposed within and with peripheral side and radial end walls spaced respectively from said annular axial and radial end walls of said driven hub member,

said driving member also having an enlarged second cylindrical section integral with said first cylindrical section and spaced axially outwardly from said annular flange whereby to define an annular shoulder extending radially outwardly and facing axially toward said flange on said driven hub member,

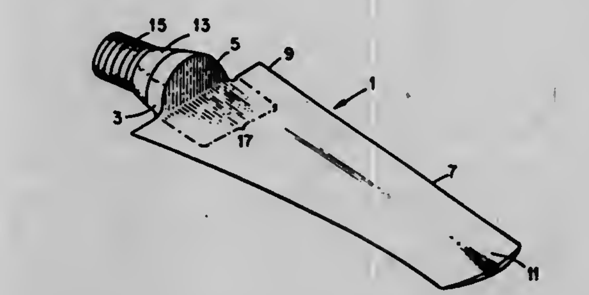
and said hub assembly also comprising an intermediate and resilient hub member having a cup-shape and connected in driving relationship between said driving and driven hub members,

said resilient hub member comprising a molded in situ elastomer with an annular cup side wall disposed between and bonded to said annular and axially extending wall of said driven hub member and said peripheral side wall of said driving hub member,

and a radial cup end wall disposed between and bonded to said radially extending end wall of said driven hub member and said radial end wall of said driving hub member, and said annular cup side wall also projecting axially beyond said axially extending annular side wall of said driven hub member and being bonded to said radial shoulder on said driving hub member with an annular portion thereof exposed radially outwardly between said shoulder and said annular flange on said driven hub member.

3,890,062
BLADE TRANSITION FOR AXIAL-FLOW COMPRESSORS AND THE LIKE

Donald E. Hendrix; Richard E. Ziegler, both of Oakridge, Tenn., and Weldon E. Swinson, Auburn, Ala., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.
Filed June 28, 1972, Ser. No. 266,900
Int. Cl. F04d *29/38*
U.S. Cl. 416—234 **5 Claims**



1. In a finished axial-flow gas machine blade including a platform and an airfoil extending therefrom, a face of said airfoil merged with a surface of said platform via a transition disposed entirely in the fillet region of said airfoil, the said transition defining in profile a line consisting of (a) an essentially straight major segment sloping outwardly from said face and toward said surface, the slope of said major segment having a value providing an essentially constant applied-moment-to-section-modulus ratio along the length thereof, and (b) an outwardly concave minor segment faired into said surface, said minor segment being substantially superimposable on a quadrant of an ellipse.

3,890,063
COMPRESSOR START AND WARM-UP CONTROL SYSTEM

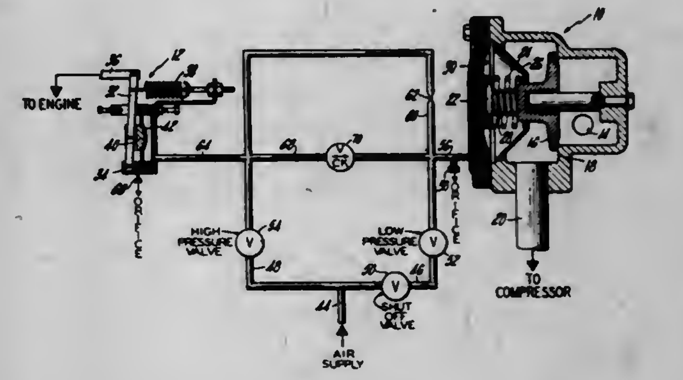
Arthur R. Spafford, Holyoke, Mass., assignor to Worthington-CEI, Incorporated, Holyoke, Mass.
Filed Nov. 16, 1973, Ser. No. 416,357
Int. Cl. F01b *49/00*
U.S. Cl. 417—27 **10 Claims**

1. A start and warm-up control for an engine driven compressor including:

means for controlling the delivery of gas to a compressor; means for controlling the speed of an engine driving the compressor;

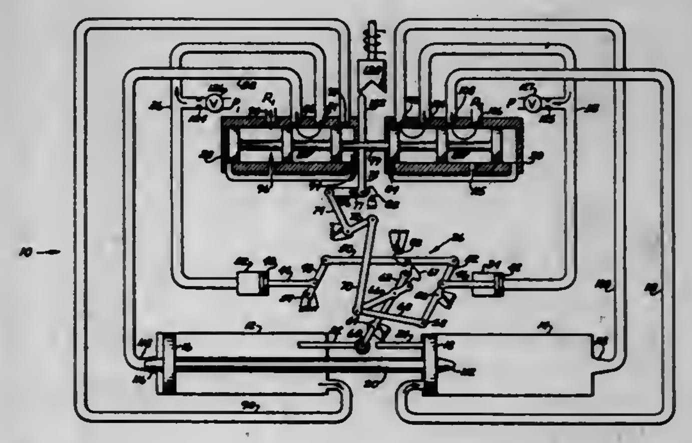
first supply line means connected to said gas delivery control means and to said speed control means, said first supply line means including first pressure responsive means responsive to a first level of compressor discharge pressure during a warmup period for delivering first signal pressure to both said gas delivery control means and said speed control means for controlling gas flow to the compressor and for reducing engine speed to a first control valve below full speed but above idle speed, said first supply line means including pressure reducing means for reducing the pressure of said first signal to said speed control means below the pressure to said gas delivery control means; and

second supply line means connected to said speed control means and to said gas delivery control means, said second supply line means including second pressure responsive means responsive to a second level of compressor discharge pressure during normal operation for delivering a signal pressure to both said gas delivery control means and said speed control means for controlling gas flow to the compressor and reducing engine speed to a second control value, said second level of compressor discharge pressure being higher than said first level of compressor discharge pressure and said second control value of engine speed being lower than said first control value of engine speed, said first and second supply line means being interconnected at a point downstream of said pressure reducing means in said first supply line means.



3,890,064
RECIPROCATING TRANSFER PUMP

Wilfred E. Boehringer, Fullerton; Jane Little, Long Beach; Robert D. Rothi, Rolling Hills, and Charles G. Westlund, Long Beach, all of Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.
Filed Jan. 11, 1973, Ser. No. 322,615
Int. Cl. F04b *41/04*
U.S. Cl. 417—237 **11 Claims**



1. A motor pump for transferring hydraulic energy between first and second hydraulic systems, said motor pump including:

first and second hydraulic cylinders including first and second pistons each having first and second sides, and connecting means connected between the second sides of said first and second pistons;

first control valve means connected between the pressure and return lines of the first hydraulic system and said first hydraulic cylinder, said first control valve means having a first position connecting the pressure and return lines of the first hydraulic system to said first and second sides of said first piston respectively and a second position connecting the pressure and return lines of the first hydraulic system to said second and first sides of said first piston respectively when said motor pump is transferring hydraulic energy from the first hydraulic system to the second;

a second control valve means connected between the pressure and return lines of the second hydraulic system and said second hydraulic cylinder, said second control valve means having a first position connecting the pressure and return lines of the second hydraulic system to said second and first sides of said second piston respectively and a second position connecting the pressure and return lines of the second hydraulic system to said first and second sides of said second piston respectively when said motor pump is transferring hydraulic energy from the first hydraulic system to the second;

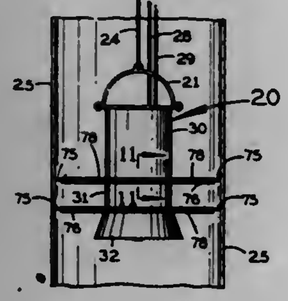
first sensing means to sense first and second predetermined positions of said pistons within said cylinders and to produce outputs in response thereto;

positioning means connected to said sensing means outputs for positioning said control valve means in their first and second positions in response to the predetermined positions of said pistons; and

second sensing means connected to the first and second hydraulic system to sense which system needs hydraulic energy transferred to it, said second sensing means including reversing means connected to said first and second control valve means, said reversing means reversing the connections between said first and second control valve means and said first and second hydraulic cylinders when the need is sensed by said sensing means so hydraulic energy is transferred to the system in need.

3,890,065
SUSPENDED SUBMERSIBLE PUMPING UNIT

J. Marlin Eller, 204 N.E. 8th Ter., and J. David Eller, 281 S.E. 18th Ave., both of Deerfield Beach, Fla. 33441
Division of Ser. No. 376,883, July 5, 1973. This application Aug. 5, 1974, Ser. No. 494,776
Int. Cl. F04b *17/00*
U.S. Cl. 417—360 **7 Claims**



1. In a submersible pumping unit for use at an underground conduit, said pumping unit having

a hydraulic motor driving a pump and located axially at one side of the pump,

an annular casing extending circumferentially around said motor and said pump, said casing being substantially smaller in cross-section than the underground conduit,

means supporting said motor and said pump inside said casing,

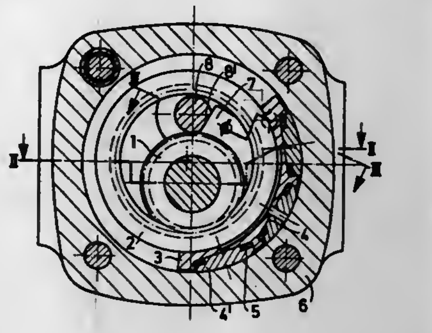
and suspension means attached to said casing for supporting the assembly of said casing and said motor and pump from above,

the improvement which comprises:

an annular rigid support plate attached to said casing and extending outward from said casing an appreciable distance laterally around the circumference of said casing, and an annular, flat, flexible and resilient sealing ring secured to said support plate and extending laterally outward therefrom around the entire circumference of said casing for wiping engagement with the inside of the conduit.

3,890,066
AXIALLY AND RADIALLY COMPENSATED HIGH PRESSURE GEAR PUMP

Otto Eckerle, Benzstrasse 6, 7502 Malsch, Germany
Filed Mar. 18, 1974, Ser. No. 452,282
Claims priority, application Germany, Mar. 16, 1973, 2313085
Int. Cl. F02c *21/00;* **F01c** *1/10, 19/02*
U.S. Cl. 418—71 **10 Claims**



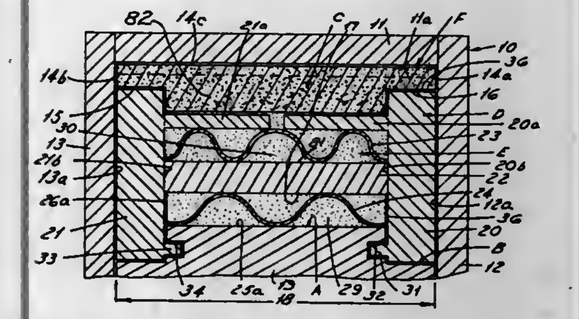
1. In a high pressure gear pump of the internally-geared type having a pinion, a cooperating gear ring, and a radially displaceable filler member arranged in the main bore of the pump housing, with a radially pressure-compensated control piston biasing the gear ring radially toward the pinion and the filler member, and with axially pressure-compensated discs bearing against the axial flanks of the pinion and gear ring in at least the area of pressure generation, the combination of:

means for abutting the filler member relative to the pump housing against back movement in the rotational direction opposed to the direction of gear rotation, while permitting a small radial displacement of the filler member; and

mechanical spring-biasing means engaging the filler member for biasing the latter toward said abutting means in said abutment direction, while permitting said radial displacement of the filler member.

3,890,067
RUBBING SEAL SYSTEM FOR A ROTARY COMBUSTION ENGINE

Vemulapalli D. N. Rao, Woodhaven, and Yeshwant P. Telang, Grosse Ile, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Aug. 24, 1973, Ser. No. 391,375
Int. Cl. F01c *19/02;* **F04c** *27/00;* **F01c** *21/00*
U.S. Cl. 418—121 **19 Claims**



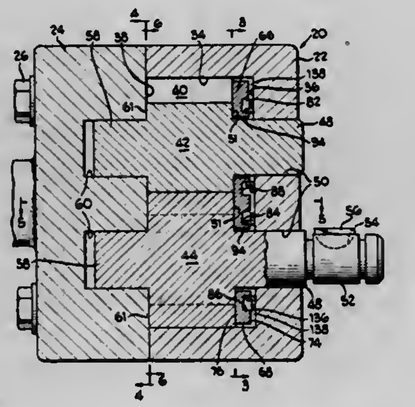
1. A sealing element carried by a rotor in a rotor housing of a rotary internal combustion engine comprising:

a. a wear-resistant body comprised of a composition which will maintain high hardness at elevated temperatures and contains volatile impurities,

b. a plurality of separated embedments disposed in said body and adjacent to at least one surface of said body which is adapted for frictional engagement with said rotor housing, the embedments being comprised of a material effective to be distributed across major portions of said one surface under the influence of frictional forces and effective, when so distributed to pack the pores of said body to prevent non-uniform loss of said impurities, said embedments being arranged so that the distributed material can be replenished during successive wear cycles of the body.

3,890,068
SEALING ARRANGEMENT FOR A FLUID PRESSURE DEVICE

Robert R. Davidson, Wooster, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.
Filed June 28, 1973, Ser. No. 374,290
Int. Cl. F01c *19/08;* **F03c** *3/00;* **F04c** *15/00*
U.S. Cl. 418—132 **5 Claims**



1. A pressure-loaded seal member for a rotary fluid-pressure energy-translating device of the positive displacement type, formed of resilient material and comprising first and second sealing walls generally normal to each other and disposed about a centroidal curve lying in a single plane, the first sealing wall having a planar first sealing surface disposed outwardly relative to the curve and parallel with the plane thereof, the second sealing wall having a second sealing surface disposed outwardly relative to the curve and intersecting the plane thereof at a locus of points equidistant therefrom, the sealing walls being joined to each other at a common edge thereof and each having a free edge opposite the common edge, and a plurality of preloading elements projecting from the free edge of the first sealing wall in transverse directions relative thereto and in spaced relation to each other, each of the preloading elements having an outer surface coplanar and contiguous with the first sealing surface, and a preloading surface generally normal to the outer surface and extending therefrom toward the plane of the curve.

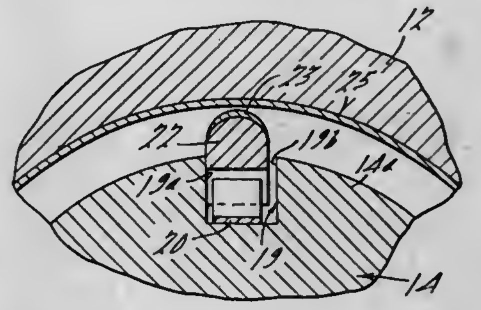
3,890,069
COATING FOR ROTARY ENGINE ROTOR HOUSINGS AND METHOD OF MAKING

Yeshwant P. Telang, Grosse Ile, and James C. Uy, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed July 5, 1973, Ser. No. 376,862
Int. Cl. F04c *1/08*
U.S. Cl. 418—178 **12 Claims**

1. A wear and chatter resistant coating system for the rotor housing of a rotary internal combustion engine, the system comprising:

a. a support portion comprised of a material having a thermal conductivity factor at least equivalent to aluminum, and

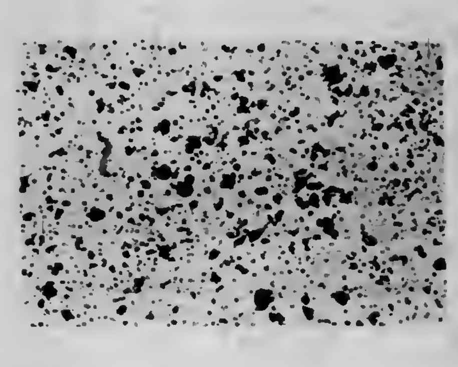
b. an outer exposed portion comprised of an admixture of generally equally hard powder particle types, one type



comprising martensitic stainless steel and the other type comprising a nickel-based alloy, said powder particles being surface fused to form a coating network, said starting powder particle types are uniformly limited to less than 200 mesh for providing an improvement in machined smoothness of said exposed portion.

3,890,070
RELATIVE COMBINATION OF AN APEX SEAL AND A ROTOR HOUSING IN THE ROTARY ENGINE

Takao Sasame, Hiroshima; Kentaro Takahashi, Saitama; Yoshikatsu Nakamura, Kanagawa, and Kazumasa Miura, Saitama, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan
Filed Aug. 3, 1973, Ser. No. 385,266
Claims priority, application Japan, Aug. 3, 1972, 47-77286
Int. Cl. F01c *21/08*
U.S. Cl. 418—178 **1 Claim**



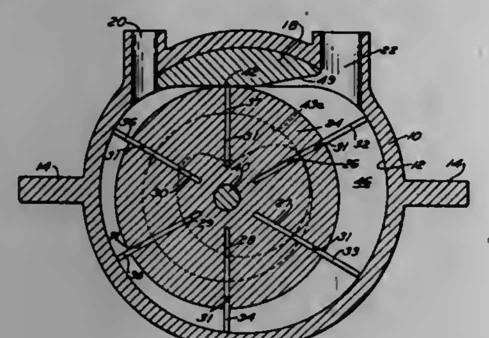
1. A combination of an apex seal and a rotor housing in a rotary engine, wherein said apex seal is made from ferrous or nonferrous metal and having more than 0.1 mm of the sliding surface layer thereof formed by spraying Fe-O compound containing oxygen 15.0 – 30.05 weight %, and said rotor housing has a hard plated sliding surface having the Hv hardness of more than 650.

3,890,071
ROTARY STEAM ENGINE

William J. O'Brien, Judson St., Raynham, Mass. 02767
Filed Sept. 24, 1973, Ser. No. 400,136
Int. Cl. F01c *1/00*
U.S. Cl. 418—260 **2 Claims**

1. A rotary steam engine comprising a substantially circular housing, an intake passage and an exhaust passage through said housing, a header plate mounted in said housing with an inner surface extending substantially on a chord of the circular housing, spaced intake and exhaust passages at opposite ends of the header plate, a cylindrical rotor eccentrically mounted in said housing to have a point of tangency at a point removed from the center of said header plate and closer to the intake passage than the exhaust passage, a shaft passing through the

axis of said cylindrical rotor, the axis of said rotor located below a plane passing through the horizontal axis of said housing, a plurality of vanes reciprocally mounted in said rotor, stationary cam means located within the housing engaging the radially inner end of said vanes, said vanes contacting the housing or the header plate throughout.



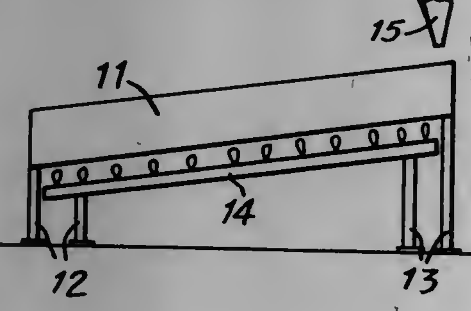
3,890,072
APPARATUS FOR FORMING SOLID SPHERICAL PELLETS

Ronald E. Barks, Thompson, Conn., assignor to Norton Company, Worcester, Mass.

Filed Sept. 4, 1973, Ser. No. 393,757

Int. Cl. B22f *9/00*

U.S. Cl. 425—6 **9 Claims**



1. An apparatus for forming substantially spherical solid pellets from droplets of a slurry of finely divided solid aluminous particles comprising

a supporting means having a continuous smoothly contoured upper surface extending between a relatively higher upper end and a relatively depressed lower end thereof exposed along its entire length to the ambient pressure of a normal atmospheric environment, and

a means for depositing droplets of said slurry upon the upper surface of said supporting means

a drying means disposed adjacent to said supporting means and operative upon said droplets adjacent to the upper end of said supporting means so as to convert said droplets to dry relatively hard pellets by the time they slide down the upper surface of said supporting means to its lower end.

3,890,073
CENTER MECHANISM FOR A PRESS TO SHAPE AND CURE TIRES

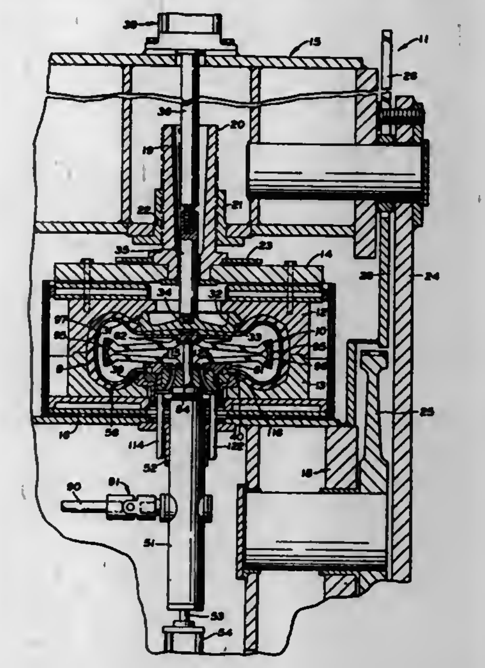
Gary R. Getz, Norton, Ohio, assignor to McNeil Corporation, Akron, Ohio

Division of Ser. No. 185,931, Oct. 4, 1971, Pat. No. 3,790,656. This application Dec. 5, 1973, Ser. No. 422,027

Int. Cl. B29h *5/02*

U.S. Cl. 425—48 **11 Claims**

1. In a press for shaping and curing tires, a center mechanism comprising, a flexible bladder over which an uncured tire band having a transverse plane of structural symmetry is receivable, opposed axially movable hubs with said bladder secured thereto, opposed bearing plates disposed within said bladder, link arms connecting said bearing plates to said hubs for displacing said bearing plates radially outwardly upon axial movement of said hubs toward each other to effect the application of mechanical pressure against the uncured tire band and thereby support it in a predetermined position with respect to said bladder, means for conforming said bladder to the uncured tire band and for subsequently disengaging said opposed bearing plates from against said bladder to allow unrestricted contact of the curing medium to the full surface of said bladder.



3,890,074
EXTRUSION AND COOLING PLANT FOR PLASTICS STRANDS

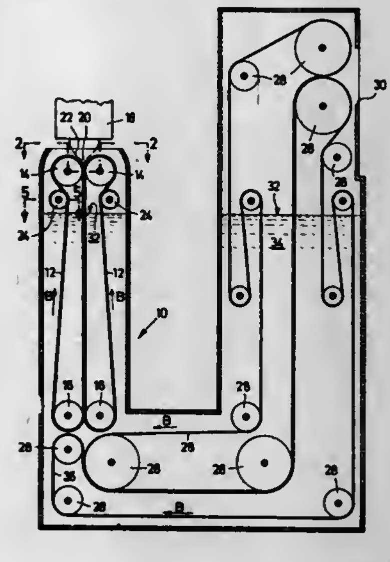
Rudolf Paul Fritsch, Goslarer Strasse 58, 7 Stuttgart 58, Germany

Filed Apr. 17, 1973, Ser. No. 351,866

Claims priority, application Germany, Apr. 22, 1972, 2219786; July 10, 1972, 2233917

Int. Cl. B29c *25/00*

U.S. Cl. 425—71 **9 Claims**



1. Apparatus for extruding and cooling plastic strands comprising a tank for liquid coolant, a die head provided with at least two rows of downwardly facing apertures from which a plurality of plastic strands are to be simultaneously extruded, the apertures of each row being offset with respect to the apertures of an adjacent row, and a pair of endless conveyor belts arranged in abutting face-to-face relationship over at least a portion of their respective lengths to define an inlet funnel below said die head for receiving strands extruded therefrom and for transporting them into a coolant in said tank, the facing surfaces of said conveyor belts being provided with longitudinally extending ribs, the ribs of one of the pair of belts being laterally offset with respect to the ribs of the other said pair of belts, each rib of one belt defining with the space between a pair of ribs of the other belt a duct extending longitudinally of said pair of belts for transporting a single extruded plastic strand.

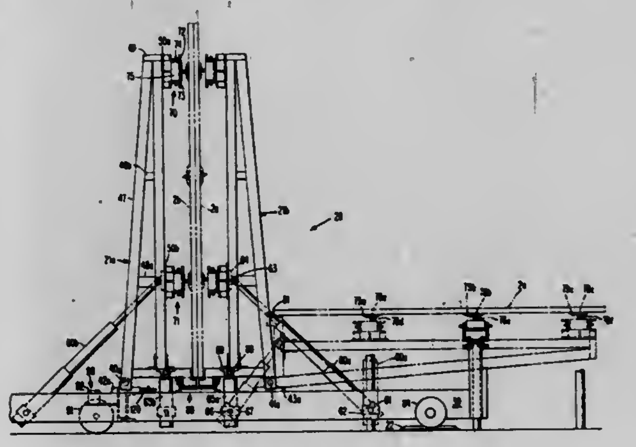
3,890,075
TRANSFER MECHANISM FOR STRUCTURAL MEMBERS

John Lorin Bourdo, Phoenix, Ariz., assignor to Automated Construction Industries, Inc., Phoenix, Ariz.

Filed Feb. 25, 1974, Ser. No. 445,249

Int. Cl. B29c *3/02*

U.S. Cl. 425—88 **10 Claims**



3. A transfer mechanism for joining and transporting pairs of mating structure mold halves having dimensions as large as in the order of 12 by 20 feet, said mechanism comprising:

a main frame;

a pair of swing frames pivotally carried by the main frame on adjacent parallel axes and adapted in horizontal positions thereof to receive respective ones of said mold half pairs and adapted in vertical positions thereof to hold the mating mold halves in engagement with each other between the swing frames to permit clamping of the mold halves together;

means connected to the main frame and to the swing frames for moving the swing frames between said horizontal and vertical positions, and

conveyor means carried by the main frame between the swing frames for supporting the mating mold halves when the swing frames are in their vertical positions.

3,890,076
DEVICE FOR THE SEALING OF A BLOCK FORMED OF A PILE OF PLATES, SUCH THAT OF FUEL CELL, WHILE MAINTAINING FREE PASSAGEWAYS BETWEEN THESE PLATES

Yves Breelle, Le Pecq; Alain Grehier, Paris, and Marcel Paty, Les Essarts Le Roi, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, France

Filed Jan. 24, 1973, Ser. No. 326,548

Claims priority, application France, Jan. 31, 1972, 7203220

Int. Cl. B29c *1/00*

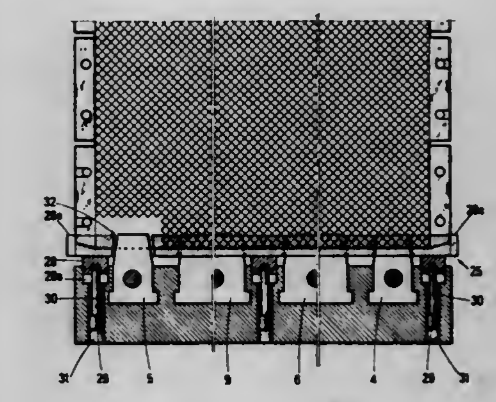
U.S. Cl. 425—110 **8 Claims**

1. A removable casting device for sealing at least the periphery of a block of piled adjacent plates maintained in spaced relationship to one another during casting, said device comprising:

separating means for insertion between the adjacent plates in such a manner to provide fluid flow passageways between sealed adjacent plates in use,

an assembly for arranging said piled adjacent plates in piled relationship comprising removable base plate means, and at least one removable side wall means for positioning said separating means between the adjacent plates, said sidewall means having extracting means for separating said block from said separating means and said at least one side wall means after casting to form the fluid flow passages, and

retaining means for retaining said separating means on said at least one side wall means.



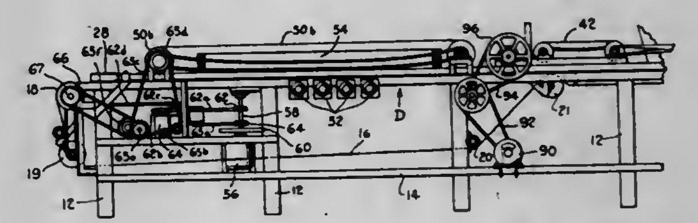
3,890,077
APPARATUS FOR MANUFACTURING ARTIFICIAL BOARDS AND SHAPES

John A. Holman, 1206 Rutledge Way, Anderson, S.C. 29621

Filed Jan. 5, 1973, Ser. No. 321,153

Int. Cl. B29c *15/00*

U.S. Cl. 425—111 **8 Claims**



1. An apparatus for producing elongated articifial boards from a mixture of filler material and thermosetting resin reinforced with elongated reinforcing members comprising: a plurality of elongated endless belts radially spaced about a longitudinal axis, rotatable members supporting each of said belts in an extended loop, said belts being positioned about said longitudinal axis so that the inner surfaces of each of said belts cooperate to define an elongated forming die with an entrance opening at one end and an exit opening at the other end, said elongated forming die having a decreasing cross sectional area from adjacent said entrance opening to an intermediate portion thereof, means for supplying said mixture of filler material and thermosetting resin to the entrance of said elongated forming die, means for feeding said elongated reinforcing members to said elongated forming die, heaters carried closely adjacent said inner surfaces of said belts, and means for rotating said belts for compressing said mixture as said mixture is pulled through said decreasing cross sectional area of said forming die and for pulling said mixture and said elongated reinforcing members through said elongated die forming an elongated reinforced cured artificial board.

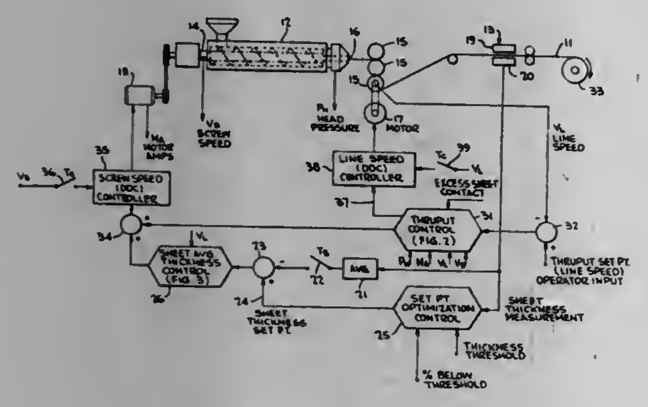
3,890,078
NONINTERACTING EXTRUDER CONTROL

Maris A. Straumanis, Columbus, Ohio, assignor to Industrial Nucleonics Corporation, Columbus, Ohio

Filed Jan. 31, 1972, Ser. No. 222,103

Int. Cl. B29f *3/06*

U.S. Cl. 425—141 **26 Claims**



HEAD PRESSURE
MOTOR
SCREW SPEED
MOTOR AMPS
LINE SPEED
SCREW SPEED (DDC) CONTROLLER
LINE SPEED (DDC) CONTROLLER
EXCESS SHEET CONTACT
THRUPUT CONTROL (FIG. 2)
SHEET AVG THICKNESS CONTROL (FIG 3)
AVG
THRUPUT SET PT. (LINE SPEED) OPERATOR INPUT
SHEET THICKNESS SET PT.
SET PT OPTIMIZATION CONTROL
SHEET THICKNESS MEASUREMENT
THICKNESS THRESHOLD
% BELOW THRESHOLD

1. In combination with apparatus for controlling an industrial product forming machine responsive to a supply of input material, first means for feeding the material to the machine, second means for taking the product formed by the machine away from the machine, both said first and second means being capable of affecting a thickness or weight property and throughput of the product formed by the machine, means for measuring the property of the formed product, means responsive to the property measuring means for comparing the measured property value with a set point for the property value to derive a first error signal, means for measuring the throughput of the machine, means for comparing the measured throughput with a set point value for throughput to derive a second error signal, means responsive to the first error signal for deriving another signal indicative of the amount by which the rate of one of the first or second means should be changed due to the property comparison, means responsive to the second error signal for deriving a further signal indicative of the amount by which the rate of said one means should be changed due to the throughput comparison, means combining said another and further signals for controlling the rate of said one means, and means responsive to said second error signal for controlling the rate of the other of the first or second means so that interaction between control of the property and throughput in the formed sheet is substantially prevented.

3,890,079
AUTOMATIC MACHINE FOR BENDING AND FLARING QUANTITIES OF PLASTIC PIPE

Willard C. Slater, Miami, Fla., assignor to Universal Plastic Pipe Bending Corporation, Miami, Fla.

Filed Nov. 13, 1972, Ser. No. 305,856

Int. Cl. B29c *17/02*

U.S. Cl. 425—155 **6 Claims**

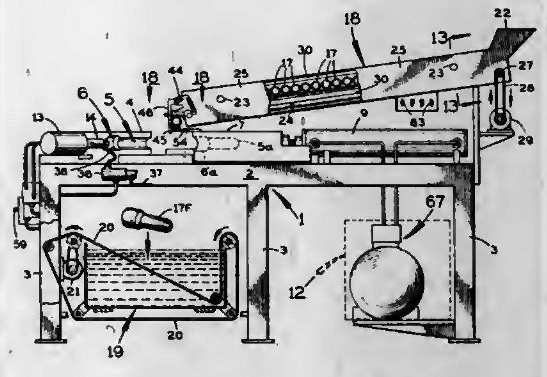
1. A machine for automatically and sequentially forming quantities of straight pre-heated softened thermal plastic round pipe of uniform predetermined dimensions into elbows having an integral expanded coupling at each end thereof comprising means forming a frame including a substantially horizontal top,

a fixed forming die member secured to said top and having a convex arcuate end surface of predetermined curvature, said end surface having a uniform recessed convex arcuate groove of predetermined axial length and a semi-circular cross section with the radius thereof substantially equal to the radius of curvature of the outside diameter of the pipe being formed and each opposite end of said arcuate groove terminating in a coaxial semi-cylindrical cavity of predetermined length and having a second cross sectional radius substantially equal to the radius of the outside diameter of the pipe plus the double thickness of the wall of the pipe,

a movable forming die member having a concave end in close mating contact with said convex end of said fixed die member and a concave second groove therein mating said convex groove in said fixed die member and a like semi-cylindrical cavity at opposite ends of said second groove mating each said semi-cylindrical cavity in said fixed die member when said movable die member is in closed mating contact with said fixed die member,

said movable die member secured to said top by slidable means for movement from closed contact with said fixed die member to a predetermined idle position a spaced distance therefrom by connection to the piston rod of a dual direction first power cylinder means for moving said movable die member from said idle to said mating contact with said fixed die member and vice versa when energized from opposite ends,

a pair of dual direction mandrel power cylinder means secured to said top with the axis of each piston rod thereof positioned in spaced coaxial relation to each axis of each opposite semi-cylindrical cavity in said fixed die member with the end of each said rod spaced a predetermined distance from opposite sides of said fixed die member,



a cylindrical forming mandrel means secured coaxial to the end of each said piston rod of said mandrel cylinder means with a coaxial tapered outer end portion terminating in a second pilot cylinder having a chamfered end for entry into the inside diameter of said pipe when each said mandrel means is moved by each said cylinder when energized into each opposite said cylindrical cavity formed by the said semi-cylindrical cavities when said movable die member is in closed position,

a coaxial bore of predetermined distance in the end of each said mandrel means with a connection to a flexible conduit for sequentially conducting pressurized air for reducing deformations in said elbow and followed by conducting pressurized cooling water in the rear portion thereof for partial rigidizing of the formed elbow prior to the reverse energizing of each said mandrel cylinder means, a pipe arresting ledge having a substantially horizontal planar upper surface of predetermined width extending outward a predetermined distance from said concave end of said movable die member with said upper surface movable in a plane in close proximity with the lower edge of said groove in said fixed die member adapted for forward movement by said movable die member to arrest each descending pre-heated pipe of predetermined length in the space between the said mating ends of said fixed die member and said movable die member when the latter is spaced from the former for the movement of said pipe into its elbow form when said movable die member is moved to its said closed position.

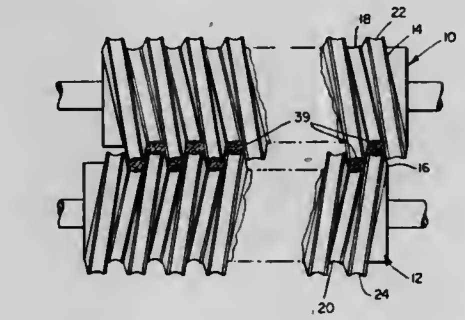
3,890,080
ROLL-PELLETIZER FOR MAKING UNIFORM PARTICLE SIZE PELLETS

Ronald F. Cotts, Norristown, Pa., assignor to IU Conversion Systems, Inc., Philadelphia, Pa.

Filed Jan. 22, 1974, Ser. No. 435,452

Int. Cl. B29c *15/00*

U.S. Cl. 425—363 **8 Claims**



1. In a roll pelletizer for compressively forming a plastic material into formed strips of indefinite length by passing said material through a pair of opposed compressive rolls each having a yieldable surface with circumferential lands and grooves, the lands of each roll mating with the grooves of the opposed roll, wherein said formed strips are subsequently broken to form pellets, each roll consists of a cylindrical base member and a continuous resilient strip helically wound thereon with successive wraps of the helical winding abutting one another, said resilient strip including a reduced depth portion in part of its width along the length thereof, said reduced depth portion defining grooves and the remaining portion of said resilient strip defining lands on the surface of said roll.

3,890,081
INJECTION HOLDING MACHINE CLAMP MECHANISM

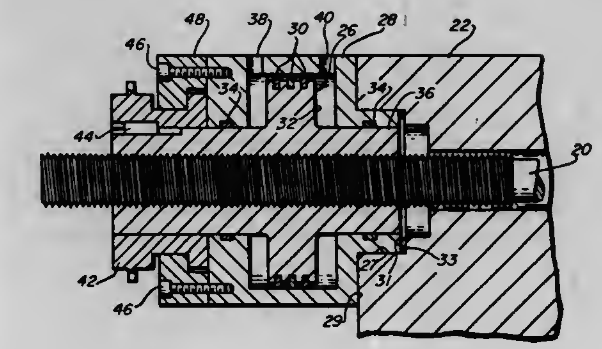
Volker R. Grundmann, Glastonbury, Conn., assignor to Litton Industrial Products, Inc., Berlin, Conn.

Continuation of Ser. No. 168,042, Aug. 1, 1971, abandoned.

This application July 30, 1973, Ser. No. 383,778

Int. Cl. B29f *1/00*

U.S. Cl. 425—450.1 **20 Claims**



1. In a plastic injection molding machine carrying first and second sections of a mold having engaging portions the combination which comprises:

a. A base;

b. A stationary platen fixed on said base in upstanding relationship, said stationary platen carrying the first section of the mold;

c. A clamp housing carried on said base in upstanding relationship and movable on said base toward and away from said stationary platen;

d. A movable platen carried on said base in upstanding relationship and disposed between said stationary platen and said clamp housing, said movable platen being selectively movable toward and away from said clamp housing and said stationary platen and said movable platen carrying the second section of the mold for selective engagement with the first section of the mold;

e. A plurality of elongated tie bars carried by said clamp housing, said stationary platen and said movable platen, said tie bars engaging said stationary platen to prevent movement of said tie bars through the stationary platen, said tie bars slidingly engaging said movable platen to allow relative longitudinal movement therebetween;

f. A plurality of pistons and cylinders carried by said clamp housing with each of said cylinders in fixed relationship thereto, each piston having internal threads engaging corresponding threads on one of said tie bars so that rotating all of said pistons varies the mold height of the injection molding machine and application of hydraulic pressure to all of said pistons in one direction causes clamping of the mold;

g. Means for traversing said movable platen with respect to said clamp housing along the upper surface of said base;

h. Blocking means for limiting relative movement of said movable platen toward said clamp housing; and

i. Drive means for simultaneously rotating each of said pistons equal angular increments to vary the mold height of the injection molding machine.

3,890,082
INJECTION MOLDING APPARATUS

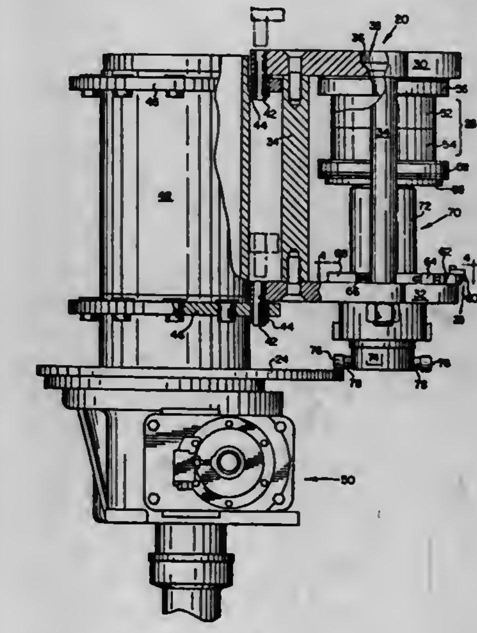
Richard H. Daly, Wood Dale; Robert V. Brink, Carpentersville, and Kare Andersen, Elgin, all of Ill., assignors to Chicago Rawhide Manufacturing Company, Elgin, Ill.

Division of Ser. No. 216,094, Jan. 7, 1972, Pat. No. 3,746,491.

This application June 11, 1973, Ser. No. 368,996

Int. Cl. B29c *3/02*

U.S. Cl. 425—451.9 **8 Claims**

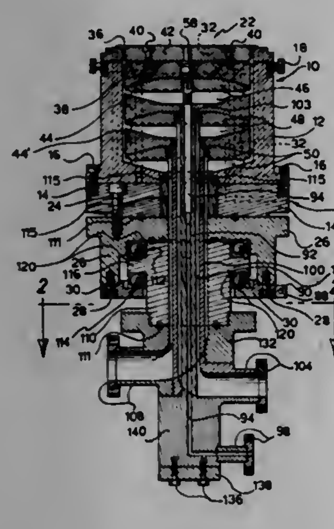


1. A molding station having a pair of spaced apart opposed frame members connected to each other by a frame support, first and second mold support parts arranged for movement relative to each other between open and closed positions, said mold support parts being disposed between said frame members, at least one of said mold support parts, in the closed position thereof, being supported by one of said frame members, a column assembly having a part supporting one of said mold support parts and being movable along a given axis with respect to one of said frame members, said column assembly including inner and outer elements relatively movable axially of each other and normally biased apart by resilient means, lock-receiving means in one of said inner and outer elements, a lock unit having a portion thereof movable relative to and supported by one of said frame members, said lock-receiving means being arranged so as to receive said lock therein only in a position of one of said inner and outer elements wherein said resilient means is at least partially compressed, whereby

a predetermined locking force may be applied through said resilient means to said mold support parts to lock said mold support parts into the closed position thereof by locking one of said column elements with respect to said one frame member.

3,890,083
EXTRUSION DEVICES

Daniel Robert St. Eve, Thornhill, Ontario, Canada, assignor to Leco Industries Limited, St. Laurent, Quebec, Canada
Filed May 30, 1973, Ser. No. 365,200
Int. Cl. B29f *3/00*
U.S. Cl. 425—462 **16 Claims**

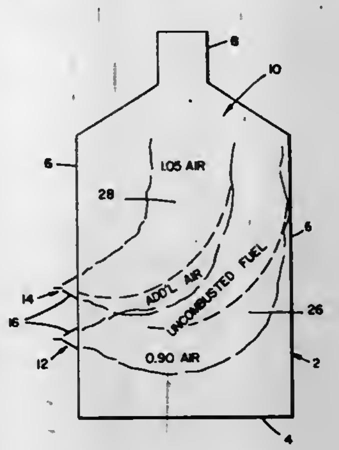


1. A rotatable coextrusion die comprising an outer die body and feeding means for feeding at least two sources of extrudable material, said outer die body having a common annular flow path terminating in a die lip, a plurality of material spreading members located within said body, each such member being comprised of a die-plate having a plurality of flow passages on opposite sides thereof and which communicate with said common annular flow path to provide a continuous flow of overlapping material streams, and said feeding means comprising at least two individual feeding means and each communicating with flow passages associated with one of said die-plates, each of said feeding means being adapted to feed an extrudable material to said flow passages, whereby all of the extrudable materials from each feeding means is combined to form a multi-layered extrudable material.

3,890,084
METHOD FOR REDUCING BURNER EXHAUST EMISSIONS

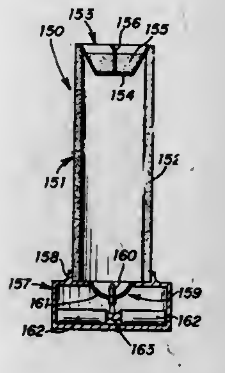
Temple S. Voorheis, Atherton, and Ralph R. Vosper, San Jose, both of Calif., assignors to Coen Company, Inc., Burlington, Calif.
Filed Sept. 26, 1973, Ser. No. 400,774
Int. Cl. F23m *3/04*
U.S. Cl. 431—10 **16 Claims**

1. A method of operating an existing industrial furnace at a low NO_x emission level, the furnace including at least two vertically spaced burners, the method comprising the step of modifying the combustion process in the furnace with the steps of firing at least a portion of one of the burners with an off-ratio air supply, firing at least a portion of the other burners with a sufficient additional air supply to provide for a low excess air firing of all burners, and combusting all fuel discharged by the burners by first combusting a portion of the fuel adjacent the burner and thereafter combusting another portion of the fuel at a location spaced from the burners.



3,890,085
ILLUMINATED CANDLE STRUCTURE

Frits J. Andeweg, 7737 Royal Ln., Dallas, Tex. 75230
Continuation-in-part of Ser. No. 212,107, Dec. 27, 1971, Pat. No. 3,761,702. This application Sept. 24, 1973, Ser. No. 400,203
Int. Cl. F23q *2/32*
U.S. Cl. 431—125 **14 Claims**

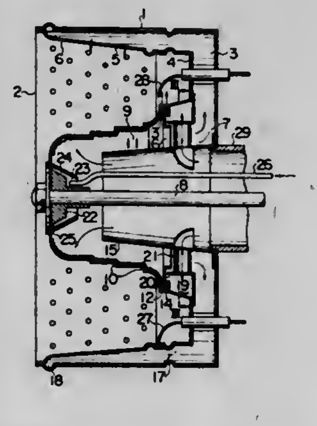


1. In a candle structure adapted for burning in the upper portion and for illumination within the lower portion:
- a translucent body portion;
- a burnable wax portion supported by said translucent body portion generally at the top thereof;
- wick means imbedded within said burnable wax portion and extending from the top of said burnable wax portion;
- a cavity of substantial size within said translucent body portion generally below said burnable wax portion;
- non-flammable barrier means positioned below the bottom of said wick in the region of the top of said cavity;
- said translucent body portion substantially surrounding said cavity;
- said cavity being of sufficient size and shape and being positioned to receive light for internal illumination of substantially the entire translucent body portion from a light source independent of said wick means at the top of the candle structure;
- a votive comprising a non-flammable shell defining the barrier means and having the burnable wax portion and the wick means received therein;
- said translucent body portion of the illuminated candle structure comprising a hollow structure; a light source below said votive and communicating with said cavity;
- said votive being supported in the upper portion of the structure with the upper edge of the votive substantially aligned with the upper end of the structure so that the votive is substantially enclosed by the structure;

- said non-flammable shell of the votive being outwardly tapered at the upper end thereof; and
- the interior of the upper end of the hollow structure comprising the translucent body portion of the candle structure being tapered to receive the shell of the votive such that the votive is supported at the top of the translucent body portion of the illuminated candle structure.

3,890,086
LIQUID FUEL BURNER FOR BURNING LIQUID FUEL IN GASIFIED FORM

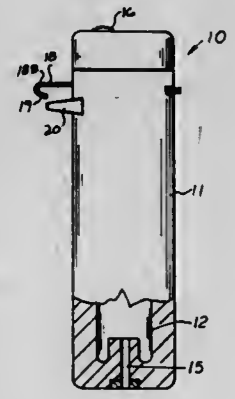
Kingo Miyahara, Tokyo, Japan, assignor to Dowa Co., Ltd., Tokyo, Japan
Filed Aug. 20, 1974, Ser. No. 499,026
Claims priority, application Japan, Aug. 22, 1974, 49-98433
Int. Cl. F23d *11/04*
U.S. Cl. 431—168 **4 Claims**



1. A liquid fuel burner for burning liquid fuel in gasified form comprising a main body made of thin sheet iron or the like, a gas chamber formed by mounting a combustion plate and an inner bottom wall along the inner periphery of the main body in spaced relationship, said combustion plate being formed therein with a multitude of gasified fuel blowing openings, a fuel gasifying member rotatably mounted within the main body, said fuel gasifying member being open at one end to communicate with said gas chamber and forming on its wall with a plurality of offset portions for promoting diffusion of the liquid fuel, a gas-air mixing plate mounted to the open end portion of said fuel gasifying member to define a scattering gap therebetween, and an air supply duct extending into the fuel gasifying member and opening therein.

3,890,087
DISPOSABLE FIREPLACE AND OVEN LIGHTER

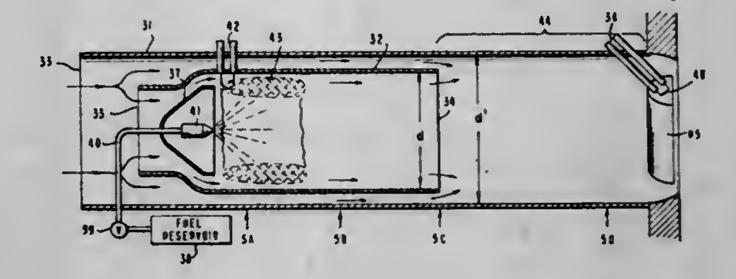
Crowell B. Jackson, 179 E. 79th St., New York, N.Y. 10021
Filed June 17, 1974, Ser. No. 479,897
Int. Cl.² F23Q *1/02*
U.S. Cl. 431—277 **9 Claims**



1. For use in a gas lighter having a housing containing a reservoir portion for containing a volatile liquid fuel,
- a normally closed valve for controlling the flow of gaseous fuel from said rcservoir,
- a sparking ignition means disposed in ignition relationship to said normally closed valve,
- the improvement comprising:
- a valve actuator connected to said normally closed valve,
- means for pivotally mounting said valve actuator on said housing,
- said actuator having an extended portion extending beyond the periphery of said housing,
- a latching means formed on the extended end of said valve actuator,
- a complementary catch means formed on said housing adjacent said latching means whereby said latching means automatically engages said catch to mechanically lock said valve actuator and connected valve in the open position upon ignition of said gas lighter.

3,890,088
APPARATUS FOR REDUCING FORMATION OF OXIDES OF NITROGEN IN COMBUSTION PROCESSES

Antonio Ferri, Woodbury, N.Y., assignor to Advanced Technology Laboratories, Inc., Westbury, N.Y.
Continuation-in-part of Ser. No. 72,985, Sept. 17, 1970, abandoned. This application Nov. 22, 1972, Ser. No. 308,721
Int. Cl. F23d *13/00, 21/00*
U.S. Cl. 431—351 **10 Claims**



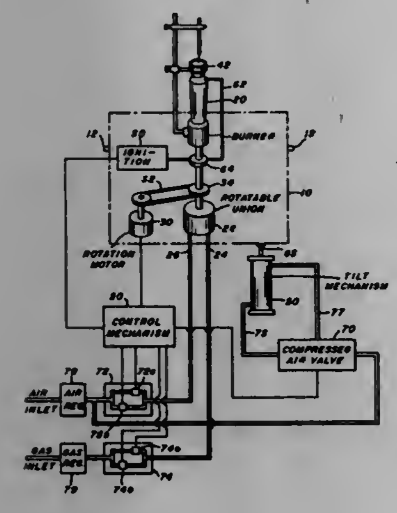
1. A combustion apparatus, comprising
- a. means for vaporizing fuel, including means for introducing fuel into said vaporizing means for vaporization thereof;
- b. mixing means downstream of said vaporizing means for mixing air with said vaporized fuel, said mixing means communicating with said vaporizing means for flow of vaporized fuel thereto, and means for flowing air into said mixing means, said mixing means being operable to mix said air and said vaporized fuel without combustion thereof;
- c. combustion means downstream of said mixing means for combusting said mixture of air and vaporized fuel, including ignitor and flame-holding means for igniting said mixture of air and vaporized fuel to form a flame; and
- d. said mixing means including means for passing said mixture of air and vaporized fuel from said mixing means to said combustion means at a velocity in excess of the flame propagation speed and said mixing means being of sufficient length to allow said air and vaporized fuel to be thoroughly mixed such that the mixing means delivers at said ignitor and flame-holding means a substantially uniform mixture of air and vaporized fuel on a molecular scale without prior combustion thereof.

3,890,089
HOMOGENEOUS FUSION SYSTEM AND METHOD

Charles K. Matocha, Lower Burrell, Pa., assignor to Aluminum Company of America, Alcoa Center, Pa.
Filed Oct. 17, 1973, Ser. No. 407,094
Int. Cl. F27b *3/06*
U.S. Cl. 432—11 **10 Claims**

10. A process for the preparation of homogeneously fused material comprising:

a. loading fusible material into holding means;
b. heating said material within said holding means for a preselected period of time to a preselected temperature below the fusion temperature to expel entrapped air and low temperature volatiles;
c. heating said material to fusion temperature for a predetermined period of time;
d. rotating said holding means for a predetermined period of time at a predetermined angle of tilt while simultaneously heating said material at fusion temperature to lap the interior wall of the holding means to clean said wall of any fusible material;



e. rotating said holding means while cyclically tilting said holding means to a predetermined angle and returning said holding means to a vertical position while simultaneously heating said material at fusion temperature to provide homogeneous mixing of said fusible material and elimination of gas bubbles; and
f. cooling said fused material at one or more predetermined temperatures for a predetermined period of time.

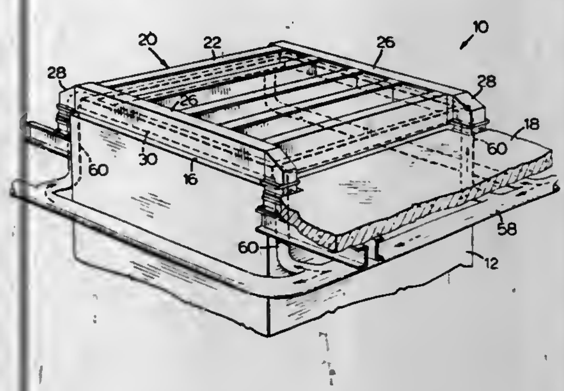
3,890,090
REFRACTORY FURNACE

Andrew G. Sanderson, 178 Patton St., King City, Ontario, Canada

Continuation-in-part of Ser. No. 346,954, April 2, 1973, Pat. No. 3,787,172. This application Nov. 14, 1973, Ser. No. 415,671

Int. Cl. F27d *1/02*, *1/18*

U.S. Cl. 432—250 5 Claims



1. A refractory furnace comprising:
A refractory wall enclosing an upwardly opening chamber; an overhead cover for the chamber comprising a frame carrying refractory material, a peripheral duct fixed to the frame and having at least one inlet leading into the duct, and air curtain outlet apertures opening towards the refractory wall;
conduit means located outside the refractory wall and connectable with a remote source of pressurized air, the conduit means having an outlet; and
the inlet of the cover being constructed and arranged to register with the outlet of the conduit means when the cover is positioned to close the chamber.

CHEMICAL

3,890,091
THE LEVEL DYEING OF WOOL POLYIMINE OR POLYAMINE AND SULFONATED PHENYLENE AMINOHLOROTRIAZINE TREATED

Pierre-Rene Cathelin, Tignieu, France, and Hermann-Heinz Konrad, Kelkheim, Taunus, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

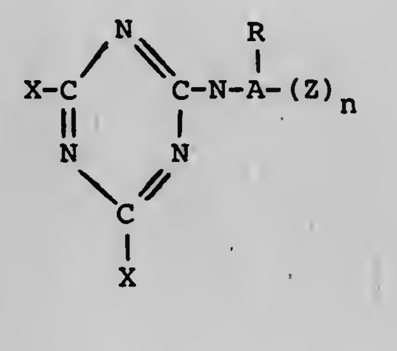
Filed Sept. 6, 1973, Ser. No. 394,797

Claims priority, application Germany, Sept. 8, 1972, 2244060

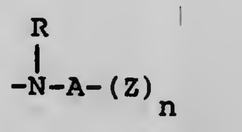
Int. Cl. D06p *7/00*

U.S. Cl. 8—17 3 Claims

1. A process for the level dyeing of wool having an anti-felting finish of polyimine or polyamine resin, with fiber-reactive dyestuffs, wherein, prior to the dyeing, the wool having the anti-felting finish is pretreated with a compound of the formula



in which R is hydrogen or an alkyl radical having up to four carbon atoms, A is phenylene, Z is an anionic group selected from the group consisting of
—SO_3(H,Me)
—O—SO_3(H,Me)
—CO—O(H,Me)
—SO_2—CH_2—CH_2—O—SO_3(H,Me),
n is an integer from 1 to 3, X is chlorine or the group



$$-\overset{R}{\overset{|}{N}}-A-(Z)_n$$

and Me is an alkali metal ion; and the dyeing with the said reactive dyestuffs is then effected.

3,890,092
FLAME-RETARDANT MATERIAL AND PROCESS

Albert Y. Garner, Yellow Springs, Ohio, assignor to Monsanto Research Corporation, St. Louis, Mo.

Filed Oct. 26, 1973, Ser. No. 410,051

Int. Cl. C08g *51/56*

U.S. Cl. 8—115.6 18 Claims

1. A process for improving the flame-retardancy of polybenzimidazole material, aromatic polyimide material or aromatic polyamide material comprising treating said material with aminocyclophosphazene in sufficient amount and curing the treated material at a sufficient temperature to improve flame-retardancy in high oxygen atmosphere.

3,890,093
MERCERIZING SOLUTIONS

Helmut Diery; Peter Hess; Karl-Heinz Schneider, all of Kelkheim, Taunus, and Gerhart Schneider, Schneidhain, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

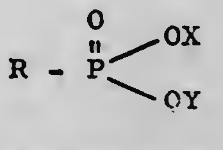
Filed June 21, 1973, Ser. No. 372,391

Claims priority, application Germany, June 26, 1972, 2231148

Int. Cl. D06m *1/02*

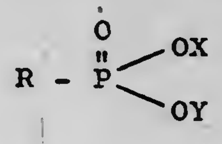
U.S. Cl. 8—127 5 Claims

1. An aqueous mercerizing solution essentially consisting of 10 to 400 g/l of sodium-, potassium- or lithium hydroxide or a mixture thereof, and 0.1 to 5 g/l of phosphonic acid derivative of the formula



in which R stands for an aliphatic linear, branched or cyclic hydrocarbon radical having 6 to 10 carbon atoms, and X and Y which may be identical or different, each stands for hydrogen, sodium, potassium or an aliphatic linear or branched hydrocarbon radical having 1 to 4 carbon atoms.

5. A process for treating with lyes and mercerizing cellulosic fibrous material, which comprises treating the fibrous material with an aqueous alkaline mercerizing solution containing, as a wetting agent 0.1 to 5 g/l of a phosphonic acid derivative of the formula



in which R stands for an aliphatic linear, branched or cyclic hydrocarbon radical having 6 to 10 carbon atoms, and X and Y which may be identical or different each stands for hydrogen, sodium, potassium or an aliphatic linear or branched hydrocarbon radical having 1 to 4 carbon atoms.

3,890,094
POLYESTER TEXTILE DYED WITH YELLOW ESTER DYESTUFFS

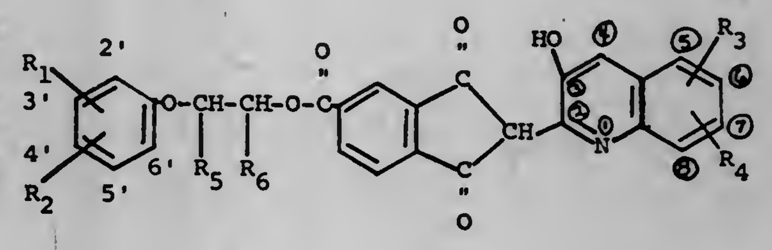
Guido R. Genta, Snyder, N.Y., assignor to American Aniline Products, Inc., Paterson, N.J.

Filed Oct. 25, 1972, Ser. No. 300,706

Int. Cl. D06p *3/54*

U.S. Cl. 8—179 5 Claims

1. A polyester textile dyed with a compound of the formula:



wherein

each of R_1 and R_2 is	independently hydrogen, chlorine, bromine, lower alkyl or phenyl, or R_1 and R_2 taken together form a 2′,3′- or 3′,4′-benzo group;
R_3 is	hydrogen, chlorine, bromine, lower alkyl, lower alkoxy or cyano;
R_4 is	hydrogen, chlorine, bromine or methyl; or R_3 and R_4 taken together are a benzo group; and
one of R_5 and R_6 is	hydrogen and the other is hydrogen or methyl.

3,890,095
CELLULOSIC TEXTILE FINISH WITH 1,3-DIMETHYLOL-4,5-DIHYDROXY-2-IMIDAZOLIDINONE, ZINC NITRATE AND A SEQUESTERING AGENT

Robert Francis Bann, Somerville; William Joseph Moran, Martinsville, and Philip B. Roth, Somerville, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 114,380, Feb. 10, 1971, Pat. No. 3,746,505, which is a continuation of Ser. No. 672,450, Oct. 3, 1967, abandoned, which is a continuation-in-part of Ser. No. 628,573, April 5, 1967, abandoned. This application Apr. 23, 1973, Ser. No. 352,778

Int. Cl. D06p *5/02;* **D06m** *13/12, 13/34*

U.S. Cl. 8—185 **11 Claims**

1. A textile finishing composition useful for rendering cellulosic textile materials wrinkle resistant and providing permanent creases therein comprising an aqueous solution of 1,3-dimethylol-4,5-dihydroxy-2-imidazolidinone, a zinc nitrate catalyst abd a sequestering agent; wherein the amount of the 1,3-dimethylol-4,5-dihydroxy-2-imidazolidinone is sufficient to provide the textile to be treated with between 1.0 and 25.0 percent of said imidazolidinone based on the weight of said textile; the amount of zinc nitrate catalyst is between 5.5 and 16.5 percent based upon the weight of the imidazolidinone and the amount of sequestering agent is between 0.05 and 3.0 percent based on the weight of the solution.

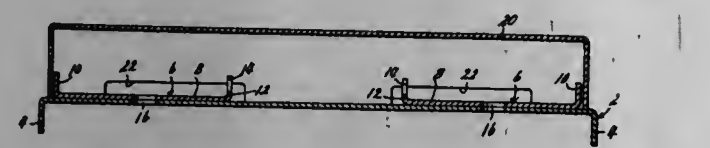
3,890,096
TRAY FOR STERILIZING DENTAL INSTRUMENTS

George D. Nichol, 411 Washington St., Pittsfield, Ill. 62363, and John C. Schmidt, 2307 Castilla Isle, Fort Lauderdale, Fla. 33301

Filed Oct. 1, 1973, Ser. No. 402,044

Int. Cl. A61l *3/02*

U.S. Cl. 21—105 **1 Claim**



1. A dental instrument tray comprising:

a. a generally planar base provided with downturned flaps operable to support the remainder thereof above a supporting surface engaged by said flaps, and having holes formed therethrough for the circulation of steam when said tray is inserted into an autoclave,

b. a pair of upwardly opening channels affixed to the top of said base in parallel spaced apart relation, the upright distal flanges of said channels being solid and imperforate, and the proximate flanges of said channels having corresponding series of upwardly opening notches formed therein, each corresponding pair of notches being adapted to receive and support a dental instrument therein, and

c. a downwardly opening cover restable on said base, said cover surrounding said channels and extending thereabove, and being restrained against horizontal displacement relative to said base by engagement thereof with upwardly projecting portions of said channels, said base and cover both being generally rectangular in a horizontal plane, said base flaps being provided along a pair of opposite edges thereof and being horizontally spaced relative to one another, the horizontal space between said flaps being slightly greater than the corresponding horizontal dimension of said cover, whereby like trays, each with its cover applied, may be nestably stacked.

3,890,097
METHOD OF PURIFYING WET PROCESS PHOSPHORIC ACID

John T. Minor, Ponca City, Okla., assignor to Agrico Chemical Company, Tulsa, Okla.

Filed May 6, 1974, Ser. No. 467,265

Int. Cl. B01d *9/00*

U.S. Cl. 23—300 **8 Claims**

1. A method of purifying merchant strength wet process phosphoric acid having, by weight, about 71 percent to 76 percent phosphoric acid and 3 percent to 6 percent sulfuric acid which comprises the steps of:

combining a quantity of sulfuric acid with said wet process phosphoric acid to raise the sulfuric acid concentration to a value between about 10 and 20 percent, by weight, so that the viscosity of the combined solution is lowered and the freezing point thereof raised;

cooling the combined phosphoric acid solution to a temperature below the freezing point thereof so that a portion of the solution is crystallized;

separating the crystalline portion from the remaining liquid portion of said solution; and

melting the separated crystalline portion to obtain purified phosphoric acid solution.

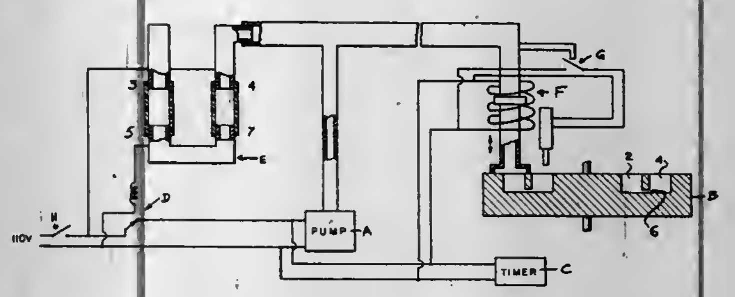
3,890,098
MACHINE FOR THE DETERMINATION OF PROTROMBIN TIME AND P.T.T.

Enrique Moreno, G.P.O. Box 3088, San Juan, P.R. 00936

Filed Nov. 16, 1973, Ser. No. 416,429

Int. Cl. G01n *11/04, 33/16*

U.S. Cl. 23—230 B **1 Claim**



1. A machine for determining Protrombin time, comprising a rotatable member, at least one pair of adjacent cup-like receptacles formed in the rotatable member, restricted orifice means providing communication between the bottom parts of the two cup-like members, means for sealing the upper end of one of the cup-like members after a reactive material and plasma have been placed therein, means for inducing movement of the plasma and reactive material from cup to cup until coagulation takes place, means for stopping the induced cup-to-cup movement, and means for measuring the time required for coagulation.

3,890,099
COLORIMETRIC ASSAY FOR UREA

David H. Jung, 3240 Brill Rd., Indianapolis, Ind. 46227

Filed July 5, 1974, Ser. No. 486,062

Int. Cl. G01n *33/16*

U.S. Cl. 23—230 B **17 Claims**

1. A process for determining the urea content of fluids comprising:

a. mixing:

1. ortho-phthalaldehyde;

2. a fluid sample;
3. N-(1-naphthyl) ethylenediamine dihydrochloride; and

b. obtaining a colorimetric reading after a period of time for the resulting mixture.

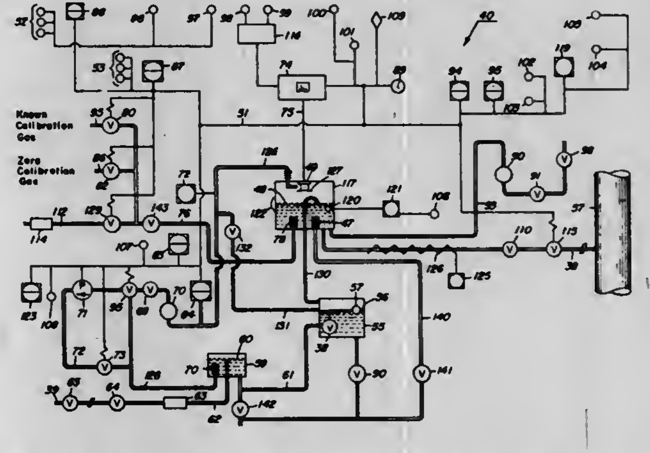
3,890,100
GAS CONDITIONING AND ANALYZING SYSTEM

Francis R. Busch, Morganhill, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Sept. 28, 1973, Ser. No. 401,953

Int. Cl. G01n *31/12;* **G21c** *17/00*

U.S. Cl. 23—232 E **43 Claims**



34. The method for conditioning and analyzing a gas sample comprising the steps of

a. introducing the gas sample to a detection zone for release under a liquid of desired conditions,

b. analyzing the sample gas introduced to the detection zone for the concentration of a selected constituent,

c. withdrawing the gas from the detection zone to a flame checking zone,

d. withdrawing the liquid from the detection zone to a regulator zone that regulates the liquid level in the detection zone,

e. discharging the gas from the flame checking zone to a discharge point and,

f. discharging the liquid from the regulator zone to a drain.

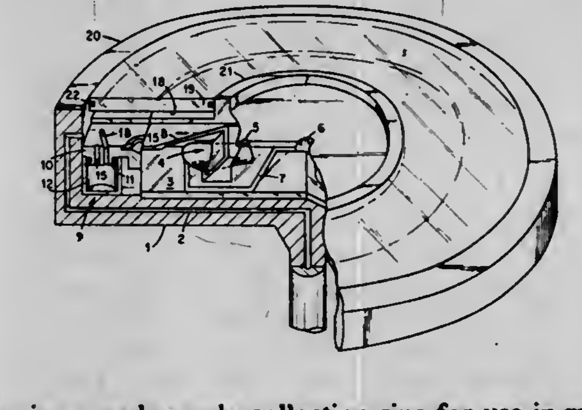
3,890,101
COLLECTION RING FOR USE IN MULTIPLE-SAMPLE BLOOD FRACTIONATION CENTRIFUGAL ROTORS

Thomas O. Tiffany, Oak Ridge; William A. Walker, Knoxville, and Wayne F. Johnson, Loudon, all of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 15, 1974, Ser. No. 443,078

Int. Cl. B01l *3/00*

U.S. Cl. 23—259 **5 Claims**



1. An improved sample collection ring for use in multiple-sample blood fractionation centrifugal rotors characterized by a central rotor portion for preparing blood fractions having a multiplicity of circumferential discharge ports; said collection ring comprising:

i. a removable annular vial holder ring having a top surface and a bottom surface nested concentrically about said central rotor portion, said vial holder ring defining:

a. first and second nipples positioned alternatively in a circular array, said nipples depending from the bottom side of said vial holder ring;

b. a first array of passageways having centripetal ends opening in register with said circumferential discharge ports and centrifugal ends opening in the bottom ends of said first nipples;

c. a second array of passageways communicating between and opening in the bottom ends of pairs of said first and second nipples; and

d. a third array of passageways having centrifugal ends opening in the bottom ends of said second nipples and centripetal ends opening in said top surface of said vial holder ring;

ii. primary and secondary sample collection vials removably attached to said first and second nipples, respectively; and

iii. means for sealing said sample collection vials to said nipples.

3,890,102
CATALYTIC ACTION GAS GENERATOR

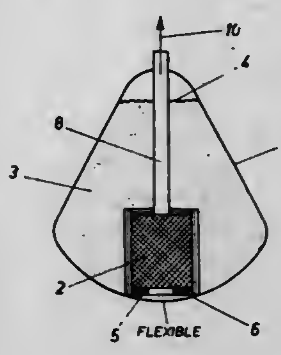
Dietrich Gathmann, Bremen, and Walter Mayland, Moordeich, Bremen, both of Germany, assignors to ERNO Raumfahrttechnik GmbH, Bremen, Germany

Filed Dec. 13, 1972, Ser. No. 314,765

Claims priority, application Germany, Dec. 31, 1971, 2165883

Int. Cl. B01j *7/02*

U.S. Cl. 23—282 **3 Claims**



1. Apparatus for generating gas by catalytic decomposition of a liquid, comprising:

a pressure vessel with a completely closed interior containing the liquid, the liquid having a particular surface level in the vessel;

a container disposed inside of the vessel and having an inlet disposed near the bottom of the vessel, below said level, the container further having an outlet and containing a catalytic substance defining a tortuous path between the inlet and the outlet, and having substantial resistance to flow of gas therethrough, whereby significant pressure is needed to drive the liquid into and through the catalyst, the inlet being normally covered by a breakable partition separating the interior of the container from its outside, which is the interior of the vessel, the partition being destructible;

means included in the pressure vessel and being accessible from the outside of the vessel for effecting destruction of said partition from the outside of the vessel and without having to open the vessel so that upon destruction of the partition the catalyst is exposed to the liquid as entering the container through the inlet and contacting the catalyst so that gas develops adjacent the inlet, and accumulates above said surface level in the vessel and pressurizes the interior of the vessel; and an outlet duct for the container connected to the outlet thereof and leading also out of the vessel, so that gas developed on contact of the liquid with the catalyst and having passed through said tortuous path may discharge, the accumulated gas inside of the vessel acting as propellant for driving liquid into the catalyst to sustain development of gas and discharge of such gas through the outlet duct.

3,890,103
ANTI-POLLUTION EXHAUST APPARATUS

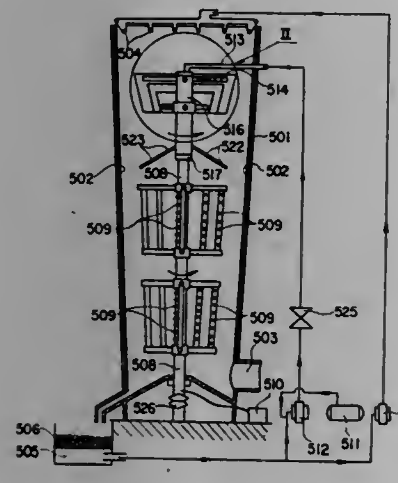
Jinemon Konishi, 21-14, 1-chome Nakasakurazuka, Toyonaka City, Osaka, Japan

Filed Aug. 23, 1972, Ser. No. 282,990

Claims priority, application Japan, Aug. 25, 1971, 46-64950; Aug. 25, 1971, 46-64951; Sept. 6, 1971, 46-68794; Oct. 12, 1971, 46-80298; Oct. 25, 1971, 46-84551

Int. Cl. C01b *17/74*; **B03c** *3/16*

U.S. Cl. 23—284 **7 Claims**



1. A pollution-reducing exhaust apparatus comprising:

a. a vertically oriented conduit having a frusto-conical inner surface with an inside diameter larger at an upper end than at a lower end,

b. an inlet near the lower end of the conduit for allowing hot, contaminant bearing gas to flow from a source of the gas into the conduit,

c. a first electrical pole axially mounted within the conduit for ionizing the contaminants,

d. a second electrical pole mounted on the inner surface of the conduit for collecting the ionized contaminants,

e. a source of liquid,

f. a source of compressed air,

g. a first spraying means positioned on the top of the first electrical pole, but elecrically insulated therefrom, and connected to the source of liquid and to the source of compressed air for spraying an air-liquid foam into the hot gas, the first spraying means comprising a first rotatably mounted rotator and a plurality of arms extending radially from the rotator, each arm containing a series of holes on one lateral side for producing rotation of the arms and rotator as the air-liquid foam is sprayed from the holes, and

h. a second spraying means located near the upper end of the conduit, connected to the source of liquid and directed toward the inner surface of the conduit for washing the second electrical pole and the inner surface of the conduit.

3,890,104
CATALYTIC CARTRIDGE

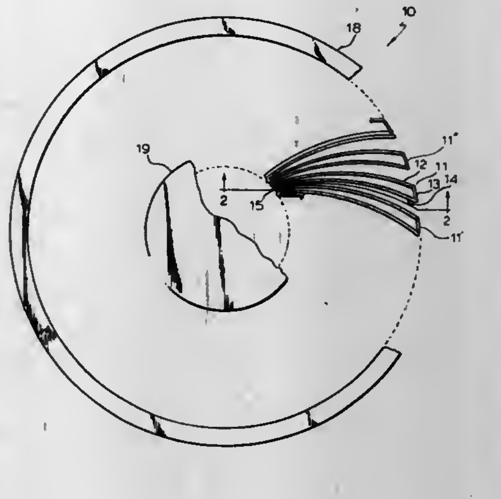
Paolo Della Porta; Bruno Ferrario; Angelo Cantaluppi; Paolo Montalenti, and Fiziano A. Giorgi, all of Milan, Italy, assignors to Saes Getters S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 194,445, Nov. 1, 1971, Pat. No. 3,857,680. This application May 3, 1972, Ser. No. 249,771

Claims priority, application Italy, Nov. 3, 1970, 31307/70The portion of the term of this patent subsequent to Dec. 31, 1991, has been disclaimed.

Int. Cl.^{2} B01J *8/04*; **B21D** *53/02*; **B23P** *15/26*

U.S. Cl. 23—288 K **10 Claims**



1. A catalytic cartridge formed of a metal strip folded alternately in opposite directions such that the strip comprises a plurality of members each comprising:

A. a first spirated segment;

B. an outer circumferential segment attached to the first spirated segment;

C. a second spirated segment attached to the outer circumferential segment;

D. an inner circumferential segment attached to the second spirated segment;

wherein the inner circumferential segment of any given member is attached to the first spirated segment of the next member,

wherein a catalytic material is carried by the strip.

3,890,105
METALLIC SINTERING POWDER OR ALLOY

Gerd Weissmann, Munich, and Edgar Kuebel, Fuerstenfeldbruck, both of Germany, assignors to Bayer Leichtmetallwerk- Graf Bluecher von Wahlstatt KG, Munich, Germany

Filed Apr. 23, 1973, Ser. No. 353,454

Claims priority, application Germany, Apr. 27, 1972, 2220683

Int. Cl. B22f *1/00*

U.S. Cl. 29—182.7 **18 Claims**

1. A powder composition for making a sintered steel alloy comprising a mixture of iron powders, and alloying components including carbides in powder form, said carbides being present from 0.5 to 50 percent by weight of the total composition, said carbides comprising an additive and wholly or predominantly carbon deficient carbides selected from the group consisting of chromium carbides, manganese carbides and mixed carbides of chromium and manganese and including the structural types M_3C, M_7C_3, $M_{23}C_6$, wherein M is the metal component and C is the carbon component of the carbide.

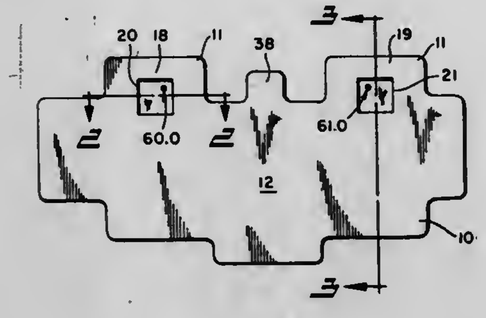
3,890,106
SELECTIVE COLD WORK HARDENING OF METALLIC EXTRUSIONS

Paul J. Miller, Richmond Heights, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed Feb. 27, 1973, Ser. No. 336,274

Int. Cl. B22f *5/00*

U.S. Cl. 29—183 **5 Claims**



1. An integral body of work hardenable brass, said body having an extruded cross section including at least one port projection, an internal seat and threads in a central area of said port projection, at least one indentation on an exterior surface of said projection, said indentation resulting from plastic displacement of material at said central area whereby the material below said indentation forming said central port area and including said seat and said threads is in a locally work hardened state throughout the thickness of the body from one face to the other produced by local cold working substantially limited to the area of the one port projection whereby a major portion of the body is not hardened beyond its extruded condition.

3,890,107
MATERIALS USEFUL FOR PROSTHETIC DEVICES AND THE LIKE

Eugene W. White; Jon N. Weber, both of State College, Pa., and Rodney A. White, Syracuse, N.Y., assignors to Research Corporation, New York, N.Y.

Filed Sept. 25, 1972, Ser. No. 291,547

Int. Cl. B27f *5/00*

U.S. Cl. 29—183 **19 Claims**

1. A substantially uniform permeable microporous synthetic material useful as a biomaterial, such as for the manufacture of prosthetic devices, characterized by a substantially uniform pore volume in the range from about 10 to about 90% and having a microstructure characterized by a pronounced three-dimensional fenestrate structure corresponding to the microstructure of the porous carbonate echinoderm or scleractinian coral skeletal material of marine life and providing a periodic minimal surface, said periodic minimal surface dividing the volume of said material into two interpenetrating regions, each of which is a single, multiply connected domain, said material having a substantially uniform pore size diameter and substantially uniform pore connections or openings in the range from about 5 microns to about 500 microns.

3,890,108
STRUCTURAL PANEL BENT FROM LAMINATED HONEYCOMB

James W. Welsh, San Diego, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

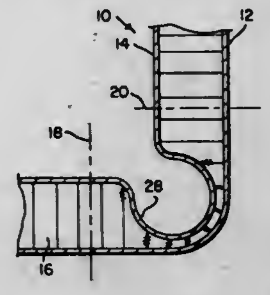
Division of Ser. No. 224,835, Feb. 9, 1973, Pat. No. 3,757,559. This application Apr. 16, 1973, Ser. No. 351,699

Int. Cl.^{2} B23P *3/20*

U.S. Cl. 29—191.4 **1 Claim**

1. A structural panel formed of a metallic inner skin, a metallic outer skin and a honeycomb core positioned between said inner and outer skins and secured to both of said skins with its cells normal to said skins, the improvement comprising:

said panel having a bend therein, said panel being substantially planar and defining a first plane on the first side of said bend and being substantially planar and defining a second plane on the second side of said bend, a first reference line normal to said first plane and a second reference line normal to said second plane, said skins being continuous from said first to said second reference lines, said core being crushed at said bend between said first and second reference lines, said inner skin and said outer skin each being bent concave toward the inside of said bend, said inner skin being bent to a smaller radius of curvature in said bend than said outer skin, said inner skin and said outer skin each being unstretched along its length between said reference lines so that the distance between said first and second reference lines along said inner skin is equal to the distance between said first and second reference lines along said outer skin, said inner skin being closer to said outer skin in said bend than at said first reference line.



3,890,109
RAZOR BLADES HAVING HIGH PURITY Al_2O_3 COATING

Frederick O. Jones, Bracknell, England, assignor to Wilkinson Sword Limited, London, England

Filed Apr. 6, 1973, Ser. No. 349,269

Claims priority, application United Kingdom, Apr. 8, 1972, 16297/72

Int. Cl. B32b *15/04*; **B26b** *21/54*

U.S. Cl. 29—195 **12 Claims**

1. A razor blade having an alumina coating on and/or adjacent a cutting edge thereof, the alumina containing less than 3×10^{-3} atomic percent of impurities.

3,890,110
COMPOSITE COATED STEEL STRUCTURE FOR CORROSION RESISTANCE

Frederick A. Glaski, Torrance, Calif., assignor to Fansteel Inc., N. Chicago, Ill.

Division of Ser. No. 284,639, Aug. 29, 1972, Pat. No. 3,784,403, which is a continuation-in-part of Ser. No. 177,929, Sept. 7, 1971, Pat. No. 3,767,456. This application June 4, 1973, Ser. No. 366,284

Int. Cl.^{2} B23P *3/00*

U.S. Cl. 29—198 **1 Claim**

1. A composite structure having a corrosion resistant surface which comprises:

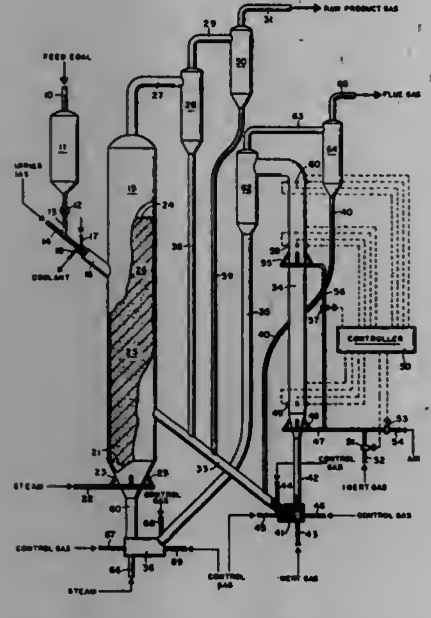
a. a non-refractory steel substrate containing free carbon and metal carbides,

b. a displacement diffusion containment coating on said substrate to isolate carbon and metal carbides from the surface of the substrate composed of titanium carbide formed from an in situ combination of titanium with the carbon and metal carbides of the substrate, said displacement diffusion coating being stable in the presence of tantalum or columbium at temperatures ranging from 900° to 1,100°C., and

c. a corrosion resistant material selected from the group consisting of tantalum and columbium molecularly bonded to said containment coating by chemical vapor deposition.

3,890,111
TRANSFER LINE BURNER SYSTEM USING LOW OXYGEN CONTENT GAS

Christian W. Knudsen, Seabrook, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.
Filed Feb. 21, 1974, Ser. No. 444,613
Int. Cl. C10j *3/12*
U.S. Cl. 48—197 R **10 Claims**



1. In a process wherein a stream of hot carbonaceous particles is continuously withdrawn from a fluidized bed reaction vessel, circulated upwardly through a transfer line burner for the combustion of a portion of the carbon in said particles, and returned to said fluidized bed reaction vessel, the improvement which comprises introducing said stream of hot particles into the lower end of said transfer line burner as a dense phase stream containing an inert gas essentially free of molecular oxygen and injecting a molecular oxygen-containing gaseous mixture having a molecular oxygen content less than about 15 percent by volume into said burner near the lower end thereof in a quantity sufficient to effect a transition from dense phase to dilute phase flow and promote said combustion of said carbon.

3,890,112
TWO-STAGE PROCESS FOR THE CONVERSION OF LIQUID HYDROCARBON TO A METHANE RICH GAS STREAM

Clyde L. Aldridge, Parish of E. Baton Rouge, La., assignor to Exxon Research and Engineering Company, Linden, N.J.
Continuation-in-part of Ser. No. 125,581, March 18, 1971, abandoned. This application Aug. 15, 1972, Ser. No. 280,761.
The portion of the term of this patent subsequent to June 11, 1991, has been disclaimed.
Int. Cl. C01b *2/14*
U.S. Cl. 48—214 **19 Claims**

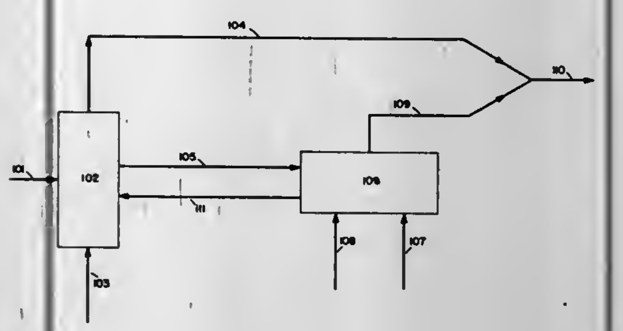
1. A process for producing a methane-rich stream by treating a hydrocarbon feedstream containing a liquid hydrocarbon, which comprises:

a. treating said feedstream in a first reaction zone maintained at a pressure between about 250 and 1,500 psig, and at a temperature between about 1,200° and 1,450°F in the presence of particulate catalyst composition comprising an alkali metal compound and a solid particulate material to produce a vaporous product comprising CH_4 and other light hydrocarbon products, and a solid hydrocarbon material which deposits on said particulate composition;

b. removing said vaporous product from said first reaction zone;

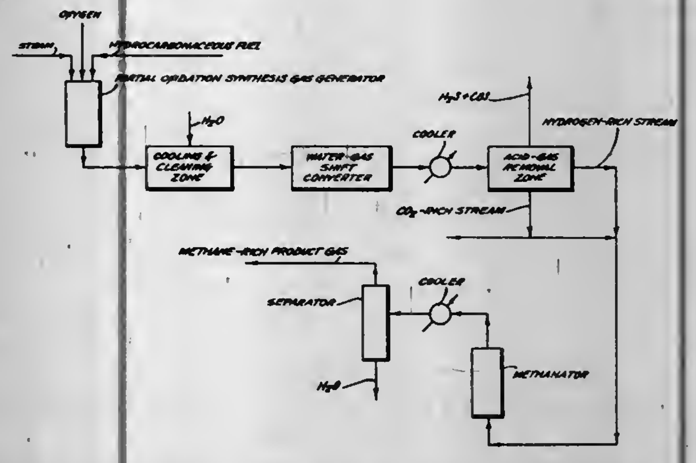
c. passing at least a portion of said particulate catalyst composition with the solid hydrocarbon material deposition to a second reaction zone maintained at a pressure between about 250 and 1,500 psig and at a temperature between about 1,000°F and 1,600°F to contact steam introduced into said second reaction zone at a steam-to-carbon in solid hydrocarbon material of the second reaction zone mole ratio between 1 and 10, whereby at least a portion of the solid hydrocarbon material deposition is converted into a gaseous product comprising CH_4, H_2, CO and CO_2; and

d. removing said gaseous product from said second reaction zone.



3,890,113
PRODUCTION OF METHANE

Edward T Child, Hacienda Heights, and Allen M. Robin, Anaheim, both of Calif., assignors to Texaco Inc., New York, N.Y.
Filed June 25, 1973, Ser. No. 373,533
Int. Cl. C10b *49/02, 57/02*
U.S. Cl. 48—197 R **10 Claims**

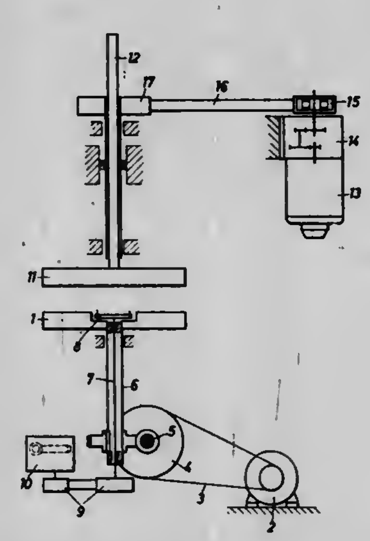


1. A process for producing a methane-rich gas stream comprising

1. producing a raw process gas stream principally comprising CO, H_2, CO_2, and H_2O and optionally containing particulate carbon, CH_4, H_2S and COS by the partial oxidation of a hydrocarbonaceous feedstock with a free-oxygen containing gas comprising about 90 to 99.9 mole % O_2 and optionally with a temperature moderator, in the reaction zone of a gas generator at an autogenous temperature in the range of about 1200° to 3500°F. and a pressure in the range of about 1 to 350 atm. abs.:
2. cooling, cleaning and adding supplemental H_2O to the effluent gas stream from (1) to produce a feed gas stream for water-gas shift conversion having a mole ratio H_2O/CO in the range of about 2 to 8;
3. reacting the feed gas stream from (2) in a catalytic water-gas shift conversion zone at a temperature in the range of about 650° to 950°F. and a pressure in the range of about 1 to 350 atm. abs. until at least 75 mole % of the CO is reacted with H_2O to produce H_2 and CO_2;
4. cooling, and purifying the effluent gas stream from (3) in an acid-gas purification zone and separating a CO_2-rich gas stream and optionally a separate stream of H_2S and COS, producing a hydrogen-rich gas stream;
5. mixing at least a portion of the CO_2-rich gas stream from (4) with the hydrogen-rich gas stream from (4) providing a feed gas mixture having a mole ratio H_2/CO_2 in the range of 4 to 10, reacting together at a temperature in the range of about 400° to 1500°F. in a catalytic methanation zone hydrogen and substantially all of the carbon oxides in said feed gas mixture, and removing from said methanation zone an effluent gas stream substantially comprising in mole % dry basis CH_4 50 to 96, H_2 3 to 46, CO 0 to 0.5, CO_2 0.3 to 0.7, $A+N_2$ 0.2 to 8; and
6. cooling the effluent gas stream from (5) and separating H_2O therefrom to produce said methane-rich product stream.

3,890,114
DOUBLE-DISC FLAT-LAPPING OR HONING MACHINE INCLUDING A FREE-WHEELING DRIVE CONNECTION

Hans-Friedrich Bovensiepen, Metzkausen, Germany, assignor to Peter Wolters, Mettmann, Rhineland, Germany
Filed June 11, 1973, Ser. No. 368,577
Claims priority, application Germany, June 15, 1972, 2229196
Int. Cl. B24b *7/04*
U.S. Cl. 51—118 **3 Claims**

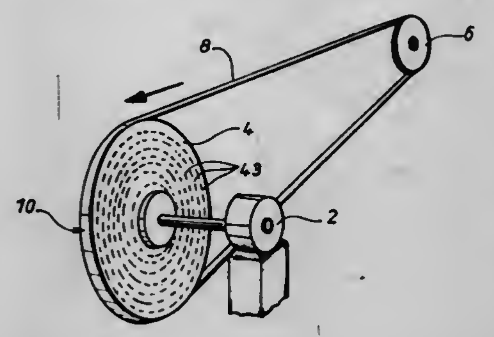


2. In a dual-disced flat-lapping and honing machine in combination:

a pair of confronting rotatable working discs and a rotatable workpiece holder disposed between two working discs, a reversible motor operatively connected to the first disc for optionally controlling the direction of rotation of the first disc, a motor operatively connected to the workpiece holder, drive means operatively connected through a free-wheeling coupling to the second working disc and functioning as a braking motor in such a way that when the braking motor is turned off, frictional engagement between workpieces of the said workpiece holder rotating in a first direction and the second working disc causes the rotation of the second working disc and reverse rotation of the workpieces of the workpiece holder causes the second working disc to become locked against rotation.

3,890,115
BACKING WHEEL FOR A BELT GRINDER

Herbert Stahl, Bottingen, Germany, assignor to SM Maschinenfabrik Herbert Stahl, Bottingen, Germany
Filed Aug. 23, 1974, Ser. No. 500,024
Claims priority, application Germany, Aug. 24, 1973, 2342831
Int. Cl. B24b *21/00*
U.S. Cl. 51—135 R **10 Claims**



1. A rotatable, laminar backing wheel for an abrasive belt comprising:

a. a first substantially circular disk of a soft and resilient material having a fist elastic modulus in tension;

b. second and third substantially circular disks of materials having respective second and third elastic moduli in tension;

c. fastening means coaxially fastening said first disk between said second and third disks under axial compression,

1. said second and third disks having respective circumferential face portions defining a common surface of rotation, and said first disk having a circumferential face portion substantially completely confined within said surface when said wheel does not rotate,
2. said first modulus being sufficiently smaller than said second and third moduli to cause the circumferential face portion of said first disk to project radially beyond said common surface under centrifugal forces when said wheel rotates.
3. said compression being sufficient to cause the radially projecting face portion of said first disk to spread axially into radial alignment with said second and third disks.

3,890,116
GRINDING MACHINE

Edward G. Robillard, Cherry Valley, Mass., assignor to Cincinnati Milacron-Heald Corporation, Worcester, Mass.
Filed Dec. 3, 1973, Ser. No. 421,028
Int. Cl. B24b *51/00*
U.S. Cl. 51—165.71 **11 Claims**

1. A grinding machine, comprising

a. a base,

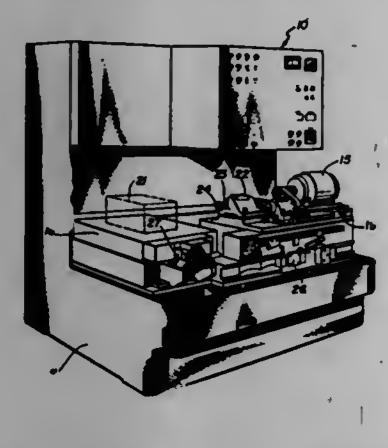
b. a workhead slide mounted on the base,

c. a wheelhead slide mounted on the base,

d. a feed mechanism, including a stepping motor, for producing transverse relative movement between the slides to produce a grinding cycle,

e. a first pulse generator having a first section for producing pulses at a first rate and a second section for producing pulses at a second rate which is substantially greater than the first rate, and

f. a control means for introducing pulses from the first section to the stepping motor during a portion of the grinding cycle and for introducing pulses from the second section to the stepping motor during another portion of the grinding cycle, the control means including a shifter means operative during an interval when the rate of pulses introduced to the stepping motor is changed between a first value and a second value, to introduce to the stepping motor pulses at rates of smoothly changing value thereby avoiding loss of synchronization between the stepping motor and pulses during the change.



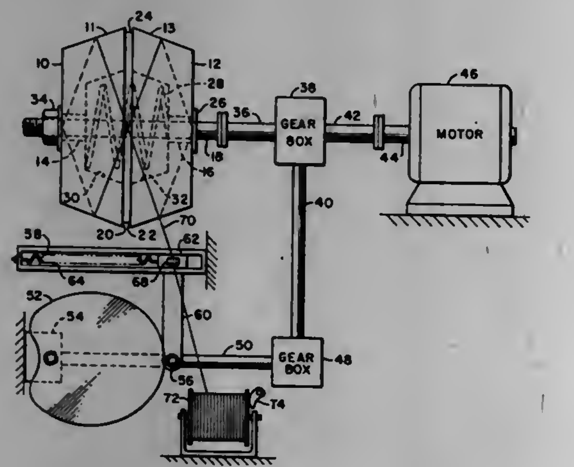
3,890,117
REINFORCING CUP-TYPE GRINDING WHEELS

George N. Peterson, Grafton, Mass., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed June 2, 1971, Ser. No. 149,192

Int. Cl. B24d *5/00, 7/00*

U.S. Cl. 51—209 R 3 Claims



1. In combination:
- a cup-type grinding wheel having an annular peripheral surface tapering from a grinding face;
- a plurality of discontinuous strands of filamentary material wound in tension around portions of the peripheral surface of said wheel in a direction nonparallel to the grinding face thereof, each strand being wound between 90° and less than 360° of said peripheral surface; and
- means for bonding said strands to the peripheral surface of said wheel so as to maintain the wheel in compression.

3,890,118
METHOD OF GRINDING GEARS

Koichi Takahashi, Yokohama, and Nobuteru Hitomi, Yokosuka, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

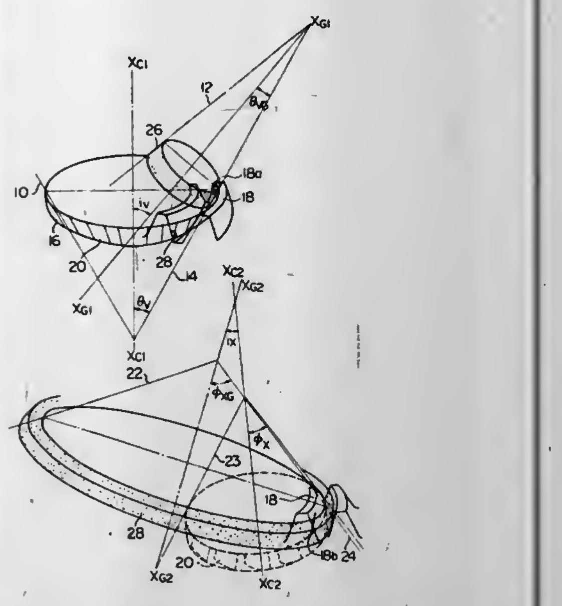
Filed Oct. 18, 1973, Ser. No. 407,606

Claims priority, application Japan, Oct. 19, 1972, 47-104016

Int. Cl. B24b *1/00*

U.S. Cl. 51—287 8 Claims

1. A method of grinding the tooth surfaces of gears with circular teeth, comprising the steps of applying an internal grinding conic surface of a truncated cone shaped grinding wheel of cup-like hollow construction to a circular arc shaped, convexly curved tooth trace of the gear, said grinding wheel having a cone in which said grinding conic surface forms a part thereof, said tooth trace having a cone in which said tooth trace forms a part of a circle forming an intersection of said cone and a plane perpendicular to a central axis of said cone, said grinding wheel being disposed on a central axis of said cone thereof in inclined and intersecting relationship to said central axis of said cone of said tooth trace, said grinding wheel being disposed in such a manner that a generatrix of said cone thereof always coincides with a generatrix of said cone of said tooth trace, said grinding conic surface having a radius of curvature which makes a maximum difference between said radius of curvature and a radius of curvature of said tooth trace within a range in which there occurs no geometrical interference of an external surface of said grinding wheel with a concavely curved tooth trace located opposedly adjacent to said convexly curved tooth trace to be ground, rotating said grinding wheel around said central axis of said cone thereof for grinding of said tooth trace, revolving said grinding wheel around said central axis of said cone of said tooth trace for grinding thereof.



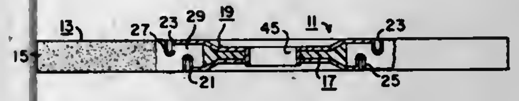
3,890,119
FLAP WHEEL FINISHING DEVICE

Gus J. Schaffner, III, Pittsburgh, Pa., assignor to Schaffner Mfg. Co., Inc., Pittsburgh, Pa.

Filed June 5, 1972, Ser. No. 259,538

Int. Cl. B24b *9/02*

U.S. Cl. 51—334 6 Claims



1. Finishing apparatus including an annulus of flaps of relatively small width, the flaps of said annulus being bonded near the center of said annulus to form a central core, said flaps extending freely from said core, the said core having slots penetrating into the opposite surfaces thereof and extending generally coaxial with said annulus, the said annulus to accommodate flange discs on opposite surfaces of said annulus extending over said core generally coaxially with said annulus with the flanges of said discs engaging said slots, the sum of the widths of said flanges being such that if the flanges were coextensive they could not be accommodated by the width of said flaps, the said apparatus being characterized by that a said slot extending into one surface is displaced radially with respect to the corresponding slots extending into the opposite surface so that no pair of slots extending into opposite surfaces of said core are coextensive.

3,890,120
PROCESS TO RECOVER SULPHUR FROM THE SULPHUR COMPOUNDS CONTAINED IN RESIDUAL GASES

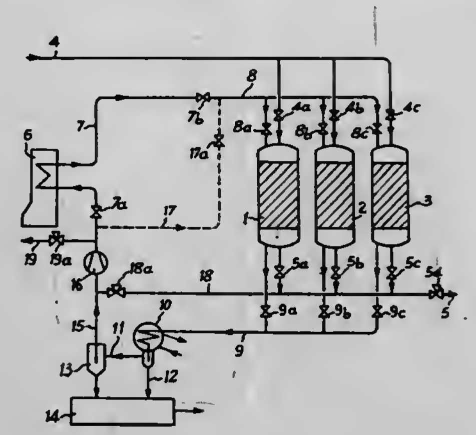
Gilbert Guyot, Pau; Pierre Mathieu; Andre Philippe, both of Orthez; Pierre Grancher, Pau, and Jean Solinhac, Orthez, all of France, assignors to Societe Nationale des Petroles

Filed Apr. 13, 1973, Ser. No. 350,913

Claims priority, application France, Apr. 18, 1972, 72.13568; Apr. 6, 1973, 73.12460

Int. Cl. B01d *53/04*

U.S. Cl, 55—62 15 Claims



1. In a process for desulphurizing residual gases containing small concentrations of hydrogen sulphide, sulphur dioxide and possibly vesicular sulphur, wherein said residual gases are passed over an adsorbent comprising alumina, mixtures of alumina and silica or combinations of silica and alumina, at a temperature of between atmospheric temperature and about 180°C, and the sulphur-loaded adsorbent is then brought into contact with a hot regenerating gas to desorb the sulphur and thus regenerate the adsorbent, the improvements comprising: controlling the contact time between the residual gases and adsorbent to between about 1 and 25 seconds, using an oxygen-free gas at a temperature of between about 200° and 350°C as the hot regenerating gas to desorb the sulphur and thus regenerate the adsorbent and blowing the adsorbent with an oxygen-free gas at a temperature of less than 180°C after the regeneration step to cool the adsorbent to a temperature required for contact with the untreated residual gases in a repeated operation, the blowing gas which is used to cool the adsorbent containing water vapor during at least part of the blowing operation to rehydrate the adsorbent so that it will not adsorb any more steam when brought into contact with the untreated gas.

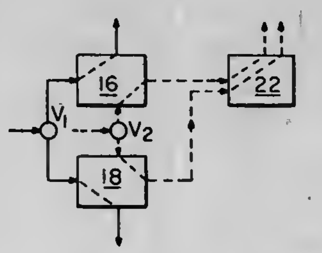
3,890,121
NOBLE GAS ABSORPTION PROCESS

Jess W. Thomas, Chatham, N.J., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 19, 1974, Ser. No. 443,262

Int. Cl. B01d *53/02*

U.S. Cl. 55—62 6 Claims



1. The method of removing a noble gas selected from the group consisting of krypton, xenon and radon from air containing concentrations thereof up to about 10^{15} pCi/liter comprising the steps of:
- a. passing a finite volume of an influent of said air at some flow rate through a first activated charcoal filter to adsorb the noble gas present in said air;
- b. then heating said first charcoal filter to drive off said noble gas and passing through said first charcoal filter a substantially reduced finite volume of air containing concentrations of said noble gas up to about 10^{15} pCi/liter at a reduced flow rate to form an effluent containing said noble gas released by said first charcoal filter;
- c. cooling said effluent;
- d. passing said effluent through a second activated charcoal filter for adsorbing the noble gas present.

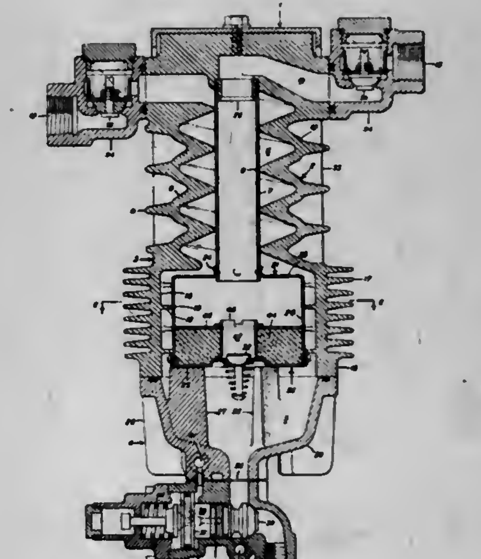
3,890,122
PLURAL-STAGE AIR FILTER ASSEMBLY

Virgil L. Frantz, Salem, Va., assignor to Graham-White Sales Corp., Salem, Va.

Filed Nov. 1, 1973, Ser. No. 412,014

Int. Cl. B01d *45/16*

U.S. Cl. 55—212 11 Claims



10. An assembly for filtering compressed air, comprising a housing having an inlet port connectable to an outlet of a compressor for admitting compressed air therefrom into said housing and an outlet port, said housing containing means for filtering compressed air passing therethrough between said inlet and outlet ports and a sump having a drain port for collecting and discharging contaminants, a drain valve opening independently of air pressure within said housing in response to and substantially throughout unloading of said compressor for draining contaminants from said sump through said drain port, and valve means in said inlet port for controlling flow of compressed air therethrough into said housing, said valve means being open during a pumping cycle of said compressor and closing at a predetermined low pressure during an unloading cycle thereof for then maintaining said low pressure in said compressor by preventing complete unloading thereof through said drain port.

3,890,123
MIST SEPARATOR

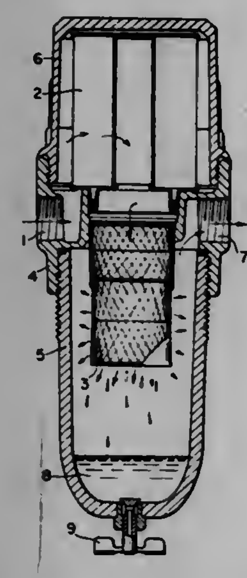
Atsushi Kuga, Kasukabe, Japan, assignor to Shoketsu Kinzoku Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 189,344, Oct. 14, 1971, abandoned. This application Dec. 6, 1973, Ser. No. 422,340

Claims priority, application Japan, May 19, 1969, 44-45265; Sept. 25, 1969, 44-75831

Int. Cl. B01d *39/08*

U.S. Cl. 55—318 **5 Claims**



1. A mist separator comprising a continuous fine fiber layer formed by overlapping single fibers having a diameter in the range of 0.1 to 0.5 microns which range is the equivalent of the mists to be separated and with said fibers forming slits therebetween having a width not greater than the diameter of said fibers, said fiber layer being formed of a plastic material having a hydrophilic property and an affinity for oil based on capillary condensation so that fine liquid particles are formed into drops by forcing them to adhere to said fine fiber layer continuously, and said fiber layer bent into a pleated chrysanthemum shape to increase the area of air passage therethrough.

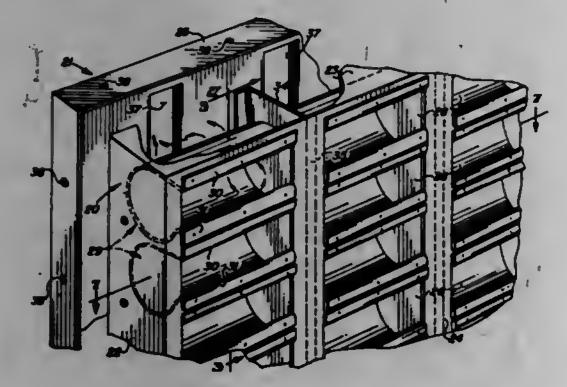
3,890,124
COMBINATION GREASE CENTRIFUGAL SEPARATOR AND FLAME TRAP

Leslie D. Howes, 742 W. El Camino Dr., Phoenix, Ariz. 85021

Filed July 22, 1974, Ser. No. 490,381

Int. Cl. B01d *45/12*

U.S. Cl. 55—346 **4 Claims**



1. A grease extracting baffle and flame trap for mounting in the exhaust duct of a ventilating system of a cooking unit comprising:

a plurality of baffles each formed to provide a substantially cylindrically shaped open ended pocket for receiving the grease laden gases for causing them to acquire a rotary and whirling movement about an annular axis in the pocket,

means mounting said baffles so that a first opening to each of said pockets arranged along their lengths is arranged with similar openings of the other pockets in a coplanar arrangement said mounting means including walls spaced from and transverse said open ended ends,

said means being angularly positionable in the ventilating system of a cooking unit so that the first openings to said pockets receive the grease laden gases being vented to atmosphere, and

a second opening for each of said pockets in the lower portion of said mounting means,

said second opening being arranged laterally of the rotary and whirling movement of the gases in that pocket for exhausting the gases from that pocket downstream of said baffles,

said second opening in each pocket being positioned along the annular axis of the rotary and whirling movement of the gases in that pocket,

said means for mounting said baffles comprising a plate provided with a plurality of openings for receiving and aligning one baffle in each of said openings,

each of said baffles being formed from a thin sheet of metal having its ends bent over to form flanges,

said baffles being formed in an arcuate configuration which extends through different openings in said plate with its end flanges overlapping parallel edges of the opening in which it is positioned whereby the arcuate configuration of said baffles form said pockets.

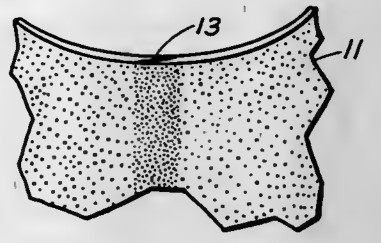
3,890,125
FILTER BAG

Vincent E. Schoeck, Hagerstown, Md., assignor to The Carborundum Company, Niagara Falls, N.Y.

Continuation of Ser. No. 182,974, Sept. 23, 1971, abandoned. This application Apr. 1, 1974, Ser. No. 457,020

Int. Cl. B01d *46/02*

U.S. Cl. 55—381 **4 Claims**



1. A filter bag for filtering solids from gases, said filter bag comprising a sheet of fabric of porous thermoplastic material having opposite edge portions of said fabric overlapped and joined together in a fused joint and defining a tubular body, said joint extending longitudinally along said tubular body, and said joint having essentially the same thickness as that of said sheet of fabric.

3,890,126
SMOKE LAMP DRAWING DEVICE

Donald B. Joseph, Venice, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed June 3, 1974, Ser. No. 475,885

Int. Cl. B01d *46/02*

U.S. Cl. 55—385 **2 Claims**

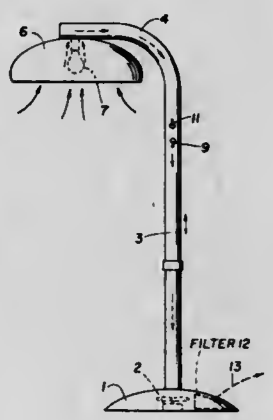
1. A smoke drawing device, comprising

a base housing of floor lamp type configuration having a drawing fan therein;

a tubular member of floor lamp type configuration supported substantially vertically by the base housing over the fan and communicating therewith, said tubular member being bent at substantially right angles to itself at its free end away from the base housing;

an outlet extending out of the base housing remote from the tubular member to an area spaced therefrom;

a lampshade type unit mounted on the tubular member at the free end thereof and opening into the tubular member in a manner whereby smoke in the area of the lampshade type unit is drawn by the fan through the tubular member and out through the outlet;



a smoke filter in the outlet for filtering smoke drawn therethrough; and

a lamp mounted to the free end of the tubular member in the lampshade type unit for illuminating an area around the lampshade type unit.

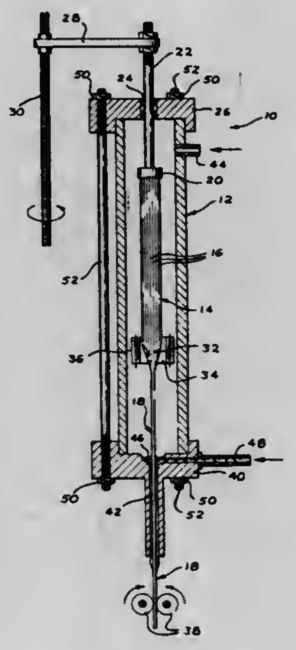
3,890,127
OPTICAL FIBER DRAWING APPARATUS

Walter P. Siegmund, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 364,785, May 29, 1973, Pat. No. 3,837,824. This application June 6, 1974, Ser. No. 477,138

Int. Cl.² C03B *25/00*

U.S. Cl. 65—12 **5 Claims**



1. Apparatus for drawing a fused multiple fiber component comprising:

a hollow chamber within which an elongated bundle of light-conducting fibers may be suspended for heating and drawing into the fused multiple fiber component, said chamber having normally closed opposite ends at least one of which may be selectively opened for receiving a bundle of light-conducting fibers to be heated and drawn within said chamber;

heating means within said chamber;

a removable cover forming the closure for one end of said chamber;

a liquid gland in said cover, said liquid gland including an elongated orifice into which a multiple fiber component drawn from said bundle may be directed and extended outwardly of said chamber when said cover is in place on said chamber, said orifice being of a diametral size greater than that of a component to be drawn from said bundle, and said gland further including an inlet to said orifice from externally of said chamber through which a liquid sealant may be introduced into said orifice peripherally about a multiple fiber component being drawn therethrough for sealing said orifice against leakage of gas directed into said chamber under pressure; and

said chamber having inlet means for receiving and directing gas under pressure into said chamber.

3,890,128
METHOD OF TOUGHENING GLASS

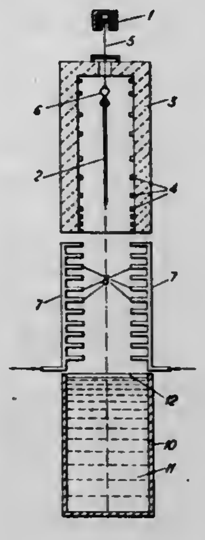
Richard Melling, Ormskirk; Donald Curtis Wright, Bolton, and John Pickup, Clyton-le-Mo Rs near Accrington, all of England, assignors to Pilkington Brothers Limited, Liverpool, England

Continuation of Ser. No. 802,151, Feb. 25, 1969, abandoned. This application June 21, 1971, Ser. No. 155,234

Claims priority, application United Kingdom, Feb. 27, 1968, 9484/68

Int. Cl. C03b *27/00*

U.S. Cl. 65—116 **7 Claims**



1. A method of toughening a glass sheet in which the glass is quenched in a chilling liquid to toughen the glass after a preliminary cooling of the glass surfaces by means of a cooling gas, which comprises:

a. heating the glass sheet to a selected high temperature near to its softening point;

b. effecting said preliminary cooling by passing the hot glass sheet at said selected high temperature at a selected rate of travel through a preliminary cooling region in which cooling gas flows are simultaneously directed against the opposite surfaces of the glass sheet uniformly over each surface at a flow rate sufficient

i. to retain substantially said selected high temperature in the center of the glass sheet up to the time of quenching in said chilling liquid, and

ii. to produce symmetrical temperature gradients from the center of the thickness of the glass sheet to both surfaces thereof sufficient to prevent deformation and fracture of the glass sheet as it is quenched in said chilling liquid; and

c. quenching the glass in the chilling liquid immediately after said preliminary cooling before any substantial relaxation of said symmetrical temperature gradients takes place.

3,890,129

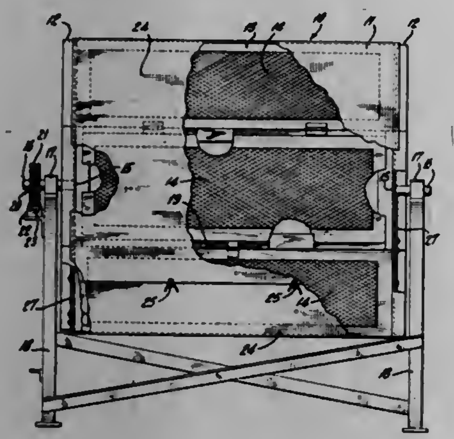
AEROBIC/ANAEROBIC COMPOSTING DEVICE AND METHOD OF COMPOSTING

Francis B. Chester, 220 East 42nd St., Bayside, N.Y. 10017

Filed Dec. 14, 1972, Ser. No. 315,115

Int. Cl. C05f *11/08, 11/06*

U.S. Cl. 71—9 **3 Claims**



2. The method of composting organic waste material which comprises the steps of:

- a. placing organic waste material in a rotatable container having open mesh sides;
- b. covering said open mesh sides of the container with a removable outer cover of moisture excluding material;
- c. periodically rotating the container about a horizontal axis with said outer cover attached and the waste material therein;
- d. said rotation mixing the material in the container and exposing said material to contact with air;
- e. discontinuing said periodic rotation of the container;
- f. placing an inner second cover over the material within the container;
- g. said inner cover directly contacting with the material in the container and preventing air from freely contacting said material;
- h. then removing both said inner and outer covers and continuing rotation of the container with the covers removed;
- i. said continued rotation effecting discharge of composted waste material from the container through the open mesh sides thereof.

3,890,130

CHEMICAL TOPPING OF *BRASSICA OLERECEA*

Edwin Francis George, Eversley, and Alan John Davidson, Wokingham, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 142,371, May 11, 1971, abandoned. This application Jan. 3, 1974, Ser. No. 430,420

Claims priority, application United Kingdom, May 22, 1970, 24826/70; July 6, 1970, 32672/70

Int. Cl.² A01N *9/20*

U.S. Cl. 71—76 **2 Claims**

1. A method of stimulating the growth of immature sprouts on the upper part of the stem of Brussels sprouts plants which comprises the foliar application to the plants of 2-m-chlorophenyl-carbamoyloxypropionic acid or a salt thereof in an amount sufficient to inhibit selectively the growth of the main apex in the plants but insufficient to cause substantial phytotoxic damage to other parts of the plants, said application being from 5 to 8 weeks prior to harvest and said salt being an alkali metal, alkaline earth metal, ammonium or alkyl amine salt wherein the alkyl contains up to 4 carbon atoms.

3,890,131

METHOD FOR CONTROLLING THE GROWTH OF WEEDS IN A COTTON GROWING AREA WITH 3,4,5-TRISUBSTITUTED ISOTHIAZOLES

David Buttimore, Benfleet, England, assignor to May & Baker Limited, Essex, England

Continuation of Ser. No. 241,833, April 6, 1972, abandoned. This application July 17, 1974, Ser. No. 489,250

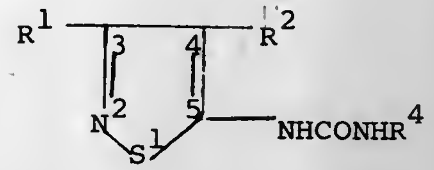
Claims priority, application United Kingdom, Apr. 7, 1971, 9019/71

Int. Cl.² A01N *9/12*

U.S. Cl. 71—90 **23 Claims**

1. A method of controlling the growth of weeds in an area used for growing a crop of cotton which comprises

applying to the area a herbidical composition containing an isothiazole of the formula:



wherein R^1 is a straight- or branched-chain alkyl of 1 to 3 carbon atoms, R^2 is alkoxycarbonyl wherein the alkoxy moiety is straight- or chanched-chain and has from 1 to 5 carbon atoms, and R^4 is a straight- or branched-chain alkyl or alkenyl of up to 5 carbon atoms, or cyclopropyl, at a rate sufficient to control the growth of weeds without causing substantial permanent damage to the cotton.

3,890,132

HERBICIDAL 1H-PYRAZOLO[3,4,-D]PYRIMIDIN-4-ONES

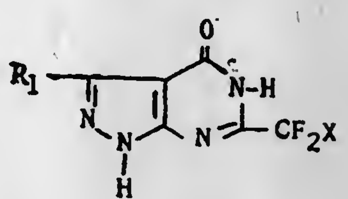
Beryl W. Dominy, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 282,383, Aug. 21, 1972, Pat. No. 3,833,582. This application June 27, 1974, Ser. No. 483,692

Int. Cl. A01n *9/22*

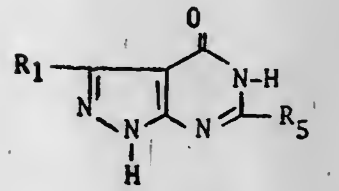
U.S. Cl. 71—92 **10 Claims**

1. A method of inhibiting the growth of weeds, which comprises applying an herbicidal amount of a compound selected from the group consisting of those having the formulae



I

and



II

or the alkali metal, ammonia, mono-, di- or trialkylamine salts thereof wherein each of the alkyl groups has from 1 to 12 carbon atoms, wherein

R_1 is selected from the group consisting of hydrogen and alkyl having from 1 to 4 carbon atoms;

X is selected from the group consisting of hydrogen, chloro, fluoro and $—CR_2R_3R_4$ wherein each of R_2, R_3 and R_4 is selected from the group consisting of hydrogen, chloro and fluoro; and

R_5 is alkyl having from 3 to 5 carbon atoms.

3,890,133

HERBICIDAL METHOD EMPLOYING META-ANILIDE UREA COMPOUNDS

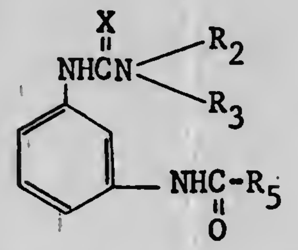
Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 180,075, Sept. 13, 1971, Pat. No. 3,790,364, which is a division of Ser. No. 23,021, March 26, 1970, Pat. No. 3,642,891, which is a continuation-in-part of Ser. No. 746,007, July 19, 1968, abandoned, which is a continuation-in-part of Ser. No. 662,573, Aug. 23, 1967, abandoned. This application Sept. 7, 1973, Ser. No. 396,255

Int. Cl. A01n *9/20*

U.S. Cl. 71—99 **26 Claims**

1. A method for controlling the growth of vegetation which comprises applying to the area where control of said vegetative growth is desired, a growth controlling amount of a compound having the formula



in which X is selected from the group consisting of oxygen and sulfur, R_2 is selected from the group consisting of hydrogen, alkyl, and lower alkoxy, R_3 is selected from the group consisting of alkyl, alkenyl and cycloalkyl, R_5 is selected from the group alkyl, and halogenated lower alkyl, provided that when X is oxygen and R_3 and R_5 are each alkyl then R_2 is other than hydrogen.

3,890,134

PHENOXY ACETALS AND THEIR UTILITY AS HERBICIDES

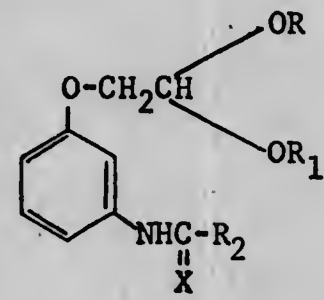
Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 124,541, March 15, 1971, Pat. No. 3,730,104. This application Aug. 3, 1973, Ser. No. 385,513

Int. Cl. A01n *9/12*

U.S. Cl. 71—100 **27 Claims**

1. A method for controlling the growth of vegetation which comprises applying to the locus wherein control is desired, an herbicidally effective amount of the compound of the formula



in which X is oxygen; R and R_1 are independently lower alkyl; R_2 is alkyl, or haloalkyl.

3,890,135

TRIFLUOROMETHYLBENZOPHENONE O-ACYLOXIMES AND THEIR USE AS CROP YIELD INCREASERS FOR PLANTS

William Joseph Middleton, Chadds Ford, Pa., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 324,878, Jan. 18, 1973, Pat. No. 3,849,494. This application Apr. 19, 1974, Ser. No. 462,396

Int. Cl. A01n *9/20*

U.S. Cl. 71—121 **3 Claims**

1. A method of increasing crop yield in plants comprising the step of applying to plants an effective crop yield increasing amount of 4-trifluoromethylbenzophenone O-acetyloxime.

3,890,136

RAW POWDERS TO BE USED FOR PRODUCTION OF LOW ALLOYS STEELS HAVING AN EXCELLENT HARDENABILITY BY POWDER METALLURGY

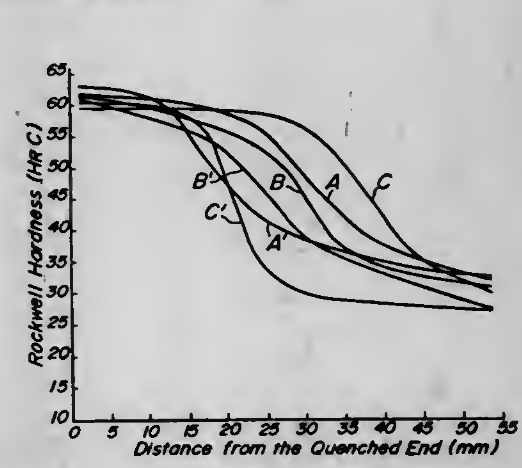
Shunji Ito, Chiba; Yasuaki Morioka, Ohami; Yoshihiro Kajinaga; Minoru Nitta, both of Chiba, and Ichio Sakurada, Ichihara, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed July 1, 1974, Ser. No. 484,945

Claims priority, application Japan, July 5, 1973, 48-75299

Int. Cl. B22f *9/00*

U.S. Cl. 75—0.5 BA **6 Claims**



1. Raw powders to be used for production of low alloy steels having an excellent hardenability by powder metallurgy, which consisting mainly of 0.90–2.50% by weight of Mn, 0.35–1.50% by weight of Cr, 0.10–1.00% by weight of Mo, not more than 0.10% by weight of Si and remainder substantially being Fe, provided that the sum of Mn and Cr is 1.70–3.10% by weight.

3,890,137

WELDING POWDER FOR PRODUCING WEAR-RESISTANT LAYERS BY BUILD-UP WELDING

Horst Beyer, and Ulrich Buran, both of Burscheid, Germany, assignors to Goetzewerke-Friedrich Goetze AG, Burscheid, Germany

Filed Mar. 15, 1974, Ser. No. 451,678

Claims priority, application Germany, Mar. 15, 1973, 2312810

Int. Cl. C22c *1/05, 27/00*

U.S. Cl. 75—.5 BB **13 Claims**

1. A welding powder for producing wear-resistant layers by build-up welding, consisting essentially of:

- a. a first component selected from the group consisting of molybdenum powder, tungsten powder, an alloy of molybdenum and tungsten in powder form, and a mixture of molybdenum powder and tungsten powder; and
- b. a second component of at least one element selected from the group consisting of oxygen, nitrogen, hydrogen and carbon, said second component being present partly in a free, unbound, dissolved state; and

when oxygen is present as the welding powder, it is present in an amount of about 0.001 to about 12 percent by weight, with the free oxygen content being from about 0.00001 to about 0.12 weight percent;

when nitrogen is present in the welding powder, it is present in an amount of about 0.001 to about 0.5 percent by weight, with the free nitrogen content being from about 0.00001 to about 0.00005 weight percent; when hydrogen is present in the welding powder, it is present in an amount of about 0.001 to about 0.5 percent by weight, with the free hydrogen content being from about 0.00001 to about 0.005 weight percent; and when carbon is present in the welding powder, it is present in an amount of about 0.01 to about 2.5 percent by weight, with the free carbon content being from about 0.003 to about 0.8 weight percent.

3,890,138

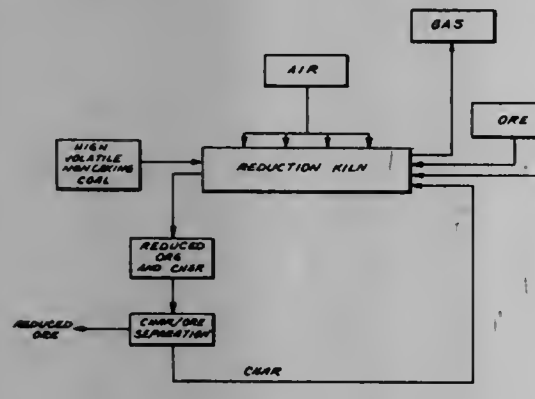
REDUCTION OF IRON-CONTAINING ORES

Harry William Hockin, Capel, Australia, assignor to Western Titanium N.L., Australia

Continuation of Ser. No. 190,671, Oct. 19, 1971, abandoned. This application Oct. 17, 1973, Ser. No. 407,156

Int. Cl. C21b *13/08*

U.S. Cl. 75—33 **5 Claims**



1. A process comprising reducing fine ore containing iron in a rotary kiln fitted with air injection devices, and having a discharge end, a feed end zone and a bed, said process further comprising using a high volatile non-caking coal as the reductant and the fuel, and adding part of the coal at the discharge end of the kiln in such a manner that substantially no coal is incorporated in the bed within at least the last 20% of the kiln length and so that some of the coal added at the discharge end of the kiln is distributed to within the feed end zone of the kiln, the remainder of the coal being added at the feed end of the kiln, the amount of coal fed into the kiln at the discharge end being about 20–30% by weight of the total coal feed, said iron being metallized to at least about 95%.

3,890,139

CONTINUOUS PROCESS FOR REFINING SULFIDE ORES

Takashi Suzuki, Urawa, and Kazuo Tachimoto, Tokyo, both of Japan, assignors to Mitsubishi Kizoku Kabushiki Kaisha, Tokyo, Japan

Filed May 1, 1973, Ser. No. 356,172

Claims priority, application Japan, May 4, 1972, 47-44302

Int. Cl. C22b *15/00*

U.S. Cl. 75—74 **4 Claims**

1. A method for the continuous production of blister copper from sulfide copper ores in a smelting furnace unit, a separator furnace unit and an oxidizing furnace unit, each controllable in operation independently of the other as to compositions of melts therein, temperatures, levels of free surfaces of corresponding melts, and the thickness of the layers of the individual melts in the separator furnace unit and the oxidizing furnace unit including the corresponding slag therein, and wherein the rates of production of slag, matte and blister copper, the rate of transfer of matte from the separator furnace unit to the oxidizing furnace unit and the rates of transfer of blister copper and slag out of the oxidizing furnace unit are maintained in constant equilibrium with the rate of transferring smelted inputs from the smelting furnace unit to the separator furnace unit, which method comprises the steps of:

a. continuously smelting in the smelting furnace unit inputs of sulfide copper ores, flux and oxygen-containing gas to yield a lower layer of matte and an upper layer of slag;

b. simultaneously, while smelting said inputs, continuously transferring said matte and slag in admixture from said smelting furnace unit to a separator furnace unit, at a rate of transfer balancing the rate of production of matte and slag, wherein the matte and the slag are permitted to separate;

c. continuously transferring slag out of said separator furnace unit for disposal at a rate balancing the rate of transfer of slag from the smelting furnace and continuously transferring matte out of said separator furnace unit to an oxidizing furnace unit at a rate of transfer balancing the rate of transfer of matte from the smelting furnace, both rates of transferring matte and slag being equal to the rate of transferring said matte and slag in admixture from the smelting furnace unit to the separator furnace unit by retaining a constant thickness of slag layer and a constant thickness of matte layer in the separator furnace unit, such that a definite amount of the matte is continuously transferred to said oxidizing furnace unit, which amount is equal to the amount transferred to the separator;

d. introducing into said oxidizing furnace unit, flux and an oxygen-containing gas to convert said matte to blister copper and slag to produce layers thereof in said oxidizing furnace; and

e. simultaneously, while oxidizing said matte in said oxidizing furnace unit, continuously transferring said blister copper out of said oxidizing furnace unit at a rate of transfer balancing the rate of production of said blister copper and simultaneously transferring said slag out of said oxidizing furnace unit at a rate balancing the rate of production of the slag in said oxidizing furnace unit, both rates of transferring the blister copper and the slag produced in said oxidizing furnace unit being balanced to the rate of feeding said matte, flux and oxygen-containing gas to said oxidizing furnace unit by retaining in said oxidizing furnace unit a constant thickness of the slag layer and a constant thickness of the blister copper layer, and the rates of transferring said blister copper and said slag out of said oxidizing furnace unit thereby being balanced to the rate of transferring said matte and slag in admixture out of the smelting furnace unit to the separator furnace unit.

3,890,140

ALUMINUM TITANATE CRUCIBLE FOR MOLTEN URANIUM

Joseph J. Asbury, Knoxville, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 10, 1973, Ser. No. 359,052

Int. Cl. C22b *61/04*

U.S. Cl. 75—84.1 R **4 Claims**

1. A method of limiting adverse contamination of uranium and uranium alloys during molten states thereof by the step of melting the uranium alone or with uranium alloying metals in a crucible or crucible liner composed of aluminum titanate.

3,890,141

CONVERSION OF SCRAP RUBBER TO FUEL AND USEFUL BY-PRODUCTS

Grant Crane; Edward L. Kay, and Joseph R. Laman, all of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Nov. 15, 1973, Ser. No. 416,132

Int. Cl. C08c *17/38;* **C08d** *17/00;* **C08c** *17/00*

U.S. Cl. 75—86 **10 Claims**

1. The method of treating solid waste vulcanized rubber by the steps of

heating the solid waste vulcanized rubber in contact with from about 10 up to about 1,000 percent of a hydrocarbon liquid at 400° to 800°F. for 0.1 to 50 hours to convert the solid waste vulcanized rubber to a fluid,

transferring the fluid thus produced to combustion apparatus,

burning the fluid, producing heat energy and ash, and collecting the ash and recovering zinc and titanium therefrom.

3,890,142

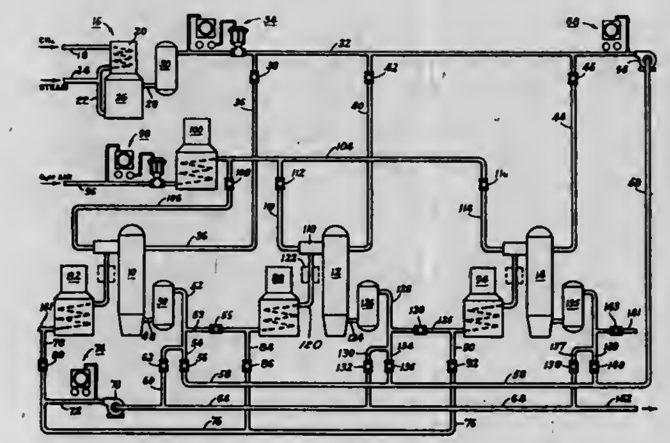
METHOD FOR GASEOUS REDUCTION OF METAL ORES

Juan Celada, and Patrick W. MacKay, both of Monterrey, Mexico, assignors to Fierro Esponja, S.A., Monterrey, Mexico

Filed Oct. 16, 1973, Ser. No. 406,805

Int. Cl. C21b *13/02*

U.S. Cl. 75—91 **9 Claims**



1. In a method for the batchwise gaseous reduction of metal oxides to metals in a multiple unit reactor system of the type in which separate bodies of metal-bearing material are simultaneously treated in one or more charging reactors, reduction reactors, and cooling reactors and a reducing gas is passed successively through said cooling and reduction reactors, the improvement which comprises passing a cool reducing gas composed largely of carbon monoxide and hydrogen through a body of largely reduced metal oxide in a cooling reactor, cooling the effluent gas from said cooling reactor, recirculating a portion of the cooled effluent gas through the body of reduced metal oxide in said cooling reactor, heating the remainder of said cooled effluent gas to a temperature of 900° to 1100°C., passing said heated gas through a body of metal oxide in a reduction reactor, recirculating to said reduction reactor a portion of the effluent gas from said reduction reactor mixed with said remainder of said effluent gas from said cooling reactor, and removing the remainder of the effluent gas from said reduction reactor from said system.

3,890,143

WELDED CONSTRUCTIONS OF STAINLESS STEELS

Eric Skoglund, Torshalla, and Olle Jarleborg, Soderfors, both of Sweden, assignors to Nyby Bruk AB, Nybybruk, Sweden

Filed Apr. 12, 1973, Ser. No. 350,655

Int. Cl. C22c *39/20*

U.S. Cl. 75—125 **7 Claims**

1. An article comprising at least one welded sheet of stainless chromium steel consisting essentially of

C	not more than	0.03%
N_2	not more than	0.03%
Cr		17 to 25%
Ni	not more than	0.5%
Cu	not more than	0.2%
Si		0.3 to 0.6%
Mn		0.3 to 0.6%
Mo		1 to 4%
Ti		0.2 to 0.66%

the balance being iron and incidential impurities, percentages being by weight.

3,890,144

PROCESS FOR MAKING IMPROVED STRENGTH DENTAL AMALGAM

David A. Hansen, Columbia, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.

Division of Ser. No. 264,619, June 20, 1972, Pat. No. 3,841,467. This application May 20, 1974, Ser. No. 471,490

Int. Cl. C22c *7/00*

U.S. Cl. 75—169 **3 Claims**

1. The method of making a dental amalgam which comprises combining mercury and a particulate dental alloy, used in making dental amalgam, in an inert atmosphere.

3,890,145

PROCESSES FOR THE MANUFACTURE OF TUNGSTEN-ASED ALLOYS AND IN THE CORRESPONDING MATERIALS

André R. Hivert, Pontoise, and Philippe M. Galmiche, Clamart, both of France, assignors to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.), Chatillon-Sous-Bagneux, France

Filed Oct. 26, 1970, Ser. No. 90,220

Claims priority, application France, Oct. 28, 1969, 69.36877

Int. Cl. B22f *3/16*

U.S. Cl. 75—224 **14 Claims**

1. Process for the manufacture of tungsten-based alloys, comprising forming a mixture of very fine tungsten powder with a metallic binder and sintering said mixture in a non-oxidizing, halogenated atmosphere, said binder occurring in the liquid state at the sintering temperature and being constituted by a very fine powder, containing as the only three constituents 65 to 90% of nickel, 5 to 20% of chromium and 5 to 15% of phosphorus, the phosphorus being introduced in the form of an alloy powder containing one at least of the two other constituents of the binder.

3,890,146

ORGANIC PHOTOCONDUCTIVE MATERIALS DERIVED FROM REACTING A PHOTOCONDUCTIVE COMPOUND WITH A COLOR COMPOUND

Shinichiro Nagashima, and Kaichi Tsuchiya, both of Tokyo, Japan, assignors to Canon Inc., Japan

Division of Ser. No. 325,258, Jan. 22, 1973, Pat. No. 3,844,781, which is a division of Ser. No. 888,886, Dec. 29, 1969, Pat. No. 3,721,554. This application May 6, 1974, Ser. No. 467,521

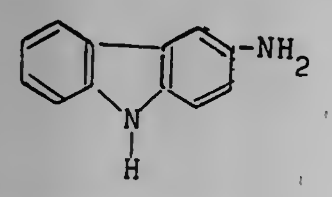
Claims priority, application Japan, Dec. 30, 1968, 44-96504; May 12, 1969, 44-36431

Int. Cl. G03g *5/04*

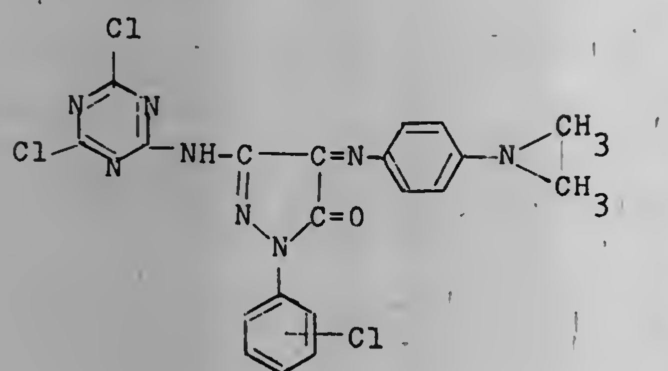
U.S. Cl. 96—1.5 **3 Claims**

1. A light transparent photoconductive material for use in electrophotography which is the reaction product obtained by condensing

a. an organic photoconductive compound of the formula



b. a colored substance of formula



3,890,147

LIGHT ACTIVATING IMAGING PROCESS

Alan R. Monahan, East Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

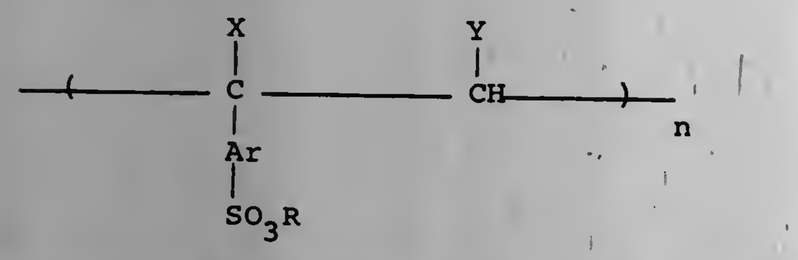
Division of Ser. No. 245,276, April 18, 1972, Pat. No. 3,834,906. This application May 29, 1974, Ser. No. 474,273

Int. Cl. G03c *5/04*

U.S. Cl. 96—27 R **2 Claims**

1. A display process comprising:

a. coating the surface of a support substrate with a layer of alkyl esters of polyvinylaryl sulfonic acids said esters satisfying the formula:



wherein R may be any straight or branched chain alkyl group including halogen substituted groups up to and including ten carbon atoms;

wherein *n* is an integer having a value of from 10 to infinity;

X and/or Y are hydrogen, halogen, alkyl or halogen substituted alkyl groups;

wherein Ar may be any polynuclear aromatic fused ring hydrocarbon up to and including 5 benzene rings;

b. selectively exposing said polymer to actinic radiation so as to insolubilize said exposed areas and produce a translucent image; and

c. projecting said image.

3,890,148

EXPOSURE OF LIGHT-SENSITIVE MATERIALS

Leslie Edward Lawson, and Peter John Smith, both of Orpington, England, assignors to Howson-Algraphy Limited, Kent, England

Continuation-in-part of Ser. No. 167,825, July 30, 1971, abandoned. This application Feb. 15, 1973, Ser. No. 332,592

Int. Cl.² G03F *7/02*

U.S. Cl. 96—33 **8 Claims**

1. A method of exposing a layer of positive-working photosensitive material which comprises assembling together a plurality of positive films to produce an image, preparing a mask by providing a sheet of actinic light transmitting material coated with a composition which does not transmit actinic light, said coated sheet being visible light transmitting, and painting parts of said composition with a liquid which interacts with said composition to permitactinic light to be transmitted through said sheet and thereby to form on the sheet an actinic light transmitting pattern corresponding to the pattern defined by the edges of the films in the assembly, and exposing the layer to actinic light through said mask either before or after subjecting the layer to an image-forming exposure through the assembly.

7. A method according to claim 1, wherein the layer of photo-sensitive material forms part of a photo-sensitive plate suitable for the production of a lithographic printing plate.

3,890,149

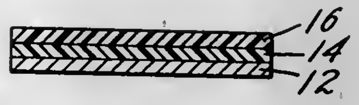
WATERLESS DIAZO PLANOGRAPHIC PRINTING PLATES WITH EPOXY-SILANE IN UNDERCOAT AND/OR OVERCOAT LAYERS

Sheldon Irwin Schlesinger, Hightstown; Ronald J. Boszak, Trenton, both of N.J.; Laurence Verlan Shuppert, and Richard James Cowling, both of Neenah, Wis., assignors to American Can Company, Greenwich, Conn.

Filed May 2, 1973, Ser. No. 356,282

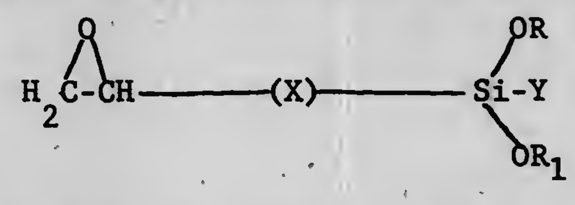
Int. Cl. G03f *7/08*

U.S. Cl. 96—33 **40 Claims**



1. A presensitized planographic printing plate capable of being imaged comprising a substrate having applied to at least one surface thereof:

1. as an undercoat layer, a sensitized composition comprising an epoxy-silane, a monomeric or prepolymeric epoxide material polymerizable to higher molecular weights through the action of a cationic catalyst, and, as a catalyst precursor, radiation-sensitive aromatic diazonium salt of a complex halogenide which decomposes upon application of energy to release a Lewis acid effective to initiate polymerization and interaction of said epoxide and epoxy-silane and
2. as an overcoat layer, an abhesive compisition comprising an organosiloxane and from 0 to 50 percent of an epoxy-silane as based on the total weight of the components in the overcoat layer said epoxy-silane in said layers being selected from compounds having the general formula



with the proviso that (1) when said overcoat layer composition is devoid of epoxy-silane, said undercoat layer composition contains about 25 to about 75 percent epoxy-silane and about 15 to about 40 percent of said catalyst precursor, and (2) when said epoxy-silane is a component of said overcoat layer composition, said undercoat layer composition contains about 1 to about 20 percent epoxy-silane and about 0.5 to about 10 percent of said catalyst precursor, all percents being based on the total weight of said epoxide material in said undercoat layer except the percent of said catalyst precursor in proviso (2) is based on the total weight of epoxide moiety containing compounds in said undercoat layer

wherein each of X, r and R_1 is an alkylene, alkoxy, arylene, alakarylene, aralkylene, carbalkoxy or ether group and Y is an alkoxy or epoxy group; said undercoat layer becoming firmly bonded to said overcoat layer throughintra- and inter-layer reaction upon exposure of said coated substrate to an energy source.

said organosiloxane being silicone elastomer formed by curing and/or polymerizing silicone gum;

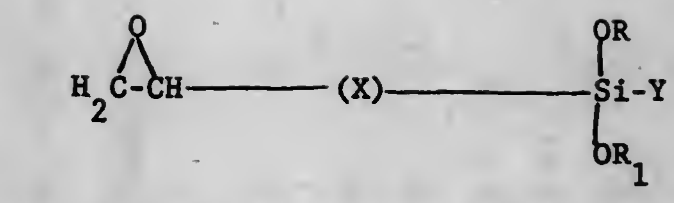
said undercoat layer becoming firmly bonded to said overcoat layer through intra- and inter-layer reaction upon exposure of said coated substrate to an energy source.

27. A method for production of planographic printing plates which are suitable for accepting ink only in the oleophilic areas and printing therefrom while rejecting ink in the oleophobic non-printing areas, in the absence of dampening, which comprises:

1. applying to a substrate (a) as an undercoat layer a sensitized composition comprising an epoxy-silane, a monomeric or prepolymeric epoxide polymerizable to higher molecular wights through the action of a cationic catalyst and, as a catalyst precursor, a radiation-sensitive aromatic diazonium salt of a complex halogenide which decomposes upon application of energy to release a Lewis acid effective to initiate polymerization and interaction of said epoxide and epoxy-silane and (b) as an overcoat layer a composition comprising an organosiloxane and from 0 to 50 percent of an epoxy-silane as based on the total weight of the components in the overcoat layer;

with the proviso that (1) when said overcoat layer composition is devoid of epoxy-silane, said undercoat layer composition contains about 25 to about 75 percent epoxy-silane and about 15 to about 40 percent of said catalyst precursor, and (2) when said epoxy-silane is a component of said overcoat layer composition, said undercoat layer composition contains about 1 to about 20 percent epoxy-silane and about 0.5 to about 10 percent of said catalyst precursor, all percents being based on the total weight of said epoxide material in said undercoat layer except the percent of said catalyst precursor in proviso (2) is based on the total weight of epoxide moiety containing compounds in said undercoat layer

said epoxy-silane in said layers being selected from compounds having the general formula



wherein each of X, R and R_1 is an alkylene, alkoxy, arylene, alkarylene, aralkylene, carbalkoxy or ether group and Y is an alkoxy or epoxy group; and

said organosiloxane being silicone elastomer formed by curing and/or polymerizing silicone gum;

2. exposing at least a portion of said coated substrate to an energy source through an article having opaque and transparent areas to effect said polymerization and interaction and to render the exposed areas of said coated substrate insoluble and
3. removing said unexposed areas of said coated substrate.

3,890,150

PHOTOSENSITIVE COMPOSITIONS INCLUDING AROMATIC BIS-ACRYLIC DERIVATIVES

Masaki Hasegawa, Tokyo; Fusae Nakanishi, Yokohama; Hachiro Nakanishi, Yokohama; Shoji Watanabe, Yokohama; Yasuzo Suzuki, Yokohama; Hisashi Nakane, Kawasaki; Toshimi Aoyama; Yukio Komatsubara, both of Tokyo; Setsuo Nojima, Kawasaki, and Hiroshi Tagami, Yokohama, all of Japan, assignors to Director-General, Agency of Industrial Science & Technology Co. Ltd., Tokyo and Tokyo Ohka Kogyo Co., Ltd., Kanagawa, both of, Japan

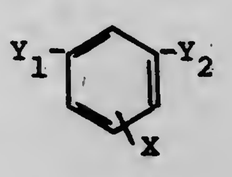
Continuation of Ser. No. 149,771, June 3, 1971, abandoned. This application Sept. 19, 1973, Ser. No. 398,825

Claims priority, application Japan, June 3, 1970, 45-48345; June 3, 1970, 45-48346

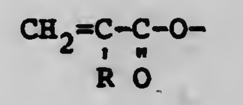
Int. Cl. G03c *1/70*

U.S. Cl. 96—33 **5 Claims**

1. A photosensitive polymer composition for insolubilization by exposure to actinic light which consists essentially of a mixture in a molar ratio of about 10:1–1:2 by weight of a solvent-soluble linear polyamide and a meta-phenylene bis-acrylic derivative of the general formula:

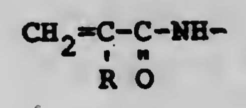


wherein Y_1 and Y_2 each represent a



$$CH_2{=}\underset{R}{C}{-}\underset{O}{\overset{\|}{C}}{-}O{-}$$

or a



$$CH_2{=}\underset{R}{C}{-}\underset{O}{\overset{\|}{C}}{-}NH{-}$$

group where R and X each stands for a hydrogen atom or a lower alkyl group.

3,890,151

METHOD FOR MAKING ELECTROLUMINESCENT SCREENS FOR COLOR CATHODE-RAY TUBES OF CONTINUOUS PHOSPHOR STRIPES

Takeshi Suzuki; Hiroshi Tanaka, both of Fukaya, and Masanori Akiyama, Honjo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Aug. 7, 1973, Ser. No. 386,317

Claims priority, application Japan, Aug. 7, 1972, 47-78420

Int. Cl. G03c *5/00*

U.S. Cl. 96—36.1 **6 Claims**

1. In a method of making an electro-luminescent screen for a color cathode ray tube comprising a plurality of separate color fields of continuous vertical stripes disposed on the viewing panel of said electroluminescent screen, each of said color fields being defined by exposure of said panel to a light source through a shadow mask, the light projected through said mask onto said panel producing a developable image of each said color fields on said panel, the steps comprising:

a. applying a film containing photosensitive material having a predetermined solvency in response to incident light onto the panel for the cathode-tay tube;

b. attaching to said panel a shadow mask with a concave face having a number of beam-passable apertures arranged in rows substantially parallel with each other, said apertures along the length of each of said rows being separated from each other by beam-intercepting bridge portions;

c. locating a light source to irradiate an area of said shadow mask on the opposite side of said shadow mask at a position representing the location of the electron gun in said cathode ray tube used to illuminate each said color field, projecting the light from said source through said mask on said film on said panel in a pattern comprising images defined by said apertures of said shadow mask, controlling the light projected by said light source to limit said lighted area in length in the direction of said rows of apertures, the apertures within said lighted area having a nearly equal angle of inclination with respect to the vertical axis of said screen, said light source having a sufficient effective length to produce on said film an image of each aperture so expanded in the lengthwise direction of the rows of the apertures as to overlap the image of each adjacent aperture in the lengthwise direction of each of the rows thereby obtaining images of the continuous vertical stripes of each said color field along the length of each of said rows on said panel film, and

d. controlling said light source to move said irradiated area on the shadow mask along the length of the rows of the apertures while inclining said light source to keep the longitudinal axis thereof substantially parallel to a line drawn tangent to the apertures in the irradiated area of said shadow mask.

3,890,152

LIGHT-SENSITIVE COPYING COMPOSITION CONTAINING DIAZO RESIN AND QUINONE DIAZIDE

Hans Ruckert, Wiesbaden-Schierstein, and Rainer Unholz, Wiesbaden-Biebrich, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Sept. 21, 1972, Ser. No. 291,095

Claims priority, application Germany, Sept. 25, 1971, 2147947

Int. Cl. G03f *7/08*

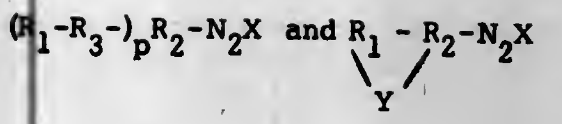
U.S. Cl. 96—75 **4 Claims**

1. A light-sensitive composition comprising, in a homogeneous admixture, (I) at least one diazonium salt mixed condensation product comprising repeating units of each of the general types

$A—N_2X$ and B

which are linked by methylene groups, in which

$A—N_2X$ is a radical of a compound of one of the general formulae



$$(R_1-R_3-)_pR_2-N_2X \quad \text{and} \quad R_1\underset{\diagdown_{Y}\diagup}{-}R_2-N_2X$$

wherein

R_1 is an arylene group of the benzene or naphthalene series,

R_2 is a phenylene group,

R_3 is a simple homopolar bond or one of the groups

$—(CH_2)_q—NR_4—$,

$—O—(CH_2)_r—NR_4—$

$—S—(CH_2)_r—NR_4—$

$—S—CH_2—CO—NR_4—$

$—O—R_5—O—$

— 0 —

— S — or

$—CO—NR_4—$

the left-hand free valence of the specified groups is attached to R_1 and the right-hand free valence is attached to R_2,

q is a number from 0 to 5

r is a number from 2 to 5

R_4 is selected from the group consisting of hydrogen, alkyl with 1 to 5 carbon atoms, aralkyl with 7 to 12 carbon atoms, and aryl with 6 to 12 carbon atoms,

R_5 is an arylene group having 6 to 12 carbon atoms

—Y— is one of the groups

—NH—, and —O—

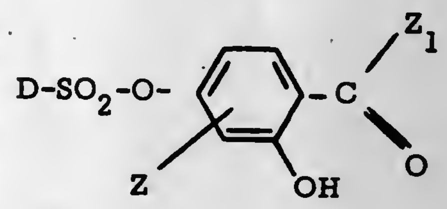
X is the anion of the diazonium compound, and

p is a number from 1 to 3, and

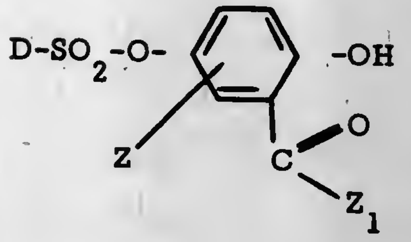
B is a radical of a compound free of diazonium groups selected from the group consisting of aromatic amines, phenols, thiophenols, phenol ethers, aromatic thioethers, aromatic heterocyclic compounds, aromatic hydrocarbons and organic acid amides,

which condensation product contains, on the average, about 0.01 to 50 B units per unit of $A—N_2X$,

and (II) at least one compound selected from the group consisting of (a) an o-naphthoquinone diazide sulfonic amide derived from a primary aliphatic amine with two to nine carbon atoms, (b) an o-naphthoquinone diazide sulfonic ester of one of the general formulae



and



wherein

D is a naphthoquinone (1,2)-diazide residue;

Z is H or OH;

Z_1 is H, OZ_2, NZ_3Z_4 or alkyl, aryl or heteroyl;

Z_2 is alkyl or aryl;

and Z_3 and Z_4 are H, alkyl or aryl, and

(c) the 4-cumyl-phenylester of naphthoquinone-(1,2)-diazide-(2)-4-sulfonic acid, the components (I) and (II) being present in quantities such that 0.5 to 4 diazide groups are present per diazonium salt group

wherein said composition when used as a supported light-sensitive layer is capable, after imagewise exposure to actinic light, of forming a positive or negative image in the same said layer dependent only on choice of developer, and wherein said positive image is formed using an aqueous alkaline developer and said negative image is formed using an aqueous acidic developer.

3,890,153

POSITIVE-ACTING NAPTHOQUINONE DIAZIDE PHOTOSENSITIVE COMPOSITION

Rinse Dijkstra, and Arnoldus Johannes Maria Van den Broek, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 233,760, March 10, 1972, abandoned. This application Dec. 6, 1973, Ser. No. 422,585

Claims priority, application Netherlands, Mar. 13, 1971, 7103379

Int. Cl. G03f *7/08;* **G03c** *1/54*

U.S. Cl. 96—91 D **4 Claims**

1. A positive-acting photosensitive composition comprising a solution in admixture of a naphthoquinone-(1,2)-diazido-(2) and a film forming polyvalent alcohol resin in admixture in an organic solvent, said film-forming resin having a softening point between 50°C and 95°C and being obtained by the esterification of 40% to 60% of groups available for esterification of a polyvalent epoxide compound with a hydroxyphenyl-monocarboxylic acid.

3,890,154

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIALS

Kinji Ohkubo; Junpei Noguchi; Kunioki Ohmura, and Masanao Hinata, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 101,233, Dec. 24, 1970, abandoned. This application Mar. 23, 1973, Ser. No. 344,401

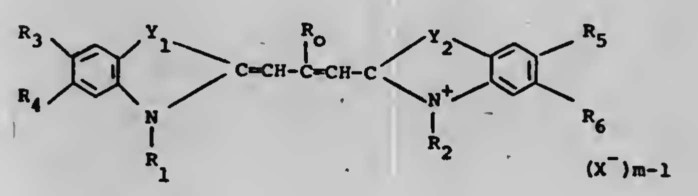
Claims priority, application Japan, Dec. 24, 1969, 44-104009; Jan. 9, 1970, 45-002819

Int. Cl. G03c *1/08*

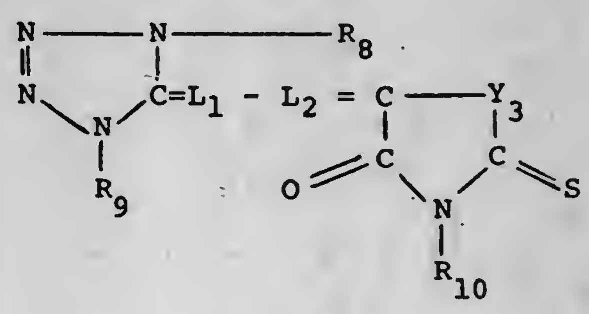
U.S. Cl. 96—125 **23 Claims**

1. A light-sensitive silver halide photographic material comprising at least one layer having high sensitivity to green light under flash exposure on a support which comprises an emulsion consisting essentially of:

1. a binder,
2. light-sensitive silver halide grain particles of homogeneous structure exhibiting high surface sensitivity, compared to core-shell type particles,
3. at least one simple salt or complex salt of a Group VIII metal selected from the group consisting of iron, cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium and platinum, and
4. at least one optical sensitizer selected from the group consisting of compounds of the general formula:



wherein R_0 is a member selected from the group consisting of a hydrogen atom and an alkyl group; wherein R_1 and R_2 each represents a member selected from the group consisting of a hydrogen atom, an alkyl group of from 1 to 4 carbon atoms, a substituted alkyl group selected from the group consisting of a hydroxyalkyl group, an acetoxyalkyl group, an alkyl group having a carboxy group and an alkyl group having a sulfa group, an allyl group, an aryl group, and an aralkyl group, in which at least one of R_1 and R_2 must be selected from the group consisting of a carboxyalkyl group and a sulfoalkyl group; wherein Y_1 and Y_2 each is selected from the group consisting of an oxygen atom, a sulfur atom, and *a* $=N—R_7$ group, in which R_7 represents an alkyl group; wherein R_3, R_4, R_5 and R_6 each is selected from the group consisting of a hydrogen atom, a halogen atom, an alkyl group, a cyano group, an alkoxy group, and an aryl group, in which if at least one R_3 and R_4 is an aryl group, then R_5 and R_6 are not an aryl group; wherein X represents an anion selected from the group consisting of a halogen ion and a thiocyanate iron; and wherein *m* represents an integer of 1 or 2, in which an intramolecular salt is formed if *m* is 1; and compounds of the formula:



wherein R_8, R_9 and R_{10} each represents a member selected from the group consisting of a hydrogen atom, an alkyl group of from 1 to 8 carbon atoms, a substituted alkyl group selected from the group consisting of a carboxyalkyl group, a hydroxyalkyl group and a sulfoalkyl group, wherein Y_3 is a member selected from the group consisting of an oxygen atom, a sulfur atom, and a $=N—R_{11}$ group in which R_{11} is a member selected from the group consisting of a hydrogen atom, an alkyl group, and an aryl group, and wherein L_1 and L_2 each represents a methine chain.

3,890,155

RADIATION-SENSITIZED FINE-GRAINED SILVER HALIDE PHOTOGRAPHIC SENSITIVE MATERIAL

Yasuharu Nakamura; Yoshiyuki Nakazawa; Tohru Sueyoshi, and Akira Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

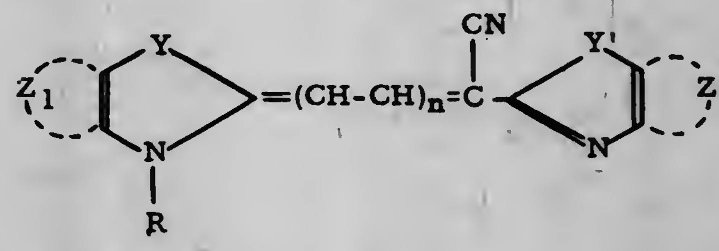
Filed Apr. 12, 1973, Ser. No. 350,579

Claims priority, application Japan, Apr. 12, 1972, 47-36676

Int. Cl. G03c *1/18, 1/20*

U.S. Cl. 96—137 **20 Claims**

1. A radiation-sensitive silver halide photographic emulsion containing silver halide crystals whose mean grain size is not greater than 0.2 micron or at least 90% in number of which are not greater than 0.25 micron in grain size and at least one sensitizing base represented by the following general formula (I);



(I)

wherein Z_1 and Z_2 each represent the atoms necessary to form a benzene ring, Y represents an oxygen atom, a sulfur atom, a selenium atom or a $>N—R_1$ group, Y′ represents a sulfur atom, a selenium atom or a $>N—R_3$ group, R_1 and R_2 which may be the same or different each represents an alkyl group, R_3 represents a hydrogen atom or an alkyl group, and n represents 1 or 2, said sensitizing base enhancing both the spectral sensitivity and the sensitivity in the absorption wave length region intrinsic to said silver halide.

3,890,156
DESENSITIZER COMPOSITIONS

Hiroharu Matsukawa; Akio Miyamoto, and Akio Watanabe, all of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

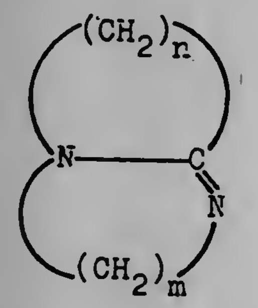
Filed June 4, 1973, Ser. No. 367,061

Claims priority, application Japan, June 3, 1972, 47-55470

Int. Cl. C09d *11/00*

U.S. Cl. 106—19 **24 Claims**

1. In a desensitizer composition for desensitizing a developer against coloring a colorless color former, which comprises an inorganic pigment, a resin binder and a desensitizing agent; the improvement comprising, as said agent at least about 1 weight percent, based on the composition weight, of an amine of the folllowing formula or a salt thereof:



wherein *m* is an integer of 2–6, *n* is an integer of 2–11, and each ring can be substituted by one or more alkyl groups of 1–4 carbon atoms.

3,890,157
CEMENTITIOUS SYSTEMS INCORPORATING PARTICULATE ADSORBENTS

Henry Nash Babcock, 4 Quintard Ave., Old Greenwich, Conn. 06870

Continuation-in-part of Ser. No. 328,498, Jan. 31, 1973, abandoned, which is a continuation-in-part of Ser. Nos. 303,984, Nov. 6, 1972, abandoned, and Ser. No. 709,229, Feb. 29, 1968, abandoned, said Ser. No. 303,984, is a division of Ser. No. 801,781, Feb. 24, 1969, Pat. No. 3,794,504. This application July 24, 1974, Ser. No. 491,317The portion of the term of this patent subsequent to Feb. 26, 1991, has been disclaimed.

Int. Cl.^{2} C04B *1/00, 7/02, 11/00*

U.S. Cl. 106—89 **14 Claims**

1. A cementitious composition which, when mixed with water, is capable of setting into a hard mass without substantial shrinkage during setting and early hardening, said composition comprising a hydraulic cement mixture and a dry adsorbent-like porous particulate solid material with an internal porosity in excess of 25 percent, an external void fraction above 35 percent and a surface area in excess of 100 m^2/g, having a volume of entrapped gas within its pores and capable of preferentially adsorbing water and controllably discharging the entrapped gas during setting and early hardening of said cement mixture while in contact with water, in an amount effective to counteract the shrinkage tendency of the cementitious composition.

3,890,158
WAX EMULSIONS FOR CONTROLLING TRANSPIRATION IN PLANTS

Donald R. Cushman, Wenonah; Edward A. Oberright, Woodbury, both of N.J.; Roy T. Edwards, deceased, late of Mullica Hill, N.J., and by Katherine Edwards, legal representative, Mullica Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 256,997, May 25, 1972, Pat. No. 3,791,839, which is a continuation-in-part of Ser. No. 60,957, July 2, 1970, abandoned, which is a division of Ser. No. 639,041, May 17, 1967, abandoned. This application Oct. 18, 1973, Ser. No. 407,706

Int. Cl. C08h *9/06*

U.S. Cl. 106—271 **5 Claims**

1. A wax emulsion composition consisting essentially of, by weight, from about 15 to about 40% paraffin wax having a melting point of from about 115°F. to about 190°F.; from about 5 to about 30% petrolatum; from about 2 to about 10% of an emulsifier comprising a mixture of sorbitan monooleate and polyoxyethylene sorbitan monooleate or their stearates and at least one member of the group consisting of alkali metal and morpholine soaps; and water in an amount sufficient to form the emulsion.

3,890,159
METHOD OF FORMING A HIGH SURFACE AREA METALLIC CADMIUM POWDER AND AN ELECTRODE THEREFROM

Roy F. Thornton, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 4, 1972, Ser. No. 311,866

Int. Cl. H01m *43/04*

U.S. Cl. 136—24 **7 Claims**

1. A method of forming a high surface area metallic cadmium powder which consists of mixing together cadmium oxide powder, and zinc powder in an aqueous alkali hydroxide solution to form a slurry, reacting the mixture thereby forming metallic cadmium powder and oxidized zinc species, washing the metallic cadmium powder and oxidized zinc species with a second aqueous alkali hydroxide solution thereby removing the oxidized zinc species, washing the metallic cadmium powder thereby removing the alkali hydroxide, and drying the metallic cadmium powder.

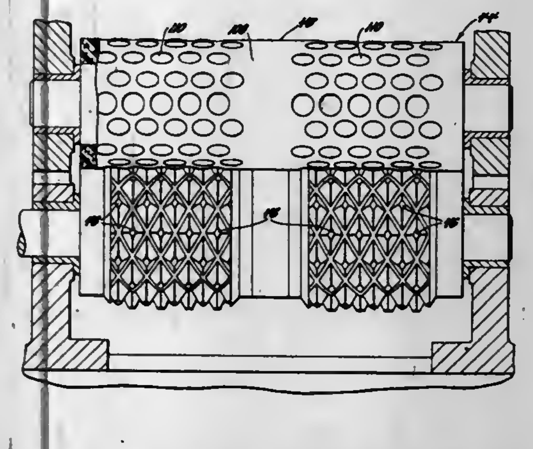
3,890,160
METHOD AND APPARATUS FOR PREVENTING CURLING OF LEAD STRIPS DURING EXPANSION

Elon Daniels, Jr., Frankton, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 20, 1973, Ser. No. 399,108

Int. Cl. H01m *35/04*

U.S. Cl. 136—36 **2 Claims**



1. A method of making lead-acid storage battery plates comprising:

advancing a narrow lead strip, having a predetermined thickness, longitudinally between two rows of progressive dies and cutters, said strip having a central, longitudinal lug-forming portion and two expandable grid-forming portions flanking the lug-forming portion and extending to both longitudinal edges of the strip, and said rows comprising a plurality of dies and cutters which converge in incremental steps on the central lug-forming portion of the strip passing between them;

periodically shearing bottom-border-forming sections from each longitudinal edge as the strip advances between the first set of dies and cutters, each of said sections being linked to successive sections and to the remainder of said grid-forming portion by unsheared portions of the strip intermediate the sections;

expanding a first part of the remaining grid-forming portions along the longitudinal edges thereof by periodically shearing rectangular wire-like segments from said edges into a plurality of tiers of undulatory skeletal elements extending at acute angles to the plane of said lug-forming portions and such that successive tiers are offset one from the other and joined one to the other by a plurality of nodes which join the ends of successive segments in one tier to the centers of like segments in successive tiers;

at approximately midway through the progressive dies, engaging the underside of said border-forming sections and pushing it upwardly to pull on the already expanded part and remove any deleterious curl forming therein;

expanding the remainder of the grid-forming portions in the same manner as done for said first parts;

said nodes for said first parts and remainders having rectangular, vertically transverse cross-sections and widths significantly greater than said predetermined thickness and equal to the sum of the widths of the adjoining skeletal elements, whereby two reticulated portions comprising a plurality of polygonal paste-retaining cells bounded by said skeletal elements and nodes are formed with a continuous row of unexpanded bottom-border-forming sections on the lateral edges thereof and extend at acute angles from the central portion in gull-wing fashion when viewed head-on;

leveling the thusly expanded strip by folding said reticulated portions down into nearly the same plane as said central portion;

uniformly stretching the reticulated portions in directions substantially perpendicular to the direction the strip is fed through the dies by urging each tier of skeletal elements in those directions independently of the other tiers to uniformly size the cells, stretch the reticulated portions to a predetermined width and slightly rotate the rectangular nodes such that diagonally opposing edges of the nodes become salient in the principal planes of the reticulated portions;

flattening the reticulated portions by further rotating said nodes and compressing said salient edges into plateaus and thereby convert the rectangular cross-sections of said nodes to polygonal cross-sections having two opposing sides thereof laying in planes substantially parallel to the faces of the pasted plate and spaced one from the other by a distance greater than said predetermined thickness but substantially less than twice said predetermined thickness;

substantially engulfing the reticulated portions in a leady active material paste and sandwiching same between strips of paper which are substantially coextensive with said reticulated portions;

drying the paper-bound pasted strip; and

finally segmenting the pasted strip into individual battery plates.

3,890,161
DIODE ARRAY

Charles M. Brown, III, 1378 Johnson St., Menlo Park, Calif. 94025

Filed July 16, 1973, Ser. No. 379,588

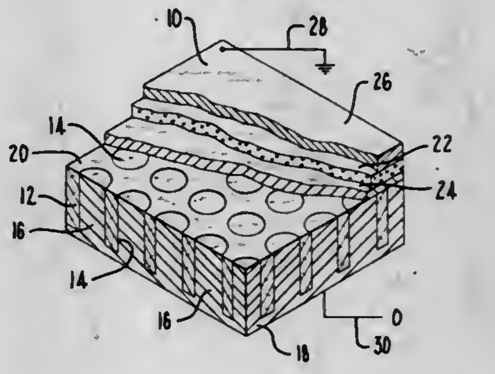
Int. Cl. F42b *1/04*

U.S. Cl. 136—212 **7 Claims**

1. A diode array for rectifying thermal electrical noise comprising:

a plurality of diodes connected in parallel having a first common output terminal from which current is withdrawn connectable to a load, and a second common ground terminal connected to ground, wherein said diodes are uniformly oriented to preferentially conduct internally generated current from thermal electrical noise to said first common output terminal,

wherein said plurality of diodes comprises:



a dielectric membrane with first and second surfaces having a plurality of discrete pores through the membrane isolating discrete metal/metal diodes formed by a first metal layer on said first surface of said membrane filling at least in part said discrete pores, a second metal layer on said second surface of said membrane, and a metal oxide layer interfacing said first and second metal layers.

3,890,162
THERMOCOUPLES

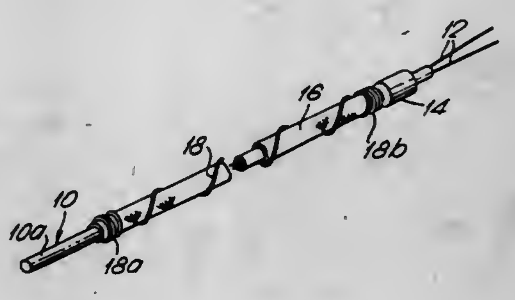
Gordon William Dawson, Colliers End, Near Ware, and Howard Meredith Dixon, Chestnut, both of England, assignors to Sangamo Weston Limited, Enfield, Middlesex, England

Filed June 6, 1973, Ser. No. 367,415

Claims priority, application United Kingdom, June 27, 1972, 30080/72

Int. Cl. H01v *1/02*

U.S. Cl. 136—230 **5 Claims**



1. A thermocouple comprising a tubular protective sheath, an elongate sensing element positioned coaxially within said sheath with a thermojunction at one end of the element within the sheath, and support means between the sensing element and the sheath, said support means having uninterrupted contact both with the sheath and with the sensing element over a substantial part of the length of the sensing element, being yieldable radially of the sensing element to provide a resilient cushioning effect along the supported length of the sensing element, and permitting relative axial movement between the sensing element and the sheath in response to differ-

ential thermal expansion of the sensing element and the sheath.

3,890,163

ULTRA HIGH FREQUENCY TRANSISTORS MANUFACTURING PROCESS

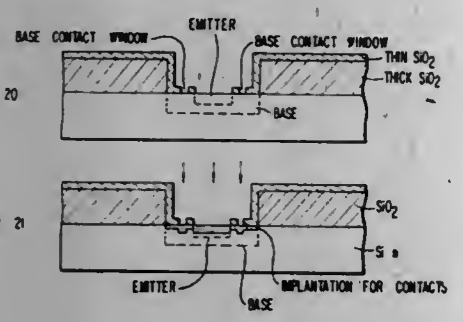
Bernard R. Pruniaux, Nice, and Jean-Louis Assemat, Paris Cedex 16, both of France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Oct. 31, 1973, Ser. No. 411,281

Claims priority, application France, Nov. 10, 1972, 72.39949

Int. Cl. H01l *7/54*

U.S. Cl. 148—1.5 9 Claims



1. Process for manufacturing a planar UHF transistor with the emitter region enclosed within the base region starting from a semiconducting body of regular lattice organization coated with an epitaxial layer of low first type of conductivity, part of which constitutes the collector region, comprising the following steps:

- oxidizing said epitaxial layer up to several tenths of micrometer thick in humid atmosphere to form a thick oxide layer;
- photoetching a first window in said oxide layer according to a base pattern;
- diffusing a first impurity of a second type of conductivity through said first window;
- oxidizing a second time said epitaxial layer including said first window up to about 0.1 μm thick in humid atmosphere to form a thin oxide layer;
- photoetching a second window for the emitter in said thin oxide layer within said first window;
- ion implanting a second impurity of said first conductivity type through said second window so as to predeposit the emitter dopant;
- annealing said body in a neutral atmosphere below 1,000° C, so as to diffuse said emitter dopant and rearrange the lattice which had been disturbed by said implantation;
- photoetching a third window in said thin oxide layer outlining the base contacts; and
- metallizing said second and third window areas on the upper face of said epitaxial layer.

3,890,164

SURFACE TREATMENT OF TINPLATE FOR IMPROVING SULFUR RESISTANCE

Shunichi Harada, and Takahisa Yoshihara, Chiba, both of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed July 9, 1973, Ser. No. 377,397

Int. Cl.^{2} C23F *7/26*

U.S. Cl. 148—6.2 5 Claims

4. Surface treatment of tin-plated steel according to claim 1 further comprising applying an aqueous acid solution containing 6-valent chromium ions after the heating step.

3,890,165

PASSIVATION OF MATERIALS WHICH COME INTO CONTACT WITH PEROXYGEN COMPOUNDS

Hsiang Peng Liao, Glen Burnie, Md., assignor to FMC Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 27,147, April 9, 1970, abandoned. This application Aug. 9, 1972, Ser. No. 279,071

Int. Cl. C23f *9/00*

U.S. Cl. 148—6.15 R 4 Claims

1. A method of passivating a stainless steel, aluminum or aluminum alloy surface that is to come into contact with a peroxygen compound, comprising contacting the surface with a liquid treating agent, said liquid treating agent being a solution consisting essentially of a solvent containing 0.5 to 10% by weight of a member of the group consisting of $Na_5(2\text{-}ethylhexyl)_5(P_3O_{10})_2$ and $Na_5(capryl)_5(P_3O_{10})_2$, at a temperature of 50° to 100°C. for at least 5 minutes.

3,890,166

ACTIVATION OF PARTICULATE ALUMINUM

Thomas J. Kondis, Pittsburgh, Pa., assignor to Aluminum Company of America, Alcoa Center, Pa.

Filed Nov. 17, 1972, Ser. No. 307,334

Int. Cl. C23f *7/00*

U.S. Cl. 148—6.27 16 Claims

1. A process for production of a highly reactive pyrophoric aluminum which permits creation and maintenance of nascent aluminum surfaces while inhibiting rewelding together of such surfaces which comprises milling particulate aluminum in the presence of a milling aid capable of sorbing onto the surface of the aluminum sufficiently to prevent welding of the particles and at the same time allow access by a reactive substance to the nascent aluminum surface; said milling aid being selected from the group consisting of: oxygen-containing compounds, olefins, hyrocarbon free radicals, hydrazine free radicals, and chlorinated hydrocarbons.

3,890,167

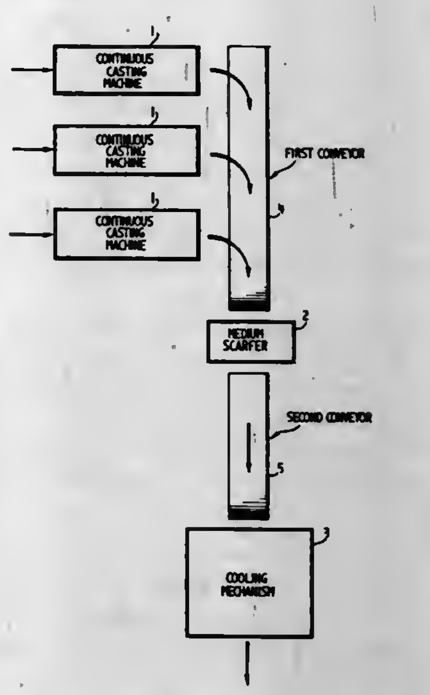
METHOD AND APPARATUS FOR PRODUCING A CASTING HAVING A SATISFACTORY SURFACE WITH A CONTINUOUS CASTING OPERATION

Teruhiko Nozaki, Nishinomiya, Japan, assignor to Kobe Steel, Inc., Kobe, Japan

Filed Sept. 7, 1973, Ser. No. 395,143

Int. Cl. B23k *7/00*

U.S. Cl. 148—9.5 6 Claims


CONTINUOUS CASTING MACHINE
CONTINUOUS CASTING MACHINE
CONTINUOUS CASTING MACHINE
FIRST CONVEYOR
MEDIUM SCARFER
SECOND CONVEYOR
COOLING MECHANISM

1. A method for producing a casting having satisfactory surface properties in the step after a continuous casting operation wherein the casting solidified in a continuous casting machine is subjected to a scarfing operation while the casting is kept at a high temperature, comprising the steps:

- applying a scarfing operation to the casting while the surface temperature of the casting is maintained at 700°–900°C, and
- immediately cooling said casting to bring the surface temperature thereof below 400°C.

5. A device for producing a casting having satisfactory surface properties, comprising a continuous casting machine for continuously solidifying molten steel, a medium scarfer for scarfing said casting at 700°–900°C in surface temperature, a cooling mechanism for cooling said casting, a first conveyor for carrying said casting from the continuous casting machine to the medium scarfer, and a second conveyer for carrying said casting from the medium scarfer to the cooling mechanism.

3,890,168

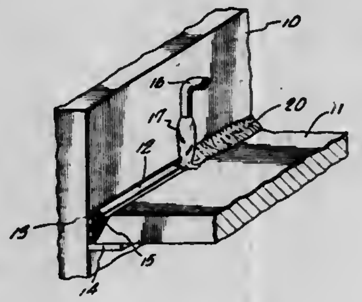
EXOTHERMIC WELDING COMPOSITION

Harold A. Shumway, 25529 Via Brava, Valencia, Calif. 91355

Continuation-in-part of Ser. No. 74,092, Sept. 21, 1970, abandoned. This application Nov. 29, 1972, Ser. No. 310,330

Int. Cl. B23k *35/34, 23/00*

U.S. Cl. 148—24 9 Claims



1. A stoichiometrically balanced; homogeneously admixed exothermic welding composition comprising the ingredients: from about 65 to 85 weight percent of an admixture of powdered elemental aluminum and powdered iron oxide with from about 9 to 15 weight percent of said composition being said powdered elemental aluminum, from about 5 to 20 weight percent of powdered glass-forming slag melting poing depressants selected from the group consisting of calcium, silicon and magnesium materials which during welding yield calcium, silicon and/ or magnesium, and an amount of selected powdered alloying agents effective to form a predetermined alloy, said composition being compressed to between about 60 and 80 percent of its theoretical volume whereby the quantity of entrained air in said composition is mimized.

3,890,169

METHOD OF FORMING STABLE NATIVE OXIDE ON GALLIUM ARSENIDE BASED COMPOUND SEMICONDUCTORS BY COMBINED DRYING AND ANNEALING

Bertram Schwartz, Westfield; Stuart Marshall Spitzer, Berkeley Heights, and Gregory Dyett Weigle, Somerset, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 26, 1973, Ser. No. 344,702

Int. Cl. H01l *7/44*

U.S. Cl. 148—187 4 Claims

1. In a process for fabricating a compound semiconductor device, the method of forming a stable oxide on the surface of a semiconductor portion comprising a material selected from the group consisting of GaAs, GaAlAs and GaPAs, comprising the steps of growing an oxide on the surface of the said semiconductor portion, drying said oxide by heating to a temperature of approximately 150–300°C for approximately ½ hour to 5 hours in a nonoxidizing ambient and subsequently annealing the oxide by heating to a temperature of approximately 450°–700°C for a period of approximately 15 minutes to 12 hours in a nonoxidizing ambient.

3,890,170

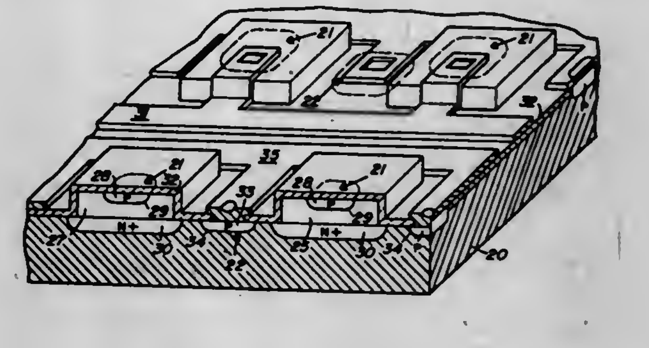
METHOD OF MAKING A MULTICOLOR LIGHT DISPLAY BY GRADED MESAING

Malcolm J. Russ, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 230,293, Feb. 29, 1972, abandoned. This application Nov. 2, 1973, Ser. No. 414,070

Int. Cl.^{2} H01l *7/36*

U.S. Cl. 148—175 3 Claims



1. A process for the manufacture of a multi-color monolithic light display comprising:

- providing a substrate of a semiconductor material of a first composition;
- epitaxially depositing thereon a semiconductor material layer graded from said first composition to a semiconductor material of a second composition;
- continuing the deposition of said second composition material to form a coherent layer on said graded layer;
- masking selected portions of said layer of said second composition material;
- epitaxially depositing mesas of semiconductor material on the unmasked portions of said layer of the second composition material, which mesas are graded from the said second composition material to a semiconductor material of a third composition;
- continuing deposition of said third composition material to form a coherent layer thereof on the surface of said mesas;
- masking selected portions of said mesa and said layer of the second composition material; and
- diffusing dopants into selected unmasked portions thereof to form PN junctions in the surface of said mesas and in the surface of the layer of the second composition material between said mesas.

3,890,171

EXPLOSIVE COMPOSITIONS CONTAINING GUAR GUM DERIVATIVE

Harvey A. Jessop, Murray, Utah, assignor to Ireco Chemicals, Salt Lake City, Utah

Continuation of Ser. No. 197,373, Nov. 10, 1971, abandoned. This application May 14, 1973, Ser. No. 360,153

Int. Cl. C06b *1/04, 19/00*

U.S. Cl. 149—19.1 4 Claims

1. A thickened, cross-linkable oxidizer salt-containing explosive composition which is pumpable when initially formulated comprising an aqueous solution of at least one inorganic oxidizer salt; a guar gum derivative having a lower molecular weight than guar gum, contained and hydrated in said solution at time of formulation, in an amount sufficient to provide for strong, stable cross-linking of the composition, said derivative consisting essentially of guar gum which has been reduced to a molecular weight in the range of about 50,000 to about 150,000 prior to its addition to said composition; a crosslinking agent and a fuel.

3,890,172

SOLID PROPELLANT COMPOSITION WITH AZIRIDINE CURED EPICHLOROHYDRIN POLYMER BINDER

Harold E. Filter, Midland; Harvey D. Bidlack, Shepherd, and Don L. Stevens, Sanford, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

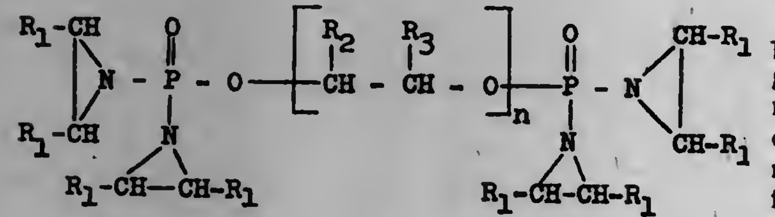
Filed Nov. 29, 1968, Ser. No. 780,945

Int. Cl. C06d *5/06*

U.S. Cl. 149—19.6 **3 Claims**

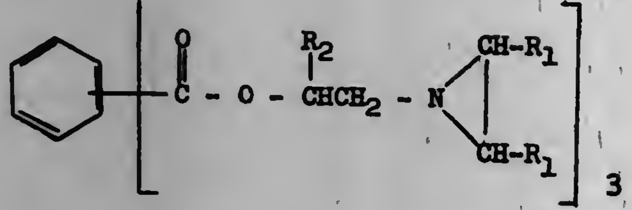
1. A solid propellant composition comprising on a weight basis:

- A. from about 50 to about 75 percent of a member selected from the group consisting of hydrazinium perchlorate, hydrazinium diperchlorate, hydroxyl amine perchlorate, nitronium perchlorate and alkali metal or ammonium nitrate, chlorates or perchlorates as oxidizer;
- B. from about 5 to about 30 percent of a member selected from the group consisting of aluminum, beryllium, lithium, magnesium, alloys thereof, and aluminum hydride, beryllium hydride, boron hydrides, lithium hydride, and magnesium hydride, as fuel, and
- C. from about 10 to about 30 percent of a polymeric binder system comprising a chloro-hydroxy polymer cured with an aziridine-based resin selected from the group consisting of:
  - a. tris[2-alkyl-1-aziridinyl]phosphine oxide, wherein the alkyl substituent group is methyl or ethyl,
  - b. tris[1-aziridinyl]phosphine oxide,
  - c. bis(1-aziridinyl) phosphinate terminated polyglycol oxides having the general formula:



wherein *n* is an integer ranging from 1 to 5; R_1 is $-H$, $-CH_3$, or C_2H_5; R_2 is $-CH_3$, or C_2H_5; and R_3 is $-H$, $-CH_3$, or C_2H_5,

  - d. tris[2-(alkyl-substituted-1-aziridinyl)-ethyl]benzenetricarboxylates corresponding to the structural formula:



wherein R_1 is $-H$, $-CH_3$ or $-C_2H_5$; and R_2 is $-H$, $-CH_3$ or $-C_2H_5$, and

  - e. triaziridinyl melamine, and wherein the polymer is a member selected from the group consisting of,
    1. polyepichlorohydrin,
    2. copolymers of epichlorohydrin and from about 1 to about 70 percent of ethylene oxide or propylene oxide.

3,890,173

SOLID PROPELLANT CONTAINING ETHYLENE-CARBOXYLIC ACID POLYMERS CURED WITH AZERIDINE-BASED RESINS

Harold E. Filter, Midland, and Harvey D. Bidlack, Shepherd, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 29, 1968, Ser. No. 780,948

Int. Cl. C06d *5/06*

U.S. Cl. 149—19.91 **5 Claims**

1. A solid propellant composition comprising on a weight basis:

- a. from about 5 to about 80 percent of a member selected from the group consisting of hydrazinium perchlorate, hydrazinium diperchlorate, hydroxyl amine perchlorate, nitronium perchlorate, and alkali metal or ammonium nitrates, chlorates or perchlorates as oxidizers;
- b. from about 5 to about 80 percent of a member selected from the group consisting of aluminum, beryllium, lithium, magnesium, alloys thereof, and aluminum hydride, beryllium hydride, boron hydrides, lithium hydride, magnesium hydride, or mixtures thereof, as fuel, and
- c. from about 5 to about 30 percent of a copolymer of ethylene with an α,β-ethylenically unsaturated carboxylic acid cured with an aziridine-based resin as binder, said copolymer having a molecular weight of from 200 to 5,000, and said binder having an aziridine equivalent/carboxyl equivalent ratio of from 0.5 to 2.0.

3,890,174

PYROTECHNIC COMPOSITION

Horace H. Helms, Jr., 1111 Brantford Ave., Silver Spring, Md. 12090, and Alexander G. Rosner, 10655 Weymouth St., Bethesda, Md. 20014

Continuation of Ser. No. 227,632, Feb. 18, 1972, abandoned. This application Nov. 27, 1973, Ser. No. 419,303

Int. Cl. C06b *15/003*

U.S. Cl. 149—44 **9 Claims**

1. A pyrotechnic composite comprising (1) a mixture of powders of (a) aluminum, (b) a metal oxide selected from the group consisting of Fe_2O_3, Fe_3O_4, CuO, Cr_2O_3, Co_3O_4, and mixtures thereof, and (c) a metal selected from the group consisting of iron, copper, silver, niobium, tungsten molybdenum and mixtures thereof and (2) a source of gas selected from the group consisting of (a) gas maintained under a pressure of 1.05–10 atmospheres in a container, said gas expanding and forcing its way from the container when exposed to the heat of the alloying and oxidizing reaction, and (b) a fluorocarbon which is selected from the group consisting of (A) one solid substance, (B) a mixture of solid substances, (C) one liquid substance, (D) a mixture of liquid substances and (E) mixtures thereof provided that any substance that is to be a source of gas must either vaporize to form gas when exposed to the heat of the alloying and oxidizing reaction, decompose to form gas when exposed to the heat of the alloying and oxidizing reaction or form gas by both vaporizing and decomposing when exposed to the heat of the alloying and oxidizing reaction.

9. A pyrotechnic composition comprising a mixture of powders of (1) aluminum, (2) a metal oxide selected from the group consisting of Fe_2O_3, Fe_3O_4, CuO, Cr_2O_3, Co_3O_4, and mixtures thereof, and (3) molybdenum.

3,890,175

NITROCELLULOSE BASE PROPELLANTS

Joseph W. Lavitt, Succasunna, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 4, 1964, Ser. No. 394,633

Int. Cl. C06b *15/02*

U.S. Cl. 149—92 **8 Claims**

1. An improved nitrocellulose base propellant having reduced smoke and moisture vapor content in its products of combustion, said propellant consisting essentially of

- about 0.5–10% by weight each of a lead salt of a fatty acid and a monoalkali metal salt of a ureide
- about 40–60% by weight of nitrocellulose containing about 10–14.2% nitrogen
- about 20–35% by weight of a nitrate ester of a polyhydroxy alcohol,
- about 5–25% by weight of an acetate ester of a polyhydroxy alcohol, and about 0.5–5.0% by weight of a stabilizer selected from the group consisting of ethyl centralite and 2-nitrodiphenylamine.

3,890,176

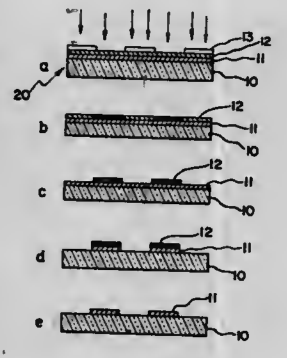
METHOD FOR REMOVING PHOTORESIST FROM SUBSTRATE

Donald A. Bolon, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 281,764, Aug. 18, 1972, abandoned. This application Dec. 17, 1973, Ser. No. 425,245

Int. Cl. B44c *1/22*

U.S. Cl. 156—2 **6 Claims**



1. In the method for effecting the complete removal of carbonaceous material from the surface of a substrate involving the steps of,

1. preheating the substrate to a temperature of up to about 260°C, and
2. subjecting the heated substrate to an oxygen atmosphere containing a small percentage of ozone, the improvement which comprises simultaneously subjecting the substrate while in an unheated state to an oxygen atmosphere containing at least ¼ percent by weight of ozone and radiant energy having a wavelength of from 1800A to 3500A and an intensity of at least 100 milliwatts, whereby complete removal of the carbonaceous material from the surface of the substrate is effected in less time and the requirement of preheating the substrate and maintaining it at an effective carbonaceous material removal temperature prior to its exposure to the oxygen atmosphere containing a small percentage of ozone is eliminated.

3,890,177

TECHNIQUE FOR THE FABRICATION OF AIR-ISOLATED CROSSOVERS

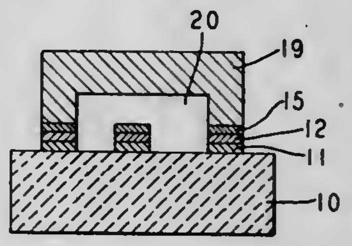
Arnold Pfahnl, Allentown, and Walter Worobey, Center Valley, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 175,501, Aug. 27, 1971, abandoned. This application Mar. 8, 1973, Ser. No. 339,175

Int. Cl. H05k *3/06*

U.S. Cl. 156—7 **3 Claims**

1. The method of fabricating, upon an insulating substrate, a pattern of deposited gold circuitry including an air-isolated gold crossover connecting a first and a third conductive area of gold and bridging a second conductive area of gold, without the necessity of multiple steps of metal evaporation, which method comprises plating (1) a gold crossover column upon each of said first and third conductive areas and (2) a gold beam over a copper spacer layer spanning said third conductive area and connecting said columns, and etching out said copper spacer layer leaving an air-isolated gold crossover CHARACTERIZED IN, as a first fabrication step, evaporating on said substrate successive layers of (1), adhesion promoter, (2) a noble metal selected from the group consisting of platinum, palladium, and rhodium which retards interdiffusion between gold and adhesion promoter, and (3) copper, and thereafter etching away those portions of the copper layer corresponding to the desired pattern of conductive circuitry with a copper etchant, plating a layer of gold upon the copper metal in the areas from which the copper has been etched, and plating a layer of copper constituting the spacer layer over the gold and copper layers in at least the area to be bridged by the crossover beam.



3,890,178

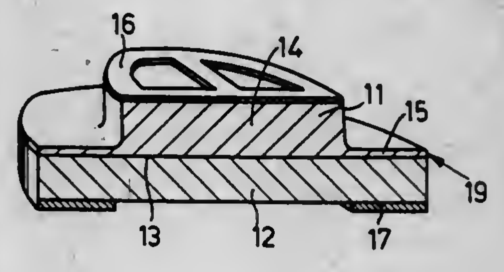
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING A MULTI-THICKNESS REGION

Jacques Lebailly, Canen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 307,197, Nov. 16, 1972, Pat. No. 3,803,460. This application Jan. 24, 1974, Ser. No. 436,185

Int. Cl. H01l *5/00*

U.S. Cl. 156—8 **5 Claims**



1. A method of manufacturing a semiconductor device comprising at least two regions of opposite conductivity types which are separated by a plane junction and further comprising an annular peripheral zone of relatively high electrical resistance that separates one of the regions from the boundary of the junction, said method comprising the steps of diffusing impurities from at least a part of one of the large faces of the semiconductor crystal to produce said first surface region that has a doping impurity concentration gradient that declines with the depth from said one face removing locally material from at least said first surface region at the diffusion face of said semiconductor crystal, said material being removed over a restricted part of said diffusion face to a depth which is at least two thirds of the distance of said junction from said surface but less than the entire said distance, said restricted part having an annular configuration and comprising a boundary of said junction, the distance between the inner limit of said restricted part and the boundary of said junction being everywhere at least equal to the diffusion depth.

3,890,179

METHOD OF MAKING ELECTRIC CONDUCTOR

Lawrence R. Deardurff, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

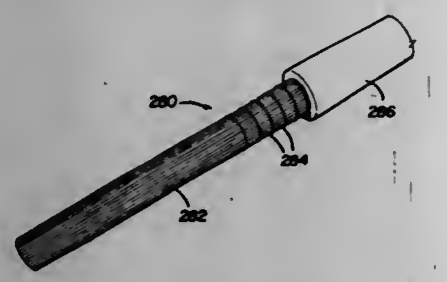
Filed June 17, 1974, Ser. No. 480,197

Int. Cl. B44d *1/18;* **H01b** *13/26*

U.S. Cl. 156—53 **4 Claims**

2. In a method of making an electrical conductor wherein a roving comprised of a plurality of glass filaments is coated

with a thermally curable liquid dispersion of conductive particles, the resistance of the conductor being determined by the degree of curing of the coating, the steps of wrapping the coated roving in a plurality of passes about a plurality of spaced curing rolls, tennsioning the roving sufficiently to flatten the roving into a ribbon-like configuration in good thermal contact with each of the curing rolls, heating the rolls to cure the thermally curable liquid dispersion, spirally wrapping an additional glass element about the ribbon-like roving after curing to obtain a cylindrical conductor, continuously monitoring the electrical resistance of said roving and controlling the degree of curing in response to the monitored resistance.



3,890,180
COATED PAPER

Ludwig Grosse, Taunusstein, and Hans Werner Dorr, Niederwalluf, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Dec. 21, 1973, Ser. No. 427,222

Claims priority, application Germany, Dec. 27, 1972, 2263450

Int. Cl. E04f *13/00*

U.S. Cl. 156—71 **5 Claims**

1. A process for releasably covering a tacky or adhesive layer carried by an article which comprises covering the layer with the coated side of a one-side coated paper formed by application to paper of an aqueous dispersion, free from emulysifying agent, of a copolymer of

a. 18 to 99 per cent by weight of ethylene,
b. 1 to 7 per cent by weight of an alkali metal salt of a compound of the formula $R_1CH_2C(R_2)CONH—SO_3H$ wherein R_1 and R_2 are hydrogen or a hydrocarbon group containing 1 to 10 carbon atoms, and
c. 0 to 75 per cent by weight of an α,β-unsaturated acid ester containing 4 to 10 carbon atoms, copolymerized at a pressure in the range of 50 to 2,500 atmospheres and at a temperature in the range of 50° to 250° C, in the presence of a free radical initiator.

3,890,181
FLEXIBLE PLASTICS HOSES

Vernon Dennis Stent, and Derek Cecil Wright, both of Woking, England, assignors to Creators Limited, Surrey, England

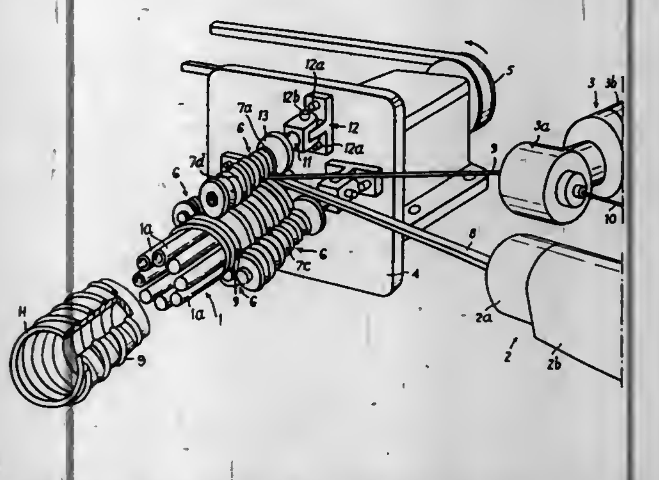
Filed Apr. 30, 1973, Ser. No. 355,593

Claims priority, application United Kingdom, Nov. 27, 1972, 54636/72

Int. Cl. B31c *3/00*

U.S. Cl. 156—143 **5 Claims**

1. A method of manufacturing a flexible plastics hose of the kind referred to, said method comprising extruding a strip of a first plastics material, simultaneously extruding a reinforcing element of a second plastics material, winding said strip into a helix around a driven mandrel while the plastics material is still in a plastic condition and bonding adjacent turns together by pressure applied between said mandrel and a plurality of annularly grooved roller means circumferentially spaced around and longitudinally along said mandrel and with the annular grooves therein disposed in a helical path corresponding to the pitch angle of said helix to form a tubular wall of said plastics material, and simultaneously winding said reinforcing element while the plastics material thereof is still in a plastic condition around said helix of said first plastics material in spaced helical turns having the same pitch angle as said helix of first plastics material by passing the reinforcing element through the annular grooves of said plurality of roller means to guide the reinforcing element into said spaced helical turns and to press it into the first plastics material by said roller means so as to partially embed said reinforcing element into said tubular wall, the plurality of grooved roller means acting like a nut on the partially embedded reinforcing element moving therethrough and engaging the progressively hardening helical turns of the reinforcing element for such a distance along the mandrel as to ensure a total reaction sufficient to advance the tubular wall with the reinforcing element partially embedded therein axially of the mandrel.



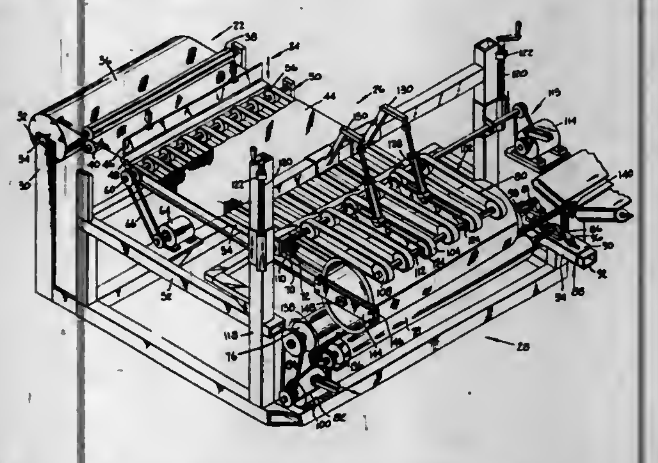
3,890,182
METHOD AND APPARATUS FOR APPLYING A COVER TO A CONDUIT

Rupert Douglas Terry, Toledo, Ohio, assignor to Johns-Manville Corporation, Denver, Colo.

Filed Apr. 4, 1973, Ser. No. 347,769

Int. Cl. B65c *3/12, 9/04;* **B65h** *81/00*

U.S. Cl. 156—187 **10 Claims**



1. Method for applying a cover to a tubular duct comprising:

a. locating a tubular duct on means for supporting the duct which includes a heated roll and a second roll in contact with an outer surface of the duct,
b. effecting rotation of the duct about its longitudinal axis while maintaining the duct in a fixed location by rotating said rolls at the same surface speed,
c. feeding a cover of finite length and having a heat activated adhesive on a major face thereof intermediate the heated roll and the duct to heat the adhesive and bring the major face with the adhesive into contact with the outer surface of the duct,
d. applying pressure to the duct to cause the heated roll to be pressed against the duct by means of pressure applying means which has a surface speed equal to the surface

speeds of said rolls and which engages the outer surfaces of the duct on a portion of the outer surface generally diametrically opposed to the support means,
e. rotating the duct until the cover is wrapped about the duct, and
f. effecting movement of the duct away from the support means after the cover has been wrapped about the duct by stopping movement of the pressure applying means while continuing the rotation of said rolls.

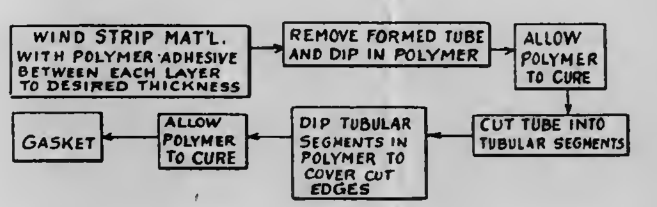
3,890,183
METHOD OF MAKING GASKETS AND PRODUCTS FORMED THEREBY

Robert G. Farnam, New Lisbon, Wis., assignor to F. D. Farnam Co., Lyon, Ill.

Continuation-in-part of Ser. No. 840,171, July 9, 1969, Pat. No. 3,697,348. This application May 4, 1972, Ser. No. 250,193

Int. Cl. B65h *81/00*

U.S. Cl. 156—193 **3 Claims**


WIND STRIP MAT'L. WITH POLYMER ADHESIVE BETWEEN EACH LAYER TO DESIRED THICKNESS
REMOVE FORMED TUBE AND DIP IN POLYMER
ALLOW POLYMER TO CURE
CUT TUBE INTO TUBULAR SEGMENTS
DIP TUBULAR SEGMENTS IN POLYMER TO COVER CUT EDGES
ALLOW POLYMER TO CURE
GASKET

1. The method of making a convolutely wound gasket characterized by having alternate discrete layers of carrier material and a fluid-impermeable polymer material comprising:

a. taking a web of a carrier material,
b. coating one side of the web with a relatively thin thickness of fluid-impermeable curable polymer material with a typical range of about 0.0001 inch to about 0.0003 inch,
c. drying the coated web to drive off volatiles,
d. coating the other side of the web with a predetermined greater thickness of fluid-impermeable curable polymer material in the range of about 0.0002 inch to about 0.010 inch,
e. drying the dual coated web by driving off the volatiles to provide a dimensionally stabilized, substantially adhesion-free and cohesion-free, coated sheet,
f. heating the coated sheet to soften the coatings,
g. winding the softened coated sheet in convolute fashion with sufficient tension to form a tube with discrete fluid-impermeable barriers of uniform thickness,
h. cutting the tube into individual gaskets, and
i. curing the fluid-impermeable polymer material.

3,890,184
METHOD OF MAKING EXTRUDED RIB BATTERY SEPARATORS

Walter A. Morgan, Daytown, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 163,206, July 16, 1971, Pat. No. 3,773,590. This application Oct. 12, 1973, Ser. No. 405,958The portion of the term of this patent subsequent to Nov. 20, 1990, has been disclaimed.

Int. Cl. H01m *3/02*

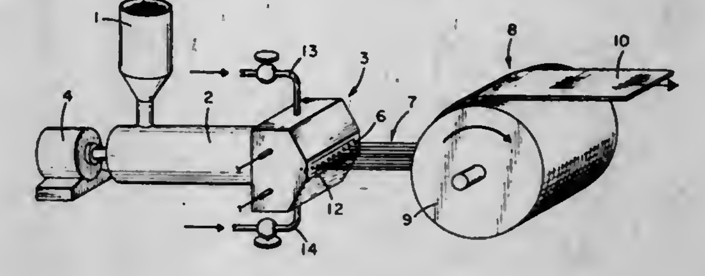
U.S. Cl. 156—244 **4 Claims**

1. A method for forming a ribbed battery separator from a gas laid nonwoven mat of polyolefin fibers having an average diameter of less than 10 microns which comprises:

passing said gas laid nonwoven mat of polyolefin fibers having an average diameter of less than 10 microns through a fixed gap between compacting calender rolls and compacting said mat to a maximum pore size of less than 40 microns,

thereafter passing said mat over a backup plate having a portion that follows an arc, and

extruding a foamed molten thermoplastic polymer through a multihole die onto said mat to form ribs on said mat as it follows said arc to compensate for shrinkage in the foamed polymer as it solidifies.



3,890,185
METHOD AND APPARATUS FOR MANUFACTURE OF DECORATIVE SHEETS

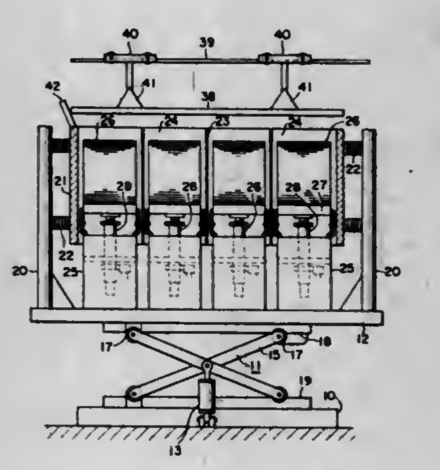
Kousuke Umazume, 13-5, 2-chome, Shimorenjaku, Mitakashi, Tokyo-to, Japan

Filed Jan. 10, 1974, Ser. No. 432,332

Claims priority, application Japan, July 14, 1973, 48-82696

Int. Cl. B32b *31/04;* **B65g** *59/02;* **B65h** *7/00*

U.S. Cl. 156—299 **5 Claims**



1. A method of manufacturing decorative sheets each comprising a relatively rigid backing sheet and a plurality of veneers bonded to one face of the backing sheets, said method comprising consecutively repeated operational cycles each comprising the steps of:

supporting the backing sheet horizontally at a predetermined height above the floor level, said backing sheet being coated with a layer of adhesive on its lower face;
elevating a frame from below said backing sheet into contact therewith, the interior of said frame being partitioned into a plurality of repositories adapted to accommodate stacks of the veneers respectively;
elevating said stacks of veneers relative to said frame until the uppermost veneers of the respective stacks contact the lower face of said backing sheet over the layer of adhesive coating thereon;
lowering the remaining stacks of veneers relative to said frame away from said backing sheet having said uppermost veneers adhering to its lower face; and
lowering said frame away from said backing sheet together with said remaining stacks of veneers accommodated in said repositories thereof.

3,890,186
METHOD OF BONDING USING A POLYESTER HOT-MELT ADHESIVE

Franz Blaschke, Witten-Annen; Arno Gardziella, Witten-Ruedinghausen, and Gerhard Schade, Witten-Bommern, all of Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

Continuation of Ser. No. 24,439, March 12, 1970, abandoned. This application Nov. 2, 1972, Ser. No. 303,289

Claims priority, application Germany, Mar. 11, 1969, 1912177

Int. Cl. C09j *5/00;* **B32b** *27/20*

U.S. Cl. 156—332 **8 Claims**

1. In the gluing of at least two objects together with a melting adhesive which is a polyester by melting a polyester polymer adhesive, juxtaposing such melted adhesive to at least two solid materials to be glued together and holding said juxtaposition until said melted adhesive has solidified and bonded said solid materials together; the improvement which comprises using as the polyester a material having a melting point of 180° to 220°C having an acid moiety comprising terephthalic acid and a glycol moiety comprising at least one glycol having 2 to 10 carbon atoms, and which improvement furthermore comprises admixing said melted polyester with about 0.01 to 0.1 weight percent of at least one non-coloring, inert, inorganic powder having a grain size of less than 5 microns.

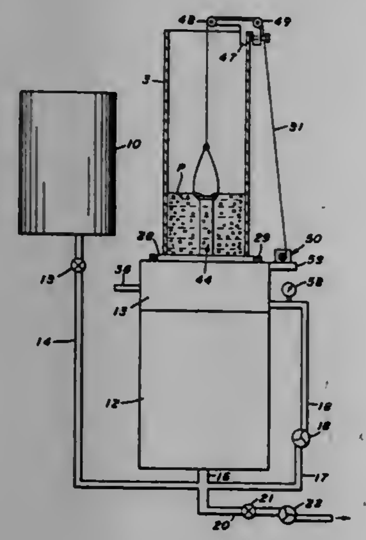
3,890,187
APPARATUS FOR FORMING AN INTERNAL TAPER IN THE WALLS OF A SLEEVE-LIKE BODY

Richard C. Glenn, Hempfield Twp., Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 339,484, March 8, 1973. This application Apr. 24, 1974, Ser. No. 463,480

Int. Cl. C23f *1/02*

U.S. Cl. 156—345 **8 Claims**



1. An apparatus for forming an internal taper in the walls of a sleeve-like body, said apparatus comprising means for mounting said body in an upright position, means for introducing an etching solution to said body to form a pool therein, overflow means for discharging the etching solution from said pool, and means connected with said overflow means for moving it vertically, whereby each successive level of the walls upwardly from the bottom is exposed to solution for a shorter time.

3,890,188
LABEL DISPENSING AND APPLYING APPARATUS

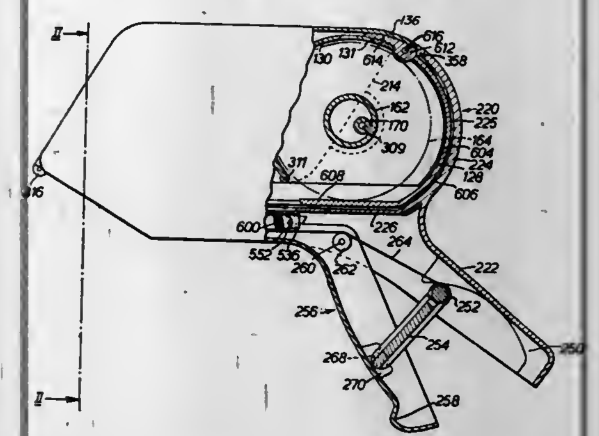
Bernard Sams, 22 Avondale Ave., No. 12, London, England

Filed Aug. 23, 1972, Ser. No. 283,212

Claims priority, application United Kingdom, Aug. 25, 1971, 39850/71; Jan. 29, 1972, 4305/72

Int. Cl. B65h *5/28*

U.S. Cl. 156—384 **22 Claims**



1. In a label applicator capable of successively printing and dispensing labels carried by a web having regularly spaced engagement means along its length, at least one print head assembly including a plurality of selectively adjustable print facets, means pivotally mounting the print head assembly, means operable to detach a printed label from the web, means operative to pivot the print head assembly to bring the operative print facets thereof into tangential contact with a label on the web while the label is moving at the same linear speed as the instantaneous linear speed of the operative print facets, and means operable to advance the web through the applicator to the detaching means including an elongated slidable member having regularly spaced means for engaging positively a plurality of the engagement means of the web, and further regularly spaced means operable to engage positively a plurality of the engagement means of the web, said further regularly spaced means being fixed relative to the applicator as a whole and serving, in cooperation with the first-mentioned engaging means, to advance a printed said label to and beyond the detaching means at an end portion of a given operational cycle, said means operative to pivot said print head assembly and said means operable to advance the web through the applicator being effective to print a given label and deliver it to the detaching means in the same operational cycle of the applicator.

3,890,189
APPARATUS FOR WELDING SYNTHETIC YARNS

Erich Tessmann, and Hans-Erich Tessman, both of Wuppertal, Germany, assignors to Heberlein & Co. AG., Wattwil, Switzerland

Filed Sept. 14, 1973, Ser. No. 397,301

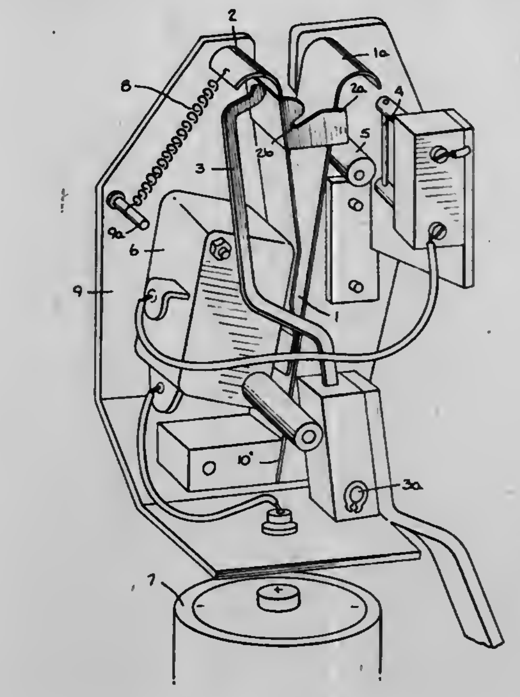
Claims priority, application Germany, Sept. 14, 1972, 2245122

Int. Cl. B65h *69/06, 69/08*

U.S. Cl. 156—433 **6 Claims**

1. Apparatus for welding synthetic yarns comprising a gripper element (2*a*) including means (2*b*) forming a yarn receiving recess, a counter-holder element (1*a*) for securing parallel yarn ends in said recess, and heating means for melting off the yarn ends while simultaneously welding the faces produced thereby, said counter-holder and gripper elements each being arranged on respective levers (1, 2), means mounting one of said levers for pivotal movement, means mounting the other of said levers for pivotal movement relative to said one of said levers, said elements each having a flat section for pinching the yarn ends therebetween, actuating means including an arm operable first to press one of said levers towards the other to

bring said yarn receiving recess and said counter-holder element together and then to pivot both elements towards said heating means, and means biasing said elements away from said heating means and from each other.



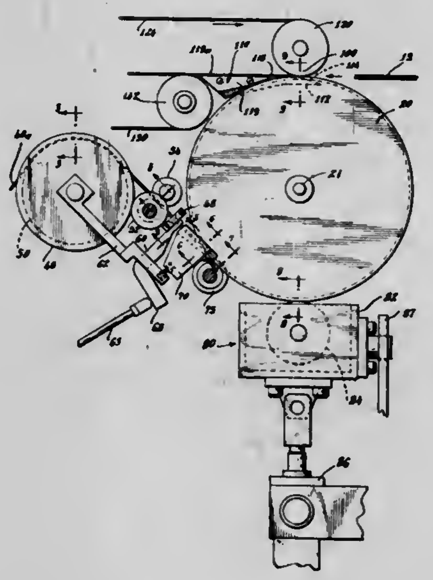
3,890,190
APPARATUS FOR FORMING AND APPLYING TIN-TIE FASTENERS

William H. Eburn, Jr., Appleton, Wis., assignor to Automation & Product Development Corporation, Norwalk, Conn.

Filed Jan. 14, 1974, Ser. No. 432,884

Int. Cl. B65b *61/18*

U.S. Cl. 156—521 **11 Claims**



4. Apparatus for attaching tin-tie strips to a succession of containers comprising, in combination

A. a rotatable support member having a closed continuous periphery and an annular groove formed in and coextensive with that periphery;

B. means for rotating the support member;

C. means for arcuately bending the transverse section of a tin-tie strip wider than said groove and for feeding the bent strip lengthwise into said groove for temporary retention therein with its convex arcuate surface outwardly directed;

D. applicator means mounted adjacent the periphery of said member for applying an adhesive to the outwardly directed surface of a strip retained in said groove during rotation of the member relative to said applicator means;

E. means for advancing a container along a path tangent to the periphery of said member; and

F. means for simultaneously disengaging an adhesive-bearing strip from said groove and pressing the adhesive-bearing surface of the strip into contact with a container as the latter is moved tangent to the periphery of said member.

3,890,191
APPARATUS FOR DETACHING PLATELETS WHICH ARE ADHERING TO A STRIP

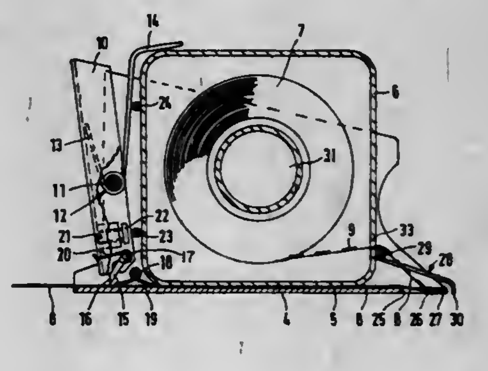
Helmut Mayer, 7750 Constance, Germany, assignor to Gerbrueder Mayer, Constance, Germany

Filed Nov. 20, 1973, Ser. No. 417,556

Claims priority, application Germany, Nov. 22, 1972, 2257293

Int. Cl. B65c *9/18, 11/00*

U.S. Cl. 156—541 **11 Claims**



4. Apparatus for detaching platelets which are adhering to a strip or ribbon, for the purpose of transferring the platelets to another support, more particularly for the production of originals for printed circuits, comprising a holder for the ribbon wound to form a ribbon coil and a deflecting edge on the holder, over which the ribbon withdrawn from the ribbon spool is guided and as a result is deflected through about 180°, the platelets being arranged on that side of the ribbon which is directed away from the deflecting edge and are largely detached from the ribbon in passing over the deflecting edge, because of their inherent rigidity, characterized by a transport mechanism to be manually actuated on the holder which comprises a driver element which, with the actuation of the transport mechanism, presses a part of the ribbon already drawn off the ribbon spool against a slide surface on the holder and so displaces it on the said surface that another section of the ribbon is drawn off the ribbon spool, and further characterized in that the transport mechanism is formed by a transport lever which is pivotable on the holder about a pivot shaft at a mid part of the lever to provide an upper lever arm for manual actuation and a lower lever arm mounting the driver element, the ribbon spool being arranged in a box-shaped housing, which is provided with a passage slot for the ribbon which is drawn off, characterized in that a coiled torsion spring extends around the pivot shaft of the transport lever and of which a projecting end bears against the end of the transport lever, while its other projecting end bears on the ribbon spool housing and holds the latter in the holder.

3,890,192
BOTTLE LABELLING MACHINE

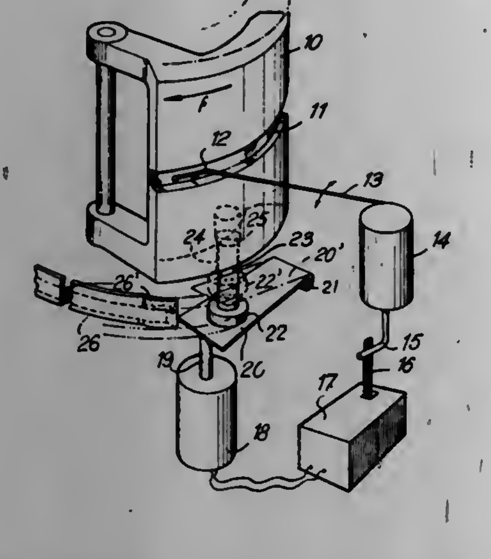
Romuald René Della Vite, Nogent sur Marne, France, assignor to Societe Francaise d'Etiquetage Virey & Garnier, Nogent sur Marne, France

Filed Mar. 23, 1970, Ser. No. 21,707

Claims priority, application France, Nov. 19, 1969, 69.39800

Int. Cl. B65c *9/20*

U.S. Cl. 156—571 **9 Claims**



1. In an installation for applying gummed labels to bottles and the like; comprising transfer cylinder means rotatable about a fixed axis to receive successive gum-free labels at a first station and to successively deliver received labels to a second station spaced from the first station for gumming the labels, said transfer cylinder means including a plurality of segments each having an exposed surface for transporting a label in contact therewith between said stations and for holding labels in contact with gum-applying means at the second station, support means rotatable about said fixed axis including means to mount said segments for rotation about said axis and for individual pivotal movement between a normal position at said second station to apply gum to a label and a radially inwardly retracted position at said second station spaced away from the gum-applying means, and sensing means including camming means, said camming means including a member mounted on a segment and a member positioned at said second station, one of said members being movable with respect to the other member when the segment approaches the second station between a first position for non-engagement with said other member when the segment is at the second station to allow the segment to assume said normal position and a second position for the movable member to engage with said other member in response to the absence of a label on the segment after the segment has moved from the first station to positively move that segment to the retracted position before said exposed surface reaches the second station, the exposed surface of each of said segments being provided with a recessed portion, said recessed portion being covered when a label is positioned on the surface, said sensing means including a movable feeler element normally biased to enter said recessed portion at a location between the first and second stations.

3,890,193
MACHINE FOR CONTINUOUS COUPLING OF FABRICS

Giovanni Cartabbia, Via Predore 10, 24067 Sarnico (Bergamo), Italy

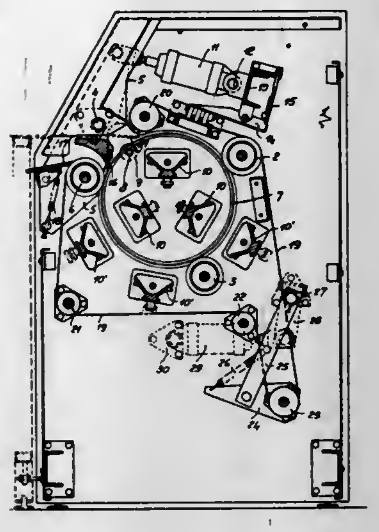
Filed Jan. 18, 1974, Ser. No. 434,579

Claims priority, application Italy, Apr. 13, 1973, 22984/73

Int. Cl. B32b *31/00*

U.S. Cl. 156—582 **9 Claims**

1. A machine for continuous adhesively connecting fabrics, comprising a drum having cylindrical outer and inner surfaces; an endless web extending in tensioned condition about a major portion of said outer surface of said drum; means for introducing the fabrics to be connected between said outer surface and said web for withdrawing said fabrics from said surface; means for floatingly mounting said drum for rotation about its axis and comprising three rollers respectively engaging the surface of said web facing away from said outer drum surface and arranged at the corners of an imaginary triangle; a stationary support, two of said rollers are mounted on said support for rotation about fixed axes parallel to the axis of said drum; means for pressing the third roller towards said outer drum surface; and a plurality of heating means respectively arranged in the interior and externally of said drum.



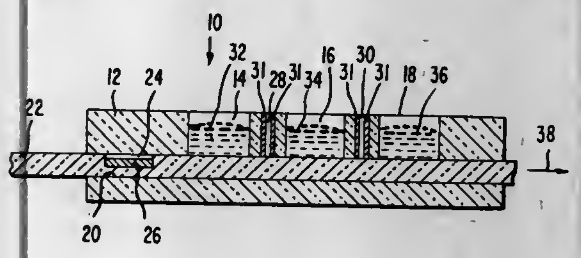
3,890,194
METHOD FOR DEPOSITING ON A SUBSTRATE A PLURALITY OF EPITAXIAL LAYERS IN SUCCESSION

Michael Ettenberg, Freehold, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 11, 1974, Ser. No. 459,951

Int. Cl.² H01L *29/14*

U.S. Cl. 156—622 **2 Claims**



1. In a method of depositing a plurality of epitaxial layers on a substrate in successsion in a furnace boat having a plurality of wells each of which contains a solution of the material to be deposited in a solvent and a slide extending across the bottoms of the wells and carrying the substrate wherein the slide is moved to carry the substrate into each well and beneath the solution in each well in succession and while the substrate is in each well, the solution in the well is cooled to deposit a layer of the material from the solution onto the substrate, the improvement comprising

while the substrate is being carried from one well to the next well, moving the substrate across an opening in the furnace boat to draw off of the substrate into the opening any solution which may have been drawn along with the substrate from the one well and thereby prevent contamination of the solution in the next well.

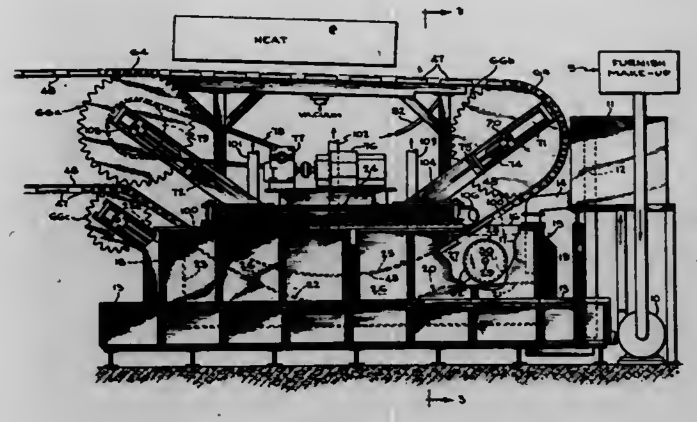
3,890,195
APPARATUS FOR MAKING MOLDED PULP PRODUCTS, INCLUDING MOLDS SECURED TO A MOVING BELT

Charles A. Lee, and Warren R. Furbeck, both of Knoxville, Tenn., assignors to International Paper Company, New York, N.Y.

Continuation of Ser. No. 114,514, Feb. 11, 1971, Pat. No. 3,802,963. This application Mar. 14, 1974, Ser. No. 451,053The portion of the term of this patent subsequent to Apr. 9, 1991, has been disclaimed.

Int. Cl. D21j *7/00*

U.S. Cl. 162—387 **8 Claims**



8. In an apparatus for the manufacture of molded fibrous products which includes means defining a channel for receiving a quantity of furnish, suction box means having a bottom surface defining a stationary boundary surface of said channel, flexible belt means movable through said channel in sliding contact with said boundary surface, and liquid pervious mold means secured to said belt means for travel through said channel, the improvement wherein said flexible belt is supported to substantially define an arcuate catenary within said channel, and wherein said bottom surface of said suction box means has an arcuate configuration conforming substantially to the catenary of said belt means within said channel.

3,890,196
NUCLEAR REACTOR FUEL ELEMENT ASSEMBLY SPACER GRID AND METHOD OF MAKING

John Chetter, Lytham-St.-Annes, England, assignor to United Kingdom Atomic Energy Authority, London, England

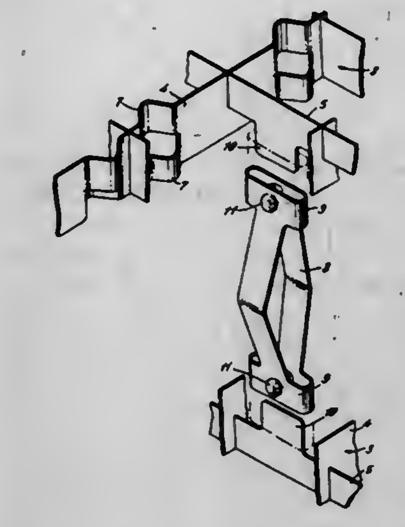
Continuation of Ser. No. 267,629, June 29, 1972, abandoned. This application Oct. 11, 1973, Ser. No. 405,277

Claims priority, application United Kingdom, July 7, 1971, 32006/71

Int. Cl. G21c *3/34*

U.S. Cl. 176—78 **6 Claims**

1. A spacer grid for a nuclear reactor fuel assembly of the kind including a plurality of elongate fuel pins supported in a bundle with their axes parallel, said spacer grid comprising two spaced apart grid tiers each tier including a plurality of intersecting strip members defining a number of openings, the openings in one tier being coincident with those in the other tier, projections extending from mutually adjacent faces of the tiers to project into the space between the tiers, resilient members having ferrule shaped ends engaging said projections and resilient portions between said ends protruding into the space between said grid tiers so as to resiliently engage fuel pins penetrating coincident openings, the ferrules being constructed and arranged so as to be engageable with said projections after individual assembly of the grid tiers, said intersecting strip members being heat bonded to one another for assembly of the grid tiers.



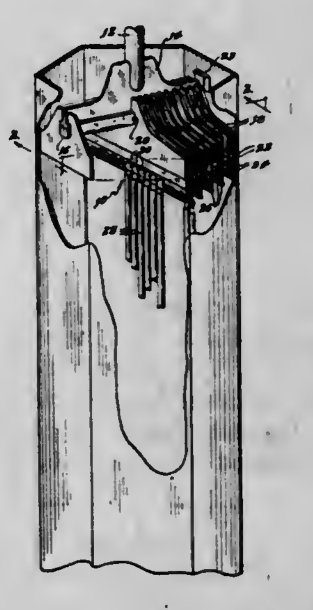
3,890,197
SUSPENSION SCHEME FOR FUEL PIN

Charles E. Butts, Newington, and Harry C. Gray, Manchester, both of Conn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 29, 1961, Ser. No. 113,566

Int. Cl. G21c *3/32*

U.S. Cl. 176—78 **3 Claims**



1. A nuclear fuel pin suspension arrangement comprising, in combination, a rod; a first beam member connected to said rod at one end thereof; a plurality of parallel-spaced slidable fuel support plates attached to said first beam member, the longitudinal axis of said first beam member being perpendicular to the longitudinal axis of each of said fuel support plates, a first coupling means disposed along the length of the first beam member for permitting said slidable fuel support plates parallel movement with respect to the longitudinal axis of said first beam member, a second coupling means located at one end of each of said slidable fuel plates for slidably engaging said first coupling means of said first beam member, a second beam member connected to the other end of each of said parallel-spaced slidable fuel support plates and providing an extension thereof, said second beam member being provided

with a third coupling means disposed along the length of said second beam member at one end thereof; and a plurality of fuel pins provided with a fourth coupling means located at one end of each of said fuel pins for slidably engaging said third coupling means of said second beam member to permit each of said fuel pins parallel movement with respect to the longitudinal axis of said second beam member.

3,890,198
CELL WALL-LYSING COMPLEX ENZYMES AND A PROCESS FOR THE PRODUCTION THEREOF

Reisuke Kobayashi; Hironari Sato; Kiyoshi Takita, all of Shimizu, and Nobuo Toyama, Miyazaki, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1972, Ser. No. 314,933

Claims priority, application Japan, Dec. 14, 1971, 46-100700; Jan. 27, 1972, 47-9486

Int. Cl. C12d *13/10*

U.S. Cl. 195—66 R **5 Claims**

1. A process for the production of a complex enzyme capable of lysing cell walls, which comprises cultivating *Pellicularia sasakii* ATCC 20365 in a culture medium containing assimilable carbon sources and assimilable nitrogen sources to produce and accumulate the complex enzyme in the medium, and then isolating the complex enzyme from the medium.

3,890,199
PROCESS FOR THE PRODUCTION OF BICYCLOMYCIN

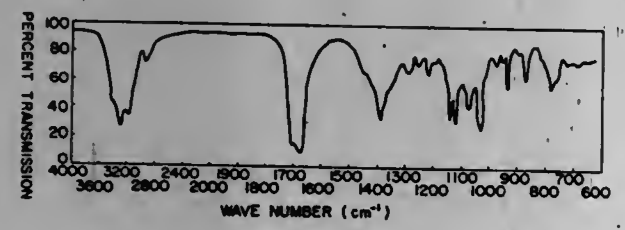
Sadao Miyamura; Nagahiro Ogasawara, both of Niigata, and Hitoshi Otsuka, Kurosaki, all of Japan, assignors to Japan Antibiotics Research Association, Tokyo, Japan

Filed Aug. 8, 1973, Ser. No. 386,852

Claims priority, application Japan, Aug. 8, 1972, 47-79806

Int. Cl. C12d *9/00*

U.S. Cl. 195—80 R **4 Claims**



1. A process for the production of bicyclomycin which comprises cultivating a strain of *Streptomyces aizunensis* identified as ATCC 21,965 under aerobic conditions in a culture medium containing assimilable carbon and nitrogen sources to produce and accumulate bicyclomycin in the culture, and recovering accumulated bicyclomycin from the culture.

3,890,200
SELECTIVE MEDIUM FOR STREPTOCOCCUS MUTANS

Harold V. Jordan, Wellesley, and Johannes Van Houte, Concord, both of Mass., assignors to Forsyth Dental Infirmary for Children, Boston, Mass.

Filed June 14, 1973, Ser. No. 369,803

Int. Cl. C12k *1/06*

U.S. Cl. 195—103.5 R **20 Claims**

1. A selective medium composition for the growth of *Streptococcus mutans*, which composition comprises in combination:

a. a solid medium selective to induce the growth of the *Streptococcus mutans;*
b. the solid medium containing therein a combination of a
  i. mono or di saccharide compound; and
  ii. a polypeptide antibiotic compound comprising bacitracin,

the saccharide and antibiotic compounds present in a concentration insufficient to prevent the growth of *Streptococcus mutans*, but sufficient to prevent the growth in sufficient quantity of interfering microorganisms.

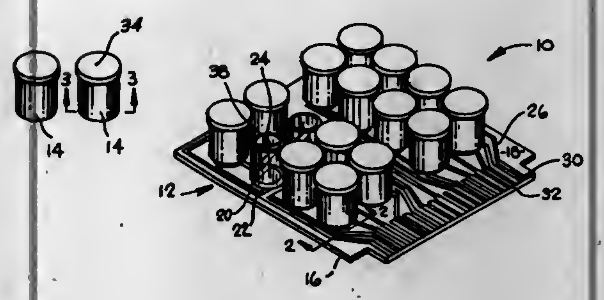
3,890,201
MULTI-CHAMBER IMPEDANCE MEASURING MODULE-CAP COMBINATION

Paxton Cady, Los Altos Hills, Calif., assignor to Bactomatic Inc., Palo Alto, Calif.

Filed Sept. 26, 1974, Ser. No. 509,669

Int. Cl. C12b *1/00*

U.S. Cl. 195—127 **3 Claims**



1. A multi-chamber module-cap combination useful for measuring the impedance of samples of nutrient media in the chambers thereof, some of which samples include aerobic microorganisms therein, comprising, in combination:

a stiff, flat, electrically non-conductive board;
a plurality of identical hollow cylinders open at both ends, each of said cylinders sealed at one end thereof at one side of said board to form a chamber, each cylinder extending to generally the same height from said one side of said board;
a plurality of electrically conductive strips attached to said one side of said board, said strips providing a pair of spaced-apart contacts under each of said chambers for measuring the impedance from one of said contacts to the other of a sample of a nutrient medium therewithin, said strips further providing accessable portions thereof for connection to impedance-measuring circuitry; and
a plurality of caps made of a resilient material adapted to fit over said cylinders, each cap comprising a generally flat disc-like top, the diameter of said top being greater than the outer diameter of said cylinder, and a skirt proceeding away from said top generally perpendicularly thereto circumferentially thereof, the length of said skirt being greater than the height of said cylinder so that when said cap is fitted over said cylinder said top is prevented from sealing against the other end of said cylinder and said skirt extends against said one side of said board to prevent contamination of said chamber, said skirt including internally thereof a plurality of ribs upraised therefrom generally evenly spaced from one another longitudinally thereof, the internal diameter of said skirt being slightly greater than the external diameter of said cylinder and an internal diameter defined by the tops of said ribs being slightly less than the external diameter of said cylinder, whereby when said cap is in place over said cylinder a press fit results between said ribs and said cylinder and a gas flow channel is provided from the interior of said chamber to the surrounding atmosphere, as defined by the space between said cylinder, said skirt and said ribs and means for preventing the bottom of said skirt from forming a gas-tight seal with said one side of said board.

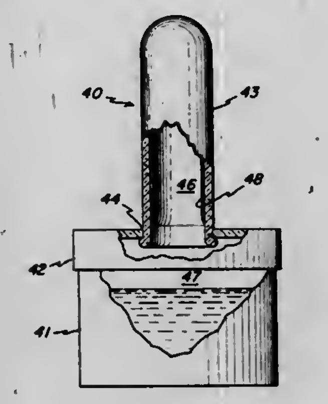
3,890,202
COMBINED SAMPLING AND BACTERIOLOGICAL CULTURING DEVICE

John A. Bergeron, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 130,254, April 1, 1971, Pat. No. 3,838,013. This application Sept. 27, 1973, Ser. No. 401,424

Int. Cl. C12b *1/02*

U.S. Cl. 195—127 **2 Claims**



1. A device for the dual purposes of sampling a liquid and culturing microorganisms present therein comprising in combination:

a. a container cup defining a first volume for receiving and containing a liquid and having closure means therefor and
b. a transparent tube having an open end and a closed end removably and sealably connected at its open end to said closure means and projecting outwardly therefrom,
c. at least one layer of sterile solid nutrient material for the growth of microorganisms covering the inside surface area of said tube and defining a second volume, said second volume being in flow communication with said first volume.

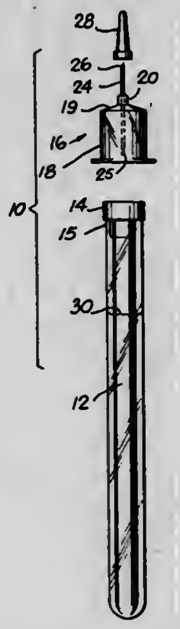
3,890,203
METHOD AND APPARATUS FOR THE COLLECTION, CULTIVATION AND IDENTIFICATION OF MICROORGANISMS FROM BODY FLUID

Jack Judson Mehl, Landing, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Continuation-in-part of Ser. No. 215,730, Jan. 6, 1972, abandoned. This application Mar. 16, 1973, Ser. No. 342,086

Int. Cl. C12b *1/00*

U.S. Cl. 195—139 **15 Claims**



1. An apparatus for collection, cultivation and identification of microorganisms contained in a specimen of body fluid, said apparatus comprising:

a container having at least one closed end and an open end; resilient closure means closing said open end of said container;
a nutrient medium partially filling said container and suitable for culturing microorganisms contained in said specimen;
a gaseous atmosphere filling the space above said nutrient medium; and
a venting assembly mounted on the container and having means for maintaining fluid communication between the outside atmosphere and the atmosphere within the container, said venting assembly comprising a tubular member passing through said resilient closure to provide fluid communication between said gaseous atmosphere above the nutrient medium and the atmosphere outside of said container, said venting assembly including a flexible body portion having a closed end and an open end so that the closure means fitted in the open end of the container is capped thereby;
the closed end of the body portion is formed with a hub having an axial bore therethrough and said tubular member is a cannula rigidly mounted in the axial bore between the ends of said bore; and
a shield mounted on the hub to enclose the portion of the cannula extending outwardly from the closed end of the body portion, the shield being formed with a plurality of ribs which are radially disposed around the inner surface thereof so that the shield when mounted on the hub forms a plurality of passageways for the circulation of microbial gases from the interior of the container to the outside atmosphere and for diffusion of atmospheric oxygen from the outside to the inside of the container.

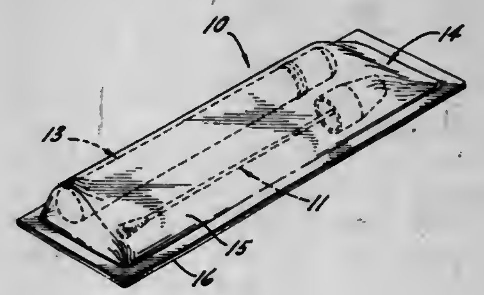
3,890,204
CULTURE COLLECTING PACKAGE

Carl Frederick Avery, Rockford, Ill., assignor to Marion Health and Safety, Inc., Rockford, Ill.

Filed Sept. 26, 1974, Ser. No. 509,706

Int. Cl. C12k *1/10*

U.S. Cl. 195—139 **5 Claims**



1. A culture collecting package, said package including a sealed one-piece ampoule made of glass, said ampoule having an elongated tubular body of circular cross-section and having domed ends, a culture-sustaining media contained within said ampoule, and a circumferentially extending score line formed in said body whereby one end portion of the ampoule may be broken away from the other end portion along said score line to allow access to said media, said package further including a swab comprising an elongated stem, a swabbing tip on one end of said stem, and a closure on the other end of said stem and sized to telescope with and close the open end of said other end portion of said ampoule after a culture has been collected on said tip and the latter has been placed in contact with said media.

3,890,205

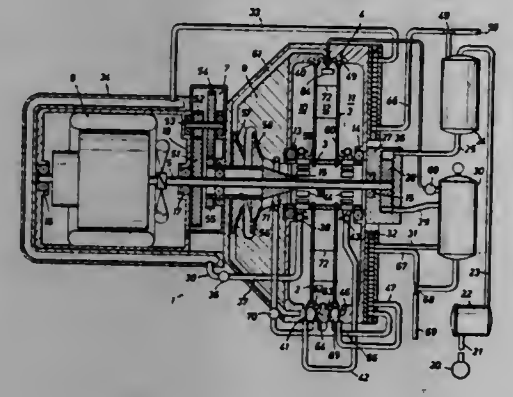
ROTARY DESALINATION ENGINE AND SYSTEM

Emanuel Schnitzer, Houston, Tex., assignor to Frontier Engineering Corporation, Houston and H. B. Zachry Company, San Antonio, both of, Tex., part interest to each

Continuation-in-part of Ser. Nos. 252,202, May 11, 1972, abandoned, and Ser. No. 427,793, Dec. 26, 1973. This application July 17, 1974, Ser. No. 489,363

Int. Cl. B01d *3/08, 3/28*

U.S. Cl. 202—236 **7 Claims**



1. A rotary desalting engine system which comprises:

a rotating drum;

at least one circular disc mounted on and fixed to said rotating drum;

said drum being hollow, permeable, and located centrally in a rotating disc chamber housing wherein each disc divides said housing into at least two chambers, at least one of which is low pressure and one of which is high pressure; said disc being a thin highly thermally conductive plate permitting rapid heat transfer through it between chambers;

channels located in the periphery of the disc chamber in said rotating disc chamber housing in which said discs rotate;

tangential outlets in said rotating disc chamber housing from said channels which maintain the liquid level over the disc periphery to provide a seal which prevents gas passage around the disc between chambers and to remove the liquids which are collected and maintained separated in said channels;

a rotating shaft to which said drum is attached;

motor means for rotating said shaft;

pump means for bringing inlet fluids into said engine;

a tri-fluid counter-flow heat exchanger through which said inlet fluids are passed for heating;

a jacket around said motor through which said inlet fluid passes and is heated by the waste heat from said motor means;

means for spraying the heated inlet fluids against a surface of said discs in the low pressure chamber wherein some of said fluid evaporates and a concentrated liquid is slung from said disc into one of said channels;

compressor means for compressing said vapors formed in the low pressure chamber and which pass through said drum into said compressor means and for introducing the compressed vapors to the high pressure chamber of said rotating disc chamber housing wherein said vapors condense on said rotating disc and are slung from said disc into one of said channels;

passage means for connecting said tangential outlets to said tri-fluid heat exchanger and passing the liquid collected and maintained separated in said channel through said exchanger whereby they are cooled; and,

means for eliminating air or other entrained gases from the system which includes a liquid phase degasser in the inlet fluid line for expanding entrained gases within said inlet fluid and expanding said gases to permit their separation at virtually no expense of energy and a vapor phase degasser which collects vapor bled from the high pressure condensing chamber and condenses the vapor to add to the purified liquid while expelling the evolved gases to the atmosphere.

3,890,206

APPARATUS FOR FACILITATING THE WITHDRAWAL OF GASES FROM A GAS FILLED CHAMBER SUCH AS A COKE OVEN

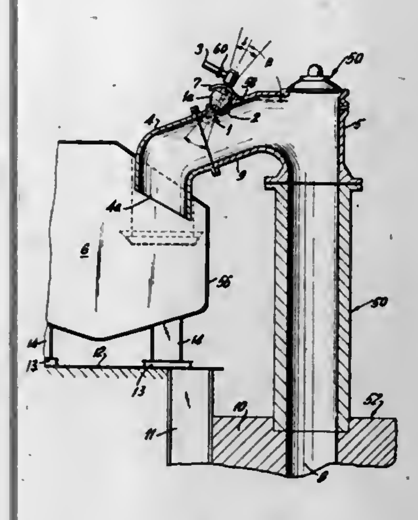
Heinz Wünsch, Herten-Disteln, Germany, assignor to Firma Carl Still, Germany

Filed Mar. 8, 1974, Ser. No. 449,457

Claims priority, application Germany, Mar. 17, 1973, 2313435

Int. Cl. C10b *27/00, 27/04*

U.S. Cl. 202—254 **8 Claims**



1. An apparatus for facilitating the withdrawal of gases from a gas filled chamber such as a coke oven to a gas receiving chamber, comprising a connecting conduit having a riser portion with a lower end connected into the gas chamber and an opposite upper end, a bend portion extending downwardly from the upper end of said riser portion and having the lower discharge end connected to the gas collecting main, and a liquid nozzle universally pivotally mounted in said bend portion having an upper end extending exteriorly of said conduit and an opposite end directed downwardly into said conduit in a selected angular orientation downstream of said riser in order to facilitate withdrawal of the gas through the riser and bend portion to the receiving chamber.

3,890,207

AIR AND WATER POLLUTION CONTROL

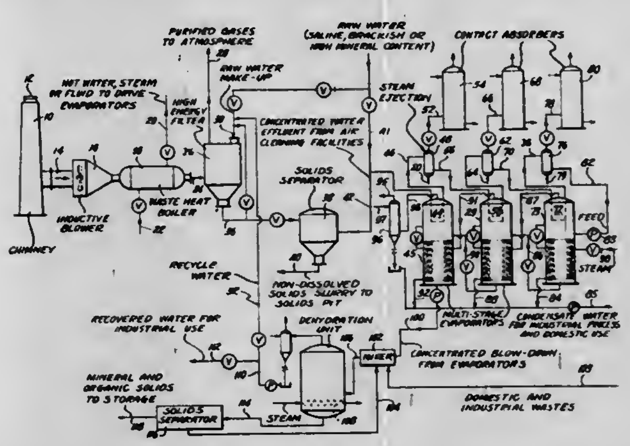
Walter H. Chapman, and John F. Eichelmann, Jr., both of El Paso, Tex., assignors to El Paso Southern Company, El Paso, Tex.

Continuation-in-part of Ser. No. 87,096, Nov. 5, 1970, abandoned, which is a continuation-in-part of Ser. No. 716,222, July 15, 1971, Pat. No. 3,592,743. This application Mar. 20, 1973, Ser. No. 343,178

Int. Cl. B01d *1/26, 1/00, 3/02, 3/00*

U.S. Cl. 203—11 **10 Claims**

3. In a process for pollution control wherein waste gases are purified by contact with water to provide a purified gaseous stream for evacuation to the atmosphere and a water effluent containing dissolving solids and dissolved and absorbed gaseous contaminants, the improvement comprising preventing water and air pollution and recovering usable water by subjecting all of said water effluent to distillation in evaporation apparatus having a preheat zone and a distillation zone to provide a usable pure water condensate and a solids concentrate, removing gaseous contaminants from said water effluent in a degassing step following said preheat zone and prior to the introduction of the water effluent into the water distillation zone, recovering said removed gaseous contaminants to prevent atmospheric pollution, and separating solids from said solids concentrate to provide usable water.


PURIFIED GASES TO ATMOSPHERE
RAW WATER (SALINE, BRACKISH OR HIGH MINERAL CONTENT)
CONTACT ABSORBERS
RAW WATER MAKE-UP
HOT WATER, STEAM OR FLUID TO DRIVE EVAPORATORS
HIGH ENERGY FILTER
STEAM EJECTION
CONCENTRATED WATER EFFLUENT FROM AIR CLEANING FACILITIES
RECOVERED WATER FOR INDUSTRIAL USE
DEHYDRATION UNIT
MINERAL AND ORGANIC SOLIDS TO STORAGE
SOLIDS SEPARATOR
STEAM
CONCENTRATED BLOW-DOWN FROM EVAPORATORS
DOMESTIC AND INDUSTRIAL WASTES

3,890,208

EXTRACTIVE DISTILLATION WITH FURFUROL AND ACYCLIC KETONE COSOLVENT

Val G. Henneberg, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Aug. 13, 1973, Ser. No. 387,920

Int. Cl. B01d *3/40*

U.S. Cl. 203—58 **10 Claims**

1. In an extractive distillation to separate mixtures of C_4 to C_5 hydrocarbons selected from the group consisting of saturated and ethylenically unsaturated hydrocarbons of like carbon number and different degrees of saturation including the steps of introducing a selective solvent to an extractive distillation column, introducing said hydrocarbon mixtures to be extractively distilled at a point below the point of introduction of said selective solvent, selectively extracting unsaturated hydrocarbon to form a liquid solvent fraction rich in the more unsaturated hydrocarbon, withdrawing a vaporous hydrocarbon fraction as overhead from the top of said extractive distillation column, and withdrawing the solvent rich in the more unsaturated hydrocarbon from the bottom of said distillation column, wherein the improvement comprises employing as said selective solvent 88 to 99 weight percent furfural and from about 1 to 12 weight percent of an acyclic ketone having from selected from the group consisting of 3-methyl-2-hexanone, 4-methyl-2-hexanone, 4-methyl-3-hexanone, 5-methyl-3-hexanone, 2-heptanone, 3-heptanone, 4-heptanone, 3-ethyl-4-methyl-2-pentanone, 3,3-dimethyl-2-hexanone, 3,4-dimethyl-2-hexanone, 2,2-dimethyl-3-hexanone, 2,5-dimethyl-3-hexanone, 4,4-dimethyl-3-hexanone, 2-methyl-4-heptanone, 3-octanone and 4-octanone, said weight percent being based on dry solvent.

3,890,209

ABRASION RESISTANT MECHANICAL MEMBER WITH COMPOSITE NICKEL-PLATING LAYER HAVING MESHLIKE POROUS PORTION AND A METHOD FOR MANUFACTURE THEREOF

Toshihiko Shigeta, Kure; Toshio Yamada, Aki; Takao Sasame, Hiroshima, and Yoshitaka Uebayashi, Aki, all of Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

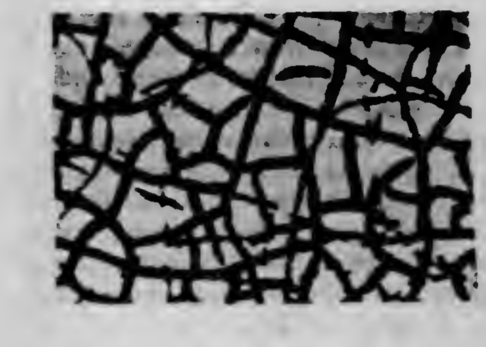
Filed June 1, 1973, Ser. No. 366,019

Claims priority, application Japan, June 3, 1972, 47-55257

Int. Cl. C23b *7/00, 5/00, 5/08*

U.S. Cl. 204—16 **6 Claims**

1. An abrasion-resistant mechanical member which comprises a composite nickel-electroplated layer on the surface of said member, said layer having a mesh-like porous portion which contains therein ceramic powder as an abrasion resistant element, said porous portion being composed of grooves of approximately 0.01 to 0.5 mm in width and present at intervals of approximately 0.5 to 9 mm. thereby to provide an oil retention characteristic.



3,890,210

METHOD AND ELECTROLYTE FOR ELECTROPLATING RHODIUM-RHENIUM ALLOYS

Peter Stevens, Parsippany, and George R. Lurie, South Bound Brook, both of N.J., assignors to Oxy Metal Industries Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 372,376, June 21, 1973, abandoned. This application Sept. 20, 1974, Ser. No. 507,831

Int. Cl. C23b *5/32*

U.S. Cl. 204—43 N **7 Claims**

1. An aqueous acidic electroplating bath, suitable for depositing a bright rhodium-rhenium alloy consisting essentially of rhodium and rhenium comprising at least 10 g/l of sulfamic acid, from 0.1 to 15 g/l of rhodium as a plateable compound, and at least 0.01 g/l rhenium as a plateable compound in a weight ratio of rhodium to rhenium of at least 4:1.

3,890,211

PROCESS FOR RECOVERING ENERGY FROM THE DECOMPOSITION OF AMALGAM IN THE ELECTROLYSIS OF ALKALI METAL CHLORIDES

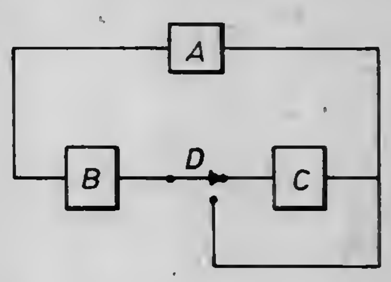
Eberhard Zirngiebl, Cologne-Flittard, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 855,772, Sept. 5, 1969, abandoned. This application Apr. 19, 1973, Ser. No. 352,490

Claims priority, application Germany, Sept. 21, 1968, 1792588

Int. Cl. C01d *1/08*

U.S. Cl. 204—99 **1 Claim**



1. The process for recovering energy from the decomposition of the amalgam which results from the electrolysis of alkali metal chlorides which process includes the steps of decomposing by electrolysis alkali metal chlorides in a primary cell having a mercury cathode which primary cell is amalgam-forming, forming sodium amalgam as a by-product of said electrolysis, decomposing the amalgam in a secondary amalgam-decomposition cell connected in series with the primary cell wherein the improvement comprises a direct current source combined with means for connecting an electrical potential from said direct current source across a primary cell and electrolyzing alkali metal chlorides in the primary cell and means for selectively connecting said electrical potential also across a secondary cell containing sodium amal-

gam in an amalgam element of $Pt/H_2,NaOH,H_2O/Na,Hg$ so that the current of said direct current source passes through both the primary cell and in series through the secondary cell when the sodium concentration in the amalgam is more than 0.01% by weight thereby decomposing the amalgam in the secondary cell with said current to reduce the sodium concentration, reducing the cell voltage in the secondary cell having said amalgam element by reducing the sodium concentration, correlating said secondary cell voltage to the selective connecting of said electrical potential across said secondary cell and disconnecting the means for connecting said electrical potential across said secondary cell when the sodium concentration in the amalgam is 0.01% by weight or less and thereby continuing electrolysis of alkali metal chlorides in the primary cell and increasing the concentration of sodium in the amalgam element of the secondary cell to more than 0.01% by weight.

3,890,212

USEFUL PRODUCT DERIVED FROM GRAPEFRUIT PULP

Jakob Harich, and Franz P. Harich, both of Orlando, Fla., assignors to Rush-Hampton, Inc., Orlando, Fla.

Continuation-in-part of Ser. No. 27,080, April 9, 1970, abandoned. This application Mar. 19, 1971, Ser. No. 126,251

Int. Cl. A61k *27/02, 27/14;* **B01j** *1/10*

U.S. Cl. 204—158 R **10 Claims**

1. A process for preparing an organic composition which comprises contacting the pulps of grapefruit with a nontoxic liquid, alkyl polyhydric alcohol or a lower alkyl ether thereof in the presence of ultraviolet light to form a reaction product, and separating this product from the pulp residue.

3,890,213

MERCAPTOALKYLTRIALKOXYSILANE PRODUCTION

Rector P. Louthan, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 28, 1973, Ser. No. 392,234

Int. Cl. B01j *1/10*

U.S. Cl. 204—158 **9 Claims**

1. A process for the preparation of mercaptoalkyltrialkoxysilanes which comprises reacting an ethylenically unsaturated trialkoxysilane with hydrogen sulfide in the presence of ultraviolet radiation.

3,890,214

METHOD AND APPARATUS FOR MECHANIZED SMUTTING OF ELECTROLYZERS

Sigbjorn Kleveland, Voyenenga, Norway, assignor to Norsk Hydro A.S., Oslo, Norway

Filed Feb. 26, 1974, Ser. No. 446,111

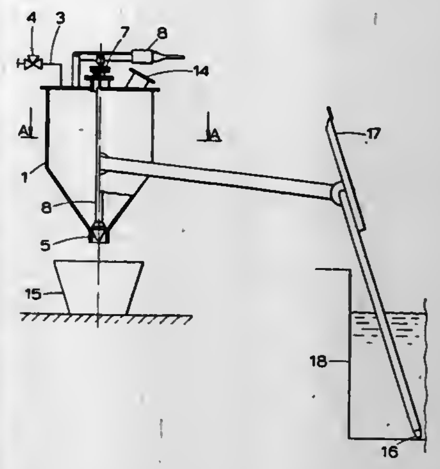
Claims priority, application Norway, Mar. 1, 1973, 825/73

Int. Cl. C22d *3/08, 3/02*

U.S. Cl. 204—70 **5 Claims**

1. In a method for the removal of sludge from electrolyzers, particularly electrolyzers for the fused salt electrolysis of magnesium, wherein a mixture of melted electrolyte and sludge, by means of a suction pipe immersed in an electrolysis bath, is transferred by suction from the bath into a collecting tank which is connected to a vacuum source, the improvement wherein said method comprises:

- passing the mixture of sludge and melted electrolyte through the suction pipe into the tank;
- separating the sludge by settling from the melt;
- neutralizing the vacuum in said tank; and
- passing the melt, after the vacuum is neutralized, back into the bath of the electrolytic cell through said suction pipe, while continuously separating the sludge from the mixture and allowing the sludge to freely sink down to the bottom of the tank.



3,890,215

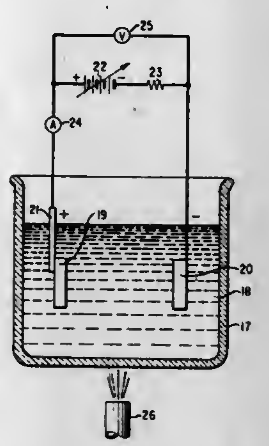
ELECTROCHEMICAL THINNING OF SEMICONDUCTOR DEVICES

James Vincent DiLorenzo, Piscataway; William Charles Niehaus; Daniel Leon Rode, both of Murray Hill, and Bertram Schwartz, Westfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 8, 1974, Ser. No. 440,664

Int. Cl. B23p *1/00;* **H01l** *7/00*

U.S. Cl. 204—129.2 **14 Claims**



1. A method for thinning a layer of semiconductor material of one conductivity type with a first impurity concentration in a structure which includes adjacent thereto a semiconductor material of the same conductivity type with a second impurity concentration comprising the steps of:

- making the structure the anode in an electrolytic cell wherein the electrolyte is capable of growing an oxide into the surface of the layer upon the application of a potential to said cell;
- applying a constant potential to said structure so as to form an electric field distribution in said structure to create a current through said layer sufficient to form an oxide into the surface of said layer;
- dissolving the oxide formed by said electrolyte thereby removing a portion of said layer; and
- repeating the oxidation and dissolution of the oxide until the current through said layer is insufficient to form said oxide into said layer when said potential is applied as the result of a predetermined electric field distribution being reached uniformly along the major portion of the surface of said layer.

3,890,216

MANUFACTURE OF HYDRAZINE

David Curtis, Bassersdorf, Switzerland, assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 317,011, Dec. 20, 1972, abandoned. This application June 24, 1974, Ser. No. 482,110

Int. Cl. C01b *21/16*

U.S. Cl. 204—177 **10 Claims**

1. A continuous recycle process for the manufacture of hydrazine comprising the steps of;

1. In an electric discharge chamber, subjecting ammonia to an electric glow discharge at a temperature of from about −10° centigrade to about −70° centigrade, under a pressure of from about 100 to about 400 millimeters of mercury;
2. Continuously transporting the product of step (1) to a reservoir and heating it to a temperature sufficient to vaporize unreacted ammonia in said product;
3. Removing liquid hydrazine from said reservoir,
4. Transporting vaporized ammonia to a condenser and condensing the vaporized ammonia of step (2); and
5. recycling the condensed ammonia to step (1).

3,890,217

REACTIVE SPUTTERING APPARATUS AND CATHODE ELEMENTS THEREFOR

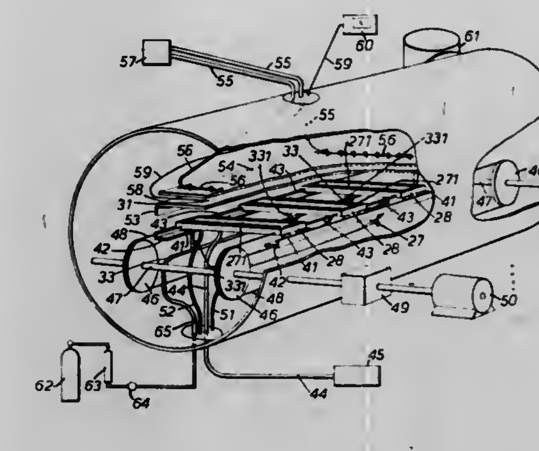
Kenneth Burrows, and Robert Hiscutt, both of Birmingham, England, assignors to Triplex Safety Glass Company Limited, London, England

Filed Apr. 11, 1974, Ser. No. 459,988

Claims priority, application United Kingdom, Apr. 27, 1973, 20184/73

Int. Cl. C23c *15/00*

U.S. Cl. 204—298 **6 Claims**



1. Apparatus for depositing a transparent, electrically conducting film of a metallic compound on to the surface of a substrate by reactive sputtering, comprising a vacuum chamber, means for supporting the substrate in the vacuum chamber, a cathode unit including a metal cathode element arranged in the vacuum chamber so as to present towards the substrate a surface substantially parallel to the substrate surface and an electrostatic shield inside said chamber which is spaced from and surrounds the cathode element on all sides except that of the surface presented towards the substrate, means for connecting the cathode element to a source of high negative potential, and means for supplying a sputtering atmosphere of a reactive gas and another gas or gases at reduced pressure through the electrostatic shield into the working space between the cathode element and the substrate, wherein the electrostatic shield is formed with spaced inner and outer walls between which, in use, the sputtering atmosphere is fed into the working space.

3,890,218

UPGRADING ALIPHATIC NAPHTHAS TO HIGHER OCTANE GASOLINE

Roger A. Morrison, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,398

Int. Cl. C10g *35/06*

U.S. Cl. 208—135 **8 Claims**

1. In the process of upgrading the octane number of feed hydrocarbon fractions boiling in the naphtha range having a clear research octane number of less than about 65 to products boiling in the same range having a clear research octane number of at least about 82 by contacting such feed fractions with a catalyst comprising a crystalline aluminosilicate zeolite catalyst having a silica to alumina ratio of at least about 12, a constraint index of about 1 to 12 and a crystal density of not substantially below about 1.6 grams per cubic centimeter at elevated temperatures of about 500° to 1500°F; the improvement, whereby converting more of said feed to said product at an equivalent octane number increase, which comprises utilizing as said catalyst said zeolite having about 0.1 to 10 weight percent of at least one member selected from the group consisting of zinc and cadmium incorporated therewith, said zeolite having a modified activity equivalent to the activity of such zeolite which has had about 0.1 to 3 weight percent of at least one metal moiety selected from the group consisting of sodium, lithium, potassium, phosphorus, antimony and arsenic incorporated therewith.

3,890,219

SELECTIVE ADSORPTION OF HIGH VISCOSITY, LOW VISCOSITY INDEX COMPONENTS FROM HYDROCARBON MIXTURES

Frederic C. McCoy, Beacon, and Raymond C. Schlicht, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Jan. 2, 1974, Ser. No. 430,134

Int. Cl. C10g *25/00*

U.S. Cl. 208—310 **22 Claims**

1. A process that comprises contacting an initial solution of diluent solvent and a hydrocarbon lubricating oil fraction with a polyurethane foam for a period of time sufficient to effect adsorption of a substantial portion of more viscous, lower viscosity index components of said lubricating oil fraction and recovering an effluent oil therefrom characterized by decreased viscosity and increased viscosity index, said diluent solvent selected from the group consisting of saturated aliphatic hydrocarbon of from 3 to 12 carbons, saturated cycloaliphatic hydrocarbon of from 3 to 8 carbons, aromatic hydrocarbon of from 6 to 9 carbons and mixtures thereof, said solvent being present in said initial solution in a ratio of solvent to oil of from 0.5 to 10:1.

3,890,220

FIBER WASTE RECLAIM SYSTEM AND METHOD

Dean K. Anderson, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

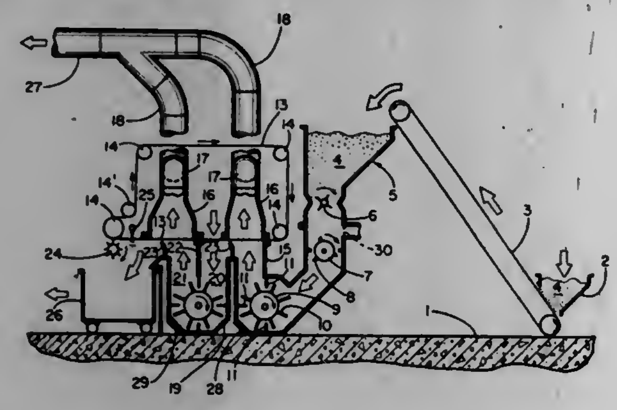
Filed Dec. 26, 1973, Ser. No. 427,784

Int. Cl. B07b *9/00*

U.S. Cl. 209—3 **4 Claims**

1. The method of separating fibers from a wrapping sheet for the fibers which comprises subjecting pieces of the fiber-sheet composite to a breaking action to break up the wrapping sheet and remove the fibers therefrom, passing an air stream through the pieces of the fiber-sheet composite as they are subjected to the breaking action, and intercepting the air stream containing the fibers and sheet material as the air

stream moves upwardly from the zone of the breaking action by passing across the air stream a foraminous screen having



openings of a size sufficient to permit airborne fibers to pass therethrough and also sufficient to retain other larger pieces.

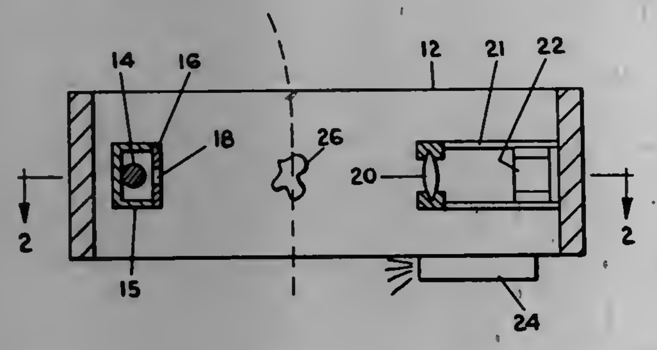
3,890,221
TRANSLUCENCY/OPAQUE SORTING

Urs Muehlethaler, Gerlafingen, Switzerland, assignor to Sortex Company of North America, Inc., Lowell, Mich.

Filed Dec. 14, 1973, Ser. No. 424,729

Int. Cl. B07c *5/342*

U.S. Cl. 209—111.7 **13 Claims**



1. A method of sorting particles according to their degree of transparency comprising the steps of:
passing each particle seriatim through a viewing zone;
illuminating one side of the particles to produce a shadow pattern on a surface in said viewing zone, the shadow pattern of at least some particles having a first area of a first level of light attenuation and a second area of a second level of light attenuation different from said first level, each of said first and second areas being less than the total area of the shadow pattern of said particles,
measuring the relative sizes of the first and second areas of light attenuation; and
sorting those particles which produce a shadow pattern whose ratio of first area to second area exceeds a predetermined value from other particles whose shadow pattern produces a ratio below the predetermined value.

3,890,222
FROTH FLOTATION METHOD FOR RECOVERY OF MINERALS BY MEANS OF ALKALI OR AMMONIUM ALKYL ALKYLARYL, AND ARYL SULFINATES AS FROTH FLOTATION REAGENTS

Vojislav Petrovich, 1925 W. Schiller St., Chicago, Ill. 60622

Filed June 12, 1974, Ser. No. 478,380

Int. Cl.² B03D *1/02*

U.S. Cl. 209—166 **7 Claims**

1. A method of beneficiating ores selected from the group consisting of hematite, magnetite sulfide, sulfate, oxide, carbonate, and silicate of zinc; sulfide, carbonate, and silicate of copper; oxide and phosphate of thorium by froth flotation process to produce a froth concentrate of desired metal values leaving gangue minerals in tailings such as silica, alumino and ferromagnesian silicates, calcite, dolomite, siderite, barite, pyrite and pyritic minerals, which comprises effecting the froth flotation of the said ores and minerals in the presence of alkyl, alkylaryl, and aryl sulfinic promoter-collectors, and their alkali metal and ammonium salts as prmoter-collectors, possessing some frothing properties, floating the desired metal values at a pH value of the flotation circuit from 5 to 9; and recovering a froth concentrate relatively rich in the desired metal value leaving a tailings relatively poor in the desired metal value.

3,890,223
JIG FOR THE PREPARATION OF COAL

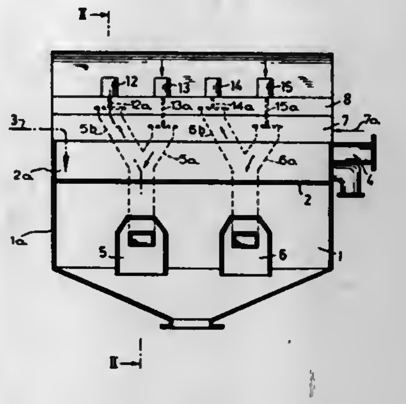
Hans Stern, Dortmund-Hocksten, Germany, assignor to Klockner-Humboldt Deutz AG, Germany

Filed May 1, 1973, Ser. No. 356,083

Claims priority, application Germany, May 6, 1972, 2222321

Int. Cl. B03b *3/26, 3/28*

U.S. Cl. 209—457 **10 Claims**



1. A jig for the preparation of material such as coal comprising in combination:
a housing for containing material in water and having a settling sieve member therein with a material discharge opening and a material intake opening;
an air inlet means for delivery of air under pressure into a space below the sieve member;
an air outlet means for discharging air from said space so that air will move the material and water in the housing relative to the sieve member;
and an air flow valve means connected to said air outlet for controlling the rate of escape of air through said air outlet,
and valve means including an intermittently operating pulsating valve and a throttle valve downstream a sufficient distance from the intermittent valve to permit expansion of gas leaving said pulsating valve.

3,890,224
PROCESS FOR CONTROLLING SURFACE POLLUTANTS

Donald Eric Weiss, Blackburn, and Hendrik Adriaan Jacobus Battaerd, North Clayton, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organisation and Imperial Chemical Industries of Australia and New Zealand Limited, Campbell, Australia

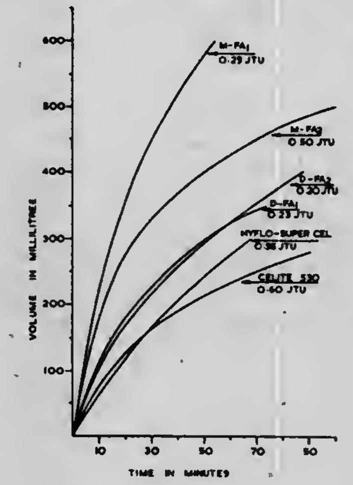
Filed Apr. 29, 1971, Ser. No. 138,679

Claims priority, application Australia, May 4, 1970, 1083/70

Int. Cl. C02b *9/02*; **E02b** *15/04*

U.S. Cl. 210—30 **11 Claims**

1. A method of removing an oil slick from aqueous media, said method comprising: firstly, treating said slick with sufficient fine particles or granules of ferromagnetic synthetic polymeric material being characterised in that said ferromagnetic particles preferentially absorb or adsorb oil from aqueous media and also the particles or granules float on the aqueous media when associated with the oil; secondly removing



said particles together with the associated oil from the aqueous media by magnetic means.

3,890,225
PROCESS FOR REMOVING HEAVY METAL IONS IN WATER

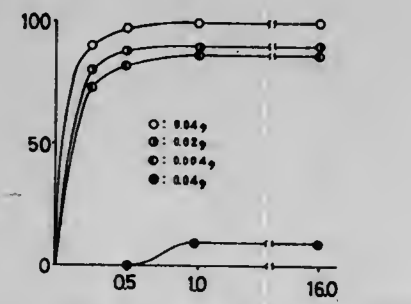
Yoshiaki Kajiyama, 177 Mukonosou 2-chome, Amagasaki, Japan

Filed June 6, 1973, Ser. No. 367,357

Claims priority, application Japan, June 7, 1972, 47-56658

Int. Cl. C02b *1/44*

U.S. Cl. 210—38 **6 Claims**



1. A process for the removal of heavy metal ions contained in water comprising contacting coral fossil lime stone with said water containing the heavy metal ions.

3,890,226
METHOD OF TREATING ALUMINUM-CONTAINING WASTE WATER

Yuiti Hanami, and Yoji Fukuyama, both of Yokohama, Japan, assignors to Kurita Water Industries Ltd., Osaka, Japan

Filed Mar. 11, 1974, Ser. No. 450,064

Int. Cl. C02b *1/20*

U.S. Cl. 210—44 **9 Claims**

1. A method of treating aluminum-containing waste waters, consisting essentially of
a. an alkaline waste water containing dissolved therein from 40 to 100 g/l of sodium hydroxide and from 10 to 80 g/l of aluminum, and
b. an acidic waste water containing dissolved therein from 100 to 175 g/l of sulfuric acid and from 10 to 20 g/l of aluminum,
comprising the steps of: rapidly adding (b) to (a), with stirring, at a rate such that the pH of the mixed waste waters becomes in the range of from about 12.5 to about 13 and aluminum hydroxide begins to precipitate therein within a time of from about 15 to 40 minutes after the beginning of addition of (b), then continuing to add and stir (b) into the mixed waste waters, at a slower rate such that the pH of the mixed waste waters is reduced to in the range of from about 5.8 to about 8.5 over a period of at least one hour and thereby precipitating beta aluminum hydroxide in substantially needle-like or granular form, the temperature of the mixed waste waters being maintained at 40°C or more during the addition of (b), terminating the addition of (b) when the pH of the mixed waste waters reaches from about 5.8 to about 8.5, and then recovering the precipitated beta aluminum hydroxide containing less than 60 wt. % water from the mixed waste waters.

3,890,227
TREATMENT OF PROCESS WATER

Philip Merchant, Jr., Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 182,866, Sept. 22, 1971, Pat. No. 3,775,312. This application Aug. 29, 1973, Ser. No. 392,718

Int. Cl. C02b *1/20*

U.S. Cl. 210—51 **16 Claims**

1. The process for the separation of salts of the condensation product of naphthalene sulfonic acids and formaldehyde from polymerization process water containing said salts in amount of less than 2 weight percent and containing less than 5 percent total solids which comprises contacting said aqueous composition containing said salt as a first component with a second component which is a polyalkylene amine of the formula $H_2N[-R-NH]_xH$ wherein R is an aliphatic radical of 1 to 5 carbon atoms and x is from 1 to 12 said contacting having been made after at least one of the components has been reduced to a pH of less than 5.0 by the addition of an acid to said component or components and whereby the pH of the combination of the first and second component is also less than 5.0, and separating the resulting precipitate from the aqueous composition.

3,890,228
POLYACRYLATE-POLYPHOSPHONIC ACID TREATMENT IN AQUEOUS SYSTEMS

Chih Ming Hwa, Palatine; Dionisio Guerrero Cuisia, Chicago, both of Ill., and John Allen Gray, Toronto, Canada, assignors to Chemed Corporation, Cincinnati, Ohio

Filed Apr. 13, 1973, Ser. No. 350,875

Int. Cl.² C02B *5/06*

U.S. Cl. 210—58 **1 Claim**

1. A method for inhibiting deposits of scale, sludge and other foulants in aqueous systems comprises adding to the said system from 0.1 to 200 parts per million of a 1:1 mixture of sodium polymethacrylate having a molecular weight of 9,000 and hydroxyethylidene diphosphonic acid.

3,890,229
PROCESS AND APPARATUS FOR CLASSIFYING GRANULAR MATERIAL SUSPENDED IN A LIQUID

Theodor Eder, Vienna, Austria, assignor to Wagner-Bird Aktiengesellschaft, Austria

Filed Aug. 31, 1973, Ser. No. 393,336

Claims priority, application Austria, Sept. 7, 1972, 7681/72

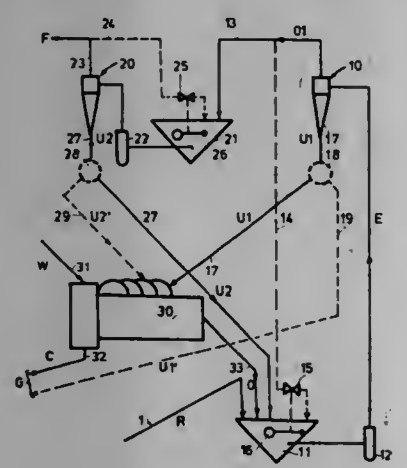
Int. Cl. B01d *37/04*

U.S. Cl. 210—73 **17 Claims**

1. In a slurry-treating method for obtaining a final fraction in which particles smaller than a given size are suspended in a given concentration, the steps of feeding the slurry which is to be treated initially to a first liquid cyclone having an upper overflow fine fraction discharge and a lower discharge for a substantially dewatered coarse fraction, then feeding the overflow fine fraction discharge from said first liquid cyclone to a second liquid cyclone having an upper overflow discharge for the final fraction and a lower discharge for a substantially dewatered coarse fraction, feeding the substantially dewatered coarse fraction from said first liquid cyclone to a gravity

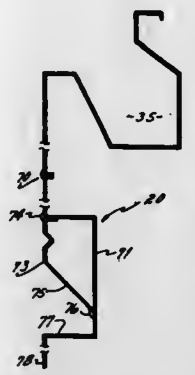
separator while maintaining at said gravity separator a load which is formed primarily by said coarse fraction from said first liquid cyclone and while supplying fresh liquid to the gravity separator at a rate which controls the concentration of the particles in the final fraction, discharging particles larger than said given size from said gravity separator, and returning from said gravity separtor to said first liquid cyclone a slurry from which particles larger than said given size has been separated.

10. In a slurry-treating apparatus for obtaining a final fraction in which particles less than a given size are suspended in a given concentration, first and second centrifugal separation stages each having at least one liquid cyclone means for providing an upper overflow fine fraction discharge and a lower discharge of a substantially dewatered coarse fraction, the upper overflow discharge of the liquid cyclone means of the second centrifugal stage providing the final fraction, first sump means for containing slurry to be treated, first pump means communicating with said first sump means and with the liquid cyclone means of said first centrifugal separation stage for feeding slurry from said first sump means to said liquid cyclone means of said first stage to be treated therein, second sump means for receiving the upper overflow fine fraction discharge from the liquid cyclone means of said first stage, second pump means communicating with said second sump means and with the liquid cyclone means of said second stage for feeding slurry from said second sump means to said liquid cyclone means of said second stage, gravity separation means and first discharge conduit means communicating therewith and with the lower discharge of said liquid cylone means of said first stage for directing the substantially dewatered coarse fraction discharged from the latter liquid cyclone means to said gravity separation means and for loading said gravity separation means primarily with the coarse fraction from said first stage, liquid supply means communicating with said gravity separation means for supplying liquid thereto at a rate which controls the concentration of the particles in the final fraction, said gravity separation means separating particles larger than a given size from the suspension treated by said gravity separation means, overflow discharge means communicating with said gravity separation means for discharging from the latter and feeding to said first sump means a suspension from which the particles larger than said given size have been separated by said gravity separation means, so that any particles smaller than said given size contained in the coarse fraction of said first stage are returned to the latter by said gravity separation means, and second discharge conduit means communicating with the liquid cyclone means of said second stage for receiving the lower discharge of substantially dewatered coarse fraction therefrom and for delivering at least the greatest part of the latter dewatered coarse fraction also to said first sump means, so that said gravity separation means is not loaded by the greatest part of the coarse fraction of said second stage.



3,890,230
WALL FORMED CONDUIT FOR SWIMMING POOLS AND METHOD OF MAKING THE SAME

James A. Patterson, P.O. Box 44147, Columbus, Ohio 43204
Filed Mar. 14, 1974, Ser. No. 451,064
Int. Cl. E04h *3/20*
U.S. Cl. 210—169 **6 Claims**



1. A swimming pool comprising, in combination:

a recirculating and filter system,

a tank with a floor and metal side and end walls,

metal gutter means constructed and arranged along the upper edge of the metal side and end walls of the pool,

conduit means with a first end connected to said gutter means and a second end in communication with said recirculating and filtering system whereby liquid collected in said gutter is conducted to said filter system,

conduit means comprising metal box structure connected to said walls and constructed and arranged around the periphery of said metal side and end walls of the pool and located on the side of said walls opposite the interior of the tank defined by said walls,

said metal box structure further being located at a height above the bottom edge of said walls and beneath the bottom of said gutter means,

a V-shaped recess formed into the side of said metal box common with the sidewall along its peripheral length and constructed and arranged whereby the interior of said recess is in fluid communication with the interior of said tank,

apertures located in the side walls of said V-shaped recess for the passage of fluid therethrough,

conduit means with a first end in communication with said filter and recirculating system and a second end in communication with the interior of said metal box structure whereby filtered water may be returned to the interior of said tank through said apertures located in the sides of the V-shaped recess.

3,890,231
INTEGRAL CIRCULAR WASTEWATER TREATMENT PLANT

Louis Maynard LaClair, Grand Island, N.Y.; John Reuben McWhirter, Westport, Conn., and William Lawrence Ross, Charlestown, W. Va., assignors to Union Carbide Corporation, New York, N.Y.
Filed Apr. 2, 1973, Ser. No. 347,398
Int. Cl. C02c *1/06*
U.S. Cl. 210—199 **14 Claims**

1. Wastewater treatment apparatus comprising:

a. A circular tank outer wall;

b. A circular inner wall concentric with and spaced from said outer wall forming an inner volume and intermediate volume between said inner and outer walls, such that the ratio of the inner wall radius (R_1) to the outer wall radius (R_2) is between 0.25 and 0.70;

c. A first radial partition extending across said intermediate volume between and joined at opposite edges to said inner and outer walls;

d. A second radial partition extending across said intermediate volume between and joined at opposite edges to said inner and outer walls, being spaced from said first raidal partition so as to form a first arcuate portion of said intermediate volume bounded by segments of said inner and outer walls comprising between 90° and 330° of their respective circumferences, and a second arcuate portion comprising the remainder of said intermediate volume;

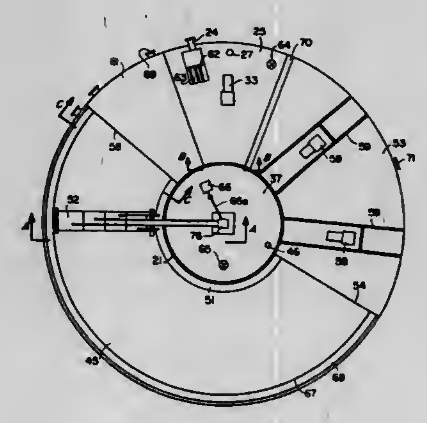
e. First fluid mixing and recirculation means within said outer wall in a first part other than said first arcuate portion and a cover enclosing said first part positioned over said first fluid mixing and recirculation means to form a first aeration zone;

f. First passage means for introducing oxygen gas in said first aeration zone;

g. Second passage means for introducing feed wastewater and thickened activated sludge to said first aeration zone;

h. Second fluid mixing and recirculation means within said outer wall in a second part other than said first arcuate portion and a second cover enclosing said second part positioned over said second fluid mixing and recirculation means to form a second aeration zone;

i. First gas interzone transfer means spaced from first passage means (f) for discharging oxygen-depleted gas from said first aeration zone and introducing same to said second aeration zone as the oxygen-containing gas therefore;



j. First liquor interzone transfer means for discharging first oxygenated liquor from said first aeration zone and introducing same to said second aeration zone for mixing therein with said oxygen-containing gas;

k. Gas vent means spaced from first gas interzone transfer means (i) for discharging oxygen-further depleted gas from said second aeration zone;

l. Liquor passage means for discharging second oxygenated liquor from said second aeration zone;

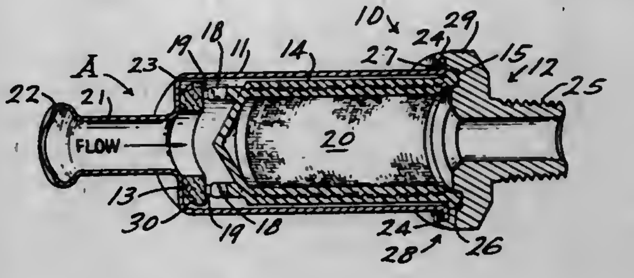
m. Means for uniformly distributing oxygenated liquor in said first arcuate portion of said intermediate volume around the inner wall segment for radial flow across said first arcuate portion for both clarification of said liquor and thickening of activated sludge therein;

n. Trough means around the outer wall segment upper part of said first arcuate portion for discharging clarified water thereform; and

o. Means for collecting and removing thickened activated sludge from the bottom part of said first arcuate portion and returning at least part of said sludge to said second passage means (g).

3,890,232
FLUID FILTER

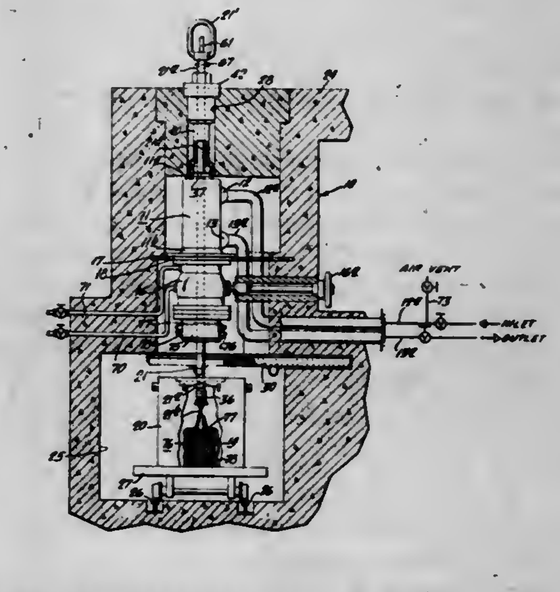
John F. Combest, Findlay, Ohio, and Rupert B. Bell, Detroit, Mich., assignors to R. L. Kuss & Co., Inc., Findlay, Ohio
Filed Mar. 26, 1973, Ser. No. 345,191
Int. Cl. B01d *35/06*
U.S. Cl. 210—223 **1 Claim**



1. A fluid filter comprising an elongate case including a pair of opposed fittings providing fluid openings therethrough, a ring-like magnetic filter adjacent one of said fittings for capturing foreign magnetic particles within the fluid, said magnetic filter including an opening therethrough positioned in the path of the flowing fluid within the case, a filtering mesh adjacent said magnetic filter for capturing remaining foreign particles within the fluid, a conically shaped deflector member between said magnetic filter and said mesh and spaced from said magnetic filtering means for deflecting fluid from an axial path radially outwardly toward said mesh, and axially extending dividers connected to said deflecting means and said mesh, said dividers including resiliently pivotal tabs for compressibly engaging said magnetic filter and providing an unrestricted flow of the fluid from said magnetic filter over said deflector member.

3,890,233
APPARATUS FOR FILTERING RADIOACTIVE FLUIDS

Edwin H. Gischel, 107 Ardwick Ter., Lansdale, Pa. 19446
Filed Apr. 25, 1974, Ser. No. 463,974
Int. Cl. B01d *29/02*
U.S. Cl. 210—237 **19 Claims**



1. Fluid filtration apparatus comprising:

a filter housing having an end wall with an aperture therein and an open end opposite said aperture in said wall,

filtering means adapted to be removably contained inside said housing,

valve means associated with the open end of said housing, said valve means having one operating position closing said open end of said housing and another operating position affording displacement of said filtering means therethrough into and out of said housing.

- a valve operator connected to said valve means and operable from a location spaced therefrom to afford actuation of said valve means between said operating positions,
- rigid elongated operator means associated with said filtering means and displaceable through said aperture for moving said filtering means into and out of said housing through said valve means, said operator means having a post portion received within said aperture and projecting outwardly of said end wall when said filtering means is mounted in operating relation in said housing,
- means releasably engaging said post outside of said housing end wall for removably mounting said filtering means in said housing, and,
- means providing a coupling of said filtering means to said operator means releasable at a location remote from said filtering means by movement of said operator means,

whereby the filtering means may be removed from the housing from a location remote from its open end.

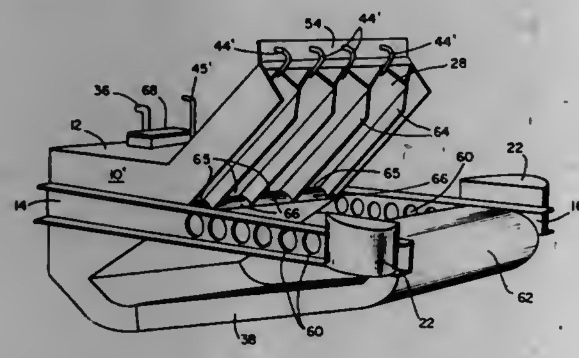
3,890,234
OIL SEPARATION AND RECOVERY DEVICE

Frank Galicia, 5043 Catherine St., Philadelphia, Pa. 19143

Filed Apr. 18, 1973, Ser. No. 352,209

Int. Cl. E02b *15/04*

U.S. Cl. 210—242 **1 Claim**



1. A float-supported device for separating two liquids of different densities forming a liquid interface, including:

- float-supported troughs comprising angularly arranged elongated structures presenting a channel substantially inverted and V-shaped in transverse section,
- a separation chamber in fluid communication with the lower portion of said angularly arranged elongated structures to receive liquid collected by said elongated structures,
- duct means with a first end in communication with a lower end of said separation chamber and a second end constructed and arranged adjacent the inverted V-shaped side of said angularly arranged elongated structures whereby heavier liquid discharged from said separation chamber is discharged in the direction of said elongated structures to induce the flow of liquid to be separated towards said troughs.

3,890,235
VACUUM FILTER

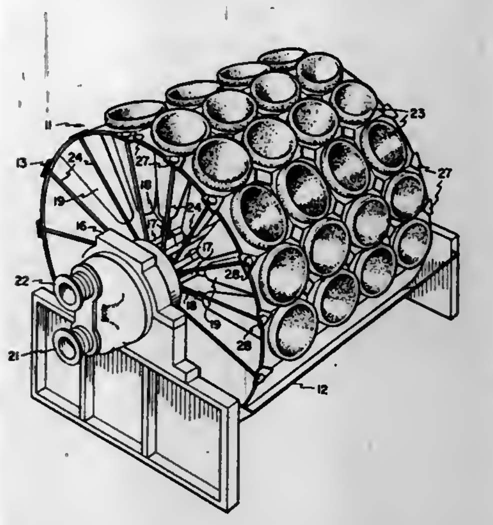
Steven S. Davis, Bountiful, Utah, assignor to Envirotech Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 275,513, July 27, 1972, Pat. No. 3,825,124. This application July 22, 1974, Ser. No. 490,651

Int. Cl. B01d *33/34*

U.S. Cl. 210—330 **2 Claims**

1. A rotary vacuum filter of the type including a tank for holding a slurry to be filtered, a rotary filter element including a plurality of filter sectors and mounted for rotation in said tank whereby said sectors pass successively into and out of submergence in said slurry, a valve and associated conduits for applying vacuum to the interior of each of said sectors during submergence and for supplying pressured fluid to the interior of said sector after emergence; the improvement in which said rotary filter element comprises a substantially cylindrical member having an elongated axial hub and an outer wall formed from a plurality of separate filter sectors each of which comprises a relatively deep concave vessel having an outwardly facing open mouth at one end and a relatively small opening in its wall remote from said open mouth, all of said vessels being spaced radially and concentrically about said hub, a plurality of conduits including a conduit extending between said relatively small opening of each of said vessels and said valve, clamp means securing all of said vessels in said spaced radial and concentric position about said hub with the outwardly facing open mouths of said sectors lying in a substantially cylindrical surface of revolution an elongated concave flexible filter medium associated with each of said vessels each of said filter mediums having one open end, and means associated with each of said vessels for securing the open end of one of said filter mediums to the open mouth of said vessel whereby said medium may be pulled into said vessel when vacuum is applied thereto and everted when pressured fluid is applied thereto.



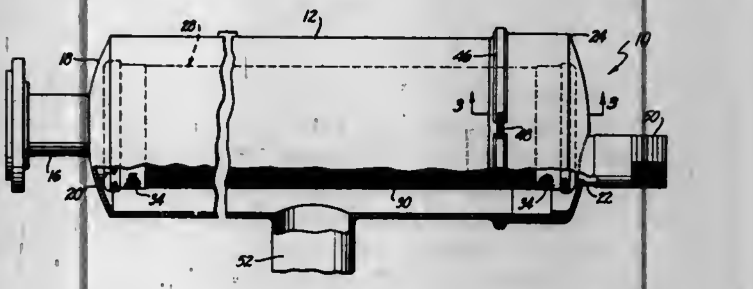
3,890,236
FILTER STRUCTURE

Gary W. Harrell, Bakersfield, Calif., assignor to AG-Water, Inc., Shafter, Calif.

Filed Jan. 14, 1974, Ser. No. 433,083

Int. Cl. B01d *29/14*

U.S. Cl. 210—433 **7 Claims**



1. In a filter structure having a housing provided with an inlet and an outlet and having a filter means located so that liquid flows through said filter structure during the operation of said filter structure the improvement which comprises:

- said housing being provided with a closure enabling said housing to be opened and closed, said closure being located opposite said inlet,
- a first tubular flange located on said housing so as to extend internally of said housing around said inlet,
- a second tubular flange of the same diameter as said first tubular flange located on said closure so as to extend internally of said closure, said second flange being aligned with said first flange,

- a self-supporting, foraminous tubular member located so as to extend through said housing, said foraminous member extending around both of said flanges, the exterior of said foraminous member being spaced from the interior of said housing,
- a flexible, fabric, tubular filter element located so as to extend along the interior of said foraminous member, said filter element having ends extending around the ends of said foraminous member and back along the exterior of said foraminous member, and
- elastomeric resilient sealing rings held under compression between said fabric filter element and each of said flanges, said sealing rings extending completely around said flanges and being constrained against expansion by the said foraminous member,
- said outlet being located in said housing exterioly of said first filter element.

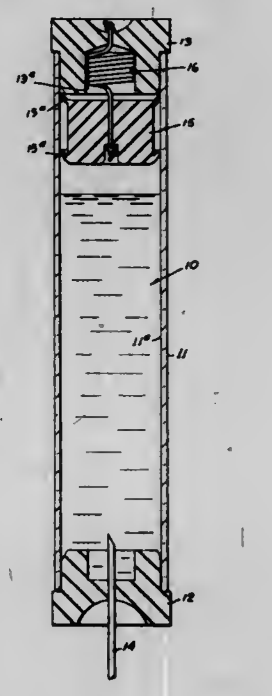
3,890,237
PLASMA SEPARATOR — CORD STOP TYPE

Joseph T. Welch, Wanaque, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Feb. 27, 1974, Ser. No. 446,341

Int. Cl. B01d *21/26*

U.S. Cl. 210—516 **2 Claims**



1. A separator assembly, capable of separating blood into its component phases of plasma or serum vs cellular portion, comprising:

- a. a container having first and second open ends, and adapted to receive blood for subsequent separation into a light phase and a heavy phase;
- b. first and second closures sealing both ends of the container, the first of said closures being formed from a self-sealing elastomeric material which is penetrable by a cannula through which blood to be separated is conducted into the container;
- c. a piston having a specific gravity relatively greater than the light phase of the blood and slidably mounted in the container, said piston having means on an outer surface in sealing engagement with an inner surface of the container, said sealing means being constructed and arranged to maintain said piston at a first position adjacent the second of said closures when subjected to a first centrifugal force and to disengage when subjected to a second greater centrifugal force so that when said container is subjected to said first centrifugal force the blood separates into its light phase and heavy phase but the piston stays in said first position and subsequently when said second greater centrifugal force is used the sealing means automatically disengages, the light phase thereby passing around the sealing means enabling the piston to move down through the light phase; and
- d. stop means comprising a cord of a predetermined length extending from said second closure to the piston whereby the piston when moving through the light phase will stop a predetermined distance from said first end of the container.

3,890,238
WATER SOLUBILITY OF POLYOXYALKYLENE POLYMERS

Matthew A. Boehmer, Allen Park, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 21, 1972, Ser. No. 317,232

Int. Cl.² C09K *3/00;* B01F *1/00;* C10M *3/22*

U.S. Cl. 252—1 **5 Claims**

1. The method of raising the critical solution temperature of an aqueous concentrated solution of a liquid polyoxyalkylene polymer surfactant containing a maximum of 20 percent by weight ethylene oxide units the balance of the polymer being made up of polyoxyalkylene units wherein each oxyalkylene unit has three, four or five carbon atoms or mixtures thereof and an initiator selected from the group consisting of ethylene glycol, propylene glycol, fatty alcohols, diamines and water by adding to said solution an alkali metal salt of an organic thiol acid having at least one -SH group, said thiol acid being selected from the group consisting of di lower alkyl dithiocarbamic acid, thioglycolic acid and mercaptobenzothiazole, said thiol acid and said polymer each being present in an amount from 1 to 60 percent with the total of both combined being in an amount of from 10 to 75 percent.

3,890,239
SURFACTANT COMPOSITIONS USEFUL IN OIL RECOVERY PROCESSES

Dale W. Dycus; Earl W. Malmberg, and Harry L. Wilchester, all of Dallas, Tex., assignors to Sun Oil Company, Dallas, Tex.

Division of Ser. No. 328,813, Feb. 1, 1973, Pat. No. 3,827,497. This application May 3, 1974, Ser. No. 466,572

Int. Cl. E21b *43/22*

U.S. Cl. 252—8.55 D **6 Claims**

1. A surfactant composition for use in flooding oil-bearing formations comprising a mixture of

- a. 0.5–15 parts by weight of a surfactant salt of an organic sulfonate
- b. 0.25–10 parts by weight of a polyalkylene glycol alkyl ether and
- c. 0.25–10 parts by weight of a salt of a sulfonated or sulfated oxyalkylated aalcohol

in which the cationic portion of the salts of Components (a) and (c) is selected from the group consisting of alkali metal, amine and ammonium.

4. A surfactant composition for use in flooding oil-bearing formations comprising a mixture of (a) 0.5–15 parts by weight of a surfactant salt of an organic sulfonate and (b) 0.5–15 parts by weight of a salt of a sulfonated oxyalkylated alcohol, each of said salts being selected from the group consisting of alkali metal, amine and ammonium.

3,890,240
TONER COMPOSITIONS AND METHODS FOR THEIR PREPARATION

David L. Hochberg, Bronx, N.Y., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Continuation-in-part of Ser. Nos. 597,240, Nov. 28, 1966, abandoned, and Ser. No. 597,247, Nov. 28, 1966, abandoned. This application May 15, 1970, Ser. No. 38,098

Int. Cl.² G03G *9/04*

U.S. Cl. 252—62.1 **6 Claims**

1. A liquid toner composition for use in electrophotography comprising a dispersion of about 15 parts by weight of finely

divided pigment in a vehicle containing about 30 to 200 parts by weight of a hydrocarbon-soluble acrylic copolymer resin and about 0.01 to 3 parts of a hydrocarbon-soluble polyvalent metal soap both dissolved in a volatile isoparaffinic hydrocarbon the electrical resistivity of which is preadjusted to a value such that the resistivity of the vehicle is between about 1×10^9 and 1×10^{12} ohm-cm. when measured at 25°C., said acrylic copolymer resin being a terpolymer of vinyltoluene, a branched-chain butyl methacrylate and lauryl or stearyl methacrylate, said pigment consisting essentially of finely divided carbon black particles whose diameters are not greater than 25 millimicrons associated with a hydrocarbon-insoluble dye of the group consisting of basic triarylmethane dyes and alizarin dyes, at least some of said carbon black being present in the form of agglomerates of said particles of carbon black, said agglomerates being of a size that will produce high density upon development of an electrostatic image with said composition, and said polyvalent metal soap being a member of the group consisting of the zinc, iron, copper, lead calcium, zirconium and solution-aged rare earth metal and manganese soaps of fatty acids of about 6–18 carbon atoms and mixtures thereof.

3,890,241
PIEZOELECTRIC CERAMIC COMPOSITIONS

Masamitsu Nishida, and Hiromu Ouchi, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation-in-part of Ser. No. 242,250, April 7, 1972, abandoned. This application Sept. 5, 1973, Ser. No. 394,465

Claims priority, application Japan, Apr. 20, 1971, 46-25865The portion of the term of this patent subsequent to Aug. 20, 1991, has been disclaimed.

Int. Cl. C04b *35/46, 35/48*

U.S. Cl. 252—62.9 **4 Claims**

1. A piezoelectric ceramic composition consisting essentially of a material represented by the formula:

$$Pb(Zn_{1/3}Nb_{2/3})_A(Sn_{1/3}Nb_{2/3})_BTi_CZr_DO_3$$

wherein the range for A, B, C, and D are $0.01 \leqq A \leqq 0.50$, $0.01 \leqq B \leqq 0.25$, $0.25 \leqq C \leqq 0.625$, $0.20 \leqq D \leqq 0.625$, and wherein $A+B+C+D=1$, and further containing a quantity of manganese equivalent to from 0.05 to 5 weight percent of manganese dioxide (MnO_2).

3,890,242
ANTIBACTERIAL DETERGENT COMPOSITIONS CONTAINING PHENYLBISMUTH BIS(2-PYRIDINETHIOL 1-OXIDE)

John Downing Curry, Oxford, Ohio, assignor to Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 218,584, Jan. 17, 1972, Pat. No. 3,753,990, which is a continuation-in-part of Ser. No. 98,086, Dec. 14, 1970, abandoned. This application Mar. 30, 1973, Ser. No. 346,396

Claims priority, application Netherlands, Apr. 4, 1972, 7204437; France, Apr. 7, 1972, 72.12388; Germany, Apr. 7, 1972, 16725; Sweden, Apr. 10, 1972, 4611/72; United Kingdom, Apr. 13, 1972, 17088/72

Int. Cl. C11d *3/48*

U.S. Cl. 252—107 **6 Claims**

1. An antibacterial and antifungal detergent composition comprising:

A. a water-soluble detergent selected from the group consisting of soaps and non-soap synthetic detergents; and

B. from about 0.2 to about 3% of phenylbismuth bis(2-pyridinethiol 1-oxide);

said detergent composition having a pH of less than about 10.

3,890,243
REMOVAL OF COBALT FROM NICKEL SALT SOLUTIONS

Louis Gandon; Christian Bozec, and Philippe Lenoble, all of Le Havre, France, assignors to Le Nickel, Paris, France

Division of Ser. No. 62,579, Aug. 10, 1970, abandoned. This application Sept. 19, 1972, Ser. No. 290,377

Int. Cl. C01g *53/06*

U.S. Cl. 252—186 **7 Claims**

1. A composition suitable for use as an oxidizing agent in an aqueous saline solution comprising a major portion of a basic nickel III carbonate having the formula

$$Ni_2(CO_3)_3 \,.\, y\, Ni_2O_3 \,.\, z\, H_2O$$

wherein *y* is between 3 and 10 and *z* is between 4 and 10, and a minor portion of a basic nickel II carbonate having the formula

$$NiCO_3 \,.\, x\, Ni(OH)_2$$

wherein *x* is between 0.5 and 2.

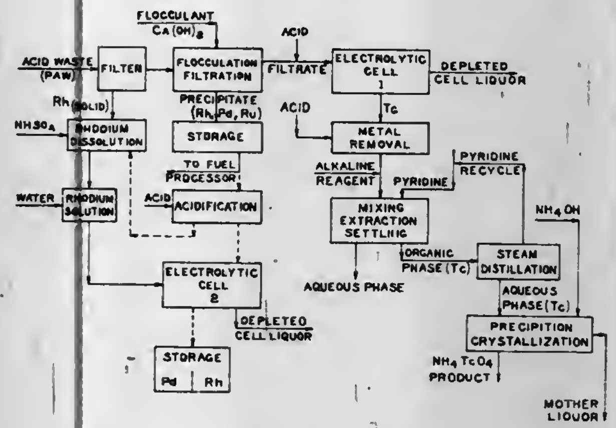
3,890,244
RECOVERY OF TECHNETIUM FROM NUCLEAR FUEL WASTES

William W. Carlin, Portland, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 24, 1972, Ser. No. 309,048

Int. Cl. C02c *5/14*

U.S. Cl. 252—301.1 R **16 Claims**



1. A process for separating technetium values from aqueous acidic solution containing said metal values and other fission product metal values, which comprises mixing with said acidic solution alkaline flocculating reagent selected from alkaline earth metal oxides and hydroxides in amounts sufficient to raise the pH of the solution to between about 9 and about 12 and thereby form a precipitate containing fission product metal values and a supernatant phase containing technetium values, separating the supernatant from the precipitate, acidifying the supernatant with mineral acid to an acid concentration of not more than about 1 molar, electrolyzing acidified supernatant in an electrolytic cell under controlled cathodic potential conditions and at a potential sufficient to deposit technetium on the cathode, removing technetium depleted supernatant from the electrolytic cell and removing elemental technetium deposits from the cathode.

3,890,245
PROCEDURE FOR INCREASING THE CHEMISORPTION CAPACITY OF CARBON WITH REGARD TO GASES

Ronald Berg, Oslo; Hans Petter Hjermstad, Rykkinn, and Gerard Albert Neefjes, Strommen, all of Norway, assignors to Institutt for Atomenergi, Kjeller, Norway

Claims priority, application Norway, July 12, 1972, 2482/72; Norway, July 25, 1973, 2622/73

Filed July 11, 1973, Ser. No. 378,161

Int. Cl. B01d *53/02*

U.S. Cl. 252—447 **2 Claims**

1. A process for increasing the chemisorption capacity of carbon comprising:

impregnating carbon with a quantity of at least one metallic compound effective for increasing the sorption capacity of the carbon; and

irradiating said impregnated carbon with a dosage of at least 1 Mrad of gamma radiation in the presence of nitrogen.

3,890,246
CATALYSTS FOR THE OXIDATION OF OLEFINS TO UNSATURATED ALDEHYDES

Robert K. Grasselli, Chagrin Falls, and Maria S. Friedrich, Cleveland, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 16,984, March 5, 1970, which is a continuation of Ser. No. 691,992, Dec. 20, 1967, Pat. No. 3,544,616. This application Dec. 7, 1971, Ser. No. 205,706

Int. Cl. B01j *11/82, 11/06*

U.S. Cl. 252—432 **4 Claims**

1. A catalyst composition consisting essentially of a catalyst support supporting an activated catalytic oxide complex of arsenic and uranium having a composition corresponding to the empirical chemical formula $U_xAs_yO_z$ where *x* is a number from about 1 to about 25; *y* is a number within the range from about 1 to about 10; *z* is a number taken to satisfy the average valences of arsenic and uranium in the oxidation states in which they exist in said catalyst, said catalyst being formed by heating the mixed oxides of arsenic and uranium in the presence of oxygen at an elevated temperature above 500°F but below their melting point for a time sufficient to form said active catalytic oxide.

3,890,247
HYDROCRACKING CATALYST

Dean Arthur Young, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 209,440, Dec. 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 869,389, Oct. 24, 1969, abandoned, which is a continuation-in-part of Ser. No. 669,288, Sept. 20, 1967, abandoned. This application Oct. 20, 1972, Ser. No. 299,190

Int. Cl. B01j *11/40*

U.S. Cl. 252—455 Z **9 Claims**

1. A hydrocarbon conversion catalyst comprising a crystalline aluminosilicate zeolite base intimately composited with at least one finely divided Group VIB metal hydrogenating component, said hydrogenating component or a precursor thereof having been initially composited with said zeolite base in a substantially undissolved particulate form by intimately admixing the two components in an aqueous medium having a pH below 5, but sufficiently high to avoid acid destruction of the zeolite crystal structure.

3,890,248
CATALYTIC OXIDE ADAPTED FOR THE PREPARATION OF UNSATURATED CARBONYL COMPOUNDS

Takashi Ohara, Nishinomiya; Michikazu Ninomiya, Kobe; Isao Yanagisawa, Toyonaka Ikeda; Michio Ueshima, Nishinomiya, and Masahiro Takata, Toyonaka Ikeda, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Division of Ser. No. 211,680, Dec. 23, 1971, Pat. No. 3,799,978. This application Aug. 29, 1973, Ser. No. 392,500

Int. Cl. B01j *11/06, 11/32, 11/22*

U.S. Cl. 252—456 **2 Claims**

1. A catalyst composition consisting essentially of a catalytic oxide in which the atomic ratio among the constituent elements Co:Fe:Bi:W:Mo:Si:Z is within the range of 2.0–20.0 : 0.1–10.0 : 0.1–10.0 : 0.5–10.0: 2.0–11.5 : 1–15.0 : 0.005–1.0, with the proviso that W plus Mo equals 12.0, and Z represents an alkaline earth metal and the oxygen content of the catalytic oxide is determined by the valence requirements of the other elements present.

3,890,249
SILICA PREPARATION

Richard E. Dietz, Bartlesville, and Joseph A. Delap, Dewey, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 29, 1972, Ser. No. 310,450

Int. Cl. B01j *11/06, 11/36*

U.S. Cl. 252—458 **9 Claims**

1. A method of preparing a silica-containing xerogel which comprises:

a. contacting a silica-containing hydrogel with an organic solvent in which water is soluble said solvent at a first temperataure elevated above the atmospheric boiling point of said organic solvent said solvent being maintained in the liquid phase by superatmosheric pressure, to remove water from said hydrogel and to form a xerogel and to form a solvent-water solution;

b. separating said solvent-water solution from said xerogel;

c. cooling said solvent-water solution to a second temperature less than said first temperature to form a water-rich phase and a solvent-rich phase; and

d. recovering the silica-containing xerogel.

3,890,250
HOT PRESSED SILICON NITRIDE CONTAINING FINELY DISPERSED SILICON CARBIDE OR SILICON ALUMINUM OXYNITRIDE

David W. Richerson, Auburn, Mass., assignor to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 340,948, March 14, 1973, abandoned. This application Aug. 27, 1973, Ser. No. 392,094

Int. Cl. H01b *1/04*

U.S. Cl. 252—516 **13 Claims**

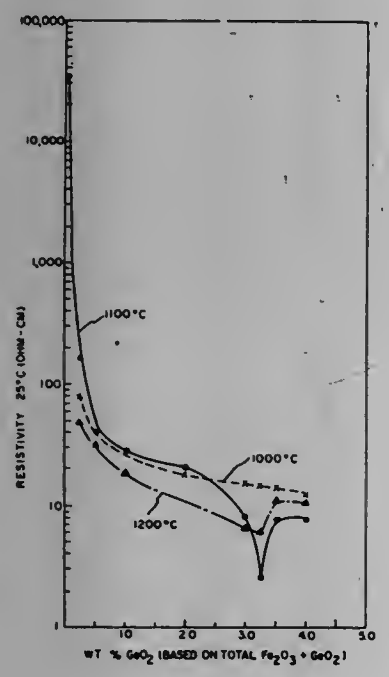
1. Monolithic, high density silicon nitride product whose silicon nitride is predominantly beta phase, the product containing between 10 and 50 percent silicon carbide, the product having interengaged matrices of silicon nitride and silicon carbide, the product being characterized by a modulus of rupture, in excess of 100,000 p.s.i. at 20°C as measured by four point flexure testing, and in excess of 40,000 p.s.i. at 1375°C as measured by three point testing, the product having an electrical resistivity between 1 and 1×10^7 ohm centimeters.

9. Monolithic, high density product comprising a mixture of silicon carbide and at least one compound containing silicon and nitrogen and having the beta silicon nitride structure, said compound being selected from the group consisting of beta silicon nitride and silicon aluminum oxynitride having an expanded beta silicon nitride structure, the product containing between 10 and 50 percent silicon carbide, the product having interengaged matrices of silicon carbide and said compound the product being characterized by a modulus of rupture in excess of 70,000 p.s.i. at 20°C as measured by three point flexure testing, the silicon carbide particles having an average size of 1 micron or less as indicated on photomicrograph at 1000× magnification, the product having an electrical resistivity between 1 and 1×10^7 ohm centimeters.

3,890,251
SEMICONDUCTIVE OXIDES

Frank Knowles Patterson, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Oct. 15, 1973, Ser. No. 406,303
Int. Cl. H01b *1/08*
U.S. Cl. 252—519 **8 Claims**



1. Semiconductive oxides of the hexagonal alpha-Fe_2O_3 crystal structure having the formula $Fe_{2-x}Ge_xO_3$, wherein x is in the range 0.0001–0.05.

3,890,252
SHAPED ARTICLES OF CRYSTALLINE COPOLYMERS OF CIS-1,4-DIHALO-2,3-EPOXYBUTANE

Edwin J. Vandenberg, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 314,287, Dec. 12, 1972, abandoned. This application Mar. 18, 1974, Ser. No. 452,487
Int. Cl. C08g *23/02*
U.S. Cl. 260—2 A **7 Claims**

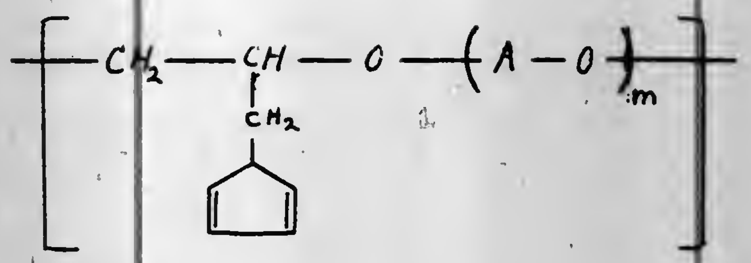
1. A shaped article of a high molecular weight, crystalline copolymer of a cis-1,4-dihalo-2,3-epoxybutane and from about 0.5 to about 5 weight % of at least one other monomer which is a halogen-substituted alkylene oxide or oxetane containing at least 4 carbon atoms, said copolymer having a crystallization half-time greater than the homopolymer of said cis-1,4-dihalo-2,3-epoxybutane.

3,890,253
REVERSIBLY CROSSLINKED POLYMERS

Yasuhiro Takeshita; Michitake Uoi; Yoshiyuki Hirai, and Mitsuru Uchiyama, all of Chiba, Japan, assignors to Idemitsu Kosan Co. Ltd., Tokyo, Japan

Division of Ser. No. 210,834, Dec. 22, 1971, Pat. No. 3,826,760. This application Feb. 27, 1974, Ser. No. 446,502
Claims priority, application Japan, Dec. 26, 1970, 45-128474; Dec. 26, 1970, 45-128475; Sept. 29, 1971, 46-75427; Sept. 29, 1971, 46-75428
Int. Cl. C08g *23/20*
U.S. Cl. 260—2 A **2 Claims**

1. A self-curing polyether characterized in that it contains recurring units of the general formula:



wherein A represents a lower alkylene group and m represents zero or a positive integer of at least 1.

3,890,254
METHOD OF RETICULATING URETHANE FOAM AND PRODUCT

James L. Guthrie, Ashton, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Feb. 13, 1973, Ser. No. 332,053
Int. Cl. C08g *22/48;* **C08j** *22/14*
U.S. Cl. 260—2.5 BD **9 Claims**

1. A method for preparing improved crosslinked reticulated hydrophilic foam having three-dimensional networks, said method comprising reacting a first component comprising isocyanate capped polyoxyethylene polyol having a reaction functionality greater than two, with a second component comprising aqueous reactant, the ratio of moles H_2O/moles NCO groups being about 6.5 to about 390 in said second and first components respectively, said first component containing monomeric organic polyisocyanate reticulating agent and a soluble or dispersible nonionic surfactant, said reticulating agent being present in an amount from about 2% by weight to about 35% by weight of the said isocyanate capped polyol, said surfactant being selected from the group consisting of (a) block copolymers of poly(oxyethylene) groups condensed onto ends of essentially water-insoluble poly (oxypropylene) chain, and (b) oxyethylated straight chain alcohol and being present in an amount from 0.1 to about 10% by weight of the isocyanate capped polyoxyethylene polyol, the polyoxyethylene polyol moiety of the isocyanate capped member having a weight average molecular weight of about 200 to about 20,000 and a hydroxyl functionality of about 2 to about 8, and recovering a reticulated foam product having cells which together provide a skeletal structure formed of a network of interconnected platelets, ribbons or strands.

3,890,255
CURE CATALYZED POLYURETHANE COMPOSITION

Bruce G. van Leuwen, Hamden, and Donald G. Powell, Woodbridge, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed May 31, 1973, Ser. No. 365,418
Int. Cl. C08g *22/08, 22/16*
U.S. Cl. 260—2.5 AQ **9 Claims**

1. In a flexible polyurethane foam prepared by the process which comprises reacting, in the presence a reaction catalyst, a foaming agent, and a curing agent, an organic polyisocyanate with an oxypropylated oxyethylated polyether triol characterized by (1) a molecular weight of about 5,800–6,600, (2)

an aliphatic triol nucleus, (3) polyoxypropylene chain segments attached through one end thereof to said nucleus, and (4) polyoxyethylene chain segments attached through one end thereof to said polyoxypropylene chain segments, with the proviso that said polyether triol contains about 7–18 moles of said ethylene oxide per every mole of said aliphatic triol,

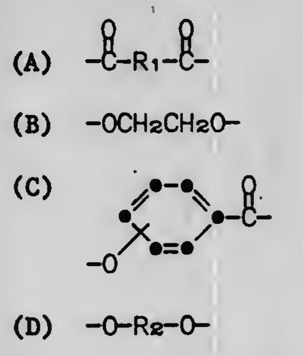
the improvement of employing as said curing agent an oxyalkylated alkanolamine, in a proportion of about 1–6 parts per every 100 parts by weight of said polyether triol, said oxyalkylated alkanolamine being substantially free of primary hydroxy groups, having a hydroxyl number of about 390–570, and being the product of condensing an alkylene oxide, selected from the group consisting of propylene oxide, butylene oxide and a mixture thereof, with an alkanolamine selected from the group consisting of an ethanolamine, a propanolamine and an ethanolpropanolamine.

3,890,256
COPOLYESTER PREPARED BY CONTACTING ACYLOXY BENZOIC ACID WITH A POLYESTER OF ETHYLENE GLYCOL AND DICARBOXYLIC ACID

Finley E. McFarlane, and Thomas G. Davis, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 7, 1974, Ser. No. 477,381
Int. Cl. C08g *17/02, 17/08*
U.S. Cl. 260—47 C **8 Claims**

1. A copolyester having an inherent viscosity of at least 0.4 measured at 25°C. using 0.50 gram of polymer per 100 ml. of a solvent composed of 60 volumes of phenol and 40 volumes of tetrachloroethane and having no substantial amount of either aliphatic to aromatic oxygen linkages or aromatic to aromatic oxygen linkages, the copolyester being comprised of the following divalent radicals:



wherein

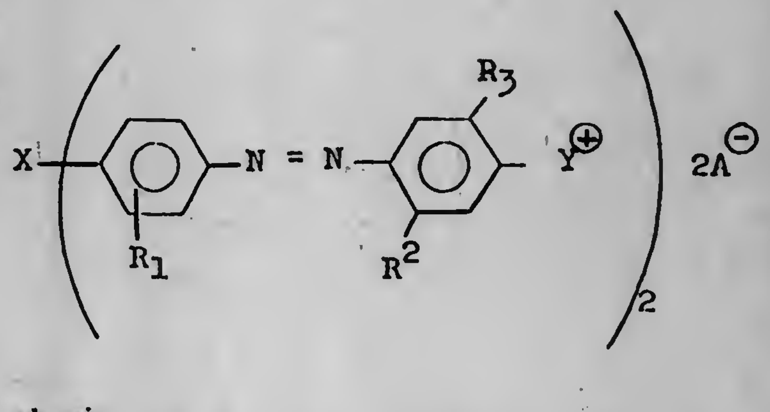
- R_1 is a divalent alicyclic radical having 4 to 20 carbon atoms, a divalent aliphatic radical having 1 to 40 carbon atoms, or a divalent aromatic radical having 6 to 16 carbon atoms with the carbonyl linkages separated by at least 3 carbon atoms, with the proviso that at least 50 mole percent of R_1 is the divalent aromatic radical,
- R_2 is a carbocyclic aromatic nucleus wherein the chain extending oxygen linkages are coaxial or parallel and are oppositely directed,
- the range of radical (C) plus radical (D) is from about 30 to about 75 mole percent, based on the total moles of radical (B), radical (C) and radical (D) combined,
- the amount of radical (D) is not greater than 30 mole percent, based on the total moles of radical (B), radical (C) and radical (D) combined,
- in radical (C) the oxygen is linked either in the meta or para position with regard to the carbonyl group, and
- at least 60 mole percent of radical (C) is the para isomer.

3,890,257
YELLOW TO ORANGE DISAZO CATIONIC DYES CONTAINING TWO QUATERNARY AMMONIUM GROUPS

Daniel Shaw James, Hockessin, Del., assignor to E. I. du Pont de Nemours and Co., Wilmington, Del.

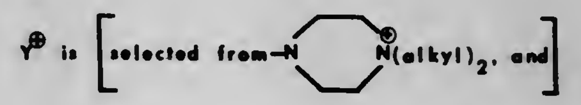
Filed Sept. 19, 1973, Ser. No. 398,575
Int. Cl. C09b *35/04, 35/22, 35/26*
U.S. Cl. 260—148 **17 Claims**

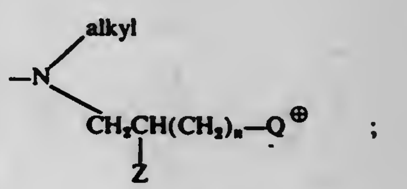
1. A dye having the formula



wherein

- X is selected from $—CH_2—$, $—C(CH_3)_2—$, $—NH—$, $—O—$, $—OCH_2(CH_2)_{1-2}O—$, $—OCH_2CH(OH)CH_2O—$, $—SO_2—$, $—S—$, $—S—S—$, $—NHCO—$, and $—NHCONH—$;
- R_1 is selected from H, CH_3, C_2H_5, Cl, and Br;
- R_2 is selected from H, alkyl, alkoxy, Cl, NHCO-alkyl, and $NHCOC_6H_5$;
- R_3 is selected from H; alkyl, and alkoxy;





wherein

- n is 0 or 1;
- Z is H when n is 0 and Z is OH when n is 1;
- Q^+ is selected from $NR_4R_5R_6$, and $NHCOCH_2NR_4R_5R_6$;
- R_4 is selected from alkyl, and hydroxyalkyl;
- R_5 is selected from alkyl, hydroxyalkyl, and cyclohexyl;
- R_6 is selected from H, alkyl and benzyl;
- R_4 and R_5 form an alicyclic ring;
- A^- is an anion; the alkyl, alkoxy, NHCOalkyl and hydroxyalkyl substituents refer to such substituents having 1 to 4 carbon atoms.

3,890,258
ELECTRIC CIRCUIT BREAKER WITH SERIES CONNECTED INTERRUPTING AND ISOLATING BREAKS

Richard H. Miller, Berwyn, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed June 28, 1974, Ser. No. 484,181
Int. Cl. H01h *33/68*
U.S. Cl. 200—150 R **8 Claims**

1. An electric circuit breaker comprising:
- a. a pair of separable interrupting contacts relatively movable between engaged and disengaged positions,
- b. opening spring means biasing a movable one of said interrupting contacts from an engaged position toward a disengaged position,

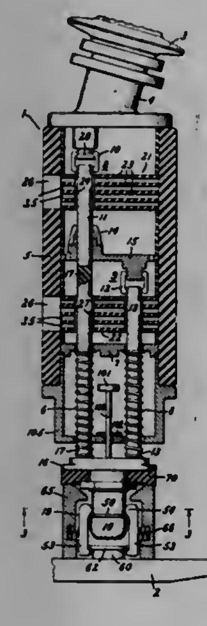
c. first and second isolating contacts electrically in series with said interrupting contacts and relatively movable between engaged and disengaged positions, said first isolating contact being mechanically coupled to said movable interrupting contact,

d. a movable blade member carrying said second isolating contact and providing a path through which closing force is applied to said movable inerrupting contact during circuit-breaker closing,

e. means for driving said blade and said second isolating contact through an opening stroke during circuit-breaker opening,

f. said opening spring means being responsive to the initial portion of the opening stroke of said blade: (i) to drive said movable interrupting contact out of engagement with the other of said interrupting contacts and (ii) to drive said first isolating contact in follow-up relationship to said second isolating contact,

g. stop means for blocking further disengaging motion of said movable interrupting contact after said movable interrupting contact has moved through predetermined opening travel and for blocking further follow-up motion of said first isolating contact, thereby causing continued opening travel of said blade to separate said isolating contacts,



h. and means for coupling said blade to said movable interrupting contact during the initial portion of said opening stroke so that opening force can then be transmitted from said blade to said movable interrupting contact through said coupling means,

i. said coupling means comprising a shoulder on one of said isolating contacts and fingers forming a part of the other of said isolating contacts having portions engaging said shoulder in a manner such as to interfere with relative motion of said isolating contacts in a disengaging direction,

j. said finger portions being urged into engagement with said shoulder during circuit-breaker opening with a force varying in magnitude directly with the value of current through said isolating contacts, said force opposing relative motion of said isolating contacts in a disengaging direction.

3,890,259

ACIDIC OLEO-ACRYLIC RESINS AND PROCESSES FOR PREPARING SAME

Giorgio Montesissa, and Giancarlo Del Signore, both of Piacenza, Italy, assignors to Duco S.p.A., Trieste, Italy

Filed Apr. 8, 1974, Ser. No. 456,950

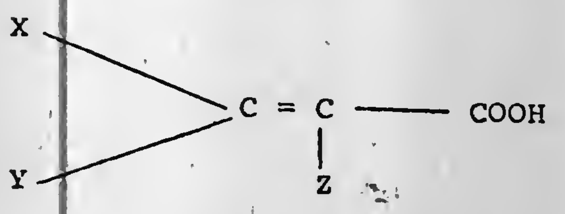
Int. Cl. C08f *19/14*

U.S. Cl. 260—23 H **14 Claims**

1. An acidic resin consisting essentially of the product obtained by reacting, at a temperature between about 250° and 300°C,

I. at least one poly-unsaturated monocarboxylic fatty acid having from 9 to 20 carbon atoms and more than one olefinic double bond or an ester of said acid with a polyvalent alcohol or a mixture of said acids and esters with

II. an α,β-unsaturated monocarboxylic acid of the formula:



wherein X and Y are independently selected from the group consisting of hydrogen and alkyl groups having from 1 to 3 carbon atoms, and Z is hydrogen or methyl group, the reaction being carried out by admixing the α,β-unsaturated monocarboxylic acid to component (I) in an amount such that in the reaction mixture, the weight ratio of free α,β-unsaturated acid to combined α,β-unsaturated acid is between 0.1 and 1; and wherein the α,β-unsaturated monocarboxylic acid constitutes between 5 and 25 percent by weight of the product, said product having an acid value ranging from 60 to 300, a viscosity value between P and Z_{10} on the Gardner-Holdt scale, and being substantially free of homopolymers of the α,β-unsaturated monocarboxylic acid.

3,890,260

STABILIZED POLYBUTADIENE RESINS

Delmar F. Lohr, Jr.; John William Fieldhouse, and Edward Leo Kay, all of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 16, 1973, Ser. No. 351,690

Int. Cl. C08d *11/04*

U.S. Cl. 260—23,7 R **6 Claims**

1. A composition curable to a hard resin having enhanced resistance to thermo-oxidative deterioration, which composition comprises

	Parts by Weight
A butadiene homopolymer or copolymer resin	100
Vinyltriacetoxysilane	0.05–5.0
Silica	100–500
Zinc bis(N-substituted-beta-aminoethanethioate)	0.5–5.0
Calcium stearate	0.5–5.0
A peroxide curing agent	0.5–6.0

the N-substituent being phenyl or N-phenyl-4-aminophenyl, and the resin being a homopolymer of butadiene or a copolymer of butadiene and styrene and containing at least 40 percent by weight of butadiene, and at least 80 percent of butadiene repeating units in the homopolymer being in the 1,2-configuration; the curing agent being a peroxide which gives radicals of the structure $R_2(CH_3)CO.$ in which each R represents a hydrocarbon radical containing 1 to 20 carbon atoms.

4. A peroxide-cured resin highly resistant to thermooxidative deterioration of physical properties, said resin containing therein

	Parts by Weight
A butadiene homopolymer or copolymer resin	100
Vinyltriacetoxysilane	0.5–5.0
Silica	100–500
Zinc bis(N-[substituted-beta] phenyl-2-aminoethanethioate)	0.5–5.0
Calcium stearate	0.5–5.0

the substituent being aniline or paraphenylenediamine and the resin being a homopolymer of butadiene or a copolymer of butadiene and styrene and containing at least 40 percent by weight of butadiene, and at least 80 percent of butadiene repeating units in the homopolymer or copolymer being in the 1,2-configuration, the resin having been cured by a peroxide which gives radicals of the structure $R_2(CH_3)CO.$ in which each R represents a hydrocarbon radical containing 1 to 20 carbon atoms.

3,890,261

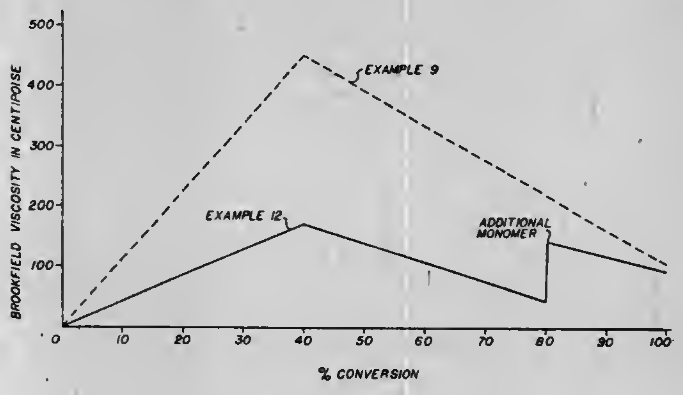
HIGH SOLIDS CHLOROPRENE POLYMER LATEX

Kenneth D. Fitzgerald, Sugarland, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 305,191, Nov. 9, 1972, abandoned. This application Apr. 15, 1974, Ser. No. 461,041

Int. Cl. C08c *11/72;* **C08d** *9/14*

U.S. Cl. 260—23.7 H **25 Claims**



1. A process for the production of high solids latexes having greater than 55 percent by weight of solids which comprises

1. polymerizing monomers comprising chloroprene containing up to 25 percent by weight of another ethylenically unsaturated organic monomer copolymerizable with chloroprene in an aqueous emulsion containing 60 to 90 percent of the total of said monomer, 100 percent of the total of water, and salts of cations selected from the group consisting of alkali metals, ammonia and mixtures thereof (a) from 0.15 to 1.0 parts of a fatty acid member selected from the group consisting of unpolymerized fatty acids, polymerized fatty acids and mixtures thereof (b) from 0.30 to 4.0 parts of a formaldehyde condensate of a naphthalene sulfonic acid and (c) from 1.4 to 4.0 parts of a rosin member selected from the group consisting of rosins, disproportionated rosins and polymerized rosins until the viscosity of the polymerization mixture reaches a peak viscosity;
2. determining said peak viscosity has been reached;
3. continuing said polyemerization until said viscosity at least begins to decline; and
4. adding the remaining monomer and continuing polymerization to to form a chloroprene polymer latex having greater than 55 percent solids by weight; provided the weight parts of said (a) are based on the weight of said fatty acid member, the weight parts of said (b) are based on the weight of said salt calculated as a salt and the weight parts of said (c) are based on the weight of said rosin member with all of the weights of (a), (b) and (c) being based on 100 parts of monomer charged up to the time of said peak viscosity.

3,890,262

PYROGENOUS RESIDUE-NOVOLAC FIBERS

James Economy, Eggertsville; Francis J. Frechette, Tonawanda; Ruey Y. Lin, Williamsville, and Luis C. Wohrer, Lewistown, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Continuation of Ser. No. 253,603, May 15, 1972, abandoned. This application Apr. 11, 1974, Ser. No. 460,244

Int. Cl. C08g *51/52*

U.S. Cl. 260—28 **9 Claims**

1. An infusible fiber comprising an aldehyde cured homogeneous blend of from about 5 to about 40 percent of a novolac, said novolac having a molecular weight ranging from about 500 to about 1,200, and a pyrogenous residue having a beta-resin content greater than about 5 percent, said residue selected from the group consisting of coal tar pitch and pyrogenous asphalts.

3,890,263

METHOD OF PRODUCING A THERMOPLASTIC COMPOSITION COMPRISING ESSENTIALLY BITUMEN AND AN ELASTOMER, AND PRODUCT THUS OBTAINED

Jean-Yves Meynard, Cormenon, France, assignor to Societe Nouvelle Siplast, Paris, France

Filed May 8, 1974, Ser. No. 468,262

Claims priority, application France, May 11, 1973, 73.17159

Int. Cl.² C08L *95/00*

U.S. Cl. 260—28.5 AS **31 Claims**

1. A method of producing a thermoplastic composition comprising bitumen, an elastomer and possibly a mineral filler, by using a dissolving intermediary, wherein there is used as an elastomer a random ethylene-propylene copolymer referred to as EPR including the random ethylene-propylene-diene terpolymer referred to as EPDM of which the diene component is selected from the group consisting of hexadiene-(1.4), dicyclopentadiene, 5-methylene-norbornene-(2), 5-ethylene-norbornene-(2) and 1-methyl-cyclooctadiene, said EPR copolymer consisting of 54 to 77% by weight of ethylene, 0 to 5% by weight of diene and the balance to 100% by weight of propylene, a solid dissolving intermediary is used which consists of at least one polyolefin, saturated or unsaturated, linear or branched, having a mean molecular weight within the range of 2,000 to 500,000 and selected from the group consisting of polyethylene, isotactic polypropylene and atactic polypropylene, said elastomer is mixed up with said dissolving intermediary in the proportions of 99 to 50% by weight of said elastomer and 1 to 50% by weight of said dissolving intermediary, at a temperature at least equal to the softening temperature of said dissolving intermediary, which ranges from 70° to 150°C in the case of polyethylenes and from 150° to 160°C for polypropylenes, the mixture is subsequently granulated to a particle size of about 2 to 3 mm., to yield a granulated elastomer and dissolving intermediary pre-mixture, whereafter said granulated pre-mixture is kneaded with said bitumen and said possible mineral filler, in the proportions of 1 to 15% by weight of said pre-mixture granular substance, 99 to 35% by weight of said bitumen and 0 to 50% by weight of said mineral filler, provided that the total of these three component elements is 100% by weight, at a temperature within the range of 180° to 250°C, in order to obtain a fine particulate dispersion of said granulated pre-mixture in the bitume n mass, said bitumen being of petroleum origin and having a penetration at 25°C of 1 to 500 according to the French standard NF T 66 004.

14. A thermoplastic composition produced by applying the method set forth in claim 1, consisting of 99 to 35% by weight of bitumen of petroleum origin having a penetration of 1 to 500 at 25°C according to the French standard NF T 66 004; of 1 to 15% by weight of fine particles dispersed through the

mass of said bitumen and consisting of a mixture of 99 to 50% by weight of a random ethylene-propylene copolymer referred to as EPR, including the random ethylene-propylene-diene terpolymer referred to as EPDM, wherein said diene component element is selected from the group consisting of hexadiene-(1.4), dicyclopentadiene, 5-methylene-norbornene-(2), 5-ethylidene-norbornene-(2) and 1-methyl-cyclooctadiene, said EPR copolymer having an ethylene content of 54 to 77% by weight, a diene content of 0 to 5% by weight, and a propylene content to make the balance to 100% by weight and a Mooney viscosity ML (1+4) at 121°C of 60 to 70, and 1to 50% by weight of at least one saturated or unsaturated polyolefin containing or not side chains and having a mean molecular weight within the range of 2,000 to 500,000, said polyolefin being selected from the group consisting of polyethylene, isotactic polypropylene and atactic polypropylene; and of 0 to 50% by weight of a mineral filler, provided that the total of the three component elements corresponds to 100% by weight.

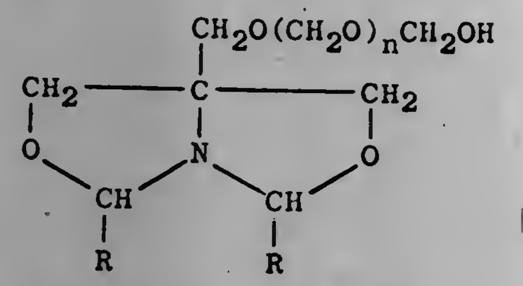
3,890,264
SURFACE-COATING COMPOSITIONS CONTAINING POLYOXYMETHYLENEOXAZOLIDINES

Henri Sidi, Paramus, and Hilding R. Johnson, Wayne, both of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Mar. 4, 1974, Ser. No. 447,797
Int. Cl. C08f *45/60*
U.S. Cl. 260—29.6 HN **18 Claims**

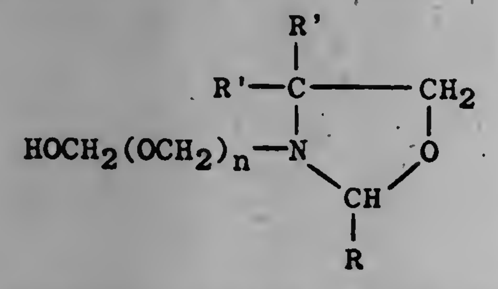
1. A surface-coating composition having improved resistance to attack by bacteria and fungi that comprises (a) a water-insoluble, film-forming, resinous binder selected from the group consisting of synthetic linear addition polymers prepared by the emulsion polymerization of ethylenically-unsaturated monomers, oleoresinous binders, and mixtures thereof and (b) 0.1 percent to 3 percent, based on the weight of the composition of a biocidal component comprising a polyoxymethyleneoxazolidine selected from the group consisting of

(i) compounds having the structural formula



wherein each R represents hydrogen, alkyl of 1 to 6 carbon atoms, phenyl, halophenyl or $—(CH_2O)_mCH_2OH$; *m* represents a number in the range of 0 to 2; and *n* represents a number in the range of 1 to 4;

ii. compounds having the structural formula



wherein each R′ represents alkyl of 1 to 6 carbon atoms or $—CH_2OH$ and R and n have the aforementioned significance; and

iii. mixtures thereof.

3,890,265
METHOD AND COMPOSITIONS FOR PROTECTING SURFACES

John Francis Corrigan, Pennant Hills, New South Wales, Australia, assignor to Enamel Varnish & Chemical Company of Australia Pty. Limited, Blacktown, New South Wales, Australia

Filed Sept. 7, 1972, Ser. No. 287,079
Int. Cl. C08g *51/04*
U.S. Cl. 260—33.6 UB **8 Claims**

1. A two-part primer composition adapted to be mixed immediately prior to use and applied to under-water metal surfaces for the protection thereof of which one part is a moisture-curing polyurethane and the second part is a suspension of a dense pigment which is a non-reactive metal with a high specific gravity in a mixture of a polyvinylbutyral binder, a solvent and phosphoric acid, said solvent being an organic solvent which dissolves the binder and is compatible with the phosphoric acid.

3,890,266
POLYCARBONATE MIXTURES

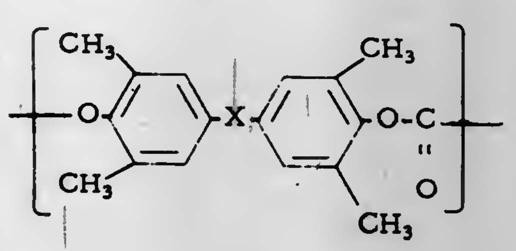
Volker Serini, Krefeld; Hugo Vernaleken, Krefeld-Bockum, and Wolfgang Cohnen, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Germany

Filed Sept. 26, 1973, Ser. No. 400,757

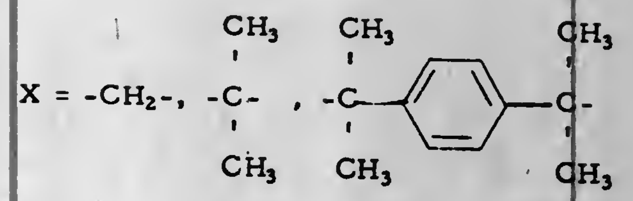
Claims priority, application Germany, Oct. 5, 1972, 2248817

Int. Cl. C08g *39/00, 51/10*
U.S. Cl. 260—37 PC **6 Claims**

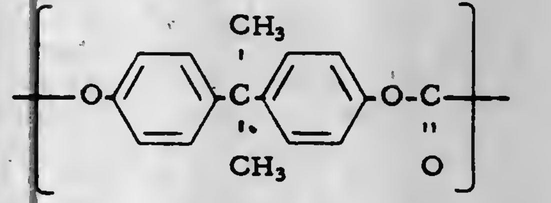
1. Polycarbonate mixtures comprising, based on the polycarbonate, 10 to 95 parts by weight of polycarbonate of recurring units:



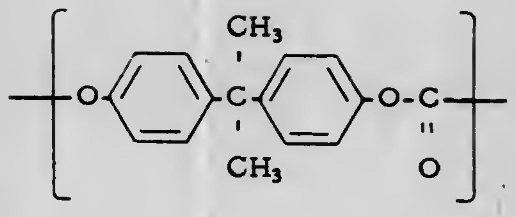
where



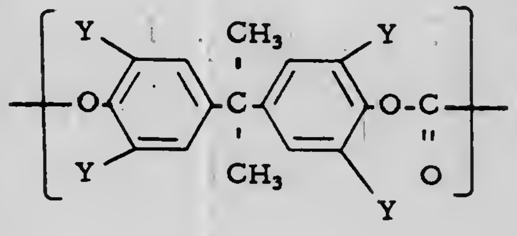
and 90 to 5 parts by weight of (1) homopolycarbonate of recurring units:



or (2) copolycarbonates of recurring units:



and



where

Y = Cl, Br

and wherein there are at least two of the former unit per latter unit, and each of polycarbonates in said mixtures has an average molecular weight, M_w, above 20,000.

3,890,267
MOLDING MATERIAL

Mitio Fukushima, Suita, and Teruo Iwanami, Takatsuki, both of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 30, 1973, Ser. No. 355,528
Int. Cl. C08f *45/10*
U.S. Cl. 260—42.18 **3 Claims**

1. A molding material consisting essentially of 95 to 20% by weight of a copolymer consisting essentially of ethylene and vinyl acetate which has been hydrolyzed and 5 to 80% by weight of glass fiber, said copolymer having ethylene content of 15 to 60% by mole and being hydrolyzed to the extent of at least 98% by mole of the vinyl acetate component of the copolymer.

3,890,268
WEATHER RESISTANT POLYVINYL CHLORIDE COMPOUNDS AND METHOD OF MAKING SAME

James D. Tanzilli, Avon Lake, and Arthur F. Korney, Rocky River, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Sept. 7, 1973, Ser. No. 395,225
Int. Cl. C08f *45/04*
U.S. Cl. 260—42.29 **10 Claims**

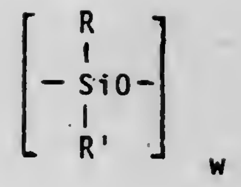
1. A rigid vinyl chloride polymeric composition having improved weathering characteristics comprising a vinyl chloride polymer and about 5 to 20 weight parts of titanium dioxide per 100 weight parts of vinyl chloride polymer wherein said titanium dioxide contains about 10 to 60% by weight anatase titanium dioxide and about 40 to 90% by weight rutile titanium dioxide.

3,890,269
PROCESS FOR PREPARING AMINOFUNCTIONAL POLYSILOXANE POLYMERS

Eugene Ray Martin, Onsted, Mich., assignor to Stauffer Chemical Company, Adrian, Mich.

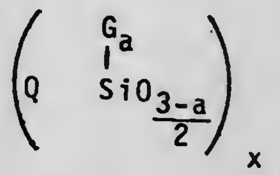
Continuation-in-part of Ser. No. 279,911, Aug. 11, 1972, abandoned. This application Mar. 18, 1974, Ser. No. 452,036
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 E **23 Claims**

1. A process for preparing aminofunctional polysiloxanes which comprises equilibrating a mixture containing a cyclic organopolysiloxane of the formula



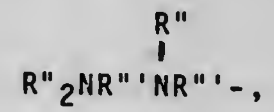
$$\left[-\overset{R}{\underset{R'}{\overset{|}{\underset{|}{Si}}}}O-\right]_w$$

where R and R′ are monovalent hydrocarbon radicals having up to 18 carbon atoms and *w* is a number of from 3 to 10 and an aminofunctional silicon compound represented by the formula

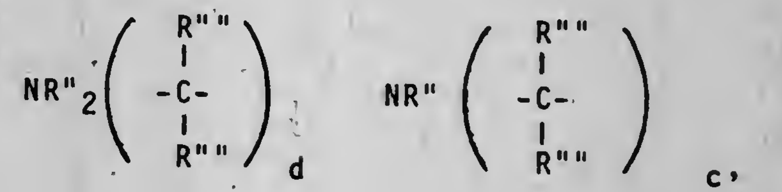


$$\left(Q\ \overset{G_a}{\overset{|}{Si}}O_{\frac{3-a}{2}}\right)_x\ Z_b$$

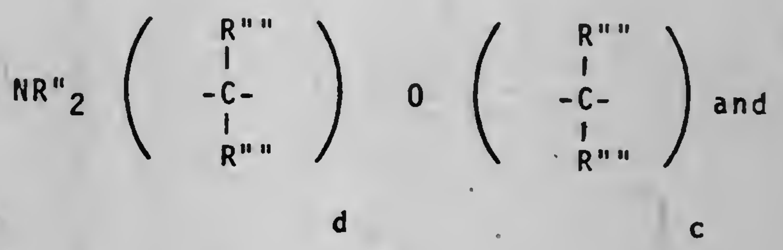
wherein G is selected from the group consisting of R, OR″, $OSiR_3$ and $OR'''NR''_2$ in which R is the same as above, R″ is selected from the group consisting of hydrogen and monovalent hydrocarbon radicals having from 1 to 18 carbon atoms, R‴ is selected from the group consisting of divalent hydrocarbon radicals, divalent hydrocarbonoxy radicals in which the oxygen is in the form of an ether linkage and unsaturated divalent hydrocarbon radicals, Q is selected from the group consisting of $R''_2NR'''—$,



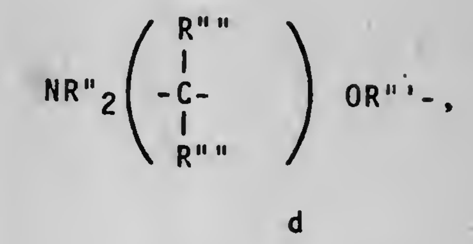
$$R''_2NR'''\overset{R''}{\overset{|}{N}}R'''-,$$



$$NR''_2\left(\overset{R''''}{\underset{R''''}{\overset{|}{\underset{|}{-C-}}}}\right)_d\quad NR''\left(\overset{R''''}{\underset{R''''}{\overset{|}{\underset{|}{-C-}}}}\right)_c,$$



$$NR''_2\left(\overset{R''''}{\underset{R''''}{\overset{|}{\underset{|}{-C-}}}}\right)_d O\left(\overset{R''''}{\underset{R''''}{\overset{|}{\underset{|}{-C-}}}}\right)_c \text{ and}$$



$$NR''_2\left(\overset{R''''}{\underset{R''''}{\overset{|}{\underset{|}{-C-}}}}\right)_d OR'''-,$$

R⁗ is selected from the group consisting of R and hydrogen, Z is selected from the class consisting of $R''O_{0.5}$, $R_3SiO_{0.5}$ and $R''NR'''O_{0.5}$, *a* is a number of from 0 to 2, *b* is a number of from 0 to 3, *c* is a number of from 1 to 10, *d* is a number of from 1 to 10 and *x* is a number of from 1 to 20,000 in the presence of a catalyst selected from the group consisting of alkali metal hydrides, alkali metal alkyls, alkali metal alkenyls and alkali metal aryls.

3,890,270

POLYVINYL HALIDE RESIN COMPOSITIONS

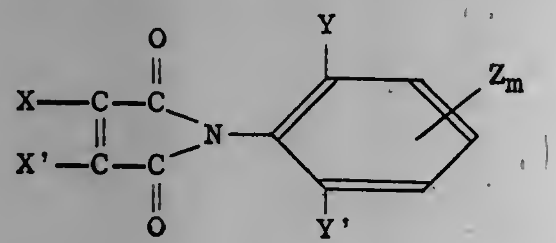
Pasquale P. Minieri, Woodside, N.Y., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Apr. 10, 1974, Ser. No. 459,812

Int. Cl. C08f *45/60*

U.S. Cl. 260—45.8 N **19 Claims**

1. A composition resistant to attack by bacteria and fungi that comprises a vinyl halide resin and from 0.01 to 2 percent, based on the weight of the composition, of a biocidal compound having the structural formula



where X and X′ each represents hydrogen or halogen; Y and Y′ each represents alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, nitro, or benzyl; Z represents alkyl of 1 to 4 carbon atoms, halogen or nitro; and *m* represents a number in the range of 0 to 3.

3,890,271

POLISH INGREDIENT

John G. Kokoszka, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 330,375, Feb. 7, 1973, Pat. No. 3,836,371. This application Feb. 1, 1974, Ser. No. 438,806

Int. Cl. C08f *11/04*

U.S. Cl. 260—46.5 R **6 Claims**

1. A composition which consists essentially of (1) 45 to 99.5% by weight of a hydroxyl endblocked polydimethylsiloxane having a viscosity in the range of 10 to 15,000 cs. at 25°C., (2) 0.3 to 35% by weight of a silane selected from the group consisting of those having the general formulae $(RO)_3SiR'NHR''$ and $(RO)_3SiR'NHCH_2CH_2NH_2$ wherein R is an alkyl radical containing from 1 to 4 carbon atoms, R′ is a divalent hydrocarbon radical free of aliphatic unsaturation and contains from 3 to 4 carbon atoms, and R″ is selected from the group consisting of the hydrogen atom and the methyl radical, and (3) 0.2 to 25% by weight of a silane having the general formula X_3SiZ wherein X is selected from the group consisting of alkoxy and acyloxy radicals containing from 1 to 4 carbon atoms and Z is a nonhydrolyzable radical selected from the group consisting of hydrocarbon radicals, halogenated hydrocarbon radicals and radicals composed of carbon, hydrogen and oxygen atoms wherein the oxygen atoms are present in hydroxyl groups, ester groups or ether linkages, there being from 1 to 10 carbon atoms in the Z radical.

3,890,272

POLYMERIZING BIS-MALEIMIDES

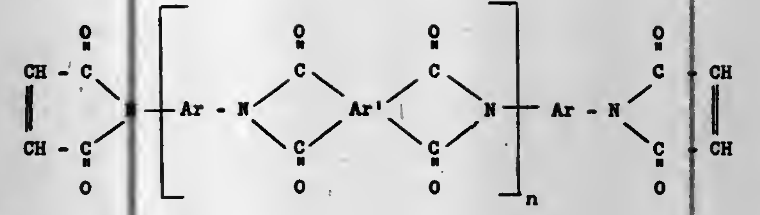
Gaetano Francis D'Alelio, South Bend, Ind., assignor to University of Notre Dame du Lac, South Bend, Ind.

Filed May 25, 1973, Ser. No. 363,799

Int. Cl. C08g *20/32*

U.S. Cl. 260—47 UA **21 Claims**

1. A process for converting a bis-maleimide of the formula:



wherein Ar is a divalent aromatic organic radical,

Ar′ is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar′ radical,

and

n is 0 or a positive integer of 1 to 20,

to a higher molecular weight polymer comprising: polymerizing said bis-maleimide at a temperature in the range of 85° to 275°C. in the presence of about 0.01 to 5% by weight of the bis-maleimide of an alkali metal salt of a Bronsted acid, said alkali metal salt of a Bronsted acid selected from the group consisting of an alkali metal salt of an organic Bronsted acid having a pk_a in the range of about 4 to 6, an alkali metal cyanide and an alkali metal carbonate.

3,890,273

ANAEROBICALLY CURABLE SEALING COMPOSITION CONTAINING 2,2-BIS(4-ACRYLOXY-ALKOXY PHENYL) PROPANE

Tsutomu Saito, Tokyo, Japan, assignor to Three Bond Co. Ltd., Tokyo, Japan

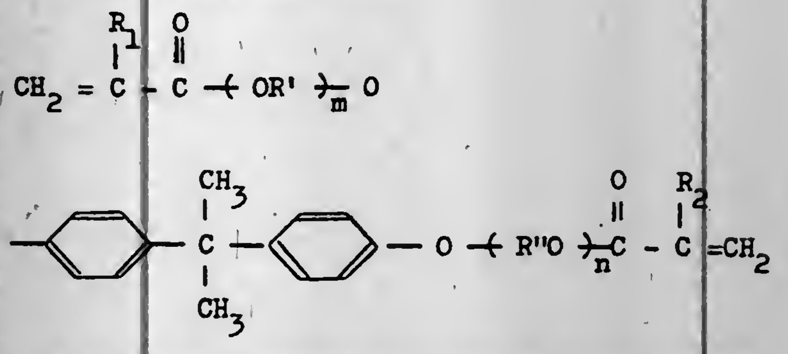
Filed Apr. 26, 1974, Ser. No. 464,343

Claims priority, application Japan, Dec. 19, 1973, 48-142652

Int. Cl. C08f *3/62*

U.S. Cl. 260—47 UA **16 Claims**

1. An anaerobically curable sealing composition consisting essentially of 100 parts by weight of a polymeric monomer having the general formula of



wherein, R_1 and R_2 represent hydrogen or alkyl radicals, respectively, R′ and R″ represent alkylene radicals having from 2 to 4 carbon atoms, respectively, and m and n represent, respectively, an integer of from 2 to 8, 0.2 to 3 parts by weight of an organic peroxide, 0.05 to 0.5 part by weight of n-dodecyl mercaptan, 0.2 to 2 parts by weight of O-sulfobenzoic imide, and 0.1 to 1 part by weight of 2,6-di-tertiary butyl p-cresol.

3,890,274

PHTHALONITRILE-TERMINATED AROMATIC POLYIMIDES

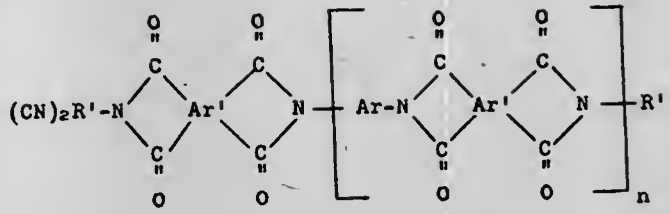
Gaetano Francis D'Alelio, South Bend, Ind., assignor to University of Notre Dame du Lac, Notre Dame, Ind.

Filed Oct. 11, 1974, Ser. No. 514,256

Int. Cl. C08g *20/32*

U.S. Cl. 260—47 CP **7 Claims**

1. A phthalonitrile-terminated aromatic polyimide having the structural formula:



wherein

Ar is a divalent aromatic organic radical,

Ar′ is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar′ radical,

R′ is an aromatic organic radical, the two cyano groups being ortho in the aromatic radical and

n is a positive integer of at least 1.

3,890,275

IMIDOMETHYL PHOSPHONATES

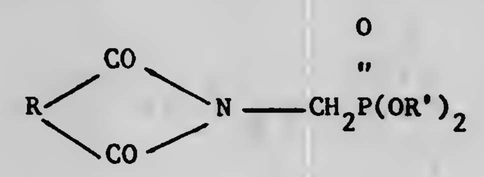
Peter Golborn, Skelmersdale, England, and James J. Duffy, Buffalo, N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 239,760, March 30, 1972, Pat. No. 3,849,440. This application Aug. 2, 1974, Ser. No. 494,109

Int. Cl. C08f *45/60;* **C08g** *51/60;* **C09k** *3/28*

U.S. Cl. 260—45.8 NE **16 Claims**

1. An article comprising a resin compound and a flame retardant amount of a compound of the formula



wherein R′ is selected from the group consisting of phenyl, lower alkenyl and halogen substituted and unsubstituted lower alkyl of 1 to 6 carbon atoms and R is selected from the group consisting of lower alkenylene and lower alkylene of 1 to 8 carbon atoms, wherein only 2 carbon atoms in said group form annular members of the imide rings.

3,890,276

SYNERGISTIC COMBINATIONS OF ORGANIC STABILIZERS FOR HALOGENATED RESINS

Christian H. Stapfer, Newtown, Pa., assignor to Cincinnati Milacron Chemicals Inc., Reading, Ohio

Continuation of Ser. No. 825,048, May 15, 1969, abandoned, which is a continuation-in-part of Ser. Nos. 729,456, May 15, 1968, Pat. No. 3,544,510, and Ser. No. 780,888, Dec. 3, 1968, Pat. No. 3,630,993. This application Apr. 24, 1973, Ser. No. 354,130

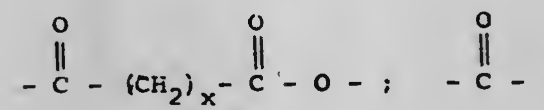
Int. Cl.² C08F *45/62*

U.S. Cl. 260—45.75 S **17 Claims**

1. A halogen-containing resin composition comprising a resin selected from the group consisting of chlorinated polyethylene, polyvinyl halides, polyvinylidene chloride and copolymers of vinyl chloride with copolymerizable ethylenically unsaturated monomers stabilized with from 0.1 to 10 weight percent of a synergistic combination of (a) an organic divalent-sulfur compound selected from the group consisting of mercaptals, mercaptols, mercaptans, mercaptocarboxylates and sulfides, said sulfides consisting of carbon, oxygen, hydrogen and sulfur, and (b) a mono-hydrocarbyltin compound corresponding to the formula

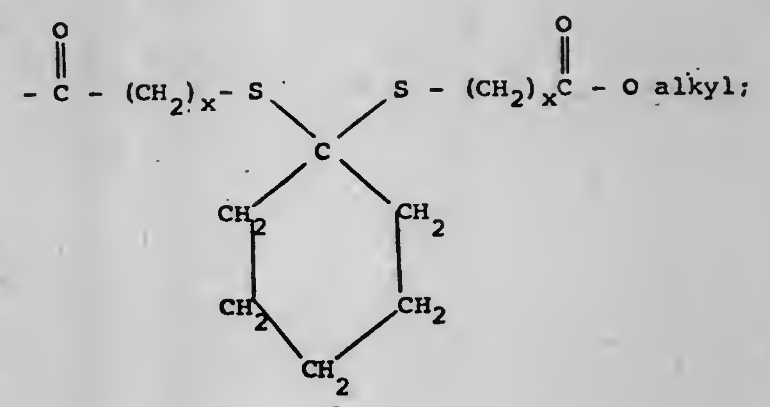
$$RSn(Z'Y)_{3-2n}$$

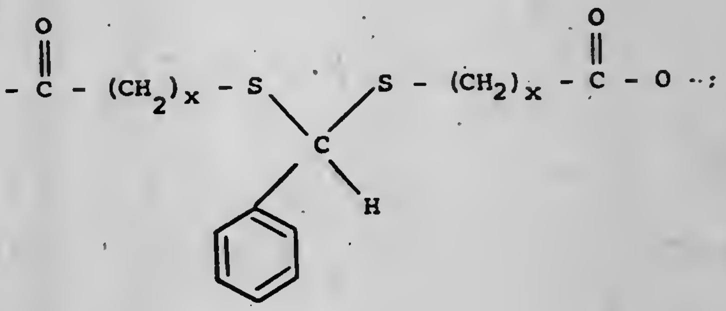
wherein R is a hydrocarbyl group containing 1 to 12 carbons, Z and Z′ are independently selected from the group consisting of oxygen and sulfur, Y is selected from the group consisting of, when at least one of Z and Z′ is sulfur, alkyl having 1 to 12 carbons; $-(CH_2)_xCOO$ alkyl, when *n* is O;

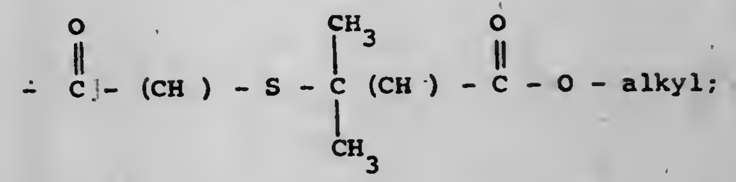


$$-\overset{O}{\overset{\|}{C}}-(CH_2)_x-\overset{O}{\overset{\|}{C}}-O-;\quad -\overset{O}{\overset{\|}{C}}-$$

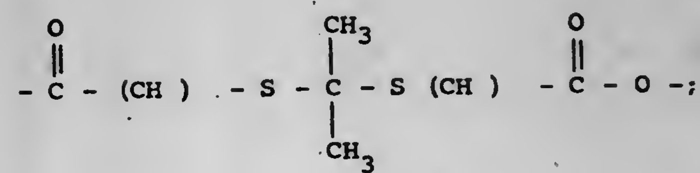
$(CH_2)_x-S$ alkyl;



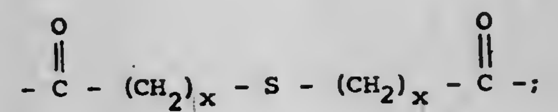




$$-\overset{O}{\overset{\|}{C}}-(CH)-S-\underset{CH_3}{\overset{CH_3}{C}}(CH)-\overset{O}{\overset{\|}{C}}-O-\text{alkyl};$$

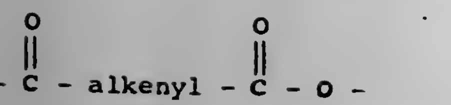


$$-\overset{O}{\overset{\|}{C}}-(CH)-S-\underset{CH_3}{\overset{CH_3}{C}}-S(CH)-\overset{O}{\overset{\|}{C}}-O-;$$



$$-\overset{O}{\overset{\|}{C}}-(CH_2)_x-S-(CH_2)_x-\overset{O}{\overset{\|}{C}}-;$$

and



$-\overset{O}{\overset{\|}{C}}-\text{alkenyl}-\overset{O}{\overset{\|}{C}}-O-$

n is a number from 0 to 1½ varying, in increments of ½ and x is 1 to 3, and the amount of (b) present in said combination being about 1 to about 25 weight percent of the weight of (a).

3,890,277

ALKYLTIN POLYSULFIDE THIOESTER STABILIZED COMPOSITION

Thomas G. Kugele, Cincinnati, and Robert E. Bresser, Sharonville, both of Ohio, assignors to Cincinnati Milacron Chemicals Inc., Reading, Ohio

Division of Ser. No. 400,127, Sept. 24, 1973, Pat. No. 3,869,487. This application Sept. 23, 1974, Ser. No. 508,713

Int. Cl.² C08F *45/62*

U.S. Cl. 260—45.75 S **15 Claims**

1. A halogen-containing polymer composition containing a compound of the formula:

$$(R_xSn)_n(-SR'COOR'')(4\text{-}x)n\text{-}2m(-S_y-)_m$$

where the tin is tetravalent, R is alkyl of 1 to 8 carbon atoms or benzyl, R′ is alkylene of 1 to 4 carbon atoms, R″ is alkyl of 1 to 18 carbon atoms, alkenyl of 2 to 18 carbon atoms, cycloalkyl having 5 to 6 carbon atoms in the ring, x is 1 to 2, y is 2 to 4, n is 1 to 10 and m is ½n to n in an amount effective to heat stabilize the polymer.

3,890,278

ANIONIC POLYMERIZATION

Jean-Marie Lehn, Strasbourg; Francois Schue, Lutzelhouse; Sylvie Boileau, Paris; Bernd Kaempf, Strasbourg; Alain André Cau, Chateauneuf sur Loire; Jean Robert Moinard, Vert le Petit, and Serge Fernand Raynal, Villejuif, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

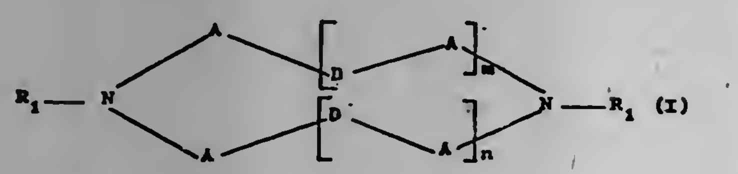
Filed Sept. 26, 1973, Ser. No. 401,119

Claims priority, application United Kingdom, Oct. 3, 1972, 45482/72; July 30, 1973, 36257/73

Int. Cl. C08g *1/12*

U.S. Cl. 260—63 R **27 Claims**

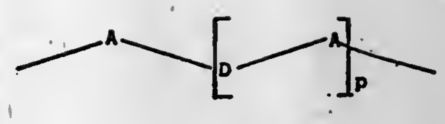
1. A process for the polymerization or copolymerization of of at least one monomer containing ethylenic unsaturation which comprises polymerizing or copolymerizing at least one monomer containing ethylenic unsaturation in a non-polar or slightly polar organic solvent medium in the presence of an anionic initiator and of a macro-heterocyclic complexing agent of the general formula I



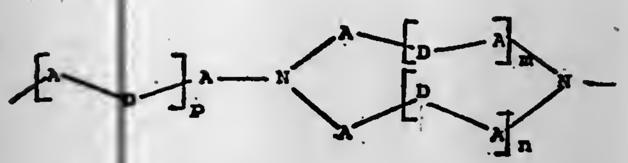
(I)

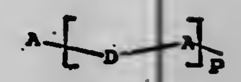
in which:

R_1 is a hydrogen atom or a hydrocarbon group or an alkoxycarbonyl group, or the two R_1 together can form a group of the general formula:



or





A is a hydrocarbon group,

D is an oxygen or sulphur atomor a hydrocarbon group, with the proviso that at least two of the D groups are oxygen atoms or sulphur atoms and that if R_1 is a hydrogen atom, a hydrocarbon group or an alkoxycarbonyl group, one of the two D groups is oxygen or sulphur and the other is oxygen, and n and p are integers from 1 to 3 and m is 2 or 3.

3,890,279

THERMOPLASTIC COPOLYESTER ELASTOMER

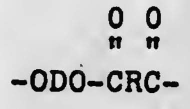
James Richard Wolfe, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

Filed Dec. 10, 1973, Ser. No. 423,017

Int. Cl. C08g *17/08*

U.S. Cl. 260—75 R **9 Claims**

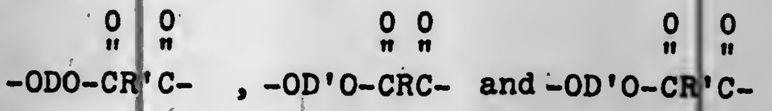
1. A thermoplastic copolyester elastomer consisting essentially of a multiplicity of recurring ester units joined head-to-tail through ester linkages, said ester units being represented by the formula:



$-ODO-\overset{O}{\overset{\|}{C}}R\overset{O}{\overset{\|}{C}}-$

(a)

and at least one other formula selected from the group consisting of:



$-ODO-\overset{O}{\overset{\|}{C}}R'\overset{O}{\overset{\|}{C}}-$, $-OD'O-\overset{O}{\overset{\|}{C}}R\overset{O}{\overset{\|}{C}}-$ and $-OD'O-\overset{O}{\overset{\|}{C}}R'\overset{O}{\overset{\|}{C}}-$

(b) (c) (d)

wherein:

R is a divalent radical remaining after removal of carboxyl groups from a symmetrical aromatic dicarboxylic acid having a molecular weight less than about 300;

R′ is a divalent radical, containing at least one side chain of 7 to about 30 carbon atoms in length, remaining after removal of carboxyl groups from a dicarboxylic acid having a molecular weight of less than about 300 neglecting the side chains;

D is a divalent radical remaining after removal of hydroxyl groups from 1,4-butanediol; and

D′ is a divalent radical, having at least one side chain of 7 to about 30 carbon atoms in length, remaining after removal of hydroxyl groups from a diol having a molecular weight of less than about 250 neglecting the side chains;

provided, said ester units corresponding to formula (a) amount to about 30 to 95 percent by weight of said copolyester and said ester units corresponding to formulae (b), (c) and (d) amount to a total of about 5 to 70 percent by weight of said copolyester.

3,890,280

POLYMERIZATION OF 2-PYRROLIDONE WITH ALKALI METAL BICARBONATE AS CATALYST

Janardan D. Upadhyaya, Stamford, Conn., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 814,197, April 7, 1969, abandoned. This application May 15, 1970, Ser. No. 37,935

Claims priority, application South Africa, Mar. 31, 1970, 70/2153

Int. Cl. C08g *20/16*

U.S. Cl. 260—78 P **14 Claims**

1. A process for the production of a polymer of 2-pyrrolidone in solid form, which consists essentially of heating a mixture of 2-pyrrolidone and an alkali metal bicarbonate polymerization catalyst to a temperature of at least about 120°C, and then polymerizing the 2-pyrrolidone in the presence of said catalyst.

3,890,281

POLYMERIC CATALYST COMPOSITION FOR HYDROCARBON OXIDATION

Howard P. Angstadt, Media, and John P. Bare, Wilmington, both of Del., assignors to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 217,945, Jan. 14, 1972, abandoned. This application June 25, 1974, Ser. No. 482,920

Int. Cl. C08g *22/02*

U.S. Cl. 260—77.5 C **13 Claims**

1. As a novel composition, a water-stable polymer having a non-metal containing backbone, said backbone containing functional groups which are complexed with a metal of any of Group IB to VIIIB, or IIA of the Periodic Table, said polymer being further characterized in being a catalyst for the autoxidation of organic compounds containing carbon-hydrogen bonds activated by adjacent activating groups.

3,890,282

METHOD OF PREPARING HANDLEABLE, MOLDABLE RESIN COMPOSITIONS

William J. Heilman, Allison Park, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed June 15, 1973, Ser. No. 370,366

Int. Cl. C08f *1/86, 15/40, 47/00*

U.S. Cl. 260—78.5 T **14 Claims**

1. A method of preparing a handleable, thermosettable, moldable composition which comprises

forming a liquid solution of

- a polyanhydride containing at least two succinic anhydride groups and less than three conjugated double bonds when one of the conjugated double bonds is between the carbon atoms alpha to the carbonyl groups in a succinic anhydride group;
- an olefinically unsaturated monooxirane compound containing as its only functional groups a single oxirane oxygen atom and an olefinic double bond capable of being polymerized by free radical means;
- an olefinically unsaturated monomer free of oxirane oxygen atoms and containing as its only functional groups at least one olefinic double bond capable of polymerization by free radical means; and
- a chemical free radical initiator which is thermally activated to generate free radicals at a temperature between about 80° C. and about 120° C.; and

polymerizing at least a portion of said olefinic double bonds of said olefinically unsaturated monooxirane compound and said olefinically unsaturated monomer by free radical means without substantial polymerization of the anhydride groups and the epoxide groups present in the mixture by heating the resin mixture at a thickness no greater than about 10 mm. to a temperature between about 80° C. and about 120° C. and controlling the temperature of the resin mixture within said range whereby substantial vinyl polymerization takes place and cooling the reaction mixture below about 60° C. whereby a handleable, thermosettable, moldable composition comprising a homogeneous mixture of polyanhydride molecules, polyepoxide molecules and any unreacted olefinically unsaturated monooxirane compound and olefinically unsaturated monomer is obtained.

3,890,283

PROCESS FOR POST-POLYMERIZING POLYGLYCOLIC ACID

Donald James Casey, Ridgefield, and Martin Epstein, Norwalk, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed June 4, 1973, Ser. No. 367,043

Int. Cl. C08g *17/017, 53/00, 53/20*

U.S. Cl. 260—78.3 R **5 Claims**

1. A process for increasing the molecular weight of polyglycolic acid comprising heating said polyglycolic acid in a solid state at a temperature between about 150°C. and 220°C. for a period of time of at least 4 days at an absolute pressure between about 0.1 mm. and 1.0 mm. of mercury.

3,890,284

TRIMELLITOYL FUNCTIONAL POLYMERS, MANUFACTURING PROCESS THEREFOR AND ELASTOMERIC EPOXY COMPOSITIONS CURED THEREWITH

Akira Ohnishi; Toshio Yukuta; Ryota Fujio; Yozo Ishida; Shu Kambara, and Minoru Kojima, all of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

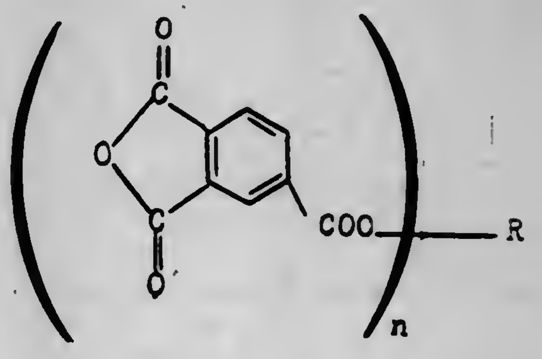
Continuation-in-part of Ser. Nos. 143,643, May 14, 1971, abandoned, Continuation-in-part of Ser. No. 143,645, May 14, 1971, abandoned. This application Aug. 13, 1973, Ser. No. 387,590

Claims priority, application Japan, May 15, 1970, 45-40900; May 15, 1970, 45-40899

Int. Cl. C08g *30/12*

U.S. Cl. 260—78.4 EP **21 Claims**

1. A trimellitoyl functional polymer having the formula



wherein R is a homo- or co-polymeric conjugated diene radical having rubber-like elasticity and having an average molecular weight of 700 to 30,000 and n is an integer of at least 2.

3,890,285
PRINTING INK COMPOSITIONS

Masujiro Sumita, and Masatoshi Mori, both of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd. and Nippon Oil Co., Ltd., both of Tokyo, Japan

Filed Oct. 19, 1973, Ser. No. 408,197

Claims priority, application Japan, Oct. 20, 1972, 47-104416

Int. Cl. C08f *15/02*

U.S. Cl. 260—78.5 BB **2 Claims**

1. A process for the preparation of a resin having an acid number of at least 180 and softening point of 100°-200°C, characterized by reacting a member selected from the group consisting of dicyclopentadiene and methyldicyclopentadiene, with an unsaturated dibasic acid anhydride in molar ratios of from 70/30 to 40/60 at 170°-330°C for 20 minutes to 10 hours.

3,890,286
PRODUCTION OF POLYCAPROAMIDE FIBER

Alex John Bingham, Lake Hiawatha, N.J.; John Christopher Haylock, and Robert Alden Lofquist, both of Richmond, Va., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Dec. 20, 1973, Ser. No. 426,775

Int. Cl. C08g *20/14*

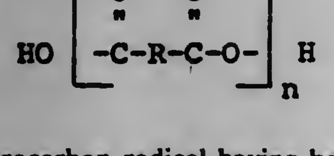
U.S. Cl. 260—78 L **10 Claims**

1. In a process for the formation of polycaproamide fiber from a fiber-forming ε-polycaproamide polymer having excess number of carboxyl end groups over amino end groups, by extruding the molten polymer through an orifice into a quenching medium and thereafter stretching the resulting filament, the improvement wherein said fiber-forming ε-polycaproamide polymer is prepared by a process comprising:

a. continuously forming a molten polymerization reaction mixture at 240°-290°C. from ε-caprolactam;

b. continuously smoothly stirring said reaction mixture while flowing over the surface thereof a gas capable of removing moisture from said reaction mixture, at a flow rate of at least 2 unit volumes of said gas, measured at standard temperature and pressure, per hour per each unit volume of said reaction mixture, until the total primary amino group plus carboxyl group analysis of the resulting polymer is not above 135 milliequivalents per kilogram of polymer; and then

c. continuously reacting said polymer at 250°-290°C. with 0.3 to 2.0 weight percent based on the weight of the polymer, of a polyanhydride of a dicarboxylic acid, having the formula



$$HO\left[-\overset{\overset{\displaystyle O}{\|}}{C}-R-\overset{\overset{\displaystyle O}{\|}}{C}-O-\right]_n H$$

where R is a hydrocarbon radical having between 4 and 18 carbon atoms, and *n* is an integer between 5 and 50, until the primary amino group analysis of the polymer is not above 34 milliequivalents per kilogram of polymer and the carboxyl group analysis of the polymer is between about 50 and about 120 milliequivalents per kilogram of polymer, thereby reducing the occurrence of nubs in the fiber.

3,890,287
POLYSULFONE COPOLYMERS

William R. Moore, and Walter L. Vaughn, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 399,779, Sept. 21, 1973, abandoned. This application June 21, 1974, Ser. No. 481,623

Int. Cl. C08f *13/06*

U.S. Cl. 260—79.3 A **5 Claims**

1. An essentially random copolymer consisting of

A. about 10 to 30 percent by weight of SO_2,

B. about 50 to 70 percent by weight of

1. vinyl aromatic monomers having 8–12 carbon atoms,
2. alpha olefins having 8–18 carbon atoms,
3. cycloalkylenes having 4–8 carbon atoms,
4. alkyl acrylates or alkyl methacrylates having 4–12 carbon atoms, or
5. mixtures thereof; and

C. about 10 to 25 percent by weight of monoolefinically unsaturated dicarboxylic acids having 4–7 carbon atoms.

3,890,288
PROCESS FOR MAKING POLY-ALPHA-OXYACRYLIC ACID AND ITS ALKALI METAL SALTS

Wilhelm Vogt, Hurth-Efferen; Edgar Fischer, Frankfurt am Main, and Eberhard Auer, Erftstadt Liblar, all of Germany, assignors to Hoechst Aktiengesellschaft, Knapsack, near Cologne, Germany

Filed June 21, 1974, Ser. No. 481,814

Claims priority, application Germany, Sept. 15, 1973, 2346500

Int. Cl. C08f *3/44*

U.S. Cl. 260—80 P **14 Claims**

1. In a process for making poly-α-oxyacrylic acid by contacting a solution of α-chloracrylic acid with radical-yielding polymerization catalysts, heating and thereby hydrolyzing the resulting poly-α-chloracrylic acid in aqueous solution with the resultant precipitation of solid poly-α-oxyacrylic acid and separating the poly-α-oxyacrylic acid, the improvement which comprises contacting an aqueous α-chloracrylic acid solution with the radical-yielding polymerization catalysts for a period of at least 30 minutes and, while leaving the resulting poly-α-chloracrylic acid unseparated, heating it for a period of at least 1 hour to temperatures within the range 80° and 110°C.

3,890,289
AUTOMATIC SCUM REMOVAL TROUGH

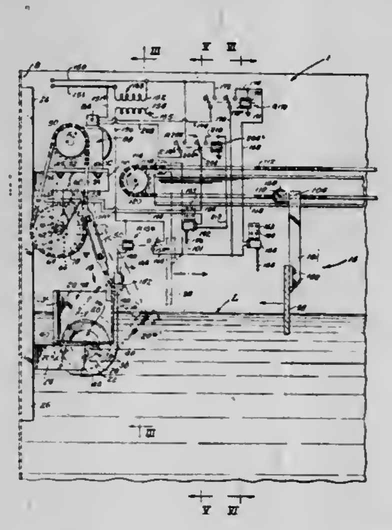
Paul R. Johnson, Mineral Wells, Tex., assignor to Harsco Corporation, Harrisburg, Pa.

Filed July 15, 1974, Ser. No. 488,422

Int. Cl. B01d *21/24*

U.S. Cl. 210—104 **12 Claims**

1. Apparatus to remove floating scum from the surface of liquid in a tank comprising: a trough having side walls; support means in the tank secured to the trough, said support means being adapted to permit vertical movement of an edge of one of the sidewalls of the trough; drive means; connector means secured between the drive means and the trough; means to energize said drive means to initiate movement of the edge of the trough in a first direction; liquid sensor means on said trough arranged to de-energize said drive means upon movement of the edge of the trough a predetermined distance below the surface of the liquid in the tank; and means to energize said drive means to initiate movement of the edge of the trough in a second direction.



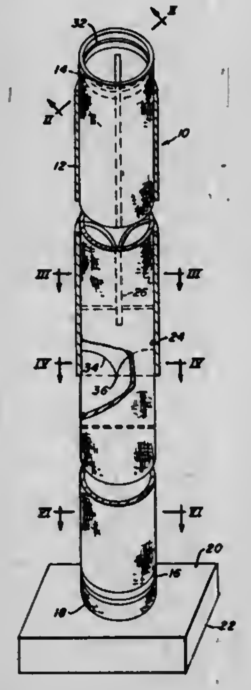
3,890,290
APPARATUS FOR FILTERING PARTICULATE MATTER FROM A FLUID STREAM

Robert V. McCabe, Harrisville, Pa., assignor to ESM, Inc., Valencia, Pa.

Filed Feb. 21, 1974, Ser. No. 444,393

Int. Cl. B01d *29/38*

U.S. Cl. 210—136 **7 Claims**



1. An apparatus for filtering particulate matter from a fluid stream comprising,

a first fabric housing having a longitudinal chamber with an open upper end portion and an open lower end portion adapted to receive said fluid stream,

a second fabric housing having a longitudinal chamber concentrically positioned within said first fabric housing chamber,

said second fabric housing secured at preselected intervals to the interior surface of said first fabric housing such that said chamber thereof is divided into a plurality of separate and distinct longitudinal passageways surrounding said second fabric housing chamber and arranged to receive said fluid stream,

said passageways having sealed upper end portions and open lower end portions,

means for supporting said first fabric housing to receive said fluid stream, and

said fabric housing having a lower end portion converging in a cone,

said cone having an orifice arranged to expand and contract to permit discharge of particulate matter from said second fabric housing chamber through said orifice to said open lower end portion of said first fabric housing chamber.

3,890,291
ALPHA-HYDROXYACRYLIC ACID/ACRYLIC ACID-COPOLYMERS AND A PROCESS FOR MAKING THEM

Wilhelm Vogt, Hurth-Efferen; Eberhard Auer, Erftstadt Liblar; Gunter Lenz, Frechen-Bachem; Karl Merkenich, Hurth-Efferen, and Klaus Henning, Hurth-Hermulheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed May 22, 1974, Ser. No. 472,277

Claims priority, application Germany, May 28, 1973, 2327097

Int. Cl. C08f *15/14*

U.S. Cl. 260—80.3 R **12 Claims**

1. Copolymers of α-hydroxyacrylic acid and acrylic acid, the copolymers containing between about 9 and 85 mol percent of acrylic acid and having a specific viscosity substantially within the range 0.05 and 1.0, determined on 1 weight percent solutions of the copolymers in aqueous 2N-sodium hydroxide solution, at 20°C.

3,890,292
ADHESIVE COMPOSITIONS AND TAPES

Reinhard D. Bohme, Hinsdale, and Perlita A. Ilagan, Chicago, both of Ill., assignors to Daubert Chemical Company, Oak Brook, Ill.

Filed May 23, 1973, Ser. No. 363,013

Int. Cl. C08f *15/40*

U.S. Cl. 260—80.76 **5 Claims**

1. A water dispersible pressure sensitive adhesive composition which in dry form is normally tacky and substantially moisture stable consisting essentially of a copolymer formed of from about 4 to about 10 percent, by weight, of a water soluble alkali metal salt of an α, β unsaturated monocarboxylic acid, from about 6 to about 20 percent, by weight, of a water soluble polyoxyalkylene monoester of an α, β unsaturated monocarboxylic acid, said monoester containing at least two alkylene oxide units, with from about 70 to about 90 percent, by weight, of copolymerizable monomers, said monomers consisting essentially of 0 to about 20 percent, by weight, of an α, β unsaturated monocarboxylic acid, and about 50 to about 90 percent, by weight, of a substantially water insoluble alkyl ester of an α, β unsaturated monocarboxylic acid, or a mixture of a substantially water insoluble alkyl ester of an α, β unsaturated monocarboxylic acid and a vinyl ester, the vinyl ester comprising from about 10 to about 40 percent, by weight, of the mixture.

3,890,293
METHOD OF PRODUCING ALDEHYDE FUNCTIONAL MULTI-COMPONENT COPOLYMERS

Toshio Yukuta; Takashi Ohashi, and Yoshiko Oguri, all of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Kyobashi, Japan

Filed May 23, 1972, Ser. No. 256,120

Claims priority, application Japan, June 1, 1971, 46-37479

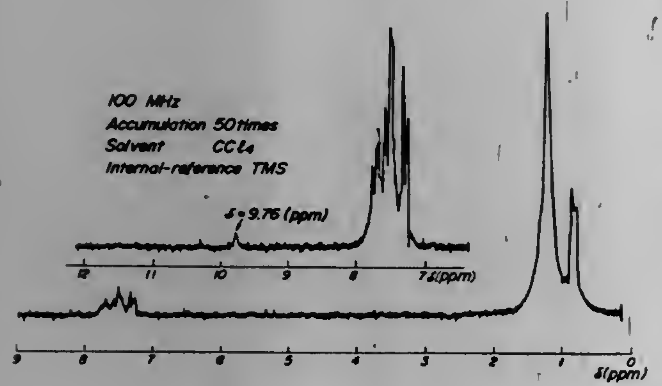
Int. Cl. C08f *27/22, 27/24*

U.S. Cl. 260—80.78 **9 Claims**

1. An aldehyde functional multi-component copolymer

having aldehyde functional groups in the side chain or in the cyclic group in the main chain, which is obtained

by subjecting a multi-component copolymer composed of 30–85 mol% of ethylene, 15–70 mol% of propylene and 1–10 mol% of at least one non-conjugated diene compound to an ozonolysis in a solvent



at a temperature of −80°C to +60°C with ozone mixed with a carrier gas in a concentration of 0.1 to 0.5% by weight based on the weight of the carrier gas, and then

reducing the resulting mixed peroxides formed by ozonolysis of olefin bond units with a trivalent phosphorus compound in an amount of 0.5 to 3.0 equivalents based on the equivalent of the mixed peroxides.

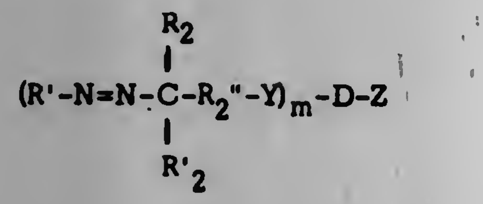
3,890,294
AZO CONTAINING POLYBUTADIENES
Chester Stephen Sheppard, Tonawanda, and Ronald Edward MacLeay, Williamsville, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 37,311, May 14, 1970, Pat. No. 3,752,802, which is a continuation-in-part of Ser. No. 667,352, Sept. 3, 1967, abandoned. This application Aug. 8, 1973, Ser. No. 386,661

Int. Cl. C08g *27/08*

U.S. Cl. 260—94.7 N **3 Claims**

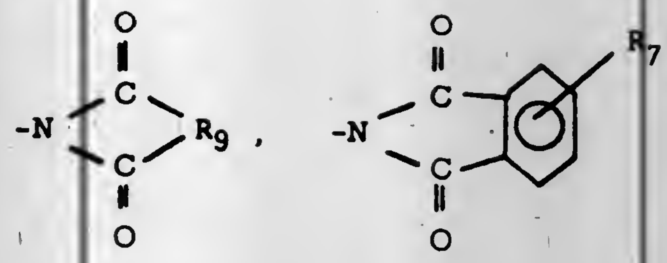
1. A polymer having the general formula:



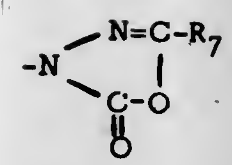
$$(R'-N{=}N-\underset{\substack{|\\R'_2}}{\overset{\substack{R_2\\|}}{C}}-R_2''-Y)_m-D-Z$$

where:

a. R′ is t-aliphatic having 4–10 carbon atoms;
b. m is an integer from 1 to 100;
c. Z is a radical selected from —OH, $—NH_2$, $—NHR_2$, —SH, $—OR_2$ and —H;
d. D is a residue having a valence of *m*+1 of polybutadiene;
e. Y is a divalent radical selected from —C(=O)O—, —OC(=O)O—, —C(=O)S—, —OC(=O)S—, —C(=O)NH—, $—C(=O)N(R_2)—$, —OC(=O)NH—, $—OC(=O)N(R_2)—$, $—OC(=O)R_3(COOH)C(=O)O—$, $—OC(=O)R_3(COOH)C(=O)NH—$, $—OC(=O)R_3(COOH)C(=O)N(R_2)—$ and $—OC(=O)R_3(COOH)C(=O)S—$;
f. R_2 is lower alkyl;
g. R'_2 is —CN, $—C(=O)OR_6$, $—OC(=O)R_6$, —Cl, —Br, —OC(=O)H, $—GC(=G)R_5$, $—GC(=G)GR_5$, $—GR_5$, $—N_3$, —SCN, —NCS, —OCN, $—OOR_8$, $—R_5$,



or



h. R_2'' is an aliphatic, aromatic, aromatic-aliphatic or cycloaliphatic diradical;
i. R_3 is an aromatic, aliphatic or cycloaliphatic triradical;
j. G is oxygen or sulfur;
k. R_5 is an alkyl or cycloalkyl radical of 1–12 carbons or an aromatic radical of 6–12 carbons;
l. R_6 is lower alkyl;
m. R_7 is H, alkyl or cycloalkyl of 1–10 carbons, or aromatic of 6–12 carbons;
n. R_8 is tertiary aliphatic;
o. R_9 is lower alkylene; and
p. R_2 and R_2'', when taken together with the tertiary carbon atom connected to the azo nitrogen atom, form a cycloaliphatic triradical of 3–10 carbons.

3,890,295
METHODS AND COMPOSITIONS TO ENHANCE TALL OIL SOAP SEPARATION
Hillel Lieberman, Warminster, and Robert J. Ziegler, Churchville, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed June 15, 1973, Ser. No. 370,508

Int. Cl.² C09F *7/00;* **C11D** *15/00*

U.S. Cl. 260—97.6 **11 Claims**

1. A method for enhancing the separation of tall oil soap from black liquors derived from alkaline pulping operations which comprises adding thereto from about 5 to about 1000 parts by weight of a polyoxy-ethylene-polyoxypropylene condensate per million parts by weight of said black liquor.

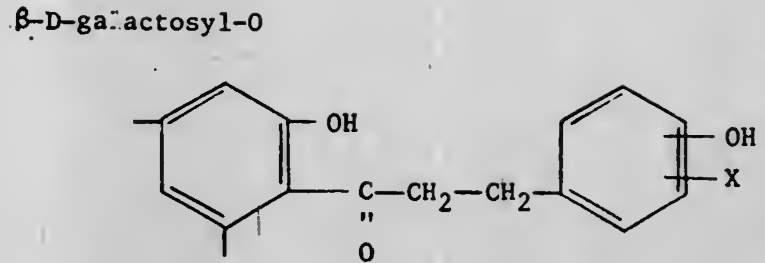
3,890,296
DIHYDROCHALCONE GALACTOSIDES AND THEIR USE AS SWEETENING AGENTS
Robert M. Horowitz, Pasadena, and Bruno Gentili, Glendale, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 256,683, May 23, 1972. This application Apr. 8, 1974, Ser. No. 459,141

Int. Cl. C07c *47/18*

U.S. Cl. 260—210 F **2 Claims**

1. A compound of the formula



wherein X represents a radical selected from the group consisting of hydrogen, hydroxy, and lower alkoxy.

3,890,297
PROCESS FOR N-ACYLATING NOVENAMINE
Lester A. Dolak, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 29, 1973, Ser. No. 346,010

Int. Cl. C07c *47/18*

U.S. Cl. 260—210 R **4 Claims**

1. A process for preparing N-acylated novenamine having anti-bacterial activity which comprises contacting novenamine with an acylating agent consisting of a derivative of the desired carboxylic or sulfonic acid in a nitrogen-containing organic.base solvent at a temperature of from about −80°C. to about 0°C. and allowing the reaction system to come to ambient temperature.

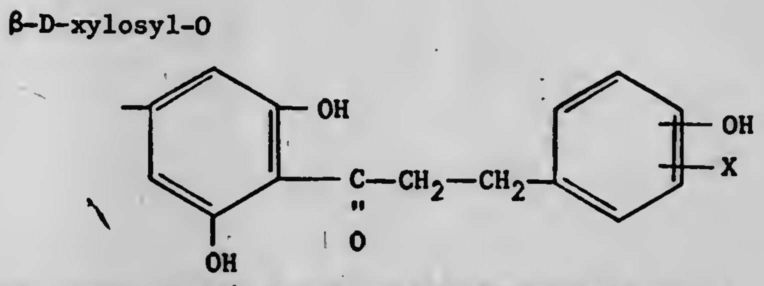
3,890,298
DIHYDROCHALCONE XYLOSIDES AND THEIR USE AS SWEETENING AGENTS
Robert M. Horowitz, Pasadena, and Bruno Gentili, Glendale, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 256,084, May 23, 1972, Pat. No. 3,826,856. This application Apr. 8, 1974, Ser. No. 459,253

Int. Cl. C07c *47/18*

U.S. Cl. 260—210 F **2 Claims**

1. A compound of the formula



wherein X represents a radical selected from the group consisting of hydrogen, hydroxy, and lower alkoxy.

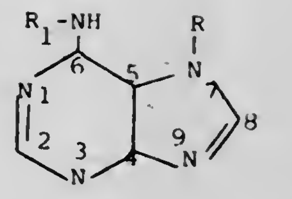
3,890,299
CYTOKININ-7-NUCLEOSIDE
Eugene J. Fox, and James D. McChesney, both of Lawrence, Kans., assignors to Kansas University Endowment Association, Lawrence, Kans.

Filed Sept. 6, 1973, Ser. No. 394,883

Int. Cl.² C07H *19/16, 19/18*

U.S. Cl. 260—211.5 R **7 Claims**

1. A novel cytokinin-7-nucleoside compound of the formula:



wherein R_1 represents a member selected from the group consisting of a $—CH_2—C_6H_5$ group, a $—C_2H_4—C_6H_5$ group, and a $—CH_2Y$ group, wherein Y represents a member selected from the group consisting of a furfuryl group, a pyridyl group, a thiophene group, a C_5–C_7 cycloalkyl group, and a C_5–C_7 cycloalkenyl group, and a $—CH_2—C_6H_4—X$ group, wherein X represents a member selected from the group consisting of an alkyl group of from 1 to 3 carbon atoms, a branched alkyl group of 3 carbon atoms, an alkenyl group of from 1 to 3 carbon atoms, a branched alkenyl group of 3 carbon atoms, a halogen atom, and a CF_3group; and wherein R represents a monosaccharide.

3,890,300
STARCH HYDROLYSATE METHODS FOR ITS PREPARATION AND PRODUCTS BASED THEREON
Michel Huchette, and Guy Fleche, both of Lestrem, France, assignors to Roquette Freres, Lestrem, France

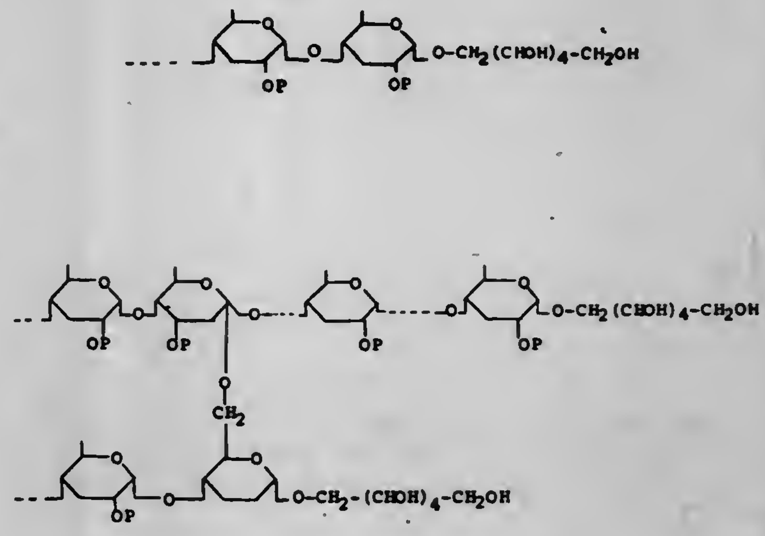
Filed May 11, 1973, Ser. No. 359,514

Claims priority, application France, May 17, 1972, 72.17703

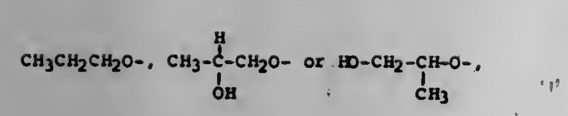
Int. Cl. C08b *19/06*

U.S. Cl. 260—233.3 R **1 Claim**

1. Starch hydrolysate, the constituent linear and branched glucose chains of which are substituted by the propylene oxide radical —OP and the terminal groups of which are hydrogenated as represented on the corresponding structural formula:



said propylene oxide radical —OP representing a group selected from



$CH_3CH_2CH_2O-$, $CH_3-\overset{H}{\underset{OH}{C}}-CH_2O-$ or $HO-CH_2-\underset{CH_3}{CH}-O-$,

the degree of substitution of said starch hydrolysate being less than 0.6.

3,890,301

ESTERS OF 4-(HIGH MOLECULAR WEIGHT ALKYL-SUBSTITUTED CARBOPHENOXY) PHTHALIC ACID

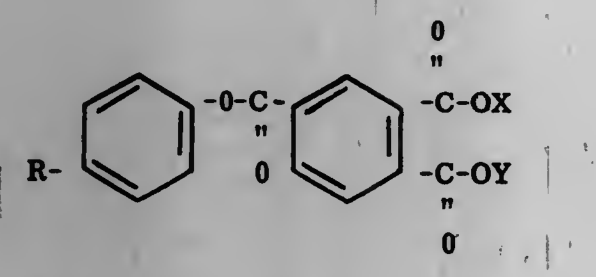
Edmond J. Piasek, Chicago, and Imre Puskas, Glen Ellyn, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Division of Ser. No. 72,831, Sept. 16, 1970. This application Sept. 29, 1972, Ser. No. 293,646

Int. Cl. C07c *65/04*

U.S. Cl. 260—234 R **10 Claims**

1. An ester of 4-(alkylcarbophenoxy)-phthalic acid of the formula:



wherein R the alkyl-substituent has from 30-214 carbon atoms and X is derived from an alcohol or a hydroxyaromatic compound having at least one HO- radical and Y is hydrogen or said X.

3,890,302

DEXTRO 1-METHYL-2-(2-NAPHTHYL) AZIRIDINE

Katsumi Kotera, 1631, Hirose, Shimamoto-cho, Osaka; Keizo Kitahonoki, 848, Nabata, Ikoma-cho, Ikoma, and Ryonosuke Kido, 3-16-28, Chokoji-minami, Osaka, all of Japan

Continuation-in-part of Ser. No. 6,307, Jan. 27, 1970, abandoned. This application June 5, 1972, Ser. No. 259,839

Claims priority, application Japan, Jan. 28, 1969, 44-6147

Int. Cl. C07d *23/06*

U.S. Cl. 260—239 E **1 Claim**

1. Dextro-1-methyl-2-(2-naphthyl)aziridine.

3,890,303

PROCESS FOR THE INTRODUCTION OF FLUORINE INTO THE 21-POSITION OF 20-OXO-STEROIDS

Peter Wieland, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

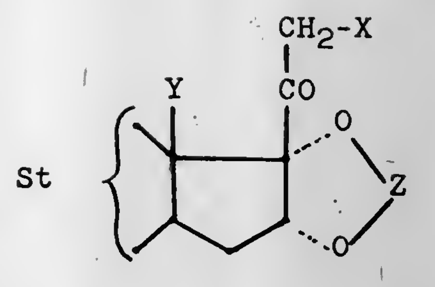
Filed Feb. 15, 1974, Ser. No. 443,054

Claims priority, application Switzerland, Feb. 28, 1973, 2951/73

Int. Cl. C07c *169/30*

U.S. Cl. 260—239.55 D **19 Claims**

1. A process for the introduction of fluorine into the 21-position of 20-oxo-steroids, accompanied by the elimination of a reactive esterified hydroxyl group in the 21-position, wherein a compound of the partial formula



(I)

wherein X represents an hydroxyl group esterified with an organic sulphonic acid or a hydrohalic acid excepting hydrofluoric acid, Y represents a hydrogen atom or a lower aliphatic radical and Z represents a cycloalkylidene radical that contains five to 11 carbon atoms or an alkylidene radical that contains not more than 11 carbon atoms, and if it contains not more than five carbon atoms, can also carry one or two cycloalkyl radicals or phenyl radicals; and St represents the optionally substituted residual part of the steroid skeleton, is treated successively with an agent which is the reaction product of the action of an alkali metal on a polycyclic aromatic hydrocarbon and with perchloryl fluoride in an aprotic solvent.

3,890,304

7-CARBAM OYL-17-HYDROXY-3-OXO-17-PREGN-4-ENE-21-CARBOXYLIC ACID-LACTONE AND RELATED COMPOUNDS

Richard M. Weier, Deerfield, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

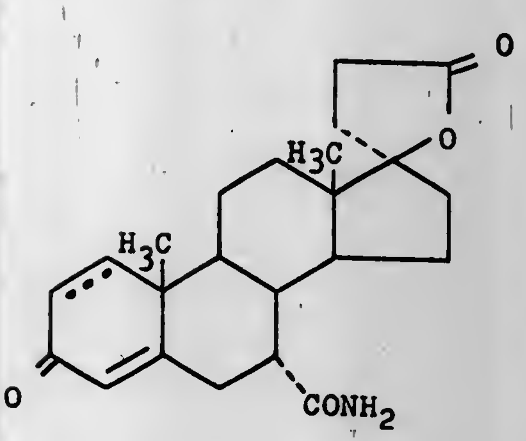
Filed Apr. 25, 1974, Ser. No. 464,253

Claims priority, application Canada, Nov. 9, 1973, 185462

Int. Cl. C07c *173/00*, *173/10*

U.S. Cl. 260—239.57 **4 Claims**

1. A compound of the formula



wherein the dotted line indicates the optional presence of a Δ^1 unsaturated linkage.

3,890,305

DIVINYLDIPHENYL COMPOUNDS

Kurt Weber, and Hans Schlapfer, both of Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

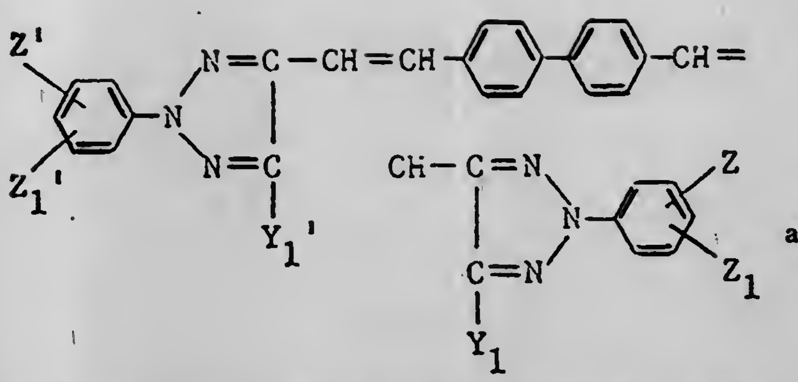
Filed Dec. 18, 1972, Ser. No. 316,155

Claims priority, application Switzerland, Dec. 30, 1971, 19172/71

Int. Cl. C07d *55/02*

U.S. Cl. 260—240 D **7 Claims**

1. A compound of the formula



wherein Y_1 and Y_1' independently of one another denote hydrogen, chlorine, alkyl with 1 to 6 carbon atoms or phenyl, naphthyl or diphenylyl or phenyl, naphthyl or disphenylyl substituted by chlorine, alkyl with 1 to 4 carbon atoms or alkoxy with 1 to 4 carbon atoms, Z and Z' independently of one another denote hydrogen, fluorine, chlorine, bromine, alkyl with 1 to 4 carbon atoms, optionally substituted alkoxy with 1 to 12 carbon atoms, alkenyloxy with 3 or 4 carbon atoms, or benzyloxy and Z_1 and Z_1' independently of one another denote hydrogen, fluorine, chlorine, bromine, alkyl with 1 to 4 carbon atoms are alkoxy with 1 to 4 carbon atoms.

3,890,306

NOVEL ACETALS AND METHODS FOR THEIR PREPARATION

Anthony W. McCollum, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 172,324, Aug. 16, 1971. This application June 20, 1973, Ser. No. 372,881

Int. Cl. C07d *13/04*

U.S. Cl. 260—240 E **18 Claims**

1. The compound 1,1,4,4-bis(ethylenedioxy)-3,3-dimethyl-1-butene.

3. A process for preparing 2-hydroxy-3,3-dimethylsuccinaldehyde bis(ethylenedioxy)acetal which comprises contacting tetrahydro-2-isopropyl-6,6-dimethylfuro-(2,3-d)-1,3-dioxol-5-ol with at least three equivalents of a diol wherein the hydroxy groups are in the 1,2- or 1,3-position, at a temperature greater than about 60°C. and less than about 110°C., in the presence of an acid catalyst selected from the group consisting of p-toluenesulfonic, hydrochloric and sulfuric acid and continuously removing the water liberated during the reaction.

3,890,307

PROCESS FOR THE PRODUCTION OF METHINE DYES

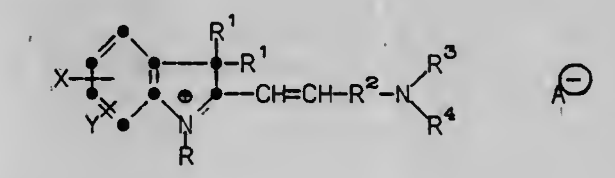
James M. Straley, and Gary T. Clark, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 2, 1973, Ser. No. 347,024

Int. Cl. C09b *23/10*, *23/14*

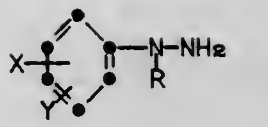
U.S. Cl. 260—240 E **3 Claims**

1. Process for the preparation of methine dyestuffs having the formula



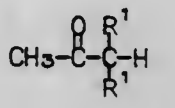
which comprises the steps of

1. heating equimolar amounts of
   a. a phenylhydrazine having the formula



and

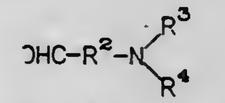
   b. a ketone having the formula



$CH_3-\overset{O}{\overset{\|}{C}}-\overset{R^1}{\underset{R^1}{C}}-H$

   in the presence of an acidic solvent containing at least one molar equivalent of acid per mole of phenylhydrazine at a temperature from about 50°–180°C. for at least an hour;

2. subsequently adding to the solution an equimolar amount of an aldehyde having the formula



$OHC-R^2-N\begin{smallmatrix}R^3\\R^4\end{smallmatrix}$

3. heating the reaction mixture for at least 2 hours at a temperature from about 50°–180°C.; and
4. recovering said methine dyestuff;

wherein

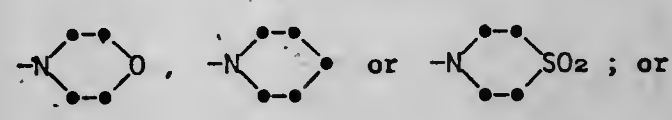
R is lower alkyl or phenyl;

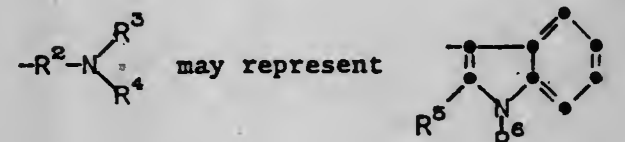
R^1 is lower alkyl;

X and Y are the same or different and each is hydrogen, halo, nitro, lower alkoxy, lower alkyl or lower alkoxycarbonyl;

R^2 is phenylene, phenylene substituted with lower alkyl, halo or lower alkoxy; naphthylene or naphthylene substituted with lower alkyl, halo or lower alkoxy;

R^3 and R^4 are the same or different and each is hydrogen, lower alkyl, phenyl, lower alkyl substituted with halo, hydroxy, cyano, lower alkoxy, acetoxy, succinimido or phthalimido; or R^3 and R^4 together with the nitrogen atom to which they are bonded may represent





wherein

R^5 is lower alkyl or phenyl;

R^6 is hydrogen, lower alkyl, benzyl or phenyl; and

A^- is a basic dye anion.

3,890,308

PLASTIC INJECTION MOLDING MACHINE

Harvey H. Collins, Athol, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.

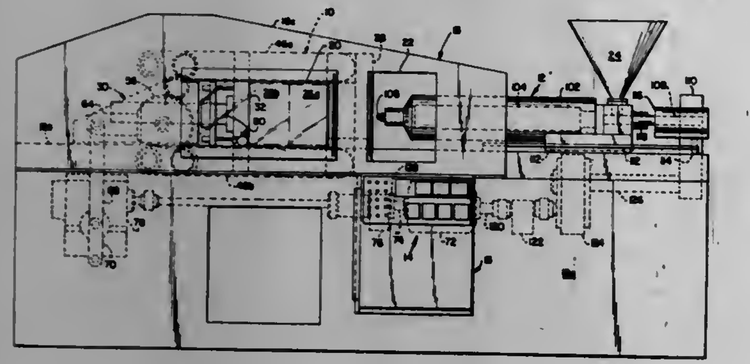
Filed Oct. 12, 1973, Ser. No. 405,815

Int. Cl. B29f *1/00*; B29c *1/16*

U.S. Cl. 425—242 R **7 Claims**

1. In a plastic injection molding machine having a longitudinally extending base, a plasticizing and injecting unit, and a fixed die plate mounted transversely on the base and supporting a mold half, a carriage movable longitudinally on the base and supporting a second die plate and complementary mold half, a mechanism for reciprocating the carriage and thereby

to engage and disengage the mold halves, said mechanism comprising at least two toggles respectively disposed on opposite sides of a longitudinal plane through the mold halves, each such toggle including a crank arm and connecting arm which are respectively pivotally connected to the carriage and to the fixed die plate and also to each other, and a common drive for simultaneously pivoting the crank arms between positions wherein the mold halves are engaged and most widely separated, the first such position being when each toggle is substantially dead center and of shortest length and the second such position being when each toggle is substantially dead center and of greatest length.



3,890,309
CEPHALOSPORIN DERIVATIVES

Michihiko Ochiai, Suita; Osami Aki, Kawanishi; Akira Morimoto, Suita; Taiiti Okada, Kyoto, and Katsutada Masuda, Ashiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

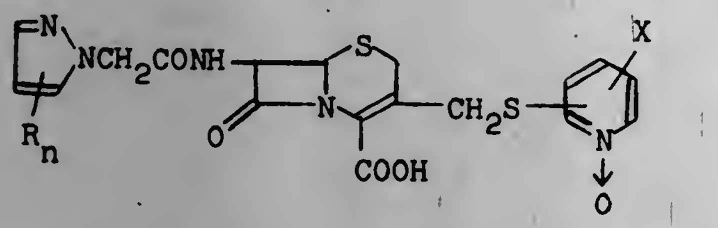
Filed July 12, 1972, Ser. No. 270,985

Claims priority, application Japan, July 12, 1971, 46-51912; Mar. 9, 1972, 47-24305

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **32 Claims**

1. A compound of the formula,



wherein R represents the same or different substituent selected from halogen atom, nitro group, lower alkyl group, amino group or carboxyl group, *n* is an integer from 0 to 3 and X represents hydrogen or halogen atom, or a pharmaceutically acceptable salt thereof.

3,890,310
METHOXYMETHYL 3-METHYL-7-β-PHENOXYACETAMIDO-CEPH-3-EM-4-CARBOXYLATE

Chester Sapino, Jr., East Syracuse, and Mariano Vecchio Ruggeri, Syracuse, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 330,770, Feb. 8, 1973, Pat. No. 3,843,639. This application Mar. 8, 1974, Ser. No. 449,301

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **1 Claim**

1. Methoxymethyl 3-methyl-7-β-phenoxyacetamidoceph-3-em-4-carboxylate.

3,890,311
7-(2-[1-(PHENYLSULFONYL)-2-PYRROLIDINYLTHIO]ACETAMINO)CEPHALOSPORANIC ACIDS

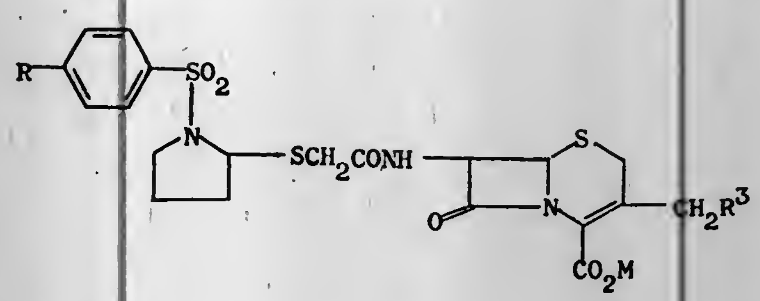
Peter H. L. Wei, Springfield, and Carl Gochman, Philadelphia, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Mar. 18, 1974, Ser. No. 452,011

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **3 Claims**

1. A compound of the formula:



in which

R is a member selected from the group consisting of H, Cl, —Br and $—NO_2$;

R^3 is a member selected from the group consisting of —H and acetoxy; and

M is a member selected from the group consisting of —H, sodium and potassium.

3,890,312
STABILIZATION AND PURIFICATION OF β-LACTONES

Yasuhiro Ogawa, Suita, and Norio Awata, Settsu, both of Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Japan

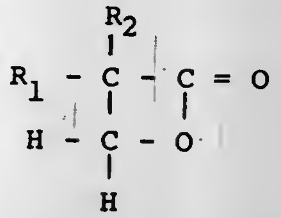
Filed Oct. 30, 1969, Ser. No. 872,727

Claims priority, application Japan, Oct. 30, 1968, 43-79537; Feb. 4, 1969, 44-8332

Int. Cl. C07d *3/00*

U.S. Cl. 260—343.9 **13 Claims**

1. A method for purifying a β-lactone represented by the formula:



wherein each of R_1 and R_2 represent hydrogen, alkyl of 1 to 4 carbon atoms or phenyl, and having impurities selected from the group consisting of carboxylic acids, aldehydes, chlorinated olefins, ketenes, ketene dimers and olefine, which consist essentially of the step of contacting the impure β-lactone with at least one substance selected from the group consisting of (1) a metal oxide selected from the group consisting of berylium oxide, magnesium oxide, calcium oxide, strontium oxide, barium oxide, lead monoxide, manganese oxide, cadmium oxide, tungsten dioxide, chromium trioxide, vanadium pentoxide, molybdenum trioxide, nickelous oxide, cuprous oxide, zinc oxide, aluminum oxide, antimony trioxide, stannous oxide, silverous oxide, red lead, ferric oxide, ceric oxide, zirconium oxide, bismuth trioxide and titanium dioxide, (2) a non-metal oxide selected from the group consisting of boron oxide, silicon oxide, selenium oxide and arsenic trioxide, (3) a mixture of metal and non-metal oxide selected from the group consisting of silica-alumina, silica-zirconia, silica-boria, acid clay, bentonite, kaolin and montmorillonite, (4) potassium permanganate and (5) a mixture of potassium permanganate and at least one metal salt selected from the group consisting of cupric chloride, zinc chloride, cupric nitrate, zinc nitrate and bismuth nitrate; said substance being employed in an amount of 0.05 to 100 % by weight based on the weight of β-lactone; said contacting being conducted at a temperature of between −10°C and 150°C; said substance being in the form of a powder, granule or lump.

3,890,313
3-DIAZINE SUBSTITUTED BENZOTHIADIAZINES

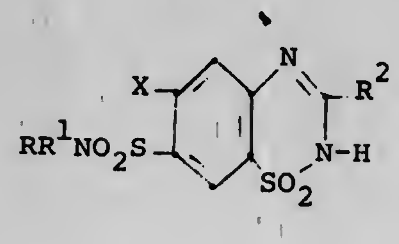
Frederick C. Novello, Berwyn, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 20, 1972, Ser. No. 236,243

Int. Cl. C07d *93/34*

U.S. Cl. 260—243 D **7 Claims**

1. A benzothiadiazine having the structure



and pharmacologically acceptable salts thereof wherein R is hydrogen or C_{1-5} alkyl; R^1 is hydrogen or C_{1-5} alkyl, R^2 is pyridazinyl or a substituted pyridazinyl derivative wherein the substituent is one or two similar or dissimilar groups selected from C_{1-3} alkyl, lower alkoxy, hydroxy, chloro and bromo; R^4 is hydrogen or C_{1-5} alkyl; and X is halo, C_{1-3} alkyl and trifluoromethyl.

3,890,314
PROCESS FOR PRODUCING 7-ACYLAMINO-3-METHYL-3-CEPHEM-4-CARBOXYLIC ACIDS

Toshiyasu Ishimaru, Suita, and Yutaka Kodama, Toyama, both of Japan, assignors to Toyama Chemical Co., Ltd., Japan

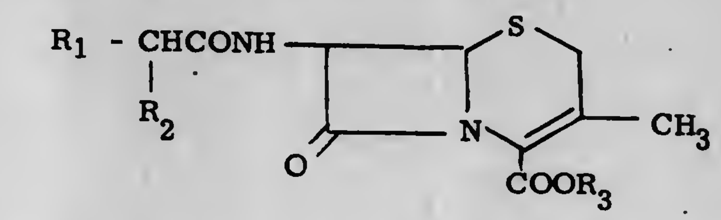
Filed Aug. 7, 1973, Ser. No. 386,355

Claims priority, application Japan, Sept. 1, 1972, 47-87816

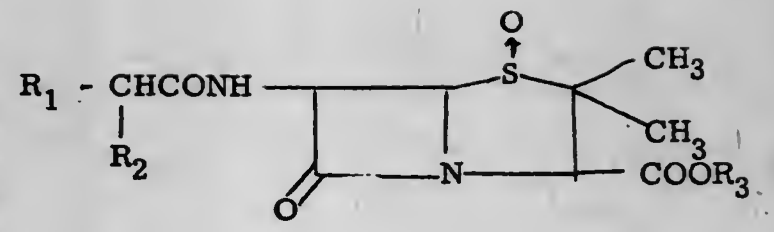
Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **10 Claims**

1. A process for preparing a 7-acylamino-3-methyl-3-cephem-4-carboxylic acid ester of the formula



wherein R_1 represents hydrogen, lower alkyl having from 1 – 5 carbon atoms, phenyl, or phenyloxy; R_2 represents hydrogen, lower alkyl having from 1 – 5 carbon atoms, halogen, azido, or N-protected amino; and R_3 represents an ester group, which comprises the step of heating 6-acylamino-penicillanic acid ester S-oxide represented by the formula



wherein R_1, R_2 and R_3 are as defined before in the presence of a catalyst consisting of an acid selected from the group consisting of phosphoric acids, sulfonic acids and Lewis acids and a sulfide, of the formula $R_5—S—R_6$, the amount of said catalyst being from .05 to 0.2 mole of an acid and from 0.01 to 0.3 mole of a sulfide per mole of said 6-acylamino- penicillanic acid ester S-oxide; wherein R_5 and R_6 are alkyl of 1 to 10 carbon atoms, allyl, vinyl, cyclohexyl, 3,3,5-trimethylcyclohexyl, chloroalkyl of 1 to 2 carbon atoms, hydroxy alkyl of 2 to 3 carbon atoms, carboxy alkyl of 1 to 2 carbon atoms, dodecoxy carbonyl ethyl, cyanoethyl, nitroethyl, mercapto ethyl, aminoethyl, methylthio propyl, methoxyethyl, methylthio ethyl, propargyl, monocarbocyclic aryl or mono carbocyclic aralkyl wherein alkyl has 1 to 2 carbon atoms.

3,890,315
METHOD FOR PREPARING N-SUBSTITUTED MORPHOLINES

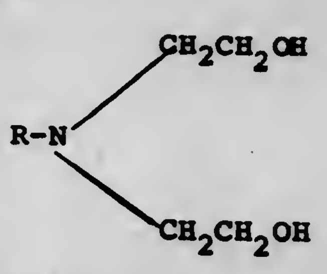
Ting P. Chen, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed June 14, 1972, Ser. No. 262,918

Int. Cl. C07d *87/26, 87/24*

U.S. Cl. 260—247 **8 Claims**

1. A liquid phase method for preparing an N-substituted morpholine which comprises the steps of forming a hydrocarbon solution of an N-substituted bis-(hydroxyethyl) amine represented by the formula:



in which R is alkyl having from 10 to 30 carbon atoms, and passing said solution through a column packed with an alumina catalyst while maintaining a reaction temperature in the range of 340° to 425°C. to effect cyclization and recovering an N-substituted morpholine.

3,890,316
HETEROCYCLIC PEROXIDES

Duane B. Priddy, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 6, 1973, Ser. No. 385,914

Int. Cl. C07d *87/28*

U.S. Cl. 260—247 **1 Claim**

1. A compound of the formula

$$(R'—O—O—R)_nY \qquad (I)$$

wherein

R is a cycloalkylidene radical of 5–7 carbon atoms,

R′ is α,α-dimethylbenzyl, lower alkyl-α,α-dimethylbenzyl,

Y is a heterocyclic radical of the group
- 4-morpholinyl-,
- 1-piperidinyl-,
- 1-pyrrolidinyl, and

n is the valence of Y.

3,890,317

PROCESS FOR S-METHYLATION OF 4-AMINO-6-T-BUTYL-3-MERCAPTO-1,2,4-TRIAZIN-5-ONE

Frank Runar Haglid, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed June 13, 1974, Ser. No. 478,969

Int. Cl. C07d *55/10*

U.S. Cl. 260—249.5 **7 Claims**

1. In the process for methyl bromide S-methylation of 4-amino-6-t-butyl-3-mercapto-1,2,4-triazin-5-one, the improvement which comprises continuous product removal from the reaction mixture.

3,890,318

DERIVATIVES OF TRIIODO AMINOBENZENECARBOXYLIC ACIDS AND THE PREPARATION THEREOF

Werner Obendorf; Irmgard Lindner; Ernst Schwarzinger, and Josef Krieger, all of Linz, Donau, Austria, assignors to Chemie Linz Aktiengesellschaft, Linz, Donau, Austria

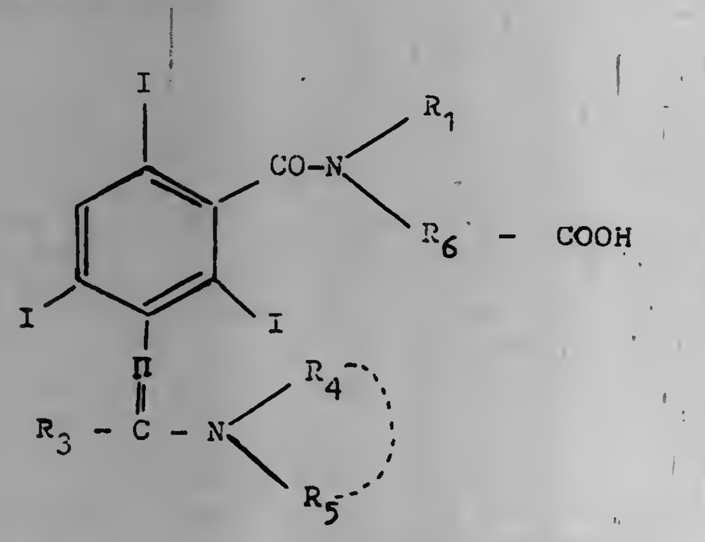
Filed July 20, 1973, Ser. No. 381,337

Claims priority, application Germany, July 21, 1972, 2235935

Int. Cl. C07d *87/42*

U.S. Cl. 260—247.2 A **9 Claims**

1. A compound selected from the group consisting of compounds of the formula



lower alkyl esters thereof and pharmaceutically acceptable salts thereof, wherein R_1 is selected from the group consisting of hydrogen, alkyl of up to 4 carbon atoms, alkenyl of up to 4 carbon atoms and alkoxyalkyl of up to 6 carbon atoms, R_3 is selected from the group consisting of hydrogen and alkyl of up to 4 carbon atoms, R_4 is selected from the group consisting of hydrogen and lower alkyl, R_5 is selected from the group consisting of alkyl of up to 4 carbon atoms, alkenyl of up to 4 carbon atoms and alkoxyalkyl of up to 6 carbon atoms, or R_4 and R_5 together with the nitrogen atom to which they are attached form a group selected from the group consisting of piperidino, pyrrolidino and morpholino and R_6 is alkylene of up to 5 carbon atoms.

3,890,319

(2-IMIDAZOLIN-2-YLAMINO) SUBSTITUTED QUINOLINES, -QUINOXALINES AND -QUINAZOLINES AS ANTIHYPERTENSIVE AGENTS

John C. Danielewicz; Michael Snarey, and Geoffrey N. Thomas, all of Kent, England, assignors to Pfizer Inc., New York, N.Y.

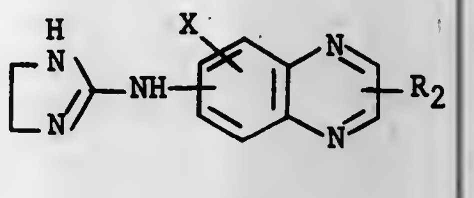
Filed Feb. 14, 1973, Ser. No. 332,485

Claims priority, application United Kingdom, Feb. 29, 1972, 9196/72; Nov. 8, 1972, 51629/72

Int. Cl. C07d *51/78*

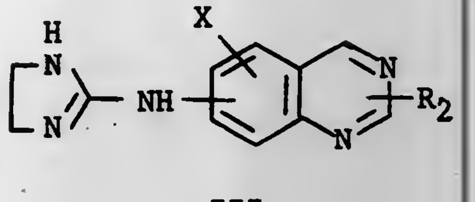
U.S. Cl. 260—250 Q **9 Claims**

1. A compound selected from the group consisting of those having the formulae



II

and



III

and the pharmaceutically acceptable acid addition salts thereof wherein X is selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy and trifluoromethyl and R_2 is selected from the group consisting of hydrogen, alkyl having 1 to 6 carbon atoms and alkoxy having 1 to 6 carbon atoms.

3,890,320

NOVEL PROCESS FOR PRODUCING 2-ACYL-3-ALKYL PYRAZINES

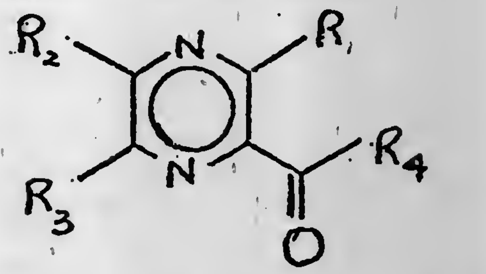
John Wolt, Freehold, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Filed Apr. 23, 1973, Ser. No. 353,779

Int. Cl. C07c *51/76*

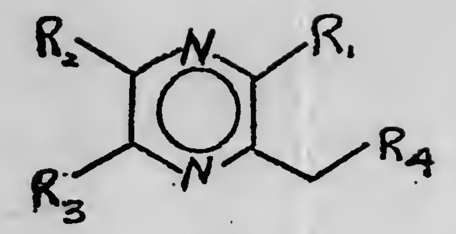
U.S. Cl. 260—250 B **8 Claims**

1. A process for producing a 2-alkanoyl-3-straight chain lower alkyl pyrazine having the structure:



wherein R_1 is C_1–C_3 straight chain lower alkyl; R_2 and R_3 are each the same or different and each is selected from the group consisting of hydrogen and methyl; and R_4 is selected from the group consisting of ethyl and methyl comprising the steps of:

a. Intimately admixing a compound having the structure:

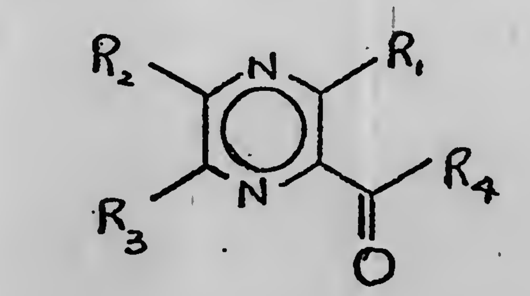


with (1) an alkali metal dichromate and (2) a C_2–C_3 straight chain alkanoic acid;

b. Heating the resulting mixture at a temperature in the range of from 80° up to 160°C; and

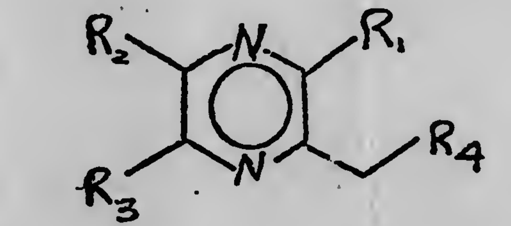
c. Recovering the 2-alkanoyl-3-straight chain lower alkyl pyrazine therefrom.

2. A process for producing a 2-alkanoyl-3-straight chain lower alkyl pyrazine having the structure:



wherein R_1 is C_1–C_3 straight chain lower alkyl; R_2 and R_3 are each the same or different and are each selected from the group consisting of hydrogen and methyl; and R_4 is selected from the group consisting of ethyl and methyl comprising the steps of:

a. Intimately admixing a compound having the structure:



with (1) a material selected from the group consisting of a C_2–C_3 straight chain alkanoic acid and approximately 50 percent aqueous sulfuric acid; and (2) and alkali metal dichromate;

b. Heating the resulting mixture at a temperature in the range of from 80° up to 160°C; and

c. Recovering the 2-alkanoyl-3-straight chain lower alkyl pyrazine therefrom.

3,890,321

6-ARYL-5-ETHYL-PYRIMIDIN-4-OL COMPOUNDS USEFUL AS INTERMEDIATES AND BRONCHODILATORS

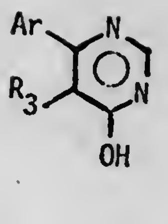
Gerald George DeAngelis, Wilton, and Hans-Jurgen Ernst Hess, Old Lyme, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 182,220, Sept. 20, 1971, which is a continuation-in-part of Ser. No. 78,216, Oct. 5, 1970, Pat. No. 3,707,560. This application June 19, 1973, Ser. No. 371,563

Int. Cl. C07d *51/38*

U.S. Cl. 260—251 R **2 Claims**

1. A compound selected from those of the formula



wherein:

R_3 is ethyl; and

Ar is selected from the group consisting of phenyl; substituted phenyl wherein said substituent is selected from the group consisting of methyl, methoxy, 3,4-dimethoxy, hydroxy, trifluoromethyl, fluorine, chlorine, bromine, cyano, nitro, dialkylamino said alkyl containing from 1 to 3 carbon atoms, amino and alkanoylamino containing from 1 to 4 carbon atoms; pyridyl; thienyl; furyl; monosubstituted pyridyl, thienyl and furyl wherein said substituent is alkanoylamino containing from 1 to 4 carbon atoms; naphthyl; 3-indolyl; 2- and 3-benzothienyl; and 2- and 3-benzofuryl.

3,890,322

1,1-DIMETHYL-2-THIO-3-(4-ALKYL-PIPERAZINO)-THOCARBONYL UREAS

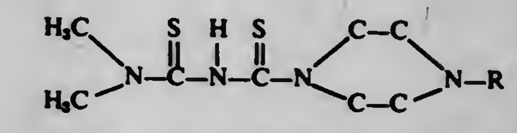
Russell F. Bellina, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed May 8, 1973, Ser. No. 358,394

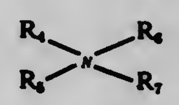
Int. Cl. C07d *5/70*

U.S. Cl. 260—268 C **6 Claims**

1. A compound of the formula.



Wherein R is alkyl of 1 to 6 carbon atoms or salts of these compounds with acids or bases, the acids being selected from those having an ionization constant of at least 1×10^{-7} and the salts formed with bases containing the cation selected from Li^+, Na^+, K^+, $Ca^{++}Cu^{++}$, Zn^{++}, Mg^{++}, Mn^{++}, and



where R_4, R_5, and R_6, are the same or different and represent hydrogen, Alkyl of 1 through 4 carbon atoms or hydroxyl alkyl of 2 through 4 carbon atoms; R_7 is hydrogen, alkyl of 1 through 12 carbon atoms, benzyl, amino, methylamino, or dimethyl amino; R_4 and R_5 taken together to form a ring that is $-(CH_2)_2-O-(CH_2)_2-$ or $-(CH_2)_j-$ where *j* is 4–6 and R_6 and R_7 are H.

3,890,323

PHENYLKETONE DERIVATIVES

Hisao Yamamoto, Nishinomiya; Shigeho Inaba, Takarazuka; Kikuo Sasajima, Toyonaka; Masaru Nakao, Osaka; Isamu Maruyama, Minoo; Keiichi Ono, Osaka, and Shigenari Katayama, Takarazuka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Japan

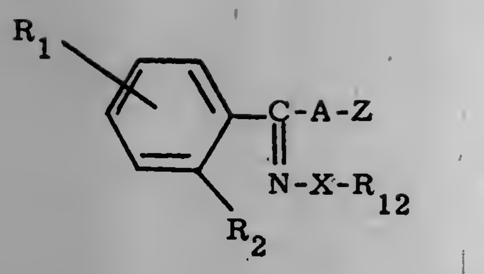
Filed June 13, 1973, Ser. No. 369,461

Claims priority, application Japan, June 14, 1972, 47-59895

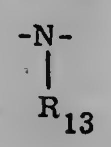
Int. Cl. C07d *51/70*

U.S. Cl. 260—268 R **7 Claims**

1. A compound of the formula:

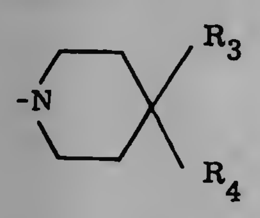


wherein R_1 is a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group, an amino group, a lower alkylamino group, a di(lower)alkylamino group, a benzylamino group or a trifluoromethyl group, R_2 is a hydrogen atom, a halogen atom, an amino group, an acylamino group selected from the group consisting of a C_1–C_5 alkanoylamino group, a benzoylamino group and a C_1–C_5 alkanoylamino group or benzoylamino group substituted with a substituent selected from the group consisting of hydrogen, halogen, hydroxyl, lower alkyl, lower alkoxy nitro, and trifluoromethyl, and N-lower alkyl-N-acylamino group, of which the acylamino moiety is the acylamino group heretofore defined, a lower alkylamino group, a di(lower)alkylamino group or a nitro group, R_{12} is a hydrogen atom, a lower alkyl group, a carbamoyl group or an aromatic group selected from the group consisting of phenyl, halophenyl, tolyl, and methoxyphenyl, A is a lower alkylene group, X is an oxygen atom or

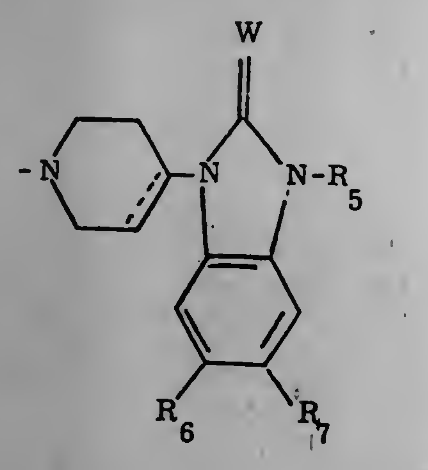


$$\underset{R_{13}}{\overset{|}{-N-}}$$

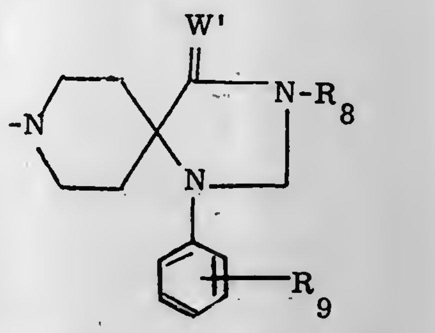
wherein R_{13} is a hydrogen atom, a lower alkyl group or an aromatic group selected from the group consisting of phenyl, halophenyl, tolyl, and methoxyphenyl and Z is a group of either one of the formulas:



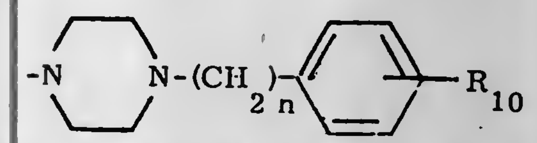
wherein R_3 is a hydrogen atom or a hydroxyl group and R_4 is a hydrogen atom, a phenyl group a benzyl group, a phenyl group substituted with one or more substituents selected from the group consisting of halogen, lower alkyl, lower alkoxy and trifluoromethyl on the benzene ring, and a benzyl group having one or more substituents selected from the group consisting of halogen, lower alkyl, lower alkoxy and trifluoromethyl on the benzene ring.



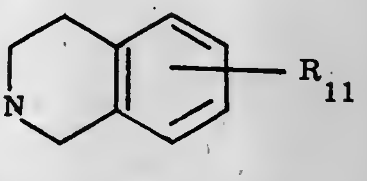
wherein W is two hydrogen atoms or an oxygen atom, R_5 is a hydrogen atom or a lower alkyl group, R_6 and R_7 are each a hydrogen atom, a halogen atom or a lower alkyl group and the dotted line is an optional bond between the carbon atoms at the 3- and 4-positions of the piperidine ring,



wherein W' is two hydrogen atoms or an oxygen atom, R_8 is a hydrogen atom or a lower alkyl group and R_9 is a hydrogen atom, a halogen atom, a lower alkyl group or a lower alkoxy group,



wherein R_{10} is a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group or a trifluoromethyl group and n is an integer of from 0 to 2, and



wherein R_{11} is a hydrogen atoms, a halogen atom, a hydroxyl group, a lower alkyl group, a lower alkoxy group or a nitro group, and its pharmaceutically acceptable acid addition salts and quaternary ammonium salts.

3,890,324

1H-PYRAZOLO[4,3-C]QUINOL-4(5H)-ONE-3-CARBOXYLIC ACIDS

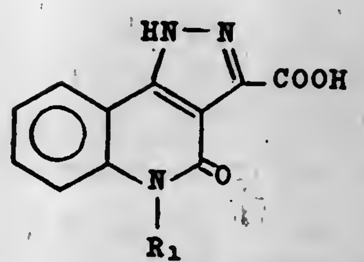
Alan S. Katner, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 12, 1974, Ser. No. 460,641

Int. Cl. C07d ***33/48***

U.S. Cl. 260—287 R **10 Claims**

1. A 1H-pyrazolo[4,3-c]quinol-4(5H)-one-3-carboxylic acid of the formula,



wherein R_1 is a monovalent group selected from the group consisting of methyl, benzyl, and monosubstituted benzyl in which the substituent is fluoro, chloro, or bromo.

3,890,325

LEUROCOLOMBINE

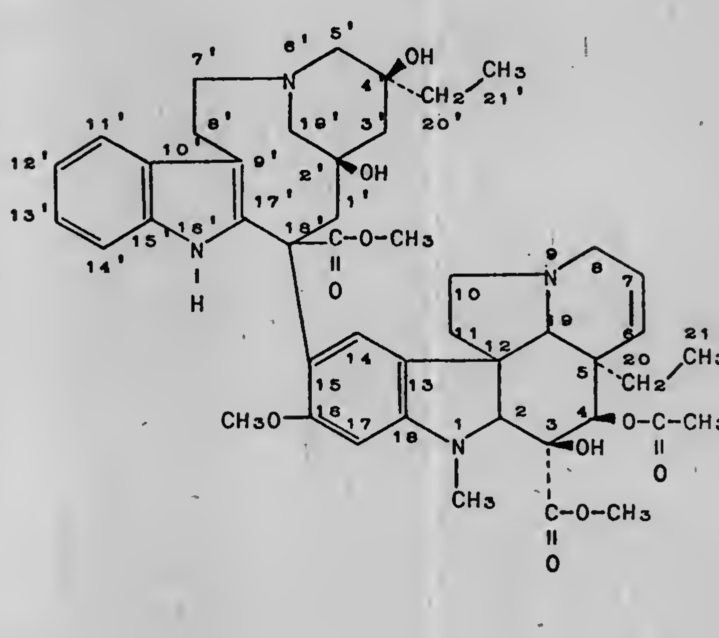
Susan L. Smith, and Douglas E. Dorman, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 15, 1974, Ser. No. 469,982

Int. Cl. C07d ***33/50***

U.S. Cl. 260—287 R **2 Claims**

1. Leurocolombine, represented by the formula:



and a pharmaceutically-acceptable acid addition salt, formed with a non-toxic acid.

3,890,326

BROMINATION WITH TRIFLUOROMETHYLBROMIDE

John H. Tobin, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Dec. 13, 1973, Ser. No. 424,394

Int. Cl.² C07D ***213/26, 213/61;*** **C07C** ***17/12***

U.S. Cl. 260—290 HL **11 Claims**

1. A process for preparing a brominated aromatic or heteroaromatic compound and fluoroform which comprises reacting a selected reactant with trifluoromethylbromide in the vapor phase and at a temperature of at least 400°C., said reactant being selected from the group consisting of aromatic hydrocarbons and heteroaromatic compounds having 6 to 10 ring atoms consisting of carbon and not more than 2 atoms of nitrogen, said aromatic reactant being substituted with hydrogen and further substituents selected from the group consisting of hydrogen, halogen, perhaloalkyl having 1 to 4 carbon atoms, nitrile and combinations of such further substituents.

3,890,327

TRANS-1,2,3,4,4A;8,9,14A-OCTAHYDROPYRIDO[R',3':2,3]INDOLO[1,7-AB][1]BENZAZEPINE

Joel G. Berger, Freeport, N.Y., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

Filed May 11, 1973, Ser. No. 359,504

Int. Cl. C07d ***57/04***

U.S. Cl. 260—293.55 **4 Claims**

1. Trans-1,2,3,4,4a,8,9,14a-octahydropyrido[4',3':2,3]indolo[1,7-ab][1]benzazepine and acid addition salts thereof with pharmaceutically suitable acids.

3,890,328

N,N-DIOXIDES OF BIS-BASIC CYCLIC KETONES

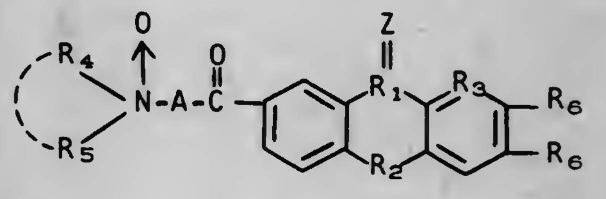
Frank P. Palopoli, and John P. Paolini, Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Mar. 8, 1974, Ser. No. 449,225

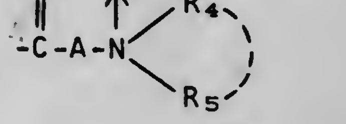
Int. Cl. C07d ***29/20***

U.S. Cl. 260—293.62 **7 Claims**

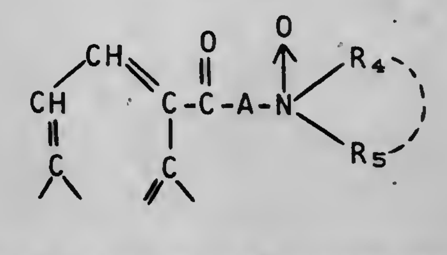
1. An essentially pure N,N-dioxide of a bis-basic cyclic ketone having the formula



wherein
Z is oxygen or H_2;
R_1 is carbon;
R_2 is a sigma bond or oxygen;
R_3 is methylidyne;
A is a straight or branched alkylene chain having from 2 to 4 carbon atoms;
R_4 and R_5 are each selected from the group consisting of lower alkyl having from 1 to 3 carbon atoms and when taken together with the nitrogen atom to which they are attached represent the pyrrolidinyl, piperidino and morpholino group;
R_6 is selected from the group consisting of hydrogen and



with the proviso that one and only one such R_6 group is hydrogen;
R_1, Z and R_3 taken together form the group



when each R_6 is hydrogen and R_2 is a sigma bond; and the pharmaceutically acceptable acid addition salts thereof.

3,890,329

HYDROGENATION PROCESS WITH UNSUPPORTED GROUP VIII METAL HYDROXIDE CATALYSTS

Leo L. Benezra, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Feb. 15, 1973, Ser. No. 332,663

Int. Cl. C07d ***29/06***

U.S. Cl. 260—293.52 **11 Claims**

1. An improved process for converting an unsaturated carbocyclic or heterocyclic compound to its more saturated carbocyclic or heterocyclic derivative, which process comprises contacting said unsaturated carbocyclic or heterocyclic compound under a hydrogen pressure ranging from about 100 to 1500 psig, at a temperature of 70°–200° C. and in the absence of a water-soluble alkaline agent, with an unreduced Group VIII metal hydroxide which is unsupported and in an undried state as the sole hydrogenation catalyst, said unreduced Group VIII metal hydroxide having been obtained by first reacting a water-soluble salt of a Group VIII metal se-

lected from the group consisting of cobalt, ruthenium, palladium, rhodium and nickel with a compound which supplies hydroxyl ions in aqueous solution, and then being isolated from the reaction mixture and washed prior to use.

3,890,330
AMINOALKYL-SP IROCYCLOALKANES

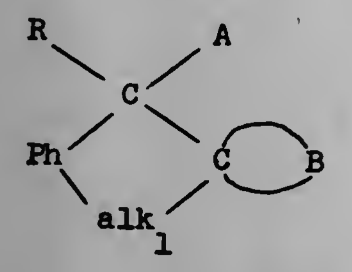
Lincoln Harvey Werner, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 796,166, Feb. 3, 1969, Pat. No. 3,706,756, which is a continuation-in-part of Ser. No. 723,585, April 23, 1968, Pat. No. 3,657,440. This application Sept. 10, 1971, Ser. No. 179,565

Int. Cl. C07c *87/28*

U.S. Cl. 260—295.5 S **5 Claims**

1. A 1-basically substituted benzcycloalkane-2-spiroaliphatic compound of the formula



in which Ph is 1,2-phenylene, or 1,2-phenylene substituted by up to two members selected from the group of lower alkyl, hydroxy, lower alkoxy, halogeno, trifluoromethyl or nitro, alk_1 is lower alkylene contributing 1 to 3 ring-carbon atoms, B is lower alkylene or alkenylene contributing 4 to 6 ring-carbon atoms, A is amino, mono- or di-lower alkylamino, N-(hydroxyl-lower alkyl)-N-lower alkylamino, di-(hydroxy-lower alkyl)-amino in which hydroxy is separated from amino by at least 2 carbon atoms, monocyclic, 3 to 7 ring-membered lower cycloalkylamino, cycloalkyl-lower alkylamino, N-cycloalkyl-N-lower alkylamino or N-cycloalkyl-lower alkyl-N-lower alkylamino, HPh-lower alkylamino, or N-lower alkyl-HPh-lower alkylamino-lower alkyl and R is hydrogen or hydroxy, or the N-oxide or therapeutically useful acid addition salts thereof.

3,890,331
3-SUBSTITUTED-5-HYDROXY (MERCAPTO) ALKYLIDENE-RHODANINE DERIVATIVES

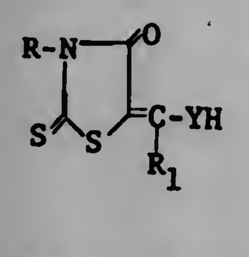
Arthur Magnani, Wynnewood, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 254,363, May 18, 1972, abandoned. This application July 13, 1973, Ser. No. 379,037

Int. Cl. C07d *91/16*

U.S. Cl. 260—294.8 D **20 Claims**

1. A chemical compound of the formula:



wherein:

R is lower alkyl of from 1 to 4 carbon atoms, straight or branched chain, cycloalkyl of from 3 to 6 carbon atoms, alkenyl of from 3 to 5 carbon atoms, phenyl, phenylalkyl of from 7 to 9 carbon atoms, monohalophenyl, dichlorophenyl, alkylphenyl, methylchlorophenyl or pyridylmethyl;

R_1 is lower alkyl of from 1 to 4 carbon atoms, phenylalkyl of from 7 to 9 carbon atoms, said alkyl moieties being straight or branched chain, monochlorobenzyl or monomethylbenzyl; and

Y is oxygen or sulfur, or a 2-aminopyridine or 2-aminothiazole salt thereof.

3,890,332
HALOPYRIDYL THIOALKYLTHIO CYANATES

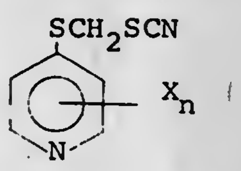
Penelope B. Domenico, Fairfax, Va., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 15, 1974, Ser. No. 460,831

Int. Cl. C07d *31/50*

U.S. Cl. 260—294.8 G **6 Claims**

1. A compound corresponding to the formula



wherein X is chloro or bromo and *n* is an integer of from 2 to 4.

3,890,333
CHROMANOL NICOTINATE DERIVATIVES

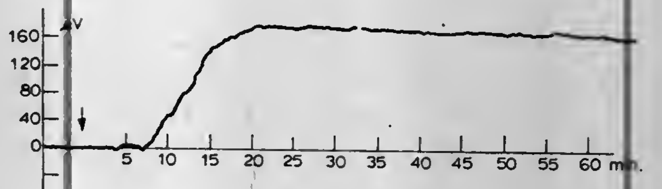
Tetsuya Nakamura, Kawagoe, and Shizumasa Kijima, Tokyo, both of Japan, assignors to Eisai Company, Ltd., Japan

Filed June 13, 1973, Ser. No. 369,432

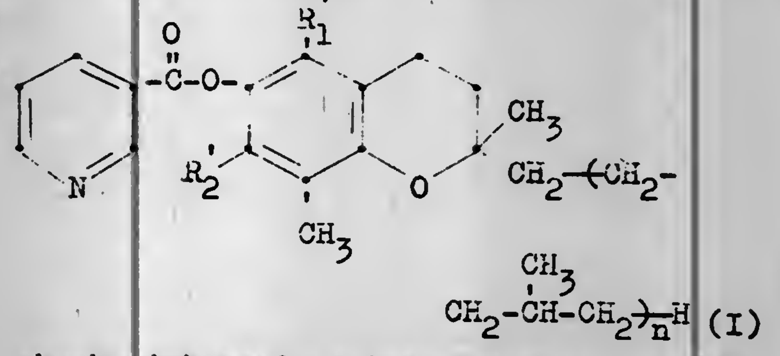
Claims priority, application Japan, June 24, 1972, 47-62845

Int. Cl.² C07D *213/55*

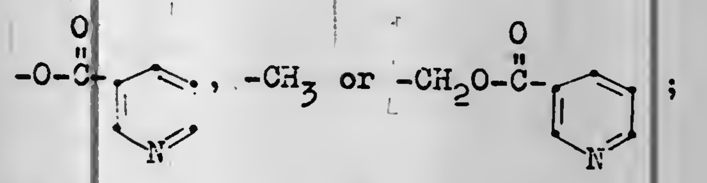
U.S. Cl. 260—295.5 B **9 Claims**



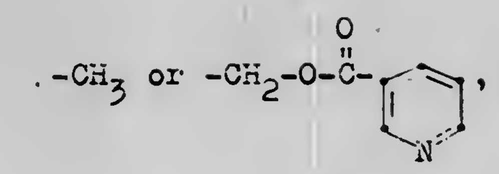
1. Chromanol nicotinate derivatives having the formula:



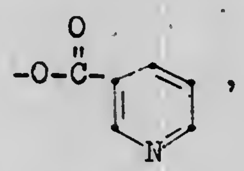
wherein *n* designates 0 or an integer of from 1 to 3; R_1' designates a radical



and R_2' designates a radical —CH_3 or



with the provision that R_2' is —CH_3 where R_1' is



and that there is no case where both the radicals R_1' and R_2' are simultaneously the radicals of —CH_3.

3,890,334
TETRASILA-ADAMANTANE COMPOUNDS

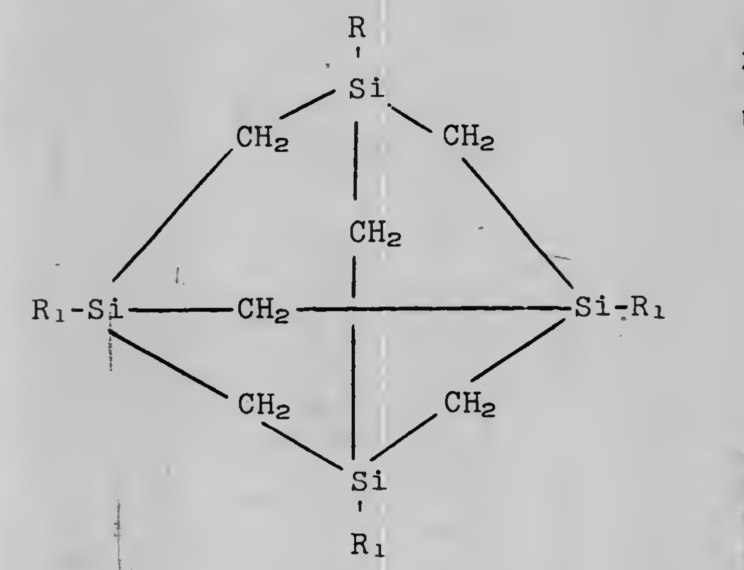
Cecil L. Frye, Midland, and Jerome M. Klosowski, Monitor Twp., Bay County, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 230,937, March 1, 1972, Pat. No. 3,776,915. This application June 22, 1973, Ser. No. 372,561

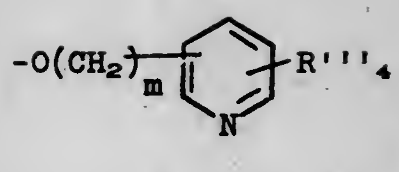
Int. Cl. C07d *103/02*

U.S. Cl. 260—297 F **24 Claims**

1. A tetrasila-adamantane of the formula



in which R is a nitrogen-containing substituent selected from the group consisting of the —O—Q′—N(R″)₂ radical wherein Q′ is a divalent hydrocarbon radical containing from one to 20 carbon atoms, said divalent radical being selected from the group consisting of alkylene, alkarylene and arylene radicals; and each R″ is selected from the group consisting of the hydrogen atom, monovalent hydrocarbon radicals, said hydrocarbon radical being selected from the group consisting of alkyl of one to 18 carbon atoms, alkenyl of three to 18 carbon atoms, cycloaliphatic of five to six carbon atoms, alkaryl of six to nine carbon atoms, aralkyl of six to nine carbon atoms, phenyl and naphthyl, and monohydroxy-substituted alkyl radicals of no more then eight carbon atoms ; the



radical in which R‴ is independently selected from the group consisting of the hydrogen atom and alkyl radicals containing from one to four inclusive carbon atoms and *m* is an integer having a value of 2 or 3; the $—CH_2—_3NR''''_2$ radical in which each R⁗ is selected from the group consisting of the hydrogen atom and monovalent hydrocarbon radicals free of aliphatic unsaturation and containing no more than eight carbon atoms and the $—ONR''''_2$ radical in which R⁗ is as defined above; and R_1 is independently selected from the group consisting of the methyl radical and R radicals.

3,890,335
5-(3-PYRIDYL)-2-FURALDEHYDE AND PREPARATION

Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Aug. 30, 1973, Ser. No. 392,936

Int. Cl. C07d *31/30*

U.S. Cl. 260—297 R **2 Claims**

1. 5-(3-Pyridyl)-2-furaldehyde.

3,890,336
CERTAIN THIAZOLES CONTAINING PHOSPHORUS ACID ESTERS

Fumio Suzuki; Mamoru Hayashi; Ikuo Kawakami; Fujio Motohashi, and Yoshiki Iwabuchi, all of Tokyo, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

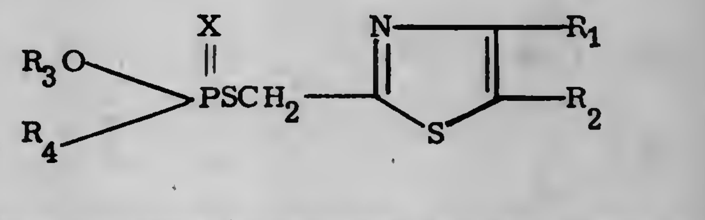
Filed Feb. 28, 1973, Ser. No. 336,834

Claims priority, application Japan, Mar. 17, 1972, 47-27212

Int. Cl. C07d *91/32*

U.S. Cl. 260—302 E **3 Claims**

1. An insecticidal and miticidal compound which comprises



wherein R_1 represents a hydrogen atom or a methyl group, R_2 represents a halogen atom or a nitro group, R_3 represents a methyl or ethyl, R_4 represents a methoxy, ethoxy or phenyl group and X represents a sulfur or oxygen atom.

3,890,337
α,α,α-TRIFLUORO-2-NITRO-6-[OXA(THIO)ZOLYL]THIA-P-TOLUNITRILES

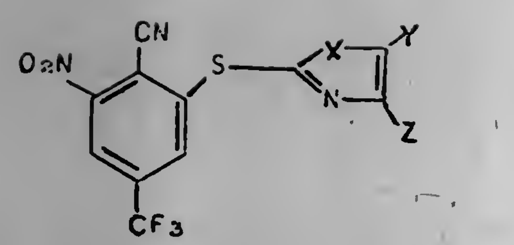
James R. Beck, Indianapolis, and Robert G. Suhr, Greenfield, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 23, 1973, Ser. No. 418,512

Int. Cl. C07d *91/32*, *85/44*

U.S. Cl. 260—302 S **7 Claims**

1. A compound of the formula



wherein
- X is oxygen or sulfur;
- Y and Z, when taken separately, are the same or different, and are hydrogen or phenyl; and
- Y and Z, when taken together with the carbon atoms to which they are attached, form a benzene ring or mono halogensubstituted benzene ring.

3,890,338

ETHANOLYSIS OF 3-TRICHLOROMETHYL-5-CHLORO-1,2,4-THIADIZOLE EMPLOYING AQUEOUS BASE

John A. Wojtowicz, Chesire, and Sudhir K. Bhutani, West Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed May 2, 1974, Ser. No. 466,434

Int. Cl. C07d *91/60*

U.S. Cl. 260—302 D **10 Claims**

1. A process for producing 3-trichloromethyl-5-lower alkoxy-1,2,4-thiadiazole comprising:

reacting 3-trichloromethyl-5-chloro-1,2,4-thiadiazole with an aqueous base selected from the group consisting of aqueous alkali metal, alkaline earth metal or ammonium hydroxides, oxides or carbonates and a lower alkanol having 1-4 carbon atoms at a temperature of ambient to 120°C. in a reaction mixture comprising water, 1.01-4 moles of said base and 1-15 moles of said alkanol per mole of 3-trichloromethyl-5-chloro-1,2,4-thiadiazole; thereafter neutralizing said reaction mixture, phasing the neutralized reaction mixture and recovering 3-trichloromethyl-5-lower alkoxy-1,2,4-thiadiazole.

3,890,339

PROCESS FOR PREPARING 3-TRICHLOROMETHYL-5-THOXY-1,2,4-THIADIAZOLE FROM TRICHLOROACETONITRILE IN ETHANOL

David F. Gavin, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed May 28, 1974, Ser. No. 474,118

Int. Cl. C07d *91/60*

U.S. Cl. 260—302 D **1 Claim**

1. A process for preparing 3-trichloromethyl-5-ethoxy-1,2,4-thiadiazole comprising:

1. Reacting trichloroacetonitrile with ammonia in the presence of sufficient ethanol to provide a weight ratio of ethanol to trichloroacetonitrile of 1:1 to 100:1;
2. Adding trichloromethanesulfenyl chloride to the reaction mixture of step 1 in an amount sufficient to produce a trichloromethanesulfenyl chloride/trichloroacetonitrile molar ratio of 1:1 to 10:1 and permitting the reaction to proceed at least until the resulting exotherm has ceased;
3. Thereafter adding a base selected from the group consisting of alkali metal or ammonium hydroxide, carbonate, and bicarbonate to the slurry resulting from step 2, said base being an added in an amount sufficient to provide 3 to 10 equivalents of alkali metal or ammonium ion per mole of trichloroacetonitrile, and thereafter recovering 3-trichloromethyl-5-ethoxy-1,2,4-thiadiazole.

3,890,340

PREPARATION OF 2,1-BENZISOTHIAZOLES

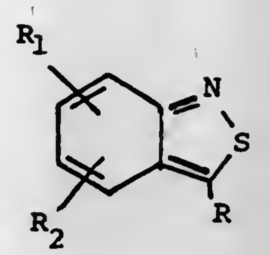
Gary M. Singerman, Prairie Village, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 19, 1973, Ser. No. 426,064

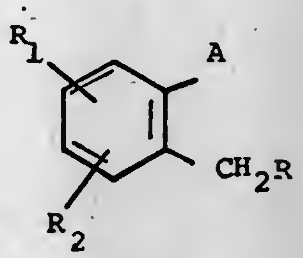
Int. Cl. C07d *91/12*

U.S. Cl. 260—304 **13 Claims**

1. A method for preparing a 2,1-benzisothiazole having the formula



which comprises reacting a 2-alkylaniline or a 2-alkyl-N-sulfinylaniline having the formula



in which A is amino or N-sulfinylamino and R, R_1 and R_2 are independently hydrogen, alkyl having one to eight carbon atoms, phenyl or phenyl substituted with halogen or lower alkyl having one to four carbon atoms and R_1 and R_2 are additionally independently selected from halogen, nitro, alkoxy having one to eight carbon atoms, chlorocarbonyl, carboalkoxy having one to eight carbon atoms, or dialkylcarbamoyl having one to eight carbon atoms with a sulfinylsulfonamide having the general formula R_3SO_2NSO in which R_3 is alkyl having one to 30 carbon atoms, optionally substituted with halogen, or phenyl, optionally substituted with halogen, alkyl having one to four carbon atoms or nitro at a temperature from about 50° to about 150° C.

3,890,341

METHOD OF PREPARING DI 6-PHENYL-2,3,5,6-TETRAHYDRO-IMIDAZO[2,1-B]THIAZOLE AND ACID ADDITION SALTS THEREOF

John Edson Gordon, Martinsville, and Imre Aurel Halmos, Summit, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed June 18, 1973, Ser. No. 371,229

Int. Cl. C07d *99/10*

U.S. Cl. 260—306.7 T **9 Claims**

1. A method of preparing dl 6-phenyl-2,3,5,6-tetrahydroimidazo[2,1-b]thiazole, and acid addition salts thereof, comprising (1) reacting dl 3-(β-hydroxyphenethyl)-2-iminothiazolidine, or an acid addition salt thereof, with a highly concentrated aqueous hydrochloric acid containing 36 to 47 percent by weight of hydrogen chloride under conditions so that the said concentration of hydrogen chloride is maintained, at temperatures of about 25°C. to 70°C. to obtain an acid addition salt of dl 3-(β-chlorophenethyl)-2-iminothiazolidine, and (2) heating the latter compound in the presence of an acid binding agent to obtain dl 6-phenyl-2,3,5,6-tetrahydroimidazo[2,1-b]thiazole or (3) treating the latter compound with an anhydrous acid and recovering the dl 6-phenyl-2,3,5,6-tetrahydroimidazo[2,1-b]thiazole acid addition salt.

3,890,342

2-ALKYL-4-ARYL-1,2,4-TRIAZOLIDIN-3-ONES

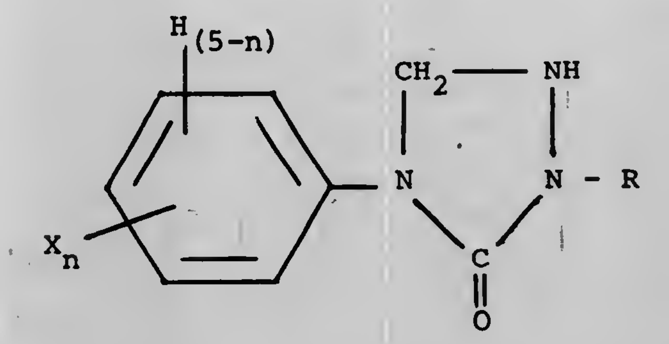
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Mar. 28, 1974, Ser. No. 455,710

Int. Cl. C07d *55/06*

U.S. Cl. 260—308 C **6 Claims**

1. A compound of the formula



wherein X is selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, halogen, halo lower alkyl and nitro; *n* is an integer from 1 to 3; and R is lower alkyl.

3,890,343

6-NITRO-2-POLYHALOALKYLBENZIMIDAZOLES

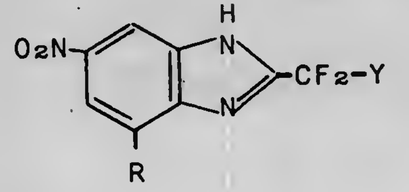
John L. Miesel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 221,808, Jan. 28, 1972, abandoned. This application Mar. 20, 1974, Ser. No. 453,135

Int. Cl. C07d *49/38*

U.S. Cl. 260—309.2 **7 Claims**

1. The compound of the formula



wherein Y represents
- a. hydrogen,
- b. chlorine,
- c. fluorine,
- d. difluoromethyl,
- e. trifluoromethyl, or
- f. pentafluoroethyl;

and R represents
1. Branched alkyl of C_3–C_6, both inclusive,
2. cycloalkyl of C_3–C_6, both inclusive,
3. cycloalkylloweralkyl, wherein cycloalkyl is of C_3–C_6, both inclusive, and loweralkyl is of C_1–C_2, both inclusive, or
4. methylcycloalkyl, wherein cycloalkyl is as defined in the preceding candidate moiety; or an alkali metal or alkaline earth metal salt thereof.

3,890,344

2-HALOALKYL-HALOALKYLSULFONYLBENZIMIDAZOLES

Gerhard Horlein, Frankfurt am Main; Adolf Studeneer, Kelkheim, Taunus; Peter Langeluddeke, Diedenbergen, Taunus, and Friedheim Schwerdtle, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

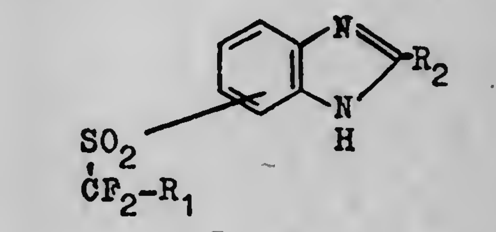
Filed May 23, 1974, Ser. No. 472,800

Claims priority, application Germany, May 25, 1973, 2326624

Int. Cl. C07d *49/38*

U.S. Cl. 260—309.2 **2 Claims**

1. A benzimidazole derivative of the formula



I

where R_1 is H, $—CF_2H$, $—CFClH$ or $—CCl_2H$ and R_2 is haloalkyl having 1 or 2 carbon atoms.

3,890,345

PREPARATION OF PYRROLINES BY THE AMINATION OF KETONES

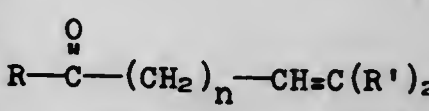
Fred L. Metz, Painesville, and James A. Scozzie, Wickliffe, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Feb. 21, 1973, Ser. No. 334,235

Int. Cl. C07d *27/14*

U.S. Cl. 260—313.1 **8 Claims**

1. A process for the production of a substituted pyrroline, which process comprises reacting (A) a ketone having the formula:



$$R—\overset{\displaystyle O}{\overset{\|}{C}}—(CH_2)_n—CH{=}C(R')_2$$

wherein R is a C_1-C_8 aliphatic radical; R' is H or R; and *n* is 1 or 2, with (B) an excess of NH_3 at a temperature between 400° and 550° C in the presence of a sintered, high porosity, alumina.

3,890,346

PROCESS FOR THE PREPARATION OF N-ARYLPHTHALIMIDINES

Abul Fateh Mohammed Iobal, Glattbrugg, Switzerland, assignor to Monsanto Company, St. Louis, Mo.

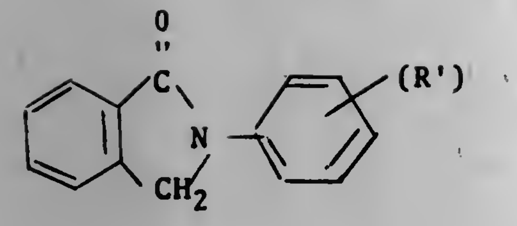
Filed Mar. 12, 1973, Ser. No. 340,134

Claims priority, application Switzerland, Mar. 22, 1972, 4213/72

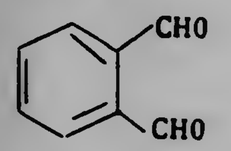
Int. Cl. C07d *27/50*

U.S. Cl. 260—325 PH **2 Claims**

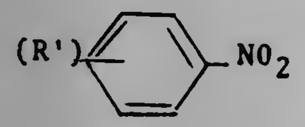
1. A process for the preparation of N-arylphthalimidine of the formula



wherein R′ is a member selected from the group consisting of hydrogen, halogen, methoxy, methyl and phenyl, and which comprises reacting at a temperature of in the range of from about 50° to about 250°C. and under a pressure on in the range of from about 50 to about 300 atmospheres an O-phthlaldehyde of the formula



with an aromatic nitro compound of the formula



wherein R′ is defined as above under carbon monoxide pressure in the presence of pyridine and a catalytic amount of a rhodium carbonyl compound.

3,890,347
ISOINDOLINE DERIVATIVES

David Middlemiss, London, England, assignor to Allen and Hanburys Limited, London, England

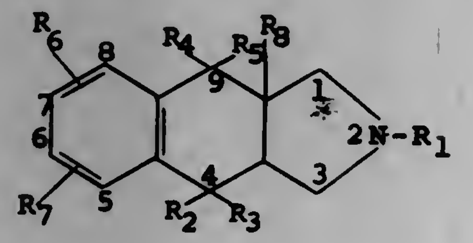
Filed Nov. 24, 1972, Ser. No. 308,958

Claims priority, application United Kingdom, Dec. 8, 1971, 56977/71

Int. Cl.² C07D *205/12*

U.S. Cl. 260—326.1 **53 Claims**

1. A compound of the formula



or a non-toxic pharmaceutically acceptable acid addition salt thereof, in which:

R_1 represents hydrogen; alkyl $(C_1\text{-}D_6)$; alkenyl $(C_2\text{-}C_6)$; alkyl $(C_1\text{-}C_6)$ substituted by hydroxy, dialkyl $(C_1\text{-}C_4)$ amino, phenyl, benzoly substituted by halo, or phenoxy substituted by $(C_1\text{-}C_4)$ alkoxy; or carbamoyl;

R_2 represents hydrogen, hydroxy, $(C_1\text{-}C_6)$ alkyl or phenyl, or together with R_4 represents a methylene bridge;

R_3 represents hydrogen, $(C_1\text{-}C_6)$ alkyl or phenyl;

R_4 represents hydrogen of hydroxy or together with R_2 a methylene bridge;

R_5 represents hydrogen;

R_6 represents hydrogen, dialkyl $(C_1\text{-}C_4)$ amino or nitro;

R_7 represents hydrogen, hydroxy, hydroxyalkyl $(C_1\text{-}C_4)$, nitro, $(C_1\text{-}C_4)$ alkoxy, acetyloxy, halogen, or a group —NR_9R_{10} in which R_9 represents hydrogen, alkyl $(C_1\text{-}C_4)$, acetyl, alkyl $(C_1\text{-}C_4)$ sulphonyl or ethoxy carbonyl and R_{10} represents hydrogen, alkyl $(C_1\text{-}C_4)$ or hydroxyalkyl $(C_1\text{-}C_4)$; and

R_8 represents hydrogen or $(C_1\text{-}C_6)$ alkyl.

3,890,348
INDOLE-1 AND INDOLINE-1-CARBOXAMIDES AND THIOCARBOXAMIDES

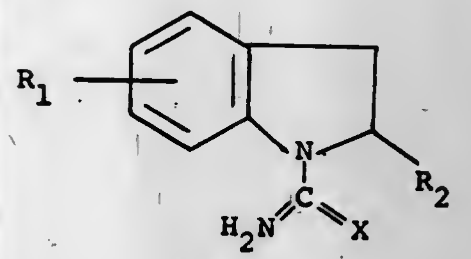
Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Mar. 26, 1973, Ser. No. 344,735

Int. Cl. C07d *27/38, 27/56*

U.S. Cl. 260—326.11 R **8 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, mono- or dialkylamino in which the alkyl group contains 1 to 3 carbon atoms, halo of atomic weight 18 to 80, amino, nitro, alkyl or alkoxy of 1 to 3 carbon atoms or trifluoromethyl,

R_2 is hydrogen or alkyl of 1 to 5 carbon atoms, and

X is sulfur or oxygen.

3,890,349
5,5-DIALKYL-3-PYRROLINE-2,2-DICARBOXYLIC ACID ESTERS

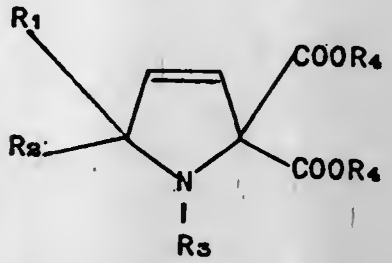
Robert D. Dillard, Zionsville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 20, 1973, Ser. No. 426,859

Int. Cl. C07d *27/14*

U.S. Cl. 260—326.46 **4 Claims**

1. A compound of the following general formula:



wherein

R_1 and R_2 are independently selected monovalent C_1—C_3 alkyl groups, or R_1 and R_2 taken together constitute a divalent polymethylene group having either four or five carbon atoms which, together with the carbon atom to which it is attached, completes a five- or six-membered carbocyclic ring;

R_3 is a monovalent C_1—C_3 alkyl group; and

R_4 is a monovalent C_1—C_6 alkyl group.

3,890,350
3-AMINO-2-(METHYLENEDIOXYPHENYL)-ACROLEINS

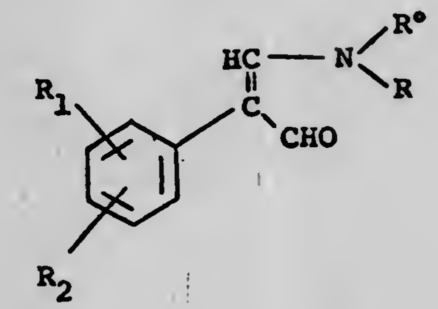
Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 88,221, Nov. 9, 1970, Pat. No. 3,767,650, which is a continuation-in-part of Ser. No. 27,460, April 10, 1970, abandoned. This application Aug. 23, 1973, Ser. No. 390,887

Int. Cl. C07d *13/10*

U.S. Cl. 260—340.5 **6 Claims**

1. A compound of the formula:



wherein

R_1 and R_2 are on adjacent ring positions and together form methylenedioxy,

$R°$ is alkyl of 1 or 2 carbon atoms,

R is alkyl of 1 or 2 carbon atoms or phenyl, or

$R°$ and R together with the nitrogen to which they are attached form a saturated heterocyclic ring having 5 to 7 ring atoms of which one is the nitrogen atom and the balance are carbon atoms.

3,890,351
LOWERALKYL ESTERS OF 3β-[TRI(LOWER ALKYL)SILYLOXY]-2α-(3-OXO OR HYDROXY-1-OCTENYL)-5-OXO-1β-CYCLOPENTANEHEPTANOIC ACID, 5-CYCLIC ETHYLENE ACETAL

David Taub, Metuchen, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed May 8, 1972, Ser. No. 251,726

Int. Cl. C07d *13/04*

U.S. Cl. 260—340.9 **5 Claims**

1. A loweralkyl ester of 3β-2α-(3-oxo-1-octenyl)-5-oxo-1β-cyclopentaneheptanoic acid, 5-cyclic ethylene acetal or a stereoisomer thereof.

3,890,352
DIOXOLANYL CARBONYL CARBOXAMIDES

Eirlys R. Isaac, Sittingbourne, and Peter Kirby, Maidstone, both of England, assignors to Shell Oil Company, Houston, Tex.

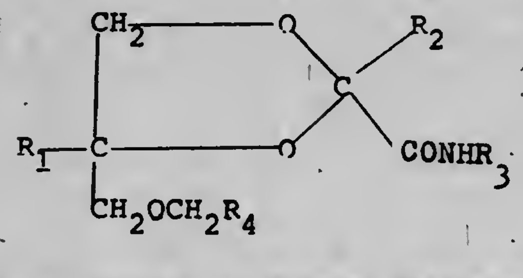
Filed June 25, 1974, Ser. No. 482,933

Claims priority, application United Kingdom, July 3, 1973, 31604/73

Int. Cl. C07c *103/86*

U.S. Cl. 260—340.9 **3 Claims**

1. An amide derivative of the formula:



wherein R_1 and R_2 each represents an alkyl group of 1–6 carbon atoms, R_3 represents an alkyl-, alkenyl-or aryl-carbonyl group of up to 8 carbon atoms optionally substituted by chlorine, and R_4 represents a phenyl group optionally substituted by fluorine or chlorine or by an alkyl group of 1–6 carbon atoms.

3,890,353
PROCESS FOR PREPARING LACTONES

Joseph J. Becker, Geneva, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

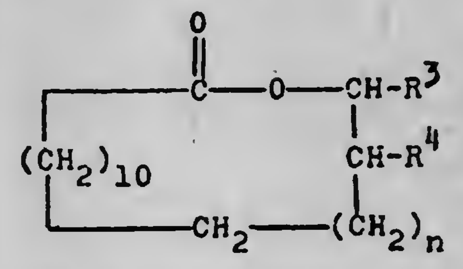
Division of Ser. No. 41,595, May 28, 1970, abandoned. This application July 9, 1973, Ser. No. 377,564

Claims priority, application Switzerland, May 29, 1969, 8192/69; May 27, 1970, 7865/70

Int. Cl. C07d *9/00*

U.S. Cl. 260—343 **13 Claims**

1. Method for preparation of lactones containing 14 to 17 ring carbon atoms having the formula

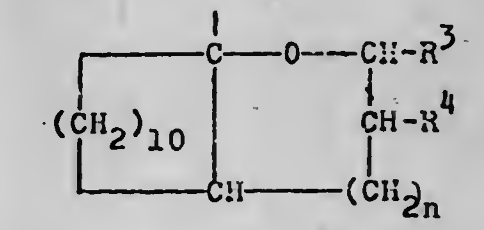


III

wherein R^3 and R^4 represent hydrogen or one of them a methyl radical and the other hydrogen and *n* represents an integer from zero to 3, which comprises cleaving the oxygen to oxygen band by means of a reducing agent of a peroxide having the formula

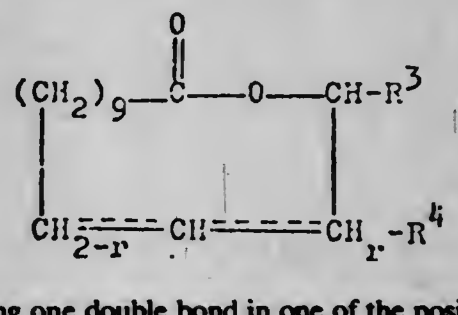
$$R^1\text{-}0\text{-}0\text{-}R^2 \qquad \text{I}$$

wherein R^1 represents hydrogen, a lower hydrocarbon radical selected from alkyl, cycloalkyl, aryl and aralkyl, a lower alkanoyl group or a group of formula



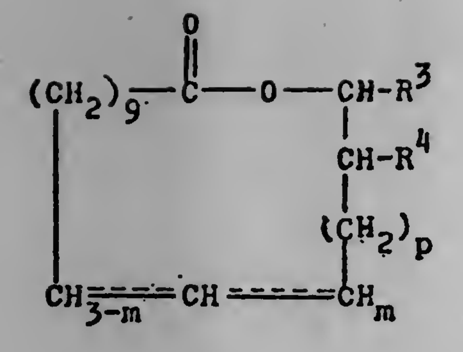
II

and R^2 represents a group of formula II, provided, that when R^1 and R^2 represent a group of formula II they are identical, to give a mixture comprising a lactone of formula III and the corresponding unsaturated lactone having, when n is zero, the formula



IVi

containing one double bond in one of the positions indicated by the dotted lines, and wherein r is zero or 1, or, when n is 1 to 3, the formula



IVii

wherein *m* is 1 or 2 and *p* is an integer from zero to 2, and either separating the lactone III from said mixture or hydrogenating the aforesaid mixture or the unsaturated compound IVi, ii, separated from said mixture.

3,890,354
PROCESS FOR PREPARING 3-(3-CYANOPROPYL)-6A-METHYL-4A-HYDROXYPERHYDRO-3H-NAPHTHA[2,1-B]BENZOPYRAN-7-OLS AND 3-(3-CYANOPROPYL)-6A-ETHYL-4A-HYDROXYPERHYDRO-3H-NAPHTHA[2,1-B]BENZOPYRAN-7-ONES AS STEROID INTERMEDIATES

Noal Cohen, Montclair; Michael Rosenberger, Caldwell, and Gabriel Saucy, Essex Fells, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 67,296, Aug. 26, 1970, Pat. No. 3,813,417. This application Mar. 13, 1974, Ser. No. 450,647

Int. Cl. C07d *7/06*

U.S. Cl. 260—343.5 **3 Claims**

1. 8-Cyano-5-hydroxyoctanoic acid lactone.

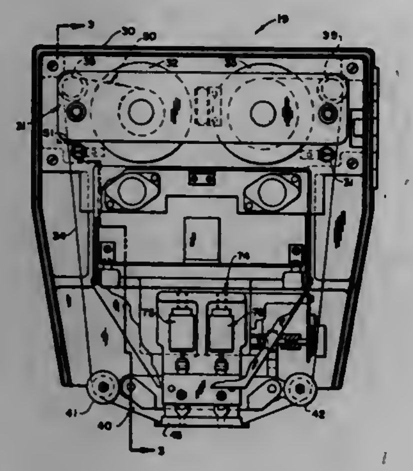
3,890,355
HIGH SPEED COLOR PRINTER FOR SCINTILLATION SCANNER

Carl J. Brunnett, Mayfield Heights; Jeremy H. Gibson, Eastlake; Walter F. Mog, Willowick, and Richard S. Smith, Mentor, all of Ohio, assignors to Picker Corporation, Cleveland, Ohio

Filed June 25, 1971, Ser. No. 156,913

Int. Cl. G01t *1/20*

U.S. Cl. 250—366 **42 Claims**



1. A scintillation scanner comprising:

a. a frame structure;

b. a scintillation responsive structure for providing a signal response to radioactivity detected;

c. a drive assembly interposed between said structures for driving said scintillation responsive structure over an area to be studied;

d. media support means carried by one of said structures and adapted to carry a media upon which an image may be printed;

e. color printer means including housing means carried by the other of said structures, said color printer means being electrically coupled to said scintillation responsive structure for printing a composite image on a media which varies in color in accordance with the intensity of radiation sensed by said scintillation responsive structure, said color printer means comprising:

i. an elongate printing ribbon having a plurality of color bands extending longitudinally thereof in side-by-side relation;

ii. ribbon support means carried by said housing means and adapted to support spaced portions of said ribbon;

iii. carriage means movably carried by said housing means and adapted to receive and laterally position a portion of said ribbon intermediate said spaced portions such that said portion has one side positioned adjacent said media support means;

iv. printing stylus means disposed adjacent the other side of said portion of said ribbon and including chisel means extensible from a retracted position to a printing position wherein said chisel means engages said portion of said ribbon and moves said ribbon into engagement with a media carried by said media support means to print an image thereon; and,

v. said carriage means comprising a relatively light mass structure adapted to laterally move only portions of said ribbon which are intermediate said spaced portions in order to selectively align said color bands with said printing stylus means.

3,890,356
7-ALKYL-$\Delta^{3,5}$-STEROIDS

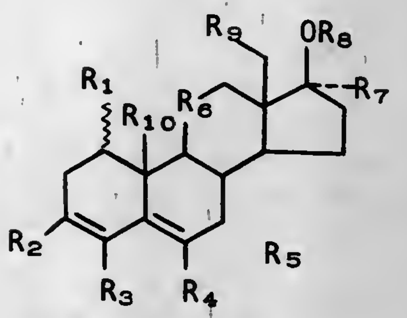
Joyce F. Grunwell, Hamilton; John O. Johnston, Cincinnati; Vladimir Petrow, Cincinnati, and Philip M. Weintraub, Cincinnati, all of Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Mar. 26, 1973, Ser. No. 344,838

Int. Cl.² C07C *167/00, 169/00*

U.S. Cl. 260—397.5 **5 Claims**

1. A 7-alkyl-3,5-unsaturated steroid having the general formula:



wherein

R_1, R_3, R_4 and R_{10} are each hydrogen or methyl;

R_2 is selected from the group consisting of hydrogen, chloro, bromo, lower alkyl having from 1 to 4 carbon atoms, phenyl, halophenyl, hydroxyphenyl, tolyl, and methoxyphenyl;

R_5 is lower alkyl having from 1 to 3 carbon atoms;

R_6 is selected from the group consisting of CH_2, CHOH and $C=O$;

R_7 is selected from the group consisting of hydrogen, lower alkyl having from 1 to 6 carbon atoms, lower alkenyl and lower alkynyl having from 2 to 6 carbon atoms, lower alkenynyl and lower alkadiynyl having from 4 to 6 carbon atoms;

R_8 is selected from the group consisting of hydrogen, acyl having from 2 to 12 carbon atoms, 2-tetrahydropyranyl, trimethylsilyl, 1-cycloalkenyl having from 5 to 8 carbon atoms, 1-methoxycycloalkyl and 1-ethoxycycloalkyl in which the cycloalkyl group has from 5 to 8 carbon atoms, and the groups R_7 and OR_8 when taken together are oxo or a cyclic acetal; and

R_9 is hydrogen with the proviso that when R_9 and R_{10} are hydrogen, R_1, R_2, R_3 and R_4 cannot all be hydrogen at the same time.

3,890,357
PROCESS FOR PREPARATION OF AMINOESTERS

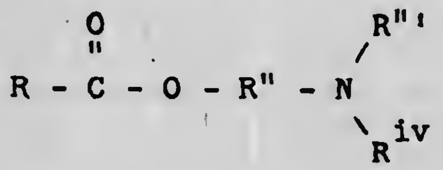
Isaac D. Rubin, Wappingers Falls; Richard F. Love, Fishkill, and Charles B. Holder, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed July 23, 1973, Ser. No. 382,102

Int. Cl. C07c *69/00*

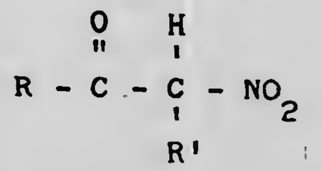
U.S. Cl. 260—404 **20 Claims**

1. The method of preparing an aminoester



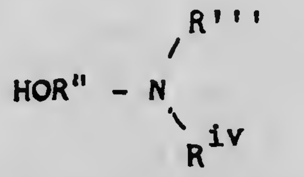
$$R-\overset{O}{\overset{\|}{C}}-O-R''-N\begin{matrix}/R'''\\ \backslash R^{iv}\end{matrix}$$

which comprises reacting a nitroketone



$$R-\overset{O}{\overset{\|}{C}}-\underset{R'}{\overset{H}{C}}-NO_2$$

with a tertiary amino alcohol



$$HOR''-N\begin{matrix}/R'''\\ \backslash R^{iv}\end{matrix}$$

wherein R, R''', and R^{iv} are saturated hydrocarbon, R' is hydrogen or saturated hydrocarbon, and R'' is divalent saturated hydrocarbon, thereby forming product aminoester; and recovering said aminoester.

3,890,358
POLYGLYCEROL PARTIAL ESTERS AND THEIR USE IN LIPSTICK FORMULATIONS

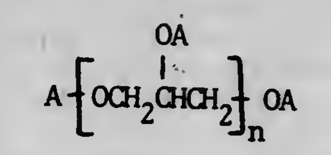
Robert B. Hutchison, and Lee R. Mores, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed May 8, 1972, Ser. No. 251,367

Int. Cl.² C07C *69/33;* **A61K** *7/027*

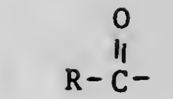
U.S. Cl. 260—410.6 **5 Claims**

1. A partial ester of a polyglycerol with a branched chain aliphatic acid having the formula



$$A\left[OCH_2\overset{OA}{\overset{|}{C}}HCH_2\right]_n OA$$

wherein *n* is an integer from 2 to about 6 and A is a hydrogen or an acyl group of the formula



$$R-\overset{O}{\overset{\|}{C}}-$$

where R is a branched chain hydrocarbon group having from 13 to 17 carbon atoms, said partial ester having at least 40% of the hydroxyl groups of the polyglycerol unesterified.

3,890,359
COMPLEXES CONTAINING SULPHUR

Grish Chandra, Penarth, Wales, assignor to Dow Corning Limited, Barry Glamorgan, Wales

Filed Jan. 30, 1974, Ser. No. 438,123

Claims priority, application United Kingdom, Feb. 7, 1973, 5962/73

Int. Cl. C07f *15/00*

U.S. Cl. 260—429 R **9 Claims**

1. Rhodium (III) complexes represented by the general formula

$$RhX_3(SR'R'')_3$$

in which each X is of the group consisting of Cl, Br or I, R' represents the R_3SiQ— group wherein R is a hydrocarbon radical of the group consisting of alkyl, aryl, aralkyl or alkaryl radical having from 1 to 18 inclusive carbon atoms and Q represents a divalent aliphatic hydrocarbon radical having from 1 to 6 inclusive carbon atoms, and R'' is of the group consisting of alkyl, aryl, aralkyl or alkaryl hydrocarbon radicals having 1 to 18 inclusive carbon atoms or the R_3SiQ— group, wherein R and Q are as defined above.

3,890,360
ENGINE AND TRANSMISSION CONTROL SYSTEM

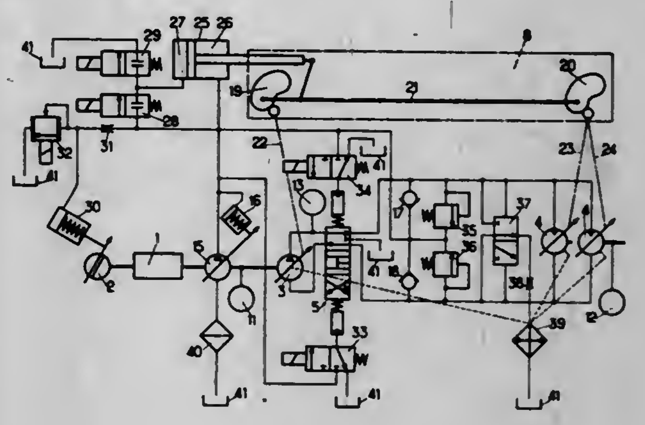
Francois C. Pruvot, Garches; Roger Maistrelli, Bougival, and Pierre Buachet, Paris, all of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of, France

Filed May 18, 1973, Ser. No. 361,449

Claims priority, application France, June 2, 1972, 72.19933

Int. Cl. F16h *39/50*

U.S. Cl. 60—431 **7 Claims**



1. Apparatus for controlling the transmission ratio and the fuel supply of a propulsive unit of a vehicle including an engine whose torque depends on the fuel supply, a fuel supply control unit, a variable ratio transmission driven by said engine, said transmission having two control inputs controlling, respectively, an increase and decrease of said ratio, operator controlled means for selecting a desired speed (N*b*) of said engine, means for measuring the actual speed (N) of said engine, a dual output governor, the first output of said governor being connected to said control inputs of said transmission and the second output controlling said fuel supply unit, the first output of said governor sending first signal to said input controlling an increase of ratio each time that said selected speed (N*b*) is higher than said actual speed (N) and sending a second signal to said input controlling a decrease of said

ratio each time that said selected speed (N*b*) is lower than said actual speed (N), a function generator which sends by the second output of said governor a third signal for controlling the position of said fuel supply control unit, the magnitude of said third signal depending on the desired torque corresponding to each engine speed as preset in said function generator and said actual engine speed (N), and an amplifier responsive to the difference (N*b*—N) between said actual speed and said selected speed, the output of said amplifier being effective to modify said third signal when said difference is higher than a predetermined value.

3,890,361

PRODUCTION OF GAMMA-BUTYROLACTONE

Junichi Kanetaka; Shoichiro Mori, both of Ami-machi, and Itaru Kobayashi, Tokyo, all of Japan, assignors to Mitsubishi Petrochemical Company, Ltd., Japan

Filed Aug. 30, 1972, Ser. No. 284,988

Claims priority, application Japan, Sept. 25, 1971, 46-74940

Int. Cl. C07d ***5/06***

U.S. Cl. 260—343.6 6 Claims

1. A process for producing gamma-butyrolactone which comprises the step of causing an aliphatic gamma-dicarboxylic compound selected from the group consisting of succinic acid, succinic anhydride, maleic acid and maleic anhydride to contact hydrogen in the presence of a hydrogenation catalyst consisting essentially of a uniform mixture of (1) nickel, (2) molybdenum, and (3) at least one element selected from the group consisting of barium and thallium, wherein the atomic ratio of molybdenum/nickel is from 0.01 to 0.20, and the atomic ratio of element (3)/nickel is from 0.02 to 0.10,

at a temperature of from 180 to 300°C and a pressure of from 30 to 200 atmospheres.

3,890,362

PREPARATION OF THIOHYDROXIMATE CARBAMATES

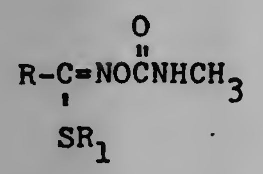
Jose R. Alvarez, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed June 19, 1972, Ser. No. 263,760

Int. Cl.² C07C ***119/18***

U.S. Cl. 260—453 R 8 Claims

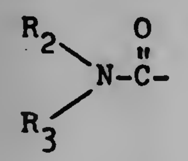
1. In the method of making S-alkyl thiohydroximate carbamates of the formula;



$$R-\underset{SR_1}{\underset{|}{C}}=NO\overset{O}{\overset{\|}{C}}NHCH_3 \qquad I$$

wherein

R is methyl, ethyl, or



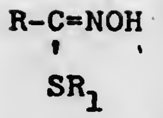
;

R_1 is methyl, ethyl, n-propyl, or isopropyl;

R_2 is hydrogen, methyl, ethyl, n-propyl, or isopropyl; and

R_3 is hydrogen or methyl, provided that when R_2 is ethyl, n-propyl or isopropyl, R_3 is hydrogen;

by reacting methyl isocyanate with an S-alkyl thiohydroximate of the formula:



$$R-\underset{SR_1}{\underset{|}{C}}=NOH \qquad II$$

wherein R and R_1 are as defined above, the improvement which comprises carrying out the reaction by adding the methyl isocyanate, in gaseous or liquid form, over a period of time of from 1 to about 12 hours, to an agitated bed of solid particles of the thiohydroximate in the absence of a continuous liquid phase while removing the heat of reaction, the rates of isocyanate addition and heat removal being balanced so as to maintain the temperature of the reaction mass at or above 0°C but below the melting points of the thiohydroximate starting material and the thiohydroximate carbamate product, the mole ratio of said isocyanate to said thiohydroximate being in the range of about 0.95 to about 1.05.

3,890,363

OIL ADDITIVE

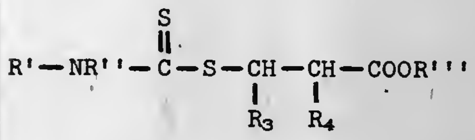
Robert E. Malec, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 348,625, April 6, 1973, Pat. No. 3,833,496. This application May 24, 1974, Ser. No. 473,129

Int. Cl.² C07C ***155/04, 155/06, 155/08***

U.S. Cl. 260—455 A 6 Claims

1. An antiwear-antirust additive for lubricating oils and greases, said additive having the formula:



$$R'-NR''-\overset{S}{\overset{\|}{C}}-S-\underset{R_3}{\underset{|}{CH}}-\underset{R_4}{\underset{|}{CH}}-COOR'''$$

wherein R′ is selected from the group consisting of aliphatic hydrocarbon radicals containing about 8–100 carbon atoms, and hydrocarbylaminohydrocarbyl radicals having the formula:

$$R_1—NR''''—R_2—$$

wherein R_1 is an aliphatic hydrocarbon radical containing about 8–100 carbon atoms, R′′′′ is selected from the group consisting of hydrogen and C_{1-4} alkyls and R_2 is a divalent aliphatic hydrocarbon radical containing about 2–10 carbon atoms, R_3 and R_4 are selected from the group consisting of hydrogen and alkyl radicals containing about 1–4 carbon atoms, R″ is selected from the group consisting of hydrogen and C_{1-4} alkyls and R‴ is selected from the group consisting of hydrogen and salt cations.

3,890,364

α-ARYL-B-(AMINO-PHENYL)ACRYLONITRILES WITH AN O-DIALKYL SULPHAMIDOXY OR SULFURIC ACID SEMI-ESTER GROUP

Hans Knupfer, Berg, Neukirchen, and Carl-Wolfgang Schellhammer, Opladen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

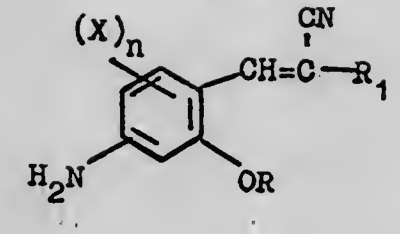
Continuation of Ser. No. 849,867, Aug. 13, 1969, abandoned. This application Dec. 11, 1972, Ser. No. 313,676

Claims priority, application Germany, Aug. 23, 1968, 1793261

Int. Cl. C07c ***121/00, 137/00***

U.S. Cl. 260—456 A 4 Claims

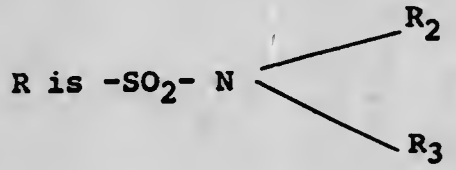
1. *β*-phenyl-acrylic acid nitrile or the formula



in which X is H or alkyl or 1–4 carbon atoms;

n is a number of 0 to 3;

R_1 is phenyl; naphthyl; carboxyl; or phenyl substituted with chloro, methyl, methoxy or methyl sulfonyl;



or

$—SO_3Z$;

R_2 and R_3 are methyl or ethyl; and

Z is H, Na or K.

3,890,365

ORGANIC REDUCTION PROCESS

David Colin Jones, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 558,250, June 17, 1966, abandoned. This application Oct. 24, 1972, Ser. No. 299,806

Claims priority, application United Kingdom, June 30, 1965, 22726/65; Aug. 26, 1965, 36683/65; Oct. 17, 1965, 42640/65

Int. Cl. C07c ***121/02, 121/26, 121/28***

U.S. Cl. 260—465.8 A 10 Claims

1. In a process for the reductive dimerization of an *α,β*-olefinically unsaturated nitrile of ester starting material selected from the group consisting of acrylonitrile, lower alkyl acrylonitrile, lower alkyl acrylates and methylene glutaronitrile to obtain the correspsonding adiponitrile, lower alkyl-substituted adiponitrile, lower alkyl adipate and tetracyanooctane, respectively, therefrom by contacting an alkali metal amalgam at a measured pH of 7 to 11.5 and a temperature favoring dimerization with a liquid reductive dimerization medium containing said starting material and an agent operative with said amalgam to provide said reduction, said agent being selected from the group consisting of water and lower alkanols, the improvement wherein said dimerization medium is free from onium salts and initially consists essentially of a homogeneous solution of the starting material and agent in a liquid non-dimerizable unreactive organic polar amide of the formula $R_1R_2NCOR_3$ where R_1 and R_3 are hydrogen or lower alkyl or are alkyl of not more than 2 carbon atoms joined to form a cyclic amide and the N atom and R_2 is hydrogen or lower alkyl, or mixture of such amide and an inert non-amide polar organic solvent, the nitrile or ester starting material constituting 2 to 40 mole % of said medium, said agent constituting from 1 to 40 mole % of said medium and the balance of said medium consisting essentially of said amide of said mixtures thereof with inert polar organic solvent, with the amide constituting more than 5 mole % of said medium.

3,890,366

α-PHENYL-β,β-PENTAMETHYLENE-GLUTARIC ACID DINITRILES AND PROCESS FOR THEIR PREPARATION

Ernst Ingo Leupold, Hofheim, Taunus, and Hans-Jurgen Arpe, Fischbach, Taunus,, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

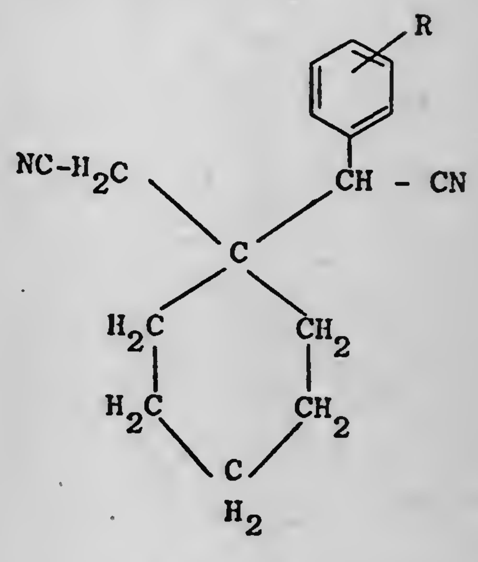
Continuation-in-part of Ser. No. 331,510, Feb. 12, 1973, abandoned. This application Apr. 23, 1973, Ser. No. 353,319

Claims priority, application Germany, Feb. 15, 1972, 2207020

Int. Cl. C07c ***121/64***

U.S. Cl. 260—465 F 9 Claims

1. A compound of the formula



in which R is hydrogen, lower alkyl of up to 4 carbon atoms, alkoxy of up to 4 carbon atoms, or halogen.

3,890,367

3,5-TERT. BUTYL-4-(2,4-DICHLOROPHENYLCARBAMYLOXY) BENZYLIDENEMALONITRILE

Roger Paul Cahoy, Overland Park, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 190,395, Oct. 18, 1971, Pat. No. 3,825,662. This application May 29, 1973, Ser. No. 364,772

Int. Cl.² C07C ***121/70***

U.S. Cl. 260—465 D 1 Claim

1. 3,5-Di-tert.butyl-4-(2,4-dichlorophenylcarbamyloxy)benzylidenemalononitrile.

3,890,368

METHOD FOR N,N-DICYANOETHYLATING AMINOPHENOLS

Norman C. Jamieson, St. Louis, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed June 21, 1973, Ser. No. 372,315

Int. Cl. C07c ***121/78***

U.S. Cl. 260—465 E 4 Claims

1. A method for preparing an N,N-dicyanoethylated aminophenol which comprises heating a mixture consisting essentially of an aminophenol, at least 2 mols of acrylonitrile for each mol of the aminophenol, and glacial acetic acid in an amount at least 50 percent by weight of the aminophenol, at a temperature between about 25°C. and the reflux temperature of the mixture, and thereafter quenching the reaction mixture with water to precipitate a substantially pure dicyanoethylated phenol.

3,890,369
PREPARATION OF OXIMES

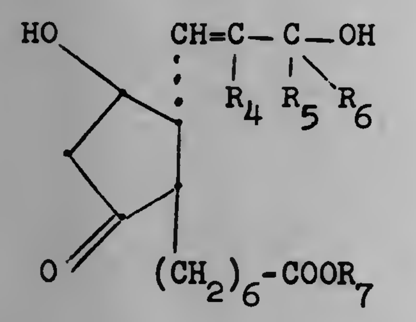
Neville Finch, West Orange, and Isidoros Vlattas, Summit, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 311,053, Dec. 1, 1972, which is a continuation-in-part of Ser. No. 241,423, April 5, 1972, Pat. No. 3,798,275. This application Jan. 31, 1973, Ser. No. 328,178

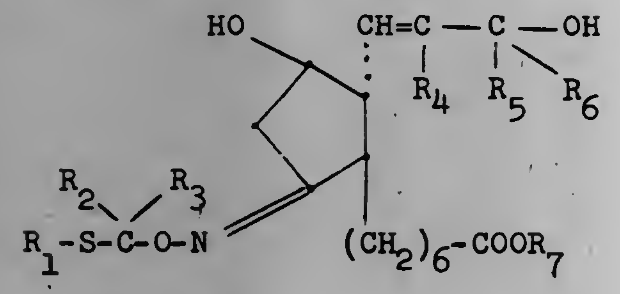
Int. Cl. C07c *61/36*, *69/74*

U.S. Cl. 260—468 D **8 Claims**

1. Process for the preparation of β-hydroxy-ketones corresponding to the formula



in which R_7 is hydrogen, an alkali metal, one equivalent of an alkaline earth metal, lower alkyl, lower alkenyl, lower alkynyl or (3 or 4 ring-membered cycloalkyl, cycloalkenyl or Ph)—C_nH_{2n}, wherein Ph is phenyl, (lower alkyl)-phenyl, (lower alkoxy)-phenyl, (lower alkylenedioxy)-phenyl, (halogeno)-phenyl, (trifluoromethyl)-phenyl, (nitro)-phenyl or (di-lower alkylamino)-phenyl, and *n* is an integer from 0 to 4, each of R_4 and R_5 are hydrogen or lower alkyl, and R_6 is lower alkyl, wherein a compound of the formula



wherein R_1 is lower alkyl, lower alkenyl, lower alkynyl or (3 to 4 ring-membered cycloalkyl, cycloalkenyl, or Ph)—C_nH_{2n}, wherein Ph and n have the meaning given above, R_2 is hydrogen, lower alkyl or said Ph and R_3 is hydrogen or lower alkyl or $R_2 + R_3$ are lower alkylene, is reacted with a mercuric salt in an aqueous, alcoholic or acidic medium at a pH between about 7 to 2, and hydrolysing the desulfurized intermediate obtained in said alcoholic medium with an acid; or with a base when obtained in said acidic medium, and the presence of a hydroxylamine acceptor.

3,890,370
PROCESS FOR PREPARING 2,6,6-TRIMETHYL 1-ALKOXYCARBONYL-2,4-CYCLOHEXADIENES

George H. Buchi, and Hans Wuest, both of Cambridge, Mass., assignors to Firmenich S.A., Geneva, Switzerland

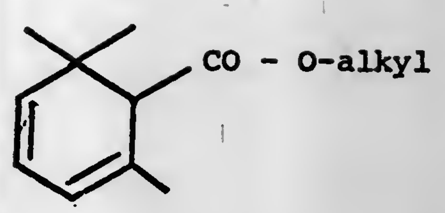
Filed Aug. 16, 1972, Ser. No. 281,220

Claims priority, application Switzerland, Aug. 17, 1971, 12119/71

Int. Cl. C07c *67/06*, *69/74*

U.S. Cl. 260—468 L **7 Claims**

1. Process for the preparation of compounds having the formula



IIIa-1

wherein the alkyl group is a lower alkyl group, which comprises treating a lower alkyl α - isopropylidene acetoacetate in an inert organic solvent with at least one mol per mol of a compound resulting from the reaction of a quaternary phosphonium salt having the formula

$$[CH_2 = CH - CH_2 - PR_3]^+X^- \qquad \text{IV}$$

wherein R represents an alkyl or aryl radical and X represents a halogen, ClO_4 or BF_4, with a strong base.

3,890,371
11β-PGE₂-TYPE COMPOUNDS

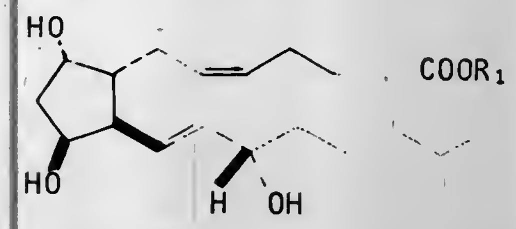
John E. Pike, and William P. Schneider, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 159,478, July 2, 1971, Pat. No. 3,772,350, which is a continuation-in-part of Ser. No. 71,390, Sept. 11, 1970, abandoned. This application Oct. 3, 1973, Ser. No. 403,094

Int. Cl. C07c *61/32*, *69/74*

U.S. Cl. 260—468 D **3 Claims**

1. A compound of the formula



wherein R_1 is hydrogen, alkyl of 1 to 8 carbon atoms, inclusive cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one to 3 chloro or alkyl of 1 to 4 carbon atoms, inclusive, and pharmacologically acceptable salts thereof wherein R_1 is hydrogen.

3,890,372
AMINO SUBSTITUTED PHENYL AND NAPHTHYL ESTERS OF PGF₂ α - TYPE COMPOUNDS

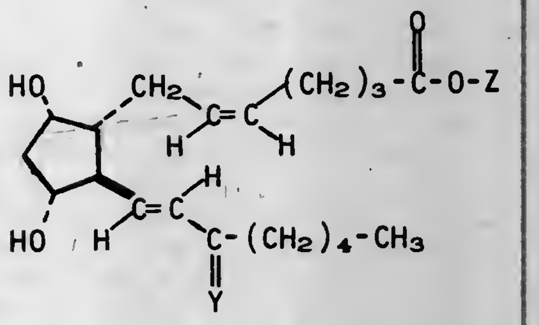
Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 8, 1974, Ser. No. 431,758

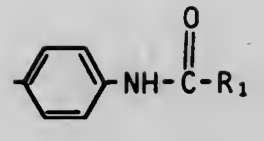
Int. Cl. C07c *69/74*, *103/38*

U.S. Cl. 260—468 D **6 Claims**

1. An optically active compound of the formula

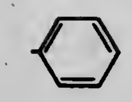


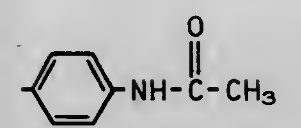
or a racemic compound of that formula and the mirror image thereof, wherein Z is

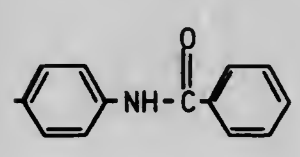
(1) 

wherein R_1 is

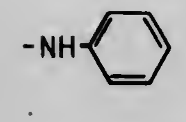
—CH_3

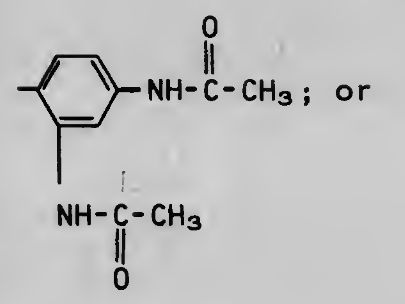




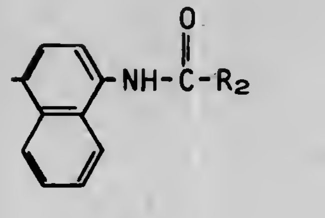


-NH_2 or



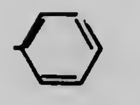
(2) 

; or

(3) 

wherein R_2 is

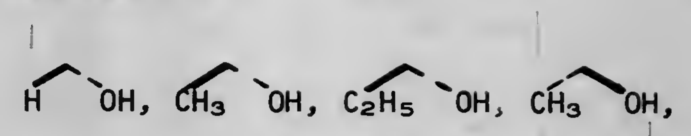
—CH_3

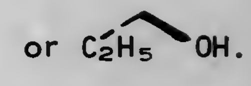


or

-NH_2 :

and wherein Y is





3,890,373
N,N-BIS(2-METHOXY-3,6-DICHLOROBENZOYLOXYALKYL)ANILINES

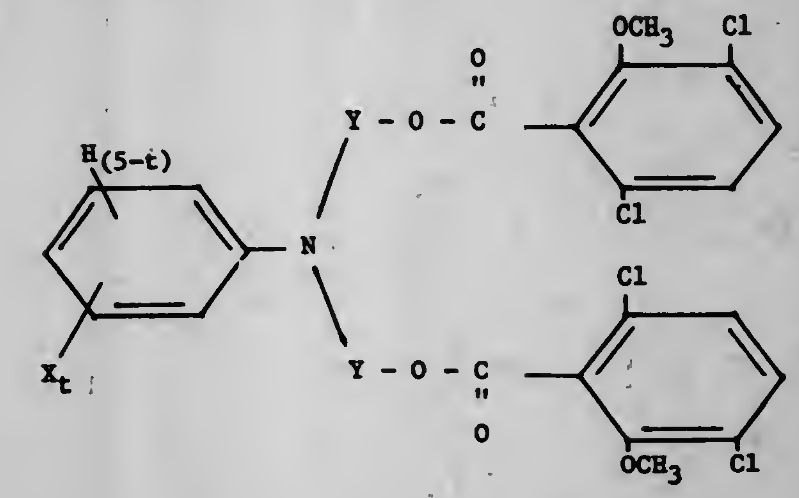
Takeo Hokama, Chicago, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed July 30, 1973, Ser. No. 383,932

Int. Cl. C07c *93/26*

U.S. Cl. 260—473 R **4 Claims**

1. A compound of the formula



wherein X is lower alkyl; t is an integer from 0 to 3; and Y is a straight or branched alkylene chain of from 2 to 3 carbon atoms.

3,890,374
METHOD FOR THE PREPARATION OF MONOMETHYL TEREPHTHALATE OR A MIXTURE THEREOF WITH P-TOULIC ACID

Takao Fujii; Tomio Harada; Koshi Namie, and Shinichi Takeda, all of Matsuyama, Japan, assignors to Teijin Hercules Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1973, Ser. No. 338,421

Claims priority, application Japan, Mar. 7, 1972, 47-23436

Int. Cl. C07c *69/82*

U.S. Cl. 260—475 R **8 Claims**

1. A process for the preparation of monomethyl terephthalate or a mixture thereof with p-toluic acid, which comprises oxidizing methyl p-toluate or a mixture thereof with no more than 80 % by weight of p-xylene by contacting the same with molecular oxygen or a molecular oxygen-containing gas in liquid phase, wherein the oxidation reaction is performed

1. in the presence of a catalyst consisting essentially of
   - A. nickel metal, a nickel compound, or a mixture thereof which is soluble in the reaction system, and
   - B. manganese metal, a manganese compound, or a mixture thereof which is soluble in the reaction system,

   the composition of the catalyst being such that the weight ratio of nickel metal to manganese metal becomes 95:5 to 0.5:99.5 , when components (A) and (B) are respectively converted to nickel metal and manganese metal,
2. at a temperature within the range of 180° to 230°C., and

in the substantial absence of bromine and bromine compound promoters and aliphatic monocarboxylic acid solvents.

3,890,375
HALOGENATED OCTYL ESTERS

Kenneth Rowland Dobson, Epsom Downs, England, assignor to BP Chemicals International Limited, England

Filed Aug. 13, 1973, Ser. No. 387,951

Claims priority, application United Kingdom, Aug. 25, 1972, 39644/72

Int. Cl. C07c *69/80*

U.S. Cl. 260—475 R **3 Claims**

1. Esters of linear C_8 alcohols of the general formula

$Z(CH_2)_3.Z^1.CH_2.O.CO.R(Y)_x$ (I)

or $Z(CH_2)_3.CH(Z).O.CO.R(Y)_x$ (II)

wherein

Z is $XCH_2.CHX—$

and

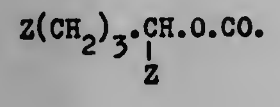
Z^1 is $—CHX.CHX—$

and

X is Cl or Br,

R is divalent phenylene,

Y is $Z(Ch_2)_3.Z^1.CH_2.O.CO$ or



$$Z(CH_2)_3.\underset{\underset{Z}{|}}{CH}.O.CO.$$

and

x is 1.

3,890,376
PROCESS FOR THE MANUFACTURE OF PERFLUOROALKYL ESTERS

Horst Jager, Bettingen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

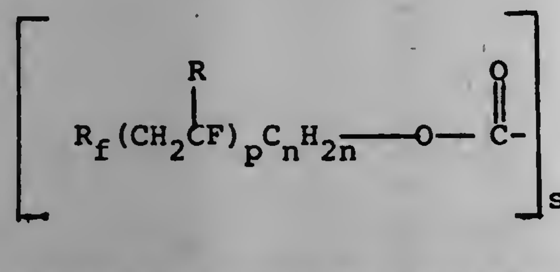
Filed Sept. 10, 1973, Ser. No. 395,810

Claims priority, application Switzerland, Sept. 19, 1972, 13678/72; Dec. 21, 1972, 18660/72

Int. Cl. C07c *69/52, 69/54, 69/60*

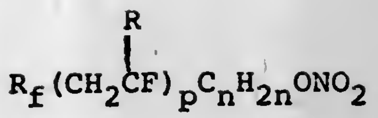
U.S. Cl. 260—485 F **21 Claims**

1. A process for the manufacture of perfluoroalkyl esters of the formula



$$\left[R_f(CH_2\overset{\overset{R}{|}}{C}F)_pC_nH_{2n}—O—\overset{\overset{O}{\|}}{C}— \right]_s$$

wherein R_f represents an unbranched or branched perfluoroalkyl radical with 4 to 14 carbon atoms, R represents hydrogen or fluorine, R_1 represents an ethylenically unsaturated hydrocarbon radical of organic monobasic, dibasic, or tribasic carboxylic acids with 3 to 6 carbon atoms, n is a whole number from 1 to 12, p is 0 or a whole number from 1 to 3, and s is a whole number from 1 to 3, which process comprises reacting at temperatures of from 30° to 150°C a perfluoroalkyl nitrate of the formula



$$R_f(CH_2\overset{\overset{R}{|}}{C}F)_pC_nH_{2n}ONO_2$$

with an organic carboxylic acid of the formula

$R_1(COOH)_s$

in an organic solvent selected from the group consisting of benzene, toluene, xylene, cyclohexane and methylcyclohexane and in the presence of concentrated sulphuric acid, the molar ratio of the perfluoroalkylnitrate to the concentrated sulphuric acid being about 0.01 to 1:1.

3,890,377
3-SUBSTITUTED PHENYLALKANOHYDROXAMIC ACIDS

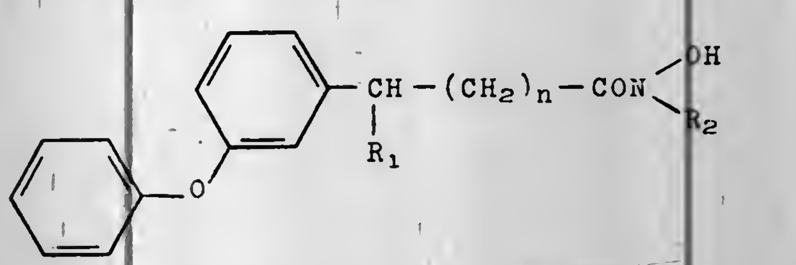
Winston S. Marshall, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 122,999, March 10, 1971, which is a continuation-in-part of Ser. No. 828,756, May 28, 1969, Pat. No. 3,600,437, and a continuation-in-part of Ser. Nos. 823,477, May 9, 1969, abandoned, and Ser. No. 752,801, Aug. 15, 1968, abandoned. This application July 17, 1973, Ser. No. 380,038

Int. Cl. C07c *103/30*

U.S. Cl. 260—500.5 H **2 Claims**

1. A compound of the formula



wherein R_1 is hydrogen, C_1 to C_5-alkyl, C_2 to C_5-alkenyl, C_2–C_5-alkynyl; n is an integer of from 0 to 3; and R_2 is hydrogen or C_1 to C_5-alkyl; and the acid addition salts thereof with pharmaceutically acceptable acids.

3,890,378
SUBSTITUTED ETHANE DIPHOSPHONIC ACIDS AND SALTS AND ESTERS THEREOF

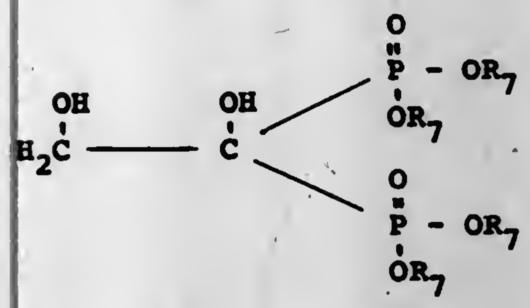
Al F. Kerst, Littleton, Conn., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 27,988, April 13, 1970, Pat. No. 3,705,191. This application Aug. 23, 1972, Ser. No. 283,114The portion of the term of this patent subsequent to Dec. 5, 1989, has been disclaimed.

Int. Cl. C07f *9/38*

U.S. Cl. 260—502.4 P **3 Claims**

1. A compound having the formula



wherein each R_7 is individually selected from the group consisting of hydrogen and alkali metal provided at least one R_7 is an alkali metal.

3,890,379
PROCESS FOR THE PREPARATION OF D(−)-2-AMINO-2-(P-HYDROXYPHENYL)-ACETIC ACID

Jozsef Schawartz, Budapest, Hungary, assignor to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT, Budapest, Hungary

Filed Aug. 10, 1973, Ser. No. 387,284

Claims priority, application Hungary, Aug. 11, 1972, CI 1262

Int. Cl. C07c *101/06*

U.S. Cl. 260—519 **2 Claims**

1. A process for the preparation of D-(−)-2-amino-2-(p-hydroxyphenyl)-acetic acid comprising the following steps:

a. reacting 4-hydrobenzaldehyde with an aqueous solution containing sodium bisulfite, ammonium chloride, and ammonium hydroxide to yield a mixture;

b. reacting the mixture formed in step (a) with sodium cyanide to yield a precipitate;

c. extracting the precipitate formed in step (b) with ethyl acetate to produce DL-2-amino-2-(p-hydroxyphenyl)-acetonitrile;

d. reacting L-(+)-tartaric acid wiuh the acetonitrile of step (c) in a reaction medium consisting of benzene, toluene, xylene, ethylacetate, butylacetate, methylethylketone, methybisobutylketone, methanol or ethanol, to crystallize therefrom D-(−)-2-amino-2-(p-hydroxyphenyl)-acetonitrile-L-(+)-hemitartarate;

e. treating the hemitartarate formed in step (d) with hydrochloric acid to form crystals of D-(−)-2-amino-2-(p-hydroxyphenyl)-acetic acid hydrogen chloride; and

f. treating the hydrogen chloride with ammonium hydroxide to precipitate D-(−)-2-amino-2-(p-hydroxyphenyl)-acetic acid.

3,890,380
PROCESS FOR INCREASING THE BULK DENSITY OF SALTS OF 2-(3-PHENOXYPHENYL)PROPIONIC ACID

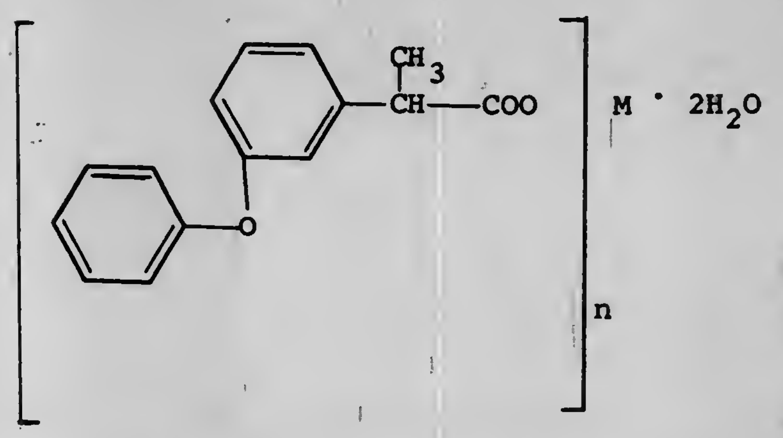
Erwin A. Stephen, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed June 19, 1974, Ser. No. 480,783

Int. Cl. C07c *65/00, 51/42*

U.S. Cl. 260—520 **7 Claims**

1. A process for increasing the bulk density of a dihydrate salt compound of the formula



in which M is sodium or calcium, and, when M is sodium, n is 1, and, when M is calcium, n is 2, said compound having a bulk density of less than 0.60 grams per milliliter, which comprises reducing the water content of said compound to less than that represented by a monohydrate form by heating said compound at a temperature form about 40°C to about 200°C., hydrating the compound of reduced water content by contacting said compound with water maintained at a temperature of from about 60°C. to about 90°C., and separating the resulting dihydrate salt compound having a bulk density of at least 0.65 grams per milliliter.

3,890,381
METHOD FOR THE PREPARATION OF DIALKALIOXYDIACETATE

Tadamitsu Kiyoura, Kamakura; Toru Takahashi, Fujisawa, and Yasuo Kogure, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals Incorporated, Tokyo, Japan

Filed Dec. 11, 1973, Ser. No. 423,778

Claims priority, application Japan, Mar. 13, 1973, 48-28595; Apr. 9, 1973, 48-39521

Int. Cl. C07c *51/26*

U.S. Cl. 260—531 C **9 Claims**

1. A method for the preparation of a dialkalioxydiacetate consisting essentially of contacting at 20° – 200° C and 1 – 35 atmo. pressure and at a pH of 7 – 14 diethylene glycol with a gas selected from oxygen and air in the presence of water in an amount of at least 5 parts by weight per part of diethylene glycol; an alkaline substance selected from the group consisting of hydroxides, oxides and carbonates of an alkali metal and an alkaline earth metal and ammonium hydroxide and carbonate; and at least a catalyst selected from the group consisting of palladium, platinum, rhodium, ruthenium, rhenium, osmium and iridium and oxides thereof.

3,890,382
N-SUBSTITUTED (2-CHLOROETHYL) PHOSPHORAMIDE CHLORIDE

Wolfgang Hofer, Wuppertal-Wohwinkel; Reinhard Schliebs, Cologne; Robert Rudolf Schmidt, and Ludwig Eue, both of Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

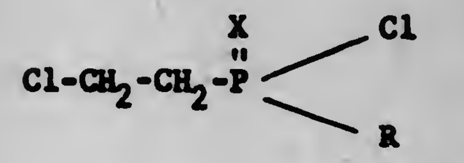
Division of Ser. No. 76,594, Sept. 29, 1970, Pat. No. 3,846,513. This application May 13, 1974, Ser. No. 469,575

Claims priority, application Germany, Oct. 4, 1969, 1950099

Int. Cl. C07f *9/26*

U.S. Cl. 260—543 P **8 Claims**

1. A 2-chloroethanephosphonic and 2-chloroethanethionophosphonic acid compound of the general formula



in which

X is oxygen or sulfur;

R is mono-phenylamino or mono-alkylamino of from 1 to 6 carbon atoms.

3,890,383
2-HYDROXY-3,4,5-TRICHLOROBENZENE-SULFONAMIDES

Ralph M. Rodia, and R. Garth Pews, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 77,703, Oct. 2, 1970, Pat. No. 3,803,062. This application May 18, 1973, Ser. No. 361,746

Int. Cl. C07c *143/78*

U.S. Cl. 260—556 AR **1 Claim**

1. The compound which is N,N-diethyl-2-hydroxy-3,4,5-trichlorobenzenesulfonamide.

3,890,384
N-[3-(4-METHYL-3-CYCLOHEXENYL)BUTYL]AMINES

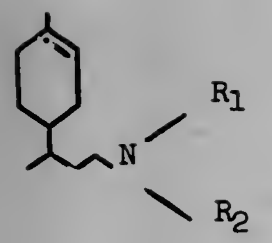
Jerry G. Strong, Fanwood, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 27, 1972, Ser. No. 221,384

Int. Cl. C07c *87/34*

U.S. Cl. 260—563 R **3 Claims**

1. A compound having the general formula:

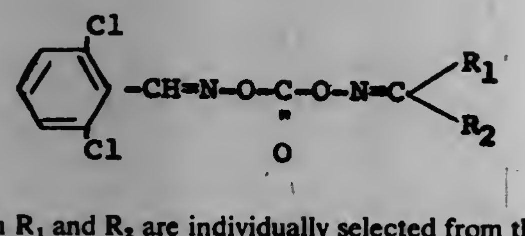


wherein R_1 and R_2 are each selected from the group consisting of hydrogen and alkyl (C_1–C_8).

3,890,385
DICHLOROBENZALDEHYDE-OXIME-CARBONATES

Reinhold Puttner, and Friedrich Arndt, both of Berlin, Germany, assignors to Schering AG, Berlin, Germany
Filed June 28, 1973, Ser. No. 374,496
Claims priority, application Germany, July 13, 1972, 2234816
Int. Cl. C07c *131/00*
U.S. Cl. 260—566 AE **5 Claims**

1. Compounds of the general formula:

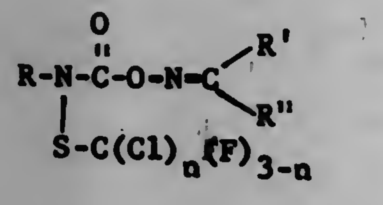


wherein R_1 and R_2 are individually selected from the group consisting of an alkyl radical having from 1 to 12 carbon atoms, a cycloalkyl radical having from 5 to 8 carbon atoms, a lower alkoxy radical, a phenyl radical, a naphthyl radical a benzyl radical, a phenylethyl radical, and when taken togeather R_1 and R_2 form a cycloalkyl radical having from 5 to 8 carbon atoms.

3,890,386
N-(TRIHALOMETHYLTHIO-CARBAMIC ACID OXIME ESTER

Engelbert Kuhle, Berg-Gladbach; Erich Klauke, Odenthal-Hahneberg; Brigitte Hamburger, Cologne, and Hans Scheinpflug, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
Filed Aug. 29, 1973, Ser. No. 392,832
Claims priority, application Germany, Sept. 6, 1972, 2243626
Int. Cl. C07c *131/00*
U.S. Cl. 260—566 AC **5 Claims**

1. An N-(trihalomethylthio)-carbamic acid oxime ester of the formula



(I)

in which
R is alkyl of up to 4 carbon atoms; phenyl or phenyl carrying at least one halogen, nitro, C_1—C_8 alkoxy radical; R′ and R″ each independently is alkyl of up to 20 carbon atoms; cyclohexyl; phenyl optionally carrying at least one halogen, cyano nitro, trifluoromethyl, C_1—C_8 alkyl or C_1—C_8 alkoxy radical; or
R and R″, conjointly with the carbon atoms that links them, form a cyclopentylidene, cyclohexylidene or norbornylidene radical optionally carrying at least one methyl or cyclohexyl radical; and

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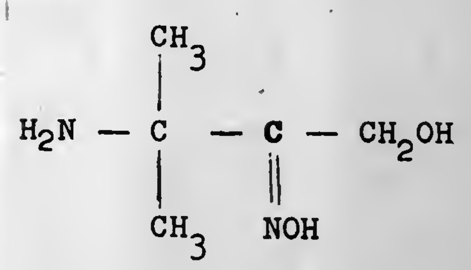
3,890,387
3-AMINO-3-METHYL-2-HYDROXY-IMINOBUTAN-1-OL AND SALTS THEREOF

Hamish Christopher Swan Wood, Glasgow, Scotland; Alexander Stuart, Bromley; Adrian Charles Ward Curran, Harrow, both of England, and Saieba Al-hassan, Baghdad, Iraq, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.
Division of Ser. No. 162,297, July 13, 1971. This application Feb. 19, 1974, Ser. No. 443,503
Int. Cl. C07c *131/00*
U.S. Cl. 260—566 A **4 Claims**

1. A compound



$$H_2N-\overset{\displaystyle CH_3}{\underset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}}-\underset{\underset{\displaystyle NOH}{\|}}{C}-CH_2OH$$

3,890,388
RING CHLORINATION OF ORTHO-TOLUIDINE

Clarence William Schimelpfenig, Wilmington, Del., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.
Filed Mar. 4, 1974, Ser. No. 447,873
Int. Cl. C07c *87/60*
U.S. Cl. 260—578 **3 Claims**

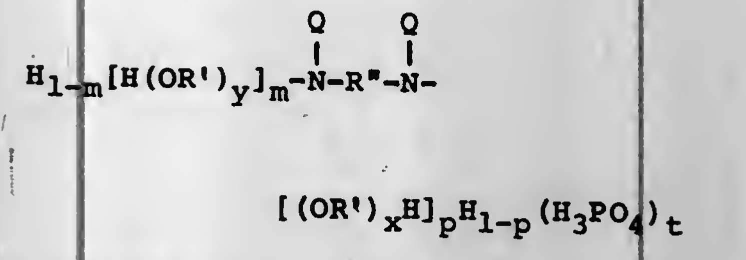
1. A process for making 4-chloro-2-aminotoluene and 6-chloro-2-aminotoluene comprising reacting ortho-toluidine in 90% to 100% concentrated sulfuric acid with at least one mole of chlorine per mole of ortho-toluidine, at a temperature of from 20°C. to 100°C.

3,890,389
PHOSPHATE SALTS OF AMINE BASED POLYOLS

Raymond H. Fowler, Chadds Ford, Pa., assignor to ICI United States Inc., Wilmington, Del.
Filed Feb. 23, 1973, Ser. No. 335,369
Int. Cl. C07c *91/02*
U.S. Cl. 260—584 B **7 Claims**

1. A polyol composition represented by the formulas:
(a) $[H(OR')_y]_zNH_{3-z}(H_3PO_4)_n$ and

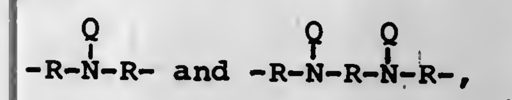
(b)



$$H_{1-m}[H(OR')_y]_m-\overset{\overset{\displaystyle Q}{|}}{N}-R''-\overset{\overset{\displaystyle Q}{|}}{N}-$$

$$[(OR')_xH]_pH_{1-p}(H_3PO_4)_t$$

wherein R″ is selected from the group consisting of alkylene groups containing from 1 to 20 carbon atoms,



$$-R-\overset{\overset{\displaystyle Q}{|}}{N}-R-\quad\text{and}\quad-R-\overset{\overset{\displaystyle Q}{|}}{N}-R-\overset{\overset{\displaystyle Q}{|}}{N}-R-,$$

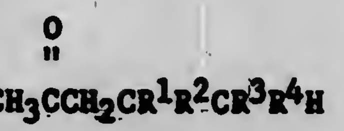
R is independently selected from the group consisting of alkylene groups containing from 1 to 6 carbon atoms, Q is independently selected from the group consisting of hydrogen and —$(OR')_yH$, R′ is independently selected from the group consisting of alkylene groups containing from 2 to 6 carbon atoms, *y* is a number of from 1 to 20, *x* is a number of from 1 to 20, *z* represents a number having an average value of 3 and *m* and *p* are independently selected values of 0 or 1 with the proviso that at least *m* or *p* is 1, *n* has a value of from 0.03 to 0.5, *t* has a value of 0.03 to 1.0 when the amine represented by formula (b) is a diamine and a value of 0.05 to 1.5 and 0.05

to 2.0 when the amine represented by formula (b) is a triamine and tetramine, respectively.

3,890,390
PROCESS FOR THE PRODUCTION OF METHYL KETONES

Nazar S. Aprahamian, deceased, late of West Nyack, N.Y. (Aida Aprahamian, executrix), assignor to Union Carbide Corporation, New York, N.Y.
Filed June 13, 1972, Ser. No. 262,308
Int. Cl. C07c *49/76, 49/06*
U.S. Cl. 260—590 **13 Claims**

1. A non-catalytic vapor phase process for the production of methyl ketones having the following structural formula:



$$CH_3\overset{\overset{\displaystyle O}{\|}}{C}CH_2CR^1R^2CR^3R^4H$$

wherein R^1, R^2, R^3, R^4 are hydrogen, a straight or branched chain alkyl radical having 1 to 8 carbon atoms wherein the total number of carbon atoms in all of said alkyl radicals is no greater than 12 carbon atoms, a phenyl radical, or a phenyl radical wherein 1 to 3 hydrogen atoms are substituted by a straight or branched chain alkyl radical having 1 to 3 carbon atoms, and wherein there are no more than 2 phenyl radicals, consisting essentially of admixing acetone with an olefin having the following structural formula:

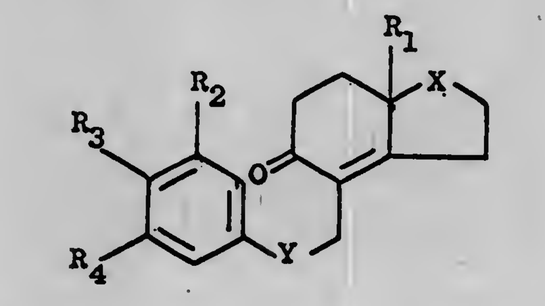
$$R^1R^2C{=}CR^3R^4$$

wherein R^1, R^2, R^3, and R^4 are as defined above
at a temperature in the range of about 300° to about 675°C.
wherein the molar ratio of acetone to olefin is in the range of about 0.1 to about 10 mols of acetone per mol of olefin.

3,890,391
9,10-SECOESTRANE DERIVATIVES AND THEIR PRODUCTION

Ulrich Eder; Gregor Haffer; Jurgen Ruppert; Gerhard Sauer, and Rudolf Wiechert, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany
Filed Oct. 24, 1973, Ser. No. 409,235
Claims priority, application Germany, Oct. 25, 1972, 2253089
Int. Cl. C07c *49/76, 49/82*
U.S. Cl. 260—590 **14 Claims**

1. A 9,10-secoestrane formula



wherein R_1 is lower alkyl; R_2, R_3 and R_4 each is a hydrogen atom or alkoxy of 1–4 carbon atoms; X is carbonyl, dialkoxymethylene wherein the alkoxy groups each contain 1–4 carbon atoms, hydroxymethylene, alkoxymethylene wherein the alkoxy group contains 1–10 carbon atoms or aralkoxymethylene wherein the aralkoxy group contains 7–10 carbon atoms; andn Y is carbonyl or dialkoxymethylene.

3,890,392
PREPARATION OF METHYL VINYL KETONE FROM 3-ETOBUTAN-1-OL

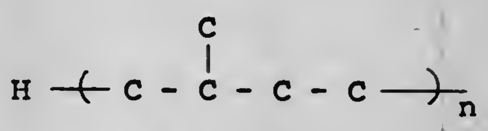
George Ember, Hackensack, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.
Filed June 25, 1973, Ser. No. 373,071
Int. Cl. C07c *45/16*
U.S. Cl. 260—596 **10 Claims**

1. A process for obtaining methyl vinyl ketone, comprising heating, at a temperature of 100°C. to 300°C. and at a pressure at or above the vapor pressure of the reaction mixture, a solution comprising about 1 to 30 weight percent 3-ketobutan-1-ol, about 0.005 to 0.50 weight percent of sulfuric acid, and about 70 to 99 weight percent of an inert solvent.

3,890,393
2-METHYL-BUTADIENYL-SULPHONES

Pierre Chabardes, Rhone; Marc Julia, Paris, and Albert Menet, Rhone, all of France, assignors to Rhone-Poulenc S.A., Paris, France
Filed Apr. 16, 1973, Ser. No. 351,343
Claims priority, application France, Apr. 17, 1972, 72.13433
Int. Cl.² C07C *147/04*
U.S. Cl. 260—607 R **8 Claims**

1. A sulphone of the general formula:
$Q-SO_2-CH=C(CH_3)-CH=CH_2$ (I)
in which Q represents a group having a carbon skeleton of formula:



$$H\left(C-\overset{\overset{\displaystyle C}{|}}{C}-C-C\right)_n$$

wherein *n* is 1–9, each C_5 unit containing 0–2 ethylenic double bonds, the remaining valencies being satisfied by hydrogen atoms, or two adjacent C_5 units are joined to form a structure containing a ring of 6 ring carbon atoms, which can be substituted by a hydroxy or oxo group, and the chain of C_5 units can have one halogen substituent, with the proviso that Q does not represent a 3-methylbutadienyl radical or a 2-butadienylmethyl radical.

3,890,394
PROCESS FOR MAKING ALPHA-CHLORO SULFIDES

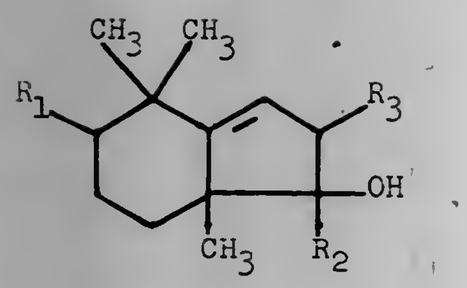
Stephen J. Kuhn, Sarnia, Ontario, Canada, assignor to The Dow Chemical Company, Midland, Mich.
Filed Apr. 28, 1972, Ser. No. 248,666
Int. Cl. C07c *149/10, 149/30, 69/04*
U.S. Cl. 260—609 R **10 Claims**

1. The process of making an α-chloro sulfide comprising reacting by contacting the corresponding sulfoxide with a dichloromethyl ether.

3,890,395
PROCESS FOR THE PHOTOCYCLIZATION OF THE DIHYDRO-IONONES AND THEIR HOMOLOGUES, AND THE PRODUCTS OBTAINABLE BY THIS PROCESS

Oskar Jeger, Zollikerberg; Hans Wolf, and Markus Zink, both of Zurich, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Oct. 16, 1972, Ser. No. 298,151
Claims priority, application Switzerland, Oct. 18, 1971, 15162/71; Oct. 18, 1971, 15163/71
Int. Cl. C07c *35/32*
U.S. Cl. 260—617 F **4 Claims**

1. A compound having the formula



wherein R_1, R_2 and R_3 each independently represent hydrogen or lower alkyl groups.

3,890,396
INDANYL BUTADIENOLS

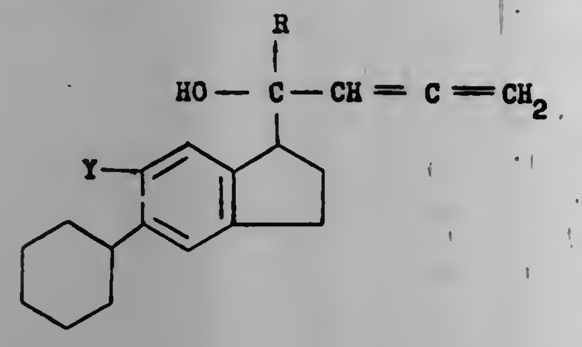
Paul L. Anderson, Dover, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Dec. 28, 1973, Ser. No. 429,390

Int. Cl. C07c ***33/02***

U.S. Cl. 260—618 F **4 Claims**

1. A compound of the formula



wherein

R is a hydrogen atom, methyl or ethyl; and

Y is a hydrogen atom or chloro.

3,890,397
PROCESS FOR THE PREPARATION OF 2-NAPHTHOLE FROM THE CORRESPONDING TETRALIN-1-HYDROPEROXIDE AND 1,2-DIALIN

Thomas Charles Rees, Park Forest South, Ill., and Gerald Sugerman, Allendale, N.J., assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Mar. 24, 1972, Ser. No. 237,809

Int. Cl. C07c ***37/06***

U.S. Cl. 260—621 H **9 Claims**

1. In a process for the preparation of 2-naphthol or a substituted 2-naphthol from Tetralin-1-hydroperoxide or the corresponding Tetralin-1-hydroperoxide and 1,2-dialin or the corresponding 1,2-dialin, the steps which comprise

a. reacting a Tetralin-1-hydroperoxide selected from the group consisting of Tetralin-1-hydroperoxide and Tetralin-1-hydroperoxide further substituted by a member of the group consisting of lower alkyl, lower alkoxy and halogen and having at least one unsubstituted beta-position with a molar excess of the corresponding 1,2-dialin in the presence of a catalyst selected from the class consisting of the halides, oxides, carbonyls, acetyl acetonates, naphthenates and alkanoates of vanadium, molybdenum, rhenium, tungsten, tantalum and titanium at a temperature of 0° to 150° C. to produce a mixture comprising the corresponding 1,2-dialin oxide, the corresponding 2-tetralone, the corresponding 1-tetralone and the corresponding 1-tetralol;

b. adding an acidic or basic catalyst selected from the group consisting of mineral acids, alkanoic acids, alkyl sulfonic acids, inorganic bases and alkali and alkaline earth alkoxides to catalytically rearrange said corresponding 1,2-dialin oxide to a mixture of the corresponding tetralones predominating in the corresponding 2-tetralone;

c. separately securing by distillation of the resulting reaction mixture (b) said corresponding unreacted 1,2-dialin, said corresponding 2-tetralone, and a remainder comprising said corresponding 1-tetralone and said corresponding 1-tetralol, and

d. dehydrogenating said corresponding 2-tetralone to the corresponding 2-naphthol by liquid or vapor phase contact at temperatures up to 500° C. with a palladium, platinium, or nickel dehydrogenation catalyst.

3,890,398
ALIPHATIC TRI-OLEFINIC HALIDES

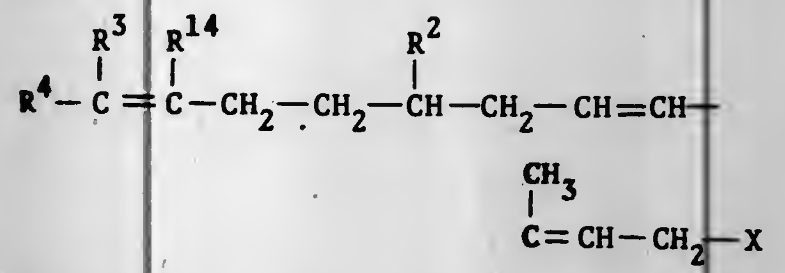
Clive A. Henrick, and John B. Siddall, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 187,897, Oct. 8, 1971, Pat. No. 3,755,411, which is a continuation-in-part of Ser. Nos. 111,650, Feb. 1, 1971, Pat. No. 3,729,486, and Ser. No. 111,702, Feb. 1, 1971, abandoned, and Ser. No. 111,765, Feb. 1, 1971, abandoned, and Ser. No. 111,766, Feb. 1, 1971, abandoned, and Ser. No. 111,770, Feb. 1, 1971, abandoned, and Ser. No. 115,725, Feb. 16, 1971, Pat. No. 3,706,733. This application Jan. 14, 1972, Ser. No. 217,930

Int. Cl. C07c ***21/18***

U.S. Cl. 260—653.3 **7 Claims**

1. A compound selected from those of the following formula:



$$R^4-\overset{R^3}{\overset{|}{C}}=\overset{R^{14}}{\overset{|}{C}}-CH_2-CH_2-\overset{R^2}{\overset{|}{C}H}-CH_2-CH=CH-\overset{CH_3}{\overset{|}{C}}=CH-CH_2-X$$

wherein,

X is bromo, chloro, fluoro or iodo;

each of R^2, R^3 and R^4 is methyl or ethyl; and

R^{14} is hydrogen or methyl.

3,890,399
PROCESS FOR THE CONTINUOUS MANUFACTURE OF 3,4-DICHLOROBUTENE-1

Klaus Gehrmann, Knapsack; Alexander Ohorodnik, Erftstadt-Liblar; Odo Dettmeier, Okriftel, and Heinz-Josef Berns, Berrenrath, all of Germany, assignors to Hoechst Aktiengesellschaft, Knapsack near Cologne, Germany

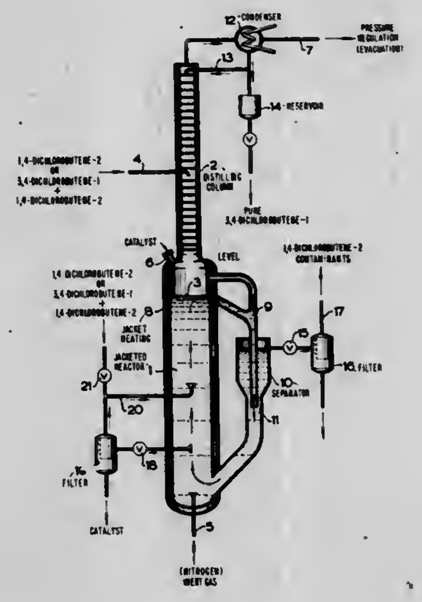
Filed Sept. 5, 1972, Ser. No. 286,292

Claims priority, application Germany, Sept. 6, 1971, 2144475

Int. Cl. C07c ***21/04***

U.S. Cl. 260—654 R **3 Claims**

1. A process for isomerizing 1,4-dichlorobutene-2 in a reaction zone in contact with a catalyst containing copper-I-chloride on a carrier material in a fluidized bed in liquid phase at boiling temperatures between 80° and 110°C under pressures between 50 and 150 mm of mercury to give 3,4-dichlorobutene-1, which process comprises continuously conveying upwardly in the reaction zone a substantially uniform suspension of fine particulate catalyst and 1,4-dichlorobutene-2 or a commercial mixture of 3,4-dichlorobutene-1 and 1,4-dichlorobutene-2 together with resulting reaction product, the upward flow being effected by the introduction, in accordance with the principle of an air-lift pump, of inert gas into, near the bottom of, the reaction zone, removing the suspension from the top of the reaction zone and then recycling downwardly the suspension through a conduit to the bottom of the reaction zone; the recycled suspension passing through an injector system situated in said conduit in a closed catalyst separating zone containing recycle liquid consisting of 1,4-dichlorobutene-2, higher boiling contaminants and small quantities of 3,4-dichlorobutene-1, the injector system providing for a suction intake into said conduit; distilling off 3,4-dichlorobutene-1 near the head of the reaction zone; conveying the 3,4-dichlorobutene-1 to a distilling zone and fractionating it therein until pure; condensing the pure 3,4-dichlorobutene-1 in a cooling zone; following establishment of the reaction equilibrium, continuously supplying starting material to the reaction zone and/or to the center portion of the distilling zone and continuously removing catalyst-free recycle liquid near the head of the catalyst separating zone; flowing



the recycle liquid, which is to be removed from the catalyst separating zone, downwardly through an injector in said zone and then upwardly through said catalyst separating zone on the outside of said injector towards a recycle liquid outlet near the head of said catalyst separating zone at a velocity smaller than the sedimentation velocity of the catalyst in the catalyst separating zone whereby the amount of catalyst removed with the recycle liquid is minimized.

3,890,400
PROCESS FOR SELECTIVELY HYDROGENATING CYCLIC OLIGOMERS OF BUTADIENE

Yvon Lagrange, La Garenne Colombes; Germain Martino, Poissy, and Christian Lassau, Chavenay, all of France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil Malmaison, France

Filed Feb. 21, 1973, Ser. No. 334,454

Claims priority, application France, Feb. 24, 1972, 72.06406

Int. Cl. C07c ***5/02***

U.S. Cl. 260—666 A **9 Claims**

1. A process for selectively and catalytically hydrogenating in liquid phase an unsaturated cyclic oligomer of butadiene selected from the group consisting of 1,5-cyclooctadiene and 1,5,9-cyclododecatriene, which comprises reacting said unsaturated oligomer with hydrogen at a temperature of from 60° to 250°C, in contact with a catalytic quantity of a reaction mixture produced by the single step of reacting at 0°–250°C:

a. an iron compound selected from the group consisting of iron halide, iron alcoholate and an iron salt of a carboxylic acid of 1–20 carbon atoms,

b. an organometallic reducing compound of the formula M $R_1R_2R_3$ in which M is aluminum or boron and each of R_1, R_2 and R_3 is a hydrogen atom or a monovalent hydrocarbon radical, and

c. a phosphine of the formulae P $R_4R_5R_6$ or $(R)_2P$-A-$P(R)_2$ wherein R_4R_5 and R_6 are monovalent hydrocarbon radicals, R is a monovalent hydrocarbon radical of 1–20 carbon atoms, and A is a direct bond or a divalent hydrocarbon radical of 1–6 carbon atoms.

3,890,401
METHOD OF PREPARATION OF ETHYLCYCLOHEXANE

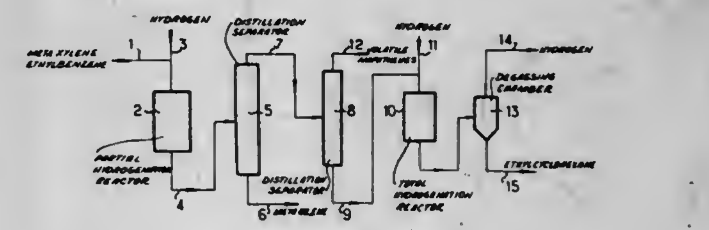
Michele Giangaspero, Monfalcone; Giorgio Tlustos, Marino Bose, and Domenico Corsi, Trieste, all of Italy, assignors to Aquila S.p.A., Trieste, Italy

Filed Dec. 27, 1973, Ser. No. 428,768

Claims priority, application Italy, Dec. 12, 1972, 33794/72

Int. Cl. C07c ***5/10, 7/00***

U.S. Cl. 260—667 **16 Claims**



1. A method for the preparation of ethylcyclohexane from an initial mixture of ethylbenzene and meta-xylene, said method comprising

effecting partial catalytic hydrogenation of said initial mixture to obtain a conversion of ethylbenzene in said mixture to ethylcyclohexane of between 50 to 99% and conversion of meta-xylene in said mixture between 10 and 50%.

separating by distillation in two steps ethylcyclohexane and non-hydrogenated ethylbenzene from the partially hydrogenated mixture, the first of said steps comprising separating from the hydrogenate the non-hydrogenated meta-xylene and the second of said steps comprising separating a fraction containing ethylcyclohexane and non-hydrogenated ethylbenzene from the remainder of the hydrogenate, and

effecting total catalytic hydrogenation of said fraction containing ethylcyclohexane and non-hydrogenated ethylbenzene.

3,890,402
OLIGOMERIZATION PROCESS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

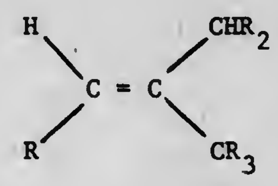
Continuation-in-part of Ser. No. 405,524, Oct. 11, 1973, abandoned. This application Mar. 15, 1974, Ser. No. 451,475

Int. Cl. C07c ***3/18***

U.S. Cl. 260—668 F **6 Claims**

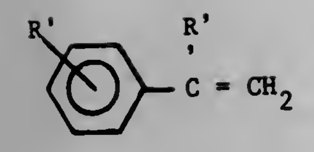
1. A process for the oligomerization of a monoalkenyl compound selected from the group consisting of

A. compounds having from 4 to 20 carbon atoms per molecule characterized by the formula



wherein each R is independently selected from the group consisting of hydrogen, alkyl, cycloalkyl and aryl; and

B. compounds having from 8 to 20 carbon atoms per molecule characterized by the formula



wherein each R' is independently selected from the group consisting of hydrogen, alkyl and cycloalkyl; which comprises contacting said monoalkenyl compound with a catalytic amount of elemental iodine in the presence of tetrahydrothiophene-1,1-dioxide as diluent under oligomerization conditions wherein said tetrahydrothiophene-1,1-dioxide is present in an approximate weight ratio of diluent to monoalkenyl compound ranging from 5:1 to 1:5, and the process temperature is in the approximate range of 25° to 250°C.

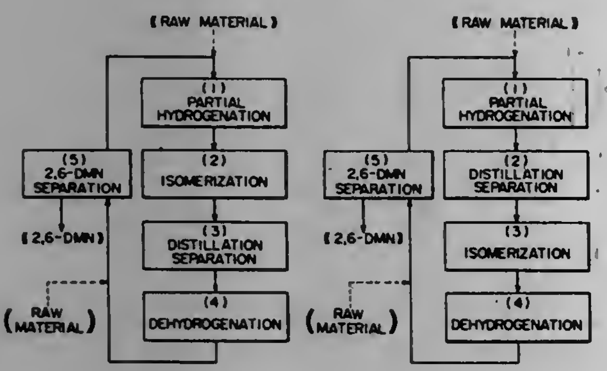
3,890,403
PROCESS FOR SEPARATING AND RECOVERING 2,6-DIMETHYLNATHTHALENES

Keizo Shimada; Takeo Nishikawa; Toshiaki Harada, and Shizuo Nagahama, all of Tokyo, Japan, assignors to Teijin Limited, Osaka, Japan

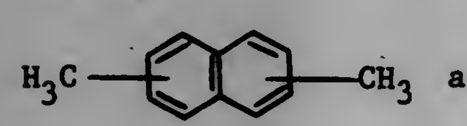
Filed Nov. 14, 1973, Ser. No. 415,646

Int. Cl. C07c *7/02*

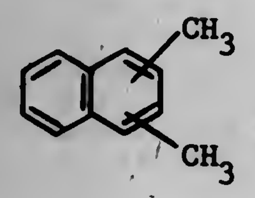
U.S. Cl. 260—674 N **8 Claims**



1. A process for separating and recovering 2,6-dimethylnaphthalene from a dimethylnaphthalene mixture containing



and

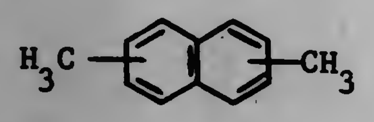


which comprises the steps of:

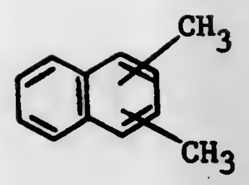
i. partially hydrogenating the above dimethylnaphthalene mixture to a dimethyltetralin mixture,

ii. subjecting said mixture to an isomerization reaction,

iii. after said isomerization of said dimethyltetralin mixture separating the partially hydrogenated dimethyltetralins (I) of said

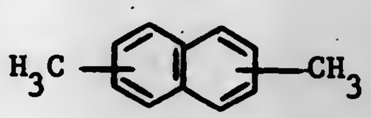


from partially hydrogenated dimethyltetralins (II) of said



and collecting dimethyltetralins (I),

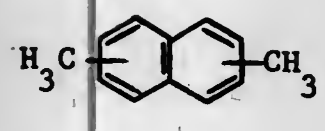
iv. dehydrogenating said dimethyltetralins (I) to be



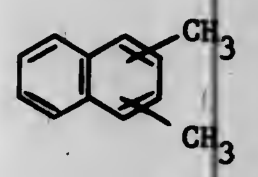
and

v. separating and recovering 2,6-dimethylnaphthalene from the resultant dehydrogenation product and recycling the residual dimethylnaphthalenes to the above partial hydrogenation step (i).

8. A process for separating and recovering 2,6-dimethylnaphthalene from a dimethylnaphthalene mixture containing



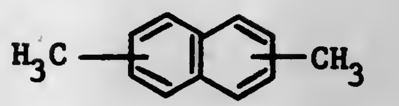
and



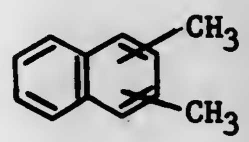
which comprises the steps of:

i. partially hydrogenating the above dimethylnaphthalene mixture to a dimethyltetralin mixture,

ii. separating the partially hydrogenated dimethyltetralins (I) of said



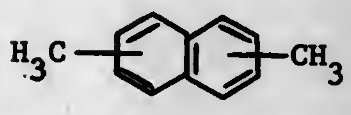
from partially hydrogenated dimethyltetralins (II) of said



and collecting dimethyltetralins (I),

iii. subjecting said dimethyltetralins (I) to an isomerization reaction,

iv. dehydrogenating said dimethyltetralins (I) to



, and

and,

v. separating and recovering 2,6-dimethylnaphthalene from the resultant dehydrogenation product and recycling the residual dimethylnaphthalenes to the above partial hydrogenation step (i).

3,890,404
METHOD FOR PRODUCING ISOPRENE

Kazumi Takagi, and Teruo Matsuda, both of Niihama, Japan, assignors to Sumitomo Chemical Co., Ltd., Japan

Continuation-in-part of Ser. No. 79,700, Oct. 9, 1970, abandoned. This application Feb. 8, 1973, Ser. No. 330,687

Claims priority, application Japan, Oct. 9, 1969, 44-80884; Jan. 20, 1970, 45-5572; Feb. 6, 1970, 45-10929

Int. Cl. C07c *1/24*

U.S. Cl. 260—681 **28 Claims**

1. A method for producing isoprene which comprises reacting isobutene with a reactant selected from the group consisting of formaldehyde, isoprene glycol and an ester of isoprene glycol and an acid at a molar ratio of isobutene to reactant of 1:1 to 10:1 in an aqueous solvent system comprising water or a mixture of water with t-butanol in the liquid phase in contact with a catalyst selected from the group consisting of aluminum chloride, ferrous chloride, ferric chloride, chromic chloride, cobaltous chloride, cobaltic chloride, nickelic chloride, cuprous chloride, manganese chloride, cadmium chloride, ferrous sulfate, ferric sulfate, aluminum sulfate, chromic phosphate and chromous phosphate at a temperature of from 110°C to 180°C and under autogenetic pressure, the concentration of the catalyst being from about 1 to 5% by weight on the basis of the total weight of the reaction mixture.

3,890,405
POLYALPHAMETHYLSTYRENE-POLYDIMETHYLSILOXANE BLOCK COPOLYMERS SUITABLE AS BLOWN FILMS

Thomas C. Kendrick, and Andrew H. Ward, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed July 26, 1973, Ser. No. 383,014

Int. Cl. C08f *33/08;* **C08g** *31/09*

U.S. Cl. 260—827 **2 Claims**

1. A block copolymer suitable for making blown films consisting essentially of polyalphamethylstyrene blocks bonded at each terminal end to polystyrene blocks and in turn the polystyrene blocks are bonded to polydimethylsiloxane blocks, each repeating block unit of one polyalphamethylstyrene block and two polystyrene blocks having a molecular weight of at least 2,000 but less than 7,000 and the total molecular weight of said block copolymer being from 30,000 to less than 500,000 and there being an average of at least 3-polyalphamethylstyrene blocks and at least 4 polydimethylsiloxane blocks per molecule in said block copolymer, said block copolymers being terminated with polydimethylsiloxane blocks wherein the end blocking groups are hydroxyl groups or trimethylsiloxy groups, wherein the combined weight of the polyalphamethylstyrene and polystyrene in the block copolymer is from 15 to 60 weight percent based on the total weight of the block copolymer and the amount of the polydimethylsiloxane is from 40 to 85 weight percent based on the total weight of the block copolymer, said polystyrene blocks being present in an amount to provide no more than 18 weight percent based on the combined weight of the polyalphamethylstyrene and polystyrene present, said block copolymers have a melt flow index greater than 1.0 as determined by the procedure of ASTM:D-1238-L.

3,890,406
MODIFIED POLYPHENYLENE OXIDES CONTAINING PHOSPHORIC ACID ESTER-ANTIMONY TRIOXIDE FLAME RETARDING ADDITIVES

Hiroomi Matsunaga, Ashiya; Takuzo Okumura, Toyonaka; Isao Takata, Takatsuki, and Teruo Saito, Osaka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

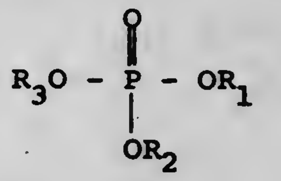
Filed Sept. 8, 1972, Ser. No. 287,559

Claims priority, application Japan, Sept. 9, 1971, 46-70021; July 26, 1972, 47-75423

Int. Cl. C08f *29/12, 29/30, 15/00*

U.S. Cl. 260—874 **8 Claims**

1. A flame-retarded composition of a modified polyphenylene oxide comprising 100 parts by weight of a modified polyphenylene oxide obtained by graft polymerizing in a dispersed state a styrene monomer in the presence of a polyphenylene oxide with a rubbery polymer, 0.5–10 parts by weight of at least one phosphoric acid ester having a boiling point of 200°C or higher, of the formula,



$$R_3O - \overset{\overset{\displaystyle O}{\|}}{\underset{\underset{\displaystyle OR_2}{|}}{P}} - OR_1$$

wherein R_1, R_2 and R_3 are individually an aliphatic or aromatic hydrocarbon group having 2 to 20 carbon atoms, and 0.2–5 parts by weight of antimony trioxide.

3,890,407
NOVEL ADHESIVE COMPOSITIONS

Paul Clayton Briggs, Jr., Wilmington, and Lawrence Carl Muschiatti, Newark, both of Del., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 273,353, July 20, 1972, abandoned. This application May 4, 1973, Ser. No. 357,387

Int. Cl. C08f *15/00*

U.S. Cl. 260—878 R **12 Claims**

1. An adhesive composition consisting essentially of a solution having a Brookfield viscosity of up to about 1 million, of a sulfur-bearing composition selected from chlorosulfonated polyethylene and a mixture of sulfonyl chloride with chlorinated polyethylene in at least one polymerizable vinyl monomer and an accelerator; said sulfur-bearing composition containing about 25–70 wt. percent of chlorine and about 3–160 mmoles sulfonyl chloride moiety per 100 g of polymer and being made from polyethylene having a melt index of about 4-500.

3,890,408
PROCESS FOR PREPARING BLOCK COPOLYMERS

Herman A. J. Schepers, Stein, and Bernard C. Roest, Geleen, both of Netherlands, assignors to Stamicarbon, N.V., Geleen, Netherlands

Filed June 30, 1972, Ser. No. 268,173

Claims priority, application Netherlands, July 2, 1971, 7109142

Int. Cl. C08f *19/08, 15/18*

U.S. Cl. 260—879 **9 Claims**

1. Process for preparing an elastomeric block copolymer having the general configuration

A—B—C

wherein A is a non-elastomeric polymer block formed from a 1-alkyl-ethylene-carboxylic acid ester derived from a 1-alkyl-ethylene carboxylic acid of 4–10 carbon atoms and wherein the alkyl group has 1–4 carbon atoms or a monoalkene aromatic compound having a number average molecular weight between about 200 and 100,000 and a glass transition point above about 25° C, B is an elastomeric conjugated diene polymer block having a number average molecular weight between about 25,000 and 1,000,000 and a glass transition point below about 0° C, C is a polymer block having a number average molecular weight between about 200 and 100,000 and a glass transition point above about 200 and 100,000 and a glass transition point above 50° C formed from a 1-alkyl-ethylene carboxylic acid ester derived from a 1-alkyl-ethylene carboxylic acid of 4–10 carbon atoms and wherein the alkyl group has 1–4 carbon atoms; said process comprising the sequential copolymerization steps of:

1. polymerizing a monomer or monomer mixture with the aid of a monofunctional lithium-based anionic initiator to form said first non-elastomer polymer block A;
2. adding a conjugated diene monomer to the reaction mixture containing said block A while continuing said polymerization under such conditions to form the said elastomeric polymer block B on non-elastomeric polymer block A;
3. adding to the reaction mixture

$$CH_2{=}C\,R_1R_2$$

wherein R_1 and R_2 independently represent an aryl group having 6–18 carbon atoms or an aralkyl group having 6–18 carbon atoms,

the amount being from 0.1 to 10 times the molar amount of the said anionic initiator, and thereafter

4. adding to the reaction mixture said 1-alkyl-ethylene carboxylic ester while continuing polymerization to form terminal block C, whereby said elastomeric block copolymer A—B—C is formed.

3,890,409
DICYCLIC DIPHOSPHATES AND DIPHOSPHITES

Horst Mayerhoefer, Oberwil/Basel-Land; Wolfgang Mueller Neuallschwil/Basel-Land, all of; Urs Sollberger, Fullinsdorf/ Basel-Land, and Rainer Wolf, Allschwil/Basel-Land, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

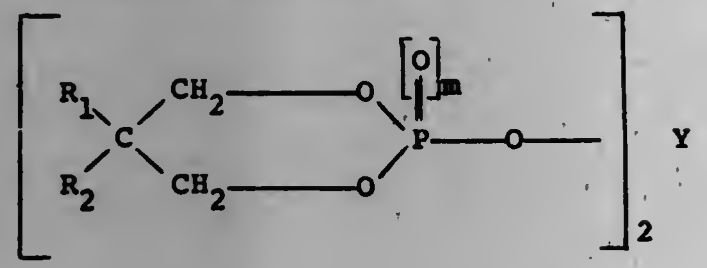
Filed May 29, 1973, Ser. No. 364,629

Claims priority, application Switzerland, June 1, 1972, 8117/72; June 14, 1972, 8898/72

Int. Cl. C07d *105/04;* **C08f** *45/58*

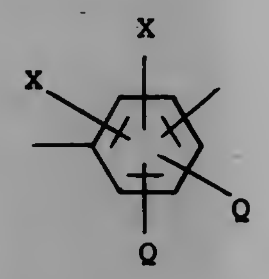
U.S. Cl. 260—927 R **12 Claims**

1. A compound of the formula



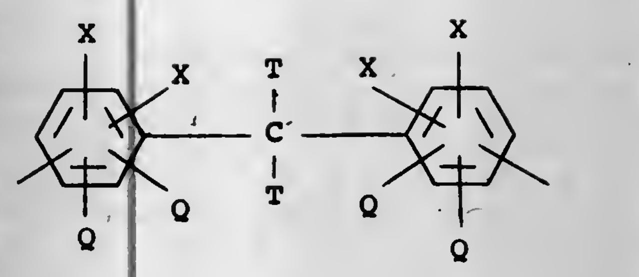
wherein R_1 and R_2 are each, independently, hydrogen or alkyl of 1 to 5 carbon atoms,

Y is a radical Y_3,



Y_3

or a radical Y_4,



Y_4

each X is, independently, chlorine or bromine,

each Q is, independently, hydrogen, methyl, chlorine or bromine, and

each T is, independently, hydrogen or alkyl of 1 to 4 carbon atoms,

and *m* is zero or the integer 1,

with the proviso that when *m* is zero, at least one Q of Y_3 is chlorine or bromine.

3,890,410
SUBSTITUTED TRITHIOPHOSPHONATES

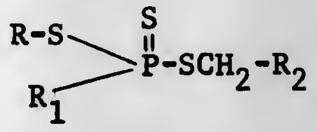
Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 284,005, Aug. 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 184,244, Sept. 27, 1971, abandoned. This application Mar. 25, 1974, Ser. No. 454,191

Int. Cl. C07f *9/40;* **A01n** *9/36*

U.S. Cl. 260—956 **7 Claims**

1. A compound having the formula



$$\begin{matrix} R{-}S \\ R_1 \end{matrix}\!\!>\overset{S}{\overset{\|}{P}}{-}SCH_2{-}R_2$$

in which R is lower alkyl, R_1 is lower alkyl and R_2 is alkynyl containing at least one acetylenic triple bond and containing from 2 to 4 carbon atoms, inclusive.

3,890,411
PROCESS FOR FORMING PHOSPHORUS CONTAINING POLYMERS

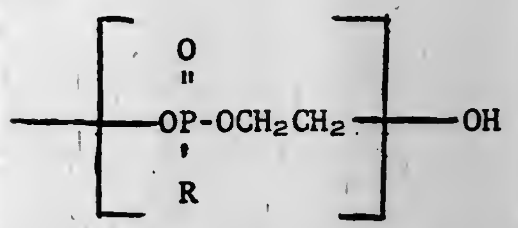
Kyung Sup Shim, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 14, 1974, Ser. No. 442,569

Int. Cl. C07f *9/40*

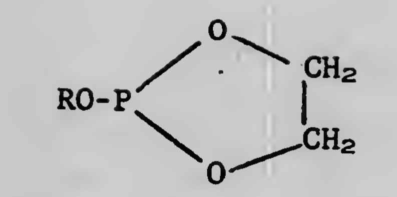
U.S. Cl. 260—969 **9 Claims**

1. A process for forming a polymer having a repeating unit of the formula



$$-\left[\overset{O}{\overset{\|}{\underset{R}{\underset{|}{OP}}}}{-}OCH_2CH_2\right]-OH$$

where R is selected from the group consisting of methyl and ethyl which comprises the heating of a phosphorane compound of the formula



where R has the same meaning set forth above, to a temperature of 100°C to 250°C in the presence of a catalytically effective amount of a lower alkylene glycol and a halide rearrangement catalyst.

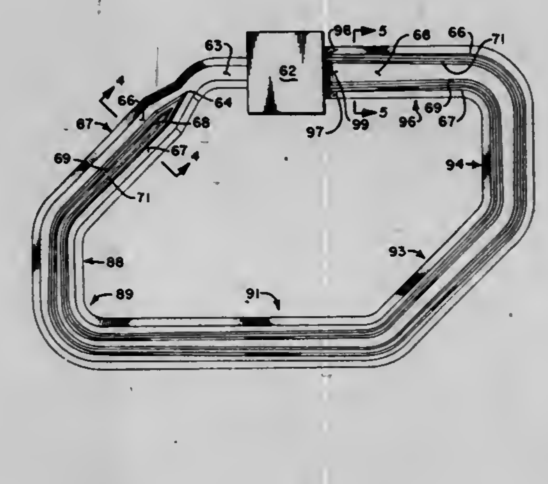
3,890,412
LIQUID COOLING ASSEMBLIES

Leonard J. Boler, Minneapolis, Minn., assignor to Cherne Industrial, Inc., Edina, Minn.

Filed Oct. 10, 1972, Ser. No. 296,779

Int. Cl. B01f *3/04*

U.S. Cl. 261—90 **9 Claims**



1. A large scale liquid cooling assembly comprising a plurality of liquid cooling spray units; each of which has a plurality of liquid spray members adapted for controlled projection of liquid drops in trajectories, substantially all of which have horizontal components extending in one common horizontal direction from the spray members of that particular spray unit, with drop sizes, velocities and volume rates of liquid spraying adapted to provide a directional wind effect across said unit along said one horizontal direction, said assembly having said spray units located and arranged in at least first and second row portions with a plurality of spray units in each row portion, the spray units in the first row portion being aligned and oriented to project liquid drops in a first horizontal direction across a reservoir portion adjacent said first row portion, and the spray units in the second row portion being aligned and oriented to project liquid drops in a second horizontal direction across a reservoir portion adjacent the second row portion, said first and second horizontal directions being angularly oriented with respect to each other, said assembly of spray units and row and reservoir portions having said spray units located and arranged in first and second spaced generally parallel rows with a plurality of cooling units in each row, and having an inner reservoir portion between said rows, a first outer reservoir portion outside the first row, and a second outer reservoir portion outside the second row, the spray units in the first row being aligned and oriented to project liquid drops in one horizontal direction across one of the reservoir portions, and the spray units in the second row being aligned and oriented to project liquid drops in the opposite horizontal direction.

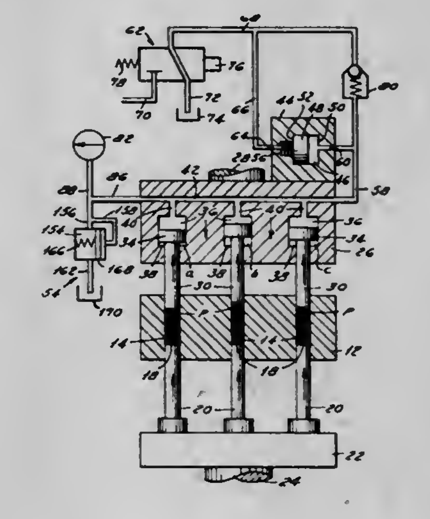
3,890,413
APPARATUS AND METHOD FOR COMPACTING PARTICULATE MATERIALS

William M. Peterson, Troy, Mich., assignor to Hydramet American Inc., Royal Oak, Mich.

Filed Aug. 15, 1974, Ser. No. 497,573

Int. Cl. B30b *11/02*

U.S. Cl. 264—40 **14 Claims**



11. The method of compacting powder in a plurality of open ended die cavities to simultaneously form a plurality of compacted pellets by applying opposed forces to two sets of axially opposed punches extending into the cavities of a die from the opposite ends thereof, at least one set of said punches being mounted on a head, said head and die being relatively movable, each punch of one set being operably connected with an individual piston movable axially within a hydraulic cylinder on said head, said cylinders being in common fluid communication, which comprises, applying a force to produce relative movement of said head and die so that each punch on the head approaches the adjacent end of the powder column in its respective cavity while the punches of the other set are positioned to engage the opposite ends of the powder columns; permitting each piston to retract slightly in its respective cylinder in response to its respective punch encountering the resistance of the adjacent end of the powder column by displacing hydraulic fluid from each cylinder into an expandable fluid chamber connected in closed circuit with said cylinders; causing said chamber to expand so as to receive said fluid from said cylinders; while continuing the application of said force, arresting expansion of said chamber before any of said retracting pistons bottom in their respective cylinders to thereby apply substantially equal relatively low pressures on all of said pistons; increasing said force to continue the relative movement of the head and die until the fluid pressure in said cylinders rises to a predetermined high value which corresponds to the desired compacting force exerted by the punches on the columns of powder to thereby form said pellets, said fluid being compressible responsive to pressure at said high value; relieving said force to reduce the pressure in said cylinders to a positive value sufficiently below said high pressure to thereby permit substantial decompression of said fluid so that the expansion thereof causes the pistons to advance relative to their cylinders; retaining both sets of punches in pressure contact with the opposite ends of the pellets by the application of a differential force thereto to cause the punches to move in the same direction relative to the die to eject the pellets axially from the cavities; and thereafter moving one set of said punches relative to the other to permit extraction of the pellets from therebetween.

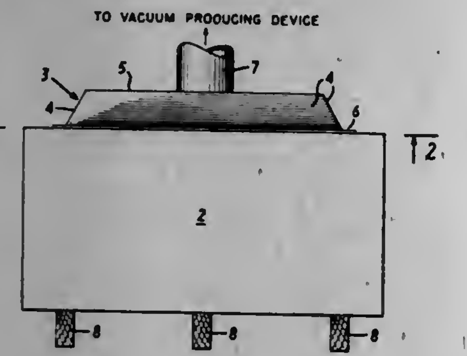
3,890,414
RAPID COOLING PROCESS FOR IMPROVING QUALITY OF POLYURETHANE FOAM

Michael Anthony Ricciardi, 100 Woodlawn Dr., Conyngham, Pa. 18219; David J. Smudin, 849 Davidson Rd., Piscataway, N.J. 08854; Richard D. Wagner, 1007 Seybert St.; Michael Pcolinsky, 8½ E. Diamond Ave., both of Hazelton, Pa. 18201, and John Edward Chaya, 638 North St., West Hazelton, Pa. 18201

Continuation-in-part of Ser. No. 117,356, Feb. 22, 1971, abandoned. This application Mar. 19, 1973, Ser. No. 340,981

Int. Cl. B29d *27/03*

U.S. Cl. 264—45.1 17 Claims



1. A process for preparing an open, cellular, solid polyurethane mass having more uniform physical properties throughout the cross-section of the mass, which comprises inducing a pressure drop across at least two opposing gas-permeable surfaces of a hot, freshly-polymerized, open-celled, solid polyurethane bun to induce a draft of gas having an initial temperature of about 80°F or lower to pass through the bun between the two surfaces in order to cool the bun rapidly and uniformly.

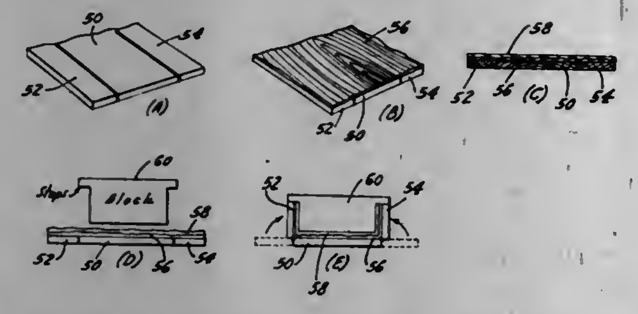
3,890,415
BOX BEAM FABRICATION PROCESS

Otis E. Hull, Oxnard, Calif., assignor to Hexcel Corporation, Dublin, Calif.

Continuation of Ser. No. 194,751, Nov. 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 885,038, Dec. 15, 1968, abandoned. This application Mar. 7, 1974, Ser. No. 449,173

Int. Cl. C08g *27/00*

U.S. Cl. 264—46.7 7 Claims



1. A process for forming a plurality of beams, each beam being defined by a bottom and a pair of spaced and parallel sidewalls, the process comprising:

a. providing a form having a central elongated base member and an elongated side member hinged to each longitudinal side of the base member;
b. providing a reusable, flat, flexible rubber-like mold liner having a grain surface simulating a wood grain;
c. placing the liner flat on a surface of the form to cover the base member and the side members with the grain surface of the liner facing upwardly;
d. spreading a layer of uncured polyurethane foam plastic over the grain surface of the mold liner while the liner is flat;
e. placing an elongated block over the layer of plastic on the base member in coextensive relationship with the base member;
f. thereafter turning the side members up relative to the base member towards the elongated block to cause the liner and layer of plastic to be folded against the block;
g. permitting the plastic to set;
h. thereafter removing the liner from the set plastic; and
i. thereafter repeating steps (c) through (h) by using the liner previously removed from the set plastic.

3,890,416
METHOD FOR PRODUCING A CAVITY OR A ZONE OF VERY LOW DENSITY IN THE INTERIOR OF EXTRUDED PROFILES OF FOAMABLE THERMOPLASTICS

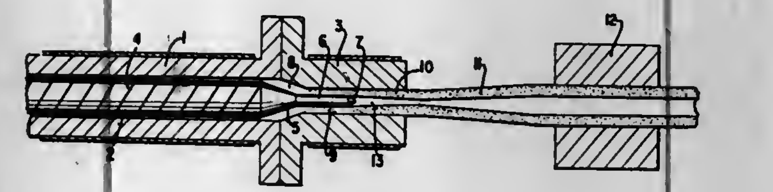
Johann Bauer, Burghausen, and Hansjochen Barth, Emmerting, both of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed May 4, 1973, Ser. No. 357,251

Claims priority, application Germany, May 5, 1972, 2222194

Int. Cl. C08g *27/00;* **B29f** *3/00*

U.S. Cl. 264—45.5 2 Claims



1. A process for the production of a cavity or a zone of very low density in the interior of an extruded profile of a foamable thermoplastic which consists of extruding a foamable thermoplastic through a narrow annular orifice flow channel containing no restriction within said narrow annular orifice, the outer surface of said flow channel being defined by the length of an extruder head, the inner surface of said narrow annular orifice flow channel comprising a rotating cylinder having a conical tip extending in the direction of extrusion flow, wherein said rotating cylinder extends further into said flow channel of said extruder head than the dimension of the outside diameter of said rotating cylinder, foaming said foamable thermoplastic and recovering a foamed thermoplastic having a cavity or a zone of very low density in the interior of its profile.

3,890,417
POROUS DIAPHRAGMS

Christopher Vallance, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 24, 1973, Ser. No. 326,475

Claims priority, application United Kingdom, Feb. 4, 1972, 5351/72

Int. Cl. C08f *47/08*

U.S. Cl. 264—49 28 Claims

1. A method of manufacturing a porous diaphragm suitable for use in electrolytic cells comprising preparing an aqueous dispersion of polytetrafluoroethylene and a solid particulate removable filler, thickening said aqueous dispersion to effect agglomeration of the solid particules therein, forming from the thickened dispersion a dough-like material containing water as lubricant for a subsequent sheet forming operation, calendering said dough-like material to form a biaxially fibrillated sheet and removing the solid particulate filler from the sheet to render it porous.

3,890,418
SKINNING PROCESS FOR EXPANSION CASTING OF POLYMERIC FOAMS

Thaddeus A. Raczek, Apalachin, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 212,653, Dec. 27, 1971, abandoned. This application Jan. 30, 1974, Ser. No. 438,100

Int. Cl. B29d *27/04;* **B29h** *7/20*

U.S. Cl. 264—54 6 Claims

1. A process for expansion casting a polymeric foam object having a skinned smooth surface which comprises:

placing a highly gas permeable membrane sheet on the surface of a mold cavity;
placing an ABS thermoplastic foam material into the mold until the mold is filled, said foam material containing a heat-sensitive, chemical blowing agent which when exposed to heat emits an inert gas which causes said material to expand to the contour of the mold cavity; and
heating said mold to a temperature sufficient to activate said blowing agent and cause expansion of said material, the blowing agent gas and any air in said cavity permeating through said sheet to produce a smooth skin on the surface of the foam material adjacent the sheet with no adherence between said sheet and the foam material.

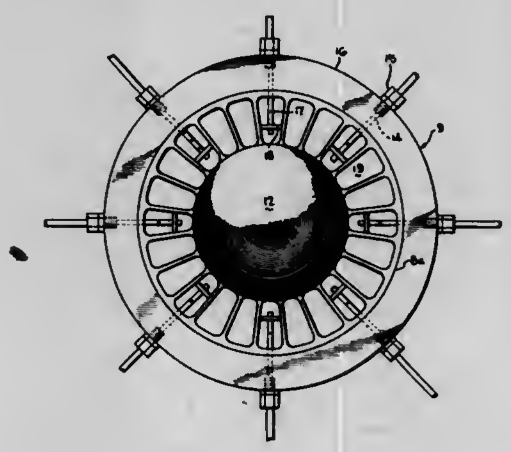
3,890,419
METHOD AND APPARATUS FOR PRODUCING STRIPED SOAP BAR

Thaddeus John Kaniecki, Pompton Plains, N.J., assignor to Armour-Dial, Inc., Phoenix, Ariz.

Continuation of Ser. No. 111,443, Feb. 1, 1971, abandoned. This application July 11, 1973, Ser. No. 368,761

Int. Cl. B29f *3/12*

U.S. Cl. 264—171 6 Claims



1. In a method for producing a multi-colored detergent bar which includes pressing and passing a detergent material in a circular motion through a final plodding stage in which said material is passed forwardly through a cylindrical channel in said plodding stage by screw action to knead said material, then passing said material through a plurality of separate ducts contained in a plate between said plodding area and a conical area and into said conical area, and compacting said material in said conical area, the improvement which comprises introducing coloring matter in a confined stream into said material from an injection tube and directing said stream from a stationary orifice in said tube with said tube being located within one of said ducts in the direction in which the detergent material is being passed through said duct, the area of said confined stream being small as compared to the area of said duct, whereby to produce an extruded bar having a stripe therein.

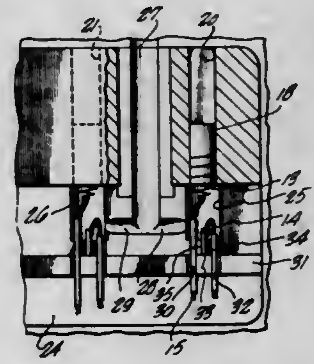
3,890,420
METHOD OF MAKING A BIPOLAR ELECTRODE STRUCTURE

Theodore C. Neward, 521 Scripps, Claremont, Calif. 91711

Filed June 4, 1973, Ser. No. 366,701

Int. Cl. B29f *1/10*

U.S. Cl. 264—261 3 Claims



1. A method of making an electrode structure including a helically coiled sharpened prong electrode and a conductor, the electrode and conductor having attached portions, the method characterized by:

a. screwing the helically coiled electrode into a helical groove in a spindle to secure the electrode thereto;
b. placing the spindle into a recess confronting a mold cavity to effect insolation of the coiled electrode from the mold cavity;
c. positioning the attached portions of the electrodes and conductor in the mold cavity;
d. extending the remaining of the conductor through an opening communicating with the mold cavity to isolate the remaining portion of the conductor from the mold cavity; and
e. injecting a mold material into the mold cavity to form a part encompassing the attached portions of the electrode and conductor.

3,890,421
METHOD FOR BIAXIALLY DRAWING PLASTIC FILMS

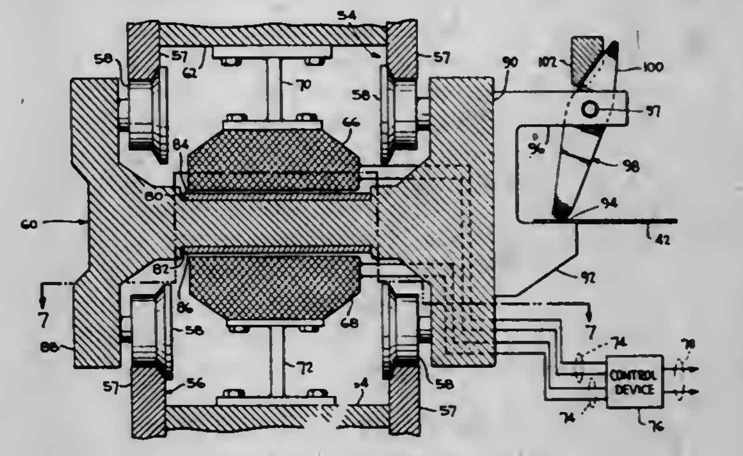
Fortune Habozit, Lyon, France, assignor to La Cellophane, Paris, France

Filed Aug. 1, 1972, Ser. No. 276,951

Claims priority, application France, Aug. 5, 1971, 71.28731

Int. Cl. B29d *7/24*

U.S. Cl. 264—289 4 Claims



3. A method of drawing a plastic film continuously as the film is advanced longitudinally, comprising the steps of:

grasping sequentially successive portions of the film along opposite edges of the film with opposed pairs of clamps mounted on carriages, wherein the carriages each incorporate an armature of a linear motor;
uniformly exciting successive field windings of a stationary element of the linear motor with which the armatures are associated to advance the carriages at a constant speed

along parallel paths and thereby advance the film longitudinally;

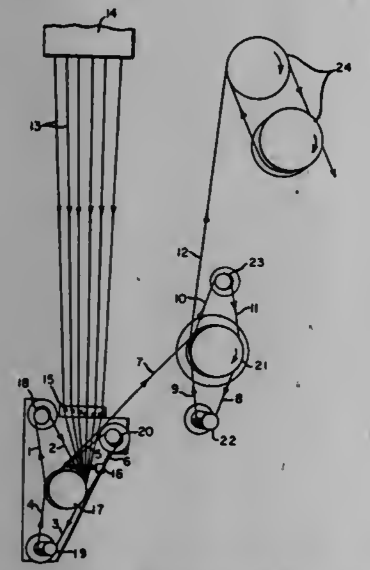
heating the film as the film advances longitudinally;

exciting successive downstream field windings with progressively more energy than adjacent upstream field windings to accelerate the downstream carriages while diverging the paths over which the pairs of clamps advance to draw the film longitudinally while drawing the film laterally; and

exciting successive field windings uniformly while advancing the pairs of clamps at a constant speed along parallel paths extending from the diverging paths and heat-setting the drawn film as the drawn film advances.

3,890,422
METHOD OF DRAWING YARN USING A PLURALITY OF SEPARATOR ROLLS WITH EACH DRIVEN ROLL

Richard Donnan Livingston, Seaford, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.
Continuation-in-part of Ser. No. 387,049, Aug. 9, 1973, abandoned. This application Apr. 26, 1974, Ser. No. 464,368
Int. Cl. B29c *17/02*
U.S. Cl. 264—290 R **3 Claims**



1. In a method for drawing synthetic yarn that includes passing substantially undrawn yarn in multiple spaced surface wraps around a driven feed roll and a plurality of associated separator rolls, then passing the yarn in multiple spaced wraps around a driven draw roll and its associated separator rolls while maintaining the yarn between the feed and draw rolls at drawing tension, all rolls being of constant diameter, the axis of said separator rolls being skewed with respect to the axis of said driven rolls, the improvement comprising: passing the yarn in multiple wraps around the driven rolls while contacting each of their associated separator rolls only once, therebeing one wrap on the driven roll for each associated separator roll.

3,890,423
ELECTROACOUSTIC TRANSDUCER ASSEMBLY

Ellis M. Zacharias, Jr., Ridgewood, N.J., assignor to Nusonics, Inc., Paramus, N.J.
Filed July 27, 1973, Ser. No. 383,406
Int. Cl. H04r *17/00*
U.S. Cl. 310—8.3 **6 Claims**

1. An electroacoustic transducer assembly comprising:

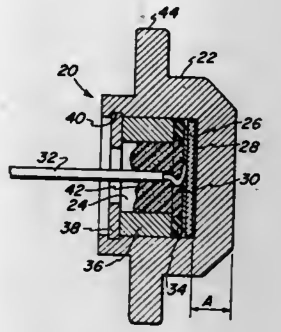
a disk shaped, electroacoustic ceramic transducer having a first face and a second face opposite the first face and a first electrode and a second electrode affixed to the first and the second opposite faces thereof, respectively;

a housing formed of a block of material of low acoustic attenuation and distortion and having a cavity therein to receive the transducer;

a nonconductive liquid free of dissolved and entrained air forming a thin film interface between the first electrode and the housing;

holding means for holding the transducer in position such that the said first electrode is in intimate contact with the housing comprising:

an O-ring in contact with the second face of the transducer;



a sleeve in contact with the O-ring; and

retaining means in contact with the sleeve to thereby hold the O-ring in compression and force the first electrode on the first face of the transducer into contact with the housing;

electrical contacting means connected to the second electrode; and

restraining means for holding the electrical contacting means to prevent excessive motion thereof.

3,890,424
METHODS OF TREATING SOLID SUBSTANCES WITH A VAPOR

Timothy Alan Davies, Weymouth, England, assignor to United Kingdom Atomic Energy Authority, London, England
Filed Nov. 8, 1971, Ser. No. 196,761
Claims priority, application United Kingdom, Nov. 20, 1970, 55422/70
Int. Cl. C01g *43/02*
U.S. Cl. 423—19 **5 Claims**

1. A method of removing unwanted evaporable solid substances from a solid material, comprising placing said solid material in a closed furnace having a pair of oppositely-disposed openings so that said material is between said openings, connecting one of said openings with a vessel containing liquid, operating the furnace so as to heat the material and continuously evacuating the furnace by way of the other of said openings in order to reduce pressure in said liquid containing vessel to promote boiling of the liquid in said vessel whereby vapor generated by boiling is drawn over the material in said furnace so as to facilitate evaporation of said unwanted substances from said material, the evaporated material being removed through said other opening.

3,890,425
REDOX TREATMENT OF ALUNITE ORE

Douglas Stevens, Golden, Colo.; Helge O. Forberg, Owensboro, Ky.; Larry D. Jennings, Arvada, Colo.; Frank M. Stephens, Jr., Lakewood, Colo.; Francis J. Bowen, Golden, Colo.; David L. Thompson, and Julian V. Copenhaver, Jr., both of Arvada, Colo., assignors to Southwire Company, Carrollton, Ga.; National Steel Corporation, Pittsburgh, Pa. and Earth Sciences, Inc., Golden, Colo.
Filed Mar. 21, 1974, Ser. No. 453,234
Int. Cl. C01f *7/06, 7/02*
U.S. Cl. 423—127 **15 Claims**

1. A method for recovering aluminum hydroxide and other valuable constituents from ore containing alunite, comprising the steps of:

a. roasting the ore to remove water of hydration,

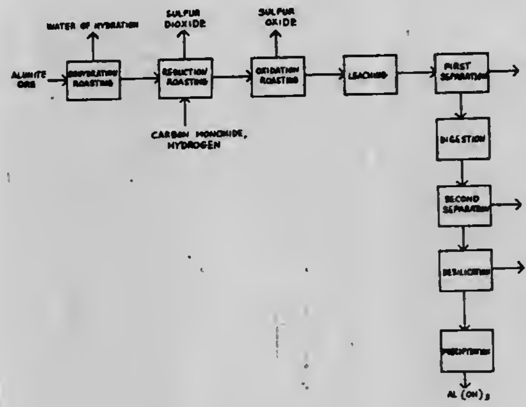
b. roasting the dehydrated ore resulting from Step (a) in a reducing atmosphere to remove sulfate,

c. roasting the reduced ore resulting from Step (b) in an oxidizing atmosphere to convert sulfides to sulfur oxides,

d. leaching the oxidized ore resulting from Step (c) with solvent to remove potassium and sulfate,

e. separating the liquid and solid portions of the slurry resulting from Step (d),

f. digesting the solid portion resulting from Step (e) with an aqueous mixture of alkali metal hydroxides at a concentration and at a temperature sufficient to extract the aluminum content from said solid portion,



g. separating the liquid and solid portions of the digestion mixture resulting from Step (f),

h. precipitating silica from the liquid portion resulting from Step (g),

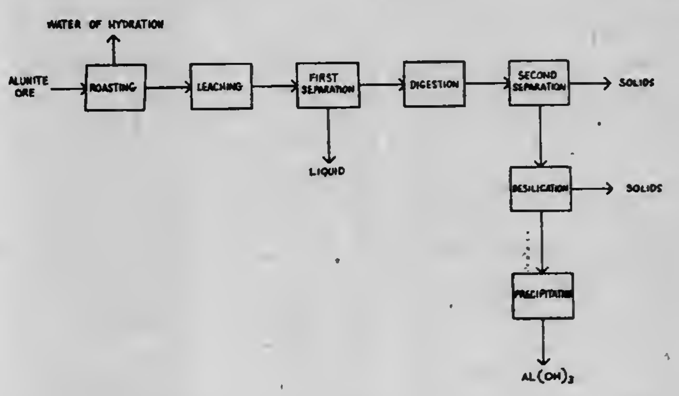
i. separating the supernatant from the precipitant resulting from Step (h),

j. precipitating aluminum hydroxide from the supernatant resulting from Step (i) and

k. separating the supernatant from the precipitated aluminum hydroxide resulting from Step (j).

3,890,426
METHOD OF TREATING ALUNITE ORE

Douglas Stevens, Golden, Colo.; Helge O. Forberg, Owensboro, Ky.; Larry D. Jennings, Arvada, Colo.; Frank M. Stephens, Jr., Lakewood, Colo., and Francis J. Bowen, Golden, Colo., assignors to Southwire Company, Carrollton, Ga.; National Steel Corporation, Pittsburgh, Pa. and Earth Sciences, Inc., Golden, Colo.
Filed Mar. 21, 1974, Ser. No. 453,225
Int. Cl. C01f *7/02, 7/06*
U.S. Cl. 423—127 **21 Claims**



1. A method for recovering aluminum hydroxide from ore containing alunite comprising the steps of:

a. roasting the ore to remove the water of hydration,

b. leaching the roasted ore from Step (a) with a weak base at a pH of from about 8 to about 12 to dissolve sulfate and alkali metals,

c. separating the liquid and solid portions of the slurry resulting from Step (b), said liquid portion containing dissolved sulfate and alkali metals,

d. digesting the solid portion from Step (c) with an aqueous mixture of alkali metal hydroxides at a concentration and at a temperature sufficient to extract the aluminum content from said solid portion,

e. separating the liquid and solid portions of the slurry resulting from Step (d),

f. precipitating silica from the liquid portion resulting from Step (e),

g. separating the liquid and solid portions resulting from Step (f),

h. precipitating aluminum hydroxide from the liquid portion resulting from Step (g),

i. separating the aluminum hydroxide precipitate from the liquid portion resulting from Step (h).

3,890,427
RECOVERY OF GALLIUM

John L. Dewey, Little Rock; George W. Cook, Benton, and Charles E. Scott, Little Rock, all of Ark., assignors to Reynolds Metals Company, Richmond, Va.
Filed Mar. 28, 1974, Ser. No. 455,519
Int. Cl. C01g *15/00*
U.S. Cl. 423—129 **8 Claims**

1. A process for treating solutions containing gallium in admixture with aluminum and caustic in order to enhance the gallium concentration which comprises:

a. adding a source of silica sufficient to react with 50–98 percent by weight of the total soda present in said solution in an amount so as to provide 2 moles of silica per mole of soda to be reacted;

b. adding a source of alumina if the $Na_2O : Al_2O_3$ ratio of the solution is above about 1 to lower the ratio to about 1 or lower;

c. heating the solution at temperatures of from about 212° to about 400° so as to cause alumina and caustic to selectively react with the silica to form a precipitate and leave the substantial portion of the gallium in solution;

d. separating the precipitate from the solution; and

e. evaporating the solution so as to increase the gallium concentration thereof.

4. In a process for enhancing the gallium concentration of a solution containing caustic, alumina and gallium wherein said solution is treated with carbon dioxide at conditions to selectively precipitate the major portion of alumina, followed by removing the precipitate and subjecting the remaining solution to a second treatment with carbon dioxide so as to precipitate a mixture of sodium aluminum compounds and sodium gallium compounds, the improvement which comprises

a. calcining said precipitate of aluminum and gallium compound and dissolving the same in water to provide a solution having a Na_2O: Al_2O_3 ratio of about 1;

b. contacting said solution from step (a) with silica in an amount equal to about 2 moles silica per mole of alumina to be reacted at elevated temperatures of from about 212° to about 400°F so as to cause the silica to selectively react with caustic and aluminum and form a precipitate and leave the substantial portion of gallium in solution;

c. separating said gallium solution from said precipitate; and

d. concentrating said gallium solution by removal of water.

3,890,428

DECOLORIZATION OF AMMONIUM THIOSULFATE

Madhusudan D. Jayawant, Hockessin, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Sept. 6, 1973, Ser. No. 394,821

Int. Cl. C01b *17/64*

U.S. Cl. 423—264 **6 Claims**

1. A method for removing coloring agents selected from the group consisting of iron compounds, sulfide ions and polysulfide ions from aqueous ammonium thiosulfate solutions comprising (a) adding to such solution a decolorizing amount of SiO_2 as aqueous sodium, potassium or lithium silicate to precipitate such coloring agents and (b) separating the precipitated coloring agents from the aqueous solutions.

3,890,429

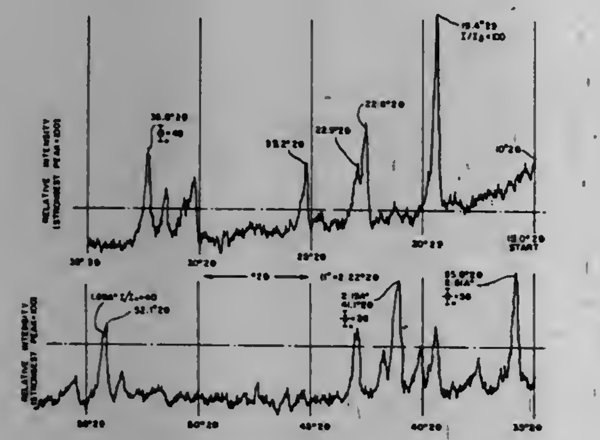
INORGANIC STANNIC OXIDE POLYMERS AND METHOD FOR THE PREPARATION THEREOF

Louis L. Pytlewski, Philadelphia, Pa., assignor to Research Corporation, New York, N.Y.

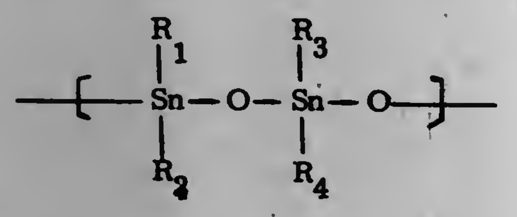
Continuation-in-part of Ser. No. 71,426, Sept. 11, 1970, Pat. No. 3,676,186, which is a continuation-in-part of Ser. No. 591,717, Nov. 5, 1966, abandoned. This application Oct. 22, 1971, Ser. No. 191,865

Int. Cl. C01b *21/48;* **C01g** *19/02, 19/04*

U.S. Cl. 423—395 **10 Claims**

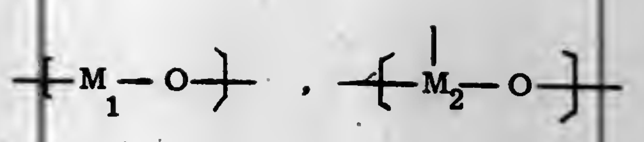


1. An inorganic hydrophilic polymer consisting essentially of (a) a major portion of first monomeric units of the formula



$$-\left[\underset{R_2}{\overset{R_1}{\mathrm{Sn}}}-O-\underset{R_4}{\overset{R_3}{\mathrm{Sn}}}-O\right]-$$

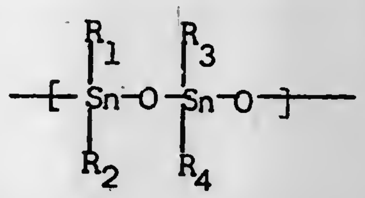
wherein at least one of the groups R_1-R_4 is a member selected from the group consisting of —OH and —O—and at least one of the groups R_1-R_4 is an anion of a water soluble salt of tin, the remainder of the groups R_1-R_4 being members selected from the group consisting of —OH, —O— and an anion as defined above and (b) a minor portion of a second monomeric unit selected from the group consisting of



$$-\left[M_1-O\right]- \;,\; -\left[\overset{|}{M_2}-O\right]-$$

and mixtures thereof wherein M_1 is a divalent metal ion and M_2 is a trivalent metal ion of a metal having two stable states of oxidation in an aqueous medium said minor portions being effective to impart colloidal properties to said polymer when dispersed in water.

4. A process for the manufacture of the polymer according to claim 1 consisting essentially of the steps of adding to water a first amount of a water soluble stannic salt which is hydrolizable to a stannic oxide monomeric unit of the formula



$$-\left[\underset{R_2}{\overset{R_1}{\mathrm{Sn}}}-O-\underset{R_4}{\overset{R_3}{\mathrm{Sn}}}-O\right]-$$

adding a second amount of a reactant selected from the group consisting of (1) a salt of a metal which has two stable valences in an aqueous solution, said salt being added in the lower valence state, and (2) an elemental metal, said second amount being an effective amount sufficient to react with said first amount of said stannic salt to provide said colloidally dispersible positively charged, hydrophilic polymer and heating the resulting aqueous mixture to an elevated temperature less than the boiling point of the mixture until a color change occurs in said mixture.

3,890,430

METHOD OF PRODUCING DIAMOND MATERIALS

Valentin Nikolaevich Bakul, ulitsa Kirova, 34a, kv.12; Alexandr Alexandrovich Shulzhenko, ulitsa Novo-Konstantinovskaya, 17, kv.27, and Anatoly Fedorovich Getman, ulitsa Syretskaya, 38, kv.2, all of Kiev, U.S.S.R.

Continuation of Ser. No. 259,804, June 5, 1972, abandoned. This application Jan. 28, 1974, Ser. No. 437,380

Claims priority, application U.S.S.R., Jan. 13, 1972, 1732201

Int. Cl. C01b *31/06*

U.S. Cl. 423—446 **3 Claims**

1. In a method for the synthesis of diamond from a reaction mixture consisting of a carbonaceous material and a carbon solvent under a pressure of at least 60 kbar and at a temperature of at least 1,700°C within the range of diamond stability, the improvement consisting in that the carbon solvent consists of:

a. a member selected from the group consisting of zinc, magnesium and combination thereof, and
b. a member selected from the group consisting of lead, lead selenide, cadmium, bismuth, tin, indium, antimony, thallium, mercury oxide and conbinations thereof.

3,890,431

SO_2 REMOVAL FROM GASES

Sidney M. Blitzer, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 4, 1973, Ser. No. 403,420

Int. Cl. B01d *53/34*

U.S. Cl. 423—575 **10 Claims**

8. A process for removing SO_2 from a gaseous stream containing SO_2 which comprises bringing said stream into contact with an aqueous solution of carboxymethoxysuccinic acid or a water soluble salt thereof whereby SO_2 is removed from said stream forming a complex containing SO_2 and carboxymethoxysuccinic acid or the salt thereof.

3,890,432

CATALYTIC HYDROGEN MANUFACTURE

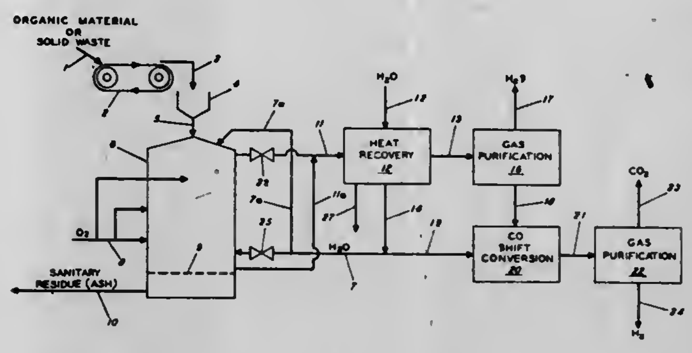
Robert J. White, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 34,834, May 5, 1970, Pat. No. 3,759,677. This application Feb. 5, 1973, Ser. No. 329,471

portion of the term of this patent subsequent to July 9, 1991

Int. Cl. C01b *1/02, 1/32, 2/06*

U.S. Cl. 423—655 **2 Claims**



1. A process for converting solid organic waste containing at least 10 weight percent oxygen and less than 5 weight percent sulfur to a synthesis gas and a sanitary inorganic residue and for separating gases obtained during the conversion of the solid waste into valuable gas streams which comprises:

a. reacting the solid waste with steam in a reaction zone at a temperature between 500° and 3000°F. to generate a hydrogen-rich gas containing hydrogen, hydrogen sulfide, carbon monoxide, and carbon dioxide, said reaction being catalyzed by the presence in the solid feed of potassium carbonate or sodium carbonate, based on the amount of the solid organic waste material feed, in the range of from about 1 to 50 weight percent,
b. withdrawing the hydrogen-rich gas from the reaction zone at a temperature between 500° and 3000°F.,
c. recovering heat from the hydrogen-rich gas by heat exchanging the hydrogen-rich gas with H_2O to obtain steam,
d. using at least a portion of the steam generated in step (c) as feed steam for reaction with the solid municipal waste according to step (a),
e. separating H_2S from hydrogen-rich gas withdrawn from heat recovery step (c),
f. shift converting carbon monoxide present in hydrogen-rich gas withdrawn from the H_2S separation step to obtain additional hydrogen and carbon dioxide, and
g. separating carbon dioxide from the hydrogen-rich gas withdrawn from the carbon monoxide shift conversion step.

3,890,433

METHOD FOR MANUFACTURING PHARMACEUTICAL PREPARATION

Ryota Oishi, Yamato 1-chome, Takatsuki-shi; Yotaka Mito, Otoshimoto-cho, Neyagawa-shi; Kenji Yamauchi, Kuwata-cho, Ibaraki-shi; Katsuyuki Takahashi, Sonehigashi-machi, Touonaka-shi, and Kazushi Hirata, Ooike 2-chome, Ibaraki-shi, all of Japan

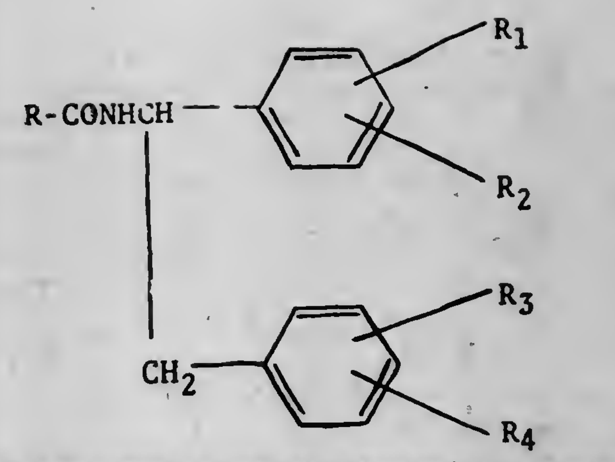
Filed Oct. 4, 1972, Ser. No. 294,949

Claims priority, application Japan, Oct. 4, 1971, 46-78058

Int. Cl. A61k *9/00*

U.S. Cl. 424—37 **16 Claims**

1. A method for manufacturing a pharmaceutical preparation of an amide compound of the following formula:



wherein R is a straight or branched, saturated or unsaturated hydrocarbon group having 17 to 25 carbon atoms, unsubstituted or substituted with hydroxyl, and wherein R_1, R_2, R_3 and R_4 are each a hydrogen atom, a halogen atom, a lower alkyl group or a lower alkoxy group, provided that R_1, R_2, R_3 and R_4 are not simultaneously all hydrogen atoms, said amide being either a paste, a semisolid or a wax-like solid with a melting point of from 50°C. to 84.5°C. at ambient temperature, the resulting preparation being highly stable to air oxidation, easily administrable through an intestinal route and exhibiting a high pharmacological activity, which comprises the steps of:

1. melting said amide compound at 110°C. to 120°C. in the presence of about 0.2 to 0.5 percent by weight, on the basis of the amount of amide compound, of at least one oil-soluble antioxidizing agent;
2. adding to and melting into the melted mixture maintained at said temperature of 110°C. to 120°C. about 1.0 to 3.0 percent by weight, on the basis of the amount of amide compound, of at least one of said oil-soluble anti-oxidizing agents;
3. dispersing the resulting melted mixture in an aqueous solution of a gellating agent and about 0.1 to 3.0 percent by weight, on the basis of the amount of amide compound, of at least one water-soluble anti-oxidizing agent by stirring said mixture at 70°C. to 85°C. until a uniform emulsion is obtained;
4. spraying the resultant emulsion, while maintained at a temperature of from 70° to 80°C., onto fine particles of a water-absorptive material which is inert and insoluble in water and has a particle size of not more than 74 microns;
5. separating the gelled beads from the fine particles of water-absorptive material, and;
6. drying the gelled beads.

3,890,434

HAIR AND ANTISEPTIC FORMULATIONS CONTAINING ADDUCTS OF BIS-(2-PYRIDYL-1-OXIDE) DISULFIDE

Guenther K. Weisse, Northford; Haywood Hooks, Jr., West Haven; Gene A. Hyde, Hamden, and Samuel I. Trotz, Orange, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 190,382, Oct. 18, 1971, Pat. No. 3,818,018. This application Mar. 28, 1974, Ser. No. 455,688

Int. Cl. A61k *7/06*

U.S. Cl. 424—70 **26 Claims**

8. A clear hair dressing composition comprising from about 10 to about 50% by weight of a grooming agent, from 0 to about 40% by weight of a solubilizing agent, from about 0.0001 to about 10% by weight of an adduct having the empirical formula:

$$(C_5H_4NOS)_2MY_t$$

or hydrate thereof, wherein M is an alkaline earth metal selected from the group consisting of calcium, magnesium, barium and strontium; Y is an anion selected from the group consisting of halide, sulfate, nitrate, chlorate and acetate and *t* is 1 or 2

and from 0 to about 89% by weight of water.

3,890,435
ANTIBIOTIC SUBSTANCE

Douglas Broadbent, Alderley Edge; Brian Frederick Burrows, Wilmslow; Stephen Barnaby Carter, Kettleshulme, and Harold George Hemming, Northenden, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 7, 1971, Ser. No. 132,181
Int. Cl. A61k *21/00*

U.S. Cl. 424—115 **2 Claims**

1. The compound cytochalasin E, said compound having the following characteristics:

melting point: variable between 200° and 200°C., but commonly 206°–209°C.

infra-red spectrum: bands having ν max (in liquid paraffin) at 3520, 3450, 3200, 3120 (all weak), 1760, 1730, 1705 (all strong), 1670, 1640, (both weak) cm.$^{-1}$

ultraviolet spectrum: no selective absorption between 225 mμ and 350 mμ.

proton magnetic resonance spectrum: peaks in the region of $\tau = 2.8$ (aromatic protons) when measured in $CDCl_3$ or C_5D_5N;

peaks (doublets) centred (when measured in C_5D_5N) at $\tau = 3.16$ and τ 4.10 respectively, both having a coupling constant of 12.0 cycles per second.

mass spectrometry: heaviest ion observed:-

m/e = 495, corresponding to $C_{28}H_{33}NO_7$ other ions:-
m/e = 337, corresponding to $C_{22}H_{27}NO_2$
m/e = 246, corresponding to $C_{15}H_{20}NO_2$.

3,890,436
ANTIBIOTIC GP-3 AND PRODUCTION THEREOF BY CULTIVATION OF *BACILLUS CEREUS*

Jun'Ichi Shoji; Mikao Mayama, both of Osaka; Shinzo Matsuura, Itami; Kouichi Matsumoto, Toyonaka, and Yoshiharu Wakisaka, Takarazuka, all of Japan, assignors to Shionogi & Company, Ltd., Japan

Filed Apr. 15, 1974, Ser. No. 461,434
Claims priority, application Japan, Apr. 25, 1973, 48-47412
Int. Cl. A61k *27/00*

U.S. Cl. 424—118 **5 Claims**

1. A process for producing antibiotic Gp-3, which comprises cultivating the antibiotic Gp-3-producing strain of Bacillus ATCC 21928 in an aqueous nutrient medium under aerobic conditions, and isolating the accumulated antibiotic from the cultured broth.

3,890,437
METHOD OF INHIBITING FERTILITY IN MAMMALS USING D—PHE^2—D—ALA^6—LRF

Theodore J. Foell, and John P. Yardley, both of King of Prussia, Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 402,958, Oct. 3, 1973. This application July 5, 1974, Ser. No. 486,124
Int. Cl. A61k *27/00;* **C07c** *103/52*

U.S. Cl. 424—177 **1 Claim**

1. A method of inhibiting fertility in a female mammal which comprises administering to said mammal an effective amount for inhibiting fertility of a compound selected from

p-L-Glu-D-Phe-L-Trp-L-Ser-L-Tyr-D-Ala-Leu-L-Arg-L-Pro-ly-NH_2

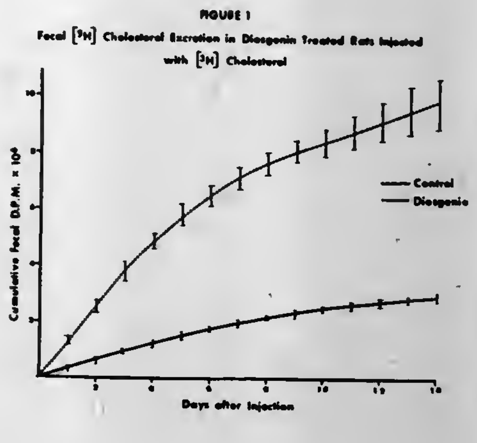
and its non-toxic salts.

3,890,438
COMPOSITIONS AND METHODS FOR REDUCING BLOOD CHOLESTEROL

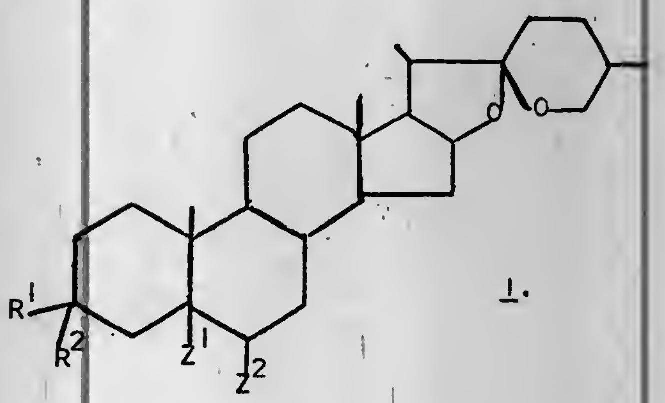
Mitchell N. Cayen, and Dushan M. Dvornik, both of Montreal, Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Sept. 17, 1973, Ser. No. 398,130
Claims priority, application Canada, Oct. 6, 1972, 153515
Int. Cl. A61k *17/00*

U.S. Cl. 424—240 **10 Claims**

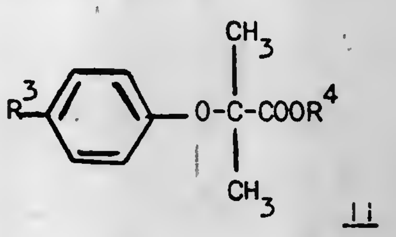


1. A method of reducing levels of blood cholesterol in humans which comprises administering to said humans a blood cholesterol lowering amount of a mixture of compound of formula 1.



1.

in which R^1 represents hydrogen, hydroxy, lower alkanoyloxy, lower alkoxy or halo and R^2 represents hydrogen, or R^1 and R^2 together represent oxo; Z^1 represents hydrogen or hydroxy, Z^2 represents hydrogen or hydroxy or Z^1 and Z^2 together represent a carbon-carbon double bond or epoxy between C-5 and C-6, and a compound of formula 11



11

in which R^3 represents halo, lower alkyl or lower alkoxy and R^4 represents hydrogen, lower alkyl, β-pyridylmethyl, an alkali metal or an alkaline earth metal; said mixture of the compounds of formula 1 and 11 being in a ratio ranging from 19:1 to 3:2 on a weight:weight basis, respectively.

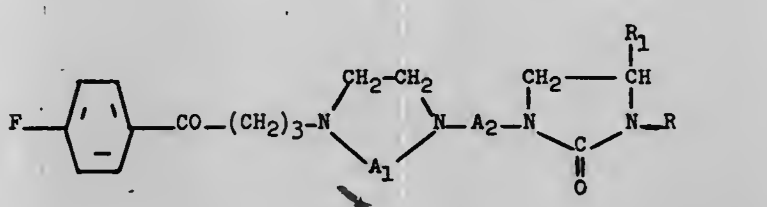
3,890,439
IMIDAZOLIDINONE DERIVATIVES IN THE TREATMENT OF EMESIS AND PSYCHOSOMATIC DISTURBANCES

Armin Zust, Birsfelden/Basel-Land, Switzerland; Walter Schindler, deceased, late of Riehen, Switzerland, and by Leonhard Gysin, executor, Basel, Switzerland, assignors to CIBA-GEIGY Corporation, Ardsley, N.Y.

Division of Ser. No. 203,870, Dec. 1, 1971, Pat. No. 3,812,126. This application Oct. 12, 1973, Ser. No. 406,041
Claims priority, application Switzerland, Dec. 7, 1970, 18133/70
Int. Cl. A61u *27/00*

U.S. Cl. 424—250 **2 Claims**

1. A pharmaceutical composition for the treatment of emesis of varying origin and of psychosomatic disturbances comprising a therapeutically effective amount of a compound of the formula



wherein

A$_1$ represents an alkylene group having 2 to 3 carbon atoms,
A$_2$ represents an alkylene group having 2 to 4 carbon atoms,
R represents an alkyl group having 1 to 4 carbon atoms, and
R$_1$ represents hydrogen, or an alkyl group having 1 to 4 carbon atoms,

or a pharmaceutically acceptable acid addition salt thereof and a pharmaceutically acceptable carrier.

3,890,440
NEMATICIDAL COMPOSITIONS COMPRISING 2-CHLORO-6-METHOXY-4-(TRICHLOROMETHYL)-PYRIDINE AND S-METHYL N-[(METHYL CARBAMOYL)OXY]THIOACETIMIDATE

Frances C. O'Melia, Pleasant Hill, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 25, 1974, Ser. No. 454,203
Int. Cl.^{2} A01N *9/12, 9/22*

U.S. Cl. 424—263 **6 Claims**

1. A synergistic nematicidal composition for use in soil which comprises an inert carrier and a mixture of toxicants consisting of about 1 part by weight of 2-chloro-6-methoxy-4(trichloromethyl)pyridine and from about ⅛ to about 16 parts by weight of S-methyl N-[(methyl carbamoyl)oxy]thioacetimidate, said mixture being present in an amount of from about 0.00001 to 90 percent by weight of the total composition.

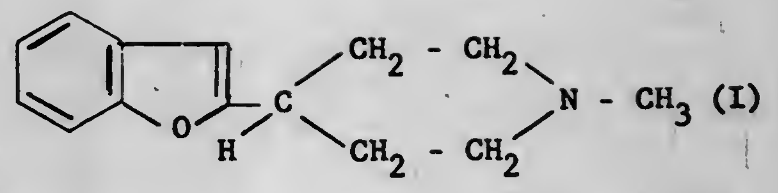
3,890,441
PHARMACEUTICAL PREPARATIONS AND METHOD OF USE

Karl Schenker, Binningen, and Raymond Bernasconi, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 22, 1974, Ser. No. 472,332
Claims priority, application Switzerland, May 25, 1973, 7527/73
Int. Cl. A61k *27/00*

U.S. Cl. 424—267 **9 Claims**

1. A pharmaceutical preparation in the form of a dragee, tablet, suppository or ampoule useful for the treatment of mental depression, comprising a therapeutically effective amount of 1-methyl-4-(2-benzofuranyl)-piperidine of the formula



or of a pharmaceutically acceptable addition salt thereof with an inorganic or organic acid, in association with a pharmaceutical carrier.

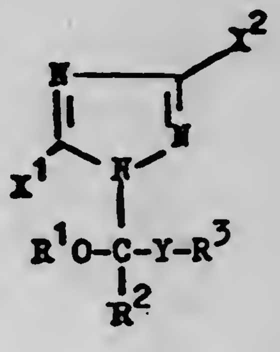
3,890,442
1,2,4-TRIAZOLE ANTIMYCOTIC COMPOSITIONS AND USE THEREOF

Werner Meiser, Wuppertal-Elberfeld; Wolfgang Krämer, Wuppertal-Barmen; Karl Heinz Büchel, and Manfred Plempel, both of Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Sept. 11, 1973, Ser. No. 396,202
Claims priority, application Germany, Sept. 26, 1972, 2247186
Int. Cl. A61k *27/00*

U.S. Cl. 424—269 **38 Claims**

19. A method of treating mycoses in humans and animals which comprises administering to said human or animal an antimycotically effective amount of 1,2,4-triazole of the formula:



or a pharmaceutically-acceptable, nontoxic salt thereof, wherein

X^1 is hydrogen or alkyl of 1 to 3 carbon atoms;
X^2 is hydrogen or alkyl of 1 to 3 carbon atoms;
R^1 is phenyl or phenyl substituted by one to five substitutents selected from the group consisting of alkyl of 1 to 4 carbon atoms, the same or different halogen, the same or different haloalkyl of 1 or 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloalkoxy of 1 or 2 carbon atoms and 2 to 5 halogen atoms, and nitro, or by one substituent selected from the group consistng of phenyl, halophenyl and amino;
R^2 is hydrogen or alkyl of 1 to 6 carbon atoms;
R^3 is alkyl of 1 to 6 carbon atoms; and
Y is CO;

in combination with a pharmaceutically-acceptable, nontoxic, inert diluent or carrier.

3,890,443
2-(SUBSTITUTED) THIAZOLINES FOR THE CONTROL OF RICE BLAST

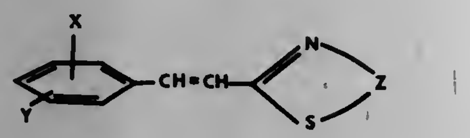
Richard C. Koch, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 397,758, Sept. 17, 1973, abandoned, which is a division of Ser. No. 203,455, Nov. 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 41,532, May 28, 1970, Pat. No. 3,624,217, which is a continuation-in-part of Ser. No. 788,642, Jan. 2, 1969, abandoned. This application Feb. 20, 1974, Ser. No. 444,137

Int. Cl. A01n *9/12*

U.S. Cl. 424—270 **3 Claims**

1. A process for the control of fungal disease on rice plants which comprises contacting the plants with a fungicidally effective amount, in admixture with a carrier therefor, of a compound having the formula



and the non-phytotoxic acid addition salts thereof wherein X and Y are each chloro or fluoro;

and Z is ethylene.

3,890,444
DRUG COMPOSITION

Helmuth Wawretschek, Friesoythe, Germany, assignor to Servomed Arzneimittel GmbH, Oldenburg, Germany

Filed Apr. 26, 1973, Ser. No. 354,558

Claims priority, application Germany, Apr. 26, 1972, 2220500

Int. Cl. A61k *27/00*

U.S. Cl. 424—273 **6 Claims**

4. The method of treating rheumatic disorder which comprises administering to a patient suffering from rheumatic disorder, an effective antirheumatic and analgesic amount of dextro-propoxyphene and phenyl butazone in mole ratio between 1 to 1 and 1 to 8 as active ingredients.

3,890,445
LACTAMIMIDE DERIVATIVES USEFUL AS HYPOGLYCEMIC AGENTS

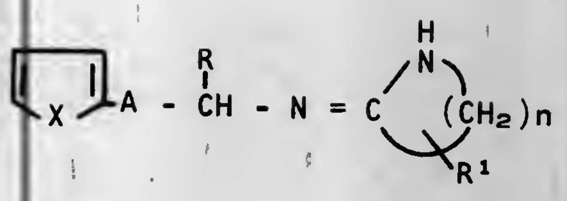
J. Martin Grisar; George P. Claxton, and Thomas R. Blohm, all of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Division of Ser. No. 321,160, Jan. 5, 1973, Pat. No. 3,816,457. This application Mar. 22, 1974, Ser. No. 453,566

Int. Cl. A61k *27/00*

U.S. Cl. 424—275 **9 Claims**

1. A method of inducing a hypoglycemic response in a hyperglycemic patient which comprises administering orally or parenterally to said patient an effective amount of a compound selected from the base of the formula:



wherein X is selected from oxygen or sulfur; A is selected from the group representing a bond or a straight or a branched alkylene chain of from 1 to 3 carbon atoms; R is selected from the group consisting of hydrogen or a straight or branched lower alkyl group of from 1 to 4 carbon atoms, a straight or branched lower alkenyl group of from 3 to 6 carbon atoms, a cycloalkyl group of from 3 to 6 carbon atoms and phenyl; R^1 is selected from the group consisting of hydrogen or a straight or branched lower alkyl group of from 1 to 4 carbon atoms; and *n* is an integer of from 3 to 11; and *a* pharmaceutically acceptable acid addition salt thereof.

3,890,446
CERTAIN DIGUANIDINO COMPOUNDS USED AS FUNGICIDES

John Graham Brown, Ware, and Henry Arthur Sheldon Payne, Ampthill, both of England, assignors to Murphy Chemical Ltd., Wheathampstead, St. Albans, Hertfordshire, England

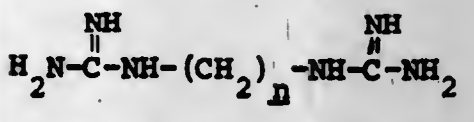
Continuation of Ser. No. 245,189, April 18, 1972, abandoned. This application Dec. 21, 1973, Ser. No. 427,141

Claims priority, application United Kingdom, Apr. 21, 1971, 10567/71

Int. Cl.² A01N *9/20*

U.S. Cl. 424—326 **6 Claims**

1. A method of preventing fungal infection in plants and seeds, which comprises applying to the plants 0.05 to 10 kg/ha and to the seeds 0.5 to 10 g/kg of seed a compound selected from the group consisting of a compound of the formula:



$$H_2N-\overset{NH}{\overset{\|}{C}}-NH-(CH_2)_n-NH-\overset{NH}{\overset{\|}{C}}-NH_2$$

and an acid addition salt thereof, wherein *n* is the integer 8, 9, or 10.

3,890,447
PERMEABLE MEAT CASINGS

Robert H. Shatney, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 2, 1972, Ser. No. 259,292

Int. Cl. A22c *13/00*

U.S. Cl. 426—105 **17 Claims**

1. A multilayered thermoplastic resinous film useful as a casing for smoking meat or sausage products and the like comprising a body supporting layer having a plurality of holes therethrough to allow passage of smoke into said meat or sausage products and at least one other layer which is highly permeable to the penetration of smoke and resistant to the penetration of greases.

3,890,448
HEATABLE PACKAGE OF FOOD

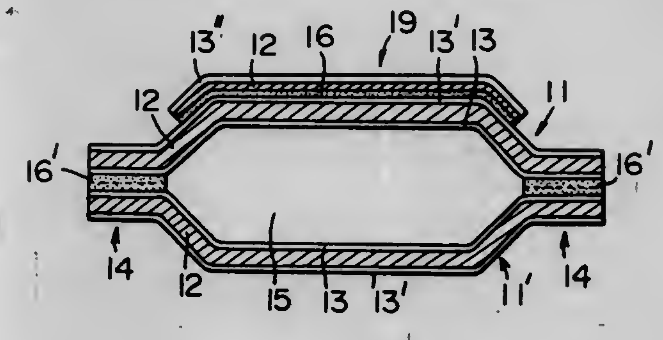
Senji Ito, Yokohama, Japan, assignor to Toyo Seikan Kaisha Limited, Tokyo, Japan

Filed Aug. 17, 1972, Ser. No. 281,407

Claims priority, application Japan, Oct. 5, 1971, 46-77539; Feb. 1, 1972, 47-10951; Feb. 1, 1972, 47-12752; Mar. 25, 1972, 47-30047

Int. Cl. B65b *25/22*

U.S. Cl. 426—126 **12 Claims**



1. A heatable package of food comprising a food product encased in a packaging container, said packaging container being composed of at least one sheet material comprising a metal sheet having a thickness of 5 to 500 microns and a protecting coating layer of heat resistant resin formed on at least the inner food contacting surface of said metal sheet, said protecting layer being composed of a polyimide imidazopyrroloneimide having a thickness of 1 to 10 microns.

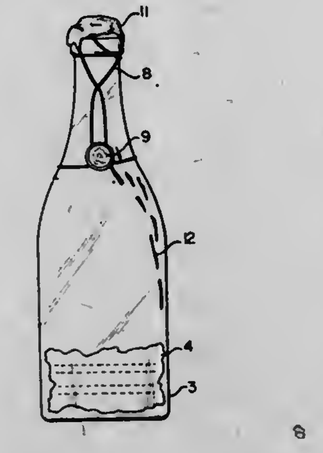
3,890,449
ARTIFICIALLY AGED BEVERAGE BOTTLE AND METHOD FOR PRODUCING THE SAME

Mario Suso Mezquita, Rafel Calvo, 30, Madrid, Spain

Filed May 15, 1973, Ser. No. 360,549

Int. Cl. B65d *11/6;* **B44c** *1/06*

U.S. Cl. 426—127 **6 Claims**



1. An artificially aged beverage container comprising:
- a beverage container containing therein a beverage and having the opening thereof closed by a closure means; and
- artificial aging means applied to the exterior of said container for imparting to said container an aged appearance, said artificial aging means including an aged appearing label applied to said exterior of said container; an adhesive layer covering said exterior of said container, including said label; a layer of powder irregularly and unevenly positioned over said adhesive layer; and a layer of fixer positioned over said adhesive layer and said powder layer to maintain the position of said powder layer with respect to said bottle exterior.

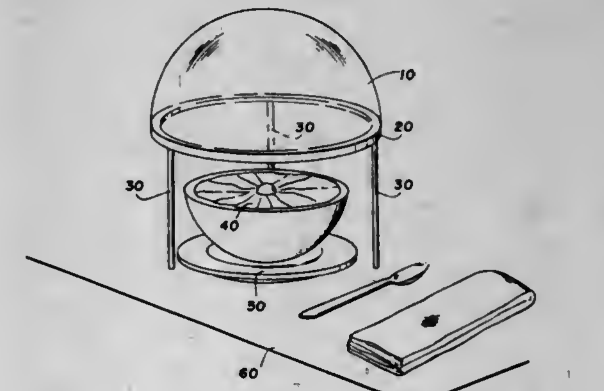
3,890,450
ANTI-SPLATTER DEVICE

Jack Orenstein, 245 E. Gunhill Rd., Bronx, N.Y. 10467

Filed June 24, 1974, Ser. No. 481,970

Int. Cl. A47g *19/00;* **A23l** *1/00*

U.S. Cl. 426—132 **1 Claim**



1. In combination with a horizontal surface
- a grapefruit disposed on the surface;
- a transparent, inverted, hemispherical hollow shell;
- a horizontal ring attached to the circular edge of the shell; and
- three like straight elongated vertical legs disposed around the ring at regular intervals and extending downwardly therefrom; the legs supporting the shell above the surface, directly above the grapefruit in a manner that the hands of a user can have access to the grapefruit without getting caught in the cover.

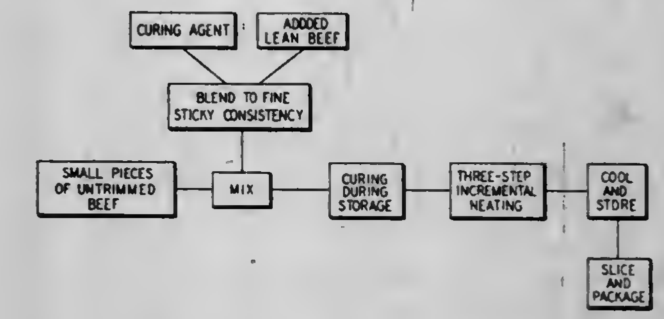
3,890,451
PROCESS OF MAKING A BACON-LIKE MEAT PRODUCT OF REDUCED FAT CONTENT

Julius L. Keszler, Boston Post Rd., Westbrook, Conn.

Filed Apr. 11, 1973, Ser. No. 350,142

Int. Cl. A23l *1/31*

U.S. Cl. 426—264 **7 Claims**


CURING AGENT
ADDED LEAN BEEF
BLEND TO FINE STICKY CONSISTENCY
SMALL PIECES OF UNTRIMMED BEEF
MIX
CURING DURING STORAGE
THREE-STEP INCREMENTAL HEATING
COOL AND STORE
SLICE AND PACKAGE

1. A process for producing a composite bacon-like meat product of reduced fat content comprising the steps of providing small untrimmed pieces of economical meat cuts, said meat pieces being in an unfrozen condition; forming a binder for the meat pieces by blending an aqueous brine curing solution with about an equal amount by weight of ground meat to form a binder composition having a sticky paste-like consistency; cooling the binder to a temperature at least 10°F. below the temperature of the untrimmed meat pieces and intimately mixing the relatively cooler binder with the relatively warmer small meat pieces to coat the surfaces of the meat pieces with the binder; encasing the binder-untrimmed meat mixture and maintaining the encased mixture under refrigeration for a curing period of at least about 14 to 16 hours; and subsequently incrementally heating the encased cured mixture without dehydration to a surface conditioning temperature of at least about 108°F. followed by heating to a temperature of about 117°–125°F and subsequently to an internal temperature of about 135°F.

3,890,452
METHOD OF REDUCING THE AFLATOXIN CONTACT OF OILSEED MEAL PRODUCTS

Jean Brandt, Geneva; Claude Giddey, Geneva, and Guy Bunter, Carouge, Geneva, all of Switzerland, assignors to Etablissements V.Q. Petersen & Cie, Senegal

Filed Feb. 12, 1974, Ser. No. 441,741

Claims priority, application Switzerland, Feb. 13, 1973, 2005/73

Int. Cl. A23k *1/00*

U.S. Cl. 426—321 **15 Claims**

1. A method of reducing the aflatoxin content of an aflatoxin contaminated oilseed product having a fats content less than 10 percent, which comprises the steps of:
   a. forming a homogeneous mixture comprising; the crushed product, from 10 to 40 percent by weight of water, at least one basic agent selected from the group consisting of the oxides and hydroxides of alkali metals and alkaline earth metals in an amount such that the homogeneous mixture has a pH of least 8, and at least one organic amine in an amount sufficient to further raise the pH to at least 9.5;
   b. reacting the homogeneous mixture by maintaining the product at a temperature between room temperature and 150°C for a time sufficient to reduce the aflatoxin content of the product to less than 100 ppb; and
   c. drying the resulting detoxified product to reduce its water content.

3,890,453
FORMING SHAPED POTATO PIECES FROM POTATO DOUGH

James F. Harmon; Richard D. Johnston; John H. Lach; William H. Von Der Lieth, all of Blackfoot, and Thomas L. Murphy, Idaho Falls, all of Idaho, assignors to American Potato Company, San Francisco, Calif.

Division of Ser. No. 170,164, Aug. 9, 1971, Pat. No. 3,771,937. This application Sept. 17, 1973, Ser. No. 398,042

Int. Cl. A23l *1/12*

U.S. Cl. 426—503 **11 Claims**

1. A process of reconstituting without agitation a mass of dehydrated potato product and water into a homogeneous potato dough suitable for shaping into French-fry potato pieces comprising the steps of:
   a. providing a variable volume chamber for constraining the contents of the chamber an outlet opening and an inlet opening and a reciprocable piston within the chamber for consolidating the contents thereof:
   b. sealing the outlet opening of the chamber with an externally mounted liquid impervious member;
   c. metering a predetermined quantity of dehydrated potato product and water into the chamber in front of the piston through the inlet opening;
   d. consolidating the contents by moving the piston within the chamber toward the outlet end of the chamber thereby reducing the volume of the chamber to a predetermined volume bounded by the impervious member, the chamber and the piston so that the water substantially fills the available voids in and between the individual dry product particles without agitation to form a homogeneous dough suitable for forming into French-fry-cut potato pieces.

3,890,454
METHOD OF CONDITIONING MEAL

Robert Jan Nijweide, Rosmalen, Netherlands, assignor to Verenigde Mengvoederfabrieken, Tramkade, 24, Netherlands

Filed Jan. 8, 1974, Ser. No. 431,707

Claims priority, application Netherlands, Jan. 17, 1973, 7300679

Int. Cl. A23b *9/00*

U.S. Cl. 426—508 **3 Claims**

1. In a method of making food products by extruding moist meal through the die holes of a pellet press, the steps of
   a. providing a first stream of meal;
   b. dividing said first stream of meal into a second stream and a third stream;
   c. adding steam and water to said second stream of meal in a proportion sufficient to elevate the temperature thereof and to raise the moisture content thereof sufficiently for causing gelatinization of at least a substantial part of the starch contained in said second stream;
   d. maintaining said second stream of meal at the elevated temperature for a time sufficient to cause at least partial gelatinization of said starch;
   e. maintaining said third stream substantially ungelatinized and with substantially less moisture content than said second stream; subsequently
   f. mixing said second stream with said third stream to produce a fourth stream of meal; and
   g. feeding said fourth stream to said die holes;

the third stream having a size and moisture content relative to the size and moisture content of the second stream to produce a moisture content and tackiness in the fourth stream favorable for extruding through the die holes to produce pellets wherein the meal is cemented together by the gelatinized starch, the moisture content of the third stream being less than that necessary to result in substantial gelatinization of the meal by heating.

3,890,455
METHOD OF ELECTROLESSLY PLATING ALLOYS

Donald F. Ballas, Underhill, Vt.; San-Mei Ku, Poughkeepsie, and John C. Marinace, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 23, 1972, Ser. No. 265,948

Int. Cl.^{2} H01L *7/00;* **B05D** *5/12*

U.S. Cl. 427—85 **3 Claims**

1. Method of electrolessly plating a doped gold alloy contact onto the surface of a semiconductor substrate including elements from the group III–V elements or mixed compounds of these elements, comprising the steps of:

mixing a gold chloride solution with a solution of zinc chloride in the ratio of 1.5 grams to 3.0 grams crystalline gold chloride to 400 milligrams to 200 milligrams zinc for a solution of 50 millileters; and

immersing the semiconductor substrate in said mixed solution for a fixed period of time until a desired thickness of doped gold alloy has been plated onto said substrate, thereby plating zinc doped gold onto said semiconductor substrate at an initial rate of 2,000 to 2,500 angstroms in approximately 2–3 minutes at room temperature.

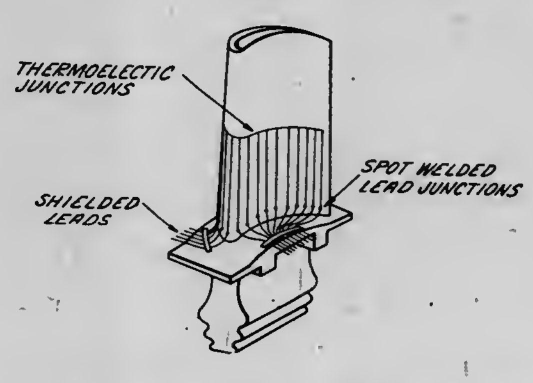
3,890,456
PROCESS OF COATING A GAS TURBINE ENGINE ALLOY SUBSTRATE

Ray R. Dils, Madison, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Aug. 6, 1973, Ser. No. 386,266

Int. Cl. B44d *1/14*

U.S. Cl. 428—216 **14 Claims**



1. In a method for coating nickel-base, cobalt-base or iron-base gas turbine engine alloy substrates having an initial rare earth and aluminum-containing nickel-, cobalt- or iron-base alloy coating approximately 0.5–5.0 mils thick thereon, said initial coating containing no more than 2%, by weight, rare earth metal and approximately 5–25%, by weight, aluminum, the improvement which comprises:

mechanically working the surface of said initial layer to induce irregularity and angular topography in the aluminum oxide to be produced;

oxidizing said initial layer to produce an irregular aluminum oxide layer approximately 0.05–0.1 mil thick to promote mechanical adherence of a noble metal layer and to prevent alloying between said initial layer and said noble metal layer;

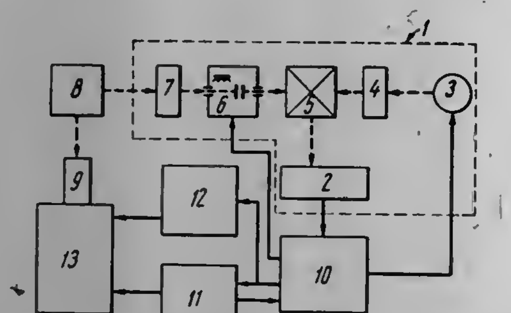
depositing a noble metal layer selected from the group consisting of platinum, rhodium, palladium and alloys thereof on said oxidized initial layer to a thickness of approximately 0.1–0.2 mil; and

oxidizing said coated substrate to cause additional growth of said oxidized initial layer to metallurgically insulate said noble metal layer from said substrate and said initial layer.

3,890,457
DEVICE FOR PROGRAM CONTROLLING METAL REMELTING PROCESSES

Pavel Ioelievich Fain, ulitsa Shamsheve, 15b, kv. 6; Vladimir Anatolievich Zimin, ulitsa Sojuza Svyazi, 13, kv. 5; Aron Zakharovich Strashun, prospekt Engelsa, 69, kv. 55; Tamara Ivanovna Isupova, ulitsa Vernosti, 34, kv. 67; Alexandr Ivanovich Pankratov, prospekt Engelsa, 17, kv. 58, and Georgy Ivanovich Romanov, naberezhnaya reki Fontanki, 127, kv. 3, all of Leningrad, U.S.S.R.

Filed Feb. 21, 1974, Ser. No. 444,667
Int. Cl. F27d *11/10*
U.S. Cl. 13—13 **3 Claims**

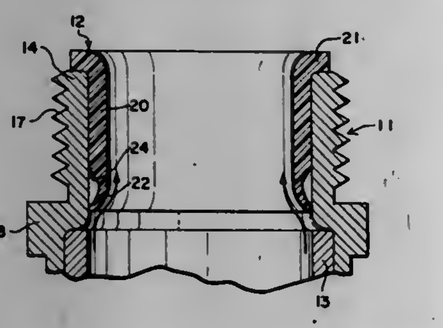


1. A device for program control of metal remelting processes in an electroslag remelting furnace having an electrode for remelting, and a mechanism for displacing said electrode, by controlling at least one parameter based upon, respectively, the remelting current, the voltage of the electroslag remelting furnace, the ohmic resistance of the molten slag in said electroslag remelting furnace, and the power released in the electroslag remelting furnace depending on the duration of the remelting process and the position of said electrode in the electroslag remelting furnace, said electorde being connected to said mechanism for displacing said electrode in the electroslag remelting furnace, comprising:
- a. two units for effecting programmed changes in the parameter being controlled;
- b. a converter for converting the displacement of said electrode into an electric signal; and
- c. a control unit for operating said units for the programmed changes in the parameter being controlled in dependence upon signals received from said converter.

3,890,458
TUBULAR COUPLING WITH INSULATIVE THROAT LINER

Thomas Mooney, Mt. Sinai, N.Y., assignor to I-T-E Imperial Corporation, East Farmingdale, N.Y.

Filed Mar. 14, 1974, Ser. No. 451,177
Int. Cl. H02g *3/04*; H01b *17/58*
U.S. Cl. 174—83 **10 Claims**

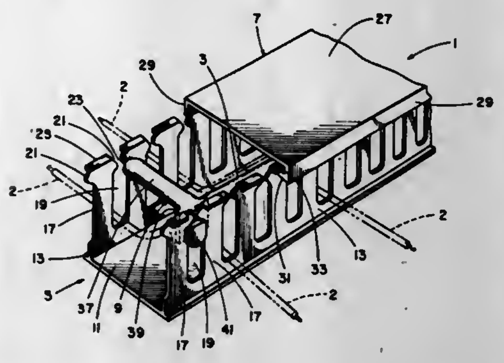


1. A coupling comprising an outer collar having an inside face and an outside face, and an inner sleeve formed of a compressible flexible polymeric resin telescoping said collar, said sleeve in its unstressed state having an outside diameter greater than and a length less than that of the inside face of said collar and having a peripheral recess in its outer face proximate its inner end and said sleeve being peripherally radially compressed in its collar telescoping position and the inner end thereof being outwardly deflected under the influence of the compressive stress in said sleeve into intimate engagement with the inside face of said collar.

3,890,459
WIREWAY SYSTEM AND RETAINING FINGER FOR USE THEREIN

Jack E. Caveney, Hinsdale, Ill., assignor to Panduit Corporation, Tinley Park, Ill.

Filed June 17, 1974, Ser. No. 479,944
Int. Cl. H02G *3/04*
U.S. Cl. 174—101 **13 Claims**



1. A wireway system for channelling, selectively routing and retaining the various wires of a wire bundle interconnecting components of an electrical system, said wireway system comprising:

a channel-shaped duct for receiving the wire bundle and having an elongate base and two substantially parallel duct walls extending generally perpendicularly from said base with each of the walls disposed adjacent respective longitudinal edges thereof, at least one of said duct walls comprising at least a pair of adjacent duct fingers which define a slot permitting selective routing of various wires of said bundle, said duct fingers having distal ends which are resiliently deflectable transversely to the longitudinal direction of said base, one finger having an ear adjacent its distal end extending toward the other finger to define a restricted throat to said slot; and

at least one retaining finger for retaining wires within the duct and for permitting the addition of wires to said bundle, said retaining finger having a base portion engaging said pair of adjacent duct fingers and further having a finger portion extending generally perpendicularly to said base portion, said base portion comprising first and second spaced walls joined by a support, said first and second spaced walls and said support defining opposed grooves for reception of said pair of adjacent duct fingers, the longitudinal extension of the first and second spaced walls relative to said duct being sufficient to overlap said adjacent duct fingers, said base portion including an abutment surface engaging said ear to hold the base portion adjacent the distal end of said one finger, said retaining finger being mounted on said duct with the first of the spaced walls disposed between the duct walls whereby the retaining finger is captively held by said duct fingers with the first and second spaced walls of said base portion preventing significant movement of said retaining finger transversely of said duct and with the finger portion extending at least partially across the base of said duct to retain wires in said duct while permitting the insertion of additional wires into the duct.

12. A retaining finger comprising:

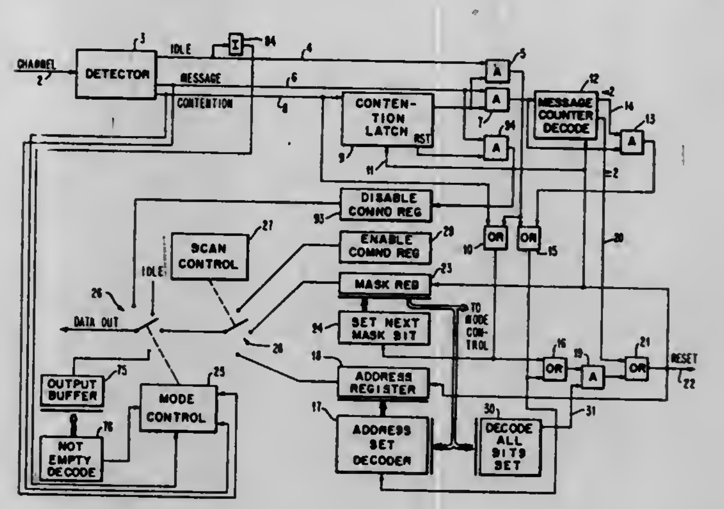
a base portion including first and second spaced walls joined by a support to define opposed grooves with one side of said support including a discontinuity constituting abutment means; and

a finger portion extending generally perpendicularly from said base portion whereby said finger is adapted to be mounted on a flexible wall having at least one open-ended slot with an ear extending into the slot and engagable by a surface of said discontinuity.

3,890,460
COMMUNICATIONS ENABLING METHOD AND APPARATUS

Lee C. Haas, and Lynn Parker West, both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,166
Int. Cl. H04q *5/00*; H04e *11/00*
U.S. Cl. 178—2 C **15 Claims**



9. Apparatus for controlling individual access for the transmission of messages on a communications channel from the plurality of remote stations interconnected by said channel, comprising:

means for inviting responses simultaneously from a first plurality of said remote stations by signals sent from said central station on said channel;

means for receiving at said central station any of said responses so initiated by said invitation reaching any of said first plurality of remote stations which have messages to transmit at the time they are so invited;

means for comparing said received responses, during the receipt thereof at said central station, with predetermined response format patterns to determine whether more than one said response is then being received in conflict with another said response; and

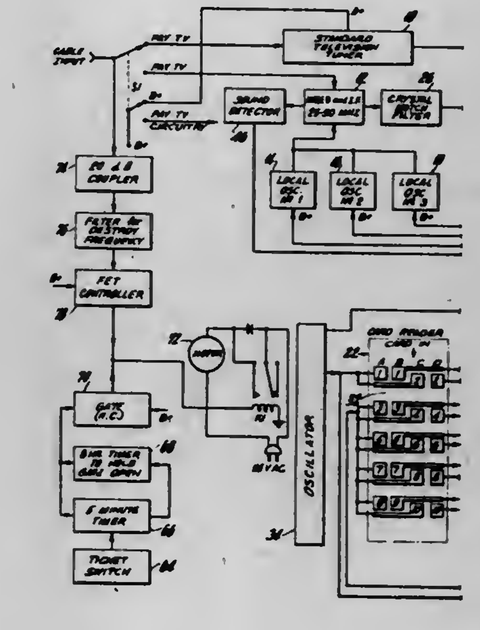
selection means, responsive to and connected to said means for comparing, for selecting progressively smaller pluralities of said remote stations and for controlling said inviting means to reinvite said selected pluralities to respond simultaneously, whenever said conflict between responses is determined to exist, until a response is received without conflict.

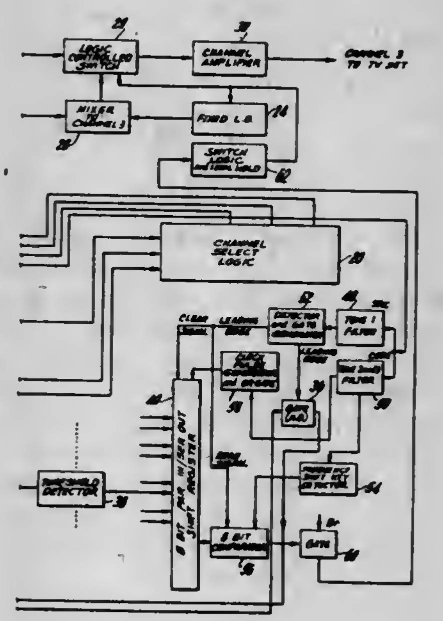
3,890,461
TICKET OPERATED SUBSCRIPTION TELEVISION RECEIVER

Joseph H. Vogelman, Roslyn; Stanley D. Spiegelman, Old Bethpage, and Jack Berens, Laurelton, all of N.Y., assignors to TheatreVision, Inc., Woodbury, L.I., N.Y.

Filed Mar. 27, 1973, Ser. No. 345,366
Int. Cl. H04n *1/44*
U.S. Cl. 178—5.1 **20 Claims**

1. A subscription television receiver for receiving a scrambled television signal including a series of tones at first and second frequencies, said receiver comprising means for receiving the scrambled television signal and said binary program identification signal, means for permitting, when enabled, the received scrambled television signal to be viewed in an unscrambled form, means for receiving a program-select card containing a first plurality of conductive areas selectively arranged on an insulating surface, the presence of one of said first plurality of conductive areas representing one binary level and the absence of one of said conductive areas representing a second binary level, whereby the arrangement of said first plurality of conductive areas on said cardd defines a binary card identification code, said card-receiving means comprising a member including a second plurality of conductive areas arranged in orthogonally intersecting rows and columns, each of said first plurality of conductive areas on said card being located when said card is received in said card-receiving means adjacent to but not in contact with adjacent ones of said second plurality of conductive areas, thereby to modify an electrical parameter of selected adjacent ones of said conductive areas, a signal source operatively connected to the conductive areas of one of said columns in said card-receiving means, switch means interposed between said signal source and said card-receiving means for applying, when actuated, the output of said signal source to the conductive areas on said one column, means for detecting the received binary program identification signal and including means for detecting said tones at said first frequency and said tones at said second frequency, means for actuating said





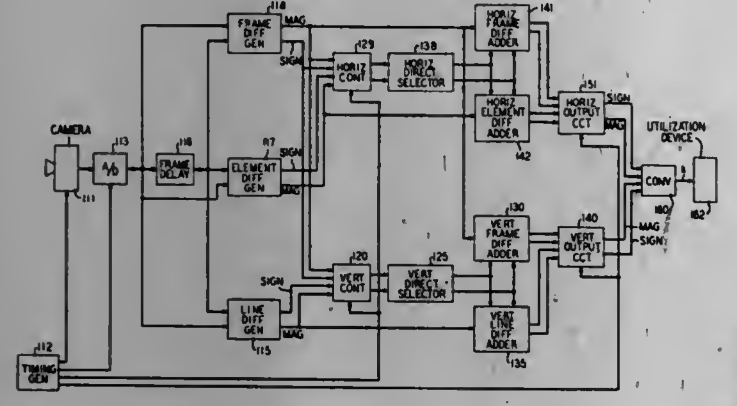
switch means upon the detection of said first frequency tone, and means for producing a binary program identification signal corresponding to the sequence of said tones at said second frequency, means for comparing said card identification code signal and said program identification signal, and means for producing an enabling signal for said permitting means when said card identification code signal corresponds to said program identification signal.

3,890,462
SPEED AND DIRECTION INDICATOR FOR VIDEO SYSTEMS
John Ormond Limb, New Shrewsbury, and John Arthur Murphy, Freehold Township, Monmouth County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 17, 1974, Ser. No. 461,586

Int. Cl. H04n *7/02*

U.S. Cl. 178—6.8 9 Claims



1. In combination,

a signal source for supplying successive frames of a video signal including a representation of a moving subject;

first comparing means connected to said signal source for supplying first and second differential signals derived by comparing picture element signals, said first differential signal indicative of the intensity difference between each picture element signal of the present video frame and a corresponding picture element signal of a previous video frame, said second differential signal indicative of the combination of the intensity differences between each picture element signal of the present video frame compared to a preceding picture element signal of the present video frame and the corresponding picture element signal in the previous video frame compared to a preceding picture element signal in the previous video frame;

storing means for accumulating first sums of said first and second differential signals when subject movement between the present and previous video frames is in a first direction and second sums of said first and second differential signals when subject movement between the present and previous video frames is in a second direction opposite to said first direction;

evaluating means including second comparing means and first magnitude means, said second comparing means compares the first and second sums of said first differential signal to provide a directional signal indicative of the direction of movement, said first magnitude means providing a first magnitude signal proportional to the magnitude of said directional signal and also providing a second magnitude signal which is representative of an algebraic combination of at least the first and second sums of said second differential signal, said first magnitude means further comprising dividing means for providing a signal representative of a division of said first magnitude signal by said second magnitude signal to determine the speed of movement.

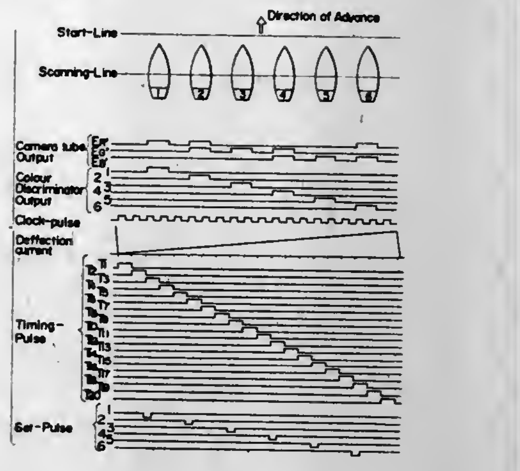
3,890,463
SYSTEM FOR USE IN THE SUPERVISION OF A MOTOR-BOAT RACE OR A SIMILAR TIMED EVENT
Yoshizo Ikegami, Amagasaki, and Kenzo Yamanouchi, Kobe, both of Japan, assignors to Konan Camera Research Institute, Japan

Filed Mar. 19, 1973, Ser. No. 342,376

Claims priority, application Japan, Mar. 21, 1972, 47-28371; July 29, 1972, 47-26309

Int. Cl. H04n *9/02*

U.S. Cl. 178—6.8 11 Claims



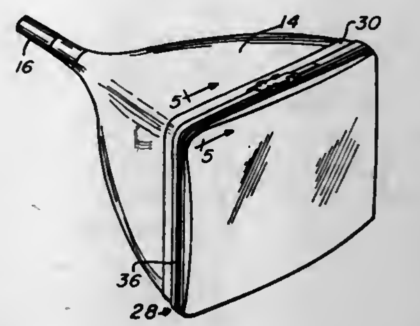
1. A race supervision system for races in which objects distinguished by different colours advance together essentially in alignment toward a reference line the system comprising a first colour television camera assembly means for movably scanning along the reference line and for producing video signal outputs in which the voltages vary in accordance with the proportions of primary colours present in the colours of objects scanned, a coded pulse generation means for producing coded pulse outputs which vary in accordance with variations in the output of said first colour television camera assembly means, a continuous timing pulse generation means for generating pulse trains in which each succeeding pulse is emitted as said first colour television camera assembly means scans each successive portion of the scanning line, and a recording means for recording coded signals when the timing pulses and the coded pulse outputs are supplied simultaneously thereto, said recording means having the contents thereof being arranged for reading out.

3,890,464
DRY, IMPULSE-RESISTANT IMPLOSION PROTECTION SYSTEM FOR LARGE SCREEN CATHODE RAY TUBES
Monty Hill, and Curtis Uthene, both of Chicago, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Dec. 10, 1973, Ser. No. 423,037

Int. Cl. H01j *61/50*

U.S. Cl. 178—7.8 5 Claims



1. A large screen cathode ray tube having an improved dry, impulse-resistant implosion protection system, comprising:

a glass bulb consisting of a front panel having a faceplate whose inner surface is coated with red-emissive, blue-emissive and green-emissive phosphor elements, and a funnel section terminating in a neck in which one or more electron guns are situated for generating electron beams to illuminate said phosphor elements, said front panel and funnel section being joined together to form an air-tight envelope;

a strip of relatively incompressible tape secured to and encircling the bulb and situated on the forward part of the bulb near the faceplate;

a first steel tension band placed directly over the tape and tensed to provide hoop compression on the bulb, the opposite ends of said tension band being secured together to prevent relative motion thereof;

a second steel tension band placed directly over the first band and also tensed to provide hoop compression on the bulb, the opposite ends of said second tension band being secured together to prevent relative motion thereof, said first and second tension bands being tensed to provide a relatively high cumulative compression on the front panel while having a rigidity and being so tightly secured at their respective ends that when a fracture of the front panel occurs, the resulting tensil strain in each band is small enough to inhibit the propagation of a fracture impulse so as to substantially confine bulb devacuation to the front panel, thus ensuring that a front panel fracture impulse will not propagate to the weaker funnel or neck portions of the bulb until the bulb has been substantially devacuated.

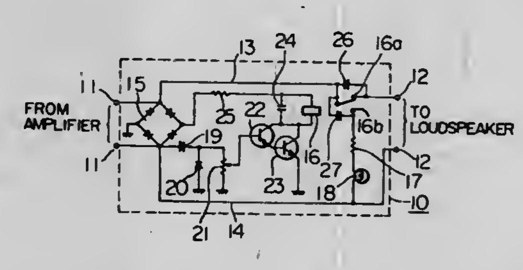
3,890,465
CIRCUIT ARRANGEMENT FOR PROTECTION OF A SPEAKER SYSTEM
Yasuo Kaizu, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed July 10, 1973, Ser. No. 377,969

Claims priority, application Japan, July 11, 1972, 47-69448; Mar. 9, 1973, 48-29364[U]

Int. Cl. H02h *3/28*

U.S. Cl. 179—1 VL 4 Claims



1. A loudspeaker protection circuit for cutting off an input signal applied to a loudspeaker when the input signal exceeds a predetermined level, comprising:

a. input means for receiving an input signal;

b. output means for applying the input signal to said loudspeaker;

c. circuit means including a relay having a normally closed contact electrically connecting said input means to said output means for applying the input signal to the output means;

d. first rectifying means receptive of the input signal for developing a first rectified signal representative of the amplitude of the input signal;

e. a control device having a conductive state and a non-conductive state and a control electrode for receiving a signal to control its conductive state;

f. second rectifying means receptive of the input signal for developing a second rectified signal representative of the amplitude of the input signal;

g. means applying said second rectified signal to said control electrode of said control element; and

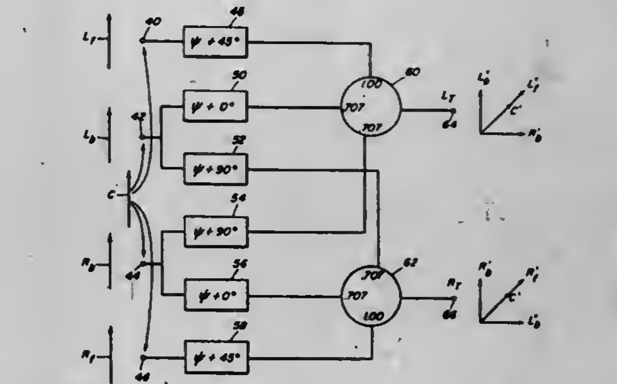
h. means electrically connecting said first rectifying means with said control device and said relay to energize said relay with said first rectified signal to open said normally closed contact and disconnect said output means from said input means when said first rectified signal exceeds a predetermined level determined by said second rectified signal.

3,890,466
ENCODERS FOR QUADRAPHONIC SOUND SYSTEM
Benjamin B. Bauer, Stamford, Conn., assignor to CBS Inc., New York, N.Y.

Continuation-in-part of Ser. No. 328,814, Feb. 1, 1973, abandoned, which is a continuation-in-part of Ser. No. 251,544, April 21, 1972, abandoned, Continuation of Ser. Nos. 44,224, June 8, 1970, abandoned, Ser. No. 124,135, March 15, 1971, Pat. No. 3,821,471, and Ser. No. 288,829, Sept. 13, 1972, abandoned. This application July 31, 1973, Ser. No. 384,334

Int. Cl. H04r *5/00*

U.S. Cl. 179—1 GQ 33 Claims



1. Apparatus for transforming a multi-channel program including at least first, second, third and fourth program signals into two composite signals, said apparatus comprising:

first, second, third and fourth input terminals to which said first, second, third and fourth signals to the extent they are present are respectively applied,

first and second output terminals,

means connected between said first and fourth input terminals and said first and second output terminals, respectively, operative to transfer substantially equal amplitude proportions of said first and fourth signals to said first and second output terminals, respectively, and

means connected between both said second and third input terminals and both said first and second output terminals operative to transfer substantially equal reduced amplitude proportions of said second and third signals to both said first and second output terminals and including phase-shifting networks operative to provide a substantially constant differential phase-shift angle between said second and third signals at one of said output terminals and said second and third signals, respectively, at the other of said output terminals over the frequency range of interest.

3,890,467
DIGITAL VOICE SWITCH FOR USE WITH DELTA MODULATION
Joseph A. Sciulli, Rockville, Md., assignor to Communications Satellite Corporation, Washington, D.C.

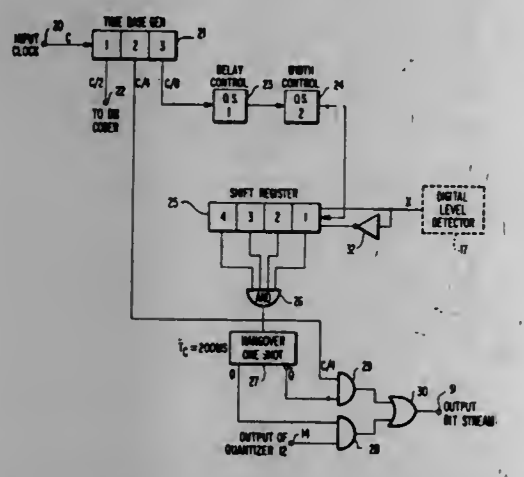
Filed Nov. 1, 1973, Ser. No. 411,878

Int. Cl. H04b *15/00*

U.S. Cl. 179—1 VC 6 Claims

1. A digital voice switch for use in a speech communication system including a continuously variable delta modulator having comparator means for comparing an input speech signal to be encoded and a synthesized feedback signal and

producing a difference signal, quantizing means for receiving said difference signal and a clock signal and generating an output bit stream consisting of binary 1's and 0's for transmission by said communication system, a binary 1 being produced when said difference signal is positive and a binary 0 being produced when said difference signal is negative, feedback integrator means connected to receive said output bit stream for producing said synthesized feedback signal having a stepped waveform, and an adaptive feedback control means including a digital level detector connected to receive said output bit stream and producing an output on the detection of a first predetermined number of consecutive 1's in said output



bit stream, low pass filter means connected to receive the output of said digital level detector to produce a control voltage, and a pulse amplitude modulator controlled by said control voltage for modulating the input to said feedback integrator means, said digital voice switch being connected to said digital level detector and comprising:

- means for detecting a second predetermined number of consecutive binary 1's in said output bit stream by sampling the output of said digital level detector; and
- means responsive to said detecting means for gating said output bit stream for transmission by said communications system whenever said second predetermined number of consecutive 1's is detected.

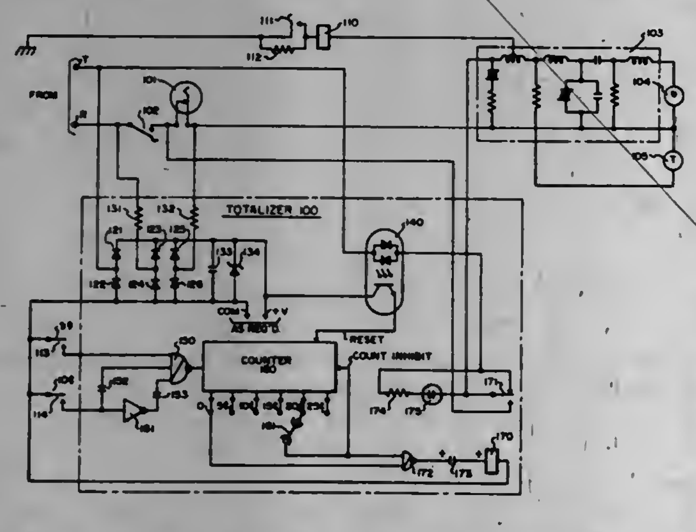
3,890,468
CIRCUIT ARRANGEMENT FOR GROUND START COIN OPERATED TELEPHONES

Robert V. Burns, Tinley Park, and Richard J. Hamilton, West Chicago, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 3, 1973, Ser. No. 421,301

Int. Cl. H04m *17/02*

U.S. Cl. 179—6.5 8 Claims



1. A coin operated telephone instrument adapted for connection to a telephone central office by means of a telephone line, said central office of the type requiring a ground start signal from said instrument prior to origination of a call by said instrument, said instrument comprising: a transmitter, a receiver, a calling device, a coin detecting mechanism normally inhibiting origination of a call by said instrument, said coin detecting mechanism operated in response to deposit of a first coin of any value to transmit a ground start signal to said central office over said telephone line; and a totalizer comprising counting means advanced once in response to deposit of each coin of a first value and advanced twice in response to deposit of each coin of a second value, said counting means initially operated to generate a first output in response to a first advance and further operated to generate a second output in response to a predetermined number of additional advances; switching means connected to said counting means initially operated in response to said counting means first output to further inhibit origination of a call by said instrument, and further operated in response to said counting means second output to permit origination of a call by said instrument.

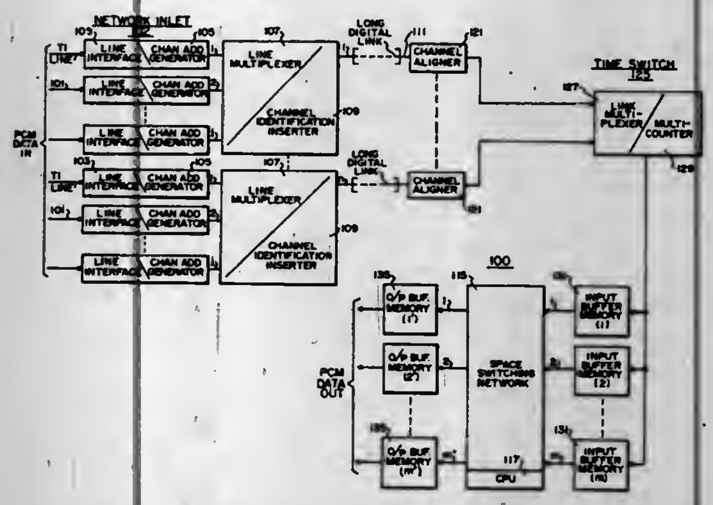
3,890,469
TIME DIVISION SWITCHING SYSTEM

Michael J. Kelly, Melrose Park, and Satyan G. Pitroda, Villa Park, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 4, 1973, Ser. No. 421,701

Int. Cl. H04j *3/00*

U.S. Cl. 179—15 AT 10 Claims



1. A time division switching system comprising: a plurality of input time division multiplex lines carrying 24 channel multiplexed PCM data, a space switching network having a different plurality of input and output ports associated therewith and output multiplex lines connected to said output ports, network inlet means receiving said input multiplex lines and providing synchronization and frame detection for said multiplexed PCM data, said network inlet means including channel address data generator means for inserting channel address data to accompany said multiplexed PCM data, means for multiplexing and distributing on a plurality of supermultiplexed lines said PCM data and said channel address data to provide therefrom a supermultiplexed time frame format and including channel indentification inserter means for inserting channel indentification coding in said supermultiplexed format channel aligner means cumulatively receiving said supermultiplexed format for separately outputting said PCM data and said channel address data, said channel aligner means referencing the selection of said PCM and said channel address data from said supermultiplexed format according to said channel identification coding, means for distributing said PCM data according to the coding of said channel address data, said distributing thereof providing another multiplexed time frame format having a lower channel occupancy level per line than said supermultiplexed format and distributed on a plurality of multiplex lines greater than said number of supermultiplexed lines, means for storing said PCM data as distributed, and means for controlling the transferring of stored

PCM data to said switching network inlet ports according to said other multiplexed time frame format and controlling said switching network for switching said PCM data from said inlet to said outlet ports thereof.

3,890,470
MEASUREMENT OF NOISE IN A COMMUNICATION CHANNEL

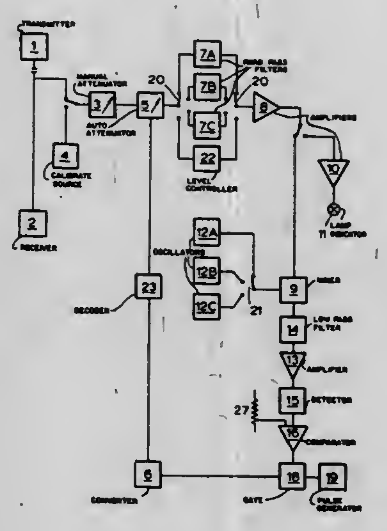
Edgar Robert Allen, Stanmore, England, assignor to The Post Office, London, England

Filed Dec. 11, 1973, Ser. No. 423,809

Claims priority, application United Kingdom, Dec. 14, 1972, 57639/72

Int. Cl. H04j *1/16*

U.S. Cl. 179—15 BF 8 Claims



1. A NPR measuring apparatus for measuring the NPR of a selected channel in a frequency multiplex transmission system said apparatus comprising:

- tapping means for extracting a broad band signal from said frequency multiplex transmission system;
- incrementally variable attenuator means connected to an output of said tapping means;
- filter means for isolating a frequency band within said channel;
- first switch means for connecting an output of said attenuator means and a selected input of said filter means;
- oscillator means for generating a signal having a frequency equal to the center frequency of said frequency band;
- mixer means having a first input connected to an output of said oscillator means, a second input and an output;
- second switch means connected between an output of said filter means and said second input of said mixer means;
  - broad band level preset means connected between said first switch means and said second switch means;
- detector means connected to an output of said mixer means;
  - comparator means having a first input connected to an output of said detector means, a second input and an output;
- reference voltage means connected to said second input of said comparator means; and
- digital drive means connected to the output of said comparator means, an output of said digital drive means connected to a control terminal of said incrementally variable attenuator.

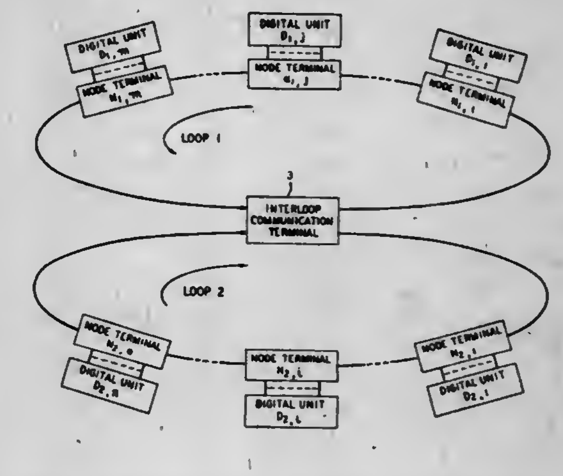
3,890,471
LOOP DATA TRANSMISSION ARRANGEMENT EMPLOYING AN INTERLOOP COMMUNICATION TERMINAL

Victor Hachenburg, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 17, 1973, Ser. No. 424,934

Int. Cl. H04j *3/08*

U.S. Cl. 179—15 AL 11 Claims



1. In a data transmission arrangement comprising a plurality of data transmission loops, an interloop communication terminal comprising:

- first means for monitoring messages received on a first of said loops to determine the busy/idle status of said first loop;
- second means for detecting a message destined for said first loop and received on a second of said loops; and
- means coupled to said first means and to said second means for transmitting on said first loop, if said first loop is idle, a message destined for said first loop and received on said second loop or for storing said message if said first loop is busy.

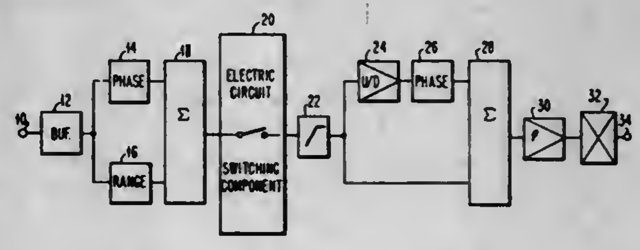
3,890,472
TRANSPARENT TIME-DIVISION PULSE-MULTIPLEX DIGITAL ELECTRIC SIGNAL SWITCHING CIRCUIT ARRANGEMENT

Dale Edward Fisk, San Jose, and Merle Edward Homan, Los Gatos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 3, 1974, Ser. No. 475,683

Int. Cl.² H04J *3/06*

U.S. Cl. 179—15 AW 10 Claims



1. A time-division pulse-multiplex digital electric signal switching circuit arrangement of the type having an electric signal switching component through which an electric signal is translated by interconnecting switching input and output terminals for a predetermined portion only of a time cycle, comprising

- input terminals at which a pulse coding modulated electric signal wave is applied,
- output terminals at which a regenerated pulse coding modulated electric signal wave is delivered in substantially the same form as that of said electric signal wave applied at said input terminals,

a circuit coupled between said signal input terminals and said switching input terminals having circuitry for driving a component electric wave of polarity and amplitude proportional to the amplitude of said signal wave, circuitry for deriving a component electric wave of amplitude value representative of the time relationship of the transistions in said electric signal wave to said time cycle of said switching component and circuitry for summing the amplitudes of said component electric waves, and

a circuit coupled between said switching output terminals and said signal output terminals having circuitry responsive to said summed component waves for regenerating said electric signal wave.

3,890,473
OPERATOR DISPLAY ARRANGEMENTS

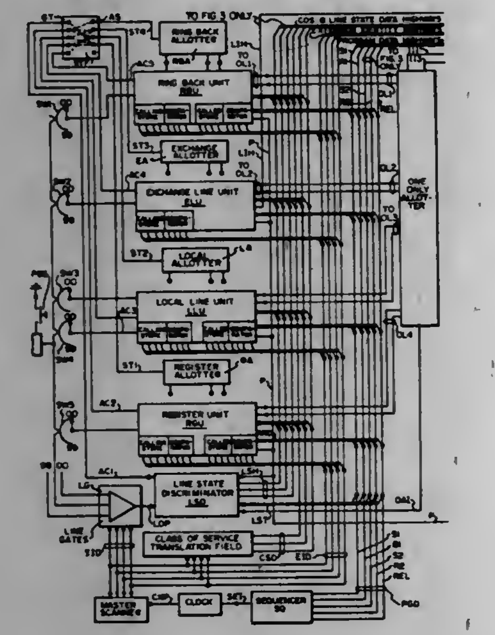
Bloomfield James Warman, Como, Italy, and Stephen Sidney Walker, Walderslade, England, assignors to GTE International Incorporated, Stamford, Conn.

Filed Jan. 14, 1974, Ser. No. 433,329

Claims priority, application United Kingdom, Apr. 19, 1973, 19183/73

Int. Cl. H04m *3/64*

U.S. Cl. 179—27 DB **6 Claims**



1. An arrangement for the display of information appertaining to the lines served by a telephone exchange, each said line having a corresponding address, which comprises an electronic display means composed of an array of light emitting elements or areas the spatial disposition of which within the array is indicative of a corresponding telephone line address, said display means being capable of displaying information by the stimulation of said particular elements or areas thereof to a light emitting condition, one or more data signalling highways linking said display means to the switching apparatus of said telephone exchange, interface means for priming sequentially, in synchronism with signals from an address generating means for the successive and cyclic generation of telephone line address signals, said individual elements or areas of said display means allocated to predetermined telephone lines served by said exchange, and means within said exchange switching apparatus for generating line information signals in time division multiplex under control of said address generating means, each information signal appertaining to a particular line address, said information signals, together with synchronizing signals from said address generating means being applied to said display means via said one or more data signalling highways, each said information signal being so synchronized to said address generating means that in accordance with the particular element or area of said display means that is stimulated to said light emitting condition the identity of the corresponding telephone line can be determined.

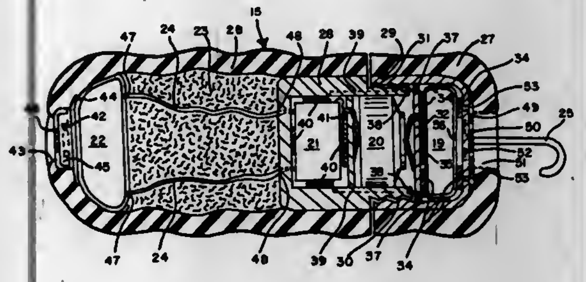
3,890,474
SOUND AMPLITUDE LIMITERS

Raymond C. Glicksberg, 704 Santa Monica Blvd., Santa Monica, Calif. 90401

Continuation-in-part of Ser. No. 253,935, May 17, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 427,911

Int. Cl. H04p *25/02*

U.S. Cl. 179—107 E **10 Claims**



1. A sound-amplitude limiter which is self-contained in the ear canal of the user, and which is used by persons with normal hearing as an indentical pair, comprising:

a. a casing which is adapted to be fitted into the ear canal;
b. a microphone within the outer tip of said casing adjacent the external ear;
c. a speaker within the inner tip of said casing adjacent the ear drum;
d. an amplifier-type circuit of nominal gain of one with output-limiter and a battery located within said casing between said microphone and said speaker;
e. a plug of sound-deadening material located within said casing between said microphone and said speaker, said plug of sound-deadening material having two electrical connecting wires passing through it;
f. the above mentioned electronic components hooked-up in operable relationship as a miniature public address system so that sound inputs above the limit of comfort for the human ear are reduced to that limit at the ear drum, while sound inputs below said limit are electronically reproduced at the ear drum.

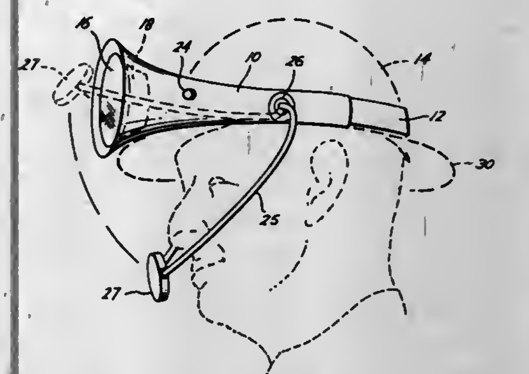
3,890,475
SELF-CONTAINED VOICE AMPLIFICATION HEADGEAR

Robert R. Denhart, Route 2, Box 741, Rosenberg, Tex. 77471

Filed Jan. 30, 1974, Ser. No. 437,990

Int. Cl. H04m *1/05*

U.S. Cl. 179—156 A **6 Claims**



1. A self-contained voice amplification headgear comprising,

a housing arranged to be carried externally by the head, hat or helmet of the user,
a speaker carried by the housing,
an amplifier electrically connected to the speaker carried by the housing,

an electrical power source carried by the housing,
a microphone arm pivotally connected to the housing,
a microphone electrically connected to the amplifier and carried by the microphone arm,
the microphone arm operable to swing the microphone to a downward position in front of the mouth of the user and upwardly and away from the mouth and face of the user into an out-of-the-way position, and
an on-off switch operable to connect the electrical power source to the amplifier when the microphone arm is in the downward position and operable to disconnect the electrical power source from the amplifier when the microphone arm is in the out-of-the-way position.

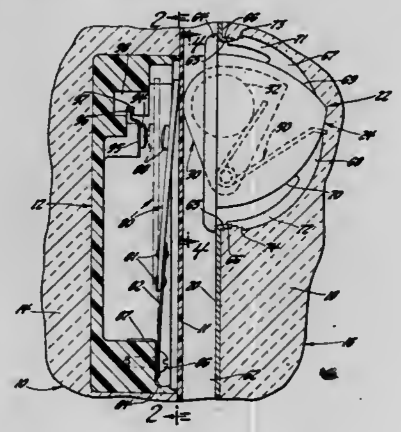
3,890,476
APPLIANCE CABINET WITH ACTUATED DOOR SWITCH

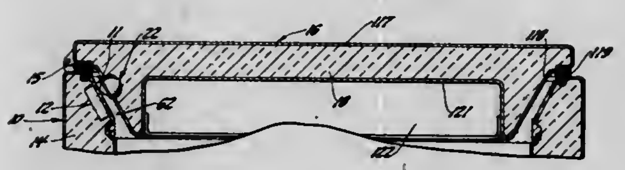
James A. Canter, Englewood, and Robert Smith, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 8, 1974, Ser. No. 495,872

Int. Cl. H01h *3/16, 36/00*

U.S. Cl. 200—61.62 **3 Claims**





1. A magnetic switch assembly for a cabinet member having walls defining a chamber therein provided with an access opening, a door member for said chamber access opening movably mounted on said cabinet member from a closed position in the access opening comprising, an open ended socket molded of non-magnetic material engaged in an aperture of the door member, a non-magnetic housing pivotally supported in said socket having a first permanent-magnet enclosed therein, means resiliently biasing said housing outwardly from said socket open end, a switch case mounted on the underside of an upright non-magnetic jamb portion of said chamber access opening, a fixed contact in said case at one end thereof, said case located in adjacent spaced relation with said socket open end when said door is closed whereby said magnet housing is urged into contact with said jamb portion by said biasing means, said switch including an electrically conducting leaf spring mounted at the opposite end of said case having an elongated contact carrying armature plate connected to and extending from said leaf spring free end past said fixed contact for cantilever movement in said case, a contact on said movable armature plate, said armature plate biased by said leaf spring in a plane substantially parallel to said jamb portion whereby its movable contact is closed to said fixed contact, a relatively weak second permanent magnet located in said case at the opposite end thereof so as to be positioned adjacent said armature plate to close said contacts in a snap-action manner upon said door being opened, and whereby upon said door being closed said first permanent magnet provides an attraction force on said armature plate of a magnitude sufficient to overcome the attraction of said second magnet and said leaf spring to hold open said contacts while said door is closed.

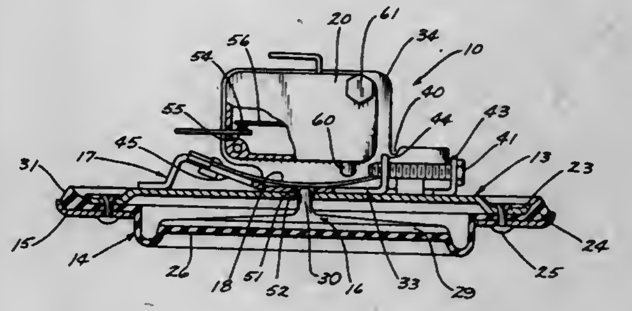
3,890,477
CONTROL DEVICE

James F. Saunders, Clarksville, Tenn., assignor to The Maytag Company, Newton, Iowa

Filed May 18, 1973, Ser. No. 361,561

Int. Cl. H01h *5/20, 35/34*

U.S. Cl. 200—83 P **3 Claims**



1. A double snap-action pressure-responsive switch comprising: a supporting base defining an opening; bracket means fixed to said base defining first and second spaced-apart supports; an elongated snap-action actuator fixed at one end to a first of said supports for preventing movement of said one end of the actuator and pivotally supported at the other end to the second support at a distance from said first support of less than the actual length of said actuator to subject said actuator to longitudinal compression and deformation for forming said actuator in a first position comprising a stable arcuate condition; input signal means including a movable plunger extending through the opening in said supporting base and a resilient diaphragm fixed along its periphery to said supporting base and operable on said plunger, said plunger being engageable with said actuator in said first position and operable responsive to a predetermined pressure on said diaphragm for moving said actuator from said first arcuate position to an unstable intermediate second position from which said actuator is movable by snap action to a third position comprising an unstable S-shape condition; and output signal means engageable by said actuator and including snap-action switch means responsive to snap action movement of said actuator into said S-shape condition for operating from a first electrical posture to a second electrical posture, said actuator being movable from said unstable S-shape condition to said stable arcuate condition responsive to a predetermined lower pressure acting on said diaphragm.

3,890,478
LIQUID LEVEL SENSOR

John W. Riddel, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

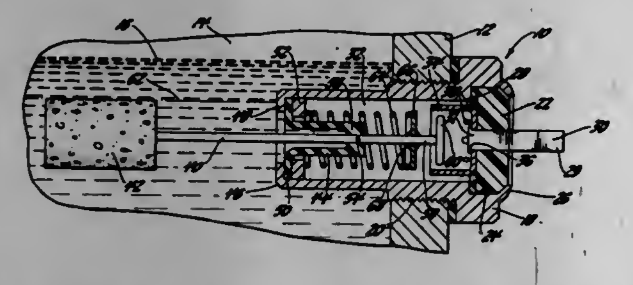
Filed Nov. 7, 1973, Ser. No. 413,448

Int. Cl. H01h *35/18*

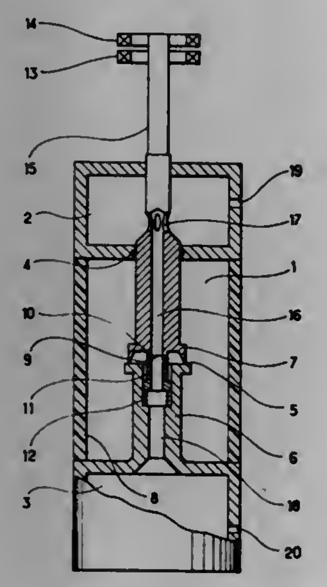
U.S. Cl. 200—84 R **2 Claims**

1. A liquid level sensor for a fluid containing tank comprising: a base member adapted to be supported by a tank wall; an insulating member supported by said base; a terminal member extending through said insulating member and having a first end portion extending outside the tank wall and adapted to be connected to an external low level indicator and a second end portion on an opposite side of said insulating member; an arm extending from said base member into said tank interior; float means in said tank interior attached to one end of said arm to produce movements of said arm in response to

changes in the liquid level in the tank; a coil spring with a first end attached to said base member and a second end within the tank and operably supporting said arm to provide a resilient connection between said base member and said arm whereby movement of said float means due to a predetermined drop in the liquid level causes said arm to laterally deflect the second end of said spring in one direction and thereby cause movement of the other end of said arm in a second opposite direction; cup-shaped contact means supported between the second end portion of said terminal member and the other end of said arm for making an electrical connection therebetween by contact with the inner cylindrical surface of the contact.

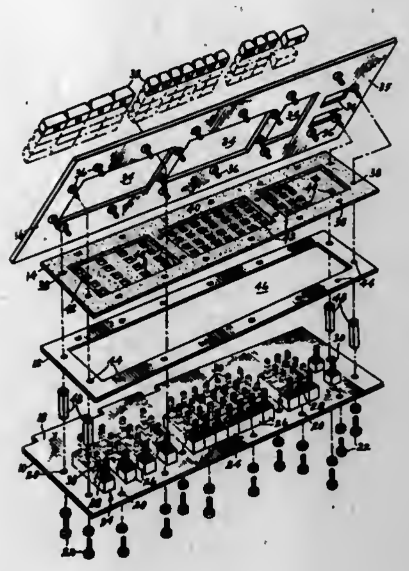


3,890,479
FAST CUT-OUT PNEUMATIC SWITCH
Edmond Thuries, Pusignan, and Francois Joly, Lyon, both of France, assignors to Delle-Alsthom, Villeubanne, France
Filed Dec. 20, 1972, Ser. No. 316,783
Claims priority, application France, Dec. 21, 1971, 71.46011
Int. Cl. H01h ***33/42***
U.S. Cl. 200—148 BV **2 Claims**



1. In a pneumatic switch comprising a cut-out chamber containing a compressed gas and, in that chamber, a set of contacts whose moving contact is installed on a moving rod crossing through a wall of said chamber, the improvement wherein: said moving rod is hollow at least throughout the whole of its length entering said chamber, the inside of said rod communicating, through an opening placed in the portion of the rod outside said chamber, with a low-pressure medium, the body of a valve being installed round the moving contact which, when the switch is in the closed position, is closed and separates the inside of the said rod from the compressed gas contained in the said chamber, electrodynamic means being placed on the outstide of said chamber in juxtaposition to said rod and acting directly thereon to cause, when they receive, a current emission, the initiation of movement of said moving rod, and subsequently, the opening of said valve, this causing the accelerated continuance of the opening movement of said moving rod under the action of the compressed gas contained in said chamber, said chamber including a hollow body, defining said seat, said fixed contact being fitted within an opening within said seat with said seat opening leading outside said chamber, to a low-pressure medium, said cut-out chamber consisting of a first cylinder, said hollow body consisting of a second cylinder having the same axis and being of smaller diameter, said second chamber leading at said first end into said chamber, and a cylindrical tank which communicates with the outside atmosphere through an orifice having a small cross section and into which the second end of said second cylinder leads and being arranged at the end of said first cylinder, on the output side of said hollow body.

3,890,480
HERMETIC SEALING STRUCTURE FOR ELECTRONIC KEYBOARD APPARATUS
David Thomas Berling, and John William Chaney, both of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed May 23, 1974, Ser. No. 472,635
Int. Cl. H01h ***13/06;*** **G06c** ***7/02;*** **B41j** ***5/08***
U.S. Cl. 200—302 **4 Claims**



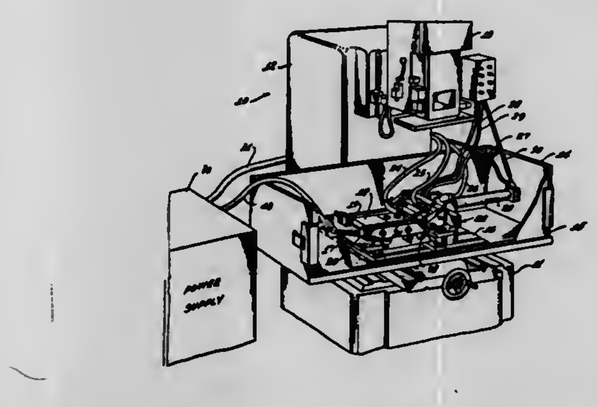
1. An improved electronic keyboard comprised in part of an electronic circuit board with keyboard switches connected thereto having keyboard switch bodies, keyboard switch shafts, keyboard switch shoulders and keyboard keytops; and a front cover plate attached to the board by means of spacer supports, and having openings for extension therethrough of the keyboard switch keytops; wherein the improvement comprises:

a. a shield, having a size and shape capable of encompassing all of the openings in the front cover plate, and being secured to an internal surface of the front cover plate enclosing all of the openings in the front cover plate, said shield having apertures corresponding in size, shape, and position to the keyboard switch shoulders for receiving the shoulders;

b. an adhesive coating on a surface of said shield facing away from said front cover plate for bonding said shield to the keyboard switch bodies about the keyboard switch shoulders to prevent the introduction onto the electronic circuit board of such contaminants as may pass through the front cover plate openings, while permitting the keyboard switches to operate independently from the shield; and

c. a retainer, having for its shape and perimeter the shape and perimeter of said shield, and cooperating with the spacer supports for clamping said shield between said retainer and the front cover plate, thereby securing said shield to the internal surface of the front cover plate about the periphery of said shield and enclosing all of the openings in the front cover plate.

3,890,481
ELECTROEROSIVE PROCESS FOR MANUFACTURING ROTARY DIES
Homer G. Buck, Los Angeles, Calif.
Continuation of Ser. No. 16,620, Oct. 10, 1969, which is a division of Ser. No. 712,247, March 11, 1968, Pat. No. 3,542,993. This application Feb. 22, 1972, Ser. No. 228,205
Int. Cl. B23p ***1/08, 1/04***
U.S. Cl. 219—69 M **10 Claims**



1. A method of manufacturing a rotary die from a roll that includes:

forming an electrical discharge electrode with a matrix surface that is a flat development of at least part of the shape characteristics desired to be imparted to a part, at least, of the endless surface of the roll,

mounting the electrode between a spaced pair of co-planar way surfaces in rigidly fixed spaced parallel relationship of the matrix surface to the way surfaces, and

engaging opposite ends of the roll and the way surfaces during relative movement therebetween to effect rotation of the roll to sequentially effect guided uniformly spaced registration of longitudinal traces of the surface of the roll with the matrix surface of the electrode.

3,890,482
APPARATUS FOR WELDING TOGETHER SUBSTANTIALLY VERTICALLY EXTENDING PIPE SECTIONS
Anthony J. DiBenedetto, Metairie, La., assignor to Gurtler Hebert & Co., Inc., New Orleans, La.
Continuation-in-part of Ser. No. 22,161, March 24, 1970, Pat. No. 3,727,025. This application Apr. 2, 1973, Ser. No. 346,892
Int. Cl. B23k ***9/18***
U.S. Cl. 219—73 **15 Claims**

1. Apparatus for welding together in end-to-end relationship substantially vertically extending upper and lower pipe sections comprising:

a support ring encircling said lower pipe section and attachable thereto,

annular track means carried by said support ring,

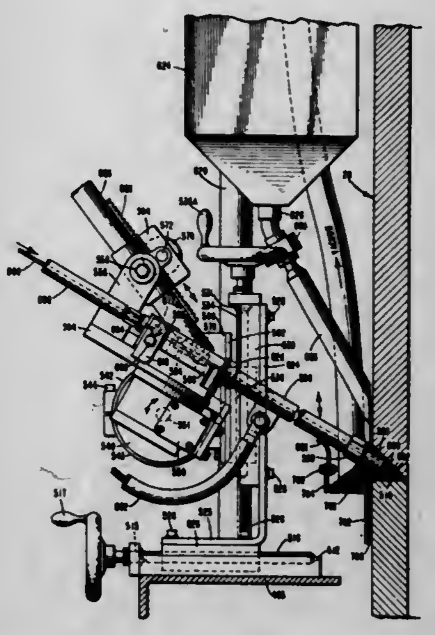
a wheeled carriage movable on said track means around said pipe sections,

carriage drive means mounted on said carriage for moving said carriage around said track means,

welding electrode radial positioning means mounted on said carriage for positioning said welding electrode generally radially with respect to said pipe sections, said radial positioning means comprising a radial slide movable generally radially of said pipe sections in a plane generally perpendicular to the axis of said pipe sections and means for moving said radial slide.

welding electrode vertical positioning means for positioning said welding electrode vertically with respect to said pipe sections, said welding electrode vertical positioning means being mounted on said radial slide and comprising a vertical slide movable generally parallel to the axis of said pipe sections and means for moving said vertical slide,

welding electrode vertical attitude positioning means for establishing the angular position of said welding electrode with respect to a plane perpendicular to the axis of said pipe sections, said welding electrode vertical attitude positioning means being mounted on said vertical slide and comprising a wire feed motor having a drive shaft,

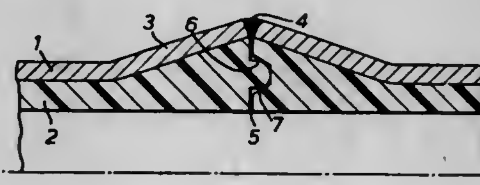


wire feed motor bracket means rotatably holding said wire feed motor to permit rotative movement of said wire feed motor with respect to said wire feed motor bracket means about the axis of said drive shaft, and means for rotatively positioning said wire feed motor with respect to said wire feed motor bracket means,

wire feed means attached to said wire feed motor and driven by said wire feed drive shaft, and

welding electrode means attached to said wire feed motor and extending toward said pipe sections.

3,890,483
JOINTS FOR PROTECTIVELY LINED OR COATED METAL PIPE SECTIONS
John David Webster, Cornwall, England, assignor to English Clays Lovering Pochin & Company Limited, England
Filed Apr. 1, 1974, Ser. No. 457,144
Claims priority, application United Kingdom, Apr. 6, 1973, 16747/73
Int. Cl. B23k ***9/00, 11/00***
U.S. Cl. 219—92 **8 Claims**



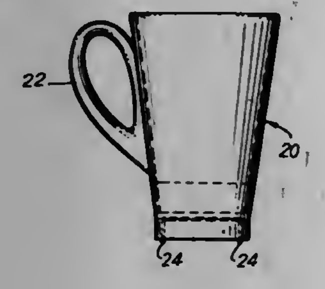
1. In a method of joining a first metallic pipe section having a coating of a heat-degradable material on the inside thereof and a second metallic pipe section along abutting metal edges by forming a welded joint between the abutting metal edges of the metallic pipe sections, the improvement which comprises before forming said welded joint inserting between the first metallic pipe section and the coating on the inside thereof along the edge which is to be welded to the second metallic pipe section a quantity of material which substantially pre-

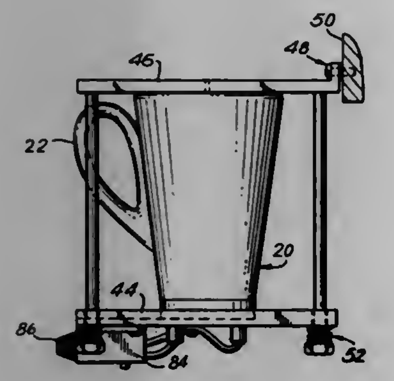
vents heat being transferred from the welded joint, during the formation thereof, to the coating in an amount sufficient to cause degration of the coating.

3,890,484
BEVERAGE-HEATING DEVICE

Jerome H. Kamins, 1036 Mayfair Rd., Baldwin, N.Y. 11510; Michael I. Mandell, 15 Westland Dr.; Harry Armen, Jr., 27 Jefferson St., both of Glen Cove, N.Y. 11542, and Paul Savet, 505 Alica Dr., Westbury, N.Y.

Filed June 4, 1973, Ser. No. 366,483
Int. Cl. F27d *11/02*
U.S. Cl. 219—432 **9 Claims**





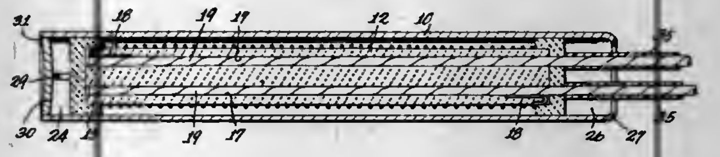
1. For use in the preparation of a heated liquid, a container made of an electrically non-conductive material, an electrically conductive heating wire embedded in a wall portion of the container between inner and outer surfaces of said wall portion, said heating wire having a pair of opposed ends exposed at the exterior of the container to form a pair of contacts to be connected to a source of current for energizing the heating wire to heat a liquid situated in the container, said contacts being situated at the bottom of the container, an electrically non-conductive base means supporting said container during the heating thereof, said base means carrying a pair of electrodes which engage said contacts, electrically conductive means connected to said electrodes for connecting the latter to a source of electricity, plate means situated over said base means and engaging the top of the container so that said base means and plate means form a pair of means between which said container is located during heating of the container, and spring means operatively connected with one of said pair of means for urging the latter toward each other when said container is situated between said pair of means, so that the container is clamped between said pair of means during heating of the container.

3,890,485
ELECTRIC HEATERS

Lloyd S. Kozbelt, Pittsburgh, Pa., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 29, 1974, Ser. No. 456,014
Int. Cl. H05b *3/80, 1/02*
U.S. Cl. 219—523 **5 Claims**

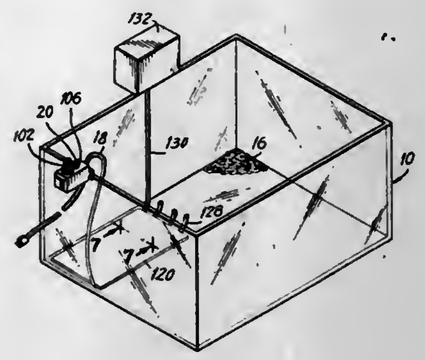
1. An electric heater, comprising:
a tubular metal sheath,
electrical-insulating, heat-conducting material transversely filling said sheath and extending for substantially the length thereof,
a heating resistance wire extending longitudinally of said sheath and through said material,
a pair of thermocouple wires of dissimilar metals extending longitudinally of said sheath and through said material in laterally spaced relation with respect to said resistance wire,
said material electrically insulating said resistance wire and said thermocouple wires from each other and said sheath,
terminal means extending from said resistance wire and outwardly of one end of said sheath for connection to a source of electricity for energizing said resistance wire to produce heat,



said thermocouple wires having terminal portions extending outwardly of said sheath one end for connection to a temperature responsive device,
said thermocouple wires being connected to each other at the opposite end of said sheath to form a heat sensing junction adjoining said sheath opposite end and be responsive to thermal conditions thereat, but being disposed within the transverse confines of said sheath opposite end for protection,
a metal disc hermetically closing said opposite end of said sheath, the inner wall surface of said disc being disposed adjacent to said heat sensing junction, and,
said thermocouple wires are connected to each other through said metal disc.

3,890,486
AQUARIUM-TANK HEATING CONTROL

Robert C. Fitzgerald, High Falls, N.Y., assignor to Equipment Development Corporation, New Canaan, Conn.
Continuation of Ser. No. 356,224, May 1, 1973, abandoned. This application Sept. 18, 1974, Ser. No. 507,075
Int. Cl. H05b *3/06*
U.S. Cl. 219—523 **11 Claims**

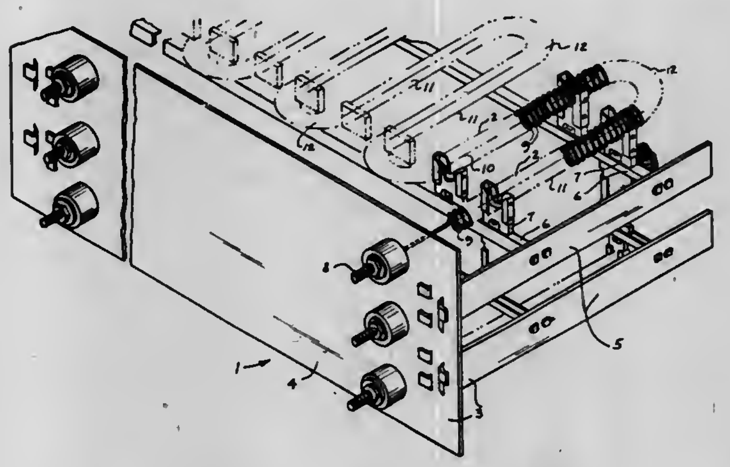


1. A heating device comprising resistive heating element means for heating a first region; temperature control means positionable in a second region spaced from said first region for controlling the temperature at which said first region is maintained by said resistive heating element means; and electrical cable means extending between said resistive heating element means and said temperature control means for applying current to said resistive heating element means, said temperature control means being adapted to control the current applied to said resistive heating element means in response to temperature at said second region, said temperature control means including first and second contact means; first and second bi-metallic element means respectively carrying said first and second contact means in facing relation for displacement thereby into and out of engagement with each other; and a resistive member mounted in series circuit with said contact means and said resistive heating element means and positioned in proximity with a side of said first bi-metallic element means opposite to the side thereof facing said second bi-metallic element means, so that the displacement of said first contact means by said first bi-metallic element means is at least principally in response to the heat generated by said resistive member and the displacement of said second contact means by said second bi-metallic element means is at least principally in response to the temperature at said second region, said resistive heating element means including a length of resistive electrical conductor means distributed over an area; and water-proof, electrically insulating material enclosing said length of resistive electrical conductor means.

3,890,487
OPEN COIL HEATER HAVING SPACED END COILS

Lawrance W. Wightman, St. Louis; Howard C. Gebhart, Chesterfield, and Nick Tichy, Affton, all of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 4, 1974, Ser. No. 447,649
Int. Cl.² H05B *3/06*
U.S. Cl. 219—532 **2 Claims**

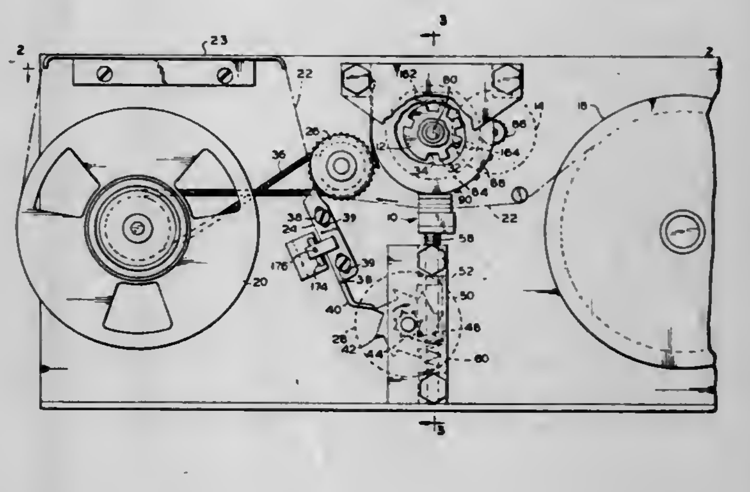


1. In an open coil heater assembly including a frame structure, means for mounting an electrical heater coil to said frame structure, and means for insulating an electrical heater coil from said frame structure, the improvement which comprises an electrical heater coil having spaced apart end turns, said electrical heater coil being formed from a plurality of spaced, continuous turns of resistance wire, said heater coil having a serpentine design including a plurality of straight conductor run portions approximately parallel to ane another, said straight conductor run portions being connected at alternate ends by a plurality of curved end portions, said curved end portions having an inner radius and an outer radius, the continuous wire turns of said straight conductor run portions and said curved end portions being stretched during the manufacture of said electrical heater coil in a direction approximately corresponding to the longitudinal axis of said straight conductor run portions so as to impart a first permanent set to said coil, and to provide a spacing between successive wire turns of said straight conductor run portions, the wire turns of said curved end portions further being stretched in a direction approximately corresponding to a radius about which said curved end portions are formed in said respective design so as to impart a second, additional permanent set to the curved end portions of said heater coil and provide a spacing between successive wire turns of said curved end portions, the spacing of the turns of said curved end portions, measured. along the inner radius of said curved end portions, being approximately equal to the spacing between the turns of said straight conductor run portions along at least one point of each turn of said coil throughout the length of each of said straight conductor run portions and said curved end portions forming said heater coil, said first and said second permanent sets maintaining said heater coil in said serpentine design before placement in said electrical heater assembly, said mounting means holding said heater coil against movement after placement of said heater coil in said electrical heater assembly.

3,890,488
DIGITAL PRINT AND PUNCH TAPE RECORDER HAVING READ-WRITE MEMORY

Harold G. Lee, and Henry O. Peterson, both of Portland, Oreg., assignors to Leupold & Stevens, Inc., Beaverton, Oreg.

Filed Dec. 5, 1973, Ser. No. 421,826
Int. Cl. G06k *1/05;* **H04l** *15/32;* **B44b** *5/00*
U.S. Cl. 235—61.9 A **21 Claims**



15. A printed and punched tape recorder in which the improvement comprises:
input means for supplying input data as electrical input signals;
electronic memory means for receiving and storing a plurality of data input signals supplied thereto by said input means, and for producing a digital data output signal corresponding to the stored data input signals;
punch means for punching a tape with holes arranged in a digital code to provide a punched number corresponding to said digital data output signal;
print means for printing a number on said tape corresonding to said punched number; and
control means including an actuator motor connected to the output of said memory means for operating said punch means and said print means, said motor being energized in response to said digit data output signal.

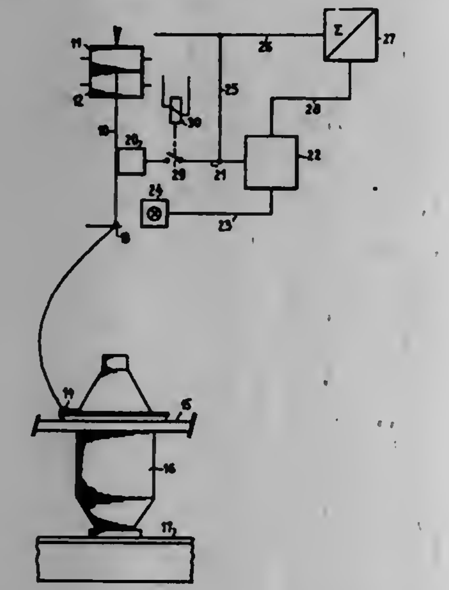
3,890,489
METHOD OF AND APPARATUS FOR ASSESSING THE RUNNING BEHAVIOR OF TEXTILE MACHINES

Ernst Felix, Uster, Switzerland, assignor to Zellweger, Ltd., Switzerland

Filed Jan. 24, 1973, Ser. No. 326,521
Claims priority, application Sweden, Jan. 24, 1972, 972/72
Int. Cl. G06m *3/02*
U.S. Cl. 235—92 PD **8 Claims**

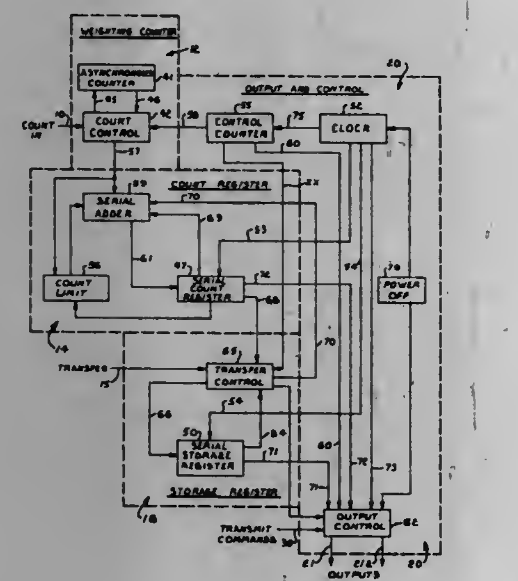
1. A method of assessing the running behavior of a textile machine including a plurality of spindles comprising the steps of detecting operational characteristics at each individual spindle, counting the detected operational characteristics at each spindle, summing the detected operational characteristics from all of said spindles and generating a signal in the immediate proximity of each spindle when the number or duration of the characteristics detected at the given spindle

reaches a predetermined value in excess of the average number of detected operational characteristics of the plural spindles prior to detection of a predetermined total number of operational characteristics from all of said spindles.



3,890,490
DIGITAL DATA TOTALIZER SYSTEM
George L. Buenger, Olathe, Kans., assignor to Rycom Instruments, Raytown, Mo.

Filed Jan. 28, 1974, Ser. No. 437,340
Int. Cl. H03k *21/08*
U.S. Cl. 235—92 TF 25 Claims



1. A digital pulse counter and encoder device having at least one input and at least one output, the device operable to parameterize primary pulses appearing at said input in binary form, the device comprising:

a weighted gate register means having a first input and second input and a first output and a second output therefrom, said first input being interconnected with said primary pulses to be counted at said input to said device, said second input being interconnected with a second source of pulses at the input to said device, said weighted gated register means functioning to produce serial binary data on an output thereof that correlates to a number of counted pulses being inputted to said device;

means for continuously recirculating said serial binary data when a primary pulse does not occur during a predetermined register cycle;

a memory means for storing said binary data, said memory means having an input and an output;

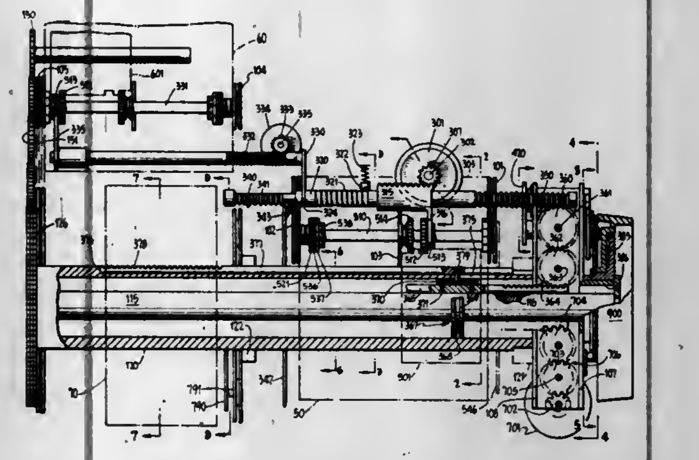
means interconnecting said first output of said weighted gated register means having said serial binary data thereon with said memory means input in response to said second source of pulses;

an output control means for converting input data to an output signal suitable for transmission over a communications link, said output control means having a first, second and third input and an output to said communications link, means interconnecting said first output control input with said memory means output;

means interconnecting said second output control input with said second output from said weighted gated register means, said output control means thereby functioning to effect the transmission of data on the control means output communications link that appears on one of said first and second control means inputs, said transmission occurring upon a preselected condition appearing on said third output control means input and corresponding to the number of primary pulses appearing at the input to said device and the elapsed time between said primary pulses.

3,890,491
ARITHMETIC UNIT FOR A POSTAGE METER
Arthur J. Malavazos, deceased, late of San Leandro, Calif.; Malavazos, administrator, by Gregory A., San Leandro, Calif., and Jan Urdal, San Mateo, Calif., assignors to A J M Research Corporation, Hayward, Calif.

Filed Apr. 3, 1974, Ser. No. 457,592
Int. Cl. G07g *1/00;* **G06c** *7/02*
U.S. Cl. 235—101 3 Claims



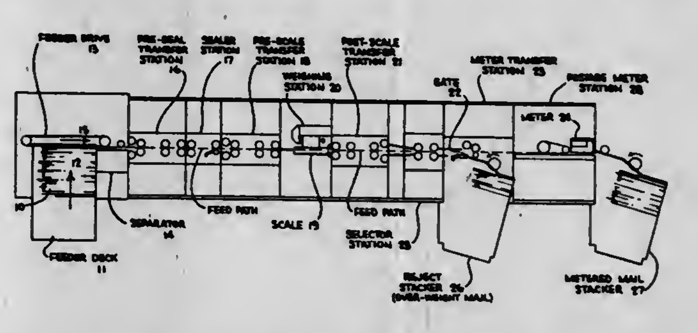
1. An arithmetic and printing unit for a postage meter comprising:

1. a cylindrical hollow main drive shaft;
2. means for mounting said drive shaft for rotation;
3. means for cyclically rotating said drive shaft;
4. an ascending register and a descending register;
5. a print head mounted on said drive shaft;
6. a manually operative selection mechanism for selecting values to be registered in said registers and in said print head;
7. a mutilated drum actuator for one of said registers mounted on said drive shaft;
8. means controlled by said selection mechanism for operating one of said registers from said actuator differentially from the value set in said selection mechanism;
9. a second mutilated drum actuator;
10. means driven by said main drive shaft for driving said second mutilated drum actuator;
11. means controlled by said selection mechanism for registering a value in said second register from the operation of said second actuator;
12. value stamping members for printing a stamp value on mail matter positionably mounted within said print head; and

13. means controlled by said selection mechanism for positioning said stamping members.

3,890,492
POSTAGE VALUE DETERMINING AND CONTROL CIRCUIT
Flavio M. Manduley, Seymour, Conn., and Anthony Storace, Tarrytown, N.Y., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed June 5, 1974, Ser. No. 476,682
Int. Cl. G06f *15/20;* **G01g** *23/42*
U.S. Cl. 235—151.33 4 Claims



1. A postage value determining and control circuit interconnected between a weighing device having a photodetector bank for supplying weight pulse signals indicative of the weight of a piece of mail, and a postage meter for imprinting a postage value upon weighed pieces of mail, said determining and control circuit receiving weight information from said weighing device, and performing a multiplication between a unit price per unit weight value and said weight information to provide a resultant postage imprinting value for said postage meter, said postage value determining and control circuit comprising:

a priority encoder operatively connected to said weighing device for converting weighing pulses from said weighing device to BCD weighing information;

unit price means for supplying a unit price per unit of weight value;

converting means operatively connected to said unit price means for converting said unit price per unit of weight value to unit price BCD information;

adder means operatively connected to said converting means for receiving said unit price BCD information and adding said unit price BCD information a plurality of times equal to the BCD weighing information so as to effect a multiplication between the unit price per unit weight value and said weight information, thereby providing a postage imprinting value for said postage meter; and control means including an up-down counter operatively connected to said adder means for controlling the addition of the adder means, the up-down counter operatively connected to said encoder for counting down a number of times corresponding to the BCD weighing information, and upon reaching a zero count condition, halting further addition in said adder means.

3,890,493
CIRCUITRY FOR DETECTING FAULTS IN DUPLICATE CONTROLLERS
Richard Duane Burtness, Boulder, Colo.; Garry Carson Hess, Champaign, Ill., and Bliss D. Jensen, Boulder, Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

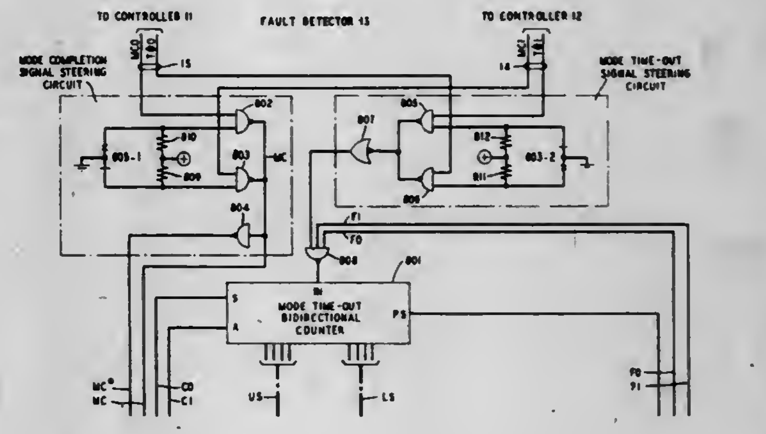
Filed Mar. 21, 1974, Ser. No. 453,351
Int. Cl.² G06F *11/00*
U.S. Cl. 235—153 AE 17 Claims

1. Fault detector circuitry for first and second system controllers and means alternately connecting each one of said controllers individually to peripheral system circuits at prescribed intervals for active and standby control of system operation, said detector circuitry comprising

means for decrementally and incrementally counting trouble signals from connected active ones of said controllers,

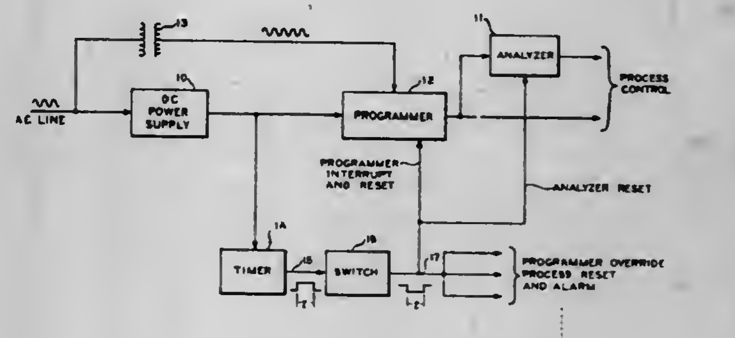
means responsive to said counting to prescribed decremental and incremental count states of said counting means for identifying a faulty one of said controllers, and

means activated by said identifying means for controlling said connecting means to switch a faulty one of said controllers into a standby control state.


TO CONTROLLER 11
FAULT DETECTOR 13
TO CONTROLLER 12
MODE COMPLETION SIGNAL STEERING CIRCUIT
MODE TIME-OUT SIGNAL STEERING CIRCUIT
MODE TIME-OUT BIDIRECTIONAL COUNTER

3,890,494
APPARATUS AND METHOD FOR ALTERING PROCESS CONTROL IN RESPONSE TO A POWER INTERRUPTION
Harry M. Meshek, Bartlesville, and Vern A. Street, Tulsa, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 28, 1974, Ser. No. 455,738
Int. Cl. G05b *19/00*
U.S. Cl. 235—153 R 18 Claims



1. Apparatus for altering a process control system in response to an interruption in the supply of electrical power to said process control system, said apparatus comprising:

a timing means having trigger input means for accepting a preselected trigger signal and timed output means for producing a timed output signal of preselected duration in response to said preselected trigger signal,

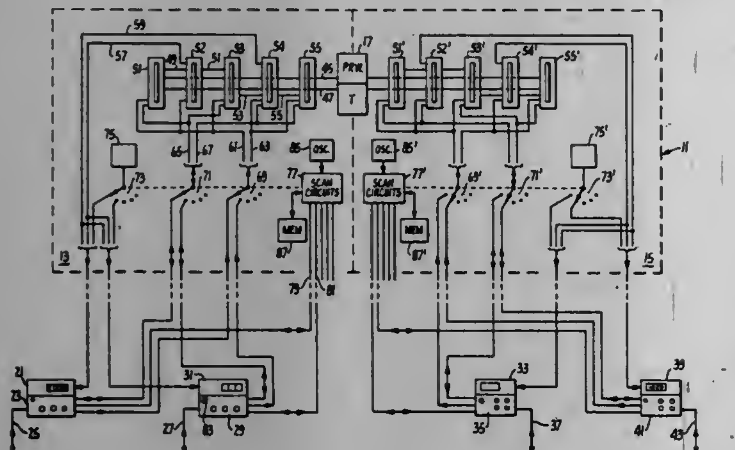
trigger signal generatng means for sensing an interruption in power provided by a first power supply means to said process control system and generating said preselected trigger signal in response to the termination of said interruption, and

process control system override means for overriding at least a portion of said process control system in response to, and for the duration of, said timed outpt signal.

3,890,495
TELEPHONE SYSTEM TESTING APPARATUS AND TECHNIQUES UTILIZING CENTRAL MEASURING EQUIPMENT WITH A PLURALITY OF REMOTE TEST STATIONS

Paul R. Bauer, Palo Alto, and Duane E. Dunwoodie, Los Altos, both of Calif., assignors to Wiltron Company, Palo Alto, Calif.

Filed Nov. 1, 1973, Ser. No. 411,818
Int. Cl. G06f ***11/00;*** **H04m** ***3/22***
U.S. Cl. 235—153 AK **18 Claims**



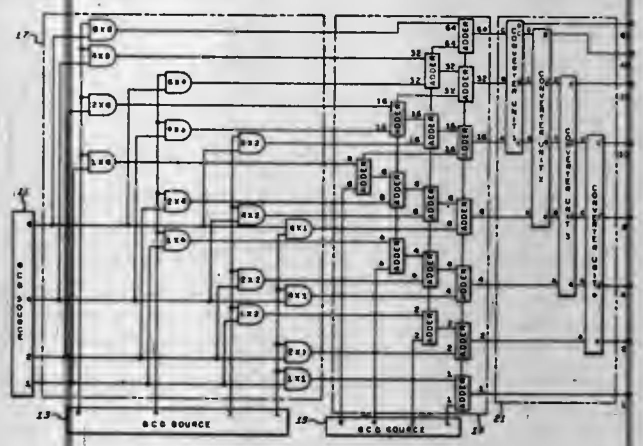
1. In a testing system having a capability of conducting a plurality of functional tests to determine a number of parameters of an electronic circuit, said testing system including means for connection to a circuit to be tested, means for displaying said circuit parameters, and means for controlling the test activities being conducted on the circuit, an improvement wherein a modular system for selecting and implementing said functional tests is employed which comprises at least two substantially identical but independent modular equipment sections, each of said sections comprising:
- a fixed number of receptacles having separate electrial contacts for connection to said circuit means, to said display means, to said control means and to contacts of other receptacles for some interconnection therebetween, and
- at least two distinct modules uniquely, mechanically and electrically acceptable to each of said fixed number of receptacles, said modules containing electronic circuits for performing said functional tests, whereby each of said independent equipment sections may duplicate each other in test functions provided or may have different test function capability depending upon hich test modules are inserted into the receptacles of each station.

3,890,496
VARIABLE 8421 BCD MULTIPLIER

Julian T. Hartzog, Clearwater, Fla., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 1, 1974, Ser. No. 456,999
Int. Cl. G06f ***7/52***
U.S. Cl. 235—159 **7 Claims**

1. An 8421 BCD digital multiplier comprising
- matrix means,
- means for applying multiplicand and multiplier input signal bits in the 8421 BCD format to the matrix means,
- a plurality of dual input gating means in said matrix means, each gating means being connected to receive a different combination of single multiplicand and single multiplier signal bits, each of said gating means providing an individual signal when both of its input terminals are energized, said individual signals being assigned a numerical value equal to the product of the numerical values of the single signal bits applied to the input terminals of that gating means,
- means to receive carry signal bits in the 8421 BCD format, an adder bank,
- means in said adder bank for adding individual signals of like numerical value from said matrix means to individual simultaneously received carry signal bits of like numerical value,
- said adder bank having a plurality of output terminals for providing intermediate output signals comprised of individual bits having assigned values arranged in the binary format,
- data conversion means including a series of connector units for converting the binary output signals from said adder bank into output signal bits in the 8421 BCD format,
- each of said converter units including a plurality of input terminals for receiving individual bits of information and a plurality of output terminals for providing individual output bits in a given decade of the 8421 BCD format, plus a carry bit in the next higher decade of the same format,
- said series of converter units being arranged in a stepped fashin in which the first unit in said series is connected to receive a group of the highest valued bits from said adder bank and each succeeding converter unit is connected to receive all bits except the carry bit from the preceding converter unit as well as the next lower valued bit from the adder bank,
- the carry bit output terminal on each of said converter units being connected directly to an individual output terminal of the digital multiplier,
- the output terminals on the last unit in said series being connected directly to an individual output terminal of the digital multiplier.

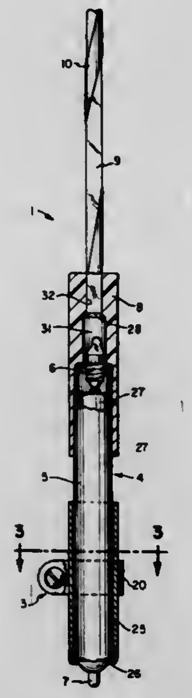


3,890,497
ILLUMINATED SAFETY POLE FOR BICYCLES OR THE LIKE

David H. Rush, Belle Harbor, N.Y., assignor to Chromalloy Electronics Div. Chromalloy American Corp., Hollywood, Fla.

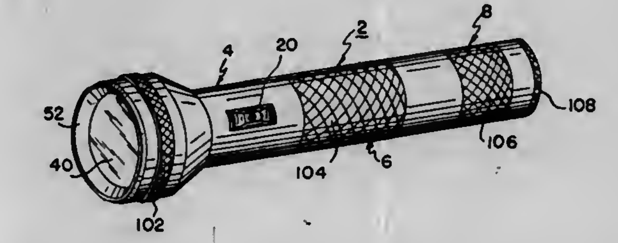
Filed Mar. 18, 1974, Ser. No. 451,741
Int. Cl. F21g ***1/00***
U.S. Cl. 240—7.55 **11 Claims**

1. An illuminated warning device for bicycles or the like comprising:
- a transparent light pipe in the form of an elongated pole;
- a light source adjacent one end of said pole for introducing light into said light pipe for passage along the length thereof; and
- material partially covering the outer surface of said light pipe for causing light within said pipe to be emitted through the side wall thereof opposite said material, said material being positioned intermediate the ends of said light pipe and the side of said pipe opposite said material being uncovered.



3,890,498
FLASHLIGHT DEVICE

Paul D. Toth, Sr., 12712 W. 13th St., Cleveland, Ohio
Continuation of Ser. No. 208,866, Dec. 16, 1971, abandoned. This application Oct. 1, 1973, Ser. No. 402,135
Int. Cl. F21v ***1/00***
U.S. Cl. 240—10.66 **13 Claims**



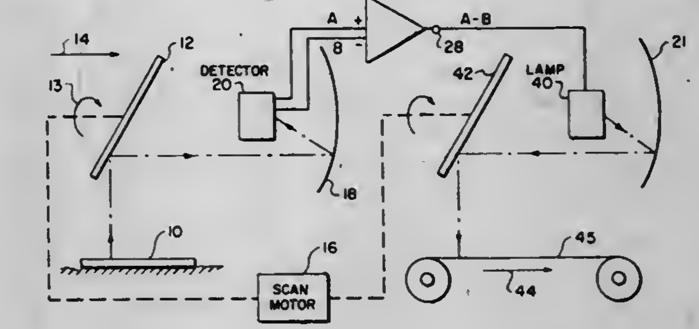
1. A flashlight device having a rugged, high strength construction for use as both a flashlight device and a working tool or hand weapon comprising:
- a body member having an elongated, generally cylindrical configuration and opposed front and rear ends, said body member including an elongated cylindrical passageway for receiving an electrical battery cell therein and said rear end including first thread means;
- a light assembly connected to the front end of said body member;
- switch means slidably mounted on said body member between its opposed front and rear ends for selectively electrically connecting a battery cell within said passageway to said light assembly and selectively energizing said light assembly;
- a rear cap assembly having complementary thread means detachably connected to the rear end of said body member, said rear cap assembly including,
  - a rear cap member including a base, a forwardly extending, shank-like flange and a generally centrally disposed aperture extending therethrough, said flange including said complementary thread means and defining an interior compartment-like recess therewithin, said aperture including an internal thread means,
  - a fastener element including an externally threaded end threadably engaged within said aperture and a transversely apertured end,
  - a carrying element extending through said transversely apertured end,

whereby said fastener element may be alternatively disposed in a first orientation with the threaded end threaded into said aperture with the carrying element disposed outside the cap assembly and in a second orientation with the carrying element disposed in said recess inside said cap assembly to permit convenient storage of said carrying element.

3,890,499
DIFFERENTIAL SCANNER SYSTEM

Bernard Lippel, West Long Beach, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 15, 1970, Ser. No. 48,617
Int. Cl. H01j ***39/12***
U.S. Cl. 250—201 **4 Claims**

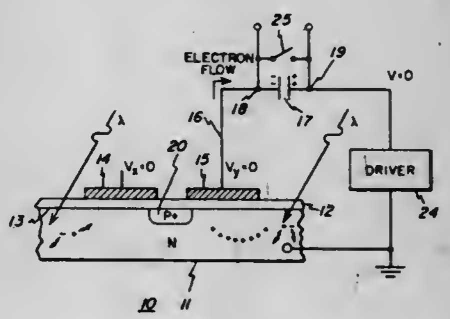


1. A dual scanner comprising means for scanning an object emitting electromagnetic radiation, a first detector responding to the electromagentic radiation emitted from each scanned element of said object, and a second detector responsive to radiant energy emanating from a background surrounding said element said first and second detectors providing electrical signals, circuit means for subtracting an electrical signal from said second detector from an electrical signal from said first detector to provide a difference signal, means for separately recording said difference signal and said signal from said second detector on separate recording means, separate means for playing back said separately recorded signals, means for combining said separately played back signals, said combined signal being applied to an energy source to modulate the intensity thereof, and means including a scanner device synchronized with said scanning means for directing said energy onto a recording device.

3,890,500
APPARATUS FOR SENSING RADIATION AND PROVIDING ELECTRICAL READOUT

Charles W. Eichelberger, Schenectady; William E. Engeler, Scotia, and Jerome J. Tiemann, Schenectady, all of N.Y., assignors to General Electric Company, Schenetady, N.Y.

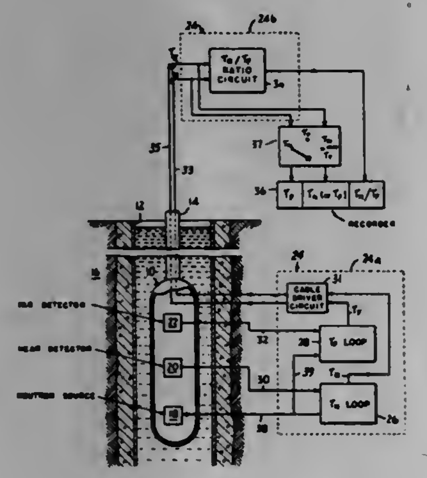
Filed Feb. 11, 1974, Ser. No. 441,054
Int. Cl. H01j ***39/12***
U.S. Cl. 250—211 J **17 Claims**



1. A radiation sensing device comprising

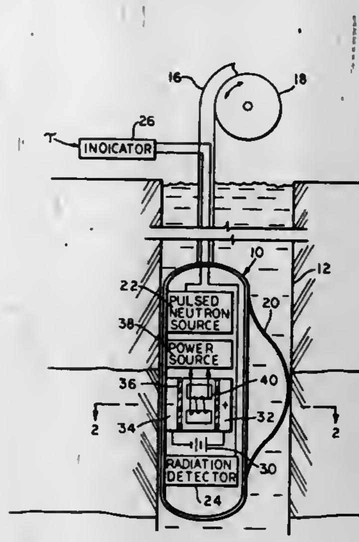
a substrate of semiconductor material of one conductivity type having a major surface,
a conducting member overlying a portion of a region of said substrate adjacent said major surface and in insulating relationship therewith,
a voltage means connected in circuit between said conducting member and said substrate for providing a voltage of one value between said conducting member and said substrate to deplete said portion of majority charge carriers,
said substrate being maintained at a fixed potential in relation to said one value of voltage,
means for exposing said substrate to radiation whereby minority carriers generated in said portion are stored therein,
means for collapsing said voltage to another value for an interval of time to inject said stored carriers into said substrate and thereafter reestablishing substantially said one value of voltage,
circuit means connected between said conducting member and said substrate,
whereby charge stored in said portion is driven out of said portion into said substrate and a current is caused to flow in said circuit means,
said circuit means including means to provide a signal which is the integral of said current flow.

3,890,501
NEUTRON LOGGING RELIABILITY TECHNIQUES AND APPARATUS
Charles Wilkin Johnstone, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed May 1, 1973, Ser. No. 356,150
Int. Cl. G01v *5/00*
U.S. Cl. 250—265 **47 Claims**



1. A method for providing verifiably accurate logging data derived at least in part by neutron logging of earth formation characteristics, comprising the steps of:
irradiating an earth formation with discrete pulses of high-energy neutrons to produce therein between pulses a population of neutrons, the decay of which is functionally related to intrinsic neutron characteristics of the formation;
detecting indications of the neutron population in the formation between neutron pulses at a first location spaced from the neutron source;
deriving a representation of an apparent value of a selected one of said neutron characteristics corresponding to the detected indications at the first location;
detecting indications of the neutron population in the formation between neutron pulses at a second location spaced from the first location and from the neutron source; and
combining said first location apparent value representation and a function of said second location detected indications to derive a representation functionally related to a quotient of the apparent values of said selected neutron characteristic corresponding to the detected neutron population indications at the first and second locations, thereby to provide information as to the validity of said first location apparent value representation as a measurement of the intrinsic value of said selected neutron characteristic.

3,890,502
PERMEABILITY LOG USING NEW LIFETIME MEASUREMENTS
Donald J. Dowling; John F. Boyd, and James A. Fuchs, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.
Filed Dec. 20, 1973, Ser. No. 426,873
Int. Cl. G01t *1/00*
U.S. Cl. 250—267 **15 Claims**

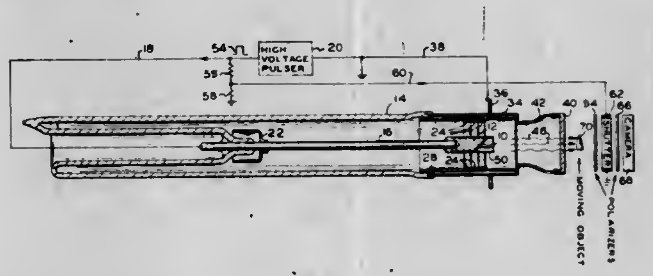


1. A method of measuring permeability of an earth formation adjacent to a borehole which comprises the steps of
altering the natural charged ion spatial distribution in formation fluids;
repetitively bombarding the formation with fast neutrons from a pulsed neutron source to create a cloud of thermal neutrons in the formation;
measuring a thermal neutron decay time characteristic of the earth formations during said altered spatial distribution of charged ions;
measuring a thermal neutron decay time for some earth formation having an unaltered spatial distribution of charged ions; and
comparing the two measures to obtain an indication of formation permeability.

3,890,503
STIMULATED EMISSION LIGHT SOURCE PUMPED BY ELECTRON BEAM OF FIELD EMISSION INITIATED VACUUM ARC
John L. Brewster, McMinnville, Oreg., assignor to Hewlett Packard Company, Palo Alto, Calif.
Continuation of Ser. No. 779,978, Nov. 29, 1968, abandoned.
This application May 28, 1971, Ser. No. 148,163
Int. Cl. G01m *23/04*
U.S. Cl. 250—321 **10 Claims**

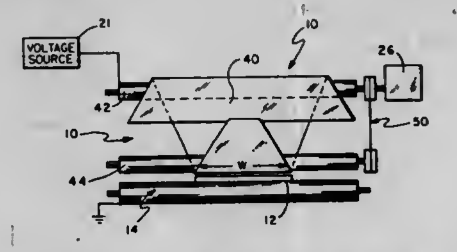
1. Apparatus for generating high intensity light pulses comprising:
light source means including particulate light emitting material capable of producing light by stimulated emission of radiation, said light emitting material being supported on an electrically conductive support member;

an evacuated envelope containing no appreciable free gas; means for mounting said light emitting material outside said envelope;
electron pumping means including an anode, and a field emission cathode having at least one sharpened emitting element mounted within said envelope, for emitting a beam of electrons through the anode to the exterior of the envelope and for bombarding the light emitting material with said electrons to cause said material to emit light; and



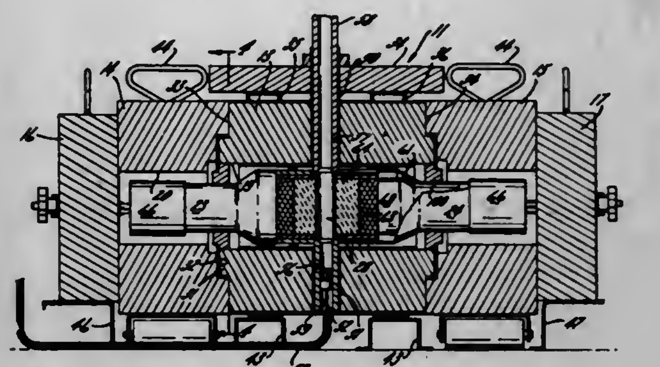
pulser means for applying narrow electrical pulses between said cathode and said anode which are each of sufficiently high voltage and high current to cause the field emission of electrons from the cathode emitting element and evaporation of a portion of said emitting element to form free ions of cathode material which produce a vacuum arc within the envelope, said vacuum arc causing an extremely high electron beam current to flow from said cathode to the particles of light emitting material so that a light pulse of high intensity is emitted by stimulated emission of radiation from said material.

3,890,504
ADJUSTABLE CORONA DISCHARGE ELECTRODE
Pyam Pendleton, and Myron R. Waldman, both of Warwick, R.I., assignors to Walco Systems, Inc., Providence, R.I.
Continuation of Ser. No. 336,203, Feb. 27, 1973, abandoned.
This application Mar. 15, 1974, Ser. No. 451,570
Int. Cl. G03g *15/00*
U.S. Cl. 250—325 **9 Claims**



1. An electrode assembly for use in the electrical surface treatment of a material comprising,
a first elongated electrode having a longitudinal dimension, a second electrode provided by an electrically conductive surface, said surface being of varying width from one end to the other of the length thereof,
means having a longitudinal dimension for positioning a portion of said second electrode surface spanning a selected width thereof in juxtaposition to a longitudinal surface of said first electrode,
said longitudinal dimension of said first electrode and said longitudinal dimension of said positioning means being in substantially parallel spaced relationship to one another to provide juxtaposed surfaces of said first and second electrodes of length equal to said selected width of said second electrode surface,
means for actuating said positioning means to move said second electrode surface relative to said first electrode from one position to another position in the direction of the length thereof, perpendicular to the longitudinal dimension of said first electrode, to change said portion of the second electrode surface juxtaposed to said longitudinal surface of said first electrode, and
means for applying a voltage across said electrodes,
whereby upon passing a material to be treated between said juxtaposed first and second electrode surfaces in a direction perpendicular to said selected width while an electrical voltage is applied between said electrodes, a corona discharge takes place between said second electrode and said material.

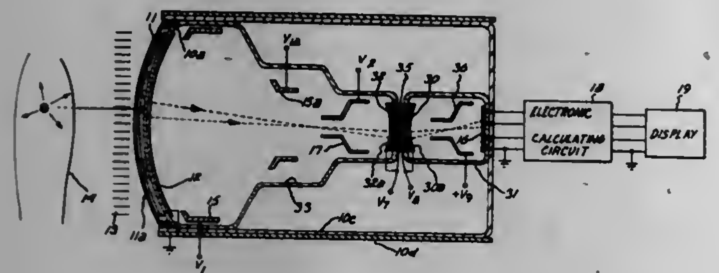
3,890,505
SCINTILLATION COUNTER; PHOTOMULTIPLIER TUBE ALIGNMENT
Robert E. Olson, Glen Ellyn, Ill., assignor to Packard Instrument Company, Inc., Downers Grove, Ill.
Filed July 27, 1973, Ser. No. 383,061
Int. Cl. G01t *1/20*
U.S. Cl. 250—361 **3 Claims**



1. In a scintillation counter having
a massive lead radiation shield,
a sample-receiving zone within said shield,
a horizontal photomultiplier tube-housing bore in said shield and extending at least to said sample-receiving zone,
at least one photomultiplier tube assembly in said bore responsive to light scintillations produced from radiation emitted by said sample, said photomultiplier tube assembly being rotatable and longitudinally moveable in said bore, and
a sample transfer bore extending radially between said receiving zone and an outer side of said shield for permitting the passage of said sample therethrough
the improvement whereby said photomultiplier tube assembly is alignable both longitudinally and perpendicularly with respect to said sample trnasfer bore, comprising:
a sample conducting tube slidably disposed in said transfer bore with an end thereof extending partially into said sample-receiving zone, said sample conducting tube end having a flat end face, and
said photomultiplier tube assembly having a flat longitudinal outer surface adapted for movement adjacent said tube end face upon longitudinal positioning of said photomultiplier tube assembly relative to said horizontal bore, said photomultiplier tube assembly having an outwardly projecting stop portion at an end of said flat surface for engaging said sample conducting tube end to establish an exact longitudinal position of said photomultiplier tube relative to said sample-receiving zone.

3,890,506
FAST RESPONSE TIME IMAGE TUBE CAMERA

Walter H. Berninger, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Nov. 15, 1973, Ser. No. 416,222
Int. Cl. G01t *1/00*
U.S. Cl. 250—370 **14 Claims**



1. An improved, fast response time, image-tube camera apparatus comprising

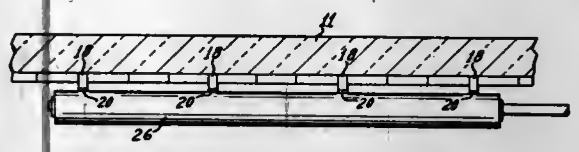
- a sealed evacuated housing having input and output ends,
- a first phosphor layer formed along a surface of the input end of said housing,
- a first photocathode film in optical communication with said first phosphor layer and disposed inside said housing adjacent and along the input end thereof, said first phosphor layer producing a pulse of light in response to an absorbed incident nuclear particle or ray of electromagnetic radiation generated external of said housing, the number of optical photons in each light pulse being proportional to the energy of the absorbed incident ray or particle, said photocathode film detecting the optical photons and emitting electrons in response thereto,
- a second phosphor layer disposed inside said housing between said first photocathode film and the output end of said housing and positioned generally normal to the paths of the electrons emitted by said first photocathode film and beyond the cross-over point thereof,
- a second photocathode film in optical communication with said second phosphor layer and disposed inside said housing between said second phosphor layer and the output end of said housing so that the apparatus comprises a dual-stage image intensifier,

semiconductor dual-axis position sensor means positioned within said housing adjacent the output end thereof for detecting electrons emitted from the second photocathode film and producing electrical signals from which the dual-axis coordinates of the second photocathode-emitted electrons impacting on said semiconductor means and the corresponding incident ray or particle can be determined, the number of impacting electrons being derivable from the output of said semiconductor means and being proportional to the energy of the incident ray or particle, and,

means for accelerating the electrons emitted from said second photocathode film and for focussing them on said semiconductor means to cause high energy pulsed electron excitation thereof so as to provide a substantial quantum gain over the conventional low energy light photon excitation thereof and so obtain improved image quality and faster response time thereover.

3,890,507
CATHODE RAY TUBES WITH TARGET SCREENS AND MANUFACTURE THEREOF

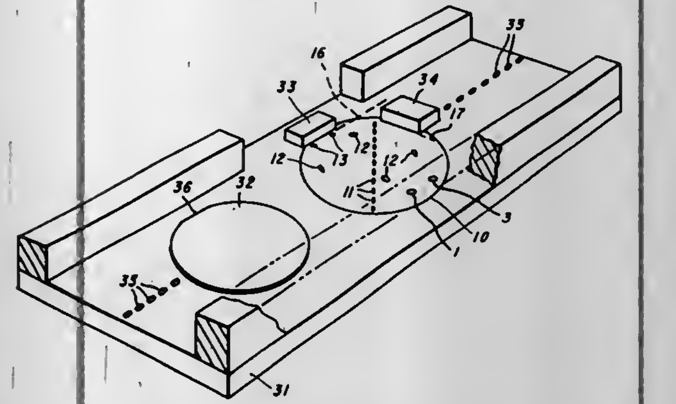
David M. Goodman, 3443 Debra Ct., Seaford, N.Y. 11783
Division of Ser. No. 63,331, Aug. 12, 1970, Pat. No. 3,801,817, which is a division of Ser. No. 772,639, Nov. 1, 1968, Pat. No. 3,598,628, which is a continuation-in-part of Ser. Nos. 488,017, Sept. 17, 1965, Pat. No. 3,564,121, Ser. No. 345,197, Feb. 17, 1964, and Ser. No. 85,353, Jan. 27, 1961, Pat. No. 3,691,424, which is a division of Ser. No. 800,854, March 20, 1959, Pat. No. 3,081,414, which is a continuation-in-part of Ser. No. 522,609, July 18, 1955, Pat. No. 2,897,388, Ser. No. 514,973, June 13, 1955, Pat. No. 2,885,591, and Ser. No. 488,039, Aug. 5, 1954, Pat. No. 2,897,398. This application Mar. 21, 1974, Ser. No. 453,663
Int. Cl. G01t *1/20*
U.S. Cl. 250—483 **13 Claims**



1. A beam-index line-screen color kinescope with an electron gun for providing a scannable electron beam, a target screen, and a transparent faceplate; said target screen comprising a first layer of different color producing elements arranged in a line-like mosaic pattern on the interior side of the faceplate in register with a line-like pattern of index signal generating elements which furnish optical index signals indicative of the position of impact of the scanning beam on the target screen; including light pipe means for transmitting said optical index signals transversely of the faceplate to an exit terminalwhere they are to be used for indexing purposes; said target screen also having a second layer of electrically conductive material disposed on the first layer on the side thereof away from the faceplate.

3,890,508
WORKPIECE ALIGNMENT SYSTEM

Mark Edward Sharp, Oklahoma City, Okla., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 28, 1973, Ser. No. 429,334
Int. Cl. G01n *21/30*
U.S. Cl. 250—548 **3 Claims**



1. A system for positioning and aligning a circular workpiece having an irregular circumference at one region along its circumference comprising in combination:

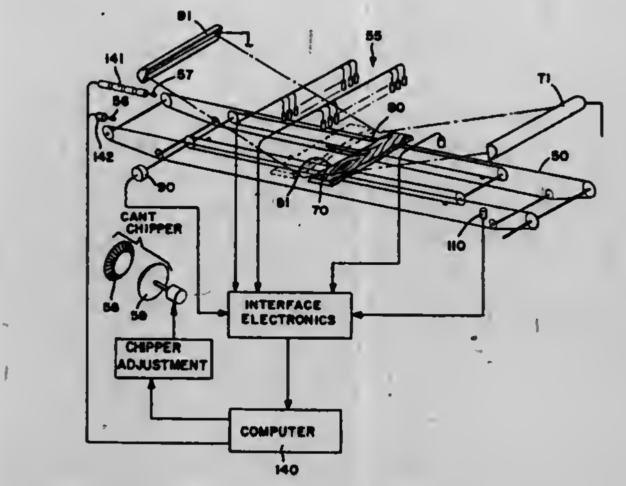
- a. a pair of stop members, and
- b. a body,
- c. said stop members being so positioned relative to said body as to position a workpiece on said body when both of said stop members are in contact with the circumference of said workpiece and in a desired aligned position only when the irregular portion of the circumference of said workpiece is in contact with one of said members,

- d. said body having
  - i. a surface on which a workpiece is received for positioning and aligning,
  - ii. a plurality of fluid passages communicating with said surface and a source of pressurized fluid and being so arranged and positioned to produce an upwardly inclined and directional fluid jet flow to urge said workpiece into contact with both said stop members,
  - iii. a second plurality of fluid passages communicating with said surface and a source of pressurized fluid and so arranged and positioned to produce an upwardly inclined and tangential fluid jet flow to rotate said workpiece while being so urged, and
  - iv. a third plurality of fluid passages communicating with said surface and a source of partial vacuum and positioned to be within the circumference of the vertical projection of said workpiece on to said surface only when both said stop members are in contact with the circumference of said workpiece and said irregular portion of the circumference of said workpiece is in contact with one of said stop members,
  - v. a plurality of photodetector means so arranged and positioned within the circumference of the vertical projection of said workpiece on to said surface that all of said plurality of photodetector means are illuminated with actuating radiation only when said workpiece is within a given rotational angle of being in said desired aligned position,

whereby said workpiece is urged against both of said stop members and rotated toward said desired aligned position at a first rotational speed while less than all of said photodetector means are illuminated with activating radiation and at a second slower rotational speed when all of said plurality of photodetector means are illuminated with said activating radiation.

3,890,509
AUTOMATIC EDGER SET WORKS METHOD AND APPARATUS

Carl W. Maxey, Everett, Wash., assignor to The Black Clawson Company, Hamilton, Ohio
Continuation of Ser. No. 251,809, May 9, 1972, abandoned. This application Feb. 7, 1974, Ser. No. 440,505
Int. Cl. G01n *21/30*
U.S. Cl. 250—561 **11 Claims**



1. A method of scanning cants having leading and trailing wanes to obtain the maximum yield therefrom including the steps of

directing a beam of light at an angle of incidence across said cant such that a sawn portion and the trailing wane are illuminated and the leading wane is placed in shadow,

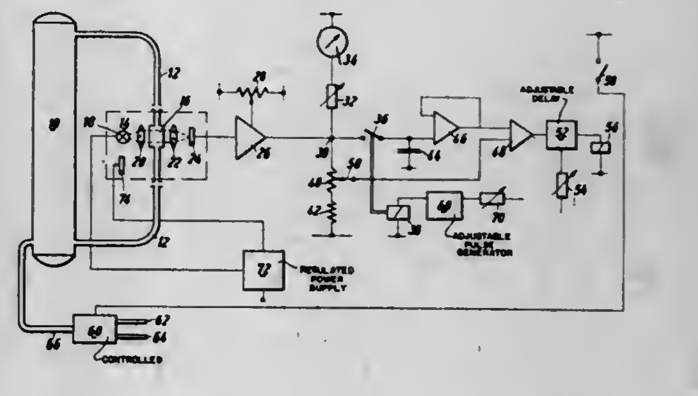
directing a second beam of light across said cant at an angle of incidence such that said sawn portion and the leading wane are illuminated and the trailing wane is placed in shadow, and

sensing the light reflected from said cant at a plurality of locations to provide information on the location of the leading and trailing edges of the cant and the leading and trailing edge of the sawn portion,

whereby the locations of the sawn portion of the cant and the leading and trailing edges of the cant are identified at said plurality of locations.

3,890,510
APPARATUS FOR CONTROLLING THE ABSORPTION OF DYE COMPONENTS IN A FLUID

Walter H. Sturm, Hanau-Hohe Tanne, Germany, assignor to Original Hanau Quarzlampen GmbH, Hanau, Germany
Filed Nov. 30, 1973, Ser. No. 420,485
Claims priority, application Germany, Dec. 13, 1972, 2260906
Int. Cl. G01n *21/26*
U.S. Cl. 250—565 **7 Claims**



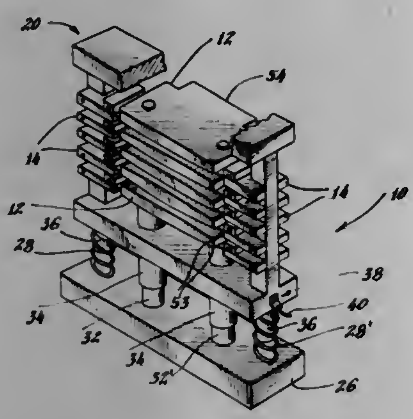
1. In an apparatus for controlling the absorption of one or more dye components contained in a dye fluid by regulating the temperature of the dye fluid depending on the transparency of the dye fluid, whereby the temperature of the dye fluid is raised to an optimum value for the absorption of a dye component as indicated by a detected change in transparency of the dye fluid and afterwards the temperature of the dye fluid is maintained at an almost constant value until the completion of the dye component absorption as indicated by a constant transparency being detected and thereafter the temperature of the dye fluid is raised to a new optimum value for the absorption of another dye component as indicated by a newly detected change in transparency of the dye fluid until all components of the dye fluid have been absorbed, said apparatus including a dye fluid container, a measuring head for measuring the transparency of the dye fluid, a shunt conduit for recirculating the dye fluid in the dye fluid container through the measuring head, and means for heating the dye fluid in the container, the improvement comprising:

- a scanning circuit connected to receive a signal proportional to the transparency of the dye fluid from said measuring head, and periodically sampling said measuring head signal,
- a storing circuit connected to said scanning circuit for storing samples of said measuring head signal,
- a comparator having one input connected to said storing circuit,
- a voltage divider circuit connected to receive said measuring head signal, said voltage divider circuit having an output directly connected to a second input of said comparator, and
- a regulating means connected to receive the output of said comparator for controlling said dye fluid heating means to increase the temperature of the dye fluid when the output of said voltage divider circuit is less than the output of said storing circuit and maintaining the temperature of the dye fluid almost constant when the output said voltage divider circuit is greater than the output of said storing circuit.

3,890,511
ELECTRET PULSE GENERATOR

Paul O. Haugsjaa, Acton, and Daniel C. Casella, Hamilton, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 15, 1974, Ser. No. 460,848
Int. Cl. H03k *3/00*
U.S. Cl. 307—106 **15 Claims**



1. An apparatus for generating a pulse of electrical energy from a mechanical force comprising

a multi-layered structure formed of a first conductor and a second conductor with an electret therebetween, said first conductor being formed with a multiple of spaced elements which are electrically connected to each other with the electret located between the elements;

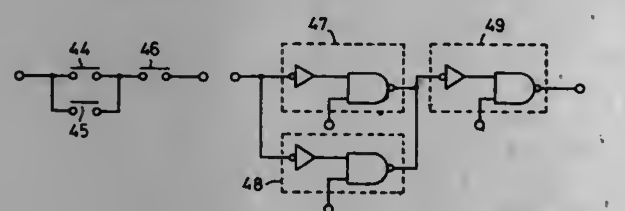
the second conductor being mounted in proximity with the electret at an electrically opposite side thereof in comparison with the electret side on which the first conductor elements are located to form different electrical charge polarities between the first and the second conductors;

said first and second conductors being mounted for relative movement with respect to each other to generate an electrical pulse when the first and second conductors are rapidly separated under action from said mechanical force.

3,890,512
LOGIC CIRCUIT EQUIVALENT TO A RELAY CONTACT CIRCUIT

Yoshiko Kumakawa, Zushi, and Kunio Ikai, Tokyo, both of Japan, assignors to Naigai Industries, Inc., Tokyo, Japan

Filed Dec. 7, 1973, Ser. No. 422,689
Claims priority, application Japan, Sept. 13, 1973, 48-106631
Int. Cl. H03k *19/08*
U.S. Cl. 307—203 **7 Claims**

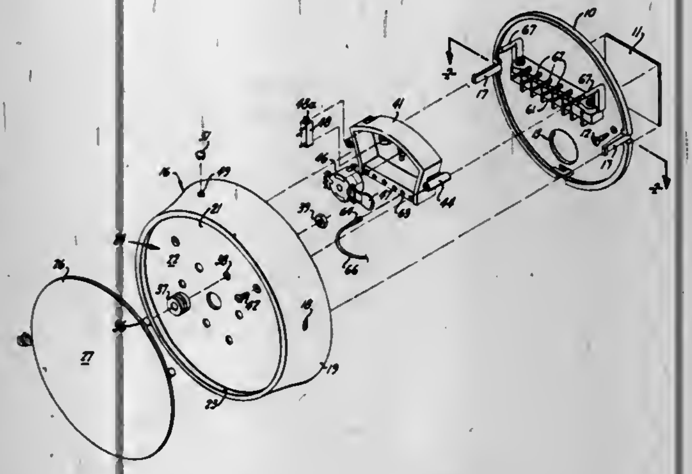


1. A logic circuit comprising a plurality of unit circuits which are connected with each other in first and second connection types, each of said unit circuits comprising an AND element having at least two input terminals and an inverter element connected to one input of the AND element, each of said unit circuits being equivalent to one relay contact in operation, said first connection type being a connection type in which the output of the AND element of one unit circuit is connected to the output of the AND element of another unit circuit to form a wired OR connection whereby a circuit construction for carrying out an OR logical operation of unit circuits is formed, said second connection type being a connection type in which the output of the AND element of one unit circuit is connected to the input of the inverter element of another unit circuit, said other input terminal of said AND element of said unit circuits being connected to a signal source, whereby a circuit construction for carrying out an AND logical operation of unit circuits is formed, the all unit circuits being respectively connected with each other in the same sequence as the relay contacts.

3,890,513
ACOUSTIC TRANSDUCER

David G. Barleen, Lafayette, and Rex B. Peters, Concord, both of Calif., assignors to Systron-Donner Corporation, Concord, Calif.

Filed Feb. 14, 1974, Ser. No. 442,387
Int. Cl. H04r *17/00*
U.S. Cl. 310—9.1 **12 Claims**



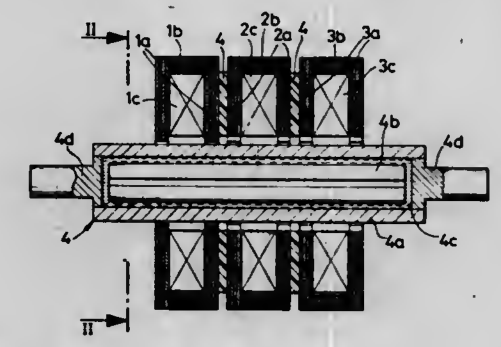
1. In an acoustic transducer for radiating or receiving energy of predetermined frequency: a base, a housing having a wall with a generally planar outer surface removably mounted on the base, mating electrical connectors carried by the base and housing for making electrical connections to components mounted in the housing, a substantially flat circular plate mounted outside the housing and spaced from the outer surface of the wall by a distance on the order of an integral number of half wavelengths of the energy to be radiated or received, a piezoelectric ceramic resonator affixed centrally to one side of the plate, and mounting means extending between the plate and the wall, said mounting means engaging the plate at a plurality of points spaced from the center of the plate by a distance corresponding to an integral multiple of one-half wavelength of energy of the predetermined frequency in the plate.

3,890,514
STEP MOTOR WITH OSCILLATION DAMPING

Gerhard Mutz, Villingen-Schwenningen, and Edmund Bausch, Kirchen-Hausen, both of Germany, assignors to Binder Magnete GmbH, Villingen, Germany

Filed Oct. 3, 1973, Ser. No. 403,212
Claims priority, application Germany, Oct. 11, 1972, 2249648
Int. Cl. H02k *37/00*
U.S. Cl. 310—49 **14 Claims**

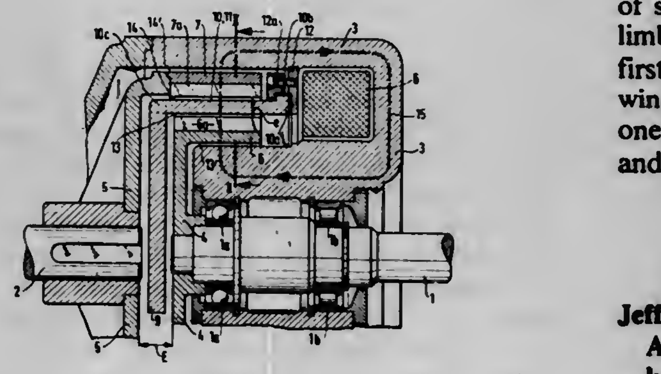
1. In a step motor comprising a plurality of axially serially positioned stator systems and a rotor; and at least one rotary member being in frictionally rotatable communication with said rotor for effecting rotary oscillation damping thereof, the improvement comprising; said rotor comprising a hollow cylinder rotatably journalled at both ends thereof, said rotary member being rotatably supported within and in frictional contact with the inner surface of said hollow cylinder.



3,890,515
MAGNETIC COUPLER FOR COUPLING ROTARY SHAFTS

Henri Fehr, Montmorency, and José Mallen-Herrero, Paris, both of France, assignors to Compagnie de Construction Mechanique Sulzer, Paris, France

Filed Nov. 29, 1973, Ser. No. 420,060
Claims priority, application Switzerland, Nov. 30, 1972, 17472/72
Int. Cl. H02k *49/04*
U.S. Cl. 310—104 **10 Claims**



1. A coupler for a pair of coaxial rotary shafts comprising a housing having means for generating an exciting field therein to produce magnetic flux;

a pair of coaxial rotors mounted in spaced apart relation to define an air gap therebetween, each rotor being disposed for mounting on a respective shaft;

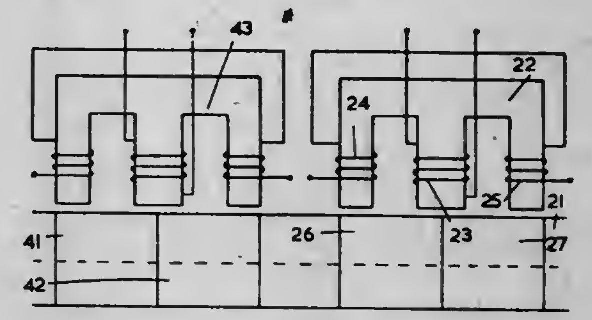
a pair of pole rings, each said pole ring being mounted on a respective rotor and located in said air gap in facing relation to each other; and

a stationary rigid gas-tight and liquid-tight partition disposed in said air gap between said pole rings to seal said rotors from each other, said partition including a plurality of magnetizable thin elongated elements extending parallel to and between said opposite poles and embedded in a non-magnetizable highly resistive material in a lattice-like manner, each element forming a magnetic path in the direction of the passage of the magnetic flux through said partition, said elements being electrically connected and grounded at one end, and an insulating layer separating each element from the adjacent elements from said connection through to the opposite end thereof to prevent looping.

3,890,516
PULSE PRODUCING DEVICES

Neville Bruce Widdowson, Redditch, and Christopher Varndell Cullingford, Inkberrow, both of England, assignors to The Lucas Electrical Company Limited, Birmingham, England

Filed Oct. 11, 1973, Ser. No. 405,436
Claims priority, application United Kingdom, Oct. 11, 1972, 46774/72; Apr. 11, 1973, 17507/73; Apr. 26, 1973, 19826/73
Int. Cl. H02k *39/00*
U.S. Cl. 310—111 **3 Claims**

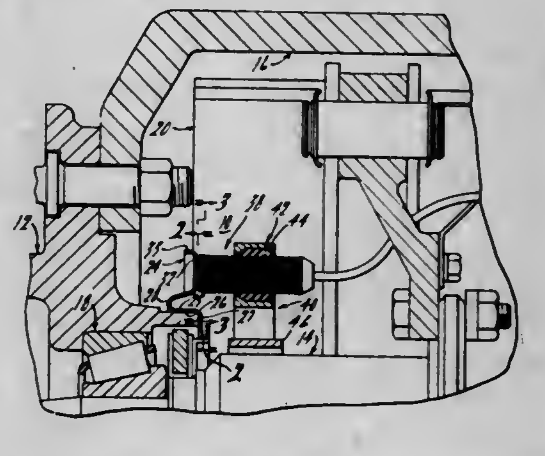


1. A pulse producing device comprising in combination a rotor, an E-shaped core, the outer end surfaces of the limbs of said core being co-planar, a first track on said rotor, said track incorporating a plurality of non-magnetic, conductive areas spaced from each other and the track being positioned so that, as the rotor rotates, said areas in turn pass close to said end surface of one outer limb of said core to modify the flow of flux between the central limb and said one outer limb, a second track on the rotor, the second track being parallel to the first track and also incorporating a plurality of non-magnetic conductive areas spaced from each other and alternating with the conductive areas on the first track, the areas on the second track passing close to said end surface of the other outer limb of said core to modify the flow of flux between the central limb and said other outer limb in turn as the rotor rotates, a first winding on the central limb of the core, and a second winding with two parts wound on the outer limbs of the core, one of said windings being fed in use with an a.c. input signal and an output being taken from the other winding.

3,890,517
WHEEL SPEED SENSOR

Jeffrey D. Marsh, and Gregg K. McPherson, both of Ann Arbor, Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

Filed Nov. 23, 1973, Ser. No. 418,558
Int. Cl. G01p *3/48;* **H02k** *19/24*
U.S. Cl. 310—168 **33 Claims**



1. A speed sensor for providing an electrical signal representative of the relative rotation between a pair of members comprising:

a stator having a first surface;

a rotor mounted on a rotatable one of said members having a second surface for confrontation with said first surface to provide a magnetic path between said first and second surfaces having a reluctance which varies with relative rotation of said stator and rotor;

magnetic means associated with said magnetic path for providing a source of magnetic flux for said path;

coil means associated with said magnetic path for providing said electrical signal; and

mounting means for mounting said stator on the other of said members with said first and second surfaces in confrontation, said mounting means including resilient means providing relative movement of said stator along a predetermined path with respect to said rotor upon engagement of said first and second surfaces tending to move said first and second surfaces apart and for restraining said relative movement when said first and second surfaces do not engage, said resilient means being an elastomeric member at least partly surrounding said stator and extending therealong for supporting engagement with said stator at at least two spaced locations along said path of movement.

3,890,518

SPARK IGNITION PLUG

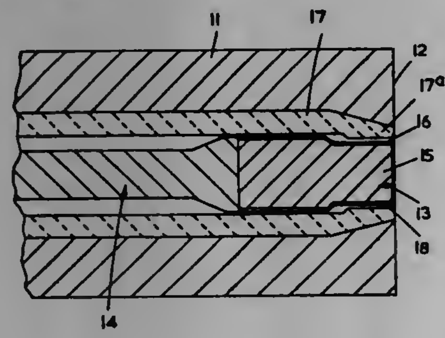
Terence Leslie Tombs, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed June 1, 1973, Ser. No. 366,078

Claims priority, application United Kingdom, June 1, 1972, 72-25628

Int. Cl. H01t *13/20*

U.S. Cl. 313—130 **4 Claims**



1. A spark ignition plug including an outer, annular electrode, an inner electrode formed at least in part of tungsten and an air gap between the electrodes, the tungsten part of the inner electrode being provided with a diffused, oxidation resistant surface layer of silicon.

3,890,519

SPARK DISCHARGE PLUGS

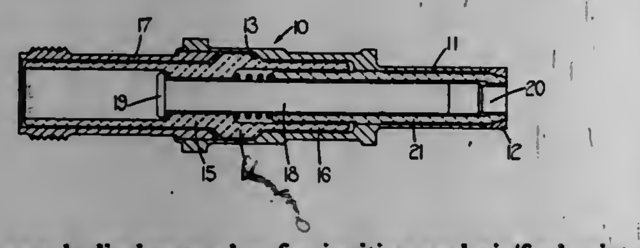
Henry James Chafer, Hemel Hempstead, and Stuart Graham, Coventry, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed May 30, 1973, Ser. No. 365,154

Claims priority, application United Kingdom, June 8, 1972, 26692/72

Int. Cl. H01t *13/22*

U.S. Cl. 313—130 **8 Claims**



1. A spark discharge plug for igniting and air/fuel mixture in an internal combustion engine and comprising an annular outer electrode, and inner electrode, an annular air gap intermediate the electrodes and an annular body of dielectric material having a permittvity of at least 50 interposed between one of the electrodes and the air gap, said body acting to ensure that when the electrodes are connected to a source of electric supply a substantial proportion of the voltage of the electric supply appears across the air gap.

3,890,520

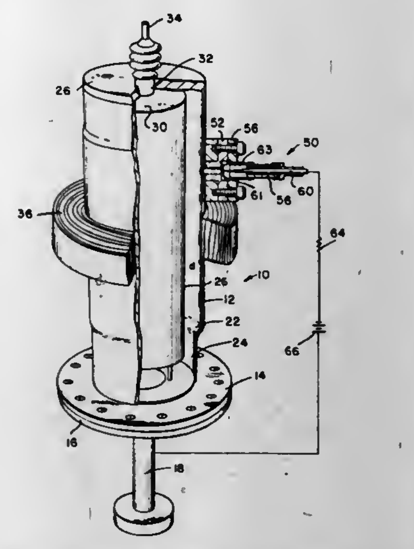
CONTINUOUS ELECTRON INJECTOR FOR CROSSED-FIELD SWITCH TUBES

Michael A. Lutz, Malibu, and Robert Holly, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 23, 1974, Ser. No. 508,389

Int. Cl. H01i *23/10*

U.S. Cl. 313—157 **3 Claims**



1. A crossed-field switch tube having an electron emitter, said crossed-field switch tube comprising:

a substantially cylindrical tubular cathode, a substantially cylindrical anode positioned within said cathode and defining an annular interelectrode space therebetween, said anode and said cathode being connectable to a source of electrode potential, a gas at subatmospheric pressure within said interelectrode space, the gas pressure being such, in relation with the interelectrode space dimension, that the conditions are outside the conductive area of the Paschen curve, a magnet positioned to provide a magnetic field in the interelectrode space so that an electron in the interelectrode space is caused to annularly spiral in the annular interelectrode space to provide cascading ionization and conduction between said anode and said cathode, said electron emitter comprising:

a field emitter in communication with said interelectrode space and insulated from one of said electrodes so that upon application of an electrical potential to said emitter, electrons are emitted into said interelectrode space to reduce ignition time delay and jitter of said crossed-field switch tube.

3,890,521

X-RAY TUBE TARGET AND X-RAY TUBES UTILISING SUCH A TARGET

Arvind Shroff, Paris, France, assignor to Thomson-CSF, Paris, France

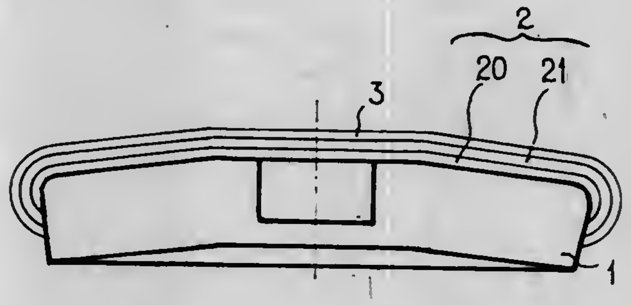
Filed Dec. 27, 1972, Ser. No. 318,904

Claims priority, application France, Dec. 31, 1971, 71.47766

Int. Cl. H01j *35/10*

U.S. Cl. 313—55 **2 Claims**

1. A target for X-ray tubes constituted by a carrier of graphite and an emissive layer made of tungsten covering said carrier and being separated by an intermediate layer, said intermediate layer is constituted by two sub-layers one of which is in contact the carrier and is made of an element selected from the group consisting essentially of iridium, osmium and ruthenium, and the other in contact with the emissive layer is made of an element selected from the group consisting essentially of hafnium, niobium, tantalum and zirconium.



3,890,522

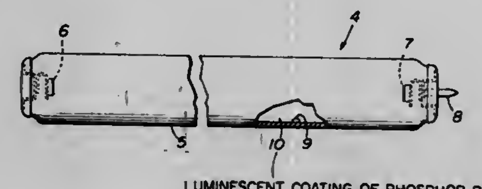
FLUORESCENT LAMP WITH PHOSPHOR COATING HAVING IMPROVED ADHERENCE TO ENVELOPE WALLS

Richard M. Klein, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 29, 1973, Ser. No. 364,568

Int. Cl. H01j *1/64, 63/04*

U.S. Cl. 313—485 **2 Claims**



LUMINESCENT COATING OF PHOSPHOR PARTICLES IN GLASSY PHOSPHATE MATRIX SELECTED FROM AMMONIUM DIHYDROGEN PHOSPHATE OR A MIXTURE OF ZINC NITRATE AND ORTHOPHOSPHORIC ACID

1. A fluorescent lamp comprising a tubular envelope; a coating on the interior surface thereof, said coating consisting essentially of a major amount of finely-divided phosphor particles within a minor amount of a glassy phosphate matrix selected from the group consisting of ammonium dihydrogen phosphate and a mixture of zinc nitrate and orthophosphoric acid, said coating exhibiting improved adherence to said interior surface without significantly decreasing the luminosity of said coating upon excitation, mercury vapor within said envelope; and a pair of electrodes spaced within said tubular envelope and being adapted for connection, at those portions thereof extending outside of said envelope, to means for producing an electric discharge within said tubular envelope.

3,890,523

VIDICON TARGET CONSISTING OF SILICON DIOXIDE LAYER ON SILICON

Raymond Poirier, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 130,625, April 2, 1971, abandoned. This application Dec. 13, 1972, Ser. No. 314,619

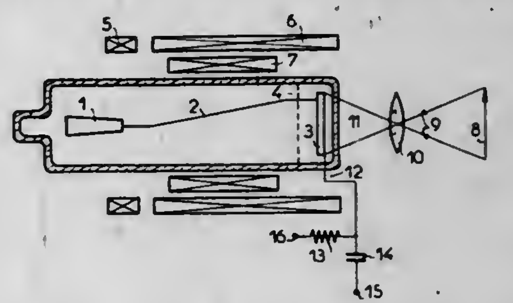
Claims priority, application France, Apr. 7, 1970, 70.12541

Int. Cl. H01j *29/45, 31/38*

U.S. Cl. 313—366 **3 Claims**

1. In a cathode ray tube intended for producing a video signal, a target consisting of:

an N-type silicon semiconductor layer having a face exposed to the incident light radiation and another face directed towards said cathode and deposited on said other face, a silicon dioxide dielectric layer upon said semiconductor layer having a uniform thickness comprised between 50 and 500 A in order to take the impact of the electron beam, the semiconductor and the dielectric layer having an interface, having free energy levels in the forbidden band of the semiconductor for trapping positive charge carriers, and means for applying to said face of said semiconductor layer a predetermined d.c. potential.



3,890,524

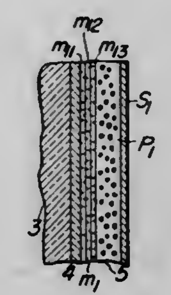
PHOTO-CONDUCTIVE TARGET COMPRISING BOTH SOLID AND POROUS LAYERS

Rokuro Watanabe, and Mitsuhiro Yoshikawa, both of Mobara, Japan, assignors to Hitachi, Ltd., Japan

Filed June 27, 1972, Ser. No. 266,708

Int. Cl. H01j *29/45, 31/38*

U.S. Cl. 313—386 **15 Claims**



14. A compound photo-conductive target for use in eletron gun type pick-up tubes comprising a transparent conductive film, a first thin amorphous solid layer provided on said conductive film, a second thin amorphous solid layer, and a porous layer intervening between said first and second thin amorphous solid layers, all of said layers consisting essentially of a photo-conductive material of the V–VI group of compounds, at least one of said solid layers having a multi-layer structure consisting of a plurality of sub-layers, the V-group element content of said photo-conductive material being greater for sub-layers successively remote from said transparent conductive film.

3,890,525

PHOTOCONDUCTIVE TARGET OF AN IMAGE PICKUP TUBE COMPRISING GRADED SELENIUM-TELLURIUM LAYER

Tadaaki Hirai, Koganei; Eiichi Maruyama, Kodaira; Kiyohisa Inao, Hachioji; Hideaki Yamamoto, Kokubunji; Naohiro Goto; Yukina Isozaki, both of Machida; Keiichi Shidara, and Teruo Uchida, both of Tokyo, all of Japan, assignors to Hitachi, Ltd. and Nippon Hoso Kyokai, both of, Japan

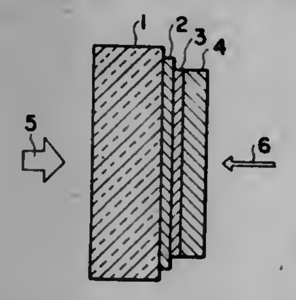
Filed June 15, 1973, Ser. No. 370,446

Int. Cl. H01j *29/45, 31/38*

U.S. Cl. 313—386 **10 Claims**

1. A photoconductive target of an image pickup tube comprising a light-transmitting substrate, a first N-type conductive layer deposited on said substrate and a P-type conductive layer making a rectifying contact at a first surface thereof with said first N-type conductive layer and having a second outer surface to be scanned by electrons, said P-type conductive layer including at least selenium and tellurium, the composition of said P-type conductive layer being different along the direction of the thickness thereof, the average content of selenium in said P-type conductive layer being not less than 50 atomic percent, the content of tellurium at said first and second surfaces of said P-type conductive layer being not more

than 10 atomic percent, the maximum tellurium content of 10 to 40 atomic percent being located on a plane in said P-type

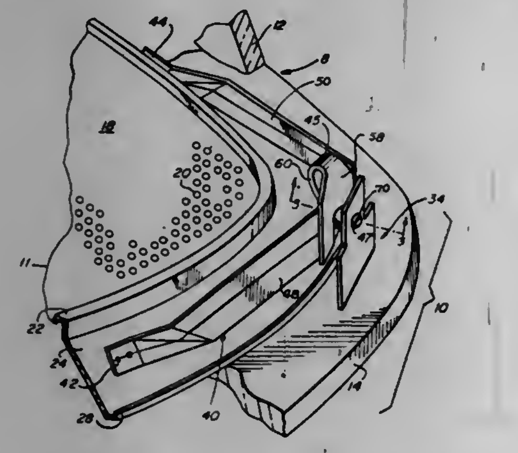


conductive layer between said first N-type conductive layer and the middle plane of said P-type conductive layer.

3,890,526
FACEPLATE MOUNTING STRUCTURE FOR CATHODE RAY TUBE COLOR SELECTION ELECTRODE

Kazimir Palac, Carpentersville, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Dec. 26, 1973, Ser. No. 428,176
Int. Cl. H01j *29/02, 29/08, 31/20*
U.S. Cl. 313—408 4 Claims



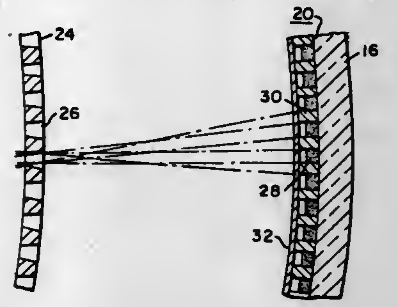
1. A component of a color cathode ray tube of a type having a color selection electrode which carries electrode suspension elements at a plurality of points spaced around the periphery thereof, comprising:
  a flangeless, three-dimensionally curved faceplate having a concave inner surface and
  a plurality of low-cost, lightweight metal studs embedded at spaced points around the periphery of said faceplate corresponding to the locations of the electrode suspension elements on the color selection electrode for supporting a color selection electrode in precise spaced relationship to said faceplate inner surface, each of said studs being relatively flat with a cross-section of substantially greater width than thickness and having a tip embedded in the envelope and means for making captive engagement with a suspension element on a color selection electrode.

3,890,527
TRIAD COLOR SCREEN HAVING ELEMENTS LARGER THAN MASK APERTURES NEAR SCREEN CENTER AND SMALLER NEAR PERIPHERY

Himanshu M. Patel, Horseheads, and George D. Dimmick, Bath, both of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 26, 1973, Ser. No. 354,579
Int. Cl.² H01J *29/07, 29/32*
U.S. Cl. 313—408 4 Claims

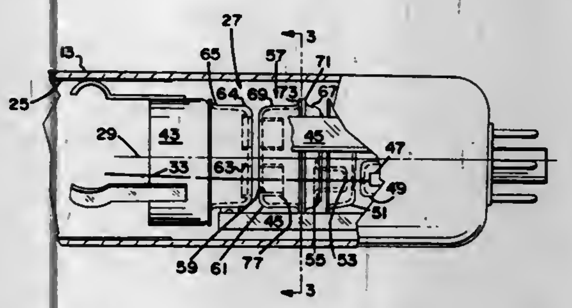
1. In a color television tube comprising; a hermetically sealed envelope, a phosphor screen faceplate portion having a plurality of triad arrays of phosphor windows with the individual phosphor windows comprising an electron beam excitable primary color emissive phosphor material surrounded by opaque material, electron gun means for directing an electron beam toward the phosphor screen, shadow mask means proximate the screen between the screen and gun means, said shadow mask having a plurality of apertures with individual apertures aligned to permit electron beam excitation of a single triad array of phosphor windows of the screen, the shadow mask apertures in the central portion of the shadow mask being slightly larger than the apertures through the remaining perimeter portion of the mask, the improvement wherein the phosphor window area for the central portion of the phosphor screen is greater than the area of the aligned mask aperture and approximately equal to the electron beam area which impinges the central portion of the screen, while the phosphor window area for the perimeter portion of the screen is less than the aligned mask aperture and electron beam area.



3,890,528
COMMON FOCUSING ELECTRODE FOR PLURALITY OF BEAMS AND HAVING SAME PLURALITY OF INTERNAL SHIELDS

Donald L. Say, Waterloo, and Harry E. Smithgall, Seneca Falls, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 29, 1974, Ser. No. 456,078
Int. Cl. H01j *29/50, 29/56*
U.S. Cl. 313—414 4 Claims

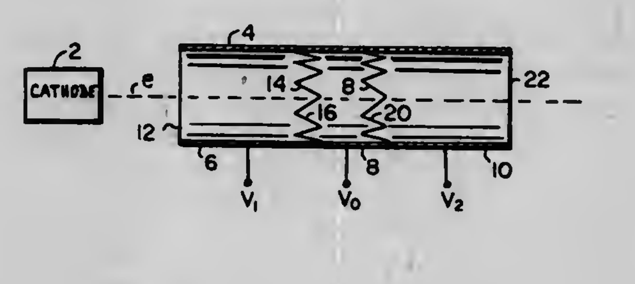


1. An improvement in a cathode ray tube multibeam bipotential electron gun structure having a longitudinal axis therethrough and having electron generating means therein formed to emit a plurality of separately controlled electron beams whereof each beam emanates from a substantially longitudinal arrangement of several related apertured grid electrodes positioned in sequential orientation in front of a rear positioned cathode component, said improvement being in the forward region of said electrode arrangement and comprising:
  a common focusing electrode member having a forward oriented front aperture plane spaced longitudinally from a rearward oriented rear aperture plane, said planes having a similar plurality of substantially circular related apertures therein, each of said front apertures having a defined tube-like extensive encompassing member of substantially cylindrical shaping integral with said front aperture plane and fabricated to extend rearward therefron a related smaller-dimensioned rear aperture formed in said rear aperture plane to effect shielding for the respective electron beam passing therethrough; each of said tube-like shielding members being of substantially equal cross-sectional dimensioning and having a length at least equaling 50 percent of the radius of the associated front aperture; and
  a common accelerating electrode member positioned forward of said focusing electrode member and having an aperture plane proximal to the front aperture plane of said focusing electrode member, said accelerating electrode aperture plane having a plurality of apertures therein substantially mating in a spatial manner with the front oriented apertures of said focusing electrode member, at least two of said accelerating electrode apertures being eccentrically aligned relative to said related focusing electrode front apertures to form non-symmetrical electrostatic lenses for focusing the respective individual electron beams traversing the particular region; each of said focusing electrode shielding members providing enhanced beam focusing by effecting improved symmetry of the equipotential lines of force in particularly the region of low beam velocity in the focusing electrode portion of said electrostatic lensing field.

3,890,529
COMPOUND ELECTROSTATIC LENS SYSTEM

Rudolf G. E. Hutter, New York, N.Y., and Herman O. Dressel, Lynnfield, Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 28, 1974, Ser. No. 473,539
Int. Cl. H01j *29/02, 29/48*
U.S. Cl. 313—460 5 Claims

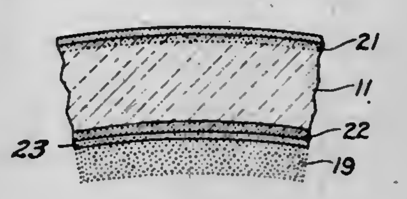


1. A compound electrostatic electrode lens system for combined focusing and acceleration of an electron beam comprising:
  A. first, second and third cylindrical electrode sections,
  B. the first section being even ended at one end and terminating in serrations of a first pattern at its other end,
  C. the second section having one end substantially adjacent to but insulated from the other end of the first section, the one end of the second section terminating in serrations which fill in the serrations of a first pattern of the first section, the other end of the second section terminating in serrations of a second pattern,
  D. the third section having one end substantially adjacent to but insulated from the other end of the second section, the one end of the third section terminating in serrations which fill in the serrations of a second pattern of the second section, the other end of the third section being even ended, and
  E. means for applying chosen potentials to each of the three sections,
  wherein both the first pattern and the second pattern are cyclic patterns which repeat at least eight times around the circumference of the cylindrical sections and which are diametrically symmetrical with respect to the axis of the cylindrical sections at all points on the axis and all rotational positions of the diameter.

3,890,530
PRECOAT FOR FLUORESCENT LAMP

Edward E. Hammer, Mayfield Village, and William C. Martyny, Lyndhurst, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 22, 1973, Ser. No. 325,430
Int. Cl. H01j *61/35*
U.S. Cl. 313—489 6 Claims

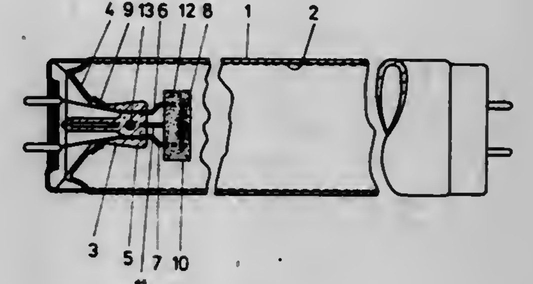


1. A mercury-vapor discharge lamp comprising a sealed glass envelope having electrodes sealed therein, and a composite protective barrier coating adhering to the inner surface of said envelope, said coating comprising a first layer consisting essentially of titanium dioxide coated on an adhering to the inner surface of said envelope and a second layer consisting essentially of aluminum oxide and antimony oxide over said titanium dioxide layer, and a phosphor coating over said second layer of the protective coating.

3,890,531
LOW PRESSURE MERCURY VAPOR DISCHARGE LAMP WITH AMALGAM

Ernst Panofski, Augsburg, and Erhard Rasch, Ottobrunn, both of Germany, assignors to Patent-Treuhand-Gesellschaft fur Elekstriche Gluhlampen mbH, Munich, Germany

Filed June 5, 1974, Ser. No. 476,478
Claims priority, application Germany, June 14, 1973, 2330391
Int. Cl.² H01J *61/26, 61/42*
U.S. Cl. 313—490 12 Claims



1. In a mercury vapor discharge lamp of the fluorescent type comprising an elongated transparent envelope having electrodes sealed into its ends, at least one of said electrodes being connected to an electrode positioning means, said electrode positioning means containing on its surface at least one ductile metal composition as the amalgam-forming metal, the improvement comprising utilizing as said ductile metal composition, a ductile amalgam-forming metal and at least one aluminum alloy selected from the group consisting of silicon-aluminum and beryllium-aluminum, said aluminum alloy being a separate solid phase dispersed throughout said ductile amalgam-forming metal at the operating temperature.

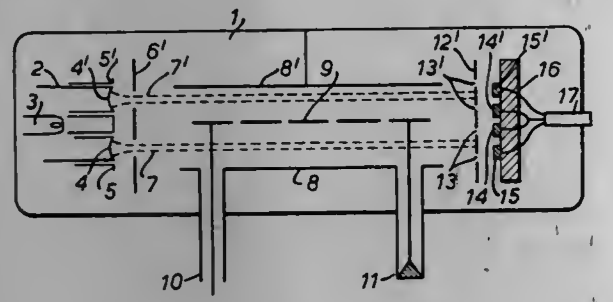
3,890,532
MICROWAVE AMPLIFIERS

Maurice Esterson, Chelmsford, England, assignor to English Electric Valve Company Limited, Chelmsford, England

Filed Oct. 3, 1973, Ser. No. 403,042

Int. Cl. H01j *23/16, 29/96*

U.S. Cl. 315—3 **6 Claims**



1. A microwave amplifier including means for generating and projecting two electron beams; a meander structure longitudinally positioned between and common to the two electron beams; two co-operating electrodes which are positioned so that the two electron beams and said meander structure lie between them; two pairs of beam receiving diodes, one pair for each beam, so positioned that each electron beam travelling undeflected between the meander structure and one of said co-operating electrodes will pass between a corresponding pair of beam receiving diodes; and means for coupling R.F. energy to the meander structure, whereby in operation the R.F. energy produces a transverse electric field between the meander structure and each said co-operating electrode so as to deflect the two electron beams in opposite directions such that each electron beam impinges upon one diode of its respective pair of beam receiving diodes.

3,890,533
THERMAL EMISSION TYPE ELECTRON GUN

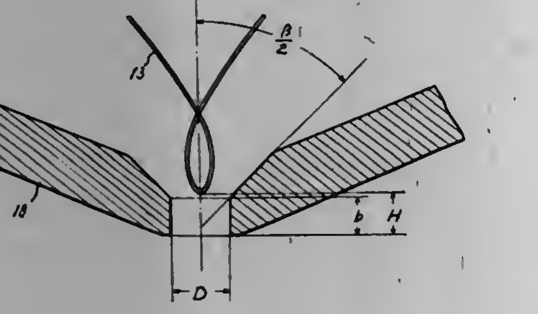
Akira Tanaka, Akishima, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed July 9, 1973, Ser. No. 377,812

Claims priority, application Japan, Aug. 8, 1972, 47-83891

Int. Cl. H01j *29/70*

U.S. Cl. 315—31 R **3 Claims**



1. In a thermal emission type electron gun comprising a filament for emitting thermal electrons, an anode arranged to face said filament, a voltage source for supplying high potential difference between said filament and anode, a Wehnelt electrode having an opening therein through which said electrons pass, said Wehnelt electrode arranged between said filament and anode, the side of said Wehnelt electrode facing the anode being convex, and means for supplying a potential to maintain the Wehnelt electrode at a negative potential with respect to the filament, the improvement comprising the distance H between the tip of the filament and the lower rim of the Wehnelt opening satisfying the relation $0.4D \leq H \leq 0.8D$ where D is the diameter of the opening the Wehnelt electrode, and the surface of the Wehnelt electrode near the opening being substantially cylindrical and the surface about the opening facing the filament being substantially cone-shaped and the angle β of said cone-shaped portion with the axis of the cylindrical opening satisfying the relation $30° \leq \beta \leq 90°$.

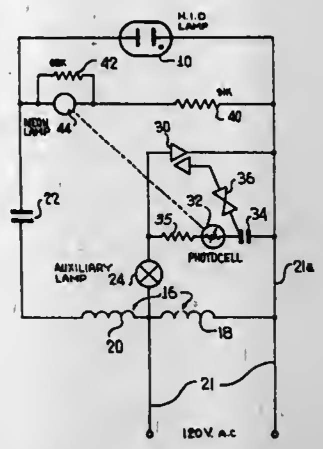
3,890,534
LIGHTING CONTROL SYSTEM

Victor Horowitz, Oceanside, N.Y., assignor to Current Industries, Inc., Oceanside, N.Y.

Continuation-in-part of Ser. No. 371,503, June 19, 1973, abandoned. This application June 19, 1974, Ser. No. 480,711

Int. Cl.² H05B *37/04, 41/46*

U.S. Cl. 315—92 **5 Claims**



1. A circuit for energizing an auxiliary lamp only in response to hot start condition of a high intensity discharge lamp, consisting of a voltage sensing circuit connected directly across said high intensity discharge lamp, means responsive only to a voltage as sensed by said voltage sensing circuit indicating that said high intensity lamp is in hot start condition for supplying energizing current to said auxiliary lamp, and a common source of ac voltage for said lamps, wherein said voltage sensing circuit includes a resistive voltage divider connected directly across said high intensity discharge lamp, a neon lamp connected across one of the resistors of said resistive voltage divider, said resistive voltage divider having a division relation such that said neon lamp is illuminated only in response to hot start conditions of said high intensity discharge lamp, said auxiliary lamp current supplying means including a triac connected in series with said auxiliary lamp across said source of AC voltage, and means including a photocell responsive only to illumination of said neon lamp for firing said triac, said last means including a phasing capacitor and a phasing resistance connected in series with said photocell across said source of ac voltage, and means connecting a trigger circuit of said triac to an electrode of said capacitor.

3,890,535
ION SOURCES

Guy Gautherin, Orsay, and Jean Aubert, Vaucresson, both of France, assignors to Agence National de Valorisation de la Recherche (ANVAR), Paris, France

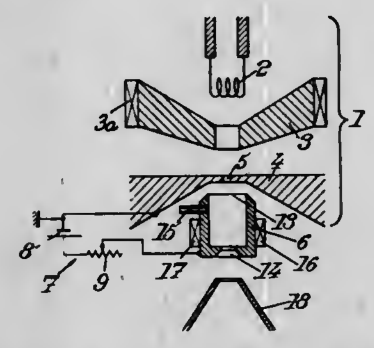
Filed Oct. 11, 1972, Ser. No. 296,594

Claims priority, application France, Oct. 13, 1971, 71.36701

Int. Cl. H01j *37/08;* **H05h** *1/00*

U.S. Cl. 315—111 **10 Claims**

1. Ion source comprising a primary plasma generator constituted by a hot cathode and an anode, between which an arc is produced, said anode defining an extraction orifice, and by an intermediate electrode pinching the arc in proximity to said extraction orifice in the anode, magnetic field producing means creating a magnetic field between the intermediate electrode and the extraction orifice, an extraction electrode downstream of said anode, said extraction orifice of the anode having a relatively small cross-section so that the pressure of the gases occurring inside said primary plasma generator is independent of the pressure existing downstream of said extraction orifice, said pressure downstream of the extraction orifice being less than said pressure inside the primary plasma generator, said generator comprising a fifth electrode arranged downstream of the extraction orifice of the anode and upstream of the extraction electrode and means for applying to said fifth electrode a potential positive with respect to that of the anode and of adjustable value, said positive potential being small in absolute value compared to the potential of the extraction electrode with respect to that of said fifth electrode.



3,890,536
ELECTRONIC FLASH DEVICE FOR PHOTOGRAPHY

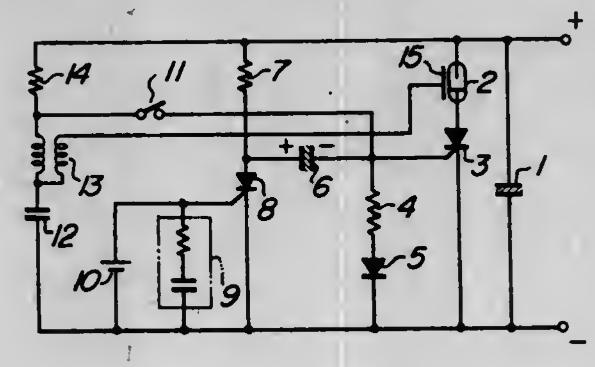
Hiroshi Iwata, Osaka, Japan, assignor to West Electric Company, Ltd., Osaka, Japan

Continuation of Ser. No. 134,798, April 16, 1971, abandoned. This application Apr. 3, 1973, Ser. No. 347,378

Claims priority, application Japan, Apr. 27, 1970, 45-36576; Apr. 27, 1970, 45-36577; June 8, 1970, 45-49681; June 8, 1970, 45-49682; June 8, 1970, 45-49683

Int. Cl. H05b *37/02*

U.S. Cl. 315—151 **7 Claims**



1. An electronic flash device comprising a luminescent discharge tube having a trigger electrode; a gate turn off element having an anode, a cathode and a gate and connected in series with said discharge tube; a main discharging capacitor connected across the series circuit of said discharge tube and said gate turn off element; a series circuit of a trigger capacitor, the primary of a transformer, a switch, a resistor and a diode, said resistor and said diode being connected between the gate and cathode of said gate turn off element to provide a first trigger circuit for applying a first trigger pulse voltage to said gate turn off element, the secondary of said transformer being connected to the trigger electrode of said discharge tube to provide a second trigger circuit for applying a second trigger pulse to said discharge tube, said first and second trigger circuits simultaneously applying the first and second trigger pulse voltages to said gate turn off element and said discharge tube, respectively, to simultaneously trigger said gate turn off elmeent and said discharge tube when said switch is closed to cause said trigger capacitor to discharge through the primary of said transformer, said resistor and said diode, said main discharging capacitor being discharged upon the simultaneous triggering of said discharge tube and said gate turn off element, so that said discharge tube is energized for luminescence; a luminescence detection circuit to monitor light radiated from said discharge tube and reflected by a foreground subject; and a control circuit coupled to said luminescence detection circuit, including a series circuit of a semiconductor switching element and a control capacitor, connected between the gate and cathode of said gate turn off element, said diode being coupled to said control capacitor forwardly with respect to the charging direction of said control capacitor and reversely with respect to the discharging direction of said control capacitor, said semiconductor switching element being triggered by said detection circuit when the quantity of light received by said luminescence detection circuit reaches a predetermined value; said control capacitor being discharged upon triggering of said semiconductor switching element to impress a reverse cut-off voltage across the gate and cathode of said gate turn off element, thereby cutting off said gate turn off element to turn off said discharge tube.

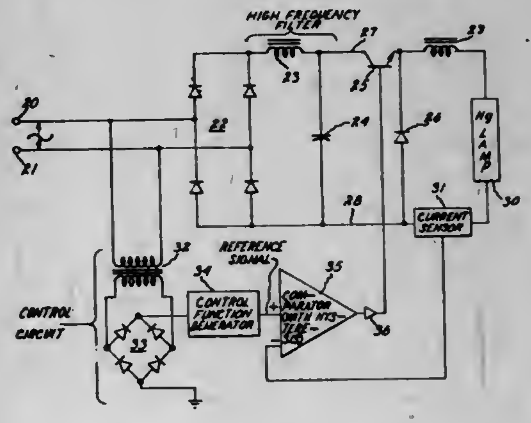
3,890,537
SOLID STATE CHOPPER BALLAST FOR GASEOUS DISCHARGE LAMPS

John N. Park, Rexford; Steven C. Peak, Schenectady, and Robert L. Steigerwald, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 2, 1974, Ser. No. 430,088

Int. Cl. H05b *41/24;* **G05f** *1/08*

U.S. Cl. 315—208 **15 Claims**



1. A solid state ballast circuit for gaseous discharge lamps comprising

a solid state chopper circuit for energization by low frequency alternating-current line voltage and line current and including high frequency filter means for supplying sinusoidal power voltage between a pair of supply terminals and controlled switching means and coasting device means effectively coupled to said supply terminals and coasting inductor means to be conductive alternately to supply lamp current through said coasting inductor means to a gaseous discharge lamp,

current sensor means coupled to sense the instantaneous lamp current and produce a sensor signal indicative thereof,

a control circuit comprising generating means for generating a reference signal with a preselected waveshape and magnitude to determine the power level and to effect shaping of said lamp current and therefore the line current to obtain a high power factor, comparing means for effectively comparing said sensor and reference signals and producing an output signal, and means actuated by said output signal for supplying turn-on and turn-off signals to operate said controlled switching means at a variable high frequency chopping rate and shape said lamp current as determined by said reference signal,

said control circuit further comprising means for temporarily shaping and increasing the magnitude of said reference signal at start-up to obtain a high starting lamp current, and

said control and chopper circuits further comprising means for supplying minimum lamp current for good reignition characteristics during the low voltage regions of said line voltage in each cycle when said comparing means is ineffective to shape the lamp current.

3,890,538

PHOTOGRAPHIC ELECTRONIC FLASH APPARATUS

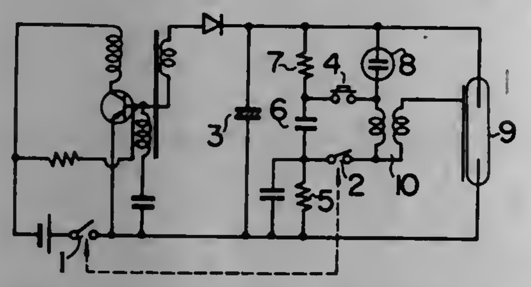
Hiroshi Iwata; Yasunori Sawada, both of Osaka, and Tetsuo Yamaoka, Settsu, all of Japan, assignors to West Electric Company, Ltd., Osaka, Japan

Filed Dec. 26, 1973, Ser. No. 427,729

Claims priority, application Japan, Dec. 28, 1972, 47-3450

Int. Cl. H05b *41/32*

U.S. Cl. 315—241 P **6 Claims**



1. A photographic flash apparatus comprising: a D.C. to A.C. converter circuit having a low-voltage power supply coupled to a transformer primary through a transistor and a first switching means, for generating a high voltage A.C. signal in an output winding of said transformer;
   - rectifying means connected to the output winding of said transformer for converting the high voltage A.C. signal into a high voltage D.C. signal;
   - a main discharge capacitor connected to said rectifying means and being charged from the high D.C. voltage;
   - a flash discharge tube having anode and cathode electrodes connected to said main discharge capacitor and also having a trigger electrode;
   - a trigger circuit including a resistor, a trigger capacitor coupled to said resistor, a trigger switch and a trigger transformer coupled to each other and to said resistor and trigger capacitor, said trigger transformer including an output winding connected to said trigger electrode of said flash discharge tube; and
   - a second switching means electrically coupled to said trigger circuit and coupled with said first switching means of said converter circuit, said second switching means rendering said trigger circuit operative to trigger said flash discharge tube when said first switching means is in an on state and rendering said trigger circuit inoperative to prevent it from triggering said tube when said first switching means is in an off state.

3,890,539

IGNITION OF DISCHARGE TUBES

Michel Remery, Evreux, France, assignor to U.S. Philips Corporation, New York, N.Y.

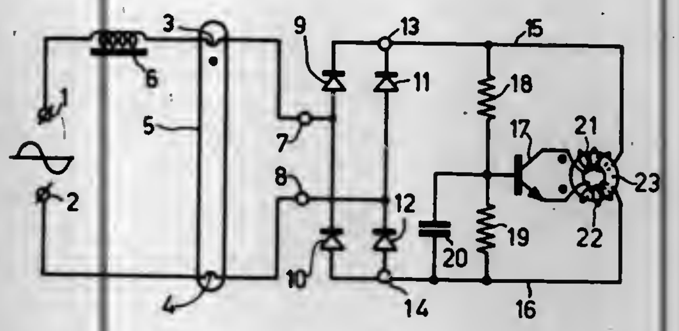
Filed Dec. 6, 1973, Ser. No. 422,588

Claims priority, application France, Dec. 15, 1972, 72.44734; Feb. 26, 1973, 73.06689

Int. Cl. H05b *41/16*

U.S. Cl. 315—273 **11 Claims**

1. A control circuit for an electric discharge tube provided with at least two electrodes comprising, a pair of input terminals for applying an AC supply voltage to said control circuit, an inductor, means connecting the series arrangement of the inductor and the discharge tube across said input terminals, an auxiliary branch circuit for connecting the tube electrodes electrically together for a short time during the ignition procedure and including a rectifier member having input terminals connected to the tube electrodes and an output section connected to two electrical supply conductors which serve to supply a transistor circuit for establishing said short-lasting electrical connection, the transistor circuit comprising a transformer having a first winding which is connected between the collector of the transistor and one of the two supply conductors and a second winding connected between said second supply conductor and a second electrode of the transistor, and means connecting the third transistor electrode to the second supply conductor.



3,890,540

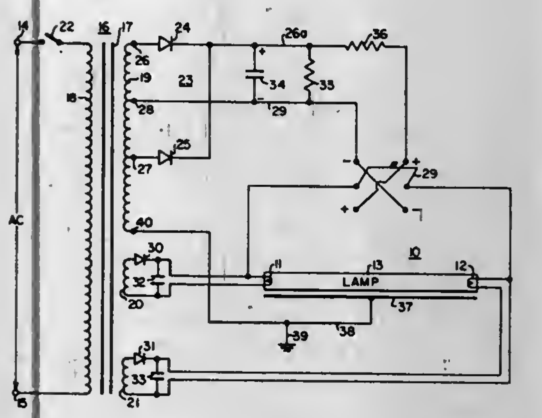
APPARATUS FOR OPERATING GASEOUS DISCHARGE LAMPS ON DIRECT CURRENT FROM A SOURCE OF ALTERNATING CURRENT

Henry Whitfield Ott, Sarasota, Fla., assignor to John Ott Laboratories, Inc., Sarasota, Fla.

Filed Feb. 19, 1974, Ser. No. 443,825

Int. Cl. H05b *41/04, 41/19*

U.S. Cl. 315—335 **9 Claims**



1. Apparatus for starting and operating a gaseous discharge lamp so as to provide flickerless operation of the lamp, said lamp having a pair of electrodes across which a voltage is applied to start and operate the lamp, said apparatus comprising:
   - a. a conductor member placed in close proximity to the lamp so that a small capacity exists between the conductor member and the lamp electrodes,
   - b. power transformer means adapted to be connected to an AC power source comprising two series-connected secondary winding sections,
   - c. rectifier means having an AC input circuit connected to one of said secondary winding sections and an output circuit connected to the lamp electrodes for operating the lamp on a DC current flowing between the lamp electrodes, and
   - d. circuit means connecting said conductor member to the other of said secondary winding sections at a potential point such that an AC voltage is applied across the conductor member and the lamp electrodes whereby a capacitive current flows therebetween to aid starting of the lamp without causing an AC ripple in the DC current flowing between the lamp electrodes.

3,890,541

CATHODE RAY TUBE APPARATUS

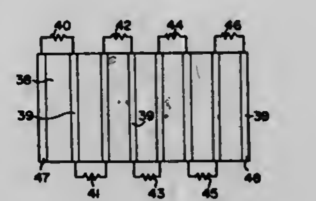
Brian Dennis McCarthy, Oxted, and Anthony Victor Krause, Ashtead, both of England, assignors to Sanders Associates, Inc., South Nashua, N.H.

Filed Mar. 31, 1971, Ser. No. 129,824

Claims priority, application United Kingdom, Apr. 2, 1970, 15746/70

Int. Cl. H01j *29/70*

U.S. Cl. 315—366 **8 Claims**



1. Cathode ray tube apparatus including an electron beam source, an electroluminescent screen, a beam-directing electrode spaced from the screen and including an insulating support sheet, a series of parallel strips of conductive material on the support sheet and resistor elements interconnecting the ends of the strips to provide a series connection; the electron beam source being arranged to launch an electron beam into the space between the screen and the beam-directing electrode, means to connect beam-directing potentials between the screen and the beam-directing electrode to provide a beam-directing field in the space between them for directing the electron beam towards the screen and means to deflect the beam in two directions arranged to be operative upon the beam before it enters the space.

3,890,542

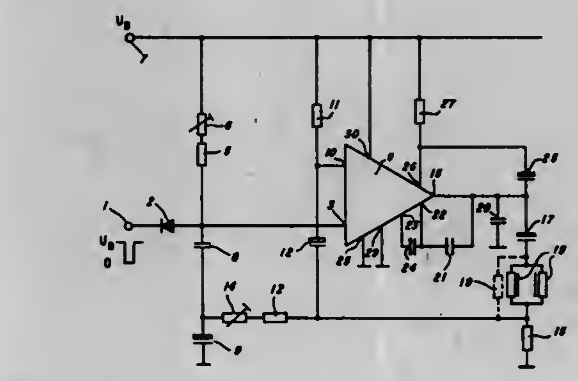
VERTICAL DEFLECTION CIRCUIT FOR TELEVISION RECEIVERS

Gunter J. Zimmermann, Drosselstrasse 12, 8051 Langenbach, Germany

Filed Aug. 15, 1973, Ser. No. 388,437

Int. Cl. H01j *29/70*

U.S. Cl. 315—389 **2 Claims**



1. Vertical deflection circuit for a television receiver, including vertical deflection coil means; integrated circuit audio amplifier means having an output connected by capacitor means to one end of said deflection coil means, said amplifier means including a differential input stage having an inverting input and a non-inverting input; a DC supply terminal connected to said amplifier to supply a DC bias voltage thereto; a repetitive saw-tooth deflection control signal generating circuit connected to said non-inverting input; said amplifier being operable to supply deflection current to said deflection coil means in response to said deflection control signal;
   - a DC supply voltage terminal connected to said amplifier means, and said amplifier means including means for producing internal symmetry of said amplifier such that said amplifier produces a quiescent output voltage equal to about one-half of said supply voltage, resistance means connected externally of said amplifier means between said DC supply terminal and said inverting input to substantially cancel said internal symmetry of said amplifier to reduce the value of said quiescent output voltage so that substantially the whole magnitude of said DC supply voltage is utilized in driving said deflection current through said deflection coil means; said deflection control signal generating means comprising first high value resistance means connected between said DC voltage supply terminal and said non-inverting input and capacitor means connected to said non-inverting input so that said capacitor means is charged from said DC voltage supply terminal through said high value resistor means; and means for applying repetitive pulses to said inverting input to rapidly discharge said capacitor means such that said charging and discharging of said capacitor means generates said repetitive saw-tooth deflection control signal; the other end of said deflection coil means being connected to a reference potential by second resistance means so that current flow through said deflection coil means generates a voltage across said second resistance means proportional to said current; feedback capacitor means connected between said inverting input and the junction between said resistor and said other end of said deflection coil means to feedback to said inverting input a negative feedback current having a magnitude determined by said current flow through said vertical deflection coil means thereby to significantly increase the effective internal resistance of said audio amplifier means and reduce the damping effect thereof on said vertical deflection coil means.

3,890,543

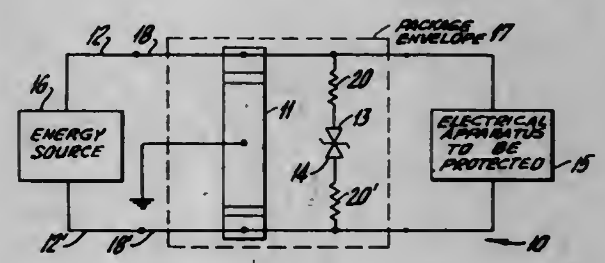
LOW VOLTAGE SURGE PROTECTION NETWORK

Gaylord D. Jonassen, Smithtown, N.Y., assignor to Telecommunications Industries, Inc., Copaigue, N.Y.

Filed Sept. 14, 1973, Ser. No. 397,258

Int. Cl. H02h *3/22*

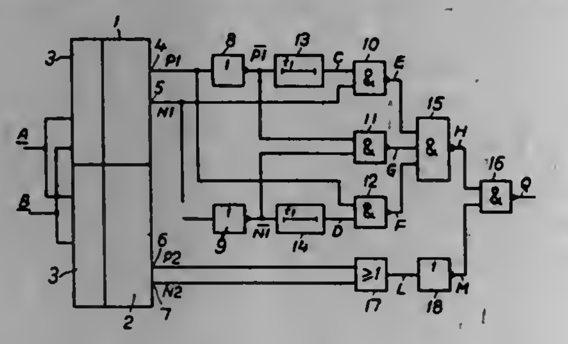
U.S. Cl. 317—16 **10 Claims**



1. A low voltage surge protection network for protecting from a line imbalance electrical apparatus coupled across an energy source, said network comprising:
   - a. a pair of semiconductor switching devices electrically coupled in series, in an oppositely poled back-to-back configuration, said electrical characteristics providing for instantaneous triggering upon the occurrence of a line imbalance;
   - b. a multi-electrode gas tube arrester wherein one of said electrodes is electrically coupled to ground, said multi-electrode gas tube arrester being rendered conductive by a voltage level that is below that which would cause the destruction of said pair of Zener Diodes;
   - c. means for providing direct electrical coupling of said Zener Diode configuration across the ungrounded electrodes of said multi-electrode gas tube arrester;
   - d. means for electrically coupling said network across said source of energy and in shunting configuration with said electrical apparatus; and

e. thermal responsive means for interrupting the flow of electrical energy to said network upon having said network reach a predetermined temperature level, wherein said means for interrupting the flow of electrical energy to said network comprises a hollow electrically conductive lining electrically coupled at one end to an ungrounded electrode of said multi-electrode gas tube arrester and the other end of said hollow electrically conductive lining being electrically coupled to said means for electrically coupling said network across said source of energy, said electrically conductive lining being encapsulated within a thermal and electrically insulative material.

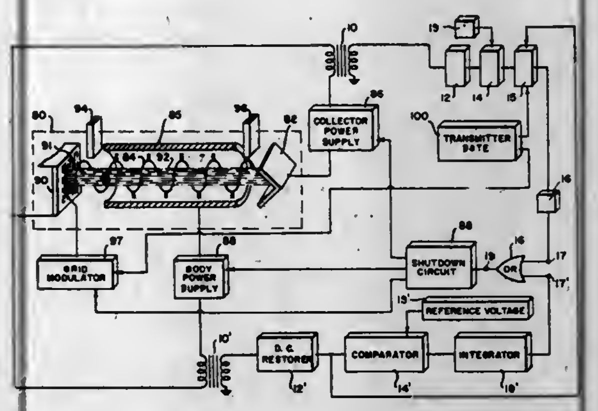
3,890,544
MEANS FOR LIMITING THE DYNAMIC OVERREACH IN, FOR EXAMPLE, AN IMPEDANCE RELAY
Michel Chamia, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Apr. 15, 1974, Ser. No. 460,988
Claims priority, application Sweden, May 21, 1973, 7307107
Int. Cl.^{2} H02H *3/26*
U.S. Cl. 317—27 R **4 Claims**



1. Means for limiting the dynamic overreach in impedance relays and the like comprising a first comparator means (1) for comparing the condition of two periodic alternating quantities (A, B) and including means to deliver a signal of a definite appearance when a primary condition is fulfilled, a second comparator means (2) including means to deliver a signal when a secondary condition is fulfilled, the secondary condition being a limitation of the primary condition, and means connecting the two comparator means to each other to transmit a tripping signal when the primary condition is fulfilled at two consecutive measuring opportunities as well as when the secondary condition is fulfilled at any measuring opportunity.

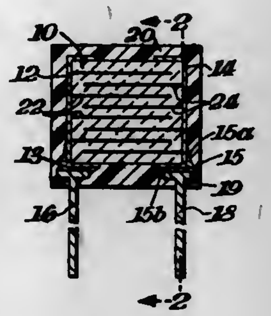
3,890,545
TRAVELING-WAVE-TUBE PROTECTION CIRCUIT
Robert Rosen, Granada Hills, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Apr. 12, 1974, Ser. No. 460,317
Int. Cl.^{2} H02H *7/20*
U.S. Cl. 317—51 **9 Claims**

1. A protection circuit for an electronic device having a current path within said device comprising:
- a transformer having a primary and a secondary winding, means connecting said primary winding serially with said current path;
- a d.c. restorer circuit having an input coupled to said secondary winding;
- a comparator circuit coupled to the output of said d.c. restorer circuit and having a reference voltage generator which produces a predetermined voltage representative of current desired in said path, and providing an output signal when the voltage at the output of said restorer circuit exceeds said reference voltage;
- an integrator having an input connected to the output of said comparator and providing an output signal when said comparator output signal remains present for longer than a predetermined period of time; and



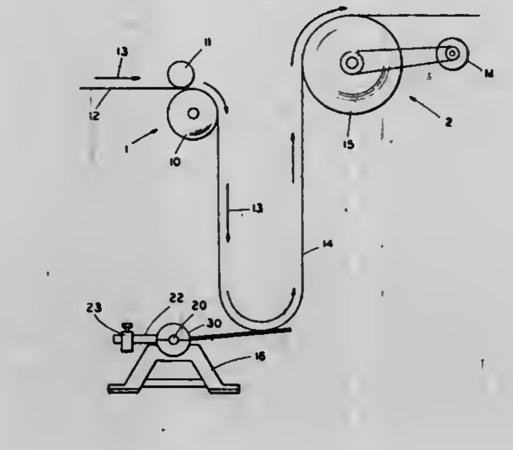
- protection means coupled to said integrator and responsive to an output signal therefrom for shutting off power to said device.

3,890,546
ELECTRICAL COMPONENT WITH OFFSET RADIAL LEADS
James H. Coleman, Wichita Falls, Tex., assignor to Sprague Electric Company, North Adams, Mass.
Filed June 3, 1974, Ser. No. 475,465
Int. Cl. H01c *1/035, 1/14*
U.S. Cl. 317—258 **9 Claims**



1. An electrical component having radial offset leads comprising:
- a rectangular electrical component body;
- a first and second metal coating covering one face and an opposite face of said body, respectively, each said coating extending over a portion of a common adjacent face of said component body;
- a first and second lead wire extending away at right angles from said common adjacent face, said lead wires each having an enlarged end portion and a shaft portion, a part of said enlarged end portion of said first and second lead wires being offset and projecting outwardly beyond said one and said opposite faces, respectively; and
- solder bonds between said enlarged end portions of said first and second lead wires and said first and second coatings, respectively, a solder fillet filling the corner formed at said projecting enlarged end portion, said shaft of said lead wires lying in a plane that is essentially coincident with a bisecting plane of said body, a first body surface plane in which said one body face lies being intersected by said shaft of said first lead wire and a second body surface plane in which said opposite body face lies being intersected by said shaft of said second lead wire.

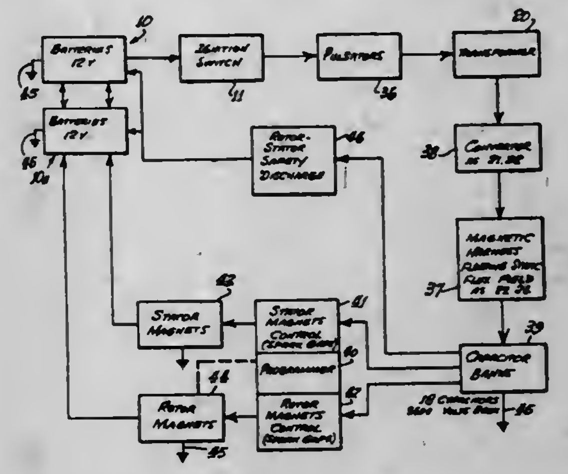
3,890,547
SPEED CONTROL DEVICE
Norman Keck, 707 Fourth Ave., Joliet, Ill. 60433
Filed Mar. 31, 1972, Ser. No. 239,927
Int. Cl. B65h *23/18*
U.S. Cl. 318—6 **4 Claims**



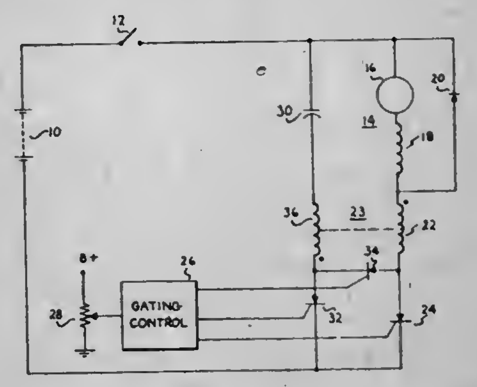
1. In a machine wherein a flexible material is passed at varying speeds through one section of the machine and also through another section of the machine with said material sagging between said sections to form a loop, said machine having a device coordinating the speed of said material in each of said sections, the improvement in said device comprising a titltable structure, a switch on said tiltable structure, said switch being of the type which shifts between making contacts and breaking contacts when its axis is tilted to a predetermined angle with the horizontal, said switch being adjustably mounted on said structure to permit adjustment by tilting said switch with respect to said tiltable structure, means sensitive to the extent said material sags between said sections for tilting said structure, and means sensitive to a shift of said switch upon the tilting of said switch to bring its axis to said predetermined angle for changing the speed of said material through one of said sections to bring the speed of said material in said sections more nearly into equilibrium, said machine including a plurality of said switches mounted on said tiltable structure each separately tiltable with respect to said structure, each of said switches being separately adjustable to permit tilting of the switch with respect to said structure, said sensitive means being effective to tilt said structure to a predetermined angle to operate one of said switches when said material sags to one extent and to tilt said structure to operate another of said switches when said material sags to a greater extent, and means sensitive to the operation of said other switch for changing by a second increment the speed at which said material passes through said one section to thereby bring the speed of said material in said sections still more nearly into equilibrium.

3,890,548
PULSED CAPACITOR DISCHARGE ELECTRIC ENGINE
Edwin V. Gray, Northridge, Calif., assignor to Evgray Enterprises, Inc., Van Nuys, Calif.
Filed Nov. 2, 1973, Ser. No. 412,415
Int. Cl. H02p *5/00*
U.S. Cl. 318—139 **18 Claims**

15. An electric engine, comprising:
- fixed electromagnets;
- movable electromagnets movable into alignment with said fixed electromagnets;
- capacitor means;
- means for charging said capacitor means; and
- means for discharging said charged capacitor means through said fixed and movable electromagnets to polarize said aligned fixed and movable electromagnets for magnetic repulsion.



3,890,549
PULSE CONTROL SYSTEM POWER CIRCUIT
Charles Edward Konrad, Roanoke, Va., assignor to General Electric Company, Salem, Va.
Filed Apr. 1, 1974, Ser. No. 456,465
Int. Cl. H02p *5/16*
U.S. Cl. 318—246 **10 Claims**



1. A pulse control power system for controllably metering power from a DC source to a load, comprising:
- a thyristor for coupling the load to a source of DC current;
- the series combination of a capacitor, inductive means, and a first unidirectional conducting means, said series combination being adapted to be coupled in parallel with said thyristor and the load;
- a second unidirectional conducting means for coupling said capacitor across the load, and poled in a direction opposite to that of said first unidirectional conducting means; and
- a gating control for periodically initiating conduction of said thyristor and for subsequently initiating the conduction of one of said unidirectional conducting means to effect commutation of said thyristor.

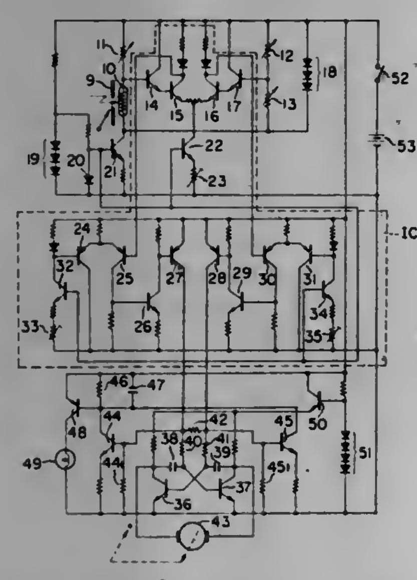
3,890,550
DIFFERENTIAL AMPLIFIER CIRCUIT FOR SERVO SYSTEM
Hideo Izumi, and Toshikazu Ichiyanagi, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 25, 1972, Ser. No. 256,819
Claims priority, application Japan, May 28, 1971, 46-36801
Int. Cl. G05f *1/00*
U.S. Cl. 318—678 **10 Claims**

1. An electric circuit for a servo system, comprising:
- a first differential circuit to produce a direct-current signal corresponding to a deviation of an input signal from a

reference value to be set, said differential circuit having two output terminals;

two semiconductor switching circuits connected to said output terminals of said differential circuit, respectively, each of said switching circuits including a second differential circuit having a first transistor, the input terminal of which is electrically connected to one of the two output terminals of said first differential circuit, and a second transistor, the input terminal of which is electrically connected to a constant voltage for applying a reference voltage to said second differential circuit and bias level varying means for varying the reference voltage;

an astable multivibrator having at least one output terminal and input terminals electrically connected to the output terminals of said second differential circuits, said astable multivibrator being constituted so as to produce an alternating pulse current having a variable and reversible direct-current component in response to the output of said second differential circuits and to produce such pulse current only when at least one of said second differential circuits provides an output to an input of said astable multivibrator;



servo control means electrically connected to the output of said astable multivibrator, said servo control means including means for causing the input to said first differential circuit to approximate said reference voltage,

whereby upper and lower limits of a non-sensitive range of said servo control means are controllable by said bias level varying means which varies the reference voltage level and in turn operating points of said second differential circuits.

3,890,551
REGENERATIVE BRAKING CIRCUIT

Allen B. Plunkett, Lawrence Park, Pa., assignor to General Electric Company, Erie, Pa.

Filed Jan. 24, 1974, Ser. No. 436,340
Int. Cl. H02p *3/18*

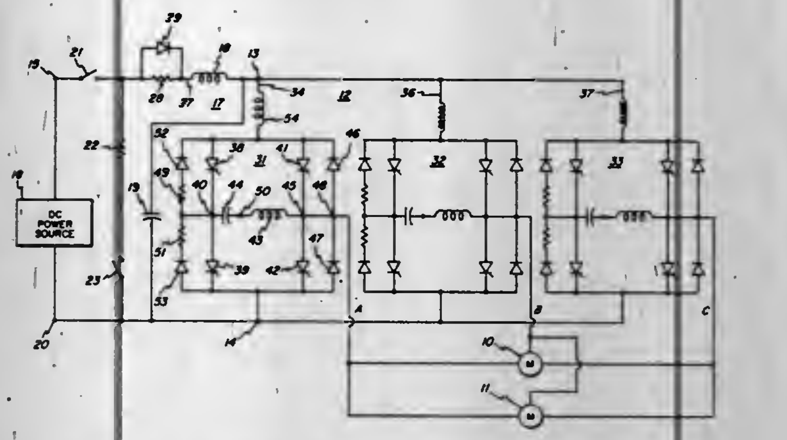
U.S. Cl. 318—376 **15 Claims**

1. A power conversion circuit for connection across a d-c power source comprising:

a. power conversion means having input terminals for connection to said d-c power source and output terminals for connection to a load;

b. commutation means connected to said power conversion means to commutate the current between said input and said output terminals, said commutation means having an increased commutation ability with increased voltage across said input terminals;

c. a dynamo electric machine for connection across said output terminals, said machine being capable of separately performing motoring and generating functions, so as to receive power from said power conversion means during periods of motoring and deliver power thereto during periods of generation;



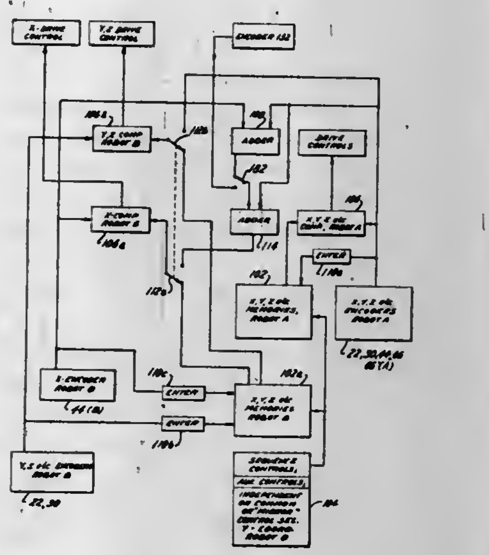
d. means for increasing the voltage across said input terminals above that which exists at said power source during periods of generation, thereby allowing said commutation means to commutate a greater amount of power during generation than during motoring.

3,890,552
DUAL-ARMED MULTI-AXES PROGRAM CONTROLLED MANIPULATORS

George C. Devol, 990 Ridgefield Rd., Wilton, Conn. 06897, and Paul S. Martin, 189-54 43rd Rd., Flushing, N.Y. 11358

Filed Dec. 29, 1972, Ser. No. 319,360
Int. Cl. G05b *19/42*

U.S. Cl. 318—568 **16 Claims**



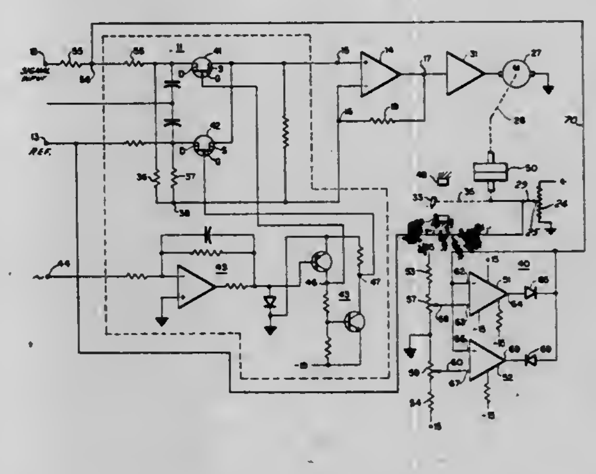
1. In combination, first and second manipulators of like construction having first and second work heads, respectively, for performing complementary operations, said manipulators being disposed in relation to each other for enabling said work heads to perform said complementary operations, said first manipulator including operating means for effecting translation of said first work head through a succession of motions, said operating means having plural actuating means for effecting translation of said first work head along plural coordinates and control means for said actuators including means for providing successive commands, and said second manipulator including second operating means having plural actuating means for effective translation of said second work head through a succession of translations along plural coordinates corresponding to those of the first manipulator, said second operating means being responsive at least indirectly to the successive commands of said first manipulator for positioning said second work head to perform operations complementary to said first work head.

3,890,553
DIRECT COUPLED AMPLIFIER IN NULL BALANCE CIRCUIT OR THE LIKE

Allen M. Diamond, Orange, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Oct. 23, 1973, Ser. No. 408,993
Int. Cl. G05b *5/01*

U.S. Cl. 318—678 **14 Claims**



1. A circuit for achievement of null balance comprising in combination with a signal input terminal and a reference terminal:

switch means with an output terminal intermittently shifted between connection to the signal input terminal and the reference terminal,

a voltage divider connected between the signal input terminal and the reference terminal,

an average voltage terminal connected to an intermediate point on the voltage divider,

a differential amplifier with first and second input terminals and an output terminal, the first being directly connected to the switch means output terminal and the second being connected to the average voltage terminal,

an adjustable-voltage source of reference voltage with adjusting means, said source being connected to said reference terminal, and

driving means responsive to output of said differential amplifier for driving said adjusting means.

3,890,554
SYSTEM FOR DRIVING A PULSE MOTOR

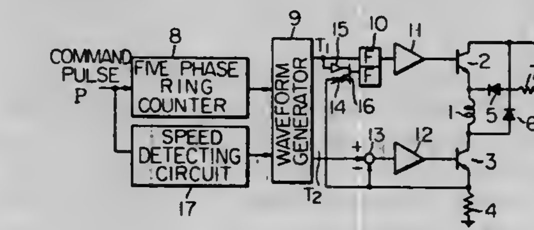
Norito Yoshitake, Hino; Hiroshi Usami; Katsuo Kobari, both of Yokohama; Hiroshi Ishida, and Yoshiki Fujioka, both of Hino, all of Japan, assignors to Fujitsu Limited and Fujitsu Fanuc Limited, Tokyo, Japan

Filed Apr. 18, 1974, Ser. No. 462,131

Claims priority, application Japan, Apr. 26, 1973, 48-47727; Apr. 26, 1973, 48-47728

Int. Cl. H02k *37/00*

U.S. Cl. 318—696 **4 Claims**



1. A system for driving a pulse motor in response to command pulses comprising:

exciting signal generating means for generating polyphase rectangular exciting signals each of which has a predetermined phase difference depending on the speed of said command pulses and poly-phase trapezoid exciting signals each of which has a predetermined phase difference depending on the speed of said command pulses,

controlling means for controlling exciting currents which are supplied to exciting coils of said pulse motor in response to both the poly-phase rectangular exciting signals and the poly-phase trapezoid exciting signals,

speed detecting means for detecting whether said speed of said command pulses is lower or higher than a predetermined speed, and

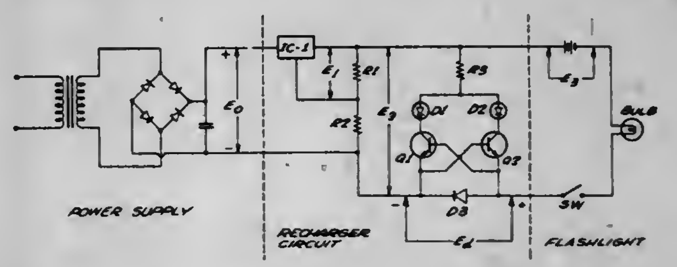
means for supplying said poly-phase trapezoid exciting signals to said controlling means when said speed of said command pulses is a low range and for supplying said poly-phase rectangular exciting signals to said controlling means when said speed of said command pulses is in a high range.

3,890,555
BATTERY RECHARGING CIRCUIT WITH INDICATOR LIGHTS

Norman C. Nelson, New Berry Springs, and Daniel C. Harley, Apple Valley, both of Calif., assignors to Kel-Lite Industries, Inc., Barstow, Calif.

Filed Sept. 6, 1973, Ser. No. 394,746
Int. Cl. H02j *7/02;* **F21l** *9/00*

U.S. Cl. 320—2 **3 Claims**



1. A battery recharger comprising:

a regulated D.C. voltage source and a charge control diode coupled together to form a series circuit;

means for coupling said series circuit in a series loop with a battery circuit such that the battery voltage opposes the voltage of said source; and

indicator circuit means coupled across said charge control diode for indicating the charging condition, including both a "CHARGE" indicator light and a "POWER OFF" indicator light;

said indicator circuit means being biased by said control diode when current from said voltage source flows through said series loop to cause said "CHARGE" indicator light to be energized and said "POWER OFF" indicator light to be deenergized; and

said indicator circuit means being biased by said control diode when said voltage source is ineffective and current from said battery flows from said series loop to cause said "CHARGE" indicator light to be deenergized and said "POWER OFF" indicator light to be energized.

3,890,556
BATTERY CHARGERS

William Gordon Melling; John Stevens; Peter George McLellan; Brian Turton Smith; Richard Gascoine Massey; John Barrington Knight, and Robert Nigel Lang, all of London, England, assignors to Westinghouse Brake & Signal Co. Ltd., London, England

Filed Sept. 24, 1973, Ser. No. 400,001

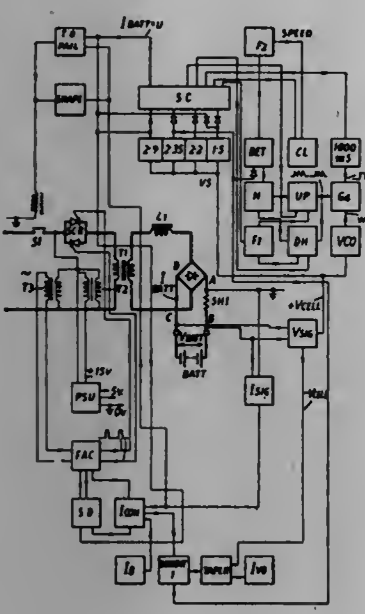
Claims priority, application United Kingdom, Oct. 14, 1972, 47491/72; Nov. 11, 1972, 52200/72; Apr. 24, 1973, 19464/73

Int. Cl. H02j *7/04*

U.S. Cl. 320—21 **17 Claims**

1. A battery charging control circuit in which the state of battery charge is assessed by measurement when the battery charging current is interrupted and including means operative during an interruption to time a period of time, means responsive to the end of said period to register the battery voltage,

means to compare the registered battery voltage with the battery voltage registered earlier during an interruption of charging current and means responsive to the result of said comparison to control the charging current thereafter applied to the connected battery.



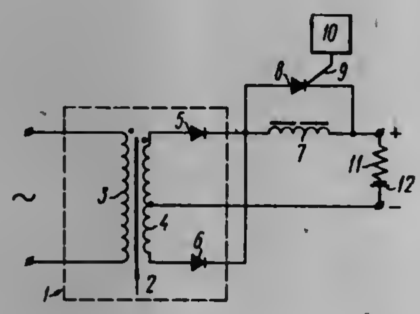
3,890,557
DEVICE FOR SETTING UP ARC CURRENT IN PULSED ARC WELDING

Georgy Yakovlevich Bogdanov, ulitsa Gavrskaya 4, kv. 71; Jury Andreevich Deminsky, ulitsa Lenina 44, kv. 1; Mikhail Isaakovich Zax, ulitsa Shkolnaya 3, kv. 4, and Jury Viktorovich Tsygankov, ulitsa vavilovykh 11/3, kv. 118, all of Leningrad, U.S.S.R.

Filed Nov. 13, 1973, Ser. No. 415,380

Int. Cl. B23k *9/06*

U.S. Cl. 321—16 **3 Claims**



1. A device for setting up an arc current in pulsed arc welding comprising: a rectifier; a choke connected to the output of said rectifier and adapted for smoothing pulsations of rectified current; a controllable valve connected in parallel to said choke and shunting said choke within a pre-set period of pulsation of the rectified current voltage with a delay as to the commencement of the rectified current voltage pulsation period.

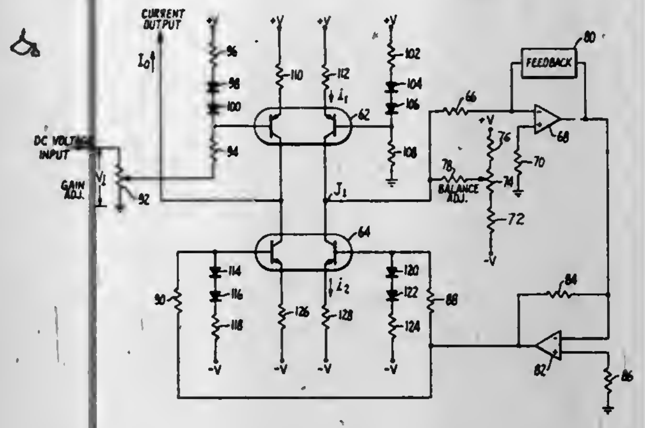
3,890,558
VOLTAGE CONTROLLED BI-DIRECTIONAL STABLE SOURCE APPARATUS

Barrett Earl Guisinger, Saratoga, and Bert H. Dann, Mountain View, both of Calif., assignors to International Video Corporation, Sunnyvale, Calif.

Filed Apr. 27, 1973, Ser. No. 355,220

Int. Cl. G05f *3/02*

U.S. Cl. 323—4 **2 Claims**



1. Voltage controlled current source apparatus comprising first and second independently amplifying voltage controlled amplifier means, said amplifier means including first and second solid state devices arranged on a single chip,

- first and second current source means connected to each of said amplifier means, respectively, for generating respective currents proportional to voltages applied to said amplifier means, said first current source current taken as the output current, said current source means including first and second solid state devices arranged on a single chip,
- means for applying a control voltage to said first amplifier means,
- means for applying a reference voltage to said second amplifier means,
- comparator means receiving the current from said second current source for comparing said second current source current to a reference for generating a comparator error voltage proportional to the difference between said second current source current and said reference, and
- means for applying said comparator error voltage to said first and second current source means to drive said second current source current to the level of said reference level whereby said first current source current is stabilized.

3,890,559
CIRCUIT FOR MONITORING AND CONTROLLING MULTIPLE POWER SUPPLIES

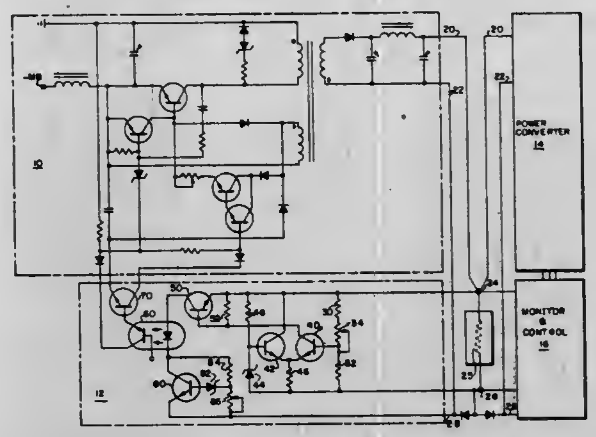
Karl H. Kuster, Glendale Heights, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 20, 1974, Ser. No. 471,262

Int. Cl. G05f *1/64*

U.S. Cl. 323—21 **8 Claims**

1. A voltage monitor and control system, connected between at least one power supply and a common load, said power supply including a direct connection to said load and including a control circuit connection, said monitor and control system comprising: a differential amplifier, a first voltage reference means connected to said differential amplifier; sensing means, connected between said load and said differential amplifier, operated in response to a voltage change at said load to cause said differential amplifier to generate an output signal proportional in magnitude to said voltage change; isolating means connected to said power supply control circuit connection; amplifying means connected between said isolating means and said differential amplifier; operated in response to said differential amplifier output signal, to operate said isolating means to extend a control signal to said power supply over said control circuit connection; and a second voltage reference means connected between said isolating means and said power supply operated in response to voltage changes at said power supply output to limit the operation of said isolating means beyond a predetermined level.



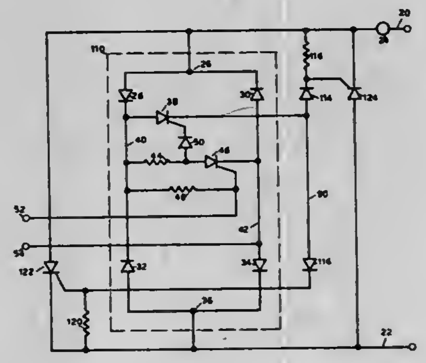
3,890,560
SOLID STATE ZERO-SENSING CONTROL

Thomas R. Huellinghorst, Florissant, Mo., assignor to Unidynamics/St. Louis, Inc., St. Louis, Mo.

Filed Oct. 24, 1972, Ser. No. 299,937

Int. Cl. H03k *17/56*

U.S. Cl. 323—22 SC **19 Claims**



1. A zero-sensing control which is very stable and which comprises a Zero-Crossing signal-sensing SCR, means connecting the anode of said signal-sensing SCR to the positive terminal of a D.C. source which is connected directly in series with a load and conducts a control current which flows thru said load and which recurrently increases the control voltage thereof from essentially zero to a peak value and then permits that control voltage to decrease to essentially zero, second means connecting the cathode of said signal-sensing SCR to the negative terminal of said D.C. source, one of said means including a resistor, (and) a further resistor connected between said positive terminal of said D.C. source and the gate of said signal-sensing SCR, and control SCR, third means connecting the gate-cathode circuit of said control SCR in parallel relation with the anode-cathode circuit of said signal-sensing SCR, whereby said signal-sensing SCR will effectively shunt said gate-cathode circuit of said control SCR and thereby keep said control SCR from becoming conductive whenever said signal-sensing SCR becomes conductive, and a threshold device in said third means, said threshold device being non-conductive whenever said anode-cathode circuit of said signal-sensing SCR is conductive and thereby preventing the flow of "firing" current through said gate-cathode circuit of said control SCR, said threshold device being conductive whenever said anode-cathode circuit of said signal-sensing SCR is non-conductive and thereby permitting the flow of "firing" current through said gate-cathode circuit of said control SCR.

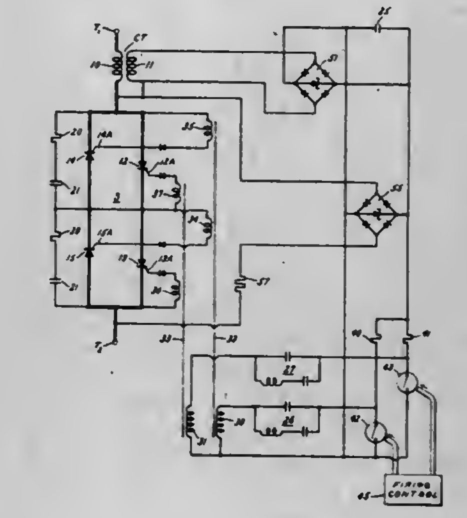
3,890,561
GATE PULSE POWER SUPPLY FOR STATIC ALTERNATING CURRENT SWITCHES

Donald M. Demarest, Wallingford, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Nov. 16, 1973, Ser. No. 416,559

Int. Cl. G05f *1/44*

U.S. Cl. 323—24 **6 Claims**



1. Alternating current static switching apparatus for an electric power circuit comprising, at least one pair of gate controlled semiconductor devices connected in inverse parallel branch circuit relation between a pair of switch terminals, said semiconductor devices each including an anode, a cathode and a gating electrode and said devices being oppositely poled for conduction of opposite half cycles of alternating power current, synchronous gate pulse generating means connected to supply current pulses to said gating electrodes during opposite half cycles when forward voltage exists between the anode and cathode of said devices respectively thereby alternately to render said devices conductive, electric energy storage means for energizing said gate pulse generating means, means responsive to voltage between said switch terminals to supply electric charging current to said energy storage means during non-conductive intervals of switch operation, and means responsive to the flow of power current through at least one of said semiconductor devices to supply electric charging current to said energy storage means during conductive intervals of switch operation.

3,890,562
REGULATED POWER SUPPLY UTILIZING A HALFWAVE SWITCH

Thomas G. West, Fort Wayne, Ind., assignor to General Electric Company, Indianapolis, Ind.

Continuation of Ser. No. 305,715, Nov. 13, 1972, abandoned. This application Jan. 25, 1974, Ser. No. 436,560

Int. Cl. G05f *1/64*; **H02p** *13/24*

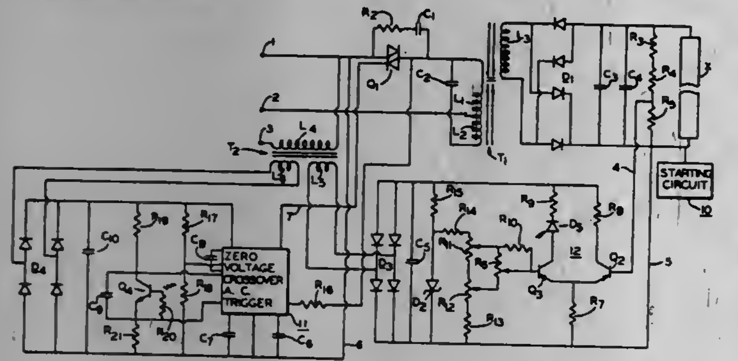
U.S. Cl. 323—14 **4 Claims**

1. A power supply circuit comprising:

- first and second input terminals for connecting said circuit to an AC source;
- half wave which means having a pair of conduction electrodes and a control electrode, one of said pair of conduction electrodes being connected to said first input terminal;
- gating means connected to said control electrode, said gating means including a zero voltage crossover AC trig-

ger; said trigger including means for sensing the voltage across said half wave switch; said trigger further including means for applying a control signal to said control electrode only near zero voltage crossover for gating on said half wave switch;

a high leakage reactance transformer having a primary winding, an extension winding and a secondary winding; one side of said primary winding being connected to the other of said pair of conduction electrodes; the other side of said primary winding being connected to said second input terminal;



output capacitance means for providing charge storage connected to said secondary winding; said output capacitance means and said transformer drawing input current which initially is lagging and approaches unity as said output capacitance means approaches full charge;

power factor capacitance means connected across said primary winding and said extension winding, said power factor capacitance means drawing leading input current of sufficient magnitude to minimize the overall circuit input current for the total charging time of said output capacitance means, such that the overall circuit input is at times lagging and at times leading.

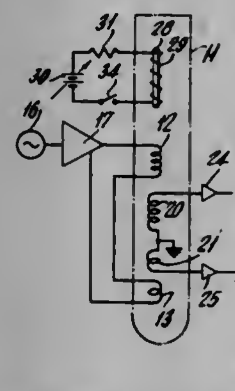
3,890,563
MAGNETIC SUSCEPTIBILITY LOGGING APPARATUS FOR DISTINGUISHING FERROMAGNETIC MATERIALS

Donald J. Dowling, and Kerry D. Savage, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 24, 1973, Ser. No. 409,203

Int. Cl. G01v ***3/10, 3/18***

U.S. Cl. 324—6 **1 Claim**



1. In magnetic susceptibility bore hole logging, the combination comprising

a logging tool,

a transmitter coil on said tool for introducing an AC magnetic field into a surrounding medium,

a receiver coil on said tool and spaced from said transmitter coil for developing a signal that is influenced by said surrounding medium,

unidirectional magnetic-field-generating means mounted on said tool for applying a magnetic saturaing field to said medium,

said last-named means comprising a high-permeability core having a saturation coil wound thereon,

a capacitor connected in circuit with said saturation coil for discharging therethrough,

an electronic switch in circuit with said capacitor for controlling said discharge, and

means including a delay circuit for gating said transmitter coil energization off until transients from said transmitter discharge have been dissipated.

3,890,564
APPARATUS FOR INDUCING EDDY CURRENT IN A SEMICONDUCTOR WAFER FOR MEASURING THE ELECTRIC CONDUCTIVITY OR RESISTIVITY THEREOF

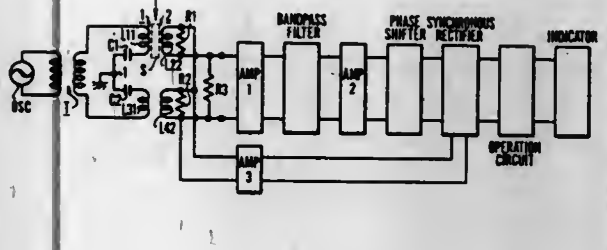
Takashi Watanabe; Koichi Watamura; Kazuya Kawatani, and Hideo Aoki, all of Tokyo, Japan, assignors to Ohkura Electric Company, Limited, Tokyo, Japan

Filed Nov. 3, 1972, Ser. No. 303,594

Claims priority, application Japan, July 4, 1972, 47-66847; July 4, 1972, 47-78931; July 4, 1972, 47-78932; July 4, 1972, 47-78933; July 4, 1972, 47-78934

Int. Cl. G01r ***33/12***

U.S. Cl. 324—40 **7 Claims**



1. An apparatus for measuring electric conductivity or resistivity of a semiconductor wafer with no electric contact to said wafer, comprising

an exciting circuit including a first extending coil for measuring, and a second exciting coil for compensating which are connected in series to each other,

an oscillator for supplying an alternating current to said first and second exciting coils,

a detecting circuit having a first detecting coil which is positioned spaced apart from said first exciting coil to form a gap therebetween, said wafer being inserted in said gap for measurement, and a second detecting coil for compensating which is connected in series opposition to said first detecting coil and is magnetically connected to said second exciting coil, thereby a differential output being obtained between each end of said first and second detecting coils,

a pair of U-shaped magnetic cores on which said first coils, respectively, are wound in such arrangement that the ends of each said magnetic core have the same polarity but the opposite polarity with respect to the ends of the other,

a bandpass filter means for eliminating higher harmonics and noise component being provided in an output portion of said detecting circuit,

a phase shifter means operatively connected to said bandpass filter means for shifting the phase of the output of said bandpass filter means by 90° with respect to the phase of the voltage induced in said second detecting coil,

a synchronous rectifier means for rectifying synchronously the output of said phase shifter with reference to the output across said second detecting coil,

an operation circuit means for obtaining an output proportional to the electric conductivity or resistivity of said wafer from the output of said synchronous rectifier means and data concerning the thickness of said wafer, and an indicator means for indicating the output of said operation circuit means.

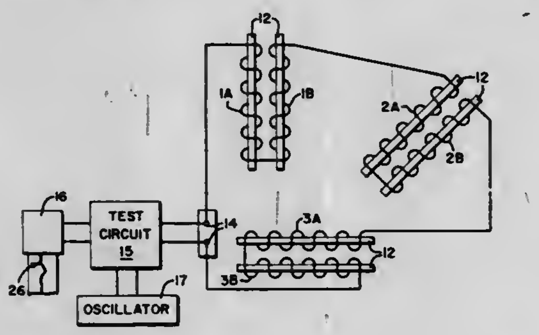
3,890,565
MEASURING CORE REDUCTANCE

Arthur W. Obenschain, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 25, 1960, Ser. No. 24,634

Int. Cl. G01r ***33/02***

U.S. Cl. 324—43 R **4 Claims**



1. A method for measuring the reductance of cores in a total field magnetometer wherein the magnetometer is placed in a constant, unidirectional magnetic field of a predetermined value, the magnetometer comprising three pairs of previously matched orthogonally arranged cores, the first pair of matched cores being parallel to the magnetic field, the second and third pair of matched cores being perpendicular to the magnetic field, which comprises the steps of (1) substituting for one of the cores of the second pair of matched cores a different core which is to be tested, (2) applying calibrated magnetic fields parallel to the first pair of cores to produce a first effect on the magnetometer, (3) rotating the magnetometer 90° from an original position about an axis parallel to the third pair of cores to produce a second effect on the magnetometer, (4) rotating the magnetometer 90° back to the original position thereof and (5) measuring the difference between the first and second effects whereby the difference measurement is indicative of said different core reductance.

3,890,566
METHOD AND AN ARRANGEMENT FOR VOLTAGE TESTING AND DRYING OF ELECTRICALLY INSULATED CONDUCTORS

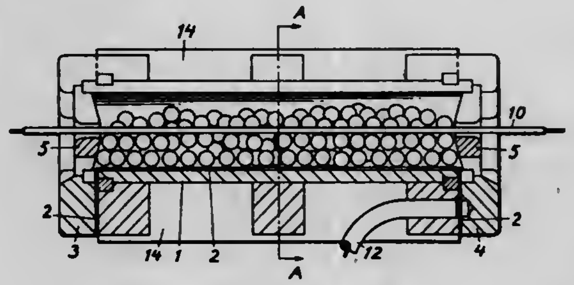
Sven Sigurd Nordblad, Spanga, and Karl-Erik Svensson, Hagersten, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Jan. 2, 1974, Ser. No. 429,978

Claims priority, application Sweden, Jan. 19, 1973, 73007619

Int. Cl. G01r ***31/16;*** **F26b** ***13/24***

U.S. Cl. 324—54 **8 Claims**



1. A method for voltage testing and drying an extruded or equivalently treated insulated conductor having an inner core of electrically conducting material and an outer insulation which is damp comprising the steps:

drawing the damp conductor in its longitudinal direction through a chamber, said chamber containing electrically conducting and freely movable spheres and said spheres contacting each other and the insulation of said conductor, and

applying a test voltage across the inner core of the conductor and said spheres while forcing the spheres in said chamber into movement around said insulated conductor so that the moisture on the insulation is transferred to the surfaces of all the spheres for faster evaporation while simultaneously testing the insulation of the insulated conductor.

3,890,567
TEMPERATURE COMPENSATED RESISTANCE MEASURING OF AN ELONGATED ELECTRICAL CONDUCTOR

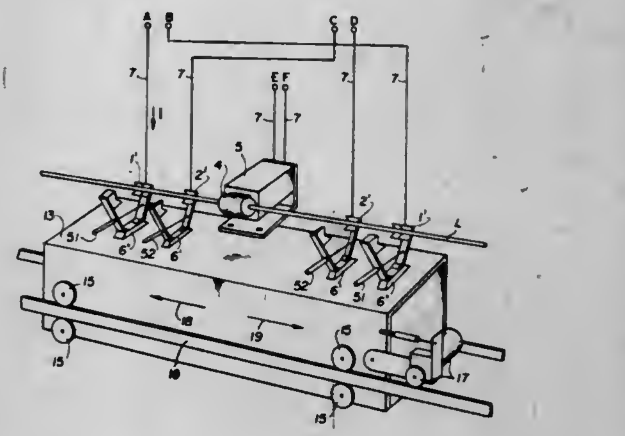
Manfred Knüifflmann, Dhunnberg 18, Leverlusen-Schlebusch, and Ingo Seldel, Sulzburgerstr. 263, Koln-Sulz, both of Germany

Continuation-in-part of Ser. No. 242,637, April 10, 1972, abandoned. This application Jan. 11, 1974, Ser. No. 432,524

Claims priority, application Germany, Apr. 14, 1971, 2118015

Int. Cl. G01r ***27/14***

U.S. Cl. 324—64 **9 Claims**



6. Apparatus for determining the resistance of an elongated conductor while said conductor moves in a path in the direction of elongation thereof comprising:

a. a carrier;

b. guide means for guiding movement of said carrier in said direction adjacent said path;

c. a plurality of contacts mounted on said carrier and spaced in said direction;

d. engaging means for releasably engaging said contacts with said conductor in longitudinally spaced relationship, and for thereby maintaining a conductive connection between said contacts while said conductor moves in said path and said carrier moves in said direction jointly with said conductor; and

e. resistance measuring means for measuring the resistance between two of said contacts while said two contacts move jointly with said carrier and said conductor.

3,890,568
METHOD AND APPARATUS FOR PARTICLE LENGTH MEASUREMENT

Wallace H. Coulter, Miami Springs, and Walter R. Hogg, Miami Lakes, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

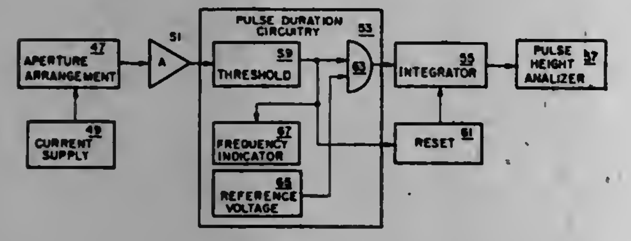
Filed Nov. 6, 1972, Ser. No. 304,127

Int. Cl. G01n ***27/00***

U.S. Cl. 324—71 CP **29 Claims**

1. A method for measuring the length of particles of substantially uniform cross-section which have been electronically scanned by a Coulter type of particle scanning aperture arrangement that generates a particle pulse for each scanned particle, the particle pulses having differing amplitudes depending upon particle volume and cross section, said method comprising the steps of: measuring the time duration that each

particle pulse exceeds a known percentage of its maximum amplitude, all particle pulses being measured at the same



percentage value, and converting said time duration to a signal parameter which is a measurement of particle length.

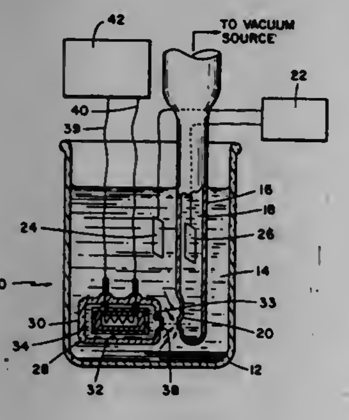
3,890,569
PARTICLE STUDY DEVICE

Walter R. Hogg, Miami Lakes, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Division of Ser. No. 279,436, Aug. 10, 1972, Pat. No. 3,859,012. This application May 24, 1974, Ser. No. 473,127

Int. Cl. G01n *27/00*

U.S. Cl. 324—71 CP **28 Claims**



1. In a particle study device comprising a sensing zone, means for passing a fluid suspension of particles through said sensing zone and means for sensing the presence of the particles within the influence of said sensing zone and for producing a signal in response to each particle sensed, the improvement comprising means for ejecting a specific amount of the fluid sample containing a plurality of particles into a flow stream leading to said sensing zone, said ejecting means including means for receiving and temporarily storing a given amount of sample, a thermal expansion device mounted within said receiving and storing means, and means for supplying a predetermined amount of energy to said thermal expansion device to raise the temperature of said device to cause said device to expand thereby to eject a specific minute amount of fluid sample from said receiving and storing means.

3,890,570
DISTORTION MEASURING DEVICE

Erik Edeling Kristensen, Tastrup, and Stig Gierup Mikkelsen, Herlev, both of Denmark, assignors to Radiometer A/S, Copenhagen, Denmark

Filed May 30, 1973, Ser. No. 365,281

Claims priority, application Denmark, June 6, 1972, 2811/72

Int. Cl. G01r *23/16*

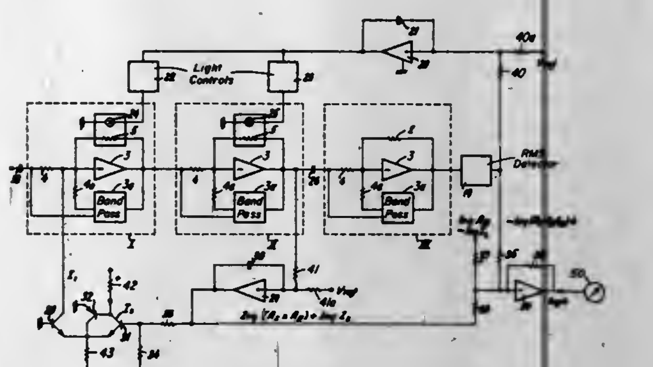
U.S. Cl. 324—77 R **5 Claims**

1. A distortion measuring device for measuring the content of distortion components of an audio frequency signal in relation to a fundamental, comprising

a plurality of series-connected active band stop filters tunable to the frequency of the fundamental, each of said band stop filters comprising an amplifier having a negative feed-back circuit including a band-pass filter, said band-pass filter comprising

integrators and controllable resistors for tuning said band-pass filter,

a phase-sensitive detector having inputs connected to receive said audio frequency signal and a signal representative of said fundamental, respectively, and



control circuit means having an input connected to the output of said phase-sensitive detector for controlling said controllable resistors in said band-pass filter so as to tune said filter to the frequency of the fundamental,

a measuring circuit connected to the filters to derive therefrom signals representing the relative value of the distortion components, and

means for transferring said signal to an indicator device.

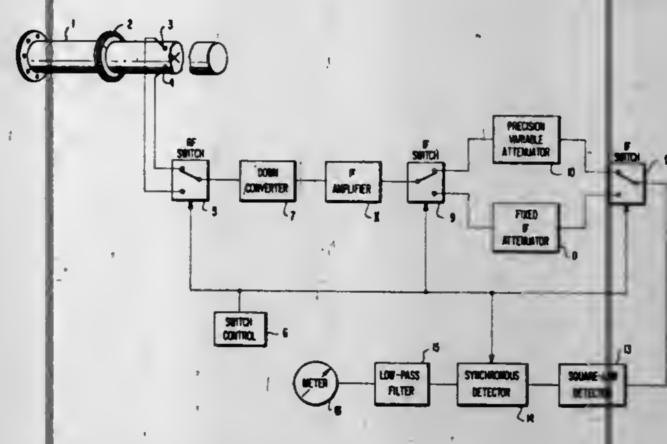
3,890,571
RADIO FREQUENCY POLARIMETER

John P. Beyer, Arlington, Va., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Oct. 17, 1973, Ser. No. 407,358

Int. Cl. G01r *21/12, 29/00*

U.S. Cl. 324—95 **7 Claims**



1. A radio frequency polarimeter for measuring the axial ratio and orientation of the principle axis of elliptically polarized electromagnetic signals, comprising:

a radio frequency pickup head having a rotatable member and means for measuring radio frequency power at two positions about said head angularly displaced by 90°;

a radio frequency switch connected to receive as two inputs the radio frequency power measured at said two positions;

converter means connected to the output of said radio frequency switch for converting radio frequency power to an intermediate frequency power;

a first intermediate frequency switch connected to the output of said converter means and providing two outputs;

a fixed intermediate frequency attenuator connected to one output and a variable attenuator connected to the other output of said first intermediate frequency switch;

a second intermediate frequency switch having two inputs connected respectively to said fixed and variable attenuators;

switch control means connected to said radio frequency switch and said first and second intermediate frequency switches for causing said switches to operate in synchronism, the frequency of said switch control means being greater than the fluctuations in the signal strength of said elliptically polarized electromagnetic signals; and

synchronous detector means connected to the output of said second intermediate frequency switch and providing an output indication proportional to the difference in the power measured at said two positions as modified by the switched gains of said fixed and variable attenuators.

3,890,572
METHOD AND APPARATUS FOR EQUALIZING PHASE-ODULATED SIGNALS

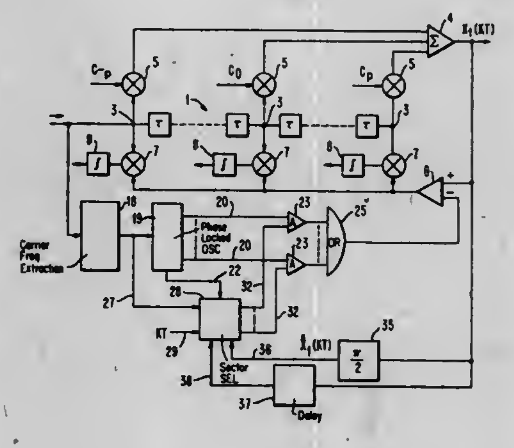
Andre Eugene Desblanche, and Jean Marc Pierret, both of Nice, France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1974, Ser. No. 437,429

Claims priority, application France, Jan. 31, 1973, 73.04200

Int. Cl. H04l *27/18*

U.S. Cl. 325—42 **12 Claims**



1. A method for equalizing a phase-modulated data signal, which may assume n distinct phase values as transmitted over a transmission medium that introduces linear distortions into the transmitted signals, comprising the steps of:

applying the signal received from the transmission medium to a first transversal filter having a variable transfer function and a plurality of different delay taps, thereby obtaining an equalized signal;

generating an adjustment error signal by comparing the output signal of said first transversal filter with a reference signal at characteristic instants defined by a clock which generates timing signals at the rate at which the data are transmitted; and

adjusting said transfer function of said first transversal filter so as to minimize said adjustment error signal;

said adjustment error signal generating step including the steps of

extracting the carrier frequency from the signal received from the transmission medium;

generating from said carrier frequency n possible reference signals, each of which consists of said extracted carrier frequency exhibiting one of said n distinct phase values;

selecting from said n possible reference signals the particular one which is to be used as a reference signal at a given characteristic instant; and

comparing said first transversal filter output signal with the selected reference signal.

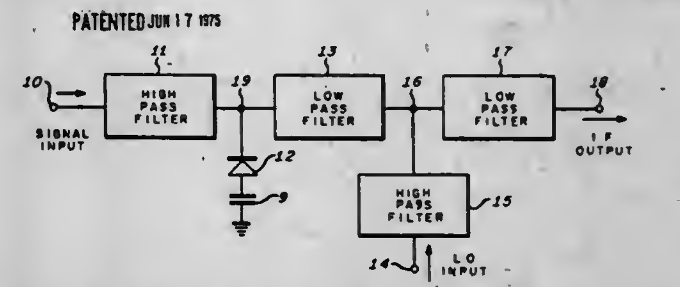
3,890,573
HIGH CONVERSION EFFICIENCY HARMONIC MIXER

Harry F. Strenglein, Clearwater, Fla., assignor to Sperry Rand Corporation, New York, N.Y.

Filed June 10, 1974, Ser. No. 477,943

Int. Cl. H04b *1/26*

U.S. Cl. 325—451 **6 Claims**



1. Harmonic signal mixer means comprising:

high pass signal input filter means,

low pass filter means in series relation with said high pass signal input filter means,

high pass local oscillator signal input filter means in series relation with said low pass filter means,

low pass intermediate frequency signal output means coupled between said low pass filter means and said high pass local oscillator signal input filter means, and

non-rectifying signal mixer circuit means coupled between said high pass signal input filter means and said low pass filter means.

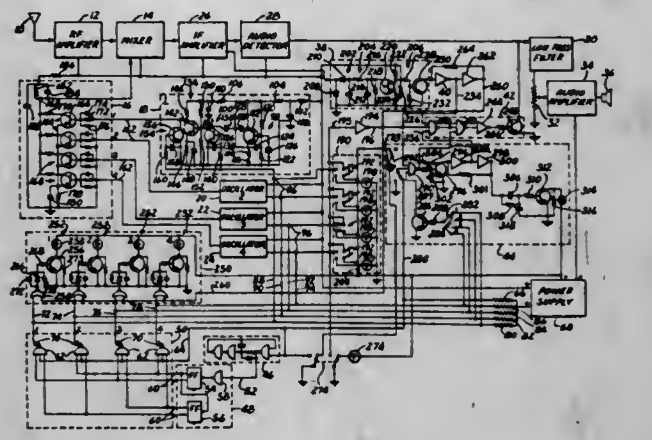
3,890,574
TIME-SHARING SCANNING RECEIVER

Masao Nakano, and Kazuyoshi Imazeki, both of Tokyo, Japan, assignors to General Research of Electronics, Inc., Chicago, Ill.

Filed Sept. 4, 1973, Ser. No. 394,120

Int. Cl. H04b *1/32*

U.S. Cl. 325—470 **13 Claims**



1. A scanning radio receiver which automatically scans a plurality of channels of respective predetermined frequencies, said receiver comprising

an RF section,

variable tuning means for selectively tuning said RF section to said predetermined frequencies,

scanning means for causing said variable tuning means to tune said RF section to each of said predetermined frequencies sequentially and periodically,

channel selection means coupled to said scanning means for producing enabling pulses in synchronism with the tuning of said RF section to a selected one of said frequencies,

signal utilization means for utilizing intelligence received by said RF section, and

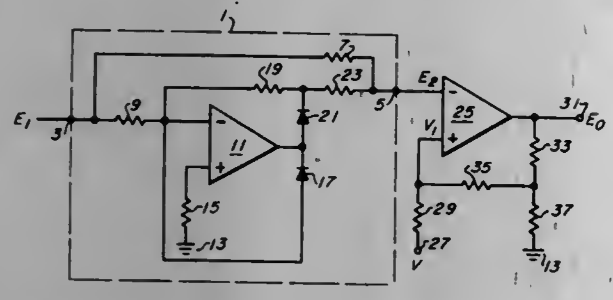
enabling means responsive to said enabling pulses for coupling said RF section to said signal utilization means substantially only during the portion of each scanning cycle when said RF section is tuned to said selected one of said frequencies.

3,890,575
WINDOW TRIP MONITOR AND COMPARATOR CIRCUIT

David A. Tawfik, Rego Park, N.Y., assignor to The Bendix Corporation, Teterboro, N.J.

Filed July 17, 1969, Ser. No. 842,490
Int. Cl. H03k *5/20*

U.S. Cl. 328—146 **14 Claims**



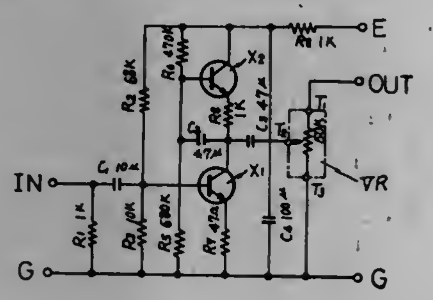
1. A window trip circuit for monitoring a signal and providing a warning indication when the signal amplitude exceeds a trip level, comprising: an absolute value amplifier responsive to the signal for providing a unipolar output having an amplitude corresponding to the amplitude of the signal; means for providing a reference signal corresponding to the trip level; and a level detector for receiving the unipolar output and the reference signal and for providing the warning indication when the amplitude of the unipolar signal exceeds the amplitude of the reference signal.

3,890,576
TRANSISTOR AMPLIFYING CIRCUIT

Kozo Kobayashi, Tokyo, Japan, assignor to Nakamichi Research Inc., Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 428,334
Claims priority, application Japan, Dec. 27, 1972, 47-4821
Int. Cl. H03f *3/42*

U.S. Cl. 330—18 **5 Claims**



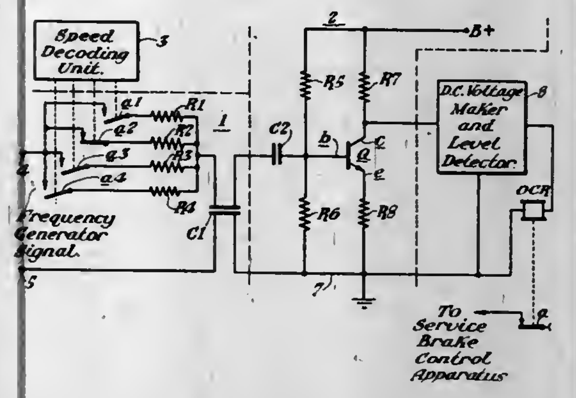
1. A transistor amplifying circuit having input and output means and a power source, comprising a first transistor of grounded emitter type having a base applied with input signal from said input means; a second transistor having an emitter connected to a collector of said first transistor in a D.C. conductive relationship to each other and a collector connected to said power source; bias circuits connected to respective bases of said first and second transistors, one of said bias circuits for said second transistor comprising high impedance elements; a capacitor having a value of capacitance sufficient to provide a relatively lower impedance for an input signal applied to said first transistor and connected between said base of said second transistor and the junction point of said collector of said first transistor and one end of D.C. conductive means with the other end connected to said emitter of said second transistor so that the output signal from said first transistor is substantially shunted from being applied across said base and said emitter of said second transistor; and a variable resistor connected between said collector of said first transistor and a ground to receive and control said output signal from said first transistor and to output the thus controlled signal to said output means, said variable resistor arranged so that the value of resistance between said junction point and said ground can vary whereby the amplitude of the output signal at said output means is substantially proportional to the value of resistance of said variable resistor between said junction point and said ground with the output impedance of said first transistor at said junction point having a value sufficiently higher than the value of resistance of said variable resistor.

3,890,577
VITAL ACTIVE LOW-PASS FILTER

Reed H. Grundy, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Aug. 15, 1973, Ser. No. 388,372
Int. Cl. H03f *3/04*

U.S. Cl. 330—31 **10 Claims**



Speed Decoding Unit
B+
D.C. Voltage Maker and Level Detector
Frequency Generator Signal
To Service Brake Control Apparatus

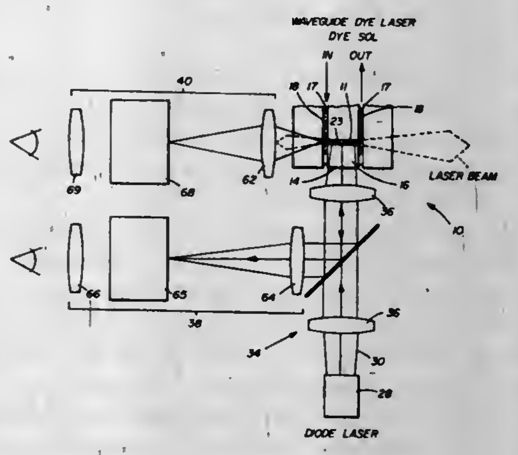
1. A vital signal frequency filtering circuit comprising, a source of a.c. signals, a fail-safe variable passive R-C network having a plurality of individual resistors and a four-terminal capacitor coupled to said source of a.c. signals, and an active amplifying circuit having its input supplied by said fail-safe passive R-C network and having its output developing a range of frequencies which is dependent upon the resistance and capacitance values of said fail-safe passive R-C network.

3,890,578
DYE LASER EXCITED BY A DIODE LASER

Gunnar Wang, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 3, 1973, Ser. No. 421,378
Int. Cl. H01s *3/20*

U.S. Cl. 331—94.5 L **17 Claims**



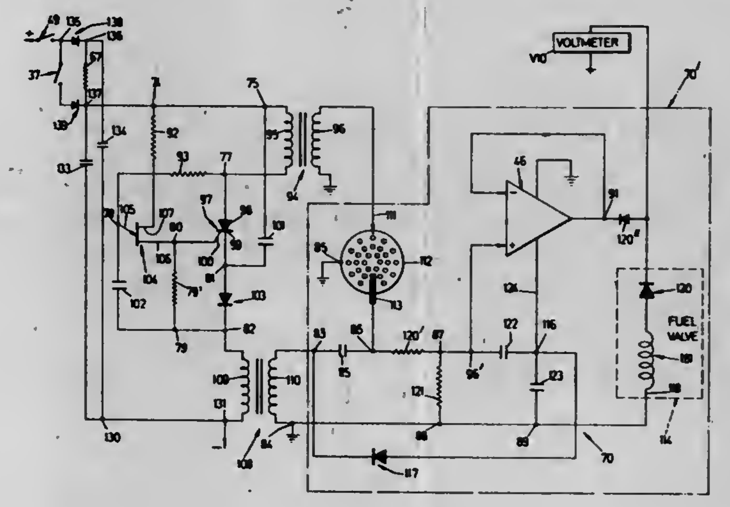
1. A laser comprising:
a. semi-conductor means having a junction between N and P type materials which stimulates emission of radiation when electrical current passes therethrough to produce laser radiation;

b. an active liquid medium comprising fluorescent organic dye molecules dissolved in a solvent, said dye molecules having an absorption band at least partially overlapping the emission radiation spectrum of said semi-conductor means;
c. a dye cavity;
d. means for positioning at least a portion of said liquid medium in said cavity;
e. means for directing the laser radiation of said semiconductor means into said liquid medium in said cavity at a power density sufficient to excite a sufficient number of dye molecules to produce a critical population inversion in which radiation is spontaneously emitted and amplified by the excited dye molecules; and
f. means for redirecting a sufficient percentage of the amplified radiation emitted by the excited dye molecules back through said dye cavity to produce laser radiation therein.

3,890,579
IGNITION SYSTEM AND COMPONENTS THEREOF

Elmer A. Carlson, Agoura, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Division of Ser. No. 447,889, March 4, 1974. This application Nov. 25, 1974, Ser. No. 526,586
Int. Cl.² H03B *11/10*

U.S. Cl. 331—111 **4 Claims**



1. An oscillator comprising: first, second and third junctions; a source of D.C. potential having positive and negative leads; first and second inductor means; a capacitor; a silicon-controlled rectifier (SCR) having an anode, a cathode and a gate; and a diode, said positive lead being connected to said first junction, said first inductor means being connected from said first junction to said SCR anode, said capacitor being connected between said first and second junctions, said SCR cathode being connected to said second junction, said diode being connected between said second and third junctions and being poled to be conductive toward said third junction, said second inductor means being connected from said third junction to said negative lead, said SCR gate being connected from said third junction.

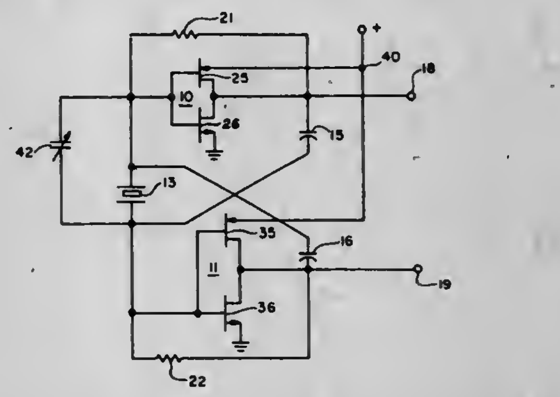
3,890,580
TWO PHASE OSCILLATOR

Harry A. Kuhn, Jr., Phoenix, Ariz., and Donald D. Schendel, Jr., North Palm Beach, Fla., assignors to Motorola, Inc., Chicago, Ill.

Filed Dec. 27, 1973, Ser. No. 428,932
Int. Cl. H03b *5/36*

U.S. Cl. 331—116 R **9 Claims**

1. A two phase oscillator circuit comprising complementary metal oxide silicon (CMOS) field-effect transistors including in combination:
first and second voltage supply terminals for connection to first and second levels, respectively, of direct current potential;
a first field-effect transistor of a first conductivity type, having source, drain and gate electrodes;
a second field-effect transistor of a second conductivity type, having source, drain and gate electrodes;
means interconnecting the drain electrodes of said first and second field-effect transistors to form a first output terminal;
means interconnecting the gate electrodes of said first and second field-effect transistors to form a first input terminal;
a third field-effect transistor of said first conductivity type, having source, drain and gate electrodes;
a fourth field-effect transistor of said second conductivity type, having source, drain and gate electrodes;



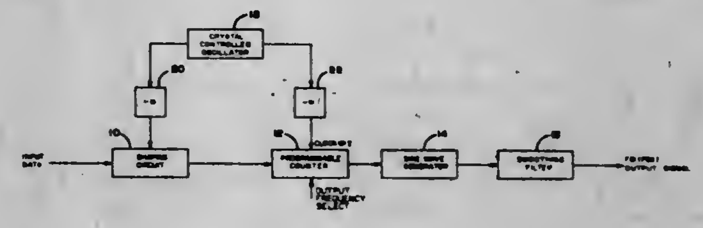
means interconnecting the drain electrodes of said third and fourth field-effect transistors to form a second output terminal;
means interconnecting the gate electrodes of said third and fourth field-effect transistors to form a second input terminal;
frequency determining circuit means coupled in circuit between said first and second input terminals;
a first feedback circuit coupling said first output terminal with said second input terminal;
a second feedback circuit coupling said second output terminal with said input terminal;
means coupling said source electrodes of said first and third field-effect transistors with said first voltage supply terminal; and
means coupling the source electrodes of said second and fourth field-effect transistors with said second voltage supply terminal.

3,890,581
DIGITAL FM (FSK) MODULATOR

Richard L. Stuart; Arvind M. Bhopale, both of Beltsville, and Paul E. Treynor, New Carrollton, all of Md., assignors to Rixon Inc., Silver Spring, Md.

Filed Dec. 27, 1972, Ser. No. 318,750
Int. Cl. H04l *27/12*

U.S. Cl. 332—11 R **9 Claims**



1. A digital FM (FSK) modulator comprising means for generating a clocking signal, variable frequency divider means connected to receive said clocking signal and providing division thereof at a rate which varies in accordance with the data

input to the modulator so as to produce a first frequency output responsive to a first data state and a second frequency output responsive to a second data state, and shaping circuit means, connected to receive the data input and including logic circuit means, for sensing when the data changes state and for producing a predetermined variable duty cycle digital output sequency responsive thereto, said variable frequency divider means including counter means connected to the output of said shaping circuit means, the frequency output of said counter means varying in accordance with said digital output sequence so as to provide a gradual change in the frequency of the modulator between the frequency corresponding to the previous data state and the frequency corresponding to the new data state during a predetermined transition period.

3,890,582

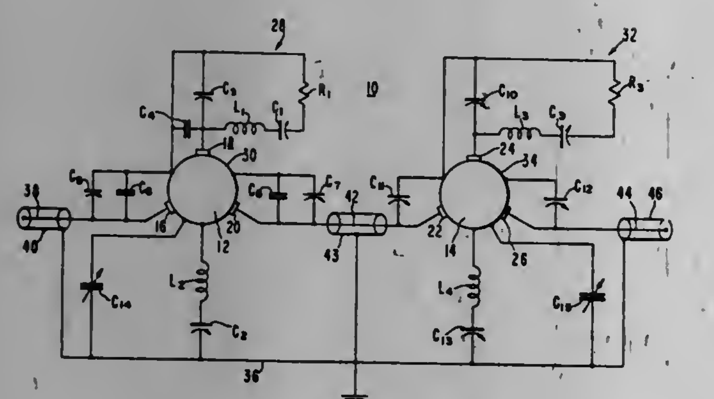
FLOATING-GROUND MICROWAVE FERRITE ISOLATORS

David Hoy Jeong, Palo Alto, Calif., assignor to Addington Laboratories, Inc., Sunnyvale, Calif.

Filed June 15, 1973, Ser. No. 370,580

Int. Cl. H01p *1/32*

U.S. Cl. 333—24.2 **3 Claims**



1. A broadband microwave isolator comprising:
a. a plurality of individual floating-ground ferrite-type isolators connected in series, each having a different center frequency and wherein the bandwidths of individual isolators having adjacent center frequencies are overlapping; and wherein each of said individual floating-ground isolators comprises:
   1. a lumped circuit element;
   2. a pair of ferrite discs sandwiching said lumped circuit element;
   3. a floating-ground plane element; and
   4. means for providing a d.c. magnetic field across said sandwiched lumped circuit element and said floating-ground plane element;
b. a TEM mode transmission line for providing microwave signals to said plurality of isolators;
c. a variable capacitance for each individual isolator connected between the isolated floating-ground and the transmission line ground for providing means for adjusting the capacitance therebetween; and
d. including means for compensating for unequal magnetic fields across said lumped circuit element and said floating-ground plane element comprising a tapered nonmagnetic shim located between said magnetic field means and said ferrite discs.

3,890,583

FLEXIBLE CIRCULAR WAVEGUIDE UTILIZING HELICAL WINDINGS

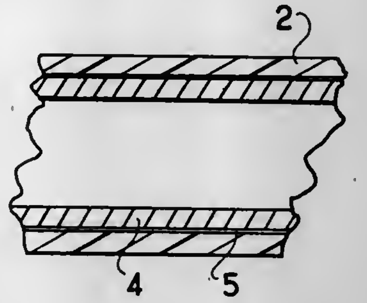
Jacques Bendayan, Lyon, France, assignor to Les Cables de Lyon, Lyon Cedex, France

Filed Feb. 26, 1974, Ser. No. 446,040

Claims priority, application France, Feb. 26, 1973, 73.06734

Int. Cl. H01p *3/14*

U.S. Cl. 333—95 A **10 Claims**



1. A circular wave guide consisting of a helical winding in contiguous turns of a conductor wire having a quadrangular cross-section with oblique and parallel sides and being coated with an insulating sheathing material, whereby certain turns are prevented from parting with the cylinder which they constitute when the wave guide is bent.

3,890,584

MEANS FOR SEALING THE CRIMPED END PORTION OF A WAVE GUIDE

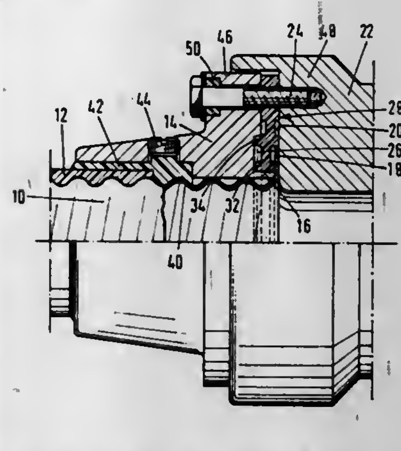
Georg Spinner, Erzgiessereistr. 33, 8 Munich 2, and Franz X. Pitschi, Nederlingerstr. 44, 8 Munich 19, both of Germany

Filed July 13, 1973, Ser. No. 379,054

Claims priority, application Germany, Aug. 3, 1972, 2238268

Int. Cl. H01p *1/04;* **F16j** *15/10*

U.S. Cl. 333—98 R **10 Claims**



1. Means for securing the crimped end of a wave guide, comprising:
a wave guide comprised of an annular, tubular conductor, said conductor having an end portion that is to be crimped and secured;
an attachment part; a separate conductor part for serving as a continuation of said conductor; said attachment part and said conductor part having respective opposed end faces defining an annular gap therebetween, said attachment part and said conductor part being oriented and positioned such that said conductor end portion is crimped so as to be oriented to extend generally radially outwardly of said conductor and said conductor end portion is in said gap between said opposed end faces;
a flexible, membrane-like, annular sealing element in said gap; said sealing element having a radially more inwardly located annular sealing land extending around it and extending axially of said conductor toward said conductor part end face; said sealing element also having a radially more outwardly located annular sealing land extending around it and extending axially of said conductor toward said conductor part end face; said inward and said outward lands being spaced apart radially a first distance; both said sealing element lands project both toward said conductor part from one side of said sealing element and toward said attachment part from the opposite side of said sealing element;
said conductor end portion being of a length such that it extends radially outward so as to be between said inward land and said conductor part end face; said conductor end portion having an end edge and said end portion being of a length such that said end edge is between said inward and said outward lands;
the lengths axially of said conductor of said lands on the said attachment part side of said sealing element are greater than the lengths axially of said conductor of the respective said lands on said conductor part side of said sealing element; said sealing element being of a thickness and said lands being of a length axially of said conductor on said conductor part side of said sealing element and said sealing elements having such flexibility that said inward land clamps said conductor end portion against said conductor part end face and said outward land clamps against said conductor part end face without contacting said conductor end portion;
said first radial distance between said inward and outward lands being great enough to cause said lands to be separated from each other a distance at their respective clamping surfaces with said conductor end portion and with said conductor part end face to provide such clearance as to maintain the recited relationship of said conductor end portion with said inward and outward lands despite normal non-uniformity of said radial length of said conductor end portion.

3,890,585

ELECTRICAL SWITCHING APPARATUS

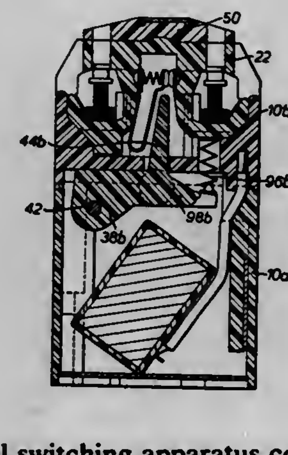
Robert William Hartop, Bedford, England, assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Apr. 4, 1974, Ser. No. 457,812

Claims priority, application United Kingdom, Apr. 5, 1973, 16457/73

Int. Cl. H01h *1/12*

U.S. Cl. 335—198 **9 Claims**



1. An electrical switching apparatus comprising:
a. a contact set including a pair of contact members and biasing means resiliently biasing said contact members towards each other;
b. a body member recessed to receive said contact set in first and second angular senses;
c. an actuator member for said contact members; and
d. mounting means which mounts said actuator member in said body member for displacement from one to another sense to actuate said contact members so that said contact members are separable, when said contact set is received by said body member in one of its two angular senses in response to displacement of said actuator into one of its respective senses.

3,890,586

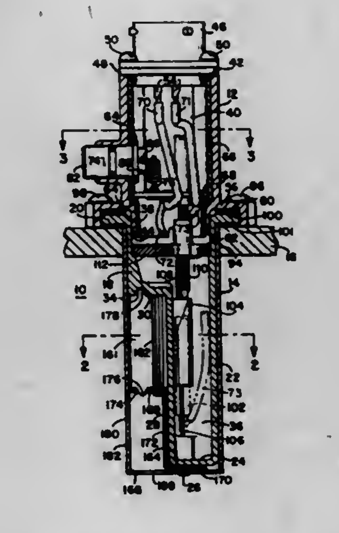
TEMPERATURE RESPONSIVE ELECTRIC SWITCH

Ward Barry Krause, Alexander, N.C., assignor to Square D Company, Park Ridge, Ill.

Filed May 28, 1974, Ser. No. 473,596

Int. Cl. H01h *37/58*

U.S. Cl. 335—208 **10 Claims**



1. A temperature responsive electric switch comprising: a pair of magnetically responsive contacts movable to an operated position in response to magnet flux, a permanent magnet having a pair of opposite polarity magnet poles at its opposite ends and a pair of walls extending between the ends with a first of said walls facing and spaced from the contacts and a second of said walls spaced from the first wall and facing away from the contacts, and a plurality of plates formed of ferromagnetic material having selected magnetization characteristics with each of the plates having an edge engaging the second wall and providing a shunt path for magnet flux when the temperature of the plates is less than the Curie temperature.

3,890,587

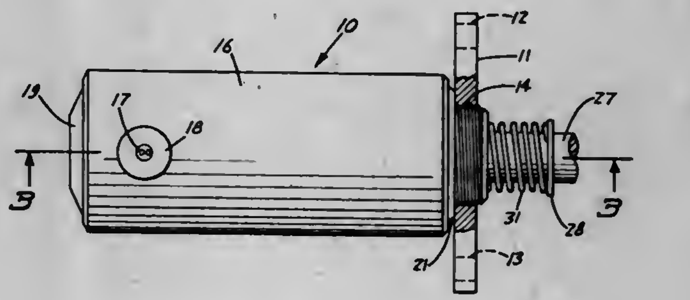
PLUNGER SOLENOID

William J. Field, Minneapolis, Minn., assignor to Laketown Manufacturing Corporation, Inc., Waconia, Minn.

Filed Apr. 1, 1974, Ser. No. 456,558

Int. Cl. H01f *3/12*

U.S. Cl. 335—255 **25 Claims**



1. A solenoid comprising: coil means for producing a magnetic field, fixed pole piece means surrounded by the coil means, said fixed pole piece means having a cylindrical portion with a generally uniform diameter surrounded by the coil means, housing means accommodating the coil means and holding the fixed pole piece means at one end section of the coil means, plunger means movable from an extended position to a contracted position relative to the fixed pole piece means in response to energization of the coil means, said plunger means having a cross sectional area smaller than the cross

sectional area of the cylindrical portion of the fixed pole piece means, and means of ferromagnetic material located between the coil means and plunger means to provide a path for leakage fluxes and minimize useless flux passage through the plunger means, said means of ferromagnetic material including a ferromagnetic sleeve surrounding a section of the plunger means when the plunger means is in the extended position, said sleeve being mounted on the housing means and extended toward the fixed pole piece means, said sleeve having an end longitudinally spaced from the fixed pole piece means a longitudinal distance greater than the longitudinal distance between the end of the plunger means and the fixed pole piece means, said coil means surrounding said sleeve.

3,890,588
WATER JACKET TEMPERATURE SENSOR

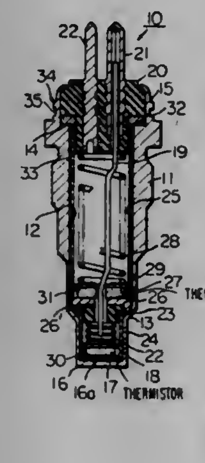
Iwao Kanaya; Kazuo Ishikawa, and Hideo Mifune, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Oct. 23, 1973, Ser. No. 408,948

Claims priority, application Japan, Oct. 26, 1972, 47-123675; Dec. 13, 1972, 47-143504; Dec. 13, 1972, 47-143505; Dec. 13, 1972, 47-143506; Feb. 19, 1973, 48-21419; May 21, 1973, 48-59952

Int. Cl. H01c *7/00;* **G01k** *7/00*

U.S. Cl. 338—28 **9 Claims**



1. A device for sensing the variation of coolant temperature, comprising:

a metal housing having a bore extending along the longitudinal axis thereof and forming closed and open end portions of said housing;

an insulating cap member at said open end portion to fluid tightly seal said housing;

a plurality of thermal resistive elements disposed in spaced parallel relationship to each other in said bore and each having a major dimension extending transversely to said longitudinal axis;

a plurality of insulating means alternately arranged with said thermal resistive elements for electrically insulating said thermal resistive elements from each other;

a plurality of means, axially arranged in contact with said thermal resistive elements, for urging said elements toward said closed end portion of the bore; and

means for conducting current between said thermal resistive elements respectively and the outside of said housing.

3,890,589
VARIABLE RESISTOR

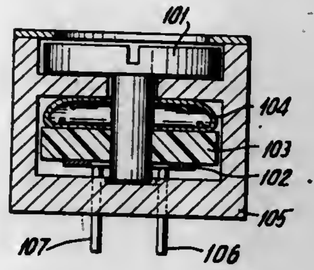
Masanori Kogo, and Hisashi Honda, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 267,630, June 29, 1972, Pat. No. 3,760,322. This application June 20, 1973, Ser. No. 371,620

Claims priority, application Japan, June 30, 1971, 46-48316The portion of the term of this patent subsequent to Sept. 18, 1990, has been disclaimed.

Int. Cl.² H01C *10/04, 10/26*

U.S. Cl. 338—89 **3 Claims**



1. A variable resistance attenuator comprising an input terminal, an output terminal, a common terminal, a first variable resistor connected between said input terminal and said output terminal, first and second resistors connected in series between said input terminal and said output terminal, and a second variable resistor connected to the series connection between said first and second resistors and connected at its opposite terminal to said common terminal, said first and second variable resistors each comprising an electrically resistive element, the incremental resistance of which varies along its length, to form a gradient of resistivity, and two brushes spaced apart by a constant distance in slidable contact with each said resistive element, said gradient being such that the resistance between the brushes varies logarithmically, but the inductance between them remains substantially constant as they are moved with respect to the gradient.

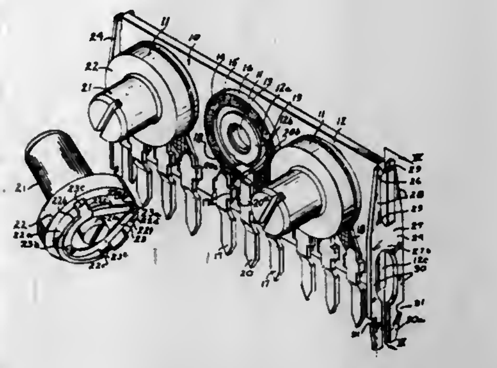
3,890,590
VARIABLE RESISTANCE CONTROL

John D. Van Benthuysen, and Jack A. English, both of Elkhart, Ind., assignors to CTS Corporation, Elkhart, Ind.

Division of Ser. No. 620,186, March 2, 1967, Pat. No. 3,421,133. This application May 27, 1968, Ser. No. 732,137

Int. Cl. H01c *5/02*

U.S. Cl. 338—174 **5 Claims**



1. A variable resistance control comprising a base of electrically nonconductive material provided with an opening and having a front side and a rear side, means defining an arcuate resistance path on the front side of the base and equally spaced around the opening, collector means secured to the front side of the base and equally spaced from the first-mentioned means, said collector means being provided with a hole axially aligned with the opening, an annular track provided on the base between the resistance path and the collector means, said track being provided with a cut out portion, a center terminal connected to said collector means, a U-shaped terminal portion disposed in the cutout portion and having a pair of legs, one leg of the terminal portion being connected to the center terminal and the other leg being connected to the collector means, disposing of the terminal portion in the cut out portion providing an uninterrupted path on the track, a shaft passing through the hole and journaled in the opening, a driver connected to the shaft, a contactor adapted to wipe both of the means and constrained to rotate with the driver, a skirt integral with the driver slidable on the annular track, a stop member integral with the center terminal, and stop means carried by the driver engageable with the stop member for limiting angular rotation of the driver.

3,890,591
GROUPING OF ELECTRO-ACOUSTIC TRANSDUCERS PARTICULARLY FOR USE IN UNDERWATER DETECTION SYSTEMS

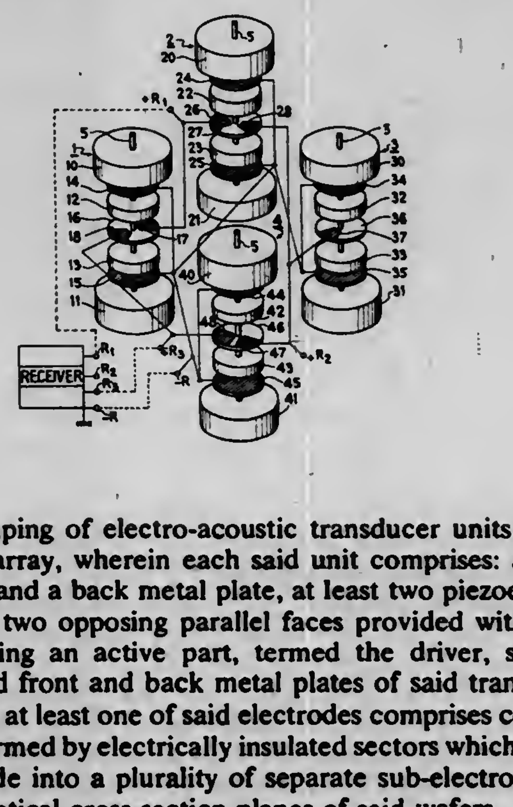
Francois Bocquillon, and Roger Massiera, both of Paris, France, assignors to Thomson-CSF, France

Filed Feb. 21, 1974, Ser. No. 444,649

Claims priority, application France, Feb. 22, 1973, 73.06565

Int. Cl. G01s *3/80*

U.S. Cl. 340—6 R **10 Claims**



1. A grouping of electro-acoustic transducer units into a directional array, wherein each said unit comprises: a front metal plate and a back metal plate, at least two piezoelectric wafers with two opposing parallel faces provided with electrodes forming an active part, termed the driver, stacked between said front and back metal plates of said transducer and wherein at least one of said electrodes comprises conductive areas formed by electrically insulated sectors which divide said electrode into a plurality of separate sub-electrodes located in identical cross section planes of said wafers.

3,890,592
CONTACTLESS CONTROL SYSTEM FOR VOLUME CONTROL AND POWER ON-OFF CONTROL

Sadafumi Kitamura, Neyagawa, and Toshiji Kanamaru, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 31, 1972, Ser. No. 276,737

Claims priority, application Japan, Aug. 10, 1971, 46-60721; Nov. 12, 1971, 46-106218

Int. Cl. H04b *11/00;* **H04n** *5/44*

U.S. Cl. 340—15 **4 Claims**

1. A contactless control system for volume control and for on-off controlling power source which comprises:

means for generating first and second signals containing information for volume control and power source on-off control;

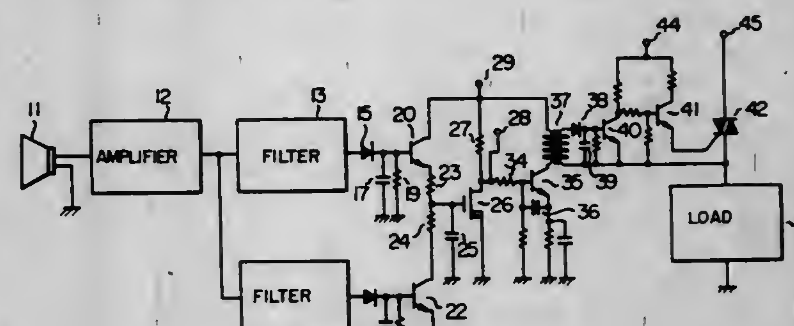
means for receiving each signal to produce a D-C voltage corresponding to the duration of said signal and memorize the voltage thus produced, wherein said receiving and memorizing means comprises a capacitor;

means to charge said capacitor by one of said two signals;

means to discharge said capacitor by the other signal;

a sound amplifier coupled to said memorizing means for amplifying a sound input signal and whose amplification degree is controlled by said D-C control signal for volume control;

a semiconductor switching element connected between a power source and a load; and



means to on-off control said switching element in response to said D-C control signal, including

an oscillator rendered operative when the level of said D-C control signal is at a predetermined level and a rectifying and smoothing circuit for rectifying and smoothing the output of said oscillator, the output of said rectifying and smoothing circuit being impressed on the gate electrode of said semiconductor switching element, said predetermined level of said D-C control signal corresponding to the minimum amplification degree of said sound amplifier.

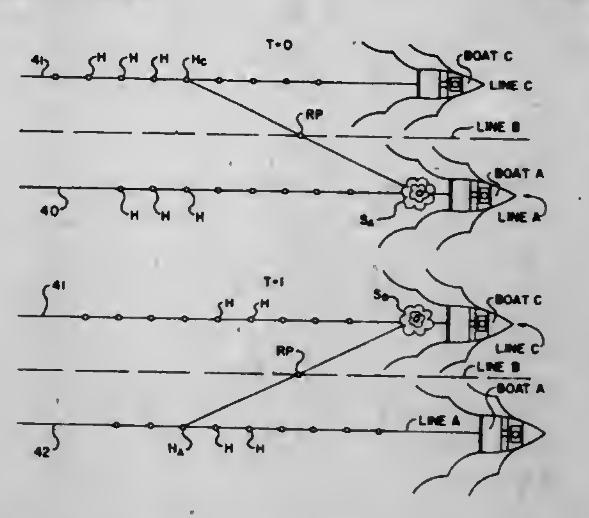
3,890,593
MULTI-DIRECTIONAL SEISMIC EXPLORATION METHODS ON NAVIGABLE WATER

JLee Davis, Ector, Tex., assignor to Advance Oil and Gas Co., Inc., Midland, Tex.

Continuation-in-part of Ser. No. 145,811, May 21, 1971, Pat. No. 3,746,122. This application June 28, 1973, Ser. No. 374,497

Int. Cl. G01v *1/28*

U.S. Cl. 340—15.5 MC **2 Claims**



1. A method for conducting a seismic exploration in a region of interest covered by navigable water comprising:

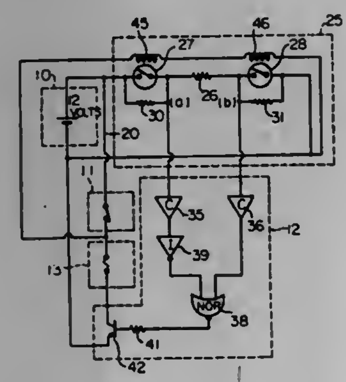
traversing said region of interest with two vessels on generally parallel courses on either side of and along a planned survey line, said vessels being aligned generally abreast and moving at substantially equal speeds, each vessel towing a string of hydrophones having hydrophones spaced uniformly therealong;

alternately creating seismic disturbances in the water adjacent one vessel and the other at times selected with regard to the speed of the vessels and the spacing of said hydrophones to produce said disturbances at intervals

spaced, in the direction of said traverse, at distances substantially equal to the spacing of said hydrophones, whereby to generate multiple signals from common reflecting points along a line deviating from the planned survey line less than the deviations of said vessels and of their strings of hydrophones from their planned courses caused by water currents and navigational errors;
recording substantially all reflections received by said hydrophones;
and stacking recordings of multiple signals received from at least one of said common points, the signals for each respective common point being a result of waves transmitted and received along paths in different vertical planes intersecting on a vertical line through said each respective common point.

3,890,594
OPERATION RECORDER FOR MOTOR VEHICLE SAFETY DEVICE

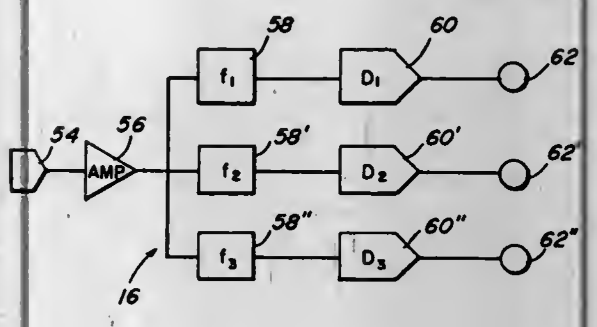
Akio Hosaka; Kosaku Baba, both of Yokohama, and Kiyoshi Wazawa, Fujisawa, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan
Filed Dec. 13, 1972, Ser. No. 314,523
Claims priority, application Japan, Feb. 9, 1972, 47-14118
Int. Cl. G08b *21/00*
U.S. Cl. 340—52 H **2 Claims**



1. An operation recorder, which is used with a vehicle safety device triggering mechanism connected across a power source, to determine whether a safety device of a vehicle is actuated prior to a collision of the vehicle or not, said operation recorder comprising:
normally closed on/off switch means connected across said power source and adapted to reverse its switch position in response to a collision of the vehicle;
normally open on/off switch means connected in series with said normally closed on/off switch means across said power source, and including switch triggering means connected to said vehicle safety device triggering mechanism and adapted to detect the actuation of the safety device to reverse the switch position of said normally open on/off switch means;
recording means connected in series with said normally closed and normally open on/off switch means and responsive only to the actuation of said normally open on/off switch means prior to the actuation of said closed on/off switch means, thereby to record the sequence of the actuations of said normally closed and normally open on/off switch means, whereby said operation recorder is capable of recording whether said safety device is actuated prior to the collision of the vehicle.

3,890,595
ALARM SYSTEM FOR PNEUMATIC TIRES

William A. Barabino, North Reading, Mass., assignor to Safety Research & Engineering Corporation, North Reading, Mass.
Division of Ser. No. 145,624, May 21, 1971, Pat. No. 3,738,308. This application June 6, 1973, Ser. No. 367,393
Int. Cl. B60c *23/00*
U.S. Cl. 340—58 **5 Claims**

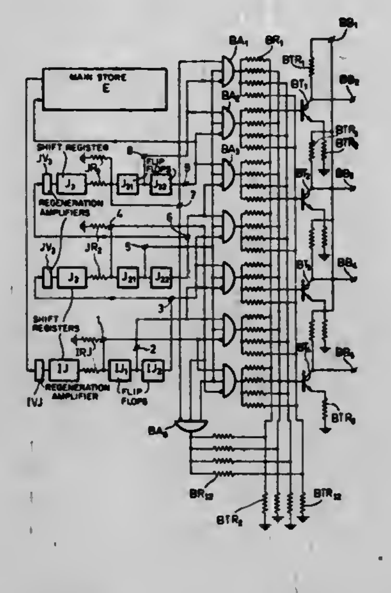


1. A tire pressure warning system for vehicles, comprising in combination
a. an air actuated sound emitting device mounted to said tire and adapted to emit a plurality of different predetermined sound signals according to a plurality of different predetermined tire pressures,
b. a sound signal sensing device mounted to said vehicle for converting said sound signals into a plurality of different electrical signals,
c. electrical signal processing means connected to said sound signal sensing device for selectively detecting said electrical signals, said processing means including a plurality of electrical filters each tuned to a different frequency and,
d. multiple output alarm means connected to said processing means for generating a distinctive alarm signal in accordance with the particular signal detected.

3,890,596
METHOD OF AND DEVICE FOR DETERMINING SIGNIFICANT POINTS OF CHARACTERS

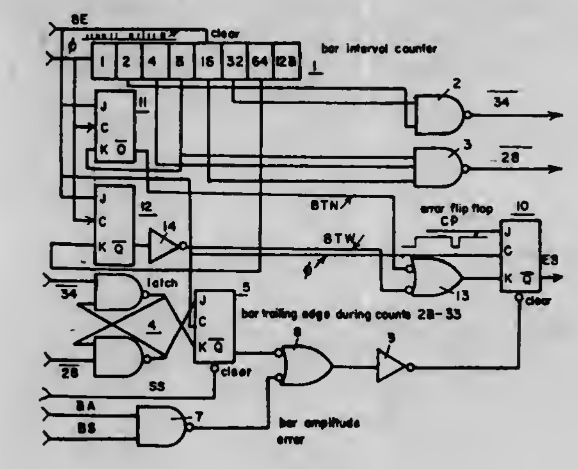
Mattijs Beun, and Pieter Reijnierse, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 196,936, Nov. 9, 1971, abandoned. This application June 5, 1973, Ser. No. 367,168
Claims priority, application Netherlands, Nov. 12, 1970, 7016537
Int. Cl. G06k *9/12*
U.S. Cl. 340—146.3 MA **5 Claims**

1. A method of determining significant points of characters comprising the steps of imaging a character on a two dimensional regular pattern of positions, deriving digital information to distinguish a character position from a background position, determining by the use of information stored in a machine memory which character positions are associated with associated skeleton characters of said characters, said skeleton characters comprising stroke elements consisting of a single series of character positions which succeed each other in accordance with an adjacency criterion, each position having at least six adjacent positions forming a ring thereabout, counting, by the use of appropriate machine elements, the number of times a character position is directly followed by a background position during a cycle of the at least six positions of said ring around a character position, and determining from said number the number of stroke elements which start from this character position.



3,890,597
BAR GEOMETRY VERIFICATION SYSTEM FOR BAR-CODED CHARACTERS

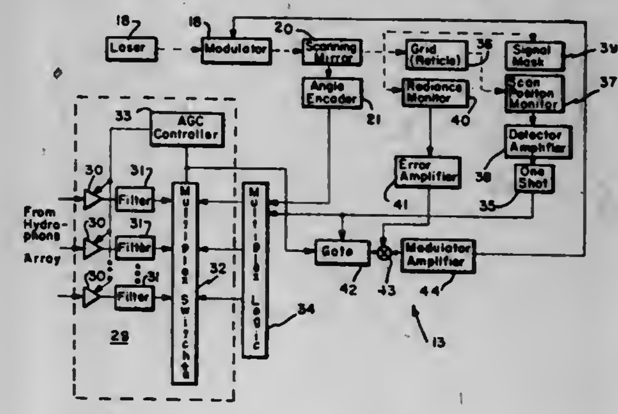
Leland J. Hanchett, Winchester, Mass., assignor to Taplin Business Machines Incorporated, Burlington, Mass.
Filed Sept. 17, 1973, Ser. No. 398,135
Int. Cl. G06k *9/18*
U.S. Cl. 340—146.3 Z **3 Claims**



1. A system for the verification of the geometry of bar coded characters including
a. a clocked bar interval counter;
b. a bar edge signal carrying line connected to said counter to restart the bar interval count of said counter at each bar edge signal carried by said line;
c. a clocked too narrow flip-flop set by each bar edge signal carried by said line and reset by a relatively low count of said counter;
d. a clocked too wide flip-flop set by each bar edge signal carried by said line and reset by a relatively high count of said counter;
e. an OR-gate combining the output of said too narrow flip-flop and said too wide flip-flop;
f. an error flip-flop set by a character presence signal and reset by the output of said OR-gate;
g. clocked first logic circuitry controlled by said counter for generating a signal when a bar edge signal occurs during a period from a time when the count of said counter equals a first number exceeding said relatively low count to a time when the count of said counter equals a second number smaller than said relatively high count, said first logic circuitry being connected to said error flip-flop to clear said error flip-flop by said signal;
h. a second logic circuitry for sensing voltage errors caused by insufficient bar height connected to said error flip-flop to clear said error flip-flop in response to said voltage errors;
i. a second OR-gate for combining the output of said first logic circuitry and the output of said second logic circuitry;
j. said OR-gate and said second OR-gate being implemented by a first and second NAND-gate; and
k. an inverter interposed between said second NAND-gate and said error flip-flop.

3,890,598
OPTICAL SIGNAL PROCESSOR

William B. Hagen, Northridge, and Morton Rudin, Gardena, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.
Filed Oct. 26, 1970, Ser. No. 84,064
Int. Cl. G01s *3/80*
U.S. Cl. 340—6 R **3 Claims**



1. An optical processor for processing the output signals of a hydrophone array comprising:
a first source of monochromatic spatially coherent light;
means for modulating the output of said first source of monochromatic spatially coherent light with the output signals of said hydrophone array;
a photosensitive film strip;
means for exposing said film with said modulated first source of monochromatic spatially coherent light including an optical encoder;
said optical encoder causing the film to be exposed so that the output of each hydrophone in the array is recorded along a separate track on said film;
means for developing said exposed film;
means for illuminating said developed film with a second source of monochromatic spatially coherent light;
means for projecting the image on said film illuminated by said second source of monochromatic spatially coherent light through a fourier transform lens to obtain the fourier transform of said images;
means for optically detecting said fourier transform of said images; and
means for commutating said detected image to separate the detected signals into a plurality of separate electrical signals, each signal corresponding to the output of a single hydrophone; whereby
further processing of said separate electrical signals may be accomplished.

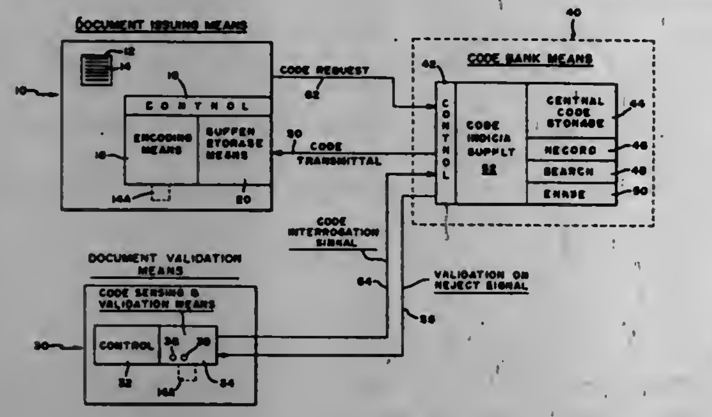
3,890,599
ARRANGEMENT FOR PROTECTING AND AUTHENTICATING A DOCUMENT

Luther G. Simjian, Greenwich, Conn., assignor to Command Automation, Inc., Greenwich, Conn.

Filed Sept. 13, 1973, Ser. No. 396,687

Int. Cl. G07f *7/02*

U.S. Cl. 340—149 R **10 Claims**



1. An arrangement for protecting and authenticating a document comprising:

a document issuing means which includes means for encoding a document, a buffer storage means adapted to store codes, and control means for causing a document in operative engagement with said encoding means to be encoded with code indicia withdrawn from said buffer storage means;

a code bank means which includes means for providing code indicia, and central code storage means;

means for coupling said document issuing means to said code bank means for causing said code indicia supply responsive to a predetermined condition of said buffer storage means to transmit and enter into said buffer storage means a plurality of code indicia for encoding a predetermined quantity of respective documents with individually differing code indicia, and for causing the code indicia transmitted to said buffer storage means to be entered and stored by said central code storage means; a document validation means which includes input means for providing a signal responsive to code indicia disposed on a document;

means coupling said document validation means to said code bank means for providing, responsive to the operation of said input means, to said code bank means an interrogation signal, and responsive to the presence of said code indicia in said central code storage means providing a document validation signal to said document validation means, and

means for controlling said central code storage means for erasing responsive to the initiation of said validation signal the respective code indicia from said central code storage means.

3,890,600
BUFFER STORES

Francis G. Roche, London, England, assignor to Cable & Wireless Limited of Smale House, London, England

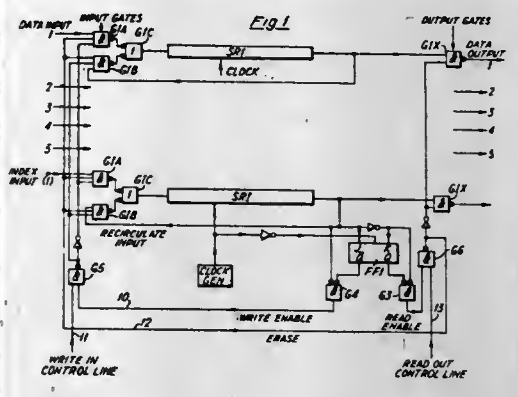
Filed Dec. 7, 1973, Ser. No. 422,514

Claims priority, application United Kingdom, Dec. 11, 1972, 57074/72

Int. Cl. G11c *21/00*

U.S. Cl. 304—172.5 **4 Claims**

1. A method of controlling the entry and removal of characters from a recirculating buffer store having a plurality of data storage channels within which the respective bits or elements of a multi-bit character entered into the store are circulated, the method comprising entering an index bit of the same given polarity into an index storage channel each time the bits of a character are entered into the respective data storage channels such that the number of index bits accumulated in the index channel always corresponds to the number of data bits accumulated in each data channel, the index channel having the same number of bit locations as the data channels, recirculating the bits in the index channel in synchronism with the bits in the data channels, sensing the signal level at the output of the final bit location in the index channel, generating a write enable signal to permit the entry of a new character into the store only in response to a transition of the sensed index signal level in a first direction, and generating a read enable signal to permit the removal of a character from the store only in response to an index signal level transition in the opposite direction whereby a block of bits of the same polarity and occupying adjacent bit locations is accumulated in the index channel, the leading and trailing edges of the block controlling the removal and entry of characters from and into the store respectively.



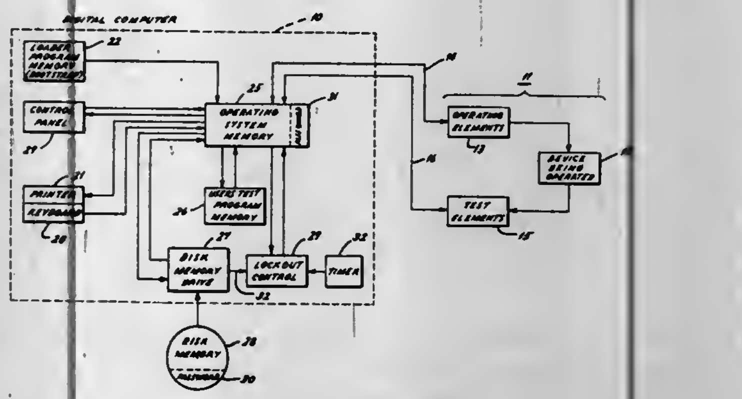
3,890,601
PASSWORD OPERATED SYSTEM FOR PREVENTING UNAUTHORIZED OR ACCIDENTAL COMPUTER MEMORY ALTERATION

John P. Pietrolewicz, Pennsauken, N.J., assignor to Philco-Ford Corporation, Blue Bell, Pa.

Filed Mar. 11, 1974, Ser. No. 449,835

Int. Cl. G06f *13/04*

U.S. Cl. 340—172.5 **9 Claims**



1. In a digital computer used to control the operation of a machine, said computer including, a high-speed operating system memory adapted to contain the computer system operating programs, a high-speed program memory adapted to contain at least one of a plurality of the programs used to operate said machine, input and output means for operating and observing the operation of said computer, a low-speed memory device having replaceable easily stored permanent memory elements, said low-speed memory device being capable of storing substantially more information than said high-speed memories thereby permitting storage of said plurality of programs along with the operating system programs and having a protected portion wherein stored information cannot be altered by said computer, said protected portion containing a password that is unique to each one of said memory elements, and means for transferring information between said high-speed memories and said low-speed memory; an automatic lockout device comprising:

means for comparing the password in said high-speed operating system memory and the password in said low-speed memory, and means to prevent alteration of information in said low-speed memory when the passwords in said high-speed operating system memory and said low-speed memory do not match.

3,890,602
WAVEFORM PRODUCING DEVICE

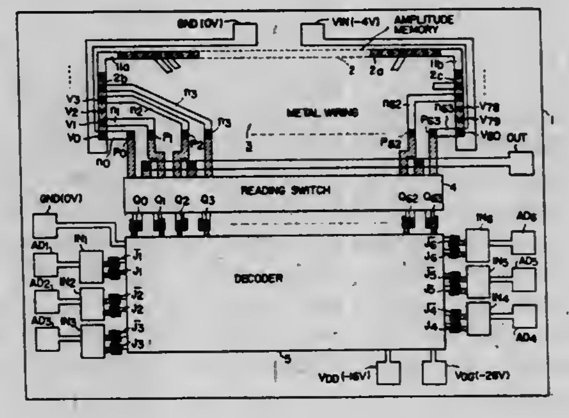
Norio Tomisawa, Hamamatsu; Yasuji Uchiyama, Hamakita; Takatoshi Okumura, and Toshio Takeda, both of Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan,

Filed Oct. 23, 1973, Ser. No. 408,430

Claims priority, application Japan, Oct. 25, 1972, 47-106945; Oct. 25, 1972, 47-106946; Oct. 25, 1972, 47-106947; Oct. 25, 1972, 47-106948

Int. Cl. G11c *11/40*

U.S. Cl. 340—173 R **8 Claims**



1. A waveform producing device which comprises,

a. a resistor zone of a diffused layer formed on a semiconductor substrate and having a plurality of connection points,

b. means for applying a predetermined voltage across the resistor zone so that different potentials appear at the respective connection points, and

c. a reading circuit for reading the different potentials at the connection points in a predetermined order, so that a waveform having variation of amplitudes corresponding to variation of the potentials at the connection points thus read is produced.

3,890,603
ASSOCIATIVE STORE

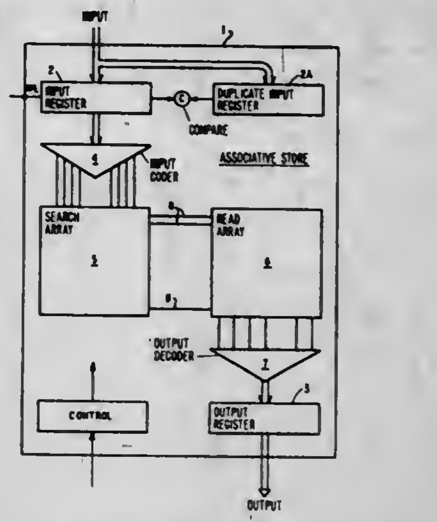
John W. Jones, Winchester; John F. Sears, Eastleigh, and Keith G. Taylor, Chandlers Ford, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 26, 1974, Ser. No. 454,982

Int. Cl. G11c *15/00*

U.S. Cl. 340—173 AM **7 Claims**

1. An associative binary store comprising a fixed search field and a fixed read field, each consisting of bistable storage circuits, a binary input register and a binary output register, coding circuitry connected between the input register and the search field and decoding circuitry connected between the read field and the output register.



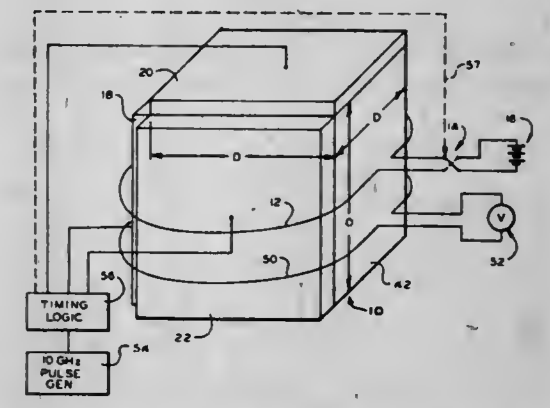
3,890,604
SELECTIVE DIPOLE ORIENTATION OF INDIVIDUAL VOLUME ELEMENTS OF A SOLID BODY

Klaus Schroder, 7226 Coventry Rd., East Syracuse, N.Y. 13057

Filed Nov. 6, 1973, Ser. No. 413,216

Int. Cl. G11c *11/22*

U.S. Cl. 340—173.2 **24 Claims**



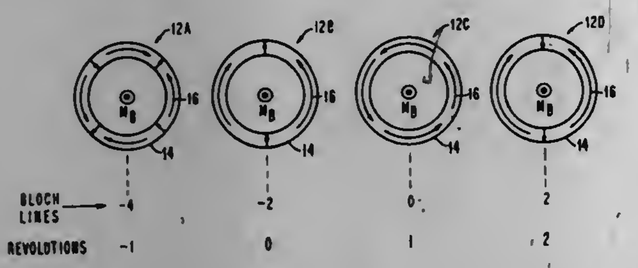
1. A system of controlling the physical properties of individual volume elements of a body of solid material by selective orientation of magnetic or ferroelectric dipoles of particles within the body, said system comprising:

a. a solid body having within each volume element thereof a first material characterized by having spontaneously alignable dipoles and a second, non-alignable material, the dipole linkage of individual particles of said first material being such that the dipole orientation within one volume element is insufficient to change the dipole orientation within other volume elements;

b. means for applying to said body at least one elastic wave, having a predetermined energy density and a pulse width defining the dimensions of said volume element, to travel through said body at a known velocity, thereby producing a maximum energy density in a given volume element of said body at a given time; and

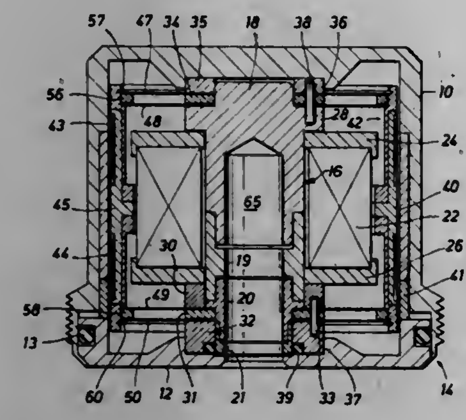
c. means for applying to at least that portion of said body including said given volume element a field of predetermined intensity and orientation, the combined energy levels of said wave and said field being sufficient to change the dipole orientation of said first material within said given volume element, the individual energy levels of said wave and said field being insufficient to change the dipole orientation of said first material.

3,890,605
MAGNETIC DOMAIN SYSTEMS USING DOMAINS HAVING DIFFERENT PROPERTIES
John Casimir Slonczewski, Katonah, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed June 29, 1973, Ser. No. 375,289
Int. Cl. G11c *11/14*
U.S. Cl. 340—174 TF 32 Claims



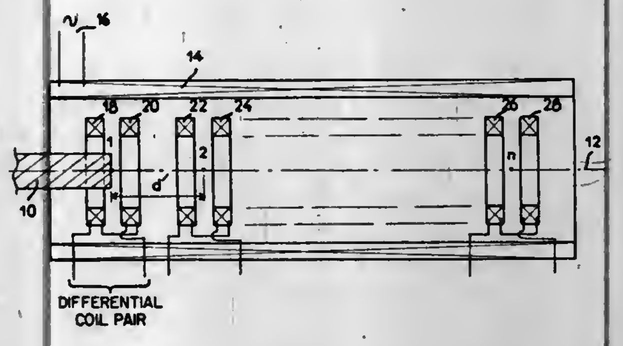
1. An information handling apparatus using cylindrical magnetic domains, comprising:
- a magnetic medium capable of supporting said cylindrical domains, said domains having domain walls in which wall magnetization exists,
- generating means for controllably producing bubble domains having desired amounts of rotation of said wall magnetization around the periphery of said domain walls, said amounts of rotation being indicative of said information,
- reading means for determining said amount of rotation of wall magnetization in said domains for detecting said information.

3,890,606
SEISMOMETER
Eugene F. Florian; Samuel E. Haggard, and Travis E. Riley, all of Houston, Tex., assignors to Mark Products, Inc., Houston, Tex.
Filed May 29, 1973, Ser. No. 364,970
Int. Cl. G01v *1/16*
U.S. Cl. 340—17 5 Claims



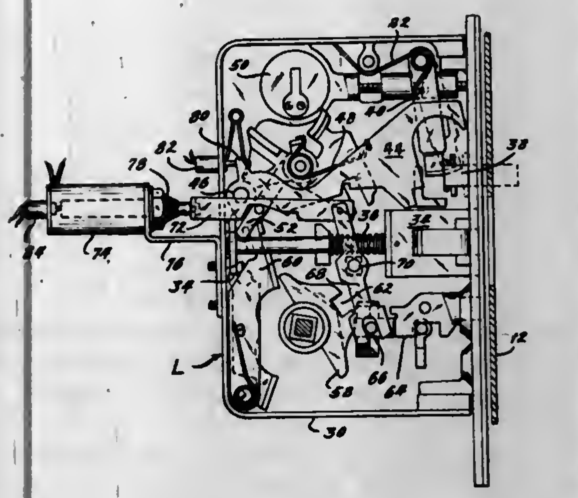
5. A seismometer for sensing motion along a selected axis comprising first and second elements that provide an output signal when moved relative to each other, a spring member connected between the members to support one of said elements relative to the other and to resist the movement of said one element relative to the other along said selected axis with a preselected resilient force to give the seismometer the desired frequency response and two spring members connected between the elements to resist movement of said element relative to the other element laterally of said selected axis while exerting substantially equal and opposite forces resisting such relative movement along said selected axis so as to have a negligible effect on the frequency response of the seismometer along said selected axis.

3,890,607
ELECTROMAGNETIC POSITION INDICATOR
Yves Pelenc, Tronche; Jean Ambier, Grenoble, and Roger Lavergne, Poisat, all of France, assignors to Merlin Gerin, Grenoble, France
Filed Jan. 17, 1973, Ser. No. 324,402
Claims priority, application France, Jan. 24, 1972, 72.02293; Apr. 25, 1972, 72.15576
Int. Cl. G08c *19/08*
U.S. Cl. 340—199 7 Claims



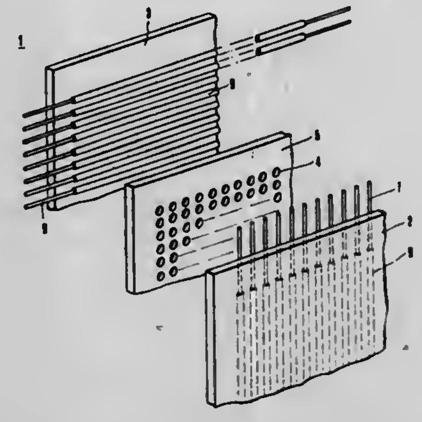
1. An electromagnetic position indicator comprising:
- a. inductively coupled primary and secondary winding means extending along a linear path, said secondary winding means comprising a plurality of pairs of series-connected differential coils spaced along said path,
- b. an elongated magnetic core having a head end movable along said path, the number of coils linked with said core varying with the position of said core,
- c. means for coupling an alternating current source to said primary winding, the application of said alternating current source to said primary winding subjecting the pairs of differential coils having a coil disposed in the immediate proximity of the head end of said core to magnetic imbalance and producing at the terminals thereof a net non-zero output signal, the remaining pairs of coils being magnetically balanced to produce at the terminals thereof a substantially zero output signal, and
- d. circuit means connected to the terminals of all pairs of said coils to deliver a signal representative of the position of said core.

3,890,608
DOOR MONITORING AND CONTROLLING DEVICE FOR A SECURITY SYSTEM
Francis C. Peterson, Affton, Mo., assignor to C. Hager & Sons Hinge Manufacturing Company, St. Louis, Mo.
Filed Oct. 11, 1972, Ser. No. 296,561
Int. Cl. G08b *13/08*
U.S. Cl. 340—274 14 Claims



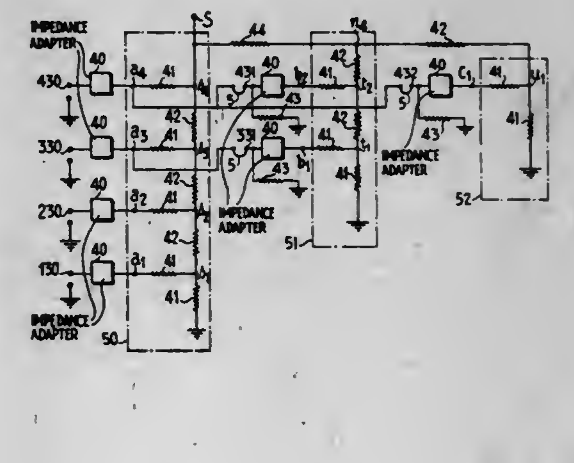
1. In a security system for monitoring a door in a door frame, and including a strike on the door frame and an alarm, an improved lock comprising: a retractable latch bolt movable between extended and retracted positions and normally urged to the extended position, the latch bolt when in its extended position being projected beyond the door for engagement with the strike to secure the door in a closed position, the latch bolt when in its retracted position being located beyond the strike so that the door is released from the strike and can be opened, retracting means for moving the latch bolt to its retracted position; a locking element movable between blocking and release positions, the locking element when in its blocking position preventing the latch bolt from moving to the retracted position, the locking element when in its release position permitting the latch bolt to move to its retracted position, the locking element being held in its release position by the latch bolt when the latch bolt is in its retracted position; an auxiliary latch projecting beyond the door when the door is open for engagement with the strike as the door is closed and being depressed by the strike when the door is closed, the auxiliary latch being connected with the locking element for holding the locking element in its release position when the door is open and the auxiliary latch is projected beyond the door, the auxiliary latch when depressed permitting the locking element to move to its blocking position, whereby the locking element will assume its blocking position only when the latch bolt is in its extended position and the auxiliary latch is depressed, and a switch operated directly by the locking element such that the switch condition changes with each movement of the locking element between its release and blocking positions, the switch being electrically connected with the alarm, whereby the switch monitors the position of the locking element.

3,890,609
LOW VOLTAGE COLD CATHODE DISCHARGE TYPE DISPLAY DEVICES WITH METAL OXIDE CATHODE AND PHOSPHOR ANODE MATRIX
Rentaro Sasaki; Akinori Watanabe, both of Takasaki; Tatsuo Ogasawara, Tokyo, and Hidetoshi Sogabe, Gyoda, all of Japan, assignors to Oki Electric Industry Co., Ltd. and Okaya Electric Industry Co., Ltd., both of Tokyo, Japan
Filed Apr. 5, 1973, Ser. No. 348,249
Int. Cl. H05b *37/00*
U.S. Cl. 340—324 M 5 Claims



1. A cold cathode discharge type display device comprising a pair of insulative substrates, at least one of the substrates being transparent, an insulative spacer disposed between said pair of substrates, said spacer being provided with a plurality of perforations which are arranged in a matrix, a plurality of cold cathode electrodes disposed between one substrate and said insulative spacer with each cold cathode electrode opposed to one row of the matrix, an electron emissive metal oxide coated on respective cold cathode electrodes, a plurality of anode electrodes disposed between the other insulative substrate and said insulative spacer with each anode electrode opposed to one column of the matrix, means for hermetically sealing the peripheries of said pair of substrates thereby forming a sealed envelope, an inert gas sealed in said envelope, and means for applying an operating voltage across a selected one of the anode electrodes and a selected one of the cathode electrodes so as to establish electric discharge at the cross-point between said selected anode and cathode electrodes thereby displaying a desired pattern.

3,890,610
HIGH-PRECISION DIGITAL-TO-ANALOG CONVERTERS
Olivier Cahen, Paris, France, assignor to Thomson-CSF, Paris, France
Filed Oct. 29, 1973, Ser. No. 410,410
Claims priority, application France, Oct. 31, 1972, 72.38594
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 CC 10 Claims



1. A digital-to-analog converter comprising:
- a first plurality of terminals including *n* digital input terminals of different binary rank, an analog output terminal and a ground terminal, *n* being an integer greater than 1; a first resistive ladder network with n first sections connected between said output and ground terminals, said sections including first series resistors of magnitude R and first branch resistors of magnitude 2R forming n first junctions;
- a second resistive ladder network with *j* second sections connected between said output and ground terminals in parallel with said first ladder network, *j* being an integer smaller than *n*, said second sections including second series resistors of magnitude R and second branch resistors of magnitude 2R forming *j* second junctions;
- a resistive connection of magnitude greater than R between said output terminal and said second ladder network;
- *n* first impedance-adapting means with substantially zero output impedance connecting each of said input terminals with a respective first junction, the separation of said first junctions from said output terminal decreasing with increasing ranks of the input terminals connected thereto; *j* second impedance-adapting means with substantially zero output impedance connecting the *j* highest-ranking input terminals with a respective second junction; and
- rupturable connector means between said *j* highest-ranking input terminals and said second impedance-adapting means enabling calibration of said first ladder network by selective disconnection of any of said second impedance-adapting means from the corresponding input terminals with resulting modification of the output voltage of said first ladder network due to energization of said corresponding input terminals.

3,890,611

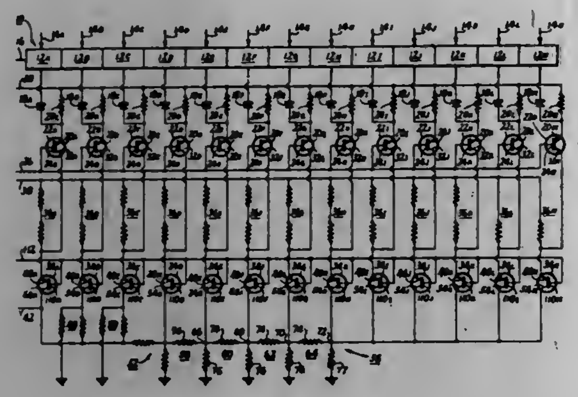
CONSTANT-CURRENT DIGITAL-TO-ANALOG CONVERTER

James J. Pastoriza, Lincoln, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.

Continuation of Ser. No. 220,016, Jan. 24, 1972, which is a division of Ser. No. 809,700, March 24, 1969, abandoned. This application Jan. 25, 1974, Ser. No. 436,522

Int. Cl. H03k *13/04*

U.S. Cl. 340—347 DA **1 Claim**



1. In a digital-to-analog converter, the combination of:

a first set of NPN transistors each including a base electrode and emitter and collector current-carrying electrodes;

a set of resistors each connected at one end to the emitter electrode of a corresponding transistor of said first set;

negative power-supply voltage means connected to the other end of each of said set of resistors;

means connected to the base electrodes of said first set of transistors to set the voltage between the bases of said transistors and the other ends of said resistors so as to provide for at least substantially constant current flow through the respective transistor when it is activated for current flow;

output circuit means connected to the collector electrodes of said first set of transistors to conduct currents developed by the activated transistors through an output line;

a second set of transistors each including a base electrode and emitter and collector current-carrying electrodes;

power supply means coupled to the base electrodes of said second set of transistors to control the base potentials thereof;

means connecting one of said current-carrying electrodes of each of said second set of transistors to said one end of a respective one of said resistors to establish paths for current flow serially through each of said second set of transistors and an associated one of said resistors;

positive power supply means connected to the other of said current-carrying electrodes of said second set of transistors to produce said serial flow of current through each transistor and the associated resistor with a predetermined magnitude sufficient to cut off current flow through the corresponding transistor of said first set of transistors which is connected to that resistor, said second set of transistors being arranged as constant-current sources to maintain said serial flow of current at said predetermined magnitude when activated; and

means coupled to each transistor of said second set of transistors to apply thereto logic control voltages for selectively activating the transistors of said second set so as to produce said serial flow of current through the respective transistor of said second set and the corresponding resistor connected thereto, whereby to cut off current flow through the corresponding transistor of said first set of transistors.

3,890,612

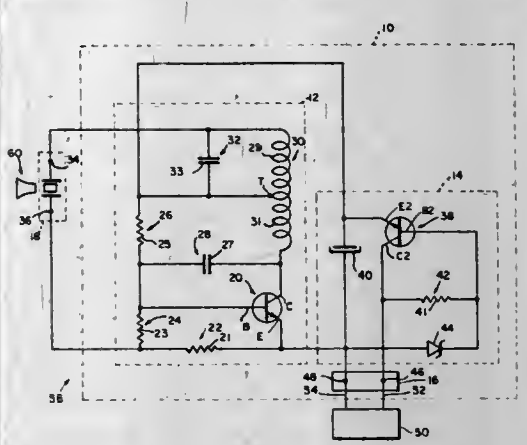
HIGH OUTPUT AUDIBLE ALARM DEVICE UTILIZING A PIEZOELECTRIC TRANSDUCER

Louis P. Sweany, Carmel, and James D. Pirtle, Lawrence, both of Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Sept. 28, 1973, Ser. No. 401,944

Int. Cl. G08b *3/10*

U.S. Cl. 340—384 E **6 Claims**



1. An audible alarm device comprising:
a. an acoustical loading means;
b. a piezoelectric transducer in spaced relation to said acoustical loading means;
c. a solid-state amplifier drive circuit cooperating with said piezoelectric transducer to produce an audible signal including an activation circuit connected to said piezoelectric transducer, a voltage regulator connected to said activation circuit, and a power supply connection means connected to said voltage regulator, said activation circuit comprising:

a transformer coil to increase voltage from a power supply to said piezoelectric transducer, a first NPN transistor, emitter connected to said voltage regulator and to a first side of a first resistance means, base connected to a first side of a second resistance means, to a first side of a third resistance means and also to a first side of a first capacitance means, collector connected to a second side of said first capacitance means and also to a primary winding of said transformer coil; a second side of said third resistance means connected to said voltage regulator, to a first side of a second capacitance means and also to a tap on said transformer coil; a secondary winding of said transformer coil connected to a second side of said second capacitance means and also to a first terminal of a piezoelectric transducer; a second side of said first resistance means connected to a second side of said resistance means and also to a second terminal of said piezoelectric transducer.

3,890,613

TECHNIQUE FOR MINIMIZING LOSS OF SENSITIVITY OF BURIED PRESSURE RESPONSIVE DEVICES

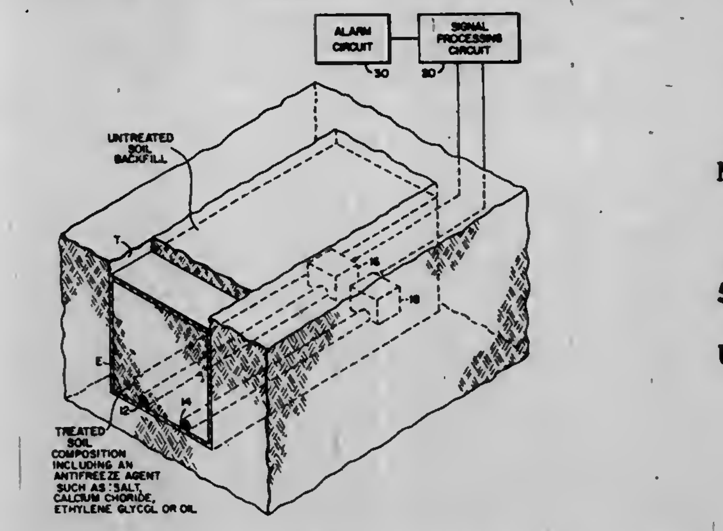
William K. Dunsworth, Export, and Fred G. Geil, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 18, 1973, Ser. No. 398,350

Int. Cl. F16l *1/00;* **E02d** *3/14*

U.S. Cl. 340—407 **1 Claim**

1. A method for minimizing loss of sensitivity of pressure responsive devices buried beneath the surface of the ground due to frozen soil conditions, comprising the steps of, adding an anti-freeze agent to a predetermined volume of previously untreated natural soil between a buried pressure responsive device and the surface of the ground, limiting the soil contacted by said anti-freeze agent to the soil defined within said predetermined volume, enclosing said pressure responsive device and said predetermined volume of soil within a non-porous enclosure, and covering said enclosure with untreated soil.


ALARM CIRCUIT
SIGNAL PROCESSING CIRCUIT
30
50
UNTREATED SOIL BACKFILL
TREATED SOIL COMPOSITION INCLUDING AN ANTIFREEZE AGENT SUCH AS SALT, CALCIUM CHLORIDE, ETHYLENE GLYCOL OR OIL

3,890,614

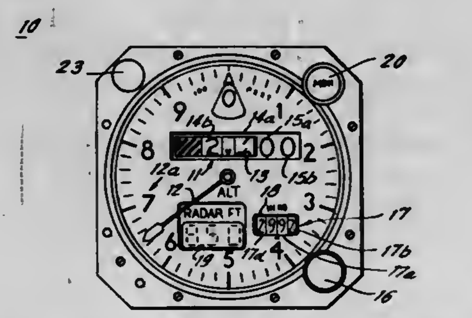
INTEGRATED RADAR-PNEUMATIC ALTIMETER DISPLAY DEVICE

Michael Argentieri, West Orange, and Robert Kelso, Bloomfield, both of N.J., assignors to Intercontinental Dynamics Corporation, Englewood, N.J.

Filed Feb. 20, 1973, Ser. No. 333,807

Int. Cl. G01l *7/00;* **G01s** *9/04;* **G08g** *5/00*

U.S. Cl. 343—5 DP **3 Claims**



1. A compact instrument for displaying an altitude reading comprising:

a housing having a front face;

said front face having a window;

electronic decimal multi-digit illuminated display means positioned behind said dial face for displaying an illuminated multi-digit altitude reading;

first means for receiving an analog signal representative of an altitude signal;

second means for converting an analog signal into a plurality of binary coded decimal digit signal groups representative of the analog signal applied to said second means;

third means coupled to said second means for coupling said signal groups to associated digit positions of said decimal multi-digit display means to provide an illuminated display of an altitude reading;

an adjustable knob positioned to be accessible at said front face, said knob being linearly movable between first and second positions and being rotatable about a central axis;

fourth means for generating an analog voltage whose magnitude represents the amount of rotation of said knob;

switch means operative under control of said knob for selectively coupling only the output of said first means to said second means when said knob is in said first position and for coupling only the output of said fourth means to said second means when said knob is in said second position;

comparison means coupled to said first means and said fourth means for generating an alarm signal whenever said knob is in said first position and the signal level derived from said first means is equal to or less than the signal level derived from said fourth means.

3,890,615

TARGET DETECTION SYSTEM

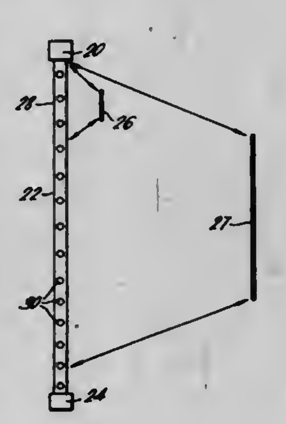
Michael James Moran, Balerno, Scotland, assignor to Microwave and Electronic Systems Ltd., Newbridge, Scotland

Filed Oct. 30, 1972, Ser. No. 301,921

Claims priority, application United Kingdom, Nov. 2, 1971, 50937/71

Int. Cl. G01s *9/44*

U.S. Cl. 343—5 PD **2 Claims**



1. A target detection system for detecting the presence of a moving target in a monitored space comprising a generator of wave energy; a distributed antenna arrangement comprising a radiative transmission line for radiating a proportion of wave energy applied thereto, one end of said transmission line being coupled to said generator for energization thereby to radiate a proportion of the energy supplied to said antenna arrangement, said antenna arrangement being distributed along a path extending through said monitored space and different portions of said antenna arrangement irradiating a portion of said space in the immediate vicinity thereof whereby the radiated energy is distributed through said space at low intensity; and a receiver coupled to another end of said transmission line to receive therefrom signals exhibiting Doppler-shift returned to said antenna arrangement from a moving target irradiated thereby, and receive non radiated energy supplied to said antenna arrangement by said generator and being responsive thereto and to said Doppler-shifted signals to derive a Doppler-shift signal indicative of the presence of a moving target.

3,890,616

RADAR ANTI-COLLISION SYSTEM FOR SHIPS IN WATERS ADJACENT LAND AREAS

Takeshima Kojima; Masabumi Iizuka, both of Tokyo; Kenta Kabayama, and Shizuhiro Izawa, both of Yokohama, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Sept. 6, 1973, Ser. No. 394,575

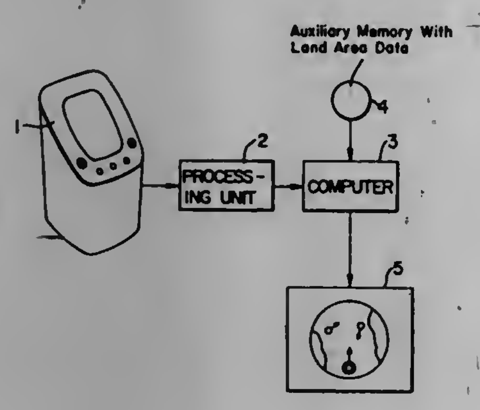
Claims priority, application Japan, Dec. 28, 1972, 48-327

Int. Cl. G01s *7/22, 7/24*

U.S. Cl. 343—5 MM **4 Claims**

1. A radar anti-collision system, for avoiding collisions between water-borne vessels in waters adjacent land areas, comprising, in combination, a radar mounted on a vessel and scanning objects in the course of the vessel; a data processing unit having an input connected to said radar and processing the positional data of land areas and of other vessels scanned by said radar; a computer connected to the output of said data processing unit; an auxiliary memory connected to an input of said computer and having stored therein a set of marine positional data with respect to land areas adjacent the course of the vessel, said auxiliary memory supplying the stored data to

said computer in accordance with a present program for comparison, in said computer, with the positional data supplied by said data processing unit from said radar; and a general display unit connected to the output of said computer; said computer comparing the stored positional data with the processed positional data and, responsive to such comparison indicating that the vessel is at a greater distance from land areas than limits defined by the stored positional data, cancelling processed positional data relating to land areas from the positional data to a collision avoidance program in said computer so that the processing by said collision avoidance program becomes more reliable and the data displayed on said general display unit, responsive to such comparison indicating that the vessel is at a greater distance from land areas than limits defined by the stored positional data, does not include any positional data relating to land areas.



3,890,617

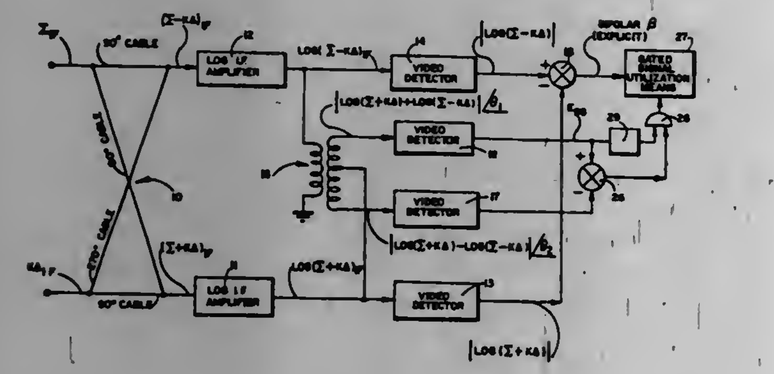
LOGARITHMIC MONOPULSE RECEIVER

James A. Moulton, Santa Ana, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 6, 1968, Ser. No. 703,381

Int. Cl.² G01S *9/22*

U.S. Cl. 343—7 A **6 Claims**



1. A monopulse system including an intermediate frequency stage providing target angle signal performance having reduced anomalies, and comprising a first and second intermediate frequency signalling channels providing a respective first and second signal indicative of the respective logarithmic vector sum and difference of a monopulse sum and difference signal, each said channels comprising

intermediate frequency vector combining means responsive to said monopulse sum and difference signals; and

logarithmic signalling means responsive to the output of said vector combining means.

3,890,618

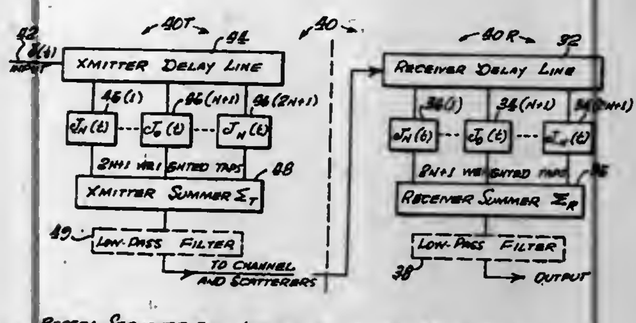
BESSEL SEQUENCE ECHO-LOCATION SYSTEM

Jeffrey M. Speiser, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 30, 1973, Ser. No. 393,259

Int. Cl. G01s *7/28*; G06f *15/34*; G06g *7/26*

U.S. Cl. 343—17.1 R **11 Claims**



BESSEL SEQUENCE ECHO-LOCATION SYSTEM-TRANSVERSAL FILTER IMPLEMENTATION

1. A transmitter for use in an echo-location system for radar or sonar, comprising:

a source of signals comprising a sequence of weighted pulses conforming to the equation

$$\sum_{n=-N}^{N} J_n(x)p(t-nT),$$

where $J_n(x)$ denotes the nth Bessel function of the first kind, $p(t)$ is the time function corresponding to an elementary pulse, and T is the spacing between elementary pulses.

3,890,619

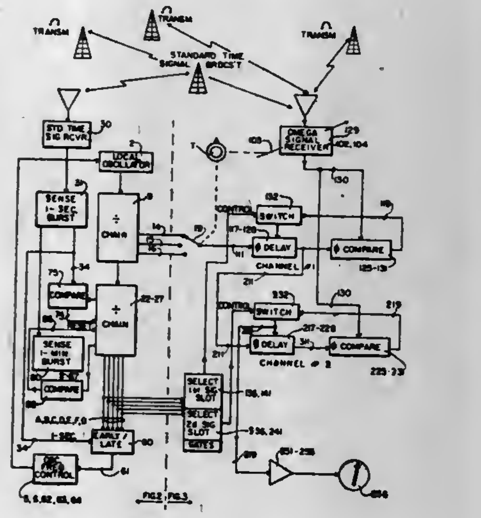
OMEGA NAVIGATION RECEIVER APPARATUS

George R. Mounce, 18 Bridle Path, Toronto, Ontario, Canada (M2L IC8)

Filed July 12, 1973, Ser. No. 378,634

Int. Cl. G01s *1/30*

U.S. Cl. 343—105 R **15 Claims**



1. Omega Navigation receiver apparatus for determing the phase relationship between multiple Omega signals of the same frequency which are transmitted successively by different Omega transmitters according to a predetermined repeating real-time cycle, and the apparatus using time signals broadcast from a Standard Time Signal station to identify the sources of said Omega signals, by determining their positions in said repeating cycles comprising in the apparatus:

a. a receiver for receiving the Omega signals and a receiver for receiving said Standard Time Signals;

b. a reference oscillator generating an oscillation;

c. frequency divider chains connected to divide the frequency of said oscillation to obtain a reference oscillation of the same frequency as said transmitted Omega signals, and to obtain timing signals representing the moments during each cycle of transmission of said successive Omega signals by said Omega transmitters;

d. comparison means connected to receive said Standard Time Signals and the locally-generated timing signals and to compare their relative times of occurrence and including timing correction means responsive to said relative times of occurrence to bring these signals into coincidence;

e. means for selecting certain Omega signals from their positions in the repeating time cycle;

f. first phase shifting means operative to shift the phase of said reference oscillation to provide a first reference signal having a predetermined phase relationship with respect to a first selected one of said received Omega signals;

g. second phase shifting means operative to shift the phase of a signal based on the first reference signal to provide a second reference signal having said same predetermined phase relationship with respect to a second selected one of said Omega signals; and

h. indicator means responsive to the amount of phase shift performed by said second phase shifting means to indicate the phase difference between the first and second Omega signals.

3,890,620

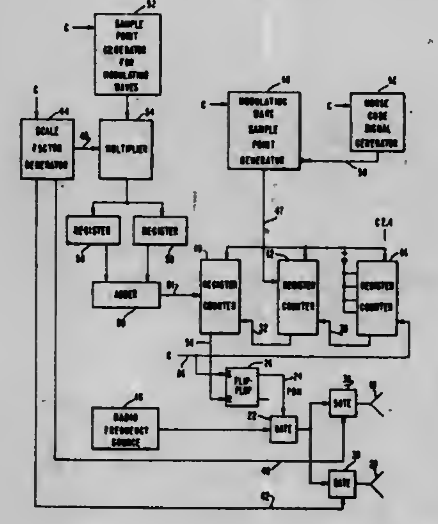
METHOD AND APPARATUS FOR MODULATION SYNTHESIS

Donald J. Toman, Pleasantville, and J. Roland Coulter, Harrison, both of N.Y., assignors to Tull Aviation Corporation, Armonk, N.Y.

Division of Ser. No. 198,839, Nov. 15, 1971, Pat. No. 3,793,597, which is a division of Ser. No. 196,288, Nov. 8, 1971, Pat. No. 3,808,558. This application Jan. 14, 1974, Ser. No. 430,272

Int. Cl. G01s *1/16*

U.S. Cl. 343—108 R **7 Claims**



1. Apparatus for synthesizing the production of a modulated radio carrier wave comprising

storage means for continuously storing the same group of digital values corresponding to a plurality of different sample points signifying various modulation levels required at successive points in time to suggest the presence of a modulation signal wave form,

means for reading out said sample point values in timed sequence,

a source of carrier waves,

means for transferring and means for applying said point values to modify the carrier waves to produce a modified carrier which is recognizable by a receiver as a carrier modulated by a repetitive wave form modulation signal, said means for applying said point values to modify the carrier wave comprising a gating device operable to gate the carrier on and off for periods proportional to the sample point values to thereby establish a pulse duration modulated carrier signal,

a plurality of antenna elements arranged in an array,

and switching means operable in synchronism with said gating device to switch the carrier to different antenna elements in said array for the successive individual periods when the carrier is on to thereby provide a composite scanning beam signal from all of the elements of said array.

3,890,621

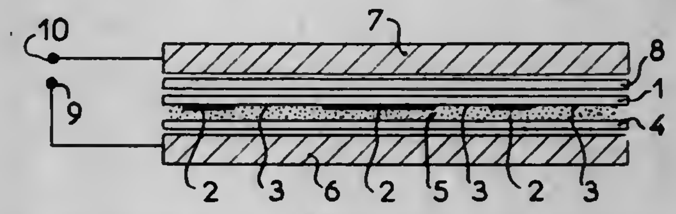
ELECTROGRAPHIC DEVICES FOR THE NON-ELECTROSTATIC DUPLICATION OF ORIGINALS PROVIDED WITH A CONDUCTIVITY PATTERN FORMED FROM INDICIA AND BLANK AREAS

Marcus Cantarano, 47, avenue F. Roosevelt, 94320 Thiais, France

Division of Ser. No. 151,489, June 9, 1971, Pat. No. 3,849,126, which is a continuation-in-part of Ser. No. 631,792, April 18, 1967, abandoned. This application Jan. 7, 1974, Ser. No. 431,961

Int. Cl. G01d *15/06*

U.S. Cl. 346—74 ES **10 Claims**



1. An electrographic device comprising an original provided with a conductivity pattern ranging from a portion formed from a first material having a greater electric conductivity to a portion formed from a second material having a lesser conductivity, means for placing a thin layer of electrically chargeable particles in contact with said conductivity pattern, means for generating an alternatively modulated electric field of sufficient strength across said conductivity pattern and said layer of electrically chargeable particles so as to transfer electric charges from said conductivity pattern to said electrically chargeable particles whereby a portion of said particles is sufficiently charged and removed from said layer of electrically chargeable particles and the remainder of said particles is insufficiently charged so that it remains in said particles layer thereby forming a stable electrographic image.

3,890,622

SEALED CASSETTE FOR MOIST FACSIMILE RECORDING PAPER

John M. Alden, Needham, Mass., assignor to Alden Research Foundation, Westboro, Mass.

Filed July 9, 1973, Ser. No. 377,261

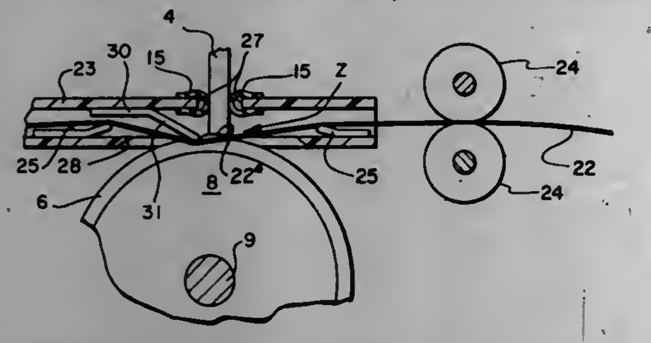
Int. Cl. G01d *5/06*, *15/28*

U.S. Cl. 346—74 E **4 Claims**

1. An electric graphic recording cassette detachably fitting a recorder having a scanning electrode cooperating with a linear electrode in a recording zone, the cassette comprising: a housing including a moist recording web supply compartment and guide means forming an exit path for the web

through the recording zone, the housing having an opening at the recording zone admitting the scanning electrode thereto, and the guide means including means urging the web toward the opening and into the recording zone, and

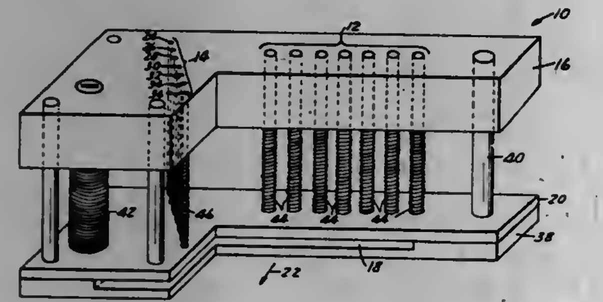
a resilient member extending along the recording zone and having a free flexing end closely adjacent the zone and biased yieldingly to displace the web out of the recording zone away from the linear electrode, the scanning electrode resiliently urging the web into contact with the linear electrode against the yielding displacement of the resilient member only at the effective recording spot where the scanning electrode opposes the linear electrode.



3,890,623
MAGNETIC DOCUMENT ENCODER HAVING MULTIPLE STAGGERED STYLI

Ronald F. Schmid, White Beak Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St Paul, Minn.

Filed May 2, 1973, Ser. No. 356,320
Int. Cl. G01d *15/12*
U.S. Cl. 346—74.1 **18 Claims**



1. An apparatus for subjecting a medium to time-spaced localized intense magnetic fields outlining alphameric characters, which apparatus comprises:

means for transporting and positioning a medium along a transport path;

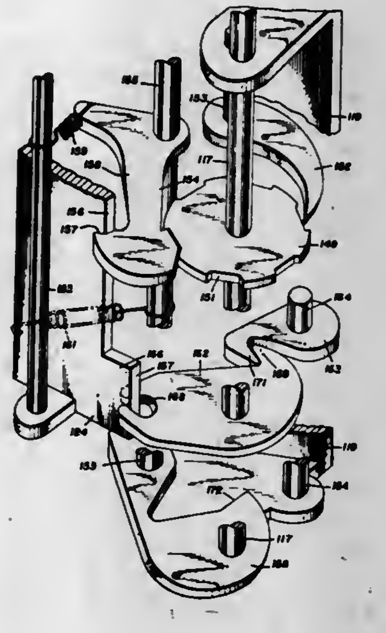
a plurality of electromagnetic styli positioned in a staggered array across said transport path such that at least two of said styli are differently spaced from a reference line normal to said transport path, each of said styli comprising a substantially cylindrical body having a high permeability, high magnetic moment, and low magnetic remanence, which body terminates at one end as a shaped pole face positioned along the transport path to concentrate the flux through said medium and terminates at the opposite end in a flux return member extending around and under said transport path and further comprising a coil surrounding said body closely positioned adjacent said pole face to maximize the flux produced in the pole face in said medium, said coil containing not more than 500 turns; and

means for selectively energizing said styli in synchronization with the movement of the medium to form a plurality of localized magnetic fields outlining an alphameric character.

3,890,624
TIME RECORDER

Rudolph B. Danke, Petersham, Mass., assignor to Simplex Time Recorder Company, Gardner, Mass.

Division of Ser. No. 236,358, March 20, 1972, Pat. No. 3,800,301. This application Jan. 24, 1974, Ser. No. 436,148
Int. Cl. G07c *1/06*
U.S. Cl. 346—91 **8 Claims**



1. A time recorder comprising
a. a housing,
b. a time stamp shaft mounted in the housing,
c. a plurality of time wheels mounted on the shaft,
d. an electric motor mounted on the frame,
e. a pawl mechanism driven by the motor and operative through pawls engaging ratchet wheels to index the wheels,
f. a locking pawl engaging a ratchet on each wheel,
g. a locking bar engaging a surface on each locking pawl to prevent movement of the wheels except when a pawl engages a ratchet for incremental motion, and
h. a release element mounted on the shaft and engageable with the locking bar, the release element being rotated about the shaft with the pawl mechanism and having a notch that envelopes an edge of the locking bar and carries it away from the surface of the locking pawl during rotation.

3,890,625
LONG-TIME EXPOSURE APPARATUS FOR CAMERA

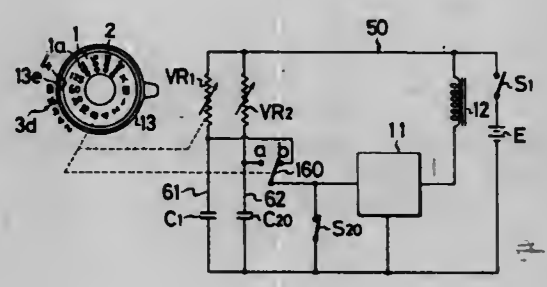
Kuramoto Yoshio, Toyonaka, and Kobori Toshio, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 23, 1973, Ser. No. 390,818
Claims priority, application Japan, Sept. 12, 1972, 47-92153; Sept. 12, 1972, 47-92154
Int. Cl. G03b *7/02, 9/58*
U.S. Cl. 354—51 **16 Claims**

11. An apparatus for setting a long-time exposure in a camera comprising:

a manually adjustable exposure time setting member for setting a desired exposure time within an ordinary exposure time,

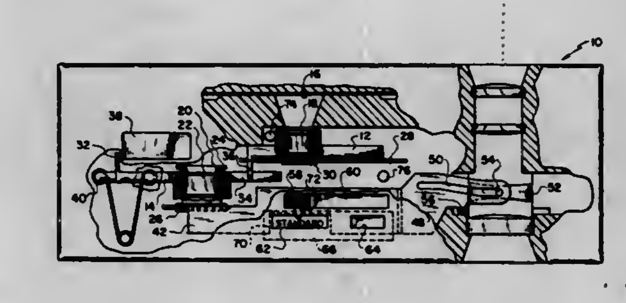
a manually adjustable long-time exposure setting member for setting an exposure time longer than any exposure time to be set by the exposure time setting member, and a delay circuit included in an exposure time control electric circuit for determining an exposure time in accordance with its time constant, the delay circuit including an exposure time control element for adjusting the time constant and capacitor means having a first capacitor for an ordinary time exposure and a second capacitor for a long-time exposure, the value of the exposure time control element being settable by the exposure time setting member and the long-time exposure setting member so as to adjust the time constant, and the capacitors and the exposure time control element being so arranged that the second capacitor is connected into the delay circuit so as to increase the capacitance of the capacitor means and that the value of the exposure time control element set by the long-time exposure setting member is made effective when the exposure time setting member is set in a specified position, whereby the time constant is determined by the increased capacitance of the capacitor means and the value of the exposure control element set by the long-time exposure setting member with the exposure time setting member set in the specified position.



3,890,626
ADJUSTING MEANS FOR CAMERAS HAVING SEVERAL LENSES

Helmut Ettischer, Stuttgart, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 10, 1974, Ser. No. 477,579
Claims priority, application Germany, June 14, 1973, 2330264
Int. Cl. G03b *3/00*
U.S. Cl. 354—197 **3 Claims**

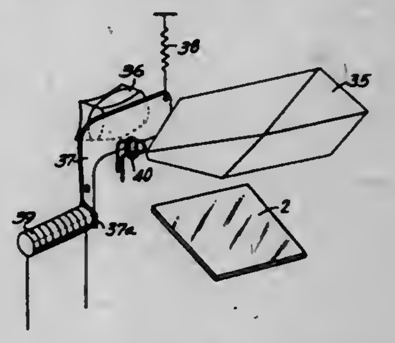


1. In a camera having an optical axis; a plurality of lenses, each lens being selectively movable between a stored position out of alignment with the optical axis and a taking position in alignment with the optical axis, at least one of said lenses being focusable while in said taking position; and a movable actuating member operatively connected to said lenses for moving one lens to its taking position while moving another lens to its stored position; the improvement comprising means interconnecting said actuating member and said focusable lens for adjusting the focus setting of said focusable lens upon movement of said actuating member.

3,890,627
CAMERA CONTROLS FOR BLOCKING LIGHT ENTERING THROUGH A VIEWFINDER OCULAR

Naoyuki Uno, Kawagoe, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Sept. 19, 1973, Ser. No. 398,811
Claims priority, application Japan, Sept. 21, 1972, 47-109950
Int. Cl. G03b *13/00*
U.S. Cl. 354—224 **12 Claims**

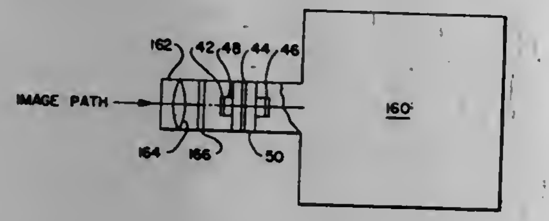


1. In a single lens reflex camera, mirror means movable between a lower viewing position and an upper exposure position, viewfinder means situated over said mirror means for receiving light reflected therefrom when said mirror means is in said lower viewing position thereof, said viewfinder means including a rear ocular for the camera operator and a prism in front of said ocular and over said mirror means for directing light from said mirror means to said ocular, said viewfinder means having behind said prism a free space through which light travels from said prism to said ocular, photosensitive means situated in said free space to receive light from said prism when said miror means is in said lower viewing position thereof to provide an electrical quantity, memory means for retaining said electrical quantity for utilization in determining the extent of exposure, light-blocking means having a blocking position situated in said free space between said ocular and photosensitive means to prevent light which enters said viewfinder means through said ocular from reaching said prism to be reflected thereby to said photosensitive means, said light-blocking means having a non-blocking position situated beyond the path of light travel from said prism to said ocular, electrical, automatically operable moving means operatively connected with said light-blocking means for automatically moving the latter from said non-blocking to said blocking position thereof, blocking switch means electrically connected with said electrical moving means for automatically actuating the latter, memory switch means having a normal position preventing operation of the memory means and an operating position rendering said memory means operative, shutter-tripping means for tripping a shutter of the camera to initiate an exposure, manually operable release means having a normal holding position and being movable by the operator from said holding position to a release position, and motion-transmitting means held by said manually operable release means in a predetermined starting position when said manually operable release means is in said holding position thereof, said motion-transmitting means being released for movement from said starting position thereof when said manually operable release means is displaced by the operator to said release position thereof, said motion-transmitting means being operatively connected with said blocking switch means, said memory switch means, said mirror means, and said shutter-tripping means for operating all of the latter means in a sequence according to which said blocking switch means is first actuated for first operating said moving means automatically to move said light-blocking means to said blocking position thereof, said memory switch means is then operated to be displaced from said normal to said operating position thereof, said mirror means is then at least started by said motion-transmitting means to move from said lower viewing position to said upper exposure position thereof, and said shutter-

tripping means is then actuated by said motion-transmitting means to open the camera shutter.

3,890,628
LIQUID CRYSTAL LIGHT CONTROL DEVICE AND CIRCUIT

Richard W. Gurtler, Mesa, Ariz., assignor to Motorola, Inc., Chicago, Ill.
Filed Oct. 23, 1973, Ser. No. 408,779
Int. Cl. G03b *9/56*
U.S. Cl. 354—227 **5 Claims**



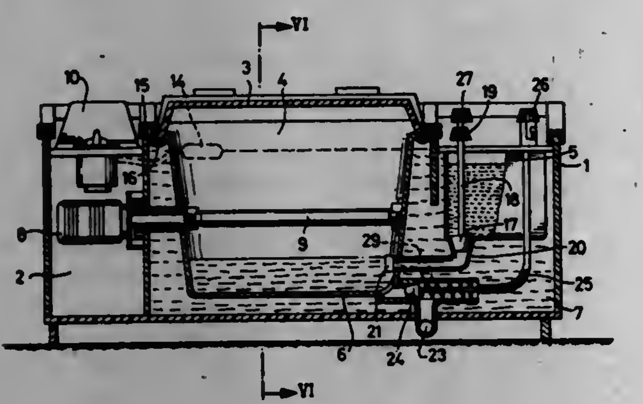
1. A camera including in combination:

lens means located in an image path suitable for transmitting an image to be photographed; and

normally closed liquid crystal shutter means located in the image path and arranged to receive the image transmitted by said lens means, said liquid crystal shutter means including first and second liquid crystal cells and means for supplying operating potentials to said liquid crystal cells, the application of operating potential to the first of said cells causing molecules of liquid crystal material in said first cell to align and thereby to pass light through said shutter means, the subsequent application of operating potential to said second cell causing molecules of liquid crystal material in said second cell to align and thereby to block passage of light through said shutter means.

3,890,629
DEVICE FOR DEVELOPING PHOTOGRAPHIC FILM OR PAPER

Heinrich Huss, Liebifstrasse 1, 6051 Weiskirchen, Germany
Continuation of Ser. No. 239,180, March 29, 1972, abandoned. This application Aug. 16, 1973, Ser. No. 388,889
Claims priority, application Germany, Mar. 31, 1971, 2115487; Mar. 31, 1971, 7112239
Int. Cl. G03d *13/00*
U.S. Cl. 354—299 **6 Claims**



1. A device for developing photographic material comprising:

a housing forming an elongated tank providing a light-impermeable developing chamber therein;

a drum in said tank rotatable about a horizontal axis for immersing photographic material therein;

a plurality of reservoirs for chemicals for use in a photographic process disposed in said housing adjacent said tank;

conduit means providing fluid communication between the tank and said reservoirs;

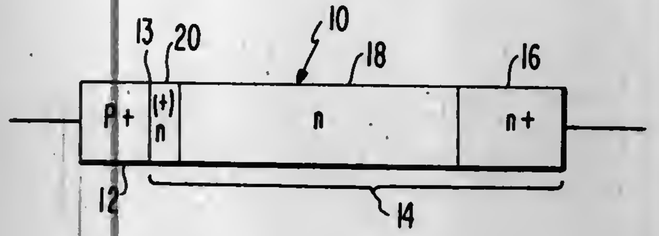
a water jacket enclosing said tank, said conduit means and said reservoirs for heat exchange through said tank and said reservoirs between chemicals therein and water of said jacket;

a temperature-control device for maintaining the temperature of said water jacket constant, the floor of said tank being arcuate and provided with a pair of spaced apart longitudinal beads; and

a barrier wall disposed in and transversely of the tank with opposite corners of the barrier wall tucked clampingly under said beads.

3,890,630
IMPATT DIODE

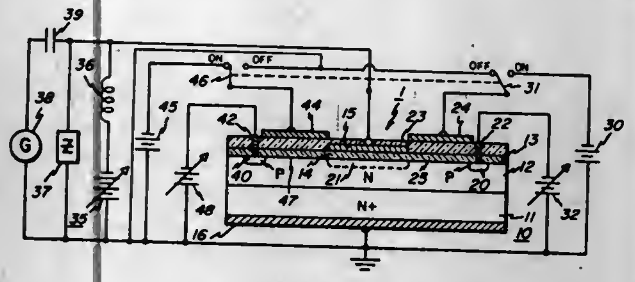
Ho-Chung Huang, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Oct. 9, 1973, Ser. No. 404,793
Int. Cl. H01l *9/00*
U.S. Cl. 357—13 **4 Claims**



1. A semiconductor diode comprising a body of single crystalline semiconductor material having a region of P-type conductivity and a region of an N-type conductivity, with a PN junction therebetween, said N-type region being divided into first, second and third subregions of which the second subregion is a center subregion doped to have a carrier concentration, n_2, substantially exceeding intrinsic carrier concentration, and the subregion contiguous to said PN junction is said first subregion doped to have a predetermined carrier concentration, n_1, greater than said center subregion carrier concentration, said third subregion being doped to have a carrier concentration substantially greater than said center subregion, said center subregion having a thickness, l_2, and said subregion contiguous to said PN junction having a thickness, l_1, less than said thickness, l_2, so that diode punch-through voltage to said third subregion substantially equals diode breakdown voltage at a desired diode operating frequency.

3,890,631
VARIABLE CAPACITANCE SEMICONDUCTOR DEVICES

Jerome J. Tiemann, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Dec. 26, 1973, Ser. No. 428,394
Int. Cl. H01l *17/00*
U.S. Cl. 357—14 **11 Claims**



1. Semiconductor apparatus for providing a capacitance for a high frequency signal variable in discrete increments comprising

a substrate of semiconductor material of one type conductivity including a plurality of spaced surface adjacent regions,

a plurality of capacitance providing electrodes, each insulatingly overlying and spaced a predetermined distance from a respective surface adjacent region of said substrate and forming with respect to a common electrode connected to said substrate a respective capacitor, said capacitance providing electrodes being connected together to provide a common capacitance providing electrode of said apparatus,

means for applying a depletion producing voltage between said common capacitance providing electrode and said common electrode corresponding to a predetermined surface potential having an absolute value less than said depletion producing voltage but greater than the inversion threshold voltage of said apparatus,

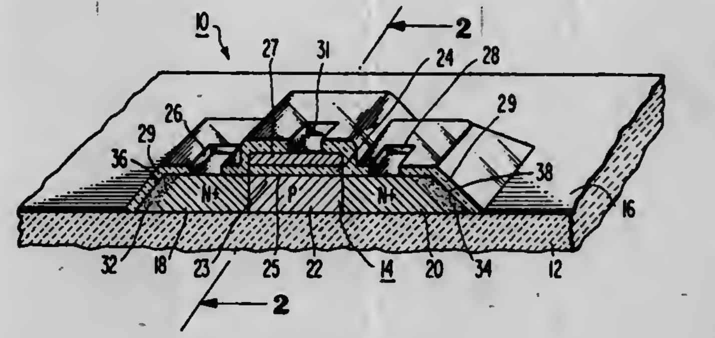
means for applying a high frequency signal between said common capacitance providing electrode and said common electrode,

control means for establishing individually in each of said surface adjacent regions a first potential in relation to said substrate corresponding to a respective low value of capacitance between a respective capacitance providing electrode and said common electrode, and for establishing alternatively and individually in each of said surface adjacent regions a second potential in relation to said substrate corresponding to a respective high value of capacitance between a respective capacitance providing electrode and said common electrode,

whereby the capacitance of said device is variable in increments dependent on the particular potentials established in the surface adjacent regions of the capacitors from a minimum value corresponding to the sum of the low value capacitances of the capacitors when said first potential is established in all of the surface adjacent regions of said capacitors to a maximum value corresponding to the sum of the high value capacitances of the capacitors when said second potential is established in all of said surface adjacent regions of said capacitors.

3,890,632
STABILIZED SEMICONDUCTOR DEVICES AND METHOD OF MAKING SAME

William Edward Ham, Monmouth Junction, and Doris Winifred Flatley, North Brunswick, both of N.J., assignors to RCA Corp., New York, N.Y.
Filed Dec. 3, 1973, Ser. No. 420,783
Int. Cl. H01l *11/00*
U.S. Cl. 357—23 **5 Claims**



1. A semiconductor device comprising:

a substrate of electrically insulating material,

a mesa of single crystal semiconductor material on said substrate,

said mesa having side surfaces extending transversely from said substrate,

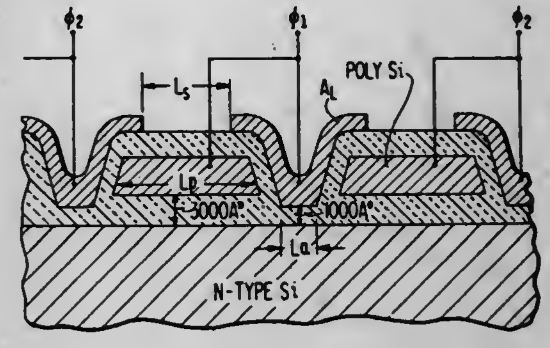
means defining a field effect transistor having source and drain regions and a channel region, said channel region extending between said source and drain regions and between two of said side surfaces, and

doped edge regions, in said channel region adjacent said two side surfaces of said channel region, having more conductivity modifiers than in the remainder of said channel region,

said conductivity modifiers being of the same conductivity type as that of said channel region.

3,890,633
CHARGE-COUPLED CIRCUITS

Walter Frank Kosonocky, Skillman, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Apr. 6, 1971, Ser. No. 131,679
Int. Cl. H01l *17/00*
U.S. Cl. 357—24 **10 Claims**



5. In a two-phase operated, charge-coupled circuit, in combination:

a substrate formed of semiconductor material at which charges may be stored;

a plurality of electrode means adjacent to one another forming a row along which charges are to propagate, each such means comprising a pair of electrodes, one electrode formed of a semiconductor and spaced at least twice as far from the substrate as the other electrode of said pair, said other electrode comprising a metal which is spaced of the order of 1,000 A or less from the substrate and which overlaps the semiconductor electrode of the same pair and the semiconductor electrode of the next adjacent electrode means, said semiconductor electrode having a substantially larger area facing the substrate than the portion of the metal electrode closest to the substrate, each semiconductor electrode being directly connected to its paired metal electrode; and

means for applying one phase of a two-phase shift voltage to alternate electrode means and the second phase of the two-phase shift voltage to the other electrode means.

3,890,634
TRANSISTOR CIRCUIT

Heinz Walter Ruegg, Hausena, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 189,086, Oct. 14, 1971, abandoned. This application Nov. 21, 1973, Ser. No. 418,210
Claims priority, application Netherlands, Oct. 23, 1970, 7015520
Int. Cl. H01l *19/00*
U.S. Cl. 357—40 **5 Claims**

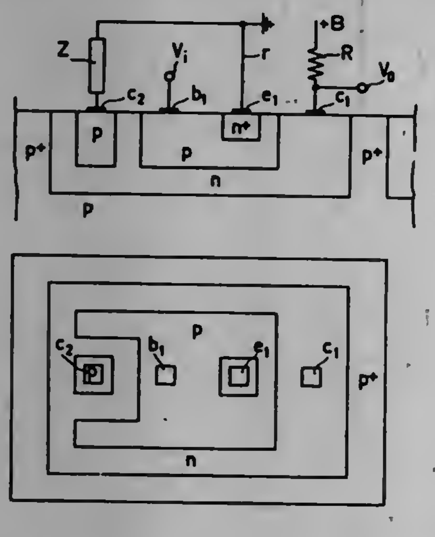
1. A solid state device comprising:

a first region of semiconductor material of one semiconductor type;

second and third regions of semiconductor material of the opposite semiconductor type forming mutually isolated islands within said first region, said second region being closely spaced from only a portion of the surface area of said third region by a portion of said first region, said portion of said first region having a width less than the diffusion length of minority carriers in said first region, whereby said portion of said first region acts substantially as the base region of a lateral transistor, said second and third regions respectively acting as the collector and emitter thereof;

a fourth region of semiconductor material of said one semiconductor type forming an isolated island within said third region, whereby said fourth region acts as the emitter region of a transversal transistor, said third and first regions respectively acting as the base and collector thereof;

a further transistor having a base of semiconductor material of said opposite semiconductor type and an emitter and collector of semiconductor material of said one semiconductor type, said base, emitter and collector being electrically connected to said second, fourth and third regions respectively, whereby said lateral transistor is conductive only when said transversal transistor is actually saturated and thereby causes said further transistor to limit saturation of said transversal transistor in response thereto; and means for making electrical connection to said third and fourth regions and to said first region at a location remote from said portion thereof spacing said second and third regions.



3,890,635

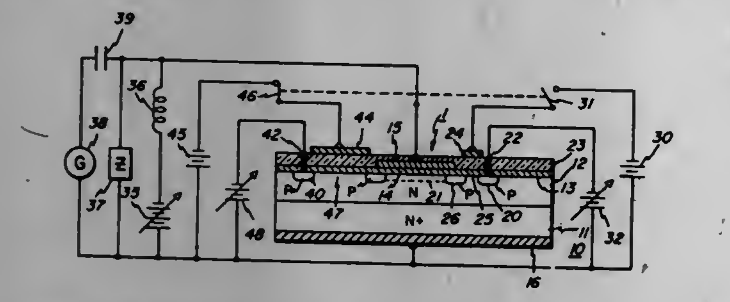
VARIABLE CAPACITANCE SEMICONDUCTOR DEVICES

William E. Engeler, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,418

Int. Cl. H01l *17/00*

U.S. Cl. 357—14 **18 Claims**



1. Semiconductor apparatus for providing a capacitance for a high frequency signal variable in discrete increments comprising

a substrate of semiconductor material of one type conductivity,

a plurality of capacitance providing electrodes, each insulatingly overlying and spaced a predetermined distance from a respective surface adjacent region of said substrate and forming with respect to a common electrode connected to said substrate a respective capacitor, said capacitance providing electrodes being connected together to provide a common capacitance providing electrode of said apparatus,

means for applying a depletion producing voltage between said common capacitance providing electrode and said common electrode corresponding to a predetermined surface potential of said surface adjacent regions, said predetermined surface potential having an absolute value less than the absolute value of said depletion producing voltage and greater than the inversion threshold surface potential of said capacitors,

means for applying a high frequency signal between said common capacitance providing electrode and said common electrode,

control means for establishing individually in each of said surface adjacent regions a first potential in relation to said substrate corresponding to a respective low value of capacitance between a respective capacitance providing electrode and said common electrode, and for establishing alternatively and individually in each of said surface adjacent regions a second potential in relation to said substrate corresponding to a respective high value of capacitance between a respective capacitance providing electrode and said common electrode,

said control means including a first control electrode, channel establishing means for individually establishing a plurality of first channel regions of opposite type conductivity in said substrate, each first channel region connected between a respective surface adjacent region and said first control electrode, and means for applying a first control potential to said first control electrode greater in magnitude than said predetermined surface potential whereby each surface adjacent region is drained of charge carries therein when a respective first channel is established,

whereby the capacitance of said device is variable in increments dependent on the particular potentials established in the surface adjacent regions of the capacitors from a minimum value corresponding to the sum of the low value capacitances of the capacitors when said first potential is established in all of the surface adjacent regions of said capacitors to a maximum value corresponding to the sum of the high value capacitances of the capacitors when said second potential is established in all of said surface adjacent regions of said capacitors.

3,890,636

MULTILAYER WIRING STRUCTURE OF INTEGRATED CIRCUIT AND METHOD OF PRODUCING THE SAME

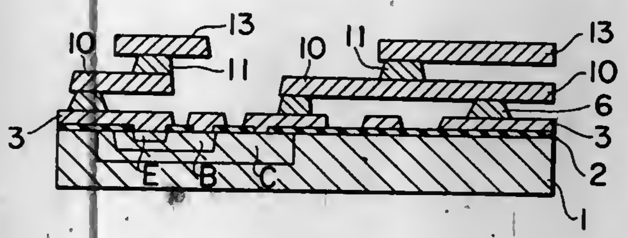
Seiki Harada, Hachioji; Atsushi Saiki, Tokyo; Takahiro Okabe, Hachioji, and Kikuji Sato, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 11, 1972, Ser. No. 287,637

Claims priority, application Japan, Sept. 9, 1971, 46-69216

Int. Cl. H01l *5/00*

U.S. Cl. 357—68 **25 Claims**



1. A multilayer wiring structure comprising:

a semiconductor substrate;

a first conductive layer formed with a first prescribed pattern over a major surface of said substrate, said layer including at least one vertically extending land portion;

a second conductive layer, formed with a second prescribed pattern in contact with only at least one selected vertically extending land portion at a position above said substrate; and

air spaces disposed between said conductive layers above said substrate.

3,890,637

SEMICONDUCTOR ELEMENT ENVELOPE

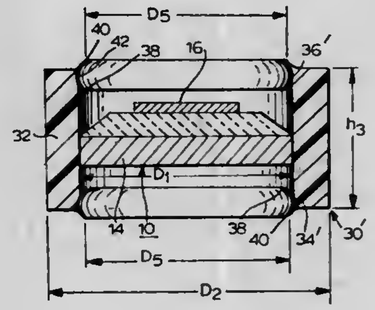
Isamu Yamamoto, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

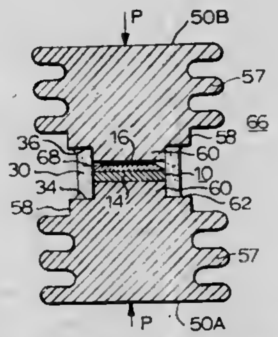
Filed Jan. 17, 1974, Ser. No. 434,117

Claims priority, application Japan, Jan. 25, 1973, 48-11315

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 357—74 **10 Claims**





1. A semiconductor device comprising, in combination, an annular member of elastic, electrically insulating material including a main portion in the form of a hollow cylinder and an annular engaging portion disposed at least at one end of said main cylindrical portion, said engaging portion including at least one annular fin integrally formed with said main portion; a semiconductor element including a wafer of semiconductive material having at least one P-N junction disposed therein and contacting the inner peripheral surface of said annular member; and a pair of electrode blocks forming an envelope for the semiconductor element with said annular member, each of said electrode blocks including a surface portion, each of said electrode blocks being disposed in contact with said semiconductor element while said surface portion of said electrode block is in engagement with said engaging portions on said annular member so that said annular fin is spread out on said surface portion of the associated electrode block, whereby the semiconductor element is hermetically sealed up between said annular fin and said surface portion of each of the electrode blocks.

3,890,638

COLOR PHASE MATCHING SYSTEM FOR MAGNETIC VIDEO TAPE RECORDINGS

David W. Bargen, San Jose, Calif., assignor to CMX Systems, Sunnyvale, Calif.

Filed Aug. 22, 1973, Ser. No. 390,577

Int. Cl. H04n *9/02*

U.S. Cl. 358—8 **16 Claims**

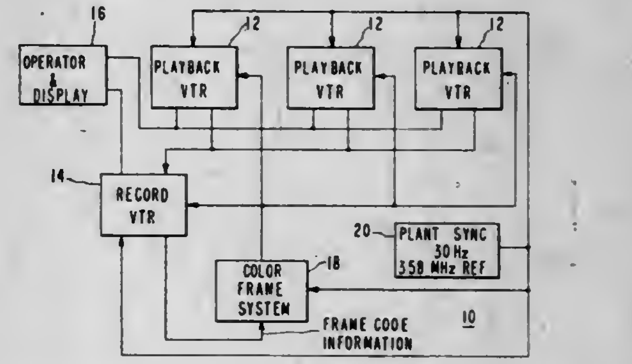
1. A color frame system for use with a video tape recorder/-reproducer for providing proper color burst phase matching comprising:

a. means for identifying alternate frames of video recorded on the recording tape;

b. means for detecting the alternate-frame identifications to generate alternate-frame identification signals to distinguish alternate frames recorded on the tape;

c. means synchronized with a stable signal source for generating frame reference signals at a frequency to provide means for distinguishing alternate video frames in time relative to said stable signal source;

d. means for comparing said alternate-frame identification signals and said frame reference signals; and



e. means reponsive to said comparison means to control the tape speed and/or position for correcting the recording tape frame position relative to said frame reference signal if required for proper color burst phase match.

3,890,639

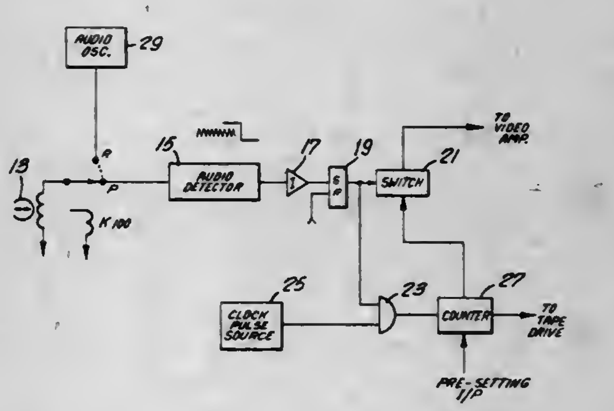
VIDEO TAPE RECORDING ANIMATION SYSTEM

Leopold Henry O'Donnell, Montreal; Robert Forget, St. Vincent de Paul, and Youssef Hasrouni, Montreal, Canada, assignors to Her Majesty the Queen in right of Canada as represented by the Secretary of State, Ottawa, Canada

Filed June 8, 1973, Ser. No. 368,300

Int. Cl. G11b *27/08, 15/00;* **H04n** *5/78*

U.S. Cl. 360—14 **8 Claims**



1. A method for controlling a video tape recorder in such a way that a selected number of frames of video information can be recorded, by video recorder means, on a video tape in said video tape recorder from a first position on the video tape on command;

said video tape comprising an audio frequency portion and a video frequency portion;

said method comprising:

positioning said video tape so that a second position on said video tape, predetermined length behind said first position, is adjacent said video recording means;

impressing an audio signal on said audio frequency portion of said video tape along the predetermined length of said video tape;

moving said video tape in its forward recording direction;

detecting the audio signal on the audio portion of said video tape while the tape is moving in its forward direction;

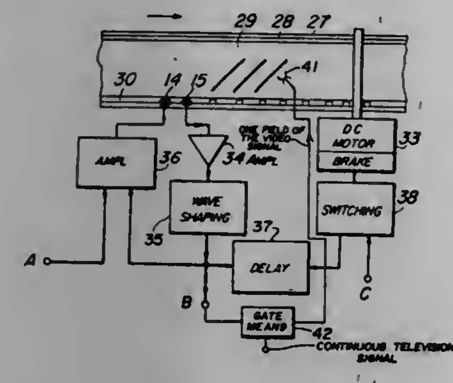
turning on the video recording means after the cessation of the audio signal and starting a count of frames elapsed after the turn on of the video recording means;

detecting a count corresponding to the selected number of frames; and

turning off said video recording means when the count is detected.

3,890,640
STEP DRIVEN MAGNETIC RECORDING AND REPRODUCING APPARATUS

Toshiomi Yabu, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Continuation of Ser. No. 102,022, Dec. 28, 1970, abandoned.
This application Oct. 29, 1973, Ser. No. 410,563
Claims priority, application Japan, Dec. 30, 1969, 45-1715
Int. Cl. G11b *15/00*
U.S. Cl. 360—50 **2 Claims**

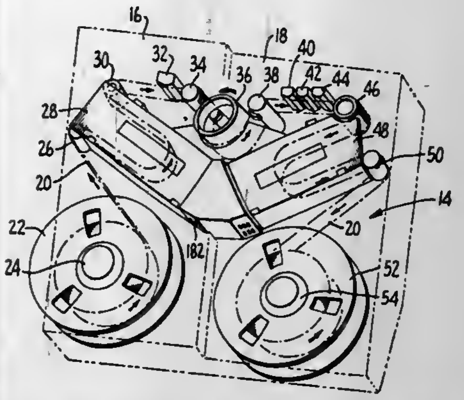


1. A magnetic recording and reproducing apparatus for the recording of information during incremental non-continuous motion of a magnetic recording medium, comprising a first head gap disposed at a fixed position relative to said magnetic recording medium, a second head gap disposed at a fixed position along the track of and spaced from said first head gap in the travelling direction of said magnetic recording medium, means for driving said magnetic recording medium, means for energizing said magnetic recording medium driving means in response to the application of a start signal to cause the travelling movement of said magnetic recording medium so that said second head gap reproduces a control signal previously recorded on said magnetic recording medium by said first head gap, means for deenergizing said magnetic recording medium driving means in response to said reproduced control signal thereby to stop the travelling movement of said magnetic recording medium, said deenergizing means including delay means for delaying the reproduced control signal to delay the deenergizing of said driving means for a predetermined period of time, means for gating at least one field of an input video signal in response to said reproduced control signal, means for applying said at least one field of the video signal gated by said gating means to a rotary head for recording it on said magnetic recording medium on a track which makes an angle with respect to the travelling direction of said magnetic recording medium, and means for applying the reproduced control signal to said first head gap to record a succeeding control signal on said magnetic recording medium at the same time that said at least one field of the video input signal is applied to said rotary head.

3,890,641
HELICAL SCAN MAGNETIC TAPE TRANSPORT SYSTEM INCLUDING VACUUM COLUMN TENSION CONTROL AND HELICAL SCANNER AIR BEARING

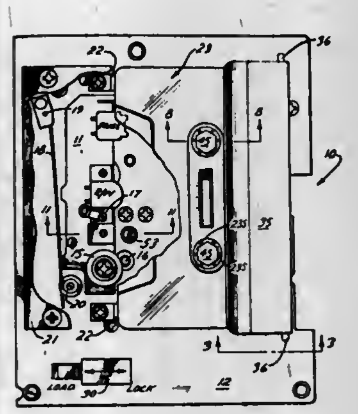
Frank S. C. Mo, Cupertino, and Vernon R. Natwick, Woodside, both of Calif., assignors to International Video Corporation, Sunnyvale, Calif.
Continuation-in-part of Ser. No. 285,923, Sept. 1, 1972, abandoned. This application Apr. 25, 1973, Ser. No. 354,227
Int. Cl. G11b *15/43, 15/60, 5/52*
U.S. Cl. 360—71 **5 Claims**

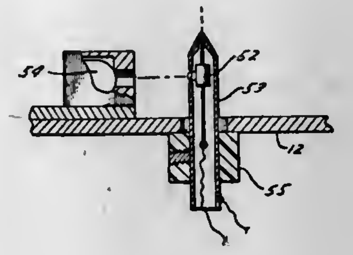
1. A tape transport system for transporting magnetic tape on a predetermined tape path comprising in combination:
- a supply means for continuously supplying magnetic tape at the beginning of the tape path;
- a take-up means for continuously storing magnetic tape at the end of the tape path;
- a plurality of air bearing guide means for low friction guiding of the tape on the tape path;
- a helical scanner assembly arranged on said tape path;
- a first vacuum column and a second vacuum column arranged on the tape path on either side of said helical scanner assembly between said supply means and said take-up means having air control means for variably controlling the tension of the tape across said helical scanner assembly, and having monitoring means for continuously monitoring the distance of the tape loop in said columns; and
- a drive capstan arranged on said tape path between said vacuum columns, said drive capstan having drive means for transporting tape on said path.



3,890,642
MAGNETIC TAPE TRANSPORT

John D. Platt, South Laguna, Calif., assignor to MSI Data Corporation, Costa Mesa, Calif.
Division of Ser. No. 104,351, Jan. 6, 1971, Pat. No. 3,731,042.
This application May 2, 1973, Ser. No. 356,373
Int. Cl. G11b *15/00*
U.S. Cl. 360—96 **2 Claims**



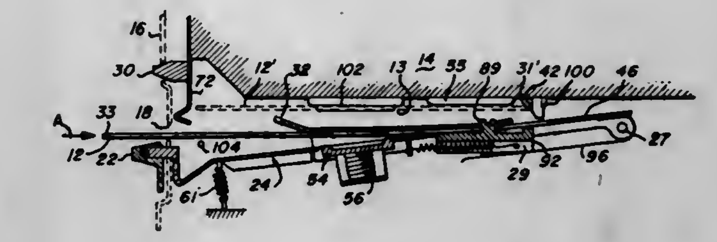


1. A tape transport assembly for a cassette tape cartridge comprising
- a base member including a pair of reel drive shafts for coupling to the reels of a cassette mounted thereon, said drive shafts each having portions for positively engaging the reels in a driving relationship when correctly coupled thereto and means operative upon rotation of the drive shafts for causing the correct and positive coupling of the reels and shafts to be effected,
- means mounted on the base member for releasably mounting a cassette tape cartridge having a pair of rotatable reels each mounting a plurality of spaced-apart reel driving elements for engaging the drive shafts and with tape extending between the reels and coupled to said reel drive shafts,
- a rotatable capstan mounted on the base member and extending therefrom so as to engage one side of the tape,
- means coupled to the capstan for rotatably driving same mounted on the opposite side of the base from the cassette mounting means,
- a head plate mounted on one side of the base member adjacent to the capstan and to allow movement toward and away from the capstan, said head plate mounting at least a single transducer and a pinch roller in spaced apart relationship to allow the pinch roller to rotatably engage the capstan with the tape therebetween,
- a radius arm pivotably mounted to the opposite side of the base member from the head plate and pivotably mounting the head plate, the head plate being pivotable with respect to the radius arm and movable therewith to allow the tape to be advanced from one reel to the other when the plate is swung towards the capstan and allowing the transducer to be operative on the advancing tape,
- means mounted on the base member for resiliently positioning the head plate relative to the base member and for urging it towards the cassette mounting means,
- control means mounted on the base member for moving the head plate toward the cassette to operatively position the transducer and pinch roller with respect to the tape and capstan, respectively, to allow a transducing operation on the tape; and for moving the head plate away from the pinch roller to allow the mounting and demounting of the tape cartridge on the base member;
- said control means including automatic means for moving the radius arm to pivot the transducer and pinch roller on the head plate away from the tape and capstan respectively to a spaced position sufficient to allow the tape of the tape cartridge to be transferred from one reel to the other reel of the tape cartridge, and means for detecting a preselected segment of the tape cartridge and signalling the detection of same, the preselected segment consisting of a light transmitting section and said detection means comprising a light emitting diode mounted on the base member adjacent the head plate for sensing the tape leader and an photoelectric sensor mounted opposite the diode for receiving the light from the diode through the light transmitting section for providing an output signal from the sensor representative of the detection of the light transmitting section of the tape, and the means for mounting the light emitting diode functions as a positioning member for locating the cassette tape cartridge on the base member.

3,890,643
FLEXIBLE DISK DRIVE CARTRIDGE LOADING APPARATUS

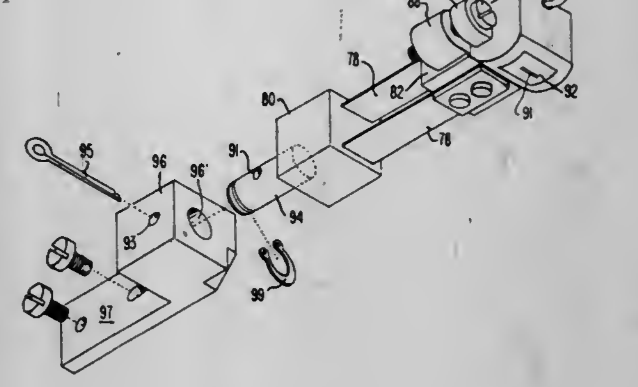
Warren L. Dalziel, Monte Sereno, Calif., assignor to Shugart Associates, Sunnyvale, Calif.
Filed July 12, 1973, Ser. No. 378,549
Int. Cl. G11b *17/04, 5/82*
U.S. Cl. 360—99 **20 Claims**

1, In a flexible disk drive apparatus including a chassis, a disk drive means affixed to the chassis, record/playback means and means for positioning a flexible disk cartridge relative to the drive and record/playback means, an improved cartridge positioning means, comprising:
- guide means having a first side pivotally affixed to said chassis and having means for receiving a cartridge inserted on a second side opposite said first side, said guide means being rotatable between a cartridge receiving position and a cartridge loaded position wherein a cartridge disposed in said guide means is moved into engagement with said drive means when said guide means is rotated from said receiving position to said loaded position;
- ejector means carried by said guide means and movable along said guide means between a released position and a cocked position, said ejector means being engaged by said cartridge and moved thereby into said cocked position as said cartridge is received by said guide means and being released to eject said cartridge from said guide means as said guide means is rotated from said loaded position to said receiving position; and
- cartridge registering means affixed to said chassis for engaging an edge of said cartridge as said guide means is rotated into said loaded position, and for moving said cartridge into registration with said drive means.



3,890,644
HEAD MOUNTING ASSEMBLY FOR READING AND WRITING ON BANK PASSBOOKS AND THE LIKE

Gunther R. Goetzinger, Detroit, and Hilliard R. Di Veto, Plymouth, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.
Filed Oct. 29, 1973, Ser. No. 410,709
Int. Cl. G11b *21/02, 21/24, 21/18*
U.S. Cl. 360—101 **23 Claims**



23. A magnetic transducing head assembly comprising, in combination:
- a first body containing a transducing head for performing magnetic transductions on a magnetizable surface as said first body is translatably moved along the longitudinal axis thereof;
- a second body spaced from the first body;

at least one flexure member bridging the distance between the first and second bodies and having its opposite end secured to said bodies to form a flexible connection therebetween which enables the first body to be deflected relative to the second body toward and into engagement with said magnetizable surface;

means for deflecting the first body such that said transducing head is moved into engagement with said magnetizable surface;

a third body positioned on the side of the second body opposite to the first body; and

means journaling the second body to the third body for rotation about an axis extending in a direction longitudinally of the flexure member and of the longitudinal axis of said magnetizable surface, said journaling means including a pin having one end secured to one of either the second body or the third body and having the other end disposed in a cylindrical aperture formed in the other of said bodies, and means rotatably retaining said pin within said aperture. whereby a rocking motion is permitted the second body relative to the longitudinal axis of said magnetizable surface to thereby enable the transducing head to closely follow any traverse surface irregularities therein.

3,890,645
MAGNETIC TRANSDUCER

Richard J. La Manna, Whippany, and Alan K. Jensen, Livingston, both of N.J., assignors to Litton Business Systems, Inc., Pine Brook, N.J.

Continuation of Ser. No. 856,856, Sept. 10, 1969, abandoned, which is a continuation of Ser. No. 487,866, Sept. 16, 1965, abandoned. This application Feb. 12, 1971, Ser. No. 128,602

Int. Cl. G11b *5/12*

U.S. Cl. 360—117 **7 Claims**

1. A transducer device for manually scanning a magnetic record, said device comprising:

a magnetic core structure having a generally U-shaped portion, the ends thereof being connected by a generally straight portion,

said straight portion being arcuately contoured in a direction generally transverse to the length thereof and being provided with a gap extending generally at an oblique angle to said length;

electrical coil means wound upon said magnetic core structure to provide for the transduction of a magnetically induced signal; and

means for manually moving said device with respect to said magnetic record.

DESIGN PATENTS

GRANTED JUNE 17, 1975

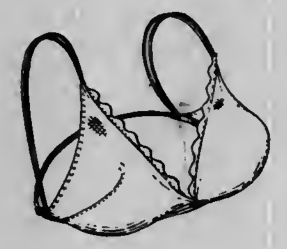
ERRATA

For CLASS	See PATENT NO.
006–209	235,413
019–076	235,425
026–014.00K	235,449

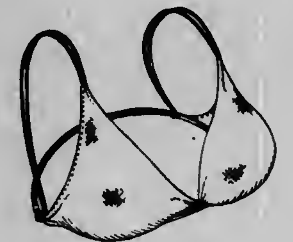
DESIGNS

JUNE 17, 1975

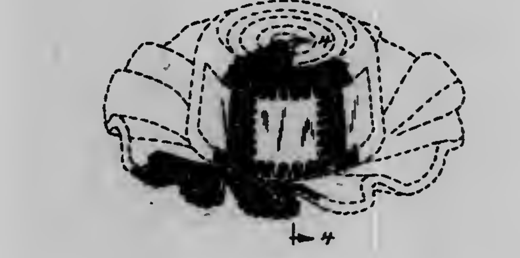
235,389
BRASSIERE
Julie Newmar, 12 Beekman Place,
New York, N.Y. 10022
Filed Mar. 7, 1974, Ser. No. 449,047
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—24



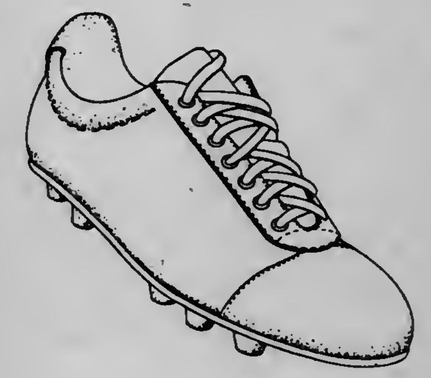
235,390
BRASSIERE
Julie Newmar, 12 Beekman Place,
New York, N.Y. 10022
Filed Apr. 12, 1974, Ser. No. 460,447
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—24



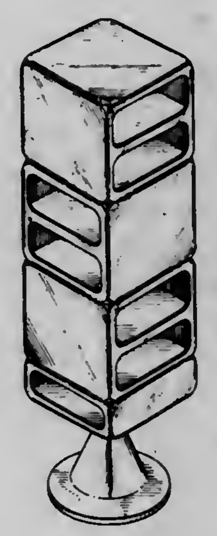
235,391
CROCHETED HAT
Alta Marie Somen, Northlake, Ill., assignor to Caron International Inc., Rochelle, Ill.
Filed Jan. 21, 1974, Ser. No. 435,255
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—257



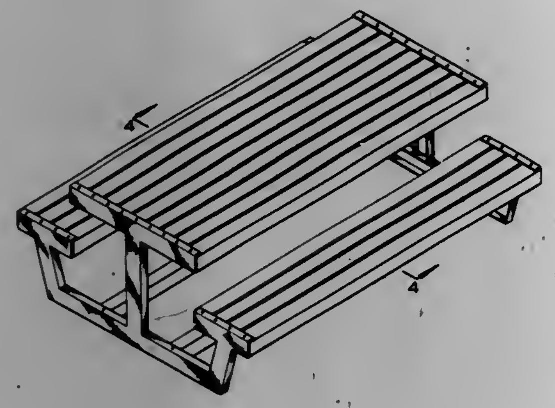
235,392
ATHLETIC SHOE
Michael J. Blumenfeld, Memphis, Tenn., assignor to Comar Athletic Enterprises, Inc., Memphis, Tenn.
Filed June 14, 1974, Ser. No. 479,488
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—311



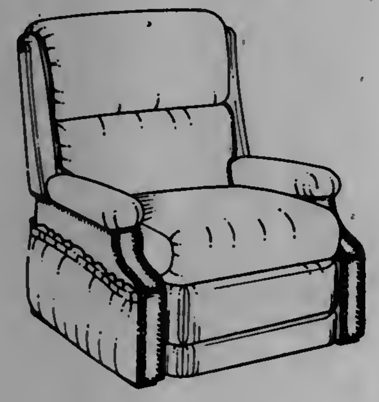
235,393
DISPLAY STAND
Roland E. Loomis, Menlo Park, Calif., assignor to House of Health, Inc., Santa Clara, Calif.
Filed July 12, 1973, Ser. No. 378,784
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—24



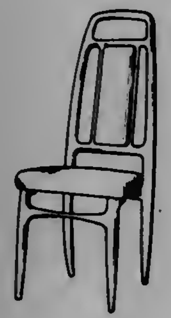
235,394
PICNIC TABLE
Douglas M. Ruth, 1212 E. Broward Blvd.,
Fort Lauderdale, Fla. 33301
Filed Nov. 16, 1973, Ser. No. 416,455
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—45



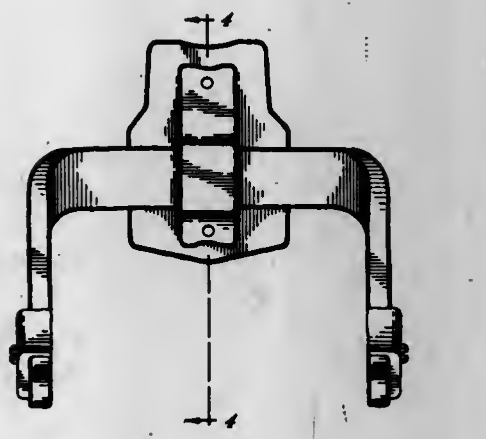
235,395
CHAIR
Morris F. Fisher, Carmel, Ind., assignor to Futorian Corporation, Amsterdam, N.Y.
Filed Feb. 26, 1973, Ser. No. 336,127
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71



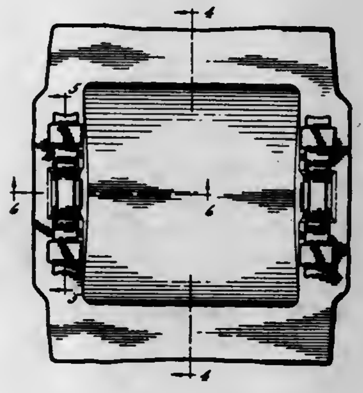
235,396
CHAIR
Kunio Onoguchi, Tokyo, Japan, assignor to France Bed Co., Ltd., Tokyo, Japan
Filed Feb. 28, 1973, Ser. No. 336,501
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—76



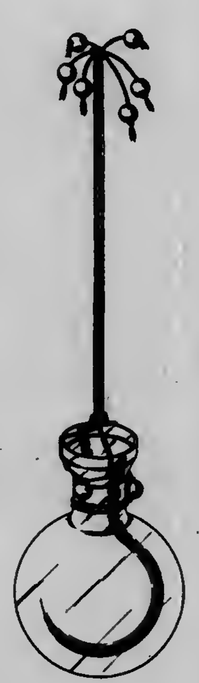
235,397
TISSUE HOLDER
Raymond U. H. Tegner, Lodi, Wis., and Robert W. Johnson, Rockford, Ill., assignors to Amerock Corporation, Rockford, Ill.
Filed Dec. 26, 1973, Ser. No. 428,244
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—97



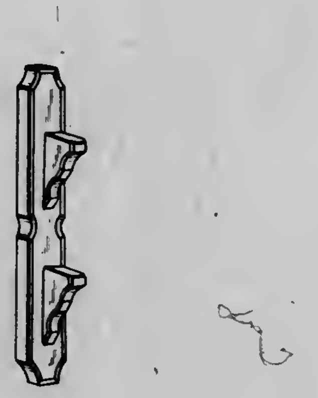
235,398
RECESSED TISSUE HOLDER
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Filed Dec. 26, 1973, Ser. No. 427,839
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—97



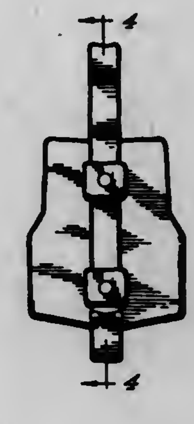
235,399
CONTAINER FOR ROOTING PLANT CUTTINGS
Joyce Malnekoff, 1360 Sherwood,
Highland Park, Ill. 60035
Filed Jan. 4, 1974, Ser. No. 430,660
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D6—113



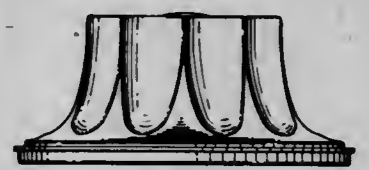
235,400
STANDARD AND BRACKET COMBINATION
Eugene Brown, 14 Willets Court,
Rockville Centre, N.Y. 11570
Original design application Feb. 25, 1972, Ser. No. 229,622, now Patent No. 231,295. Divided and this application Apr. 4, 1974, Ser. No. 457,421
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—114



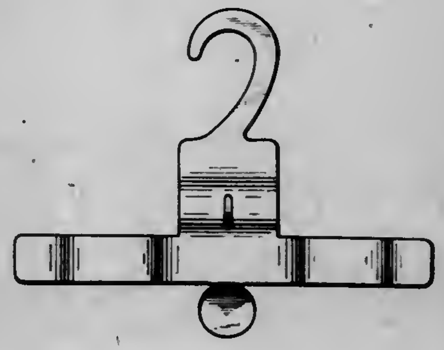
235,401
GARMENT HOOK
Raymond U. H. Tegner, Lodi, Wis., and Robert W. Johnson, Rockford, Ill., assignors to Amerock Corporation, Rockford, Ill.
Filed Dec. 26, 1973, Ser. No. 427,842
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D6—120



235,402
COMBINED COVER AND FOOD MOLD INSERT
James B. Swett, Barrington, R.I., and Richard A. Boucher, Northboro, Mass., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Jan. 24, 1974, Ser. No. 436,325
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—131



235,403
HINGED SKIRT AND TROUSER HANGER
Dwight C. Brown, 5712 N. 20th St.,
Arlington, Va. 22205
Filed Mar. 1, 1974, Ser. No. 447,301
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—252

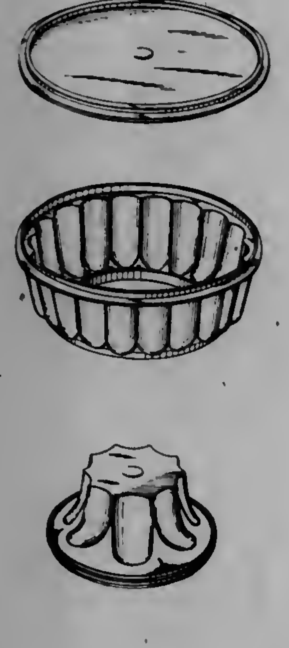


235,404
FOOD MOLD

James B. Swett, Barrington, R.I., and Richard A. Boucher, Northboro, Mass., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Jan. 24, 1974, Ser. No. 436,324
Term of patent 14 years
Int. Cl. D7—*02*

U.S. Cl. D7—43

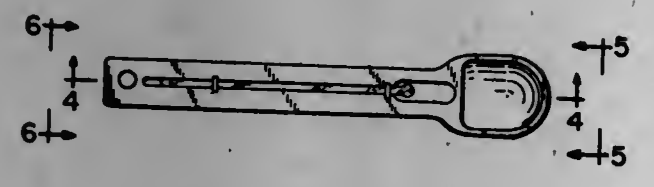


235,405
TEMPERATURE MEASURING SPOON

Lester Brown, Flushing, and Frederick J. Burg, Bellerose, N.Y., Robert Dziekonski, Fort Lee, N.J., and Michael Lax, New York, N.Y., assignors to Salton, Inc., Bronx, N.Y.

Filed Oct. 10, 1972, Ser. No. 296,035
Term of patent 14 years
Int. Cl. D10—*04*

U.S. Cl. D7—50

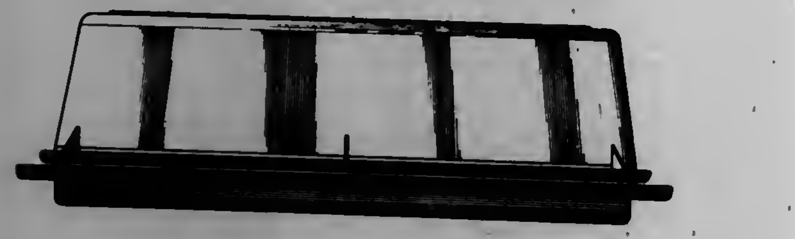


235,406
COMBINED FOOD STORAGE AND SERVING DISH

Robert Daenen, Erembodegem, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Jan. 9, 1974, Ser. No. 432,025
Term of patent 14 years
Int. Cl. D7—*01*

U.S. Cl. D7—76

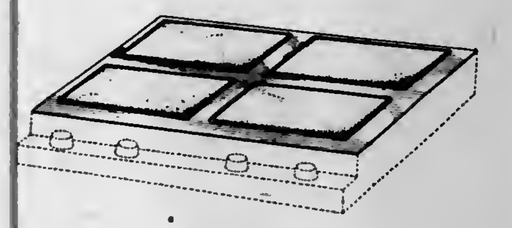


235,407
RANGE TOP

Jack J. Tyson, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 29, 1971, Ser. No. 129,290
Term of patent 14 years
Int. Cl. D7—*02*

U.S. Cl. D7—121

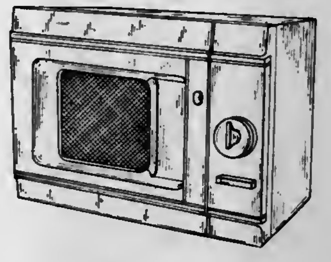


235,408
ELECTRONIC COOKING RANGE

Yoshio Suganoya and Takao Miyake, Osaka, Japan, assignors to Sharp Kabushiki Kaisha (Sharp Corporation), Osaka, Japan

Filed June 20, 1973, Ser. No. 371,751
Claims priority, application Japan Dec. 26, 1972
Term of patent 14 years
Int. Cl. D7—*02*

U.S. Cl. D7—128

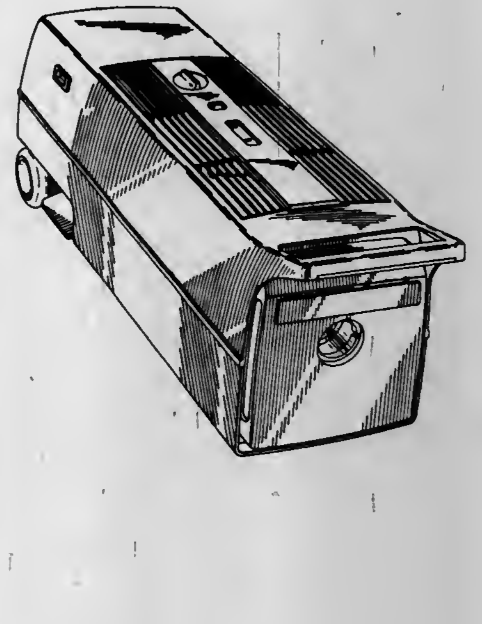


235,409
SUCTION CLEANER OR THE LIKE

Martin James Mims, 35 Rockmount Road, Upper Norwood, London SE. 19, England

Filed Aug. 6, 1973, Ser. No. 385,998
Claims priority, application Great Britain May 4, 1973
Term of patent 14 years
Int. Cl. D15—*05*

U.S. Cl. D7—168

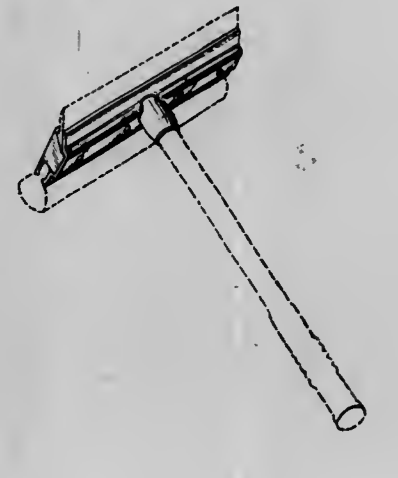


235,410
CLAMPING ARRANGEMENT FOR A COMBINED SQUEEGEE AND SPONGE DEVICE

Maurice J. Epstein, University Heights, Ohio, assignor to Dorothy Epstein, University Heights, Ohio

Filed June 13, 1973, Ser. No. 369,433
Term of patent 14 years
Int. Cl. D7—*05*

U.S. Cl. D7—178

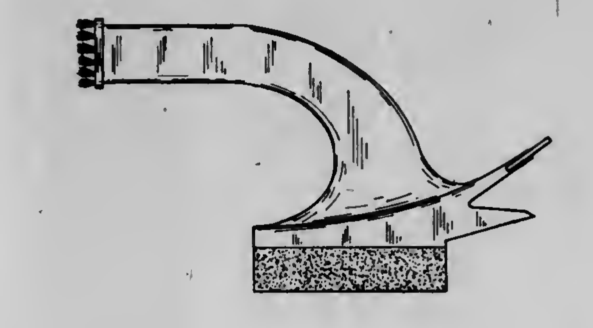


235,411
GLASS CLEANING DEVICE

Brian D. Savage, 319 Poplar Place, Birmingham, Ala. 35209

Filed Sept. 24, 1973, Ser. No. 400,252
Term of patent 14 years
Int. Cl. D7—*05*

U.S. Cl. D7—179

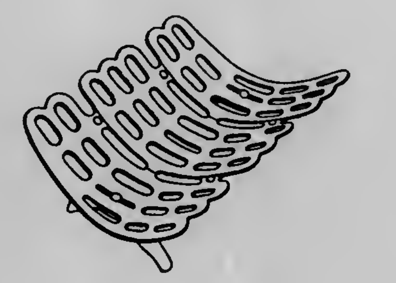


235,412
FIREPLACE GRATE

Richard W. Mellow, Jr., Ladue, Mo., assignor to Liberty Foundry Co.

Filed Mar. 6, 1974, Ser. No. 448,546
Term of patent 14 years
Int. Cl. D7—*08*

U.S. Cl. D7—207

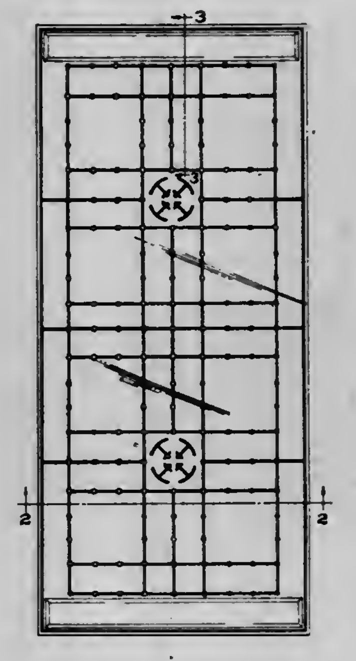


235,413
PLASTIC FLOOR MATTING

Ralph W. Murphy, Marietta, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 29, 1973, Ser. No. 420,006
Term of patent 14 years
Int. Cl. D16—*13*

U.S. Cl. D6—209

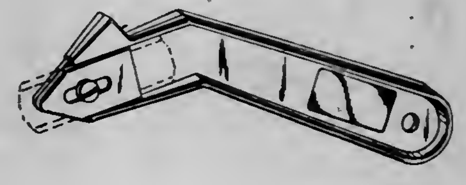


235,414
CARPET KNIFE

Robert G. Miller, Janesville, Wis., assignor to Nancy Eastman, Footville, Wis.

Filed Aug. 14, 1973, Ser. No. 388,162
Term of patent 14 years
Int. Cl. D8—*03*

U.S. Cl. D8—98

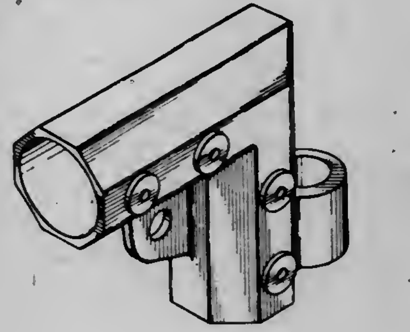


235,415
COMBINATION GATE HINGE AND CORNER

Leo J. Martini, South Gate, Calif., assignor to Master Fence Fittings, Inc., La Habra, Calif.

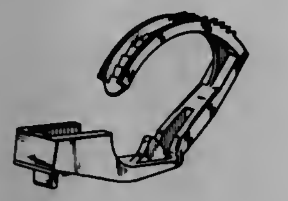
Filed May 6, 1974, Ser. No. 467,393
Term of patent 14 years
Int. Cl. D8—*09*

U.S. Cl. D8—191



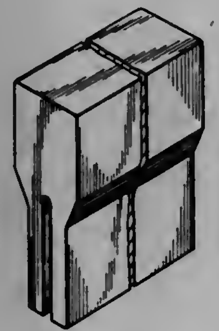
235,416
CLAMP

William A. Fortsch, Livingston, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Apr. 8, 1974, Ser. No. 458,853
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—229



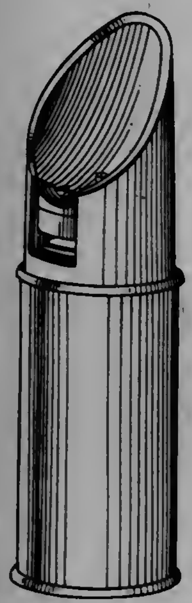
235,417
HANGER BAR FOR SUSPENDING A PLATE-TYPE ELECTRODE

David Francis John Triston Rodgers, Warley, England, assignor to Imperial Metal Industries (Kynoch) Limited, Warwickshire, England
Filed Feb. 15, 1973, Ser. No. 332,637
Claims priority, application Great Britain Sept. 20, 1972
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—259



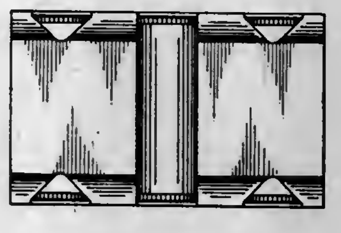
235,418
PRESSURIZED DISPENSING CONTAINER

Tor Petterson, Palos Verdes Peninsula, Calif., and Ronald R. Gutkowski, Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Nov. 29, 1973, Ser. No. 420,042
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—9



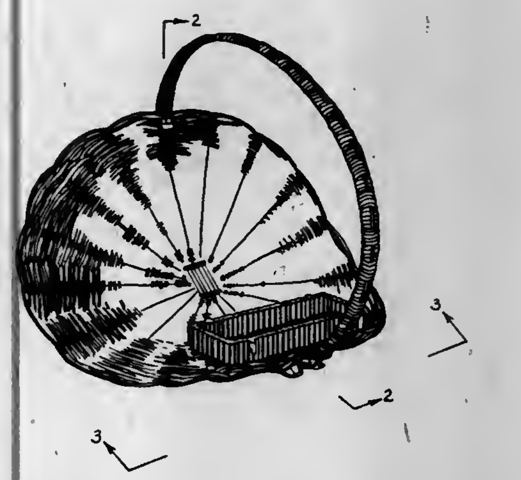
235,419
CONTAINER PACKAGE

Glen R. Harrelson, Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.
Filed Jan. 15, 1973, Ser. No. 323,808
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—193



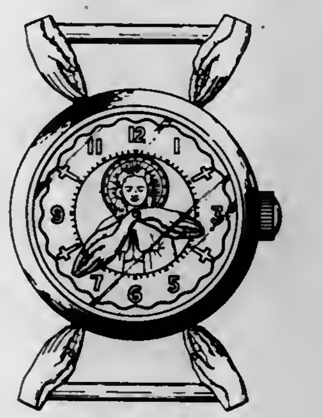
235,420
BASKET FOR FLOWERS OR THE LIKE

Ernest O. Brody, Cleveland, Ohio, assignor to Lancaster Colony Corporation, Columbus, Ohio
Filed Jan. 31, 1973, Ser. No. 328,318
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—247



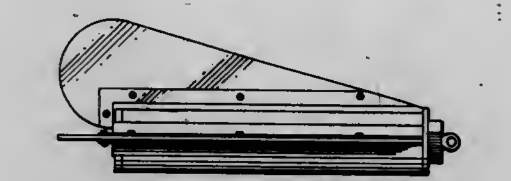
235,421
WRIST WATCH

Nicholas G. Pitrelli, 97—48 107th St., Ozone Park, Long Island, N.Y. 11416
Filed May 11, 1973, Ser. No. 359,556
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39



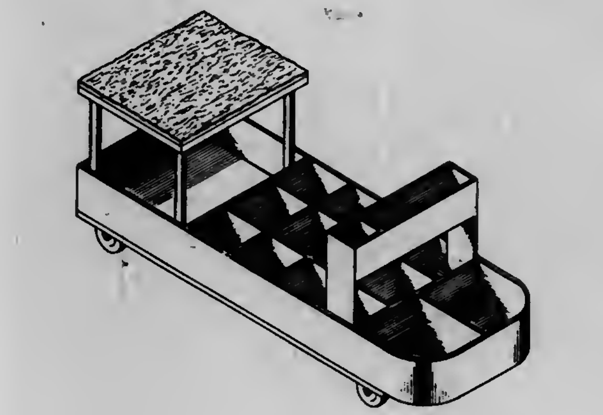
235,422
HOUSING FOR BOTTOM CURRENT METER

Shale J. Niskin, 2941 Lucaya St., Miami, Fla. 33133
Filed Apr. 1, 1974, Ser. No. 456,728
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96



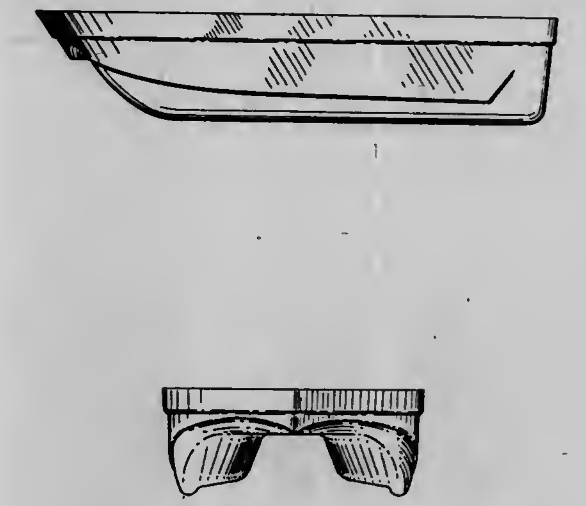
235,423
CADDY FOR PLUMBERS AND ELECTRICIANS

Elmer H. Gullion, 115 Chester St., Grass Valley, Calif. 95945
Filed Feb. 1, 1974, Ser. No. 438,619
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—29



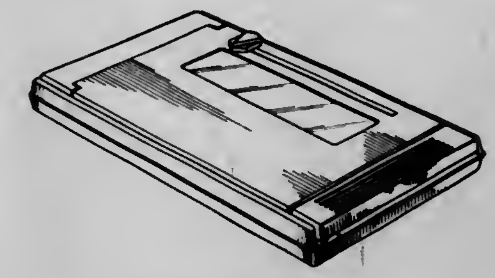
235,424
BOAT HULL

Leedice S. Smith, Elk, Wash. 99009
Filed Aug. 23, 1973, Ser. No. 390,890
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



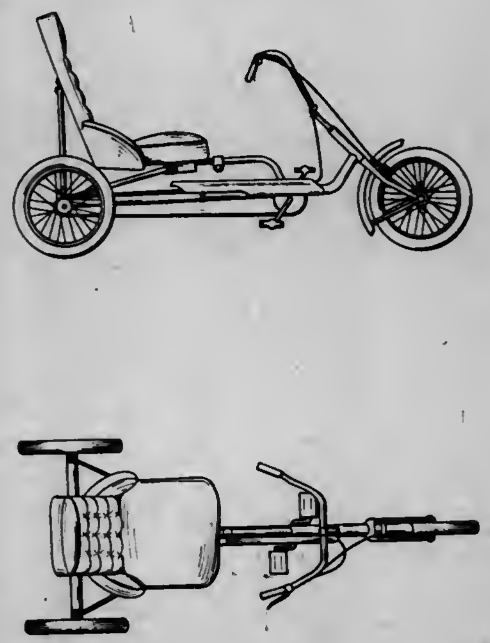
235,425
LIST FINDER

Chuzo Mori, Tokyo, Japan, assignor to Carl Manufacturing Company, Ltd., Tokyo, Japan
Filed Feb. 26, 1973, Ser. No. 336,050
Claims priority, application Japan Sept. 6, 1972
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76



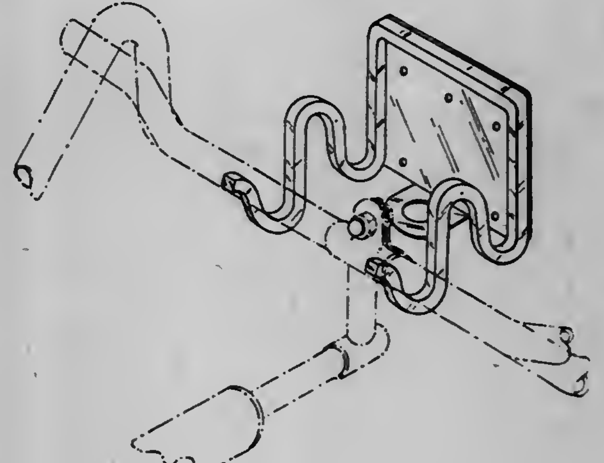
235,426
TRICYCLE

Dean H. Foster, 5835 E. 21st Place, and George R. Foster, 4619 E. 25th St., both of Tulsa, Okla. 74114
Filed Aug. 24, 1973, Ser. No. 391,263
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—112

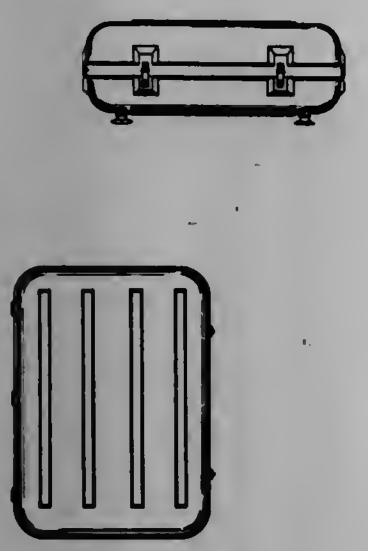


235,427
BICYCLE HANGER

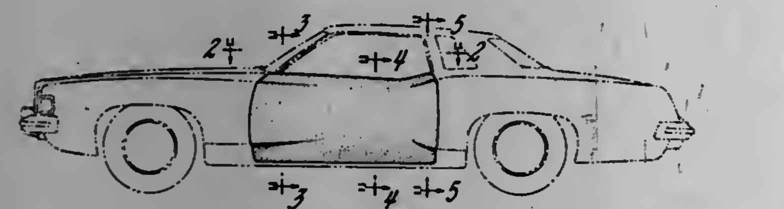
Alexander L. Generalis, and Michael C. Roberto, both of 249 S. 10th St., Philadelphia, Pa. 19107
Filed May 11, 1973, Ser. No. 359,215
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D12—115



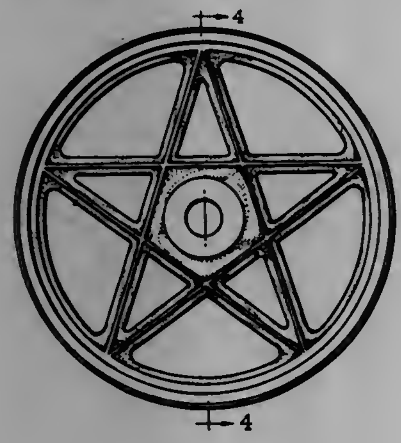
235,428
CAR TOP LUGGAGE CARRIER
Donald G. Hart, R.R. 1, Geneseo, Ill. 61254
Filed Nov. 8, 1973, Ser. No. 413,876
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157



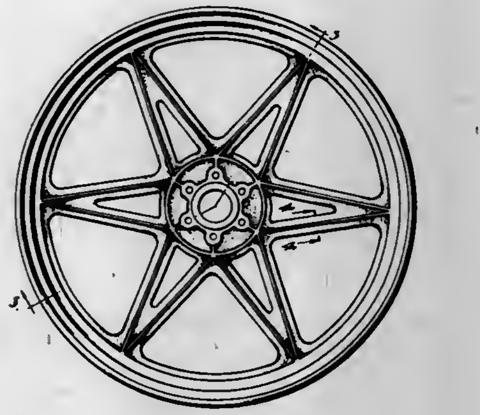
235,429
DOOR FOR AN AUTOMOBILE
Gordon M. Brown, West Bloomfield, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 29, 1973, Ser. No. 392,422
Term of patent 3½ years
Int. Cl. D12—*08*
U.S. Cl. D12—196



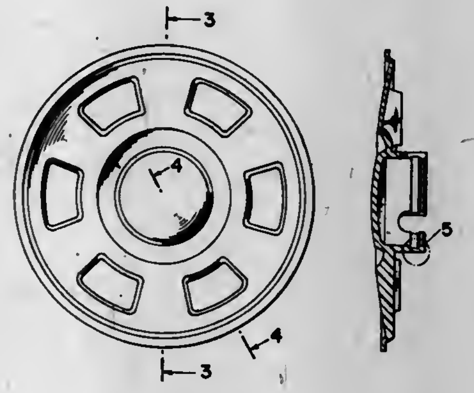
235,430
MOTORCYCLE WHEEL
Delmer D. Scott, Encino, Calif., assignor to Shelby Dowd Industries, Inc., Marina Del Rey, Calif.
Filed Mar. 25, 1974, Ser. No. 454,226
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205



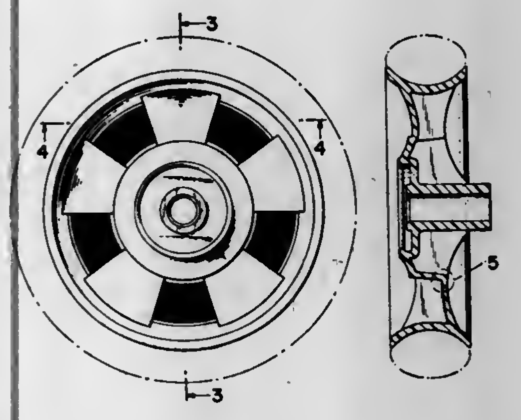
235,431
MOTORCYCLE WHEEL
Delmer D. Scott, Encino, Calif., assignor to Shelby Dowd Industries, Inc., Marina Del Rey, Calif.
Filed June 21, 1974, Ser. No. 483,936
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205



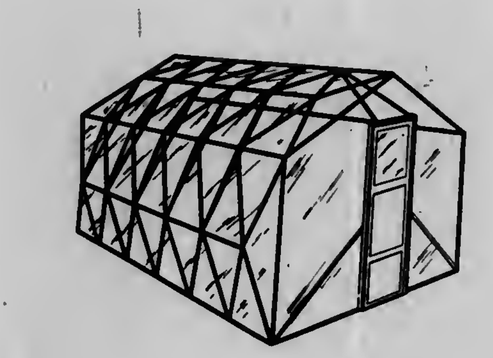
235,432
WHEEL COVER
Joseph R. May, Chatham, and Donald F. Morgan, Bloomingdale, N.J., assignors to Amerace Corporation, New York, N.Y.
Filed Jan. 23, 1974, Ser. No. 435,888
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



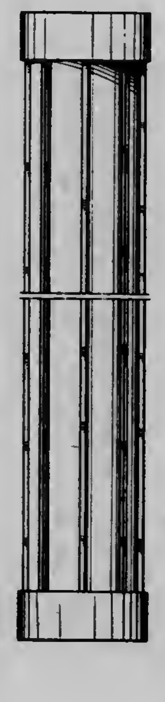
235,433
WHEEL CENTER
Joseph R. May, Chatham, and Donald F. Morgan, Bloomingdale, N.J., assignors to Amerace Corporation, New York, N.Y.
Filed Feb. 13, 1974, Ser. No. 442,150
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



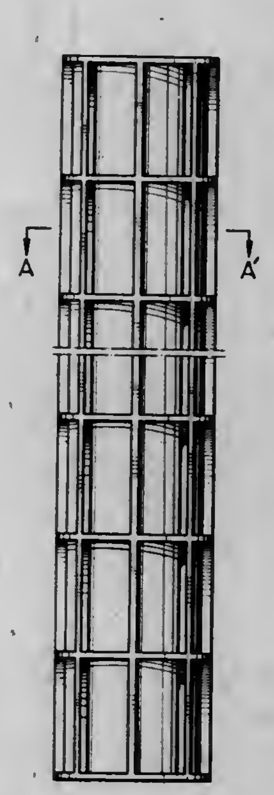
235,434
BUILDING
Richard J. Hemmelsbach, Spring Lake, Mich., assignor to Space Age Industries, Inc., West Olive, Mich.
Filed Mar. 20, 1973, Ser. No. 342,948
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 R



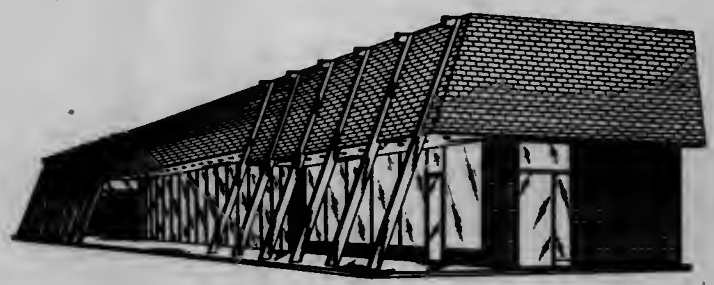
235,435
HOLLOW METALLIC CONSTRUCTION PILE
Akemasa Otani, 23–14, 204, Takanawa 3-chome, Minato-ku, and Kenichi Watanabe, 23–19, Kamiikedai 4-chome, Ota-ku, both of Tokyo, Japan
Filed Apr. 27, 1972, Ser. No. 248,352
Claims priority, application Japan Oct. 30, 1971
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 H



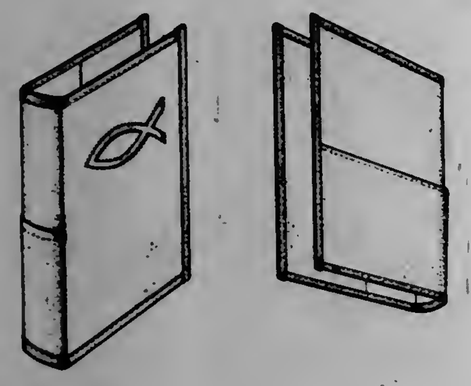
235,436
HOLLOW METALLIC CONSTRUCTION PILLAR
Akemasa Otani, 23–14, 204, Takanawa 3-chome, Minato-ku, and Kenichi Watanabe, 23–19, Kamiikedai 4-chome, Ota-ku, both of Tokyo, Japan
Filed Apr. 27, 1972, Ser. No. 248,353
Claims priority, application Japan Oct. 30, 1971
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 H



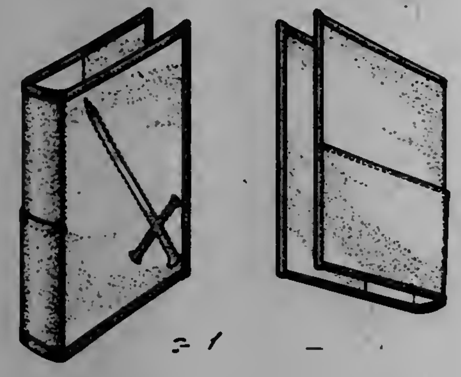
235,437
STORE BUILDING FACADE
Joseph Binder, Oceanside, and Carrl Palestini, Lido Beach, N.Y., assignors to The Bohack Corporation, Brooklyn, N.Y.
Filed Aug. 16, 1972, Ser. No. 281,141
(Filed under Rule 47(a) and 35 U.S.C. 116)
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 B



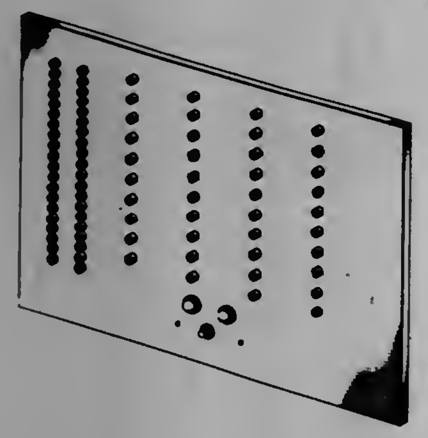
235,438
BOOK COVER
Gregg L. Gray, Laguna Beach, Calif.
(1117 W. Struck, Orange, Calif. 92667)
Filed Aug. 22, 1973, Ser. No. 390,505
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—26



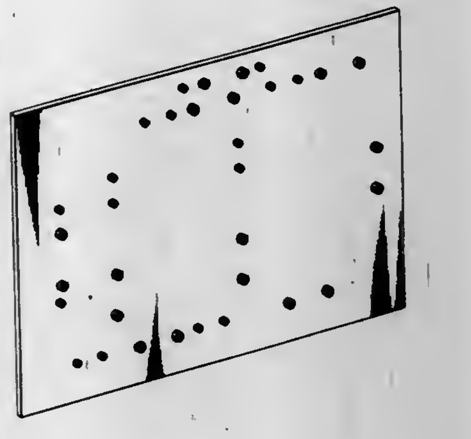
235,439
BOOK COVER
Gregg L. Gray, Laguna Beach, Calif.
(1117 W. Struck, Orange, Calif. 92667)
Filed Aug. 23, 1973, Ser. No. 390,743
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—26



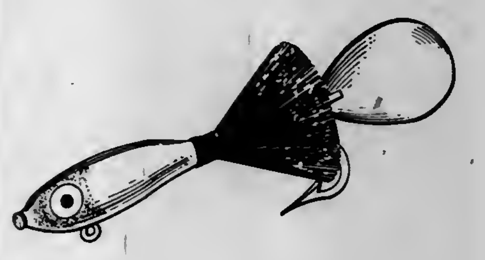
235,440
EDUCATIONAL PLUG-IN BOARD
Charles G. Valentine, Stamford, Conn., assignor to
Xerox Corporation, Stamford, Conn.
Filed Apr. 20, 1973, Ser. No. 353,187
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62



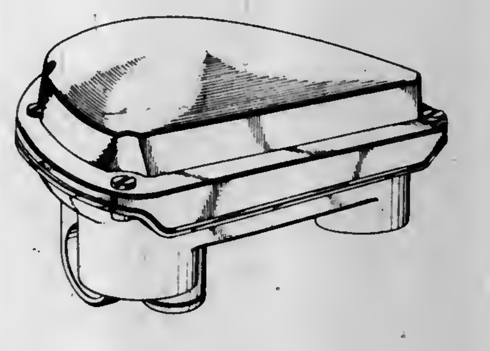
235,441
BASIC MEASUREMENT EDUCATIONAL BOARD
Charles G. Valentine, Stamford, Conn., assignor to
Xerox Corporation, Stamford, Conn.
Filed Apr. 27, 1973, Ser. No. 355,224
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62



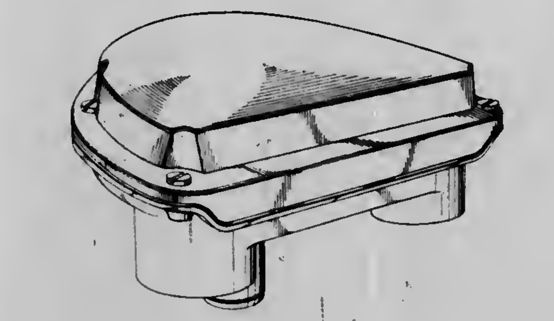
235,442
FISH LURE
Earl E. Miller, Knoxville, Tenn., assignor to
Brunswick Corporation, Skokie, Ill.
Filed Sept. 17, 1973, Ser. No. 397,958
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



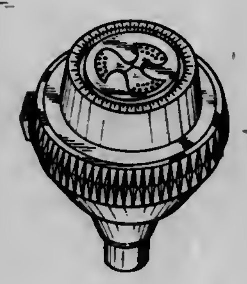
235,443
PRESSURE REGULATOR OR SIMILAR ARTICLE
Dwight N. Johnson and Theodore E. Kwast, Anaheim, Calif., assignors to The Singer Company, New York, N.Y.
Filed May 30, 1973, Ser. No. 365,338
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—21



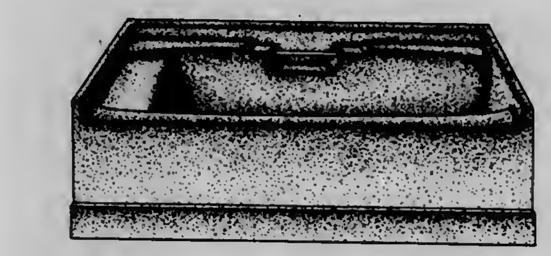
235,444
PRESSURE REGULATOR OR SIMILAR ARTICLE
Dwight N. Johnson and Theodore E. Kwast, Anaheim, Calif., assignors to The Singer Company, New York, N.Y.
Filed June 11, 1973, Ser. No. 368,896
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—21



235,445
SHOWER HEAD
Frederick Gordon Mackay, Tarzana, Gerald William Lee, Glendale, and Allan Bernard Johnson, Tarzana, Calif., assignors to Teledyne Industries, Inc., doing business as Teledyne Aqua Tec Co., Fort Collins, Colo.
Filed Dec. 17, 1973, Ser. No. 425,163
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

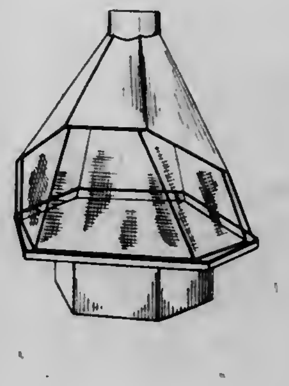


235,446
BATHTUB
Stanley F. Korol, Mansfield, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Aug. 20, 1973, Ser. No. 389,904
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55

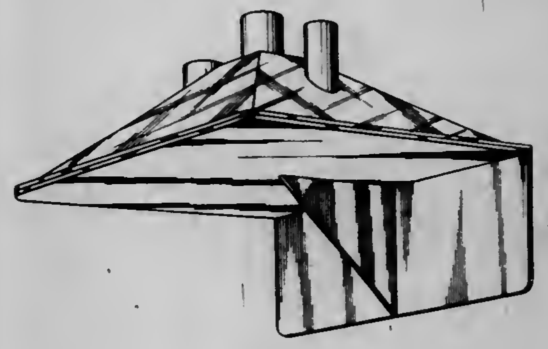


235,447
FREESTANDING FIREPLACE
Paul H. Lever, P.O. Box 1289,
Fallbrook, Calif. 92028
Filed Dec. 6, 1973, Ser. No. 422,279
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

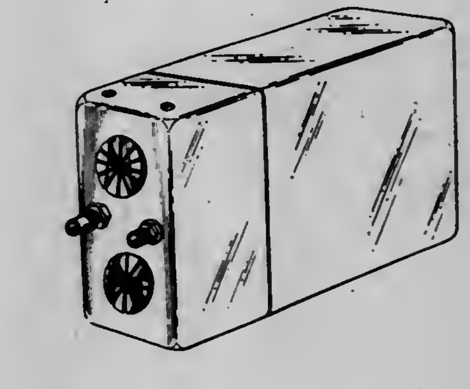
FIG



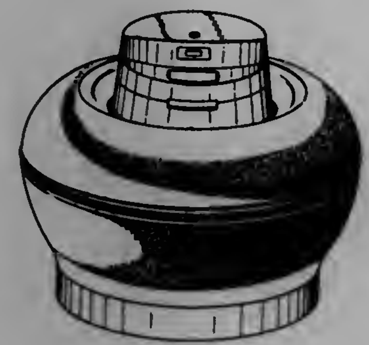
235,448
HUMIDIFIER HOUSING FOR ATTACHMENT TO A COMBUSTION SYSTEM
Fred A. Wentworth, Jr., 20 Heights Road,
Stratham, N.H. 03885
Filed June 17, 1974, Ser. No. 480,238
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—147



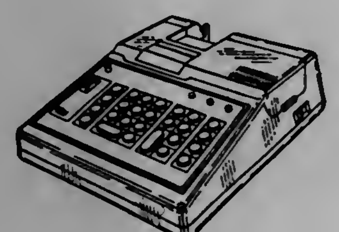
235,449
MINIATURE RADIO RECEIVER
Jack N. Holcomb, P.O. Box 23130,
Fort Lauderdale, Fla. 33307
Filed Apr. 19, 1973, Ser. No. 352,619
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 K



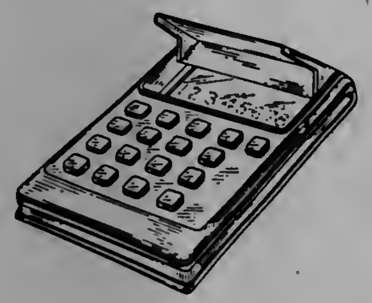
235,450
VAPORIZER HUMIDIFIER
David Chapman, Chicago, Ill., assignor to Gerber Products Company, Fremont, Mich.
Filed Apr. 22, 1974, Ser. No. 463,005
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—148



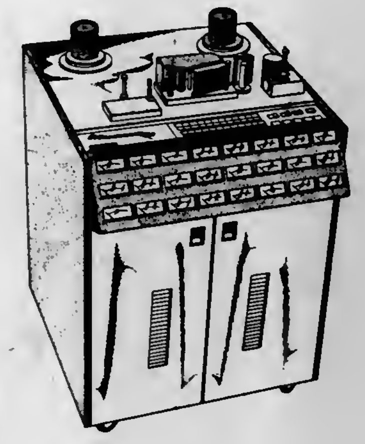
235,451
CALCULATING MACHINE OR SIMILAR ARTICLE
Minoru Ishikawa, Kyoto, Japan, assignor to Omron Tateisi Electronics Co.
Filed Aug. 24, 1973, Ser. No. 391,045
Claims priority, application Japan Mar. 15, 1973
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C



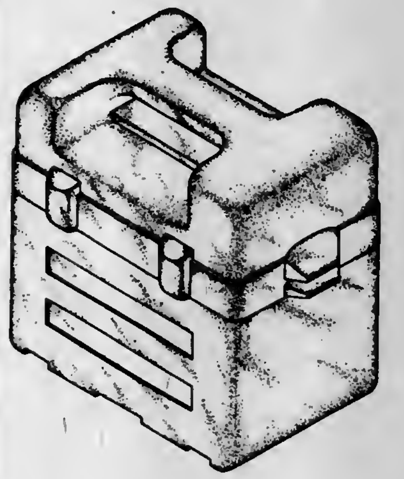
235,452
ELECTRONIC CALCULATING MACHINE
Matafumi Ikeda, Osaka, Japan, assignor to Sharp Kabushiki Kaisha (Sharp Corporation), Osaka, Japan
Filed Aug. 31, 1973, Ser. No. 393,651
Claims priority, application Japan Mar. 19, 1973
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C



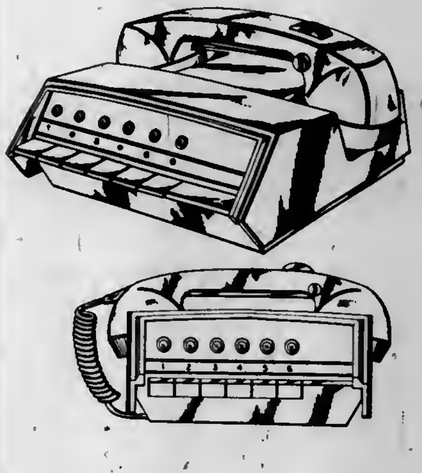
235,453
MAGNETIC TAPE TRANSPORT
Albert W. Martin, 3775 Pinewood Place, Santa Clara, Calif. 95050
Filed Feb. 11, 1974, Ser. No. 441,395
Term of patent 3½ years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



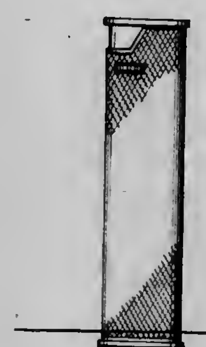
235,454
BATTERY CARRIER
Albert A Lindow, Jr., 1761 Brett Ave., Pittsburgh, Pa. 15205
Filed Sept. 10, 1973, Ser. No. 395,768
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D26—6



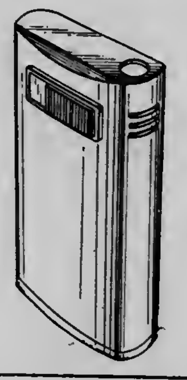
235,455
MULTIPLE LINE REMOTE DICTATION RECORDING STATION OR SIMILAR ARTICLE
David K. Walz, Atlanta, Ga., assignor to Lanier Electronic Laboratory, Inc., Atlanta, Ga.
Filed Jan. 9, 1974, Ser. No. 432,056
Term of patent 14 years
Int. Cl. D14
U.S. Cl. D26—14 A



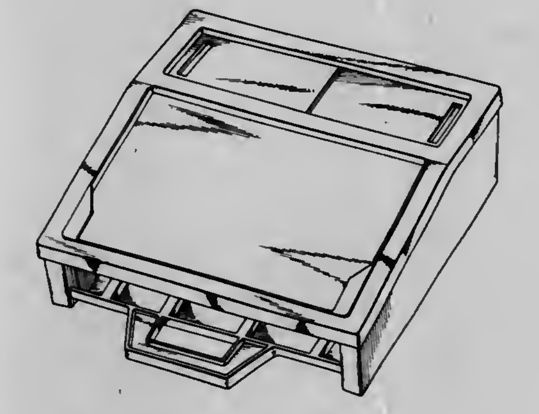
235,456
LIGHTER
Conrad Zellweger, Chene-Bougeries, Switzerland, assignor to La Nationale S.A., Geneva, Switzerland
Filed Sept. 11, 1973, Ser. No. 396,214
Claims priority, application Switzerland Apr. 11, 1973
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36



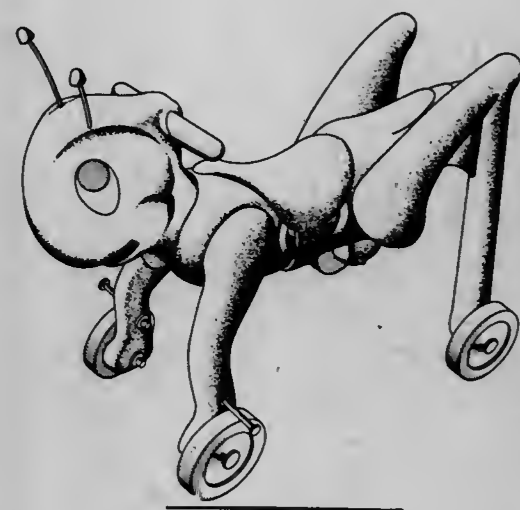
235,457
LIGHTER
Masaaki Takashima, 12–10, 2-chome, Mejiro, Toshima-ku, Tokyo, Japan
Filed Apr. 18, 1974, Ser. No. 461,850
Claims priority, application Japan Oct. 23, 1973
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42



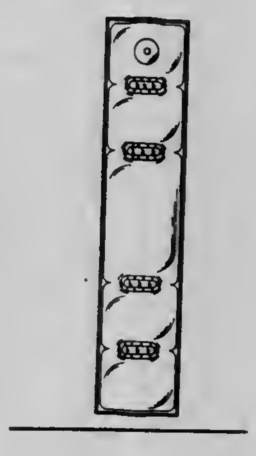
235,458
TOY DESK
Victor G. Reiling, Jr., East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 6, 1972, Ser. No. 312,593
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 A



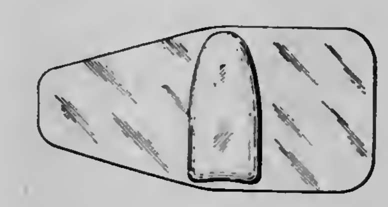
235,459
FIGURE RIDING TOY
Rouben T. Terzian and Kathy Dunn, Chicago, Ill., and Laurie Jay Campbell, Erie, Pa., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Apr. 18, 1974, Ser. No. 461,950
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



235,460
INFLATABLE CUSHION PAD FOR A GOLF BAG SHOULDER STRAP OR THE LIKE
Bill N. Lovelace and Frank A. Pritchard, both of 2215 Bennett, Wichita, Kans. 67213
Filed Feb. 12, 1973, Ser. No. 331,354
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GB



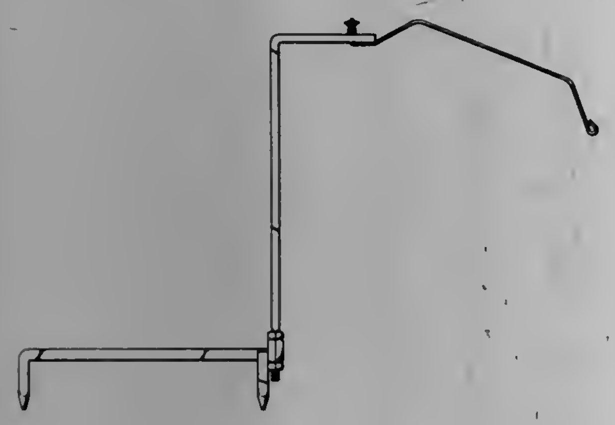
235,461
PUTTING AID ATTACHMENT FOR A GOLF CLUB SHAFT
Anthony J. Prisco, Sr., Woodcliff Lake, N.J. (102 Beech St., Westwood, N.J. 07675)
Filed Aug. 27, 1973, Ser. No. 391,738
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB



235,462

FOOTBALL KICKING TEE

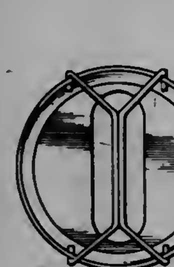
Albert W. Pennington, 52 Pinewood Drive,
Farmington, Conn. 06032
Filed Aug. 20, 1973, Ser. No. 390,117
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 GT



235,463

COMBINED TENNIS BALL RETRIEVER AND STORAGE CONTAINER

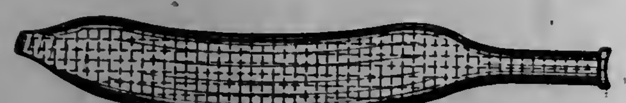
Frederick D. Heffner, San Gabriel, Calif.
(2350 Huntington Drive, San Marino, Calif. 91108)
Filed Sept. 4, 1973, Ser. No. 393,992
Term of patents 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST



235,464

TOY BAT

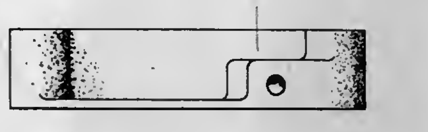
Samuel F. Speers, 120 Mount Hope St.,
North Attleboro, Mass. 02703
Filed Oct. 1, 1973, Ser. No. 402,615
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D34—5 BC



235,465

HEAD FOR A GOLF PUTTER

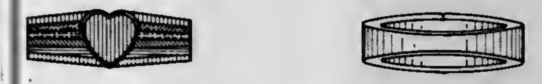
Tony J. Vella, 3504 Wesleyan Ave.,
Rockford, Ill. 61108
Filed Oct. 5, 1973, Ser. No. 403,847
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



235,466

FINGER RING

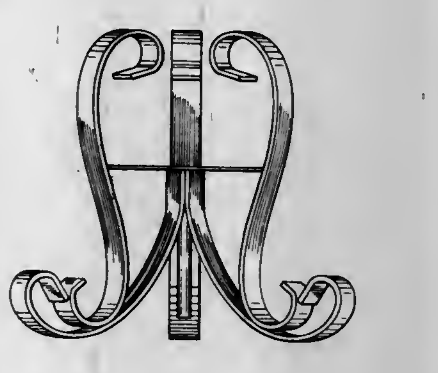
George Volkhausen, 79 Albert Ave.,
Cranston, R.I. 02905
Filed Oct. 25, 1973, Ser. No. 409,642
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10 A



235,467

CANDLE HOLDER

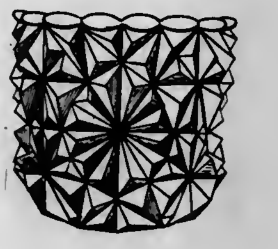
Lon H. Wilkie, Jr., 6092 Estes St.,
Arvada, Colo. 80002
Filed Mar. 21, 1973, Ser. No. 343,567
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2



235,468

CANDLEHOLDER

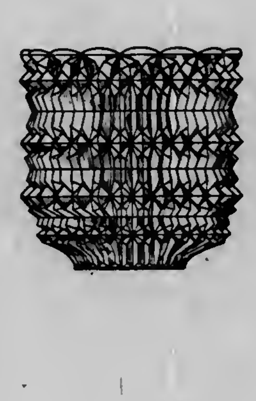
Preston J. Frazier, Jr., Houston, Tex., assignor to
Faroy, Inc., Houston, Tex.
Filed July 12, 1973, Ser. No. 378,611
Term of patent 14 years
Int. Cl. D7—*01;* D26—*01*
U.S. Cl. D48—2



235,469

CANDLEHOLDER

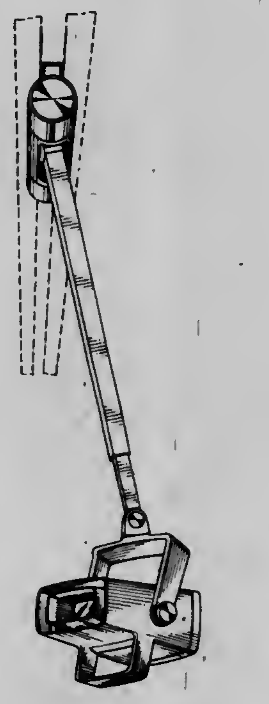
Preston J. Frazier, Jr., Houston, Tex., assignor to
Faroy, Inc., Houston, Tex.
Filed Aug. 30, 1973, Ser. No. 393,150
Term of patent 14 years
Int. Cl. D7—*01;* D26—*01*
U.S. Cl. D48—2



235,470

COMBINED READING AND EXAMINATION LIGHT AND SUPPORT THEREFOR

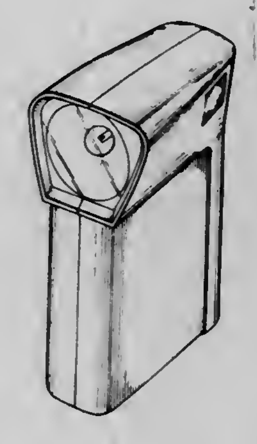
Mitchell Bobrick, Redondo Beach, and Mel Evenson, Santa Monica, Calif., and Morris M. Buzan, St. Charles, and Murray L. Quin, St. Louis, Mo.; said Buzan and Quin assignors to Emerson Electric Co.
Filed July 5, 1973, Ser. No. 376,542
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 H



235,471

FLASHLIGHT

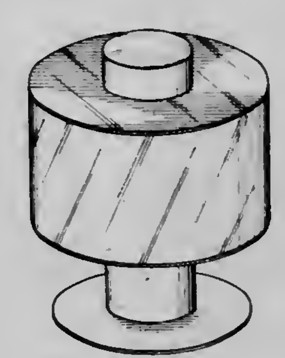
John H. Squadra, Rowayton, Conn., assignor to The Ashflash Corporation, South Norwalk, Conn.
Filed July 1, 1974, Ser. No. 484,415
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A



235,472

OUTDOOR GROUND LEVEL LIGHTING FIXTURE

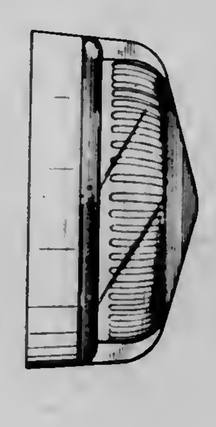
Hans Paul Ludwig Gelsler, Norderstedt, Germany,
assignor to Deutsche Texaco Aktiengesellschaft
Filed Apr. 24, 1972, Ser. No. 247,252
Term of patent 14 years
Int. Cl. D26—*03, 05;* D20—*03;* D6—*01*
U.S. Cl. D48—31



235,473

COMBINED CLEARANCE AND MARKER LAMP

Robert I. Nagel, Skokie, Ill., assignor to Dominion Auto Accessories Limited, Toronto, Ontario, Canada
Filed Jan. 2, 1974, Ser. No. 430,199
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 R



235,474

BUCKET STEP FOR AN AERIAL LIFT BUCKET AND LINER

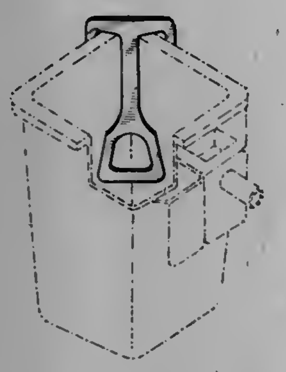
Louis J. Kachavos, New Boston, N.H., assignor to Plastic Techniques, Inc., New Boston, N.H.

Filed May 23, 1974, Ser. No. 472,623

Term of patent 14 years

Int. Cl. D12—*05*

U.S. Cl. D54—1 A



235,475

DIAMOND HOLDING TOOL

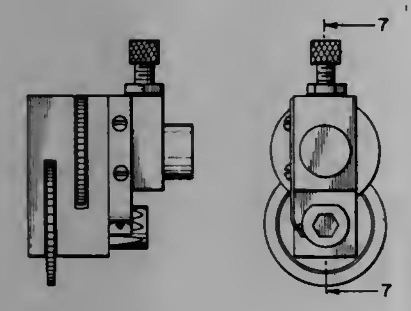
Herbert Waldman, 1739 52nd St. 11204, and Joseph Waldman, 989 Montgomery St. 11213, both of Brooklyn, N.Y.

Filed Feb. 2, 1973, Ser. No. 328,901

Term of patent 14 years

Int. Cl. D15—*99*

U.S. Cl. D54—13 A



235,476

ARTICULATED CONVEYOR UNIT

Patrick O'Neill and Patrick Joseph Douglas, Dungannon, Northern Ireland, assignors to Powerscreen International Limited

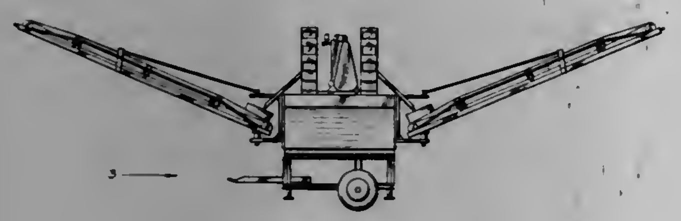
Filed Mar. 14, 1973, Ser. No. 341,256

Claims priority, application Great Britain Aug. 26, 1972

Term of patent 14 years

Int. Cl. D12—*05*

U.S. Cl. D55—1 C



235,477

ARTICULATED CONVEYOR UNIT

Patrick O'Neil and Patrick Joseph Douglas, Dungannon, Northern Ireland, assignors to Powerscreen International Limited

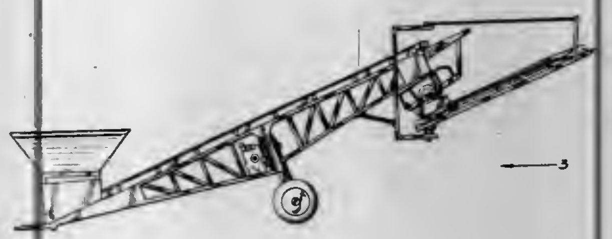
Filed Mar. 14, 1973, Ser. No. 341,258

Claims priority, application Great Britain Aug. 26, 1972

Term of patent 14 years

Int. Cl. D12—*05*

U.S. Cl. D55—1 C



235,478

MICROSCOPE STAND

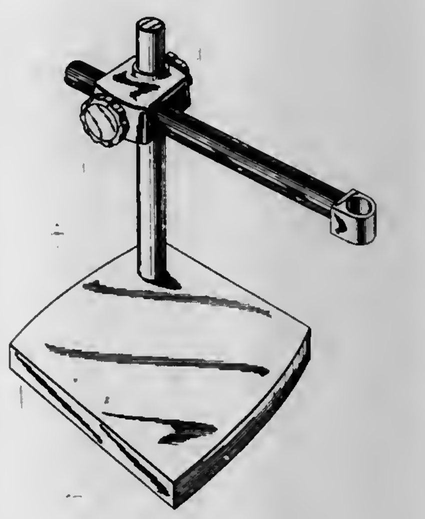
John T. Armbruster, Niagara Falls, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Mar. 21, 1973, Ser. No. 343,583

Term of patent 14 years

Int. Cl. D16—*06*

U.S. Cl. D57—1 E



235,479

NOVELTY LENS FOR SUNGLASSES

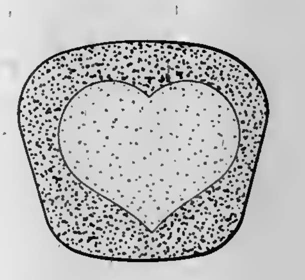
José Canato Filho, Caixa Postal, 706, 15100-Sao do Rio Preto, Sao Paulo, Brazil

Filed Aug. 10, 1973, Ser. No. 387,273

Term of patent 14 years

Int. Cl. D16—*06*

U.S. Cl. D57—1 A



235,480

PORTABLE TYPEWRITER

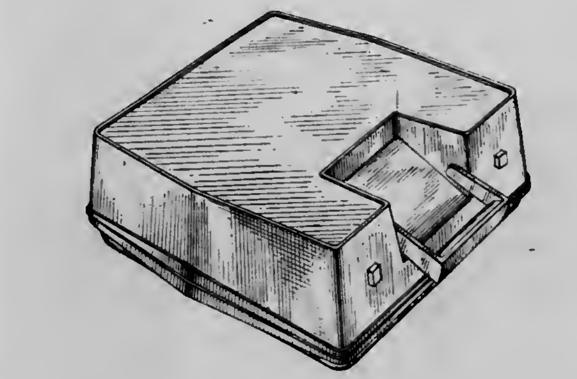
Karl T. Baughman, Lake Forest, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.

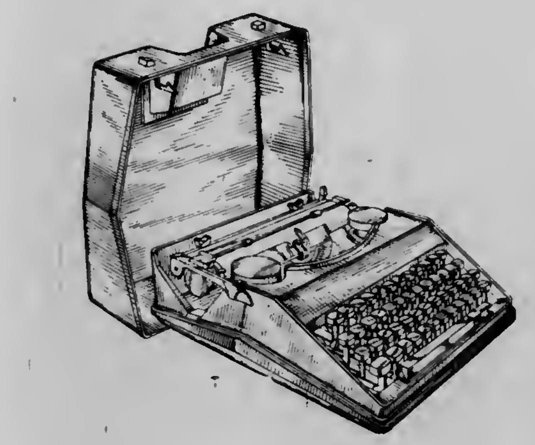
Filed Mar. 12, 1973, Ser. No. 340,328

Term of patent 14 years

Int. Cl. D18—*01*

U.S. Cl. D64—11 A





235,481

FIXTURE FOR A ROOF PENETRATION MEMBER

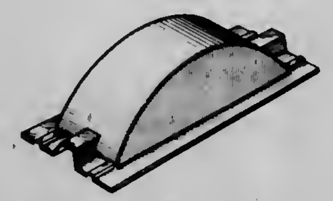
John N. Rave, Hales Corners, and John A. Jobst, Milwaukee, Wis., assignors to Inland-Ryerson Construction Products Company, Milwaukee, Wis.

Filed Mar. 29, 1973, Ser. No. 346,178

Term of patent 14 years

Int. Cl. D25—*99*

U.S. Cl. D68—1



235,482

SEWING MACHINE FRAME OR SIMILAR ARTICLE

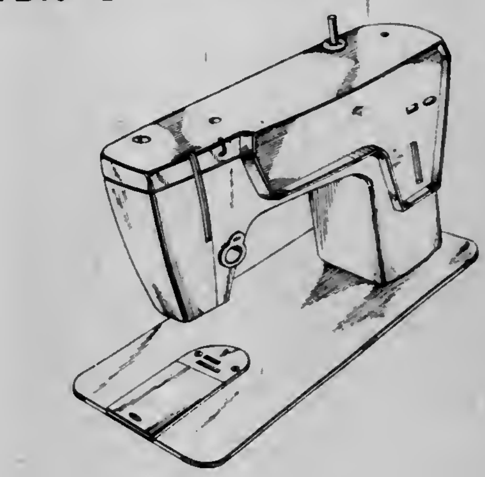
Donald M. Genaro, Haworth, N.J., assignor to The Singer Company, New York, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,588

Term of patent 14 years

Int. Cl. D15—*01*

U.S. Cl. D70—1



235,483

EAR PLUG

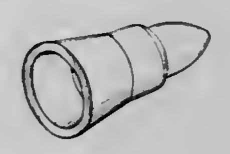
Charles Leight, 5336 W. Pico Blvd., Los Angeles, Calif. 90019

Filed Jan. 11, 1973, Ser. No. 322,746

Term of patent 14 years

Int. Cl. D24—*04*

U.S. Cl. D83—1 J



235,484

INHALATOR

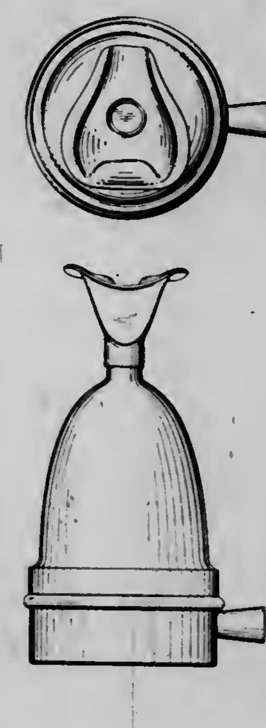
Mario Baro and Carmen Baro, both of 8450 SW. 21st St., Miami, Fla. 33155

Filed Feb. 23, 1973, Ser. No. 335,324

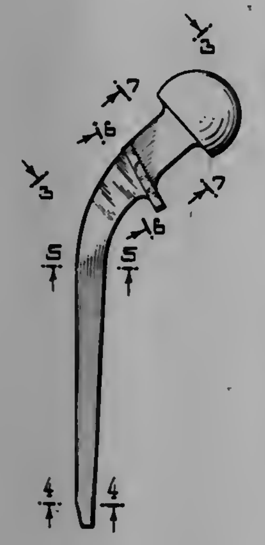
Term of patent 14 years

Int. Cl. D24—*02;* D23—*01*

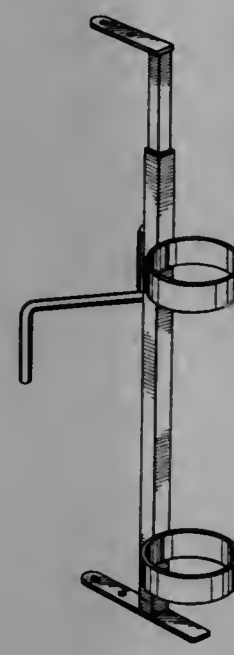
U.S. Cl. D83—1 N



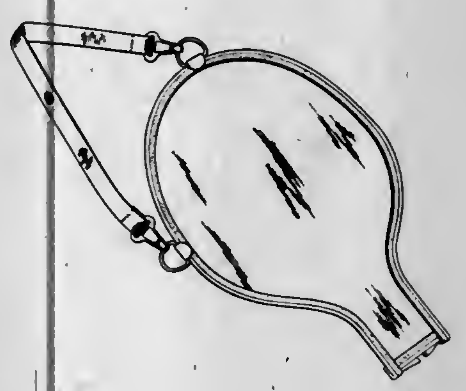
235,485
FEMORAL HIP PROSTHESIS
Harlan C. Amstutz, 433 Burlingame Ave., Los Angeles, Calif.
Filed June 7, 1973, Ser. No. 368,414
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D83—1 E



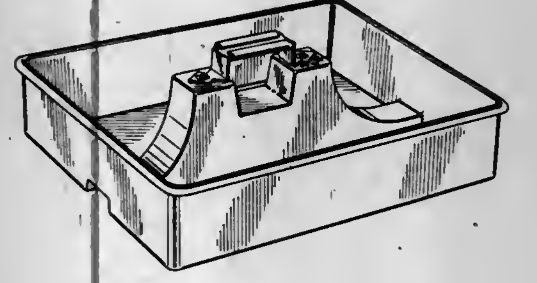
235,486
OXYGEN BOTTLE HOLDER FOR MEDICAL USE
Hugo H. van den Bergh, 7103 Werner St., San Diego, Calif. 92122
Filed Dec. 20, 1973, Ser. No. 426,511
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 B



235,487
TENNIS RACKET JACKET
Robert J. Rivera, 424 Atlantic Ave., Brooklyn, N.Y. 11217
Filed Aug. 15, 1973, Ser. No. 388,423
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



235,488
CARRIER TRAY
Calvin D. Swalm, 8930 Heraldry St., San Diego, Calif. 92123
Filed Dec. 26, 1973, Ser. No. 427,642
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF JUNE, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Emery Company, The: *See*—
  Bradley, Chester D., 3,889,529.
A. H. Robins Company, Incorporated: *See*—
  Lerner, Irwin S., 3,889,666.
A J M Research Corporation: *See*—
  Malavazos, Arthur J., deceased; Malavazos, administrator, by Gregory A.; and Urdal, Jan, 3,890,491.
A. W. Chapman Limited: *See*—
  Adams, Albert John, 3,889,913.
Abbondio, Antonio; and Celio, Tino, to Gretag Aktiengesellschaft. Method and apparatus for measuring the color density of printing inks applied to a moving web. 3,890,048, Cl. 356-199.000.
ACF Industries, Incorporated: *See*—
  Peters, Clifford M., 3,889,922.
  Sittner, Edward H., Jr.; and Girard, Robert R., 3,889,783.
Achenbach, Dieter; and Siegfried, Joswig, to Wolf-Gerate GmbH. Grass shears with an electric motor drive. 3,889,373, Cl. 30-233.000.
Acme-Hamilton Manufacturing Corporation: *See*—
  Bauman, Joseph F.; and Elson, Arthur M., 3,889,830.
Adams, Albert John, to A. W. Chapman Limited. Seat slide mechanism. 3,889,913, Cl. 248-430.000.
Adams, Robert E., to J. W. Greer, Inc. Homogenizer-mixer. 3,889,931, Cl. 259-96.000.
Adams, Samuel F.; and Guerin, Robert J., to American Paper Tube Company. Incrementally-tapered bobbins. 3,889,899, Cl. 242-118.320.
Adams, Sidney George William; and Galliford, Edgar Horace, to James Burn Bindings Limited. Machines for binding packets of perforated sheets. 3,889,309, Cl. 11-1.00A.
Addington Laboratories, Inc.: *See*—
  Jeong, David Hoy, 3,890,582.
Addressograph-Multigraph Corporation: *See*—
  McVey, Charles W., 3,889,593.
Adler, Martin H.: *See*—
  Feren, Morton, 3,890,044.
Admiral Corporation: *See*—
  Maleck, Leroy Robert, 3,889,419.
Advance Enterprises, Inc.: *See*—
  Faltin, Hans G., 3,889,939.
Advance Oil and Gas Co., Inc.: *See*—
  Davis, JLee, 3,890,593.
Advanced Chemical Technology: *See*—
  Simon, Alvin L.; and Butz, Klaus S., 3,889,839.
Advanced Technology Laboratories, Inc.: *See*—
  Ferri, Antonio, 3,890,088.
AE&CI Limited: *See*—
  Coetzee, Josef Erasmus, 3,889,571.
Aengenheister, Joerg, to Siemens Aktiengesellschaft. Apparatus for producing epitaxial layers. 3,889,635, Cl. 118-421.000.
Aerojet-General Corporation: *See*—
  Beichel, Rudi; and O'Brien, Charles J., 3,889,462.
  Luscher, Werner P., 3,889,775.
Aerosonic Corporation: *See*—
  Owens, Frederick J.; Bishop, Jerry B.; and Fidelman, David, 3,889,387.
AFA Corporation, The: *See*—
  Uroshevich, Miroslav; Powers, Richard T.; and Sperber, Raymond L., 3,889,847.
AG-Water, Inc.: *See*—
  Harrell, Gary W., 3,890,236.
Agence National de Valorisation de la Recherche (ANVAR): *See*—
  Gautherin, Guy; and Aubert, Jean, 3,890,535.
Agrico Chemical Company: *See*—
  Minor, John T., 3,890,097.
Ahlgren, Nils Harald. Methods for shifting loads. 3,889,926, Cl. 254-1.000.
Ahonen, Aarre, to Oy Wartsila AB. Door arrangement. 3,889,421, Cl. 49-395.000.
Air-Trol Systems, Inc.: *See*—
  Edes, Ferenc; and Gianatasio, Henry L., 3,889,895.
Aisin Seiki Kabushiki Kaisha: *See*—
  Kazaoka, Kenichi; Hirose, Kimiharu; Takeshita, Yasuo; Matsumoto, Hisao; and Okamoto, Kazuo, 3,889,971.
  Uozake, Seizo; and Sakashita, Hitoshi, 3,889,615.
Aizawa, Tsuneo: *See*—
  Sato, Masao; Aizawa, Tsuneo; Ohnishi, Kenji; Koizumi, Shigeo; Fukuda, Akio; Kikuchi, Shinki; and Kusanagi, Shichiro, 3,889,561.
  Sato, Masso; Aizawa, Tsuneo; Ohnishi, Kenji; Koizumi, Shigeo; Fukuda, Akio; Kikuchi, Shinki; and Kusanagi, Shichiro, 3,889,567.
Aki, Osami: *See*—
  Ochiai, Michihiko; Aki, Osami; Morimoto, Akira; Okada, Taiiti; and Masuda, Katsutada, 3,890,309.
Akiyama, Masanori: *See*—
  Suzuki, Takeshi; Tanaka, Hiroshi; and Akiyama, Masanori, 3,890,151.
Aktiebolaget Henry Hulthen: *See*—
  Hulthen, Martin Henry, 3,889,313.
Aktiebolaget Platmanufaktur: *See*—
  Grahn, Per Herbert; and Hakansson, Karl Gustav Eugen, 3,889,442.
Aktiengesellschaft Adolph Saurer: *See*—
  Porter, Allan William Henry, 3,889,720.
  Porter, Allan William Henry, 3,889,722.
Al-hassan, Saieba: *See*—
  Wood, Hamish Christopher Swan; Stuart, Alexander; Curran, Adrian Charles Ward; and Al-hassan, Saieba, 3,890,387.
Albertazzi, Gastone, to Finike Italiana Marposs, Soc. In Accomandita Semplice di Mario Possati & C. Automatic measuring machine for checking similar workpieces with at least one dimension different. 3,889,380, Cl. 33-174.0QL.
Alden, John M., to Alden Research Foundation. Sealed cassette for moist facsimile recording paper. 3,890,622, Cl. 346-74.00E.
Alden Research Foundation: *See*—
  Alden, John M., 3,890,622.
Aldridge, Clyde L., to Exxon Research and Engineering Company. Two-stage process for the conversion of liquid hydrocarbon to a methane rich gas stream. 3,890,112, Cl. 48-214.000.
Alexander, Sell, Steldt & DeLaHunt: *See*—
  Nelson, Norman E., 3,889,900.
Alimenti, Giovanni: *See*—
  Portinari, Antonio; and Alimenti, Giovanni, 3,889,455.
Allen, Archelaius Dawson, to Gullick Dobson Limited. Mine roof supports. 3,889,475, Cl. 61-45.00D.
Allen, Edgar Robert, to Post Office, The. Measurement of noise in a communication channel. 3,890,470, Cl. 179-15.0BF.
Allen and Hanburys Limited: *See*—
  Middlemiss, David, 3,890,347.
Allen West and Company, Limited: *See*—
  Evans, John Richard, 3,889,878.
Allied Chemical Corporation: *See*—
  Bingham, Alex John; Haylock, John Christopher; and Lofquist, Robert Alden, 3,890,286.
  Ousterling, David L.; and Jones, Harold F., 3,889,696.
Allmanna Svenska Elektriska Aktiebolaget: *See*—
  Chamia, Michel, 3,890,544.
Aluminum Company of America: *See*—
  Burkhardt, Daniel J., 3,889,451.
  Kondis, Thomas J., 3,890,166.
  Matocha, Charles K., 3,890,089.
Alvarez, Jose R., to du Pont de Nemours, E. I., and Company. Preparation of thiohydroximate carbamates. 3,890,362, Cl. 260-453.00R.
Amada Company Limited: *See*—
  Sato, Masao; Aizawa, Tsuneo; Ohnishi, Kenji; Koizumi, Shigeo; Fukuda, Akio; Kikuchi, Shinki; and Kusanagi, Shichiro, 3,889,561.
  Sato, Masso; Aizawa, Tsuneo; Ohnishi, Kenji; Koizumi, Shigeo; Fukuda, Akio; Kikuchi, Shinki; and Kusanagi, Shichiro, 3,889,567.
Amaya, Toshiyuki, to Pioneer Electric Corporation. Automatic chord performance apparatus for a chord organ. 3,889,568, Cl. 84-1.010.
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  - Ziv, Avraham, 3,889,898.
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- Andersen, Kare: *See*—
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- Anderson, Dean K., to Kimberly-Clark Corporation. Fiber waste reclaim system and method. 3,890,220, Cl. 209-3.000.
- Anderson, Paul E., to Martin Marietta Aluminum, Inc. Method and means for constructing large tanks. 3,889,836, Cl. 220-5.00A.
- Anderson, Paul L., to Sandoz, Inc. Indanyl butadienols. 3,890,396, Cl. 260-618.00F.
- Anderson, Robert D., to TCI, Inc. Live bottom chute for spreaders. 3,889,883, Cl. 239-679.000.
- Andersson, Claes-Goran Staffan: *See*—
  - Danielson, Claes Otto Sigfrid; Andersson, Claes-Goran Staffan; and Gram, Hans-Ake Christian, 3,889,450.
- Andeweg, Frits J. Illuminated candle structure. 3,890,085, Cl. 431-125.000.
- Angstadt, Howard P.; and Bare, John P., to Sun Ventures, Inc. Polymeric catalyst composition for hydrocarbon oxidation. 3,890,281, Cl. 260-77.50C.
- Anthony, Donald L. Plural aperture dispenser. 3,889,724, Cl. 141-1.000.
- Aoki, Hideo: *See*—
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- Aprahamian, Aida, executrix: *See*—
  - Aprahamian, Nazar S., deceased, 3,890,390.
- Aprahamian, Nazar S., deceased (Aprahamian, Aida, executrix), to Union Carbide Corporation. Process for the production of methyl ketones. 3,890,390, Cl. 260-590.000.
- Apstein, Maurice, to United States of America, Army. Fuze. 3,889,599, Cl. 102-70.20P.
- Aquila S.p.A.: *See*—
  - Giangaspero, Michele; Tlustos, Giorgio; and Corsi, Domenico, 3,890,401.
- Argentieri, Michael; and Kelso, Robert, to Intercontinental Dynamics Corporation. Integrated radar-pneumatic altimeter display device. 3,890,614, Cl. 343-5.0DP.
- Armao, Thomas Anthony. Cryoadhesion preventing cryosurgical instruments. 3,889,680, Cl. 128-303.100.
- Armco Steel Corporation: *See*—
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- Arnold, Robert W. Jet propulsion unit for boats. 3,889,623, Cl. 115-16.000.
- Arnold, William J.: *See*—
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- Aronson, Moses, to United States of America, Navy. Direct fire weapons simulator. 3,889,396, Cl. 35-25.000.
- Aronstein, Jesse; and Harding, William E., to International Business Machines Corporation. Continuous processing system. 3,889,355, Cl. 29-569.000.
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- Arrow Development Co., Inc.: *See*—
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- Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
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- Asbury, Joseph J., to United States of America, Energy Research and Development Administration. Aluminum titanate crucible for molten uranium. 3,890,140, Cl. 75-84.10R.
- Aspinwall, Peter; and Barbour, Richard H., Jr., to Comstock & Wescott, Inc. Knife edge endless loop book cutter. 3,889,564, Cl. 83-174.000.
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- Atlas Copco Aktiebolag: *See*—
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- Avery, Carl Frederick, to Marion Health and Safety, Inc. Culture collecting package. 3,890,204, Cl. 195-139.000.
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  - Hosaka, Akio; Baba, Kosaku; and Wazawa, Kiyoshi, 3,890,594.
- Babcock, Henry Nash. Cementitious systems incorporating particulate adsorbents. 3,890,157, Cl. 106-89.000.
- Babcock & Wilcox Company, The: *See*—
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- Bacon, Karl W., to Arrow Development Co., Inc. Amusement ride with a vehicle track portion following the shape of a helix. 3,889,605, Cl. 104-56.000.
- Bactomatic Inc.: *See*—
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- Bailey, Denis M., to Sterling Drug Inc. 5-(3-Pyridyl)-2-furaldehyde and preparation. 3,890,335, Cl. 260-297.00R.
- Bailey, William V., to United States of America, Interior. Vibrating wire meter. 3,889,525, Cl. 73-67.200.
- Baily, Everett M.; Rathbone, Donald E.; and Johnson, Lynn F., to Idaho Research Foundation, Inc. Harvester boom control. 3,889,796, Cl. 198-7.000.
- Bair, Howard C.; and Larsen, Richard C. Saw bar mounted sharpener for chain saws. 3,889,556, Cl. 76-25.00A.
- Baker, Alfred. Nasal adapter for administering analgesic gas. 3,889,671, Cl. 128-206.000.
- Bakul, Valentin Nikolaevich; Shulzhenko, Alexandr Alexandrovich; and Getman, Anatoly Fedorovich. Method of producing diamond materials. 3,890,430, Cl. 423-446.000.
- Balcom Chemicals, Inc.: *See*—
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- Balius, Donald G. Retractable propeller guard for outboard motor or stern drive unit. 3,889,624, Cl. 115-42.000.
- Ballas, Donald F.; Ku, San-Mei; and Marinace, John C., to International Business Machines Corporation. Method of electrolessly plating alloys. 3,890,455, Cl. 427-85.000.
- Ballheimer, Benny, to Caterpillar Tractor Co. Connecting rod assembly. 3,889,553, Cl. 74-579.00R.
- Balser, Martin, to Xonics, Inc. Acoustic wind sensor. 3,889,533, Cl. 73-189.000.
- Bann, Robert Francis; Moran, William Joseph; and Roth, Philip B., to American Cyanamid Company. Cellulosic textile finish with 1,3-dimethylol-4,5-dihydroxy-2-imidazolidinone, zinc nitrate and a sequestering agent. 3,890,095, Cl. 8-185.000.
- Barabino, William A., to Safety Research & Engineering Corporation. Alarm system for pneumatic tires. 3,890,595, Cl. 340-58.000.
- Barber, Gerald L. Method and apparatus for transporting. 3,889,602, Cl. 104-23.0FS.
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- Barbron Corporation: *See*—
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- Bargen, David W., to CMX Systems. Color phase matching system for magnetic video tape recordings. 3,890,638, Cl. 358-8.000.
- Barks, Ronald E., to Norton Company. Apparatus for forming solid spherical pellets. 3,890,072, Cl. 425-6.000.
- Barleen, David G.; and Peters, Rex B., to Systron-Donner Corporation. Acoustic transducer. 3,890,513, Cl. 310-9.100.
- Barnett, Jewell M.: *See*—
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- Barth, Hansjochen: *See*—
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- Bauer, Benjamin B., to CBS Inc. Encoders for quadraphonic sound system. 3,890,466, Cl. 179-1.0GQ.
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- Bauer, Johann; and Barth, Hansjochen, to Wacker-Chemie GmbH. Method for producing a cavity or a zone of very low density in the interior of extruded profiles of foamable thermoplastics. 3,890,416, Cl. 264-45.500.
- Bauer, Paul R.; and Dunwoodie, Duane E., to Wiltron Company. Telephone system testing apparatus and techniques utilizing central measuring equipment with a plurality of remote test stations. 3,890,495, Cl. 235-153.0AK.
- Bauman, Joseph F.; and Elson, Arthur M., to Acme-Hamilton Manufacturing Corporation. Method for handling waste material, refuse and the like. 3,889,830, Cl. 214-152.000.
- Baumgarten, Carl B., to Gomco Surgical Manufacturing Corp. Uterine aspirating curette. 3,889,657, Cl. 128-2.00B.
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- Bayle, Robert Vincent, to Gemmer-France. Method of making a controlled torque connecting member. 3,889,511, Cl. 72-370.000.
- Beck, James R.; and Suhr, Robert G., to Eli Lilly and Company. α,α,α-Trifluoro-2-nitro-6-[oxa(thia)zolyl]thio-p-tolunitriles. 3,890,337, Cl. 260-302.00S.
- Becker, Floyd W., to Drill Systems Inc. Apparatus for pulling drill pipe. 3,889,927, Cl. 254-105.000.
- Becker, Joseph J., to Firmenich S.A. Process for preparing lactones. 3,890,353, Cl. 260-343.000.
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- Begin, Claude. Reversible door frame. 3,889,423, Cl. 49-504.000.
- Behrens, James D.: *See*—
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- Beichel, Rudi; and O'Brien, Charles J., to Aerojet-General Corporation. Consumable detonation reaction engine and system. 3,889,462, Cl. 60-250.000.
- Bell & Howell Company: *See*—
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- Bell Telephone Laboratories, Incorporated: *See*—
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  - DiLorenzo, James Vincent; Niehaus, William Charles; Rode, Daniel Leon; and Schwartz, Bertram, 3,890,215.
  - Hachenburg, Victor, 3,890,471.
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- Bellina, Russell F., to du Pont de Nemours, E. I., and Company. 1,1-Dimethyl-2-thio-3-(4-alkyl-piperazino)-thocarbonyl ureas. 3,890,322, Cl. 260-268.00C.
- Bellmann, Bernhard: *See*—
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  - Melead, James J., 3,889,892.
- Belsley, Kenneth I., to United States of America, Navy. Arming system. 3,889,598, Cl. 102-16.000.
- Bendayan, Jacques, to Les Cables de Lyon. Flexible circular waveguide utilizing helical windings. 3,890,583; Cl. 333-95.00A.
- Bender, Horst, to WIBAU (Westdeutsche Industrie-und Strassenbaumaschinen-Gesellschaft m.b.H.). Reciprocating valve for double piston concrete pump. 3,889,713, Cl. 137-625.480.
- Bender, Hugo, to Hoechst Aktiengesellschaft. Welded polyester bags. 3,889,870, Cl. 229-55.000.
- Bender, Richard E.: *See*—
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- Bendix Corporation, The: *See*—
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  - Tawfik, David A., 3,890,575.
- Benezra, Leo L., to Diamond Shamrock Corporation. Hydrogenation process with unsupported Group VIII metal hydroxide catalysts. 3,890,329, Cl. 260-293.520.
- Bennett, Milton C., to J. I. Case Company. Piston rod floating wiper. 3,889,958, Cl. 277-24.000.
- Bennett, Robert A. Container closure opening means. 3,889,842, Cl. 220-253.000.
- Benzoni, Rene Pierre: *See*—
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- Berg, Robert A., to Consolidated Packaging Corporation. Display carton. 3,889,867, Cl. 229-28.00R.
- Berg, Ronald; Hjermstad, Hans Petter; and Neefjes, Gerard Albert, to Institutt for Atomenergi. Procedure for increasing the chemisorption capacity of carbon with regard to gases. 3,890,245, Cl. 252-447.000.
- Berger, Joel G., to du Pont de Nemours, E. I., and Company. Trans-1,2,3,4,4a,8,9,14a-octahydropyrido[r',3':2,3]indolo[1,7-ab][1]benzazepine. 3,890,327, Cl. 260-293.550.
- Bergeron, Duncan G.; and Leach, Ray E. Seedling tree growing apparatus. 3,889,416, Cl. 47-34.130.
- Bergeron, John A., to General Electric Company. Combined sampling and bacteriological culturing device. 3,890,202, Cl. 195-127.000.
- Berglund, Harold R.: *See*—
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- Berninger, Walter H., to General Electric Company. Fast response time image tube camera. 3,890,506, Cl. 250-370.000.
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- Bernstein, Herbert J.; and Arnold, William J. Photographic printing apparatus. 3,890,045, Cl. 355-73.000.
- BernzOmatic Corporation: *See*—
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- Beyer, Horst; and Buran, Ulrich, to Goetzewerke-Friedrich Goetze AG. Welding powder for producing wear-resistant layers by build-up welding. 3,890,137, Cl. 75-.5BB.
- Beyer, John P., to Communications Satellite Corporation. Radio frequency polarimeter. 3,890,571, Cl. 324-95.000.
- Bhopale, Arvind M.: *See*—
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  - Filter, Harold E.; and Bidlack, Harvey D., 3,890,173.
- Biek, Paul Albert, to Dresser Industries, Inc. Socket retainer for rotatable power tool. 3,890,051, Cl. 403-20.000.
- Bierhenke, Hartwig, to Siemens Aktiengesellschaft. Process for the production of high value ohmic load resistors and mos transistors having a low starting voltage. 3,889,358, Cl. 29-571.000.
- Binder Magnete GmbH: *See*—
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- Bingham, Alex John; Haylock, John Christopher; and Lofquist, Robert Alden, to Allied Chemical Corporation. Production of polycaproamide fiber. 3,890,286, Cl. 260-78.00L.
- Binks, Chester J.; and Moser, Joseph M., to Restaurant Technology, Inc. Steam injector spatula. 3,889,582, Cl. 99-450.000.
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Blaschke, Franz; Gardziella, Arno; and Schade, Gerhard, to Dynamit Nobel AG. Method of bonding using a polyester hot-melt adhesive. 3,890,186, Cl. 156-332.000.
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Blue, Donald F., to Caterpillar Tractor Co. Machine slide assembly. 3,890,017, Cl. 308-3.00A.
Bluem, Gary R. Fluid pressure testing apparatus. 3,889,530, Cl. 73-146.800.
Blum, Raymond T., to Bausch & Lomb Incorporated. Optical lens generating machine having an air rotatable spherical bearing workpiece holder. 3,889,426, Cl. 51-55.000.
Blumer, Larry D., to General Motors Corporation. Power booster and master cylinder assembly. 3,889,468, Cl. 60-548.000.
Bocquillon, Francois; and Massiera, Roger, to Thomson-CSF. Grouping of electro-acoustic transducers particularly for use in underwater detection systems. 3,890,591, Cl. 340-6.00R.
Bode, Charles H., Jr.; Craig, Carlton E.; Friend, Donald L.; Lazzaretti, Louis G.; and Wagner, George J., Jr., to United States Steel Corporation. Extractor for guide rolls. 3,889,344, Cl. 29-252.000.
Boden, Karl; and Scheffer, Dietrich, to Padana AG. Magnetic bearings. 3,890,019, Cl. 308-10.000.
Boehmer, Matthew A., to BASF Wyandotte Corporation. Water solubility of polyoxyalkylene polymers. 3,890,238, Cl. 252-1.000.
Boehringer, Wilfred E., to McDonnell Douglas Corporation. Thermal fuse mechanical disconnect. 3,889,789, Cl. 192-82.00T.
Boehringer, Wilfred E.; Little, Jane; Rothi, Robert D.; and Westlund, Charles G., to McDonnell Douglas Corporation. Reciprocating transfer pump. 3,890,064, Cl. 417-237.000.
Boeing Company, The: *See—*
  Hilby, Noel Evan, 3,889,903.
Bogdanov, Georgy Yakovlevich; Deminsky, Jury Andreevich; Zax, Mikhail Isaakovich; and Tsygankov, Jury Viktorovich. Device for setting up arc current in pulsed arc welding. 3,890,557, Cl. 321-16.000.
Boggs, Roger L.; and Reinsma, Harold L., to Caterpillar Tractor Co. Impact absorbing noise suppression device. 3,889,550, Cl. 74-443.000.
Bohme, Reinhard D.; and Ilagan, Perlita A., to Daubert Chemical Company. Adhesive compositions and tapes. 3,890,292, Cl. 260-80.760.
Boileau, Sylvie: *See—*
  Lehn, Jean-Marie; Schue, Francois; Boileau, Sylvie; Kaempf, Bernd; Cau, Alain Andre; Moinard, Jean Robert; and Raynal, Serge Fernand, 3,890,278.
Boler, Leonard J., to Cherne Industrial, Inc. Liquid cooling assemblies. 3,890,412, Cl. 261-90.000.
Bolon, Donald A., to General Electric Company. Method for removing photoresist from substrate. 3,890,176, Cl. 156-2.000.
Bonner, Francis J., Sr., to Bonner, Marion K. Therapeutic stump treating air sac prosthesis. 3,889,301, Cl. 3-20.000.
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  Wiese, Winfred J., 3,889,960.
Borsten, Herman: *See—*
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Bosse, Robert W., to Groov-Pin Corporation. Method of mounting locking, self-tapping threaded stud insert assembly. 3,889,352, Cl. 29-432.000.
Boszak, Ronald J.: *See—*
  Schlesinger, Sheldon Irwin; Boszak, Ronald J.; Shuppert, Laurence Verlan; and Cowling, Richard James, 3,890,149.
Bourdo, John Lorin, to Automated Construction Industries, Inc. Transfer mechanism for structural members. 3,890,075, Cl. 425-88.000.
Bourgine, Louis: *See—*
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Bovensiepen, Hans-Friedrich, to Peter Wolters. Double-disc flatlapping or honing machine including a free-wheeling drive connection. 3,890,114, Cl. 51-118.000.
Bowen, Francis J.: *See—*
  Stevens, Douglas; Forberg, Helge O.; Jennings, Larry D.; Stephens, Frank M., Jr.; Bowen, Francis J.; Thompson, David L.; and Copenhaver, Julian V., Jr., 3,890,425.
  Stevens, Douglas; Forberg, Helge O.; Jennings, Larry D.; Stephens, Frank M., Jr.; and Bowen, Francis J., 3,890,426.
Bowers, Gerald M.; and Cay, Norman S., to Unicorp Incorporated. Apparatus for loading and unloading susceptors from reactor. 3,889,821, Cl. 214-1.0BB.
Boyd, John F.: *See—*
  Dowling, Donald J.; Boyd, John F.; and Fuchs, James A., 3,890,502.
Boyd, Roy W., Jr., to Rosen, Irving; and Rosen, Gerald J. Apparatus for removing a sternum from a chicken carcass. 3,889,317, Cl. 17-11.000.
Boyer, Harold E., to Bell & Howell Company. Vacuum conveyor belt with air bearing. 3,889,801, Cl. 198-184.000.
Bozec, Christian: *See—*
  Gandon, Louis; Bozec, Christian; and Lenoble, Philippe, 3,890,243.
BP Chemicals International Limited: *See—*
  Dobson, Kenneth Rowland, 3,890,375.
Bradley, Chester D., to A. H. Emery Company, The. Rectangular hydraulic load cell. 3,889,529, Cl. 73-141.00R.
Brakebill, Harold G.; Lewis, Jay L.; and Berleyoung, Walter J., to Robertshaw Controls Company. Pressure regulator construction and method of making the same. 3,889,335, Cl. 29-157.10R.
Brand, Robert. Gas pedal biasing device. 3,889,938, Cl. 267-153.000.
Brandis, Curt; and Schatz, Oskar, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Worm throttle means. 3,889,932, Cl. 259-191.000.
Brandt, Jean; Giddey, Claude; and Bunter, Guy, to Etablissements V.Q. Petersen & Cie. Method of reducing the aflatoxin contact of oilseed meal products. 3,890,452, Cl. 426-321.000.
Brash, Douglas J., to General Mills, Inc. Wagon wheel package loader. 3,889,445, Cl. 53-26.000.
Brattgard, Sven-Olof. Chair provided with wheels. 3,889,963, Cl. 280-36.00B.
Bray, William W., Sr. Ducted grease vapor exhaust system. 3,889,581, Cl. 98-115.00K.
Bredt, Elmer S. Landing gear for semi-trailer. 3,889,972, Cl. 280-150.500.
Breelle, Yves; Grehier, Alain; and Paty, Marcel, to Institut Francais du Petrole, des Carburants et Lubrifiants. Device for the sealing of a block formed of a pile of plates, such that of fuel cell, while maintaining free passageways between these plates. 3,890,076, Cl. 425-110.000.
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Bresser, Robert E.: *See—*
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Brewster, John L., to Hewlett Packard Company. Stimulated emission light source pumped by electron beam of field emission initiated vacuum arc. 3,890,503, Cl. 250-321.000.
Bricker, Norman C., to Raymond Lee Organization, Inc., The. Gear clutches with selector valve. 3,889,790, Cl. 192-85.0AT.
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  Ohnishi, Akira; Yukuta, Toshio; Fujio, Ryota; Ishida, Yozo; Kambara, Shu; and Kojima, Minoru, 3,890,284.
  Yukuta, Toshio; Ohashi, Takashi; and Oguri, Yoshiko, 3,890,293.
Briggs, Paul Clayton, Jr.; and Muschiatti, Lawrence Carl, to du Pont de Nemours, E. I., and Company. Novel adhesive compositions. 3,890,407, Cl. 260-878.00R.
Bright, William L. Safety lock for enclosures. 3,889,993, Cl. 292-251.000.
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Broadbent, Douglas; Burrows, Brian Frederick; Carter, Stephen Barnaby; and Hemming, Harold George, to Imperial Chemical Industries Limited. Antibiotic substance. 3,890,435, Cl. 424-115.000.
Brock, Gordon L. Electronic module and method of fabricating same. 3,889,365, Cl. 29-627.000.
Brooks, Robert C., to Armco Steel Corporation. Gate valve and seal. 3,889,925, Cl. 251-327.000.
Brost, Julien H. Check valve with elastomeric valve element. 3,889,710, Cl. 137-512.150.
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Brown, Bruce B., to United States of America, Army. Gage for measuring the circumferential expansion of internally pressurized tubes. 3,889,381, Cl. 33-179.000.
Brown, Charles M., III. Diode array. 3,890,161, Cl. 136-212.000.
Brown, John Graham; and Payne, Henry Arthur Sheldon, to Murphy Chemical Ltd. Certain diguanidino compounds used as fungicides. 3,890,446, Cl. 424-326.000.
Bruckner, Arnold D.; and Johnson, Marlyn D., to Liberty Carton Co. Mail handling container. 3,889,868, Cl. 229-34.00R.
Bruel, Alain. Grape and juice recovering device to be fitted to a grape-gathering machine. 3,889,454, Cl. 56-330.000.

Brumlik, George C., to Ingrip Fasteners Inc. Multi-element self-gripping device. 3,889,322, Cl. 24-204.000.
Brunner, Rolf H.; and Lester, William C., to International Business Machines Corporation. Variable incidence drive for deposition tooling. 3,889,632, Cl. 118-49.100.
Brunnett, Carl J.; Gibson, Jeremy H.; Mog, Walter F.; and Smith, Richard S., to Picker Corporation. High speed color printer for scintillation scanner. 3,890,355, Cl. 250-366.000.
Brunt, Geoffrey Albert Kenyon: *See—*
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Bryant, Walter Kenneth, to Lucas Electrical Company Limited, The. Bulbholder assemblies for lamp units. 3,890,031, Cl. 339-119.00L.
Buachet, Pierre: *See—*
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Buc, John L. Pencil sharpener. 3,889,730, Cl. 144-28.500.
Buchanan, John Brown; Stephens, Stanley William; and Grenfell, Julian Pascoe, to Badalex Limited. Apparatus for assembling components. 3,889,336, Cl. 29-203.00P.
Buchel, Karl Heinz: *See—*
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Buchi, George H.; and Wuest, Hans, to Firmenich S.A. Process for preparing 2,6,6-trimethyl 1-alkoxycarbonyl-2,4-cyclohexadienes. 3,890,370, Cl. 260-468.00L.
Buchner, Heinrich: *See—*
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Buck, Homer G. Electroerosive process for manufacturing rotary dies. 3,890,481, Cl. 219-69.00M.
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Buenger, George L., to Rycom Instruments. Digital data totalizer system. 3,890,490, Cl. 235-92.0TF.
Buford, Wesley E.: *See—*
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Buhayar, Eric S.; and Gerstenkorn, Gordon F., to Scott Paper Company. Apparatus for resurfacing the cylindrical face of large drier drums. 3,889,424, Cl. 51-49.000.
Bull, David W.; and Miller, Gerald K., to Nartron Corporation. Flow sensor and system. 3,889,535, Cl. 73-208.000.
Bunter, Guy: *See—*
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Burkhardt, Daniel J., to Aluminum Company of America. Capping spindle for securing closures on containers. 3,889,451, Cl. 53-342.000.
Burns, Robert V.; and Hamilton, Richard J., to GTE Automatic Electric Laboratories Incorporated. Circuit arrangement for ground start coin operated telephones. 3,890,468, Cl. 179-6.500.
Burroughs Corporation: *See—*
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Burroughs Wellcome Co.: *See—*
  Wood, Hamish Christopher Swan; Stuart, Alexander; Curran, Adrian Charles Ward; and Al-hassan, Saieba, 3,890,387.
Burrows, Brian Frederick: *See—*
  Broadbent, Douglas; Burrows, Brian Frederick; Carter, Stephen Barnaby; and Hemming, Harold George, 3,890,435.
Burrows, Kenneth; and Hiscutt, Robert, to Triplex Safety Glass Company Limited. Reactive sputtering apparatus and cathode elements therefor. 3,890,217, Cl. 204-298.000.
Burtness, Richard Duane; Hess, Garry Carson; and Jensen, Bliss D., to Bell Telephone Laboratories, Incorporated. Circuitry for detecting faults in duplicate controllers. 3,890,493, Cl. 235-153.0AE.
Busch, Francis R., to General Electric Company. Gas conditioning and analyzing system. 3,890,100, Cl. 23-232.00E.
Buschmann, Karl: *See—*
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Buttimore, David, to May & Baker Limited. Method for controlling the growth of weeds in a cotton growing area with 3,4,5-trisubstituted isothiazoles. 3,890,131, Cl. 71-90.000.
Butts, Charles E.; and Gray, Harry C., to United States of America, Energy Research and Development Administration. Suspension scheme for fuel pin. 3,890,197, Cl. 176-78.000.
Butz, Klaus S.: *See—*
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Cady, Paxton, to Bactomatic Inc. Multi-chamber impedance measuring module-cap combination. 3,890,201, Cl. 195-127.000.
Cahen, Olivier, to Thomson-CSF. High-precision digital-to-analog converters. 3,890,610, Cl. 340-347.0CC.
Cahoy, Roger Paul, to Gulf Research & Development Company. 3,5-Tert. butyl-4-(2,4-dichlorophenylcarbamyloxy) benzylidenemalonitrile. 3,890,367, Cl. 260-465.00D.
Calgon Corporation: *See—*
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Campbell, Kenneth James: *See—*
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Cantarano, Marcus. Electrographic devices for the development composition and transfer of particles images. 3,890,039, Cl. 355-3.00R.
Cantarano, Marcus. Electrographic devices for the non-electrostatic duplication of originals provided with a conductivity pattern formed from indicia and blank areas. 3,890,621, Cl. 346-74.0ES.
Canter, James A.; and Smith, Robert, to General Motors Corporation. Appliance cabinet with actuated door switch. 3,890,476, Cl. 200-61.620.
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  Schoeck, Vincent E., 3,890,125.
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Carlin, William W., to PPG Industries, Inc. Recovery of technetium from nuclear fuel wastes. 3,890,244, Cl. 252-301.10R.
Carlson, Elmer A., to International Telephone and Telegraph Corporation. Ignition system and components thereof. 3,890,579, Cl. 331-111.000.
Carnahan, Thomas G.: *See—*
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Carrigan, Tracy, to FMC Corporation. Wheel mounting apparatus. 3,889,542, Cl. 73-460.000.
Cartabbia, Giovanni. Machine for continuous coupling of fabrics. 3,890,193, Cl. 156-582.000.
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Casella, Frank P. Clock housing and decorative means therefor. 3,889,806, Cl. 206-223.000.
Casey, Donald James; and Epstein, Martin, to American Cyanamid Company. Process for post-polymerizing polyglycolic acid. 3,890,283, Cl. 260-78.30R.
Casey, John W.; Easley, Sydney E.; Gough, Melvin O.; and Jones, William F., to General Motors Corporation. Lubricated spline coupling. 3,889,489, Cl. 64-9.00R.
Cashew Company, Ltd.: *See—*
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Castela, Andre; and Joubert, Philippe, to Institut Francais du Petrole, des Carburants et Lubrifiants. Device for maintaining a working fluid under a predetermined pressure. 3,889,466, Cl. 60-533.000.
Castle, Trevor William. Electronic amusement machine. 3,889,956, Cl. 273-138.00A.
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  Boggs, Roger L.; and Reinsma, Harold L., 3,889,550.
  Cryder, John R.; and Hall, Lowell R., 3,889,469.
  Eftefield, Larry G., 3,889,404.
Cathelin, Pierre-Rene; and Konrad, Hermann-Heinz, to Hoechst Aktiengesellschaft. Level dyeing of wool polyimine or polyamine and sulfonated phenylene amino-chlorotriazine treated. 3,890,091, Cl. 8-17.000.
Cattaneo, Sergio, to Honeywell Information Systems Italia. Mosaic printing head. 3,889,793, Cl. 197-1.00R.
Cau, Alain Andre: *See—*
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Celada, Juan; MacKay, Patrick W.; and de la Pena, Ramon, to Fierro Esponja, S.A. Method and apparatus for reducing particulate metal ores to sponge iron. 3,889,864, Cl. 266-24.000.
Celada, Juan; and MacKay, Patrick W., to Fierro Esponja, S.A. Method for gaseous reduction of metal ores. 3,890,142, Cl. 75-91.000.
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Chabardes, Pierre; Julia, Marc; and Menet, Albert, to Rhone-Poulenc S.A. 2-Methyl-butadienyl-sulphones. 3,890,393, Cl. 260-607.00R.
Chafer, Henry James; and Graham, Stuart, to Joseph Lucas (Industries) Limited. Spark discharge plugs. 3,890,519, Cl. 313-130.000.
Chamia, Michel, to Allmanna Svenska Elektriska Aktiebolaget. Means for limiting the dynamic overreach in, for example, an impedance relay. 3,890,544, Cl. 317-27.00R.
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Chandler, Robert F., Jr., to General Electric Company. Shot volume and cushion point control for injection molding apparatus. 3,889,849, Cl. 222-63.000.
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Charlton, Paul, to Norprint Limited. Impregnated roller. 3,889,597, Cl. 101-367.000.
Chatterjee, Pronoy Kumar; and Schwenker, Robert Frederick, Jr., to Personal Products Company. Cellulose graft copolymer containing non-ionic and ionic polymer moieties as absorbent media in absorbent dressings. 3,889,678, Cl. 128-284.000.
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Chester, Francis B. Aerobic/anaerobic composting device and method of composting. 3,890,129, Cl. 71-9.000.
Chetter, John, to United Kingdom Atomic Energy Authority. Nuclear reactor fuel element assembly spacer grid and method of making. 3,890,196, Cl. 176-78.000.
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Jeger, Oskar; Wolf, Hans; and Zink, Markus, 3,890,395.
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Clamon, Robert Dale, to Dresser Industries, Inc. Rotary rock bit with wiper pad lubrication system. 3,890,018, Cl. 308-8.200.
Clancy, David, to Colgate-Palmolive Company. Web feeding and folding apparatus. 3,889,941, Cl. 270-69.000.
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Claxton, George P.: *See—*
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Cleaver, Brian William; and Rees, Alfred, to Joseph Lucas (Electrical) Limited. Method of supporting distributor blank for machining. 3,889,356, Cl. 29-559.000.
Clement, Vernon D. Cantilevered drapery processing machine. 3,889,857, Cl. 223-32.000.
Clerk, Robert Cecil. Axial piston rotary barrel type hydraulic pumps or motors. 3,889,578, Cl. 91-499.000.
Cline, Lee R. Aid for making a baseball batters' box. 3,889,379, Cl. 33-174.00G.
Close, Albert R., to American Safety Equipment Corporation. Free pull retractor. 3,890,003, Cl. 297-388.000.
Clough, Gary Lee, to Champion International Corporation. Money machine envelope. 3,889,873, Cl. 229-72.000.
Cloyd, Harold S., to Nosco Plastics, Inc. Tilt indicator for shipping containers and the like. 3,889,627, Cl. 116-114.0AH.
Cluett, Peabody & Co., Inc.: *See—*
Hughes, Francis H.; and Crawford, Douglas J., 3,889,612.
CMX Systems: *See—*
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Coderre, Curtis M., to Northrop Corporation. Hydraulic system reservoir having separate oil and air-oil chambers. 3,889,705, Cl. 137-171.000.
Coen Company, Inc.: *See—*
Voorheis, Temple S.; and Vosper, Ralph R., 3,890,084.
Coetzee, Josef Erasmus, to AE&CI Limited. Manufacture of safety fuse. 3,889,571, Cl. 86-1.00R.
Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Process for preparing 3-(3-cyanopropyl)-6a-methyl-4a-hydroxyperhydro-3h-naphtha[2,1-b]benzopyran-7-ols and 3-(3-cyanopropyl)-6a-methyl-4a-hydroxyperhydro-3h-naphtha[2,1-b]benzopyran-7-ones as steroid intermediates. 3,890,354, Cl. 260-343.500.
Cohnen, Wolfgang: *See—*
Serini, Volker; Vernaleken, Hugo; and Cohnen, Wolfgang, 3,890,266.
Coiner, Ronald W., to Westinghouse Air Brake Company. Electrically controlled fluid pressure system for converting digital control signals to analog signals. 3,890,013, Cl. 303-20.000.
Coleman, James H., to Sprague Electric Company. Electrical component with offset radial leads. 3,890,546, Cl. 317-258.000.
Colgate-Palmolive Company: *See—*
Clancy, David, 3,889,941.
Taylor, Glenn N., 3,889,679.
Collins, Donald S.; and Peoples, Patrick J., to Howell Laboratories, Inc. Glossmeter for providing a linear response corresponding to true gloss readings. 3,890,049, Cl. 356-199.000.
Collins, Harvey H., to Package Machinery Company. Plastic injection molding machine. 3,890,308, Cl. 425-242.00R.
Collins, Robert F., to Kendall Company, The. Surgical drape. 3,889,667, Cl. 128-132.00D.

Colt Industries Operating Corp.: *See—*
Yankee, Herbert L.; and Hlavaty, Robert J., 3,889,516.
Combest, John F.; and Bell, Rupert B., to R. L. Kuss & Co., Inc. Fluid filter. 3,890,232, Cl. 210-223.000.
Combustion Engineering, Inc.: *See—*
McGough, Thomas Clifton, Jr., 3,889,552.
Ranger, Eugene, 3,889,820.
Command Automation, Inc.: *See—*
Simjian, Luther G., 3,890,599.
Commonwealth Scientific and Industrial Research Organisation and Imperial Chemical Industries of Austrailia and New Zealand Limited: *See—*
Weiss, Donald Eric; and Battaerd, Hendrik Adriaan Jacobus, 3,890,224.
Communications Satellite Corporation: *See—*
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Container Corporation of America: *See—*
Helms, Charles Robert, 3,889,808.
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Corsi, Domenico: *See—*
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Cotts, Ronald F., to IU Conversion Systems, Inc. Roll-pelletizer for making uniform particle size pellets. 3,890,080, Cl. 425-363.000.
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Hogg, Walter R., 3,890,569.
Coulter, J. Roland: *See—*
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Coulter, Wallace H.; and Hogg, Walter R., to Coulter Electronics, Inc. Method and apparatus for particle length measurement. 3,890,568, Cl. 324-71.0CP.
Couture, J. Walter, to Black Clawson Company, The. Pulping apparatus. 3,889,885, Cl. 241-46.110.
Cowling, Richard James: *See—*
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Cramer, William H. Automobile accelerator locking device. 3,889,499, Cl. 70-202.000.
Crane, Grant; Kay, Edward L.; and Laman, Joseph R., to Firestone Tire & Rubber Company, The. Conversion of scrap rubber to fuel and useful by-products. 3,890,141, Cl. 75-86.000.
Crausaz, Rene: *See—*
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Croset, Michel; and Velasco, Gonzalo, to Thomson-CSF. Short wavelength waveguides. 3,889,361, Cl. 29-600.000.
Cryder, John R.; and Hall, Lowell R., to Caterpillar Tractor Co. Tandem master cylinder with in-line check valves. 3,889,469, Cl. 60-562.000.
CTS Corporation: *See—*
Van Benthuysen, John D.; and English, Jack A., 3,890,590.
Cuisia, Dionisio Guerrero: *See—*
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Cunningham, Lonnie C.; and Travis, Thomas P. Liquid dispersal apparatus. 3,889,881, Cl. 239-70.000.
Curran, Adrian Charles Ward: *See—*
Wood, Hamish Christopher Swan; Stuart, Alexander; Curran, Adrian Charles Ward; and Al-hassan, Saieba, 3,890,387.
Current Industries, Inc.: *See—*
Horowitz, Victor, 3,890,534.
Curry, John Downing, to Procter & Gamble Company. Antibacterial detergent compositions containing phenylbismuth bis(2-pyridinethiol 1-oxide). 3,890,242, Cl. 252-107.000.
Curtis, David, to Hooker Chemicals & Plastics Corporation. Manufacture of hydrazine. 3,890,216, Cl. 204-177.000.
Curtis, Herbert E., to MB Associates. Cartridge assembly for a gas powered weapon system including a pressure responsive seal. 3,889,652, Cl. 124-41.000.
Cushman, Donald R.; Oberright, Edward A.; Edwards, Roy T., deceased; and by Edwards, Katherine, legal representative, to Mobil Oil Corporation. Wax emulsions for controlling transpiration in plants. 3,890,158, Cl. 106-271.000.
Cutler-Hammer, Inc.: *See—*
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D'Alelio, Gaetano Francis, to University of Notre Dame du Lac. Polymerizing bis-maleimides. 3,890,272, Cl. 260-47.0UA.
D'Alelio, Gaetano Francis, to University of Notre Dame du Lac. Phthalonitrile-terminated aromatic polyimides. 3,890,274, Cl. 260-47.0CP.
Daly, Richard H.; Brink, Robert V.; and Andersen, Kare, to Chicago Rawhide Manufacturing Company. Injection molding apparatus. 3,890,082, Cl. 425-451.900.
Dalziel, Warren L., to Shugart Associates. Flexible disk drive cartridge loading apparatus. 3,890,643, Cl. 360-99.000.
Danielewicz, John C.; Snarey, Michael; and Thomas, Geoffrey N., to Pfizer Inc. (2-Imidazolin-2-y(amino) substituted quinolines, -quinoxalines and -quinazolines as antihypertensive agents. 3,890,319, Cl. 260-250.00Q.
Daniels, Elon, Jr., to General Motors Corporation. Method and apparatus for preventing curling of lead strips during expansion. 3,890,160, Cl. 136-36.000.
Danielson, Claes Otto Sigfrid; Andersson, Claes-Goran Staffan; and Gram, Hans-Ake Christian, to Helsingborgs Spikfabriks AB. Methods and apparatuses for making strips of nails for use in nail driving tools. 3,889,450, Cl. 53-198.00R.
Danke, Rudolph B., to Simplex Time Recorder Company. Time recorder. 3,890,624, Cl. 346-91.000.
Dann, Bert H.: *See—*
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Bohme, Reinhard D.; and Ilagan, Perlita A., 3,890,292.
David, Pierre Y.; Charles, Joel M.; and Toscano, Robert Julien Antoine, to Etat Francais. Winch with constant tension cable. 3,889,928, Cl. 254-172.000.
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Davidson, Robert R., to Borg-Warner Corporation. Sealing arrangement for a fluid pressure device. 3,890,068, Cl. 418-132.000.
Davies, Timothy Alan, to United Kingdom Atomic Energy Authority. Methods of treating solid substances with a vapor. 3,890,424, Cl. 423-19.000.
Davis, Frank H.; Wolfe, Homer O., Jr.; and Clapp, Billy D., to Certain-teed Products Corporation. Method for packaging fiber glass insulation. 3,889,444, Cl. 53-24.000.
Davis, JLee, to Advance Oil and Gas Co., Inc. Multi-directional seismic exploration methods on navigable water. 3,890,593, Cl. 340-15.5MC.
Davis, Richard P. Method of making printed circuit boards. 3,889,363, Cl. 29-625.000.
Davis, Robert L., to Rohm and Haas Company. Pallet for large coil of sheet material and cooperating roller stand for dispensing sheet material from coil. 3,889,831, Cl. 214-340.000.
Davis, Rodney L.; Cronk, Don Ray; and Hansen, Carl C., to Whirlpool Corporation. Self-aligning integral lint screen handle and lid for a dryer. 3,889,392, Cl. 34-82.000.
Davis, Steven S., to Envirotech Corporation. Vacuum filter. 3,890,235, Cl. 210-330.000.
Davis, Thomas G.: *See—*
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Day, Donald L.; Halstead, Charles H.; and Huck, Neil F., to Textron Inc. Metal roof. 3,889,437, Cl. 52-520.000.

Day, John J.; and Hirschman, Paul S., to Ocean Protein Corporation. Rearing tank for aquatic animals. 3,889,639, Cl. 119-2.000.
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DeAngelis, Gerald George; and Hess, Hans-Jurgen Ernst, to Pfizer Inc. 6-Aryl-5-ethyl-pyrimidin-4-ol compounds useful as intermediates and bronchodilators. 3,890,321, Cl. 260-251.00R.
Deardurff, Lawrence R., to Owens-Corning Fiberglas Corporation. Method of making electric conductor. 3,890,179, Cl. 156-53.000.
de Boer, Jan, to U.S. Philips Corporation. Electric dry shaver. 3,889,371, Cl. 30-34.100.
De Boer, Jan J.; and Borsten, Herman, to Nederlandse Organisatie Voor Toegepast-Natuurweten-Schappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel En Verkeer. Preparation of cotton yarns from slivers and rovings. 3,889,328, Cl. 28-76.00R.
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Della Vite, Romuald Rene, to Societe Francaise d'Etiquetage Virey & Garnier. Bottle labelling machine. 3,890,192, Cl. 156-571.000.
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Denhart, Robert R. Self-contained voice amplification headgear. 3,890,475, Cl. 179-156.00A.
Denis, Roger; and Barnett, Jewell M., to said Roger Denis, by said Jewell M. Barnett. Vacuum curettage device. 3,889,682, Cl. 128-304.000.
Denouter, Pieter J.; and Grolman, Bernard, to American Optical Corporation. Device for consistent response to a fluid pulse and method and apparatus for verifying instruments utilizing fluid pulses. 3,889,518, Cl. 73-4.00R.
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Desblanche, Andre Eugene; and Pierret, Jean Marc, to International Business Machines Corporation. Method and apparatus for equalizing phase-modulated signals. 3,890,572, Cl. 325-42.000.
Deslauriers, Clovis F. Stripping machine. 3,889,863, Cl. 225-99.000.
DeSourdis, Paul L., to Felters Company, The. Machinery mount. 3,889,907, Cl. 248-24.000.
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Devol, George C.; and Martin, Paul S. Dual-armed multi-axes program controlled manipulators. 3,890,552, Cl. 318-568.000.
Dewey, John L.; Cook, George W.; and Scott, Charles E., to Reynolds Metals Company. Recovery of gallium. 3,890,427, Cl. 423-129.000.
Diamond, Allen M., to Beckman Instruments, Inc. Direct coupled amplifier in null balance circuit or the like. 3,890,553, Cl. 318-678.000.
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DiBenedetto, Anthony J., to Gurtler Hebert & Co., Inc. Apparatus for welding together substantially vertically extending pipe sections. 3,890,482, Cl. 219-73.000.
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Dietz, Richard E.; and Delap, Joseph A., to Phillips Petroleum Company. Silica preparation. 3,890,249, Cl. 252-458.000.
Dijkstra, Rinse; and Van den Broek, Arnoldus Johannes Maria, to U.S. Philips Corporation. Positive-acting napthoquinone diazide photosensitive composition. 3,890,153, Cl. 96-91.00D.
Dillard, Robert D., to Eli Lilly and Company. 5,5-Dialkyl-3-pyrroline-2,2-dicarboxylic acid esters. 3,890,349, Cl. 260-326.460.
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Dillon, William E., to Skil Corporation. Vibration isolation handle for portable chain saw or the like. 3,889,763, Cl. 173-162.000.
DiLorenzo, James Vincent; Niehaus, William Charles; Rode, Daniel Leon; and Schwartz, Bertram, to Bell Telephone Laboratories, Incorporated. Electrochemical thinning of semiconductor devices. 3,890,215, Cl. 204-129.200.
Dils, Ray R., to United Aircraft Corporation. Process of coating a gas turbine engine alloy substrate. 3,890,456, Cl. 428-216.000.
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Dobson, Kenneth Rowland, to BP Chemicals International Limited. Halogenated octyl esters. 3,890,375, Cl. 260-475.00R.
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Dolak, Lester A., to Upjohn Company, The. Process for n-acylating novenamine. 3,890,297, Cl. 260-210.00R.
Domenico, Penelope B., to Dow Chemical Company, The. Halopyridyl thioalkylthio cyanates. 3,890,332, Cl. 260-294.80G.
Domenighetti, Domenico. Combined-action vibro compacting machine for the construction or roads. 3,890,056, Cl. 404-117.000.
Dominy, Beryl W., to Pfizer Inc. Herbicidal 1H-pyrazolo[3,4-d]pyrimidin-4-ones. 3,890,132, Cl. 71-92.000.
Donnelly, William R., to Readi Temp, Inc. Heat transfer package with shaped frangible ampule. 3,889,483, Cl. 62-4.000.
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Dougherty, Emery W. Liquid dental opaquer and method. 3,889,385, Cl. 32-12.000.
Dove, Curtis N., Jr.; and George, Jimmie, to Flotation Trailer Trac, Inc. Flotation/tire/assembly. 3,890,010, Cl. 301-52.000.
Dovey, Brian H.; Bartner, Elliot; Kaplan, Sheldon; and Sarnoff, Stanley J., to Survival Technology, Inc. Tip assembly for syringes. 3,889,673, Cl. 128-215.000.
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Dowling, Donald J.; Boyd, John F.; and Fuchs, James A., to Texaco Inc. Permeability log using new lifetime measurements. 3,890,502, Cl. 250-267.000.
Dowling, Donald J.; and Savage, Kerry D., to Texaco Inc. Magnetic susceptibility logging apparatus for distinguishing ferromagnetic materials. 3,890,563, Cl. 324-6.000.
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Duncan, Gorden E. Shock absorber nut removing tool. 3,889,558, Cl. 81-55.000.
Dunn, Byron G. Motor vehicle fire extinguisher. 3,889,752, Cl. 169-59.000.
Dunn, Byron G. Fire extinguishing system. 3,889,754, Cl. 169-59.000.
Dunn, Byron G. Electrical appliance fire extinguisher. 3,889,755, Cl. 169-59.000.
Dunn, Byron G. Marine vessel fire extinguisher. 3,889,756, Cl. 169-59.000.
Dunn, Byron G. Commercial cooking unit fire extinguisher. 3,889,757, Cl. 169-59.000.
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Eburn, William H., Jr., to Automation & Product Development Corporation. Apparatus for forming and applying tin-tie fasteners. 3,890,190, Cl. 156-521.000.
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Eder, Theodor, to Wagner-Bird Aktiengesellschaft. Process and apparatus for classifying granular material suspended in a liquid. 3,890,229, Cl. 210-73.000.
Eder, Ulrich; Haffer, Gregor; Ruppert, Jurgen; Sauer, Gerhard; and Wiechert, Rudolf, to Schering Aktiengesellschaft. 9,10-Secoestrane derivatives and their production. 3,890,391, Cl. 260-590.000.
Edes, Ferenc; and Gianatasio, Henry L., to Air-Trol Systems, Inc. Web-tension sensing and control apparatus. 3,889,895, Cl. 242-75.430.
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Eichelberger, Charles W.; Engeler, William E.; and Tiemann, Jerome J., to General Electric Company. Apparatus for sensing radiation and providing electrical readout. 3,890,500, Cl. 250-211.00J.
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Eller, J. Marlin; and Eller, J. David. Suspended submersible pumping unit. 3,890,065, Cl. 417-360.000.
Elliott, James Madison. Finishing plug. 3,889,436, Cl. 52-514.000.
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Elsner, Edwin C., deceased; and Elsner, Viola Hazel, executrix, to Fink, Max; and Hahn, Floyd G., part interest to each. Mechanism for indicating load tension on a fastening device. 3,889,526, Cl. 73-88.00F.
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  - Malec, Robert E., 3,890,363.
- Ettenberg, Michael, to RCA Corporation. Method for depositing on a substrate a plurality of epitaxial layers in succession. 3,890,194, Cl. 156-622.000.
- Ettischer, Helmut, to Eastman Kodak Company. Adjusting means for cameras having several lenses. 3,890,626, Cl. 354-197.000.
- Eubank, Joseph P., Jr. Structural frame. 3,889,433, Cl. 52-86.000.
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- Evans, Allan P., to United States of America, Navy. Process for reducing friction loss in flowing organic fluids. 3,889,702, Cl. 137-13.000.
- Evans, John Richard, to Allen West and Company, Limited. Multi-way valve and position controller therefor. 3,889,878, Cl. 237-8.00R.
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- Evgray Enterprises, Inc.: *See—*
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- Fain, Pavel Ioelievich; Zimin, Vladimir Anatolievich; Strashun, Aron Zakharovich; Isupova, Tamara Ivanovna; Pankratov, Alexandr Ivanovich; and Romanov, Georgy Ivanovich. Device for program controlling metal remelting processes. 3,890,457, Cl. 13-13.000.
- Fairchild Industries, Inc.: *See—*
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- Falconi, Lodovico. Frame for bicycles, motor bicycles and the like. 3,889,975, Cl. 280-281.000.
- Faltin, Hans G., to Advance Enterprises, Inc. Auxiliary cut-off unit for web printing presses and method of forming severed pieces. 3,889,939, Cl. 270-21.000.
- Fanciullo, Anthony. Sealing washer for high torque spinning bolt-head outdoor uses. 3,889,569, Cl. 85-1.0JP.
- Fansteel Inc.: *See—*
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- Farmer, Ernest Leonard; and Ecob, Osmond Herbert, to Wildt Mellor Bromley Limited. Yarn float controller means for circular knitting machines. 3,889,493, Cl. 66-19.000.
- Farnam, Robert G., to F. D. Farnam Co. Molded type heat insulating gasket. 3,889,961, Cl. 277-166.000.
- Farnam, Robert G., to F. D. Farnam Co. Method of making gaskets and products formed thereby. 3,890,183, Cl. 156-193.000.
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- Fazlin, Fazal A. Process for making color television masks. 3,889,329, Cl. 29-25.140.
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- Fehseke, Richard L. Opposite side centering and hold-down trailer uprights. 3,889,973, Cl. 280-179.00A.
- Feinberg, Robert S.; and Selick, David A. Means for preserving tennis balls or the like. 3,889,807, Cl. 206-315.000.
- Felix, Ernst, to Zellweger, Ltd. Method of and apparatus for assessing the running behavior of textile machines. 3,890,489, Cl. 235-92.0PD.
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- Ferri, Antonio, to Advanced Technology Laboratories, Inc. Apparatus for reducing formation of oxides of nitrogen in combustion processes. 3,890,088, Cl. 431-351.000.
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- Fieuzal, Jean Henri; Bourgine, Louis; and Benzoni, Rene Pierre, to Etat Francais. Reversible-output rotary gear device. 3,889,549, Cl. 74-409.000.
- Fihn, Hans, to Weikal Plastik GmbH & Co. Kunststoffprodukte KG. Transport container for skis and poles. 3,889,861, Cl. 224-45.00S.
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- Filecci, Joseph E. Double action trigger mechanism for semi-automatic pistol. 3,889,412, Cl. 42-69.00B.
- Filter, Harold E.; Bidlack, Harvey D.; and Stevens, Don L., to Dow Chemical Company, The. Solid propellant composition with aziridine cured epichlorohydrin polymer binder. 3,890,172, Cl. 149-19.600.
- Filter, Harold E.; and Bidlack, Harvey D., to Dow Chemical Company, The. Solid propellant containing ethylene-carboxylic acid polymers cured with azeridine-based resins. 3,890,173, Cl. 149-19.910.
- Filter, Walther, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft; and Etablissement Wanderfield & Co. Weaving machine comprising shuttle braking means. 3,889,723, Cl. 139-186.000.
- Finch, Neville; and Vlattas, Isidoros, to Ciba-Geigy Corporation. Preparation of oximes. 3,890,369, Cl. 260-468.00D.
- Fine, Boyce. Truck loading and unloading apparatus. 3,889,827, Cl. 214-77.00P.
- Fingerle, Alfred A., to Sun Oil Company of Pennsylvania. Sample vaporizer for gas chromatography. 3,889,538, Cl. 73-422.0GC.
- Finike Italiana Marposs, Soc. In Accomandita Semplice di Mario Possati & C.: *See—*
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- Fisk, Dale Edward; and Homan, Merle Edward, to International Business Machines Corporation. Transparent time-division pulse-multiplex digital electric signal switching circuit arrangement. 3,890,472, Cl. 179-15.0AW.
- Fitzgerald, Kenneth D., to Petro-Tex Chemical Corporation. High solids chloroprene polymer latex. 3,890,261, Cl. 260-23.70H.
- Fitzgerald, Robert C., to Equipment Development Corporation. Aquarium-tank heating control. 3,890,486, Cl. 219-523.000.
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- Fleissner, Heinz, to VEPA AG. Process for shrinking non-woven webs. 3,889,325, Cl. 26-18.500.
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  - Jordan, Harold V.; and Van Houte, Johannes, 3,890,200.
- Fort, Charles P. Combination electrical and mechanical lock system. 3,889,501, Cl. 70-283.000.
- Fortine, Eugene A., to Simpson Manufacturing Co., Inc. Mudsill tie-down. 3,889,441, Cl. 52-715.000.
- Fowler, Raymond H., to ICI United States Inc. Phosphate salts of amine based polyols. 3,890,389, Cl. 260-584.00B.
- Fox, Eugene J.; and McChesney, James D., to Kansas University Endowment Association. Cytokinin-7-nucleoside. 3,890,299, Cl. 260-211.50R.
- Fox Valley Corporation: *See—*
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- Frangmeier, Alvin W. Rain gutter attachments. 3,889,474, Cl. 61-14.000.
- Frank, Rudolf; Witzig, Karl Emil; and Witzig, Armin, to Frank, Rudolf; and Witzig, Karl Emil. Indexing-type work platform for machine tools. 3,889,555, Cl. 74-826.000.
- Frankfurt, Sandor. Cooling system for beverage coolers. 3,889,487, Cl. 62-99.000.
- Frantz, Virgil L., to Graham-White Sales Corp. Plural-stage air filter assembly. 3,890,122, Cl. 55-212.000.
- Fraser, Donald J. Jig for precast brick-wall panels. 3,889,917, Cl. 249-64.000.
- Frechette, Francis J.: *See—*
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- Frederick, Leonard Long. Jet sheet and circular pile with water hammer assist. 3,889,482, Cl. 61-53.500.
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- Frische, Dale George, to Indian Head Inc. Bottle chuck having a snap-on snap-off coupling. 3,889,800, Cl. 198-179.000.
- Fritsch, Rudolf Paul. Extrusion and cooling plant for plastics strands. 3,890,074, Cl. 425-71.000.
- Frontier Engineering Corporation: *See—*
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- Frye, Cecil L.; and Klosowski, Jerome M., to Dow Corning Corporation. Tetrasila-adamantane compounds. 3,890,334, Cl. 260-297.00F.
- Fryer, Robert B. Ambulance cot with cardiopulmonary resuscitation seat and method of administering cardiopulmonary resuscitation. 3,889,663, Cl. 128-28.000.
- Fuchs, James A.: *See—*
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  - Sato, Masso; Aizawa, Tsuneo; Ohnishi, Kenji; Koizumi, Shigeo; Fukuda, Akio; Kikuchi, Shinki; and Kusanagi, Shichiro, 3,889,567.
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- G. D. Searle & Co.: *See—*
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- Garberi, Sergio; and Bertino, Lorenzo, to Ing. C. Olivetti & C., S.p.A. Removable cartridge for the inked ribbon for typewriters, calculating machines or other office machines. 3,889,795, Cl. 197-151.000.
- Gardner, Conrad O. Exhaust emission control systems and devices. 3,889,464, Cl. 60-286.000.
- Gardner, John E. Football blocking sled. 3,889,949, Cl. 273-55.00R.
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- Garris, Charles R., to SmithKline Corporation. Quality control monitor for medicinal capsule packaging apparatus. 3,889,447, Cl. 53-53.000.
- Garst, Frederick, to Occanneechi Orchards, Inc. Method and apparatus for automatic folding of a space divider. 3,889,580, Cl. 93-37.0SP.

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Gauthier, Michel; Tessier, Marcel; Fleruy, Daniel; and Jegousse, Michel, to Centre National pour l'Exploitation des Oceans; and Le Nickel, part interest to each. Method and apparatus for continuous underwater mining using plural ships. 3,889,403, Cl. 37-69.000.
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Hanami, Yuiti; and Fukuyama, Yoji, to Kurita Water Industries Ltd. Method of treating aluminum-containing waste water. 3,890,226, Cl. 210-44.000.
Hanchett, Leland J., to Taplin Business Machines Incorporated. Bar geometry verification system for bar-coded characters. 3,890,597, Cl. 340-146.30Z.
Hanks, James V., to Horton Manufacturing Co., Inc. Internal caliper brake. 3,889,784, Cl. 188-71.400.
Hansel, Gernot: *See—*
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Hansen, David A., to University of Missouri, The Curators of the. Process for making improved strength dental amalgam. 3,890,144, Cl. 75-169.000.
Hansen, Kaj. Apparatus for picking up filamentous or long-fibred elements from fluid flowing through a chute. 3,889,810, Cl. 209-76.000.
Hanson, Howard G. Vehicle for transporting haystacks and the like. 3,889,832, Cl. 214-514.000.
Harada, Minoru, to Japanese National Railways. Double loop track system for railway freightyard and freight station. 3,889,603, Cl. 104-26.00R.
Harada, Seiki; Saiki, Atsushi; Okabe, Takahiro; and Sato, Kikuji, to Hitachi, Ltd. Multilayer wiring structure of integrated circuit and method of producing the same. 3,890,636, Cl. 357-68.000.
Harada, Shunichi; and Yoshihara, Takahisa, to Kawasaki Steel Corporation. Surface treatment of tinplate for improving sulfur resistance. 3,890,164, Cl. 148-6.200.
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Harich, Jakob; and Harich, Franz P., to Rush-Hampton, Inc. Useful product derived from grapefruit pulp. 3,890,212, Cl. 204-158.00R.
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Harmon, James F.; Johnston, Richard D.; Lach, John H.; Von Der Lieth, William H.; and Murphy, Thomas L., to American Potato Company. Forming shaped potato pieces from potato dough. 3,890,453, Cl. 426-503.000.
Harold Schnair, Delta Quality: *See—*
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Harper, Michael Ronald; and Fergus, Neil David, to Victor Products, Inc. One-way compression and starting release. 3,889,646, Cl. 123-48.00D.
Harrell, Bob G., to Jackes-Evans Manufacturing Company. Kick-proof access control handle. 3,889,498, Cl. 70-78.000.
Harrell, Gary W., to AG-Water, Inc. Filter structure. 3,890,236, Cl. 210-433.000.
Harris, Donald L.; and Hakim, Salomon. Shunt system for the transport of cerebrospinal fluid. 3,889,687, Cl. 128-350.00V.
Harris, Robert M., Jr., to Foremost-McKesson, Inc. Container construction. 3,889,834, Cl. 215-10.000.
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Hartop, Robert William, to Cutler-Hammer, Inc. Electrical switching apparatus. 3,890,585, Cl. 335-198.000.
Hartzell, George W.; and Gunnerman, Robert J., to Hartzell Industries, Inc. Sawmill. 3,889,566, Cl. 83-708.000.
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Henkler, Herbert, to BASF Aktiengesellschaft. Arrangement for exposing photosensitive materials with information displayed on the screen of a cathode ray tube. 3,890,041, Cl. 355-18.000.
Henneberg, Val G., to Petro-Tex Chemical Corporation. Extractive distillation with furfurol and acyclic ketone cosolvent. 3,890,208, Cl. 203-58.000.
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Hildebrand, Clinton L. Vehicle door operator. 3,889,420, Cl. 49-302.000.
Hill, James A.; and Keefer, George E., to Owens-Illinois, Inc. Recuperator structures and method of making same. 3,889,744, Cl. 165-83.000.
Hill, Monty; and Uthene, Curtis, to Zenith Radio Corporation. Dry, impulse-resistant implosion protection system for large screen cathode ray tubes. 3,890,464, Cl. 178-7.800.
Himeno, Shohachi, to Conde Kabushiki Kaisha. Knife for cutting in sliding contact with ruler edge. 3,889,368, Cl. 30-162.000.
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Hix, Donald E.; and Dyer, Robert S. Anti-theft device for outboard motors. 3,889,500, Cl. 70-232.000.
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Holbrook, Legrand K., to Medical Development Corporation. Mold structure for fabricating fluid collection receptacles. 3,889,920, Cl. 249-151.000.
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Horowitz, Robert M.; and Gentili, Bruno, to United States of America, Agriculture. Dihydrochalcone galactosides and their use as sweetening agents. 3,890,296, Cl. 260-210.00F.
Horowitz, Robert M.; and Gentili, Bruno, to United States of America, Agriculture. Dihydrochalcone xylosides and their use as sweetening agents. 3,890,298, Cl. 260-210.00F.
Horowitz, Victor, to Current Industries, Inc. Lighting control system. 3,890,534, Cl. 315-92.000.
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- Hoyer, Sigurd, to Potter Instrument Co., Inc. Compact magnetic tape drive with overlapping tape reels lying in different planes. 3,889,901, Cl. 242-209.000.
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- Huchette, Michel; and Fleche, Guy, to Roquette Freres. Starch hydrolysate methods for its preparation and products based thereon. 3,890,300, Cl. 260-233.30R.
- Huck, Neil F.: *See—*
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- Hueck and Cie: *See—*
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- Huffman, Herman M.; Swanson, Kenneth B.; and Jensen, Kenneth D., to Midland-Ross Corporation. Accumulator arrangement for a booster brake mechanism. 3,889,467, Cl. 60-548.000.
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- Hull, Otis E., to Hexcel Corporation. Box beam fabrication process. 3,890,415, Cl. 264-46.700.
- Hull, Thomas Neil, Jr.; Nye, James Leroy; and Steyer, William, to General Electric Company. Retractable sound suppressor for a gas turbine engine. 3,889,882, Cl. 239-127.300.
- Hulthen, Martin Henry, to Aktiebolaget Henry Hulthen. Cloth weight. 3,889,313, Cl. 16-1.000.
- Hummel, Thomas. Easy off wheel retainer. 3,890,009, Cl. 301-9.0DN.
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- Husted, Paul R.; and Galan, Felix. Micrometer tooth measuring apparatus. 3,889,382, Cl. 33-179.000.
- Hutchison, Robert B.; and Mores, Lee R., to Emery Industries, Inc. Polyglycerol partial esters and their use in lipstick formulations. 3,890,358, Cl. 260-410.600.
- Hutchison, Stanley O., to Chevron Research Company. Inflatable packer. 3,889,749, Cl. 166-187.000.
- Hutter, Rudolf G. E.; and Dressel, Herman O., to GTE Laboratories Incorporated. Compound electrostatic lens system. 3,890,529, Cl. 313-460.000.
- Hwa, Chih Ming; Cuisia, Dionisio Guerrero; and Gray, John Allen, to Chemed Corporation. Polyacrylate-polyphosphonic acid treatment in aqueous systems. 3,890,228, Cl. 210-58.000.
- Hyde, Gene A.: *See—*
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- I-T-E Imperial Corporation: *See—*
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- Ichikawa, Junji, to Canon Kabushiki Kaisha. Exposure device for transmitting light waves modulated to contain information. 3,890,038, Cl. 355-1.000.
- Ichiko Industries Limited: *See—*
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- Ichiryu, Ken; Shigeta, Masayuki; and Kajiwara, Toshiyuki, to Hitachi, Ltd. Thickness control device for rolling mill. 3,889,504, Cl. 72-8.000.
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- Idemitsu Kosan Co. Ltd.: *See—*
  - Takeshita, Yasuhiro; Uoi, Michitake; Hirai, Yoshiyuki; and Uchiyama, Mitsuru, 3,890,253.
- Ihle, Josef, to Ungerer, Irma. Process and an apparatus for regulating the drive or deceleration of power driven or decelerated rollers in drawing and straightening installations. 3,889,505, Cl. 72-17.000.
- Iizuka, Masabumi: *See—*
  - Kojima, Takeshima; Iizuka, Masabumi; Kabayama, Kenta; and Izawa, Shizuhiro, 3,890,616.
- Ikai, Kunio: *See—*
  - Kumakawa, Yosihiko; and Ikai, Kunio, 3,890,512.
- Ikeda, George: *See—*
  - Hinckley, Grayson W.; and Ikeda, George, 3,889,486.
- Ikeda, Shojiro: *See—*
  - Nishi, Sunao; Ikeda, Shojiro; and Kawazoe, Asao, 3,889,354.
- Ikegami, Yoshizo; and Yamanouchi, Kenzo, to Konan Camera Research Institute. System for use in the supervision of a motor-boat race or a similar timed event. 3,890,463, Cl. 178-6.800.
- Ilagan, Perlita A.: *See—*
  - Bohme, Reinhard D.; and Ilagan, Perlita A., 3,890,292.
- Illinois Tool Works Inc.: *See—*
  - Koscik, Richard A., 3,889,909.
  - Koscik, Richard Allen, 3,889,320.
- Ilukowicz, Robert John, to Preco Industries, Ltd. Plastic threaded insert for forming voids in concrete products. 3,889,916, Cl. 249-59.000.
- Imazeki, Kazuyoshi: *See—*
  - Nakano, Masao; and Imazeki, Kazuyoshi, 3,890,574.
- Imperial Chemical Industries Limited: *See—*
  - Broadbent, Douglas; Burrows, Brian Frederick; Carter, Stephen Barnaby; and Hemming, Harold George, 3,890,435.
  - George, Edwin Francis; and Davidson, Alan John, 3,890,130.
  - Jones, David Colin, 3,890,365.
  - Kenyon, Derek; and Wilson, Donald James, 3,889,457.
  - Vallance, Christopher, 3,890,417.
- Imral, Sadik S., to Intertherm, Inc. Sheet metal "Y" adaptor for ducts. 3,889,987, Cl. 285-155.000.
- Inaba, Shigeho: *See—*
  - Yamamoto, Hisao; Inaba, Shigeho; Sasajima, Kikuo; Nakao, Masaru; Maruyama, Isamu; Ono, Keiichi; and Katayama, Shigenari, 3,890,323.
- Inao, Kiyohisa: *See—*
  - Hirai, Tadaaki; Maruyama, Eiichi; Inao, Kiyohisa; Yamamoto, Hideaki; Goto, Naohiro; Isozaki, Yukinao; Shidara, Keiichi; and Uchida, Teruo, 3,890,525.
- Incando, Peter Anthony. Hair piece and method and apparatus for making same. 3,889,695, Cl. 132-53.000.
- Indian Head Inc.: *See—*
  - Frische, Dale George, 3,889,800.
- Industrial Nucleonics Corporation: *See—*
  - Straumanis, Maris A., 3,890,078.
- Industrie Pirelli Societa per Azioni: *See—*
  - Portinari, Antonio; and Alimenti, Giovanni, 3,889,455.
- Industrie-Werke Karlsruhe Augsburg AG: *See—*
  - Vorgrimler, Ludwig; and Hupp, Gerhard, 3,889,572.
- Ing. C. Olivetti & C., S.p.A.: *See—*
  - Garberi, Sergio; and Bertino, Lorenzo, 3,889,795.
- Ingrip Fasteners Inc.: *See—*
  - Brumlik, George C., 3,889,322.
- Insolio, Thomas A.; Kozyrski, Vincent T.; and Witkoski, Edward J., to Fletcher-Terry Company, The. Apparatus for cutting glass and plastic sheet. 3,889,862, Cl. 225-96.500.
- Institut Francais du Petrole, des Carburants et Lubrifiants: *See—*
  - Breelle, Yves; Grehier, Alain; and Paty, Marcel, 3,890,076.
  - Castela, Andre; and Joubert, Philippe, 3,889,466.
  - Lagrange, Yvon; Martino, Germain; and Lassau, Christian, 3,890,400.
- Institutt for Atomenergi: *See—*
  - Berg, Ronald; Hjermstad, Hans Petter; and Neefjes, Gerard Albert, 3,890,245.
- Intercontinental Dynamics Corporation: *See—*
  - Argentieri, Michael; and Kelso, Robert, 3,890,614.
- International Business Machines Corporation: *See—*
  - Aronstein, Jesse; and Harding, William E., 3,889,355.
  - Ballas, Donald F.; Ku, San-Mei; and Marinace, John C., 3,890,455.
  - Brunner, Rolf H.; and Lester, William C., 3,889,632.
  - Desblanche, Andre Eugene; and Pierret, Jean Marc, 3,890,572.
  - Fisk, Dale Edward; and Homan, Merle Edward, 3,890,472.
  - Haas, Lee C.; and West, Lynn Parker, 3,890,460.
  - Jones, John W.; Sears, John F.; and Taylor, Keith G., 3,890,603.
  - Raczek, Thaddeus A., 3,890,418.
  - Sionczewski, John Casimir, 3,890,605.
- International Flavors & Fragrances Inc.: *See—*
  - Wolt, John, 3,890,320.
- International Harvester Company: *See—*
  - O'Toole, Peter J., 3,890,012.
- International Nickel Company of Canada, Ltd., The: *See—*
  - Jaquay, Louis Harold, 3,889,933.
- International Paper Company: *See—*
  - Lee, Charles A.; and Furbeck, Warren R., 3,890,195.
  - Nehring, John R., 3,889,677.
- International Telephone and Telegraph Corporation: *See—*
  - Carlson, Elmer A., 3,890,579.
  - Tobey, Hubert E.; Hood, John W.; and Irvin, Dee L., 3,889,548.
- International Video Corporation: *See—*
  - Guisinger, Barrett Earl; and Dann, Bert H., 3,890,558.
  - Mo, Frank S. C.; and Natwick, Vernon R., 3,890,641.
- Intertherm, Inc.: *See—*
  - Imral, Sadik S., 3,889,987.
- Iobal, Abul Fateh Mohammed, to Monsanto Company. Process for the preparation of N-arylphthalimidines. 3,890,346, Cl. 260-325.0PH.
- Ireco Chemicals: *See—*
  - Jessop, Harvey A., 3,890,171.
- Irvin, Dee L.: *See—*
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- Irvine, James M.: *See—*
  - Silverman, Ira; and Irvine, James M., 3,889,893.
- Isaac, Eirlys R.; and Kirby, Peter, to Shell Oil Company. Dioxolanyl carbonyl carboxamides. 3,890,352, Cl. 260-340.900.
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- Ishida, Yozo: *See—*
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- Ishimaru, Toshiyasu; and Kodama, Yutaka, to Toyama Chemical Co., Ltd. Process for producing 7-acylamino-3-methyl-3-cephem-4-carboxylic acids. 3,890,314, Cl. 260-243.00C.
- Isozaki, Yukinao: *See—*
  - Hirai, Tadaaki; Maruyama, Eiichi; Inao, Kiyohisa; Yamamoto, Hideaki; Goto, Naohiro; Isozaki, Yukinao; Shidara, Keiichi; and Uchida, Teruo, 3,890,525.
- Isupova, Tamara Ivanovna: *See—*
  - Fain, Pavel Ioelievich; Zimin, Vladimir Anatolievich; Strashun, Aron Zakharovich; Isupova, Tamara Ivanovna; Pankratov, Alexandr Ivanovich; and Romanov, Georgy Ivanovich, 3,890,457.
- Ito, Senji, to Toyo Seikan Kaisha Limited. Heatable package of food. 3,890,448, Cl. 426-126.000.
- Ito, Shunji; Morioka, Yasuaki; Kajinaga, Yoshihiro; Nitta, Minoru; and Sakurada, Ichio, to Kawasaki Steel Corporation. Raw powders to be used for production of low alloys steels having an excellent hardenability by powder metallurgy. 3,890,136, Cl. 75-0.5BA.
- IU Conversion Systems, Inc.: *See—*
  - Cotts, Ronald F., 3,890,080.
- Iwabuchi, Yoshiki: *See—*
  - Suzuki, Fumio; Hayashi, Mamoru; Kawakami, Ikuo; Motohashi, Fujio; and Iwabuchi, Yoshiki, 3,890,336.
- Iwanami, Teruo: *See—*
  - Fukushima, Mitio; and Iwanami, Teruo, 3,890,267.
- Iwasaki, Yasuhiro; Shiota, Hiroshi; and Seko, Seido, to Mitsubishi Jukogyo Kabushiki Kaisha. Apparatus for bending a steel plate. 3,889,513, Cl. 72-385.000.
- Iwata, Hiroshi, to West Electric Company, Ltd. Electronic flash device for photography. 3,890,536, Cl. 315-151.000.
- Iwata, Hiroshi; Sawada, Yasunori; and Yamaoka, Tetsuo, to West Electric Company, Ltd. Photographic electronic flash apparatus. 3,890,538, Cl. 315-241.00P.
- Izawa, Shizuhiro: *See—*
  - Kojima, Takeshima; Iizuka, Masabumi; Kabayama, Kenta; and Izawa, Shizuhiro, 3,890,616.
- Izraeli, Hyman, to Thomas & Betts Corporation. Partitioned electrical connector. 3,890,029, Cl. 339-98.000.
- Izumi, Hideo; and Ichiyanagi, Toshikazu, to Canon Kabushiki Kaisha. Differential amplifier circuit for servo system. 3,890,550, Cl. 318-678.000.
- J. I. Case Company: *See—*
  - Bennett, Milton C., 3,889,958.
- J. & P. Coats, Limited: *See—*
  - Gailey, Robert McNaught; and Hurley, Joseph John, 3,889,634.
- J. W. Greer, Inc.: *See—*
  - Adams, Robert E., 3,889,931.
- Jackes-Evans Manufacturing Company: *See—*
  - Harrell, Bob G., 3,889,498.
- Jackson, Crowell B. Disposable fireplace and oven lighter. 3,890,087, Cl. 431-277.000.
- Jackson, Ira J.; O'Connor, Thomas F.; and Buckley, James H., to Trans-World Compacters, Inc. Container adapter for refuse compactor. 3,889,589, Cl. 100-218.000.
- Jackson, John G., to Du Charme, Leon, a part interest. Well drilling method and apparatus. 3,889,764, Cl. 175-69.000.
- Jaffa, David, to Precision Screen Machines Inc. Continuous rotary screen printing method and apparatus. 3,889,595, Cl. 101-116.000.
- Jagenberg Werke AG: *See—*
  - Strack, Hans Josef, 3,889,846.
- Jager, Horst, to Ciba-Geigy AG. Process for the manufacture of perfluoroalkyl esters. 3,890,376, Cl. 260-485.00F.
- Jahn, Alfred, to Siemens Aktiengesellschaft. Method of machining printed-circuit boards and/or working patterns for such printed-circuit boards. 3,889,383, Cl. 33-180.00R.
- Jakimowicz, Christopher C., to National Steel Corporation. Static gas pressure measuring device. 3,889,521, Cl. 73-38.000.
- Jakob, Hans, to Maschinenfabrik Goebel GmbH. Device for adjustment of oscillation amplitude on zigzag folding apparatus. 3,889,940, Cl. 270-61.00F.
- James Burn Bindings Limited: *See—*
  - Adams, Sidney George William; and Galliford, Edgar Horace, 3,889,309.
- James, Daniel Shaw, to du Pont de Nemours, E. I., and Company. Yellow to orange disazo cationic dyes containing two quaternary ammonium groups. 3,890,257, Cl. 260-148.000.
- Jamieson, Norman C., to Mallinckrodt, Inc. Method for N,N-dicyanoethylating aminophenols. 3,890,368, Cl. 260-465.00E.
- Japan Antibiotics Research Association: *See—*
  - Miyamura, Sadao; Ogasawara, Nagahiro; and Otsuka, Hitoshi, 3,890,199.
- Japanese National Railways: *See—*
  - Harada, Minoru, 3,889,603.
- Jaquay, Louis Harold, to International Nickel Company of Canada, Ltd., The; and Dravo Corporation. Metallurgical lance. 3,889,933, Cl. 266-34.00L.
- Jarboe, Theodore Lee; and Groseclose, Connie Dean. Protective wearing apparel. 3,889,297, Cl. 2-16.000.
- Jarleborg, Olle: *See—*
  - Skoglund, Eric; and Jarleborg, Olle, 3,890,143.
- Jarvis, Lactance A.; and Nimtz, Ronald L., to Clark Equipment Company. Rolling apparatus. 3,889,618, Cl. 113-55.000.
- Jayawant, Madhusudan D., to du Pont de Nemours, E. I., and Company. Decolorization of ammonium thiosulfate. 3,890,428, Cl. 423-264.000.
- Jean Walterscheid GmbH: *See—*
  - Geisthoff, Hubert, 3,889,980.
- Jeger, Oskar; Wolf, Hans; and Zink, Markus, to Ciba-Geigy Corporation. Process for the photocyclization of the dihydro-ionones and their homologues, and the products obtainable by this process. 3,890,395, Cl. 260-617.00F.
- Jegousse, Michel: *See—*
  - Gauthier, Michel; Tessier, Marcel; Fleruy, Daniel; and Jegousse, Michel, 3,889,403.
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  - Stevens, Douglas; Forberg, Helge O.; Jennings, Larry D.; Stephens, Frank M., Jr.; Bowen, Francis J.; Thompson, David L.; and Copenhaver, Julian V., Jr., 3,890,425.
  - Stevens, Douglas; Forberg, Helge O.; Jennings, Larry D.; Stephens, Frank M., Jr.; and Bowen, Francis J., 3,890,426.
- Jensen, Alan K.: *See—*
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- Jensen, Kenneth D.: *See—*
  - Huffman, Herman M.; Swanson, Kenneth B.; and Jensen, Kenneth D., 3,889,467.
- Jeong, David Hoy, to Addington Laboratories, Inc. Floating-ground microwave ferrite isolators. 3,890,582, Cl. 333-24.200.
- Jessop, Harvey A., to Ireco Chemicals. Explosive compositions containing guar gum derivative. 3,890,171, Cl. 149-19.100.
- Jesswein, Ronald M., to Clark Equipment Company. Tractor unit for an articulated vehicle. 3,889,976, Cl. 280-400.000.
- John Chatillon & Sons, Inc.: *See—*
  - Hejzlar, Sid, 3,889,768.
- John Graves and Associates Incorporated: *See—*
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- Johnson, Lynn F.: *See—*
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- Johnson, Paul R., to Harsco Corporation. Automatic scum removal trough. 3,890,289, Cl. 210-104.000.
- Johnson, Thomas J., to Celestron Pacific. Method for making schmidt corrector lenses. 3,889,431, Cl. 51-284.000.
- Johnson, Wayne F.: *See—*
  - Tiffany, Thomas O.; Walker, William A.; and Johnson, Wayne F., 3,890,101.
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- Johnston, Richard D.: *See—*
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- Johnstone, Charles Wilkin, to Schlumberger Technology Corporation. Neutron logging reliability techniques and apparatus. 3,890,501, Cl. 250-265.000.
- Joly, Francois: *See—*
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- Joly, Jean; and Sangalli, Silvio, to Rhone-Poulenc-Textile. Method for interlacing strands of a textile yarn. 3,889,327, Cl. 28-72.120.
- Jonassen, Gaylord D., to Telecommunications Industries, Inc. Low voltage surge protection network. 3,890,543, Cl. 317-16.000.
- Jones, Chester L. M.; Yoakam, Raymond J.; Hazar, Mitchell M.; and Dillon, Alfred J. Means and method for servicing fluid cushioned aircraft landing gear struts. 3,889,904, Cl. 244-104.00R.
- Jones, Christopher Robin: *See—*
  - Williams, Malcolm; Brunt, Geoffrey Albert Kenyon; and Jones, Christopher Robin, 3,889,648.
- Jones, David Colin, to Imperial Chemical Industries Limited. Organic reduction process. 3,890,365, Cl. 260-465.80A.
- Jones, Frederick O., to Wilkinson Sword Limited. Razor blades having high purity Al_2O_3 coating. 3,890,109, Cl. 29-195.000.
- Jones, Harold F.: *See—*
  - Ousterling, David L.; and Jones, Harold F., 3,889,696.
- Jones, John W.; Sears, John F.; and Taylor, Keith G., to International Business Machines Corporation. Associative store. 3,890,603, Cl. 340-173.0AM.

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Jonkers, Cornelius O. Belt conveyor and method for operating such a conveyor. 3,889,802, Cl. 198-184.000.

Jordan, Harold V.; and Van Houte, Johannes, to Forsyth Dental Infirmary for Children. Selective medium for streptococcus mutans. 3,890,200, Cl. 195-103.50R.

Jordan, Heinz: *See—*
- Rademacher, Friedrich; Quest, Karl; Knabe, Uwe; Unger, Dieter; Jordan, Heinz; Heckmann, Werner; and Plock, Karl, 3,889,725.

Joseph, Donald B., to Raymond Lee Organization, Inc., The. Smoke lamp drawing device. 3,890,126, Cl. 55-385.000.

Joseph Lucas (Electrical) Limited: *See—*
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Joseph Lucas (Industries) Limited: *See—*
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- Tombs, Terence Leslie, 3,890,518.

Joseph, Mark T., to Samsonite Corporation. Pack frame and sack therefor. 3,889,859, Cl. 224-8.00R.

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Julia, Marc: *See—*
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Jung, David H. Colorimetric assay for urea. 3,890,099, Cl. 23-230.00B.

Jurgens, Heinz; and Ostendorf, Heinrich, to Brown, Boveri & Cie AG. Device for transporting bars. 3,889,798, Cl. 198-127.000.

Justus, Edgar J.; and Roerig, Arnold J., to Beloit Corporation. Controlled deflection roll drive. 3,889,334, Cl. 29-115.000.

Kabayama, Kenta: *See—*
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Kabushiki Kaisha Suehiro Sharyo Seisakusho: *See—*
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Kain, Philip. Shampoo delivery assembly. 3,889,851, Cl. 222-146.0HS.

Kaizu, Yasuo, to Victor Company of Japan, Limited. Circuit arrangement for protection of a speaker system. 3,890,465, Cl. 179-1.0VL.

Kajinaga, Yoshihiro: *See—*
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Kajiyama, Yoshiaki. Process for removing heavy metal ions in water. 3,890,225, Cl. 210-38.000.

Kakihara, Minoru, to Mitsui Shipbuilding & Engineering Co. Ltd. Stern tube bearing. 3,889,626, Cl. 115-34.00R.

Kallander, Charles A. Ergonomic drive for bicycles and other human powered machines. 3,889,974, Cl. 280-251.000.

Kambara, Shu: *See—*
- Ohnishi, Akira; Yukuta, Toshio; Fujio, Ryota; Ishida, Yozo; Kambara, Shu; and Kojima, Minoru, 3,890,284.

Kamins, Jerome H.; Mandell, Michael I.; Armen, Harry, Jr.; and Savet, Paul. Beverage-heating device. 3,890,484, Cl. 219-432.000.

Kamman, Gordon W., to Houdaille Industries, Inc. Hydraulic buffer. 3,889,934, Cl. 267-34.000.

Kanamaru, Toshiji: *See—*
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Kanaya, Iwao; Ishikawa, Kazuo; and Mifune, Hideo, to Matsushita Electric Industrial Co., Ltd. Water jacket temperature sensor. 3,890,588, Cl. 338-28.000.

Kanegafuchi Boseki Kabushiki Kaisha: *See—*
- Ogawa, Yasuhiro; and Awata, Norio, 3,890,312.

Kanetaka, Junichi; Mori, Shoichiro; and Kobayashi, Itaru, to Mitsubishi Petrochemical Company, Ltd. Production of gamma-butyrolactone. 3,890,361, Cl. 260-343.600.

Kaniecki, Thaddeus John, to Armour-Dial, Inc. Method and apparatus for producing striped soap bar. 3,890,419, Cl. 264-171.000.

Kanitz, Roy E., to Sperry Rand Corporation. Self-braking follower mechanism for card files and the like. 3,889,838, Cl. 220-22.300.

Kann, Jerry Albert. Removable gooseneck hitch. 3,889,978, Cl. 280-415.00B.

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Kapitanov, Nikolai Nikolaevich; Petrova, Natalya Petrovna; Milonov, Oleg Borisovich; and Dyachikhin, Anatoly Alexandrovich. Surgical apparatus for suturing soft tissues. 3,889,683, Cl. 128-305.000.

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Karl Suss KG: *See—*
- Suss, Winfried, 3,889,544.

Karpenko, Anatole N., to Anchor/Darling Valve Company. Valve stem operator. 3,889,924, Cl. 251-249.500.

Kashio, Toshio, to Casio Computer Co. Ltd. Electronic clock devices. 3,889,458, Cl. 58-4.00A.

Kaspar, Hans, to Neomat AG. Device for holding front wall or inside wall facings as well as inside or outside facings of a ceiling in a pre-set distance from a supporting wall respectively a ceiling. 3,889,439, Cl. 52-709.000.

Kasravi, Peter B. Flexible geodesic-type toys. 3,889,950, Cl. 273-58.00D.

Katayama, Shigenari: *See—*
- Yamamoto, Hisao; Inaba, Shigeho; Sasajima, Kikuo; Nakao, Masaru; Maruyama, Isamu; Ono, Keiichi; and Katayama, Shigenari, 3,890,323.

Kathawala, Faizulla G., to Sandoz, Inc. Indole-1 and indoline-1-carboxamides and thiocarboxamides. 3,890,348, Cl. 260-326.11R.

Katner, Allen S., to Eli Lilly and Company. 1H-Pyrazolo[4,3-]quinol-4(5H)-one-3-carboxylic acids. 3,890,324, Cl. 260-287.00R.

Katz, Otto; and Tischinger, Heinrich, to Ledermann & Co. Fast exchange clamping device for rotary tools. 3,889,333, Cl. 29-104.000.

Kaufman, Sydney M., to Ford Motor Company. Brazing metal alloys. 3,889,349, Cl. 228-173.000.

Kauranen, Herbert A.; and Schettl, Alvin J., to Kelvinator, Inc. Self-locking oven door hinge. 3,889,654, Cl. 126-194.000.

Kawakami, Ikuo: *See—*
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- Lohr, Delmar F., Jr.; Fieldhouse, John William; and Kay, Edward Leo, 3,890,260.

Kazaoka, Kenichi; Hirose, Kimiharu; Takeshita, Yasuo; Matsumoto, Hisao; and Okamoto, Kazuo, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Safety belt apparatus. 3,889,971, Cl. 280-150.0SB.

Keathley, Donald P., to ICI United States Inc. Sleeve valve arrangement. 3,889,703, Cl. 137-67.000.

Keck, Norman. Speed control device. 3,890,547, Cl. 318-6.000.

Keefer, George E.: *See—*
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Keller, John Ansley, to Heavy Light Mfg. Corp. Container means. 3,889,866, Cl. 229-22.000.

Kelley, Charles N., to Harold Schnair, Delta Quality. Tail pipe system. 3,889,772, Cl. 180-64.00A.

Kelly, Michael J.; and Pitroda, Satyan G., to GTE Automatic Electric Laboratories Incorporated. Time division switching system. 3,890,469, Cl. 179-15.0AT.

Kelsey-Hayes Company: *See—*
- Hayes, Edward J., 3,890,014.
- Marsh, Jeffrey D.; and McPherson, Gregg K., 3,890,517.

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- Patience, Donald; Hartigan, Edward G.; and Knohl, Herbert, 3,889,494.

Kendrick, Thomas C.; and Ward, Andrew H., to Dow Corning Corporation. Polyalphamethylstyrene-polydimethylsiloxane block copolymers suitable as blown films. 3,890,405, Cl. 260-827.000.

Kenyon, Derek; and Wilson, Donald James, to Imperial Chemical Industries Limited. Macrofilamentary yarns. 3,889,457, Cl. 57-140.00R.

Keon, Richard F.: *See—*
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Kerst, Al F., to Monsanto Company. Substituted ethane diphosphonic acids and salts and esters thereof. 3,890,378, Cl. 260-502.40P.

Keszler, Julius L. Process of making a bacon-like meat product of reduced fat content. 3,890,451, Cl. 426-264.000.

Ketterer, Marta Carlota; and Ketterer, Victor Garcia. Fluid discharge unit. 3,889,302, Cl. 4-110.000.

Ketterer, Victor Garcia: *See—*
- Ketterer, Marta Carlota; and Ketterer, Victor Garcia, 3,889,302.

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- Leinek, Albert Arturovich; Khomyakov, Igor Stepanovich; Privalov, Igor Serafimovich; and Filaretova, Galina Pavlovna, 3,889,318.

Khuzaie, Kamel Ahmad, to General Electric Company. Venturi arrangement. 3,889,537, Cl. 73-213.000.

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Kieronski, John P.; and Keon, Richard F., to Whitin Machine Works, Incorporated. Flute suspension plate. 3,889,311, Cl. 15-306.00A.

Kijima, Shizumasa: *See—*
- Nakamura, Tetsuya; and Kijima, Shizumasa, 3,890,333.

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- Sato, Masso; Aizawa, Tsuneo; Ohnishi, Kenji; Koizumi, Shigeo; Fukuda, Akio; Kikuchi, Shinki; and Kusanagi, Shichiro, 3,889,567.

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Kindelan, James J., to Overmyer Mould Company of Pennsylvania. Multi-station drill apparatus. 3,890,057, Cl. 408-43.000.

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Kinzel, Augustus B. Displaceable swimming pool cover. 3,889,303, Cl. 4-172.130.

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Kirby, Peter: *See—*
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Kirley, Joseph F. Self-inflatable pocket disposable umbrella. 3,889,700, Cl. 135-19.500.

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Kitamura, Sadafumi; and Kanamaru, Toshiji, to Matsushita Electric Industrial Co., Ltd. Contactless control system for volume control and power on-off control. 3,890,592, Cl. 340-15.000.

Kitrilakis, Sotiris, to Searle Cardio-Pulmonary Systems Inc. Spirometer. 3,889,660, Cl. 128-2.080.

Kivlen, John A., to Exxon Research and Engineering Company. Furnace over-pressure prevention. 3,889,877, Cl. 236-15.00C.

Kiyoura, Tadamitsu; Takahashi, Toru; and Kogure, Yasuo, to Mitsui Toatsu Chemicals Incorporated. Method for the preparation of dialkalioxydiacetate. 3,890,381, Cl. 260-531.00C.

Klabacka, Robert, to Diesel Truck Drivers Training School Inc. Golf ball target. 3,889,957, Cl. 273-182.00R.

Klare, Robert John, to du Pont de Nemours, E. I., and Company. Regenerated cellulose softener recovery method and apparatus. 3,889,390, Cl. 34-23.000.

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Klein, Richard M., to GTE Laboratories Incorporated. Fluorescent lamp with phosphor coating having improved adherence to envelope walls. 3,890,522, Cl. 313-485.000.

Kleveland, Sigbjorn, to Norsk Hydro A.S. Method and apparatus for mechanized smutting of electrolyzers. 3,890,214, Cl. 204-70.000.

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Knudsen, Christian W., to Exxon Research and Engineering Company. Transfer line burner system using low oxygen content gas. 3,890,111, Cl. 48-197.00R.

Knufflmann, Manfred; and Seidel, Ingo. Temperature compensated resistance measuring of an elongated electrical conductor. 3,890,567, Cl. 324-64.000.

Knupfer, Hans; and Schellhammer, Carl-Wolfgang, to Bayer Aktiengesellschaft. α-Aryl-b-(amino-phenyl)acrylonitriles with an O-dialkyl sulphamidoxy or sulfuric acid semi-ester group. 3,890,364, Cl. 260-456.00A.

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Kobayashi, Kozo, to Nakamichi Research Inc. Transistor amplifying circuit. 3,890,576, Cl. 330-18.000.

Kobayashi, Kyoji: *See—*
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Kobayashi, Reisuke; Sato, Hironari; Takita, Kiyoshi; and Toyama, Nobuo, to Kumiai Chemical Industry Co., Ltd. Cell wall-lysing complex enzymes and a process for the production thereof. 3,890,198, Cl. 195-66.00R.

Kobe Steel, Inc.: *See—*
- Nozaki, Teruhiko, 3,890,167.

Kobe Steel, Ltd.: *See—*
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Koch, Richard C., to Pfizer Inc. 2-(Substituted) thiazolines for the control of rice blast. 3,890,443, Cl. 424-270.000.

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Koehne, Frank J., deceased; and by Koehne, Mildred M., administratrix. Incendiary device for destroying improperly handled classified data and the like. 3,889,601, Cl. 102-90.000.

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- Koehne, Frank J., deceased; and Koehne, Mildred M., administratrix, 3,889,601.

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Kojima, Takeshima; Iizuka, Masabumi; Kabayama, Kenta; and Izawa, Shizuhiro, to Mitsubishi Jukogyo Kabushiki Kaisha. Radar anti-collision system for ships in waters adjacent land areas. 3,890,616, Cl. 343-5.0MM.

Kokoszka, John G., to Dow Corning Corporation. Polish ingredient. 3,890,271, Cl. 260-46.50R.

Koller, Josef. Overhead ropeway crab for conveying loads. 3,889,819, Cl. 212-94.000.

Komatsubara, Yukio: *See—*
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Konishi, Jinemon. Anti-pollution exhaust apparatus. 3,890,103, Cl. 23-284.000.

Konrad, Charles Edward, to General Electric Company. Pulse control system power circuit. 3,890,549, Cl. 318-246.000.

Konrad, Hermann-Heinz: *See—*
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Koscik, Richard Allen, to Illinois Tool Works Inc. Headliner/molding retainer and method of installing same. 3,889,320, Cl. 24-73.0PM.

Kosonocky, Walter Frank, to RCA Corporation. Charge-coupled circuits. 3,890,633, Cl. 357-24.000.

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Kozlov, Vladimir Dmitrievich; and Breido, Isaak Yankelevich. Device for measuring nonuniformity of photoparametric characteristics of materials. 3,890,050, Cl. 356-237.000.

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Kranenberg, Helmut; and Sawitz, Michael, to Bethlehem Steel Corporation. Apparatus for cooling a steel member while being rolled on a continuous hot-rolling mill. 3,889,507, Cl. 72-201.000.
Krause, Anthony Victor: *See—*
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Krawitt, Donald R., to Mount Sinai School of Medicine of the City University of New York. Method of determining the presence of calculi in body cavities. 3,889,656, Cl. 128-2.00R.
Krayer, Harry J., III, to Xerox Corporation. Platen transport for automatic document handler. 3,889,943, Cl. 271-4.000.
Krenzer, John, to Velsicol Chemical Corporation. 2-Alkyl-4-aryl-1,2,4-triazolidin-3-ones. 3,890,342, Cl. 260-308.00C.
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Kristensen, Erik Edeling; and Mikkelsen, Stig Glerup, to Radiometer A/S. Distortion measuring device. 3,890,570, Cl. 324-77.00R.
Kronogard, Sven Olof, to United Turbine AB and Co., Kommanditbolag. Universal gas turbine automotive engine. 3,889,771, Cl. 180-44.00R.
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Kuga, Atsushi, to Shoketsu Kinzoku Kogyo Kabushiki Kaisha. Mist separator. 3,890,123, Cl. 55-318.000.
Kugele, Thomas G.; and Bresser, Robert E., to Cincinnati Milacron Chemicals Inc. Alkyltin polysulfide thioester stabilized composition. 3,890,277, Cl. 260-45.75S.
Kuhle, Engelbert; Klauke, Erich; Hamburger, Brigitte; and Scheinpflug, Hans, to Bayer Aktiengesellschaft. N-(trihalomethylthiocarbamic acid oxime ester. 3,890,386, Cl. 260-566.0AC.
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Kuster, Karl H., to GTE Automatic Electric Laboratories Incorporated. Circuit for monitoring and controlling multiple power supplies. 3,890,559, Cl. 323-21.000.
Kuypers, Ned Robert. Dual stapler. 3,889,865, Cl. 227-109.000.
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Lackey, Walter J., Jr.; and Sease, John D., to United States of America, Energy Research and Development Administration. Means for effecting fluidization in pyrolytic carbon coating processes. 3,889,631, Cl. 118-48.000.
LaClair, Louis Maynard; McWhirter, John Ruben; and Ross, William Lawrence, to Union Carbide Corporation. Integral circular wastewater treatment plant. 3,890,231, Cl. 210-199.000.
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Ladney, Michael, Jr. Venting construction for molds for forming plastic foam parts. 3,889,919, Cl. 249-141.000.
Laffranchi, Ernest. Heat exchanger. 3,889,746, Cl. 165-155.000.
Lagrange, Yvon; Martino, Germain; and Lassau, Christian, to Institut Francais du Petrole des Carburants et Lubrifiants. Process for selectively hydrogenating cyclic oligomers of butadiene. 3,890,400, Cl. 260-666.00A.
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Lebold, Steve. Hot and cold pack. 3,889,684, Cl. 128-402.000.
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Lee, Charles A.; and Furbeck, Warren R., to International Paper Company. Apparatus for making molded pulp products, including molds secured to a moving belt. 3,890,195, Cl. 162-387.000.
Lee, Harold G.; and Peterson, Henry O., to Leupold & Stevens, Inc. Digital print and punch tape recorder having read-write memory. 3,890,488, Cl. 235-61.90A.
Legille, Edouard; and Mahr, Rene N., to S.A. des Anciens Etablissements Paul Wurth. Charge distribution chute. 3,889,791, Cl. 193-3.000.
Legris, Andre, to Societe d'Exploitation des Brevets OCLAUR. Pipe couplings. 3,889,989, Cl. 285-341.000.
Lehn, Jean-Marie; Schue, Francois; Boileau, Sylvie; Kaempf, Bernd; Cau, Alain Andre; Moinard, Jean Robert; and Raynal, Serge Fernand, to Societe Nationale des Poudres et Explosifs. Anionic polymerization. 3,890,278, Cl. 260-63.00R.
Leinek, Albert Arturovich; Khomyakov, Igor Stepanovich; Privalov, Igor Serafimovich; and Filaretova, Galina Pavlovna. Device for feeding lap of fibres to carding member of ringless spinning apparatus. 3,889,318, Cl. 19-105.000.
Leitner, Kajetan. Screw-threaded fastening members. 3,889,733, Cl. 151-41.730.
Lejeune, Daniel, to Compagnie Generale des Establissements Michelin, raison sociale Michelin & Cie. Wheel rim with trough accommodating balancing weight. 3,890,008, Cl. 301-5.00B.
Lemelson, Jerome H. Fiber reinforced composite material and method of making same. 3,889,348, Cl. 29-419.00R.

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Liberty Carton Co.: *See—*
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Lieberman, Hillel; and Ziegler, Robert J., to Betz Laboratories, Inc. Methods and compositions to enhance tall oil soap separation. 3,890,295, Cl. 260-97.600.
Lilja, Lars Harry; and Ottoson, Charles Folke Sigvard. Arrangement in a pipe for enclosing insulation. 3,889,715, Cl. 138-117.000.
Limb, John Ormond; and Murphy, John Arthur, to Bell Telephone Laboratories, Incorporated. Speed and direction indicator for video systems. 3,890,462, Cl. 178-6.800.
Limmer, Bobby Lee: *See—*
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Linhart, Georg, to Techn-Chemie Kessler & Co. GmbH. Reinforced flexible hoses and their manufacture. 3,889,716, Cl. 138-129.000.
Linton, A. Leon, to Southern Systems. Conveyor control means. 3,889,606, Cl. 104-172.00S.
Lippel, Bernard, to United States of America, Army. Differential scanner system. 3,890,499, Cl. 250-201.000.
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Loeffler, Robert L.; and Winsor, Ronald D., to Package-King, Inc. Apparatus for preloading a tray and transferring the preloaded material to a sealing fixture for heat sealing. 3,889,452, Cl. 53-390.000.
Lofquist, Robert Alden: *See—*
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Lutz, Michael A.; and Holly, Robert, to Hughes Aircraft Company. Continuous electron injector for crossed-field switch tubes. 3,890,520, Cl. 313-157.000.
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Malcolm, Donald B., to Dravo Corporation. Method of and apparatus for drying particulate minerals for agglomeration. 3,889,391, Cl. 34-33.000.
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Maleck, Leroy Robert, to Admiral Corporation. Two-way opening door for household refrigerator. 3,889,419, Cl. 49-193.000.
Malisow, Jack T., to Research & Development. Board game apparatus. 3,889,954, Cl. 273-134.00C.
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- Manduley, Flavio M.; and Storace, Anthony, to Pitney-Bowes, Inc. Postage value determining and control circuit. 3,890,492, Cl. 235-151.330.
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- Marshall, Leonard, to C.A.V. Limited. Vehicle guidance. 3,889,478, Cl. 61-72.600.
- Marshall, Winston S., to Eli Lilly and Company. 3-Substituted phenylalkanohydroxamic acids. 3,890,377, Cl. 260-500.50H.
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- Martin, Edwin M. Tear-away face mask subassembly for football helmets. 3,889,296, Cl. 2-9.000.
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- Martin Marietta Aluminum, Inc.: *See*—
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- Masson Scott Thrissell Engineering Limited: *See*—
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- Mast, Oscar. Propulsion system. 3,889,543, Cl. 74-88.000.
- Masuda, Katsutada: *See*—
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- Matsuda, Takuma: *See*—
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- Matsuda, Teruo: *See*—
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- Matsumoto, Hisao: *See*—
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- Matsushita Electric Industrial Co., Ltd.: *See*—
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- May & Baker Limited: *See*—
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- Mayer, Hans; and Schroeder, Heinz-Jurgen, to Siemens Aktiengesellschaft. Steam generator feed-water preheater improvement. 3,889,641, Cl. 122-32.000.
- Mayer, Helmut, to Gerbrueder Mayer. Apparatus for detaching platelets which are adhering to a strip. 3,890,191, Cl. 156-541.000.
- Mayerhoefer, Horst; Mueller, Wolfgang; Soliberger, Urs; and Wolf, Rainer, to Sandoz Ltd. Dicyclic diphosphates and diphosphites. 3,890,409, Cl. 260-927.00R.
- Mayfran Incorporated: *See*—
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- MB Associates: *See*—
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- McCabe, Francis J. Heat actuated link. 3,889,314, Cl. 16-48.500.
- McCabe, Robert V., to ESM, Inc. Apparatus for filtering particulate matter from a fluid stream. 3,890,290, Cl. 210-136.000.
- McCarthy, Brian Dennis; and Krause, Anthony Victor, to Sanders Associates, Inc. Cathode ray tube apparatus. 3,890,541, Cl. 315-366.000.
- McChesney, James D.: *See*—
  - Fox, Eugene J.; and McChesney, James D., 3,890,299.
- McCollum, Anthony W., to Eastman Kodak Company. Novel acetals and methods for their preparation. 3,890,306, Cl. 260-240.00E.
- McCoy, Frederic C.; and Schlicht, Raymond C., to Texaco Inc. Selective adsorption of high viscosity, low viscosity index components from hydrocarbon mixtures. 3,890,219, Cl. 208-310.000.
- McCoy, Thomas A., to Carando Machine Works. Metal cup abrading machine. 3,889,427, Cl. 51-80.00A.
- McDaniel, Johnny B. Lack of ground indicator. 3,890,030, Cl. 339-113.00L.
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- McDonnold, Dion C. Anti-slip shoe attachment. 3,889,401, Cl. 36-7.600.
- McFadden, Daniel G.; and Levine, Richard C., to DieComp, Inc. Apparatus and method for automatic splitting of die cavities. 3,889,876, Cl. 235-151.100.
- McFarlane, Finley E.; and Davis, Thomas G., to Eastman Kodak Company. Copolyester prepared by contacting acyloxy benzoic acid with a polyester of ethylene glycol and dicarboxylic acid. 3,890,256, Cl. 260-47.00C.
- McGee, Kevin, to Sir Howard Grubb Parsons & Co., Limited. Adjustable-spring attenuator for radiated beams. 3,890,033, Cl. 350-266.000.
- McGough, Thomas Clifton, Jr., to Combustion Engineering, Inc. Actuating device for multiple dampers. 3,889,552, Cl. 74-519.000.
- McKee, Lewis W.; Donner, William E.; Oliva, Victor B.; Berglund, Harold R.; and Morrison, John C., to Barden Corporation, The. Yarn covering spindle. 3,889,456, Cl. 57-18.000.
- McKenney, John D.: *See*—
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  - Melling, William Gordon; Stevens, John; McLellan, Peter George; Smith, Brian Turton; Massey, Richard Gascoine; Knight, John Barrington; and Lang, Robert Nigel, 3,890,556.
- McNair, Samuel L., to Dazey Products Co. Combined storage holder and sharpener for knives. 3,889,809, Cl. 206-372.000.
- McNally Pittsburg Manufacturing Corporation, The: *See*—
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- McNeil Corporation: *See*—
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- McPherson, Gregg K.: *See*—
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- McWhirter, John Ruben: *See*—
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- Mehl, Jack Judson, to Becton, Dickinson and Company. Method and apparatus for the collection, cultivation and identification of microorganisms from body fluid. 3,890,203, Cl. 195-139.000.
- Meidensha Electric Mfg. Co., Ltd.: *See*—
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- Meili, Ernst, to F. Knobel Elektro-Apparatebau AG. Method for fabricating a choke with adjustable air gap and choke produced thereby. 3,889,360, Cl. 29-593.000.
- Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, to Bayer Aktiengesellschaft. 1,2,4-Triazole antimycotic compositions and use thereof. 3,890,442, Cl. 424-269.000.
- Melead, James J., to Beloit Corporation. Center start surface wind reel with automatic cut-off and transfer. 3,889,892, Cl. 242-56.00R.
- Melling, Richard; Wright, Donald Curtis; and Pickup, John, to Pilkington Brothers Limited. Method of toughening glass. 3,890,128, Cl. 65-116.000.
- Melling, William Gordon; Stevens, John; McLellan, Peter George; Smith, Brian Turton; Massey, Richard Gascoine; Knight, John Barrington; and Lang, Robert Nigel, to Westinghouse Brake & Signal Co. Ltd. Battery chargers. 3,890,556, Cl. 320-21.000.
- Membrino, Hercules. Opening, filling and sealing device for thermoplastic bags. 3,889,449, Cl. 53-189.000.
- Menet, Albert: *See*—
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- Merck & Co., Inc.: *See*—
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  - Taub, David, 3,890,351.
- Merkenich, Karl: *See*—
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- Merlin Gerin: *See*—
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- Meshek, Harry M.; and Street, Vern A., to Phillips Petroleum Company. Apparatus and method for altering process control in response to a power interruption. 3,890,494, Cl. 235-153.00R.
- Messa, Pietro. Rotary hook for thread-knotting machines. 3,889,990, Cl. 289-5.000.
- Messrs. Lakufol Kunstsloffe GmbH & Co.: *See*—
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- Metz, Fred L.; and Scozzie, James A., to Diamond Shamrock Corporation. Preparation of pyrrolines by the amination of ketones. 3,890,345, Cl. 260-313.100.
- Meynard, Jean-Yves, to Societe Nouvelle Siplast. Method of producing a thermoplastic composition comprising essentially bitumen and an elastomer, and product thus obtained. 3,890,263, Cl. 260-28.5AS.
- Mezquita, Mario Suso. Artificially aged beverage bottle and method for producing the same. 3,890,449, Cl. 426-127.000.
- Microwave and Electronic Systems Ltd.: *See*—
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- Middlemiss, David, to Allen and Hanburys Limited. Isoindoline derivatives. 3,890,347, Cl. 260-326.100.
- Middleton, William Joseph, to du Pont de Nemours, E. I., and Company. Trifluoromethylbenzophenone O-acyloximes and their use as crop yield increasers for plants. 3,890,135, Cl. 71-121.000.
- Midland-Ross Corporation: *See*—
  - Huffman, Herman M.; Swanson, Kenneth B.; and Jensen, Kenneth D., 3,889,467.
  - Palm, Walter C.; and Lyon, James E., 3,889,935.
- Miesel, John L., to Eli Lilly and Company. 6-Nitro-2-polyhaloalkylbenzimidazoles. 3,890,343, Cl. 260-309.200.
- Mifune, Hideo: *See*—
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- Mihic, Wlajko. Device for attaching an insert to a toolholder. 3,889,332, Cl. 29-96.000.
- Mikkelsen, Stig Glerup: *See*—
  - Kristensen, Erik Edeling; and Mikkelsen, Stig Glerup, 3,890,570.
- Millard, Richard J.; and Poat, David R., to Sprague Electric Company. Screen printed solid electrolytic capacitor. 3,889,357, Cl. 29-570.000.
- Miller, Allan W.: *See*—
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- Miller, Delmar S.: *See*—
  - Wiechowski, Joseph W.; Miller, Delmar S.; and Kostner, Richard C., 3,889,579.
- Miller, George E., Jr.; Kahn, Paul; and Dabney, William C., to Cutter Laboratories, Inc. Tubular unit with vessel engaging cuff structure. 3,889,685, Cl. 128-348.000.
- Miller, Gerald K.: *See*—
  - Bull, David W.; and Miller, Gerald K., 3,889,535.
- Miller, Leslie R.; and McKenney, John D., to Royal Industries, Inc. Automatic collet hinge/screw placement machine. 3,889,343, Cl. 29-211.00D.
- Miller, Matthew N., to Fairchild Industries, Inc. Multi-position door and hinge. 3,889,843, Cl. 220-332.000.
- Miller, Owen A. Dip type measuring dispenser. 3,889,539, Cl. 73-425.40R.
- Miller, Paul J., to Weatherhead Company, The. Selective cold work hardening of metallic extrusions. 3,890,106, Cl. 29-183.000.
- Miller, Richard H., to General Electric Company. Electric circuit breaker with series connected interrupting and isolating breaks. 3,890,258, Cl. 200-150.00R.
- Miller, Stanley J.; and Hook, Bernard, to Gulf & Western Manufacturing Company. Horizontal can ironing press. 3,889,509, Cl. 72-349.000.
- Milonov, Oleg Borisovich: *See*—
  - Kapitanov, Nikolai Nikolaevich; Petrova, Natalya Petrovna; Milonov, Oleg Borisovich; and Dyachikhin, Anatoly Alexandrovich, 3,889,683.
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  - Yamakoshi, Noboru; Minami, Toshihiro; and Somekawa, Sinitiro, 3,889,510.
- Minieri, Pasquale P., to Tenneco Chemicals, Inc. Polyvinyl halide resin compositions. 3,890,270, Cl. 260-45.80N.
- Minnesota Mining and Manufacturing Company: *See*—
  - Schmid, Ronald F., 3,890,623.
  - Viker, Harris W.; and Kropp, William E., 3,889,844.
- Minolta Camera Kabushiki Kaisha: *See*—
  - Yoshio, Kuramoto; and Toshio, Kobori, 3,890,625.
- Minor, John T., to Agrico Chemical Company. Method of purifying wet process phosphoric acid. 3,890,097, Cl. 23-300.000.
- Miska, Stefania. Hair band protector. 3,889,298, Cl. 2-174.000.
- Mito, Yotaka: *See*—
  - Oishi, Ryota; Mito, Yotaka; Yamauchi, Kenji; Takahashi, Katsuyuki; and Hirata, Kazushi, 3,890,433.
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  - Iwasaki, Yasuhiro; Shiota, Hiroshi; and Seko, Seido, 3,889,513.
  - Kojima, Takeshima; Iizuka, Masabumi; Kabayama, Kenta; and Izawa, Shizuhiro, 3,890,616.
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- Mitsubishi Petrochemical Company, Ltd.: *See*—
  - Kanetaka, Junichi; Mori, Shoichiro; and Kobayashi, Itaru, 3,890,361.
- Mitsui, Kazuhiko, to Olympus Optical Co., Ltd. Endoscope. 3,889,662, Cl. 128-6.000.
- Mitsui Shipbuilding & Engineering Co. Ltd.: *See*—
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- Mitsui Toatsu Chemicals Incorporated: *See*—
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- Miura, Kazumasa: *See*—
  - Sasame, Takao; Takahashi, Kentaro; Nakamura, Yoshikatsu; and Miura, Kazumasa, 3,890,070.
- Miyahara, Kingo, to Dowa Co., Ltd. Liquid fuel burner for burning liquid fuel in gasified form. 3,890,086, Cl. 431-168.000.
- Miyamoto, Akio: *See*—
  - Matsukawa, Hiroharu; Miyamoto, Akio; and Watanabe, Akio, 3,890,156.
- Miyamoto, Naomichi. Microtome knife sharpening machine. 3,889,425, Cl. 51-56.000.
- Miyamura, Sadao; Ogasawara, Nagahiro; and Otsuka, Hitoshi, to Japan Antibiotics Research Association. Process for the production of bicyclomycin. 3,890,199, Cl. 195-80.00R.
- Miyauchi, Yoshio; and Okuno, Tetsuji, to Dainippon Screen Seizo Kabushiki-Kaisha. Mechanism for mounting contact screen in photoengraving camera. 3,890,042, Cl. 355-53.000.
- Mizuno, Nobuhiko; and Wakai, Hideo, to Cashew Company, Ltd. Cashew unshelling apparatus. 3,889,583, Cl. 99-576.000.
- Mo, Frank S. C.; and Natwick, Vernon R., to International Video Corporation. Helical scan magnetic tape transport system including vacuum column tension control and helical scanner air bearing. 3,890,641, Cl. 360-71.000.
- Mobelec International Limited: *See*—
  - Rivers, Robert Leitch, 3,889,650.
- Mobil Oil Corporation: *See*—
  - Cushman, Donald R.; Oberright, Edward A.; Edwards, Roy T., deceased; and Edwards, Katherine, legal representative, 3,890,158.
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- Mocarski, Stanislaw, to Ford Motor Company. Method of producing a forged article from prealloyed water-atomized ferrous alloy powder. 3,889,350, Cl. 29-420.500.
- Mog, Walter F.: *See*—
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- Mohr, Robert G.; Hodges, Ronald R.; Hockenberry, Jack; Scheerhorn, Douglas; and Wilcox, Gale F., to Steelcase Inc. End panel support system. 3,890,023, Cl. 312-198.000.
- Moinard, Jean Robert: *See*—
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- Mommer, Richard Paul, to Balcom Chemicals, Inc. Dispensing and metering package. 3,889,855, Cl. 222-355.000.
- Monahan, Alan R., to Xerox Corporation. Light activating imaging process. 3,890,147, Cl. 96-27.00R.
- Monsanto Company: *See—*
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  - Kerst, Al F., 3,890,378.
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- Montesissa, Giorgio; and Del Signore, Giancarlo, to Duco S.p.A. Acidic oleo-acrylic resins and processes for preparing same. 3,890,259, Cl. 260-23.00H.
- Moon, Howard R. Corner fitting. 3,890,022, Cl. 312-140.000.
- Mooney, Thomas, to I-T-E Imperial Corporation. Tubular coupling with insulative throat liner. 3,890,458, Cl. 174-83.000.
- Moore, Trevor J., to Perkins Engines Limited. Engine cooling system. 3,889,644, Cl. 123-41.770.
- Moore, William R.; and Vaughn, Walter L., to Dow Chemical Company, The. Polysulfone copolymers. 3,890,287, Cl. 260-79.30A.
- Moran, Michael James, to Microwave and Electronic Systems Ltd. Target detection system. 3,890,615, Cl. 343-5.0PD.
- Moran, William Joseph: *See—*
  - Bann, Robert Francis; Moran, William Joseph; and Roth, Philip B., 3,890,095.
- Morane, Bruno, to Societe Anonyne dite: L'Oreal. Dispensing cap for valved, pressurized container. 3,889,856, Cl. 222-402.130.
- Moreiras, Luis: *See—*
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- Mores, Lee R.: *See—*
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- Mori, Masatoshi: *See—*
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- Mori, Shoichiro: *See—*
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- Morrison, John C.: *See—*
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- Morrison, Roger A., to Mobil Oil Corporation. Upgrading aliphatic naphthas to higher octane gasoline. 3,890,218, Cl. 208-135.000.
- Morrow, A. Elmo, to Mac-Fab Manufacturing, Inc. Load-bundling and strapping apparatus. 3,889,585, Cl. 100-26.000.
- Morse, George W. Hay product and method for forming. 3,889,884, Cl. 241-24.000.
- Mosely, Donald E., to Bitco, Inc. Layer separating apparatus for lumber stacking machines. 3,889,825, Cl. 214-6.00M.
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- Moser, Willard W. Tie down brackets for securing bights of flexible members. 3,889,321, Cl. 24-146.000.
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  - Kuhn, Harry A., Jr.; and Schendel, Donald D., Jr., 3,890,580.
  - Russ, Malcolm J., 3,890,170.
- Moulton, James A., to Rockwell International Corporation. Logarithmic monopulse receiver. 3,890,617, Cl. 343-7.00A.
- Mounce, George R. Omega navigation receiver apparatus. 3,890,619, Cl. 343-105.00R.
- Mount Sinai School of Medicine of the City University of New York: *See—*
  - Krawitt, Donald R., 3,889,656.
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- Muehlethaler, Urs, to Sortex Company of North America, Inc. Translucency/opaque sorting. 3,890,221, Cl. 209-111.700.
- Mueller, Noel J. Highway tanker wagon and method of making and delivering liquid products. 3,889,701, Cl. 137-1.000.
- Mueller, Wolfgang: *See—*
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- Mulligan, Jack E., to Ramsey Corporation. Apparatus for assembling piston ring end guides. 3,889,342, Cl. 29-211.00D.
- Mullins, Albert A., to Schlumberger Technology Corporation. Setting and releasing apparatus for sidewall anchor. 3,889,750, Cl. 166-217.000.
- Murphy Chemical Ltd.: *See—*
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  - Limb, John Ormond; and Murphy, John Arthur, 3,890,462.
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- Mutz, Gerhard; and Bausch, Edmund, to Binder Magnete GmbH. Step motor with oscillation damping. 3,890,514, Cl. 310-49.000.
- Nadolny, Felix J. Torque control adaptor for ratchet wrench. 3,889,490, Cl. 64-29.000.
- Nagahama, Shizuo: *See—*
  - Shimada, Keizo; Nishikawa, Takeo; Harada, Toshiaki; and Nagahama, Shizuo, 3,890,403.
- Nagashima, Shinichiro; and Tsuchiya, Kaichi, to Canon Inc. Organic photoconductive materials derived from reacting a photoconductive compound with a color compound. 3,890,146, Cl. 96-1.500.
- Naigai Industries, Inc.: *See—*
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- Naito, Okito: *See—*
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- Nakamichi Research Inc.: *See—*
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- Nakamura, Tetsuya; and Kijima, Shizumasa, to Eisai Company, Ltd. Chromanol nicotinate derivatives. 3,890,333, Cl. 260-295.50B.
- Nakamura, Yasuharu; Nakazawa, Yoshiyuki; Sueyoshi, Tohru; and Sato, Akira, to Fuji Photo Film Co., Ltd. Radiation-sensitized fine-grained silver halide photographic sensitive material. 3,890,155, Cl. 96-137.000.
- Nakamura, Yoshikatsu: *See—*
  - Sasame, Takao; Takahashi, Kentaro; Nakamura, Yoshikatsu; and Miura, Kazumasa, 3,890,070.
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- Nakanishi, Fusae: *See—*
  - Hasegawa, Masaki; Nakanishi, Fusae; Nakanishi, Hachiro; Watanabe, Shoji; Suzuki, Yasuzo; Nakane, Hisashi; Aoyama, Toshimi; Komatsubara, Yukio; Nojima, Setsuo; and Tagami, Hiroshi, 3,890,150.
- Nakanishi, Hachiro: *See—*
  - Hasegawa, Masaki; Nakanishi, Fusae; Nakanishi, Hachiro; Watanabe, Shoji; Suzuki, Yasuzo; Nakane, Hisashi; Aoyama, Toshimi; Komatsubara, Yukio; Nojima, Setsuo; and Tagami, Hiroshi, 3,890,150.
- Nakano, Masao; and Imazeki, Kazuyoshi, to General Research of Electronics, Inc. Time-sharing scanning receiver. 3,890,574, Cl. 325-470.000.
- Nakao, Masaru: *See—*
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- Nakawaki, Yoshiharu, to Kabushiki Kaisha Suehiro Sharyo Seisakusho. Trailers. 3,889,977, Cl. 280-408.000.
- Nakazawa, Yoshiyuki: *See—*
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- Nederlandse Organisatie Voor Toegepast-Natuurweten-Schappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel En Verkeer: *See—*
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- Nelson, Norman C.; and Harley, Daniel C., to Kel-Lite Industries, Inc. Battery recharging circuit with indicator lights. 3,890,555, Cl. 320-2.000.
- Nelson, Norman E., to Alexander, Sell, Steldt & DeLaHunt. Cartridge tape guide. 3,889,900, Cl. 242-199.000.
- Nelson, Perry L.: *See—*
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- Nemec, Josef, to Ceske vysoke uceni technicke. Method and apparatus for testing the fusion weldability of metallic materials. 3,889,519, Cl. 73-15.00R.
- Neomat AG: *See—*
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- New Zealand Dairy Board: *See—*
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- Neward, Theodore C. Method of making a bipolar electrode structure. 3,890,420, Cl. 264-261.000.
- Newhall, Jay H. Vivo temperature sensing method and apparatus. 3,889,658, Cl. 128-2.00H.
- Nichol, George D.; and Schmidt, John C. Tray for sterilizing dental instruments. 3,890,096, Cl. 21-105.000.
- Nicholson, Brian, to Norprint Limited. Hand-held self-adhesive-label applicators. 3,889,594, Cl. 101-111.000.
- Nicolay, Karl; Buschmann, Karl; and Madueno, Jesus Perez, to Durkoppwerke GmbH. Feed for sewing machine. 3,889,614, Cl. 112-153.000.
- Niehaus, William Charles: *See—*
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- Nihon Denshi Kabushiki Kaisha: *See—*
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- Nijweide, Robert Jan, to Verenigde Mengvoederfabrieken. Method of conditioning meal. 3,890,454, Cl. 426-508.000.
- Nikitinsky, Mikhail Pavlovich: *See—*
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- Nishi, Sunao; Ikeda, Shojiro; and Kawazoe, Asao, to Shinto Kogyo Kabushiki Kaisha. Method of forming a crimped tube joint. 3,889,354, Cl. 29-516.000.
- Nishida, Masamitsu; and Ouchi, Hiromu, to Matsushita Electric Industrial Co., Ltd. Piezoelectric ceramic compositions. 3,890,241, Cl. 252-62.900.
- Nishikawa, Takeo: *See—*
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- Noguchi, Yukihide, to Takeda Chemical Industries, Ltd. Method and apparatus for printing indicia on products. 3,889,591, Cl. 101-37.000.
- Nojima, Setsuo: *See—*
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- Nolte, David G., to Texaco Inc. Leak-detection apparatus and liquid level variations detector. 3,889,523, Cl. 73-49.200.
- Nomura, Junji: *See—*
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- Noneman, Thomas S.; Smith, Thomas R.; and Stokes, John B., to Tomco Plastic Inc. Molded plastic drawer. 3,890,024, Cl. 312-330.000.
- Nordblad, Sven Sigurd; and Svensson, Karl-Erik, to Telefonaktiebolaget L M Ericsson. Method and an arrangement for voltage testing and drying of electrically insulated conductors. 3,890,566, Cl. 324-54.000.
- Norprint Limited: *See—*
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- Norsk Hydro A.S.: *See—*
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- North, Arthur J.; and Stover, Raymond W., to Xerox Corporation. Self-biased development electrode and reproducing machine employing same. 3,889,637, Cl. 118-637.000.
- Northrop Corporation: *See—*
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- Norton Company: *See—*
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  - Villani, Gerard J.; and Fedora, Ronald P., 3,889,347.
- Nosco Plastics, Inc.: *See—*
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- Novak, Warren D. Slide compass. 3,889,377, Cl. 33-27.00C.
- Novello, Frederick C., to Merck & Co., Inc. 3-Diazine substituted benzothiadiazines. 3,890,313, Cl. 260-243.00D.
- Nozaki, Teruhiko, to Kobe Steel, Inc. Method and apparatus for producing a casting having a satisfactory surface with a continuous casting operation. 3,890,167, Cl. 148-9.500.
- Nusonics, Inc.: *See—*
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- Obadal, Richard Dick; and Loynachan, William David, to Deere & Company. Reinforced flexible tube. 3,889,717, Cl. 138-131.000.
- Obendorf, Werner; Lindner, Irmgard; Schwarzinger, Ernst; and Krieger, Josef, to Chemie Linz Aktiengesellschaft. Derivatives of triiodo aminobenzenecarboxylic acids and the preparation thereof. 3,890,318, Cl. 260-247.20A.
- Obenschain, Arthur W., to United States of America, Navy. Measuring core reductance. 3,890,565, Cl. 324-43.00R.
- Oberg Manufacturing Co., Inc.: *See—*
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- Oberright, Edward A.: *See—*
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- O'Brien, William J. Rotary steam engine. 3,890,071, Cl. 418-260.000.
- Occanneechi Orchards, Inc.: *See—*
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- Ocean Protein Corporation: *See—*
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- Ochiai, Michihiko; Aki, Osami; Morimoto, Akira; Okada, Taiiti; and Masuda, Katsutada, to Takeda Chemical Industries, Ltd. Cephalosporin derivatives. 3,890,309, Cl. 260-243.00C.
- Ochs, David J.; and Behrens, James D. Emergency medical harness. 3,889,668, Cl. 128-134.000.
- O'Connor, Sean E. Flexible highway marker. 3,890,054, Cl. 404-10.000.
- O'Connor, Thomas F.: *See—*
  - Jackson, Ira J.; O'Connor, Thomas F.; and Buckley, James H., 3,889,589.
- O'Donnell, Leopold Henry; Forget, Robert; and Hasrouni, Youssef, to Canada, Her Majesty the Queen in right of, as represented by the Secretary of State. Video tape recording animation system. 3,890,639, Cl. 360-14.000.
- Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.): *See—*
  - Hivert, Andre R.; and Galmiche, Philippe M., 3,890,145.
- Offner, Burton E. Stock shelf layout indicators. 3,889,408, Cl. 40-10.00R.
- Offshore Company, The: *See—*
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  - Oguri, Eizo; Ogawa, Hiroshi; Date, Koki; and Takeba, Kanji, 3,889,388.
- Ogawa, Yasuhiro; and Awata, Norio, to Kanegafuchi Boseki Kabushiki Kaisha. Stabilization and purification of β-lactones. 3,890,312, Cl. 260-343.900.
- Oggesen, Heinrich, to Messrs. Lakufol Kunstsloffe GmbH & Co. Carrier-bag. 3,889,869, Cl. 229-54.00R.
- Oguri, Eizo; Ogawa, Hiroshi; Date, Koki; and Takeba, Kanji, to Takeda Chemical Industries, Ltd. Method of and device for drying small solids. 3,889,388, Cl. 34-10.000.
- Oguri, Yoshiko: *See—*
  - Yukuta, Toshio; Ohashi, Takashi; and Oguri, Yoshiko, 3,890,293.
- O'Hara, Arthur C. Hose coiling apparatus. 3,889,896, Cl. 242-86.000.
- Ohara, Takashi; Ninomiya, Michikazu; Yanagisawa, Isao; Ueshima, Michio; and Takata, Masahiro, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Catalytic oxide adapted for the preparation of unsaturated carbonyl compounds. 3,890,248, Cl. 252-456.000.
- Ohashi, Takashi: *See—*
  - Yukuta, Toshio; Ohashi, Takashi; and Oguri, Yoshiko, 3,890,293.
- Ohkubo, Kinji; Noguchi, Junpei; Ohmura, Kunioki; and Hinata, Masanao, to Fuji Photo Film Co., Ltd. Light-sensitive silver halide photographic materials. 3,890,154, Cl. 96-125.000.
- Ohkura Electric Company, Limited: *See—*
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- Ohnishi, Akira; Yukuta, Toshio; Fujio, Ryota; Ishida, Yozo; Kambara, Shu; and Kojima, Minoru, to Bridgestone Tire Company Limited. Trimellitoyl functional polymers, manufacturing process therefor and elastomeric epoxy compositions cured therewith. 3,890,284, Cl. 260-78.4EP.
- Ohnishi, Kenji: *See—*
  - Sato, Masao; Aizawa, Tsuneo; Ohnishi, Kenji; Koizumi, Shigeo; Fukuda, Akio; Kikuchi, Shinki; and Kusanagi, Shichiro, 3,889,561.
  - Sato, Masso; Aizawa, Tsuneo; Ohnishi, Kenji; Koizumi, Shigeo; Fukuda, Akio; Kikuchi, Shinki; and Kusanagi, Shichiro, 3,889,567.
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- Oishi, Ryota; Mito, Yotaka; Yamauchi, Kenji; Takahashi, Katsuyuki; and Hirata, Kazushi. Method for manufacturing pharmaceutical preparation. 3,890,433, Cl. 424-37.000.
- Okabe, Takahiro: *See—*
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- Oki Electric Industry Co., Ltd.: *See—*
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- Olsen, Ralph A., to Ford Motor Company. Dry sand core process for use with lost foam molding process. 3,889,737, Cl. 164-34.000.
- Olson, Robert E., to Packard Instrument Company, Inc. Scintillation counter; photomultiplier tube alignment. 3,890,505, Cl. 250-361.000.
- Olympus Optical Co., Ltd.: *See—*
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- O'Melia, Frances C., to Dow Chemical Company, The. Nematicidal compositions comprising 2-chloro-6-methoxy-4-(trichloromethyl)-pyridine and S-methyl N-[(methyl carbamoyl)oxy]thioacetimidate. 3,890,440, Cl. 424-263.000.
- Ono, Keiichi: *See—*
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- Orenstein, Jack. Anti-splatter device. 3,890,450, Cl. 426-132.000.
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- Orr, Wallace H.; and Grindle, James L., to General Electric Company. Electrical socket. 3,890,027, Cl. 339-64.00R.
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- Osaka Gas Kabushiki Kaisha: *See—*
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- Osborne, Geoffrey Vaughan; and Rowland, Roger Gilbert, to National Research Development Corporation. Prosthetic hip joint devices. 3,889,299, Cl. 3-1.000.
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- O'Toole, Peter J., to International Harvester Company. Hydraulic brakes system for mobile vehicles. 3,890,012, Cl. 303-6.00R.
- Otsuka, Hitoshi: *See—*
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- Ott, Henry Whitfield, to John Ott Laboratories, Inc. Apparatus for operating gaseous discharge lamps on direct current from a source of alternating current. 3,890,540, Cl. 315-335.000.
- Ottoson, Charles Folke Sigvard: *See—*
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- Owens, Frederick J.; Bishop, Jerry B.; and Fidelman, David, to Aerosonic Corporation. Directional gyroscope. 3,889,387, Cl. 33-318.000.
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- Palac, Kazimir, to Zenith Radio Corporation. Faceplate mounting structure for cathode ray tube color selection electrode. 3,890,526, Cl. 313-408.000.
- Palm, Walter C.; and Lyon, James E., to Midland-Ross Corporation. Vehicle body height control valve. 3,889,935, Cl. 267-65.00D.
- Palopoli, Frank P.; and Paolini, John P., to Richardson-Merrell Inc. N,N-dioxides of bis-basic cyclic ketones. 3,890,328, Cl. 260-293.620.
- Pamer, Karl A., to McNeil Corporation. Force limited power actuated device. 3,889,929, Cl. 254-173.00B.
- Panduit Corporation: *See—*
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- Panofski, Ernst; and Rasch, Erhard, to Patent-Treuhand-Gesellschaft fur Elekstriche Gluhlampen mbH. Low pressure mercury vapor discharge lamp with amalgam. 3,890,531, Cl. 313-490.000.
- Paolini, John P.: *See—*
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- Park, John N.; Peak, Steven C.; and Steigerwald, Robert L., to General Electric Company. Solid state chopper ballast for gaseous discharge lamps. 3,890,537, Cl. 315-208.000.

- Parsons, Hubert J., to Hardinge Brothers, Inc. Seals for collets. 3,889,962, Cl. 279-46.000.
- Passons, William Erby; and Card, Joseph Lewis. Tufted fringe product. 3,889,616, Cl. 112-409.000.
- Pastoriza, James J., to Analog Devices, Incorporated. Constant-current digital-to-analog converter. 3,890,611, Cl. 340-347.0DA.
- Pate, Robert Lee, to McNally Pittsburg Manufacturing Corporation, The. Reversible car plow feeder for stock pile recovery systems. 3,889,826, Cl. 214-17.0DA.
- Patek Philippe S.A.: *See—*
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- Patent-Treuhand-Gesellschaft fur Elekstriche Gluhlampen mbH: *See—*
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- Patience, Donald; Hartigan, Edward G.; and Knohl, Herbert, to Kendall Company, The. Stocking with compensated knee pressure. 3,889,494, Cl. 66-178.00A.
- Patterson, Frank Knowles, to du Pont de Nemours, E. I., and Company. Semiconductive oxides. 3,890,251, Cl. 252-519.000.
- Patterson, James A. Wall formed conduit for swimming pools and method of making the same. 3,890,230, Cl. 210-169.000.
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- Pax Systems, Inc.: *See—*
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- Pelenc, Yves; Ambier, Jean; and Lavergne, Roger, to Merlin Gerin. Electromagnetic position indicator. 3,890,607, Cl. 340-199.000.
- Pendleton, Pyam; and Waldman, Myron R., to Walco Systems, Inc. Adjustable corona discharge electrode. 3,890,504, Cl. 250-325.000.
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- Persson, Henry, to Sibilia, Thomas W.; Cariani, Montero; and Knorr, Richard K. Floating paddle. 3,889,308, Cl. 9-307.000.
- Persson, Jan Edvard, to Atlas Copco Aktiebolag. Earth drilling apparatus. 3,889,959, Cl. 277-27.000.
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- Peters, Beldon A., to Exxon Production Research Company. Subsurface safety valve. 3,889,751, Cl. 166-224.00A.
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- Petrovich, Vojislav. Froth flotation method for recovery of minerals by means of alkali or ammonium alkyl alkylaryl, and aryl sulfinates as froth flotation reagents. 3,890,222, Cl. 209-166.000.
- Petrow, Vladimir: *See—*
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- Pietrolewicz, John P., to Philco-Ford Corporation. Password operated system for preventing unauthorized or accidental computer memory alteration. 3,890,601, Cl. 340-172.500.
- Pike, John E.; and Schneider, William P., to Upjohn Company, The. 11β-PGE$_2$-Type compounds. 3,890,371, Cl. 260-468.00D.
- Pilie, Roland J.; and Mack, Eugene J., to United States of America, Navy. Fog water collector. 3,889,532, Cl. 73-170.00R.
- Pilkington Brothers Limited: *See—*
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- Pitt, Norman, to Structural Materials. Apparatus for the preparation of siliceous ashes. 3,889,608, Cl. 110-8.00R.
- Pitts, Floyd B., Jr. Brake stand for wheelchairs. 3,889,964, Cl. 280-43.240.
- Platt, John D., to MSI Data Corporation. Magnetic tape transport. 3,890,642, Cl. 360-96.000.
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- Ploeckl, Johann, to Zellweger AG. Optical scanner. 3,890,034, Cl. 350-7.000.
- Plunkett, Allen B., to General Electric Company. Regenerative braking circuit. 3,890,551, Cl. 318-376.000.
- PneuDraulics, Inc.: *See—*
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Polaner, Mardy, to Barbron Corporation. Feed tube flame arrester. 3,889,649, Cl. 123-142.000.
Pollock, Johnny A.; and Spector, George. Press for home removal of piston pins. 3,889,339, Cl. 29-252.000.
Polos, Constantine D. Self-drilling anchor device. 3,889,570, Cl. 85-68.000.
Polska Akademia Nauk Instytut Maszyn Przeplywowych: *See—*
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Porter, Allan William Henry, to Aktiengesellschaft Adolph Saurer. Heald machine. 3,889,720, Cl. 139-66.00R.
Porter, Allan William Henry, to Aktiengesellschaft Adolph Saurer. Braking and driving device for the shuttle of a weaving loom. 3,889,722, Cl. 139-142.000.
Porter, Kenneth E.; and Nelson, Perry L., to American Bioculture, Inc. High density treatment product. 3,889,418, Cl. 47-58.000.
Portinari, Antonio; and Alimenti, Giovanni, to Industrie Pirelli Societa per Azioni. Method and apparatus for impregnating stranded wires during stranding thereof. 3,889,455, Cl. 57-7.000.
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PPG Industries, Inc.: *See—*
Carlin, William W., 3,890,244.
Prada, Luis E., to General Electric Company. Combination ice cube and crushed ice dispenser. 3,889,888, Cl. 241-101.100.
Pramstraller, Wilmuth, to Durst S.p.A. Fabbrica Macchine ed Apparecchi Fototecnici. Enlarging apparatus for use in a bright room. 3,890,043, Cl. 355-62.000.
Precision Screen Machines Inc.: *See—*
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Preco Industries, Ltd.: *See—*
Ilukowicz, Robert John, 3,889,916.
Presnick, Michael C. Inflatable insulation for packaging. 3,889,743, Cl. 165-46.000.
Pretty, Frederick A., to USM Corporation. Control for fluid pressure actuators. 3,889,586, Cl. 100-53.000.
Pretty Products, Inc.: *See—*
Wilson, Michael C., 3,889,837.
Price, Larry V., to Robertshaw Controls Company. Gage construction and spacing member therefor or the like. 3,889,840, Cl. 220-82.00A.
Priddy, Duane B., to Dow Chemical Company, The. Heterocyclic peroxides. 3,890,316, Cl. 260-247.000.
Privalov, Igor Serafimovich: *See—*
Leinek, Albert Arturovich; Khomyakov, Igor Stepanovich; Privalov, Igor Serafimovich; and Filaretova, Galina Pavlovna, 3,889,318.
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Provi, Mike A., 3,889,353.
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Pruniaux, Bernard R.; and Assemat, Jean-Louis, to Societe Lignes Telegraphiques et Telephoniques. Ultra high frequency transistors manufacturing process. 3,890,163, Cl. 148-1.500.
Pruvot, Francois C.; Maistrelli, Roger; and Buachet, Pierre, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Engine and transmission control system. 3,890,360, Cl. 60-431.000.
Puck, Alfred: *See—*
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Pullman Incorporated: *See—*
Glassmeyer, John Joseph, 3,889,619.
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Puskas, Imre: *See—*
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Puttner, Reinhold; and Arndt, Friedrich, to Schering AG. Dichlorobenzaldehyde-oxime-carbonates. 3,890,385, Cl. 260-566.0AE.
PX Petrocontrol AB: *See—*
Wallin, Jan Olof Wilhelm, 3,889,706.
Pytlewski, Louis L., to Research Corporation. Inorganic stannic oxide polymers and method for the preparation thereof. 3,890,429, Cl. 423-395.000.
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R. H. Bouligny, Inc.: *See—*
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R. L. Kuss & Co., Inc.: *See—*
Combest, John F.; and Bell, Rupert B., 3,890,232.
R & R Products, Inc.: *See—*
Rogers, Roy H., 3,889,761.
Rachel, Todd L., to Bendix Corporation, The. Speed governor for an engine having an electronic fuel injection system. 3,889,647, Cl. 123-102.000.
Raczek, Thaddeus A., to International Business Machines Corporation. Skinning process for expansion casting of polymeric foams. 3,890,418, Cl. 264-54.000.
Rademacher, Friedrich; Quest, Karl; Knabe, Uwe; Unger, Dieter; Jordan, Heinz; Heckmann, Werner; and Plock, Karl, to Holstein & Kappert Maschinenfabrik Phonix GmbH. Method of filling beer cans or the like. 3,889,725, Cl. 141-5.000.
Radiometer A/S: *See—*
Kristensen, Erik Edeling; and Mikkelsen, Stig Glerup, 3,890,570.
Rail, Larry E. Body support. 3,890,004, Cl. 297-423.000.
Rain Jet Corporation: *See—*
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Rakestraw, Lawrence F., to Monsanto Company. Pressurized nitrogen to extrude molten steel-silicon alloy. 3,889,739, Cl. 164-82.000.
Ramsey Corporation: *See—*
Mulligan, Jack E., 3,889,342.
Rand, Myron Joel, to Bell Telephone Laboratories, Incorporated. Ohmic contacts to silicon. 3,889,359, Cl. 29-578.000.
Randour, Victor: *See—*
Blomstrom, Gary D.; Piepho, Donald A.; Randour, Victor; and York, Lyle E., 3,889,769.
Ranger, Eugene, to Combustion Engineering, Inc. Method and apparatus for suspendedly supporting a platform. 3,889,820, Cl. 214-1.0BB.
Ranieri, Louis F. Self-contained multi-blade package and assembly utilizing same. 3,889,699, Cl. 125-16.00R.
Ranini, Daniel G., to Poclain. Excavator with teeth coupled for pivotal movement in opposite senses. 3,889,405, Cl. 37-141.00R.
Rao, Vemulapalli D. N.; and Telang, Yeshwant P., to Ford Motor Company. Rubbing seal system for a rotary combustion engine. 3,890,067, Cl. 418-121.000.
Rasch, Erhard: *See—*
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Rathbone, Donald E.: *See—*
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Ravich, Leonard E., to Gorham International, Inc. Disposable towel. 3,889,804, Cl. 206-223.000.
Ray, Robert G. Curtain rod and window shade bracket. 3,889,912, Cl. 248-255.000.
Raygo, Inc.: *See—*
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Raymond Lee Organization, Inc., The: *See—*
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Emrich, Roy P., 3,889,399.
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Razdan, Raj K., to United States of America, Army. 1-(2-(Phenyl-lower-alkyl)-aziridines munition payload. 3,889,600, Cl. 102-90.000.
RCA Corporation: *See—*
Ettenberg, Michael, 3,890,194.
Ham, William Edward; and Flatley, Doris Winifred, 3,890,632.
Harmening, Wayne Arthur, 3,889,551.
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Readi Temp, Inc.: *See—*
Donnelly, William R., 3,889,483.
Redrow, Allan Raymond. Hair dressing method and device. 3,889,692, Cl. 132-7.000.
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Rees, Thomas Charles; and Sugerman, Gerald, to Bayer Aktiengesellschaft. Process for the preparation of 2-naphthole from the corresponding tetralin-hydroperoxide and 1,2-dialin. 3,890,397, Cl. 260-621.00H.
Regan, A. Michael; and Watkins, Bruce J., to Regan Offshore International, Inc. Telescopic riser tensioning apparatus. 3,889,747, Cl. 166-.500.
Regan Offshore International, Inc.: *See—*
Regan, A. Michael; and Watkins, Bruce J., 3,889,747.
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Reith, Kurt A., to Textron Inc. End attachment for watch bands. 3,889,323, Cl. 24-265.00B.
Remery, Michel, to U.S. Philips Corporation. Ignition of discharge tubes. 3,890,539, Cl. 315-273.000.
Remond, Jean-Pierre: *See—*
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White, Eugene W.; Weber, Jon N.; and White, Rodney A., 3,890,107.
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Restall, George. Animal operated liquid dispenser. 3,889,640, Cl. 119-75.000.
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Ribouleau, Edmond. Distributing apparatus for agricultural purposes. 3,889,853, Cl. 222-177.000.
Ricciardi, Michael Anthony; Smudin, David J.; Wagner, Richard D.; Pcolinsky, Michael; and Chaya, John Edward. Rapid cooling process for improving quality of polyurethane foam. 3,890,414, Cl. 264-45.100.
Ricciardi, Ronald J.; and Ferrara, Angelo. Automatically controlled weigh feeding apparatus. 3,889,848, Cl. 222-58.000.
Rice, Joseph Albert. Cot storage cart. 3,889,814, Cl. 211-27.000.
Richardson, Edwin A., to Shell Oil Company. Buffer regulated mud acid. 3,889,753, Cl. 166-307.000.
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Grunwell, Joyce F.; Johnston, John O.; Petrow, Vladimir; and Weintraub, Philip M., 3,890,356.
Palopoli, Frank P.; and Paolini, John P., 3,890,328.
Riche, Robert M., to Societe Technique et Commercial d'Installations Industrielles "Luceat". Marine loading arm for bunkering vessels. 3,889,728, Cl. 141-387.000.
Richerson, David W., to Norton Company. Hot pressed silicon nitride containing finely dispersed silicon carbide or silicon aluminum oxynitride. 3,890,250, Cl. 252-516.000.
Riddel, John W., to General Motors Corporation. Liquid level sensor. 3,890,478, Cl. 200-84.00R.
Ridonia Wheel, Inc.: *See—*
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Riley, Patrick F. Method for making a bait bedding composition. 3,889,638, Cl. 119-1.000.
Riley, Travis E.: *See—*
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Rixon Inc.: *See—*
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Roberson, James H., to Crompton & Knowles Corporation. Method and system for producing blended textile fibrous materials. 3,889,319, Cl. 19-145.500.
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Wanner, Karl; Karl, Hubertus; Hansel, Gernot; Bleicher, Manfred; and Schmid, Wolfgang, 3,889,491.
Roberts, Harold Devere. One piece permanent support frame for upper dentures and process of mounting the same. 3,889,375, Cl. 32-10.00A.
Robertshaw Controls Company: *See—*
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Goodhouse, Carl J., 3,889,875.
Price, Larry V., 3,889,840.
Tyler, Hugh J., 3,889,362.
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Child, Edward T; and Robin, Allen M., 3,890,113.
Robnolte, Wilber B. Device for facilitating the feeding of sheets into a reproduction machine or the like. 3,889,942, Cl. 271-3.000.
Roche, Francis G., to Cable & Wireless Limited of Smale House. Buffer stores. 3,890,600, Cl. 304-172.500.
Rochfort, William Phillip King. Concrete laying machine. 3,890,055, Cl. 404-84.000.
Rockwell International Corporation: *See—*
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Schrader, Carl N.; and Fisher, Frank H., 3,889,786.
Rode, Daniel Leon: *See—*
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Rodia, Ralph M.; and Pews, R. Garth, to Dow Chemical Company, The. 2-Hydroxy-3,4,5-trichlorobenzenesulfonamides. 3,890,383, Cl. 260-556.0AR.
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Roessl, Julius. Portable shelter. 3,889,698, Cl. 135-2.000.
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Romanov, Georgy Ivanovich: *See—*
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Rosen Enterprise, Inc.: *See—*
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Rosen, Robert, to United States of America, Navy. Traveling-wave-tube protection circuit. 3,890,545, Cl. 317-51.000.
Rosen, William E., to Rosen Enterprise, Inc. Method of treating tobacco with catalase and hydrogen peroxide. 3,889,689, Cl. 131-140.00P.
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Rubino, Vito Michael. Vacuum siphon pump. 3,889,704, Cl. 137-123.000.
Ruckert, Hans; and Unholz, Rainer, to Hoechst Aktiengesellschaft. Light-sensitive copying composition containing diazo resin and quinone diazide. 3,890,152, Cl. 96-75.000.
Rudin, Morton: *See—*
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Rush, David H., to Chromalloy Electronics Div. Chromalloy American Corp. Illuminated safety pole for bicycles or the like. 3,890,497, Cl. 240-7.550.
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Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., to Gas Developments Corporation. Air conditioning apparatus and method. 3,889,742, Cl. 165-7.000.
Russ, Malcolm J., to Motorola, Inc. Method of making a multicolor light display by graded mesaing. 3,890,170, Cl. 148-175.000.
Russell, Ronald William, to New Zealand Dairy Research Institute; and New Zealand Dairy Board. Apparatus for packaging extrudable material. 3,889,448, Cl. 53-122.000.
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St. Eve, Daniel Robert, to Leco Industries Limited. Extrusion devices. 3,890,083, Cl. 425-462.000.
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Saito, Tsutomu, to Three Bond Co. Ltd. Anaerobically curable sealing composition containing 2,2-bis(4-acryloxy-alkoxy phenyl) propane. 3,890,273, Cl. 260-47.0UA.
Sakai, Satoshi; Shimizu, Norio; and Nomura, Junji, to Matsushita Electric Works, Ltd. Electric dry shaver blade assembly. 3,889,372, Cl. 30-43.600.
Sakashita, Hitoshi: *See—*
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Salakari, Martti. Vehicle-tire stud with relatively movable parts. 3,889,735, Cl. 152-210.000.
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Sams, Bernard. Label dispensing and applying apparatus. 3,890,188, Cl. 156-384.000.
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Sanderson, Andrew G. Refractory furnace. 3,890,090, Cl. 432-250.000.
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Sasaki, Rentaro; Watanabe, Akinori; Ogasawara, Tatsuo; and Sogabe, Hidetoshi, to Oki Electric Industry Co., Ltd.; and Okaya Electric Industry Co., Ltd. Low voltage cold cathode discharge type display devices with metal oxide cathode and phosphor anode matrix. 3,890,609, Cl. 340-324.00M.
Sasame, Takao; Takahashi, Kentaro; Nakamura, Yoshikatsu; and Miura, Kazumasa, to Nippon Piston Ring Co., Ltd. Relative combination of an apex seal and a rotor housing in the rotary engine. 3,890,070, Cl. 418-.
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Sato, Masao; Aizawa, Tsuneo; Ohnishi, Kenji; Koizumi, Shigeo; Fukuda, Akio; Kikuchi, Shinki; and Kusanagi, Shichiro, to Amada Company Limited. Horizontal band saw machine. 3,889,561, Cl. 83-58.000.
Sato, Masso; Aizawa, Tsuneo; Ohnishi, Kenji; Koizumi, Shigeo; Fukuda, Akio; Kikuchi, Shinki; and Kusanagi, Shichiro, to Amada Company Limited. Horizontal band saw machine. 3,889,567, Cl. 83-818.000.
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Sawa, Kiyohiko, to Kobe Steel, Ltd. Apparatus for pulverizing vulcanized rubber and rubber products. 3,889,889, Cl. 241-228.000.
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Say, Donald L.; and Smithgall, Harry E., to GTE Sylvania Incorporated. Common focusing electrode for plurality of beams and having same plurality of internal shields. 3,890,528, Cl. 313-414.000.
Scandaletos, Lazare, to S.P.A.M. Abrasive tools. 3,889,430, Cl. 51-206.0NF.
Scans Associates, Inc.: *See—*
  Grikscheit, Henry W.; and Converse, Vernon G., III, 3,889,528.
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Schaefer, William H.; and Bender, Richard E., to General Dynamics Corporation. Laminated reinforcing facing for a game racket. 3,889,951, Cl. 273-73.00F.
Schaffner, Gus J., III, to Schaffner Mfg. Co., Inc. Flap wheel finishing device. 3,890,119, Cl. 51-334.000.
Schaffner Mfg. Co., Inc.: *See—*
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Scheerhorn, Douglas: *See—*
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Schenker, Karl; and Bernasconi, Raymond, to Ciba-Geigy Corporation. Pharmaceutical preparations and method of use. 3,890,441, Cl. 424-267.000.
Schepers, Herman A. J.; and Roest, Bernard C., to Stamicarbon, N.V. Process for preparing block copolymers. 3,890,408, Cl. 260-879.000.

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Schimelpfenig, Clarence William, to du Pont de Nemours, E. I., and Company. Ring chlorination of ortho-toluidine. 3,890,388, Cl. 260-578.000.
Schindler, Walter, deceased: *See—*
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Schlicht, Raymond C.: *See—*
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Schoeck, Vincent E., to Carborundum Company, The. Filter bag. 3,890,125, Cl. 55-381.000.
Scholtes, Lorin H. Retractable scoop for catching machined parts. 3,889,559, Cl. 82-2.500.
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Senecal, William J., to Gulf & Western Manufacturing Company. Brake drum and disc micrometer. 3,889,378, Cl. 33-143.00R.
Serini, Volker; Vernaleken, Hugo; and Cohnen, Wolfgang, to Bayer Aktiengesellschaft. Polycarbonate mixtures. 3,890,266, Cl. 260-37.0PC.
Serup, Alfred. Parachute drying apparatus. 3,889,389, Cl. 34-15.000.
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Sharp, Mark Edward, to Texas Instruments Incorporated. Workpiece alignment system. 3,890,508, Cl. 250-548.000.
Shatney, Robert H., to Dow Chemical Company, The. Permeable meat casings. 3,890,447, Cl. 426-105.000.
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Sheffer, Harvey I.; and Selke, Donald A., to Sheffer Corporation, The. Locking cylinder with improved locking structure. 3,889,576, Cl. 91-394.000.
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Shelver, Lyle N. Thermal glass structural device. 3,889,434, Cl. 52-172.000.
Sheppard, Chester Stephen; and MacLeay, Ronald Edward, to Pennwalt Corporation. Azo containing polybutadienes. 3,890,294, Cl. 260-94.70N.
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- Shiga, James T. Game with puck launching means and goal tender. 3,889,952, Cl. 273-121.00R.
- Shigeta, Masayuki: *See—*
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- Shim, Kyung Sup, to Stauffer Chemical Company. Process for forming phosphorus containing polymers. 3,890,411, Cl. 260-969.000.
- Shimada, Keizo; Nishikawa, Takeo; Harada, Toshiaki; and Nagahama, Shizuo, to Teijin Limited. Process for separating and recovering 2,6-dimethylnaththalenes. 3,890,403, Cl. 260-674.00N.
- Shimizu, Kazuya, to Barry Wright Corporation. Combined air mounts. 3,889,936, Cl. 267.65 R-.
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- Shimoji, Masaharu; Satow, Haruhiko; and Kawano, Tetsuo, to Toyo Kogyo Co., Ltd. Fuel injection-type rotary piston engine. 3,889,643, Cl. 123-8.090.
- Shinto Kogyo Kabushiki Kaisha: *See—*
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- Shionogi & Company, Ltd.: *See—*
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- Shoji, Jun'Ichi; Mayama, Mikao; Matsuura, Shinzo; Matsumoto, Kouichi; and Wakisaka, Yoshiharu, to Shionogi & Company, Ltd. Antibiotic GP-3 and production thereof by cultivation of *bacillus cereus*. 3,890,436, Cl. 424-118.000.
- Shoketsu Kinzoku Kogyo Kabushiki Kaisha: *See—*
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- Short, John R. Controller for automatic pinsetter. 3,889,947, Cl. 273-43.00A.
- Shroff, Arvind, to Thomson-CSF. X-ray tube target and X-ray tubes utilising such a target. 3,890,521, Cl. 313-55.000.
- Shugart Associates: *See—*
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- Shughart, Mervin Leonard, to AMP Incorporated. Locator for applicators adapted to apply electrical connectors to printed circuit boards. 3,889,337, Cl. 29-203.00B.
- Shulzhenko, Alexandr Alexandrovich: *See—*
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- Sidi, Henri; and Johnson, Hilding R., to Tenneco Chemicals, Inc. Surface-coating compositions containing polyoxymethyleneoxazolidines. 3,890,264, Cl. 260-29.6HN.
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- Siemonsen, Frederik A., to Reynolds Metals Company. Heat exchanger and method of making same. 3,889,745, Cl. 165-151.000.
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- Sien, Gerald Bruce, to Sien Equipment Company. Articulated frame mine dumper. 3,890,005, Cl. 298-22.00P.
- Silverman, Ira; and Irvine, James M., to Computer Peripherals, Inc. Ribbon drive and control system. 3,889,893, Cl. 242-57.100.
- Simjian, Luther G., to Command Automation, Inc. Arrangement for protecting and authenticating a document. 3,890,599, Cl. 340-149.00R.
- Simmons, Walter John; and Willis, Frank Marsden, to du Pont de Nemours, E. I., and Company. Process for forming partitioned film packages and apparatus for use therein. 3,889,446, Cl. 53-28.000.
- Simms Group Research & Development Limited: *See—*
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- Singerman, Gary M., to Gulf Research & Development Company. Preparation of 2,1-benzisothiazoles. 3,890,340, Cl. 260-304.000.
- Sionczewski, John Casimir, to International Business Machines Corporation. Magnetic domain systems using domains having different properties. 3,890,605, Cl. 340-174.0TF.
- Sir Howard Grubb Parsons & Co., Limited: *See—*
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- Sittner, Edward H., Jr.; and Girard, Robert R., to ACF Industries, Incorporated. Brake lever system for railway cars. 3,889,783, Cl. 188-52.000.
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- Slater, Willard C., to Universal Plastic Pipe Bending Corporation. Automatic machine for bending and flaring quantities of plastic pipe. 3,890,079, Cl. 425-155.000.
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- Smith, Fred T., to Sargent Industries, Inc. Noise reduction apparatus and method. 3,889,828, Cl. 214-83.300.
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- Smith, Richard C., to Wright Manufacturing Company. Articulated two-part prosthesis replacing the ankle joint. 3,889,300, Cl. 3-1.910.
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- Smith, Robert E.; and Carter, Leroy C., to Westinghouse Electric Corporation. Bearing lubrication system. 3,890,021, Cl. 308-126.000.
- Smith, Susan L.; and Dorman, Douglas E., to Eli Lilly and Company. Leurocolombine. 3,890,325, Cl. 260-287.00R.
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- Smith, Willoughby Arthur. Coating of substrates with particle materials. 3,889,636, Cl. 118-621.000.
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  - Stevens, Douglas; Forberg, Helge O.; Jennings, Larry D.; Stephens, Frank M., Jr.; and Bowen, Francis J., 3,890,426.
  - Thomas, Onas Leon, 3,889,833.
- Spafford, Arthur R., to Worthington-CEI, Incorporated. Compressor start and warm-up control system. 3,890,063, Cl. 417-27.000.
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- Speiser, Jeffrey M., to United States of America, Navy. Bessel sequence echo-location system. 3,890,618, Cl. 343-17.10R.
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- Square D Company: *See—*
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- Stahl, Herbert, to SM Maschinenfabrik Herbert Stahl. Backing wheel for a belt grinder. 3,890,115, Cl. 51-135.00R.
- Stamicarbon, N.V.: *See—*
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- Stanley Works, The: *See—*
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- Stapfer, Christian H., to Cincinnati Milacron Chemicals Inc. Synergistic combinations of organic stabilizers for halogenated resins. 3,890,276, Cl. 260-45.75S.
- Stapp, Paul R., to Phillips Petroleum Company. Oligomerization process. 3,890,402, Cl. 260-668.00F.
- Starbuck, Herman S. Trash burner conversion unit. 3,889,611, Cl. 110-18.00R.
- Statler, Lowell E. Friction-type shock absorber. 3,889,937, Cl. 267-9.00C.
- Stauffer Chemical Company: *See—*
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  - Martin, Eugene Ray, 3,890,269.
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- Steinegger, Hans; Glauser, Walter; Rossier, Jean-Pierre; Crausaz, Rene; and Matthey-Doret, Pierre Andere, to Establissments Sim S.A. Surface grinding machine including work feed, delivery, and measurement means. 3,889,428, Cl. 51-112.000.
- Stent, Vernon Dennis; and Wright, Derek Cecil, to Creators Limited. Flexible plastics hoses. 3,890,181, Cl. 156-143.000.
- Stephen, Erwin A., to Eli Lilly and Company. Process for increasing the bulk density of salts of 2-(3-phenoxyphenyl)propionic acid. 3,890,380, Cl. 260-520.000.
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- Stevens, Douglas; Forberg, Helge O.; Jennings, Larry D.; Stephens, Frank M., Jr.; Bowen, Francis J.; Thompson, David L.; and Copenhaver, Julian V., Jr., to Southwire Company; National Steel Corporation; and Earth Sciences, Inc. Redox treatment of alunite ore. 3,890,425, Cl. 423-127.000.
- Stevens, Douglas; Forberg, Helge O.; Jennings, Larry D.; Stephens, Frank M., Jr.; and Bowen, Francis J., to Southwire Company; National Steel Corporation; and Earth Sciences, Inc. Method of treating alunite ore. 3,890,426, Cl. 423-127.000.
- Stevens, John: *See—*
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- Stevens, Peter; and Lurie, George R., to Oxy Metal Industries Corporation. Method and electrolyte for electroplating rhodium-rhenium alloys. 3,890,210, Cl. 204-43.00N.
- Stewart, James M., to Stewart Research, Inc. Suction-irrigator. 3,889,675, Cl. 128-240.000.
- Stewart Research, Inc.: *See—*
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- Steyer, William: *See—*
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- Stier, Otto; and Kuhn, Heinz, to Vollmer Werke Maschinenfabrik GmbH. Apparatus for hard facing saw blade teeth. 3,889,741, Cl. 164-332.000.
- Stigler, Joseph T., to Rostgo International Corporation. Container filling machine. 3,889,726, Cl. 141-142.000.
- Stockwell, Orville E. Beet door operator. 3,890,006, Cl. 298-23.00D.
- Stoeberl, Helmut. Moulding of shells. 3,889,918, Cl. 249-85.000.
- Stoferle, Theodor; and Bellmann, Bernhard. Fluidic system for monitoring machine tool wear during a machining operation. 3,889,520, Cl. 73-37.500.
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- Straumanis, Maris A., to Industrial Nucleonics Corporation. Noninteracting extruder control. 3,890,078, Cl. 425-141.000.
- Strecker, William V., to Peck & Hale, Inc. Adjustable link. 3,890,053, Cl. 403-44.000.
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- Stull, James T., to United States Steel Corporation. Bearing construction for idler rolls and maintenance method for idler roll bearings. 3,890,016, Cl. 308-1.00R.
- Sturm, Walter H., to Original Hanau Quarzlampen GmbH. Apparatus for controlling the absorption of dye components in a fluid. 3,890,510, Cl. 250-565.000.
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- Sun Oil Company: *See—*
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- Sutliff, Wayne N.; and Downen, Jim. Deep well drilling jar. 3,889,766, Cl. 175-297.000.
- Sutter, Melville B. Sill anchoring means. 3,889,440, Cl. 52-714.000.
- Suzuki, Fumio; Hayashi, Mamoru; Kawakami, Ikuo; Motohashi, Fujio; and Iwabuchi, Yoshiki, to Nissan Chemical Industries, Ltd. Certain thiazoles containing phosphorus acid esters. 3,890,336, Cl. 260-302.00E.
- Suzuki, Takashi; and Tachimoto, Kazuo, to Mitsubishi Kizoku Kabushiki Kaisha. Continuous process for refining sulfide ores. 3,890,139, Cl. 75-74.000.
- Suzuki, Takeshi; Tanaka, Hiroshi; and Akiyama, Masanori, to Tokyo Shibaura Electric Co., Ltd. Method for making electroluminescent screens for color cathode-ray tubes of continuous phosphor stripes. 3,890,151, Cl. 96-36.100.
- Suzuki, Yasuzo: *See—*
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- Swearingen, Judson S. Process and apparatus for low temperature refrigeration. 3,889,485, Cl. 62-54.000.
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- Takagi, Kazumi; and Matsuda, Teruo, to Sumitomo Chemical Co., Ltd. Method for producing isoprene. 3,890,404, Cl. 260-681.000.
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- Takamatsu, Ikuo, to Yoshida Kogyo Kabushiki Kaisha. Apparatus for applying sliders to a slide fastener chain. 3,889,341, Cl. 29-207.5SL.
- Takase, Mituo, to Hitachi, Ltd. Hydraulic turbine operating method and apparatus. 3,890,059, Cl. 415-1.000.
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- Takeda, Yasutsugu, to Hitachi, Ltd. Complex light spatial modulator. 3,890,035, Cl. 350-150.000.
- Takeshita, Yasuhiro; Uoi, Michitake; Hirai, Yoshiyuki; and Uchiyama, Mitsuru, to Idemitsu Kosan Co. Ltd. Reversibly crosslinked polymers. 3,890,253, Cl. 260-2.00A.
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- Tanaka, Akira, to Nihon Denshi Kabushiki Kaisha. Thermal emission type electron gun. 3,890,533, Cl. 315-31.00R.
- Tanaka, Hiroshi: *See—*
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- Tanaka, Hisayuki; Wada, Yukio; and Shiba, Seiichro, to Matsushita Electric Works, Ltd. Electric hair dryer with spray. 3,889,693, Cl. 132-9.000.
- Tanzilli, James D.; and Korney, Arthur F., to B. F. Goodrich Company, The. Weather resistant polyvinyl chloride compounds and method of making same. 3,890,268, Cl. 260-42.290.
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- Tarmann, Bruno; and Knorr, Johann, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Continuous casting plant. 3,889,740, Cl. 164-274.000.
- Taub, David, to Merck & Co., Inc. Loweralkyl esters of 3β-[tri(lower alkyl)silyloxy]-2α-(3-oxo or hydroxy-1-octenyl)-5-oxo-1β-cyclopentane-heptanoic acid, 5-cyclic ethylene acetal. 3,890,351, Cl. 260-340.900.
- Tausch, Gilbert H., to Perry R. Bass, Inc.; and Sid W. Richardson Foundation, part interest to each. Apparatus for installing and removing flow control devices from a mandrel having one or more pockets. 3,889,748, Cl. 166-117.500.
- Tawfik, David A., to Bendix Corporation, The. Window trip monitor and comparator circuit. 3,890,575, Cl. 328-146.000.
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- Teach, Eugene G., to Stauffer Chemical Company. Herbicidal method employing meta-anilide urea compounds. 3,890,133, Cl. 71-99.000.
- Teach, Eugene G., to Stauffer Chemical Company. Phenoxy acetals and their utility as herbicides. 3,890,134, Cl. 71-100.000.
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- Telang, Yeshwant P.; and Uy, James C., to Ford Motor Company. Coating for rotary engine rotor housings and method of making. 3,890,069, Cl. 418-178.000.
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- Terashima, Toshikatu, to Nakajima All Kabushiki Kaisha. Typewriter platen releasing mechanism having an elastically deformable gear disc. 3,889,794, Cl. 197-123.000.
- Terry, Rupert Douglas, to Johns-Manville Corporation. Method and apparatus for applying a cover to a conduit. 3,890,182, Cl. 156-187.000.
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- Thomas, Hans Peter; and Buchner, Heinrich, to Klockner-Humboldt-Deutz AG. Device for thermically treating granular and/or lumpy materials. 3,889,393, Cl. 34-167.000.
- Thomas, Hans Robert; and Eril, Wolfgang, to Hueck and Cie. Printing unit for selective indirect intaglio and flexographic printing. 3,889,596, Cl. 101-154.000.
- Thomas, Jess W., to United States of America, Energy Research and Development Administration. Noble gas absorption process. 3,890,121, Cl. 55-62.000.
- Thomas, Onas Leon, to Southwire Company. Personnel safety platform for forklift. 3,889,833, Cl. 214-620.000.
- Thomas, Robert E., to John Graves and Associates Incorporated. Display standard. 3,889,409, Cl. 40-11.00A.
- Thomas, Robert E., to John Graves and Associates Incorporated. Display standard. 3,889,410, Cl. 40-11.00A.
- Thomas, Walter B., to Koppers Company, Inc. Wheel and bearing assembly. 3,890,020, Cl. 308-16.000.
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- Thornton, Roy F., to General Electric Company. Method of forming a high surface area metallic cadmium powder and an electrode therefrom. 3,890,159, Cl. 136-24.000.
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- Tiffany, Thomas O.; Walker, William A.; and Johnson, Wayne F., to United States of America, Energy Research and Development Administration. Collection ring for use in multiple-sample blood fractionation centrifugal rotors. 3,890,101, Cl. 23-259.000.
- Tillson, Robert S., to General Electric Company. Rejection type fuse holder. 3,890,032, Cl. 339-258.00F.
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- Tischlinger, Edward A., to MPL, Inc. Method of assembling a glass tube and thermoplastic resin, finger grip and nose sleeve syringe body assembly. 3,889,351, Cl. 29-447.000.
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- Tobey, Hubert E.; Hood, John W.; and Irvin, Dee L., to International Telephone and Telegraph Corporation. Channeling conveyor. 3,889,548, Cl. 74-395.000.
- Tobin, John H., to Olin Corporation. Bromination with trifluoromethylbromide. 3,890,326, Cl. 260-290.0HL.
- Tokyo Ohka Kogyo Co., Ltd.: *See—*
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- Toman, Donald J.; and Coulter, J. Roland, to Tull Aviation Corporation. Method and apparatus for modulation synthesis. 3,890,620, Cl. 343-108.00R.
- Tombs, Terence Leslie, to Joseph Lucas (Industries) Limited. Spark ignition plug. 3,890,518, Cl. 313-130.000.
- Tomco Plastic Inc.: *See—*
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- Tomisawa, Norio; Uchiyama, Yasuji; Okumura, Takatoshi; and Takeda, Toshio, to Nippon Gakki Seizo Kabushiki Kaisha. Waveform producing device. 3,890,602, Cl. 340-173.00R.
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- Torme, Melvin H. Book support rack. 3,889,914, Cl. 248-445.000.
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- Tuttle, Herman L. Multiple-lock securing system. 3,889,497, Cl. 70-14.000.
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- Vogt, Wilhelm; Fischer, Edgar; and Auer, Eberhard, to Hoechst Aktiengesellschaft. Process for making poly-alpha-oxyacrylic acid and its alkali metal salts. 3,890,288, Cl. 260-80.00P.
- Vogt, Wilhelm; Auer, Eberhard; Lenz, Gunter; Merkenich, Karl; and Henning, Klaus, to Hoechst Aktiengesellschaft. Alpha-hydroxyacrylic acid/acrylic acid-copolymers and a process for making them. 3,890,291, Cl. 260-80.30R.
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- Wagstaff, Robert A.; and Pedersen, Poul K., to Sperry Rand Corporation. Apparatus to control both the operation of a cutting reel and the grinding mechanism of a forage harvester. 3,889,887, Cl. 241-101.200.
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- Walker, Fred M. Carton opener. 3,889,367, Cl. 30-2.000.
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- Waller, Jack Douglas; Limmer, Bobby Lee; and Sandlin, Felix M. Cryosurgical spraying apparatus. 3,889,681, Cl. 128-303.100.
- Wallin, Jan Olof Wilhelm, to PX Petrocontrol AB. Float-controlled valve. 3,889,706, Cl. 137-172.000.
- Walters, Ratus W. Floor stand support and bracing system. 3,889,910, Cl. 248-122.000.
- Wang, Gunnar, to Eastman Kodak Company. Dye laser excited by a diode laser. 3,890,578, Cl. 331-94.50L.
- Wanner, Karl; Karl, Hubertus; Hansel, Gernot; Bleicher, Manfred; and Schmid, Wolfgang, to Robert Bosch G.m.b.H. Torque-transmitting safety coupling. 3,889,491, Cl. 64-29.000.
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- Webster, John David, to English Clays Lovering Pochin & Company Limited. Joints for protectively lined or coated metal pipe sections. 3,890,483, Cl. 219-92.000.
- Webster, Peter R.: *See—*
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- Weier, Richard M., to G. D. Searle & Co. 7α-carbam oyl-17-hydroxy-3-oxo-17α-pregn-4-ene-21-carboxylic acid γ-lactone and related compounds. 3,890,304, Cl. 260-239.570.
- Weigl, James, to Puritan-Bennett Corporation. Respiration rate control system. 3,889,669, Cl. 128-145.800.
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- Weiland, Rolf-Jurgen, to Siemens Aktiengesellschaft. Adjustable dental chair. 3,889,998, Cl. 297-217.000.
- Weintraub, Philip M.: *See—*
  - Grunwell, Joyce F.; Johnston, John O.; Petrow, Vladimir; and Weintraub, Philip M., 3,890,356.
- Weirich, Walter; and Rosenberg, Harry, to Gewerkschaft Eisenhutte Westfalia. Mine roof support chocks. 3,889,481, Cl. 61-45.00D.

- Weiss, Donald Eric; and Battaerd, Hendrik Adriaan Jacobus, to Commonwealth Scientific and Industrial Research Organisation and Imperial Chemical Industries of Austrailia and New Zealand Limited. Process for controlling surface pollutants. 3,890,224, Cl. 210-30.000.
- Weisse, Guenther K.; Hooks, Haywood, Jr.; Hyde, Gene A.; and Trotz, Samuel I., to Olin Corporation. Hair and antiseptic formulations containing adducts of bis-(2-pyridyl-1-oxide) disulfide. 3,890,434, Cl. 424-70.000.
- Weissmann, Gerd; and Kuebel, Edgar, to Bayer Leichtmetallwerk-Graf Bluecher von Wahlstatt KG. Metallic sintering powder or alloy. 3,890,105, Cl. 29-182.700.
- Welch, Joseph T., to Becton, Dickinson and Company. Plasma separator — cord stop type. 3,890,237, Cl. 210-516.000.
- Welch, Verlon; and Hinton, Dreama B. Legislative board game apparatus. 3,889,955, Cl. 273-134.00D.
- Weldstow Limited: *See—*
  - Tyas, Trevor, 3,889,326.
- Wellman, Ellis M.; and Moreiras, Luis, to Weatherhead Company, The. Internal combustion engine liquid cooling system. 3,889,879, Cl. 237-12.30B.
- Welsh, James W., to Hughes Aircraft Company. Structural panel bent from laminated honeycomb. 3,890,108, Cl. 29-191.400.
- Wendt, Michael E., to General Electric Company. Plastic orifice inlet extension means. 3,889,988, Cl. 285-239.000.
- Wennerstrom, Carl G. Extensible crane. 3,889,818, Cl. 212-55.000.
- Werner, Lincoln Harvey, to Ciba-Geigy Corporation. Aminoalkyl-spirocycloalkanes. 3,890,330, Cl. 260-295.50S.
- West Electric Company, Ltd.: *See—*
  - Iwata, Hiroshi, 3,890,536.
  - Iwata, Hiroshi; Sawada, Yasunori; and Yamaoka, Tetsuo, 3,890,538.
- West, Emery L.: *See—*
  - Roller, William G.; and West, Emery L., 3,889,625.
- West, Lynn Parker: *See—*
  - Haas, Lee C.; and West, Lynn Parker, 3,890,460.
- West, Thomas G., to General Electric Company. Regulated power supply utilizing a halfwave switch. 3,890,562, Cl. 323-14.000.
- Westermann, William S. Apparatus for trimming and removing the flashing from phonograph records. 3,889,563, Cl. 83-124.000.
- Western Electric Company, Incorporated: *See—*
  - Shaffer, John Richard, 3,889,506.
- Western Titanium N.L.: *See—*
  - Hockin, Harry William, 3,890,138.
- Westford, Grimes. Trailer hitch connection protector. 3,889,981, Cl. 280-507.000.
- Westinghouse Air Brake Company: *See—*
  - Coiner, Ronald W., 3,890,013.
  - Grundy, Reed H., 3,890,577.
- Westinghouse Brake & Signal Co. Ltd.: *See—*
  - Melling, William Gordon; Stevens, John; McLellan, Peter George; Smith, Brian Turton; Massey, Richard Gascoine; Knight, John Barrington; and Lang, Robert Nigel, 3,890,556.
- Westinghouse Electric Corporation: *See—*
  - Dunsworth, William K.; and Geil, Fred G., 3,890,613.
  - Patel, Himanshu M.; and Dimmick, George D., 3,890,527.
  - Smith, Robert E.; and Carter, Leroy C., 3,890,021.
- Westlund, Charles G.: *See—*
  - Boehringer, Wilfred E.; Little, Jane; Rothi, Robert D.; and Westlund, Charles G., 3,890,064.
- Wharton, Franklin Eugene, to McDonald, William F., a part interest. Can crusher. 3,889,587, Cl. 100-98.00R.
- Wheeler, Henry D.: *See—*
  - Wheeler, Robert P.; Wheeler, Jeffrey P.; and Wheeler, Henry D., 3,889,402.
- Wheeler, Jeffrey P.: *See—*
  - Wheeler, Robert P.; Wheeler, Jeffrey P.; and Wheeler, Henry D., 3,889,402.
- Wheeler, Robert P.; Wheeler, Jeffrey P.; and Wheeler, Henry D. Shrub baller with articulated digger support members. 3,889,402, Cl. 37-2.00R.
- Whetzel, Grace Eva. Doll with removable wig. 3,889,414, Cl. 46-172.000.
- Whirlpool Corporation: *See—*
  - Davis, Rodney L.; Cronk, Don Ray; and Hansen, Carl C., 3,889,392.
- White, David B., to E. S. & A. Robinson (Canada) Ltd. Recloseable flexible bag. 3,889,871, Cl. 229-65.000.
- White, Eugene W.; Weber, Jon N.; and White, Rodney A., to Research Corporation. Materials useful for prosthetic devices and the like. 3,890,107, Cl. 29-183.000.
- White, Max A. Trailer hitch guide. 3,889,384, Cl. 33-264.000.
- White, Robert J., to Chevron Research Company. Catalytic hydrogen manufacture. 3,890,432, Cl. 423-655.000.
- White, Rodney A.: *See—*
  - White, Eugene W.; Weber, Jon N.; and White, Rodney A., 3,890,107.
- White, William Paul, to United Kingdom Atomic Energy Authority. Openwork conveyor belting. 3,889,803, Cl. 198-189.000.
- Whitin Machine Works, Incorporated: *See—*
  - Kieronski, John P.; and Keon, Richard F., 3,889,311.
- Whitt, Delbert K., to Pete Whitt, Inc. Texture and acoustic spraying equipment. 3,889,850, Cl. 222-135.000.
- WIBAU (Westdeutsche Industrie-und Strassenbaumaschinen-Gesellschaft m.b.H.): *See—*
  - Bender, Horst, 3,889,713.
- Widdowson, Neville Bruce; and Cullingford, Christopher Varndell, to Lucas Electrical Company Limited, The. Pulse producing devices. 3,890,516, Cl. 310-111.000.
- Widmer, Werner, to Societe Genevoise d'Instruments de Physique. Apparatus for controlling the feeler displacement of an electronic dimensional. 3,889,540, Cl. 73-432.00A.
- Wiechert, Rudolf: *See—*
  - Eder, Ulrich; Haffer, Gregor; Ruppert, Jurgen; Sauer, Gerhard; and Wiechert, Rudolf, 3,890,391.
- Wiechowski, Joseph W.; Miller, Delmar S.; and Kostner, Richard C., to Poly-Trusions, Inc. Oil well pumping system having reinforced plastic sucker rod. 3,889,579, Cl. 92-3.000.
- Wieland, Peter, to Ciba-Geigy Corporation. Process for the introduction of fluorine into the 21-position of 20-oxo-steroids. 3,890,303, Cl. 260-239.55D.
- Wiese, Winfred J., to Borg-Warner Corporation. Cooling seal. 3,889,960, Cl. 277-81.000.
- Wightman, Lawrance W.; Gebhart, Howard C.; and Tichy, Nick, to Emerson Electric Co. Open coil heater having spaced end coils. 3,890,487, Cl. 219-532.000.
- Wiklund, Olof Bruno, to Sunds Aktiebolag. Binding machine. 3,889,584, Cl. 100-26.000.
- Wilchester, Harry L.: *See—*
  - Dycus, Dale W.; Malmberg, Earl W.; and Wilchester, Harry L., 3,890,239.
- Wilcox, Gale F.: *See—*
  - Mohr, Robert G.; Hodges, Ronald R.; Hockenberry, Jack; Scheerhorn, Douglas; and Wilcox, Gale F., 3,890,023.
- Wildt Mellor Bromley Limited: *See—*
  - Farmer, Ernest Leonard; and Ecob, Osmond Herbert, 3,889,493.
- Wilfert, Karl; and Barenyi, Bela, to Daimler-Benz Aktiengesellschaft. Motor vehicle, especially passenger motor vehicle. 3,889,968, Cl. 280-111.000.
- Wilger, John F.; Uyetake, Tadao S.; and Lai, Clifford Y. C., to United States of America, Navy. Pipe closure apparatus. 3,889,714, Cl. 138-89.000.
- Wilkerson Corporation: *See—*
  - Vander Horst, John; Hounshell, Robert F.; and Dunn, Myron, 3,889,484.
- Wilkins, John B. Plastic containers. 3,889,732, Cl. 150-48.000.
- Wilkinson Sword Limited: *See—*
  - Jones, Frederick O., 3,890,109.
- Williams, Cecil E. Compact rotary-housing incinerator and steam generator. 3,889,610, Cl. 110-10.000.
- Williams, Malcolm; Brunt, Geoffrey Albert Kenyon; and Jones, Christopher Robin, to C.A.V. Limited. Fuel systems for engines. 3,889,648, Cl. 123-139.00E.
- Williamson, George. Automatic bale stooker. 3,889,823, Cl. 214-6.00B.
- Willis, Frank Marsden: *See—*
  - Simmons, Walter John; and Willis, Frank Marsden, 3,889,446.
- Willis, Frederick Gordon, to Mars, Inc. Energy absorbing device for coin handling mechanisms and the like. 3,889,792, Cl. 194-1.00K.
- Wilson, Donald James: *See—*
  - Kenyon, Derek; and Wilson, Donald James, 3,889,457.
- Wilson, Michael C., to Pretty Products, Inc. Dish drainer having integrally hinged sidewalls. 3,889,837, Cl. 220-7.000.
- Wiltron Company: *See—*
  - Bauer, Paul R.; and Dunwoodie, Duane E., 3,890,495.
- Wingardh, Uno, to Sprinter Pack AB. Method of forming a container with lid for liquids, especially carbonized beverages. 3,889,443, Cl. 53-14.000.
- Winsor, Ronald D.: *See—*
  - Loeffler, Robert L.; and Winsor, Ronald D., 3,889,452.
- Witkoski, Edward J.: *See—*
  - Insolio, Thomas A.; Kozyrski, Vincent T.; and Witkoski, Edward J., 3,889,862.
- Witzig, Armin: *See—*
  - Frank, Rudolf; Witzig, Karl Emil; and Witzig, Armin, 3,889,555.
- Witzig, Karl Emil: *See—*
  - Frank, Rudolf; Witzig, Karl Emil; and Witzig, Armin, 3,889,555.
- Wohrer, Luis C.: *See—*
  - Economy, James; Frechette, Francis J.; Lin, Ruey Y.; and Wohrer, Luis C., 3,890,262.
- Wojtowicz, John A.; and Bhutani, Sudhir K., to Olin Corporation. Ethanolysis of 3-trichloromethyl-5-chloro-1,2,4-thiadizole employing aqueous base. 3,890,338, Cl. 260-302.00D.
- Woldring, Sabbo, to General Electric Company. Open circuit system for respiration testing. 3,889,672, Cl. 128-208.000.
- Wolf-Gerate GmbH: *See—*
  - Achenbach, Dieter; and Siegfried, Joswig, 3,889,373.
- Wolf, Hans: *See—*
  - Jeger, Oskar; Wolf, Hans; and Zink, Markus, 3,890,395.
- Wolf, Rainer: *See—*
  - Mayerhoefer, Horst; Mueller, Wolfgang; Soliberger, Urs; and Wolf, Rainer, 3,890,409.
- Wolfe, Homer O., Jr.: *See—*
  - Davis, Frank H.; Wolfe, Homer O., Jr.; and Clapp, Billy D., 3,889,444.
- Wolfe, James Richard, Jr., to du Pont de Nemours, E. I., and Company. Thermoplastic copolyester elastomer. 3,890,279, Cl. 260-75.00R.
- Wollersheim, Philip. Material compacting device. 3,889,588, Cl. 100-177.000.
- Wolt, John, to International Flavors & Fragrances Inc. Novel process for producing 2-acyl-3-alkyl pyrazines. 3,890,320, Cl. 260-250.00B.

- Wood, David, to Masson Scott Thrissell Engineering Limited. Apparatus for ejecting stacks of articles from containers. 3,889,824, Cl. 214-6.00H.
- Wood, Hamish Christopher Swan; Stuart, Alexander; Curran, Adrian Charles Ward; and Al-hassan, Saieba, to Burroughs Wellcome Co. 3-Amino-3-methyl-2-hydroxy-iminobutan-1-ol and salts thereof. 3,890,387, Cl. 260-566.00A.
- Wood, Louis Leonard; and Frisch, Kurt Charles, to W. R. Grace & Co. Method for preparing horticultural foam structures. 3,889,417, Cl. 47-58.000.
- Worobey, Walter: *See—*
  - Pfahnl, Arnold; and Worobey, Walter, 3,890,177.
- Worthington-CEI, Incorporated: *See—*
  - Spafford, Arthur R., 3,890,063.
- Wright, Derek Cecil: *See—*
  - Stent, Vernon Dennis; and Wright, Derek Cecil, 3,890,181.
- Wright, Donald Curtis: *See—*
  - Melling, Richard; Wright, Donald Curtis; and Pickup, John, 3,890,128.
- Wright Manufacturing Company: *See—*
  - Smith, Richard C., 3,889,300.
- Wright, Thomas C., to Vistron Corporation. Merchandise display stand. 3,889,813, Cl. 211-13.000.
- Wuest, Hans: *See—*
  - Buchi, George H.; and Wuest, Hans, 3,890,370.
- Wunsch, Heinz, to Carl Still, Firma. Apparatus for facilitating the withdrawal of gases from a gas filled chamber such as a coke oven. 3,890,206, Cl. 202-254.000.
- Wurm, Jaroslav: *See—*
  - Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., 3,889,742.
- Xerox Corporation: *See—*
  - Krayer, Harry J., III, 3,889,943.
  - Monahan, Alan R., 3,890,147.
  - North, Arthur J.; and Stover, Raymond W., 3,889,637.
  - Schmidlin, Fred W., 3,890,040.
- Xonics, Inc.: *See—*
  - Balser, Martin, 3,889,533.
- Yabu, Toshiomi, to Matsushita Electric Industrial Co., Ltd. Step driven magnetic recording and reproducing apparatus. 3,890,640, Cl. 360-50.000.
- Yamada, Toshio: *See—*
  - Shigeta, Toshihiko; Yamada, Toshio; Sasame, Takao; and Uebayashi, Yoshitaka, 3,890,209.
- Yamakoshi, Noboru; Minami, Toshihiro; and Somekawa, Sinitiro, to Kobe Steel, Ltd. Hot forging process. 3,889,510, Cl. 72-364.000.
- Yamamoto, Hideaki: *See—*
  - Hirai, Tadaaki; Maruyama, Eiichi; Inao, Kiyohisa; Yamamoto, Hideaki; Goto, Naohiro; Isozaki, Yukinao; Shidara, Keiichi; and Uchida, Teruo, 3,890,525.
- Yamamoto, Hisao; Inaba, Shigeho; Sasajima, Kikuo; Nakao, Masaru; Maruyama, Isamu; Ono, Keiichi; and Katayama, Shigenari, to Sumitomo Chemical Co., Ltd. Phenylketone derivatives. 3,890,323, Cl. 260-268.00R.
- Yamamoto, Isamu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor element envelope. 3,890,637, Cl. 357-74.000.
- Yamanouchi, Kenzo: *See—*
  - Ikegami, Yoshizo; and Yamanouchi, Kenzo, 3,890,463.
- Yamaoka, Tetsuo: *See—*
  - Iwata, Hiroshi; Sawada, Yasunori; and Yamaoka, Tetsuo, 3,890,538.
- Yamauchi, Kenji: *See—*
  - Oishi, Ryota; Mito, Yotaka; Yamauchi, Kenji; Takahashi, Katsuyuki; and Hirata, Kazushi, 3,890,433.
- Yanagisawa, Isao: *See—*
  - Ohara, Takashi; Ninomiya, Michikazu; Yanagisawa, Isao; Ueshima, Michio; and Takata, Masahiro, 3,890,248.
- Yankee, Herbert L.; and Hlavaty, Robert J., to Colt Industries Operating Corp. Hardening coating for thread rolling dies. 3,889,516, Cl. 72-469.000.
- Yardley, John P.: *See—*
  - Foell, Theodore J.; and Yardley, John P., 3,890,437.
- Yasukawa, Hideaki; and Naito, Okito, to Kabushiki Kaisha Suwa Seikosha. Method and apparatus for correcting time in an electronic wristwatch. 3,889,460, Cl. 58-23.00R.
- Yoakam, Raymond J.: *See—*
  - Jones, Chester L. M.; Yoakam, Raymond J.; Hazar, Mitchell M.; and Dillon, Alfred J., 3,889,904.
- York, Lyle E.: *See—*
  - Blomstrom, Gary D.; Piepho, Donald A.; Randour, Victor; and York, Lyle E., 3,889,769.
- Yoshida Kogyo Kabushiki Kaisha: *See—*
  - Takamatsu, Ikuo, 3,889,341.
- Yoshihara, Takahisa: *See—*
  - Harada, Shunichi; and Yoshihara, Takahisa, 3,890,[illegible]4.
- Yoshikawa, Mitsuhiro: *See—*
  - Watanabe, Rokuro; and Yoshikawa, Mitsuhiro, 3,890,524.
- Yoshimura, Syoichiro, to Nippon Electric Company, Limited. Flat-article sorting apparatus for an automatic mail handling system and the like. 3,889,811, Cl. 209-74.00M.
- Yoshio, Kuramoto; and Toshio, Kobori, to Minolta Camera Kabushiki Kaisha. Long-time exposure apparatus for camera. 3,890,625, Cl. 354-51.000.
- Yoshitake, Norito; Usami, Hiroshi; Kobori, Katsuo; Ishida, Hiroshi; and Fujioka, Yoshiki, to Fujitsu Limited and Fujitsu Fanuc Limited. System for driving a pulse motor. 3,890,554, Cl. 318-696.000.
- Young, Dean Arthur, to Union Oil Company of California. Hydrocracking catalyst. 3,890,247, Cl. 252-455.00Z.
- Young, Richard H. Stud removing tool. 3,889,557, Cl. 81-53.200.
- Youngelson, Harold: *See—*
  - Sinclair, Brett Jason; and Youngelson, Harold, 3,889,554.
- Yukuta, Toshio; Ohashi, Takashi; and Oguri, Yoshiko, to Bridgestone Tire Company Limited. Method of producing aldehyde functional multi-component copolymers. 3,890,293, Cl. 260-80.780.
- Yukuta, Toshio: *See—*
  - Ohnishi, Akira; Yukuta, Toshio; Fujio, Ryota; Ishida, Yozo; Kambara, Shu; and Kojima, Minoru, 3,890,284.
- Zacharias, Ellis M., Jr., to Nusonics, Inc. Electroacoustic transducer assembly. 3,890,423, Cl. 310-8.300.
- Zahradka, Pavel; Petranek, Milan; and Hrabanek, Jiri, to Elitex, Zavody textilniho strojirenstvi, generalni reditelstvi. Method of securing courses on double cylinder knitting machines. 3,889,492, Cl. 66-14.000.
- Zatkin, Allen M. Crown removing device. 3,889,376, Cl. 32-41.000.
- Zax, Mikhail Isaakovich: *See—*
  - Bogdanov, Georgy Yakovlevich; Deminsky, Jury Andreevich; Zax, Mikhail Isaakovich; and Tsygankov, Jury Viktorovich, 3,890,557.
- Zegel, Snyder M. Teaching aid for accounting. 3,889,395, Cl. 35-24.00R.
- Zehring, Robert B.; Kinninger, Richard W.; and Miller, Allan W., to General Motors Corporation. Hydraulic shock absorber unit. 3,889,787, Cl. 188-317.000.
- Zeitlin, Wolf. Wheeled accessories for suitcases. 3,889,965, Cl. 280-47.13R.
- Zeitlin, Wolf. Wheeled accessory for suit cases. 3,889,966, Cl. 280-47.13R.
- Zellweger AG: *See—*
  - Ploeckl, Johann, 3,890,034.
- Zellweger, Ltd.: *See—*
  - Felix, Ernst, 3,890,489.
- Zenith Radio Corporation: *See—*
  - Hill, Monty; and Uthene, Curtis, 3,890,464.
  - Palac, Kazimir, 3,890,526.
- Ziegler, Richard E.: *See—*
  - Hendrix, Donald E.; Ziegler, Richard E.; and Swinson, Weldon E., 3,890,062.
- Ziegler, Robert J.: *See—*
  - Lieberman, Hillel; and Ziegler, Robert J., 3,890,295.
- Zimin, Vladimir Anatolievich: *See—*
  - Fain, Pavel Ioelievich; Zimin, Vladimir Anatolievich; Strashun, Aron Zakharovich; Isupova, Tamara Ivanovna; Pankratov, Alexandr Ivanovich; and Romanov, Georgy Ivanovich, 3,890,457.
- Zimmerman, Jessie G.: *See—*
  - Snider, Robert T.; and Zimmerman, Jessie G., 3,889,413.
- Zimmermann, Gunter J. Vertical deflection circuit for television receivers. 3,890,542, Cl. 315-389.000.
- Zingarelli, Dino, to Martin Wells Pty. Ltd. Spectacle frames with removable tinted lenses. 3,890,037, Cl. 351-47.000.
- Zink, Markus: *See—*
  - Jeger, Oskar; Wolf, Hans; and Zink, Markus, 3,890,395.
- Zirngiebl, Eberhard, to Bayer Aktiengesellschaft. Process for recovering energy from the decomposition of amalgam in the electrolysis of alkali metal chlorides. 3,890,211, Cl. 204-99.000.
- Ziv, Avraham, to American Safety Equipment Corporation. Piggyback dual lock bar. 3,889,898, Cl. 242-107.400.
- Zoecon Corporation: *See—*
  - Henrick, Clive A.; and Siddall, John B., 3,890,398.
- Zuercher, Warren H., to Kimwood Corporation. Residue removal system for belt abrader. 3,889,429, Cl. 51-135.00R.
- Zust, Armin; Schindler, Walter, deceased; and by Gysin, Leonhard, executor, to CIBA-GEIGY Corporation. Imidazolidinone derivatives in the treatment of emesis and psychosomatic disturbances. 3,890,439, Cl. 424-250.000.
- Zweekly, Raymond Tibor, to Valeron Corporation, The. Lateral lock indexable insert cutting tool. 3,889,330, Cl. 29-96.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF JUNE, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Aereon Corp. : *See—*
  - Fitzpatrick, John R., and Bock. Re. 28,454.
- Bock, Juergen K. : *See—*
  - Fitzpatrick, John R., and Bock. Re. 28,454.
- Fitzpatrick, John R., and J. K. Bock, to Aereon Corp. Airship. Re. 28,454, 6–17–75, Cl. 244—25.
- Plaste Co., Inc. : *See—*
  - Sandow, Kiyoshi. Re. 28,453.
- Sandow, Kiyoshi, to Plaste Co., Inc. Heat and Smoke Vent. Re. 28,453, 6–17–75, Cl. 52—232.

LIST OF PLANT PATENTEES

- Dearing, Ellis H., ½ interest to Otto D. Terrell. Four leaf clover plant. 3,730, 6–17 ?75, Cl. 88.
- Fischer, Carl H., to Selected Glads, Inc. Gladiolus. 3,732, 6–17–75, Cl. 85.
- Selected Glads, Inc. : *See—*
  - Vincent, Harold and H. J. 3,731.
  - Fischer, Carl H. 3,732.
- Terrell, Otto D. : *See—*
  - Dearing, Ellis H. 3,730.
- Vincent, Harold and H. J., to Selected Glads, Inc. Gladiolus. 3,731, 6–17–15, Cl. 85.
- Vincent, Herbert J. : *See—*
  - Vincent, Harold and H. J. 3,731.

LIST OF DESIGN PATENTEES

- Armbruster, John T., to American Optical Corp. Microscope stand. 235,478, 6–17–75, Cl. D57—1.
- Amerace Corp. : *See—*
  - May, Joseph R., and Morgan. 235,432.
  - May, Joseph R., and Morgan. 235,433.
- American Optical Corp. : *See—*
  - Armbruster, John T. 235,478.
- Amerock Corp. : *See—*
  - Tegner, Raymond U. H., and Johnson. 235,397.
  - Tegner, Raymond U. H. 235,398.
  - Tegner, Raymond U. H., and Johnson. 235,401.
- Amstutz, Harlan C. Femoral hip prosthesis. 235,485, 6–17–75, Cl. D83—1.
- Ashflash, Corp., The : *See—*
  - Squardra, John H. 235,471.
- Baro, Carmen : *See—*
  - Baro, Mario and Carmen. 235,484.
- Baro, Mario and Carmen. Inhalator. 235,484, 6–17–75, Cl. D83—1.
- Baughman, Karl T., to Sears, Roebuck and Co. Portable typewriter. 235,480, 6–17–75, Cl. D64—11.
- Binder, Joseph, and C. Palestini, to The Bohack Corp. Store building facade. 235,437, 6–17–75, Cl. D13—1.
- Blumenfeld, Michael J., to Comar Athletic Enterprises, Inc. Athletic shoe. 235,392, 6–17–75, Cl. D2—311.
- Bobrick, Mitchell, M. Evenson, M. M. Buzan, and M. L. Quin; said Quin and Buzan assignors to Emerson Electric Co. Combined reading and examination light and support therefor. 235,470, 6–17–75, Cl. D48—20.
- Bohack Corp., The : *See—*
  - Binder, Joseph, and Palestini. 235,437.
- Boucher, Richard A. : *See—*
  - Swett, James B., and Boucher. 235,402.
  - Swett, James B., and Boucher. 235,404.
- Brody, Ernest O., to Lancaster Colony Corp. Basket for flowers or the like. 235,420, 6–17–75, Cl. D9—247.
- Brown, Dwight C. Hinged skirt and trouser hanger. 235,403, 6–17–75, Cl. D6—252.
- Brown, Eugene. Standard and bracket combination. 235,400, 6–17–75, Cl. D6—114.
- Brown, Gordon M., to General Motors Corp. Door for an automobile. 235,429, 6–17–75, Cl. D12—196.
- Brown, Lester, F. J. Burg, R. Dzielonski, and M. Lax, to Salton, Inc. Temperature measuring spoon. 235,405, 6–17–75, Cl. D7—50.
- Brunswick Corp. : *See—*
  - Miller, Karl E. 235,442.
- Burg, Ferderick J. : *See—*
  - Brown, Lester, Burg, Dzielonski, and Lax. 235,405.
- Buzan, Morris M. : *See—*
  - Bobrick, Mitchell, Evenson, Buzan, and Quin. 235,470.
- Campbell, Laurie J. : *See—*
  - Terzian, Rouben T., Dunn, and Campbell. 235,459.
- Carl Mfg. Co., Ltd. : *See—*
  - Mori, Chuzo. 235,425.
- Caron International Inc. : *See—*
  - Somen, Alta M. 235,391.
- Chapman, David. Vaporizer humidifier. 235,450, 6–17–75, Cl. D23—148.
- Comar Athletic Enterprises, Inc. : *See—*
  - Blumenfeld, Michael J. 235,392.
- Daenen, Robert, to Dart Industries, Inc. Combined food storage and serving dish. 235,406, 6–17–75, Cl. D7—76.
- Dart Industries, Inc. : *See—*
  - Daenen, Robert. 235,406.
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CLASSIFICATION OF PATENTS

ISSUED JUNE 17, 1975

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53.5	3,889,482
72.6	3,889,478
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456	3,889,502
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92	3,890,132
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212	3,889,536
213	3,889,537
422GC	3,889,538
425.4R	3,889,539
432A	3,889,540
460	3,889,541
	3,889,542
CLASS 74	
88	3,889,543
89.15	3,889,544
231M	3,889,545
234	3,889,546
336	3,889,547
395	3,889,548
409	3,889,549
443	3,889,550
469	3,889,551
519	3,889,552
579R	3,889,553
798	3,889,554
826	3,889,555
CLASS 75	
.5BA	3,890,136
.5BB	3,890,137
33	3,890,138
74	3,890,139
84.1R	3,890,140
86	3,890,141
91	3,890,142
125	3,890,143
169	3,890,144
224	3,890,145
CLASS 76	
25A	3,889,556
CLASS 81	
53.2	3,889,557
55	3,889,558
CLASS 82	
2.5	3,889,559
CLASS 83	
4	3,889,560
58	3,889,561
94	3,889,562
124	3,889,563
174	3,889,564
255	3,889,565
708	3,889,566
818	3,889,567
CLASS 84	
1.01	3,889,568
CLASS 85	
1JP	3,889,569
68	3,889,570
CLASS 86	
1R	3,889,571
CLASS 89	
155	3,889,572
169	3,889,574
CLASS 90	
12A	3,889,575
78	3,889,573
CLASS 91	
394	3,889,576
487	3,889,577
499	3,889,578
CLASS 92	
3	3,889,579
CLASS 93	
37SP	3,889,580
CLASS 96	
1.5	3,890,146
27R	3,890,147
33	3,890,148
	3,890,149
	3,890,150
36.1	3,890,151
75	3,890,152
91D	3,890,153
125	3,890,154
137	3,890,155
CLASS 98	
115K	3,889,581
CLASS 99	
450	3,889,582
576	3,889,583
CLASS 100	
26	3,889,584
	3,889,585
53	3,889,586
98R	3,889,587
177	3,889,588
218	3,889,589
219	3,889,590
CLASS 101	
37	3,889,591
93.47	3,889,592
110	3,889,593
111	3,889,594
116	3,889,595
154	3,889,596
367	3,889,597
CLASS 102	
16	3,889,598
70.2P	3,889,599
90	3,889,600
	3,889,601
CLASS 104	
23FS	3,889,602
26R	3,889,603
32R	3,889,604
56	3,889,605
172S	3,889,606
CLASS 105	
199CB	3,889,607
CLASS 106	
19	3,890,156
89	3,890,157
271	3,890,158
CLASS 110	
8E	3,889,609
8R	3,889,608
10	3,889,610
18R	3,889,611
CLASS 112	
113	3,889,612
121.15	3,889,613
153	3,889,614
252	3,889,615
409	3,889,616
CLASS 113	
8	3,889,617
55	3,889,618
CLASS 114	
26	3,889,619
39	3,889,620
206R	3,889,621
CLASS 115	
11	3,889,622
16	3,889,623
18E	3,889,625
34R	3,889,626
42	3,889,624
CLASS 116	
114AH	3,889,627
CLASS 118	
3	3,889,628
6	3,889,629
46	3,889,630
48	3,889,631
49.1	3,889,632
68	3,889,633
325	3,889,634
421	3,889,635
621	3,889,636
637	3,889,637
CLASS 119	
1	3,889,638
2	3,889,639
75	3,889,640
CLASS 122	
32	3,889,641
264	3,889,642
CLASS 123	
8.09	3,889,643
41.77	3,889,644
45R	3,889,645
48D	3,889,646
102	3,889,647
139E	3,889,648
142	3,889,649
148E	3,889,650
	3,889,651

CLASS 124	
41	3,889,652
CLASS 125	
16R	3,889,699
CLASS 126	
110R	3,889,653
194	3,889,654
387	3,889,655
CLASS 128	
2B	3,889,657
2H	3,889,658
2R	3,889,656
2.06A	3,889,659
2.08	3,889,660
	3,889,672
6	3,889,661
	3,889,662
28	3,889,663
75	3,889,664
92R	3,889,665
127	3,889,666
132D	3,889,667
134	3,889,668
145.8	3,889,669
204	3,889,670
206	3,889,671
215	3,889,673
218M	3,889,674
240	3,889,675
246	3,889,676
278	3,889,677
284	3,889,678
287	3,889,679
303.1	3,889,680
	3,889,681
304	3,889,682
305	3,889,683
348	3,889,685
349B	3,889,686
350V	3,889,687
351	3,889,688
402	3,889,684
CLASS 131	
140P	3,889,689
185	3,889,690
267	3,889,691
CLASS 132	
7	3,889,692
9	3,889,693
53	3,889,694
	3,889,695
CLASS 134	
57R	3,889,696
95	3,889,697
CLASS 135	
2	3,889,698
19.5	3,889,700
CLASS 136	
24	3,890,159
36	3,890,160
212	3,890,161
230	3,890,162
CLASS 137	
1	3,889,701
13	3,889,702
67	3,889,703
123	3,889,704
171	3,889,705
172	3,889,706
251	3,889,707
268	3,889,708
504	3,889,709
512.15	3,889,710
599	3,889,711
625.47	3,889,712
625.48	3,889,713
CLASS 138	
89	3,889,714
117	3,889,715
129	3,889,716
131	3,889,717
CLASS 139	
1R	3,889,718
25	3,889,719
66R	3,889,720
91	3,889,721
142	3,889,722
186	3,889,723
CLASS 141	
1	3,889,724
5	3,889,725
142	3,889,726
312	3,889,727
387	3,889,728
CLASS 144	
3D	3,889,729
28.5	3,889,730
CLASS 147	
36	3,889,731
CLASS 148	
1.5	3,890,163
6.15R	3,890,165
6.2	3,890,164
6.27	3,890,166
9.5	3,890,167
24	3,890,168
175	3,890,170
187	3,890,169
CLASS 149	
19.1	3,890,171
19.6	3,890,172
19.91	3,890,173
44	3,890,174
92	3,890,175
CLASS 150	
48	3,889,732
CLASS 151	
41.73	3,889,733
CLASS 152	
158	3,889,734
210	3,889,735
CLASS 156	
2	3,890,176
7	3,890,177
8	3,890,178
53	3,890,179
71	3,890,180
143	3,890,181
187	3,890,182
193	3,890,183
244	3,890,184
299	3,890,185
332	3,890,186
345	3,890,187
384	3,890,188
433	3,890,189
521	3,890,190
541	3,890,191
571	3,890,192
582	3,890,193
622	3,890,194
CLASS 160	
135	3,889,736
CLASS 162	
387	3,890,195
CLASS 164	
34	3,889,737
49	3,889,738
82	3,889,739
274	3,889,740
332	3,889,741
CLASS 165	
7	3,889,742
46	3,889,743
83	3,889,744
151	3,889,745
155	3,889,746
CLASS 166	
.5	3,889,747
117.5	3,889,748
187	3,889,749
217	3,889,750
224A	3,889,751
307	3,889,753
CLASS 169	
59	3,889,752
	3,889,754
	3,889,755
	3,889,756
	3,889,757
74	3,889,758
CLASS 172	
3	3,889,759
175	3,889,760
706	3,889,761
CLASS 173	
139	3,889,762
162	3,889,763
CLASS 174	
83	3,890,458
101	3,890,459
CLASS 175	
69	3,889,764
257	3,889,765
297	3,889,766
CLASS 176	
78	3,890,196
	3,890,197
CLASS 177	
136	3,889,767
229	3,889,768
CLASS 178	
2C	3,890,460
5.1	3,890,461
6.8	3,890,462
	3,890,463
7.8	3,890,464
CLASS 179	
1GQ	3,890,466
1VC	3,890,467
1VL	3,890,465
6.5	3,890,468
15AL	3,890,471
15AT	3,890,469
15AW	3,890,472
15BF	3,890,470
27DB	3,890,473
107E	3,890,474
156A	3,890,475
CLASS 180	
9.5	3,889,769
14R	3,889,770
44R	3,889,771
64A	3,889,772
65R	3,889,773
104	3,889,774
118	3,889,775
CLASS 181	
50	3,889,776
CLASS 182	
6	3,889,777
17	3,889,778
223	3,889,779
CLASS 184	
1R	3,889,780
15R	3,889,781
CLASS 187	
9	3,889,782
CLASS 188	
52	3,889,783
71.4	3,889,784
73.3	3,889,785
218R	3,889,786
317	3,889,787
CLASS 191	
40	3,889,788
CLASS 192	
82T	3,889,789
85AT	3,889,790
CLASS 193	
3	3,889,791
CLASS 194	
1K	3,889,792
CLASS 195	
66R	3,890,198
80R	3,890,199
103.5R	3,890,200
127	3,890,201
	3,890,202
139	3,890,203
	3,890,204
CLASS 197	
1R	3,889,793
123	3,889,794
151	3,889,795
CLASS 198	
7	3,889,796
35	3,889,797
127	3,889,798
168	3,889,799
179	3,889,800
184	3,889,801
	3,889,802
189	3,889,803
CLASS 200	
61.62	3,890,476
83P	3,890,477
84R	3,890,478
148BV	3,890,479
150R	3,890,258
302	3,890,480
CLASS 202	
236	3,890,205
254	3,890,206
CLASS 203	
11	3,890,207
58	3,890,208
CLASS 204	
16	3,890,209
43N	3,890,210
70	3,890,214
99	3,890,211
129.2	3,890,215
158R	3,890,212
158	3,890,213
177	3,890,216
298	3,890,217
CLASS 206	
223	3,889,804
	3,889,805
	3,889,806
315	3,889,807
364	3,889,808
372	3,889,809
CLASS 208	
135	3,890,218
310	3,890,219
CLASS 209	
3	3,890,220
74M	3,889,811
76	3,889,810
111.7	3,890,221
166	3,890,222
457	3,890,223
CLASS 210	
30	3,890,224
38	3,890,225
44	3,890,226
51	3,890,227
58	3,890,228
73	3,890,229
104	3,890,289
136	3,890,290
169	3,890,230
199	3,890,231
223	3,890,232
237	3,890,233
242	3,890,234
330	3,890,235
433	3,890,236
516	3,890,237
CLASS 211	
1.5	3,889,812
13	3,889,813
27	3,889,814
41	3,889,815
43	3,889,816
163	3,889,817
CLASS 212	
55	3,889,818
94	3,889,819
CLASS 214	
1BB	3,889,820
	3,889,821
1.5	3,889,822
6B	3,889,823
6H	3,889,824
6M	3,889,825
17DA	3,889,826
77P	3,889,827
83.3	3,889,828
147G	3,889,829
152	3,889,830
340	3,889,831
514	3,889,832
620	3,889,833
CLASS 215	
10	3,889,834
CLASS 219	
69M	3,890,481
73	3,890,482
92	3,890,483
432	3,890,484
523	3,890,485
	3,890,486
532	3,890,487
CLASS 220	
3	3,889,835
5A	3,889,836
7	3,889,837
22.3	3,889,838
72	3,889,839
82A	3,889,840
200	3,889,841
253	3,889,842
332	3,889,843
359	3,889,844
CLASS 221	
70	3,889,845
79	3,889,846
265	3,889,847
CLASS 222	
58	3,889,848
63	3,889,849
135	3,889,850
146HS	3,889,851
153	3,889,852
177	3,889,853
284	3,889,854
355	3,889,855
402.13	3,889,856
CLASS 223	
32	3,889,857
35	3,889,858
CLASS 224	
8R	3,889,859
45R	3,889,860
45S	3,889,861
CLASS 225	
96.5	3,889,862
99	3,889,863
CLASS 227	
109	3,889,865
CLASS 228	
173	3,889,349
CLASS 229	
22	3,889,866
28R	3,889,867
34R	3,889,868
54R	3,889,869
55	3,889,870
63	3,889,872
65	3,889,871
72	3,889,873
CLASS 232	
35	3,889,874
CLASS 235	
61A	3,889,875
61.9A	3,890,488
92PD	3,890,489
92TF	3,890,490
101	3,890,491
151.1	3,889,876
151.33	3,890,492
153AE	3,890,493
153AK	3,890,495
153R	3,890,494
159	3,890,496
CLASS 236	
15C	3,889,877
CLASS 237	
8R	3,889,878
12.3B	3,889,879
CLASS 239	
18	3,889,880
70	3,889,881
127.3	3,889,882
679	3,889,883
CLASS 240	
7.55	3,890,497
10.66	3,890,498
CLASS 241	
24	3,889,884
46.11	3,889,885
100	3,889,886
101.1	3,889,888
101.2	3,889,887
228	3,889,889
245	3,889,890
CLASS 242	
55	3,889,891
56R	3,889,892
57.1	3,889,893
74	3,889,894
75.43	3,889,895
86	3,889,896
107.3	3,889,897
107.4	3,889,898
118.32	3,889,899
199	3,889,900
209	3,889,901
CLASS 244	
17.23	3,889,902
25	Re.28,454
42CC	3,889,903
104R	3,889,904
CLASS 246	
170	3,889,905
CLASS 248	
2	3,889,906
24	3,889,907
42	3,889,908
56	3,889,909
122	3,889,910
228	3,889,911
255	3,889,912
430	3,889,913
445	3,889,914
475B	3,889,915
CLASS 249	
59	3,889,916
64	3,889,917
85	3,889,918
141	3,889,919
151	3,889,920
161	3,889,921
CLASS 250	
201	3,890,499
211J	3,890,500
265	3,890,501
267	3,890,502
321	3,890,503
325	3,890,504
361	3,890,505
366	3,890,355
370	3,890,506
483	3,890,507
548	3,890,508
561	3,890,509
565	3,890,510
CLASS 251	
14	3,889,922
170	3,889,923
249.5	3,889,924
327	3,889,925
CLASS 252	
1	3,890,238
8.55D	3,890,239
62.1	3,890,240
62.9	3,890,241
107	3,890,242
186	3,890,243
301.1R	3,890,244
432	3,890,246
447	3,890,245
455Z	3,890,247
456	3,890,248
458	3,890,249
516	3,890,250
519	3,890,251
CLASS 254	
1	3,889,926
105	3,889,927
172	3,889,928
173B	3,889,929
CLASS 259	
4	3,889,930
96	3,889,931
191	3,889,932
CLASS 260	
2A	3,890,252
	3,890,253
2.5AQ	3,890,255
2.5DB	3,890,254
23H	3,890,259
23.7H	3,890,261
23.7R	3,890,260
28	3,890,262
28.5AS	3,890,263
29.6HN	3,890,264
33.6UB	3,890,265
37PC	3,890,266
42.18	3,890,267
42.29	3,890,268
45.75S	3,890,276
	3,890,277
45.8NE	3,890,275
45.8N	3,890,270
46.5E	3,890,269
46.5R	3,890,271
47CP	3,890,274
47UA	3,890,272
	3,890,273
47C	3,890,256
63R	3,890,278
75R	3,890,279
77.5C	3,890,281
78L	3,890,286
78P	3,890,280
78.3R	3,890,283
78.4EP	3,890,284
78.5BB	3,890,285
78.5T	3,890,282
79.3A	3,890,287
80P	3,890,288
80.3R	3,890,291
80.76	3,890,292
80.78	3,890,293
94.7N	3,890,294
97.6	3,890,295
148	3,890,257
210F	3,890,296
	3,890,298
210R	3,890,297
211.5R	3,890,299
233.3R	3,890,300
234R	3,890,301
239E	3,890,302
239.55D	3,890,303
239.57	3,890,304
240D	3,890,305
240E	3,890,306
	3,890,307
243C	3,890,309
	3,890,310
	3,890,311
	3,890,314
243D	3,890,313
247	3,890,315
	3,890,316
247.2A	3,890,318
249.5	3,890,317
250B	3,890,320
250Q	3,890,319
251R	3,890,321
268C	3,890,322
268R	3,890,323
287R	3,890,324
	3,890,325
290HL	3,890,326
293.52	3,890,329
293.55	3,890,327
293.62	3,890,328
294.8D	3,890,331
294.8G	3,890,332
295.5B	3,890,333
295.5S	3,890,330
297F	3,890,334
297R	3,890,335
302D	3,890,338
	3,890,339
302E	3,890,336
302S	3,890,337
304	3,890,340
306.7T	3,890,341
308C	3,890,342
309.2	3,890,343
	3,890,344

313.1	3,890,345
325PH	3,890,346
326.1	3,890,347
326.11R	3,890,348
326.46	3,890,349
340.5	3,890,350
340.9	3,890,351
	3,890,352
343	3,890,353
343.5	3,890,354
343.6	3,890,361
343.9	3,890,312
397.5	3,890,356
404	3,890,357
410.6	3,890,358
429R	3,890,359
453R	3,890,362
455A	3,890,363
456A	3,890,364
465D	3,890,367
465E	3,890,368
465F	3,890,366
465.8A	3,890,365
468D	3,890,369
	3,890,371
	3,890,372
468L	3,890,370
473R	3,890,373
475R	3,890,374
	3,890,375
485F	3,890,376
500.5H	3,890,377
502.4P	3,890,378
519	3,890,379
520	3,890,380
531C	3,890,381
543P	3,890,382
556AR	3,890,383
563R	3,890,384
566AC	3,890,386
566AE	3,890,385
566A	3,890,387
578	3,890,388
584B	3,890,389
590	3,890,390
	3,890,391
596	3,890,392
607R	3,890,393
609R	3,890,394
617F	3,890,395
618F	3,890,396
621H	3,890,397
653.3	3,890,398
654R	3,890,399
666A	3,890,400
667	3,890,401
668F	3,890,402
674N	3,890,403
681	3,890,404
827	3,890,405
874	3,890,406
878R	3,890,407
879	3,890,408
927R	3,890,409
956	3,890,410
969	3,890,411
CLASS 261	
90	3,890,412
CLASS 264	
40	3,890,413
45.1	3,890,414
45.5	3,890,416
46.7	3,890,415
49	3,890,417
54	3,890,418
171	3,890,419
261	3,890,420
289	3,890,421
290R	3,890,422
CLASS 266	
24	3,889,864
34L	3,889,933
CLASS 267	
9C	3,889,937
34	3,889,934
65D	3,889,935
65R	3,889,936
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21	3,889,939
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69	3,889,941
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90	3,889,944
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19A	3,889,996
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62	3,889,997
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217	3,889,998
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31	3,890,011
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6R	3,890,012
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106	3,890,511
203	3,890,512
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1R	3,890,015
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10	3,890,019
16	3,890,020
126	3,890,021
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8.3	3,890,423
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104	3,890,515
111	3,890,516
168	3,890,517
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198	3,890,023
330	3,890,024
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55	3,890,521
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485	3,890,522
489	3,890,530
490	3,890,531
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111	3,890,535
151	3,890,536
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335	3,890,540
366	3,890,541
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258	3,890,546
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139	3,890,548
246	3,890,549
376	3,890,551
568	3,890,552
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22SC	3,890,560
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54	3,890,566
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71CP	3,890,568
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451	3,890,573
470	3,890,574
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173.2	3,890,604
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324M	3,890,609
347CC	3,890,610
347DA	3,890,611
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407	3,890,613
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5PD	3,890,615
7A	3,890,617
17.1R	3,890,618
105R	3,890,619
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74.1	3,890,623
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150	3,890,035
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266	3,890,033
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47	3,890,037
CLASS 354	
51	3,890,625
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227	3,890,628
299	3,890,629
CLASS 355	
1	3,890,038
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16	3,890,040
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62	3,890,043
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112	3,890,058
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260	3,890,071
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655	3,890,432
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70	3,890,434
115	3,890,435
118	3,890,436
177	3,890,437
240	3,890,438
250	3,890,439
263	3,890,440
267	3,890,441
269	3,890,442
270	3,890,443
273	3,890,444
275	3,890,445
326	3,890,446
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6	3,890,072
48	3,890,073
71	3,890,074
88	3,890,075
110	3,890,076
111	3,890,077
141	3,890,078
155	3,890,079
242R	3,890,308
363	3,890,080
450.1	3,890,081
451.9	3,890,082
462	3,890,083
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126	3,890,448
127	3,890,449
132	3,890,450
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508	3,890,454
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125	3,890,085
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277	3,890,087
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250	3,890,090

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		235,390		121	235,407		62	235,424		76	235,425	D34—	5BC	235,464	D54—	1A	235,474
	257	235,391		128	235,408		112	235,426	D22—	27	235,442		CB	235,461		13	235,475
	311	235,392		131	235,402		115	235,427	D23—	21	235,443		GB	235,460	D55—	1C	235,476
D6—	24	235,393		168	235,409		157	235,428			235,444		GH	235,465			235,477
	45	235,394		178	235,410		196	235,429		35	235,445		GT	235,462	D57—	A	235,479
	71	235,395		179	235,411		205	235,430		55	235,446		ST	235,463		E	235,478
	76	235,396		207	235,412			235,431		97	235,447		15AJ	235,459	D64—	11A	235,480
	97	235,397	D8—	98	235,414		211	235,432		147	235,448		A	235,458	D68—	1	235,481
		235,398		191	235,415			235,433		148	235,450	D45—	10	235,466	D70—		235,482
	113	235,399		229	235,416	D13—	1B	235,437	D26—	5C	235,451	D48—	2	235,467	D83—	B	235,486
	114	235,400		259	235,417		H	235,435			235,452			235,468		E	235,485
	120	235,401	D9—	9	235,418			235,436			235,453			235,469		J	235,483
	209	235,413		193	235,419		R	235,434		6	235,454		20H	235,470		N	235,484
	252	235,403		247	235,420	D19—	26	235,438		14A	235,455		24A	235,471	D87—	R	235,487
D7—	43	235,404	D10—	39	235,421			235,439		K	235,449		31	235,472			235,488
	50	235,405		96	235,422		62	235,440	D27—	36	235,456						

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

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3,890,075
3,890,124
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42 : Re.28,454
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48 : Re.28,453
3,889,367
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56 : 3,890,006

DESIGN PATENTS

1 : 235,411
235,472
6 : 235,393
235,415
235,418
235,423
235,430
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235,438
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235,481

PLANT PATENTS

17 : 3,731
27 : 3,732
40 : 3,730

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PATENTS

June 24, 1975

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

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PATENT AND TRADEMARK OFFICE NOTICES

Change of Address

There recently has been an increased incidence in the number of applications suffering from disruptions in communications stemming from failure to notify the Patent and Trademark Office of a change of address on the part of applicant's representative (attorney or agent of record) in each application wherein he holds an active power of attorney. Applications have become abandoned as a result of an Office action being mailed to the old, uncorrected address and thereby failing to reach the representative at his new address sufficiently early to permit him to file a timely response. Accordingly, the requirement set out below is published as a reminder and is designed to ameliorate this problem.

Where an attorney or agent of record (or applicant, if he is prosecuting his application pro se) changes his correspondence address, he is responsible for promptly notifying the Patent and Trademark Office of his new correspondence address (including ZIP code number). A separate notification must be filed in *each application* for which he is intended to receive communications from the Office. The notification should also include his telephone number.

While the notification need take no particular form, it should be provided in a manner calling attention to the fact that a change of address is being made. Thus, the mere inclusion, in a paper being filed for another purpose, of an address different from the previously provided correspondence address, without mention of the fact that an address change is being made, would not ordinarily be recognized or deemed as instructions to change the address on the file record.

It is emphasized that the above-delineated responsibility is *additional* to the separate obligation (see 37 CFR 1.347) of a registered attorney or agent to notify the Attorney's Roster of any change of his address for entry on the register, which must be done in a letter separate from any notice of change of address filed in individual applications. That obligation continues without change.

The degree of care exercised in adhering to the foregoing requirement for notification of change of address in each concerned application will be a factor for consideration in deciding petitions filed under 37 CFR 1.137 to revive applications which have become abandoned because of a failure to timely receive an Office action addressed to the old address. In such instances, the showing of the cause of unavoidable delay must include an adequate showing that a timely notification of the change of address was filed in the concerned application, in a manner resonably calculated to call attention to the fact that it was a change of address. If no such notification was made, or was made belatedly, the showing must include an adequate explanation of that failure or delay. A showing that notification was made on a paper filed in the Patent and Trademark Office listing *plural* applications as being affected will not be considered a proper notification.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

May 28, 1975.

Certificates of Correction for the Week of June 24, 1975

Re. 28,296
3,620,650
3,661,611
3,665,021
3,731,868
3,747,696
3,759,978
3,761,238
3,770,164
3,770,788
3,771,531
3,782,530
3,785,159
3,785,749
3,786,058
3,786,405
3,788,375
3,788,622
3,793,257
3,795,683
3,803,439
3,804,820
3,808,543
3,812,497
3,819,810
3,821,016
3,822,279
3,822,827
3,825,583
3,826,031
3,828,203
3,829,452
3,831,550
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3,834,414
3,835,062
3,838,121
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3,839,065
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3,840,738
3,841,393
3,843,084
3,843,638
3,844,028
3,844,226
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3,846,623
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3,850,631
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3,866,160
3,867,088
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3,868,263
3,868,334
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3,870,082
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3,872,773
3,872,995
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3,875,164
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3,876,355
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3,877,325
3,877,518
3,877,680
3,877,718
3,878,591
3,878,787
3,879,382

Disclaimer and Dedication

3,504,154.—*Victor H. Marcolini*, Cicero, Ill. EDM POWER SUPPLY WITH SEPARATE SOURCES OF GAP IONIZING POTENTIAL AND MATERIAL ERODING ENERGY. Patent dated Mar. 31, 1970. Disclaimer and dedication filed Sept. 14, 1974, by the assignee. *Amsted Industries Incorporated.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

Dedications

3,794,431.—*Larry R. Rothrock*, Poway, Calif. METHOD AND APPARATUS FOR STANDARDIZING OPTICALLY PUMPED LASER MATERIALS. Patent dated Feb. 26, 1974. Dedication filed Nov. 14, 1974, by the assignee, *Union Carbide Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,817,128.—*James P. Evans*, Oklahoma City, Okla. RAPIDLY ADJUSTABLE WRENCH. Patent dated June 18, 1974. Dedication filed June 24, 1974, by in the inventor.

Hereby dedicates to the Public the remaining term of said patent.

3.858,677.—*Robert J. Bussey*, Alamo, Calif. RETORT MUFFLER. Patent dated Jan. 7, 1975. Dedication filed Feb. 10, 1975, by the assignee, *The Clorox Company.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,863,325.—*Thomas B. Gurganus*, Avon, and *Leland L. Grubb*, Parma, Ohio. GLASS CLOTH IN METAL FORGING. Patent dated Feb. 4, 1975. Dedication filed Mar. 10, 1975, by the assignee, *Aluminum Company of America.*

Hereby dedicates to the Public the remaining term of said patent.

Disclaimers

3,520,417.—*Larry L. Durr* and *Edward D. Fulton*, Lebanon, Ind. PLEATED PAPER FILTER AND METHOD OF MAKING SAME. Patent dated July 14, 1970. Disclaimer filed Apr. 18, 1975, by the assignee, *The Carborundum Company.*

Hereby disclaims the entire remaining term of said patent.

3,566,685.—*Carl W. Zimmerman* and *George V. Copland*, Duncan, Okla. FLUID FLOW METERING METHOD AND SYSTEM. Patent dated Mar. 2, 1971. Disclaimer filed Nov. 1, 1974, by the assignee, *Halliburton Company.*

Hereby enters this disclaimer to claims 8, 9, 28 and 29 of said patent.

3,571,609.—*Louis I. Knudson*, Norwich, N.Y. IGNITION APPARATUS SELECTIVELY OPERABLE AT DIFFERENT LEVELS OF DISCHARGE ENERGY. Patent dated Mar. 23, 1971. Disclaimer filed Nov. 6, 1974, by the assignee, *General Laboratory Associated, Inc.*

Hereby enters this disclaimer to claims 9 and 10 of said patent.

3,575,169.—*Joseph A. Voss*, Denver, Colo., and *Carl W. Johnson*, Neenah, Wis. HYGIENIC MEDIUM APPLICATOR. Patent dated Apr. 20, 1971. Disclaimer filed July 17, 1974, by the assignee, *Kimberly-Clark Corporation.*

Hereby enters this disclaimer to claims 1–5 of said patent.

3,591,962.—*Joseph A. Connell*, Harbor City, Calif. CRYOGENIC POWER SOURCE FOR STARTING JET ENGINES. Patent dated July 6, 1971. Disclaimer filed Nov. 26, 1973, by the assignee, *NRG Incorporated.*

Hereby enters this disclaimer to claim 4 of said patent.

3,724,945.—*Felix R. Masiello*, Parsippany, N.J. SHEET FEEDING AND CUTTING DEVICE. Patent dated Apr. 3, 1973. Disclaimer filed Jan. 30, 1975, by the assignee, *Addressograph-Multigraph Corporation.*

Hereby enters this disclaimer to claim 9 of said patent.

3,764,948.—*Emil Robert Plasko*, Dayton, Ohio. THERMAL LIMITER FOR ONE OR MORE ELECTRICAL CIRCUITS AND METHOD OF MAKING THE SAME. Patent dated Oct. 9, 1973. Disclaimer filed Apr. 4. 1975, by the assignee, *Micro Devices Corp.*

Hereby enters this disclaimer to claims 1 through 5, and 11 through 15 of said patent.

3,816,802.—*Roy I. Crask*, Edina, and *William D. Egerer*, Minneapolis, Minn. LIGHTING ARRESTER. Patent dated June 11, 1974. Disclaimer filed Mar. 28, 1975, by the assignee, *Buckbce Mears Company.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5 and 6 of said patent.

3,819,060.—*Giles A. Kendall*, Burbank, Calif., and *William D. Wallace*, Chicago, Ill. DAMPING APPARATUS. Patent dated June 25, 1974. Disclaimer filed May 2, 1975, by the assignee, *Menasco Manufacturing Co.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,828,082.—*Richard S. Henion*, Brockport, and *Cataldo A. Maggiulli*, Pittsford, N.Y. PROCESS FOR PREPARING 3-ALKYL-2-BENZOTHIAZOLINYLIDENE KETONES. Patent dated Aug. 6, 1974. Disclaimer filed Mar. 31, 1975, by the assignee, *Eastman Kodak Company*.

Hereby enters this disclaimer to claims 1 to 9, inclusive, of said patent.

* * *

3,829,385.—*Charles Theodoric Abbott, Jr.* and *George Cunningham Smith, Jr.* Montgomery, Ohio. DETERGENT COMPOSITIONS CONTAINING N-CHLOROIMIDES. Patent dated Aug. 13, 1974. Disclaimer filed Sept. 12, 1974, by the assignee, *The Procter & Gamble Company*.

Hereby disclaims the term of this patent subsequent to June 18, 1991.

* * *

3,831,892.—*David M. Herman*, Bonanza, Oreg. JACK LOCK. Patent dated Aug. 27, 1974. Disclaimer filed Nov. 11, 1974, by the inventor.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

* * *

3,838,097.—*Joseph G. Wirth* and *Darrell R. Heath*, Schenectady, N.Y. PROCESS FOR MAKING POLYETHERIMIDES AND PRODUCTS DERIVED THEREFROM. Patent dated Sept. 24, 1974. Disclaimer filed Nov. 1, 1974, by the assignee, *General Electric Company*.

Hereby enters this disclaimer to claims 30–39 of said patent.

3,838,787.—*Harry J. McCloskey*, Philadelphia, Pa. SCORED AND SEAM WELDED CAN. Patent dated Oct. 1, 1974. Disclaimer filed Nov. 6, 1974, by the assignee, *Ellisco Incorporated*.

Hereby enters this disclaimer to claims 1, 2, 3, 4 and 7 of said patent.

* * *

3,846,715.—*J. Michael Yarborough*, Santa Clara, Calif. MULTIPLE DYE STREAM LASER. Patent dated Nov. 5, 1974. Disclaimer filed Mar. 26, 1975, by the assignee, *Coherent Radiation*.

Hereby enters this disclaimer to claim 7 of said patent.

* * *

3,854,258.—*Joseph J. Colado*, Addison, and *Norman G. Turner*, Lake Bluff, Ill. ARTICULATED HOLD-DOWN ANCHOR DEVICE FOR THE EMBEDDED CABLES OF A PRESTRESSED CONCRETE GIRDER. Patent dated Dec. 17, 1974. Disclaimer filed Mar. 21, 1975, by the assignee, *Superior Concrete Accessories, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

* * *

3,863,653.—*Georges Boudouris*, Grenoble, and *Gregoire Kalopissis, Jean-Luc Levesque*, and *Paul Roussopoulos*, Paris, France. METHOD FOR TREATING FIBERS BY SUBJECTING THEM TO HIGH FREQUENCY ELECTRIC FIELDS. Patent dated Feb. 4, 1975. Disclaimer filed Apr. 15, 1975, by the assignee, *Societe Anonyme dite: L'Oreal*.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 24, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-26-74
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-22-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-24-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-3-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-1-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	11-6-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-28-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-2-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning: Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-29-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-8-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	2-4-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-15-74
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-3-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-30-74
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	8-9-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-29-74

Expiration of patents: The patents within the range of numbers indicated below expire during June 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,836,826, to 2,840,820 inclusive
Plant Patents	Numbers 1,714, to 1,721 inclusive

PLANT PATENTS

GRANTED JUNE 24, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,733
NECTARINE TREE

David L. Armstrong, Orange, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Feb. 7, 1974, Ser. No. 440,480

Int. Cl. A01h *5/03*

U.S. Cl. Plt.—40 1 Claim

1. A new variety of asexually reproduced nectarine tree, substantially as herein illustrated and described, said tree being characterized in particular by its tendency to produce fruit which ripens in mid-June in a growing region such as Wasco, Calif., in which locale the chilling requirement is comparble to that of the Springtime peach, the said fruit, when mature, being about three inches in axial diameter, of the freestone type, white fleshed, juicy, aromatic, and full-flavored; the fruit of said new variety being further characterized by excellent storing and shipping characteristics.

3,734
AVOCADO TREE

Harold E. Kendall, P.O. Box 458, Goulds, Fla. 33170

Filed Feb. 13, 1974, Ser. No. 442,052

Int. Cl. A01h *5/03*

U.S. Cl. Plt—44 1 Claim

1. A new and distinct variety of avocado tree, substantially as shown and described.

3,735
POINSETTIA PLANT

Paul Ecke, Jr., Encinitas, Calif., assignor to Paul Ecke Ranch, Encinitas, Calif.

Filed Apr. 22, 1974, Ser. No. 462,995

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—86 1 Claim

1. A new and distinct variety of poinsettia plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a very vigorous, tough, durable and tall plant habit, with the ability to grow well as a multiple stem and multiple bloom plant, a very vigorous and extensive root system, stiff stems which do not require staking, retention of the bracts, foliage and inflorescenses for a long period of time after reaching maturity, a habit of not requiring light to delay bud set, a well-pinching habit which produces 3 or more breaks, a normal blooming habit at about 2° lower night temperatures than required for variety "C–1 Pink" (Plant Pat. No. 3,120) during the months of October, November and December, but having the ability to be satisfactorily brought into bloom and full maturity in every month of the year through the exercise of proper greenhouse cultural techniques, a distinctive and attractive appearance of the bracts and their absence of any tendency to droop with age, a distinctive and attractive Hot Pink general color tonality of the bracts, absence of drooping and retention of the position of the inflorescences relative to the bracts without rising as occurs in other varieties as their inflorescenses approach maturity, and excellent keeping qualities and consequent suitability for home decoration.

PATENTS

GRANTED JUNE 24, 1975

ERRATA

For CLASS	See PATENT NO.
228–173	3,890,696
061–030	3,890,802
075–000.5 BA	3,890,816
137–625.6	3,891,145
138–094.3	3,891,146
357–041	3,891,190
281–029	3,891,240
280–047.13 R	3,891,245
073–204	3,891,391
204–016	3,891,542
423–465	3,891,690
260–889	3,891,816

PATENTS

GRANTED JUNE 24, 1975

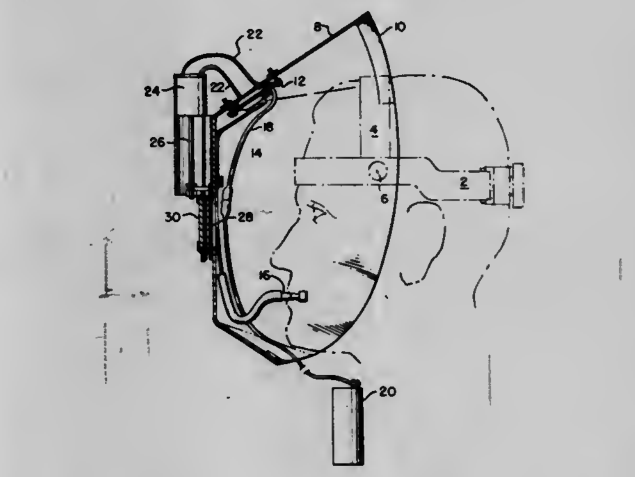
GENERAL AND MECHANICAL

3,890,646

WELDING HOOD

Donald G. Fassett, Route 3 Box 670, Olympia, Wash. 98506, and Ralph F. Thompson, 9242 S. "G" St., Tacoma, Wash. 98444

Filed Oct. 19, 1973, Ser. No. 408,066
Int. Cl. F16p *1/06*; **A61f** *9/00*
U.S. Cl. 2—8 **7 Claims**



1. In a welding helmet including a face shield having an opening, and a window reciprocatively mounted on the face shield to be moved to and from a viewing position in registry with the opening, the improvement comprising:
- actuator means responsive to the breath of the wearer for moving the window to and from its viewing position;
- means connecting said actuator means with the window;
- said connecting means including a threaded shaft having a longitudinal axis, said shaft being rotatively movable by said actuator means about its longitudinal axis, nut means secured to the window and yieldingly threadedly engaged with the shaft to be moved along the shaft in response to rotation of said shaft about its longitudinal axis, so as to thereby correspondingly move the window to and from its viewing position;
- said nut means comprising a plurality of mutually opposed nut sections threadedly engaging said shaft, and means for biasing said nut sections relatively toward each other so as to yieldingly grip said shaft therebetween, said biasing means being adapted to allow said nut sections to be forced out of engagement with said shaft in response to continued rotation of said shaft about its longitudinal axis when movement of the window is stopped.

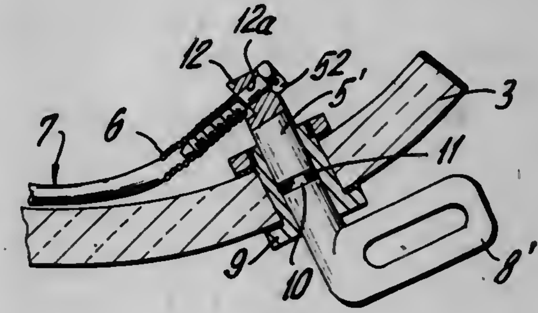
3,890,647

WINDOW SHIELD FOR RESPIRATORY MASK AND PROTECTIVE HELMUTS

Ernst Warncke, Lubeck, Germany, assignor to Dragerwerk Aktiengesellschaft, Germany

Filed Jan. 18, 1974, Ser. No. 434,435
Claims priority, application Germany, Feb. 1, 1973, 2304866
Int. Cl.² A61F *9/04*
U.S. Cl. 2—9 **11 Claims**

1. A face mask construction, particularly an oxygen mask or similar respiratory mask or protective helmet, comprising a mask body having a large window area thereon with a curved viewing window of a transparent material having a curvature extending over substantially its whole viewing area, a pivot bushing extending through said mask adjacent each side of said window, a pivot member rotatably supported in each of said bushings and having an exterior handle end and an interior inwardly extending end, a wiper body extending between said pivot members and connected to the interior ends thereof, said wiper body being of resilient material and being held by said interior end in a position to bear resiliently against the interior surface of said window, said pivot members being rotatable to move said wiper body through a path between the opposite edges thereof.

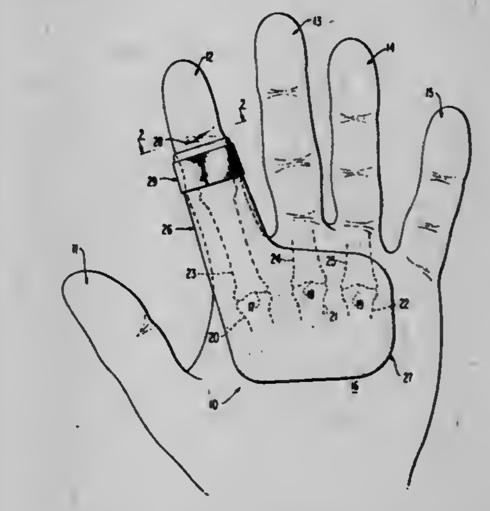


3,890,648

PROTECTIVE DEVICE FOR USE BY PLAYER OF A HARDBALL GAME, PARTICULARLY BASEBALL

Robert Eugene Beal, 1305 Veerman, Pekin, Ill. 61554

Filed Sept. 11, 1974, Ser. No. 505,096
Int. Cl.² A41D *13/00*; **A47J** *45/10*
U.S. Cl. 2—20 **10 Claims**



1. A protective device for a hand adapted to be worn on the hand between the palm side of the hand and a conventional glove used in hardball games such as baseball, comprising
- a first body portion of elongated shape adapted to overlie a part of the first finger on the palm side of the hand adjacent the palm of the hand,
- a second body portion of generally rectangular shape adapted to overlie at least the part of the palm of the hand which overlies the knuckle joint of the first finger, the knuckle joint of another finger and parts of the carpal and metacarpal bones adjacent such knuckle joints,
- the first body portion and the second body portion being of unitary construction and including impact absorbing material,
- and attaching means for attaching the first body portion to the first finger of the hand to support the first body portion in overlying relation with said part of the first finger, the relative unitary relation between the first body portion and the second body portion being such that when the first body portion overlies said part of the first finger

the second body portion overlies at least said part of the palm of the hand which overlies the knuckle joint of the first finger, the knuckle joint of another finger and the carpal and metacarpal bones adjacent such knuckle joints.

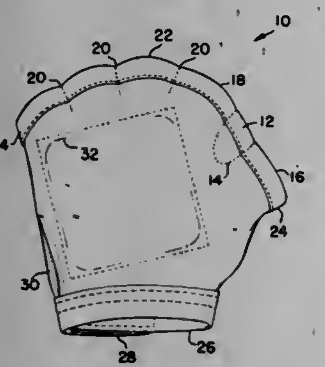
3,890,649
SAFETY GLOVE FOR FOOTBALL PLAYERS

Dennis R. Diggins, Chula Vista, Calif., assignor to Daniel M. Ramirez, Chula Vista, Calif.

Filed Feb. 21, 1974, Ser. No. 444,319

Int. Cl. A11d *19/00*

U.S. Cl. 2—161 A **1 Claim**



1. A protective glove for the hand of a football player comprising a body portion made of a flexible tear-resistant fabric and covering the palm, back and sides of the hand, a plurality of contiguous, truncated finger stalls formed along one end of said body portion by a plurality of lineal stitchings, spaced along and substantially perpendicular to said one end, a truncated thumb stall on said one end which is spaced from the index finger stall by a web of said fabric formed by a U-shaped stitching along said one end, a strengthening strip sewed along said one end on the palm, back and sides of said body portion to completely encompass said finger and thumb stalls along said end, the edges of the palm and back side of said body protion opposite said one end being unconnected to each other to provide an opening to receive said hand in said body portion and encompass the wrist of the player, a strap attached to the edges of said opening and having locking means on each end thereof to secure the said opening around the wrist and a pocket formed on the interior surface of the back side of said body portion to removably receive a protective pad therein.

3,890,650
ARTIFICIAL FOOT FOR LEG PROSTHESES

Jan Prahl, Luneburg, Germany, assignor to Ipos Gesellschaft fur Integrierte Prothesenentwicklung und Orthopadietechnischen Service m.b.H. & Co. K.G., Germany

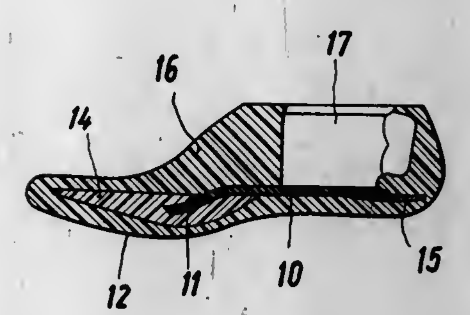
Filed Aug. 2, 1974, Ser. No. 494,277

Claims priority, application Germany, Aug. 18, 1973, 2341887

Int. Cl. A61f *1/08*

U.S. Cl. 3—7 **4 Claims**

1. An artificial foot made of foamed synthetic materials that are foamed within a mold, for leg prostheses, characterized by a metallic base plate disposed in the area of the sole of the foot within the foamed foot member, a forwardly extending portion of said metallic base plate defining a downwardly depending offset portion, the configuration of said offset portion of said base plate adapted to the roll-off motion of the ball of the foot, said offset portion secured to a forefoot core made of a homogeneous plastic material, the configuration of said forefoot core corresponding to the shape of the point of the foot, and a rearwardly extending portion of said metallic base plate supported by a portion of a tab made of a homogeneous plastic material, said tab being disposed within the heel portion of the foot.



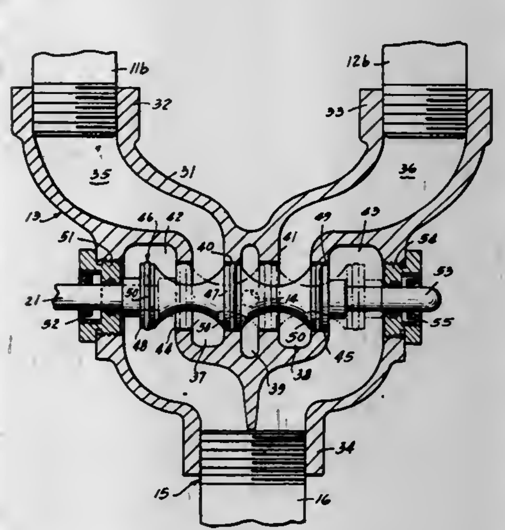
3,890,651
PRESSURE TANK WATER CLOSET SYSTEM

Robert Arnold Wood, 1970 Woodcliff Ln., Palatine, Ill. 60067

Filed Mar. 11, 1974, Ser. No. 449,752

Int. Cl. E03d *3/10*

U.S. Cl. 4—26 **12 Claims**



1. A water closet flushing apparatus which comprises a pair of elongated upright tanks of small cross sectional area adapted to fit in the wall space of a building, each tank having sealed top ends capable of trapping air and open bottoms for receiving and discharging water, a spool valve having a housing receiving the bottoms of the tanks in sealed relation, a valve spool slidably mounted in said housing, a water inlet to said housing, a water outlet from said housing, a valve spool slidable in the housing from first position feeding water from the inlet to one tank and discharging water from the other tank to the outlet to a second position discharging water from the one tank to the outlet and feeding water from the inlet to said other tank.

3,890,652
FLUSH WATER VALVE ASSEMBLY

Howard A. Fulton, Big Prairie, Ohio, assignor to Mansfield Sanitary, Inc., Perrysville, Ohio

Filed Aug. 15, 1973, Ser. No. 388,389

Int. Cl. E03d *1/34*

U.S. Cl. 4—58 **5 Claims**

1. A flush water valve assembly of the class described comprising:

a. a flush water valve seat means having an integral radial spider in axial alignment therewith fixedly mounted in the flush water outlet passage of the bottom wall of a water reservoir tank and an upstanding vertical valve guide blade means fixedly mounted on said spider in axial alignment therewith,

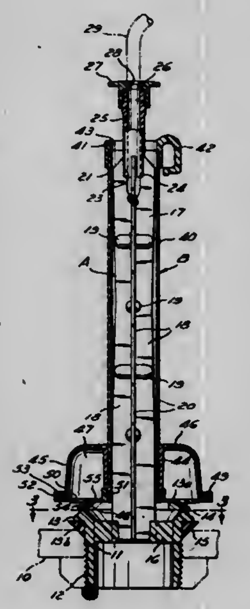
b. a cylindrical movable flush valve means having an upstanding cylindrical tubular element extending above the water level in the reservoir prior to the flush release and slidably mounted on said valve guide blade means and in frictional engagement therewith, a ring float chamber having a flat bottom surface mounted on the lower end of said tubular element and an elastomeric flush valve means removably mounted over the bottom surface of said ring float means in water seal alignment with said valve seat means and having a valve opening hook means adjacent to the top of said tubular element,

c. said guide blade means having integral guide blades spaced apart and extending upwardly from said spider to just below the top of said tubular element prior to the flush release thereof,

d. said guide blades having like recesses along the adjacent inner top edges thereof extending downwardly and having shoulders therein adjacent their midpoint and forming an axially aligned opening therein,

e. a water replenishing after flush trap seal refill tube fixedly mounted in said opening adjacent said shoulders and extending above the tops of said tubular element and guide blade means,

f. a nippled cap ring valve control means removably mounted on the upper end of said water refill tube and having a substantially flat upper surface and an integral nipple on its lower surface, the said cap ring having an outside ring diameter of at least equal to the outside diameter of said tubular element thereby limiting the upward movement thereof when the valve is open and a nipple and ring inside diameter sufficient for mounting on said refill tube and to receive an after flush water supply refill tube for replenishing the water supply in the trap of the plumbing fixture.



3,890,653
INCINERATOR TOILET HAVING A VERTICALLY MOVABLE INCINERATOR CHAMBER LID

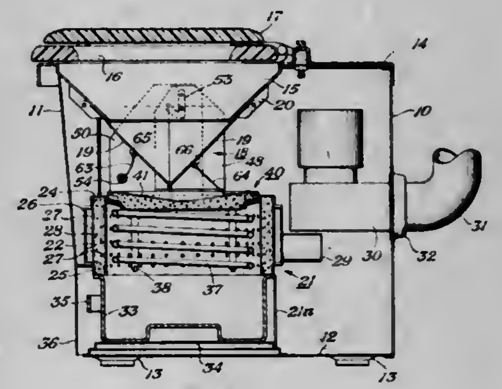
Ernest Bayne Blankenship, Irving, Tex., assignor to Research Products/Incinolet Corporation, Dallas, Tex.

Filed Nov. 6, 1970, Ser. No. 87,413The portion of the term of this patent subsequent to June 24, 1991, has been disclaimed.

Int. Cl. A47k *11/02*

U.S. Cl. 4—131 **18 Claims**

1. An incinerator toilet comprising:
an incinerator chamber having an open upper end,
a recessed seat located below the top of said upper end of said chamber and extending around the opening of said upper end,
a lid for opening and closing said upper end of said chamber,
said lid having a seat adapted to fit into and engage said recessed seat to close said upper end of said chamber,
a bowl disposed above said chamber and including an upper bowl portion and a lower bowl portion,
said lower bowl portion comprising hinged sections adapted to move inward together and to move outward away from each other for closing and opening the bottom end of said lower bowl portion,
means for initially raising said lid out of said recessed seat and then moving said lid laterally of said upper end of said incinerator chamber to open said upper end,
said hinged sections being allowed to move outward away from each other to open the bottom portion of said lower bowl portion when said lid is moved laterally of said upper end of said chamber to its open position to allow substance in said bowl to pass into said incinerator chamber.



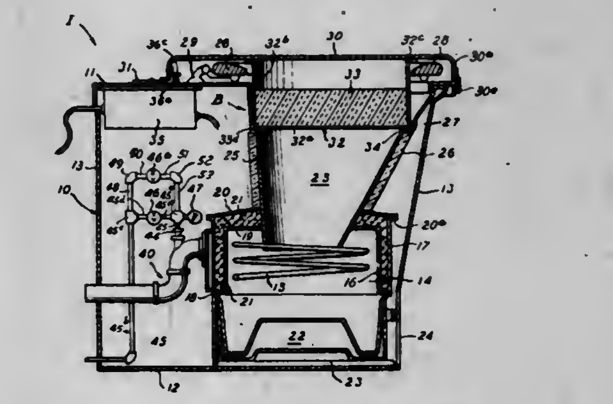
3,890,654
INCINERATOR TOILET VENTED BY AIR EJECTOR

Ernest Bayne Blankenship, Dallas, Tex., assignor to Research Products/Incinolet Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 148,456, June 1, 1971. This application July 27, 1973, Ser. No. 383,164

Int. Cl. A47k *11/02*

U.S. Cl. 4—131 **27 Claims**



1. An incinerator toilet comprising:
housing means including an incinerator chamber and having an opening for receiving substances therethrough,
a cover movable to open and closed positions for opening and closing said opening of said housing means,
means for heating the interior of said incinerator chamber,
an exhaust line connected with and extending outwardly from said incinerator chamber,
an air inlet means having its discharge end within said exhaust line and directed downstream thereof,
a pressure line for supplying air under pressure to said air inlet means,

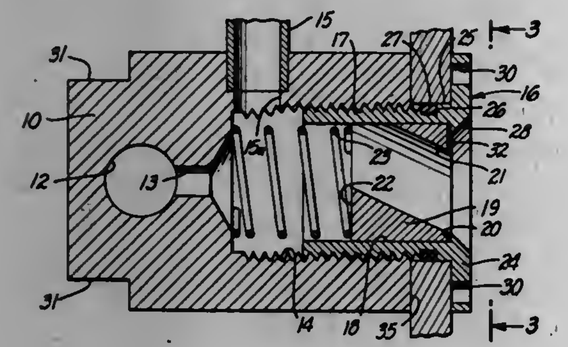
said pressure line having an inlet end connectable to a source of air under pressure,
first electrically operable valve means of a first predetermined orifice for controlling flow of air from said pressure line to said air inlet means,
a second electrically operable valve means of a second predetermined larger orifice predetermined location, controlling flow of air from said pressure line to said air inlet means, and
an electrical input circuit and control means operatively associated with said first and second valve means and said input circuit for causing said first valve means to be open when electric current is supplied to said input circuit and causing said second valve means to be open when said cover is in open position and the temperature in said incinerator toilet at a predetermined location is above a predetermined value.

3,890,655

WHIRLPOOL JET FOR BATHTUBS

Cleo D. Mathis, 1808 Potrero Ave., South El Monte, Calif. 91733

Filed Aug. 27, 1973, Ser. No. 392,046
Int. Cl. A47k *3/10*
U.S. Cl. 4—178 7 Claims



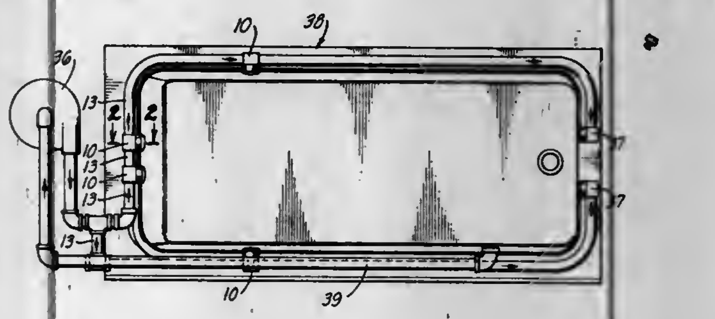
1. A whirlpool jet for bathtubs and the like comprising a housing, a chamber formed within said housing, a water inlet connected at one end thereof to a source of water supply under pressure and at the opposite end thereof to the inner end of said chamber, a Venturi air inlet extending through said housing to the inner end of said chamber, whereby the movement of water through said chamber is speeded by a Venturi effect, a water outlet extending through a circular opening in the wall of the bathtub, said water outlet being threadedly mounted within the outer end of said chamber, said water outlet having an annular radial flange, said flange having an inner surface abutting against the inside of the bathtub wall, said housing having a flat outer end abutting against the outside of the bathtub wall, said water outlet having an annular groove formed therein adjacent to said flange, a resilient O-ring bushing mounted in said groove, said bushing making sealing engagement with the inner edge surface of said opening, the bathtub wall upon rotational tightening of said water outlet with respect to said housing being held between said flange and said housing to mount said jet on the bathtub without any fastening members being connected to the bathtub, the threaded engagement between said water outlet and housing providing automatic adjustment of said jet to fit various thicknesses of bathtub walls.

3,890,656

WHIRLPOOL JET FOR BATHTUBS

Cleo L. Mathis, 1808 Potrero Ave., South El Monte, Calif. 91733

Continuation-in-part of Ser. No. 392,046, Aug. 27, 1973. This application May 16, 1974, Ser. No. 470,369
Int. Cl. A47k *3/10*
U.S. Cl. 4—178 5 Claims



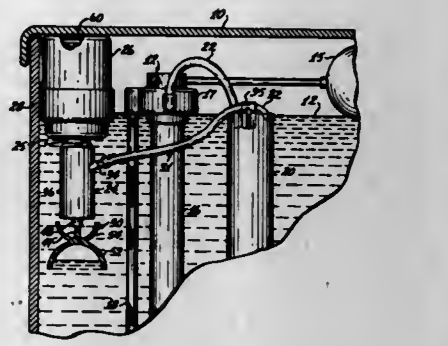
1. A whirlpool jet assembly for bathtubs comprising a plurality of housings spaced around the exterior of a bathtub, each of said housings having a transversely directed water inlet opening and an adjacent transversely directed air inlet opening disposed above said water inlet opening, a horizontally directed water supply pipe extending around the exterior of said bathtub and directly connected to each of said water inlet openings without fittings, a horizontally directed air supply pipe extending around the exterior of said bathtub and directly connected to each of said air inlet openings without fittings, each of said housings having a horizontally directed water passage extending from said water inlet opening to a mixing chamber within said housing, a venturi air passage extending vertically from said air inlet opening into said mixing chamber, whereby the movement of water into and through said chamber is speeded by venturi action, a horizontally directed water outlet extending between said mixing chamber and the interior of said bathtub, and a jet outlet control mounted in the outer end of said water outlet for directing water into said bathtub.

3,890,657

CHEMICAL DISPENSER FOR TOILET

Roy M. Gray, 2102 N. 26th Pl., Phoenix, Ariz. 85008

Filed May 16, 1974, Ser. No. 470,592
Int. Cl. E03d *9/02*
U.S. Cl. 4—223 9 Claims



1. A dispenser for delivering a predetermined amount of liquid to the toilet bowl of a toilet tank combination each time the toilet is flushed, said dispenser comprising:
a. a liquid reservoir mountable within the flush tank of the toilet;
b. a housing attached to said liquid reservoir and having a liquid metering chamber formed therein which is in liquid receiving communication with said liquid reservoir; eservoir;
c. delivery means on said housing through which liquid from the metering chamber thereof is delivered to the toilet bowl;

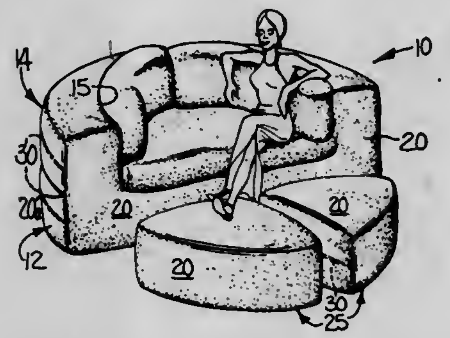
d. valve means within said housing for controlling the flow of liquid between said liquid reservoir and the metering chamber of said housing, said valve means when open allows liquid to enter into the metering chamber and will close when the metering chamber is substantially filled;
e. a piston reciprocally movable within the metering chamber of said housing for holding said valve means closed between flushing operations of the toilet and for allowing said valve means to open upon commencement of a flushing operation, said piston adapted to pump the liquid from the metering chamber of said housing to said delivery means as a flushing operation nears completion; and
f. float means within the flush tank of the toilet and coupled to said piston for reciprocally moving said piston in response to the emptying and filling of the flush tank during a flushing operation of the toilet.

3,890,658

FOLD-OPEN CONVERTIBLE OCCUPANT-RECEIVING UNIT OF FURNITURE

Frank W. Petersilie, Boone, N.C., assignor to Investments and Innovative Concepts, Inc., Boone, N.C.

Filed Aug. 29, 1974, Ser. No. 501,623
Int. Cl.² A47B *83/00;* **A47C** *17/00*
U.S. Cl. 5—2 B 18 Claims



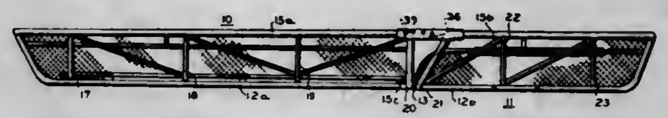
1. A fold-open, convertible, occupant-receiving, unit of furniture characterized by being constructed for easily converting to and from a folded-close unit of furniture with an upstanding side and back portion for use as a sofa, chair or the like and to and from a folded-open, flat unit of furniture of a predetermined geometric shape with no upstanding portions for use as a bed, ottoman or the like; said unit of furniture comprising:
a first member of predetermined shape generally defining one half of the folded-open outside configuration of said unit of furniture;
a second member having the same general outside configuration and shape as said first member for being generally symmetrical therewith and defining the other half of the folded-open configuration of said unit of furniture when placed in side-by-side position therewith and having a cut out therein to define a void therethrough;
means for hingedly connecting said first member to said second member for pivotal movement of said second member to and from a folded-close, superimposed position on top of said first member wherein said first member provides an upstanding side and back portion, said cut out in said second member provides an occupant receiving void in said second member and the portion of said first member contained within said cut out of said second member provides an occupant receiving seat portion, and to and from a folded-open position in side-by-side relation with said first member for providing a flat unit of furniture with no upstanding portions; and
means for being positioned within said cut out of said second member when said second member is in the folded-open position thereof for filling the cut out to provide a generally continuous flat surface for said unit of furniture in the folded-open position thereof.

3,890,659

SPLINT STRETCHER

Samuel M. Staubs, 1204 Duncan St., Key West, Fla. 33040

Filed June 24, 1974, Ser. No. 482,147
Int. Cl.² A61G *1/02*
U.S. Cl. 5—82 2 Claims



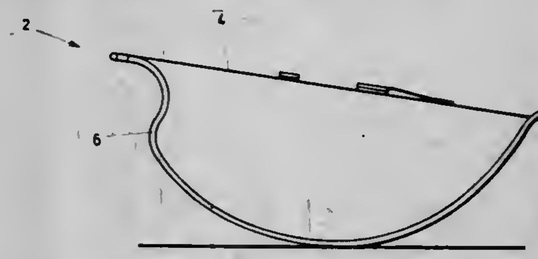
1. A splint stretcher having a framework including a pair of spaced apart upper and lower longitudinally extending side members on each side thereof, the lower ones of said side members being hinged for pivotal up and down movement at a frame pivot point intermediate their length, cross members extending between the lower side members on each side of the frame pivot point to form a stretcher bed frame with a body position and a hinged leg and foot portion, each of the upper side members being interrupted at a point intermediate their length in the vicinity of said frame pivot point to form first and second upper side member sections, the interrupted upper side member of the upper body stretcher portion being extended downward at an angle of about 90° to be secured to the corresponding lower side member at the body portion side of the frame pivot point, the interrupted upper side member of the leg and foot stretcher portion being extended downward at an angle greater than 90° to be secured to the corresponding lower side member at the leg and foot portion side of the frame pivot point, one of the upper side member sections on at least one side of the stretcher having a pin receiving aperture in the side member adjacent the point of interruption, the corresponding other one of said side member sections on at least one side of the stretcher having an adjusting brace secured to extend towards the one side member section in alignment with the longitudinal axis of the other side member, and each brace having a plurality of pin receiving apertures spaced along its length whereby the leg and foot portion of the stretcher may be secured in desired ones of different positions relative to the body portion with a respective pin extending through aligned apertures of the respective upper side frame section and adjusting brace.

3,890,660

FURNITURE

Richard C. Pedler, 802 Exeter Hall, Sol Harris Crescent, Durban, Natal, South Africa

Filed May 13, 1974, Ser. No. 469,696
Int. Cl.² A47D *9/00*
U.S. Cl. 5—101 3 Claims



1. A bed for a baby comprising a pair of spaced apart, substantially parallel, rocker elements formed from steel rod, each element being curved towards each end to form oppositely directed substantially S-shaped portions, the free ends of each element being directed away from each other, a pair of substantially straight, parallel, spaced apart cross elements joining corresponding free ends of the side elements, and a web secured to and tensioned between the side elements, the web being substantially inextensible longitudinally, and means for restraining a baby on the web with its head towards one cross element, its feet towards the other, the configuration of the rocker elements being such that when the bed is occupied

it tends to assume an equilibrium position in which the baby's head is not lower than its feet.

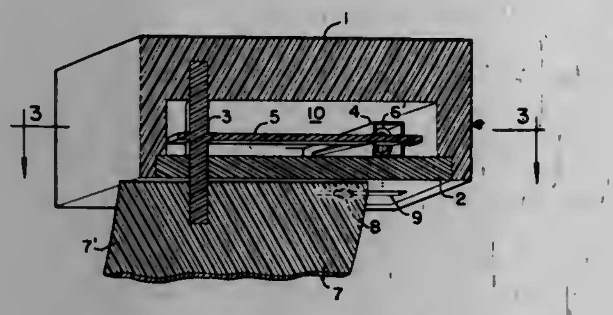
3,890,661
SURFBOARD RUDDER-FIN COMBINATION

Robert F. Johnson, 82 Cambridge Rd. N.W., Calgary, Alberta T2K 1R3, Canada

Filed Feb. 21, 1974, Ser. No. 444,406

Int. Cl. A63c *15/00*

U.S. Cl. 9—310 B **1 Claim**



1. In combination
- a. a surfboard body portion,
- b. a rudder mounted thereunder,
- c. a vertical shaft, one end of which is rotatably mounted in the body portion and the other end of which is integral with the rudder in such space relationship that the two lateral rudder surface portions on each side of the point of integration are unequal in area dimensions,
- d. a lever arm secured at right angles to and near the end of the shaft which is rotatably mounted, and
- e. resilient means movable in the fore and aft direction relative to the vertical shaft for effectively changing the length of the lever arm to vary the force required for rudder action.

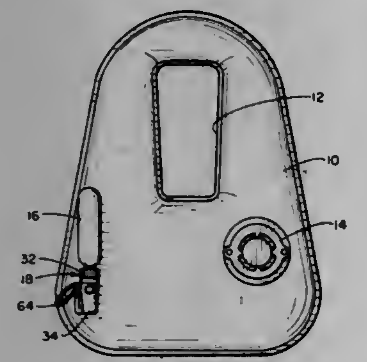
3,890,662
REFILLABLE PRESSURIZED GAS CARTRIDGE AND ATTACHMENT MEANS FOR REFILLING SAME

Robert E. Roberts, Carson, Calif., assignor to Under Sea Industries, Inc., Compton, Calif.

Filed Nov. 5, 1973, Ser. No. 413,187

Int. Cl. B63c *9/00*

U.S. Cl. 9—313 **3 Claims**



1. In scuba diving equipment:
- a. a buoyancy compensator having provisions for attachment to the upper torso of a diver;
- b. said buoyancy compensator having an air-inflatable chamber to increase the positive buoyancy of the diver or to counterbalance the negative buoyancy of the diver;
- c. a detonator housing fitted to, and carried by, the buoyancy compensator;
- d. said detonator housing having passage means communicating at one end with said chamber;
- e. a gas cartridge having a neck;
- f. a normally closed valve mounted in the cartridge neck and having a valve actuator accessible at the neck that is movable inwardly to open the valve;
- g. said detonator housing and said cartridge having means detachably coupling the cartridge neck to the other end of said passage means to establish communication between said passage means and the interior of said cartridge via said valve;
- h. a detonator rod slidably mounted on said detonator cartridge and movable from a retracted position to an advanced position in which said valve actuator is engaged to open said valve; and
- i. a detonator lever manipulable for operating said detonator rod.

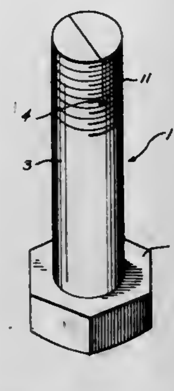
3,890,663
METHOD OF FORMING A COTTER KEY HOLE IN A BOLT

Matthew J. Lebryk, Rte. 1, Custer, Wis.

Filed May 6, 1974, Ser. No. 467,010

Int. Cl. B23g *9/00*

U.S. Cl. 10—27 R **4 Claims**



1. A method of forming a transverse hole in the shank of a bolt, comprising the steps of longitudinally splitting the end of the bolt shank into two diverging connected sections, said sections being connected at a juncture and each connected section having an inner surface facing the inner surface of the other connected section, inserting a cutting tool longitudinally between the two diverging connected sections and cutting a transverse groove at said juncture, and crimping the two sections together to bring the inner surfaces into contiguous relationship and reform the shank with the groove comprising a transverse hole extending through the reformed shank.

3,890,664
SURFACE TREATMENTS

Raymond Hanson, Rearsby, England, assignor to USM Corporation, Boston, Mass.

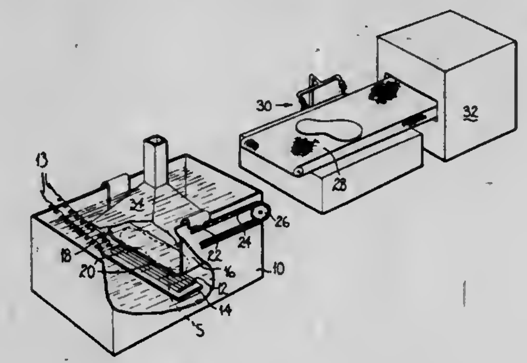
Filed Nov. 21, 1973, Ser. No. 417,871

Claims priority, application United Kingdom, Nov. 23, 1972, 54229/72; Oct. 11, 1973, 47452/73

Int. Cl. A43d *00/00*

U.S. Cl. 12—146 B **8 Claims**

1. The method of surface pretreatment of bodies of non-conductive synthetic elastomer material to improve the ability of that surface to be coated or adhesively bonded comprising establishing an electrical potential across an anode and a cathode in a body of aqueous electrolyte to generate at said anode, products of electrolysis reactive with said elastomer to form reaction products more readily wet and bonded by coatings and adhesive compositions, said anode being substantially inert to products of electrolysis generated at said anode, disposing the surface to be treated in said body of electrolyte closely adjacent to said anode for engagement and reaction with said products of electrolysis as they are formed and maintaining said surface adjacent said anode for a period for reaction of the elastomer at said surface with products of electrolysis generated at said anode to form on said body a surface of reacted elastomer integral with the elastomer of



said body and readily wetted and strongly adhered to by coatings and adhesives.

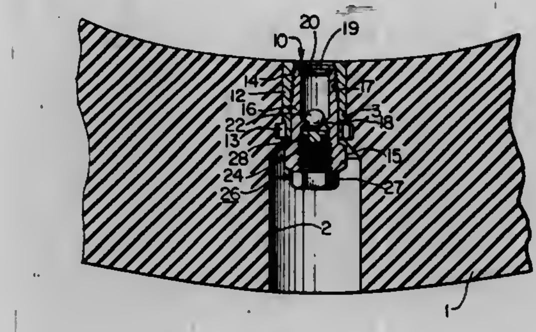
3,890,665
PIPELINE CLEANING BALL AND VALVE STRUCTURE

Murl R. Richardson, Fort Worth, Tex., assignor to Oil States Rubber Co., Arlington, Tex.

Filed Oct. 1, 1973, Ser. No. 402,082

Int. Cl. B08b *9/04*

U.S. Cl. 15—104.06 R **6 Claims**



1. A pipeline cleaning ball and valve structure, comprising:
- a. an inflatable ball having a hollow center surrounded by thick walls of elastomeric material defining the outer surfaces of the ball, and having a wall recessed part-way into one wall from outside the ball and the well joining a bore extending the rest of the way through the wall into the center of the ball;
- b. a valve assembly in the well and including a sleeve member bonded to the elastomeric material at the bore and internally threaded, and including a valve-carrier member having external threads by which it is removably secured in the threaded sleeve member and said carrier member having an opening through it with a check valve in the opening located within the thickness of the wall of the ball and recessed within the length of the carrier member, and including a plug member operative to removably close and seal the opening through the valve carrier member, the valve assembly and plug member being recessed in said well beneath the outer periphery of the ball by a distance amounting to a substantial proportion of the thickness of the wall of the ball.

3,890,666
SURFACE TEXTURE MODIFICATION DEVICE FOR CARPETS

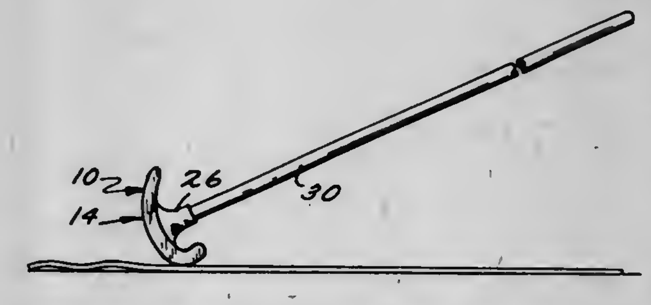
Thomas J. McKenzie, 6230 N. Camino, Tucson, Ariz. 85718

Filed July 3, 1973, Ser. No. 376,152

Int. Cl. A47l *13/00*

U.S. Cl. 15—142 **6 Claims**

1. A surface texture modification device for carpets comprising:
- a monolithic head having an elongated, continuous curved outer surface, a portion of which is convex;
- the head as viewed in cross-section comprising an inverted comma having an upper tail and a lower ball; and



- elongated handle means secured to the head for permitting the outer surface of the head to be pushed across a carpet to modify the texture of the carpet.

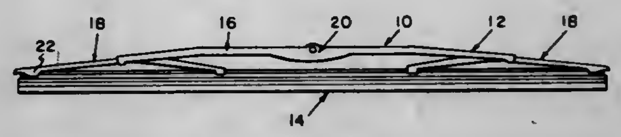
3,890,667
WIPING ELEMENT OF A WIPER BLADE

John A. Mason, Valparaiso, Ind., assignor to The Anderson Company, Gary, Ind.

Filed Oct. 16, 1973, Ser. No. 406,809

Int. Cl. B60s *1/38*

U.S. Cl. 15—250.42 **3 Claims**



1. In a wiper assembly having a wiper blade and a pressure-distributing superstructure operatively connected thereto, said wiper blade having a resilient wiping element and a flexible backing strip, said superstructure slidably engaging with said backing strip at a plurality of spaced apart locations thereon, in combination, said wiping element having a retention portion and an enlarged intermediate portion defining a pair of oppositely facing longitudinal grooves therebetween, a plurality of gripping means in the lower part of each groove near each end portion thereof, and spacer means in each groove in juxtaposed relation to each plural gripping means and disposed in the upper part of each of said grooves, said gripping means and said spacer means are formed integrally with said retention portion and said intermediate portion of said wiping element whereby the backing strip is gripped by said gripping means as said spacer means abuts the upper surface of said backing strip to prevent distortion of the wiping lip of said wiping element.

3,890,668
LOCKABLE CASTOR, IN PARTICULAR SWIVEL CASTOR

Herbert Stosberg; Horst Fleishmann; Günter Reinhards, and Siegfried Engels, all of Wermelskirchen-Tente/Rhineland, Germany, assignors to Tente-Rollen G.m.b.H., Wermelskirchen-Tente, Germany

Filed Dec. 22, 1971, Ser. No. 210,759

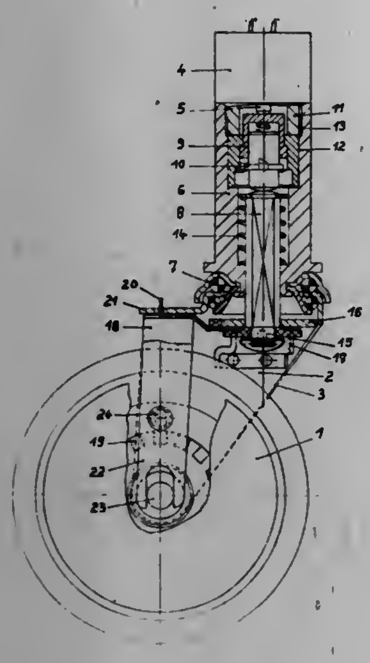
Claims priority, application Germany, Jan. 20, 1971, 2102509

Int. Cl. B60b *33/00*

U.S. Cl. 16—35 **11 Claims**

1. A castor comprising a fixing pin, a castor fork mounted on the fixing pin, a wheel mounted in the hollow of the castor fork, a locking mechanism including movable catch members for arresting a movement of the wheel, the catch members being accommodated in the hollow of the castor fork, an electromagnet with a movable magnetic core and which is force-lockingly connected to the catch members, a movable actuating pin connecting the movable magnet core and the catch members, said electromagnet being united with and a

part of said fixing pin, and a spring operatively interposed between the electromagnet and the catch members so that the electromagnet can act on the catch members against the pressure of the spring.



3,890,669

LOCKABLE CASTOR, IN PARTICULAR SWIVEL CASTOR

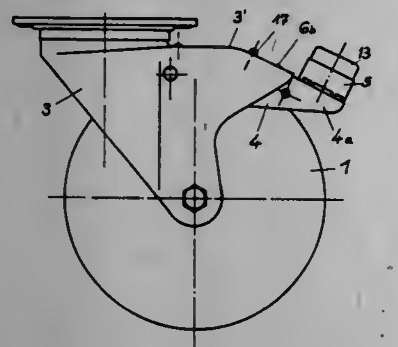
Günter Reinhards, Wermelskirchen, Rhineland, Germany, assignor to Firm Tente-Rollen Gesellschaft mit beschrankter Haftung Companie, Wermelskirchen-Tente, Rhineland, Germany

Filed Jan. 8, 1974, Ser. No. 431,659

Claims priority, application Germany, Mar. 3, 1973, 2310775

Int. Cl. B60b *33/00*

U.S. Cl. 16—35 **8 Claims**



1. A castor, in particular a swivel castor, comprising a wheel which is supported in a wheel clevis and locking means for locking the rotation of the wheel and/or the swivel motion of the wheel clevis including a clamping lever that is pivotably supported in the clevis cavity and is pivotable and lockable in its locking position by operation of a push-button control element, characterised in that the push-button control element is attached or fastened on the pivotable clamping lever as a part thereof and so that the push-button control element forms a pivotable unit with the clamping lever, and a movable lever locking element which also is attached or fastened on the pivotable clamping lever and which can be locked itself in its locking position by said push-button control element after locking said pivotable clamping lever.

3,890,670

ADJUSTABLE FURNITURE HINGE

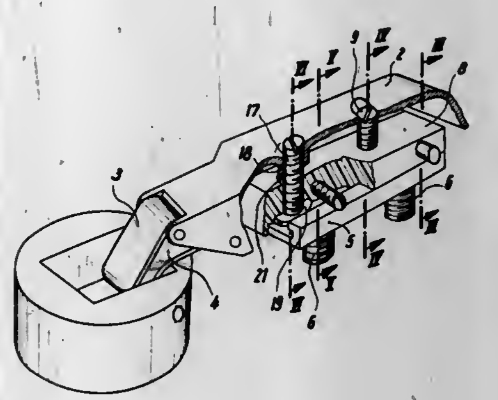
Gerhard Sewing, Lohne, and Jurgen Bachor, Kirchlengern, both of Germany, assignors to Paul Hettisch & Co., Kirchlengern, Germany

Filed Aug. 16, 1974, Ser. No. 498,226

Claims priority, application Germany, Aug. 21, 1973, 2342113

Int. Cl.² E05D *7/04*

U.S. Cl. 16—129 **10 Claims**



1. An adjustable furniture hinge, comprising a hinge member and an elongated hinge arm pivoted thereto for movement about a pivot axis; first means mounting said hinge arm remote from said hinge member for movement about another axis extending transverse to the elongation of said hinge arm; second means for adjustingly shifting said hinge arm longitudinally of said other axis; and third means operable independently of said second means for adjustingly shifting said hinge arm lengthwise of itself.

3,890,671

RECESSED HINGES FOR ARTICLES OF FURNITURE

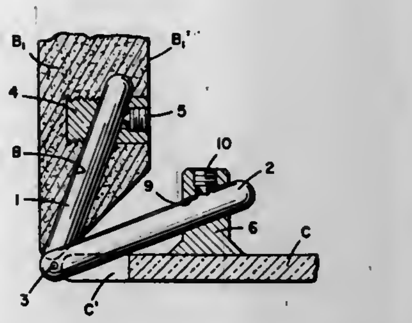
Marco Fantoni, Udine, Italy, assignor to McClure Furniture Industries, Inc., Milton, Pa.

Filed June 17, 1974, Ser. No. 480,276

Claims priority, application Italy, Sept. 21, 1973, 83429/73

Int. Cl. E05d *11/00*

U.S. Cl. 16—137 **4 Claims**



1. A hinge system for furniture articles and the like, comprising: first and second elongated shafts; means pivotally coupling respective end portions of said shafts to each other; means adjustably mounting said shafts to respective relatively movable adjacent panels and at an angle to the principal planes of said respective panels; and means for adjustably securing said shafts to said respective panels.

3,890,672

FRICTIONALLY ADJUSTABLE HINGE ASSEMBLY WITH NONROTATABLE HINGE PIN BEARING SLEEVE

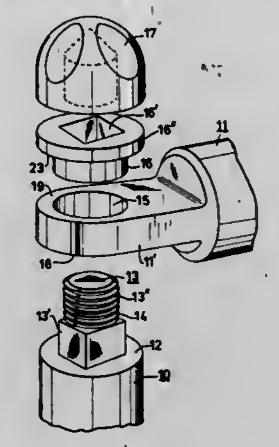
Nils Ture Lennart Berthagen, Manadsvagon 74, S-175 42 Jarfalla

Filed June 14, 1974, Ser. No. 479,376

Claims priority, application Sweden, Sept. 9, 1973, 73124430

Int. Cl. E05d *11/08*

U.S. Cl. 16—141 **9 Claims**



1. In a hinge assembly including two elements (10,11) mounted for pivotal movement relative to each other, a first abutment surface (12) on a first of said elements, a shaft (13) extending outwardly from and perpendicular to said abutment surface and having a non-round lower portion (13') adjacent the first abutment surface and an upper portion, a flat web member (11') having upper and lower bearing surfaces extending from the second of said elements and defining a cylindrical bearing hole (15) therein through which the shaft extends, a sleeve (16) having an outwardly extending flange (16'') defining a second abutment surface (23), a central passageway (16') having the same non-round configuration as the lower portion of the shaft, and an external cylindrical bearing surface, the sleeve being fitted over and axially slidable on the shaft with the non-round portion engaging the central passageway in a non-rotatable manner and the bearing surface accommodated within the bearing hole, and with the first and second abutment surfaces spaced from but facing each other and, respectively, facing said upper and lower bearing surfaces; of the web, and locking means (17) mounted on the upper portion of the shaft retaining the sleeve thereon, the improvements characterized by:

a. the axial length of the external cylindrical bearing surface being greater than the thickness of the web, and

b. the locking means engaging the upper portion of the shaft to such a depth that the end of the sleeve remote from the flange bears against the first abutment surface, whereby the shaft, sleeve and locking means assembly is rotatable in the bearing hole while having a limited end play defined by the difference between the axial length of the external cylindrical bearing surface and the thickness of the web.

3,890,673

AUTOMATIC HEAD SPLITTER

David J. Neubauer, 8086 Cedar St., Omaha, Nebr. 68124

Filed July 5, 1973, Ser. No. 376,688

Int. Cl. A22b *5/20*

U.S. Cl. 17—1 A **8 Claims**

1. An automatic head splitter for splitting the head of an animal, the splitter comprising:

a frame having a compartment formed therein and a horizontal top surface;

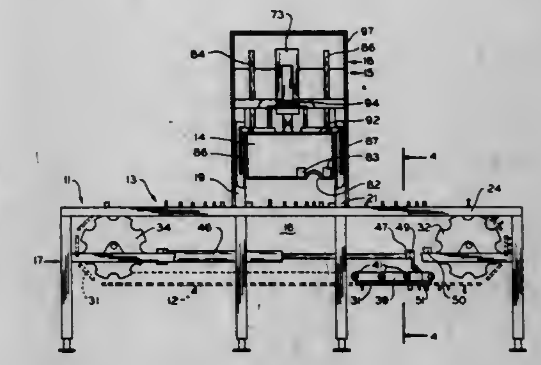
a movable bed operably disposed in said compartment, with said bed forming at least a portion of said horizontal top surface;

a housing mounted on top of said frame and having an opening formed therein which is disposed transversely of said bed and which is defined on the bottom thereof by said bed;

power means operably connected to said bed for moving said bed relative to said housing;

a vertically disposed knife movably mounted in said housing;

second power means operably connected to said knife for moving said knife from a first position distal of said bed to a second position proximate said bed and from said proximate position to said distal position;



a gate movably mounted to said housing and having a tab secured thereto said gate being movable from an open position to a closed position covering said opening wherein said second power means is operable to move said knife from said distal position to said proximate position only when said gate is in said closed position;

latch means secured to said knife, said latch means coactable with said tab for moving said gate to said open position when said knife moves from said proximate position to said distal position; and

third power means mounted in said housing and operable to disengage said latch means from said tab thus permitting said gate to move from said open position to said closed position by gravity.

3,890,674

APPARATUS FOR REMOVING THE BONES FROM POULTRY

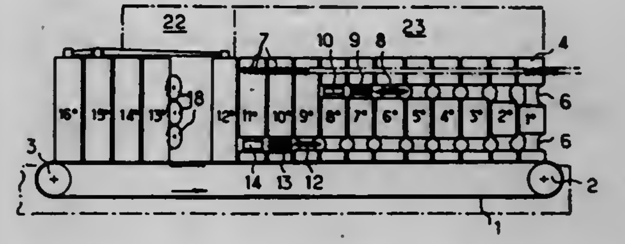
Maurice Fradin, Saint Jean de Monts, France, assignor to Agence National de Valorization de la Researche (ANVAR), Neuilly-sur-Seine, France

Filed Nov. 30, 1973, Ser. No. 420,479

Claims priority, application France, Dec. 1, 1972, 72.42734; Nov. 13, 1973, 73.40231

Int. Cl. A22b *3/08*

U.S. Cl. 17—11 **7 Claims**



1. Apparatus for removing the bones from poultry, comprising a base conveyor to receive the poultry thereon and cause it to travel from an infeed end to an outfeed end, two rows of vertically mounted rollers, one at each side of said conveyor, a plurality of said rollers proceeding inwardly from said infeed end being peripherally grooved at two axially separated locations, a row of horizontally mounted rollers arranged above said conveyor to press down on the incoming poultry, cutter means on at least two laterally opposed ones of said vertically mounted rollers, wheels having curved cutting flutes arranged on at least two other laterally opposed ones of said vertical

rollers, said wheels being rotatable in a direction opposite to that of the other vertically mounted rollers, deflecting means consisting of selected ones of said vertically mounted rollers, two hinged systems comprising selected groups of said vertically mounted rollers at said outfeed end with said rollers being mounted on support members, said hinged systems forming a pair of inwardly tapering walls to enclose the poultry carcass minus its legs and wings, said hinged systems also incorporating a plurality of cutters arranged in vertical lines with each of said cutters arranged obliquely to said vertical line, hoppers positioned to receive bones from the wings and legs and the flesh respectively, and a hopper at the outfeed end of the apparatus to receive the stripped carcass.

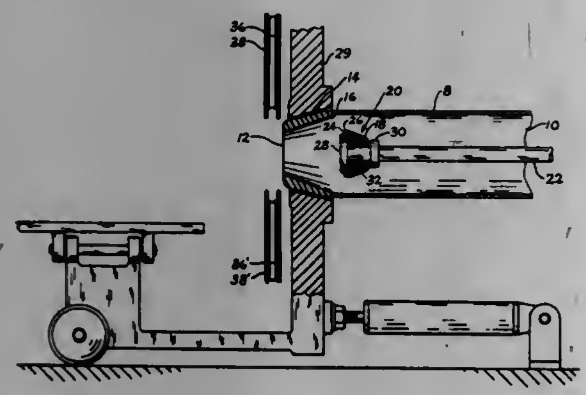
3,890,675
PRODUCT STUFFING APPARATUS

Joseph A. Nausedas, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Aug. 3, 1973, Ser. No. 385,306

Int. Cl. A22c *11/02*

U.S. Cl. 17—41 **2 Claims**



1. Apparatus for stuffing a viscous pumpable product into a flexible casing, which apparatus comprises
   a. a stuffing horn having an inlet end and a discharge end for said product, said discharge end having an external portion and an internal tapered portion;
   b. a movable product stoppering means internally mounted in said stuffing horn and having a tapered portion adapted to seat against the internal tapered portion of said discharge end and a circumferential knife edge in advance of said tapered portion thereof;
   c. means for advancing product to be stuffed through said horn; and
   d. means for moving said stoppering means into and out of engagement with said internal tapered portion.

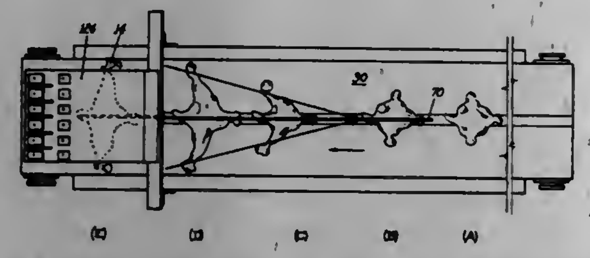
3,890,676
METHOD FOR EVISCERATING CLAMS

Harold F. Snow, Scarborough, Maine, assignor to Borden, Inc., Columbus, Ohio

Division of Ser. No. 244,616, April 17, 1972, Pat. No. 3,789,457. This application Oct. 3, 1973, Ser. No. 403,105

Int. Cl. A22b *3/00*

U.S. Cl. 17—45 **9 Claims**



1. A method for removing viscera or any part thereof from a clam comprising disposing a clam on a moving surface with its root at the trailing end; moving the two muscles of the clam toward the sides of the moving surface; and applying force in an eviscerating section to the clam body between the muscles to squeeze out viscera from the clam.

3,890,677
FIBER DRAFTING APPARATUS

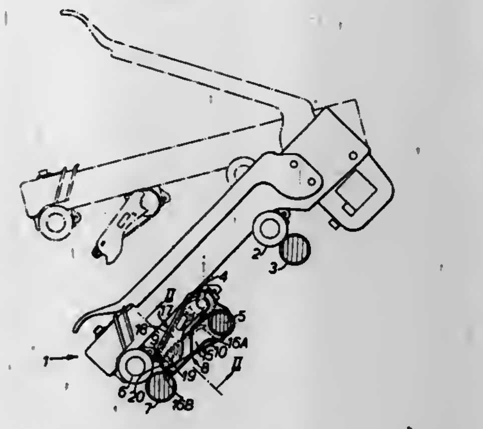
John Michael Noguera, 1 Greville House, Kinnerton St., London S.W. 1, England

Continuation-in-part of Ser. No. 273,610, July 20, 1972, abandoned. This application Nov. 9, 1973, Ser. No. 414,430

Claims priority, application United Kingdom, July 15, 1971, 33380/71

Int. Cl. D01h *5/88*

U.S. Cl. 19—255 **2 Claims**



1. A textile fibre drafting cradle arrangement comprising a lower cradle; a rear platform part carried by said lower cradle; a forward platform part carried by said lower cradle and being an extension of said rear platform part; forward lateral flaps extending from said forward platform part of said lower cradle; and an upper cradle with forward end engaged with said forward platform part in assembled position, said forward platform part being a lower tensor inter-changeably locatable in said lower cradle to determine the permitted maximum tensor spacing at the delivery opening whereby different lengths of fibre can be spun with the same platform tensor, said upper cradle having a width such that side walls thereof are disposed on either side of said lower cradle in the assembled position, said side walls terminating at their forward ends in hook parts that engage under said forward lateral flaps extending from said forward platform part of said lower cradle, said hook parts comprising the only parts of said forward platform part that project laterally beyond the side walls of said upper cradle.

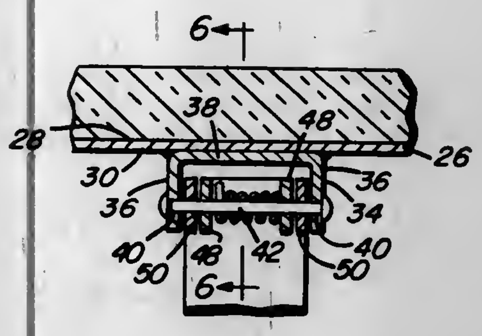
3,890,678
TIE BUTTON

Sidney H. Leonard, Jr., Kenosha, Wis., assignor to Sidney H. Leonard, Sr., Kenosha, Wis., a part interest

Filed July 2, 1974, Ser. No. 485,132

Int. Cl. A41d *25/04*

U.S. Cl. 24—49 C **2 Claims**



1. A tie button for covering and providing ornamentation at the juncture of the lower portion of a necktie knot and the free hanging portion of the tie disposed below the knot, said button comprising an ornament body defining front and rear sides, the front side of said body including means rendering the structure ornamental when viewed from the front side thereof, the rear side of said body including curved C-shaped clamp arms opening toward each other and supported at one pair of adjacent base ends from a central portion of the rear side of the body for pivotal movement relative to the body about an axis disposed at generally right angles relative to front-to-rear extending path passing centrally through the body and generally normal to a plane in which the other pair of ends of the clamp arms are swingable between closed operative positions with the other pair of free ends of said arms swung toward each other and open inoperative positions with said other pair of ends of said arms swung away from each other, said arms, when in said closed positions, defining at least a substantially closed generally circular boundary for disposition about said juncture, and means connected between said arms and said body yieldingly biasing said arms toward said operative positions, a pair of apertured mounting flanges outstanding from the rear side of said body in spaced apart generally parallel relation, said base ends of said arms including corresponding pairs of opposite side interdigitated furcations provided with aligned apertures, said flanges including bores aligned with said apertures, and a pivot shaft passed through said apertures and bores defining said axis, said means connected between said arms and said body comprising a butterfly spring having a coiled central portion disposed on the center portion of said pivot shaft between said opposite side furcations and opposite end portions engaged with the outer surfaces of said base ends of said arms and biased toward said free ends of said arms.

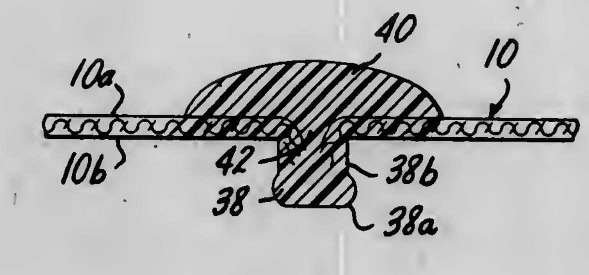
3,890,679
GARMENT FASTENER SUBASSEMBLY AND METHOD FOR MAKING THE SAME

Jack Simon, Rye, N.Y., assignor to Athlone Industries, Inc., Parsippany, N.Y.

Filed Nov. 9, 1973, Ser. No. 414,245

Int. Cl. A44b *17/00*

U.S. Cl. 24—213 **6 Claims**



1. A method for making a fastener subassembly comprised of a fibrous strip member and a unitary fastener element extending in part through said strip member and secured thereto, comprising the steps of: (a) arranging first and second dies, each defining a mold cavity, in opposed clamping relation to a non-apertured fibrous strip member; (b) supplying successively into one of said dies solidified and fluid molding material under pressure sufficient both to force said solidified material through said strip member to thereby rupture said strip member and define a passage in said strip member extending between the mold cavities and to force said fluid molding material into said passage and into each said mold cavity to fill said passage and each said mold cavity with said fluid molding material; (c) solidifying molding material in said passage and in each said cavity; and (d) separating said dies from said strip member.

2. The fastener subassembly provided by practicing the method claimed in claim 1.

3,890,680
FASTENER

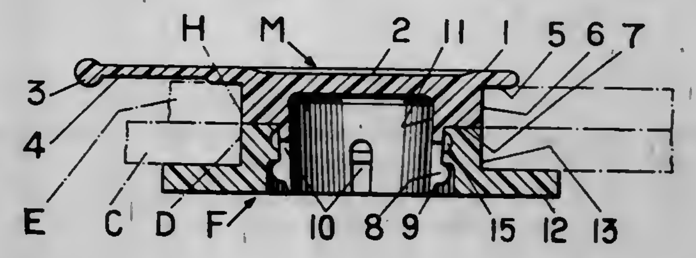
Toshitsugu Furuya, Hyogo, Japan, assignor to Furuya Kogyo Kabushiki Kaisha, Hyogo, Japan

Filed Aug. 16, 1973, Ser. No. 388,788

Claims priority, application Japan, Aug. 16, 1972, 47-82277

Int. Cl.² A44B *17/00*

U.S. Cl. 24—214 **2 Claims**



1. A fastener comprising a counterpart element and a main element which is insertable into said counterpart element, said main element having a cylindrical insert portion including an extruded skirt element having a raidally extending first portion of semi-circular cross-section and a second leading end portion with walls tapered towards the axis of the cylindrical insert portion and a plurality of slots in the open end thereof, said counterpart element including a cylindrical head portion in the center thereof and a flange portion around said cylindrical head, the cylindrical head comprising in sequence a first aperture means having a diameter smaller than the diameter of said first portion of said skirt element and a ring shaped groove for loosely engaging said first portion of said skirt element therein, shoulder means having a diameter less than the diameter of said first aperture means, and a second aperture means having a diameter greater than the diameter of said skirt element wherein when said main element is partially inserted into said counterpart element, said first aperture means engages said skirt element to temporarily hold said main element in said counterpart element and when said main element is completely inserted into said counterpart element said skirt element is firmly held in said second aperture means by said shoulder means.

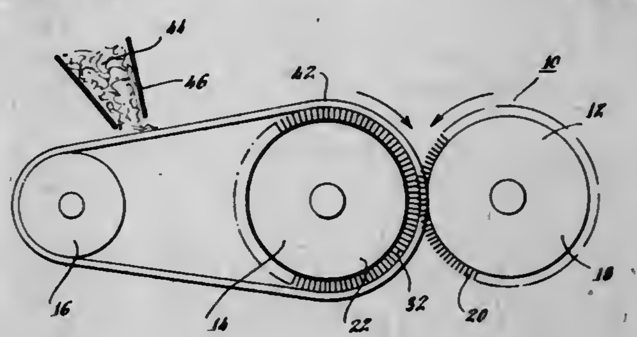
3,890,681
APPARATUS FOR NEEDLING TEXTILES

Eugene Zoltan Fekete, East Greenbush, and Raymond J. Grady, Colonie, both of N.Y., assignors to Huyck Corporation, Wake Forest, N.C.

Filed July 11, 1974, Ser. No. 487,668

Int. Cl. D04h *18/00*

U.S. Cl. 28—4 R **14 Claims**



1. An apparatus for needling textiles comprising
a needle support member which is capable of traveling along a closed travel path and has a multiplicity of felting needles affixed thereto, the long axes of which are oriented substantially normal to the surface of said member, and a backing member which is capable of traveling along a closed travel path and has a surface comprising pressure-tolerant, laterally displaceable, elongated fabric support members which are affixed at one end to the surface of said backing member and have their long axes

oriented substantially normal to the surface of said backing member;

said closed travel paths each aggregating 360° of angular change and being so positioned with respect to each other that at least at one point along said paths, a portion at least of said needles will reside among said elongated members.

3,890,682

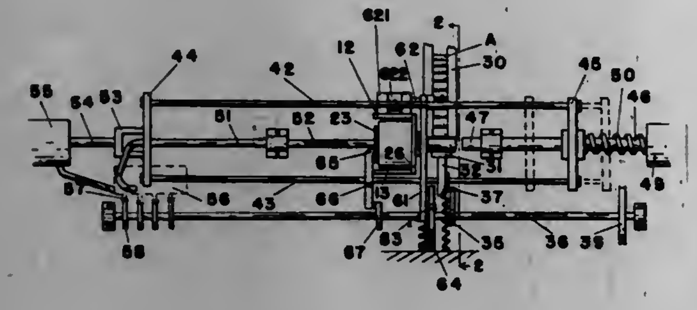
SHAPING AND TURNING MACHINE

George R. Eckstein, Fairfield, Conn., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Sept. 29, 1951, Ser. No. 248,921

Int. Cl. B21d *51/54*

U.S. Cl. 29—1.3 **1 Claim**



1. Apparatus for operating on hollow cylindrical workpiece comprising a tubular forming die of solid one-piece cross section, means for feeding workpieces into alignment with said die, means for thrusting workpieces into said solid die whereby said workpieces are shaped to the configuration of said die, means for revolving said die about an axis concentric with the workpiece therein, a tool, means for applying said tool to said workpiece while rotating said die to perform an operation thereon and for retracting said tool upon completion of said operation, means for ejecting said workpiece from said die comprising a tubular member and connections thereto for applying a jet of compressed air to the interior of said hollow workpiece, a carriage mounting said workpiece thrusting and ejecting means, and hydraulic means for reciprocating said carriage in the direction of the axis of said die.

3,890,683

ROLLER WITH AN ELASTIC HYDROGEL LAYER FOR DYE APPLICATION OR PRINTING ON GLASS AND OTHER MATERIALS

Jiri Vodnansky, and Artur Stoy, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved No. 3 Narodni, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 427,432, Dec. 21, 1973, abandoned. This application Apr. 10, 1974, Ser. No. 459,618

Claims priority, application Czechoslovakia, Dec. 22, 1972, 8917-72

Int. Cl. B21b *31/08*

U.S. Cl. 29—132 **15 Claims**

1. A roller suitable for the application of coloring materials onto a surface, comprising (I) an inner core of a material which does not substantially swell in aqueous solutions, (II) an outer surface including (1) copolymers of acrylonitrile with (2) at least one monomer selected from the group consisting of acrylamide, methacrylamide, N-lower alkyl acrylamides, N-lower alkyl methacrylamides, ethylenically unsaturated monocarboxylic acids, ethylene sulfonic acid, salts of said acids and compatible mixtures thereof and (3) at least one swelling agent selected from the group consisting of C_{1-4} alkylene and polyalkylene glycols and their methoxy and ethoxy derivatives, glycerol and acetyl derivatives thereof, (a) phenols, aromatic alcohols, hydroaromatic alcohols, C_{1-1} aliphatic alcohols, esters of (a), (b) fatty acids, and quaternary salts and esters of (b).

3,890,684

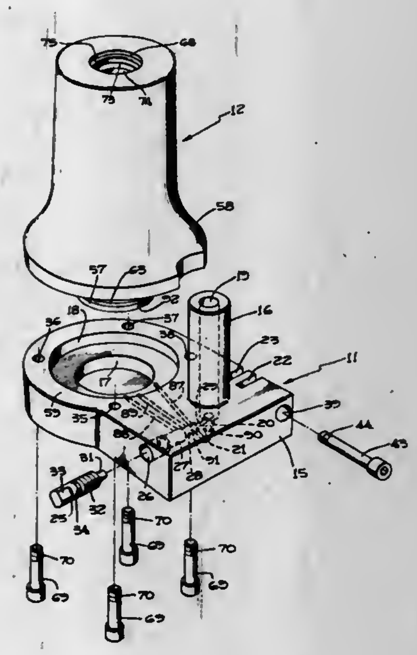
METHOD OF MAKING A HYDRAULIC JACK

Erven Tallman, 15934 S. Figueroa St., Gardena, Calif. 90247

Filed May 9, 1974, Ser. No. 468,532

Int. Cl. B23p *15/00;* **F15b** *15/18;* **B66f** *3/24*

U.S. Cl. 29—156.4 R **8 Claims**



1. A method for forming and assembling a weight lifting jack for reception of a conventional hydraulic ram and a conventional pump piston and pump actuating mechanism therefor,

and for attachment of a pump release valve screw,

said method comprising forming a base unit by casting therein concentric radially spaced recesses having annular walls

and circumferentially spaced fastening holes extending from the bottom upwardly,

casting a pump housing on the base unit with a downwardly open pump cylinder bore therein,

forming a relief valve bore in a communicating relationship with the exterior and said pump cylinder bore,

and forming hydraulic passages between said recesses and said pump cylinder bore,

forming a vertical unit by casting concentric radially spaced inner and outer cylinders whereby to provide a ram chamber in the inner cylinder and a reservoir between the inner and outer cylinders closed by material of the casting at the outer end,

cast forming inner ends of the cylinders to fit into the respective inner and outer recesses,

casting circumferentially spaced anchoring recesses in respective alignment with said anchoring holes,

and finally fastening said units together with self tapping bolts extending between said holes and said recesses.

3,890,685

METHOD FOR MANUFACTURING HOLLOW SCREWS FOR HEAT EXCHANGERS

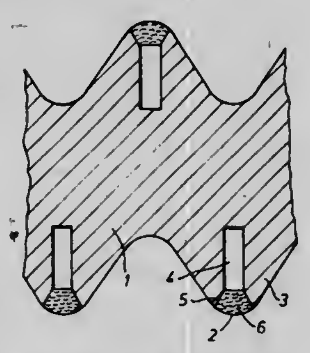
Helmut Rünte, and Peter Schwartz, both of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 30, 1974, Ser. No. 474,622

Claims priority, application Germany, June 6, 1973, 2328793

Int. Cl. B23p *15/02*

U.S. Cl. 29—156.8 H **4 Claims**



1. A method for manufacturing hollow screws for heat exchangers, comprising cutting a groove into the screw thread along the screw comb, and joining the edges of the groove walls together by an impervious weld seam.

3,890,686

SURFACE COATING FOR FERROUS ALLOY PARTS

Jacques-Jean Caubet, Andrezieux-Boutheon, France, assignor to Centre Stephanois de Recherches Mecaniques Hydromecanique et Frottement, Andrezieux Boutheon (Loire), France

Filed Apr. 24, 1974, Ser. No. 463,923

Claims priority, application France, Apr. 25, 1973, 73.15787

Int. Cl. B32b *15/18, 15/20*

U.S. Cl. 29—196.1 **3 Claims**

1. A mechanical part made of ferrous alloys and coated with a surface layer, characterized in that said layer enables the part to resist wear, seizing, corrosion, and shocks at the same time, while simultaneously the ability to adsorb a film of lubricating oil increases without the resistance to fatigue being altered, said layer consisting essentially of the $FeSn_2$, FeSn, $FeSnC_x$ phases (x ranging from 0.7 to 1.3), according to the following proportions:

$FeSn_2$ ranging from 5 to 30 percent by volume
FeSn ranging from 60 to 95 percent by volume
$FeSnC_x$ ranging from 0 to 10 percent by volume,

the distribution of said three phases within the layer being in accordance with the diagrams of FIGS. 1, 2 and 3, respectively.

3,890,687

METHOD FOR SPRING ASSEMBLY

Joseph H. Goldberg, 505 N. Lake Shore Dr., Chicago, Ill. 60611

Filed Nov. 4, 1974, Ser. No. 520,472

Int. Cl. B21f *35/00;* **B23p** *13/00*

U.S. Cl. 29—173 **8 Claims**

1. A method of producing planar circular, coiled springs having radial uniformity, said method comprising the steps of:

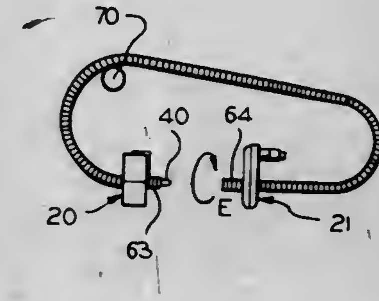
a. coiling wire into elongated helical spring;

b. cutting said spring to a precise length which is equal to the circumference of said circular spring plus an overlap length;

c. inserting a connecting rod into one end of said circular spring helix, the diameter of said rod fitting into the helix with a snugness such that it does not easily fall out, and the length of said rod being approximately equal to the overlap length;

d. preliminarily turning said spring a predetermined rotary distance in a first direction to pre-stress said spring, and

e. bringing together and intertwining the tip ends of said elongated spring by turning said spring said predetermined rotary distance in a direction opposite to said first direction, whereby no residual pre-stress remains in said spring.



3,890,688

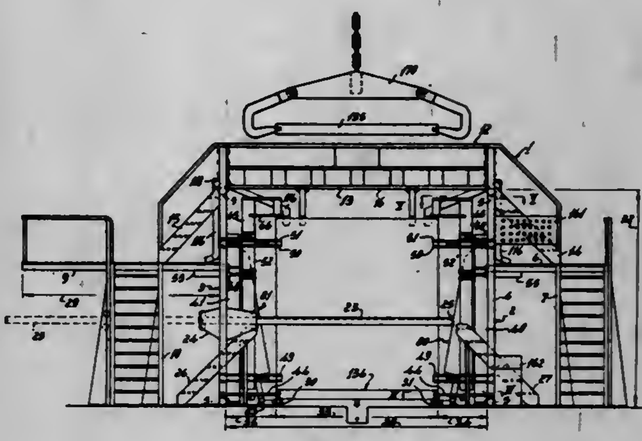
APPARATUS FOR THE CONSTRUCTION AND OR ASSEMBLY OF PREFABRICATED BUILDING SECTIONS OR ROOM UNITS

Cornelis Van Der Lely, 7, Bruschenrain, Zug, Switzerland

Filed May 17, 1973, Ser. No. 361,290

Int. Cl. B23p *19/00*

U.S. Cl. 29—200 R **52 Claims**



1. Apparatus for manufacturing prefabricated building sections from prefabricated top, bottom and side components constructed at least in part of metal beams and concrete, the apparatus comprising:

lower positioning means adapted to carry in a horizontal disposition a said bottom component;

a frame which includes vertically disposed frame parts, one of said frame parts located on each side of said lower positioning means;

side component positioning means mounted on each said frame part for performing the function of receiving and positioning a side component relative to said bottom component carried by said lower positioning means, side component stop means associated with said side component positioning means for performing the function of maintaining each said side component for securing in its desired position relative to said bottom component;

top component positioning means and top component stop means associated with said top component positioning means mounted on the upper aspect of each said frame part for performing the function of positioning and maintaining a said top component for being rigidly secured to said side component.

3,890,689

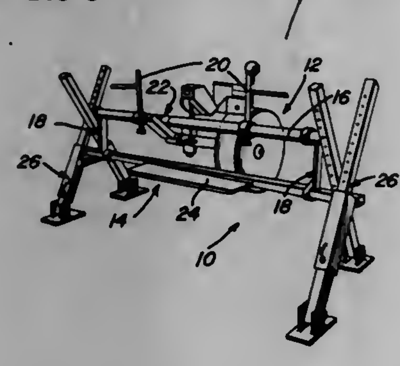
HOLDING FRAME FOR CABLE SPLICING TOOLS AND METHOD FOR SPLICING CABLES

Donald D. Copas, 303 Fredericks Ln., Jefferson City, Mo. 65101

Filed Jan. 3, 1974, Ser. No. 430,486

Int. Cl. H01r *43/00;* **H05k** *13/04;* **B23q** *7/00*

U.S. Cl. 29—203 C **14 Claims**



1. A holding frame for buried cables and pedestals for use in connection with cable splicing tools, comprising, in combination:

a. a framework including a support bar and legs for holding the support bar above an associated supporting surface;
b. means for mounting the support bar on the legs;
c. means mounted on the support bar for retaining buried cables and pedestals to be spliced; and
d. means provided on the support bar for attaching a splicing tool to the framework and permitting the tool to splice the retained cable sections.

3,890,690

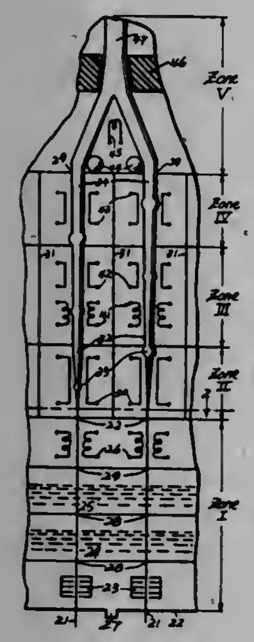
METHOD OF MAKING REINFORCED METAL MATRIX COMPOSITES HAVING IMPROVED LOAD TRANSFER CHARACTERISTICS AND REDUCED MISMATCH STRESSES

Chou H. Li, 379 Elm Dr., Roslyn, N.Y. 11576

Continuation-in-part of Ser. No. 769,938, Oct. 23, 1968, Pat. No. 3,663,356. This application May 4, 1972, Ser. No. 250,195

Int. Cl. B23p *17/00*

U.S. Cl. 29—404 **38 Claims**



1. The method for making reinforced, metal-matrix composite, comprising: preparing a plurality of elongated, high-strength and high-modulus reinforcing members; dispersing the members in spatial relationship in a strain-hardenable metal matrix; effectively bonding the members to the surrounding matrix at selected, discrete surface regions along their lengths; and stressing the composite sufficiently to locally strain the matrix near the discretely bonded regions whereby the matrix in the space between the members is substantially and selectively though nonuniformly strain-hardened and strengthened and whereby spheres of influence induced by the straining and strain-hardening in the matrix within the space near the discrete regions on one member are caused to significantly overlap similar spheres of influences near the neighboring members so as to substantially increase mechanical interaction and load transfer ability between the one member and the neighboring members through the intervening hardened and strengthened matrix.

3,890,691

METHOD OF PRODUCING AN APPARATUS FOR HYDRO-THERAPEUTIC TREATMENT

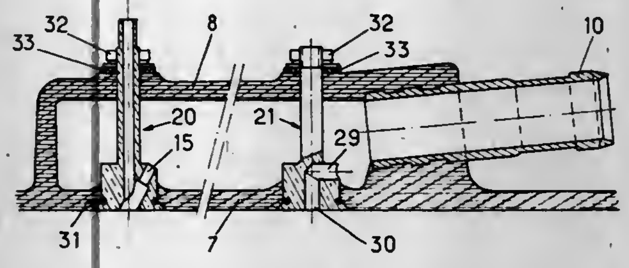
Jean-Baptiste Montagne, 4, rue des Tourterelles, 67200 Oberhausbergen, France

Filed July 8, 1974, Ser. No. 486,583

Claims priority, application France, July 9, 1973, 73.26061

Int. Cl. B23p *17/00*

U.S. Cl. 29—423 **14 Claims**



1. A method of producing a vessel for a sanitary apparatus, especially an apparatus for hydro-therapeutic treatment, having channels of integral double-walled structure, comprising the steps of providing a mold having a wall with an outer surface corresponding to the inner surface of the vessel to be produced and being formed in the wall thereof with a row of apertures; placing said mold on a support with the outer surface facing upwardly; fixing coaxially with each of said apertures an insert projecting beyond said outer surface; applying onto said outer surface a first layer of hardenable or polymerizable plastic material with said inserts projecting beyond said first layer; placing on each row of inserts an elongated plug of meltable or dissolvable material having the form of the channel to be produced and provided with passages through which said inserts respectively extend; applying onto the outer surface of said elongated plug an additional layer of plastic material, while said first layer is still in plastic condition, so as to join said additional layer to said first layer; removing said inserts after said layers have hardened to provide in said layers openings corresponding to surface portions of said inserts; removing said elongated plug by melting or dissolving the material thereof; and placing nozzle members having outer surface portions identical with said surface portions of said inserts into said openings previously occupied by said inserts.

3,890,692

PROCESS AND APPARATUS FOR THE REMOVAL OF ARROWS

John J. Jandura, Jr., Main Rd., Towaco, N.J. 07082

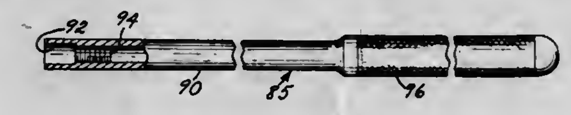
Filed Feb. 13, 1974, Ser. No. 442,184

Int. Cl. B23p *19/02*

U.S. Cl. 29—427 **8 Claims**

1. An archery process which comprises discharging from a bow an arrow having a shaft and a head threaded thereto, embedding said head in a substrate from which the force which must be applied to said shaft to effect removal of said arrow may be sufficient to cause deformation of said shaft if applied thereto. unthreading said shaft from said embedded

arrowhead, threadably engaging said arrowhead with a mating threaded end of a greater strength extractor tool having an outer diameter not greater than said shaft, extracting said arrowhead from said substrate by use of said extractor tool, recovering said arrowhead by unthreading said recovery arrowhead from said extractor tool threaded end, and rethreading said recovered arrowhead to said shaft.



3,890,693

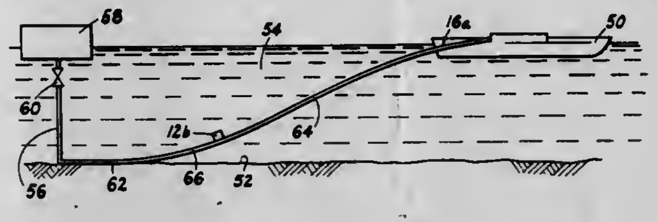
METHOD FOR CONTROLLED PRESSURIZATION OF A PIPELINE DURING CONSTRUCTION THEREOF

Harold N. Eagleton; Jerome D. Lormand, and Joe S. Herring, all of P.O. Box 36117, Houston, Tex. 77036

Filed Oct. 26, 1972, Ser. No. 301,191

Int. Cl. F16l *1/00*

U.S. Cl. 29—429 **15 Claims**



1. In the construction of a pipeline, a method for pressurizing the interior of the pipeline which comprises providing a selectively sealed chamber within the pipeline, directing a pressure fluid into the chamber for providing a preselected pressure therein, enlarging the chamber within the pipeline during the construction thereof, maintaining the pressure within the chamber at said predetermined level during the enlarging thereof throughout the pipeline construction operation, and utilizing said pressure for applying axial tension to the pipeline.

3,890,694

DEVICE FACILITATING THE POSITIONING OF A PIPE COUPLING

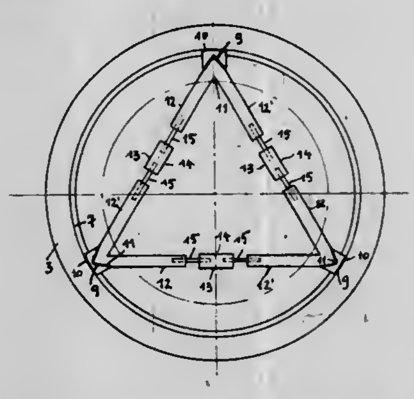
Gilbert Pineur, Avenue A. Sonck 3, 4280 Hannut, Belgium

Filed May 1, 1974, Ser. No. 466,075

Claims priority, application Belgium, May 4, 1973, 799088

Int. Cl. B23p *11/02*

U.S. Cl. 29—450 **5 Claims**



1. A device for positioning a single-unit pipe coupling onto pipes and for positioning pipes into a coupling, characterised in that it is composed of at least three plates of metal or of other hard material such as wood, the thickness of which is slightly less than the width of a median groove in the coupling in which an expansion joint or seal is seated, and the surface area of which is sufficient to ensure that, while being positioned inside the groove, they extend beyond the internal diameter of the pipes to be coupled together, these plates being fixed to corner pieces having two arms, generally of metal, and identical in number to the plates, the magnitude of the angle inscribed inside the two arms of said corner pieces being determined in such a way that it is possible to align one arm of one corner piece with one arm of an adjacent corner piece, and is further composed of means enabling an extension and a contraction to be exerted in succession and progressively on each of the arms of mutually aligned corner pieces, such means enabling one of said arms to be progressively separated from the other at the time of positioning of the plates in the groove of the coupling and conversely enabling said arms to be progressively brought together in order to withdraw the plates from the groove of the coupling.

5. A method of coupling together pipes of diameter exceeding 45 cm by means of the device of claim 1, characterised in that, after the diameter of the circle within which the external edge of the plates is inscribed has been reduced to a value slightly less than the smallest internal diameter of the coupling, these plates are positioned opposite to the groove of the coupling, each corner piece is successively and progressively moved apart so as to introduce the plates into the groove, the coupling is driven onto the first pipe, the device is held in position, the second pipe is driven into the coupling, and each corner piece is successively and progressively brought together in such a way as to reduce the diameter of the circle within which the external edge of the plates is inscribed to a value slightly less than the internal diameter of the pipes.

3,890,695

METHOD OF INSERTING A GRUMMET OR THIMBLE IN SAIL CLOTH OR THE LIKE

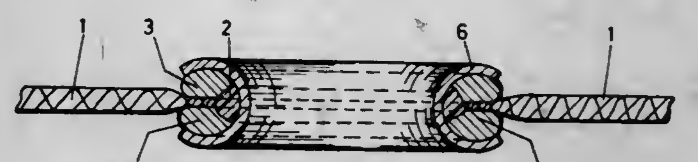
Douwe Gaastra, Heeg, Netherlands, assignor to Gaastra B.V., Sneek, Netherlands

Filed Apr. 16, 1973, Ser. No. 351,481

Claims priority, application Netherlands, May 8, 1972, 7206211

Int. Cl. B23p *3/00, 25/10*

U.S. Cl. 29—458 **2 Claims**

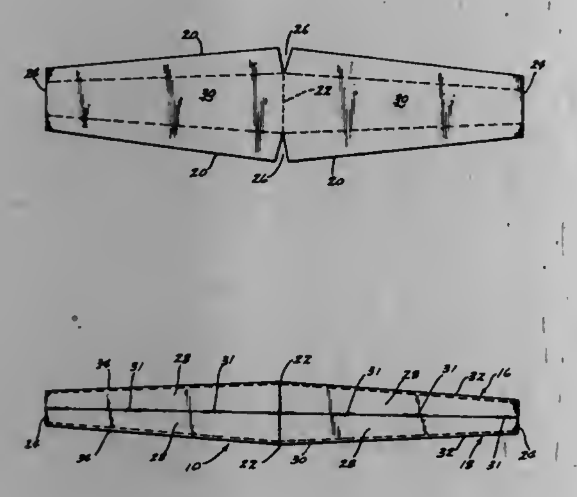


1. A method for inserting a grummet or thimble in a material, such as sail cloth or the like, comprising the steps of

forming an opening in said material;
ravelling the edge of said opening;
smearing said raveled edge with a thermosetting adhesive to form a thickened edge about the opening;
positioning a first ring on a tube having a flared end and an unflared end so that said first ring comes to rest on said flared end;
inserting the unflared end of said tube into said opening so that said unflared end projects therethrough and said first ring is placed in contact with one side of said material against the thickened edge of said opening;
positioning a second ring on said projecting end of said tube so that said second ring is in contact with the other side of said material against the thickened edge of said opening;
and deforming the ends of said tube so that said tube assumes a torus-shaped configuration to tightly clamp the adhesive-smeared thickened edge of said opening between said first and second rings.

3,890,696
TOW TRUCK BOOM AND METHOD OF CONSTRUCTING SAME

Earl R. Buske, 206 Fourth Ave., Pocahontas, Iowa 50574
Filed May 10, 1973, Ser. No. 359,104
Int. Cl. B23k *31/06*
U.S. Cl. 228—173 5 Claims



1. Method of constructing a boom having a cross sectional area that increases from the opposite ends towards the center comprising the steps of,

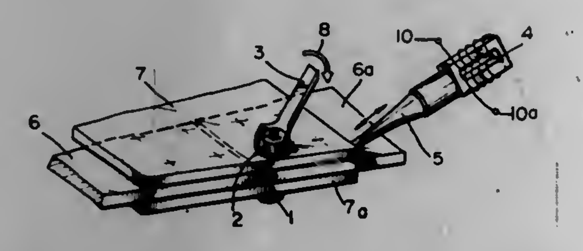
providing a pair of channel-shaped members in face-to-face relationship wherein each channel member includes side walls which increase in height from the outer ends of the members towards the center and a V-shaped notch is provided at the center of each side wall, said notch having its vertex at the base of the channel,

bending of the base of each of said members along a fold line extending across the base of each member and through the vertexes of said V-shaped notches to bring said members into engagement along the edges of their adjacent side walls, and

bonding together the adjacent edges of said members.

3,890,697
METHOD OF FIXING MEMBERS WITH BOLTS

Masaki Horioka, Yokohama, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 25, 1973, Ser. No. 409,683
Claims priority, application Japan, Oct. 25, 1972, 47-106167
Int. Cl. B23p *19/00*
U.S. Cl. 29—526 8 Claims



1. A method of securing at least two members together with at least one threaded bolt, comprising:

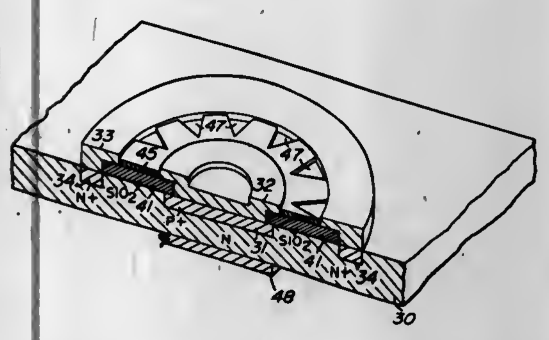
placing said at least two members together with respective surfaces thereof in contact with each other;

threadably fastening said members together with a threaded bolt which passes through at least one of said members; and

applying vibratory energy to at least one of said members jointly with the tightening of said threaded bolt.

3,890,698
FIELD SHAPING LAYER FOR HIGH VOLTAGE SEMICONDUCTORS

Lowell E. Clark, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.
Division of Ser. No. 194,380, Nov. 1, 1971, abandoned. This application Dec. 3, 1973, Ser. No. 421,377
Int. Cl. B01j *17/00*
U.S. Cl. 29—577 4 Claims



1. A method for increasing the breakdown voltage of a semiconductor device having

a first region of a first conductivity type having an upper surface,

a second region of a second conductivity type located in said first region and in contact with said upper surface thereof,

a third region of a higher doping concentration of said first conductivity type located in said first region in contact with said upper surface thereof and spaced from said second region,

a first conductive terminal making an ohmic contact with said first region,

a second conductive terminal having an outer boundary having a curved portion and making an ohmic contact with said second region, and

a third conductive terminal located outside said second conductive terminal and making an ohmic contact with said third region, said third conductive terminal having an inner boundary having a curved portion and being spaced apart from said second conductive terminal forming a space between said respective curved portions thereof, said method comprising the steps of:

applying a resistive material to said space between said respective curved portions thus making contact with said second and third terminals and forming a series of higher resistivity areas and lower resistivity areas in said resistive material with the higher resistivity areas being concentrated adjacent said third terminal to cause the electric field created through the application of a voltage to said terminals to be uniform between said second and third terminals.

3,890,699
METHOD OF MAKING AN OHMIC CONTACT TO A SEMICONDUCTOR MATERIAL

Juri Vilms, Palo Alto, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed June 4, 1974, Ser. No. 476,250
Int. Cl.² B01J *17/00*
U.S. Cl. 29—590 2 Claims

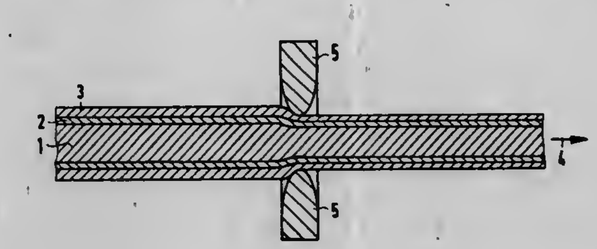
1. Method of making an ohmic contact to N-type gallium arsenide including the steps of

a. depositing a layer of gold on the gallium arsenide surface, a layer of silver on said gold layer, said silver layer being at least 0.080 microns thick, and a layer of germanium on said silver layer wherein the three layer structure has the composition about 25 to 35 weight percent gold, about 35 to 45 weight percent silver and about 25 to 30 weight percent germanium, and

b. alloying the three layer structure in an inert atmosphere and at a temperature in the range of 460° to 490°C for 1 to 10 minutes.

3,890,700
METHOD FOR THE MANUFACTURE OF A COMPOSITE WIRE WITH AN ALUMINUM CORE AND NIOBIUM CLADDING

Heinrich Diepers, Erlangen-Bruck; Horst Müsebeck, Erlangen, and Eduard Wirkner, Furth, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed July 12, 1973, Ser. No. 378,423
Claims priority, application Germany, Aug. 3, 1972, 2238293
Int. Cl. H01v *11/14*
U.S. Cl. 29—599 11 Claims

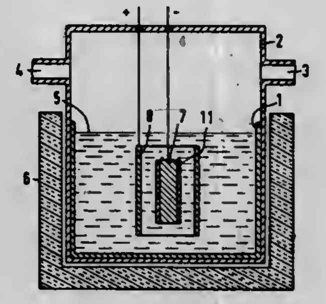


1. A low temperature method for manufacturing a composite wire having an aluminum core clad with niobium without subjecting the composite wire to any temperature above about 100°C., said method comprising the steps of

a. forming an aluminum rod;
b. covering said rod with a niobium jacket to form a starting structure;
c. applying a drawing aid to the outside of said jacket;
d. repetitively cold-drawing the starting structure until a intimate mechanical bond between the aluminum and niobium is achieved;
e. removing said drawing aid from said jacket; and
f. subjecting the resulting structure to a surface-smoothing cold-forming process.

3,890,701
PROCESS FOR THE PRODUCTION OF A COMPOSITE WIRE HAVING AN ALUMINUM CORE AND A NIOBIUM COVER

Heinrich Diepers, Erlangen-Bruck, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany
Filed June 13, 1974, Ser. No. 478,962
Claims priority, application Germany, June 22, 1973, 2331925
Int. Cl. H01v *11/14*
U.S. Cl. 29—599 5 Claims

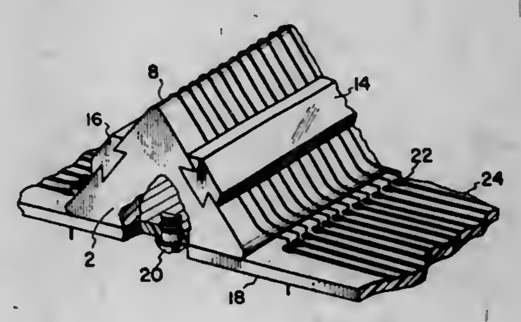


1. In a low temperature process for producing a composite wire having an aluminum core and niobium case surrounding the core without submitting the composite wire to any temperature above about 100°C., in which process an initial rod is produced from a rod-like aluminum core with a niobium case surrounding the core after which the initial rod is reduced in cross section by a plurality of cold drawing steps, with a drawing aid applied to and surrounding the niobium case, thereby obtaining an intimate mechanical bond between the niobium and aluminum, with the final step comprising a surface smoothing cold deformation carried out after removal of the drawing aid, an improved process for forming the initial rod for use in making the composite rod comprising:

a. coating a carrier with a niobium layer by fusion electrolysis to form a cylindrical case of niobium over the carrier;
b. removing the carrier to leave only the niobium case; and
c. pushing an aluminum rod of suitable diameter inside the niobium case.

3,890,702
METHOD OF MAKING THERMAL RECORDING PRINT HEAD

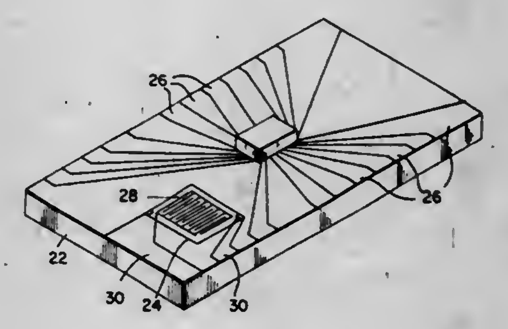
Charles E. Lane, III, Meadowbrook, Pa., assignor to Honeywell, Inc., Minneapolis, Minn.
Division of Ser. No. 457,622, April 3, 1974. This application July 22, 1974, Ser. No. 490,230
Int. Cl. H05b *3/00*
U.S. Cl. 29—611 3 Claims



1. A method of manufacturing a print head comprising the steps of winding a single layer of spaced turns of a wire on an electrically resistive support mandrel having a longitudinal wire support edge and an undercut groove in each face of said mandrel adjacent to said support edge, filling said grooves in said mandrel and encompassing adjacent ones of said wires with a wire retaining compound and cutting said winding of wire along a predetermined longitudinal line on said mandrel.

3,890,703
METHOD OF MAKING HUMIDITY SENSOR

Lawrence E. Frazee, Huntington, N.Y., and Anthony V. Fraioli, Essexfells, N.J., assignors to Plessey Incorporated, Melville, N.Y.
Filed Feb. 19, 1974, Ser. No. 443,436
Int. Cl. H01c *1/14, 17/00*
U.S. Cl. 29—621 5 Claims



4. In the method of producing a humidity sensor by firing a layer of a cobalt oxide paste onto a high-temperature resistant, dielectric substrate to produce a hygroscopic element, the improvement comprising firing said element a second time for a short period at a temperature of about 1500°C. in a reducing atmosphere, whereby the resistivity of said element is lowered.

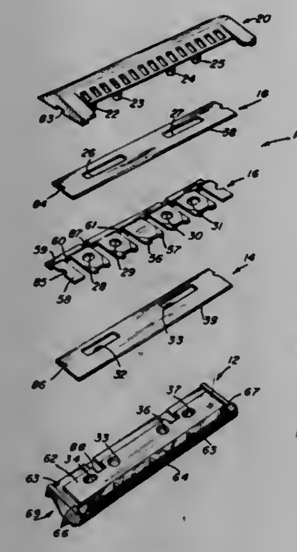
3,890,704
RAZOR BLADE CARTRIDGE

Frank A. Ferraro, Trumbull, Conn., assignor to Warner-Lambert Co., Morris Plains, N.J.

Filed Jan. 14, 1974, Ser. No. 433,030

Int. Cl.² B26B *21/06, 21/22*

U.S. Cl. 30—47 **5 Claims**



1. A razor blade cartridge comprising:

a. a plastic blade seat member including a transversely elongated guard surface defining a front surface of said blade seat member, and at least two transversely spaced perforations therethrough, each one of said perforations being transversely elongated and having a first longitudinal dimension;

b. a first blade located on said blade seat member including a forward cutting edge spaced upwardly and rearwardly of said guard surface, and at least two transversely spaced apertures, each one of said first blade apertures being transversely elongated and having a second longitudinal dimension greater than said first dimension;

c. a spacer member located on said first blade including at least two transversely spaced holes;

d. a second blade located on said spacer member including a forward cutting edge spaced upwardly and rearwardly of the forward cutting edge of said first blade, and at least two transversely spaced apertures, each one of said second blade apertures being transversely elongated and having a third longitudinal dimension greater than said second dimension; and

e. a cap member located above said second blade and including at least two plastic posts extending downwardly through said apertures, said holes and said perforations, said posts initially having a longitudinal outer dimension equal to or greater than the longitudinal dimensions of said apertures and said perforations to provide a longitudinal interference fit of said posts in said apertures and said perforations.

3,890,705
COUPLING PIN FOR AN ELECTRIC DRY-SHAVER

Eduard Willem Tietjens, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

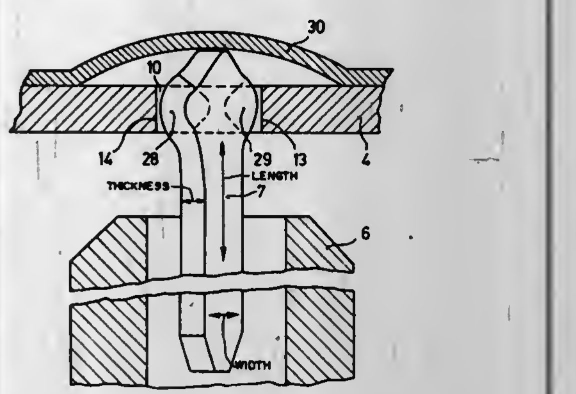
Filed Nov. 29, 1973, Ser. No. 420,115

Claims priority, application Netherlands, Dec. 22, 1972, 7217486

Int. Cl. B26b *19/14*

U.S. Cl. 30—43.6 **5 Claims**

1. In a shaving head of a rotary dry shaver including a shear plate tiltably mounted within a housing, a rotatably cutter positioned for engaging said shear plate, drive means for imparting rotary motion, a coupling member having a first part engaged and driven by said drive means and a drive end formed as a coupling pin for engaging and driving said cutter, and spring means engaging and urging said coupling pin axially against said cutter which is correspondingly urged axially against said shear plate, the improvement in combination therewith wherein said cutter has defined therein a central, rectangular aperture defining a pair of long side-walls and a pair of side-walls for receiving said coupling pin, and said coupling pin is formed of sheet material and comprises a shank having length and width in the plane of the sheet and thickness, and a drive end which is insertable axially within said aperture and has a pair of ears which extend in the opposite directions widthwise, each bar having a rounded outer edge of radius substantially equal to one-half of the length of one of said long walls, each ear also curved out of the plane of said sheet about a lengthwise axis, with the outer surface of each ear having a radius about said axis substantially equal to one-half the length of one of said shorter walls.



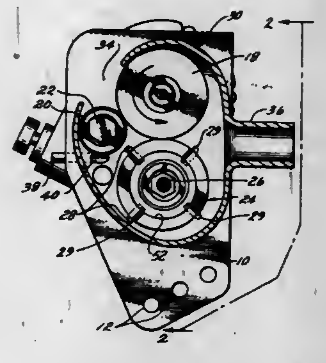
3,890,706
ROVING CUTTER FOR FIBER REINFORCED SYNTHETIC RESIN SPRAYERS

Jay Johnson, 5350 Jessen Dr., LaCanada, Calif. 91011

Filed Aug. 24, 1973, Ser. No. 391,208

Int. Cl. B26b *17/00*

U.S. Cl. 30—180 **2 Claims**



1. An improved cutter wheel for use in a cutter for chopping rovings of fibrous material, comprising an elongated cylindrical member having at least one radial slot extending transversely between the ends of the cylindrical member, said slot having a convex surface longitudinally in an arc over at least a portion of the length thereof in the direction of the axis of revolution of the cylindrical member, and a cutter blade of straight spring material positioned in the slot and having a sharp cutting edge along one elongated edge projecting radially outwardly from the cylindrical member, the width of the slot being greater than the thickness of the blade, the blade being held in a flexed curved shape against said convex surface when inserted in the slot by bending the blade, the blade being locked in the slot merely by the straightening action of the spring blade producing a lateral force pressing the center portion of the blade against said convex surface and the ends of the blade against the opposite surface of the slot.

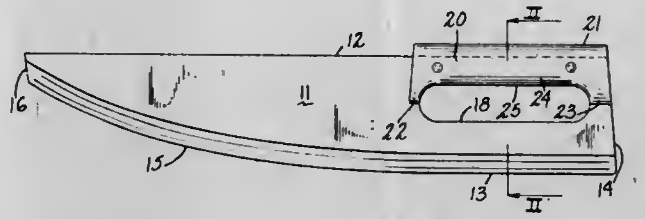
3,890,707
KITCHEN KNIFE

Henry V. Cremonese, 261 W. 11th St., New York, N.Y. 10014

Filed Jan. 3, 1974, Ser. No. 430,541

Int. Cl. B25g *3/00*

U.S. Cl. 30—340 **8 Claims**



1. A knife comprising an elongated blade having an upper edge and a lower cutting edge, a front portion and a widened rear portion, the cutting edge being substantially straight in said rear portion and curving convexly therefrom to said front portion, an opening in said blade in said rear portion between said upper edge and said substantially straight portion of said cutting edge and substantially directly over said straight portion, and a handle mounted to said blade above said opening, whereby a user may grasp said handle with fingers received through said opening.

3,890,708
COMPASS SAW

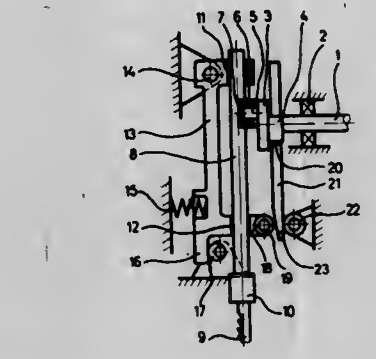
Friedrich Bauer, Wolfschulgen, Germany, assignor to Metabowerke KG Closs, Rauch, & Schnitzler, Nurtingen, Germany

Filed July 18, 1973, Ser. No. 380,165

Claims priority, application Germany, July 21, 1972, 2235882

Int. Cl. B27b *19/02*

U.S. Cl. 30—393 **13 Claims**



1. A compass saw comprising a housing; a drive shaft rotatably mounted in said housing and having eccentric means; an elongated rod connected to said eccentric means to be reciprocated thereby; a saw blade fixed to one end of said rod for reciprocation therewith; rocking means mounted in said housing for pivoting movement about a pivot axis and guiding said rod for reciprocation in longitudinal direction; means in said housing for counterbalancing the mass forces produced by the movement of said rod and said saw blade connected thereto, said counterbalancing means comprising an eccentric on said drive shaft and an elongated balancing body extending substantially parallel to said rod and being reciprocated by said eccentric in opposition to the movement of said rod, said balancing body having spaced from said eccentric a free end, and on one side thereof between said eccentric and said free end, a face inclined to the direction of its elongation; engaging means on said rocking means engaging said inclined face of said balancing body for causing said rocking means to pivot about said pivot axis during reciprocating movement of said rod and said saw blade connected thereto; and means in said housing cooperating with said rocking means for adjusting the pivoting movement the latter performs about said pivoting axis.

3,890,709
ROTATABLE CUTTER HEAD FOR AN ELECTRIC DRY SHAVER

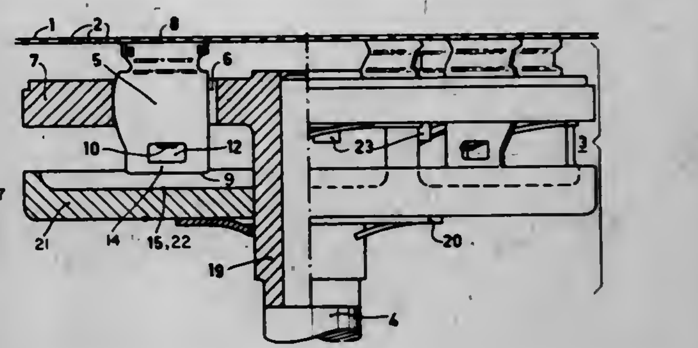
Eduard Willem Tietjens, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 3, 1973, Ser. No. 421,069

Claims priority, application Netherlands, Jan. 12, 1973, 7300454

Int. Cl. B26b *19/14*

U.S. Cl. 30—43.6 **9 Claims**



1. In an electric dry shaver including a perforated shear plate, the improvement comprising a rotatable cutter head including a support member having top and bottom surfaces, being rotatable about a central axis, and including a plurality of slots extending therethrough with corresponding top and bottom parts, a plurality of cutters each being situated in one of said slots, means for rotating said support member, each cutter having a central part in said slot, a top part extending above the top of said slot and terminating in a cutting edge for engaging said shear plate, and a bottom part extending below the bottom of said slot with an aperture in said bottom part of said cutter transverse of said slot, and spring means secured to the said support member and having a resilient finger extending at least partially across the bottom of each slot and having diameter smaller than said aperture in the cutter, said finger when a cutter is inserted downward through each slot, initially blocking the cutter's bottom part from extending through the bottom of the slot, said spring being deflectable when the cutter is urged further downward until said finger springs through said aperture, said finger then positioned while traversing said aperture and being deflected, to alone resiliently urge the cutter upward.

3,890,710
DENTAL DOWEL PIN POSITIONING AND ALIGNING APPARATUS

Charles G. Jaeger, 1340 N. Pike Lake Ct., Minneapolis, Minn. 55112

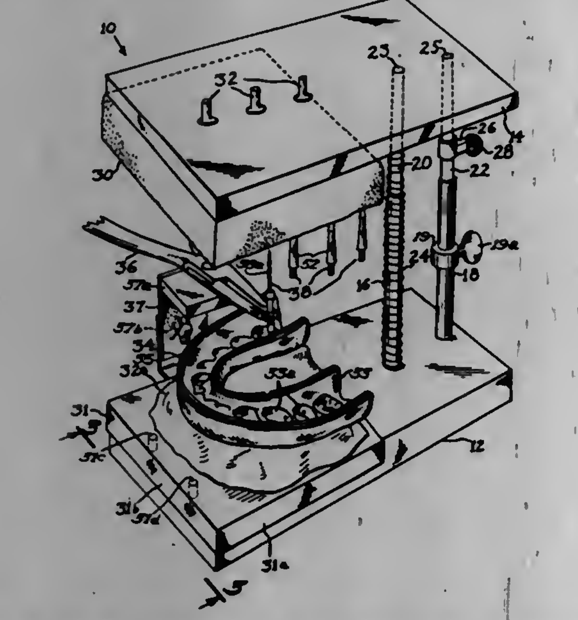
Filed Apr. 12, 1974, Ser. No. 460,385

Int. Cl. A61c *13/00*

U.S. Cl. 32—11 **11 Claims**

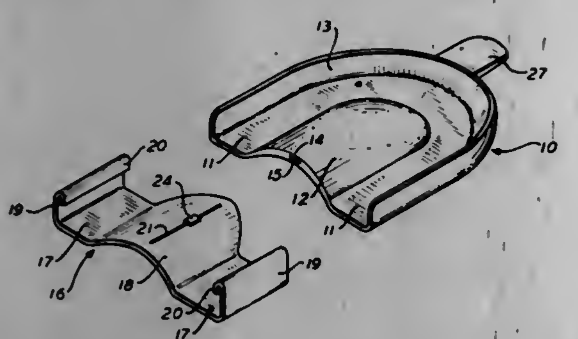
1. A dowel pin holding and aligning apparatus for aligning and retaining dowel pins in selected positions during a dental casting operation in making a positive replica of a tooth from a negative impression which is formed in an impression material, said apparatus comprising a supporting base, said base being adapted to support a dental tray for a dental impression in which the dowel pins are to be placed, a temporary dowel pin holder above said portion of the base adapted to support the tray, the temporary dowel pin holder comprising a deformable retaining material having a pierceable surface within which the dowel pins remain temporarily once they are embedded therein, a slidable mounting element supporting the temporary retainer on the base such that the temporary retaining element can be moved with respect to the base and tray along an axis parallel to the axis of the pins and parallel to the longitudinal axis of the negative impression of the teeth within which the pins are to be located, that is to say substantially normal to the plane of the tray on the base, each dowel pin including a needle-like piercing element, whereby during use

each pin can be placed in desired locations within a tooth impression in the tray, relative sliding motion can then be established between the base and the temporary retainer while the dowel pin is held in position within its tooth impression thereby forcing the dowel pin into the deformable retaining material which then holds the dowel pin in place and locates each of said dowel pins a selected distance above the lower end of its tooth impression thereafter while each additional successive pin is embedded one after another in the temporary retaining element until all of the pins have been properly located and the retainer being then movable to a position in which all of the pins are simultaneously transferred to their original positions within the negative tooth impressions of the tray for the casting of stone around the end of the pins within the negative tooth impressions.



3,890,711
ADJUSTABLE DENTAL IMPRESSION TRAY

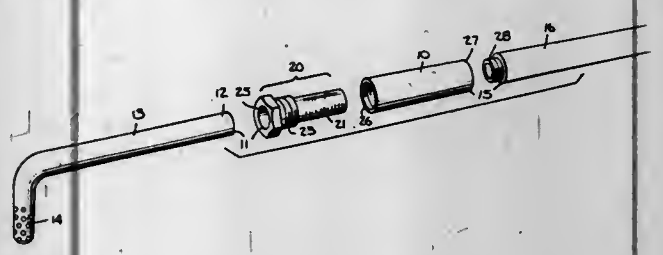
William F. Burns, 21 Brooklawn, Pompton Plains, N.J. 07444
Filed Apr. 18, 1974, Ser. No. 461,885
Int. Cl. A61c *9/00*
U.S. Cl. 32—17 **2 Claims**



1. An adjustable dental impression tray including a primary impression unit, an extension unit telescopically mounted on said primary unit for adjustment relative thereto in proximal and distal directions, and releasable means for securing said primary and said extension units in their adjusted position; said primary unit being provided with an elongated longitudinally extending securing means retaining slot of T-shaped cross-section in open communication with the distal end and with one face thereof, said extension unit being provided with an elongated slot in juxtaposition to the said T-slot of said primary unit and in communication therewith; said securing means comprising a mounting head slidably retained within the T-slot of said primary unit, a threaded stem affixed to said head and extending through and beyond both of said elongated slots, a clamp nut threadably engaged with the extending portion of said stem, and a retainer head affixed to the projecting end of said stem for preventing disassembly of said securing means.

3,890,712
SALIVA EJECTOR

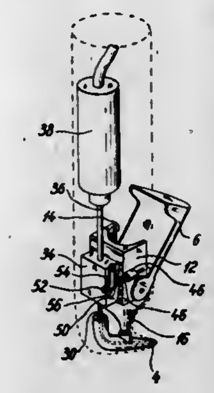
Oscar Lopez, 50 Edgewater Rd., Cliffside Park, N.J. 07010
Filed Aug. 29, 1973, Ser. No. 392,424
Int. Cl. A61c *17/04*
U.S. Cl. 32—33 **9 Claims**



1. An improved saliva ejector comprising:
- a pliable semi-rigid tubular end piece being open at one end and defining a perforate closure at the other end;
- a strainer unit of integral construction adapted to receive, in friction fit, said tubular end piece;
- first connecting means to secure said strainer unit to a suction tube;
- said strainer unit including a head which defines an orifice dimensioned to frictionally receive said tubular end piece, an elongated cylindrical strainer open at one end to communicate with said orifice and closed at its other end and an intermediate section disposed between said head and said strainer with externally threaded second connecting means for securing said strainer unit to said first connecting means, said strainer having an exterior diameter less than the interior diameter of said first connecting means to provide an annular space therebetween.

3,890,713
DENTAL DEVICES

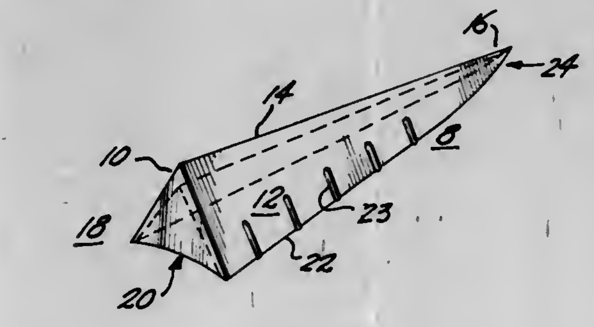
Nils Villadsen Nielsen, Sdr. Hallundbaek, Hodsager, Holstebro, Denmark
Filed Sept. 25, 1973, Ser. No. 400,654
Claims priority, application United Kingdom, Sept. 27, 1972, 44594/72
Int. Cl. A61c *5/04*
U.S. Cl. 32—60 **15 Claims**



1. A dental implement for use in connection with filling of tooth cavities with a tooth filling material, comprising: a housing means, an outlet means provided on said housing means including an outlet spout provided with a central outlet passage having an outlet opening, a side opening provided in said outlet spout and communicating with said central outlet passage, a reciprocably mounted plunger means disposed in said central outlet passage, said plunger means being reciprocable between a retracted position uncovering said side opening and an advanced position covering said side opening, said plunger means including an outer end portion which is situated adjacent the outlet opening of said outlet passage when said plunger means is in said advanced position, a removable cartridge means for holding the tooth filling material, means mounted on said housing means for receiving said cartridge means, means disposed in said housing at said cartridge receiving means for holding said cartridge means therein, and a power driven vibrator means connected to said plunger means for reciprocating the same in said central outlet passage, a connector conduit means disposed between said cartridge means and said side opening for guiding the filling material from said container means to said outlet opening whereby the filling material is dispensed through the outlet opening into the cavity and compressed therein.

3,890,714
DENTAL WEDGE

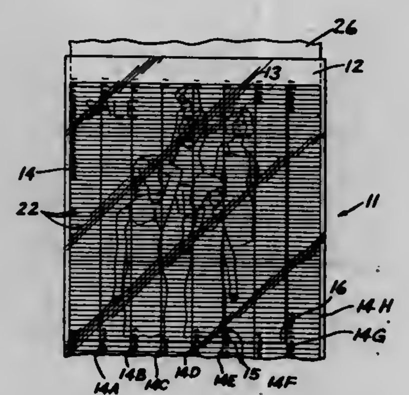
Kenneth W. Gores, 1026 112th N.E., Bellevue, Wash. 98004
Filed Nov. 29, 1973, Ser. No. 419,954
Int. Cl. A61c *3/00*
U.S. Cl. 32—64 **3 Claims**



1. A wedge for pressing the lower portion of a dental contour band to a tooth encircled thereby, comprising:
- pliable means forming an elongated trihedron-like resilient body having an apex and an open side opposite thereto; said apex being formed by the junction of common edges of an angularly flaired pair of vee-joined, thin, triangular walls;
- each of said walls, in cross-section, tapering from said junction to its opposite edge; and
- a third wall fully closed the space between said paired walls adjacent the larger end of the open-side of said body said third wall providing a resilient resistance to collapse of said paired walls.

3,890,715
DEVICE FOR MEASURING ADVERTISING SPACE

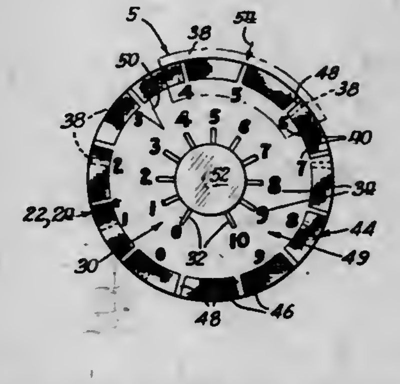
Arthur R. Kaplan, 20 E. Delaware, Chicago, Ill. 60611
Filed Aug. 27, 1973, Ser. No. 392,075
Int. Cl. G01b *5/26;* **G06g** *1/00*
U.S. Cl. 33—1 B **4 Claims**



1. A device for measuring the area of a newspaper ad upon superimposing the device on the ad comprising
- a transparent sheet,
- a series of parallel column lines spaced equally from each other defining newspaper columns, the left one of said column lines being used for locating the sheet along the left side of the ad and another one of said column lines being used for the right-hand boundary of said ad, an upper marginal line on said sheet perpendicular to said column lines to define an upper locating line for locating at the top of the ad, a series of parallel, transverse lines extending perpendicularly to said column lines and being spaced uniformly from each other, said column lines and transverse lines defining a grid work of areas, and indicia in said areas indicating the multiplication product of the transverse lines and number of columns thereby providing an area measurement at the lower right-hand area on said sheet superimposed over the lower right-hand corner of the ad, said transverse lines being spaced at whole number multiples of 1/14th of an inch to provide an area measurement in agate lines.

3,890,716
VERNIER INDICATOR

Donald Hatch, 10 Whaley Ln. Whaley Bridge, Stockport, England
Continuation-in-part of Ser. No. 67,342, Aug. 27, 1970, abandoned, which is a continuation-in-part of Ser. No. 791,901, Jan. 17, 1969, abandoned. This application Oct. 9, 1973, Ser. No. 404,594
Int. Cl. G01d *3/10*
U.S. Cl. 33—1 D **24 Claims**

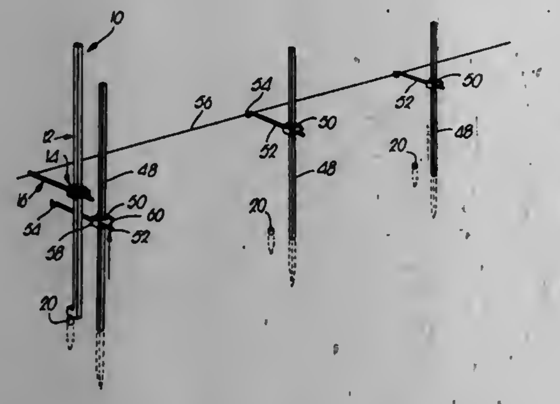


1. A circular vernier indicator of hand manipulatable dimensions and of an outer diameter of within the range of hand gripping, comprising
- a lower dial member and an upper dial member rotatable relative to one another about a common axis and having upwardly directed dial faces transverse to the axis and positioned in operable relative axial proximity, and having physical characteristics such as to enable visual observation of the scales, referred to below, on both dial faces in direction from upwardly of the dial members,
- a. one of the dial members having a circular normal scale on its dial face adjacent the axis with radial indicating elements angularly spaced and distributed circumferentially,
- b. the dial member other than in (a) having an indexing element positioned generally radially outwardly of the normal scale and having a radially inwardly directed point adjacent the normal scale and cooperable with that scale,
- c. one of the dial members having a circular second scale on its dial face adjacent its periphery and spaced radially further from the axis than the normal scale and having indicating elements distributed circumferentially at the same angular spacing of the normal scale and thereby constituting an expanded scale relative thereto, the second scale being made up of elements so dimensioned and proportioned that the indicating elements therein are of circumferential dimension similar to that of the indicating elements of the normal scale, and portions between the indicating elements of much greater circumferential dimension than the indicating elements and effectively obstructing visual comparison between the second scale and the vernier scale referred to below, and
- d. the dial member other than in (c) having a circular third scale on its dial face with indicating elements distributed circumferentially and angularly spaced dissimilarly to those of the second scale and thus constituting a vernier scale, but also having portions between the indicating

elements of much greater circumferential extent than the indicating elements and of nonindicating character.

3,890,717
DEVICE FOR SETTING GRADING LINES

Russell W. Haun, 10205 Newton, Kansas City, Mo. 64134
Filed May 8, 1974, Ser. No. 467,888
Int. Cl. G01c *15/00*
U.S. Cl. 33—86 **11 Claims**



1. A gauging device for use in setting grading lines while being positioned completely above the ground, said device comprising:

- an elongated, graduated gauge member adapted to be manually held in an upright position while resting atop a hub driven into the ground for establishing the location above said hub at which a grading line is to be supported,
- said gauge member being provided with a lower end having a horizontal cross-sectional area at least as large as the horizontal cross-sectional area of the remainder of the gauge member, means secured to said lower end projecting laterally therefrom and point means carried by and projecting dowardly from said laterally projecting means for engaging the top of said hub;
- an indicator member shiftable longitudinally on said gauge member for disposition at a predetermined height on the gauge member in registration with a graduation corresponding to said height;
- a line holder member carried by said indicator member and projecting laterally outwardly from said gauge member for temporarily supporting the line at said predetermined height and at a predetermined horizontal distance from said hub; and
- a level on one of said members for trueing the device.

3,890,718
METHOD FOR DETERMINING ASTRONOMIC NORTH BY GYROCOMPASS

Leslie F. Gregerson, and Gordon R. Symonds, both of Ottawa, Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada
Filed July 27, 1973, Ser. No. 383,117
Claims priority, application Canada, July 27, 1972, 148083
Int. Cl. G01c *19/38*
U.S. Cl. 33—301 **7 Claims**

1. The method of determining North by gyrocompassing in which a gyrocompass having one degree of freedom has its rotor spin axis in the horizontal plane and is suspended by a filar band for oscillation about a vertical axis in the band as a torsion pendulum, which comprises:

- observing and recording the times of transit of the spin axis while the rotor is spinning across a fixed point located close to the Meridional plane which includes and oscillation axis, and across a pair of fixed points located approximately equiangularly distant East and West from said Meridional plane;
- observing and recording times of transit of the spin axis with the rotor non-spinning during a plurality of oscillatory swings across said fixed points;
- establishing from said timing observations a mean period P_c and a mean period P_z respectively for said spinning and non-spinning swings;
- establishing quasi-angular velocities ω_q of a Simple Harmonic Motion:

$$x = A.\sin\omega_q t$$

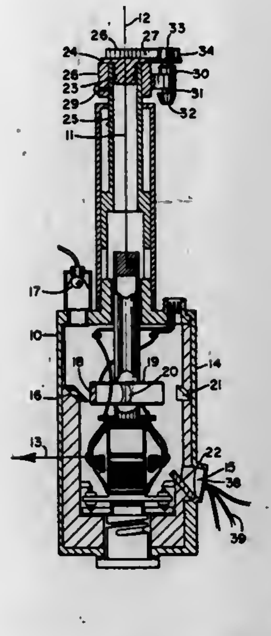
such that:

$$\omega_{qc} = 2\pi/P_c$$

and

$$\omega_{zq} = 2\pi/P_z$$

- establishing from said time measurements the time intervals t_R and t_L defined by successive transits of the spin axis across the Meridional and East pair of fixed points and across the Meridional and West pair of fixed points;



- establishing the apparent offset distances of the near-Meridional fixed point from the equilibrium North direction represented by the differences from the half-period times $P_c/2$ and $P_z/2$ of the mean periods of swings East and West as respective time time intervals

$$t_C \text{ and } t_c;$$

- establishing the apparent amplitude A of said Simple Harmonic Motion as

$$A_c = \frac{1 + \dfrac{\sin\omega_q t_C - \sin\omega_q t_L}{\sin\omega_q t_R - \sin\omega_q t_C}}{\sin\omega_q t_L - \sin\omega_q t_R}$$

$$A_z = \frac{1 + \dfrac{\sin\omega_q t_c - \sin\omega_q t_L}{\sin\omega_q t_L - \sin\omega_q t_c}}{\sin\omega_q t_L - \sin\omega_q t_R}$$

- deriving angular representations of the differences S between the equilibrium direction and the near-Meridional fixed point expressed as an angular distance in units of time interval t_R as

$$S_c = A_c \,.\, \sin\omega_q t_C$$
$$S_z = A_z \,.\, \sin\omega_q t_c$$

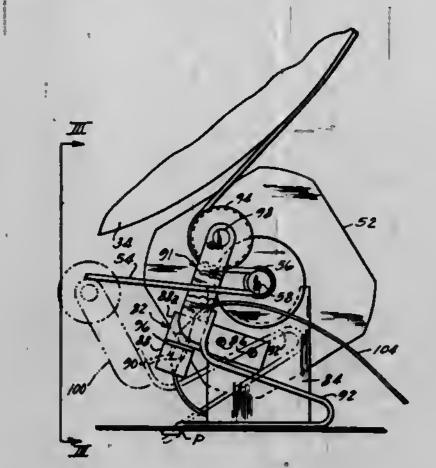
- and establishing the true direction of North from the angular difference n between the direction determined by the fixed near-Meridional point and North as

$$n = [1 + k]S - kS_z$$

where k is the ratio of the torsion torque of the band to the torque τ due to the directive moment of Earth's centripetal force, derived from the periods of spinning and non-spinning swings as observed.

3,890,719
BROKEN BELT POWER-DISCONNECT SYSTEM FOR DRYERS

Albert T. Braga, Stevensville; Robert A. Brenner, St. Joseph, and Ralph S. Odle, Jr., Michigan City, all of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Jan. 25, 1974, Ser. No. 436,448
Int. Cl. F26b *19/00*
U.S. Cl. 34—55 **11 Claims**

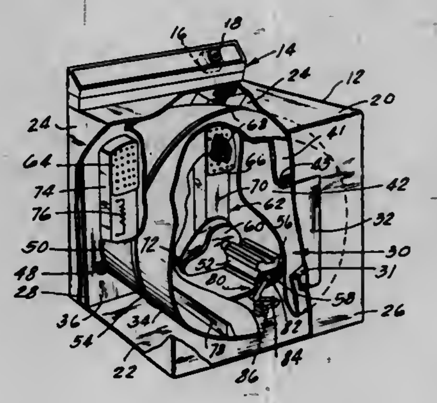


1. A clothes drying machine comprising:

- a rotatable drum;
- a drive motor;
- a power lead for delivering power from a power source and electrically connected to said drive motor;
- flexible drive means coupling said drive motor and said drum for rotating said drum when said drive motor is energized via said power lead; and
- power-disconnect apparatus including
  - a separable connector in said power lead,
  - idler means in mechanical contact with and tensioning said flexible drive means, and
  - separating means mechanically interacting together with said idler means for separating said connector in response to loss of tension from said flexible drive means.

3,890,720
BROKEN BELT SWITCH CONTROL SYSTEM FOR CLOTHES DRYER

George V. Nichols, Benton Harbor, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Jan. 25, 1974, Ser. No. 436,545
Int. Cl. F26b *19/00*
U.S. Cl. 34—55 **7 Claims**

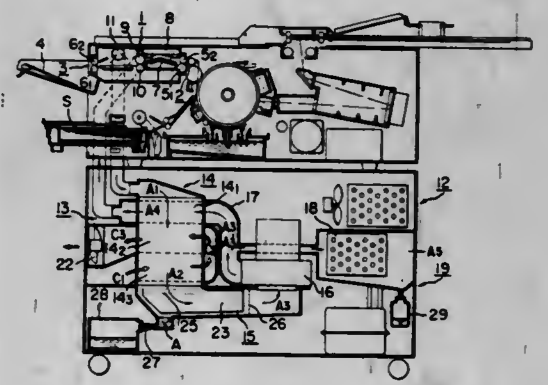


1. In a clothes dryer having a rotatable drum, heater means for drying clothes in the drum, a motor to rotate the drum, a belt connecting the motor and the drum for rotating the drum, tensioning means including a spring bracket and belt engagement means for applying tension to and held in an energy storing position by the belt, and an electrical circuit for connection to an electrical supply including the motor and the heater means, the improvement comprising:

- means for preventing damage to the dryer and clothes therein on breaking of the belt, comprising a switch connected in the electrical circuit for controlling the energization of the motor, said switch including
  - a switch actuator mounted spaced from and in the path of movement of the spring bracket for direct contact by the spring bracket upon breaking of the belt and release of the energy stored in the bracket to open the circuit and interrupt energization of the motor.

3,890,721
DEVELOPING LIQUID RECOVERY DEVICE IN A COPYING MACHINE

Hajime Katayama; Koichi Miyamoto, both of Tokyo, and Shoji Ohashi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 19, 1973, Ser. No. 426,054
Claims priority, application Japan, Dec. 26, 1972, 48-994; Apr. 17, 1973, 48-43493; June 4, 1973, 48-62737
Int. Cl. F26b *21/06*
U.S. Cl. 34—73 **12 Claims**



1. A developing liquid recovery device comprising:

- a drying chamber which includes an inlet and an outlet for a copy medium and which is of substantially hermetically sealed construction, said drying chamber accommodating heating means for heating the copy medium bearing an image formed by wet-developing to dry the copy medium with developing liquid vapor produced from the copy medium;
- a condenser chamber for accommodating means for cooling the developing liquid vapor produced in said drying chamber to form the vapor into mist;
- a mist collector chamber for accommodating means for applying an electric field to the developing liquid vapor in the form of mist to collect the mist;
- means for circulating an air flow through said drying chamber, said condenser chamber and said mist collector chamber in the order named; and
- discharging means disposed downstream of said mist collector chamber and upstream of said drying chamber, said discharging means discharging a part of the air flow to maintain the pressure in said drying chamber at a lower value than that of the ambient pressure.

3,890,722

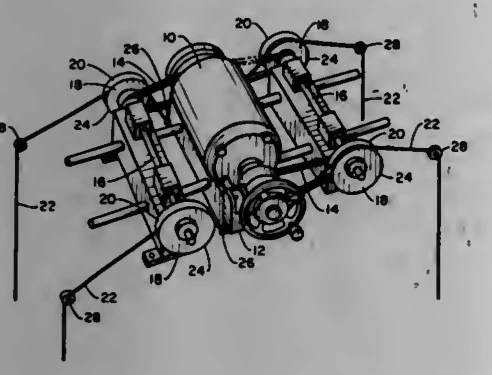
MOTION SIMULATOR

Daniel Nunez, 2326 Stafford Rd., Thousand Oaks, Calif. 91360

Filed Sept. 4, 1973, Ser. No. 394,024

Int. Cl. G09b *9/08*

U.S. Cl. 35—12 P **18 Claims**



1. A motion simulator system capable of motion in a plurality of degrees of freedom, comprising:

a platform;

a plurality of calibrated, variable-centered pulley wheels having means for adjusting the placement of a variable center of each said pulley wheel about which each said pulley wheel rotates;

a plurality of fixed points equal in number to said plurality of pulley wheels;

a plurality of means for supporting said platform, each said support means being connected between one said fixed point and said platform, each said support means mechanically communicating with and having the capability of continuous movement with respect to one of said pulley wheels, each said pulley wheel being capable of imparting a predetermined movement to the support means mechanically communicating therewith that is a function of the placement of said variable center of said pulley wheels;

means connected to said pulley wheels for imparting variable-speed, rotating motion to said pulley wheels about the variable center of said variable centered pulley wheels; and

power means connected to said variable-speed, rotating motion imparting means, whereby when said variable-speed, rotating motion imparting means is actuated for rotating said pulley wheels predetermined movements are imparted to said platform.

3,890,723

DUMMY, IN PARTICULAR FOR VEHICLE OR VEHICLE ACCESSORY TESTS

Edouard Haurat, Valentigney, and Roland Bouclet, Audincourt, both of France, assignors to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Boulogne-Billancourt, both of, France

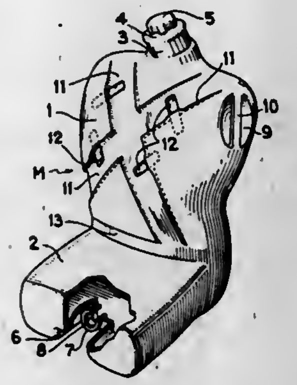
Filed Feb. 4, 1974, Ser. No. 439,282

Claims priority, application France, Feb. 20, 1973, 73.05891

Int. Cl. G09b *23/00*

U.S. Cl. 35—17 **10 Claims**

1. A dummy, in particular for carrying out tests on vehicles or automobile accessories, the dummy comprising an outer wall defining a cavity which constitutes a reservoir for a liquid, such as water, the wall defining outwardly an outer surface having substantially the shape and size of the trunk of a human body, the reservoir being closed except for the provision of reservoir filling means and reservoir emptying means and means for closing the emptying means, the filling means being in the upper part of the trunk and the emptying means in the lower part of the trunk in an upright position of the trunk and the cavity having a volume which is a major part of the volume defined by said outer surface of the wall whereby, when the reservoir is substantially filled with said liquid and the dummy is in use, the dummy has substantially the weight of a human trunk and, when the reservoir is empty, the dummy is considerably lighter and can be easily handled and carried.



3,890,724

QUESTION AND ANSWER EDUCATIONAL GAME WITH AN ANSWER CONTROL DEVICE

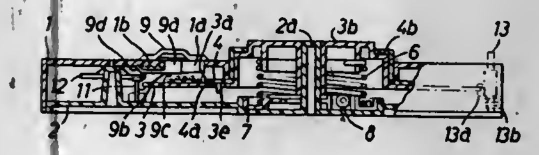
Walter Hesener, 66 Rue de la Prulay, 1217 Meyrin-Geneva, Switzerland

Division of Ser. No. 129,469, March 30, 1971, Pat. No. 3,780,453. This application Oct. 10, 1973, Ser. No. 404,907

Claims priority, application Switzerland, Mar. 31, 1970, 4696/70; May 29, 1970, 8136/70; Sept. 5, 1970, 13300/70; Nov. 20, 1970, 17285/70; Nov. 30, 1970, 17659/70

Int. Cl. G09b *3/00*

U.S. Cl. 35—48 R **14 Claims**



1. A method of playing an educational game which game comprises a housing, a plurality of setting means adapted to be moved in a first direction relative to the housing into any one of at least two answer positions, each such answer position being representative of one of several possible answers to a given question and one of such answers being the correct answer, a code bearing means located in the housing and carrying a plurality of code elements, the code bearing means being movable in a second direction transverse to the first direction relative to the plurality of setting means, the code elements cooperating with the setting means so as to prevent relative movement therebetween in the second direction if any one of the setting means is in a position corresponding to an incorrect answer, and to permit relative movement therebetween in the second direction if each of a predetermined number of the setting means is in a position corresponding to a correct answer, and a set of question-carrying elements, each element being divided into and containing thereon a plurality of ordered questions each of which has at least one correct answer, each such question designed to have the answer thereto entered by moving a select one of said setting means into one of its answer positions, the method comprising the steps of: selecting one question-carrying element from said set for associating with said educational game; determining the answers believed to be correct for each of the questions on the selected question-carrying element; selecting the setting means which corresponds to each of the plurality of ordered questions on the selected question-carrying element, and entering each of said determined answers to the respective questions on the educational game by moving the selected one of the related setting means into the one of the at least two answer positions which corresponds to the determined answer to the question associated therewith.

3,890,725

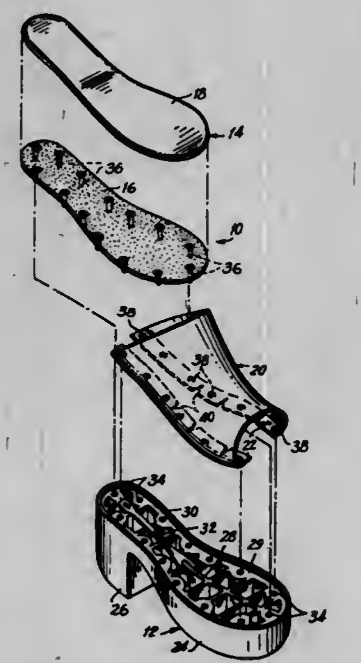
SHOE CONSTRUCTION

Darrell Bernard Lea, Kogarah, Sydney, Australia, and Laszlo Klein, Hendon, London, England, assignors to Darrel Bernard Lea; Robert Phillips Marcus and Howard Lee Gilman, all of New York, N.Y.

Filed Sept. 14, 1973, Ser. No. 397,344

Int. Cl. A43b *3/14*

U.S. Cl. 36—11.5 **50 Claims**



1. A shoe construction comprising:

a sole unit having a plurality of first connectors spaced along the peripheral portion of the upper surface thereof; an insole positioned on the upper surface of said sole unit; an upper having edge portions positioned between said insole and the upper surface of said sole unit, said edge portions of said upper having a plurality of holes therethrough; and

a plurality of second connectors mounted on said insole, said second connectors extending through said holes in said edge portions of said upper into substantially permanent engagement with said first connectors to connect said insole and the edge portions of said upper to the upper surface of said sole unit;

each of said first connectors comprising a body portion having a plurality of downwardly and inwardly extending, flexible and resilient tabs defining a central opening therebetween, and each of said second connectors comprising a flange portion and a pin portion being adapted to be received within said central opening defined by said tabs of said first connector and being of a size greater than said central opening so as to be engaged by said tabs when inserted in said central opening.

3,890,726

ROCK GUARD FOR SCRAPER DRAFT ARM

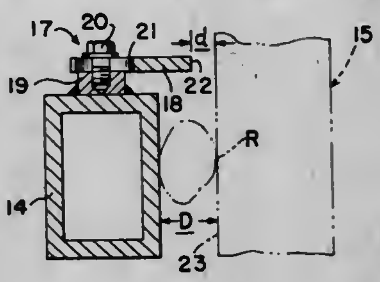
William T. Girard; Thomas R. Hamilton, and Bennett N. Waddell, all of Joliet, Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Jan. 31, 1974, Ser. No. 438,286

Int. Cl. E02f *9/24*

U.S. Cl. 37—124 **7 Claims**

1. In a tractor scraper combination having a scraper bowl pivotally attached to a tractor by a pair of laterally-spaced draft arms each positioned adjacent to a respective side of said scraper bowl, the invention comprising guard means attached on each of said draft arms to extend substantially the entire length thereof and each further extending between an upper surface of a respective draft arm and a respective side of said scraper bowl, and having inner edges thereof spaced a first predetermined distance from a respective side of said scraper bowl which is substantially less than a second predetermined distance between each draft arm and the side of the scraper bowl.



3,890,727

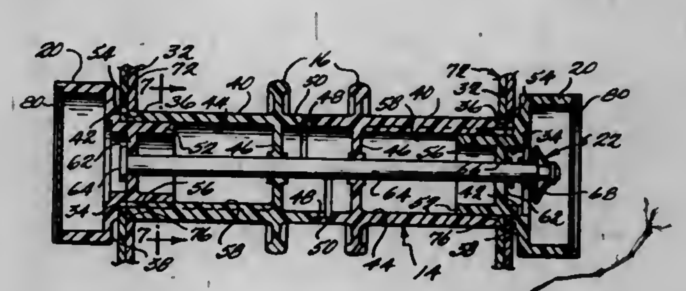
ROTARY CARD FILE

Lloyd E. Rose, North Smithfield, R.I., assignor to Textron Inc., Providence, R.I.

Filed Aug. 23, 1973, Ser. No. 390,702

Int. Cl. G09f *11/02*

U.S. Cl. 40—68.6 **13 Claims**



1. A rotary card file comprising a base structure including a pair of horizontally spaced vertically extending suppport elements having horizontally aligned openings therein defining rotary spindle supporting surfaces, said support elements having inwardly and outwardly facing annular spindle control surfaces adjacent said spindle supporting surfaces, a card supporting spindle structure extending horizontally between said support elements having means thereon for supporting a series of cards in articulated relation about the periphery thereof, said spindle structure including annular spindle control surfaces on the ends thereof interengaging the inwardly facing spindle control surfaces of said support elements, a pair of turning knob members disposed outward of said support elements, said turning knob members including annular spindle control surfaces on the inner ends thereof interengaging the outwardly facing spindle control surfaces of said support elements and shaft sections extending inwardly through said support element openings in supported relation with respect to the spindle supporting surfaces thereof, said spindle structure having recesses within the end portions thereof receiving said shaft sections, interengaging means between said shaft section and said recesses for permitting relative axial movement between said knob members and said spindle structure but preventing relative rotational movement between said knob members and said spindle structure when said shaft sections are disposed within said recesses, and means extending axially through said spindle structure and connected between said knob members for resiliently urging the latter axially toward each other and hence the interengaging spindle control surfaces into engagement, said resilient urging means including spring means for provding a desired balance between ease of turning and maintenance of the card carrying spindle in any position into which it is manually moved.

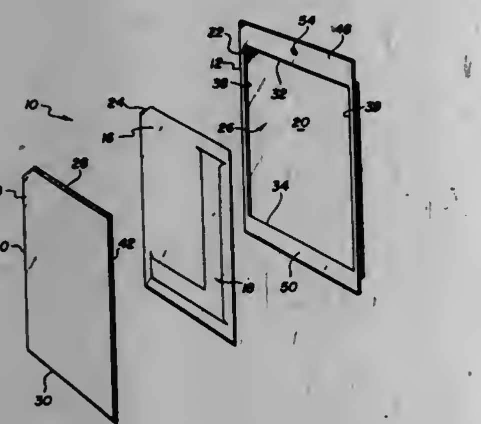
3,890,728
DISPLAY CHARACTER MODULE FOR CHANGEABLE COPYBOARDS

Wilfried Schubert, Bensenville, Ill., assignor to National Advertising Company, Bedford Park, Ill.

Filed Sept. 17, 1973, Ser. No. 398,074

Int. Cl. G09f *07/08*

U.S. Cl. 40—140 **7 Claims**



1. A display character module for changeable copyboards, said character module comprising:

a front plate with a transparent image display portion defined within top, bottom and side portions of said front plate;

an image bearing carrier sheet disposable adjacent said display portion within said front plate side portions;

a back plate superimposable over said image bearing carrier sheet, said back plate including a pair of oppositely beveled edges for engaging said top and bottom portions of said front plate;

a plurality of projections on said front plate side portions projecting inwardly over said image display portion from two opposite sides of said front plate;

said back plate having a width slightly greater than the distance between said projections but slightly less than the distance between said two opposite sides of said front plate to enable a detachable locking engagement of said back plate and said projections; and

mounting means on one of said plates for mounting said module on said changeable copyboard.

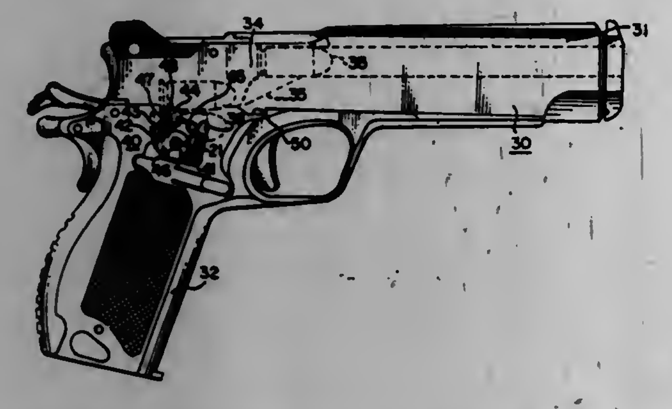
3,890,729
PROJECTILE OR CARTRIDGE INJECTOR FOR AUTOMATIC WEAPONS EMPLOYING MAGAZINES

David M. Frisoli, 2 Homestead Rd., Edison, N.J. 08817

Filed Oct. 9, 1973, Ser. No. 404,518

Int. Cl.² F41C *13/00, 25/02*

U.S. Cl. 42—7 **6 Claims**



1. In an automatic firearm of the type employing a magazine for holding a number of stacked cartridges to be fired in succession, said magazine including a spring for forcing said cartridges toward a firing chamber of said firearm, said firearm exhibiting a movement from a recoil position to a rest position after a firing of one of said cartridges, in combination therewith apparatus for positioning those of said cartridges to be next fired for insertion into the firing chamber of said firearm during said movement from said recoil to said rest position, comprising:

a. means activated by said movement and adapted to coact with a predetermined cartridge during said movement to force said one cartridge to assume an injection position necessary for proper insertion into said chamber, said means including a moveable arm capable of moving in a direction into said magazine for pushing said predetermined cartridge upwardly prior to injection of the cartridge into said firing chamber off said firearm.

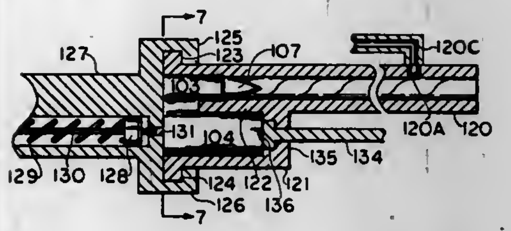
3,890,730
AMMUNITION AND WEAPON SYSTEMS

Andrew J. Grandy, 2707 Grant Ave., North Hills, Pa. 19038

Division of Ser. No. 239,595, March 30, 1972, Pat. No. 3,857,339. This application Feb. 21, 1974, Ser. No. 444,608

Int. Cl. F41c *11/00;* **F41f** *3/02*

U.S. Cl. 42—16 **25 Claims**



1. In a weapon system having a substantially cylindrical barrel and a capsule chamber integral therewith but laterally offset therefrom,

longitudinally translatable breech means adapted to be rotated for securement in a locking position with said barrel and chamber, said breech means having a longitudinal passage for receiving a firing pin, said passage being in alignment with said chamber when said breech means is secured in locking position.

3,890,731
METHOD OF AND DEVICE FOR EXTRACTING CARTRIDGE CASES

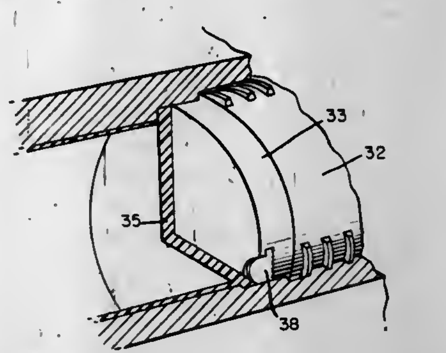
Henry Wilhelm Aldrin, Degerfors, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed Dec. 26, 1973, Ser. No. 427,597

Claims priority, application Sweden, Jan. 8, 1973, 7300177

Int. Cl. F41c *15/00*

U.S. Cl. 42—25 **3 Claims**



1. Apparatus for extracting a cartridge case formed of an elastic material from the chamber of a firearm comprising:

a breech block,

an obturating member in the form of a circular disc secured to the end of said breech block facing the chamber,

said obturating member defining a recess at its periphery for receiving a part of the cartridge case as it is deformed in response to the pressure and heat generated at the time of firing,

whereby movement of said breech block with said obturating member secured thereto subsequent to firing results in removal of said cartridge case.

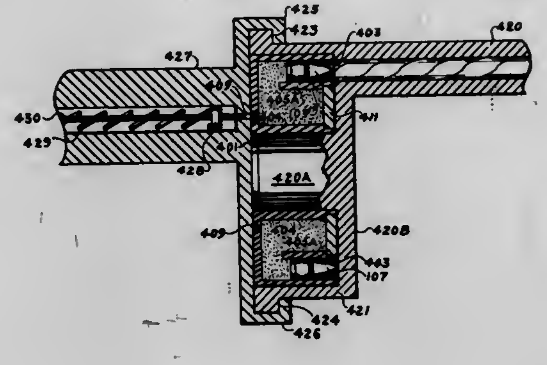
3,890,732
AMMUNITION AND WEAPON SYSTEMS

Andrew J. Grandy, 2707 Grant Ave., North Hills, Pa. 19038

Division of Ser. No. 239,595, March 30, 1972, Pat. No. 3,857,339. This application Feb. 21, 1974, Ser. No. 444,441

Int. Cl. F41c *1/00*

U.S. Cl. 42—39.5 **5 Claims**



1. In a weapon system having a substantially cylindrical barrel and breech means rearward of said barrel, said barrel having a longitudinal axis along which a projectile is launchable,

said breech means having a reciprocable firing pin, said firing pin having a longitudinal axis laterally offset from said barrel and barrel axis, and

a cylinder housing integral with said barrel and having an internal rearwardly extending substantially central stub.

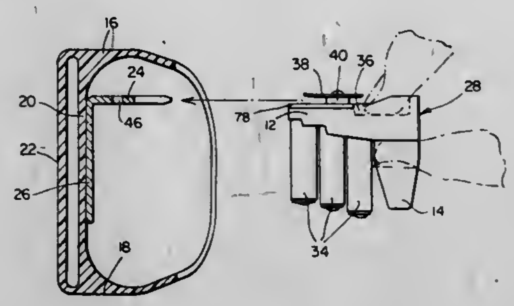
3,890,733
HOLDER FOR REVOLVER LOADER

Paul P. Kubik, 304 Llewellyn Rd., Ambler, Pa. 19002

Filed Jan. 17, 1974, Ser. No. 434,132

Int. Cl. F42b *39/04*

U.S. Cl. 42—89 **12 Claims**



1. A holder for an ammunition loader comprising:

an open sided enclosure of a size and a configuration adapted to receive and at least partly surround an ammunition loader within the confines of said enclosure;

an engagable bracket member disposed within said enclosure and extending toward the open side thereof, said bracket member being positioned to securely receive the loader to permit the loader to be easily and quickly released; and

means to attach said holder to clothing accessories worn by an individual.

3,890,734
AUTOMATIC FISHING APPARATUS

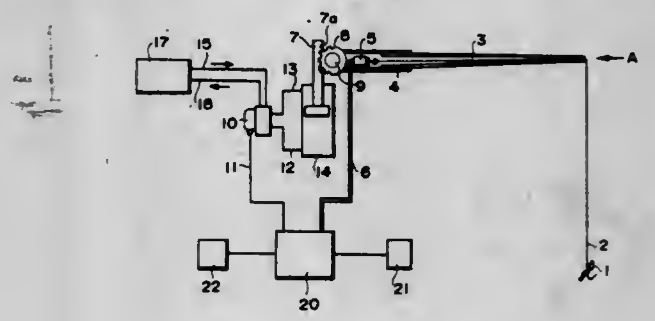
Taneichi Kawai, Anjo, and Koji Nishida, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya-shi, Japan

Filed Dec. 20, 1973, Ser. No. 426,961

Claims priority, application Japan, Dec. 22, 1972, 48-674

Int. Cl. A01k *97/00*

U.S. Cl. 43—4 **14 Claims**



1. A device for detecting the pulling force on a fishing line when caused by a fish being hooked on the fishing line, comprising a housing, an element disposed in said housing and connected to said fishing line, said element being subjected to the pulling force of said fishing line, strain gauge means mounted on said element for detecting the strain of said element to thereby detect the pulling force on said fishing line, and sealing means sealing the inside of said housing containing said element and strain gauge means from the outside environment.

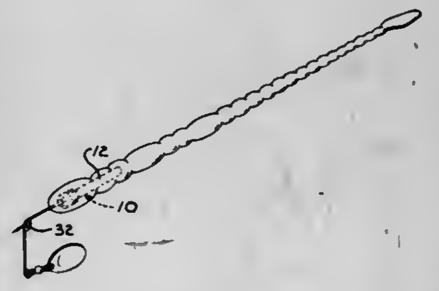
3,890,735
MECHANISM FOR FISHING LURE

Dehart M. Serrill, 1745 No. Main, Kansas City, Mo. 64116

Filed Aug. 20, 1973, Ser. No. 389,570

Int. Cl. A01k *83/02, 85/02*

U.S. Cl. 43—36 **7 Claims**



1. In a fishing lure comprising an elongated worm body of homogeneous soft plastic material, the improvement comprising:

an elongated tubular housing disposed in said worm body and surrounded by said plastic material,

said housing having at least three equally spaced peripheral openings in the sidewall thereof;

a rigid enlarged portion extending around said housing adjacent said openings and having an upwardly inclined edge presenting a cam surface extending to each of said openings;

at least three elongated spring steel members normally disposed in retracted positions in said housing and adapted to move through said openings to extended fish-catching positions projecting from said worm body and in frictional engagement with said cam surface,

each of said members having an end disposed on said cam surface in said retracted positions and characterized by a degree of spring bias against said cam surface to hold said members in said retracted positions,

each of said members being further characterized by a line of curvature at the point of frictional contact between the member and said cam surface when the member is in its extended position whereby to project from said housing at an angle greater than the angle of inclination of the member in its retracted position within the housing; and attaching means coupled with the end of each of said members which is distal to said cam surface,

said attaching means accommodating limited movement of the members in any direction and being adapted to be secured to a fishing line whereby a sharp pull on the line slides said members through their respective openings and said cam surface guides said members through said worm body to their fish-catching positions.

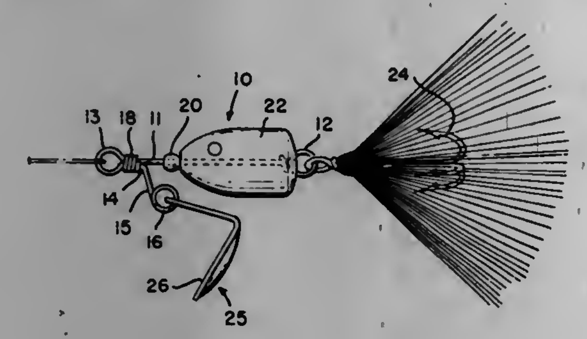
3,890,736
ACTION-SHAFT FISH LURE MOUNT

R. B. Worden, P.O. Box 384, Granger, Wash. 98932

Filed May 1, 1974, Ser. No. 465,873

Int. Cl. A01k *85/00*

U.S. Cl. 43—42.11 **5 Claims**



1. A fishing lure mount having a main body shaft of elongated wire and provided with forward and rearward loops lying in a common plane, an action shaft integrally connected to the main body shaft close behind said forward loop, said action shaft extending downwardly at a sharp angle from said main body shaft and terminating in an action loop, said action loop lying in the same plane as said forward and rearward loops, said action shaft having a relatively short length compared to said main body shaft so that the action loop lies close to said forward loop of said main body shaft, a bent blade connected to said action loop for limited oscillating movement whereby the bent blade transmits to the forward end of the lure mount a wiggling motion similar to that of a minnow wiggling, a buoyant lure body on said main body shaft rearward of said action shaft, and means for hooking a fish coupled to said rearward loop.

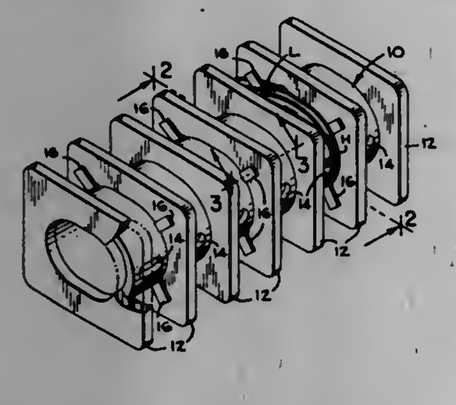
3,890,737
FISH HOOK RECEPTACLE

Boyd C. Jones, 750 Brahams Way, Sunnyvale, Calif. 94087

Filed Mar. 25, 1974, Ser. No. 454,325

Int. Cl. A01k *97/06*

U.S. Cl. 43—57.5 R **4 Claims**



1. A fish hook receptacle which comprises

a tubular member having a slot therein to accommodate the hook portion of the fish hook,

a flange projecting outwardly from said tubular member, and resilient means on the side of said flange for releasably receiving and holding the leader portion of said fish hook.

3,890,738
SET OF INTERCONNECTABLE PRESSURE ELEMENTS FOR MAKING CONSTRUCTION MODELS

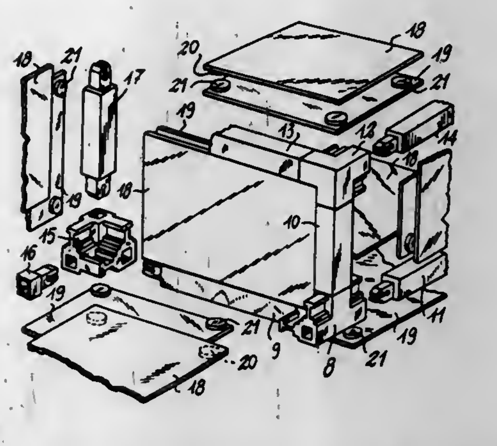
Giancarlo Bassani, Brescia, Italy, assignor to Decio Maraglio, Clusone D'Iseo (Brescia), Italy

Filed Oct. 18, 1973, Ser. No. 407,441

Claims priority, application Italy, Nov. 30, 1972, 5240/72

Int. Cl. A63h *33/00*

U.S. Cl. 46—16 **3 Claims**



1. A combination of pressure interconnectable construction elements comprising:

connectors;

elongated connecting rods; and

cover plates;

each said connector having at least two connection means angularly spaced from one another, and a recess formed on at least one side of each of said connection means;

each said rod having a connection means at each of its ends removably pressure fitted within said connector connection means; and

each of said plates having ridges projecting from at least one surface and adjacent the edges thereof, said ridges removably pressure fitted within the recesses in said connector.

3,890,739
METHODS OF PRODUCING GRASS CARPETS

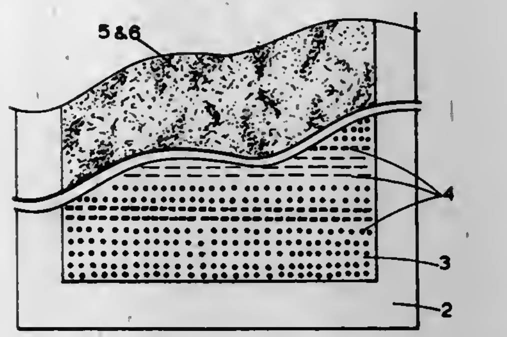
Jack Blackburn, 103 Portland, Rd., Birmingham B 16 90 X, England

Filed Aug. 15, 1973, Ser. No. 388,379

Claims priority, application United Kingdom, Aug. 15, 1972, 37924/72

Int. Cl. A01c *1/04*

U.S. Cl. 47—56 **5 Claims**



1. A method of producing a grass carpet comprising laying directly on a root impermeable surface a sheet of water impermeable material formed with a plurality of apertures, spreading grass seed and growing material such as soil, humus, compost, on top of the sheet, the size and shape of the apertures in the sheet being such that said seed and material is prevented from passing through the apertures, and applying water to the growing material.

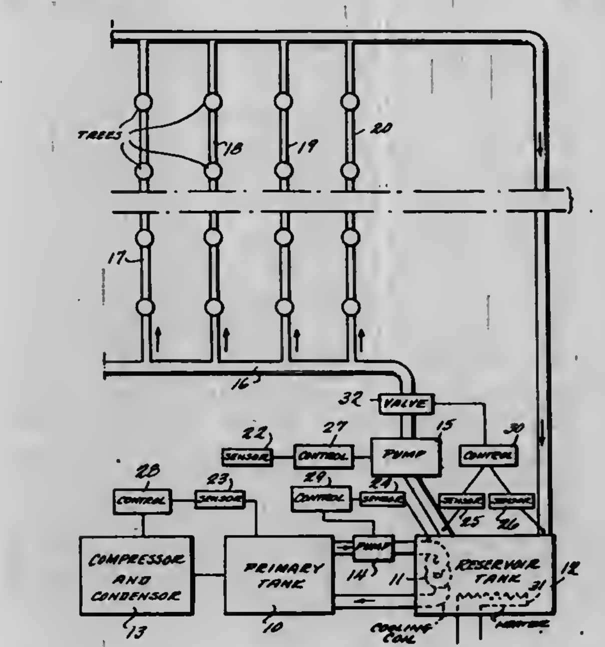
3,890,740
FRUIT BUD RETARDING METHOD AND SYSTEM

Gary E. Miller, Salt Lake City, Utah, assignor to Technical Materials, Limited, Salt Lake City, Utah

Filed May 7, 1973, Ser. No. 357,574

Int. Cl. A01g *15/00*

U.S. Cl. 47—58 **13 Claims**



1. A method of retarding budding of a fruit tree comprising the steps of:

maintaining a temperature immediately adjacent and encircling the exterior of the trunk below 38° F substantially independently of ambiant air temperature; and

intermittently discontinuing maintainence whenever excessive moisture stress exists to permit the temperature to rise above 38° F in order to prevent excessive moisture stress and dehydration and damage to said tree.

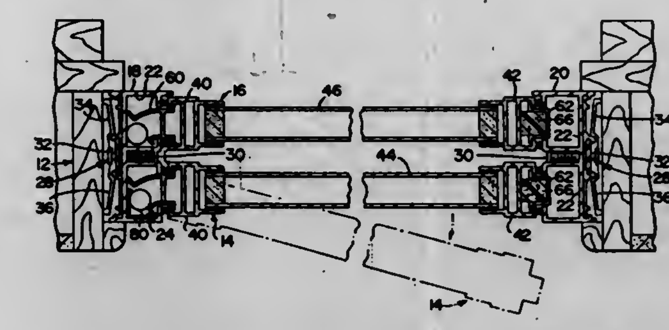
3,890,741
DOUBLE HUNG PIVOTAL WINDOW

Waldo O. Johnson, Wooster, and Robert G. Buynak, North Canton, both of Ohio, assignors to Louisiana-Pacific Corporation, Portland, Oreg.

Filed Oct. 17, 1973, Ser. No. 407,207

Int. Cl. E05d *15/22*

U.S. Cl. 49—162 **2 Claims**



1. In a pivotally positioned double hung sash assembly including a jamb liner, a sash having one vertical edge portion slidably or operably engaging the jamb liner and means releasably engaging the opposite vertical edge of said sash for sliding movement, the improvement comprising said jamb liner including a laterally inwardly open channel section with overhanging flange members thereon, said sash including a laterally outwardly open channel section thereon with overhanging flange members thereon, a vertically extending connecting means extending between and engaging said channel sections for sliding movement of said sash in said jamb liner, said connecting means fixedly engaging said sash and having end flanged arcuate sections extending into said jamb liner to permit pivotal movement of said sash about said jamb liner, a second jamb liner for the opposite vertical edge of said sash, a resiliently positioned laterally movable guide strip protruding laterally from and carried by said sash to engage the second jamb liner, and a control means fixedly engaging an end portion of said guide strip and extending beyond an end of the sash whereby the control means can be twisted on a vertical axis to free the end portion of said guide strip from the second jamb liner and the remainder of said guide strip can be progressively disengaged from such second jamb liner.

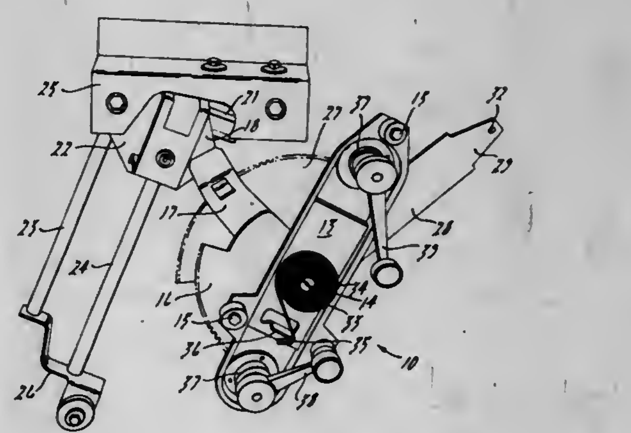
3,890,742
WINDOW REGULATOR MECHANISM

Floyd N. Ladd, Warren, and Donald G. Stacy, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 3, 1974, Ser. No. 457,534

Int. Cl.^{2} E05F *11/44*

U.S. Cl. 49—350 **7 Claims**



1. A window regulator mechanism adapted to lower or raise a window panel into or out of a window well,

the window panel being vertically divided into separately movable ventilation and visibility sections,

the window regulator mechanism comprising:

an elongated mounting plate,

a first gear sector freely rotatably mounted on a pivot shaft journalled in the mounting plate intermediate the ends of the latter,

a first regulator arm fixed to the first gear sector and coupled to the ventilation section for lowering and raising the latter in response to rotation of the first gear sector,

a second gear sector mounted on the pivot shaft and coupled to the latter for rotation therewith,

a second regulator arm fixed to the second gear sector and coupled to the visibility section for raising and lowering the latter in response to rotation of the second gear sector,

and independent first and second drive means located at opposite ends of the mounting plate and coupled to the first and second gear sectors, respectively, for rotating the latter to independently lower and raise the window panel sections.

3,890,743
VEHICLE WINDOW LIFTER

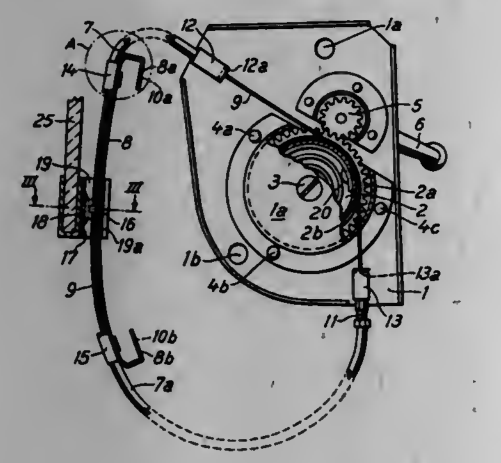
Wilhelm Eckhardt, Kolschhausen, and Klaus Küster, Ehringshausen, both of Germany, assignors to Küster & Co. GmbH, Germany

Filed Oct. 30, 1973, Ser. No. 411,160

Claims priority, application Germany, Nov. 10, 1972, 7241280

Int. Cl.² E05F *11/48*

U.S. Cl. 49—352 **8 Claims**



1. A window lifter for vehicles, comprising:
- a. a base plate;
- b. a drum rotatably mounted on said base plate;
- c. a first and a second length of cable conduit, each fastened with one end to said base plate at substantially opposite sides;
- d. a spacer bar inserted between said respective other ends of said conduits;
- e. a cable loop closed by pressing a nipple over both cable ends of which a portion is wound around said drum; said cable extending through said first and said second length of conduit and traveling openly accessible in parallel to said spacer bar;
- f. means for attaching the window pane to said cable hinged on said nipple where said cable is openly accessible along said spacer bar;
- g. means provided at said base plate and said spacer bar for mounting said window lifter in the vehicle door; and
- h. fittings for fastening the respective ends of said first and second length of cable conduit to said base plate and said spacer bar, said fittings consisting of a U-shaped sheet metal part provided with a bottom against which the conduit end rests and having tabs on one side for insertion into appropriate holes of the base plate.

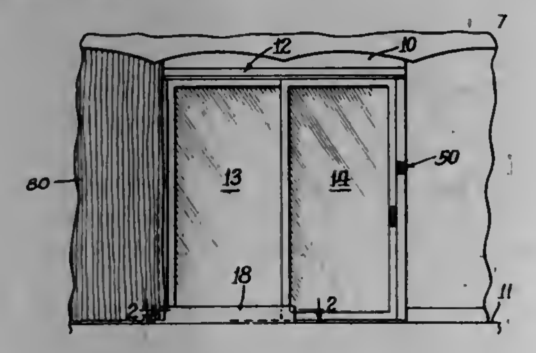
3,890,744
PATIO DOOR OPERATOR

Martin A. Galis, Palatine, Ill., assignor to George Giambalvo, Winfield, Ill.

Filed Mar. 1, 1974, Ser. No. 447,097

Int. Cl.² E05F *15/14*

U.S. Cl. 49—360 **6 Claims**



1. An apparatus for operating a sliding door unit of the type commonly referred to as a patio door used in a building wherein there is a floor at the bottom of the door unit immediately to one side of the door unit, said door unit being movable between a closed and an open position, and wherein there is a fixed similar unit at the opposite side of said door unit, said door unit having a first end thereof immediately adjacent said similar unit when said door unit is in the closed position and a second end remote from said similar unit when said door unit is in said closed position, said apparatus comprising:
- a housing adapted to be mounted on said floor immediately at said one side of said door unit when said door unit is in the open position, said housing having an opening on the side thereof adjacent said door unit, said opening being of a length approximately equal to the width of said door unit, electric motor means within said housing and having a generally circular driving member on the output shaft thereof, a flexible endless member, means mounted on the housing and contacting the endless member for training said endless member in a path of movement within the housing, a first position of said path being in engagement with the driving member so that when said motor is running said endless member will move along said path, a second portion of said path being parallel to said opening, and means extending through said opening and having a portion within the housing engaging said endless member and a position outside said housing for engaging said door unit immediately adjacent said first end thereof for causing said door unit to move with said endless member,
- whereby said apparatus can be readily installed without structural modifications to the building by mounting it on said floor adjacent the position occupied by said door unit when it is in the open position.

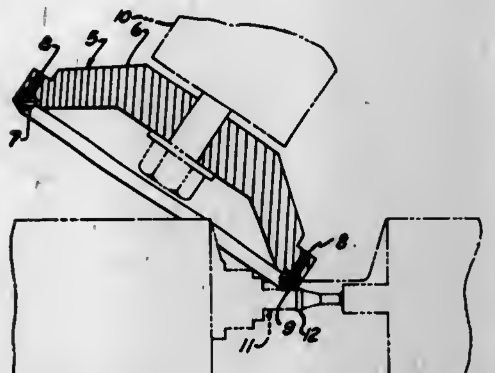
3,890,745
ANGLE DIAMOND GRINDING WHEEL

Anthony R. Geonnotti, 1500 Bridgewater Rd., Cornwells Heights, Pa. 19020

Filed Feb. 16, 1973, Ser. No. 332,921

Int. Cl. B24b *7/10, 19/00;* **B24d** *7/18*

U.S. Cl. 51—71 **4 Claims**



1. Apparatus for grinding an outer surface of carbide inserts to a specified configuration, comprising:
- locator means for positioning inserts along a specified axis with said outer surface exposed at a predetermined orientation for grinding; and
- a grinding wheel including a frustoconical flange portion having a shaft mount at a central location and a protuberance about the outer periphery of said flange, said protuberance having a generally triangular cross section tapering away from said outer periphery coaxially with said shaft, thereby defining outer and inner annular surfaces situated at predetermined acute angles to the plane of said outer periphery, the outer of said annular surfaces being formed with diamond abrasive surface to constitute a work surface, the angle of said outer annular surface to the plane of said outer periphery being in the range 15° to 55°;
- said wheel rotating in a plane intersecting said axis at said angle of said outer annular surface to the plane of said outer periphery.

3,890,746
FLAPPER WHEEL

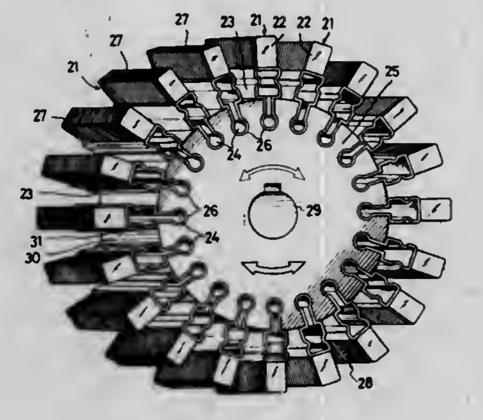
Kyuji Saegusa, 22-6, 2-chome, Shimomaruko, Ohta-ku, Tokyo; Eitetsu Sonobe, 35-132 Oaza Koizumi, Ageo-shi, Saitama-ken, and Susumu Sudo, 42-1, Sakae, Sakai-machi, Sawa-gun, Gunma-ken, all of Japan

Filed June 27, 1974, Ser. No. 483,848

Claims priority, application Japan, Sept. 7, 1973, 48-100812

Int. Cl. B24b *9/02*

U.S. Cl. 51—334 **10 Claims**



1. A flapper wheel comprising a rotary wheel member having a centrally positioned longitudinal axis, said wheel member having parallel planar sides, said wheel member having a plurality of segmental areas being divided by a plurality of longitudinal grooves circumferentially and equally spaced around its cylindrical surface, the longitudinal grooves being located parallel to the centrally positioned longitudinal axis of the rotary wheel member; a plurality of abrasive pad units, each of which being inserted into one of said longitudinal grooves, each of said abrasive pad units including multiple superimposed sheets of abrasive covered material, the planar surfaces of said superimposed abrasive sheets being arranged substantially parallel to the planar sides of the rotary wheel member, each of said superimposed sheets having an inner clamped end and an outer working end; a plurality of slidably mounted holder means, each of which clamps and maintains together the inner ends of said superimposed abrasive sheets in a laminar relationship to each other with said inner ends being substantially aligned, the outer working end of each of said superimposed abrasive sheets having an arcuate configuration, said arcuate working edges of said superimposed abrasive sheets being arranged substantially parallel to the direction of the grinding track operatively created by the contacts between a workpiece and said arcuate working edges of the superimposed abrasive sheets.

3,890,747
PREFABRICATED, SPACE-BOUNDING BUILDING SECTIONS AND A BUILDING MADE FROM SAID SECTIONS

Cornelis Van Der Lely, 7, Bruschenrain, Zug, Switzerland

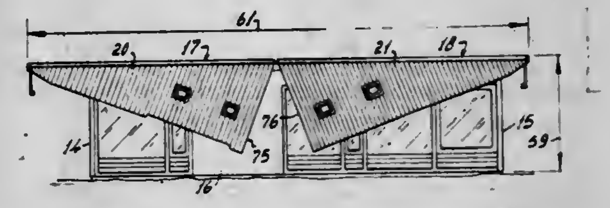
Filed Feb. 28, 1973, Ser. No. 336,732

Claims priority, application Switzerland, Feb. 28, 1972, 2541/72

Int. Cl. E04b *1/344*

U.S. Cl. 52—64 **45 Claims**

1. The combination of a prefabricated parallelepiped box-shaped section for inclusion in a building comprised of a plurality of such sections and portions of a roof for said sections, the combination comprising:
- said section;
- at least two said roof portions;
- hinge means disposed at a first end of said section, said hinge means pivotally connecting a first of said roof portions to the top of said section whereby said first portion is selectively pivotable about an angle having its apex proximate the upper edge of said first end from a substantially horizontal transport position adjacent the top of the section to the desired roof angle in the completed building;



- connection means disposed at the second end of said section opposite said first and comprising a slideable part for receiving the second of said roof portions when in a substantially horizontal transport position adjacent the top of the section and for sliding therein when the roof is raised to its position in the completed building and securing means for securing said second roof portion in its position in the completed building, said connection means being mounted on the section proximate the upper edge of its said second end.

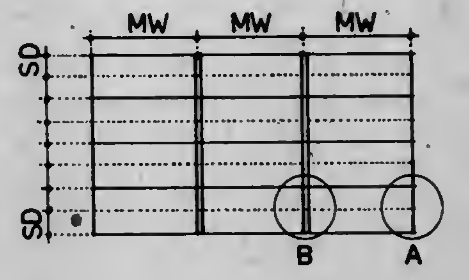
3,890,748
STRUCTURE OF COORDINATED MODULAR BUILDING CONSTRUCTION

Miroslav Fencl, 59-28 57th Dr., Flushing, N.Y. 11378

Continuation-in-part of Ser. No. 369,562, June 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 294,391, Oct. 12, 1972, abandoned, which is a continuation-in-part of Ser. No. 289,935, Sept. 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 143,547, May 14, 1971, abandoned. This application July 15, 1974, Ser. No. 485,461

Int. Cl.² E04H *1/04*

U.S. Cl. 52—79 **6 Claims**



1. A modular structure assembled of a plurality of self-supporting modules made of reinforced concrete, each module having a form of a rectangular tube defined by two walls, a floor slab and a ceiling slab, said structure being composed in a "wall beside wall - front end to back end - floor slab over ceiling slab" fashion so that adjacent walls create a doubled wall structure and adjacent floor-and ceiling slabs create a doubled floor structure;
- each said module being imaginarily divided into several equal tubular segments of which the depth is denoted as a segmental depth - SD - ;
- said modules being composed of structurally interconnected components - walls manufactured as one-piece panels, floor- and ceiling slabs consisting of one or several panels manufactured in widths which are multiples of SD; said components being manufactured substantially as a ribbed slab with one surface flat and opposite surface fluted at least one flute of ceiling slab aligned with a corresponding flute of walls;

solid rims being provided at both wall ends in said floor- and ceiling panels;
solid rims being provided at bottom of said wall panels;
at least two vertical pipes - each provided with a lifting nut welded at top - being embedded in each said wall panel and positioned at uniform distance T from outer side of wall panel and at uniform distance D from wall end or SD line, respectively;
vertical reinforcing bars being embedded in each wall panel and positioned generally on rib- and wall thickness centers;
both said pipes and bars protruding at wall top and wall bottom to the extent of the thickness of the corresponding floor panel or ceiling panel, such protrusions serving as dowels grouted in holes provided in floor panels and ceiling panels in corresponding positions.

3,890,749

REINFORCEMENT ASSEMBLY FOR INTERNALLY BRACED STRUCTURES HAVING AREAL OUTER SURFACES

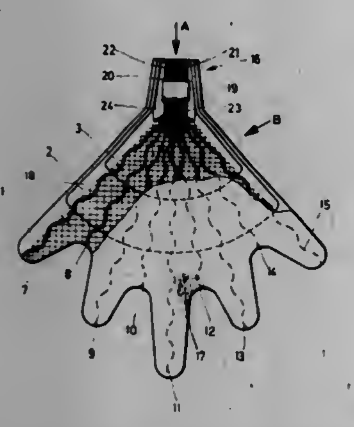
Rolf Günther, Munich, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Germany

Filed July 15, 1974, Ser. No. 488,439

Claims priority, application Germany, July 18, 1973, 2336541

Int. Cl. E04c *2/36;* **B64c** *3/18, 1/24*

U.S. Cl. 52—84 **17 Claims**



1. A reinforcement assembly for mounting and transmitting forces to an internally braced structural element having means defining thereon areal outer surfaces, particularly a structural element for use in vehicles such as aircraft and spacecraft, said structural element including a fulcrum region at which said element is mounted and through which forces are transmitted thereto, said assembly comprising plate means extending generally parallel to said areal surfaces internally of said structural element from said fulcrum region in overlapping relationship on opposite sides thereof, said plate means being arranged to provide to said structural element fiber reinforcement which increases in the direction of said fulcrum region, and web means extending between said opposed plate means in directions generally perpendicular thereto, said web means being arranged to also extend radially outwardly from said fulcrum region in a generally diverging configuration.

3,890,750

CONSTRUCTION SYSTEM

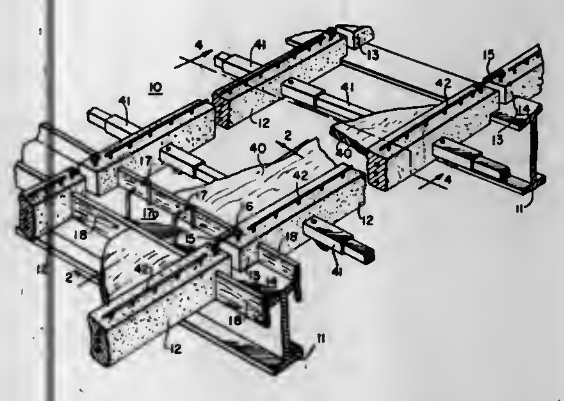
Herbert M. Berman, and Ira Hooper, both of New York, N.Y., assignors to Composite Construction Systems, Inc.; New York, N.Y.

Filed Dec. 8, 1972, Ser. No. 313,549

Int. Cl. E04b *1/16*

U.S. Cl. 52—127 **1 Claim**

1. A construction system comprising at least three horizontally disposed, spaced, structural members, each of said structural members being in an elevated position and secured to base supports, a plurality of horizontal trusses laterally bracing a portion of said structural members, a plurality of spaced, parallel concrete joists securely engaging and transversely extending between each pair of adjacent structural members, and means to connect adjacent end portions of said concrete joists to each other or to said structural members to form continuous tension or compression ties at selected intervals along top flanges of said structural members, said continuous ties terminating in said horizontal trusses, and a plurality of reusable, longitudinally extensible and retractable support members supported by said joists and adapted to support concrete slab forms to receive concrete thereover.



3,890,751

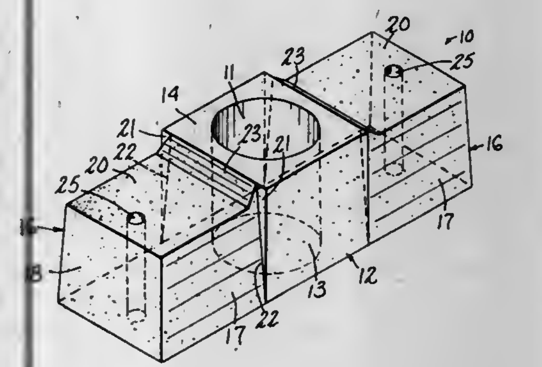
POST HOLE BLOCK

Arnold P. Caputo, Hamden, Conn.; David W. Anthony, Norwell, and William H. Pickett, Framingham, both of Mass., assignors to Plasticrete Corporation, Hamden, Conn.

Filed Mar. 11, 1974, Ser. No. 449,981

Int. Cl. E02d *27/42*

U.S. Cl. 52—166 **4 Claims**



1. A post hole block comprising a body of heavy material, substantially rectangular in horizontal cross-section and horizontally elongated, said body being provided midway between its longer sides with a vertical hole to receive a post, and the upper surface of the body spaced from said hole being lower than the upper surface adjacent said hole, the block having a central section and lower end sections, said hole being in the center of the central section, and at least a portion of the upper surface of each end section sloping upward to the level of said central section, said block being traversed by additional smaller holes each extending from points on the upper surface spaced from said vertical hole downward through the body.

3,890,752

SECURING GLAZING RAILS TOGETHER

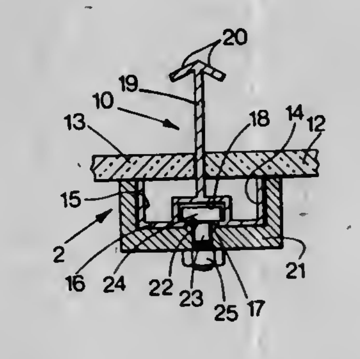
Frank Edmund Bolton, Royal Leamington Spa, England, assignor to Banbury Buildings Holdings Limited, Warwickshire, England

Filed Nov. 20, 1973, Ser. No. 417,561

Claims priority, application United Kingdom, June 23, 1973, 29950/73

Int. Cl. E04c *3/06*

U.S. Cl. 52—495 **1 Claim**



1. A greenhouse or like structure including a glazing assembly comprising at least a pair of glazing rails connected together end-to-end and a pane of glazing material supported by said rails along an edge of said pane, a rib on each said rail extending longitudinally thereof and having a cross-section of channel shape inverted with respect to the plane of the pane and having in its wall remote from the pane, a longitudinal slot giving access to an undercut longitudinal recess defined in the rib, and a connector having a cross-section of channel shape to fit closely over the ribs of the rails to bridge abutting end portions thereof, the inner face of the base of the connector being formed with an inwardly-projecting tongue fitted into the slots in the outer faces of the ribs of the rails, whereby the latter are held from lateral and twisting movement relatively to one another by engagement of the sides of the connector with respective sides of the ribs of the rails and by engagement of the tongue on the connector in the slots in the ribs of the rails, the connector including a fastener by which said connector is secured to each said rail, said fastener having an inner end retained in the undercut recesses in the rails.

3,890,753

CEILING OR WALL COVERING

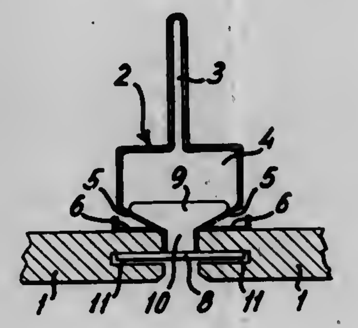
Jørgen Skoubo Johansen, No. 26 Hjortespringparken, 2730 Herlev, Denmark

Filed Mar. 13, 1973, Ser. No. 340,724

Claims priority, application Denmark, Mar. 22, 1972, 1332/72

Int. Cl. E04b *5/57*

U.S. Cl. 52—500 **4 Claims**



1. A ceiling or wall covering comprising:
parallel supporting rails, an undercut groove in each rail,
a plurality of panels,
locking members, each of which has a body with at least one retaining wing for engaging adjoining edges of two adjacent panels, a head, and a neck portion,
said panels being detachably fastened to said rails by said locking members, each of said bodies being turnable and slidable in the groove of an associated supporting rail, each of said bodies being fixed in its associated rail by turning said body about an axis at right angle to the face of the panel,
adjacent panels being separated by a space located directly adjacent and parallel to an associated supporting rail, each space providing access for a tool such as a screwdriver to turn and slide each of said locking members in the groove of its associated supporting rail, and
the greatest cross-sectional dimension of the neck portion of each locking member is less than the width of said space.

3,890,754

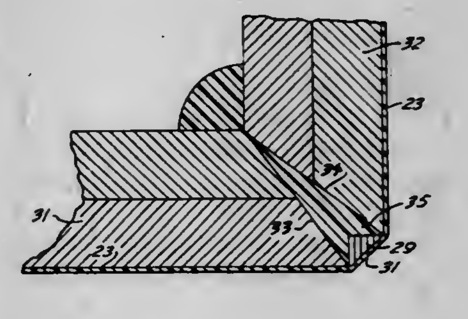
CORNER BEND IN FIBROUS SHEET MATERIAL

Graham David Spurdle, 675 Alpine Ct., North Vancouver, British Columbia, Canada

Filed Oct. 9, 1973, Ser. No. 404,228

Int. Cl. F04c *2/00*

U.S. Cl. 52—631 **3 Claims**



1. An exterior corner structure for a rigid sheet of fibrous material having a flexible sheet of finishing veneer on the exterior surface thereof comprising:

a. a pair of sheet portions connected by said veneer extending unbroken between the two sheet portions,
b. said sheet portions being at substantially a right angle to each other,
c. said sheet portions having bevelled end faces,
d. a central rib of triangular cross-section disposed between said end faces and connected to said veneer and having side surfaces spaced from said bevelled end faces,
e. the inner edges of said sheet portions being in contact with each other and said end faces being non-parallel to each other whereby a space is defined by said end faces of said sheet portions and said side surfaces of said central rib, and
f. an adhesive substantially filling said space and bonded to said end faces and said side surfaces.

3,890,755

CONSTRUCTION SET

Dieter Specht, Dhunn, Germany, assignor to Masyc AG, Laufen, Switzerland

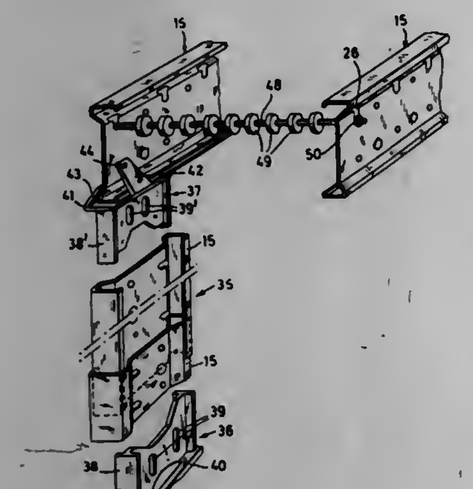
Filed May 23, 1973, Ser. No. 363,045

Int. Cl. F04c *3/08*

U.S. Cl. 52—645 **6 Claims**

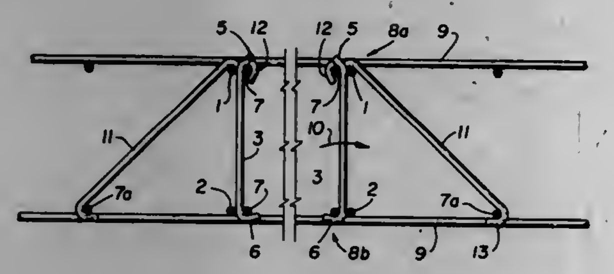
1. In a construction set, a structural element comprising an elongated web having a first and a second transversely spaced longitudinally extending margins, a first flange extending along said first margin, a second flange extending along said second margin, and a plurality of cutouts spaced along said elements and including a first row of equidistant cutouts arranged parallel to said first margin adjacent said first flange, and a second row of equidistant cutouts arranged parallel to said second margin adjacent said second flange, the cutouts of said first row being aligned in the transverse direction of said web with the corresponding cutouts of said second row; and a disc-shaped connector having an axis of rotational symmetry

and provided with two elongated arcuate holes extending along a circular arc having a center located within said axis of rotational symmetry and a diameter corresponding to the



distance between said first and second rows of cutouts, said connector further including means for accommodation in said cutouts of said structural element.

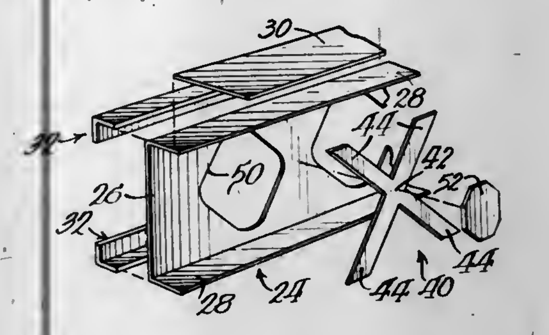
3,890,756
CONCRETE REINFORCEMENT
Edmund Wagner, Rheinblickstr. 6, D-6202 Wiesbaden-Bierbrich, Germany
Filed July 16, 1973, Ser. No. 379,411
Claims priority, application Germany, July 15, 1972, 2234941
Int. Cl. E04b *5/04;* **E04c** *3/02*
U.S. Cl. 52—648 **3 Claims**



1. A reinforcement for an at least partially prefabricated reinforced concrete slab, comprising in combination:

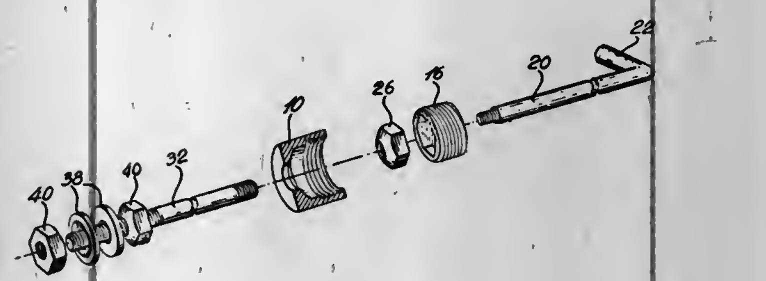
1. two structural steel mats each comprising a plurality of longitudinally extending steel rods and a plurality of transversely extending steel rods substantially perpendicular to the longitudinal rods;
2. a plurality of planar lattice girders extending between the two mats and comprising only a single upper boom rod, a single lower boom rod and affixed thereto a plurality of braces extending diagonally between the upper and lower boom rods, the girder extending in the direction of the longitudinally extending steel rods of the mats;
   - a. the said braces having bent terminating ends facing opposite the side to which the upper and lower boom rods are affixed, one terminating end partially encircling and thereby supporting a longitudinal rod of the structural steel mats, the opposite terminating end being hook-shaped,
   - b. the lower boom rod being carried by the transverse rods of one of the structural steel mats, and
   - c. the upper boom rod being in contact with the transverse rods of the steel mat spaced from the mat carrying the lower boom rod, and
   - d. said plurality of planar lattice girders being spaced apart along the said structural steel mats; and
3. a plurality of tension rods each extending transversely to the plane defined by the booms affixed to one of the longitudinal rods of the one structural steel mat, the tension rod partially encircling and thereby supporting one of the boom rods, and
4. a pair of girders and tension rods being associated in mirror-image fashion.

3,890,757
BOOM MEMBERS HAVING STIFFENER ELEMENTS FOR CRANE BOOM CONSTRUCTIONS
Gerald P. Lamer, Rothschild, and Terry M. Holmes, Schofield, both of Wis., assignors to J. I. Case Company, Racine, Wis.
Filed Feb. 28, 1974, Ser. No. 446,593
Int. Cl. E04c *3/08*
U.S. Cl. 52—695 **7 Claims**



1. A boom for a crane or the like comprising an elongated hollow member having a plurality of flat walls, at least one of said walls having a plurality of openings spaced from each other, a stiffening element located between each adjacent pair of openings, each stiffening element having a central core generally aligned with a longitudinal center line for said at least one wall and a plurality of arms extending from said central core to the outer edges of said at least one member, said stiffening elements being secured to a surface of said at least one wall between said openings and reinforcing the edges of said openings, and a plurality of buttons each having a dimension greater than the dimension of said cores, said buttons overlying respective central cores and being secured to said surface.

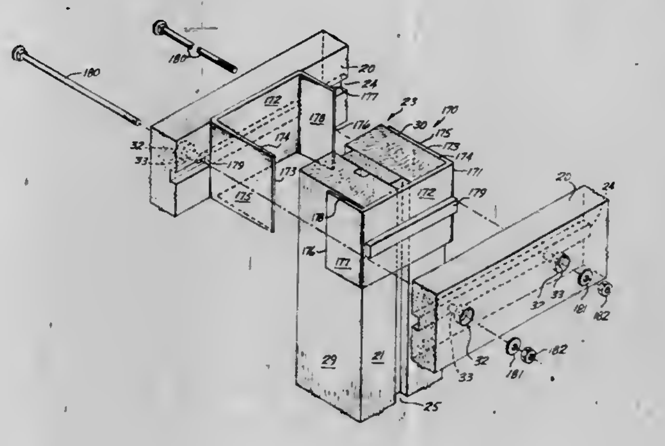
3,890,758
ANCHORING DEVICE FOR SECURING AND POSITIONING EQUIPMENT
Michel Bouchard, 4200 Dorchester St., Montreal H3Z 1V3, Quebec, Canada
Filed Nov. 29, 1973, Ser. No. 420,298
Claims priority, application Canada, Feb. 28, 1973, 164858
Int. Cl. E04b *1/41;* **E02d** *27/44*
U.S. Cl. 52—713 **10 Claims**



1. An anchoring device for securing equipment to a concrete structure poured in at least two phases and for precisely positioning said equipment in said structure, comprising:

- a. a threaded rod securable to the equipment,
- b. a nut on said rod having a spherical face,
- c. a socket having a hole therein receiving said rod, said hole being larger than said rod, said socket also having a matching spherical internal recess for receiving said nut therein,
- d. a plug connected to said socket with said nut therebetween whereby said nut is prevented from rotation by the plug, and
- e. an anchor connected to said plug and adapted to be positioned within the primary phase of the concrete structure.

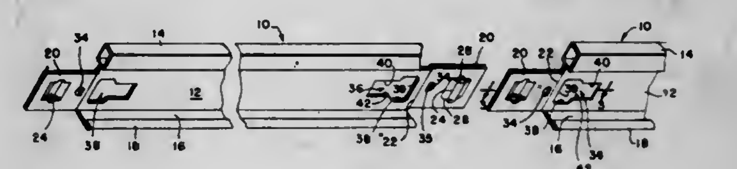
3,890,759
CONNECTOR
Robert W. Selden, and Edward W. Schein, both of Seattle, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.
Division of Ser. No. 137,382, April 26, 1971, Pat. No. 3,777,434. This application Oct. 11, 1973, Ser. No. 405,724
Int. Cl. E04c *3/12*
U.S. Cl. 52—753 C **2 Claims**



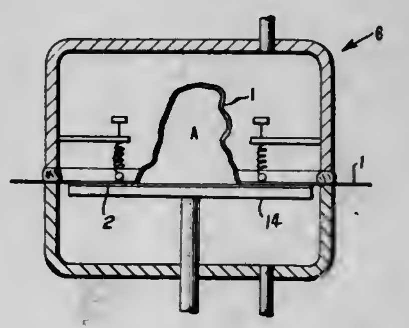
1. An assembly comprising
a pair of members,
each member having a center plate and a pair of legs extending outwardly from one face of said plate,
said legs being transverse of a longitudinal direction of said plate and being substantially parallel,
one of said legs being tapered on its inner face and the other of said legs being tapered on its outer face,
a key extending longitudinally of the outer face of said center plate,
the legs of said members extending toward each other and said members being joined along said tapered faces,
said members being wedged against an element extending centrally through said members, and
a pair of other elements being held against the outer faces of said center plates,
said latter elements having grooves on their inner faces which mate with said key, and
means holding said latter elements against said center plate, and said connector to said former element.

3,890,760
MAIN BEAM JOINT FOR SUSPENDED CEILINGS
Paul H. Jones, Willow Grove, Pa., assignor to National Rolling Mills Co., Malvern, Pa.
Filed Jan. 25, 1974, Ser. No. 432,680
Int. Cl. F16b *7/22*
U.S. Cl. 52—758 A **11 Claims**

1. A main beam for use in a suspended ceiling grid structure comprising an elongated central web, means providing oppositely disposed bottom flanges at the lower edge of said central web, and coupling means integral with the main beam for connecting the end of the main beam to the end of another similarly constructed main beams, said coupling means including an extension on the end of said central web and offset laterally relative thereto, a tongue member projecting laterally from said extension with a pair of spaced guide edges and a pair of engaging lugs extending from the guide edges, a longitudinally extending slot formed in said central web adjacent said extension having an enlarged entrance portion connected to a smaller sliding portion with the enlarged entrance portion receiving the tongue member and its lugs, said smaller sliding portion having a pair of spaced longitudinally extending slot edges which are spaced apart approximately the same amount as the guide edges of the tongue member and which receive said tongue guide edges in a manner such that the tongue guide edges ride between said slot edges and the tongue member lugs reach through the slot and engage the distal side of the slot and the slot gives sliding support to the tongue member.



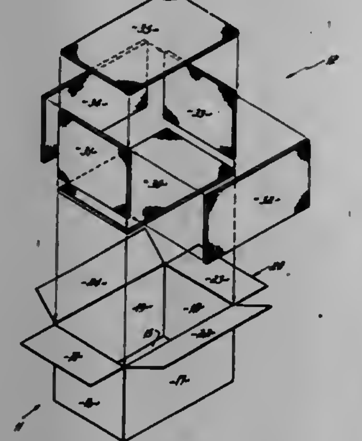
3,890,761
VACUUM SKIN PACKAGING METHOD
Harold Eugene Ramsey, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.
Filed Oct. 17, 1973, Ser. No. 407,249
Int. Cl. B65b *31/02*
U.S. Cl. 53—22 A **1 Claim**



1. A method of forming a vacuum skin package is provided including the steps of:
positioning an article to be packaged between a top and bottom web of plastic film, with the bottom part of the article resting on the bottom web;
pushing, by means of web positioning means, the top web into a first package forming position whereat such top web is in contact with the top part of the article, is closely adjacent all the side parts of the article, and is spaced from and is closely adjacent but not sealed to the bottom web;
removing air from between the top and bottom webs while the top web is in the first package forming position;
moving, by means of web positioning means, the top and bottom webs relative to each other and into a second package forming position whereat spaced parts of the top web are in sealing contact with opposed parts of the bottom web, still leaving other spaced, opposed parts of the top and bottom web unsealed; and
pushing, by means of air exerted on the outer surface of the top web, the top web into a third package forming position, whereat such other spaced, opposed parts of the top and bottom webs are in sealing contact and other parts of the top web are in skin-like contact with the top and side parts of the article thereby to form a sealed vacuum skin-package.

3,890,762
PRODUCE SHIPPING CONTAINER AND PACKING METHOD

G. Fred Ernst, and William P. Faulkner, both of Lexington, Ky., assignors to Day Star Corporation, Lexington, Ky.
Filed Aug. 20, 1973, Ser. No. 389,723
Int. Cl. B65b *55/14*; **B65d** *5/40, 5/62*
U.S. Cl. 53—25 **10 Claims**



1. A method of packing produce for shipment comprising, preparing a slab of polystyrene foam having a density of 0.5–1.5 lbs./cu. ft.,

cutting flat sheets of polystyrene from said slab,

cutting said sheets into panels fittable in facial proximity against the respective inside surfaces of a box, said box made of air permeable sheet material having a bottom wall, side walls, and a top,

placing so cut bottom and side panels within said box against the bottom wall and side walls thereof to form a liner therefor,

said panels being sized to fit snugly against one another at the edges of the box thereby to support one another against the inside surfaces of the box to define a packing space within said liner,

packing produce within said packing space,

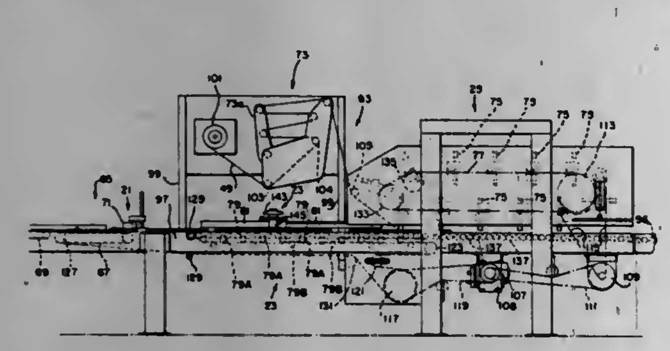
placing a cover panel over the top of said space, the cover panel residing on top edges of the side panels so as to reside adjacent the inside surface of the top of the box,

closing the top of the box,

and cooling the closed, packed container to shipment temperature.

3,890,763
PACKAGING MACHINE AND METHOD

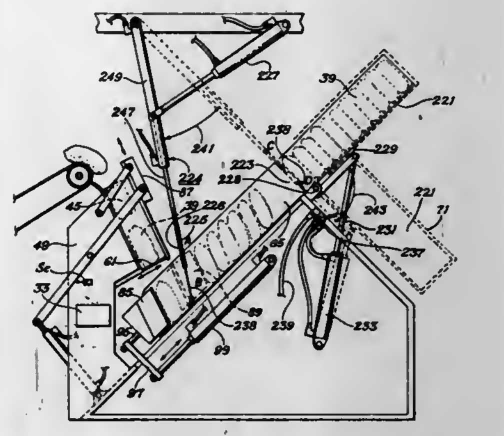
John E. Ullman, Huntingdon Valley, Pa., assignor to Huntington Industries Incorporated, Bethayres, Pa.
Filed Oct. 9, 1973, Ser. No. 404,642
Int. Cl. B65b *53/02, 7/00*
U.S. Cl. 53—39 **27 Claims**



1. A method of packaging articles such as cans, bottles and the like in a series of trays having a bottom and upstanding walls extending therefrom with a first pair of spaced-apart walls connected together by a second pair, conveying a series of filled trays along a predetermined path, comprising the steps of applying an adhesive onto said first pair of walls, placing a film sheet over a plurality of said trays, disposing said film sheet against said applied adhesive on said walls and over said articles, compressing said film sheet against said applied adhesive on said walls until the adhesive sets, separating the film sheet between trays, and shrinking said sheet to hold the articles to the tray.

3,890,764
SEMI-AUTOMATIC PACKING OF PACKAGES

Carl C. Hartman, 415 N. Pacific, Mineola, Tex. 75773
Division of Ser. No. 267,022, June 28, 1972, Pat. No. 3,815,321. This application Mar. 25, 1974, Ser. No. 454,449
Int. Cl. B65b *57/10, 57/20*
U.S. Cl. 53—61 **13 Claims**



1. Apparatus for semi-automatically packing packages being supplied by automatic packaging apparatus at a rapid rate, comprising:

a. at least one chute; said chute being upstanding such that gravity will effect movement of said packages longitudinally thereof;

b. gate means for accumulating a series of at least one package from said at least one chute; said gate means having a gate moving means for moving said gate from beneath said series caught thereon, referred to as being moved to an open position, and for moving said gate into position beneath the bottom end of said at least one chute to receive a next series from said at least one chute, referred to as being moved to a closed position;

c. switch means for effecting moving of said gate means into its respective open and closed positions; said switch means being connected with said gate moving means and monitoring a respective said at least one chute such that said gate moving means moves said gate means into its open position after passage of a package down said chute;

d. receiver means for receiving said packages from said gate means; said receiver means being positioned beneath said gate means and such that said packages are retained at a desired position in which they are emplaced into said receiver means; said receiver means comprising a load chute that is inclined at an angle sufficient to hold said packages in said desired position as they are moved up said load chute;

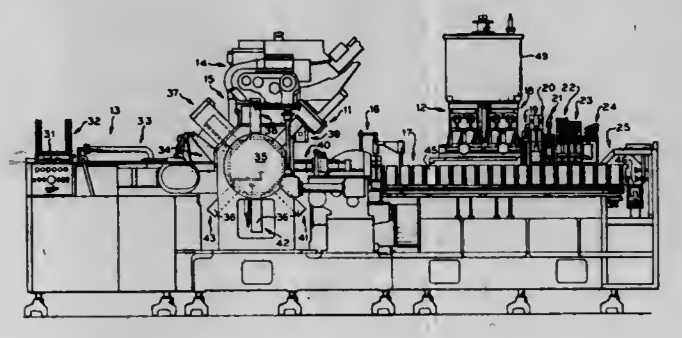
e. clearance means for effecting a clearance space in said receiver means sufficient to receive the next said series from said gate means until a predetermined number of packages are emplaced in said receiver means; said clearance means comprising a ram for advancing said plurality of packages longitudinally of said load chute and a comb for holding said packages at the position to which they are advanced by said ram when said ram is retracted away from said packages;

f. package moving means for effecting movement of said series of said at least one package from said gate means into said receiver means in a desired position; said package moving means comprising gravity in combination with said gate moving means for moving said gate into its open position to allow the accumulated said series to fall into said active load chute in front of said ram and for moving said gate means into its closed position to accumulate a next said series; and

g. a package pack moving means for moving said predetermined number of packages included in a pack to make room for the next series of at least one package from said at least one chute; said package pack moving means comprising a pivotally mounted surge chute linearly aligned with said load chute and disposed adjacent the open end of said load chute so as to receive packages moved longitudinally out of the open end of said load chute; and second means comprising a second comb that has a free end that is movable into a pre-load position behind said predetermined number of packages and movable longitudinally of said load chute to a load position to move said packages out of the open end of said load chute and into said pivotally mounted surge chute; and second moving means for moving said free end of said second comb; said second moving means being connected with said second comb.

3,890,765
CARTON FORMING MACHINE

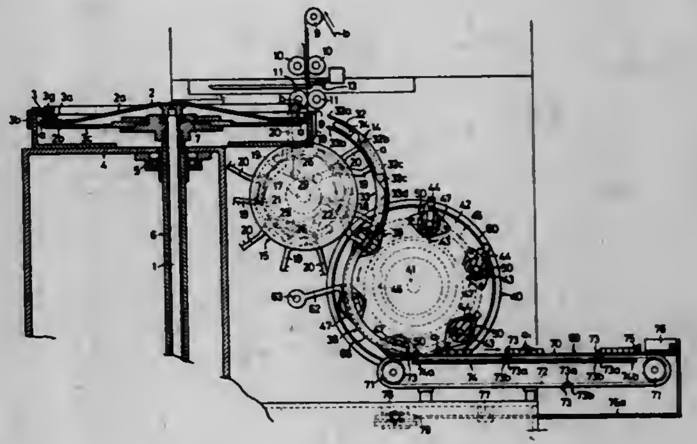
Silvio T. Farfaglia; Leslie O. Coburn, both of Fulton; Robert G. Halpin, Minneto, and Ronald E. Bock, Fulton, all of N.Y., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Sept. 7, 1973, Ser. No. 395,037
Int. Cl. B65b *3/02*
U.S. Cl. 53—183 **45 Claims**



1. A machine for forming a tubular carton from a generally rectangular flat sidewall blank having thermoplastic coatings on the upper and lower surfaces thereof and having first and second side margins and top and bottom margins, which comprises a forming mandrel, means for wrapping said sidewall blank around said forming mandrel to overlap said first and second side margins thereof, a conveying means having a conveyor run on which said blank is to be transported through a heating station to said forming mandrel, said conveying means having means for engaging a blank deposited on said conveyor run, a supply magazine means for containing a plurality of said blanks, transfer means for successively withdrawing individual blanks from said supply magazine means and for depositing each thus withdrawn individual blank on said conveyor run, holding means for maintaining the position to the thus deposited blank on said conveyor run until after the thus deposited blank is contacted by said means for engaging, means for actuating said holding means to contact said thus withdrawn individual blank as the blank is being deposited on said conveyor run, means for periodically activating said conveying means, means for actuating said transfer means during the time said conveying means is inactive, a first conduit means positioned in said heating station at least generally parallel to and spaced generally upwardly from the location which would be occupied by the upper surface of the first side margin of the blank in said heating station, said first conduit means having orifices therein spaced along the length thereof and directed at the location which would be occupied by said upper surface of said first side margin of the blank in said heating station, a second conduit means positioned in said heating station at least generally parallel to and spaced generally downwardly from the location which would be occupied by the lower surface of the second side margin of the blank in said heating station, said second conduit means having orifices therein spaced along the length thereof and directed at the location which would be occupied by the lower surface of said second side margin of the blank in said heating station, and means for supplying a hot gas to said first and second conduit means.

3,890,766
PACKING AND ALIGNING DEVICES FOR PIECES OF CANDY

Akihiro Hatta, Sakai, Japan, assignor to Tenchi Kikai Kabushiki Kaisha, Sakai, Japan
Filed Mar. 25, 1974, Ser. No. 454,609
Claims priority, application Japan, Apr. 7, 1973, 48-39877
Int. Cl. B65b *11/30*
U.S. Cl. 53—234 **8 Claims**



1. A packing and aligning device for candy of square columnar hexahedron, said device comprising, in combination:

a rotary disk for receiving a large number of collectively thrown pieces of candy on the surface of the disk rotating horizontally;

a guide channel disposed on the circumference of said disk and designed to receive and transfer the pieces of candy on the disk in longitudinal alignment;

a feed channel for receiving pieces of candy from said guide channel into which they were received, said feed channel being formed in the side of the terminal thereof with an opening for taking out candy and with a receiving portion fronting said opening and adapted to receive packing paper cut into a specified size thereinto, and being further formed below said terminal portion and in the side opposite to said opening with a crossing path permitting the passage of a member clamping said candy therethrough; packing paper feed means for cutting packing paper into a specified size and feeding the same to said packing paper receiving portion, said means including a mechanism for unrolling a long roll of packing paper and cutting said packing paper into specified lengths;

a takeout turret for clamping the pieces of candy in the terminal portion of said feed channel one by one together with the packing paper and transferring the candy thus clamped together with the paper along a first transfer path, said turret including a first turret base rotating at constant speed in the direction in which it crosses said feed channel, plural pairs of first clamping members pivotally supported at equal spaces on the circumference of said base and adapted to clamp said candy together with packing paper by the clamp portions thereof, and a set of first cam mechanism for controlling each of said clamping members so that the members make closing and opening operation in the direction of rotation of said base by rotation of the base, carry out said clamping in the terminal portion of said feed channel, and release said clamping at the terminal of said first transfer path;

first folding members positioned along the inner and outer circumferences and on both sides of said first transfer path and adapted for successively bending surplus ends of packing paper over the four sides adjacent to the front side of the piece of candy facing the inner and outer circumferences and both sides of said first transfer path, said surplus ends of packing paper being the surplus ends of the packing paper brought into clamped contact with the front side of said piece of candy;

a relay transfer turret for clamping at the terminal of the first transfer path the piece of candy clamped by said takeout turret, transferring the same along a second transfer path, and releasing said clamping at the terminal of the path, said turret including a second turret base rotating in synchronism with the first turret base, plural pairs of second clamping members pivotally supported at equal spaces on the circumference of said base and adapted to clamp the piece of candy in the terminal portion of the first transfer path, said piece of candy being clamped by said first clamping members, in the direction intersecting at right angles with the direction in which said first clamping members open and adapted to receive said piece of candy from the first clamping members, and second cam mechanisms for operating opening and closing of said clamping members at a specified position by rotation of said second turret base and for rotating said second clamping members, which clamped the piece of candy at said specified position, immediately after the members clamped the piece of candy and then changing the direction of transfer of the piece of candy;

a swing member positioned on the outer circumference of said second transfer path and adapted to swing in synchronism with rotation of said each turret base and to fold a surplus end of packing paper behind the piece of candy, said surplus end of packing paper projecting behind the direction of advance of the piece of candy which was changed in the direction of transfer by said cam mechanisms;

second folding members positioned on the outer circumference side of said second transfer path and adapted to fold over the folded surplus end of said front side a surplus end of packing paper on the front side of the piece of candy being transferred and then to fold the folded surplus ends jutting out on both folded sides internally and longitudinally of the piece of candy; and

an aligning and transfer mechanism designed to receive in a laterally aligned state the packed pieces of candy released at the terminal of said second transfer path from clamping by the relay transfer turret and to group, push and feed said packed pieces of candy by each specified quantity.

3,890,767
APPARATUS FOR APPLYING LIDS TO CONTAINERS

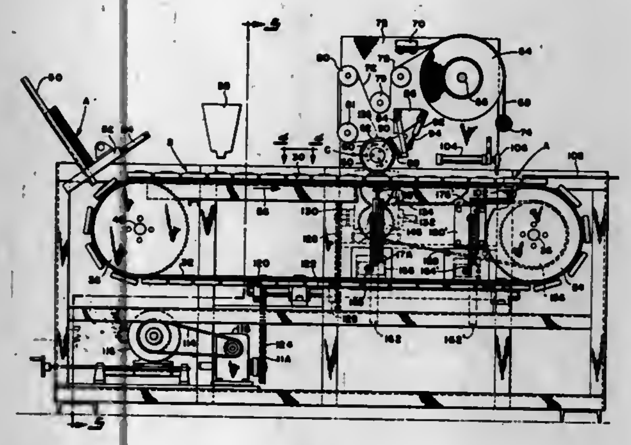
Richard S. Cawrse, 915 Beachside Ln., Huron, Ohio 44839

Filed Nov. 23, 1973, Ser. No. 418,608

Int. Cl. B65b *7/28*

U.S. Cl. 53—296 **6 Claims**

1. Apparatus for applying lids to the upper open ends of containers comprising conveyor means having indexing means to convey successive containers thereon horizontally in stepwise manner to a lidding position; a mandrel of polygonal cross-section at such lidding position disposed above said conveyor means; drive means for said mandrel operative to rotatably index said mandrel about a horizontal axis to horizontally position successive faces thereof above a container at such lidding position; means creating a vacuum on the mandrel face which is at lidding position and on at least the next two mandrel faces; means supporting a roll of lid material having heat sensitive adhesive material on one side thereof for rotation of said roll about an axis parallel to that of said mandrel for application of the leading end portion of said lid material onto at least the last one of the mandrel faces which have vacuum applied thereon with the other side of said lid material held by vacuum against said face whereby indexing of said mandrel will unwind said lid material from said roll to advance it to lidding position as the mandrel is successively indexed; knife means operative in response to indexing of said mandrel to cut the lid material at a vertex between such next faces; heating means in said mandrel effective to heat the lid material to activate said heat sensitive material on one side for adherence to the container at lidding position; elevator means operative to raise and lower a container at said lidding position to press the upper open end thereof against the heat activated side of the lid on the mandrel face which is then at lidding position, and to lower the container with the lid adhered thereto with respect to said mandrel; and valve means operative in response to elevation of said elevator means for applying air pressure on the mandrel face which is then at lidding position to aid in sealing the lid against the elevated container, to assist in separating the lid from said mandrel face when said elevator means and container thereon is lowered, and to provide a cooling effect on said lid to assist in deactivating said heat sensitive adhesive material.



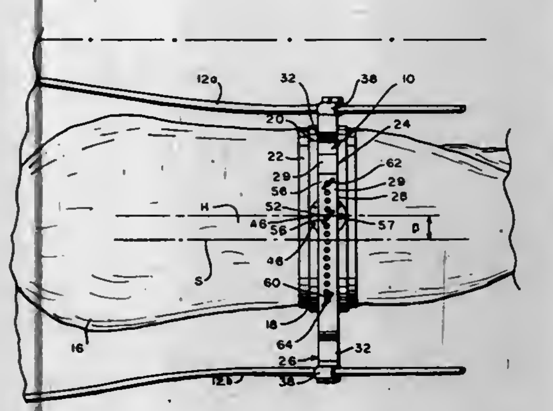
3,890,768
TOW BAR ASSEMBLY FOR SULKY

Clarence Gaines, Sherburne, and Chester Depew, Farmingdale, both of N.Y., assignors to Clarence Gaines, Sherburne, N.Y.

Filed Oct. 9, 1973, Ser. No. 404,754

Int. Cl. B68c *1/00*

U.S. Cl. 54—39 **7 Claims**



1. A tow bar assembly for coupling a sulky having a pair of laterally spaced shafts to opposite sides of a horse comprising: a belt like saddle means engageable around said horse and overlaying the back of said horse;

a flexible pad underlying said saddle means on the back of said horse;

an inverted U-shaped bar structure having a bight and depending sides; and

an attachment means for pivotally and adjustably securing the bight of said bar structure at a selected point to said saddle means with said bight extending transversely of said horse so that said shafts may be secured to said depending sides of said bar structure said attachment means comprising:

a stationary threaded stud secured to said pad and extending through said saddle means at the central plane of symmetry of said horse; and

a nut engaged on said stud.

3,890,769
HAY MAKING MACHINES

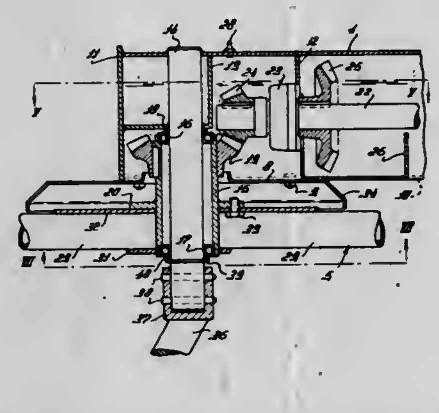
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Division of Ser. No. 231,899, March 6, 1972, Pat. No. 3,785,133. This application Nov. 19, 1973, Ser. No. 417,230

Claims priority, application Netherlands, Mar. 5, 1971, 7102932

Int. Cl. A01d , *79/00*

U.S. Cl. 56—1 **10 Claims**



1. A method of operatively connecting rotary rake members on agricultural implement in driving engagement with the power take off of a prime mover, comprising passing the shaft of an input pinioned shaft through an opening in the front wall of an elongated hollow frame beam having an open bottom, entering a drive shaft having pinion gears mounted at each end thereof each with bearings together with an intermediate pinion gear, all assembled as a unit, through the open bottom of said frame beam, retaining the further pinion gear in driving engagement with the input shaft and securing the bearings within recesses of partitions that are spaced apart within said frame beam, and fastened to same adjacent each end thereof, positioning the drive shaft parallel to the longitudinal axis of the beam, then connecting the end pinion gears of said drive shaft to the driving gears of each of the rotary members.

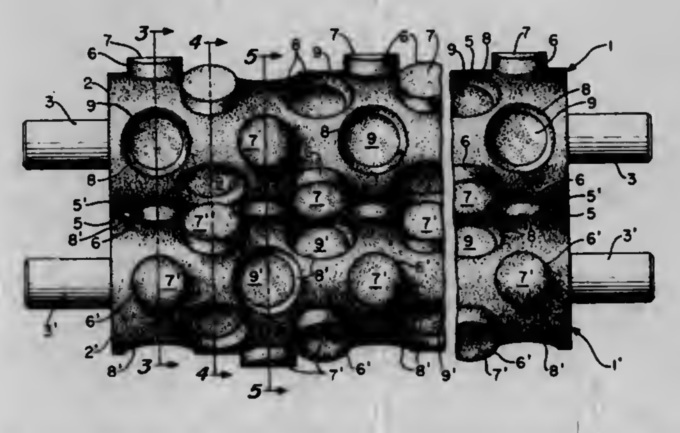
3,890,770
HAY CONDITIONER ROLL

Paul E. Milliken, Massillon, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 28, 1974, Ser. No. 446,975

Int. Cl. A01d *73/00*

U.S. Cl. 56—1 **12 Claims**



1. A roll assembly for use on a hay conditioning machine comprising a pair of intermeshing rolls disposed in adjacent parallel relationship, each of said rolls comprising:

- A. an elongated cylindrical elastomeric body portion having a peripheral surface which contacts a similar peripheral surface on the other roll as the rolls rotate;
- B. a plurality of spaced apart lugs extending radially outwardly from the peripheral surface of each roll and having a top surface;
- C. a plurality of spaced apart depressions extending radially inwardly from the peripheral surface of each roll and having a bottom surface;
- D. the relative position of the lugs on each roll being such that they correspond to the depressions in the opposite roll;
- E. the top surface of each lug contacting the bottom surface on the corresponding depression on the opposite roll as the rolls rotate;
- F. the relative positions of the lugs and depressions on the rolls being such that as the rolls rotate hay passing between them is crushed between both the contacting peripheral surfaces of the rolls and between the tops of the lugs and the bottoms of the corresponding depressions and the hay is crimped around the corners formed by the lugs, depressions and the peripheral surfaces of the rolls.

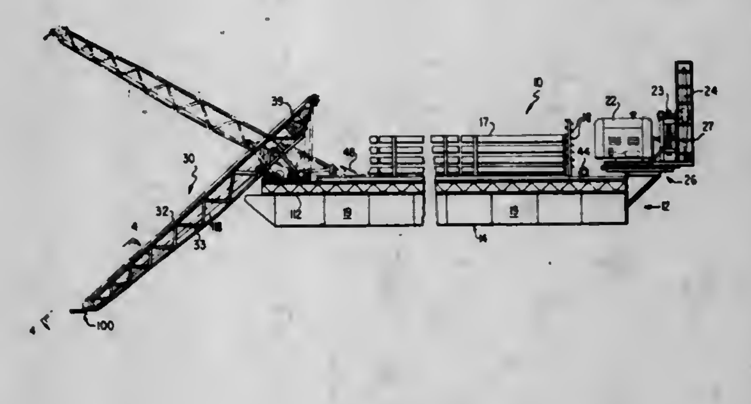
3,890,771
AQUATIC HARVESTER WITH IMPROVED FLOTATION SYSTEM

Thomas G. Kelpin, 8877 Boyonne Dr., Shreveport, La. 71108

Filed Jan. 19, 1973, Ser. No. 325,066The portion of the term of this patent subsequent to Oct. 17, 1989, has been disclaimed.

Int. Cl. A01d *45/08*

U.S. Cl. 56—9 **11 Claims**



1. An aquatic harvester comprising

an aquatic craft having a plurality of pontoon members secured longitudinally beneath a deck member said deck member being adapted to receive a payload of harvested aquatic material,

a pick-up assembly mounted on said craft for aquatic material both at and below the surface of the water and

as the sole means of propulsion an steering, a single above-the-water propulsion and steering system having an air propulsion unit, mounting means for said air propulsion unit capable of rotating 360° about a vertical axis, wherein said unit comprises an engine, an aerodynamic propeller and means connecting the crankshaft of said engine to the propeller,

each of said pontoon members comprising at least one closed, integrally formed buoyant capsule constructed of a synthetic resinous material.

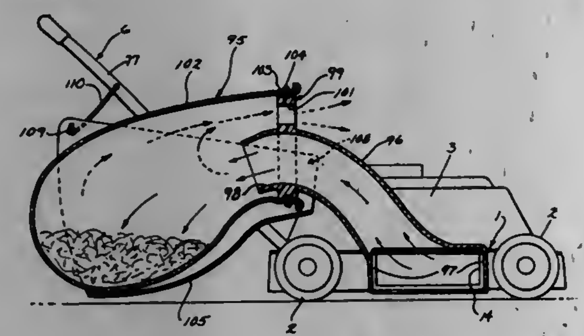
3,890,772
SELF-PROPELLED LAWN MOWER

Lester H. Seifert, R.R. No. 2, Park Ave., Kiel, Wis. 53042; Raymond P. Powers, 3515 N. 10th St., Sheboygan, Wis. 53081; William M. Schmidt, 35 Claireview Rd., Grosse Point Farms; Stanley E. Thorwaldsen, 286 Williams St., Grosse Point, both of Mich. 48236; Frederick Smith, 247 Cambridge, Mt. Clemens, Mich. 48043; David C. McElroy, 22000 St. Gertrude, St. Clair Shores, Mich. 48081, and Roy P. Dunton, 37446 Charter Oaks, Mt. Clements, Mich. 48043

Division of Ser. No. 289,539, Sept. 15, 1972, Pat. No. 3,802,170. This application Feb. 1, 1974, Ser. No. 438,589

Int. Cl. A01d *35/22*

U.S. Cl. 56—202 **5 Claims**



1. A grass catching attachment for connection to a rotary lawn mower, said lawn mower including a housing having a discharge outlet, power means mounted on the housing, and rotary cutting means disposed within the housing and operably connected to said power means, said mower also including handle means attached to the housing, said attachment comprising chute means removably connected with the housing and having one end communicating with said discharge outlet, the opposite end of said chute means defining an outlet opening, means connected to said opposite end of the chute means and defining a second opening located adjacent said outlet opening, an impervious throw-away bag having a neck bordering an open end thereof, means for removably securing the neck of the bag around said outlet opening and around said second opening, whereby grass clippings being discharged from the housing pass through the chute means and through said outlet opening into the bag and air is discharged from the bag through said second opening to the exterior, flexible protective support means carried by the mower for supporting the throw-away bag, and connecting means for removably attaching a portion of said protective support means to said chute means.

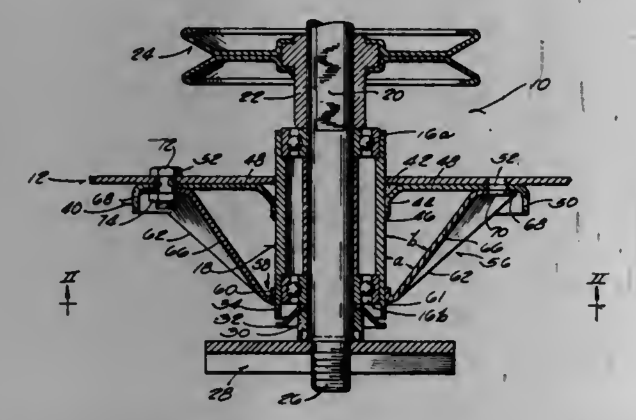
3,890,773
MOWER BLADE SUPPORT ASSEMBLY

Charles C. Frost, Newaygo, Mich., assignor to C. L. Frost & Son, Inc., Grand Rapids, Mich.

Filed Dec. 12, 1973, Ser. No. 426,613

Int. Cl. A01d *55/18*

U.S. Cl. 56—255 **11 Claims**



7. In a rotary mower drive assembly including an elongate spindle housing, spaced bearing means secured in said housing, a spindle journaled for rotation in said bearings, and mounting means extending from said housing for mounting said housing and said spindle to a lawn mower deck; the improvement comprising:

a support fixed to said housing, said support being spaced from said mounting means along the length of said spindle housing; wall means on said support member extending angularly outwardly from said housing and into abutment with said mounting means for securement therewith to said lawn mower deck, one of said support and mounting member being secured to said housing intermediate said spaced bearing means.

3,890,774
GRAPE-GATHERING MACHINE

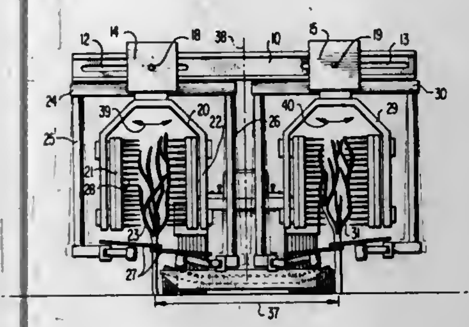
Alain Bruel, Domaine du Petit Chaumont, Aigues Mortes, France

Filed June 7, 1973, Ser. No. 367,903

Claims priority, application France, June 7, 1972, 72.21140

Int. Cl. A01g *19/00*

U.S. Cl. 56—330 **5 Claims**



1. A grape gathering machine comprising a wheeled chassis, draw bar means for connecting said chassis to a tractor, a front gantry and a rear gantry mounted on said chassis transversely of the longitudinal axis of the chassis, a pair of parallel spaced apart travellers adjustably mounted between said front and rear gantries, adjusting means for varying the spacing between said travellers and a first and second plurality of inverted U-shaped frame means pivotally suspended from said travellers to define two tunnels adapted to surround two rows of vines simultaneously, said first frame means having beater means thereon and said second frame means having recovery means thereon.

3,890,775
BEATING DEVICE FOR A GRAPE-GATHERING MACHINE

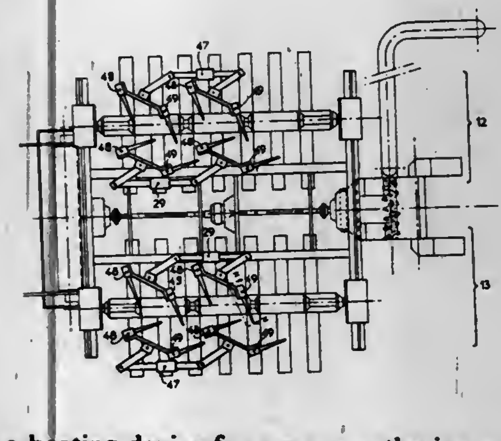
Alain Bruel, Domaine du Petit Chaumont, Aigues-Mortes, France

Filed June 11, 1973, Ser. No. 368,787

Claims priority, application France, June 9, 1972, 72.21513

Int. Cl. A01g *19/00*

U.S. Cl. 56—330 **15 Claims**



1. In a beating device for a grape gathering machine of the type having a mobile structure, and at least one tunnel defining member in the shape of a downwardly open "U" having two vertical arms attached to the mobile structure such that the two vertical arms move along either side of a row of vine stocks, the improvements comprising:

a. at least a pair of spindles pivotally attached to each of said vertical arms and extending parallel thereto;

b. a frame pivotally attached to each spindle, equidistantly from either end of the frame;

c. a plurality of flexible rods attached to each end of said frames, said rods facing a generally rearward direction with respect to the direction of movement of the mobile structure;

d. oscillating means attached to said at least one tunnel defining member to oscillate a pair of said frames with respect to said at least one tunnel defining member about said spindle so as to cause said rods to contact said vine stocks and shake the grapes therefrom;

e. linkage means connecting said oscillating means to a pair of said frames, and

f. means attached to said mobile structure to move said at least one tunnel defining member laterally with respect to said mobile structure.

3,890,776
WATCH WITH SOLAR CELL UNIT

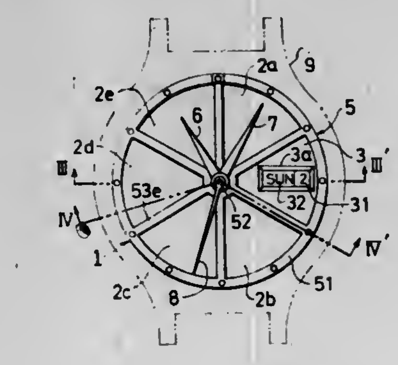
Yoshihisa Urushida, Tokyo, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Mar. 26, 1974, Ser. No. 454,988

Claims priority, application Japan, Mar. 27, 1973, 48-36230

Int. Cl. G04c *3/00;* **G04b** *19/06*

U.S. Cl. 58—23 C **5 Claims**



1. In an electronic watch of the type having a solar cell unit comprised of a plurality of separate spaced apart solar cell elements positioned in place of a conventional time display dial, the improvement comprising the provision of a protecting and positioning means for covering the edges of each cell element and separating said elements from each other, said protecting and positioning means comprising an inner ring portion, a plurality of radially extending arms spanning the space between adjacent cell elements and partially overlying the outer surfaces of said cell elements adjacent the edges thereof, an outer peripheral member connecting the outer ends of said arms and partially overlying the outer surfaces of said cell elements along the outer periphery thereof and a dependent rib on the under surface of each of said arms extending in between said cell elements.

3,890,777
DISPLAY DEVICE

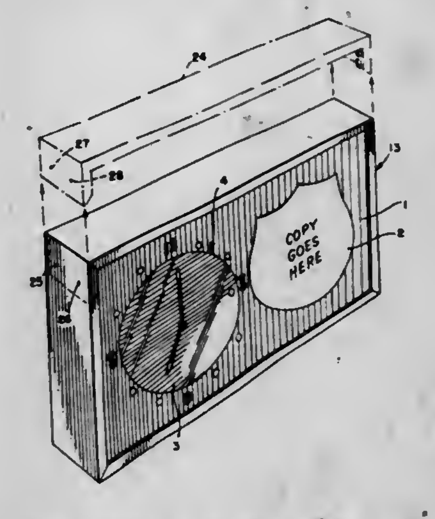
Robert B. Stanish, Chicago, Ill., assignor to Poster Products, Inc., Chicago, Ill.

Filed Nov. 1, 1973, Ser. No. 411,711

Int. Cl. G04b *19/30, 19/00*

U.S. Cl. 58—50 R **5 Claims**

1. A clock comprising a clock driving mechanism, a first pattern disc rotatable in response to said mechanism including radial transparent sections on an opaque background, a second disc rotatable in response to said mechanism at the rate of one revolution every 12 hours and having a radial transparent section and otherwise being colored with the colored portion being light transmitting, and a third disc rotatable in response to said mechanism at the rate of one revolution every hour and having the same characteristics as the second disc except that it is a different color, said discs being aligned with one another, a light source adapted to produce light rays which are transmitted through said first, second and third discs in the order named, the second and third discs blocking light everywhere except at locations aligned with one of the transparent sections in the second and third discs so that whenever a transparent section in the second and third disc is aligned with a transparent section on the first disc a colored radially moving flashing illuminated hour and minute hand is presented to the viewer.



3,890,778
WATCH STEM INTERMEDIATE SETTING POSITION WITH FUNCTIONS DETERMINED BY WHETHER INTERMEDIATE POSITION WAS ACHIEVED BY PUSHING STEM IN OR PULLING STEM OUT

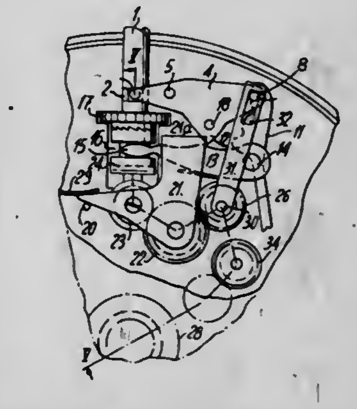
Marc Aeschmann, Geneva, Switzerland, assignor to Ebauches S.A., Switzerland

Filed July 29, 1974, Ser. No. 492,855

Claims priority, application Switzerland, Aug. 2, 1973, 11263/73; July 9, 1974, 9409/74; July 9, 1974, 9410/74

Int. Cl. G04b *23/12, 19/24, 27/04*

U.S. Cl. 58—57.5 **13 Claims**



1. In a timepiece including a plurality of indicating members and a device for setting the indications of said members, said device comprising a manually operable rotatable and axially displaceable actuating stem, and means for defining three discrete axial positions of the stem namely a pushed-in position, an intermediate position in which the stem is operatively connected with at least one indicating member for actuation thereof by rotation of the stem, and a pulled-out position, the improvement comprising means for selectively operatively connecting said stem in said intermediate position with a first indicating member in response to pulling out of the stem from the pushed-in position to the intermediate position and with a second indicating member in response to pushing in of the stem from the pulled-out position to the intermediate position.

3,890,779
CHRONOGRAPH WATCH

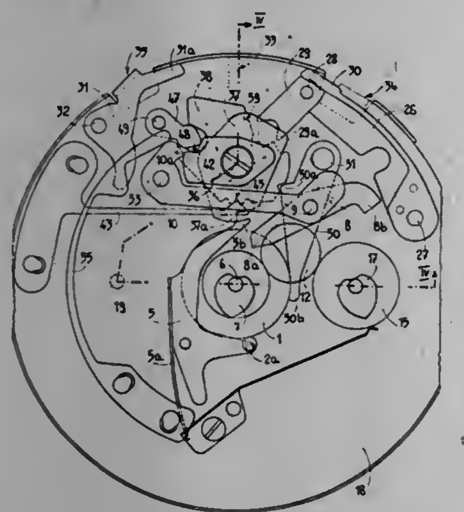
Edmond Capt, and Gerald Gander, both of Le Sentier-Canton of Vaud, Switzerland, assignors to Valjoux S.A., Les Bioux, Switzerland

Filed Apr. 4, 1974, Ser. No. 457,987

Claims priority, application Switzerland, Apr. 6, 1973, 5000/73

Int. Cl. G04f *7/04*

U.S. Cl. 58—76 **2 Claims**



1. A chronograph watch including a frame, a setting stem, return-to-zero hammers and a chronograph mechanism having a cam rotatable about an axis, a first control lever for controlling running and stopping of the chronograph and a second return-to-zero control lever, said cam being controlled by said control levers, said watch comprising, the axis of rotation of the cam intersecting the axis of the stem, said control levers being arranged substantially symmetrically with respect to the axis of said cam and the stem, the return-to-zero hammers including at least a lever independent from said cam, said last named lever being articulated on the frame and being operated by said cam.

3,890,780
BEARING SUPPORT FOR THERMAL POWER ENGINES

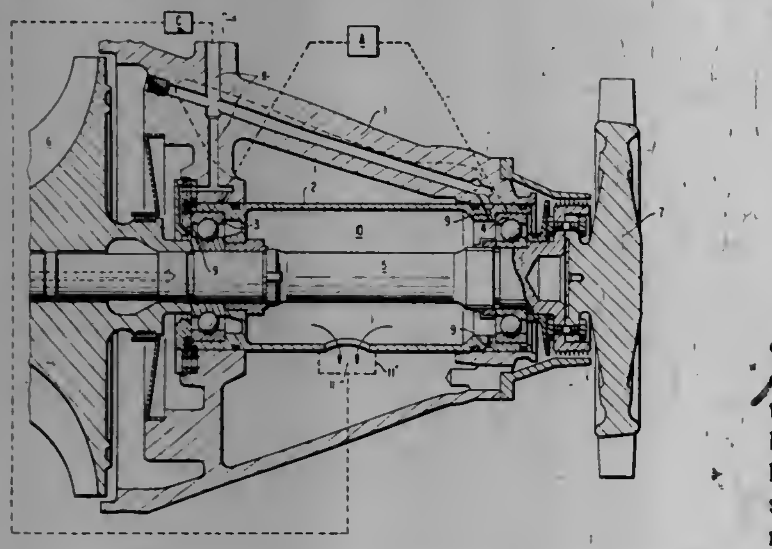
Klaus Hagemeister, Munich, and Josef Wiesbock, Dachau, both of Germany, assignors to Motoren-und Turbinen-Union Munich GmbH, Germany

Filed Aug. 31, 1973, Ser. No. 393,275

Claims priority, application Germany, Aug. 31, 1972, 2242734

Int. Cl. F02c *7/06*

U.S. Cl. 60—39.08 **24 Claims**



1. Apparatus for supporting a high-speed rotor shaft comprising:

first bearing means for directly rotatably suporting said shaft, said first bearing means including a first outer race surrounding roller means of said first bearing means,

second bearing means for directly rotatably supporting said shaft, said second bearing means including a second outer race surrounding roller means of said second bearing means, said second bearing means being engageable with said shaft at a position spaced axially from said first bearing means,

a housing subject to substantial heat loads and disposed in surrounding relationship and spaced radially from said shaft and bearing means at least along the length of the shaft between said bearing means,

lubricant supply means for supplying lubricant to each of said bearing means,

and receiving sleeve means clampingly engaged with and extending between said first and second outer races, said sleeve means being spaced radially inwardly of internal walls of said housing and including lubricant conducting means for conducting lubricant away from each of said bearing means while maintaining said lubricant out of contact with said internal walls of said housing such that any heating up of the lubricant at said internal walls is prevented.

3,890,781
FLUID COOLED COMBUSTION CHAMBER CONSTRUCTION

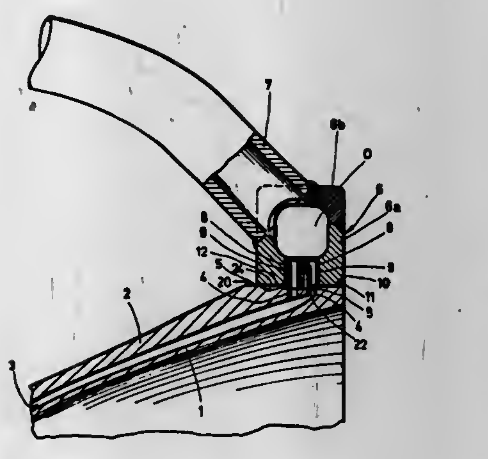
Günther Schmidt, Asteinweig 21, 8012 Ottobrunn-Riemerling; Armin Theiss, Neusatzerstrasse 6a, 8 Munich 82; Dederra, Carl-Helmut, Mozartstrasse 87a, 8012 Ottobrunn, and Leonhard Kaiser, Kemptener Strasse 60, 8 Munich 49, all of Germany

Filed Apr. 4, 1969, Ser. No. 813,677

Claims priority, application Germany, Apr. 18, 1968, 1751180

Int. Cl. F02k *11/02*

U.S. Cl. 60—267 **6 Claims**



1. A construction for a combustion chamber having a fluid cooled wall, comprising a combustion chamber wall having a cooling duct defined therethrough and being made of a relatively soft material, said wall having an annular ring mouting base defined on the exterior thereof overlying said duct, at least one bore defined through said wall from the exterior of said ring mounting base into said duct, and a closed annular ring conduit, of a structurally strong material such as steel, surrounding said wall and having an exterior annular ring base overlying said mounting base and at least one ring bore aligned with the bore of said wall.

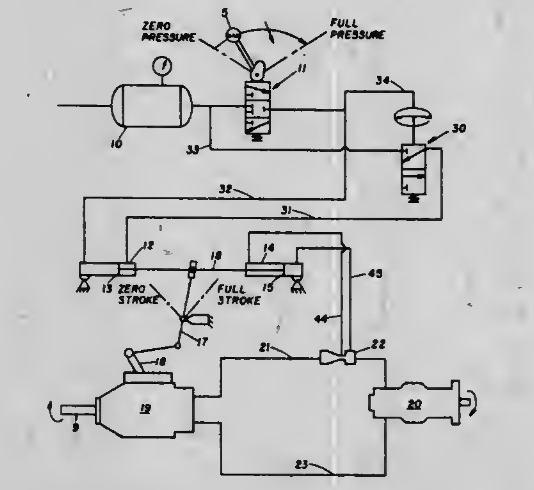
3,890,782
VARIABLE SET POINT SPEED CONTROL FOR HYDROSTATIC TRANSMISSIONS

Warren C. Wauson, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Aug. 19, 1974, Ser. No. 498,810

Int. Cl. F16h *39/46*

U.S. Cl. 60—327 **16 Claims**



1. A control system for hydraulic transmissions having a variable displacement pump driving a hydraulic motor in a hydraulic system comprising:

a regulated air pressure signal;

sensing means in said hydraulic system for creating a fluid pressure signal responsive to the flow of hydraulic fluid in said hydraulic system;

two opposing pistons, one being responsive to said regulated air signal and the other being responsive to the fluid pressure signal of said sensing means; and

means responsive to said opposing pistons for controlling the displacement of said variable displacement pump.

3,890,783
DUAL PRESSURE CONTROL ASSEMBLY

Thomas E. Allen, Mustang, and Don W. Smith, Edmond, both of Okla., assignors to CMI Corporation, Oklahoma City, Okla.

Filed Apr. 1, 1974, Ser. No. 456,843

Int. Cl. F16h *39/46*

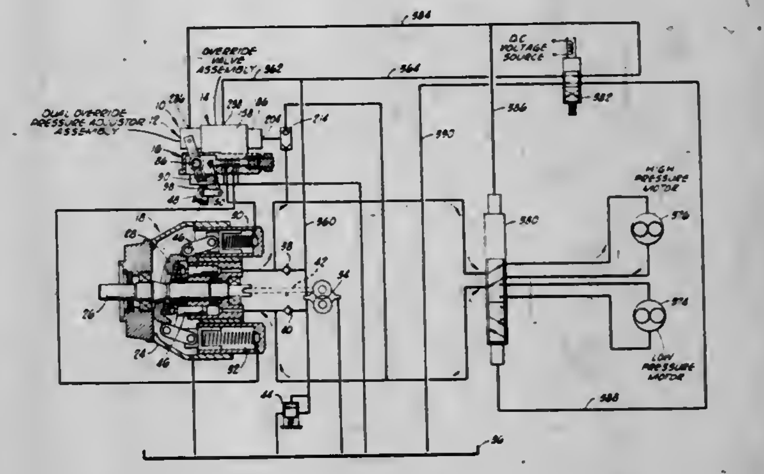
U.S. Cl. 60—420 **9 Claims**

1. In a hydrostatic transmission system of the type which includes a hydraulically servo controlled variable displacement pump which selectively provides pressurized hydraulic fluid to either of two loads having higher and lower maximum working pressures, respectively, a control valve assembly for directing pressurized control fluid to said servo controlled variable displacement pump to vary the swashplate angle of the pump in response to an external control signal, and a source of pressurized control fluid for providing pressurized control fluid to the control valve assembly, the improvement comprising:

override valve assembly means interposed between the source of pressurized control fluid and the control valve assembly for reducing the flow of pressurized control fluid therethrough to the control valve assembly to reduce the swashplate angle of the pump when the maximum working pressure of either load is exceeded, said override valve assembly means including a slidable spool valve member carried therein and having first and second ends, a conduit communicating between the first end of the spool valve member and the pressurized hydraulic fluid from the variable displacement pump, spring means operatively engaging the second end of the spool valve member for biasing the spool valve member against the pressure of the pressurized hydraulic fluid from the variable displacement pump whereby the override valve assembly means provides substantially unrestricted flow of pressurized control fluid therethrough when the maximum working pressure of either load is not exceeded;

override conduit means interconnecting the source of pressurized control fluid and said override valve assembly means for providing pressurized control fluid to said override valve assembly from the source of pressurized control fluid;

a dual override pressure adjustor assembly carried by said override valve assembly means and including a body assembly carried by said override valve assembly means, piston means slidably disposed within the body assembly with one end portion thereof operatively engaging the spring means of said override valve assembly means, and a port formed in the body assembly communicating with the opposite end portion of the piston means;



control valve means for alternately selecting, in response to stimulus external thereto, one of the two loads to which pressurized hydraulic fluid is provided by the variable displacement pump;

first dual override conduit means for interconnecting the source of pressurized control fluid and said control valve means;

second dual override conduit means for interconnecting the port in the body assembly of said dual override pressure adjustor assembly and said control valve means; and

valve member means in said control valve means intermediate said first and second dual override conduit means for placing the piston means in fluid communication with the source of pressurized control fluid to increase the bias of the spring means on the spool valve member against the pressure of the hydraulic fluid from the variable displacement pump when the variable displacement pump is providing pressurized hydraulic fluid to the load having the higher maximum working pressure and, ultimately, blocking fluid communication between the source of pressurized control fluid and the piston means to decrease the bias of the spring means on the spool valve member against the pressure of the hydraulic fluid from the variable displacement pump when the variable displacement pump is providing pressurized hydraulic fluid to the load having the lower maximum working pressure, said valve member means being responsive to stimulus external to said control valve means.

3,890,784
THERMOHYDRAULIC ENGINES

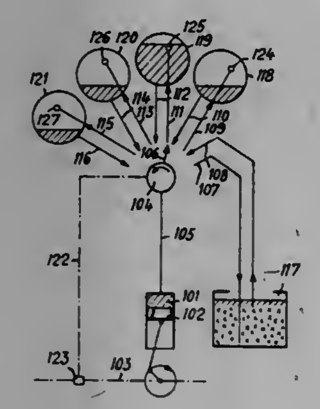
Jean André Georges Tubeue, Le Chesnay, France, assignor to Societe Europeenne de Propulsion, Puteaux, France

Filed Apr. 23, 1974, Ser. No. 463,381

Claims priority, application France, Apr. 26, 1973, 73.15990; Apr. 26, 1973, 73.15991; Apr. 26, 1973, 73.15992; Apr. 26, 1973, 73.15993; Apr. 26, 1973, 73.15994

Int. Cl. F03c *1/00*

U.S. Cl. 60—516 **13 Claims**



1. A thermohydraulic engine of the liquid piston type comprising:

a. a power output shaft member;

b. at least one compartment of variable volume coupled in driving relationship to the output member;

c. at least two expansion chambers connected for fluid communication with said compartment;

d. said compartment to be filled and at least one of the expansion chambers to be partially filled with a liquid during use of the engine, said liquid defining a wall of said chambers; and

e. means in each of said expansion chambers for introducing a product capable of producing energy by its expansion, into said selected one of said two expansion chambers in direct contact with said liquid in said chamber when the liquid therein has substantially reached a predetermined level;

f. the number of said compartments of variable volume being less than twice the number of said expansion chambers, and

g. conduit means for leading said liquid which has been contacted with said product from said chambers to a liquid receiver, whereby components of said product are carried to said receiver in said liquid.

3,890,785
STIRLING CYCLE ENGINE WITH COMMON HEAT EXCHANGER HOUSING

Bo Goran Torsten, Torstensson, Ginstgatan, Sweden, assignor to Kommanditbolaget United Stirling AB & Co., Malmo, Sweden

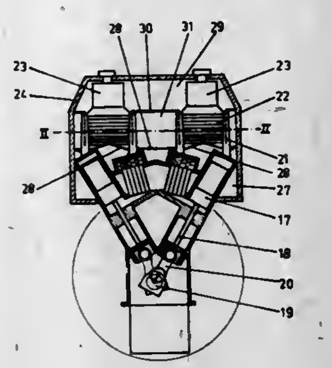
Filed Feb. 16, 1973, Ser. No. 333,326

Claims priority, application United Kingdom, Feb. 19, 1972, 7802/72

Int. Cl. F02g *1/04*

U.S. Cl. 60—525 **6 Claims**

1. A multi-cylinder double-acting Stirling cycle hot gas engine of compact V-configuration having a single crank shaft comprising in combination, eight cylinders each with adjacent regenerator-cooler units arranged in two lines of four, means connecting each line of cylinders to contain gas charges circulating only within the respective line of four cylinders, and a plurality of burner units each disposed to heat a plurality of said cylinders.



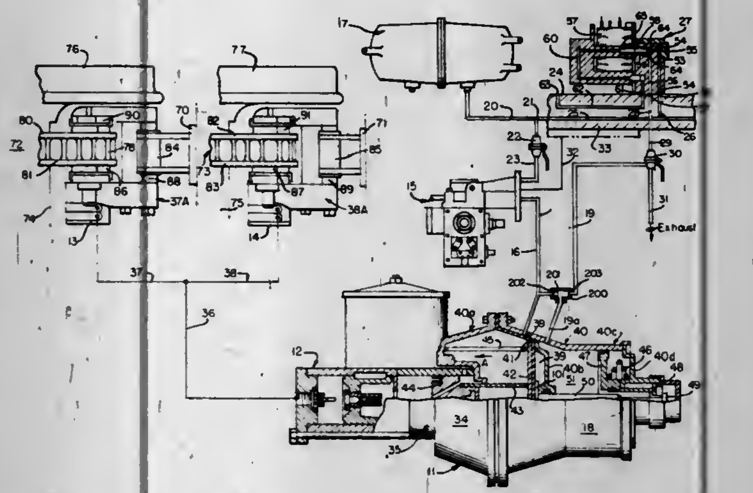
3,890,786
PNEUMATIC TO HYDRAULIC CONVERTER WITH PARKING BRAKE

Thomas H. Engle, Cape Vincent, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Aug. 31, 1973, Ser. No. 393,533

Int. Cl. F15b *7/08*

U.S. Cl. 60—547 **10 Claims**



1. A pneumatic to hydraulic converter for actuating hydraulic brakes with a pneumatic control system comprising

a. a first fluid responsive pneumatic motor means, said first pneumatic motor being responsive to positive variations in fluid pressure to actuate a first hydraulic master cylinder.

b. a spring applied fluid released motor means restrained by a second pneumatic motor means, said spring motor means being responsive to reductions in fluid pressure in said second pneumatic motor to actuate said first hydraulic master cylinder.

c. a hydraulic slack adjuster means, said adjuster means comprising a reciprocal piston with first and second working chambers on either side of said piston, said first working space communicating with said first hydraulic master cylinder, said second working space communicating with said hydraulic brakes, said slack adjuster means having first and second stop means for limiting the reciprocation of said piston,

d. transfer valve means for permitting the transfer of hydraulic fluid from said first working space to said second working space when said piston abuts said first stop means, said valve also permitting the transfer of hydraulic fluid from said second working space to said first working space upon a predetermined differential in hydraulic pressure between said first and second spaces.

3,890,787
METHOD AND MEANS FOR HEATING BUILDINGS IN A DISTRICT HEATING SYSTEM WITH WASTE HEAT FROM A THERMAL POWER PLANT

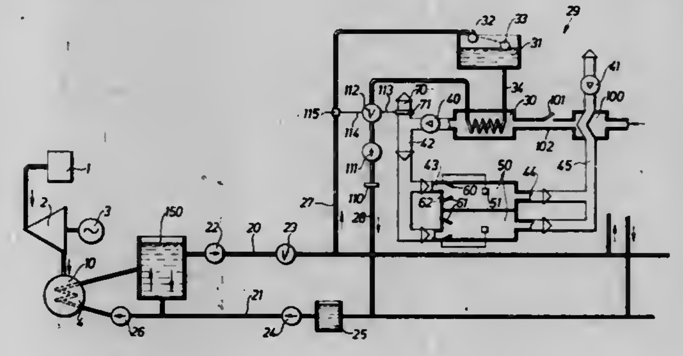
Peter Heinrich Erwin Margen, Nykoping, Sweden, assignor to Aktiebolaget Atomenergi, Sweden

Filed Mar. 15, 1973, Ser. No. 341,280

Claims priority, application Sweden, Mar. 17, 1972, 3513/72

Int. Cl. F24d *3/04*

U.S. Cl. 60—648 **27 Claims**



21. District heating system including a plurality of buildings containing individual rooms to be heated, comprising a thermal power plant utilizing steam to generate electricity and including a first heat exchanger arranged to receive the steam after it has been used in generating electricity for transferring waste heat from the steam, distribution pipes connected to said first heat exchanger for flowing water from said first heat exchanger after it has passed in heat transfer relation with the steam to the buildings in the district heating system, and return pipes for recirculating the water from the buildings to the first heat exchanger, wherein the improvement comprises a second heat exchanger located in each building, said distribution pipes and return pipes connected to said second heat exchanger for circulating the heated water therethrough, conduit means connected to said second heat exchanger for flowing air therethrough in indirect heat transfer relation with the heated water, first channels connected to said second heat exchanger for conveying heated air to individual rooms in the building, and a second channel connected to said first channels upstream from the point at which they supply air to the individual rooms for conveying heated air to the atmosphere.

3,890,788
HYDROSTATIC DRIVE SYSTEM

Cyril W. Habiger, Joliet, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed Apr. 24, 1974, Ser. No. 463,443

Int. Cl. F15b *15/18*

U.S. Cl. 60—468 **7 Claims**

1. A hydrostatic drive system for a vehicle providing precise slow speed control of vehicle movement comprising;

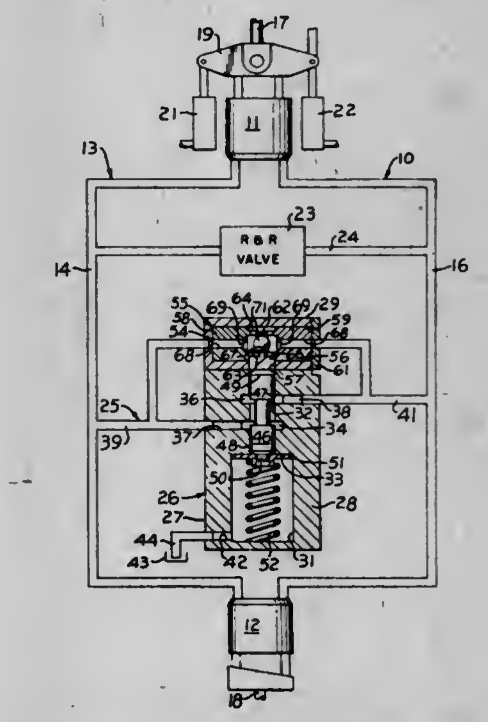
a variable displacement pump;

a hydraulic motor;

a closed hydraulic system interconnecting said pump and said motor for communicating fluid therebetween;

fluid bypass means disposed within said hydraulic system in parallel with said motor including a pressure responsive automatically variable restrictor valve having a passage extending therethrough, a valve member operatively associated with said passage and a spring resiliently urging said valve member to an open position permitting fluid flow through the bypass means for dampening pressure surges and smoothing fluid flow in the hydraulic system at relatively slow vehicle speeds when the fluid flow in the hydraulic system is below a predetermined flow rate and a predetermined pressure value, said restrictor valve being effective to increase the fluid pressure in the closed hydraulic system as the fluid flow through the bypass means increases and responsive to such increased pressure progressively to reduce fluid flow through the bypass means for increasing the speed of the vehicle, and eventually to block such fluid flow through the bypass means when the fluid pressure exceeds said predetermined value to assure delivery of all fluid flow from the pump to the motor at high speeds and at high vehicle load conditions where the fluid pressure remains above said predetermined pressure even though the flow rate decreases below the predetermined rate at which said restrictor valve is normally opened; and

said restrictor valve including means providing an auxiliary flow path for transmitting fluid under pressure from said closed hydraulic system to said valve member for moving it toward a closed position against the bias of said spring for blocking fluid flow through said passage when the fluid pressure in the hydraulic system exceeds said predetermined value.



3,890,789
THERMAL POWER PLANTS

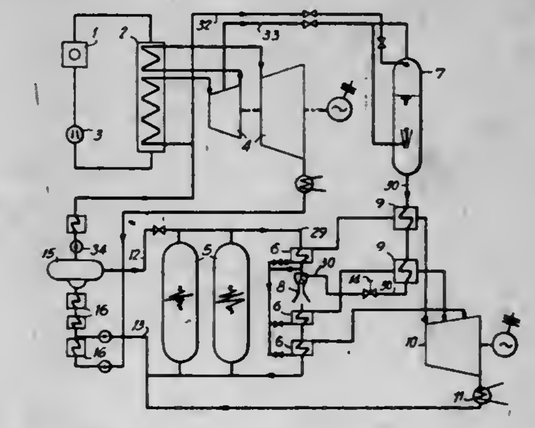
Georg Beckmann, and Paul Viktor Gilli, both of Vienna, Austria, assignors to Waagner-Biro Aktiengesellschaft, Austria

Filed Dec. 6, 1973, Ser. No. 422,413

Claims priority, application Austria, Dec. 7, 1972, 10474/72

Int. Cl. F01k *3/12, 1/14*

U.S. Cl. 60—659 **14 Claims**



1. In a thermal power plant, such as a nuclear power plant, primary circuit means for generating primary power and accumulator circuit means communicating with said primary circuit means for generating additional peak power to be used in addition to the primary power during peak power periods, said accumulator circuit means including a displacement accumu-

lator means for accumulating a reserve of energy during non-peak periods, steam generator means communicating with said displacement accumulator means for generating steam with fluid circulated between said displacement accumulator means and said steam generator means, circulating conduit means communicating with said displacement accumulator means and said steam generator means for circulating the fluid between said steam generator means and said displacement accumulator means, circulating means operatively connected with said circulating conduit means for circulating fluid therethrough, and drive accumulator means operatively connected with said circulating means for driving the latter.

3,890,790
ANTI-HEAVE PROTECTIVE SYSTEM

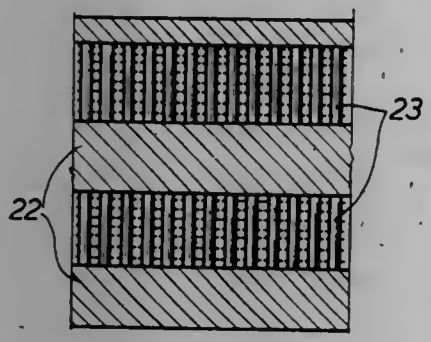
Jacques Edouard Lamy, Fontenay-aux-Roses, France, assignor to C. J. Doris, Paris, France

Continuation of Ser. No. 324,305, Jan. 17, 1973. This application May 21, 1974, Ser. No. 471,878

Claims priority, application France, Jan. 18, 1972, 72.01560

Int. Cl. E02b *3/06*

U.S. Cl. 61—3 **6 Claims**



1. Protective system against the heaving action of waves of water comprising a bulky obstacle means having a spreading-out surface and providing a substantially uninterrupted impingement area of substantial extent athwart the wave path and exposed to the impact of successive surges of the heave to induce along said spreading-out surface alternate ascending and descending motions of a mass of water of a thickness greater than a limit layer of water, and means providing a multiplicity of energy dissipating material elements distributed over and projecting in front of said spreading-out surface a distance sufficient to penetrate into said mass of water beyond said limit layer, said elements serving to slow down said ascending and descending water motions and phase-shift the same with respect to the heave, in which the obstacle means is constituted by a plurality of separate obstacle members arranged in staggered relation in a direction perpendicular to the spreading-out surface, and the material elements are borne by the separate obstacle members.

3,890,791
METHOD OF BUILDING A TUNNEL AND TUNNEL BUILT ACCORDING TO SAID METHOD

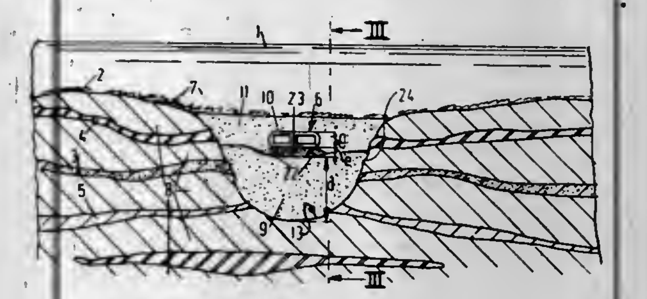
Jan De Koning, Amsterdam, and Romke Van Der Veen, Jutphaas, both of Netherlands, assignors to Ballast-Nedam Group N.V., Amsterdam, Netherlands

Filed Apr. 16, 1973, Ser. No. 351,268

Int. Cl. E02d *29/06*

U.S. Cl. 61—43 **5 Claims**

1. The method of building a tunnel in the bottom of a body of water, which tunnel comprises a series of interconnected tunnel elements, comprising the steps of dredging a tunnel trench in said bottom till a depth which is several times the tunnel height is reached, partially filling said trench with a ballast bed of foundation material to a depth below said bottom but at least twice the height of said tunnel laying the tunnel in the partially filled trench in temporarily supported position above the level of the foundation material, and then completing the filling of said trench with foundation material substantially to the level of said bottom whereby to encompass and bury said tunnel.



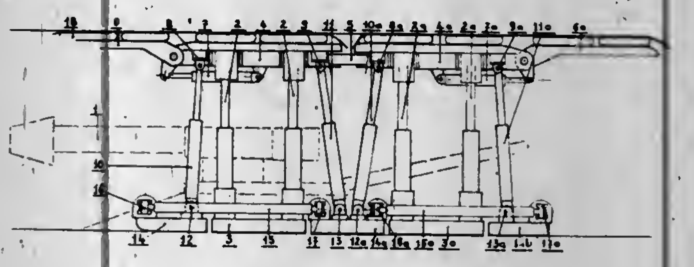
3,890,792
WALKING-PROPS FOR MINING GALLERIES

Georges Alacchi, Villa Saint-Joseph, rue Jules Ferry, Frais Marais 59500 Douai, France

Filed June 5, 1973, Ser. No. 367,132

Int. Cl. E21d *15/44*

U.S. Cl. 61—45 D **9 Claims**



1. A walking-prop system for mining galleries, of the type adapted to be kept in contact with the gallery's roof during shifting and comprising at least a front roof support frame and a rear roof support frame both arranged one behind another in the direction of advance, each of said support frames being constituted by a plurality of double-acting load-bearing props, a shoe carried by the lower-end of said load-bearing props and adapted to contact the floor of the gallery, a cap member connected to the upper end of said load-bearing props and adapted to contact the roof of said gallery, at least one double acting shifting jack disposed between said front and rear support frame and connecting the opposite ends of the cap members of each of said support-frames, wherein each support frame include at least a double acting supporting jack placed in front of the corresponding support-frame and pivotally connected on its upper end to the cap member of said support-frame and on its lower end to a front base shoe in contact with the floor of the gallery and also a double acting supporting jack placed in the rear of the corresponding support-frame and pivotally connected on its upper end to the cap member of the corresponding support-frame and on its lower end to a rear base shoe in contact with the floor of said gallery, and wherein the front base shoe and the rear base shoe of each support-frame are linked together by a connecting jack.

3,890,793
SUPPORT ADVANCING APPARATUS FOR MINES

Manfred Koppers, and Friedhelm Kuhnapfel, both of Duisburg, Germany, assignors to Rheinstahl AG, Germany

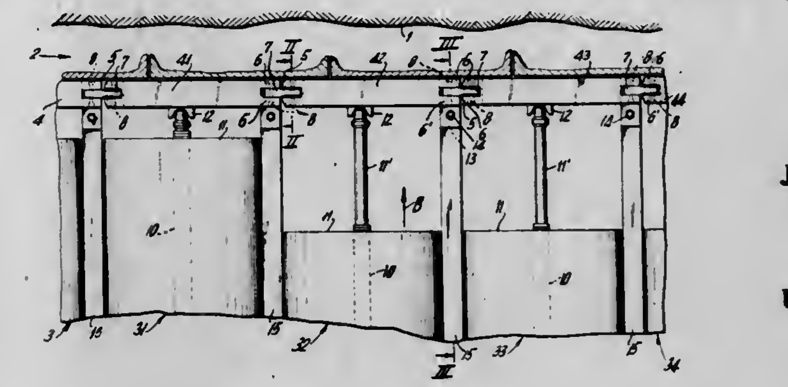
Filed Sept. 27, 1974, Ser. No. 510,064

Claims priority, application Germany, Oct. 8, 1973, 2350401

Int. Cl.^{2} E21D *23/00*

U.S. Cl. 61—45 D **7 Claims**

1. An advancing support system for following the dip of a longwall in an underground mine operation, comprising an abutment beam made up of a plurality of individual beam elements arranged in end-to-end axial alignment along the length of the longwall, connecting means pivotally connecting adjacent individual beams together so that they may pivot substantially only in one plane perpendicular to the footwall, a support unit alongside each individual beam element, and means associated with each support unit connected to respective ones of said individual beams for selectively shifting them relative to said longwall.



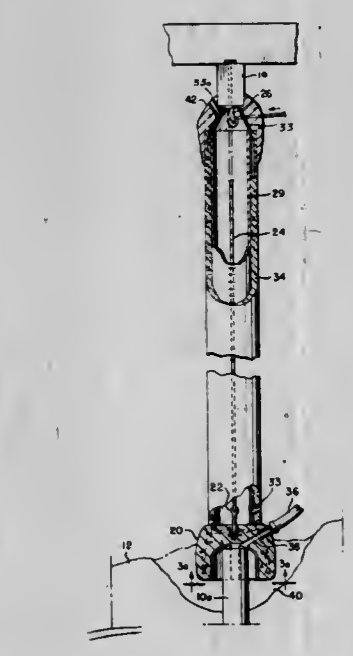
3,890,794
METHOD OF REPLACING PILING

John T. Broadfoot, Star Rte. 1, Box 144, Kingston, Wash. 98346

Filed Dec. 26, 1972, Ser. No. 318,093

Int. Cl. E02d *5/26, 5/40*

U.S. Cl. 61—54 **10 Claims**



1. A method of providing a load-bearing, cast-in-situ concrete piling, comprising:

providing a concrete base member adapted to be secured to a sound bottom piling stub whose upper end is just below the mud line;

securing an elongated, hollow, concrete form tube to the top of the base member;

applying a layer of quick-setting concrete completely over the outer surface of the form tube and its intersection with the base member of sufficient thickness to form a hollow, load-bearing concrete column;

suspending the base member and hollow column in the water above and over the piling stub;

lowering the integral base and column into contact with the piling stub;

securing the base to the piling stub; and

securing the upper end of the column to an overhead support member, the elongated, hollow, concrete form tube extending from the base member to just below the overhead member so as to form a continuous load-bearing concrete column extending from the piling stub to just below the overhead member.

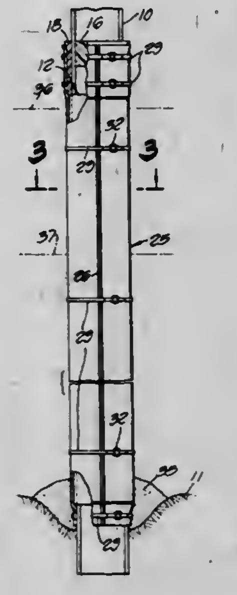
3,890,795
KIT OF COMPONENTS AND A METHOD OF PROTECTING STEEL PILING FROM CORROSION

John R. Maurer, Glendora, Calif., assignor to Walter A. Plummer, Sherman Oaks, Calif.

Filed May 21, 1973, Ser. No. 362,170

Int. Cl. E02d *5/60*

U.S. Cl. 61—54 **13 Claims**



1. That method of protecting H-beam steel piling against corrosion which comprises: mounting elongated non-metallic corner protector means lengthwise of each outer longitudinal corner of the piling, securing barrier blocks into the opposite sides of the piling adjacent the upper ends of said corner protector means to seal the entrance to the space disposed on the opposite sides of the pile web and in an area spaced above high water level, applying a resilient sealing collar about said piling radially opposite said barrier blocks, sheathing said piling opposite said collar and therebelow with a substantially fluid-tight jacket of supple sheet plastic, securing said plastic jacket snugly about said piling and corner protector means and in a fluid-tight manner about said sealing collar thereby to exclude oxygen and preventing corrosion of the piling.

3,890,796
METHOD FOR REMOVING LIQUID CONTAMINANTS FROM A SUBMERGED TANK

Jean J. Kruger, Northport, N.Y., and Vincent E. Rositto, 58 Higbie La., West Islip, N.Y. 11795, assignors to said Vincent E) Rossitto by said Jean J. Kruger

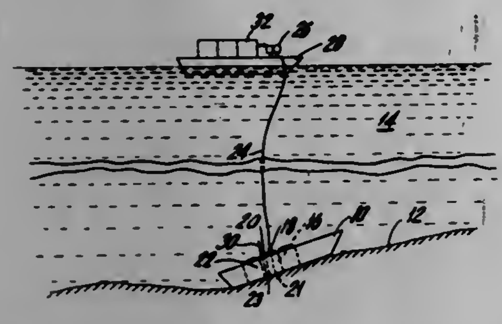
Division of Ser. No. 231,631, March 3, 1972, Pat. No. 3,813,887. This application Dec. 26, 1973, Ser. No. 427,786

Int. Cl.^{2} B63C *7/12, 11/40*

U.S. Cl. 61—69 **8 Claims**

1. A method of removing liquid material from a submerged tank comprising the steps of:

drilling a first hole and drilling a second hole in the submerged tank while the tank is submerged and while the drill and at least each area of the tank being drilled is isolated from the liquid in which the tank is submerged as such area is drilled so as to prevent the liquid material in the tank from escaping, during drilling, into and contaminating the liquid surrounding the tank, said first hole being positioned higher than said second hole; and pumping the liquid material out from one of said first and second holes, while liquid surrounding the submerged tank enters the other of said holes.



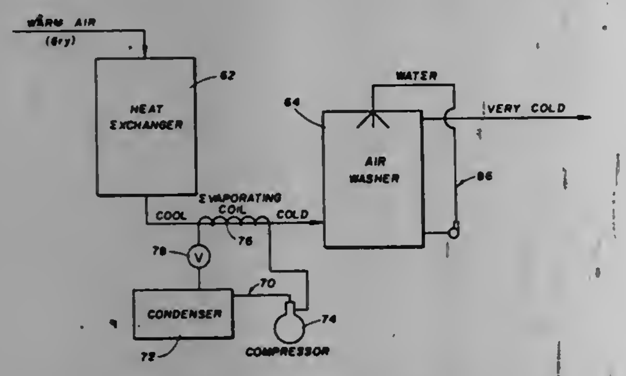
3,890,797
AIR CONDITIONING PROCESS

Ted R. Brown, 1212 Princeton Ave., Salt Lake City, Utah 84105

Division of Ser. No. 359,368, May 11, 1973, which is a continuation-in-part of Ser. No. 172,968, Aug. 19, 1971, abandoned. This application Nov. 23, 1973, Ser. No. 418,527

Int. Cl.² F25D *17/06*

U.S. Cl. 62—91 **2 Claims**



1. A process for controlling the temperature and moisture content of air having a dew point of not more than 57°F corresponding to at least 90°F dry bulb temperature, sequentially

preparing an air flow path accommodating 400-600 CFM/ton net sensible cooling;

drawing fresh dry air exclusively from a fresh air source and through the flow path in the amounts of 400 to 600 CFM/ton net sensible cooling;

pre-cooling the fresh air with a heat exchanger without altering its moisture content;

refrigerating the pre-cooled air to further cool the air and coincidentally condense excess moisture; and

scrubbing the cooled air with recirculating water to adiabatically cool the air to within a range of 53° to 60°F.

3,890,798
REFRIGERATOR CONTROL APPARATUS

Ryoichi Fujimoto, Tochigi-ken; Kazuo Takasugi, Higashiyamato; Fumiyuki Inose; Kenji Maio, both of Kokubunji, and Norio Yokozawa, Fuchu, all of Japan, assignors to Hitachi, Ltd., Japan

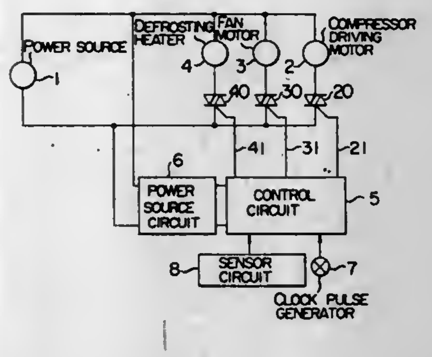
Filed Aug. 12, 1974, Ser. No. 496,897

Claims priority, application Japan, Nov. 5, 1973, 48-123436

Int. Cl. F25d *21/06*

U.S. Cl. 62—155 **6 Claims**

1. A refrigerator control apparatus comprising: an electronic timer including first, second and third counters, a clock signal being applied to the input stage of said first counter, the output of said first counter being applied to the input stage of said second counter; means for picking up a first timing signal from a predetermined stage of said first counter; means for picking up a second timing signal from the output stage of said second counter; means for picking up a third timing signal from the output stage of said third counter; means for controlling the overload time of a compressor in response to said first timing signal; means for controlling the suspension time of said compressor in response to said second timing signal; means for controlling the defrosting suspension time in response to said third timing signal; and means for applying the output of said first counter to said third counter during the running time of said compressor.



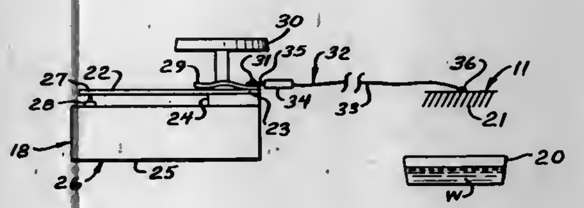
3,890,799
BIMETAL THERMOSTAT DEFROST AND AIR TEMPERATURE CONTROL

George William Sisk, Jr., Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Mar. 8, 1974, Ser. No. 449,283

Int. Cl. F25b *1/00*

U.S. Cl. 62—215 **16 Claims**



1. In a refrigeration apparatus for cooling air having a refrigeration unit including an evaporator means and means for flowing air to be cooled in heat transfer association with the evaporator means, temperature responsive means for controlling operation of said refrigeration unit comprising: means for flowing air to be cooled in a flow path substantially bypassing said evaporator; a thermostat including a bimetal actuating element disposed in said flow path to be in heat transfer relationship with said air; and thermal conductor means in heat transfer relationship with said evaporator means and said bimetal actuating element whereby the thermostat is responsive to the frost condition of the evaporator means and the temperature of bypassed air.

3,890,800
SAFETY RESILIENT SLIP COUPLING FOR PIERCED EARRINGS

Donald J. Montague, Casilla 3714, Lima, Peru

Filed Oct. 9, 1973, Ser. No. 404,848

Int. Cl. A44c *7/00*

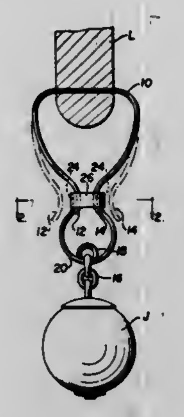
U.S. Cl. 63—13 **10 Claims**

1. A pierced earring having a safety coupling comprising:

an elongated spring member formed into a loop for insertion through an aperture in an earlobe;

an earring ornament; and,

means for supporting said ornament from said loop, said ornament supporting means being secured to said earring ornament and being automatically operable under tension between said loop and said earring ornament downwardly away from the portion of said loop that normally rests in the earlobe aperture to separate said loop from said ornament supporting means thereby eliminating tension on the loop and protecting the earlobe from damage.



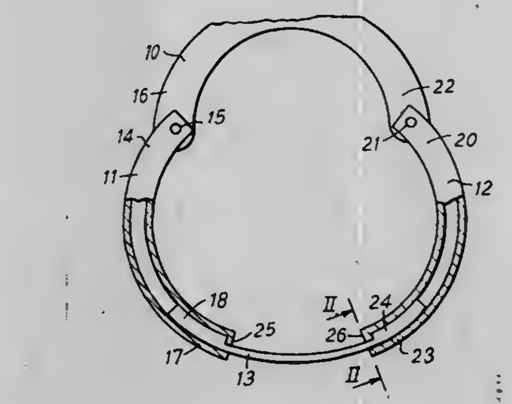
3,890,801
ADJUSTABLE RING-SHAPED ARTICLES OF JEWELRY

Jacob Newman, 85 Hatton Grdn., London, England

Filed Jan. 2, 1974, Ser. No. 429,718

Int. Cl. A44c *9/02*

U.S. Cl. 63—15.65 **7 Claims**



1. A ring-shaped article of jewelry comprising:

a base;

two arcuate links, each link pivotally connected to opposite sides of said base for angular movement about an axis parallel to the axis of said ring-shaped article, wherein each of said links comprises an arcuate tube having a cross section which has a flat side turned outward at the end of each of said tubes remote from said base to form abutments;

a resilient strip having a cross section which has a flat side and having its ends telescopically mounted one in each of said tubes, the strip being telescopically movable relative to said links by pressure to adjust the internal dimensions of the article, the center portion of such strip between said ends being cut away along its flat sides so that the end portions are larger than its center portion, said end portions being a close sliding fit within said tubes, the abutments on said tubes forming a close sliding fit against the flat side of the center portion of the strip and engaging the larger end portions of said strip when the article is expanded to its maximum size thereby preventing withdrawal of the strip from the tube said close sliding fits of said end portions within said tubes and between said abutments and said flat side of said center portion providing means affording sufficient frictional resistance to prevent relative movement of said links and strip out of adjusted position during normal use.

3,890,802
REINFORCED DIKE

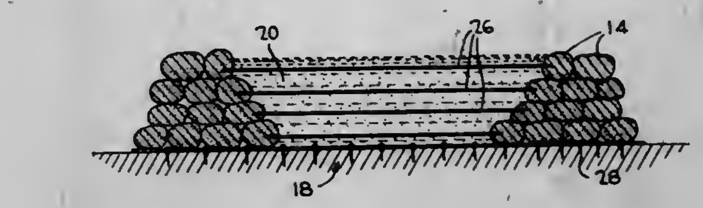
Edouard Auriat, Montrouge, and Yves Gaudard, Lyon, both of France, assignors to Rhone-Poulenc-Textile, Paris, France

Filed Apr. 6, 1973, Ser. No. 348,473

Claims priority, application France, Apr. 24, 1972, 72.14763

Int. Cl. E02b *7/02*

U.S. Cl. 61—30 **15 Claims**



7. The dike as recited in claim 1 wherein said porous reinforcing element is a non-woven sheet of continuous filaments.

3,890,803
TORQUE TRANSMITTING DEVICE WITH TORQUE LIMITING DEVICE

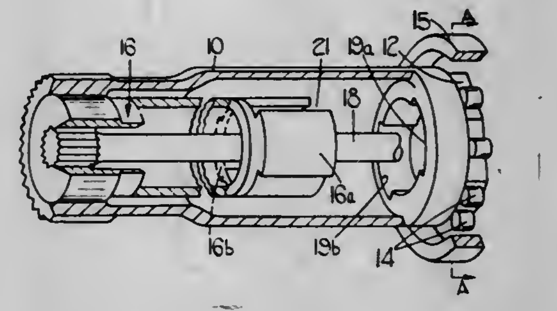
Francis John Neal, and John Richard Simmons, both of Wolverhampton, England, assignors to Lucas Aerospace Limited, Birmingham, England

Filed Jan. 28, 1974, Ser. No. 437,481

Claims priority, application United Kingdom, Feb. 3, 1973, 5466/73

Int. Cl. F16d *3/14*

U.S. Cl. 64—27 B **12 Claims**



1. A torque transmitting device comprising an input drive member, a co-axial output drive member, first and second coupling members through which torque is transmitted from the input drive member to the output drive member, said coupling members each having abutment means engageable with both the input drive member and the output drive member, said coupling members being interengaged to permit limited relative angular movement therebetween about the common axis of the input and output members, pre-stressed torsion means applying a torque load to the coupling members in opposite directions to urge these to a limiting angular position relative to one another, whereby when the torque applied to the input drive member in either direction exceeds the pre-stressing of the torsion means, the drive members are moved relative to one another; and a brake actuable on such relative movement of the drive members to prevent turning thereof.

3,890,804
KNITTING MACHINES

Norberto Puig Anglada, Puigblanch St. Nr. 22, Mataro, Barcelona, Spain

Continuation-in-part of Ser. No. 190,115, Oct. 18, 1971, abandoned. This application Dec. 20, 1973, Ser. No. 426,548

Claims priority, application Spain, Nov. 25, 1970, 386160

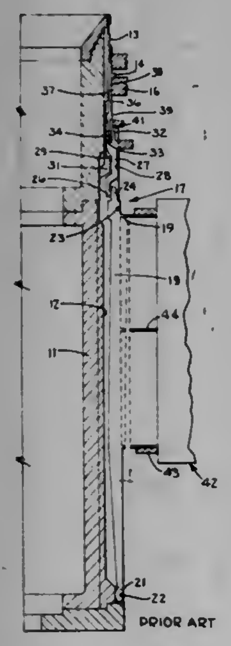
Int. Cl. D04b *15/68*

U.S. Cl. 66—50 R **7 Claims**

1. In a circular knitting machine comprising a cylinder housing having a plurality of elongated slots formed therein

and extending longitudinally thereof, and a plurality of pattern control linkages associated with said slots for controlling the knitting pattern of said machine, the improvement wherein each of said linkages includes:

- an elongated rodlike control element formed as an elongated resiliently flexible member and disposed within and extending substantially longitudinally along a respective slot, one end of said flexible member being fixedly and stationarily anchored relative to said cylinder housing, the remainder of said flexible member being spaced from the bottom wall of said slot whereby the extremity of said flexible member adjacent the other end thereof is freely angularly displaceable in a direction substantially perpendicular to said bottom wall;
- an elongated selector jack member positioned within said slot and spaced throughout the length thereof from the bottom wall of said slot, said jack member having hook means on the opposite ends thereof;
- projection means fixedly mounted on one of said members intermediate the ends thereof and projecting transversely toward the other of said members, the other of said members having an intermediate portion thereof disposed in bearing engagement with said projection means;



- pivot means mounting said selector jack member on said cylinder housing for permitting said jack member to pivotally swing about either end thereof for causing displacement of the extremity of said flexible member in a direction substantially perpendicular to the bottom wall of said slot in response to an external pushing force imposed on said selector jack member, said pivot means including a pair of pivot members mounted on said cylinder housing, one of said pivot members being engaged with each of said hook means; and
- said selector jack member having lug means disposed for actuation by an external pattern control projection, whereby a pushing force exerted on said selector jack member adjacent one end thereof is translated to said flexible member due to pivoting of said jack member about the other end thereof, and whereby a pushing force exerted on said selector jack member adjacent said other end thereof is translated to said flexible member due to pivoting of said jack member about said one end thereof.

3,890,805
NEEDLE SELECTION DEVICE FOR A CIRCULAR KNITTING MACHINE

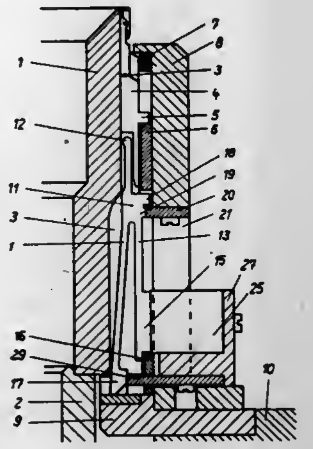
Norbert Paul Bourgeois, Troyes, France, assignor to Etudes et Bonneterie S.A., Nyon, Switzerland

Filed Apr. 2, 1973, Ser. No. 346,793

Claims priority, application Switzerland, Apr. 4, 1972, 4911/72

Int. Cl. D04b *15/66, 15/68, 15/78*

U.S. Cl. 66—50 R **2 Claims**



1. A device for the selection of knitting accessories such as needles of a circular knitting machine including a needle cylinder and at least one selection station on a fixed part of said machine surrounding the needle cylinder and pivotal jacks associated with the accessories to be controlled, each jack and an associated accessory being disposed in a respective guide groove of the needle cylinder, the improvement wherein:

- each jack comprises an elastically deformable part located facing the interior of its guide groove, and
- each selection station comprises:
  - magnetic selection means disposed on a cam-box of the machine exterior to said needle cylinder;
  - means for pivoting the pivotal jacks towards the exterior of the guide grooves and submitting them to the influence of said magnetic selection means;
  - a bearing surface disposed on said cam-box exterior to said needle cylinder for bearing against the jacks which are submitted to the influence of said magnetic selection means;
  - a thrust member fixed on said cam-box for acting on said elastically deformable part of each jack and deforming it in a direction towards the interior of its guide groove against the force of attraction of said magnetic selection means; and
  - said magnetic selection means being situated between said bearing surface and said thrust member.

3,890,806
ELECTRICAL PATTERNING SYSTEM FOR CIRCULAR KNITTING MACHINES

Gerhard Grozinger, Spaichingen, Wurtt, Germany, assignor to Mayer & Cie. Maschinenfabrik, Tailfingen, Wurtt, Germany

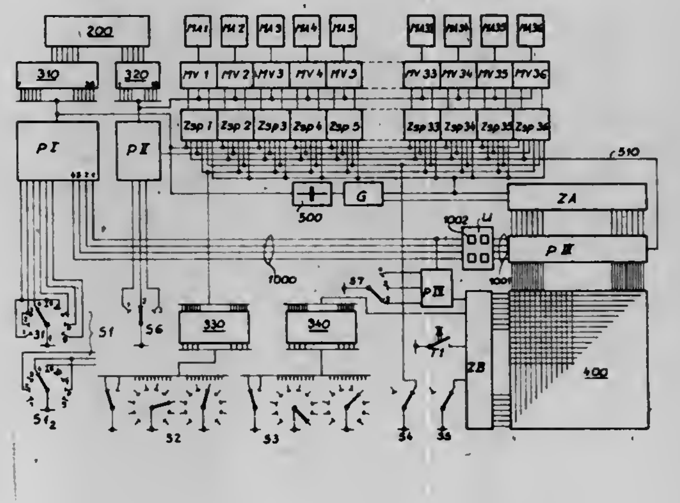
Continuation-in-part of Ser. No. 94,365, Dec. 2, 1970. This application June 5, 1972, Ser. No. 259,818

Claims priority, application Germany, June 3, 1971, 2127561

Int. Cl. D04b *15/78*

U.S. Cl. 66—50 R **23 Claims**

8. In a control system for a circular knitting machine which has a plurality of knitting stations respectively associated with different pattern characteristics and together arranged to effect knitting of a patterned fabric composed of fabric units each having one of said pattern characteristics, the combination comprising a plurality of information locations each corresponding to a respective fabric unit to be knitted and each arranged to receive and store information representing the pattern characteristic selected for the corresponding fabric unit, said information locations being organized into information location groups scanning means for scanning said locations and for generating groups of pattern signals, each group of signals indicating which locations store information representing a respective one of said pattern characteristics, said scanning means being operative for scanning each of said information location groups, prior to the scanning of the next group, a number of times equal to the number of different pattern characteristics represented by said information, and routing means for establishing a plurality of different selectable routing schemes according to each one of which each of said groups of signals is routed to a respective knitting station associated with one of said pattern characteristics, and including selecting means for selecting a routing scheme from said plurality of different routing schemes, said routing means and selecting means thereby making it possible to preserve the geometry of a particular pattern while changing the assignment of pattern characteristics within such pattern, said knitting machine having a plurality of buffer stores each associated with a respective one of said knitting stations, and wherein said routing means comprises means for establishing the sequence in which successive ones of said buffer stores are permitted to receive pattern signals, and for establishing the sequence in which successive groups of pattern signals are presented to buffer stores, and wherein said selecting means comprises means for altering at least one of said sequences.



3,890,807
DRIVING MECHANISM FOR KNITTING NEEDLE DISPLACEMENT IN WARP KNITTING MACHINES, SUCH AS RASCHEL MACHINES, PARTICULARLY

Johannes Socha, Monchen-Gladbach, and Wolfgang Groth, Rheydt, both of Germany, assignors to W. Schlafhorst & Co., Maschinenfabrik, Monchen-Gladbach, Germany

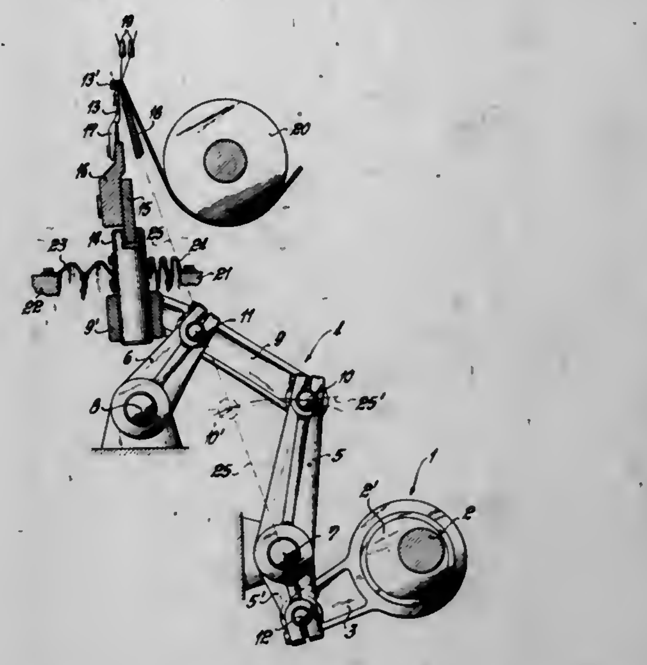
Filed Dec. 3, 1973, Ser. No. 420,795

Claims priority, application Germany, Dec. 2, 1972, 2259170

Int. Cl. D04b *23/00*

U.S. Cl. 66—86 R **4 Claims**

1. Drive means to provide a tilting motion in addition to an up and down motion to knitting needles, comprising a crank drive, including a crank shaft, a first frame mounted rocker arm connected to the crank shaft, a link member having one end connected to the other end of said first rocker arm, a second frame mounted rocker arm pivotally connected to an intermediate point on said link, a carrier of knitting needles rigidly connected to the other end of said link at an angle of 110° to 160° to the axis of said link, the lengths of said crank shaft, rocker arms and link being chosen to impart an up and down motion and a tilting motion to said carrier.



3,890,808
DEVICE ON A FLAT KNITTING MACHINE FOR INSERTING A DESIGN

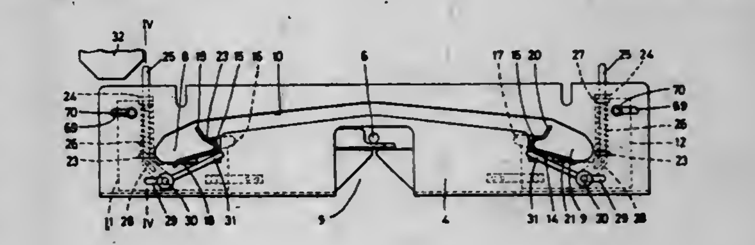
Heintz Züllig, Wettingen, and Robert Leutwyler, Regensdorf, both of Switzerland, assignors to Madag Maschinen- und Apparatebau Dietikon AG, Switzerland

Filed Aug. 19, 1974, Ser. No. 497,785

Claims priority, application Switzerland, Aug. 21, 1973, 12028/73; Feb. 22, 1974, 2565/74

Int. Cl. D04b *15/52*

U.S. Cl. 66—127 **13 Claims**



1. A device on a flat knitting machine for inserting a design thread, said device having a nut mounted in a movable lock for the main thread and a thread guide fastened into the apparatus base for the main and design threads, comprising:

- means for stretching said design thread;
- two hold-back agents for said stretched design thread, said agents arranged on both sides of said nut in the direction of movement of said lock;
- a selector shaft guide connecting said agents and passing next to said nut;
- means for freeing said design thread from said hold-back agents depending upon the direction of movement of said lock.

3,890,809
CIRCULAR KNITTING MACHINE WITH PNEUMATIC THREAD FEEDING DEVICES

Riccardo Tenconi, Via Tallera, 20, Varese, Italy (21100)

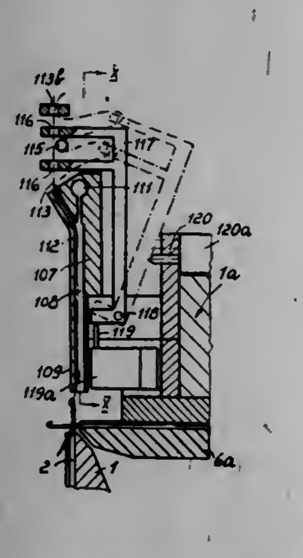
Filed Feb. 20, 1973, Ser. No. 334,164

Int. Cl. D04b *15/58, 15/60*

U.S. Cl. 66—132 R **1 Claim**

1. In a circular knitting machine for manufacturing open tubular fabric having a fixed needle cylinder and cams rotat-

able around said needle cylinder, the needle cylinder having needles arranged along an arc thereof and a zone free of needles extending along the remaining arc thereof, thread feed devices arranged rotatably around said needle cylinder and cutting means arranged for cutting the knitted thread at the end of said arc provided with needles, said feed devices each comprising a plurality of passages directed towards the needle cylinder, a duct for supplying compressed air into said passages and means for selectively controlling feeding of said threads through said passages, said means including a plurality of levers in a number corresponding to the number of threads of each feed device and each having two spaced arms extending into the path of a respective thread and having eyelets for passing said thread therethrough, said levers being pivotable between a first position in which the respective thread is held in a rest position inside the corresponding passage withdrawn from the path of the needles and a second position in which the respective thread is held in an operative position projecting from said passages into the path of the needles, a fixed stop member arranged between said arms to form loops of the thread around said fixed stop member and said eyelets when the corresponding lever is in said first position, thereby retracting the thread from the path of the needles, and control means for selectively operating said levers in response to the working programme of the machine and the pattern of the article to be manufactured to pass from said first position into said second position or viceversa when said feed devices travel through said zone of the needle cylinder free of needles, said control means comprising pushers engaging said levers at opposite sides of their pivoting points and electromagnetical actuation means responsive to the working programme of the machine for controlling said pushers.



3,890,810
APPARATUS FOR MONITORING A THREAD OR THE LIKE

Rene Domig, Kusnacht, Switzerland, assignor to Aktiengesellschaft Gebruder Loepfe, Zurich, Switzerland

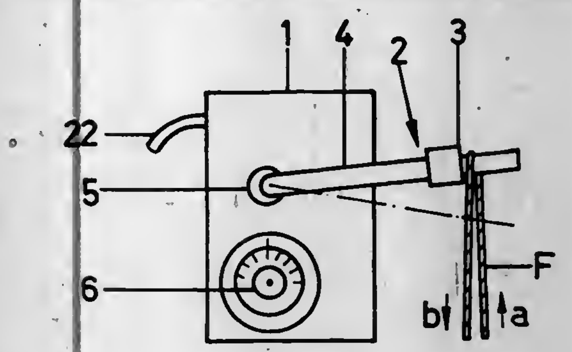
Filed Mar. 18, 1974, Ser. No. 452,993

Claims priority, application Sweden, Mar. 30, 1973, 734594

Int. Cl. D04b *35/14*

U.S. Cl. 66—161 **9 Claims**

1. An apparatus for monitoring the travel and tension of a thread or the like preferably at a textile machine, comprising a guide element, means for holding the guide element by means of a counter force against a tension force normally exerted by the thread in a position in which the thread is in contact with the guide element, but in the presence of an impermissibly high tension force prevailing at the thread said guide element releases the thread, said guide element being equipped with a tribo-electric transducer, said tribo-electric transducer embodying a substantially elongate contact body equipped with a lengthwise bore and an electrode arranged in said lengthwise bore, said tribo-electric transducer upon release of the thread from the contact body or upon standstill of the thread generating an electrical signal serving to trigger a predetermined operation.



3,890,811
PADDER-TYPE APPARATUS FOR THE CONTINUOUS APPLICATION OF LIQUIDS TO PERMEABLE MATERIALS

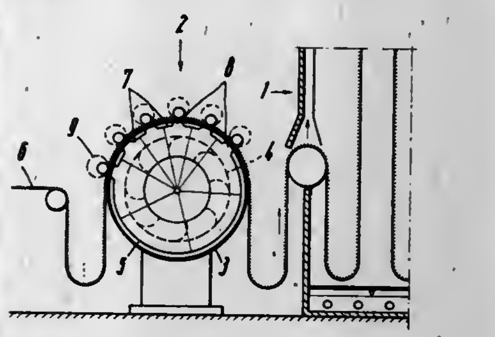
Hans Fleissner, Egelsbach near Frankfurt am Main, Germany, assignor to Vepa AG, Switzerland

Filed Sept. 10, 1973, Ser. No. 395,441

Claims priority, application Germany, Sept. 9, 1972, 2244272

Int. Cl. B05c *1/10*

U.S. Cl. 68—200 **6 Claims**



1. A padder-type apparatus for the continuous application of liquid to permeable, thick voluminous, web-shaped materials including tufted carpets and needled-felt carpets, plush and the like textile material, said apparatus comprising at least one sieve drum means having a gas-permeable surface with an operating width for supporting and for conveying the material to be wetted with said liquid, said sieve drum means having an interior placed under a suction draft and means within said interior for defining a plurality of series-disposed, narrow, suction zones extending across the operating width of said sieve drum means, and a plurality of printing stencil means each operatively associated with one of said suction zones positioned on one side of the material conveyed across said zones for applying said liquid thereto, whereby said liquid is drawn into the material by an intense suction draft applied at said suction zones.

3,890,812
PLASTIC WASHBOARD

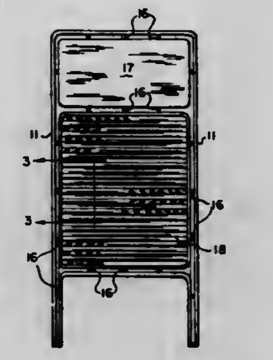
William V. Sunday, 9904 Manor Ave., Cleveland, Ohio 44102

Filed May 10, 1974, Ser. No. 468,749

Int. Cl. D06f *3/02*

U.S. Cl. 68—224 **7 Claims**

1. A unitary synthetic plastic washboard consisting of a U-shape outer rim having a longer dimension and a shorter dimension; said longer dimension including two parallel outer side members; a cross member connected between said side members at the top; two intermediate cross members connected between said side members parallel to said first named cross member, one nearer the top and the other nearer the bottom of said U-shape rim; a washboard structure of alternating parallel ridges and grooves completely filling the space between said intermediate cross members and said outer side members; said side members extending below said lower intermediate cross member and forming legs there; a soapdish bottom connected between said top cross member and said upper intermediate cross member and said outer side members; all of said outer side members and said cross members being of channel shape having parallel walls all terminating at a common level and all opening at one face of said washboard; and cross braces in said channel shapes connected crosswise between said parallel walls at spaced point along said side members and said cross members.



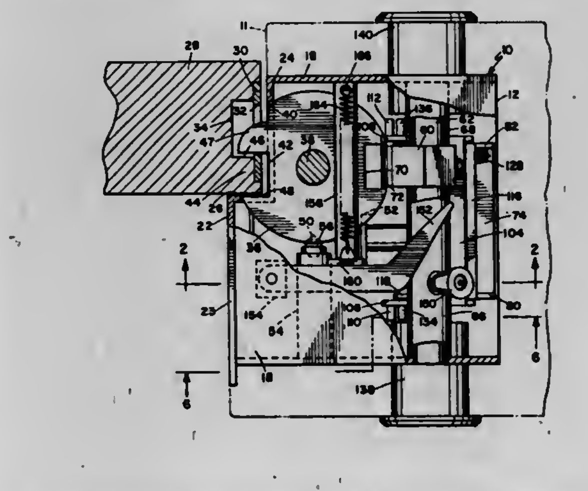
3,890,813
COMBINATION LATCH & DEAD BOLT LOCK ASSEMBLY

Lawson B. Cothron, San Diego, Calif., assignor to Labann Corporation, Calif.

Filed May 24, 1973, Ser. No. 363,733

Int. Cl.^{2} E05B *65/10;* **E05C** *3/02*

U.S. Cl. 70—92 **3 Claims**



1. A combination latch and dead bolt lock assembly, comprising:
- a lock unit for attachment to one portion of a structure and a striker for attachment to another portion of a structure to be locked in the first portion;
- said lock having a frame;
- a disc latch element mounted in said frame for rotation about an axis substantially perpendicular to the direction of motion of the striker relative to the adjacent lock unit; an edge portion of said latch element having a locking notch therein and another edge portion having latching notch therein to receive and retain a portion of said striker, said latching notch being disposed at an angle to the corresponding radious of the disc latch element and defining a tongue portion with the adjacent edge portion of the latching element to engage said striker in the locked position;
- a locking element rotatably mounted in said frame on an axis substantially perpendicular to said latch element axis and having a portion engageable in said locking notch to lock the latter against rotation;
- a spring means capable of biasing said locking element against said disc latch element whereby upon rotation of said disc latch element into locked position, said locking element engages said locking notch;
- a means of disengaging said locking element from said disc latching element; and
- retaining means for maintaining said locking element clear of said latching element;
- means for disengaging said retaining means to render same ineffective, whereby said lock assembly can be rendered inoperable to permit free movement of said one portion relative to said other portion of said structure; and
- said locking element being mounted on a shaft journalled in said frame and said shaft has a radially projecting bearing element, and said means of disengaging said locking element includes an externally projecting panic bolt manually operable from outside said lock unit comprising a rod axially slidably mounted on said frame and having an angled arm mounted thereto and extending therefrom into proximity with said bearing element such that axial movement of said rod cause said arm to angularly displace said bearing element to rotate said locking element on said shaft clear of said locking notch.

2. A combination latch and dead bolt lock assembly comprising:
- a lock unit for attachment to one portion of a structure and a striker for attachment to another portion of a structure to be locked in the first portion;
- said lock having a frame;
- a disc latch element mounted in said frame for rotation about an axis substantially perpendicular to the direction of motion of the striker relative to the adjacent lock unit; an edge portion of said latch element having a latching notch therein to receive and retain a portion of said striker, said latching notch being disposed at an angle to the corresponding radius of the disc latch element and defining a tongue portion with the adjacent edge portion of the latch element to engage said striker in the locked position;
- a locking element rotatably mounted in said frame and having a portion engageable with said latch element to lock the latter against rotation;
- a spring means capable of biasing said locking element against said disc latch element whereby upon rotation of said disc latch element into locked position, said locking element engages said latch element;
- a means of disengaging said locking element from said disc latch element comprising at least one key operated lock operatively connected to said locking element and capable of rotating said locking element against the bias of said spring means; and
- a brace capable of holding open said locking element to prevent engagement of said latch element by said locking element, said brace being actuated upon disengagement of said latch element by said key-operated lock.

3,890,814
PUSHBUTTON LOCKSET MECHANISM

Marco Fantoni, Udine, Italy, assignor to McClure Furniture Industries, Inc., Milton, Pa.

Filed Aug. 28, 1974, Ser. No. 501,333

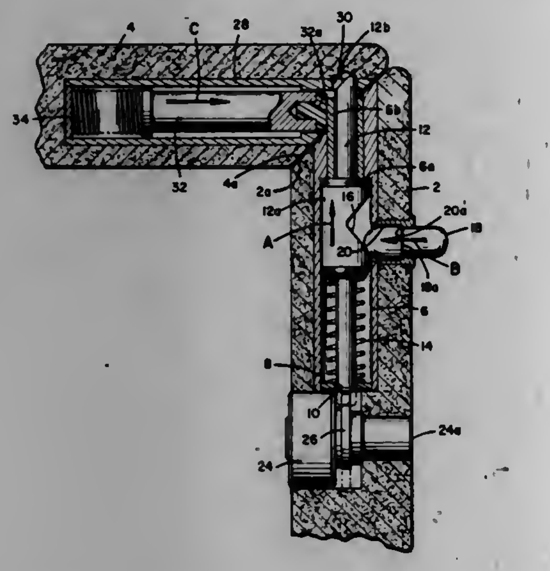
Claims priority, application Italy, Sept. 21, 1973, 83427/73

Int. Cl.^{2} E05B *63/22;* **E05F** *1/10*

U.S. Cl. 70—106 **7 Claims**

1. Locking apparatus for furniture articles and the like, comprising: a first elongated member; first means mounting said first member to a first furniture panel for movement along the longitudinal axis of said first member; a second elongated member; second means mounting said second member to a second furniture panel for movement along the longitudinal axis of said second member; first biasing means urging said first member into locking engagement with said second mounting means for locking said first and second furniture

panels against relative movement; second biasing means urging said second member into engagement with said first mounting means; and means coupled to said first member for moving said first member in a direction opposite to its normally biased direction and out of locking engagement with said second mounting means to permit relative movement of said first and second furniture panels.



4. Locking apparatus according to claim 1, further comprising: locking means movable between locking and unlocking positions, wherein in said locking position, said locking means engages said first member to prevent movement thereof out of locking engagement with said second mounting means and in said unlocking position said locking means is disengaged from said first member to permit movement of the latter out of locking engagement with said second mounting member.

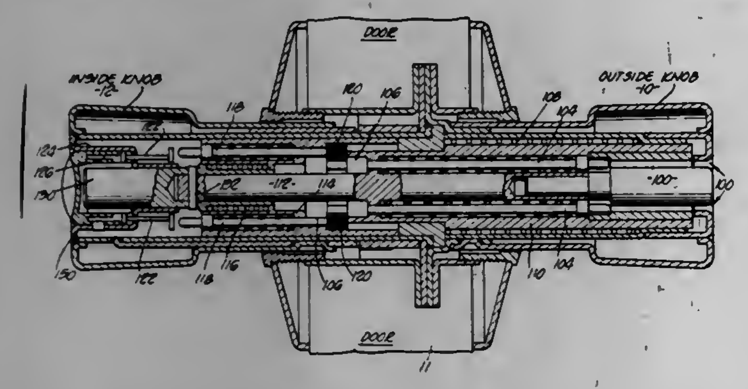
3,890,815
LOCK ASSEMBLY

James W. Raymond, 300 Avenida Cumbre, Newport Beach, Calif. 92660, and James A. Millett, 18143 Firestone Ct., Fountain Valley, Calif. 92708

Filed Feb. 19, 1974, Ser. No. 443,310

Int. Cl. E05b *27/08*

U.S. Cl. 70—363 7 Claims



1. A lock assembly including: a casing; a first tubular carrier mounted in said casing; a second tubular carrier mounted in said casing coaxially with said first carrier; a tubular logic carrier mounted in said casing at a first end thereof coaxially with said first and second tubular carriers; a first tubular logic member mounted coaxially in said tubular logic carrier and having axially extending quadrants of different lengths; a first plurality of pins mounted on said first carrier at angularly spaced positions around the axis thereof and individually axially movable in said first carrier; a first plurality of tumblers respectively mounted on the ends of said pins remote from said first tubular logic member and individually settable to different axial positions established by the lengths of the quadrants of said first logic member; a second plurality of pins mounted on said second tubular carrier at angularly spaced positions about the axis thereof displaced axially towards the other end of the casing and individually axially movable with respect to said second carrier; a second plurality of tumblers respectively mounted on the pins of the second plurality at the ends thereof adjacent the tumblers of the first plurality; and means for receiving a key in said other end of said casing to engage the pins of the second plurality and to set the tumblers of the second plurality at different axial positions to a predetermined relationship with respect to the positions of the tumblers of the first plurality to permit the second carrier to be turned relative to the first carrier.

3,890,816
ELIMINATION OF CARBIDE SEGREGATION TO PRIOR PARTICLE BOUNDARIES

Robert E. Allen, Cincinnati; Jon L. Bartos, Loveland, and Peter Aldred, Fairfield, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Sept. 26, 1973, Ser. No. 400,920

Int. Cl. C22c *19/00*

U.S. Cl. 75—0.5 BA 5 Claims

1. A nickel-base alloy powder, sized for use in making an article by powder metallurgical techniques, consisting essentially of:

0.03 to less than 0.3 wt. % C;
up to 16 wt. % total of elements selected from the group consisting of Al and Ti;
about 4-30 wt. % Cr;
up to about 3.6 at. % of elements selected from the group consisting of Mo and W;
at least one element selected from the group consisting of Cb, Ta, Hf and Zr, the Cb when selected being up to about 10 wt. %, the Ta when selected being up to about 10 wt. %, the Hf when selected being up to about 8 wt. %, and the Zr when selected being up to about 1 wt. %, the sum of selected elements being at least about 0.3 at. %;
up to about 5 wt. % V;
up to about 1 wt. % B;
up to about 30 wt. % Co;
with the balance essentially Ni and incidental impurities;
the alloy being characterized by the substantial absence of $M_{23}C_6$ carbide, the balance of the carbide being predominantly MC-type.

3,890,817
METHODS OF ROLLING STRIP MATERIALS, AND STRIP MATERIALS ROLLED THEREBY

John Wilmot Beeston, Rugby; Greyham Frank Bryant, Southall, and Peter David Spooner, Pinner, all of England, assignors to Gec-Elliott Automation Limited, Hertfordshire, England

Filed Aug. 19, 1974, Ser. No. 498,549

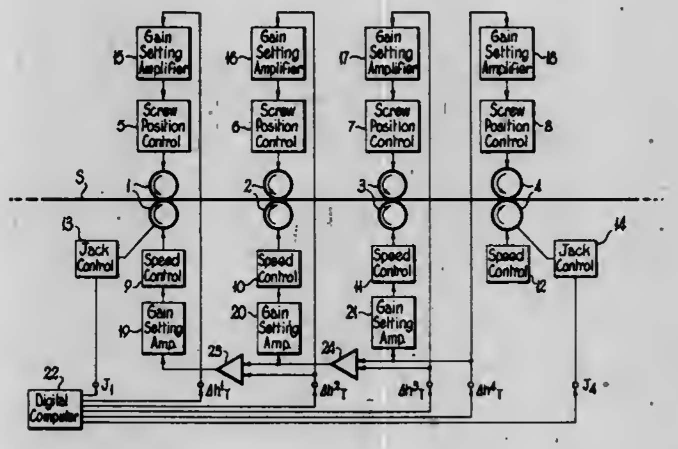
Claims priority, application United Kingdom, Aug. 23, 1973, 40000/73

Int. Cl. B21b *37/00*

U.S. Cl. 72—6 2 Claims

1. A method of rolling strip material in a rolling mill having at least one adjustable rolling stand, comprises the steps of:

a. from measurements of the mill settings and data regarding the strip material to be rolled, calculating at least approximately the roll force to give the required gauge which should theoretically occur on the nose of the strip material at each stand, and also calculating theoretically the roll camber at each stand;
b. determining at least approximately the ideal roll force for each stand which, with the calculated roll camber on the respective stand, will give the nose a shape threadable into a subsequent rolling stand or a shape within predetermined limits of badness;
c. comparing the calculated roll force at each stand with the determined ideal roll force at that respective stand, and if the calculated roll force differs from the determined ideal roll force sufficiently to give the nose an unthreadable shape or a shape outside predetermined limits of badness, modifying the mill settings to produce a roll force and/or a roll camber for each stand which will give the nose a threadable shape or a shape within predetermined limits of badness;



d. threading the strip material through the mill and as each inter-stand tension is successively established, changing the settings of the mill to those settings appropriate to a predetermined rolling schedule (if not already at those settings); and
e. rolling the strip material substantially according to the rolling schedule.

3,890,818
PROCESS FOR HOT EXTRUDING METALS

Jacques de Charsonville, L'Isle-Adam, France, assignor to Cefilac, Paris, France

Filed Mar. 14, 1973, Ser. No. 341,232

Int. Cl. B21c *23/32*

U.S. Cl. 72—42 4 Claims

1. In a process including heating and hot extruding billets of metals and alloys subject to surface contamination at their deformation temperature, the improvement comprising:

A. coating the billet surface, while cold, with a thin layer of powdered metal;
B. coating the coated surface of the billet, while cold, with a powdered amorphous material; and
C. forming a continuous protective layer on the billet surface by heating the coated billet to the temperature of hot extrusion, said layer protecting against surface contamination of the billets.

3,890,819
APPARATUS FOR DEFORMING SHEET METAL BLANKS BY FLUID PRESSURE

Bruno DeLuca, Rome, Italy, assignor to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

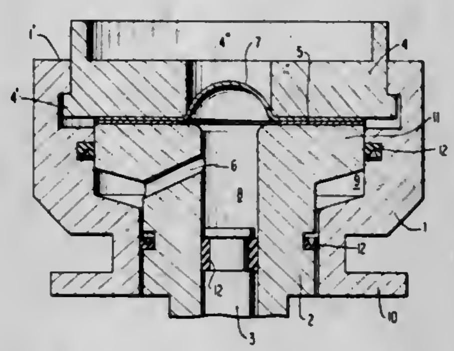
Filed July 25, 1973, Ser. No. 382,506

Claims priority, application Italy, July 25, 1972, 51741/72

Int. Cl. B21d *26/04*

U.S. Cl. 72—57 7 Claims

1. Apparatus for deforming only a central portion of sheet material by fluid pressure, comprising means to clamp a peripherial portion of said material entirely about said central portion while leaving said central portion exposed, means mounting said clamping means for free and unimpeded movement toward said material, means to apply the pressure of a fluid under pressure to said exposed central portion of said material to deform only said central portion of said material, and means to apply said pressure also to said clamping means so that the force with which said peripheral portion is clamped by said clamping means varies directly as said pressure over the entire range of said pressure thereby to maintain said peripheral portion against substantial radially inward movement over said entire range of pressure.



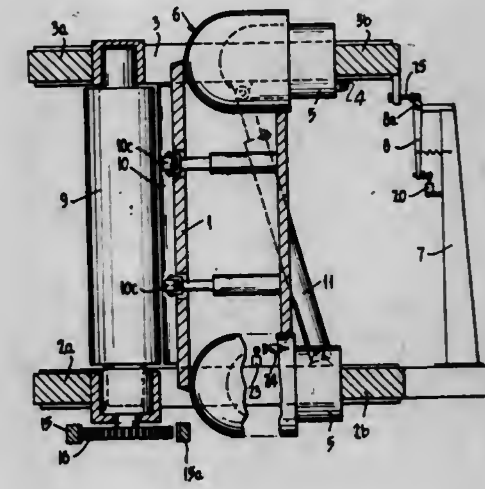
3,890,820
PLATE BENDING MACHINES

Donald Hoggan; Ernest Walter Wright, and Ian Day, all of West Footscray, Australia, assignors to Industrial Engineering Limited, Australia

Filed Oct. 15, 1973, Ser. No. 406,614

Int. Cl. B21d *5/14*

U.S. Cl. 72—169 4 Claims



1. A plate bending machine comprising:
a bi-partite frame of open rectangular construction;
a roll member rotatably mounted at each end in said frame;
two hydraulic piston-cylinder members mounted relative to said frame;
a movable bolster associated with the piston-cylinder members and slidably mounted on said frame for reciprocal movement relative to said roll member in response to applied fluid pressure in said piston-cylinder members, the longitudinal axis of the frame being substantially in alignment with respective axes of the hydraulic piston-cylinder members;
abutment members extending from said bolster and toward said roll member for contacting, holding and bending a plate to be bent to conform the plate to the periphery of the roll member, one of the piston and cylinders of each of said members forming a rigid joint with the movable bolster and forming a rigid structure with the roll member and the bipartite frame.

3,890,821
COLD PILGER ROLLING MILL AND METHOD FOR THE ROLLING OF TUBES

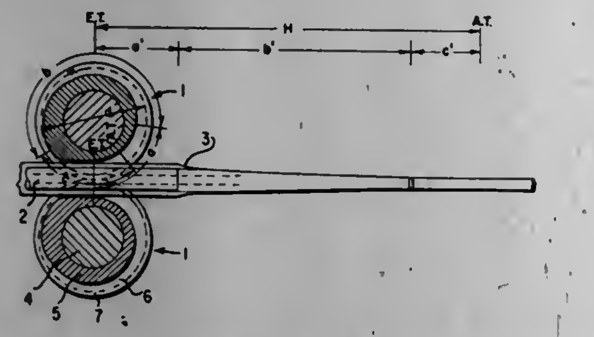
Josef Gerretz, Viersen, and Fritz Zeunert, Rheydt, both of Germany, assignors to Wean United, Inc., Pittsburgh, Pa.

Filed May 22, 1974, Ser. No. 472,250

Claims priority, application Germany, June 7, 1973, 2329526

Int. Cl.^{2} B21B *21/00*

U.S. Cl. 72—208 **3 Claims**



1. Cold pilger rolling mill for the rolling of tubes, having a reciprocating stand and grooved rolls mounted therein, and a device for advancing and/or turning the rolled material, and having a torque and mass compensation arrangement, the grooved rolls being in working contact with the rolled material at the outgoing travel and at the return travel and releasing the rolled material for advancing and/or for turning before the outgoing travel and before the return travel, characterized in that the grooved rolls are ring grooved rolls in which a portion of their circumferences comprises cooperative tapered working groove portions, and said mill includes means for causing a rotation angle of said ring grooved rolls during each of an outgoing and return travel to be greater than 330°, and wherein each angle of rotation of the ring grooved roll is smaller than the angle defined by said working groove portion plus twice the difference between this working groove portion and 360°.

3,890,822
PUNCH FOR MANUFACTURING FLEXIBLE CONICAL TUBES

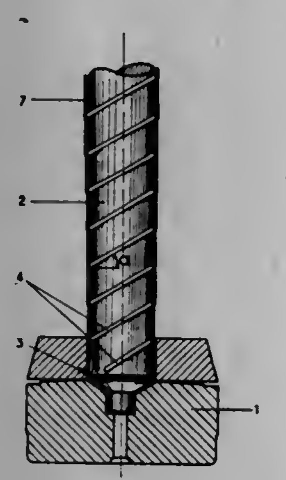
Philippoteau Michel, S'Maur, France, assignor to Scal (Societe de Conditionnement en Aluminum), Paris, France

Division of Ser. No. 309,773, Nov. 27, 1972, Pat. No. 3,839,890. This application June 6, 1974, Ser. No. 476,868

Claims priority, application France, Nov. 25, 1971, 71.42251

Int. Cl.^{2} B21C *25/00*

U.S. Cl. 72—273 **6 Claims**



1. A punch for manufacturing flexible metal tubes of frustoconical shape from a metal blank by inverse-impact extrusion in which the punch has axially spaced helical projecting ridges over at least a portion of its length and in which the cross section of each ridge is generally in the shape of a trapezium having a base which tapers outwardly gradually from the direction of the head of the punch to a frustum the axis of which coincides with the axis of the punch.

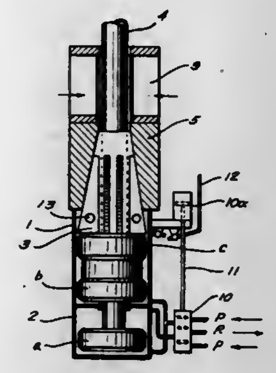
3,890,823
METHOD AND A DEVICE FOR REDUCING THE PIPE DIAMETER

Stefan I. Radu, Constanta, Romania, assignor to Intreprinderea Mecanica de Utilaje Medcidia, Judetul Constanta, Romania

Filed Mar. 15, 1973, Ser. No. 341,743

Int. Cl. B21d *41/04*

U.S. Cl. 72—402 **3 Claims**



1. An apparatus for shaping a workpiece comprising:
- an upright support;
- a vise having radially movable clamps engageable with said workpiece in an upright position thereof for centering said workpiece on said support, said vise being vertically movable with said workpiece;
- a sleeve fixed on said support and surrounding said workpiece below said vise, said sleeve having an upwardly tapering cavity;
- an annular array of shaping jaws vertically shiftable on said support and receivable in said cavity, said jaws having conical segment, outer faces engageable with the wall of said cavity and stepped inner faces conforming to the configuration to be shaped in said workpiece;
- a support plate carrying said array of jaws and vertically displaceable therewith;
- at least one hydraulic motor mounted on said support for shifting said plate upwardly to drive said jaws into said cavity and displace said jaws vertically and radially to deform said workpiece; and
- control means for selectively pressurizing said hydraulic motor with a hydraulic medium.

3,890,824
IMPLOSION JACK

Jean Camion, demeurant 43, carnot, Nogent; Etienne Campot, demeurant 6, avenue de brimont, Chatou; Jean Conneau, demeurant 58 Bd. Voltaire, Paris; Serge Contival, 253 Bd. Gabirel Peri, Noisy-Le-Sec; Andre Dejoux, demeurant 15, rue Lakanal; Jean Detton, demeurant 80 rue Taitbout, both of Paris; Maurice Gournelle, demeurant 1 rue des Bruyeres, Asnieres, and Antoine Traimond, 7 rue Jean Ferrandi, Paris, all of France

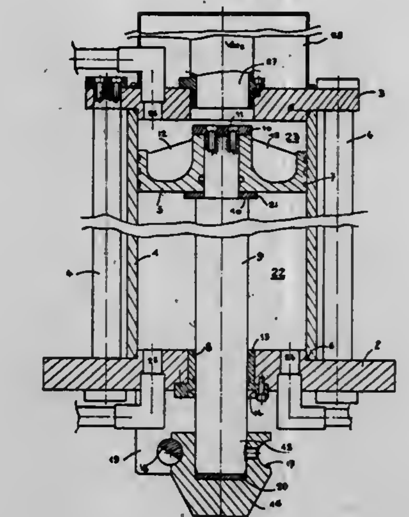
Filed Nov. 2, 1972, Ser. No. 303,057

Claims priority, application France, Nov. 5, 1971, 71.39699

Int. Cl. B21j *7/20*

U.S. Cl. 72—453 **14 Claims**

1. A force-producing device comprising a chamber, a piston movable between first and second positions in the chamber, transmitting means connected to the piston for transmitting force generated by the piston moving between the first and second positions, vacuum means connected to the chamber on both sides of the piston for evacuating fluid from the chamber, fluid means connected to the chamber on both sides of the piston for introducing fluid into the chamber, valve means associated with the vacuum and fluid means for selectively communicating the vacuum and fluid means with the chamber on each side of the piston.



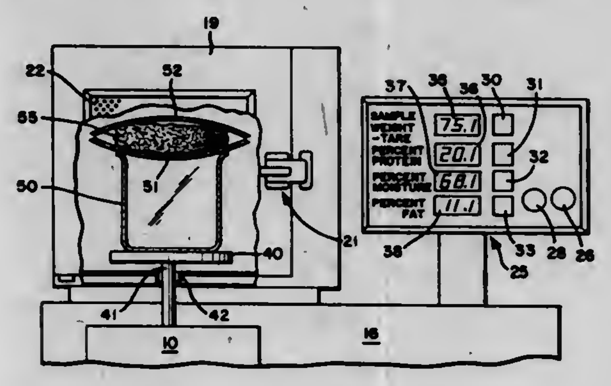
3,890,825
ANALYSIS OF COMMINUTED MEAT PRODUCTS

Kenneth E. Davis, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Continuation-in-part of Ser. No. 268,926, July 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 29,278, April 16, 1970, Pat. No. 3,673,852. This application Oct. 18, 1973, Ser. No. 407,667

Int. Cl. G01n *25/02*

U.S. Cl. 73—15 B **20 Claims**



1. A process for the determination of fat content of edible communited meat products comprising the steps of
- a. providing a sample of known weight, the weight of said sample being the same or variable for each determination of fat content,
- b. exposing said sample to dielectric heating for a period of time sufficient to render the fat and moisture and to provide a residue cooked short of charring, said dielectric heating being operative to effect release of said moisture directly as vapor and said fat being released as liquid,
- c. collecting the melted fat rendered from said sample,
- d. weighing said melted fat,
- e. determining from the weight of melted fat alone the amount of fat remaining in the residue and the loss of fat with moisture, said determined amount being variable depending upon the amount of fat rendered from the sample, and
- f. calculating the amount of fat in the sample from the rendered amount and said determined amount.

11. Apparatus for determining the amount of moisture and/or fat and/or protein in a comminuted meat product comprising
- a sample holder assembly for holding a sample of the product to be analyzed,
- said sample holder assembly including a receptacle means operable to collect separately fat released from the sample,
- dielectric heating means including an enclosure for receiving said sample holder assembly and a sample thereon for heating the sample to render and collect fat from the sample and to vaporize moisture in the sample,
- scale means having a support member in said enclosure proportioned to receive said sample holder assembly for determining the weight of the sample both before and after the weight loss due to vaporization of moisture and also for determining the weight of rendered fat collected in said sample assembly,
- said scale means providing output signals related to each of such weights, and
- computing means connected to receive said signals from said scale means and to compute the percentage of moisture in the original sample as a function of the weight of moisture vaporized and released from the sample.

3,890,826
INTOXICATED DRIVER CAPABILITY TESTER

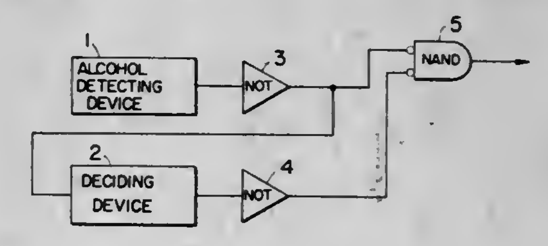
Fumiyuki Inose; Takaji Suzuki, both of Kokubunji, and Hideki Kohno, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 16, 1973, Ser. No. 341,844

Claims priority, application Japan, Mar. 17, 1972, 47-27863

Int. Cl. G01n *31/00*

U.S. Cl. 73—27 R **8 Claims**



1. An intoxicated driver capability tester comprising:
- means for detecting alcohol in a driver's body which generates a first output signal when the amount of alcohol in the driver's body is less than a predetermined reference value and which generates a second output signal when the amount of alcohol in the driver's body is greater than the predetermined reference value;
- first signal generating means for generating a third output signal when the first output signal is applied from said alcohol detecting means and for generating a fourth output signal when the second output signal is applied from said alcohol detecting means;
- means for deciding a driver's capability for driving, said deciding means being responsive to the fourth output signal from said first signal generating means for initiating an operation to be effected by the driver to determine the driver's capability for driving, said deciding means being responsive to the operation effected by the driver for generating a fifth output signal when the driver is in a state capable of driving and for generating a sixth output signal when the driver is not in a state capable of driving;
- second signal generating means for generating a seventh output signal when the fifth output signal is applied from said deciding means and for generating an eighth output signal when the sixth output signal is applied from said deciding means; and
- third signal generating means having one input for receiving the output signals from said first signal generating means and another input for receiving the output signals from

said second signal generating means, said third signal generating means generating a ninth output signal indicative of a state capable of driving in response to said third output signal being applied to the one input thereof, generating a tenth output signal indicative of a state capable of driving in response to said seventh output signal being applied to the another input thereof, and generating an eleventh output signal indicative of a state not capable of driving in response to the fourth output signal being applied to the one input thereof and the eighth output signal being applied to the another input thereof.

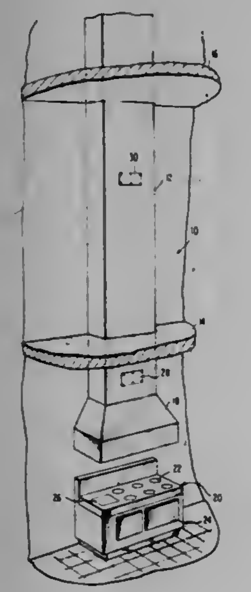
3,890,827
METHOD AND APPARATUS FOR MONITORING GREASE BUILDUP WITHIN AN EXHAUST SYSTEM

Quentin H. Van Schoyck, Christmas, Fla., assignor to Cylpik, Incorporated, Winter Park, Fla.

Filed Aug. 23, 1973, Ser. No. 390,757

Int. Cl. G01n *33/00*

U.S. Cl. 73—28 **10 Claims**



1. A method for monitoring the collection and buildup of grease upon the interior surface of an exhaust system of the type utilized to vent vapors from a cooking facility comprising the steps of:
   a. applying at least one set of operably connected patches upon the interior surface of the exhaust system;
   b. removing one of the patches from the set of patches at a predetermined time subsequent to initial application of the set of patches;
   c. examining the removed patch to determine the quantity of grease collection upon the patch;
   d. comparing the quantity of grease collected upon the removed patch with a preselected standard to determine the quantity of grease buildup within the exhaust system; and
   e. repeating steps (*b*) through (*d*) until the set of patches are exhausted or the preselected standard of grease buildup is exceeded.

3,890,828
DEVICE FOR MEASURING THE HUMIDITY OF GASEOUS SUBSTANCES

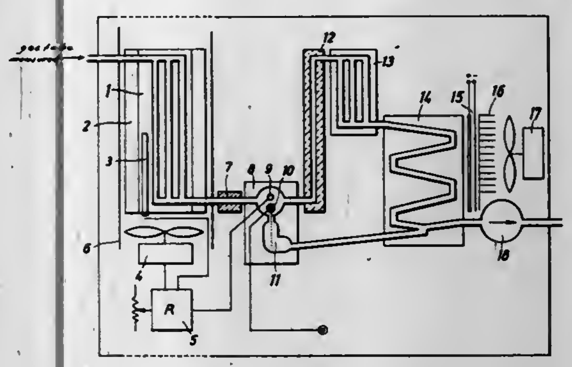
Harry Pleva, Rutesheim, Germany, assignor to Werner & Pfleiderer, Stuttgart, Germany

Filed May 29, 1973, Ser. No. 364,612

Claims priority, application Germany, May 30, 1972, 7225853

Int. Cl. G01n *25/62*

U.S. Cl. 73—29 **7 Claims**



1. A device for measuring the humidity of gaseous substances in conformity with the psychrometric method, which includes: heat exchanger means for heat exchange with a gaseous substance the humidity of which is to be measured, a measuring chamber arranged in series with said heat exchanger means for receiving from the latter the gaseous substance the temperature of which is to be measured, first conduit means for conveying gaseous substance the humidity of which is to be measured to said heat exchanger means, second conduit means leading from said heat exchanger means to said measuring chamber for conveying gaseous substance after its heat exchange with said heat exchanger means to said measuring chamber, a cooling blower and electric heating means associated with said heat exchanger means for respectively cooling and heating up the gaseous substance passing through said heat exchanger means, and thermostatic control means operatively connected to said measuring chamber and operable automatically to control the operation of said blower and said electric heating means so as to maintain substantially constant the temperature of the gaseous substance the humidity of which is to be measured in said measuring chamber, a dry resistance thermometer arranged in said measuring chamber, a dry resistance thermometer arranged in said measuring chamber and operable to serve as actual value feeler and operatively connected to said thermostatic control means, a wet resistance thermometer arranged in said measuring chamber, and also condenser means arranged in series and in communication with but behind said measuring chamber when looking in the direction of flow of the gaseous substance passing from said measuring chamber to said condenser means, said condenser means having an outlet, said wet resitance thermometer arranged in said measuring chamber having an aspiration element, and third conduit means having one end connected to said outlet and having its other end connected to said aspiration element, said other end of said third conduit means being located at a lower level than said outlet.

3,890,829
METHOD AND APPARATUS FOR ACOUSTICAL IMAGING

Adrianus Korpel, Prospect Heights, and Robert L. Whitman, Oak Park, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

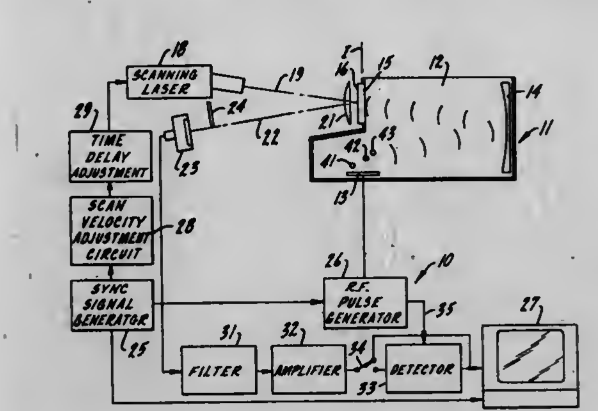
Filed Apr. 11, 1973, Ser. No. 350,276

Int. Cl. G01n *29/04*

U.S. Cl. 73—67.5 H **8 Claims**

1. The method of acoustically inspecting a specimen in a sonic propagation medium comprising the following steps:

pulse-insonifying the specimen with a series of periodically repetitive pulses of high-frequency acoustic energy propagated along a given insonification path so as to generate reflected acoustic waves in the sonic medium from points on the specimen lying in a predeterminable object plane, the direction of the insonification path being chosen such that the angle formed between the insonification path and the normal to the object plane is substantially greater than zero, and the duration of each acoustic pulse being very much shorter than the pulse repetition period;



receiving the reflected waves at an image plane having a predetermined angular displacement other than normal from the insonification path;

scanning the image plane with a transducer to intercept acoustic energy from the specimen and develop an electrical signal characteristic of the acoustic properties of the specimen along a desired object plane intersecting the specimen; and

synchronizing the velocity and location of the scanning with energy arriving at successive points in the image plane from points successively insonified by an acoustic pulse in the object plane.

3,890,830
GRAIN MOISTURE TESTER

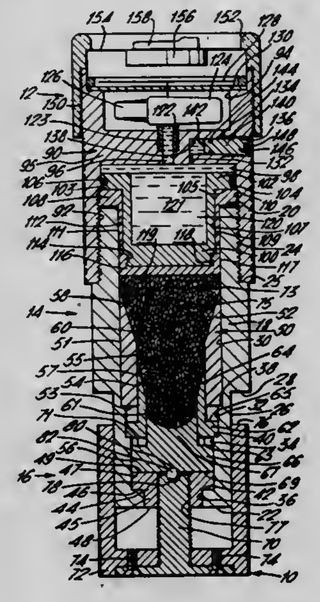
Gerhard J. Dyck, 1306 13th St. E., Saskatoon, Canada

Filed Sept. 13, 1974, Ser. No. 396,750

Claims priority, application Canada, Dec. 13, 1972, 158724

Int. Cl. G01n *25/56, 3/08*

U.S. Cl. 73—73 **2 Claims**



1. An apparatus for determining the moisture content of particulate material by compressing said particulate material said apparatus comprising: (a) a substantially closed variable volume compression chamber; (b) a hollow piston slidable in said chamber, the interior of said piston including a substantially concave face and comprising a plurality of telescopically interengageable hollow piston elements relatively movable with respect to one another, whereby the interior of said hollow piston provides a generally frusto-conical compression chamber, and whereby the volume of said generally frusto-conical chamber may be varied; (c) a plug disposed movably therein to provide a wall of said generally frusto-conical chamber facing said concave piston face and movable towards and away from said concave piston face; (d) piston actuating means for moving said piston elements relative to one another, thereby to vary the volume of said generally frusto-conical chamber, said piston actuating means comprising means for sequentially moving said piston elements relative to one another; and (e) a transducer means operatively associated with said plug to resist movement of said plug in response to a pressure generated within said compression chamber, and to provide a signal indicative of a pressure generated within said compression chamber, said signal being indicative of the moisture content of said particulate material.

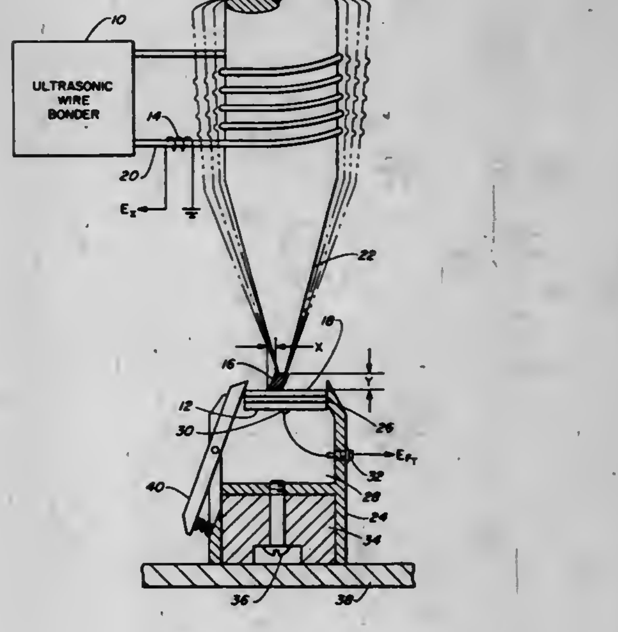
3,890,831
ULTRASONIC BOND MONITOR

John H. Cusick, Santa Rosa; Alvin E. Brown, Redwood City; Al S. Hamamoto, San Jose, and Jack L. S. Bellin, Palo Alto, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 325,272, Jan. 19, 1973. This application Feb. 22, 1974, Ser. No. 444,927

Int. Cl. G01n *19/04*

U.S. Cl. 73—88 B **2 Claims**



1. A method of indicating the quality of a bond made by an ultrasonic bonder during the bonding process comprising:

deriving a first electrical signal proportional to the tangential forces applied to the materials during the bonding process;

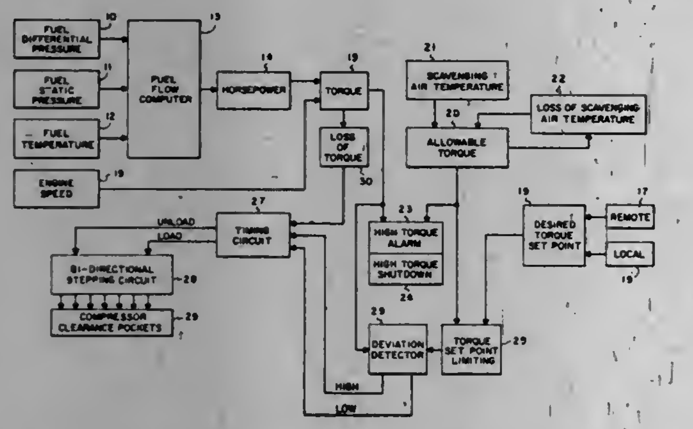
deriving a second electrical signal proportional to the traverse motion of the bonding tool;

combining the first and second electrical signals to produce an output signal equal to the ratio of the first electrical signal to the second electrical signal; and

displaying the combined signal so that the operator of the ultrasonic bonder can readily detect poor bonds.

3,890,832
ENGINE TORQUE MONITORING SYSTEM

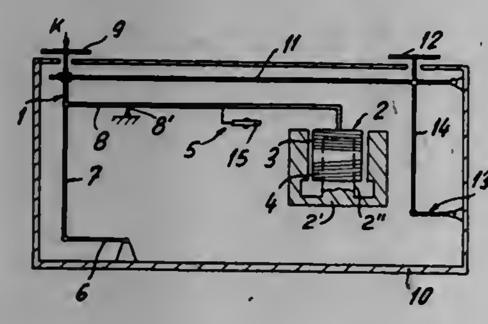
Charles F. Nick, and Morris J. Davidson, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.
Division of Ser. No. 164,555, July 21, 1971, Pat. No. 3,808,882. This application Feb. 14, 1974, Ser. No. 442,566
Int. Cl.² G01M *15/00*
U.S. Cl. 73—116 **7 Claims**



1. A system for monitoring the torque on an engine, comprising:
- means for generating a first electrical signal functionally related to such torque;
- means for generating a second electrical signal indicative of a desired torque set point;
- means for comparing said first and said second electrical signals to establish the deviation therebetween; and
- means for generating a third electrical signal functionally related to a performance characteristic of the engine and means for limiting said second electrical signal with said third electrical signal.

3,890,833
PRESSURE MEASURING APPARATUS

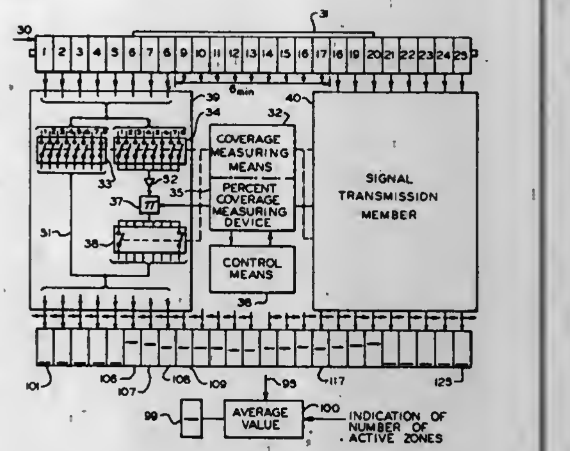
Jon Peer, Stafa, Switzerland, assignor to Precisa AG, Rechenmaschinenfabrik, Zurich, Switzerland
Filed Aug. 13, 1973, Ser. No. 387,663
Claims priority, application Switzerland, Aug. 18, 1972, 12249/72
Int. Cl. G01g *7/02;* **G01l** *1/14*
U.S. Cl. 73—141 A **8 Claims**



1. Measuring apparatus comprising:
- a force sensing unit mounted for movement in response to a force to be measured and having a rest position from which it is displaced to an extent dependent upon the magnitude of said force;
- a magnetic structure comprising a permanent magnet component including a core portion and a composite coil component comprising first and second separately energizable coils mounted on said core portion for displacement relative thereto, one of said components being stationary and the other component being movable and interconnected with said force sensing unit for balancing a force applied thereto;
- means for sensing an initial displacement of said force sensing unit from its rest position and providing a corresponding output current in said first coil which produces a corresponding counter balancing electromagnetic force that restores said force sensing unit to its rest position; and
- means for sensing the current in said first coil and maintaining an output current in said second coil to hold said force sensing unit in its rest position, the force applied to said force sensing unit being now balanced by the electromagnetic force produced by said second coil so that the current in said first coil drops to zero, whereby subsequent forces applied to said force sensing unit are balanced by an electromagnetic force produced by said first coil and measured relative to the initially applied force by the current in said first coil.

3,890,834
FORCE OR TENSION MEASURING MEANS

Michael Henze, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Continuation-in-part of Ser. No. 394,773, Sept. 6, 1973, abandoned. This application Apr. 17, 1974, Ser. No. 461,730
Claims priority, application Sweden, Sept. 11, 1972, 11654/72
Int. Cl. G01l *5/10*
U.S. Cl. 73—144 **6 Claims**



1. In an arrangement wherein a plurality of measuring devices are arranged side-by-side for measuring the pressure of a strip placed on top thereof at each a plurality of zones, with the outputs of the measuring devices provided to indicating means, apparatus to correct for errors caused by the measuring devices on the ends not being completely covered by the strip comprising:

a. means for coupling the measuring devices of the completely covered zones to the indicating means;

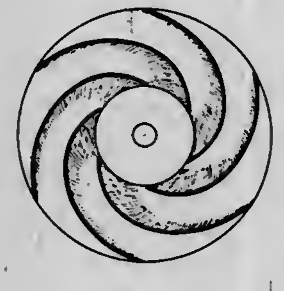
b. means having the outputs of said partially covered devices as inputs, said means adapted to correct said inputs and provide corrected outputs; and

c. means providing said corrected outputs to said indicating means.

3,890,835
CHEMICAL RECORDING OF FLOW PATTERNS

Richard Dötzer, and Winfried Plundrich, both of Nurnberg, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed July 7, 1972, Ser. No. 269,746
Claims priority, application Germany, July 7, 1971, 2133835
Int. Cl. G01m *9/00*
U.S. Cl. 73—147 **12 Claims**

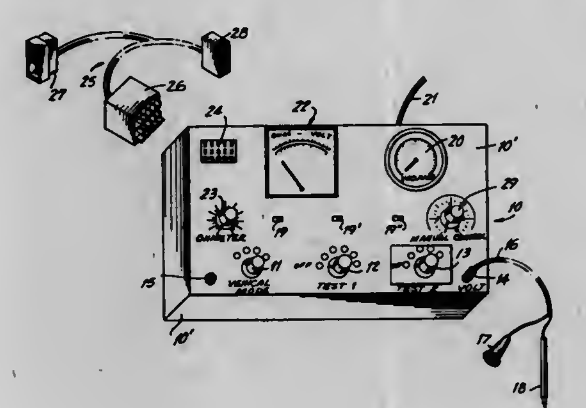
1. A method of chemically recording the flow pattern of a fluid over a surface which comprises:
- treating said surface to produce an oxidized layer of aluminum upon said surface,
- passing over said layer a fluid containing a reagent compound which produces a chemical change upon contact with said layer which is characteristic of the flow pattern of the fluid over the layer, and



- visibly recording said flow pattern with a dye substance in said layer.

3,890,836
AUTOMATIC TEMPERATURE CONTROL SYSTEM ANALYZER

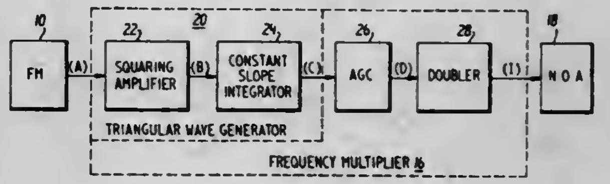
James M. McKenzie, Tarrytown, and Jeffrey L. Sachs, Harrison, both of N.Y., assignors to Draf Tool Co., Inc., Bedford Hills, N.Y.
Filed Oct. 15, 1973, Ser. No. 406,448
Int. Cl.² G01M *19/00*
U.S. Cl. 73—168 **8 Claims**



1. An analyzer for testing a plurality of automatic temperature control systems comprising in combination:
- meter means for measurement of a voltage applied thereto; harness interposition means adapted to interpose said analyzer into the electric harness system of an automobile's automatic temperature control system at a plurality of connection points;
- model selector switching means electrically coupled to the connection points of said harness interposition means for selecting an operative mode of said analyzer corresponding to the type of automatic temperature control system to be tested by providing connection to the active connection points associated with said type of system;
- meter adapter means including said meter and a plurality of terminals for selectively coupling said meter means to selected terminals dependent upon the type of system to be tested;
- test selector and adapter means electrically coupled to said mode selector means and meter adapter means for interconnecting selected connection points through said mode selector switching means and meter adapter means terminals for selectively modifying or channeling the signals therebetween for the performance of at least two tests on each type of system, and a rectifier having input terminals coupled to said mode selector means and output terminals coupled to said test selector and adapter means.

3,890,837
ELECTRONIC SIGNAL MULTIPLIER FOR FLOWMETERS

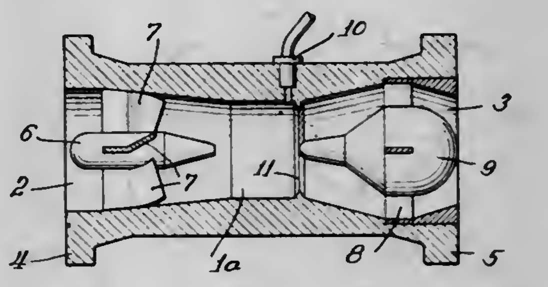
Joseph G. Frizzell, and Jack R. Hulme, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.
Division of Ser. No. 286,429, Sept. 5, 1972, Pat. No. 3,796,960. This application Oct. 29, 1973, Ser. No. 410,398
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 E **9 Claims**



1. Apparatus for multiplying the frequency of the output signal from a fluid flowmeter means in which the frequency is variable as a function of fluid flow through the flowmeter means, comprising:
- means for generating a square wave signal corresponding in frequency to the frequency of said flowmeter means output signal;
- means for integrating said square wave signal for providing a triangular wave signal related in both peak-to-peak amplitude and frequency to the frequency of said output signal;
- means for adjusting the peak-to-peak amplitude of said triangular wave signal to a predetermined constant value while leaving the frequency thereof unchanged; and
- doubling means including means for simultaneously full wave rectifying said amplitude adjusted triangular wave signal and biasing the full wave rectified signal by an amount sufficient to center it about a zero reference potential axis, thereby to provide a triangular wave signal having a frequency double that of said output signal.

3,890,838
TUBULAR SWIRL FLOW METER

Wolf Paetzold, Hocheim, Germany, assignor to Elster AG, Mainz-Kastel, Germany
Filed May 16, 1974, Ser. No. 470,404
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 B **5 Claims**



1. In a tubular swirl flow meter having a measuring tube, a swirl device at the entrance thereto and a measuring sensor downstream from the swirl device, the improvement wherein an annular shoulder is provided in the measuring tube near the sensor, the height of said shoulder being approximately equal to the normal thickness of the boundary layer for the flowing fluid having the smallest Reynolds number.

3,890,839
APPARATUS FOR MEASURING A FLUID FLOW RATE

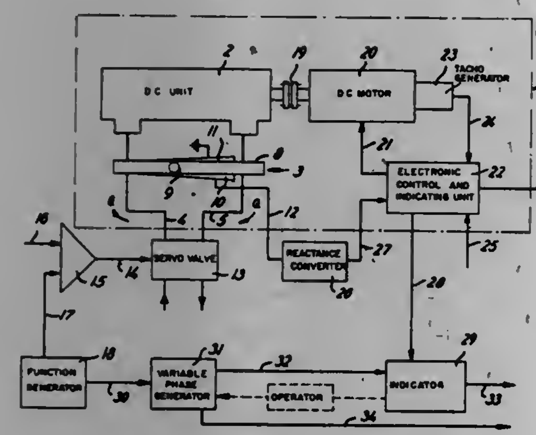
Erik Trostmann, Birkerod, and Jens Andreas Toft Fensvig, Lyngby, both of Denmark, assignors to Instituttet for Produktudvikling, Lyngby, Denmark

Filed July 20, 1973, Ser. No. 381,138

Claims priority, application Denmark, July 25, 1972, 3676/72

Int. Cl. G01f *1/00*

U.S. Cl. 73—199 **14 Claims**



1. An apparatus for measuring a fluid flow rate, said apparatus comprising:

a. a positive displacement screw rotor device having a stator with a fluid inlet and a fluid outlet, a displacer screw rotor rotatably supported in said stator, and a variable speed drive motor for said rotor;

b. a cylinder made of an electrically insulating material connected between said fluid inlet and said fluid outlet in parallel with said positive displacement screw rotor device;

c. a piston-like body at least the surface of which is made of an electrically conductive material, said piston-like body being freely movable within said cylinder in the longitudinal direction thereof substantially without viscous friction between said piston-like body and the internal wall of said cylinder;

d. two capacitor plates which are insulated from one another and from said piston-like body, said capacitor plates extending in the longitudinal direction of said cylinder substantially diametrically opposite each other with a distance between them which decreases from one end of said cylinder towards the opposite end thereof;

e. a converter for supplying an electric output signal dependent upon the capacitance of the capacitor formed by said capacitor plates and said piston-like body;

f. means responsive to said output signal for controlling the rotational speed of said screw rotor; and

g. means for indicating the rotational speed of said screw rotor.

3,890,840
LASER CONTROLLED FATHOMETER

Richard J. Malloy, Ojai, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 7, 1974, Ser. No. 477,250

Int. Cl. G01b *11/26;* **G01f** *23/00*

U.S. Cl. 73—290 V **7 Claims**

1. A laser controlled fathometer comprising:

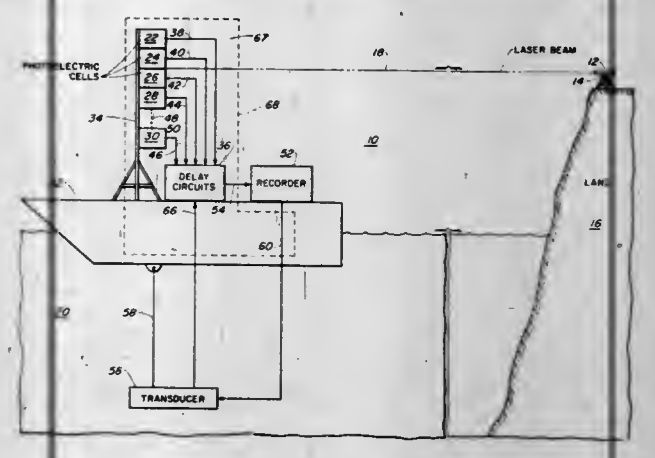
a. means placed on a datum point for generating a laser beam in a horizontal plane;

b. a depth sounding transducer for transmitting and receiving a sonar signal;

c. means for supporting said transducer a fixed distance under the surface of a body of water;

d. a recorder communicating with said transducer; and

e. detector means affixed to said transducer support means and communicating with said recorder for receiving said laser beam at one of a plurality of laser beam receptor cells thereon indicative of the position of said detector means with respect to said datum point and for delaying the recording of a received signal from said transducer for a specific time.



3,890,841
THERMAL NOISE MEASUREMENT SYSTEM

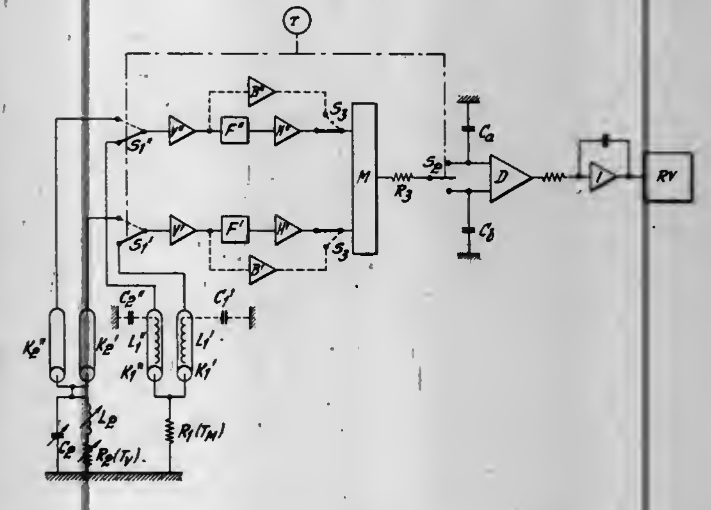
Heinz Brixy, Julich, Germany, assignor to Kernforschungsanlage Julich GmbH, Julich, Germany

Filed June 13, 1973, Ser. No. 369,733

Claims priority, application Germany, June 15, 1972, 22291403

Int. Cl. G01k *7/30*

U.S. Cl. 73—359 **7 Claims**



1. A system for the measurement of temperature, comprising:

a measuring branch having a measuring resistor adapted to generate a thermal-noise signal proportional to absolute measure temperature and at least one cable in series with said measuring resistor;

a reference branch including a reference resistor at a reference temperature and at least one cable in series therewith;

a pair of amplifier paths each comprising a preamplifier, a filter connected to the output of the respective preamplifier, and a main amplifier energized through the respective filter;

switch means for alternately connecting said branches to said amplifier paths so that both amplifier paths are simultaneously connected in one switch condition with one branch and in another switch condition with the other branch;

a multiplier circuit receiving inputs from the main amplifier of both said amplifier paths for producing an output representing the product of the signals applied thereto;

a differential amplifier having a pair of inputs each connected to a respective storage capacitor;

a commutating switch synchronized with said switch means for applying the output of said multiplier corresponding to connection of one of said branches to both said amplifier paths to one of said capacitors in one such condition and the output of said multiplier corresponding to connection of the other of said branches to both said amplifier paths to the other capacitor in said other switch condition;

an integrator receiving an output from said differential amplifier; and

read out means connected to said integrator for registering the temperature at said measuring resistor, said switch means including two single-pole double-throw switches having respective output contacts connected to the preamplifier of each of said amplifier paths, said measuring branch comprising a first cable connected to one input contact of one of said single-pole double-throw switches and a second cable connected to the corresponding input of the other single-pole double-throw switches, said reference branch having a first cable connected to the other input contact of said one of said single-pole double-throw switches and a second cable connected to the other input contact of the other single-pole double-throw switch, said single-pole double-throw switches being ganged for joint operation.

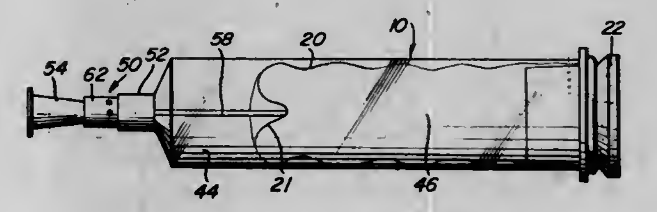
3,890,842
DISPOSABLE MANOMETER

Maynard Ramsey, III, Durham, N.C., assignor to Ramtech, Inc., Tampa, Fla.

Filed Apr. 23, 1974, Ser. No. 463,393

Int. Cl. G01l *7/00*

U.S. Cl. 73—420 **10 Claims**



1. A disposable blood pressure monitor comprising an elongated tubular structure, means on one end of said tubular structure adapted to place the interior of said tubular structure in direct communication with a fluid system to be monitored, a flexible membrane received within said tubular structure, said flexible membrane separating said tubular structure into first and second chambers, stopper means engaging the other end of said tubular structure and filling means removably mounted on said means of said tubular structure adapted to place the interior of said tubular structure in direct communication with a fluid system to be monitored, said filling means comprising a hollow receptacle member, tube means secured to said hollow receptacle member and communicating with said hollow receptacle member, said tube means extending into said tubular structure and engaging said flexible membrane to depress said flexible sac-like membrane within said tubular structure.

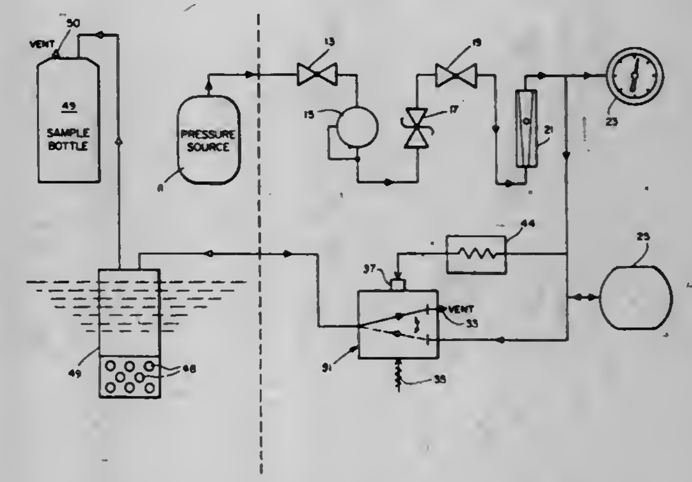
3,890,843
LIQUID SAMPLING

Malcolm F. Irwin, West Chester, Pa., assignor to Pro-Tech Inc., Malvern, Pa.

Continuation-in-part of Ser. No. 341,319, March 14, 1973, Pat. No. 3,788,145. This application Jan. 28, 1974, Ser. No. 437,530The portion of the term of this patent subsequent to Jan. 29, 1990, has been disclaimed.

Int. Cl. G01n *1/14*

U.S. Cl. 73—421 B **5 Claims**



1. In apparatus for sampling liquid from a body thereof, including means for accumulating propellant fluid at a given rate from a source thereof under superatmospheric pressure and normally closed switching valve means between the accumulating means and a sampling locus in the body of liquid, the valve means having a pressure-sensing line connected to the accumulating means and being adapted to open at a given actuating pressure and to reclose at a given decrement in pressure sensed thereby, improved fluid-impeding means located in the pressure-sensing line, being effective to reduce the rate of pressure drop therein upon actuation and thus to increase the open time of the valve means for a given pressure decrement and comprising a fluidic delay line.

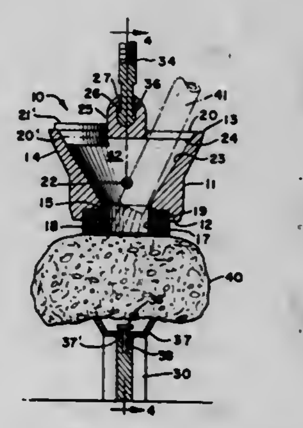
3,890,844
PERIPHYTON SAMPLER AND METHOD FOR SAMPLING

William F. Gale, River Rd., Wapwallopen, Pa. 18660

Filed July 25, 1974, Ser. No. 491,694

Int. Cl. G01h *1/02*

U.S. Cl. 73—421 R **8 Claims**



1. A periphyton sampler for underwater use by SCUBA divers on stones and other solid underwater objects to collect periphytic cells and the like from the solid object being sampled comprising a rigid hollow body member having a top, a bottom and an integral connecting side wall, an aperture through said bottom defined by a circular margin, a rigid cylindrical collar having one end extending outwardly from said bottom and its other end affixed to the bottom inside said margin, a pliable sealing collar surrounding said rigid collar frictionally retained thereon, said sealing collar having one

end extending outwardly beyond said one end of said rigid collar in order to sealingly engage with the surface of a solid object having surface irregularities thereon, at least one opening in said top to permit the access of a cleaning implement inside of said hollow body to aid in removing periphytic cells from said stone, a stopper for closing said top opening, a conduit extending through said side wall for draining a sample from the hollow body, and means for clamping said hollow body to a solid object with said sealing collar engaged in sealing relationship to the surface of said solid object.

3,890,845

APPARATUS FOR DETERMINING IMBALANCE IN 120 DEGREE SPACED COMPONENTS AND METHOD OF CORRECTING SAID IMBALANCE

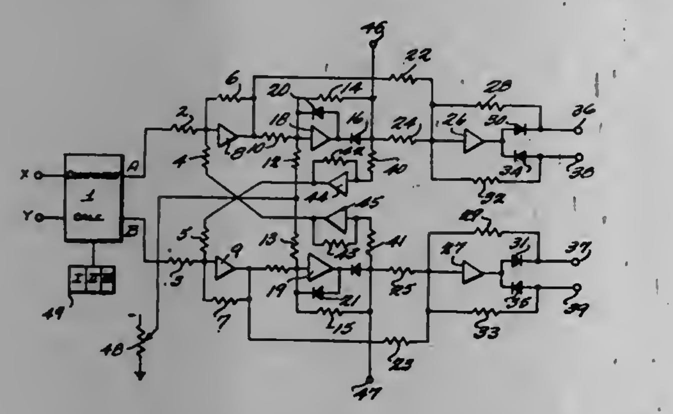
Richard Muller, Worfelden, Germany, assignor to Gebr. Hofmann KG, Darmstadt, Germany

Filed June 26, 1974, Ser. No. 483,442

Claims priority, application Germany, Aug. 23, 1973, 2342665

Int. Cl. G01m *1/22, 1/34*

U.S. Cl. 73—462 **6 Claims**



1. In a method of eliminating imbalances in rotors, with which a compensation of masses by removing material is carried out in components displaced by 120°, and with which further material is subsequently removed in components displaced by 60° with respect to the former components, in case only limited material is available for removal, the improvement wherein, if the amount of initial imbalance in a first component exceeds the amount of material available for removal in this component, the removal of the maximum possible amount of material is effected leaving a residual amount still to be eliminated in this component, and material is removed in a second adjacent component displaced by 120° until in this component, too, an amount of imbalance has been obtained equal to said residual amount, and that the imbalance resulting from these two residual amounts is eliminated by removing material in a third component displaced by 60° with respect to both said first and second components.

3,890,846

UHF TUNER COMPOSITE DIAL MOUNTING ARRANGEMENT

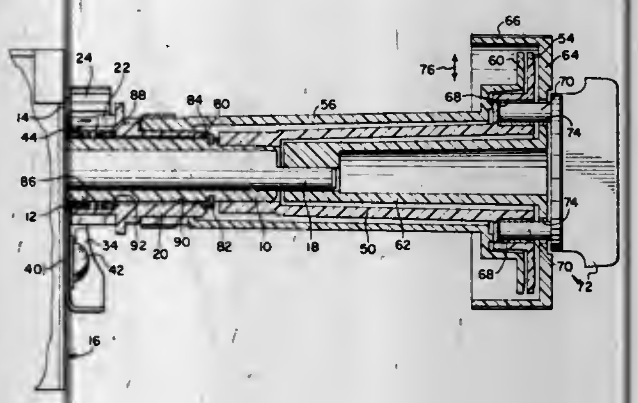
Alarico A. Vaidettaro, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Filed May 24, 1973, Ser. No. 363,589

Int. Cl. F16h *35/18;* **H03j** *1/14*

U.S. Cl. 74—10.41 **5 Claims**

1. In a UHF tuner of the type having a continuously variable main tuning shaft rotation of which is effective selectively to receive signals from all television stations in the UHF band, a selector shaft, a sleeve-like member generally concentric with and surrounding said selector shaft, and means for rotating said sleeve-like member a predetermined increment for each revolution of said selector shaft, the improvement comprising means for mounting said sleeve-like member so that it may be rotated by said predetermined increments without tilting of the longitudinal axis thereof with respect to said selector shaft, said mounting means including means defining an annular bearing seat on said selector shaft having an annular sloping bearing surface, and means urging said sleeve-like member into engagement with said bearing surface, thereby to maintain said sleeve-like member centered relative to said selector shaft as said member is rotated by said predetermined increments.



3,890,847

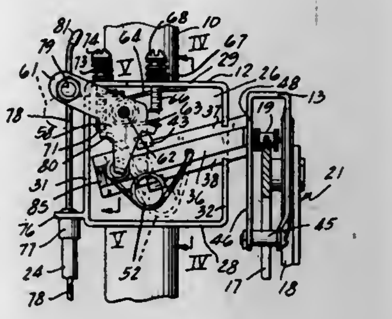
FRONT DERAILLER FOR BICYCLES

Walter Dian, Downers Grove, Ill., assignor to Beatrice Foods Company, Elgin, Ill.

Filed Apr. 12, 1974, Ser. No. 460,542

Int. Cl. F16h *11/04;* **B62m** *9/00, 1/02*

U.S. Cl. 74—217 B **8 Claims**



1. A front derailler mechanism for a bicycle having at least two sprocket plates for moving the drive chain comprising, a displaceable fork engageable with said chain to change it from one to another of said sprocket plates, a control cable mounted on the bicycle and movable to at least two positions, a control unit mounted on the bicycle and connected to said control cable and to said displaceable fork and including means for moving said fork between said sprocket plates under control of said control cable wherein under conditions when said fork is blocked from moving the fork will not move when said control cable is moved but will be subjected to a spring bias so that it moves to the commanded position when blocking has terminated and such that the cable is not subjected to excessive tension forces.

3,890,848

CONTROL ASSEMBLY FOR REAR VIEW MIRROR

James G. Clontz, 108 S. Gum St., Summerville, S.C. 29483

Filed May 13, 1974, Ser. No. 469,479

Int. Cl. F16c *1/10*

U.S. Cl. 74—501 M **2 Claims**

1. A rear view mirror mounted externally of a vehicle operable by the driver's foot adjacent the floorboard interiorly of the vehicle for observing the position of a passing motorist comprising:

a substantially vertical standard carried externally of the vehicle supporting the mirror in an adjusted position;

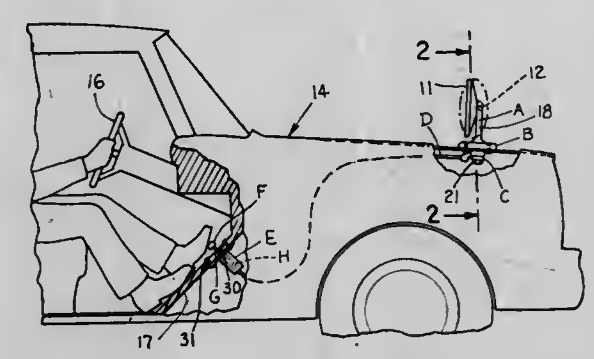
means for mounting said standard on said vehicle for oscillatory movement about a fixed substantially vertical axis externally of the vehicle;

linkage means carried by said standard extending laterally thereof;

a flexible cable connected on one end to said linkage means for moving said linkage means imparting oscillatory movement to said standard;

an elongated housing carried by said vehicle adjacent the floorboard for receiving the other end of said cable;

a pedal carried interiorly of said vehicle adjacent the floorboard depressible by the driver's foot;



an operator extending from said pedal into said housing engaging said other end of said cable within said housing for movement responsive to movement of the pedal; and resilient means within said housing, exerting a resilient force urging said operator in a direction against movement by the pedal;

whereby the mirror may be moved from said adjusted position to a position for observing a passing motorist by depression of the pedal by the driver's foot, and whereby the mirror will return to said adjusted position automatically responsive to said resilient means upon release of the pedal by the driver's foot.

3,890,849

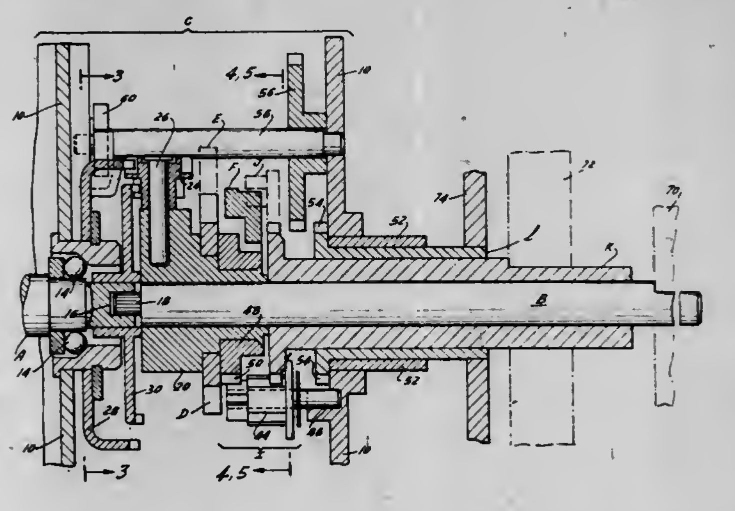
UHF TUNER STOP MECHANISM

Meigs Newberry, East Longmeadow, Mass., assignor to General Instrument Corporation, Clifton, N.J.

Continuation-in-part of Ser. No. 386,839, Aug. 8, 1973, abandoned. This application Jan. 9, 1974, Ser. No. 432,048

Int. Cl. F16h *35/18*

U.S. Cl. 74—10.2 **29 Claims**



1. A stop assembly for use with a tuning mechanism in a TV receiver or the like comprising a support, a coarse tuning shaft rotatably mounted on said support and operably connected to condition the tuner mechanism, a rotatable member operably connected to said shaft to be driven thereby and having a cam thereon with a raised section and a lowered section, a pawl movable by said cam between an inner position wherein it engages said lowered section of said cam and an outer position wherein it engages said raised section of said cam, a stop lug rotatably mounted on said support and operably connected to said disc to be rotated thereby, said lug having an extended portion located radially outwardly from said pawl when the latter is in said inner position, normally out of the path of movement of said pawl toward its said outer position but movable to intersect the said path of movement of said pawl and prevent said pawl from moving to its outer position at a predetermined point in the rotation of said disc.

3,890,850

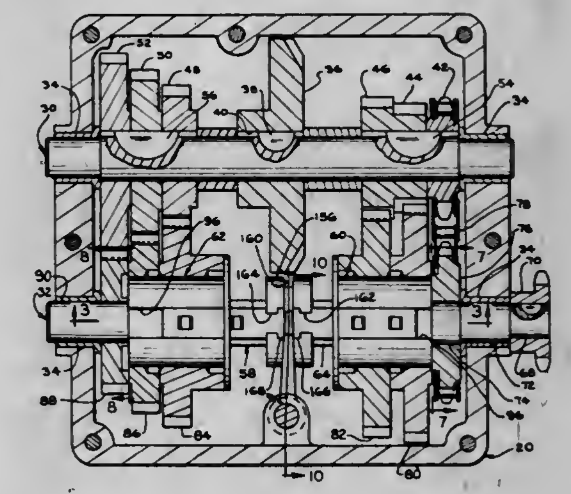
TRANSMISSION WITH DRAW-KEY TYPE SHIFT

Hans Hauser, and Robert D. McGuire, both of Fredericktown, Ohio, assignors to The J. B. Foote Foundry Co., Fredericktown, Ohio

Filed May 21, 1973, Ser. No. 362,116

Int. Cl. F16h *3/08;* **F16d** *21/04*

U.S. Cl. 74—372 **23 Claims**



1. A transmission comprising a rotatably-mounted shaft having longitudinally-extending guide means, a plurality of toothed members rotatably mounted on said shaft, each of said members having engageable means, selector means comprising a plurality of spaced projections cooperating with said guide means and extending outwardly from a common side thereof, there being one of said projections for each of at least some of said members, each of said projections being engageable with the engageable means of one of said members to cause that member to rotate with said shaft when so engaged, spacing means associated with said projections for spacing them apart distances such that not more than one of said projections is engaged with the engageable means of one of said members for any position of said projections and said spacing means along said guide means, resilient means for urging said projections outwardly from said shaft, and means for moving said projections and said spacing means along said guide means and along said shaft.

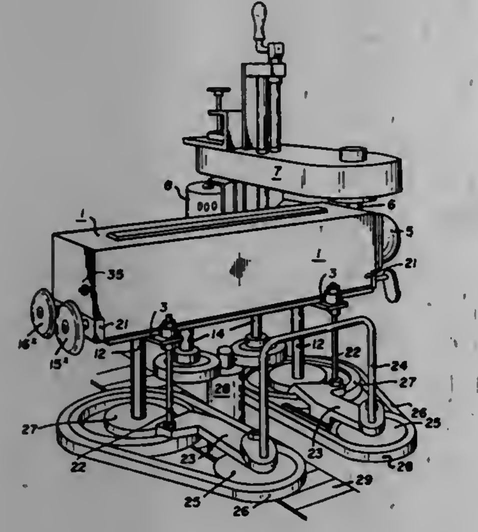
8. A transmission comprising a rotatably-mounted shaft having a longitudinally-extending groove therein, a plurality of gears rotatably mounted on said shaft, at least some of said gears each having a recess which can communicate with said groove of said shaft, gear selector means comprising a carrier positioned within said groove of said shaft, said carrier having mounted thereon a plurality of spaced projections extending from a common side thereof and adapted to extend within the recesses of the gears to individually connect said gears and said shaft, resilient means movable with said carrier and extending outwardly into engagement with said projections, carrier-moving means on said shaft and engageable with said carrier to move said projections relative to said gears longitudinally of said shaft, and means for moving said moving means along said shaft to move said carrier and said projections carried thereby.

15. A transmission comprising a rotatably-mounted shaft having a plurality of gears rotatably mounted thereon, at least

some of said gears each having dogs adjacent said shaft, gear selector means comprising a carrier mounted for longitudinal movement on said shaft, a plurality of spaced projections mounted on said carrier for movement transverse to the longitudinal extent of said shaft, there being one of said projections for each of at least some of said gears, said carrier spacing said projections apart distances such that not more than one of said projections engages one of the gears for any position of said carrier on said shaft to enable not more than one gear to be engaged and rotatable with said shaft at any one time, and resilient means engageable with said projections for urging said projections from said carrier toward said gears.

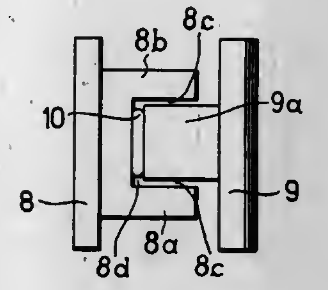
23. A transmission comprising a rotatably-mounted shaft having a longitudinally-extending groove therein, a plurality of gears rotatably mounted on said shaft, at least some of said gears each having a recess which can communicate with said groove of said shaft, gear selector means comprising a carrier positioned within said groove of said shaft, said carrier having a width slightly less than the width of said groove and having an outer arcuate surface with a radius of curvature substantially the same as the radius of said shaft, said carrier having mounted thereon a plurality of spaced projections extending from a common side thereof and adapted to extend within the recesses of the gears, resilient means movable with said carrier and extending outwardly into engagement with said projections, carrier-moving means on said shaft and engageable with said carrier to move said projections relative to said gears longitudinally of said shaft, and means for moving said moving means along said shaft to move said carrier and said projections carried thereby.

3,890,851
CONTAINER-CAP APPLYING MACHINE
Nathan Lanes, 400 Rugby Rd., Brooklyn, N.Y. 11226
Filed Mar. 23, 1973, Ser. No. 344,549
Int. Cl. F16h *35/08*
U.S. Cl. 74—400 2 Claims



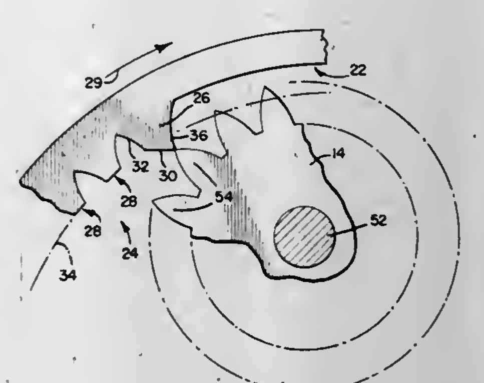
1. In a contaner cap applying machine, an open bottom caisng, two sets of two brackets each within said casing and carrying depending pulley shafts and driven gears thereon, a spline drive shaft between the two sets of brackets and having drive gears engaging said driven gears, power means for driving said spline shaft, rotatable toothed shafts, one for each set of brackets and adapted to move them for spacing adjustment of said brackets, and means for supporting the brackets at their lower ends comprising elements at least one of which is operable to force said brackets against the casing base walls, and to release said force preliminary to adjust the spacing of either or both sets thereof.

3,890,852
DRIVE FOR CONVERTERS, ROTATING DRUMS, PLATE CONVEYORS OR THE LIKE
Walter Schroder, 463 Bochum-Stiepel, Stemmannsfeld, Germany
Filed July 6, 1973, Ser. No. 377,016
Int. Cl. F16h *57/00*
U.S. Cl. 74—410 2 Claims



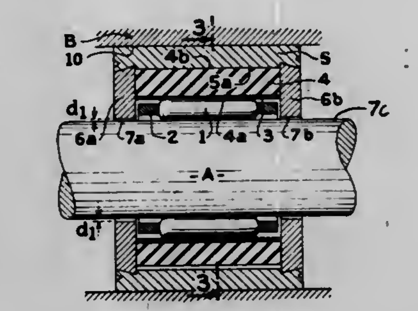
1. A drive mechanism for transmitting rotary motion to a large rotary driven member comprising in combination:
- a larger driven gear mounted for rotation about an axis;
- first and second spaced pinion gears in driving mesh with said larger gear;
- a movable rigid carrier plate for said pinion gears having movement in a plane transverse of the axis of said larger gear with said gears rotatably mounted thereon at fixed locations so that said pinions move with said plate;
- stop means limiting the movement of said carrier plate having stop members facing in a direction generally radially toward the axis of the larger gear to control the depth of the mesh between the pinions and larger gear;
- and cushioning means yieldingly cushioning the movement of said carrier plate.

3,890,853
GEAR MECHANISM FOR PRODUCING PERIODIC ROTATION
Albert John Feltz, Rochester, N.Y., assignor to The Singer Company, New York, N.Y.
Filed July 31, 1974, Ser. No. 493,354
Int. Cl.^{2} F16H *55/04, 1/06, 55/06, 27/04*
U.S. Cl. 74—435 10 Claims



1. A gear mechanism comprising
- a rotatable ring gear having along its inner periphery at least one segment without teeth and at least one segment with at least one tooth
- said segment including an asymmetrically pointed lead-in tooth having a leading face and a trailing face; and
- a rotatable pinion gear located within and engageable with the toothed segment of the ring gear and having a plurality of teeth extending radially therefrom.

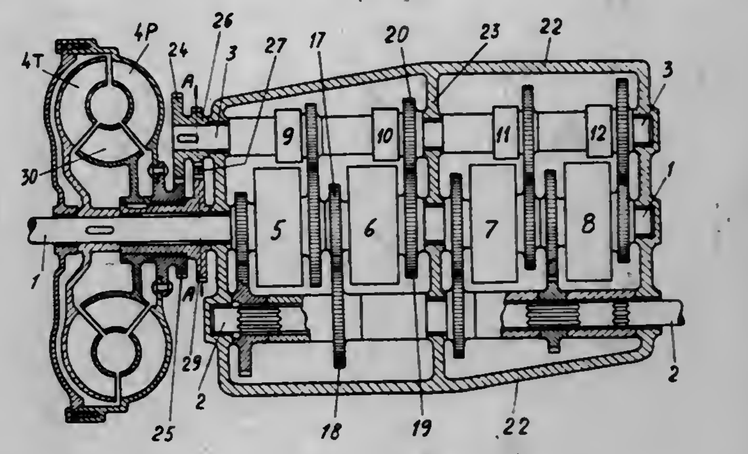
3,890,854
ROLLING BEARING ASSEMBLY, IN PARTICULAR FOR A STEERING SHAFT OF AN AUTOMOBILE VEHICLE
Alfred Pitner, Paris, France, assignor to Nadella, France, a part interest
Filed June 14, 1973, Ser. No. 369,842
Claims priority, application France, June 26, 1972, 72.23014
Int. Cl. B62d *1/18;* **F16c** *27/04, 35/04*
U.S. Cl. 74—492 10 Claims



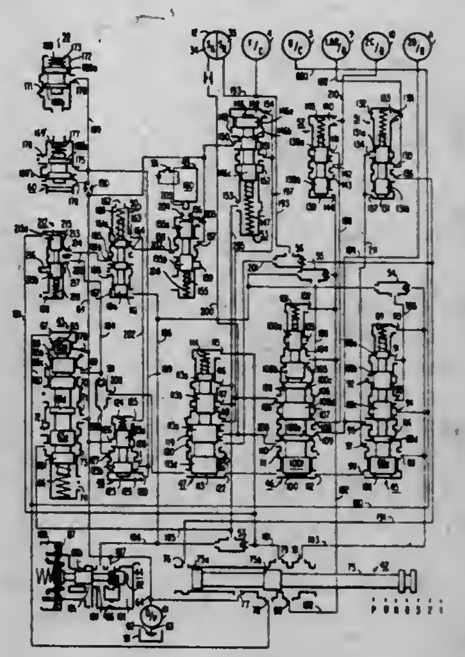
1. A vehicle steering assembly for orienting steering road wheels of the vehicle comprising a steering wheel for the driver of the vehicle, a steering shaft carrying said steering wheel and a rolling bearing assembly comprising means defining a rolling bearing inner raceway associated with said shaft, a ring arrangement of rolling elements around the raceway, a steering wheel shaft mount for connection to the body of the vehicle, said mount defining a bore, a thin sleeve located within the bore and defining an outer raceway for the rolling elements, elastically yieldable support means interposed between the sleeve and the bore for radially supporting the sleeve in an elastically yieldable manner with respect to the bore, means defining at least one first abutment surface of cylindrical shape coaxial with the inner raceway and associated with the bore, means defining a second abutment surface associated and radially movable with the shaft, the elastically yieldable support means being capable of elastically yielding to a given maximum radial extent after which extent impairment of the elastically yieldable support means occurs, and the radial distance between said first and second abutment surfaces being less than said maximum radial extent of said elastic yield to preclude impairment of said elastically yieldable support means but sufficient to allow said shaft radial movements relative to said mount, in opposition to the action of said elastically yieldable support means, which are brought about by vibrations and forces normally to be expected in vehicle use, whereby said elastically yieldable support means are protected from impairment by the effect of abnormal forces on said shaft.

3,890,855
FULLY AUTOMATIC TORQUE RESPONSIVE PLANETARY GEARBOX WITH PLURAL COUNTERSHAFTS
Hans Ivar Reenskoug, 63 Skogsgatan, Linkoping, Sweden
Filed May 20, 1974, Ser. No. 471,534
Claims priority, application Sweden, May 23, 1973, 7307241
Int. Cl. F16h *47/00, 47/08*
U.S. Cl. 74—730 3 Claims

1. A fully automatic gearbox comprising a torque converter having a rotary pump element and a rotary turbine element, said gearbox including a primary shaft, an output shaft, and a return shaft, said shafts cooperating with said torque converter and with a plurality of planetary gearings to provide at least two mechanical steps of gear changing each of which includes a planetary gearing having three rotary members, the primary shaft of the gearbox being coupled to one of the rotary elements of the torque converter and to a first one of the three rotary members in each of said plurality of planetary gearings, said planetary gearings being arranged one after the other, one for each step of gear changing, a plurality of free wheel couplings, one for each gear changing step, a second one of the rotary members of each of the planetary gearings being arranged to cooperate, directly or via the free wheel coupling of the associated gear changing step, either with the output shaft of the gearbox or with the return shaft, said return shaft being coupled to another rotary element in the torque converter, transmission of motion and gear change being operative to cause the pump element and the turbine element of the torque converter to rotate in the same direction with the pump element having in all operating conditions a higher speed than the turbine element, the third rotary member of each of the planetary gearings being arranged to cooperate directly or via the free wheel coupling of the associated step of gear changing either with the return shaft or with the output shaft of the gear box.



3,890,856
CREEP PREVENTING HYDRAULIC CONTROL CIRCUIT FOR VEHICLE AUTOMATIC TRANSMISSION
Toshiyuki Miyauchi, and Kunio Ohtsuka, both of Yokohama, Japan, assignors to Nissan Jidosha Kabushiki Kaisha, Yokohama, Japan
Filed Oct. 24, 1973, Ser. No. 409,199
Claims priority, application Japan, Nov. 2, 1972, 47-109515
Int. Cl. B60k *23/00;* **F16h** *3/74*
U.S. Cl. 74—869 5 Claims



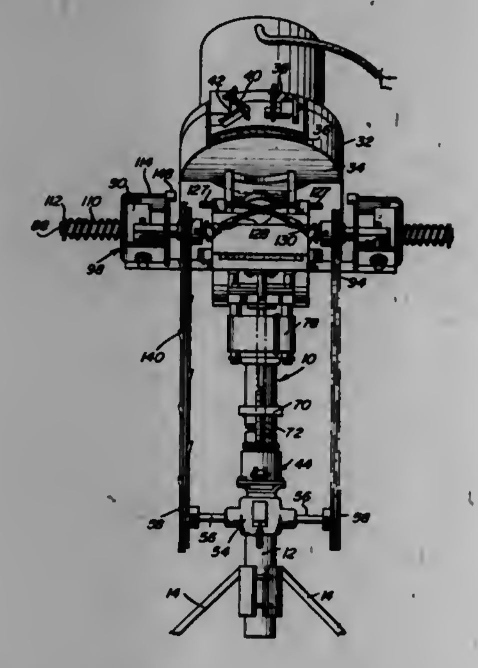
1. In a hydraulic control circuit for a vehicle automatic transmission of the type having a hydraulic pressure source, pressure regulating means to regulate the hydraulic pressure from said source, a plurality of shift control valves which selectively transmit hydraulic fluid to a plurality of frictional elements to cause engagement and disengagement of said

elements to change the output gear ratio of said transmission, the improved creep-preventing mechanism comprising:

a. a first fluid flow control means;
b. a second fluid flow control means;
c. a third fluid flow control means;
d. means connecting said first, second and third flow control means in series;
e. electric means to control said first fluid control means in response to the position of the vehicle throttle such that said first fluid control means allows hydraulic fluid to pass therethrough only when said throttle is in a predetermined position;
f. means to control said second flow control means in response to the vehicle throttle such that said second fluid flow control means allows hydraulic fluid to pass to said third fluid flow control means only when said throttle is in a predetermined position; and
g. means to control said third fluid flow control means in response to a manually controllable gear selector valve such that said third fluid flow control means allows fluid to pass therethrough only when said gear selector valve is in a predetermined position.

3,890,857
AUTOMATIC CHAIN SHARPENER

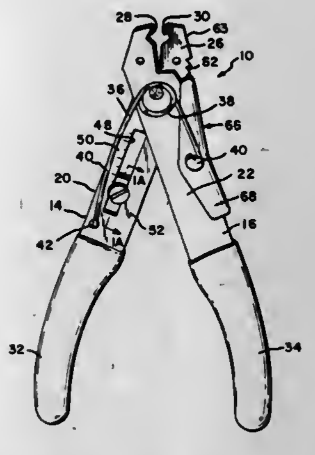
Jack F. Simington, Star Rt. Box 141, Chiloquin, Oreg. 97624
Continuation-in-part of Ser. No. 392,889, Aug. 30, 1973. This application June 20, 1974, Ser. No. 481,447
Int. Cl. B23d *63/16*
U.S. Cl. 76—25 A **4 Claims**



1. A chain saw chain sharpening device comprising a support, a rotary grinding head journaled from said support, a pair of chain support mounts mounted on said support and including portions thereof on opposite sides of said head supported for shifting along a first path extending transversely of the axis of rotation of said head, said support mounts including means for supporting a saw chain for guided lengthwise adjustment of said chain along a second path transverse to said axis and said first path, first driven means drivingly connected to said support mount portions for reciprocating the latter along said first path and second drive means for intermittently advancing said chain in timed relation to reciprocation of said support mount portions, an elongated support member rotatably supported from said support and extending and lengthwise reciprocal along said first path, said support mount portions including support discs mounted on said support member for rotation and reciprocation with said support member and about each of which a saw chain may be trained, said first drive means including a follower and being drivingly connected to said support member for reciprocation of the latter, said first drive means including a lost motion connection with said support member, and adjustable limit means carried by said support and engageable by said support discs to limit movement of the latter away from the axis of rotation of said grinding head, said lost motion connection including a pair of opposing springs connected between said follower and said support discs.

3,890,858
WIRE STRIPPER

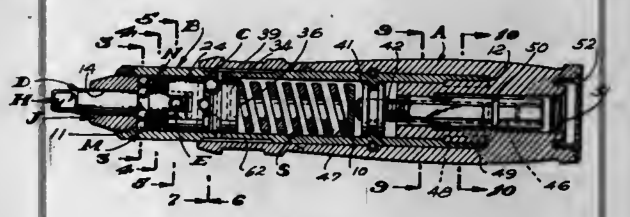
Gustaf Rudolph Lawson, Willingboro, N.J., and John H. Stuart, Levittown, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed May 20, 1974, Ser. No. 471,414
Int. Cl. H02q *1/12*
U.S. Cl. 81—9.5 R **11 Claims**



1. In a wire stripper of the type comprising first and second arms pivotally connected to each other to define two facing jaws with wire stripping means thereon and two handles with means for biasing the handles and jaws to an open position, the improvement comprising first means for limiting the minimum opening between said jaws to a predetermined range of openings, second means for selectively limiting the maximum opening between said handles over a predetermined range of openings said second means cooperating with said first means throughout the range of openings to prevent said arms from spreading.

3,890,859
TORQUE DRIVER TOOL

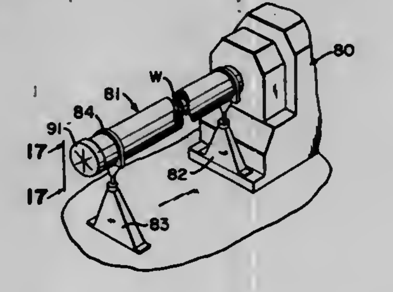
Bosko Grabovac, Mission Viejo, and Ivan N. Vuceta, San Gabriel, both of Calif., assignors to Consolidated Devices, Inc., El Monte, Calif.
Filed Aug. 9, 1974, Ser. No. 496,099
Int. Cl. B25b
U.S. Cl. 81—52.4 R **12 Claims**



1. A torque driver tool comprising an elongate tubular body with front and rear ends, a block in the front end of the body and having a central, axially extending opening, an elongate drive shaft rotatably engaged in said opening and having a work engaging front end projecting from the block and body and a rear end projecting into the body, thrust bearing means between the shaft and block, a driven plate with a rear surface and radially extending and rearwardly opening channels rotatably positioned in the body rearward of the block, a thrust bearing between the block and drive plate, coupling means coupling the rear end of the shaft and drive plate in rotary driving engagement, radially extending cam parts engaged in the channels in the drive plate in rotary driving engagement therewith and having convex portions projecting rearwardly from the rear surface, an axially shiftable drive plate with a front surface in the body in rearward spaced relationship with the driven plate and having a radially extending forwardly opening channel, an elongate radially extending ball engaging drive bar fixed in the body between the plates and having a rear portion slidably engaged in the forward portion of the channel in the drive plate, circumferentially spaced balls positioned between and normally engaging the front and rear surfaces and engageable with the drive bar and the convex portions of the cam parts and spring means in the body rearward of the drive plate and normally yieldingly urging the drive plate forwardly in the body toward the driven plate with the balls in bearing engagement therebetween.

3,890,860
SILENCER AND SUPPORT MEANS FOR A METAL WORKPIECE DURING MACHINING THEREOF

Daniel J. Gordon, 22132 Treadwell, Farmington, Mich. 48024, assignor to Dayco Corporation, Dayton, Ohio
Filed May 21, 1973, Ser. No. 361,933
Int. Cl.² B23B *25/00*
U.S. Cl. 82—38 A **2 Claims**



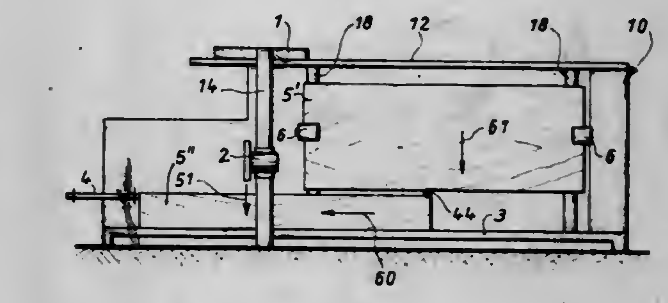
1. A device for silencing and supporting a metal workpiece during the machining thereof comprising an inner tubular member; an outer tubular member; a flexible foam product made of an elastomeric material and provided in the space between said tubular members, said flexible foam product filling the entire volume between said tubular members and serving to absorb and trap sound as well as absorb vibrations of said workpiece; and an end cap fastened to an end portion of said device and serving as a silencing boot, said end cap having a planar end wall adjoined by a cylindrical wall which frictionally engages an outer end portion of said outer tubular member to detachably fasten said end cap to said device, said end cap being made of an elastomeric material and having a plurality of integral flaps defined in said end wall, said flaps being normally arranged coplanar with each other and being foldable transverse their associated plane to allow movement of said workpiece axially through said inner tubular member.

3,890,861
METHOD AND APPARATUS FOR SAWING A PANEL INTO PORTIONS

Fritz Gebhardt, Nurtingen, Germany, assignor to Karl M. Reich Maschinenfabrik GmbH, Nurtingen, Germany
Filed Feb. 1, 1974, Ser. No. 438,557
Claims priority, application Germany, Feb. 6, 1973, 2305673; Dec. 1, 1973, 2359988
Int. Cl. B27b *5/06*
U.S. Cl. 83—23 **3 Claims**

1. A method of dividing a substantially planar panel having an edge which comprises:

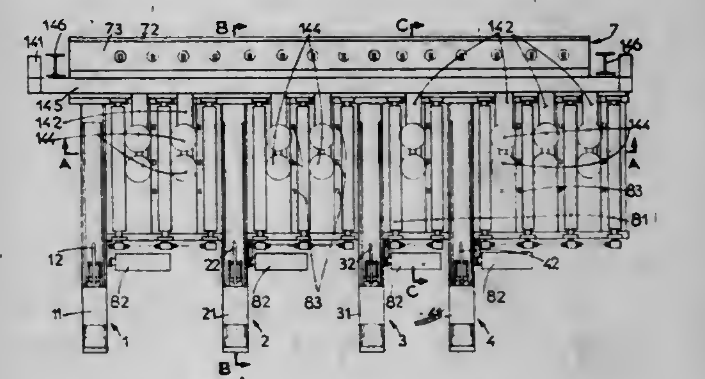
a. standing said panel on a support in a position in which said edge is at least approximately horizontal, and the panel extends upward from said edge;
b. first cutting said panel spacedly parallel to said edge into a lower section and an upper section while securing said upper section in the position thereof relative to said support, whereby another edge is formed on said upper section;
c. thereafter cutting said lower section transversely to the direction of said first cutting into at least two pieces;



d. removing said pieces from said support;
e. lowering said upper section until said other edge rests on said support; and
f. cutting said upper section spacedly parallel to said other edge into two parts.

3,890,862
APPARATUS FOR SHEARING THE EDGES OF A SHEET OF METAL

Bernard Lhenry, Le Creusot, France, assignor to Creusot-Loire, Paris, France
Filed Oct. 3, 1973, Ser. No. 403,022
Claims priority, application France, Oct. 26, 1972, 72-38005
Int. Cl. B65h *9/00*
U.S. Cl. 83—71 **11 Claims**



1. Apparatus for shearing the edges of a sheet comprising: an edge shearer,

a table adjacent the shearer for supporting a sheet,
at least one carriage guided for movement in a direction perpendicular to the cutting line,
means for gripping an edge of a sheet, the gripping means being mounted at an extremity of at least one carriage on that side adjacent the shears,
motor driving means for linear displacement of each carriage in opposite senses,
means for rotating a sheet adjacent the shears, after cutting a first edge of a sheet,
detectors for detecting the passage of the edge of a sheet adjacent the cutting line, each situated at an equal direction from the cutting line in the direction of displacement of a carriage,
detectors mounted at the end nearest to the shears of each carriage operably by the edge of a sheet remote from the cutting line for controlling the advance of the carriage in relation to the said edge,
position coders for controlling position of each carriage,
and means for controlling operation of the apparatus.

3,890,863
STAMPING MACHINE FOR SLOTTING CORE PLATES

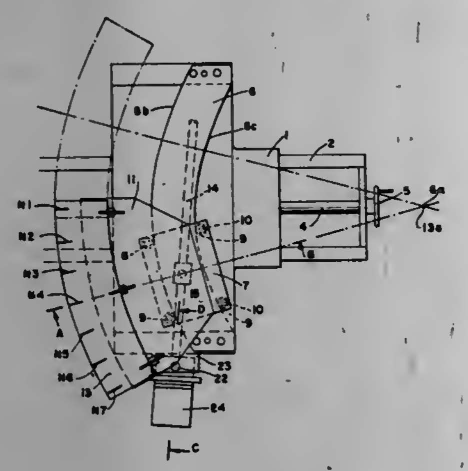
Markus Reihle, Weingarten, and Erich Harsch, Baindt, both of Germany, assignors to Maschinenfabrik Weingarten AG, Weingarten, Germany

Filed Sept. 4, 1974, Ser. No. 503,160

Claims priority, application Germany, Sept. 5, 1973, 2344697

Int. Cl.² B26D *7/06*

U.S. Cl. 83—71 **20 Claims**



1. A stamping machine for slotting annular segment-shaped plates, including a carriage for supporting the plate to be slotted; means for movably supporting the carriage; an arcuate template in engagement with the carriage for guiding the carriage in a circularly arcuate path, the improvement comprising:

- a. a drive spindle having a driven side and a driving side;
- b. means connecting said driving side of said spindle to said carriage for displacing said carriage upon motion of said spindle by transmitting spindle movements to said carriage;
- c. first and second stepping motors; and
- d. coupling means connecting said stepping motors to said driven side of said spindle for moving said spindle in response to the rotation of either one of said motors.

3,890,864
MESHES CUTTING MACHINE

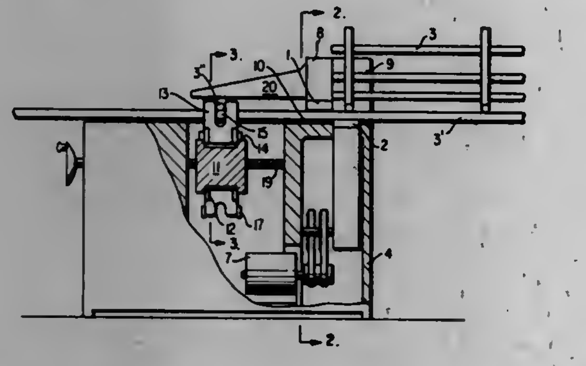
Yasunobu Kobayashi, Osaka, and Hikaru Ogawa, Kobe, both of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed June 5, 1974, Ser. No. 476,534

Claims priority, application Japan, June 5, 1973, 48-64259

Int. Cl. B23d *15/04, 33/02*

U.S. Cl. 83—162 **8 Claims**



1. A meshes cutting machine provided with a pair of cooperating cutting edges for cutting meshes consisting of wire members, and with a mechanism for moving said meshes, comprising:

- a guide groove extending along the extension line of the cutting line of said meshes in the advancing direction of said meshes; and
- a drive pawl mechanism located on the open side of said guide groove and adapted to shift the lengthwise members of said meshes in parallel with said guide groove.

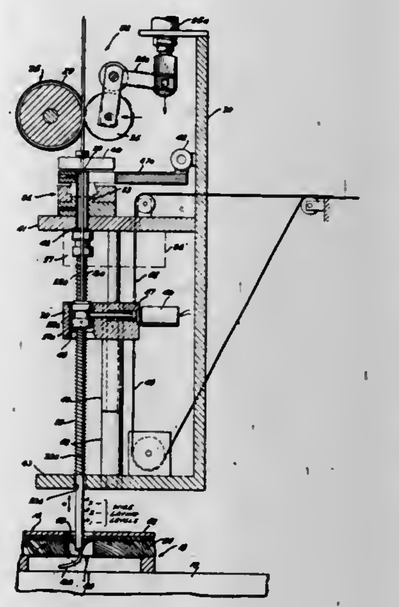
3,890,865
SYSTEM FOR DISPENSING AND CUTTING STRAND MATERIAL

John W. Tarbox, Malibu; Walter E. Hinds, Los Angeles, and Rodolfo Castro, La Palma, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 274,160, July 24, 1972, Pat. No. 3,844,462. This application Oct. 3, 1973, Ser. No. 403,299

Int. Cl. B26d *1/08*

U.S. Cl. 83—198 **8 Claims**



1. A dispensing head for strand material comprising:

means for supplying strand material;

means for feeding said strand material including means for drivingly engaging said strand material, the feeding means includes a feed tube including means for supporting said feed tube to receive strand material cut to the desired length and means for producing axial movement of the feed tube to position the end thereof for dispensing the strand material; and

means for receiving and cutting the driven strand material to a desired length, said latter means including axially aligned annular members having annular opposing cutting edges for passing the strand material and slidable for cutting the strand material.

3,890,866
DEVICE FOR CUTTING A CONTINUOUS STRIP OF PAPER

Jean Verjux, Pavillons Sous Bois, France, assignor to Usines Decoufle, Paris, France

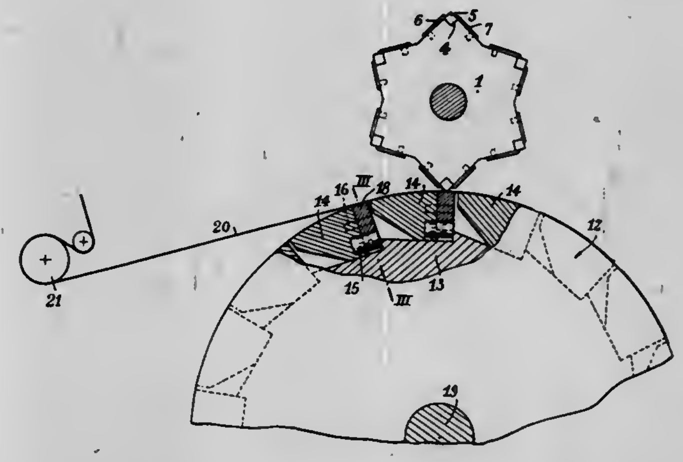
Filed Feb. 4, 1974, Ser. No. 439,213

Claims priority, application France, Feb. 22, 1973, 73.06310

Int. Cl. B26d *25/12*

U.S. Cl. 83—346 **5 Claims**

1. Device for cutting a continuous strip of paper into sections having the same predetermined length, which comprises cutting elements mounted on a rotary holder adapted to cut a strip of paper travelling continuously against the surface of a likewise rotary counter-drum, spaced cutting inserts so mounted that the cutting elements engage a registering insert when cutting the strip of paper, a plurality of pins corresponding to said inserts mounted respectively in said counter-drum to extend in a direction parallel to the peripheral tangent of said counter-drum, each of said cutting inserts being mounted to pivot on one of said pins during the operation of the device.



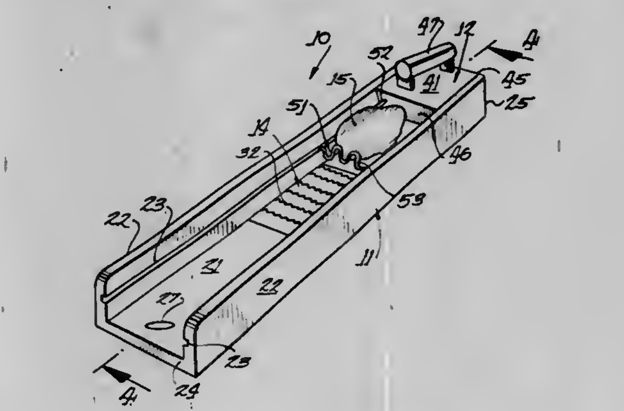
3,890,867
POTATO CHIP SLICING DEVICE

Mary P. Wilson, 6241 S.W. 20th Ter., Miami, Fla. 33155

Filed Mar. 11, 1974, Ser. No. 450,143

Int. Cl. B26d *4/44*

U.S. Cl. 83—404 **2 Claims**



1. A potato peel slicing device intended for the slicing of a potato into thin slices of uniform thickness for the making of potato chips, and the like, the device comprising, in combination:

- an elongated longitudinally extending track having a substantially U-shaped transverse cross-section shape formed of a horizontally extending bottom surface and a pair of opposed vertically extending side wall surfaces defining a runway therebetween;
- an opening in said bottom surface extending longitudinally thereof and between opposite side wall surfaces and disposed approximately midway between opposite ends of said bottom surface;
- said track having a front end and a back end, a vertically extending stop member disposed adjacent to said back end and interconnecting said side wall surfaces and projecting to a level above the height of the bottom surface, each of said track side wall surfaces being provided with a longitudinally extending slot extending from end to end thereof parallel to said bottom surface and spaced approximately midway between said bottom surface and the top edge of said side wall surfaces and wherein said frame assembly is comprised of a generally U-shaped member having rod-like leg members projecting horizontally and of a dimension adapted to be slidingly received in an associated one of said grooves for guiding said frame assembly longitudinally along said runway;
- a plurality of cutting blade members disposed in said bottom surface opening and extending transversely of said track between said opposite side wall surfaces, said cutter blades being inclined at a direction upwardly of said bottom surface and inclined toward said track back end, the spacing between each of the blades being substantially identical, said blades having a leading cutting edge which is disposed at a level above the level of the interior surface of said bottom surface;
- a rectangularly shaped pushing block having a top surface, a bottom surface, opposed side surfaces, a back surface, and a front leading surface, said block being of a width to be received in said runway with said side surfaces in sliding juxtaposition with the interior surfaces of said side wall surfaces of said track whereby said pushing block may be moved reciprocally in opposite directions along said runway between said front end and said back end of said bottom surface, the front leading edge of said pushing block being beveled inwardly and downwardly from said top surface to said bottom surface, and a cylindrical handle member being affixed to said top surface by a pair of longitudinally spaced apart bracket means with the handle adapted to be readily grasped in the hand of an individual to effect the reciprocal movement of said pushing block along said runway; and
- frame means associated with said pushing block and projecting forwardly of the front surface thereof and adapted to receive a potato therein for retaining the potato relative to the pushing block whereby movement of the pushing block from the back end to the front end will push the potato over the cutting blades to slice the potato into a plurality of thin strips of uniform thickness suitable for the making of potato chips, said base member of said frame assembly being formed of a cylindrical rod bent in the desired configuration of a general sine wave and having bottom loop portions terminating adjacent the interior surface of said track bottom surface.

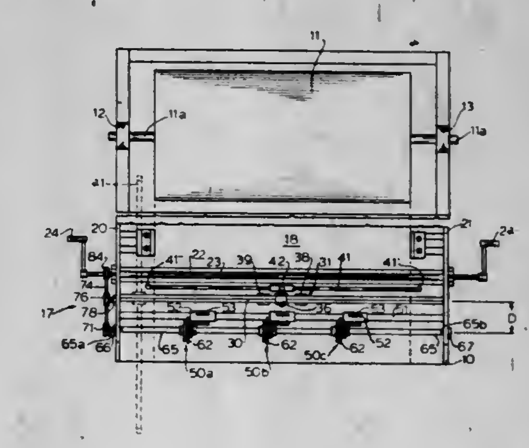
3,890,868
INSULATION CUTTER

Lloyd P. Pickler, 634 McKee St., Albemarle, N.C. 28001

Filed Apr. 24, 1974, Ser. No. 463,763

Int. Cl. B26d *3/12, 1/20*

U.S. Cl. 83—408 **3 Claims**



1. A cutting apparatus for cutting thick, fibrous insulation type material fed from a substantially long continuous supply roll into pieces of predetermined and variable widths and length comprising:

- a. a work table having a supporting frame and a table surface;
- b. a roll support extending across the end of said table opposite said table surface and rotatably mounting a continuous supply roll of said material;
- c. a pair of upper and lower opposed rollers mounted adjacent and forward of said roll support and proximate said table surface and extending across said table, the upper of said rollers being an idler roller and being adjustably spring loaded towards said lower roller, the lower of said rollers having handle operator means and a frictional

surface for gripping the width of said material, said rollers being adapted to withdraw a predetermined length of said material from said roll and force such length onto said table surface;

d. a plurality of slitting blade arrangements adjustably mounted on a rod extending across and above said table surface and being adjacent and forward of said rollers, each said slitting blade arrangement including:
   1. bracket means adjustably secured to said mounting rod and providing below said rod a vertically and laterally adjustable slitting blade mount;
   2. a thin slitting disc blade rotatably positioned on said slitting blade mount at a selected lateral position and height above said table corresponding to a preset width and material thickness and adapted to slit said thickness to such preset width as said material is pushed by said rollers against the cutting edge of said slitting blade, the longitudinal spacing between said rollers and slitting blade being minimal to minimize buckling of said material as it approaches said blade; and
   3. presser foot means providing a pair of surfaces for slidably engaging the top of the material immediately adjacent the sides of said blade at some predetermined upward limiting position at the point of slitting;

e. an auxiliary material pulling arrangement including an auxiliary shaft extending across said table surface immediately beneath said slitting blade arrangements, and rotatably supported by said frame, said shaft having a plurality of frictional surfaced collar members, one for each said slitting blade arrangement, adjustably mounted thereon and arranged for being driven by said auxiliary shaft at locations corresponding to the selected lateral positions of said slitting blade arrangements, each said collar member having a groove for receiving a respective said slitting blade therein such that the bottom surface of said material during slitting is engaged on either side of said blade by a respective collar member peripheral surface and its upper surface by a said slitting blade edge;

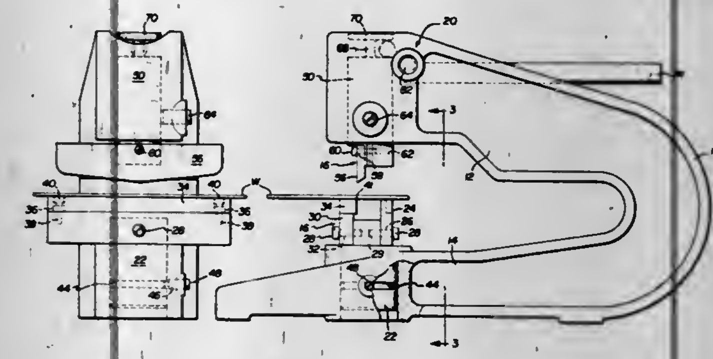
f. belt and pulley drive means connecting said lower roller and said auxiliary shaft member such that rotation of said lower roller by said handle means in turn causes said shaft member and said collar members to rotate, to allow said supply material as it passes said slitting arrangements to simultaneously contact said collar members and to be pulled through said slitting blades to supplement the pushing effort of said rollers during slitting of the material, and subsequent to slitting said collar members being effective to push said material forward of said auxiliary shaft;

g. cut-off blade means positioned between said rollers and slitting blade means including a support rail extending across said table adjacent said rollers, a wheel bracket arrangement providing a set of wheels adapted to ride said rail and a bracket supported by said wheels providing a vertically adjustable cut-off blade mount, and a cut-off disc blade rotatably mounted on said cut-off blade mount, said cut-off blade means being adapted when adjusted to a vertical position corresponding to said material thickness and pushed across said table to cut said material to a preset length corresponding to the length of said material drawn onto the said table past said rail; and

h. a horizontal handle bar mounted for rotation about a vertical axis above and on said wheel bracket arrangement and having upright hand grip means at the ends thereof, said handle bar being adapted to move said cut-off blade across said material from either side of said table and when not in use said handle being adapted to being rotated and releasably held in a horizontal plane to a position substantially perpendicular to said rail while said cut-off blade remains positioned at one side of said table thereby leaving aisle space on both sides of said table free of the obstruction of said handle and the central area of said table free of the obstruction of said cut-off blade.

3,890,869
LOUVER CUTTER

Eugene Van Cleave, Redford, Mich., assignor to Van Mark Products Corporation, Farmington Hills, Mich.
Filed Nov. 29, 1972, Ser. No. 310,046
Int. Cl. B26d *5/08, 7/70*
U.S. Cl. 83—559 **6 Claims**



1. In an apparatus for punching louvers or the like in workpieces, said apparatus including a frame having upper and and lower legs, a ram mounted for reciprocation in said upper frame leg, said ram having a punch secured thereto, and die means mounted on said lower leg, the improvement of means for jointly indexing said ram and said die means comprising: a spring detent threaded through said frame for engaging and resiliently holding said ram in an indexed position;

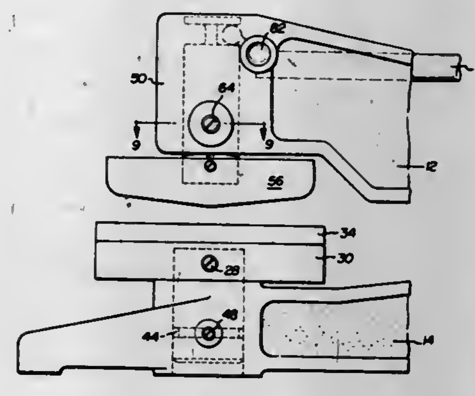
said spring detent of sufficient resiliancy for releasing said ram from an indexed position upon rotation of said ram with sufficient force to override the resilient holding of said ram by said spring detent; and

a fastener in said lower leg for releasably securing said die means in an indexed position;

so that upon releasing said fastener and positioning said ram adjacent said die means, and then indexing said ram to override the resilience of said spring detent, said die is jointly indexed with said ram and said die is properly aligned relative to said ram for subsequent punching operations.

3,890,870
FREE TRAVEL HANDLE FOR LOUVER PUNCH OR THE LIKE

Eugene Van Cleave, Orchard Lake, Mich., assignor to Van Mark Products Corporation, Farmington Hills, Mich.
Division of Ser. No. 310,046, Nov. 29, 1972. This application May 6, 1974, Ser. No. 467,012
Int. Cl. B26d *5/08*
U.S. Cl. 83—616 **4 Claims**



3. In a portable machine for stamping louvers or the like in sheet metal stock, said machine including a frame, anvil means, and a ram reciprocable between first and second positions and having a removable cutting member secured thereto, the improvement comprising:

handle means including a first portion engaging said ram for positive motion of said ram between said first and second positions, and having a second portion for limited free pivotal travel with respect to said first portion,

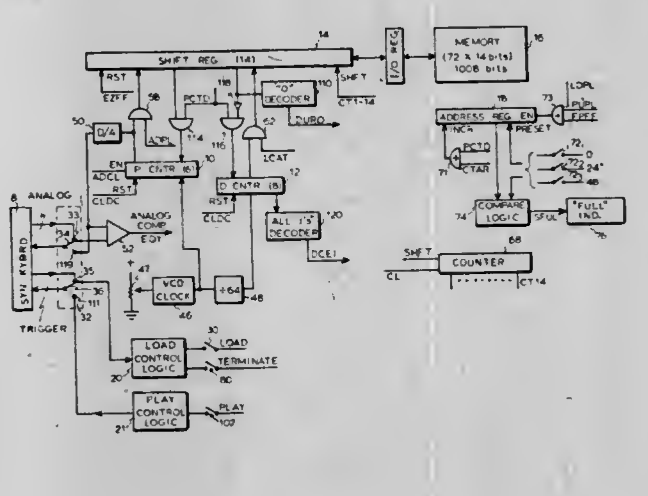
said first handle portion includes a rod having a tapped hole, and

a ball and integral link, said link being threaded in said hole and said ball engaging said ram,

said second handle portion includes a sleeve having an arcuate peripheral slot, the ends of said slot for limiting the free pivotal travel of said second portion of said handle means, said rod being disposed in said sleeve and said integral link extending through said slot into said tapped hole.

3,890,871
APPARATUS FOR STORING SEQUENCES OF MUSICAL NOTES

Thomas E. Oberheim, Santa Monica, Calif., assignor to Oberheim Electronics Inc., Santa Monica, Calif.
Filed Feb. 19, 1974, Ser. No. 443,292
Int. Cl. G10h *1/00;* **G10f** *5/00*
U.S. Cl. 84—1.01 **14 Claims**



1. In combination with an electronic music synthesizer having a keyboard and means responsive to the playing of each key for producing a trigger pulse and an analog voltage level representative of pitch, a sequencer apparatus responsive to the playing of a sequence of keys for storing information describing the melody represented thereby, said sequencer apparatus comprising:

duration logic means responsive to each trigger pulse subsequent to the initial trigger pulse in a sequence, for providing a multibit digital code representing the time duration since the immediately preceding trigger pulse;

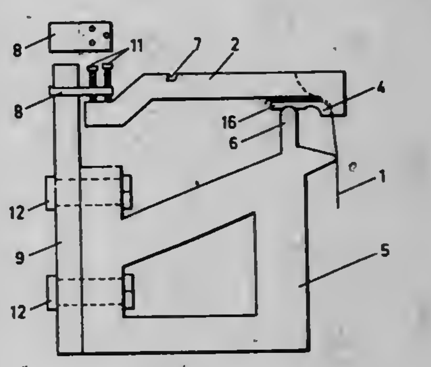
level logic means for providing a multibit digital code representing the level of analog voltage after each trigger pulse;

memory means comprised of a plurality of word locations each for storing a multibit word; and

means responsive to each trigger pulse provided by said duration logic means subsequent to the initial trigger pulse in a sequence for successively storing digital words in sequential locations of said memory means, each word comprised of a first digital code representative of time duration provided by said duration logic means and a second digital code representative of analog voltage level provided by said level logic means.

3,890,872
DEVICE FOR STRINGING AND TUNING OF STRINGS IN PIANOS, GRAND PIANOS, HARPSICHORDS, ZITHERS AND THE LIKE

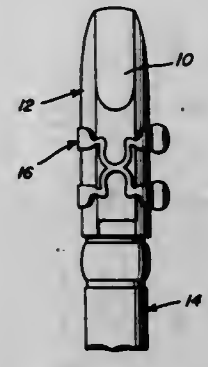
Gunnar O. Sjöstrand, Atvidaberg, and Staffan G. Sjöstrand, Linkoping, both of Sweden, assignors to Musikindustriell Forskning MIFO AB, Linkoping, Sweden
Filed Apr. 5, 1974, Ser. No. 458,403
Int. Cl.^{2} G01C *3/10*
U.S. Cl. 84—207 **6 Claims**



1. In a device for stringing and tuning of the strings in pianos and like stringed instruments, wherein an elongated rocker is journalled on a fixed arcuate abutment to be swung about an axis transverse to the direction of the string, thhe string being suspended from the rocker at a point spaced from one side of the axis of said abutment, the rocker being in engagement with adjustable tuning means at a location spaced from the other side of said axis, the improvement which comprises a movable clamping element connected with said rocker, the lower surface of said clamping element being in sliding contact with said abutment, the upper surface of said clamping element being disposed below the lower surface of said rocker for resiliently clamping the string between said element and rocker.

3,890,873
LIGATURE

Robert L. Harrison, 204 Yarmouth Dr., Tiffin, Ohio 32730
Filed June 12, 1974, Ser. No. 478,729
Int. Cl. G10d *9/02*
U.S. Cl. 84—383 **8 Claims**



1. A ligature for a reed instrument, comprising, in combination:

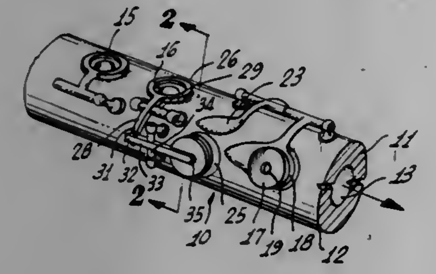
a. first and second split bands, each of these bands having a pair of ends arranged forming a split;

b. clamp means mounted on the ends of the bands and arranged bridging the splits for drawing the ends of the bands toward and away from one another and permitting the bands to be tightened on and removed from a mouthpiece of a reed instrument; and

c. a web connected to the bands at points thereof spaced from the clamp means, the web arranged forming a face for retainingly contacting a reed and holding the reed on the mouthpiece, the web including a pair of substantially

U-shaped members each having a bight portion and a pair of legs extending codirectionally from the bight portion, the members being connected together at the bight portions thereof, with the legs of each of the members extending away from the legs of the other of the members and connected to a respective one of the bands, corresponding legs of each U-shaped member being arranged in common planes.

3,890,874
KEYING MECHANISM FOR WIND INSTRUMENTS
Charles N. Vedder, P.O. Box 2075, Ventura, Calif. 93001
Filed Jan. 10, 1974, Ser. No. 432,590
Int. Cl. G10d *7/02*
U.S. Cl. 84—384 **3 Claims**



1. In a flute having a tubular body with a plurality of holes therethrough selectively coverable by a player's fingers, and including an E flat key operable to open a normally closed E flat hole, the improvement wherein:

the body includes an additional E flat hole at substantially the same axial location as the original E flat hole; and the flute further includes

a cover for said additional E flat hole,

a key operable simultaneously with the covering of a particular existing hole,

mechanical means linking said key with said cover, and resilient means urging said cover open;

whereby said additional E flat hole is automatically uncovered as said key is released by removal of a finger from the particular existing hole, and simultaneous operation of the E flat key is rendered unnecessary.

3,890,875
OCTAVE LOCATOR FOR KEYBOARD AND NOTE READING
Verna M. Leonard, 8701 Highway 41, Fresno, Calif. 93710
Filed July 24, 1974, Ser. No. 491,258
Int. Cl. G09b *15/02*
U.S. Cl. 84—471 **6 Claims**

1. A music teaching aid comprising:

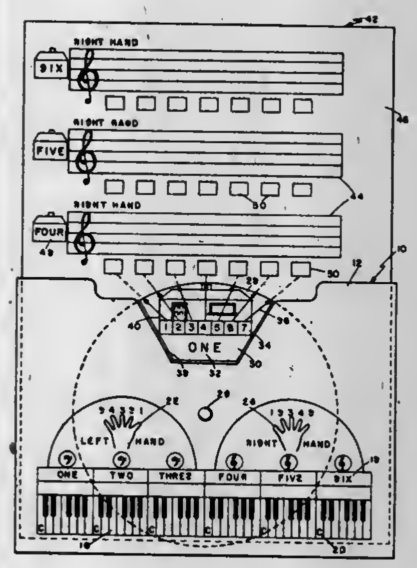
a. an envelope having a front panel and a rear panel;

b. said front panel having a representation thereof of a piano keyboard divided into numbered octaves;

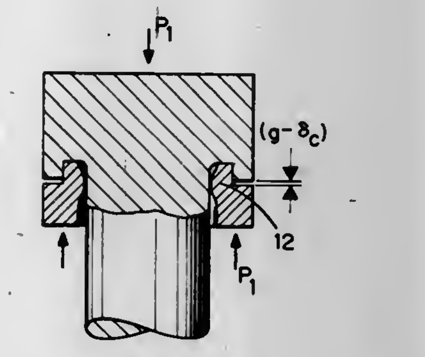
c. a dial rotatably mounted to the rear surface of said front panel and having a plurality of peripheral sectors provided in the same quantity as said numbered octaves and being numbered to individually correspond therewith;

d. said front panel having a portion cut away to expose any selected one of said sectors;

e. an insert sheet insertable into said envelope and being of height dimension to have a first portion extending from said envelope when a second portion is fully inserted on said envelope and having at least one musical staff on said first portion, whereby the user can rotate the dial to select a particular numbered sector and inscribe notes contained in the corresponding octave on said staff.

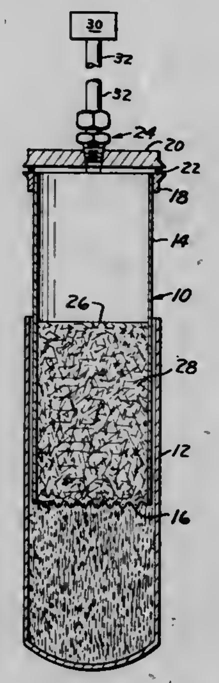


3,890,876
TWO-PART, TWO-MATERIAL FASTENING ELEMENT
Norman C. Dahl, 40 Fern St., New York, N.Y. 02173
Filed June 18, 1973, Ser. No. 370,965. The portion of the term of this patent subsequent to Sept. 11, 1990, has been disclaimed.
Int. Cl. F16b *31/02*
U.S. Cl. 85—62 **13 Claims**



1. A fastener indicator device which comprises a yielding section therein subject to plastic deformation on application of a predetermined compressive force and characterized by a groove or gap therein, which device is further characterized by the yielding section composed of a material which has been workhardened by the application of a loading force of the same character as that force to which the device is subject in use, such loading force slightly less than or equal to the said predetermined force, but greater than the force which would cause initial yielding of the material, whereby in use a change in the dimension of the groove or gap indicates that the fastener carries the predetermined force.

3,890,877
STAPLE ORIENTING APPARATUS
Edwin L. Lista, Roseville, and Kenneth S. Williams, Sacramento, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.
Continuation of Ser. No. 521,757, Jan. 18, 1966. This application Oct. 6, 1969, Ser. No. 866,088
Int. Cl. C06b *21/00*
U.S. Cl. 86—1 **5 Claims**

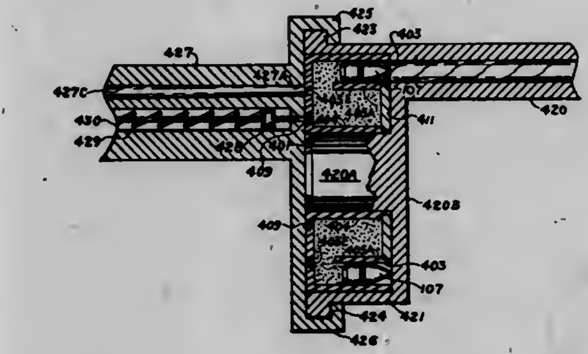


1. An apparatus for casting uncured solid propellant having elongated metal staples randomly dispersed therein comprising:

a tube for containing the uncured solid propellant; and

a fine mesh screen fixedly attached to the bottom end of said tube, said screen having openings therein whereby when the solid propellant passes through said screen, the metal staples of said propellant are oriented in the direction of propellant flow.

3,890,878
AMMUNITION AND WEAPON SYSTEMS
Andrew J. Grandy, 2707 Grant Ave., North Hills, Pa. 19038
Division of Ser. No. 239,595, March 30, 1972, Pat. No. 3,857,339. This application Feb. 21, 1974, Ser. No. 444,595
Int. Cl.² F41F *3/02*
U.S. Cl. 89—1.7 **6 Claims**



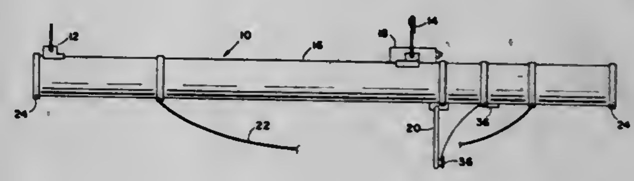
1. In a weapon system having a substantially cylindrical barrel and breech means rearward of said barrel, said barrel having a longitudinal axis along which a projectile is launchable,

said breech means having a reciprocable firing pin, said firing pin having a longitudinal axis laterally offset from said barrel and barrel axis,

a cylinder housing integral with said barrel and having an internal rearwardly extending substantially central stub, and

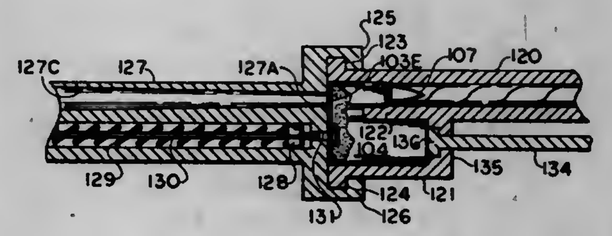
said breech means having a recoil vent, said recoil vent being substantially in operative alignment with said barrel.

3,890,879
ANTI-TANK LAUNCHER
Lonnie L. Looger, Madison, and Wiley B. Vickers, Huntsville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Nov. 21, 1973, Ser. No. 418,002
Int. Cl. G41f *3/02*
U.S. Cl. 89—1.816 **1 Claim**



1. A lightweight man-transportable rocket launcher comprising: a tube for storing and launching a rocket; a firing sight movably attached to said tube, said firing sight including a foldup forward and rear sight pivotally attached to said tube; means for storing said sight when not in use; a foldup shoulder recoil stop, and end caps for closing said tube and protecting a rocket in said tube until said launcher is activated for use, said end caps being provided with a removable end wall having scoring thereon to define a tear strip and to tab secured to the leading edge of said tear strip to actuate removal of said end wall.

3,890,880
AMMUNITION AND WEAPON SYSTEMS
Andrew J. Grandy, 2707 Grant Ave., North Hills, Pa. 19038
Division of Ser. No. 239,595, March 30, 1972, Pat. No. 3,857,339. This application Feb. 21, 1974, Ser. No. 444,581
Int. Cl.² F41F *3/02*
U.S. Cl. 89—1.705 **18 Claims**



1. In a weapon system having a substantially cylindrical barrel and a capsule chamber integral therewith, said barrel having a longitudinal axis, said chamber being laterally offset from said barrel and barrel axis,

longitudinally translatable breech means adapted to be rotated for securement in a locking position with said barrel and chamber, said breech means having a longitudinal passage for receiving a firing pin, said passage being in alignment with said chamber when said breech means is secured in locking position, and

a recoil vent provided in said breech means, said recoil vent being in alignment with said barrel when said breech means is in locking position.

3,890,881
AUTOMATIC FIRING WEAPON

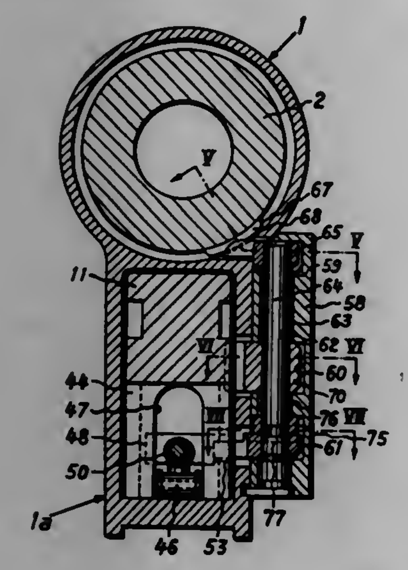
Ernst Hurlemann, Zurich, and Jurg Zellweger, Neerach, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon Buhrle & Co., Zurich, Switzerland

Filed Aug. 23, 1973, Ser. No. 390,953

Claims priority, application Switzerland, Aug. 31, 1972, 12889/72

Int. Cl. F41d *5/12*

U.S. Cl. 89—176 **5 Claims**



1. An automatic firing weapon comprising a housing, a weapon barrel movable relative to said housing, a breechblock mechanism including a breechblock displaceably mounted in said housing, a pivotable shaft, a safety lever pivotably mounted in the housing on said pivotable shaft, said breechblock having a stop, the safety lever in cooperative action with the stop at the breechblock preventing recoil movement of the breechblock, a control cam pivotally mounted in said housing on said pivotable shaft, the control cam and said safety lever being connected with said pivotable shaft, an unlocking lever mounted on said pivotable shaft, means for placing said unlocking lever in driving connection with said pivotable shaft and means associated with said breechblock for manually actuating said unlocking lever, said barrel acting by means of a control surface thereon upon the control cam sliding upon said control surface for displacing the safety lever into a position releasing the breechblock after firing a shot.

3,890,882
FLUID DEVICE HAVING PLASTIC HOUSING AND MEANS FOR MOUNTING A CYLINDER BARREL

Wilfred S. Bobier, 4518 Brightmore, Bloomfield Hills, Mich. 48013

Continuation-in-part of Ser. No. 60,333, Aug. 30, 1970, Pat. No. 3,739,691. This application Jan. 22, 1973, Ser. No. 325,128

Int. Cl. F01b *13/04*

U.S. Cl. 91—487 **5 Claims**

1. A fluid pressure energy translating device of the axial piston type comprising:

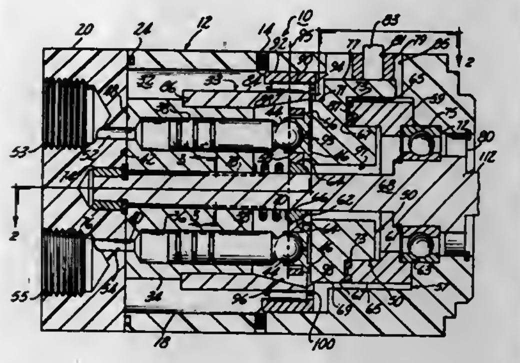
a housing having a longitudinal bore with a stationary valve plate at one end thereof;

a drive shaft rotatably carried within said housing bore, said drive shaft having a male spline;

a rotatable cylinder barrel mounted on said drive shaft and having one end in abutment with said valve plate, said cylinder barrel having a plurality of arcuately spaced cylinder bores, said cylinder barrel having a female spline mating with said drive shaft male spline to form a driving connection thereinbetween;

a bearing means having an inner race carried by the outer peripheral surface of said cylinder barrel, said bearing means having an outer race carried by the wall of said housing longitudinal bore such that said bearing means providing radial support for said cylinder barrel;

said male and female splines having complementary configurations for permitting self-centering alignment between said cylinder barrel and said drive shaft such that said cylinder barrel will float on said valve plate and said cylinder barrel will be centered with respect to said bearing means, said female spline having a pitch diameter which is greater than the pitch diameter of said male spline such that there is an enlarged radial clearance space between said splines;



a plurality of pistons with inner ends disposed for reciprocal stroking movement within said cylinder bores; and

an inclined thrust plate mounted in said housing in a driving relation with the other ends of said pistons for imparting a reciprocal stroking movement to said pistons within said cylinder barrel bores as said cylinder barrel rotates whereby the radially directed forces exerted on said cylinder barrel are not transferred to said drive shaft.

3,890,883
FLOW CONTROL ARRANGEMENT FOR AN AXIAL PISTON PUMP

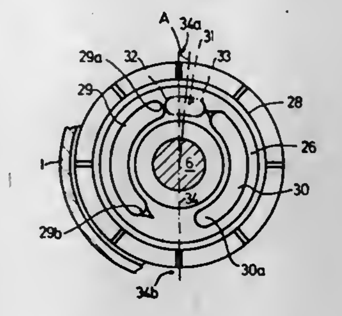
Werner Rometsch, Gerlingen; Walter Robeller, Boblingen; Gerhard Lutz, Faurndau; Eckehart Reichel, Aschaffenburg-Schweinheim; Paul Bosch, Ludwigsburg, and Gerd Vohringer, Schwieberdingen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Feb. 15, 1973, Ser. No. 332,749

Claims priority, application Germany, Feb. 25, 1972, 2208890

Int. Cl. F04b *13/04*

U.S. Cl. 91—499 **10 Claims**



1. Flow control arrangement for an axial piston pump, comprising cylinder body means having an axis, cylinders arranged in a circle about said axis, and pistons in said cylinders; housing means including a swash plate engaged by said pistons, one of said means being rotatable relative to the other means about said axis so that each piston is axially advanced and retracted by said swash plate between advanced and retracted dead center positions located in an axial plane; said cylinder body means having a first control face formed with a circular row of cylinder ports communicating with said cylinders, respectively, and said housing means having a second control face formed with a part-circular continuous inlet port and a part-circular continuous outlet port, respectively located on opposite sides of said plane, said inlet and said outlet port being the only ports formed in said second control face, said first and said second control faces cooperating during rotation so that said inlet and outlet ports are swept by said cylinder ports, said inlet port being longer than said outlet port and having one end located closer to said plane in the region of said retracted dead center position than half of the circumferential extension of each cylinder port so that each cylinder port communicates with said one end of said inlet port also after the respective piston has passed through said retracted dead center position and begins to move towards said advanced dead center position whereby the respective cylinder is completely filled while the center of the respective cylinder port moves a predetermined angle beyond said plane.

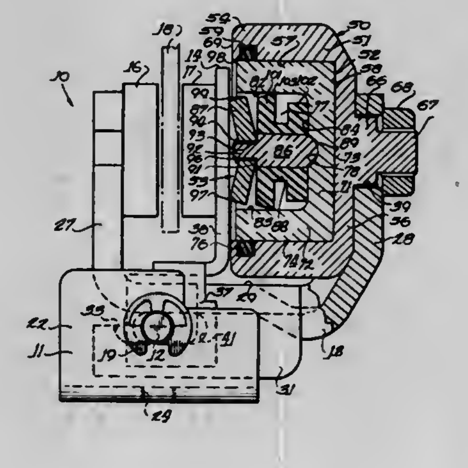
3,890,884
HYDRAULIC ACTUATOR

Russell E. Silberschlag, Glen Ellyn, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 23, 1973, Ser. No. 418,534

Int. Cl. F16j *1/10;* **F16d** *65/32*

U.S. Cl. 92—84 **3 Claims**



1. An hydraulic actuator comprising a housing member including a substantially cylindrical chamber opening outwardly through a wall thereof and a generally cup shaped piston slidably received within said chamber and adapted to move outwardly in response to fluid pressure in said chamber, said piston including head and skirt wall portions defining a central cavity opening outwardly of said actuator, said head portion including a seat in said cavity remote from the open end thereof, and

a thrust assembly extending into said central cavity having an annular foot disposed outwardly of said piston, a strut having a head portion engageable with said seat extending through said central cavity between said annular foot and said piston head wall, and a resilient collar embracing said strut adjacent said annular foot having intersecting planar surfaces thereon defining a peripheral sharp edge frictionally engaging said skirt portion of said piston, said resilient collar being an elastomeric sleeve including a pair of spaced annular portions, one of said annular portions defining said sharp peripheral edge engaging said piston skirt adjacent said annular foot, and the other of said annular portions having a face abutting said piston head wall portion outwardly of said seat, said collar peripheral edge yieldably urging said strut toward a centered position with respect to said piston skirt permitting displacement of said strut from said centered position under load while substantially isolating said piston skirt from lateral forces imposed on said thrust assembly under load.

3,890,885
ACTUATORS

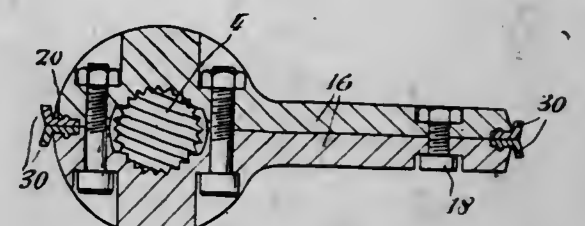
Alan Richard Brine Nash, 39 Abbott's Ride, Farnham, England

Filed July 18, 1973, Ser. No. 380,204

Claims priority, application United Kingdom, July 21, 1972, 34366/72

Int. Cl. F01c *9/00*

U.S. Cl. 92—125 **11 Claims**



1. A rotary actuator having a piston comprising a pair of similar opposed portions secured together to form a substantially planar vane-like member and peripheral sealing means extending around said member, a plane of jointing between said opposed piston portions being substantially coincident with a main central plane of the piston, a tubular recess being formed between said piston portions at one region of the piston, a shaft comprising bearing portions for mounting the piston in a rotary member extending into said tubular recess, and splines being provided on the shaft and on said opposed piston portions for interengagement to prevent rotation between the shaft and the piston portions, the shaft splines being formed by radially outwardly facing surfaces and the piston portion splines being formed by radially inwardly facing portions complementary to the shaft spline surfaces in engagement therewith, the splines on the two piston portions being confined to peripheral regions of the tubular recess remote from the plane of jointing.

3,890,886
APPARATUS FOR INTERLEAVING SHEETS OF PAPER BETWEEN INDIVIDUAL SLICES OF CHEESE FOR PACKAGES OF SLICED CHEESE

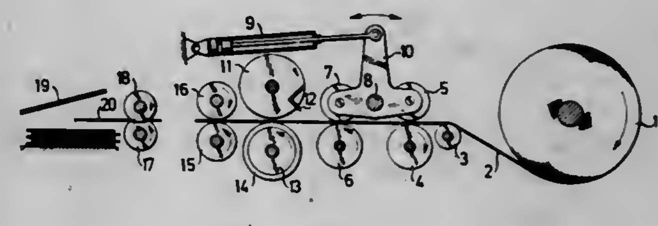
Andreas Fessler, and Ewald Fessler, both of Heimenkirch, Allgau, Germany, assignors to Hochland, Reich, Summer & Co., Heimenkirch/Allgau, Germany

Filed Oct. 23, 1973, Ser. No. 408,519

Claims priority, application Germany, Oct. 26, 1972, 2252605

Int. Cl. B65b *41/10*

U.S. Cl. 93—93 D **10 Claims**



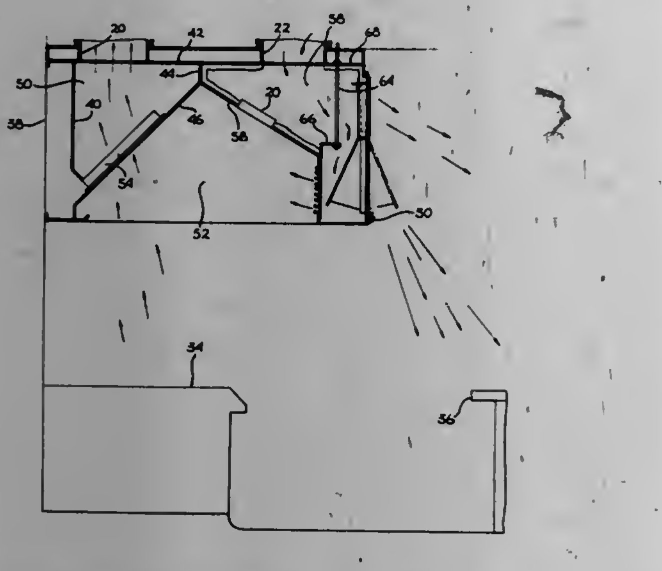
1. An apparatus for interleaving sheets of paper between individual slices of cheese for packages of sliced cheese comprising a pair of feeding rollers which feed a paper web from a roll of paper, a perforating cutter roller downstream of said feeding rollers which rotates continuously and at a faster peripheral speed than said feeding rollers and cooperates with a backing roller to separate a paper sheet of desired length from the leading web end, and a pair of rollers following said cutter roller to position said paper sheet without subsequent support underneath a falling cheese slice.

3,890,887
EXHAUST HOOD

Arnold S. Kaufman, Studio City, and Albert Sweet, Northridge, both of Calif., assignors to Elsters, Inc., Hollywood, Calif.

Filed Jan. 16, 1974, Ser. No. 433,727
Int. Cl. F23j *11/00*

U.S. Cl. 98—115 K **4 Claims**



1. An Exhaust Hood comprising:

a. means for defining an exhaust plenum for collecting fumes and vapors and delivering them to an exhaust outlet;

b. means defining a front plenum for coupling to a source of air;

c. means for directing air from said front plenum in a predetermined direction for passage at least in part along a flow path leading toward said exhaust plenum; and

d. a ventilation door on the front of said Exhaust Hood and in communication with said plenum, said ventilation door being movable from a closed position to an open position to direct air from said plenum generally outward and downward from said Exhaust Hood, said ventilation door being rotatable about a horizontal axis between said closed position and said open position, and having an upper portion above said horizontal axis and a lower portion below said horizontal axis, the front of said upper portion of said door above said axis and the rear of the lower portion of said door below said axis engaging cooperatively disposed members on said plenum when said door is closed, said door being movable to said open position by movement of said lower portion of said door outward whereby air from the plenum may flow outward over the top of said door and between the lower portion of said door and the front of said Exhaust Hood.

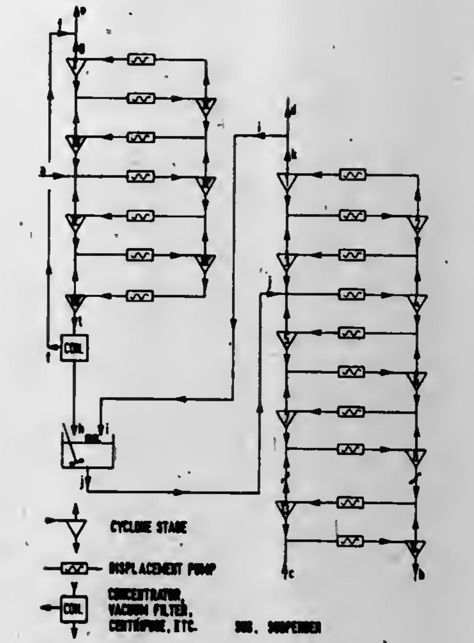
3,890,888
METHOD AND APPARATUS FOR THE RECOVERY OF NON-DILUTED OR LITTLE DILUTED JUICE AND OF STARCH FROM ROOT CROPS

Petrus Verberne, Hoogezand, Netherlands, assignor to W. A. Scholten's Chemische Fabrieken B.V. of W. A., Foxhol, Netherlands

Filed Dec. 22, 1972, Ser. No. 317,682
Claims priority, application Netherlands, Jan. 5, 1972, 7200127
Int. Cl. A23l *1/12*

U.S. Cl. 99—483 **12 Claims**

1. A method of recovering starch and slightly diluted juice from root crops, comprising the steps of grating tubers, without the addition of water, to a pulp in which the fibers are predominantly larger than 0.2 mm but not larger than 1 mm, feeding the pulp into at least the 4th hydrocyclone stage of a countercurrent hydrocyclone system containing at least 13 hydrocyclone stages each having a supply pump which is independent of counterpressure connected thereto, all hydrocyclone stages other than the first and final having the discharge conduit connected to the supply pump of the next succeeding stage and the overflow conduit connected to the supply pump of the next preceding stage, feeding countercurrently into the final hydrocyclone stage fresh water in an amount of up to 0.8 m³ per metric ton of tubers, and withdrawing from the final hydrocyclone stage a substantially pure starch fraction and withdrawing from the overflow of the first stage a fraction consisting of slightly diluted juice containing fibers.

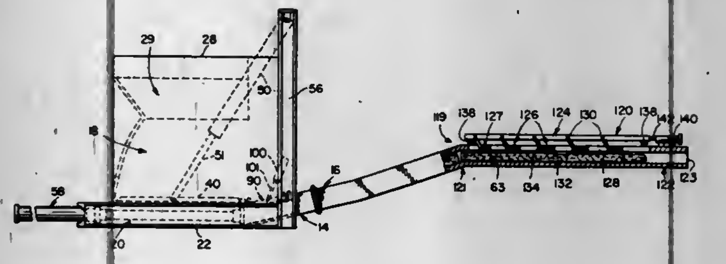


3,890,889
MATERIAL COMPACTING AND DISPOSAL APPARATUS

Francis B. Fishburne, 24 Summit Dr., Asheville, N.C. 28704

Filed Dec. 13, 1972, Ser. No. 314,601
Int. Cl. B30b *15/16, 15/30*

U.S. Cl. 100—48 **11 Claims**



1. In a material compacting and disposal apparatus, the combination of:

a press unit comprising

rigid means defining an elongated compression chamber having a uniform transverse cross-section throughout its length and an elongated lateral opening via which material can be supplied to the chamber,

a press platen having a shape conforming to the cross-sectional shape of said compression chamber,

first power means connected to said press platen to drive the same through said chamber,

confining wall means positioned adjacent said lateral opening to define a rigid precompression chamber having a cross-sectional shape conforming to said lateral opening, a gate having a plane shape conforming to the shape of said lateral opening and mounted for movement between an initial retracted position, in which uncompacted material can be supplied to said chambers, and an actuated position, in which said gate fills said lateral opening and completes said compression chamber, and

said power means connected to said gate and operative to force the same from said initial position through said precompression chamber to said actuated position to compress said material;

an extrusion housing forming a continuation of said compression chamber at the end thereof toward which said press platen is driven by said first power means, said extrusion housing comprising

a fixed wall conduit with a lateral opening extending lengthwise thereof and across the entire width thereof,

a rigid extrusion gate of plane shape conforming to and extending completely across said lateral opening of said conduit, said extrusion gate being mounted for pivotal movement about a transverse axis located adjacent said conduit, and

yieldable means connected to said extrusion gate and operative to yieldably maintain the same in a position within said conduit, the space between said extrusion gate and said conduit defining a tapering extrusion throat having a maximum cross-section smaller than said compression chamber cross-section; and

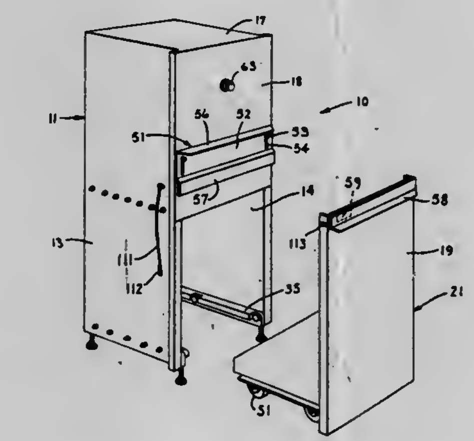
elongated conduit means connected to said extrusion housing for conducting compressed material away therefrom.

3,890,890
WASTE COMPACTOR WITH CLAMSHELL BAG SUPPORT

Ransom J. Hennells, Plymouth Township, Wayne County, Mich., assignor to Compactor Company, Inc., Belleville, Mich.

Filed Mar. 20, 1973, Ser. No. 342,979
Int. Cl. B30b *15/18*

U.S. Cl. 100—48 **16 Claims**



1. A waste compactor for permitting the depositing and compacting of waste within a container, comprising:

housing means;

extendible ram means mounted on said housing means adjacent the upper end thereof, said ram means being vertically extendible downwardly for permitting compacting of waste;

removable cart means coacting with the lower end of said housing means and including a substantially horizontal wall means positionable directly beneath said ram assembly when said cart means is in a first position permitting compacting of waste, said cart means being movable outwardly relative to said housing means to a second position wherein said cart means is laterally spaced from said ram means, said cart means when in said second position permitting a container to be mounted thereon or released therefrom; and

guide means coacting between said housing means and said cart means for guiding the movement of said cart means toward and away from said first position, said guide means including a pair of substantially parallel, horizontally elongated guide rails fixedly secured to the opposite sides of said housing means adjacent the lower end thereof, said guide rails each including upper and lower guide surfaces;

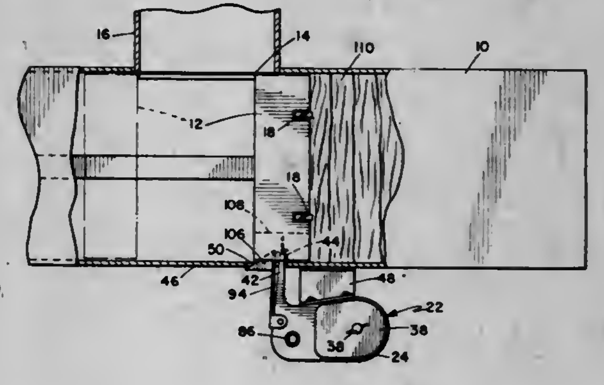
said guide means further including a pair of elongated, substantially L-shaped guide flanges fixedly secured to and projecting downwardly from the horizontal wall means of said cart means, said guide flanges being disposed adjacent and extending longitudinally along the opposite sides of said horizontal wall means, each said L-shaped guide flange including a substantially vertical leg which has its upper end fixedly secured to said horizontal wall means and a substantially horizontal leg fixedly secured adjacent the lower end of said vertical leg, said horizontal legs of said pair of guide flanges projecting outwardly away from one another, said L-shaped guide flanges in cooperation with said horizontal wall means defining a pair of substantially channel-shaped elements which open outwardly in opposite directions from one another, said channel-shaped elements being disposed to partially surround the guide rails when said cart means is moved toward or away from said first position.

3,890,891
TAGGING ATTACHMENT FOR HAY BALER

Don D. Floyd, 359 J St., and Lee M. Whittle, 598 W. Fredrick Rd., both of Brawley, Calif. 92227

Filed Aug. 9, 1974, Ser. No. 496,063
Int. Cl. B30b *15/00*

U.S. Cl. 100—102 **10 Claims**



1. A tagging attachment for a hay baler having a baling chamber with hay inlet, a reciprocating plunger for compacting hay in successive layers in the chamber to form a bale, holding means for holding compacted layers of hay in the chamber between strokes of the plunger, and control means for controlling the length of a bale, the tagging attachment comprising:

a casing having means for holding a roll of tags therein;

a hollow arm extending from said casing and having an end nozzle thereon;

mounting means for holding the casing on the hay baler with said nozzle projecting into the baling chamber;

feed means in said casings for feeding tags from the roll and through said arm, to extend one at a time from said nozzle;

a knife mounted on said arm for cutting off the extended tag;

and timing means for timing the knife action to cut off the tag between predetermined layers of the hay bale.

3,890,892
ULTRASONIC MARKING

Guenter H. Loose; William J. Diesel, and Thadeus S. Graczyk, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 85,595, Oct. 30, 1970, abandoned. This application Nov. 9, 1972, Ser. No. 305,050
Int. Cl. B44c *1/24*

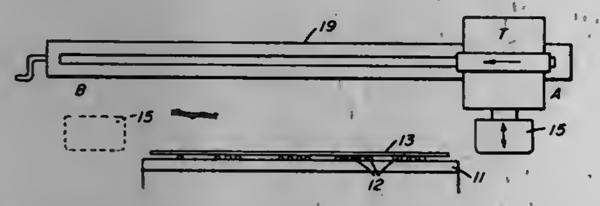
U.S. Cl. 101—32 **2 Claims**

1. A method for embossing indicia into a thin sheet of malleable thermoplastic material which comprises:

providing an anvil having an indicia defined thereon by a plurality of individual spaced dot-like protuberances projecting from the surface of said anvil;

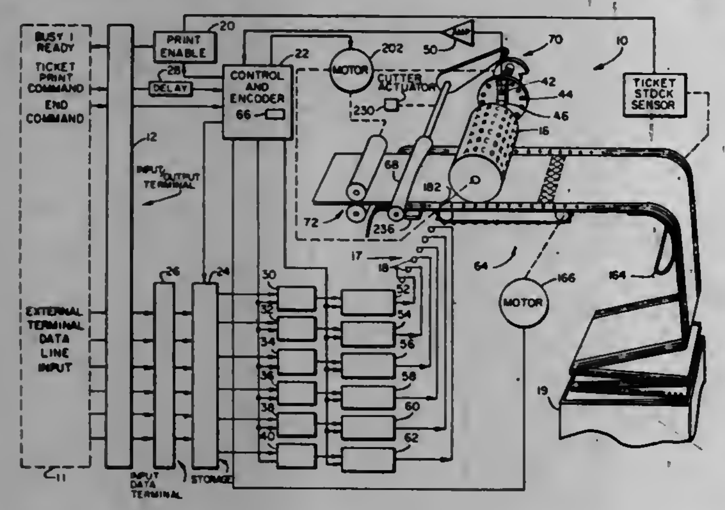
positioning a thermoplastic material over the anvil with one side of said material resting upon and in engagement with the dot-like protuberances; and

applying ultrasonically vibrating pressure impulses generated by an ultrasonic vibrating device comprising a transducer and horn to the opposite side of said thermoplastic material for applying heat and pressure to said material causing said material in register with and resting on the protuberances to melt, be displaced and to resolidify forming a plurality of clear, undistorted, indentations extending partially through said material and which due to the reduced thickness at said indentations are substantially transparent and clearly visible in the presence of a weak light.



3,890,893
MULTIPLE SHEET TICKET PRINTER

Robert D. Kodis, Brookline, Mass., assignor to Di/An Controls, Inc., Boston, Mass.
Continuation of Ser. No. 300,144, Oct. 24, 1972, abandoned. This application May 13, 1974, Ser. No. 469,354
Int. Cl. B41f *13/58*, *13/60*; **B41j** *9/10*
U.S. Cl. 101—69 **3 Claims**



1. A high speed rotary printer for printing selected symbols on an endless web of multiple sheet stock formed with sprocket holes disposed in spaced parallel relationship with the longitudinal axis thereof, said printer comprising:

a. a rotatable printing cylinder having rows of raised characters disposed about its periphery in arcuate columns;

b. an impactor assembly including a plurality of actuators, impactors and hammers, one of each said actuator associated with one of each said impactors, one of each said impactors associated with one of each said hammers, one of each said hammer associated with one of each said rows of raised characters, each said actuator having energized and deenergized states, each said impactor operative between a rest position and an actuated position, each said hammer restrained for reciprocal movement between a rest position and a strike position, said impactor moved from its rest position to its actuated position when said actuator associated therewith is momentarily in its energized state, said moved impactor momentarily engaging said hammer associated therewith, said engaged hammer moving from its rest position to its strike position and decoupling from said moved impactor, said moved impactor returning to its rest position, said engaged hammer striking the multiple sheet stock and momentarily forcing the multiple sheet stock against one of said raised symbols in said row in registration with said engaged hammer, said hammer returning to its rest position, said raised symbol pressed against the multiple sheet stock being printed on each of the multiple sheets;

c. first sprocket drive means;

d. second sprocket drive means;

e. a belt engaging said first and second sprocket drive means, said belt including sprocket pins adapted for engagement with the sprocket holes in the multiple sheet stock, the multiple sheet stock forwardly advancing in a path from said first sprocket drive means to said second sprocket drive means when engaged by said belt;

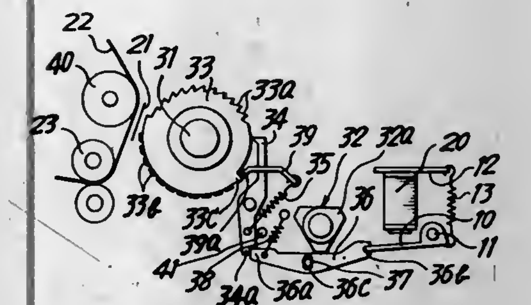
f. a rotating cutting blade operatively connected to said second sprocket drive means, said rotating cutting blade operative to sever the sprocket holes from the multiple sheet stock;

g. rotary cutter means positioned in said path after said second sprocket drive means, said rotatable printing cylinder disposed in said path between said first sprocket drive means and said rotary cutter means, said rotary cutter means disposed in perpendicular relationship to the longitudinal axis of the multiple sheet stock and operative to sever the multiple sheet stock after said symbols are printed thereon; and

h. tension means engaging opposite faces of the multiple sheet stock, said tension means disposed in said path after said rotary cutter means, said tension means providing tension on the multiple sheet stock and ejecting the printed multiple sheet stock from the printer when severed by said rotary cutter means.

3,890,894
ELECTROMAGNETICALLY-OPERATED PRINTER

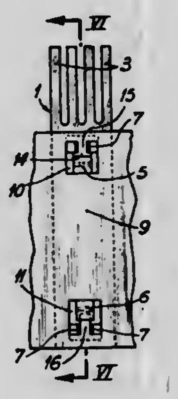
Shohachi Nihira, Tokyo, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan
Continuation-in-part of Ser. No. 356,472, May 2, 1973, Pat. No. 3,848,527. This application Aug. 15, 1974, Ser. No. 497,562
Claims priority, application Japan, May 4, 1972, 47-44378
Int. Cl. B41j *5/00*
U.S. Cl. 101—93.18 **1 Claim**



1. An electromagnetically-operated printer for printing on paper comprising a type wheel which comprises a plurality of column wheels frictionally mounted on a shaft in groups, each column wheel having types, hooks and a projection operative as a reset edge, means for printing the types on the paper, stopping means for engaging with said projections of all of the column wheels, said types being so arranged that when all column wheels are stopped by said stopping means, the wheels in each group are positioned in different phases, a select pawl provided for each column wheel and adapted to engage with said hooks of each column wheel, type selecting means for selecting a given type for each of the column wheels of said type wheel, column selecting means for each group of wheels rotating at a predetermined ratio relative to the shaft of said type wheel, said column selecting means being functionally coupled to said type selecting means, and electromagnetic means each corresponding to said column selecting means and functionally coupled to said type selecting means, said electromagnetic means being controlled by an electrical control means for comparing a given type with the type position of said type wheel, and said type selecting means being actuated only when both said column selecting means and said electromagnetic means are simultaneously actuated.

3,890,895
ENDLESS TYPE-CARRYING TAPE FOR PRINTING MACHINE

Jacques Roland Deproux, Sevres, France, assignor to Compagnie Honeywell Bull (Societe Anonyme), Paris, France
Filed Nov. 12, 1973, Ser. No. 414,998
Int. Cl. B41i *1/20*
U.S. Cl. 101—111 **9 Claims**



1. A type-carrying assembly for impact printers, comprising in combination:

an endless, flexible tape adapted to be supported by the type-carrying drive of an impact printer; and

a series of type-bearing members secured to said tape along the length thereof, each such member comprising an elongate strip of stiff, resilient material presenting a base portion disposed in face-to-face relation with said tape to extend transversely thereof and a free end portion projecting laterally of the tape, said free end portion providing a series of flexible and resilient type-bearing fingers joining said base portion near that edge of the tape from which said free end portion projects and extending therefrom essentially perpendicular to the length of the tape, said fingers being separated from each other, said tape being provided with transversely spaced openings for each member, and the base portion of each member being provided with locking tab means consisting of a pair of oppositely directed and outwardly offset tangs adapted to fit through said openings when the member is sprung into bowed shape and to lock with the tape when released from such bowed shape.

3,890,896
TEXTILE-PRINTING MACHINE

Peter Zimmer, Untere Sparchen 54, A 6330 Kufstein, Austria
Filed Jan. 3, 1973, Ser. No. 320,739
Claims priority, application Austria, Jan. 4, 1972, 3172/72; Feb. 24, 1972, 001531/72
Int. Cl. B41f *15/40*, *15/44*
U.S. Cl. 101—119 **6 Claims**

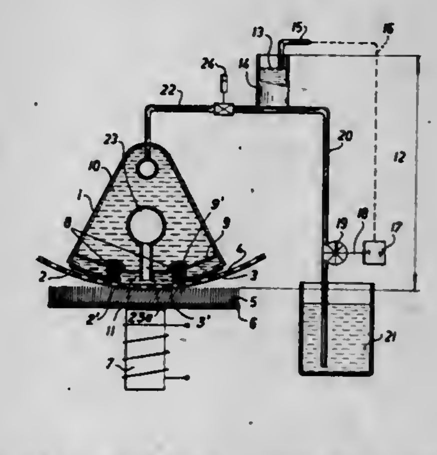
1. In a textile-printing machine, in combination:

a downwardly open receptacle for coloring fluid;

a pair of elastic sealing strips extending across part of the open bottom of said receptacle and forming a discharge slot therebetween, said strips sloping downwardly toward said slot and being provided with upturned confronting edge bounding said slot;

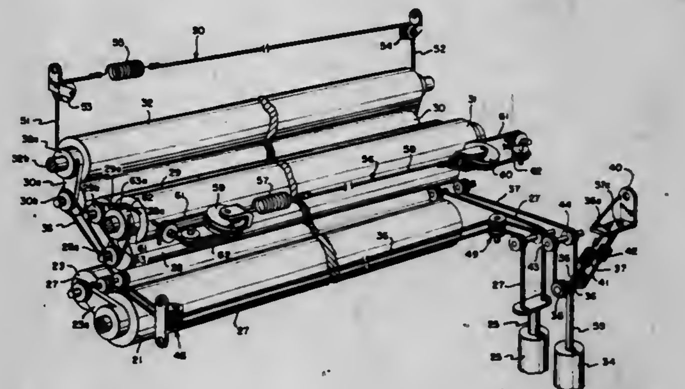
an apertured masking screen underneath said receptacle bridging said slot; and

loading means within said receptacle bearing on said strips adjacent said upturned edges for holding the lowest parts of said strips in firm contact with said screen against an underlying substrate to be colored, thereby preventing said coloring fluid from penetrating between said mask and said strips.



3,890,897
OFFSET ROTARY PRINTING PRESS WITH CABLE ACTUATED FORM ROLLERS

Chris A. Christoff, Lancaster, Calif., assignor to Stevens Corporation, Fort Worth, Tex.
Division of Ser. No. 55,016, July 15, 1970, Pat. No. 3,774,537. This application Aug. 2, 1972, Ser. No. 277,825
Int. Cl. B41f *31/36*
U.S. Cl. 101—148 **4 Claims**



1. A rotary printing press having a plate cylinder and form rollers for contact with the plate cylinder comprising a cable actuated system for moving at least two form rollers simultaneously toward a plate cylinder; said system including:

a. a first motor in a fixed position;

b. at least two cables connected to and drawn by said first motor;

c. said form rollers being pivotally attached about some predetermined axis other than their own;

d. each form roller having two end members with each end defining a sheave for receiving said cables;

e. said cables being connected to the form rollers by looping one cable about the sheave at one end of each form roller, looping the other cable about the sheave at the other end of each form roller, and securing each cable to a fixed point such that drawing of said cables will cause the form rollers to move simultaneously toward plate cylinder; and

f. a spring loaded cable actuation system separate from said first motor and said two cables and acting opposite thereto for moving the form rollers away from the plate cylinder upon deactuation of said first motor and for maintaining the form rollers at a predetermined distance from the plate cylinder until actuation of said first motor.

3,890,898

DIRECTIONALLY REVERSIBLE ROTARY OFFSET PRINTING MACHINE AND WETTING SYSTEM THEREFOR

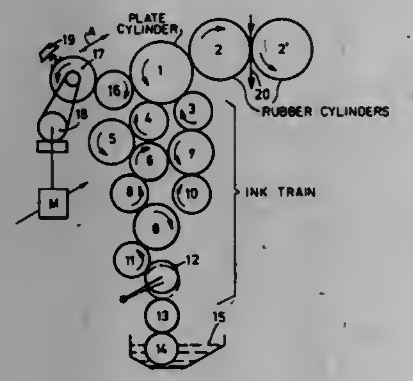
Hermann Fischer, Augsbury, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Augsburg, Germany

Filed Dec. 26, 1973, Ser. No. 427,788

Claims priority, application Germany, Jan. 16, 1973, 2301879

Int. Cl.^{2} B41F *7/26*

U.S. Cl. 101—148 **8 Claims**



1. Directionally reversible rotary offset printing machine comprising
a plate cylinder operable in either direction of rotation when printing;
inking means (3–15) having a fixed location with respect to the plate cylinder (1) and applying ink to the plate cylinder;
a wetting system (16–19) having a fixed location with respect to the plate cylinder (1), separate from the inking means, so that the relative position of the wetting system and of the inking means, with respect to the surface of the plate cylinder reverses upon reversal of the direction of rotation of the plate cylinder (1);
wherein the wetting system comprises
at least two rollers, one of the rollers (17) being axially shiftable and forming a rubbing cylinder and having a surface capable of being coated by ink,
the other roller (16) forming a wetting liquid transfer roller having a rubberized surface and being located in frictional, rotation-transmitting engagement with the rubbing cylinder (17) and further engaging the plate cylinder (1), the circumferential speed of said wetting transfer roller (16) being controlled by its engagement with the rubbing cylinder (17) and differing from the circumferential speed of the plate cylinder (1);
means (M) positively driving the shaft of the rubbing cylinder (17) so that the surface of the rubbing cylinder (17) will be rotating at a circumferential speed differing from the surface of the circumferential speed of the plate cylinder, as well as being axially reciprocating;
and means (19) applying a wetting liquid to the surface of the rubbing cylinder (17) so that a fine film of wetting liquid will form over ink deposited on the surface of the rubbing cylinder by transfer from the plate cylinder (1) over the transfer roller (16), for application of said wetting liquid to the plate cylinder by the transfer roller (16) when driven by engagement of its ink-and-wetting liquid coated surface with the ink-and-wetting liquid coated surface of the rubbing cylinder (17).

3,890,899

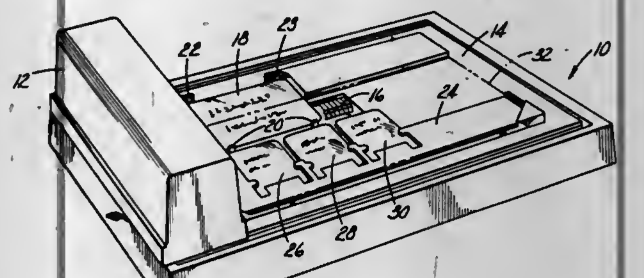
CARD GAGE FOR DATA RECORDER

Walter James Brugge, Highland Heights, and Edward Francis Takacs, Willoughby, both of Ohio, assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Feb. 25, 1974, Ser. No. 445,799

Int. Cl. B41f *27/04*

U.S. Cl. 101—269 **13 Claims**



1. In a data recorder apparatus for imprinting data from a plurality of generally rectangular embossed information cards disposed on a rigid bed, a mounting for holding the cards securely in place during imprint, said mounting comprising:
an elongated main body of generally planar configuration mounted to the data recorder bed,
a plurality of gage fingers longitudinally spaced along the length of said main body and integral therewith, each of said fingers extending laterally outward from said main body and generally disposed in the plane thereof, each of said fingers including a pair of oppositely facing surfaces generally perpendicular to the recorder bed and defining side gages, the side gages on adjacent fingers being spaced apart a distance approximately equal to the width of a card for engagement with the side edges of the card,
a plurality of elongated wall surfaces longitudinally spaced along the length of said main body, each being perpendicular to said side gages and the data recorder bed and defining a bottom gage adapted to engage the bottom edge of a card,
each of said fingers includes a distal end portion spaced from said main body, each distal end portion including a pair of protrusions extending in opposite directions laterally from said side gages of the associated finger, said protrusions defining retaining gage surfaces which cooperate with notches in the side edges of the cards to prevent their movement away from said bottom gage, and
a plurality of tab portions integral with said main body, each of said tab portions extending laterally outward from said main body in the same general direction as said fingers and overhanging one of said bottom gages to retain the bottom edge of an inserted card, said protrusions being spaced from said main body by a distance greater than the distance said tab portions extend outwardly from said main body, whereby the bottom edge of a card may be inserted under said tab portion and the notches brought down over said protrusions when mounting the card.

3,890,900

ELECTRICAL SAFING AND ARMING CIRCUIT

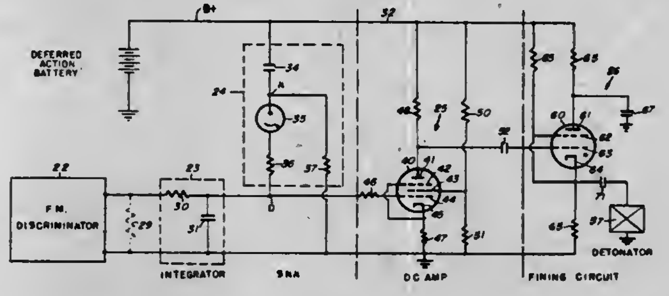
William I. Gould, Jr., Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 5, 1960, Ser. No. 60,755

Int. Cl. F42c *15/40*

U.S. Cl. 102—70.2 R **4 Claims**

1. A safing and arming circuit for blocking transients in an electronic fuze caused by the rising voltage of a deferred-action battery, comprising: an amplifier having a plate electrode connected to said battery, a control grid, an input terminal, and a resistor connecting said grid to said terminal; and an inhibiting circuit having a capacitor, a gaseous discharge voltage regulator tube, and a current limiting resistor connected serially between said battery and said input terminal for producing an inhibiting voltage at said terminal only during the rise time of said rising voltage.



3,890,901

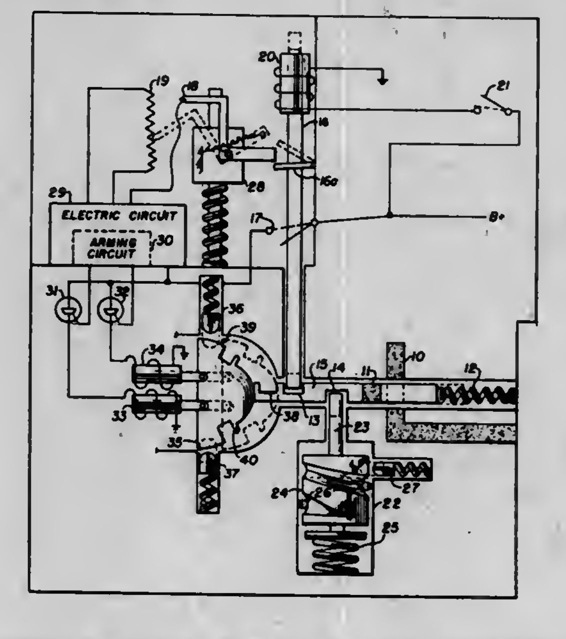
DIGITAL ELECTRONIC SAFETY AND ARMING SYSTEM

Matthew E. Anderson, Ontario, and Stephen L. Redmond, China Lake, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 255,746, May 22, 1972, Pat. No. 3,793,890. This application Oct. 29, 1973, Ser. No. 410,922

Int. Cl.^{2} F42C *9/00, 11/00, 15/40*

U.S. Cl. 102—70.2 R **10 Claims**



1. A digital electronic safety and arming system for an explosive missile comprising:
an arming path operative upon actuation for detonating said missile;
means for causing a discontinuity in said arming path;
a first interlock engaged with said means for maintaining said discontinuity;
a safety release responsive upon actuation for disengaging said first interlock;
a second interlock engaged with said means and being responsive to a predetermined minimum acceleration for disengagement;
means for producing a digital output signal representative of distance in response to an acceleration signal developed during a determinable fixed time period;
comparator means for comparing said output signal with a digital reference signal representative of a minimum safe distance, and producing an arming signal when the compared signals are equal; and
arming means responsive to said arming signal for eliminating said discontinuity thereby arming said missile.

3,890,902

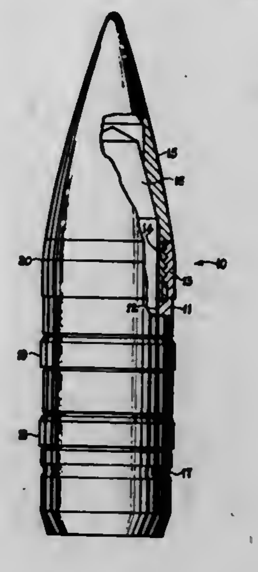
PROJECTILE

Bruce W. Travor, Holland, Pa., and Samuel L. Brown, Willingboro, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 4, 1973, Ser. No. 421,570

Int. Cl.^{2} F42B *13/16, 13/06*

U.S. Cl. 102—93 **3 Claims**



1. In an aerodynamically stable projectile having a heavy penetrator positioned within a non-discarding sabot,
said non-discarding sabot including a sabot body portion and an aerodynamic windshield nose member threadedly secured thereto,
said heavy penetrator secured within said sabot body portion and said nose member,
said nose member having a forward tapered external surface, said nose tapered surface terminating in a closed forward end,
said sabot body portion having a forward exterior surface containing a cylindrical portion and a tapered portion forwardly thereof defining an origin of ogive therebetween, said tapered sabot portion being a mating continuation of said nose tapered surface,
said sabot body portion carrying a first rotating band rearward of the center of gravity of said projectile, and
a second rotating band having a mid-point located on said sabot body portion forward of said projectile center of gravity.

3,890,903

STORAGE ASSEMBLIES

Richard G. D. Showell, Bishampton, near Pershore, England, assignor to Bar Productions (Bromsgrove) Limited, Bomsgrove, England

Filed Nov. 30, 1973, Ser. No. 420,694

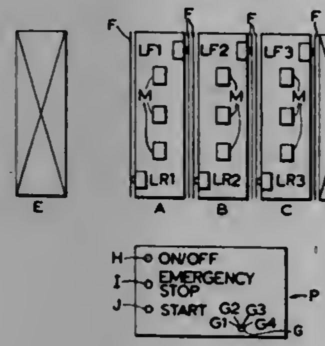
Claims priority, application United Kingdom, Aug. 4, 1973, 37102/73

Int. Cl. A47b *53/00*

U.S. Cl. 104—1 R **14 Claims**

1. A storage assembly comprising a row of storage members which are movable along the length of the row in either of two opposite directions so that a gangway can be provided between any two neighbouring storage members; drive means associated with each storage member which serves to move it along the length of the row; two drive switch means associated with each storage member which each control the drive means associated with said storage member and operate to cause the latter to be driven in a different direction along the length of the row; separate elongate feeler bars mounted on both sides of each storage member towards the bottom thereof so that each extend substantially the full width of the storage member and is operated by the neighbouring storage member opposite when said storage member on which it is mounted has closed onto said neighbouring storage member; two sensor switches

mounted on each storage member which are each operated by a respective one of said feeler bars when the latter is operated; a central programmer including a plurality of selector switches and manually operable means which control operation of the selector switches in a predetermined manner for selection of the different gangways; and a plurality of control circuits each of which includes a selector switch, a sensor switch and one



of said drive switch means which is associated with the same storage member as the sensor switch and which operates to cause the associated drive means to drive said storage member in a direction which results in operation of the sensor switch through the associated feeler bar, said drive switch means being operative only when the selector switch is operated and the sensor switch is not operated.

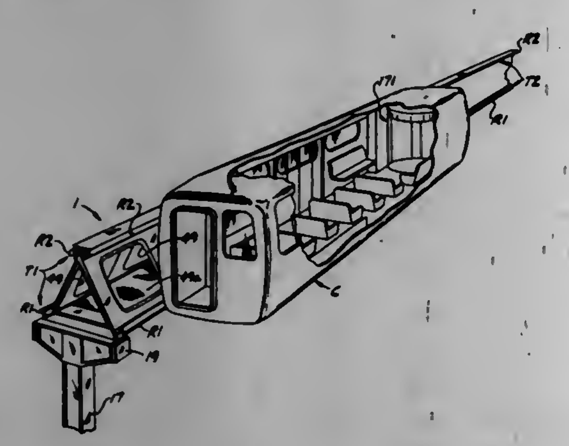
3,890,904
RAILWAY SYSTEM

Lawrence K. Edwards, 565 Arastradero Rd., Palo Alto, Calif. 94306

Filed Oct. 1, 1973, Ser. No. 402,299

Int. Cl. E01b *25/08*

U.S. Cl. 104—121 **25 Claims**



2. A railway system as set forth in claim 1 wherein the car supporting and guiding means comprises inclined wheels that engage the head of the lower rail, one wheel ahead of the center of the car and one wheel behind the center of the car, said lower rail and wheels being in a plane inclined to the vertical oppositely from the inclined plane of the rail heads.

3,890,905
APPARATUS FOR DRIVING A DEVICE WITHIN A PIPE

Edward A. Clavin, Houston, Tex., assignor to CRC-Crose International, Inc., Houston, Tex.

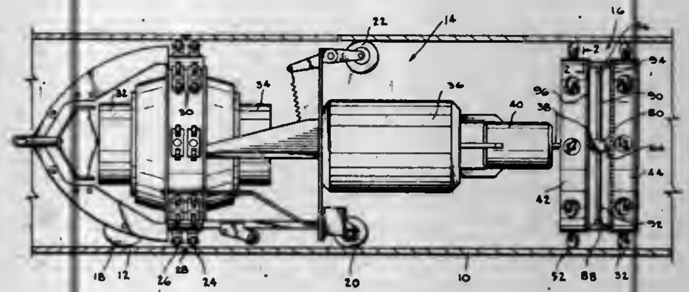
Filed Feb. 1, 1974, Ser. No. 438,645

Int. Cl.^{2} B61B *13/10;* **B23B** *31/40;* **B08B** *9/04*

U.S. Cl. 104—138 G **13 Claims**

1. An apparatus for driving a device within a pipe comprising:

- a. a first drive member, said first drive member having its axis coincidental with the axis of said pipe, said first drive member having a first rim thereon, said first drive member having a hub at its center of rotation and a plurality of spokes supporting said rim which extend between said hub and the interior of said rim;
- b. a second drive member, said second drive member having its axis coincidental with the axis of said pipe, said second drive member having a second rim thereon, said second drive member having a hub at its center of rotation and a plurality of spokes supporting said rim which extend between its hub and the interior of its rim;



- c. a plurality of wheels;
- d. means for mounting said plurality of wheels on the rims of said first and second drive members, said wheels extending outwardly from said first and second rims to engage the interior of said pipe; and
- e. means for rotating each of said first and second drive members in opposite directions about their axes whereby engagement of said wheels against the interior of said pipe develops a driving force to move the device through the pipe.

3,890,906
LINEAR SYNCHRONOUS MOTOR FOR MAGNETICALLY LEVITATED VEHICLE

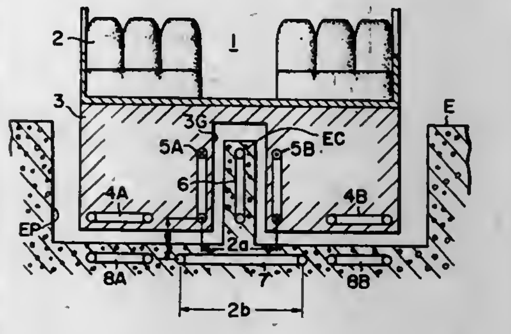
Naoki Maki, Naka, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 27, 1973, Ser. No. 345,475

Claims priority, application Japan, Mar. 28, 1972, 47-31005

Int. Cl. B61b *13/08*

U.S. Cl. 104—148 SS **11 Claims**



1. In a magnetically levitated vehicle which includes a linear synchronous motor having field coils on the vehicle for generating a constant magnetic field and driving coils disposed on the ground and opposite to the path of said field coils, the improvement wherein the ratio of the width of said driving coils to the width of said field coils is chosen so as to fall in the range expressed by the following formula, where $2a$ is the width of said field coils, $2b$ is the width of said driving coils, and g is the average distance between the paths of said field coils and said driving coils in the normal running of the vehicle:

$$1+\frac{g}{2a} \leq \frac{b}{a} \leq 1+\frac{g}{a}+\sqrt{\frac{2g}{a.}}$$

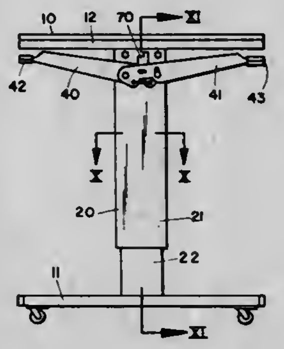
3,890,907
VERTICALLY ADJUSTABLE OVERBED TABLE

Warren J. Peterson, Stevens Point, Wis., assignor to Joerns Furniture Company, Stevens Point, Wis.

Filed Oct. 24, 1973, Ser. No. 409,360

Int. Cl. A47b *9/02*

U.S. Cl. 108—136 **14 Claims**



1. A vertically adjustable overbed table comprising:

a pedestal, a horizontal table top mounted at the top of said pedestal and a base platform at the lower end of said pedestal;

said pedestal including an outer column and an inner column, said outer column telescopically engaging said inner column and being adapted for vertical telescoping movement with respect to said inner column; at least one spring means associated with said columns for maintaining the telescoping movement of said outer column and said inner column in approximate equilibrium; and a clutch assembly mounted within said pedestal;

said clutch assembly including a rotatable clutch drum, means for rotating said drum during telescopic movement of said columns, a tensioned clutch spring means surrounding said drum for permitting upward movement of one of said columns with respect to the other of said columns when an upward force is exerted thereon sufficient to overcome the equilibrium effect of said constant force spring and for permitting downward movement of said one column with respect to said other column only when the tension of said clutch spring is released; and means for releasing the tension of said clutch spring.

3,890,908
METHOD AND APPARATUS FOR PYROLYTICALLY REDUCING WASTE

Jurgen von Klenck, Dusseldorf; Erich Michel, Essen, and Klaus-Dieter Gerstenacker, Dusseldorf, all of Germany, assignors to Mannesmann-AG, Dusseldorf, Germany

Filed Jan. 25, 1974, Ser. No. 436,484

Claims priority, application Germany, Jan. 26, 1973, 2304369

Int. Cl. F23g *7/00*

U.S. Cl. 110—8 R **39 Claims**

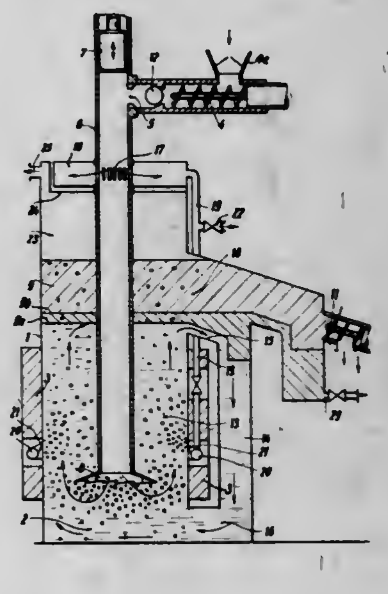
1. Method of pyrolytically reducing waste products under exclusion of air comprising the steps of:

feeding the waste products to and deep into a bath of molten material for discharge into the bath well below the top thereof, the waste being composed predominantly of components other than the material, the molten material having elevated temperature sufficient to sustain pyrolytic reduction of waste and under conditions causing the waste products to drift freely upwardly in the molten material thereby pyrolytically decomposing and reducing the waste product, through continuing heat transfer from the molten material to the waste product under direct contact therewith; and

extracting the products as resulting from the pyrolytic reduction from above the surface of the bath including continuous discharge of gas developing upon waste decompositioning.

23. Apparatus for pyrolytically reducing waste products comprising:

first means constructed for exclusion of air, for holding a bath of molten material at elevated temperatures sufficient to sustain reduction of waste;



second means projecting into the first means for feeding the waste products to and discharging them deep into a bath of molten material when in the first means through discharge opening well below the surface of the bath and under conditions causing the waste products to drift freely in upward direction in the molten material thereby pyrolytically reducing the waste products through continuing heat transfer from the molten material to the waste product under direct contact therewith;

third means, external to the interior of the first means for continuously heating the bath; and

means for extracting the products as resulting from the pyrolytic reduction from above the surface of the bath.

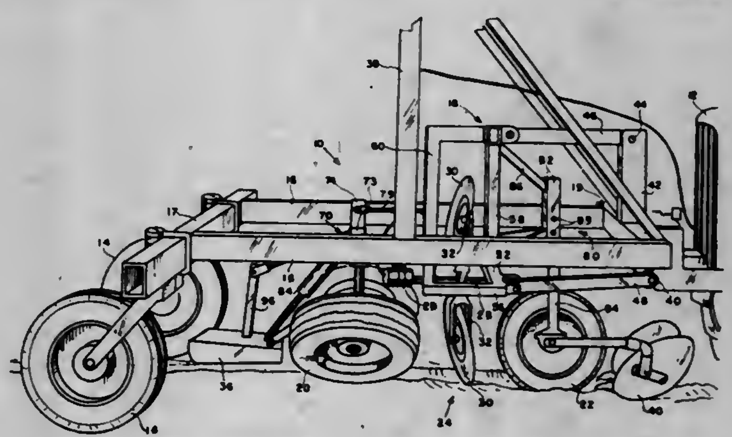
3,890,909
DEVICE FOR ALIGNING, CUTTING AND COVERING SEED CANE

Vernie A. Boots, Belle Glade, Fla., assignor to A. Duda & Sons, Inc., Oviedo, Fla.

Filed Mar. 8, 1973, Ser. No. 339,279

Int. Cl. A01c *1/00*

U.S. Cl. 111—1 **16 Claims**



1. A seed cane cutting device comprising a wheeled main frame that can be caused to move through a field, a floating frame pivotally connected to said main frame, said floating

frame supporting a rotary type cutter assembly, said cutter assembly being disposed in a position to cut seed cane lying on the ground during its rotation, with the plane in which said cutter assembly is operative being substantially perpendicular to the path of travel of the prime mover, means for driving said cutter assembly in rotation in a pre-established relationship to the speed of travel of the prime mover over the ground, such that the faster the prime mover travels, the faster said cutter assembly is caused to rotate, said floating frame utilized for carrying said rotating cutter assembly having a wheel operatively disposed on its underside aft of said cutter and operatively associated therewith, said wheel serving not only to support a substantial portion of the weight of said floating frame, but also able to hold substantially stationary during the cutting operation, the canes encountered and acted upon by said cutter assembly.

3,890,910
METHOD OF LAYING WEBS OF COMPOSITE MATERIAL CONTAINING PLANT SEED

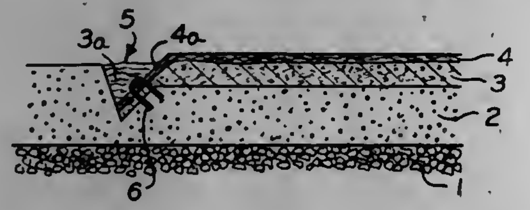
Herbert Angruner, Vienna, Austria, assignor to Bunzl and Biach Aktiengesellschaft, Vienna, Austria

Filed Apr. 19, 1973, Ser. No. 352,422

Claims priority, application Austria, Apr. 19, 1972, 3423/72

Int. Cl. A01c *1/00*

U.S. Cl. 111—1 **11 Claims**



1. Method of laying composite webs containing plant seeds over a field surface comprising:

treating said field surface by producing a water-permeable gravel foundation, applying and solidifying a layer of sand, applying a complete fertilizer having depot action, applying a vegetation layer and compacting it, applying a complete fertilizer which is immediately absorbable, and slightly roughening the surface;

then laying the composite webs over the surface of the field; sewing the edges of the webs to each other;

fastening the webs to the ground by removable wire clamps; and

spreading a thin layer of sand in an amount of about 0.3 to 1 kg/m².

3,890,911
AUTOMATIC HEMMING MACHINE

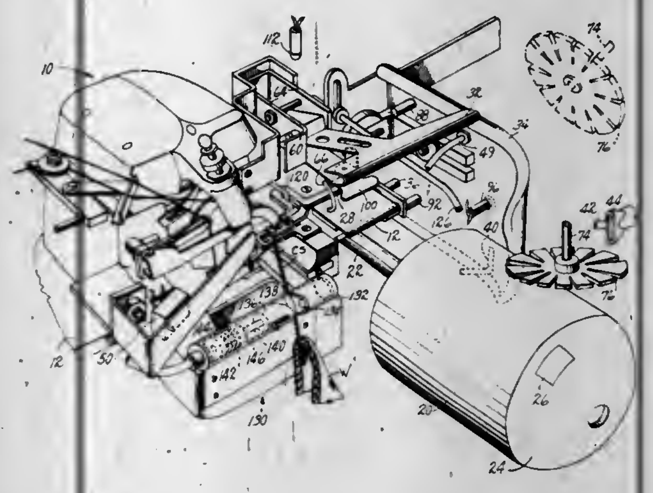
Edward S. Babson, Ipswich; John W. Brennan, Salem; Robert F. Gorini, Beverly, and Ronald C. Mason, Hamilton, all of Mass., assignors to USM Corporation, Boston, Mass.

Filed Apr. 11, 1974, Ser. No. 460,165

Int. Cl. D05b *21/00, 35/10, 37/04*

U.S. Cl. 112—121.12 **13 Claims**

11. In combination with an overedging machine hairing stitch forming means, inner and outer hemmers movable into and out of cooperative relation, an edge gage, and feed mechanism for feeding the peripheral margin of a tubular work piece to be hemmed in a path extending along the gage, through the hemmers, and through the operating locality of the stitch forming means, an automatic work guidance mechanism comprising a drum-like rotary work feeder having an axis generally normal to said path and adapted loosely to receive and support the workpiece, and a movable member frictionally engageable with portions of the workpiece to urge it axially of the work feeder during hemming, means responsive during a cycle of hemming operation first to the unfinished marginal edge of the workpiece and then to the finished edge of the workpiece for controlling said automatic guidance mechanism, means for moving the hemmers into and out of cooperative relation, means for ejecting the workpiece from the machine, means for terminating operation of the stitch forming means to provide chain-off, means for severing the chain-off, and control mechanism including a trigger responsive to the finished edge for automatically and sequentially actuating said means for moving the hemmers out of cooperative relation, sais means for ejecting the workpiece from the machine, said means for terminating operation of the stitch forming means to provide chain-off after the hemming has overlapped, and then said means for severing the chain-off to release the finished workpiece.



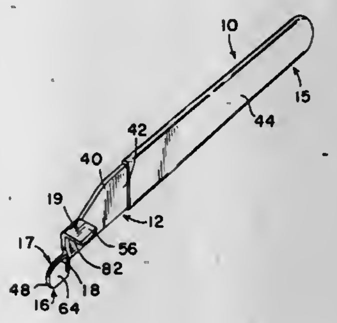
3,890,912
HAND TOOL FOR OPENING CANS

Claude A. Young, 126 Kensington, LaGrange, Ill. 60525

Filed Sept. 30, 1974, Ser. No. 510,618

Int. Cl. B67b *7/00*

U.S. Cl. 113—1 K **8 Claims**



1. A can opener of the type adapted to open cans by unfolding the can ridge that is formed at one end of the can by folding the end rims of the can end closure and can side wall against the side of the can to define one ridge edge that projects away from the can, a second opposing ridge edge that lies about the can side wall, and a composite flange structure separating said ridge ends that lie about the can side wall in juxtaposition therewith, said opener comprising:

a lever having a hand grip portion at one end of same,

with the other end of said lever defining a blade portion,

said blade portion defining a rounded working edge that is convexly rounded longitudinally of said lever and is grooved longitudinally of same,

said working edge being offset to one side of said lever approximately 0.090 inch but being in substantial parallelism with said lever hand grip portion,

with said groove being proportioned to define along the side of said blade portion edge that is at said one side of said lever a marginal wedging rim proportioned to be wedged between the can ridge second edge and the can side wall, and a fulcrum element fixed to said lever and adjacent said blade portion and between same and said hand grip portion and projecting laterally of said blade portion, in the direction said blade portion is offset from said hand grip portion, for placing same on the can ridge one edge for fulcrum serving purposes,

whereby, when the side of said blade portion at said one side of said lever is placed in substantial tangency with the can side wall with said working edge engaging the can ridge second edge and the fulcrum element engaging the can ridge one edge, said lever hand grip portion may be actuated by hand axially of the can to effect a swinging of the can ridge flange structure about the can ridge one edge and away from the can side wall to a diagonally directed relation with the can side wall, with the ridge second end projecting at an obtuse angle relative to the can side wall, whereupon the can end may be separated from the can side wall by drawing the can end away from the can side wall.

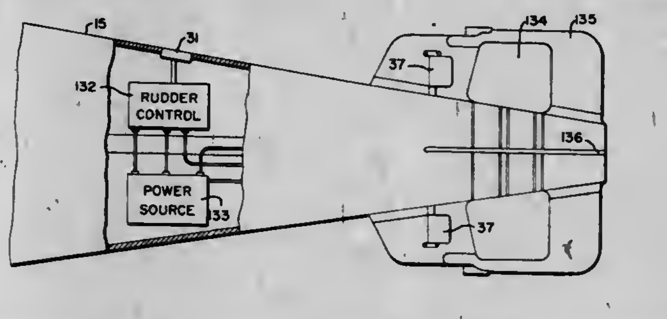
3,890,913
SINGLE COMMAND ACOUSTICAL GUIDANCE SYSTEM

Herman E. Ellingson, Silver Springs, Md., and Gilbert Lieberman, Haddonfield, N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 2, 1961, Ser. No. 86,825

Int. Cl.² F42B *19/00*

U.S. Cl. 114—20 R **9 Claims**



1. A method of destroying a target with a homing torpedo comprising the steps of detecting the target range and bearing in a passive manner, computing the expected target position after a predetermined period of time from the initially detected range and bearing, adjusting a torpedo turning means mounted on the torpedo prior to the launching of the torpedo to cause the torpedo to turn through a fixed angle upon actuation by a signal, launching the torpedo toward the expected target position, rotating a disc having indicia at a position remote from the torpedo, rotating a disc on the torpedo in synchronism with the indicia bearing disc, generating an acoustic signal only when the torpedo is approximately a predetermined distance from the target to actuate the turning means, the direction of the torpedo turn being controlled by the position of the disc on the torpedo, generating the acoustic signal exactly at a time indicated by the indicia bearing disc corresponding to the direction of the target relative to the torpedo, whereby the torpedo is directed to an area where it can home on the target.

3,890,914
TORPEDO CONTROL SYSTEM

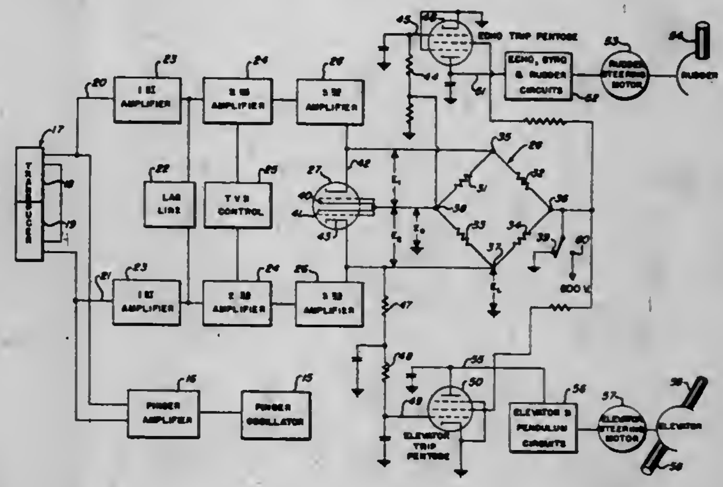
Paul C. Gardner, Scotia, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1950, Ser. No. 188,465

Int. Cl.² F42B *19/01;* **G01S** *9/66*

U.S. Cl. 114—23 **11 Claims**

1. In an automatic steering system for directing a moving body equipped with motorized steering gear toward a source of wave energy, means energized by said wave energy for generating separate dc voltages of relative magnitudes varying with the directional relationship of said source to said body, an amplitude comparator bridge including four resistor arms in endless series differentially energized by said voltages applied across first and second adjacent arms of said series and adapted to provide across a third arm of said series a control voltage of a polarity depending on the relative magnitudes of said separate voltages, and means controlling the steering gear motor in accordance with the polarity of said control voltage.



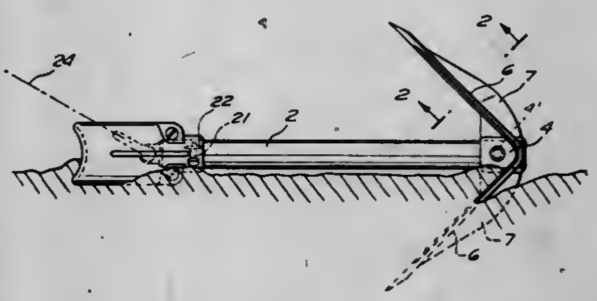
3,890,915
ANCHOR

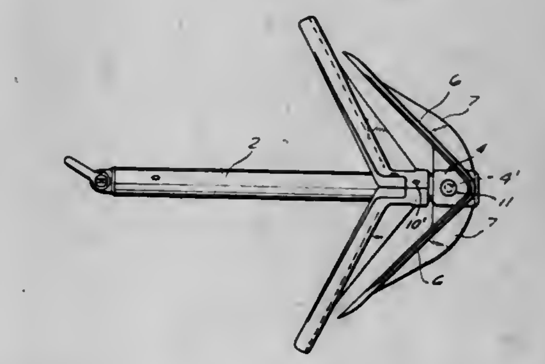
L. Francis Herreshoff, deceased, late of Marblehead, Mass., and by Muriel D. Vaughn, executrix, Marblehead, Mass., assignors to Margarete L. Stinnes, New York, N.Y.

Filed Oct. 12, 1973, Ser. No. 405,812

Int. Cl. B63b *21/34*

U.S. Cl. 114—207 **10 Claims**





1. An anchor comprising a shank; a pair of anchor arms extending inclined with respect to each other from one end of said shank to opposite sides of the latter; a shackle fastened to the other end of said shank; and a stock member having a pair of straight arms projecting to opposite sides of said shank and being movable on the latter from a working position in which said stock member is located in the region of said other end of said shank and its straight arms are located substantially in a plane normal to the plane in which said anchor arms are located, to a storing position in which the straight arms of the stock member are located closely adjacent to and substantially in the same plane as said pair of anchor arms, each of the straight arms of the stock member having a front face facing away from said one end of said shank and being concavely curved in a direction transverse to the longitudinal direction of the respective arm of said stock member.

3,890,916

FENDER FOR MOORING POSTS OR THE LIKE

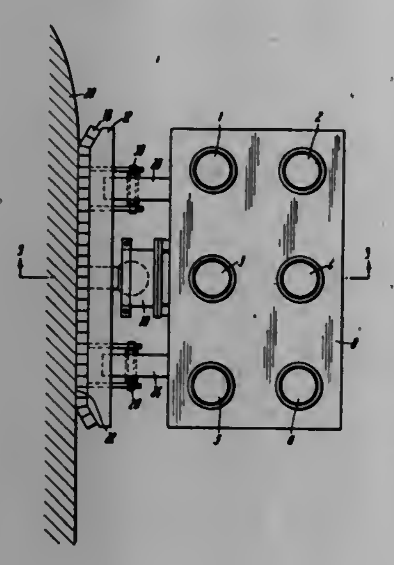
Josef Tummers, Heimgarten, and Walter Pisarik, Hattingen, both of Germany, assignors to Mannesmannrohren-Werke Aktiengesellschaft, Dusseldorf, Germany

Filed Sept. 24, 1973, Ser. No. 399,930

Claims priority, application Germany, Sept. 22, 1972, 2247197

Int. Cl.² B63B *59/02*

U.S. Cl. 114—219 **2 Claims**



1. Fender for mooring facilities for ships comprising a fender body having a surface for engaging mooring ships:

a single ball and socket arrangement for cardanically mounting the fender to the mooring facility on the other side from the surface at a single point and centrally located pivot mount to undergo a pivot motion about a horizontal axis and a vertical axis, both axes running through the pivot mount, so that upon engagement of the fender by a ship, the fender pivots on these axes into surface-to-surface engagement with the ship and independently from any force as exerted by the ship upon the fender; and

resilient means displaced from the cardanic mounting for centering the fender in a normal position, when not engaging a ship and wherein the engaging surface is vertically oriented; and

means laterally displaced from the ball and socket mount for preventing the fender from turning on an axis transverse to the engaging surface thereof.

3,890,917

MARINE FENDERS

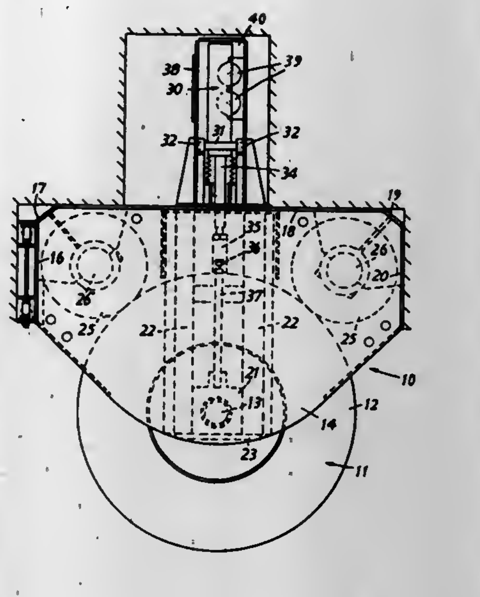
John Morton Ackroyd, Windsor, and Graham Arthur Nigel Hart, Aylesbury, both of England, assignors to Firestone Burleigh Marine Pneumatic Fendering Company Limited, Middlesex, England

Continuation-in-part of Ser. No. 218,892, Jan., 1972, abandoned. This application Dec. 20, 1973, Ser. No. 426,697

Claims priority, application United Kingdom, Jan. 19, 1971, 2685/71

Int. Cl. B63b *21/04*

U.S. Cl. 114—220 **10 Claims**



1. A fender unit comprising a supporting structure, a wheel mounting, a wheel having a pneumatic tire and means mounting said wheel for rotation about a vertical axis in said wheel mounting, said supporting structure having guide means for guiding the movement of said wheel mounting for guided movement in a rectilinear path perpendicular to said axis inwardly from and outwardly towards an outer limiting position, at least one roller and means mounting said roller in the supporting structure for rotation about a fixed vertical axis, said roller being in engagement with the pneumatic tyre of the wheel resiliently to resist inward movement of the wheel along said path, and hydraulic control means operative to apply high resistance to initial inward movement of the wheel along said path and to reduce said resistance as inward displacement of the wheel from its outer limiting position increases.

3,890,918

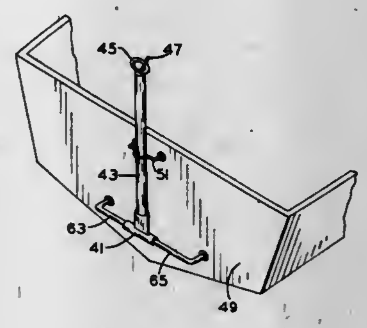
SKI BAR

James F. Sell, R.R. 3, Box 157, Muncie, Ind. 47302

Filed Jan. 21, 1974, Ser. No. 434,854

Int. Cl. B63b *21/56*

U.S. Cl. 114—235 WS **6 Claims**



1. An accessory for attachment to a stern side wall of a power boat for providing a relatively high, easy release tow rope attachment point above the general level of the boat stern comprising:

an elongated tubular member;

a ring affixed to the tubular member near one end thereof through which a tow rope bight may be passed;

means near the other end of the tubular member for attaching the said other end to the stern side wall comprising a pair of at least L-shaped members each threaded near one end thereof and adapted to attachably pass through the stern side wall; and

means intermediate the tubular member ends for attaching the tubular member to the stern side wall near the upper edge thereof.

3,890,919

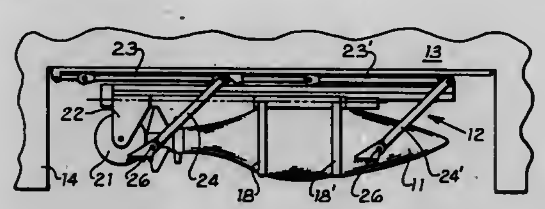
EXTERNAL LAUNCHER FOR UNDERWATER WEAPON

Everett W. Opdahl, Lutherville, and Chang-Kyo Kim, Severna Park, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 25, 1974, Ser. No. 491,712

Int. Cl.² B63G *8/32*

U.S. Cl. 114—239 **3 Claims**



1. A launching device for an underwater weapon carried externally by an undersea vehicle having a recess therein comprising,

a launching system comprised of a first launching rail and a second launching rail slidably and extendably attached to said first launching rail,

means attached to said undersea vehicle for moving said launching system into and out of said recess, and

a carriage slidably attached to said second launching rail having means for releasably retaining said underwater weapon whereby said weapon is released after said second rail is extended relative to said first rail and said carriage moves longitudinally along said second rail.

3,890,920

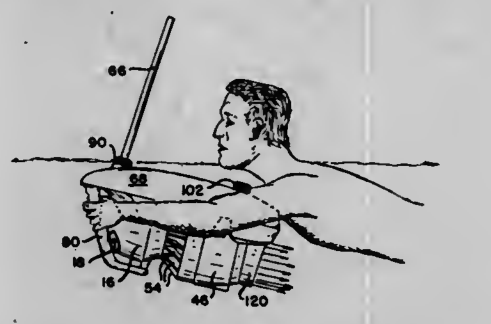
CONTROLS FOR AQUATIC TOWING CRAFT

Eggert Buelk, Hamburg, Germany, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed June 6, 1973, Ser. No. 367,651

Int. Cl. B63b *21/56*

U.S. Cl. 115—6.1 **5 Claims**



1. A unitary self-powered craft for towing an individual through water at or near its surface comprising; motive power means including means to produce a motive force when immersed in water, handle means on said craft to be grasped by an individual whereby said individual is propelled through the water when said craft is in operation said handle means being fixed and vertically oriented with respect to said craft and adapted to enable said person to control the direction of movement of said craft through the water, and means on said craft to cause said craft to turn in a constant arc of curvature when said handle means is released whereby said craft returns to substantially the same location occupied by the craft when said handle means was released.

3,890,921

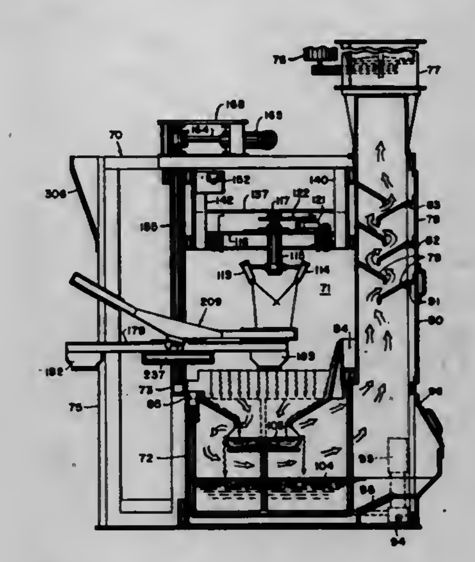
ROTATIVELY INDEXED SPRAY-PAINTING MACHINE

Harry Szczepanski, 900 Clancy N.E., Grand Rapids, Mich. 49503

Filed Nov. 1, 1971, Ser. No. 194,164

Int. Cl. B05c *11/12, 11/16*

U.S. Cl. 118—4 **5 Claims**



1. A spray-painting machine including a housing defining a spray chamber, spray gun means disposed to project spray within said chamber, ventilation means operative to maintain a flow of air within said chamber, wash means providing at least one water curtain within said chamber, and carrier means rotatably mounted in said housing on a vertical axis of rotation, said carrier means having at least two sets of related workpiece-holding and mask-holding means, said sets being angularly displaced from each other about the axis of rotation of said carrier means, said machine also including an indexing mechanism adapted to rotate said carrier means between positions in which each of said sets is, in turn, placed at said loading station and in said chamber, wherein the improvement comprises:

actuating means operative to move the mask-holding means of said two sets oppositely, respectively, to spraying position in said chamber and a position providing clearance over said loading station, said mask-holding means being a unitary structure pivotally mounted on said carrier means at the central portion thereof and adapted to rock between said opposite positions.

3,890,922

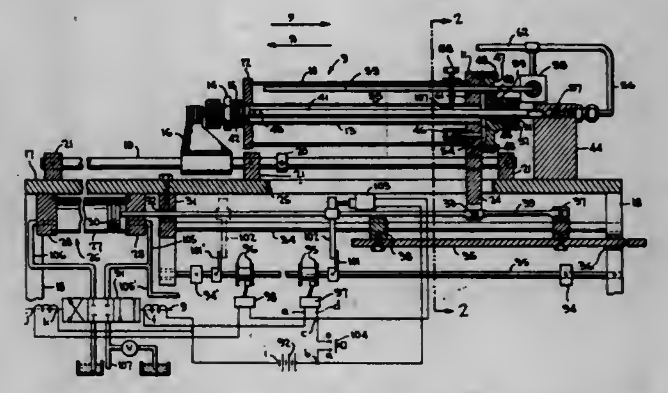
SEALANT APPLYING APPARATUS

George F. Nordenholt, 25 Dogwood Dr., Ft. Lauderdale, Fla. 07960

Filed Mar. 22, 1974, Ser. No. 453,837

Int. Cl. B05c *5/02*

U.S. Cl. 118—7 **15 Claims**



1. Apparatus for delivering a ribbon of sealant material onto a workpiece, comprising: a closed-ended reservoir cylinder mounted for forward and rearward axial movement; a coaxial piston-cylinder located within said reservoir cylinder dividing it into a fluid containing piston chamber and a fluid reserve chamber; a fixed hollow piston rod within said piston chamber having openings near its one end and said rod extending outwardly of the forward end of said reservoir cylinder; said chambers communicating with one another through a one-way valve means on said cylinder; a sealant-containing feed

cylinder means interconnected with a pressurized sealant supply means; a first hydraulic actuator connected by means of its plunger to that of said feed cylinder means, said first actuator and said feed cylinder means having approximately the same volumetric capacity, and conduit means interconnecting said actuator with said fluid reserve chamber; whereby rearward movement of said reservoir cylinder pumps the fluid from said piston-cylinder and into said hydraulic actuator which causes the sealant to be discharged from the feed cylinder means, said sealant supply means refilling said feed cylinder means when needed and causing said fluid actuator to pump fluid into said reservoir, and whereby forward movement of said reservoir cylinder draws the fluid from said fluid reserve chamber and back into said piston-cylinder through said valve means.

3,890,923
ENROBING APPARATUS

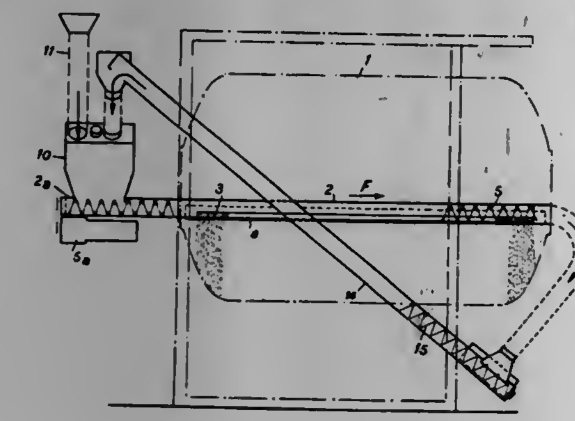
Bernard Dumoulin, 58 avenue de Bonneuil, 94 La Varenne Saint-Hilaire, France

Filed Jan. 3, 1974, Ser. No. 430,400

Claims priority, application France, Jan. 4, 1973, 73.00218

Int. Cl. A23g *3/20*

U.S. Cl. 118—19 **3 Claims**



1. Apparatus for coating various articles, such as food or pharmaceutical articles, with a powdered product, comprising an elongated hollow treatment drum having opposite ends, said drum being rotatable about a horizontal axis and adapted to receive said articles; distributing means extending through the entire length of said drum and comprising a tube having a first end adapted to receive said powdered product and an opposite end, said tube being provided in a portion thereof extending within the drum from the region of one of said opposite ends of the drum to the region of the other of said opposite ends with perforations, a rotating feed screw extending substantially coaxially through said tube, a helicoidal brush provided on the periphery of said feed screw for passing the powdered product through said perforations, and an adjustable shutter extending along said portion of said tube for partial closure of said perforations; a recycling conduit communicating with said first and said opposite end of said tube; and means for feeding the powdered product through said recycling conduit.

3,890,924
APPARATUS FOR WAXING A THREAD

Aloys Horstmann, Greven, Westphalia, Germany, assignor to Hamel G.m.b.H, Zwirnmaschinen, 44 Munster, Westphalia, Germany

Filed May 29, 1973, Ser. No. 364,537

Claims priority, application Germany, May 30, 1972, 2226311

Int. Cl. B05c *1/06*

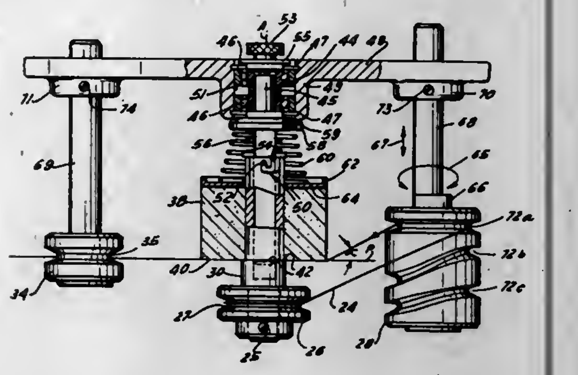
U.S. Cl. 118—78 **13 Claims**

1. An apparatus for waxing a thread being fed between two locations, said apparatus comprising:

a support,

a spindle on said support having and rotatable about a longitudinal axis and provided with an abutment defining on rotation a plane perpendicular to said axis;

an annular body of wax transfixed by said spindle and lying to one side of said plane, said body having one axial end at said plane bearing against said abutment, said thread passing over said one end;



means on and rotatable with said spindle for biasing said one end against said abutment, said abutment and said means constituting the sole elements axially limiting said body; and

a pair of thread guides on said support and defining with said spindle a path for said thread, at least one of said guides lying to said one side of plane with said path lying to said one side of said plane and forming an angle therewith between said one guide and the intersection of said thread and said body.

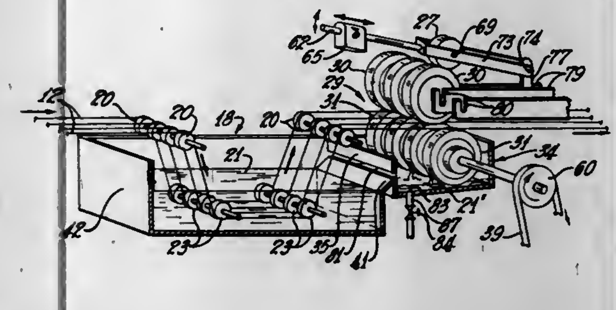
3,890,925
STRAND DOCTORING MEANS

Cletis L. Roberson, Newark; Robert G. Russell, Granville; Ralph M. Stream, Newark, and Harold E. Leaman, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 847,669, Aug. 5, 1969, abandoned. This application Jan. 22, 1973, Ser. No. 325,268

Int. Cl. B05c *11/02*

U.S. Cl. 118—104 **1 Claim**



1. A die apparatus comprising at least two adjacent wheels rotating about parallel axes, said wheels further having elastomeric circumferential surfaces which cooperate to form an enveloping contact around a linear material passed between said surfaces, said contact being established to remove adjunctive material from said linear material in amounts dependent upon the pressure applied thereto by said surfaces; means for wetting the elastomeric circumferential surface of at least one of the wheels; and a means for selectively adjusting the contact pressure exerted on said linear material comprising an elongated member having one end pivotally attached to a fixed surface; a weight adjustably and removably affixed to the end region of said elongated member distal to said fixed surface; and a fulcrum wheel rotatably secured to an intermediate region of said elongated member, said fulcrum wheel being positioned in rolling contact with the circumferential surface of at least one wheel of said die apparatus to thereby exert a distributed force on said wheel dependent upon the size and relative position of said weight.

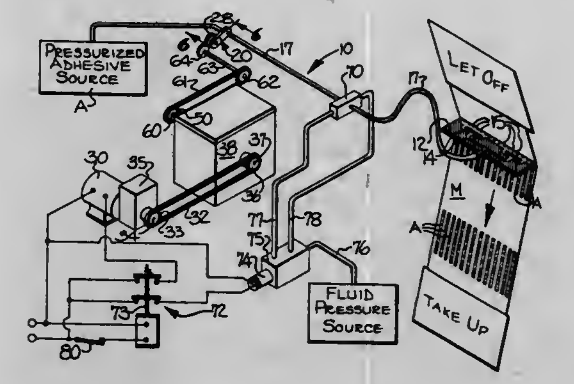
3,890,926
APPARATUS FOR INTERMITTENTLY APPLYING DEPOSITS OF ADHESIVE ONTO A MOVING WEB OF MATERIAL

Richard K. Teed, Greenwood, S.C., assignor to Riegel Textile Corporation, New York, N.Y.

Filed July 25, 1974, Ser. No. 491,765

Int. Cl. B05c *5/02*

U.S. Cl. 118—325 **8 Claims**



7. Apparatus for intermittently applying deposits of adhesive at predetermined locations on a face of a moving web of material; said apparatus comprising:

adhesive extruding head means comprising a generally flat plate member having a forward, straight, longitudinally-extending edge positioned adjacent and transversely across the face of the moving web, said plate member including internally thereof a plurality of interconnected channels for receiving and conveying adhesive therethrough, and a plurality of extruding port means spaced along the length of said forward edge and connected with said channel for receiving adhesive therefrom and for extruding adhesive onto the face of the moving web of material in a predetermined pattern of spaced-apart longitudinally-extending sets of lines;

adhesive supply and conduit means connected with said channels of said extruding head means for containing a supply of adhesive under pressure and for conveying the adhesive to said extruding head means;

selectively operable, metering pump means positioned in said adhesive conduit means for selectively pumping metered amounts of adhesive from said supply means through said conduit means to said extruding head means; and

control and drive means connected with said pump means for selectively operating said pump means intermittently for predetermined time periods for timed, intermittent, metered pumping action of adhesive to said extruding head means for timed intermittent application of adhesive onto the face of the moving web of material at predetermined intervals to form longitudinally spaced-apart sets of lines of predetermined length at predetermined intervals, said control and drive means comprising motor means, first mechanical drive means connected with and driven by said motor means, cam means connected with said first mechanical drive means for being rotated thereby, cam follower means in engagement with said cam means for being linearly reciprocated back and forth thereby, rack and pinion gear means in which said rack means is connected with said cam follower means for reciprocating back and forth linear movement therewith and for rotating said pinion back and forth thereby, second mechanical drive means connected with said pump means for driving said pump means during operation thereof, and one-way clutch means connected between said pinion and said second mechanical drive means for operating said second mechanical drive means during rotation of said pinion means in one direction and for not operating said second mechanical drive means during rotation of said pinion means in the other direction, whereby said pump means is intermittently driven for predetermined time periods in relation to the profile of said cam means.

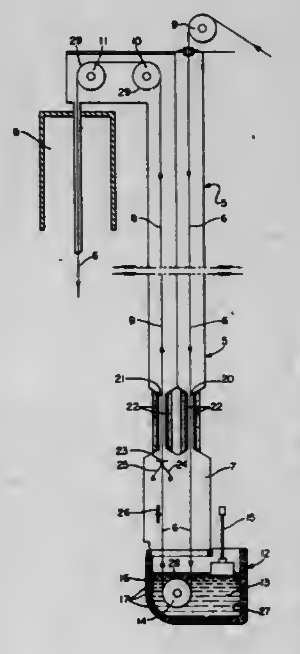
3,890,927
APPARATUS FOR TREATING TIRE CORD FABRIC

Edward E. Hunter, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 25, 1974, Ser. No. 463,937

Int. Cl. B05c *3/12*

U.S. Cl. 118—419 **4 Claims**



1. An apparatus for treating tire cord fabric, comprising:

a. a dip tank containing a liquid coating comprising a mixture of a substance for promoting the bond between the warp cords of the tire cord fabric and rubber material in which the fabric is later embedded, and a vaporizable solvent which is chemically compatible with the substance, the dip tank including a series of fluid passageways which are adjacent surfaces of the dip tank coming in contact with the liquid coating and sealed from liquid coating in the dip tank;

b. means for sealing the dip tank from the ambient atmosphere;

c. an applicator drum, rotatable in the dip tank, for directing tire cord fabric into the liquid coating, the drum including a series of fluid passageways which are sealed from the liquid coating and disposed adjacent the outer cylindrical surface of the drum;

d. means for cooling the applicator drum to a temperature sufficient to reduce the rate of evaporation of the solvent occurring when the drum is not cooled, said means including means for circulating cooling fluid through the fluid passageways of the drum; and

e. means for cooling the dip tank to help reduce the rate of evaporation of the solvent, said means including means for circulating cooling fluid through the fluid passageways of the dip tank, the cooling fluid circulated through the drum and dip tank being a liquid at a temperature in the range of from 35° to 50°F.

3,890,928
MAGNETIC BRUSH FOR USE IN DEVELOPING ELECTROPHOTOGRAPHIC IMAGES

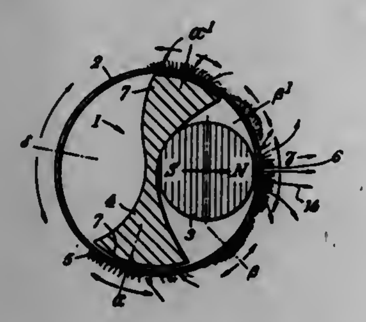
Peter Jeanmaire, Wettswil, and Paul Heinzer, Zurich, both of Switzerland, assignors to Wifo Wissenschaftliches Forschungs-Institut A.G., Zurich, Switzerland

Filed Dec. 20, 1973, Ser. No. 426,578

Claims priority, application Switzerland, Dec. 28, 1972, 18946/72

Int. Cl. G03g *13/06*

U.S. Cl. 118—637 **6 Claims**



1. A magnetic brush for use in applying to a latent electrophotographic image on a carrier sheet a developer powder composed of a mixture of particles of magnetizable material and a powdered toner, comprising a rotatable hollow cylinder of non-magnetic material and a stationary magnetic excitation system disposed within the cylinder and producing at the surface of the cylinder successive magnetic field zones of medium intensity sufficient to take up the developer powder zones, of higher intensity for causing filaments to project radially from the cylinder for application of toner powder to the image and zones of intensity low enough to shed the developer powder from the cylinder, the magnetic excitation system comprising a permanent magnet extending axially of the cylinder in a position offset from the axis of the cylinder with its axis of magnetization extending radially with respect to the cylinder and one pole in close proximity to the inner wall of the cylinder, and a screen of magnetizable material also extending axially of the cylinder and disposed adjacent the other pole of the magnet.

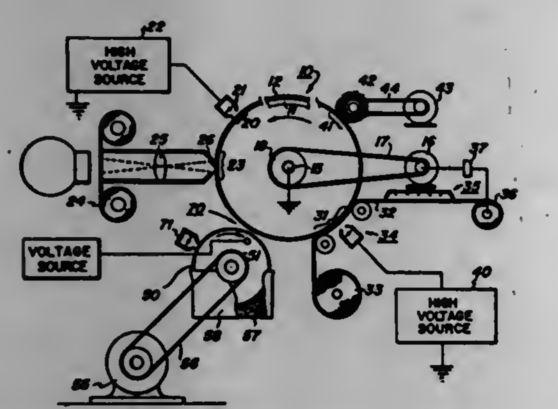
3,890,929
XEROGRAPHIC DEVELOPING APPARATUS

Lewis E. Walkup, Honolulu, Hawaii, assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 332,851, Feb. 15, 1973. This application May 24, 1974, Ser. No. 473,027

Int. Cl. G03g *13/06*

U.S. Cl. 118—637 **8 Claims**



1. An apparatus for developing a latent electrostatic image recorded on an image retaining member comprising:

a. a donor member for supporting a uniform layer of electroscopic developing material adjacent the image retaining member, said donor member and image retaining member being spacially disposed as to create a space gap between both members; and

b. means to introduce a pulse electrical bias across said gap, said pulse being of a strength and a duration sufficient to enable the deposition of the electroscopic material onto the charged image areas and prevent the development of non-image areas.

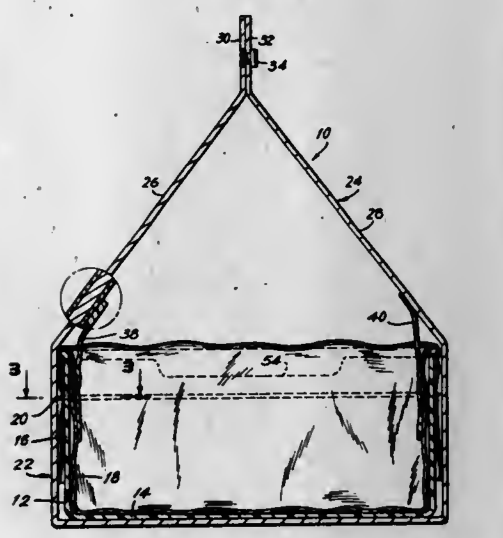
3,890,930
ANIMAL COMMODE

Michael A. Clark, 476 Bradford St., Brooklyn, N.Y. 11207

Filed Nov. 2, 1973, Ser. No. 412,064

Int. Cl. A01k *29/00;* **A47k** *11/02*

U.S. Cl. 119—1 **9 Claims**



1. In an animal commode, inner container means for receiving an animal, said inner container means having a bottom wall and side walls extending upwardly from the periphery of said bottom wall while being open at the top, so that an animal can enter into said inner container means, liner means removably carried by said inner container means and lining the interior thereof, so that from time to time said liner means can be removed from said inner container means and replaced by another liner means, and outer means extending beneath said inner container means around the latter and over the top thereof while leaving said inner container means freely accessible to an animal at least at one end of said outer means, said outer means having over said container means an upper portion blocking the interior of said inner container means from view at least from above and said upper portion of said outer means being movable with respect to the remainder of said outer means to and from a normal position located over said inner container means, so that when said upper portion of said outer means is moved away from said normal position thereof said inner container means is freely accessible for removal and replacement of said liner means, said outer means being in the form of a box in which said inner container means is located, and said upper portion of said outer means being in the form of a pair of swingable flaps of said box pitched toward each other and removably connected to each other over said inner container means for providing at opposed ends of the latter a pair of triangular openings through which an animal has free access to the interior of said inner container means.

3,890,931
SANITARY PET BOX

Helene Saver, 155 E. 49th St., New York, N.Y. 10017

Filed June 17, 1974, Ser. No. 480,046

Int. Cl. A01k *29/00*

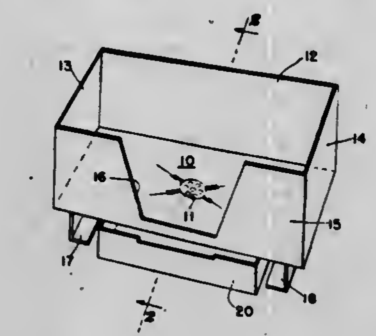
U.S. Cl. 119—1 **1 Claim**

1. A sanitary disposal device for pets comprising:

a. a metal box having a base member divided into four sections, each with sloping surfaces leading to a central drainage plate formed with a series of holes; said box also including a back wall, two side walls, and a front wall formed with a gate for each access by a pet;

b. two angle irons positioned under the base of said box for supporting it above a floor and thereby defining a space under the box;

c. a storage pan removably positioned in the space under the box for collecting liquid refuse from the box which passes through the holes in the drainage plate in the base; and



d. a metal folding shield removably attached to the back and side walls of the box; said shield formed with strips which are placed outside the box and formed with sloping corners at the end portions.

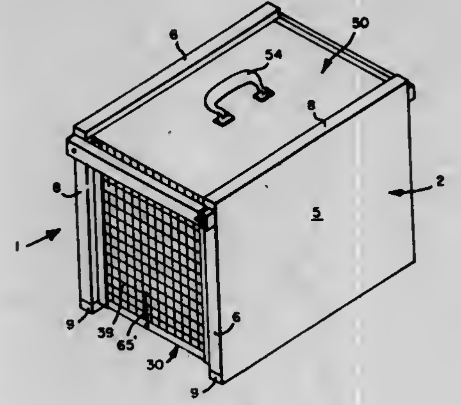
3,890,932
COLLAPSIBLE CONTAINER AND LATCHING MEMBER

Anthony V. Sanzone, 14513 Homerite Dr., San Jose, Calif. 95124, and Antonio C. Sanzone, 349 Richlee Dr., Campbell, Calif. 95008

Filed Oct. 9, 1973, Ser. No. 404,212

Int. Cl.² A01K *1/02*

U.S. Cl. 119—19 **16 Claims**



1. A collapsible container comprising:
a top and bottom wall member;
a front and rear wall member;
a first and a second side wall member;
an elongated member, said elongated member having a first and a second end;
means for pivotably connecting said first end of said elongated member to said first side wall member; and
means for releasably coupling said second end of said elongated member to said second side wall member wherein said coupling means includes:
an elongated stud, said stud being fixed to and having a portion projecting from said second side wall member;
a retaining member movably attached to said projecting portion of said stud;
a stud receiving slot adjacent said second end of said elongated member for receiving said projecting portion of said stud; and
means adjacent said slot for receiving said retaining member and further wherein said retaining member and said retaining member receiving means adjacent said slot include means which cooperate for minimizing inadvertent decoupling of said second side wall member.

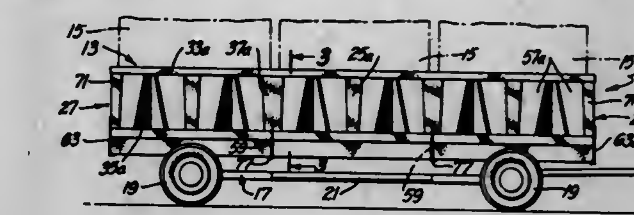
3,890,933
HAYING FEEDER

Edward Boehm, Rural Rte. 1, Mandan, N. Dak. 58554

Continuation-in-part of Ser. No. 339,208, March 8, 1973, abandoned. This application Mar. 1, 1974, Ser. No. 447,068

Int. Cl. N01k *5/00*

U.S. Cl. 119—60 **11 Claims**



1. A haying feeder for feeding livestock adapted to hold at least one large bale of hay comprising:
a peripheral wall at least substantially circumscribing a space into which the bale can be deposited, said space having a completely open upper end to permit the bale to be deposited in said space from above;
said peripheral wall including first and second generally opposed wall portions;
each of said wall portions including at least one strong structural section, at least one of said structural sections lying intermediate the ends of the associated one of said wall portions;
each of said structural sections having an inner surface which slopes inwardly as it extends downwardly, said inner surfaces of said structural sections being adapted to engage and at least partially support the bale in said space; and
said peripheral wall having a plurality of openings therein, each of said openings being of sufficient size to receive the head of livestock whereby said openings make the bale in said space accessible to livestock.

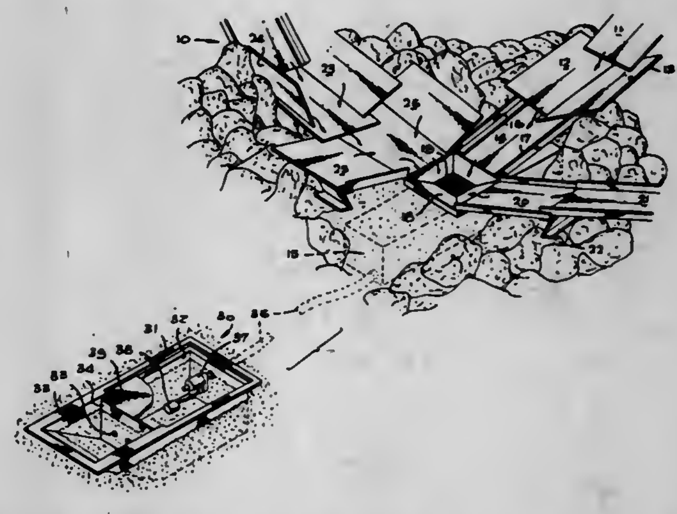
3,890,934
WATER COLLECTION AND STORAGE DISPERSION APPARATUS

Frank R. Walcott, 1212 N. Ontario St., Burbank, Calif. 91505

Filed July 16, 1973, Ser. No. 379,553

Int. Cl. A01k *7/02*

U.S. Cl. 119—78 **5 Claims**



1. In a water collection and storage dispersion apparatus for use in a natural wildlife environment, the combination comprising:
a water storage means;
a rainfall water collecting means diverging with respect to said storage means for conducting a flow of rainfall water to said storage means for holding and storage purposes;
water dispensing means remotely connected to said storage means via a flexible hose for supplying a quantity of water from said storage means to said dispensing means for immediate use by wildlife;

valve means operably connected to said hose for regulating the flow of water from said storage means to said dispensing means whereby the level of water in said dispensing means is maintained at a predetermined level;
said collecting means comprises a plurality of panels arranged with overlapping edge marginal regions so as to define an open-topped water conducting path in the form of a trough leading to said storage means;
said storage means comprises an elongated tank composed of wall panels secured together by interlocking ribs;
said storage means further includes a central panel having a recessed entrance leading to the interior of said tank and said collecting means terminating at said tank entrance for delivering collected water thereto; and
said dispensing means includes an enclosure having an enclosed immediate storage chamber and an open drinking chamber with fluid conducting means interconnecting said chambers.

3,890,935

HEAT EXCHANGE APPARATUS WITH GAS CHAMBER BELOW HEAT EXCHANGE BED

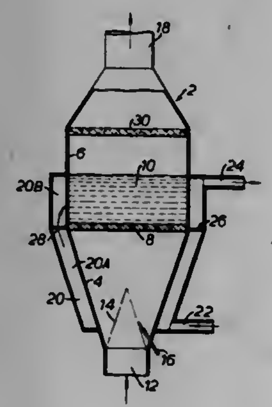
Norman Moss, Ilford; Barrie James Martin, Shenfield, and Michael John Broad, Enfield, all of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Feb. 16, 1973, Ser. No. 333,087

Claims priority, application United Kingdom, Mar. 2, 1972, 9693/72

Int. Cl. F28d *13/00*

U.S. Cl. 122—4 D **5 Claims**



1. Heat exchange apparatus for use in a central-heating system, which apparatus comprises first and second chambers separated by a gas-permeable plate, and a jacket for receiving water to be heated surrounding the first and second chambers, said first chamber being provided with an igniter for igniting a gaseous medium in said first chamber proximate the bottom of said jacket to form hot gases which, during use of the apparatus, pass through the plate into a heat exchange bed of particulate material positioned in the second chamber and supported on the plate to fluidize said particulate material.

3,890,936

HOT WATER GENERATOR FOR SHOCK TESTING FABRICATED PIPING COMPONENTS

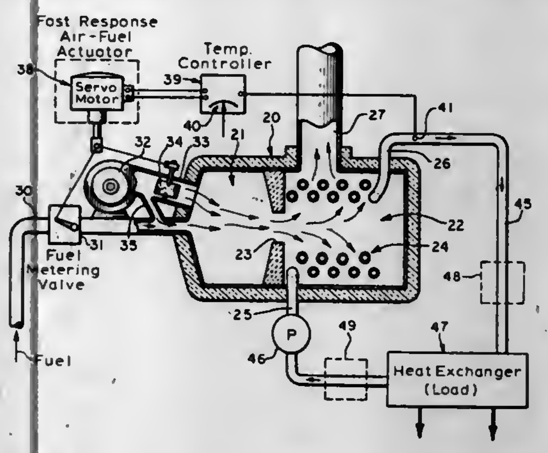
Michael J. McInerney, 1956 Beverly Pl., Highland Park; Robert T. Brady, 658 Prospect Ave., Elmhurst, and Alvia E. Phillips, 438 N. Ardmore, Villa Park, all of Ill., assignors to Vapor Corporation, Chicago, Ill.

Filed Jan. 28, 1974, Ser. No. 437,249

Int. Cl. F22b *37/10*

U.S. Cl. 122—248 **8 Claims**

1. A hot water generator having a high turndown ratio for rapidly increasing the temperature of hot water to a point of substantially theoretical maximum heat absorption and temperature rise without nucleation, said generator comprising a housing defining connected substantially cylindrical coil and combustor sections, an annularly shaped helical coil axially aligned in the coil section having a plurality of longitudinally arranged rows and radially arranged layers of watertubes with an open central area for receiving combustion gases and defining a water flow path, an inlet at the outermost layer of said watertubes, an outlet at the innermost layer of said watertubes, piping outside the generator connected between the inlet and outlet of the coil to define therewith a continuous closed loop water flow path, a load in the piping, a pump in the piping causing a constant water flow in the flow path such that the pressure maintained will limit the water temperature to just below the nucleate boiling point, a flue gas outlet in the coil section outward of the coil, a fuel and air induction system including a fossil fuel burner delivering fuel to the combustor section and a blower for producing and delivering combustion air to the combustor section, a fuel line having a fuel metering valve therein connected to the burner, a duct connecting the blower to the combustor section and having a damper for controlling combustion air, a combustion air bleed line ahead of the damper for continually bleeding a small amount of air directly into the fuel line downstream of the valve to maintain combustion stability at low fire, a choke in the housing between the combustor section and the coil section directing combustion gases from the combustor section to the central area of the coil, a fast response air-fuel actuator connected to the fuel valve and air damper for quickly providing the necessary air fuel supply, and control means operating said actuator in response to a set point temperature input and the input of a temperature measuring device at the outlet of said coil to control fuel and air flow change from low fire to high fire and produce a maximum rate of water temperature increase without nucleation.



3,890,937

DISTRIBUTOR DRIVE ARRANGEMENT FOR A ROTARY COMBUSTION

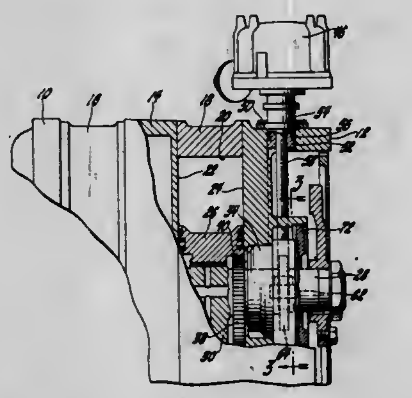
Erkki A. Koivunen, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 25, 1974, Ser. No. 463,913

Int. Cl. F02b *53/12, 53/14*

U.S. Cl. 123—8.45 **2 Claims**

1. A rotary combustion engine comprising housing means having internal walls cooperatively defining a cavity, a crankshaft having an eccentric located in said cavity, a pair of crankshaft journal bearing means rotatably supporting said crankshaft in said housing on opposite sides of said eccentric, a rotor rotatably mounted on said eccentric in said cavity, a rotary phasing gear concentric with said eccentric and fixed to one side of said rotor, one of said crankshaft journal bearing means comprising a stationary phasing gear fixed to said housing means and meshing with said rotary phasing gear, said rotor cooperating with said walls of said housing to provide a plurality of chambers that are spaced about and move with said rotor while varying in volume as said rotor and said crankshaft rotate, intake passage means for supplying said working chambers with a combustible mixture, a spark plug for igniting the mixture in said working chambers, exhaust passage means for exhausting said working chambers, a distributor for operating said spark plug comprising a stationary body secured to said housing means, a distributor shaft rotatably supported in said distributor body and extending within said housing means to said stationary gear, a distributor driving gear concentric with and fixed to said crankshaft adjacent said stationary gear, a distributor driven gear concentric with and fixed to said distributor shaft, and means for rotatably supporting said distributor shaft in said stationary gear whereby said stationary gear provides a bearing support for both said distributor driving gear and said distributor driven gear to assure accurate relationship between their axes to minimize gear backlash and consequently ignition spark scatter.



3,890,938

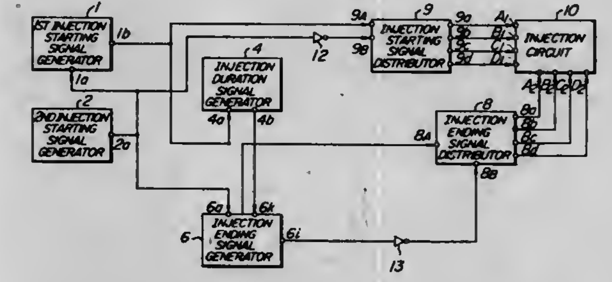
ELECTRICAL FUEL INJECTION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Kazuo Oishi; Noriyoshi Ando, and Hiroshi Yoshida, all of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation-in-part of Ser. No. 97,880, Dec. 14, 1970, abandoned. This application Apr. 19, 1973, Ser. No. 352,697

Int. Cl. F02b *3/00*

U.S. Cl. 123—32 EA **22 Claims**


1
1ST INJECTION STARTING SIGNAL GENERATOR
1b
1a
2
2ND INJECTION STARTING SIGNAL GENERATOR
2a
4
INJECTION DURATION SIGNAL GENERATOR
4a
4b
12
9A
9B
9
INJECTION STARTING SIGNAL DISTRIBUTOR
9a
9b
9c
9d
A1
B1
C1
D1
10
INJECTION CIRCUIT
A2
B2
C2
D2
8
8A
INJECTION ENDING SIGNAL DISTRIBUTOR
8B
6
6a
6k
INJECTION ENDING SIGNAL GENERATOR
6i
13

1. A system for electrically controlling fuel injection in a multi-cylinder internal combustion engine comprising in combination:
- a first starting signal generator for generating a first fuel injection starting signal at a predetermined angle in each cycle of operation of a selected reference cylinder, said starting signal being generated in synchronism with the rotation of said engine,
- a second starting signal generator for generating a plurality of succeeding fuel injection starting signals in synchronism with the rotation of said engine, each of said succeeding fuel injection starting signals defining the time at which fuel injection to a corresponding one of the remaining cylinders in said engine is initiated,
- a duration signal generator connected to said first starting signal generator for generating a fuel injection duration signal, said signal having a time duration proportional to the quantity of fuel to be injected into said cylinders,
- an ending signal generator connected to said second starting signal generator and to said duration signal generator for generating fuel injection termination signals, each of said signals defining the time at which fuel injection to a corresponding one of the cylinders is terminated, said ending signal generator comprising means for generating a saw-tooth waveform in synchronism with said succeeding fuel injection starting signals, means responsive to said duration signal for generating a duration signal termination signal, and means responsive to said saw-tooth waveform and said duration termination signal for generating fuel injection termination signals for each of said cylinders,
- a fuel injection termination signal distributor connected to said ending signal generator for distributing said fuel injection termination signals successively to each of said cylinders in a predetermined order, and
- a starting signal distributor connected to said first and second starting signal generators for distributing said succeeding fuel injection starting signals to said cylinders in said predetermined order.

3,890,939

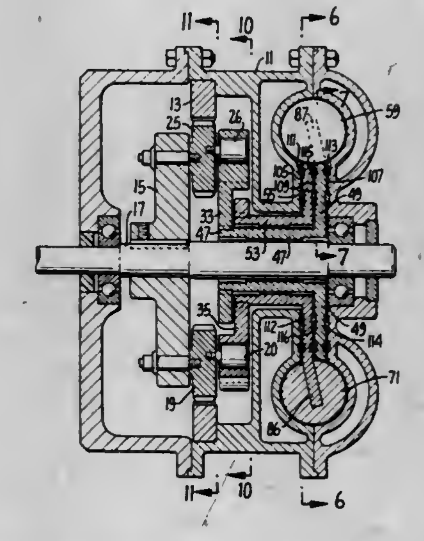
ROTARY ENGINE WITH IMPROVED SEAL AND TIMING MECHANISM PROVIDING LINEAR ACCELERATION BETWEEN PISTONS DURING THE POWER STROKE

Alex A. McIntosh, 1491 Benito Ave., Burlingame, Calif. 94010

Filed Mar. 22, 1973, Ser. No. 343,972

Int. Cl. F02b *53/00*

U.S. Cl. 123—8.47 **10 Claims**



1. A rotary internal combustion engine, comprising:
- a continuous cylinder having at least two pistons sealed to the walls thereof and capable of traveling completely around said cylinder,
- at least one each of an intake port, an exhaust port and an ignition means communicating with said cylinder,
- a drive shaft as a power output of said engine, and
- means attached to said drive shaft for transferring power from said pistons thereto and for timing the relative motion of said pistons, said power transfer and timing means including means for causing the relative acceleration between said at least two pistons to be linearly increasing at least for a period following ignition, whereby an increased potential power of expanding gases after ignition is communicated with the drive shaft.

3,890,940

INTERNAL COMBUSTION ENGINE WITH INDIRECT FUEL INJECTION

Hans List, 126 Heinrichstrasse, Graz, Austria

Filed May 25, 1973, Ser. No. 364,530

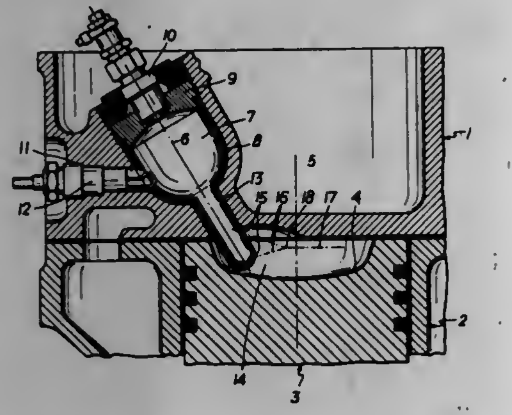
Claims priority, application Austria, May 25, 1972, 4554/72

Int. Cl. F02b *23/08*

U.S. Cl. 123—32 C **3 Claims**

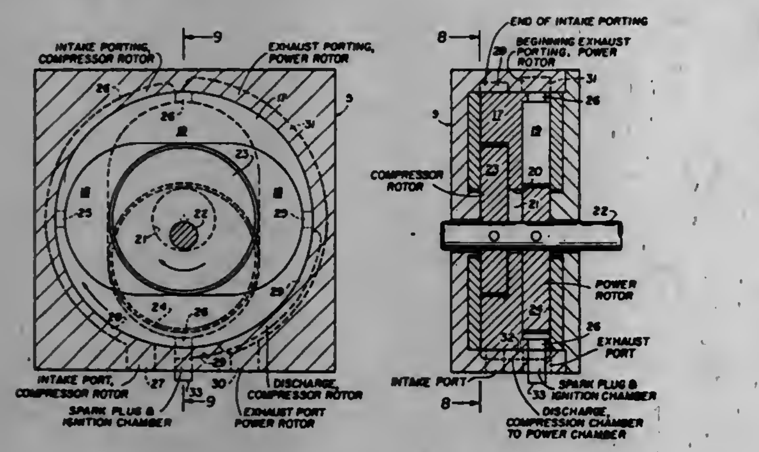
1. In an internal combustion engine with indirect fuel injection, a cylinder having a cylinder axis, a piston located in said cylinder and having a piston head, a trough-shaped recess provided in said piston head, a cylinder head, a main combustion chamber formed between the cylinder head and the piston head, a hollow insert disposed in the cylinder head and

having an axis forming an acute angle with the cylinder axis, said insert forming an auxiliary combustion chamber, a plug closing said insert at one end and having a central bore, a fuel injection nozzle protruding into said central bore in alignment with the axis of said insert, a lateral bore in the cylinder head extending also into said insert, a spark plug disposed in said lateral bore and protruding into said insert, the insert having an axial extension opposite the fuel injection nozzle and having a smaller diameter than the remaining portion of the insert, said extension protruding into the main combustion chamber in a peripheral area of said trough-shaped recess of the piston head, two overflow apertures provided in said extension and having axes being coplanar with the cylinder axis and intersecting inside the main combustion chamber, said axes of the overflow bores forming identical acute angles with a reference plane which is normal to the cylinder axis.



3,890,941
ROTARY ENERGY CONVERTER

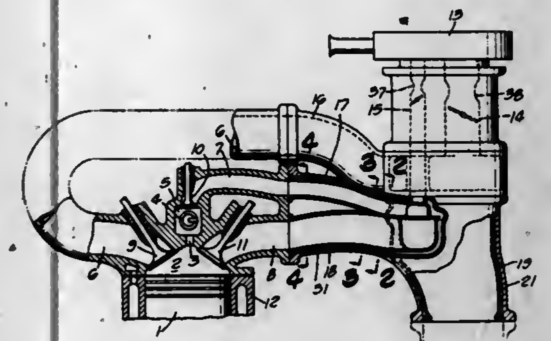
Herman L. Paul, Jr., 720 Old Mill Rd., Wyomissing, Pa. 19510
Division of Ser. No. 392,072, Aug. 27, 1973. This application July 15, 1974, Ser. No. 488,717
Int. Cl. F02b *57/00*
U.S. Cl. 123—44 R **5 Claims**


INTAKE PORTING, COMPRESSOR ROTOR
9
EXHAUST PORTING, POWER ROTOR
INTAKE PORT, COMPRESSOR ROTOR
SPARK PLUG & IGNITION CHAMBER
DISCHARGE, COMPRESSOR ROTOR
EXHAUST PORT POWER ROTOR
8
END OF INTAKE PORTING
BEGINNING EXHAUST PORTING, POWER ROTOR
COMPRESSOR ROTOR
POWER ROTOR
EXHAUST PORT
INTAKE PORT
SPARK PLUG & IGNITION CHAMBER
DISCHARGE, COMPRESSION CHAMBER TO POWER CHAMBER

1. In a rotary energy converter, a fixed housing provided with a cylindrical chamber for receiving and operably supporting a primary rotor, said housing being provided with an intake port and an exhaust port extending from the exterior thereof into open communication with the interior of said cylindrical chamber; a circular primary rotor mounted within said cylindrical chamber for rotation about its own fixed axis; said primary rotor being provided with a first symmetrical diametrically-extending parallel-sided chamber having its opposed ends arranged for open communication with the exterior of said primary rotor for passing communication with said intake port and with an intake channel associated therewith; a first circular secondary rotor operably positioned within the said first chamber of said primary rotor between the parallel sides thereof, said first secondary rotor being eccentrically affixed to a shaft operably mounted in said housing for rotation about an axis disposed in parallel offset relation with respect to the axis of rotation of said primary rotor; said primary rotor being provided with a second symmetrical diametrically-extending parallel-sided chamber having its opposed ends arranged for open communication with the exterior of said primary rotor for passing communication with said exhaust port and with an exhaust channel associated therewith, said second parallel-sided chamber having its longitudinal axis oriented at an angle with respect to the longitudinal axis of said first parallel-sidedchamber, said first and second parallel-sided chambers being separated by a median web having a central aperture whereby to provide clearance around said shaft; a second circular secondary rotor operably positioned within said second parallel-sided chamber between the parallel sides thereof and being eccentrically affixed to said shaft at an orientation complementary to the longitudinal axis of said second parallel-sided chamber; one portion of the wall of said cylindrical chamber being provided with an intake channel having an end in open communication with said intake port and another portion of the wall of said cylindrical chamber being provided with a discharge channel, said intake and discharge channels lying in the general plane of said first parallel-sided chamber; the wall of said cylindrical chamber being provided with a transfer channel having one end in open connunication with an end of said discharge channel and its other end extending for communication with the said second parallel-sided chamber; another portion of the wall of said cylindrical chamber being provided with an exhaust channel having one end in open communication with said exhaust port and its other end closed, said exhaust channel lying in the general plane of said second parallel-sided chamber; and a spark plug mounted on said housing intermediate said intake and exhaust ports and extending radially inwardly toward communication with said second parallel-sided chamber whereby to permit said rotary energy converter to operate as a two-stage internal combustion engine.

3,890,942
REDUCTION OF NO_x, HC, AND CO IN THE EXHAUST GASES OF INTERNAL COMBUSTION ENGINES

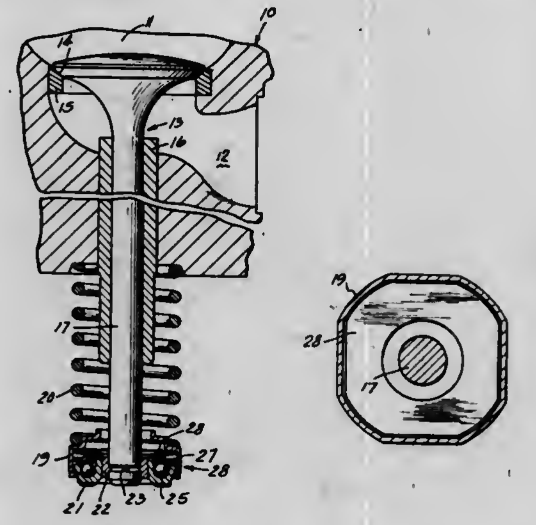
Tasuku Date, Tokyo; Shizuo Yagi, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation-in-part of Ser. No. 291,254, Sept. 22, 1972, abandoned. This application Apr. 23, 1973, Ser. No. 353,786
Claims priority, application Japan, Jan. 11, 1972, 47-4973; Mar. 6, 1972, 47-22210
Int. Cl. F02b *19/10, 19/18*
U.S. Cl. 123—75 B **27 Claims**



1. A method for obtaining substantially complete combustion in a four-cycle spark-ignition internal combustion piston engine while minimizing production of unwanted emissions such as NO_x, HC and CO in the engine exhaust gases, comprising the steps of: introducing two separate mixtures of air and fuel into a main combustion chamber at separate locations and in a manner to minimize the mixing of the two mixtures during both the suction and compression strokes of the piston, one said mixture being substantially richer in fuel content, said richer mixture being introduced into the main combustion chamber through an auxiliary chamber and torch opening connecting the chambers, controlling the amount of richer mixture introduced into the main combustion chamber to form a smaller volume than the other mixture, simultaneously compressing both mixtures with part of the richer mixture being returned through the torch opening into the auxiliary chamber, maintaining quiescence and minimum turbulence within the main combustion chamber during and at the end of the compression stroke, spark-igniting the compressed mixture in the auxiliary chamber to project a torch flame through the torch opening to ignite the quiescent mixtures in the combustion chamber, the torch opening being placed so that the torch flame axis extends symmetrically from the auxiliary chamber toward the axis of the piston and inclined with respect thereto, the torch flame producing a continuing combustion of the air-fuel mixtures in the main combustion chamber, the resulting temperature rise in the main chamber reaching a peak and then falling from the peak less than one-half of the amount of the rise during the remainder of the power stroke.

3,890,943
VALVE ROTATING DEVICES

Herbert Schonlau, and Walter Meyerhoff, both of Hannover, Germany, assignors to Teves-Thompson GmbH, Germany
Filed Dec. 3, 1973, Ser. No. 421,116
Claims priority, application Germany, Dec. 11, 1972, 2260628; Dec. 11, 1972, 2260726
Int. Cl. F01l *1/32;* **F16k** *29/00*
U.S. Cl. 123—90.3 **6 Claims**

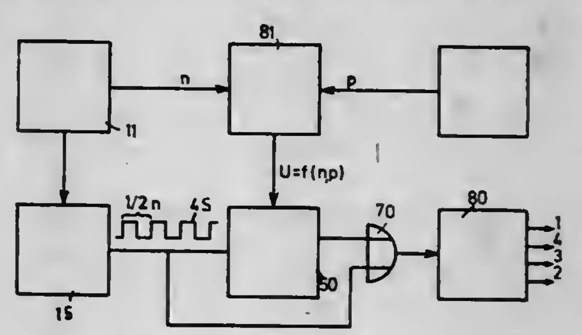


1. A valve rotating device comprising a housing arranged to seat a valve spring thereon, a retainer cap received within said housing, a spring washer having its inner periphery bottomed on said retainer cap, a valve having a valve stem secured to said retainer cap, and shiftable means acting between said spring member and said retainer cap to incrementally rotate said retainer cap during axial movement of said valve stem within said housing, said spring member being enclosed entirely by said housing in closely spaced relation thereto, said spring member and said housing each having complementarily shaped straight sided portions preventing relative rotation between the two.

3,890,944
ELECTRONIC IGNITION SYSTEM WITH AUTOMATIC IGNITION ADVANCEMENT AND RETARDATION

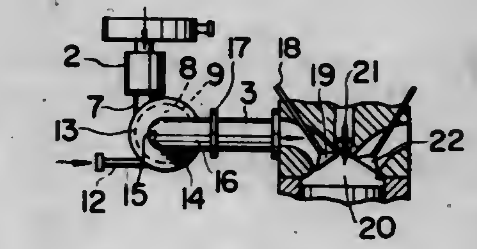
Peter Werner, Stuttgart, and Ulrich Drews, Schwieberdingen, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Oct. 3, 1973, Ser. No. 403,170
Claims priority, application Germany, Oct. 7, 1972, 2249322
Int. Cl. F02p *5/04*
U.S. Cl. 123—117 R **8 Claims**

1. In the ignition system of an internal combustion engine, in combination, igniting means having a control input and operative for igniting a combustion mixture in an engine cylinder of the engine upon receipt of an ignition signal at said control input; transducer means for determining the value of at least one engine operating variable; a timing circuit comprised of energy-storing timing means, first means operative for effecting a first change of stored energy of said energy-storing timing means during the time the engine crankshaft moves through a predetermined angle, and second means operative subsequent to the completion of said first change of stored energy for effecting an opposite second change of stored energy of said timing means, at least a predetermined one of said first and second means comprising means connected to said transducer means and operative for effecting the respective change of stored energy of said energy-storing timing means at a rate of energy change dependent upon the value of said engine operating variable; and ignition signal generating means connected to said energy-storing timing means and connected to the control input of said igniting means and operative for applying to said control input of said igniting means an ignition signal upon completion of said second change of stored energy, wherein said first and second means together comprise synchronizing means for generating a crankshaft-position-synchronizing signal when the engine crankshaft assumes a predetermined angular orientation, bistable frequency-dividing means having an input connected to said synchronizing means for receipt of crankshaft-position-synchronizing signals therefrom, and having two stable states, and wherein said first means comprises means operative for effecting said first change of stored energy when said bistable means is in a predetermined one of the two stable states thereof, and wherein said second means comprises means operative for effecting said second change of stored energy when said bistable means is in the other of the two stable states thereof.



3,890,945
EXHAUST GAS CLEANING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Kenji Goto, and Norikatsu Ishikawa, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Japan
Filed Jan. 31, 1974, Ser. No. 438,424
Claims priority, application Japan, Mar. 19, 1973, 48-30906; Apr. 7, 1973, 48-39139
Int. Cl. F02b *33/00*
U.S. Cl. 123—119 A **13 Claims**



1. In an engine exhaust gas cleaning system in which a portion of engine gases are recirculated from an engine exhaust system to an intake system of an internal combustion

engine so as to reduce nitrogen oxide content in the engine exhaust gases,

the improvement comprising a cylindrical chamber interposed between a carburetor and an intake pipe of the engine, an exhaust gas recirculation conduit providing fluid communication between an exhaust pipe of the engine and said cylindrical chamber, and a mixture conduit providing fluid communication betweenm the carburetor and said cylindrical chamber and having its outlet tangentially connected to the latter for establishing a swirling flow therein to promote mixing between the air-fuel mixture from the carburetor and the recirculated exhaust gases from the exhaust pipe.

3,890,946

METHOD AND SYSTEM TO REDUCE NOXIOUS COMPONENTS IN THE EXHAUST EMISSION FROM INTERNAL COMBUSTION ENGINES WITH CARBURETOR SUPPLY

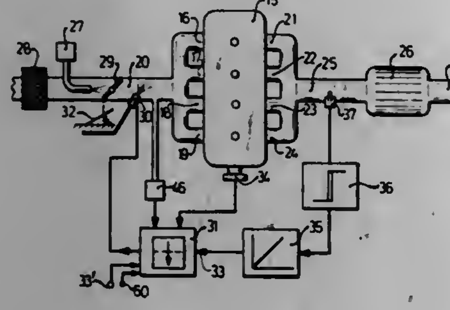
Josef Wahl, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Gerlingen-Schillerhohe, Germany

Filed June 12, 1974, Ser. No. 478,520

Claims priority, application Germany, July 21, 1973, 2337198

Int. Cl. F02b *3/00;* **F02n** *7/00;* **F02d** *5/00*

U.S. Cl. 123—119 R **22 Claims**



1. Method to reduce noxious components in the exhaust from internal combustion engines having a carburetor to supply a fuel-air mixture to the engine, comprising the steps of

supplying fuel from the carburetor to the engine in a quantity less than that forming a stoichiometric level to supply a lean fuel-air mixture to the engine;

sensing the composition of the exhaust gases by testing oxygen content therein, and providing a sensing signal representative of oxygen in the exhaust gases;

intermittently injecting fuel to the fuel-air mixture being supplied to the engine;

and controlling the injection time, for each injection of fuel, in dependence on sensed composition of the exhaust gases by injecting fuel during respectively longer, or shorter time intervals, as the sensed composition of the exhaust gases changes between lean ($\lambda>1$) and rich ($\lambda<1$) mixture to provide an overall fuel-air mixture being applied to the engine which is just below stoichiometric value.

3,890,947

DISTRIBUTOR FOR ENGINE IGNITION SYSTEM

Masao Shibagaki, Hiroshima, and Masayoshi Oonishi, Himeji, both of Japan, assignors to Toyo Kogoyo Co., Ltd., Hiroshima and Mitsubishi Kenki Kabushiki Kaisha, Tokyo, both of, Japan

Filed Aug. 22, 1973, Ser. No. 390,517

Claims priority, application Japan, Aug. 29, 1972, 47-100785

Int. Cl. F02p *5/04*

U.S. Cl. 123—148 DS **3 Claims**

1. An ignition system comprising

a first ignition plug,
a second ignition plug,
a third ignition plug,
a fourth ignition plug,
a first ignition coil,
a second ignition coil,
a first peripheral electrode,
a second peripheral electrode,
a third peripheral electrode,
a fourth peripheral electrode,
a fifth peripheral electrode,

said first, second, third, fourth and fifth peripheral electrodes being mounted to a distributor cap so that each of said peripheral electrodes is equidistant from the center of said distributor cap and so that said peripheral electrodes are disposed in a clockwise direction with the second electrode 90° from the first electrode, the fourth electrode 45° from the second electrode, the fifth electrode 90° from the fourth electrode and the third electrode 90° from the fifth electrode,

a distribution rotor having the same center as said distribution cap,

a first rotor electrode being mounted to said distribution rotor so that its ends span a first arc on said distribution rotor and on said distribution cap of 90°,

a second rotor electrode being mounted to said distribution rotor so that its ends span a second arc on said distribution rotor and on said distribution cap of 90° and so that said first arc and second arc are diametrically opposed,

a third rotor electrode being mounted to said distribution rotor so that its ends span a third arc on said distribution rotor and on said distribution cap of 180° and so that the ends of said third electrode lie midway between adjacent ends of said first and second rotor electrodes,

means connecting said first ignition coil to said third rotor electrode,

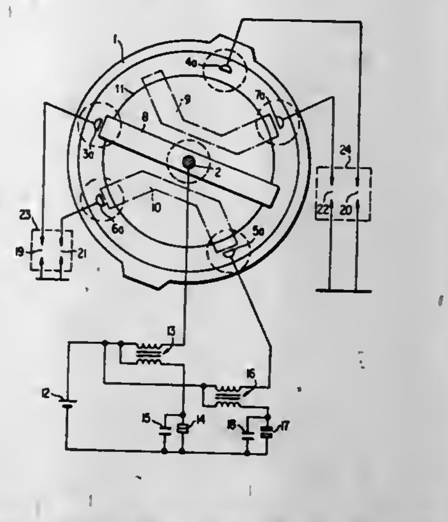
means connecting said second ignition coil to said fifth peripheral electrode,

means connecting said first ignition plug to said first peripheral electrode,

means connecting said second ignition plug to said second peripheral electrode,

means connecting said third ignition plug to said third peripheral electrode,

means connecting said fourth ignition plug to said fourth peripheral electrode.



3,890,948

ALTERNATOR DRIVEN CAPACITOR POWER SYSTEM

Floyd M. Minks, Kissimmee, Fla., assignor to Brunswick Corporation, Chicago, Ill.

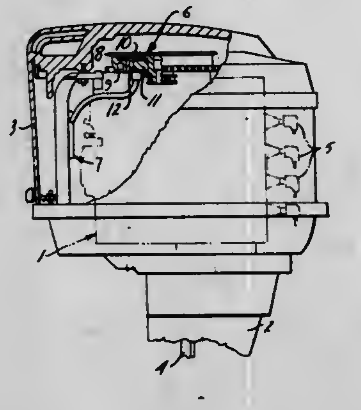
Filed June 13, 1968, Ser. No. 736,789

Int. Cl. F02p *3/06*

U.S. Cl. 123—148 E **13 Claims**

1. An alternator driven capacitor discharge system having an alternator including at least a pair of winding means having

overlapping alternating current output voltages connected to charge an energy storage means during a given portion of each cycle of the output of each of the winding means, said storage means being connected in an output circuit with a switch means having a control input means, the improvement comprising firing means connected to said control input means and to both of said winding means and responsive to the relative amplitude and phase of the voltages produced by each cycle of the output of both of said winding means to actuate said switch means during each cycle and discharge the energy in said storage means in timed relation to the rotation of said alternator with the same winding means that charges said energy storage means operative to actuate said switch means, said winding means having differently varying outputs with speed, and means correspondingly connecting said winding means to said firing means such that one winding essentially controls the firing in one speed range and the other winding essentially controls the firing in a different speed range, and wherein said alternator charges the energy storage means during one polarity of a full cycle and actuate the firing means during the alternate opposite polarity of the cycle and said pair of winding means having a first winding providing a peak output at a first selected speed and a second winding providing a peak output at a second selected speed and establishing substantially in phase outputs under open circuit conditions and a trigger capacitor means connected to both said windings and selectively charged by the output of said windings in accordance with the speed of the engine to a selected level and then discharged into said switch means to fire said switch means.



3,890,949

TWIST TURBULENCE FORMING PASSAGE, ESPECIALLY IN THE INTAKE SYSTEM OF RECIPROCABLE INTERNAL COMBUSTION ENGINES

Ludwig Elsbett, and Gunter Elsbett, both of D 8543 Hilpoltstein, Germany

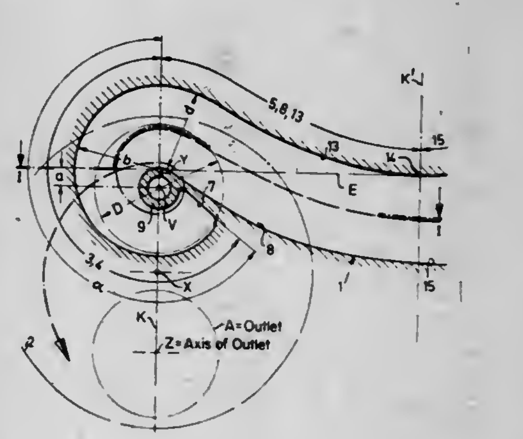
Filed July 16, 1973, Ser. No. 379,557

Claims priority, application Germany, July 17, 1972, 2235050

Int. Cl. F02f *1/42*

U.S. Cl. 123—188 M **11 Claims**

1. In combination with an internal combustion engine having a cylinder, a cylindrical gas inlet passage having an opening at one end located axially into one end of the cylinder and adapted for being closed at the cylinder end, a helical channel having one end in communication with the passage, a valve having an actuating stem coaxial with the cylindrical gas inlet passage, said cylinder having cylinder means for slidably receiving the valve stem and disposed near the other end of the cylindrical gas inlet passage and rising from said other end of said cylindrical gas inlet passage to the other end of said helical channel, and a supply channel for supplying gas to said helical channel and having one end connected to said other end of said helical channel and the other end adapted to recieve the gas to be supplied to said cylinder via said channels and passage, the axis of said helical channel being laterally offset from the axis of said cylindrical gas inlet passage and the peripheral wall of said helical passage being a substantially uniform distance from the axis of said helical channel.



3,890,950

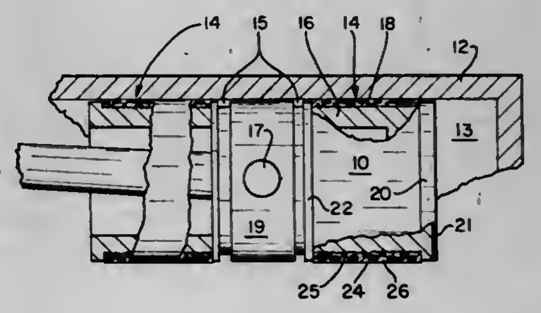
PISTON LUBRICATING

Charles W. Haldeman, Concord, Mass., assignor to Megatech Corporation, Billerica, Mass.

Filed Oct. 2, 1973, Ser. No. 402,708

Int. Cl. F02f *23/00*

U.S. Cl. 123—193 P **8 Claims**



1. Self-lubricating piston apparatus for a combustion engine comprising,

means defining a base piston structure having an external wall,

means defining a bearing surface layer for said structure bonded to said external wall and comprising a plastic matrix extending longitudinally along and over the full lateral extent of said base surface,

means defining a first strengthening reinforcement and lubricating phase distributed in said matrix comprising a plurality of elongated plastic impregnated yarn of ceramic fibers of lamellar crystal structure at an external surface of said layer running the full lateral extent of said bearing surface layer and parallel to each other,

means defining a second strengthening reinforcement and lubricating phase distributed throughout the longitudinal and lateral extent of said bearing surface layer comprising a dispersed particulated solid lubricant, and means defining heat transfer paths regularly distributed through said bearing surface layer for conducting heat from said external surface and said fibers through at least a portion of the thickness dimension of said bearing surface layer.

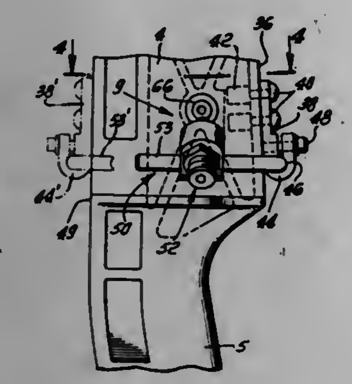
3,890,951
ADJUSTABLE ARROW REST

Thomas Paul Jennings, Sun Valley; John Monroe Williamson, Hollywood, and Carl Sumida, Los Angeles, all of Calif., assignors to Jennings Compound Bow, Inc., North Hollywood, Calif.

Filed Nov. 12, 1973, Ser. No. 414,863

Int. Cl. F41b *5/00*

U.S. Cl. 124—41 **12 Claims**



1. An adjustable arrow rest comprising:
- an assembly including a sliding plunger having an arrow engaging tip and means to yieldingly bias the plunger for supporting engagement with the shaft of an arrow;
- first means releasably attached to a second means for supporting said assembly at a position spaced from a bow;
- second means adapted to be mounted on a bow operatively connected to said first means to permit movement of said first means and said assembly with respect to said second means in an upward or downward direction generally along the longitudinal dimension a bow and to also permit transverse movement of said first means and said assembly with respect to generally the longitudinal axis of a nocked arrow supported by a bow;
- said second means including a quick release to fix said first means and said assembly in a desired position vertically with respect to the longitudinal dimension of a bow and transversely with respect to the longitudinal axis of a nocked arrow supported by a bow to fix said first means and said assembly in the new position, and
- third means operatively connecting said assembly to said first means to releasably fix the angle of said assembly so as to vary the angle between the longitudinal axis of the plunger and the long dimension of a bow.

3,890,952
PORTABLE CAMPING STOVE

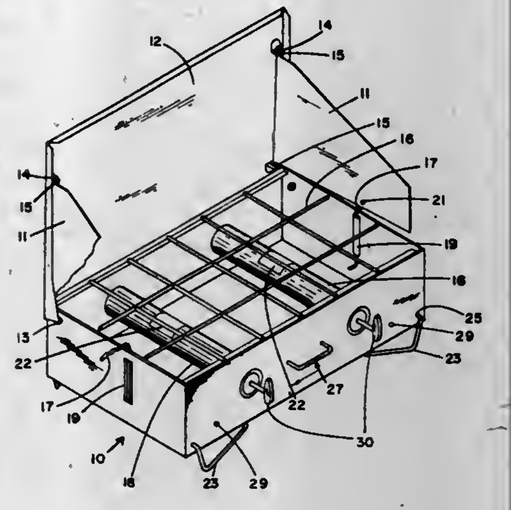
Mervin A. Hamre, 842 Cherokee Ave., St. Paul, Minn. 55107

Filed Oct. 15, 1973, Ser. No. 406,345

Int. Cl. F24c *5/06*

U.S. Cl. 126—45 **6 Claims**

1. A portable stove comprising:
- a housing having side walls;
- a plurality of burner assemblies mounted to said housing between two side walls, each of said burner assemblies comprising a first cylindrical chamber having first aperture means in one side, a second cylindrical chamber rotationally and axially movably mounted inside said first chamber and in intimate sealing contact therewith, said second chamber having second aperture means in one side;
- a handle extending outside a side wall connected to an end of said second chamber so as to allow said second chamber to be moved to various positions having varying degrees of overlap between said aperture means; and
- a fuel absorbent packing material in said second chamber adapted to be saturated with inflammable fuel, which fuel can be burned when exposed to the air by a suitable alignment of said aperture means.



3,890,953
ELECTRICAL APPARATUS GENERATING A LOW FREQUENCY, ALTERNATING MAGNETIC FIELD FOR PROMOTING THE GROWTH OF BONE AND OTHER BODY TISSUES

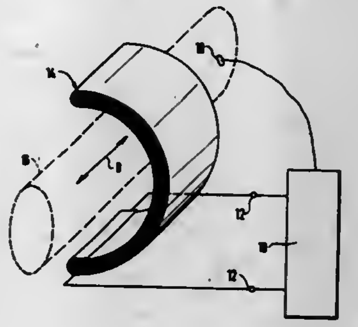
Werner Kraus, Munich, and Hans-Dieter Viehbach, Aisingerwies, both of Germany, assignors to Werner Kraus, Munich, Germany

Filed Apr. 6, 1972, Ser. No. 241,727

Claims priority, application Germany, Apr. 6, 1971, 2116869

Int. Cl. A61n *1/42*

U.S. Cl. 128—1.5 **5 Claims**



1. In an electrical apparatus for promoting the growth of bone and other body tissues by the application thereto of a low frequency alternating magnetic field, such apparatus having current generating means and field applicator means, the improvement wherein the applicator means comprises a flat solenoid coil having an axis about which the coil is wound and composed of a plurality of parallel and flexible windings, each said winding having two adjacent elongate portions and two 180° coil bends joining said elongate portions together, said coil being flexible in the coil plane in the region of said elongate portion for being bent into a U-shape, said coil being bent into such U-shape about an axis parallel to the coil axis and adapted for connection to a source of low frequency alternating current.

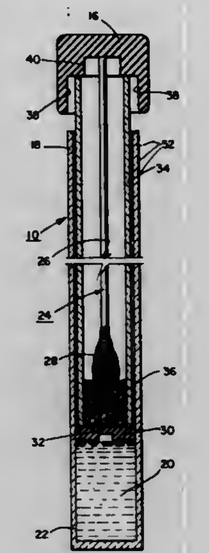
3,890,954
METHOD OF AND APPARATUS FOR COLLECTING CULTURES

Donald J. Greenspan, Riverside, N.J., assignor to U.S. Medical Research & Development, Inc., Riverside, N.J.

Filed May 8, 1973, Ser. No. 358,350

Int. Cl. A61b *10/00*

U.S. Cl. 128—2 W **11 Claims**



1. An apparatus for collecting cultures including an elongated member having an absorbent swabbing tip received within a container tube having an open end, a closed end and sides therebetween, a culture-sustaining liquid at the closed end of the tube, the improvement comprising plug means within said tube adjacent said culture-sustaining liquid, a portion of said plug means extending outwardly toward the sides of said tube in resilient contact therewith so as to form a sliding, substantially liquid-tight junction with the sides of said tube, said plug means including a resilient isolating valve member closing an opening in said plug means, said resilient isolating valve member being closed when said plug means is stationary within said tube so as to create substantial physical isolation of the swab within the tube from the culture-sustaining liquid when the plug means is located above the culture-sustaining liquid, said resilient isolating valve member opening in response to movement of said plug means toward the bottom of said tube through said culture-sustaining liquid so as to moisten said absorbent swabbing tip of said swab with said culture-sustaining liquid, said plug means having a surface adjacent said tip tapering radially inwardly toward said closed end for guiding the absorbent tip toward the center of said plug means to enable said elongated member to transmit a substantially axial force for moving said plug means through the culture-sustaining liquid.

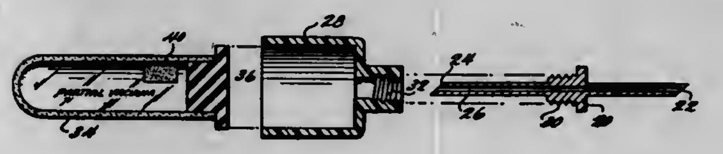
3,890,955
VACUUM INDICATOR

John Elliott, Philadelphia, Pa., assignor to Angelika Elliott, Philadelphia, Pa.

Division of Ser. No. 228,687, Feb. 23, 1972, Pat. No. 3,800,780. This application Jan. 15, 1974, Ser. No. 433,561

Int. Cl. A61b *10/00*

U.S. Cl. 128—2 F **5 Claims**



1. An apparatus for removing blood having a tube with at least partial vacuum pressure therein below atmospheric pressure and a needle connected to said tube with an end adapted for penetrating into a blood carrying body vessel and an interior blood transferring cavity so that, when said end has penetrated into a vessel, said cavity is in pneumatic connection with the interior of said tube and blood from that vessel is drawn through said cavity into the interior of said tube, the improvement comprising a quantity of hemoglobin painted on a portion of said tube, which has a color which varies as a function of the amount of oxygen about it, said material being within said tube for indicating by a change in color, a change in the amount of oxygen and the loss of said partial vacuum pressure.

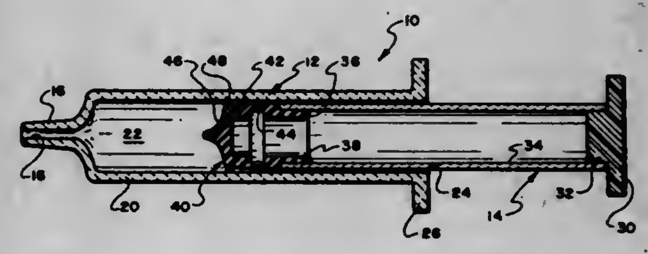
3,890,956
BLOOD-GAS SAMPLER

Harvey Robert Moorehead, Salt Lake City, Utah, assignor to Deseret Pharmaceutical Co., Inc., Sandy, Utah

Filed June 27, 1974, Ser. No. 483,594

Int. Cl.^{2} A61B *5/14*; **A61M** *5/315*

U.S. Cl. 128—2 F **7 Claims**



1. A blood-gas arterial syringe comprising:
- a hollow barrel having means at the leading end for receiving an arterial needle, said means comprising a relatively small diameter port whereby blood is communicated from an artery to the hollow of the barrel, the barrel further comprising an intermediate portion having a relatively large essentially uniform inside diameter which opens at the trailing end of the barrel;
- a plunger normally extending through the said opening and disposed along the intermediate portion of the barrel, the plunger comprising means at the trailing end for advancing the plunger into the barrel, and an intermediate section having a lateral dimension less than said inside diameter of the intermediate portion of the barrel;
- the improvement comprising a seal comprising a cup-shaped body initially defining an essentially annular wall coaxial to but spaced from the inside surface of the intermediate portion of the barrel and an end closure comprising the leading end of the seal, the body being united at its trailing end to the leading end of the intermediate section of the plunger, the seal further comprising at least one radially extending annular seal bead spanning at all times between the annular wall and the inside surface of the intermediate portion of the barrel creating only limited resistance to plunger extension under force of arterial pressure, the seal further comprising a reduced thickness section of the annular wall located forward of said union between said trailing end of the seal and the leading end of the intermediate section of the plunger and creating an annular buckling region which is forced radially outward by fluid pressure creating an additional temporary annulus in sealing contact with the inside surface of the barrel as the plunger is advanced into the barrel causing blood within the barrel to be expelled through the small diameter port whereby blood leakage across the seal is alleviated, the temporary annulus collapsing to the initial configuration when the plunger is no longer advanced.

3,890,957

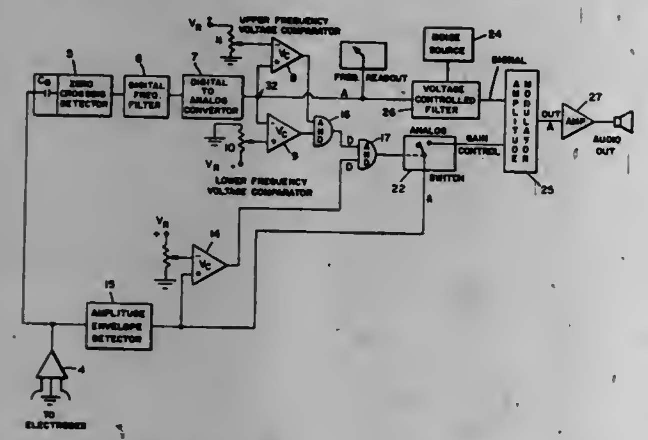
BIOLOGICAL FEEDBACK SYSTEMS

James A. Freeman, Berkeley, Calif., assignor to FSW Associates, Calif.

Continuation of Ser. No. 299,774, Oct. 24, 1972, abandoned. This application Aug. 2, 1974, Ser. No. 494,288

Int. Cl. A61b *5/04*

U.S. Cl. 128—2.1 B **12 Claims**



1. In a bio-feedback device or system for processing a bio-generated signal produced by human or animal organism, means for generating an electrical signal in response to a bio-generated signal,

means for detecting the dominant frequency of said electrical signal, means for discriminating against subdominant frequenices and noise contained in said signal, said means comprising means for establishing an inhibit time interval after each detection having a duration slightly less than but approaching the periodicity interval being investigated for controlling the output of said detecting means so that the output thereof is inhibited during said time interval,

means for converting said detected dominant frequency to a signal the magnitude of which is proportional to said

indicator means for creating a signal which varies between conditions perceptible to said organism, and

means responsive to the magnitude of said analog signal for changing the indicated value of said indicator means.

3,890,958

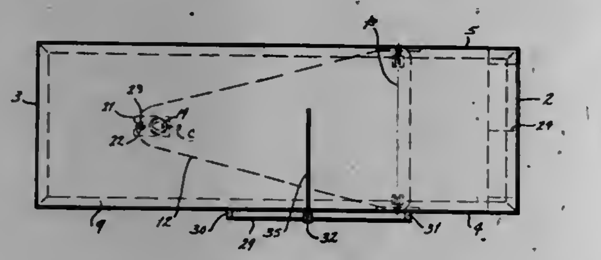
PHYSIOLOGICAL DIAGNOSTIC APPARATUS

Louis P. Fister, St. Louis, and Robert Paine, University City, both of Mo., assignors to Moog Automotive, Inc., St. Louis, Mo.

Filed Apr. 8, 1974, Ser. No. 459,108

Int. Cl.^{2} A61B *5/10*

U.S. Cl. 128—2 S **20 Claims**



1. An apparatus for measurement of the extent of shifting of mass longitudinally within a patient's recumbent body resulting from visceral changes and changes of distribution of blood and extra-cellular body fluids comprising a flat platform dimensioned for receiving a patient's recumbent body thereon, said platform having opposed ends and side edges, a rigid support frame, rockable means mounting said platform on said frame for rockable movement about a pivot axis transversely of said platform, said rockable means inhibiting shiftable movement of said platform longitudinally and transversely and against lateral tilting, a load-actuated device provided beneath said platform and on one side of said pivot axis, said load-actuated device engaging the under face of said platform, signal processing means connected to said load-actuated device receiving signals therefrom and emitting output signals, means operatively provided with said signal processing means eliminating output signals caused by signals generated by said load-actuated device from the weight of said platform and from the weight of the patient's body, and means driven by said signal processing means for recording output signals developed by the shifting of mass within a patient's body in a direction longitudinally of said platform and within a plane substantially parallel to the plane of said platform.

3,890,959

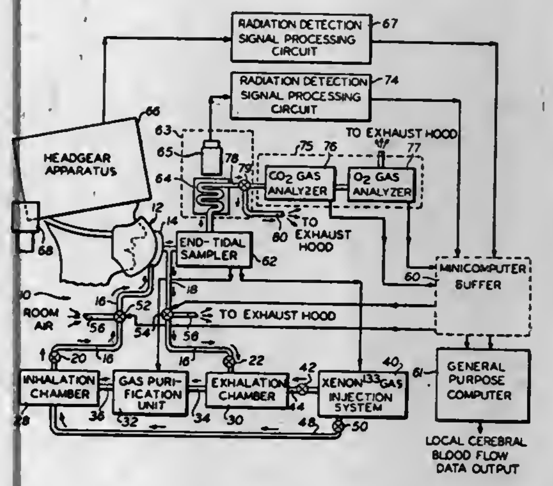
METHOD FOR DETERMINING DISCRETE LOCALIZED BLOOD FLOW IN A LARGE VOLUME OF TISSUE

Myron Youdin, Flushing; June N. Barker, and Theobald Reich, both of New York, all of N.Y., assignors to New York University, New York, N.Y.

Continuation-in-part of Ser. No. 126,770, March 22, 1971, Pat. No. 3,769,966. This application Apr. 26, 1973, Ser. No. 354,489

Int. Cl. A61b *5/02, 6/00*

U.S. Cl. 128—2.05 F **59 Claims**



1. A method for determining a discrete localized blood flow in a preselected radiation emission detection zone of a volume of tissue comprising the steps of

a. defining a plurality of radiation emission detection zones for at least a portion of said tissue volume, said plurality of zones including said preselected zone;
b. defining a plurality of effective fields of view, each of said plurality of zones being within at least one effective field of view, each of said effective fields of view being defined with respect to an associated predetermined axis of view, each of said effective fields of view including said preselected zone and at least a portion of one or more of said other zones of said plurality of zones;
c. providing a source of radiation emission for said blood for causing each detection zone to have an associated quantity of radioisotope concentration and an associated quantity of radiation emission dependent on said associated radioisotope concentration; and
d. quantifying said associated quantity of radioisotope concentration for said preselected zone by quantifying a resultant radiation emission quantity for each of said effective fields of view, said resultant radiation emission quantities being dependent on said radioisotope concentrations of said preselected zone and said portions of said plurality of zones included within each of said effective fields of view, whereby said discrete localilzed blood flow may be determined.

3,890,960

MEDICAL DIAGNOSTIC INSPECTION SPATULA

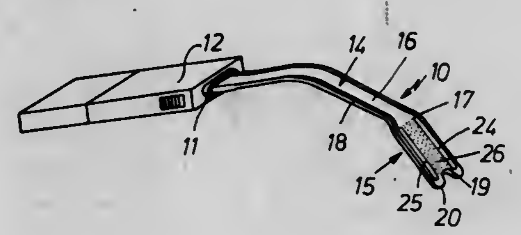
Friedgard Wunsch, nee Kuhn, and Erich Wunsch, both of Schwieberdingen, Germany, assignors to Efrudec-Vertriebsgesellschaft mbH fur Industrieprodukte aus Metall und Kunststoff, Schwieberdingen, Germany

Filed Dec. 13, 1973, Ser. No. 424,612

Claims priority, application Germany, Jan. 19, 1973, 2302614

Int. Cl. A61b *1/06*

U.S. Cl. 128—16 **13 Claims**



1. A spatula, particularly for the diagnostic inspection of the mouth and throat, comprising an elongated body portion having an upper and a lower surface, two opposite end portions and a central portion located intermediate of the latter, one of said end portions being adapted to be received into the mouth cavity; a pair of transversely spaced skids provided at said one end portion and extending downwardly of said lower surface, whereby said skids only contact the rear part of the tongue and do not contact the base area of the tongue upon insertion of said one end portion into the mouth cavity; and groove-shaped recesses formed in said upper surface of said one end portion in the region of said skids and extending substantially longitudinally along the length of said skids.

3,890,961

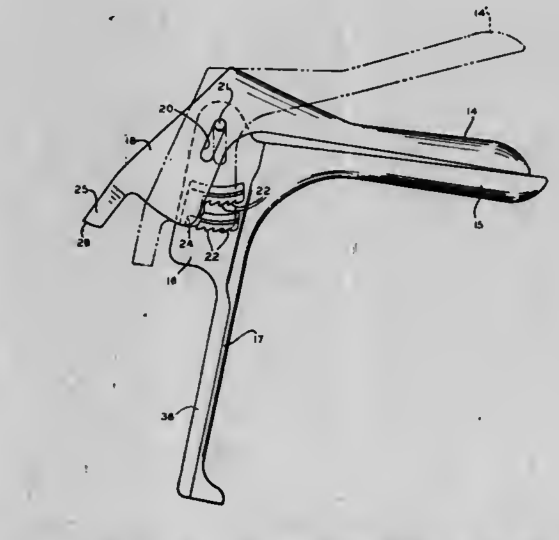
DISPOSABLE VAGINAL SPECULUM

William C. Moore, Skaneateles; John D. Connors, Auburn, and Richard W. Newman, Marcellus, all of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Aug. 23, 1973, Ser. No. 390,695

Int. Cl. A61b *1/32*

U.S. Cl. 128—17 **6 Claims**



1. A vaginal speculum comprising a pair of separable blades of resilient material fastened together by a pin and slot connection to permit relative pivotal and spatial adjustment of the blades, the pivotal adjustment permitting the blades to be moved between closed and various degrees of open positions, one of the blades having a double row of ratchet teeth positioned one above the other and the other blade having a pawl selectively engageable with the teeth in either of said rows, and means to enable the pawl to be moved from one row to the other while the blades are in an open position.

3,890,962

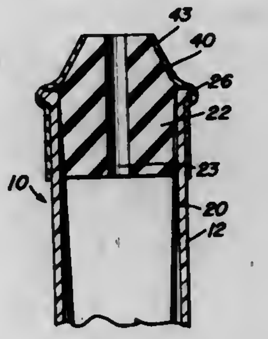
DISPOSABLE MANOMETER

Maynard Ramsey, III, Durham, N.C., assignor to Ramtech, Inc., Tampa, Fla.

Continuation-in-part of Ser. No. 84,718, Oct. 28, 1970, Pat. No. 3,720,211, which is a continuation-in-part of Ser. No. 881,121, Dec. 1, 1969, Pat. No. 3,648,687. This application Mar. 5, 1973, Ser. No. 338,283

Int. Cl. A61b *5/02*

U.S. Cl. 128—2.05 D **6 Claims**



1. A disposable blood pressure monitor comprising an elongated tubular structure, means on one end of said tubular structure adapted to place the interior of said tubular structure in direct communication with the blood pressure system to be monitored with the other end terminating in a lip configuration, a flexible sacklike membrane received within the lip end of the tubular structure, said sacklike membrane separating said tubular structure into first and second chambers, adapted to transmit pressure of the blood pressure system to be monitored and a one-hole stopper frictionally engaging the inner surface of said tubular structure with the peripheral edge of said sacklike membrane being sealingly positioned between the inner surface of said tubular structure and the outer surface of said stopper, a cover member made of heat, shrinkable material placed over the outer surface, of said stopper and the outer surface of said tubular structure and shrunk over the top and sides of said stopper to hold said stopper and tubular structure is a fixed relationship to prevent accidental dislodging thereof said heat shrinkable material when shrunk defining an aperture over the hole of said one hole stopper so that pressure indicating means can be detachably and sealingly received within the hole of said one hole stopper without rupturing said heat shrinkable material.

3,890,963

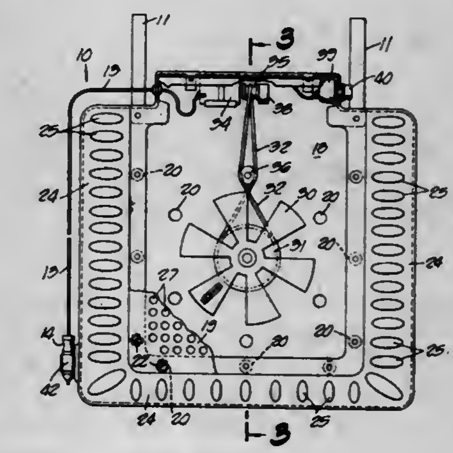
KINESTHERAPY DEVICE

John W. Patterson, 1528 1/2 Beverly Dr., Los Angeles, Calif. 90035

Filed Feb. 1, 1974, Ser. No. 438,674

Int. Cl. A61h *29/00*

U.S. Cl. 128—24.1 **7 Claims**

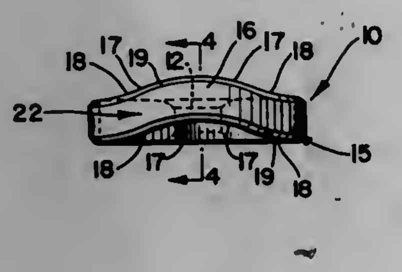


1. A kinesthetherapy device having a relatively thin hollow main body adapted to be placed against the back or beneath

the buttocks, said main body having wide area base and cover plates interconnected by a flexible peripheral member and provided with a multiplicity of widely distributed air inlet and outlet openings, a motor driven air circulating means mounted within said main body operable to circulate air through said widely distributed openings and against a person resting against said cover plate, said motor driven means including means powered by said motor for vibrating said main body, service cord means extending between said motor and a source of electrical energy, and manually operable speed control means in circuit with said motor and said service cord means.

3,890,964
TONGUE CLEANING AND MASSAGE INSTRUMENT

Edwin W. Castanedo, Rt. 1 Box 265, Keithville, La. 71047
Filed Dec. 28, 1973, Ser. No. 429,158
Int. Cl.^{2} A61H *7/00;* A61B *17/22*
U.S. Cl. 128—62 R **2 Claims**

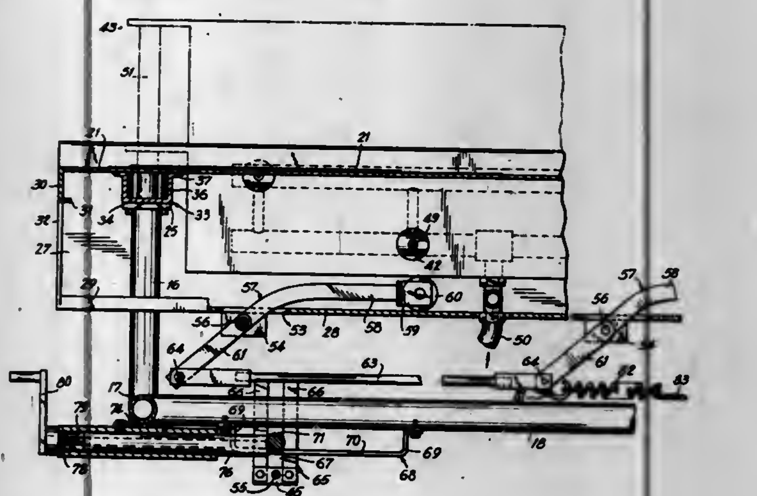


1. A tongue massaging and conditioning instrument for enhancing the circulation through the tongue and freeing the papillae of the dorsal mucosa of pathogenic foreign matter potentially hazardous to health and destructive of the teeth comprising an elongated handle portion terminating at one end in a pair of longitudinally divergent arms mounting at their spaced ends a transversely directed, centrally arched, cross-bar substantially in the plane of said handle and arms, the opposite ends of said cross-bar comprise reversely curved (merge through reversed) arcuate segments merging into the divergent arm ends and thereby forming along one edge a centered convex portion adapted, when said instrument is held to position said one edge against the tongue and drawn forwardly along the tongue, to cooperate with the depressed medial area of the tongue and forming along the opposed edge respective laterally outwardly and downwardly sloping end portions adapted, when said instrument is held to position said opposed edge against the tongue and drawn forwardly along the tongue, to cooperate with the areas of the tongue laterally related to the depressed medial area, said one edge and said opposed edge being bevelled in a direction such that they intersect the inner wall of the cross-bar at an angle less than 90°.

3,890,965
HYDROTHERAPY APPARATUS

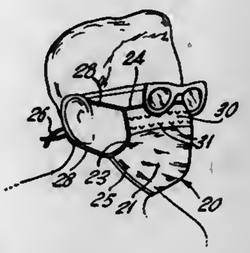
Marie Drew, 636 Commonwealth, Bronx, N.Y. 10471
Filed May 8, 1974, Ser. No. 468,029
Int. Cl. A61h *9/00*
U.S. Cl. 128—66 **9 Claims**

1. A hydrotherapy apparatus comprising a horizontally extending platform provided with liquid drains, a support frame on which said platform is mounted, longitudinally spaced nozzles located along opposite sides of said platform and directed toward the space above said platform, means for connecting said nozzles to a source of pressurized liquid, means for adjusting the vertical levels of said nozzles comprising a mount member supporting a group of said nozzles along each side of said platform, and means for raising and lowering said mount members between depressed positions with said nozzles being below the level of said platform and raised positions with said nozzles being above the level of said platform.



3,890,966
ANTI-FOG SURGICAL FACE MASK WITH SLITS

Gary Bertil Aspelin, Bridgewater Twp.; Richard Francis Caffrey, Maplewood, and William Lauer, Madison, all of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.
Filed Nov. 1, 1973, Ser. No. 411,872
Int. Cl. A61b *19/00*
U.S. Cl. 128—146.2 **8 Claims**



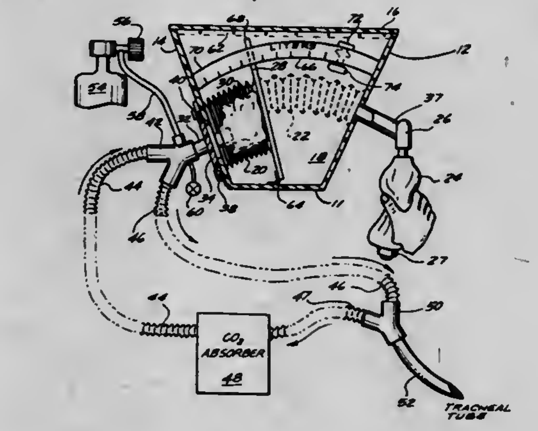
1. A surgical face mask comprising a body portion having upper and lower parts, said body portion comprising a filtration medium for filtering bacteria, means for securing the mask over the mouth and nose of the wearer, and a sheet of air impervious material secured to the upper part of said body portion, substantially the entire area of one major surface of said air impervious material overlying said body portion, said sheet of air impervious material having slits defining downwardly extending flaps which are outwardly movable under the influence of exhaled breath to provide paths for directing the flow of said exhaled breath away from the eyes of the wearer.

3,890,967
BREATHING INDICATOR AND VENTILATOR

James O. Elam, Chicago, Ill., and Henning M. Ruben, Copenhagen, Denmark, assignors to James O. Elam, Chicago, Ill.
Filed Oct. 17, 1973, Ser. No. 407,218
Int. Cl. A61m *37/00*
U.S. Cl. 128—202 **15 Claims**

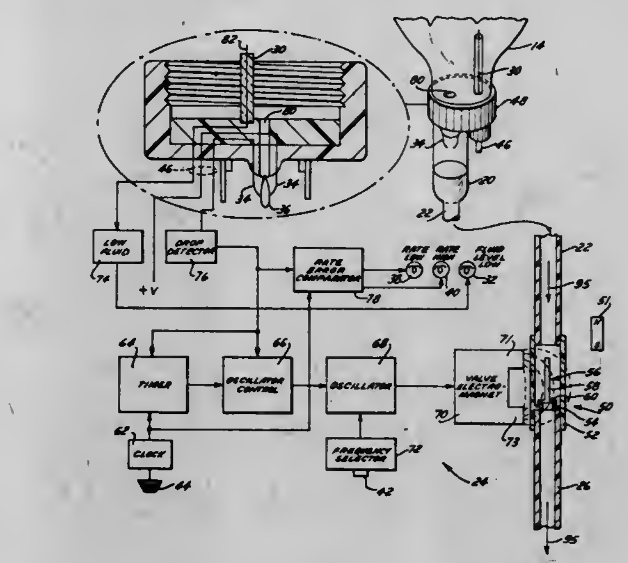
1. A breathing responsive device comprising a first bellows, a first conduit means for conducting a first quantity of gas between said first bellows and a patient, a second bellows, mounting means for mounting said first and second bellows in mechanically coupled relationship to one another, said second

bellows being pneumatically isolated from said first bellows, second conduit means for conducting a second quantity of gas to said second bellows, and indicating means associated with said first bellows for indicating the relative extent thereof.



3,890,968
FLUID FLOW CONTROL MEANS

Oscar L. Pierce; Arthur H. Hutchison; Olin B. King, and Lonnie S. McMillian, all of Huntsville, Ala., assignors to SCI Systems, Inc., Huntsville, Ala.
Filed June 25, 1971, Ser. No. 156,854
Int. Cl. A61m *5/00*
U.S. Cl. 128—214 E **16 Claims**



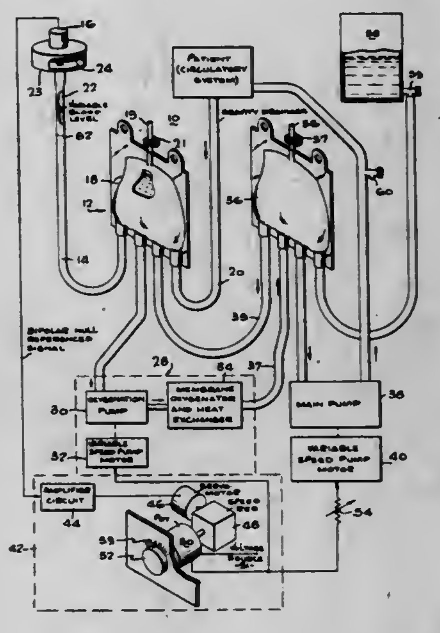
1. A parenteral fluid flow controller comprising, in combination, closed conduit means for conveying said fluid to a patient, flow control valve means including a magnetic check valve enclosed within said conduit for controlling the flow of said fluid to said patient, actuating means including magnetic means outside of said conduit for repeatedly actuating said valve means to permit flow therethrough in increments, drop formation means for forming drops of said fluid from a fluid reservoir, and control means for making the time duration of opening of said valve means inversely proportional to the time rate of formation of said drops at substantially all times during the operation of said controller.

3,890,969
CARDIOPULMONARY BYPASS SYSTEM

Halbert Fischel, Santa Ana, Calif., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.
Filed Jan. 21, 1974, Ser. No. 435,223
Int. Cl.^{2} A61M *01/03*
U.S. Cl. 128—214 R **8 Claims**

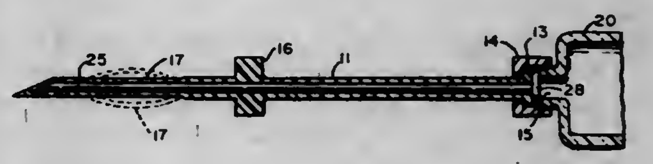
1. A cardiopulmonary bypass system for receiving a variable rate gravity fed venous blood flow from a human circulatory system, revitalizing the blood and returning the blood to the circulatory system at a flow rate substantially equal to the gravity fed blood flow comprising:

a first collapsible bag disposable below a withdrawal point coupled to receive a gravity fed flow of blood at an inlet, the collapsible bag being at least partially filled with blood and substantially without a blood-gas interface, the collapsible bag having a sufficient flexibility such that a collapse of the bag resulting from an emptying of blood therein inhibits a suction from occurring at the inlet;
a second collapsible bag;
recirculation path means for communicating blood from the second collapsible bag to the first collapsible bag;
revitalization means coupled between the first and second collapsible bags for continuously oxygenating and warming blood from the first bag and transporting the oxygenated and warmed blood to the second bag;
main pump means coupled to the second bag for delivering a blood flow from the second bag to a human circulatory system at a rate controlled by a control signal applied thereto;
blood volume transducer means coupled to the first bag for providing a signal related to the blood volume in the first bag; and
controller means responsive to the blood volume indication for supplying a control signal to the main pump means to drive the main pump means at a rate which tends to maintain the blood volume of the first bag at a predetermined level such that the return blood flow rate is held substantially equal to the venous blood flow.



3,890,970
RETENTION CANNULA OR CATHETER AND APPLICATOR

Robert L. Gullen, 3411 N. 5th Ave., Phoenix, Ariz. 85013
Filed Jan. 21, 1974, Ser. No. 434,963
Int. Cl. A61m *5/32*
U.S. Cl. 128—215 **2 Claims**



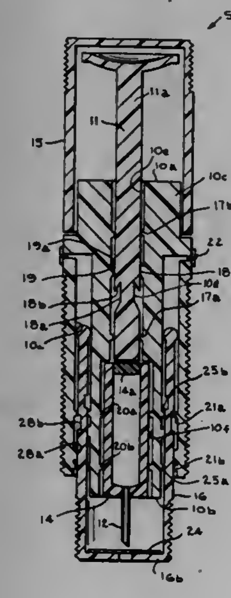
1. A cannula for penetration into and retention within soft body tissue, for injecting treating fluid into said tissue, comprising:

- a. A flexible catheter tube of resilient plastic material having adjacent its forward end a thin membranous part expandable into a balloon structure and having a front end closed and formed in a point to fit over and be inserted into said tissue by a stylet, said catheter including openings therein positioned adjacent said closed end to permit transmission of treating fluids from said catheter to surrounding tissue;
- b. A rigid stylet slideably mounted within said catheter and having its forward end formed into a point for supporting the pointed closed end of said flexible catheter during insertion in said tissue;
- c. And means connected to said catheter for supplying treating fluid therethrough to said body tissue.

3,890,971
SAFETY SYRINGE

Thomas A. Leeson, 187 West Hamilton Ave., Campbell, Calif. 95008, and Mark Scott Hamilton, 556 Commercial St., San Francisco, Calif. 94111

Filed Oct. 23, 1973, Ser. No. 408,515
Int. Cl. A61m *5/22, 5/24*
U.S. Cl. 128—218 R **7 Claims**

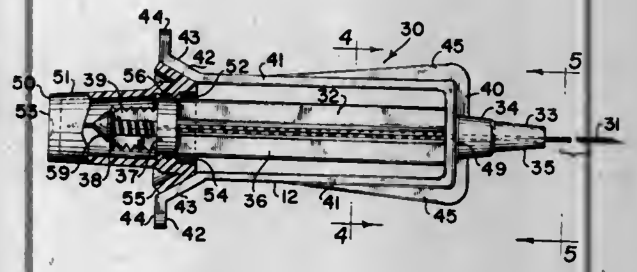


1. A lockable safety syringe, comprising:
- a barrel housing having a bore therethrough, said barrel housing bore being adapted at one end thereof to receive a container for medicine having a needle mounted therewith for protrusion outwardly from said barrel housing;
- a plunger mounted in said barrel housing bore at the other end thereof for slidable movement, said plunger being movable into said container for medicine for displacing medicine in said container outwardly through said needle; a protective cap mounted on said one end of said barrel housing over said needle;
- cap safety lock means for locking said protective cap over said needle to prevent reuse of said syringe; and
- plunger safety lock means for locking said plunger against movement to prevent reuse of said plunger whereby said plunger safety lock means cooperates with said cap safety lock means to prevent reuse of said syringe, said cap safety lock means and said plunger safety lock means being located within said housing so as to be inaccessible after locking each of said means.

3,890,972
SYRINGE INJECTOR WITH POP-TOP CAP

Wendell Evert Standley, Lake Forest, and Glenn Lee Beall, Gurnee, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Sept. 25, 1973, Ser. No. 400,573
Int. Cl. A61m *5/24;* **B65d** *83/10*
U.S. Cl. 128—220 **7 Claims**



1. A medicament injector for receiving a vial having a stopper therein,
- said injector comprising an integral holder including a solid post having a double-ended cannula molded therein, the post extending along a substantial portion of the length of the cannula,
- said post having a hub on the distal end thereof from which one end of the cannula projects and a stem on the proximal end for receiving the stopper of the vial, the other end of the cannula projecting from the stem;
- a laterally extending base interconnecting the post and the hub;
- a pair of opposed, longitudinally extending wings projecting from the base toward the stem and terminating in finger grips, said finger grips including angularly projecting portions extending from said wings in a slanted manner; a stop member extending from the post at the proximal end thereof; and
- a cap member defined by a tubular body portion having an open end and a closed end, the open end being defined by a base portion from which extends an obtusely slanted flange mating with the angularly projecting portion of the finger grips of said wings, said base portion adapted to engage the stop on the post and to be frictionally held on the post whereby said cap can be removed by applying pressure to the extending wings.

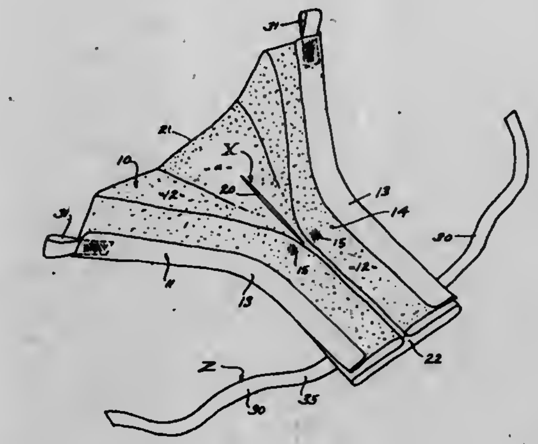
3,890,973
SANITARY DIAPER

Alwyn K. Davis, 483 Massey St., Thousand Oaks, Calif. 91360, and Ward A. St. John, 58 Farland Dr., Newbury Park, Calif. 91320

Filed June 29, 1973, Ser. No. 374,939
Int. Cl. A61f *5/44*
U.S. Cl. 128—286 **20 Claims**

1. A sanitary diaper having an inner absorbent layer and a contiguously overlying and impervious outer layer, and including a normally closed slit-shaped excrement diverting

opening through the inner absorbent layer to be spread by and to pass fluid excrement from the interior to the exterior of the

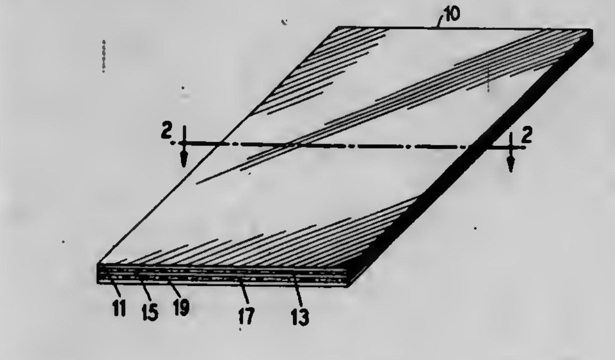


inner absorbent layer for containment within the confines of said impervious outer layer.

3,890,974
DISPOSABLE ABSORBENT ARTICLE CONTAINING SLITTED HYDROGEL FILM

Theodore F. Kozak, Peekskill, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 18, 1974, Ser. No. 480,523
Int. Cl. A41b *13/02*
U.S. Cl. 128—287 **11 Claims**



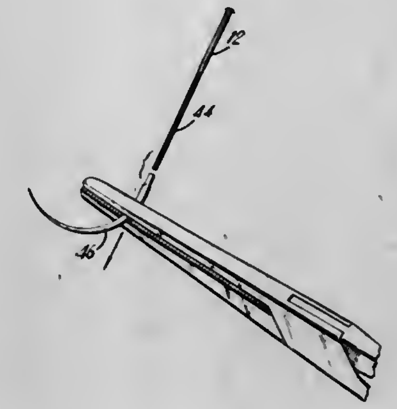
1. A disposable absorbent article for placement adjacent to the body, including:
- a. a hydrophobic liquid permeable topsheet for placement adjacent to the body;
- b. a liquid impermeable backsheet; and
- c. a hydrophilic, substantially water insoluble film disposed between said topsheet and said backsheet, said film containing a plurality of slits of from about 1/6 to ⅜ inch in length, whereby liquid contacting said film causes the film to swell thereby opening said slits to permit passage of liquid therethrough.

3,890,975
CONTROLLED RELEASE SUTURE

Walter McGregor, Somerset, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 258,159, May 31, 1972, abandoned. This application Oct. 26, 1973, Ser. No. 409,974
Int. Cl. A61b *17/06*
U.S. Cl. 128—339 **13 Claims**

1. A needle-suture combination comprising a needle having a sharp end and a blunt end and having an opening in said blunt end; and a suture one end of which is coated with a resin and of smaller diameter than the remainder of the suture, said resin-coated end being received within said opening with the remainder of said suture extending outwardly of said blunt end, said blunt end of said needle being swaged to the extent that the resin-coated end of said suture is compressed to from about 62% to about 75% of its original diameter and said

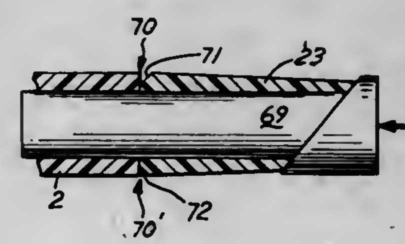


needle-suture combination is characterized by a suture pull-out value of from about 3 to about 26 ounces.

3,890,976
CATHETER TIP ASSEMBLY

Seymour Bazell, Skokie; Ralph G. Ostensen, Morton Grove, and Edward M. Goldberg, Glencoe, all of Ill., assignors to Medical Products Corporation, Skokie, Ill.

Division of Ser. No. 301,172, Oct. 26, 1972. This application Jan. 21, 1974, Ser. No. 434,937
Int. Cl. A61m *25/00*
U.S. Cl. 128—351 **4 Claims**

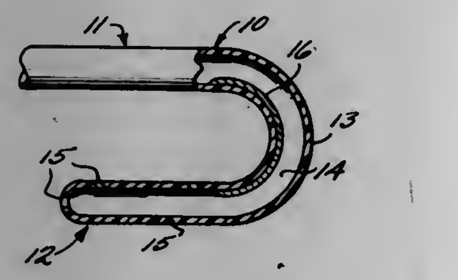


1. An improved tracheal tube comprising:
- a. a flexible, tubular body portion with a durometer of above 60 to about 85 having a central passage extending axially therein from a proximal to a distal end;
- b. an inflatable cuff positioned on the tubular body portion;
- c. means for inflating said cuff;
- d. a separate molded tip secured to the distal end of the flexible tubular body portion,
  - i. said tip having a distal portion and having an aperture therein communicating with the central passage of said tube body portion,
  - ii. said tip being resilient material having a durometer higher than the durometer of said flexible tube body portion, and in the range of from about 75 to about 95,
  - iii. said distal portion having a distally extending inward taper and a chamfered leading edge of uniform thickness around its entire circumference oriented transverse to the axis of the aperture for ease of insertion into a body, and
  - iv. said tip also having a proximal portion with an inwardly beveled edge abutting and heat sealed to the distal end of said tube body portion,
  - v. said heat seal providing a smooth transition between the tubular body portion and the tip on both the exterior and the interior thereof;
- e. said tip providing a tracheal tube wherein the tip does not fold over upon striking an obstruction when inserted into the body.

3,890,977

KINETIC MEMORY ELECTRODES, CATHETERS AND CANNULAE

Bruce C. Wilson, 34 Twickwood Ln., Glens Falls, N.Y. 12801
Filed Mar. 1, 1974, Ser. No. 447,340
Int. Cl. A61b *5/02;* **A61m** *25/00*
U.S. Cl. 128—418 15 Claims



1. A catheter comprising

a. an elongated generally cylindrical body member having a proximate and a distal end, said distal end for insertion into a body,

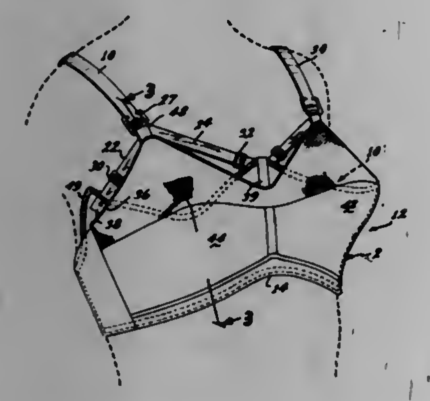
b. a distal portion of said body member capable of assuming a shape for ready insertion into a body, and a different shape for proper location in a body, and

c. means for shifting said distal portion from said readily insertable shape to said different properly locating shape upon bringing said portion to a specified temperature, said means comprising at least a portion of transitional temperature activated mechanical memory material formed into said distal portion.

3,890,978

BRASSIERE CONSTRUCTION

Mulford J. Nobbs, Hacienda Heights, Calif., assignor to Con-Stan Industries, Inc., City of Industry, Calif.
Filed Feb. 1, 1974, Ser. No. 438,868
Int. Cl. A41c *3/00*
U.S. Cl. 128—485 9 Claims



1. In a brassiere construction having an outer covering with breast covering cups, said covering encircling the body of the wearer, and an inner breast supporting band which contacts the undersurfaces of the wearer's breasts in providing support to the breasts, the improvement comprising:

said band having a permanent compound three-dimensional curvature to correspond with the three-dimensional curvature of the undersurfaces of the supported breasts;

said band being breathable so as to permit the flow of air to the supported breast areas and to promote the removal of moisture from said band and from the supported breast areas;

said band including rib cage portions having a transverse curvature to correspond with the transverse curvature of the wearer's rib cage;

said rib cage portions being relatively flat in a vertical direction to correspond to the generally fat configuration of the rib cage in a vertical direction;

said band including cupping portions which are curved upwardly, outwardly and transversely to a three-dimensional compound curvature corresponding to the three-dimensional curvature of the undersurface of the breast; said cupping portions being shaped and positioned to cradle the undersurface of the breast in firmly supporting the breast;

said band including outwardly curved portions joining said rib cage portions and said cupping portions;

said outwardly curved portions having a compound curvature in both a vertical and transverse direction;

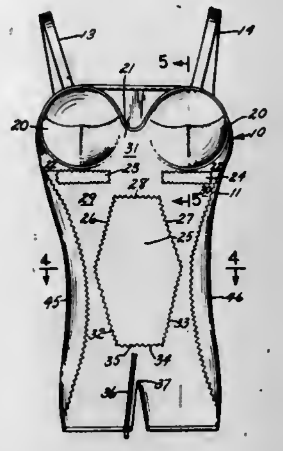
said outwardly curved portions including an inwardly and downwardly curved portion which forms a merger between the upward and outward curvature of said cupping portions and the relatively flat vertical configuration of said rib cage portions, and

said inwardly and downwardly curved portion having a curvature which transmits forces directed inwardly and downwardly from said cupping portions along an unbroken curved path into the substantially flat vertical configuration of said rib cage portions such that the downwardly and inwardly directed forces conveyed through said cupping portions are received by said rib cage portions without the formation of wrinkles in said band.

3,890,979

REINFORCED FOUNDATION CONSTRUCTION

Jeannette I. Fierst, 2 Weybridge Rd., Great Neck, N.Y. 11023
Filed Nov. 5, 1973, Ser. No. 412,876
Int. Cl. A41c *1/00*
U.S. Cl. 128—555 7 Claims



1. In a control foundation garment, including a tubular main body element formed of spandex yarn and having a given modulus of elasticity in each of two mutually perpendicular directions, the improvement comprising: a plurality of reinforced areas formed by the securing of elastic panels having modulus of elasticity in each of said two mutually perpendicular directions of at least three times that of the modulus of elasticity of said main body element in each of said directions, in areas requiring control.

3,890,980

METHOD FOR PREVENTING THE ESCAPE OF TOBACCO CRUMBS OR DETRITUS AT THE ENDS OF CIGARETTES IN TRANSPARENT PACKAGES

Erwin Helmut Geldmacher, Im Haag 472, Niederteuffen, Aargan, Switzerland
Filed June 19, 1972, Ser. No. 264,364
Claims priority, application Germany, June 24, 1971, 2131460; June 24, 1971, 2131459; June 24, 1971, 2131458
Int. Cl. A24c *05/60*
U.S. Cl. 131—121 1 Claim

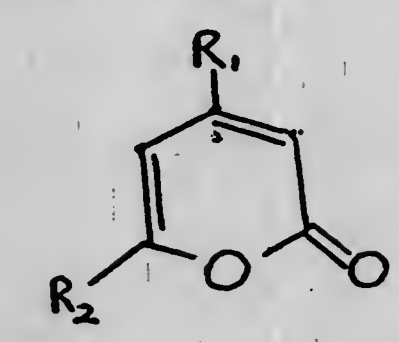
1. A method for preventing the emergence of tobacco particles from cigarettes to be packaged comprising the step of heating only the cigarette end to effect a rapid heating by microwave heating sufficiently to coagulate the proteins in the tobacco to seal the end thereof against the escape of detritus.

3,890,981

NOVEL PROCESS FOR ALTERING THE ORGANOLEPTIC PROPERTIES OF TOBACCO USING ONE OR MORE ALPHA-PYRONES AND PROCESS

Joaquin Francisco Vinals, Red Bank, N.J.; Alton Dewitt Quinn, Abrahamsville, Pa., and Alan Owen Pittet, Atlantic Highlands, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.
Division of Ser. No. 471,785, May 20, 1974, Pat. No. 3,861,403. This application Sept. 4, 1974, Ser. No. 503,110The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.
Int. Cl. A24b *15/04*
U.S. Cl. 131—144 6 Claims

1. A process for altering the organoleptic properties of tobacco comprising the step of adding to tobacco a tobacco flavoring composition comprising one or more 6-alkyl-alpha-pyrone compounds having the structure:



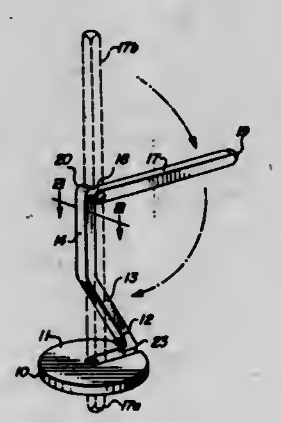
wherein R_1 is selected from the group consisting of methyl and hydrogen, and R_2 is C_3—C_5 alkyl and at least one tobacco flavoring additive selected from the group consisting of:

Esters;
Aldehydes;
Ketones;
Acetals;
Natural Oils and Extracts;
Lactones,
Ethers;
Pyrazines; and
Pyrroles

3,890,982

PIPE SMOKERS' FOLDING COMBINATION TOOL

Bernard C. Bruget, 313 E. Catalina, Yarnell, Ariz. 85012
Filed Oct. 15, 1974, Ser. No. 514,597
Int. Cl.² A24F *09/04*
U.S. Cl. 131—243 1 Claim



1. A pipe smoker's folding combination tool for tamping smoking tobacco within the bowl of a smoker's pipe, for aerating said tobacco, and for picking and cleaning the bowl and stem of said pipe, said tool comprising:

a. a disk sized to be inserted into a pipe bowl;

b. an arm extending from said disk generally perpendicular to a face thereof;

c. an elongate shaft hingedly affixed at one end thereof to the free end of said arm; and

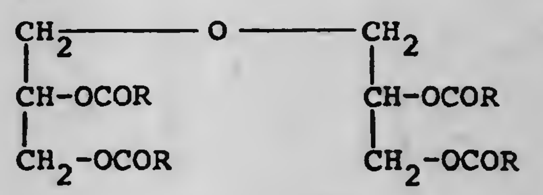
d. means defining an elongate aperture extending radially inward from the edge of said disk and sized to receive the free end of said shaft therethrough.

3,890,983

METHOD FOR PREPARING CIGARETTE FILTER

Hideo Sawada, and Junji Kawamoto, both of Sakai, Japan, assignors to Daicel, Ltd., Osaka, Japan
Filed Aug. 22, 1973, Ser. No. 389,083
Int. Cl. A24b *15/02*
U.S. Cl. 131—267 7 Claims

1. A tobacco smoke filter comprising a bundle of substantially longitudinally extending cellulose acetate fibers having a size of from 1 to 16 denier per fiber, said fibers being substantially uniformly coated with from 1 to 20% by weight, based on the weight of the fibers, of a plasticizer comprising as an ingredient a compound or a mixture of compounds having the formula:



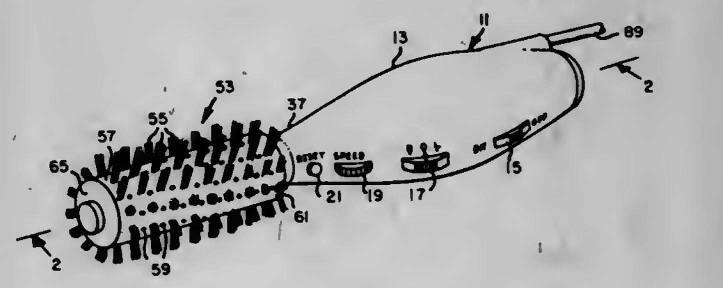
$$\begin{array}{lcl} CH_2 & \text{———— O ————} & CH_2 \\ | & & | \\ CH\text{-}OCOR & & CH\text{-}OCOR \\ | & & | \\ CH_2\text{-}OCOR & & CH_2\text{-}OCOR \end{array}$$

wherein R is hydrogen or a lower alkyl group having one to four carbon atoms and at least two R are said lower alkyl groups.

3,890,984

HAIR DRYER WITH ROTARY BRUSH

Alexander C. Lesetar, 1510 Lexington Dr., San Jose, Calif. 95117
Filed Jan. 23, 1974, Ser. No. 435,730
Int. Cl. A45d *20/00*
U.S. Cl. 132—9 3 Claims



1. A combination hair drying and rotary implement, comprising:

a hollow handle including therein a heater-fan unit and a motor;

a conduit non-rotatably mounted longitudinally adjacent one end of the handle and positioned to accept a flow of hot air from the heater-fan unit and guide the hot air so it does not contact the motor, the conduit having a longitudinal slot commencing adjacent the end of the conduit removed from the handle and terminating short of the handle, the slot serving to direct the hot air directionally outwardly through a limited angle from the slot; and

a brush comprising a tube having bristles extending from the external cylindrical surface thereof, the tube further having a plurality of openings therethrough adjacent the bristles, the tube rotatably communicating at one end thereof with the motor, the tube being substantially concentric with the conduit and being adapted to fit externally around the conduit, said tube detachably communicating with said motor whereby a plurality of brushes are usable with a single handle, means within said handle for automatically stopping the rotation of said brush responsive to high resistance to rotation thereto as when hair becomes entangled in the bristles thereof, and, on said handle, means for selecting the direction of rotation of said brush, means for manually starting rotation of said brush after rotation has been stopped responsive to high resistance thereto, means for manually stopping rotation of said brush, and means for manually stopping and starting said heater-fan unit.

3,890,985

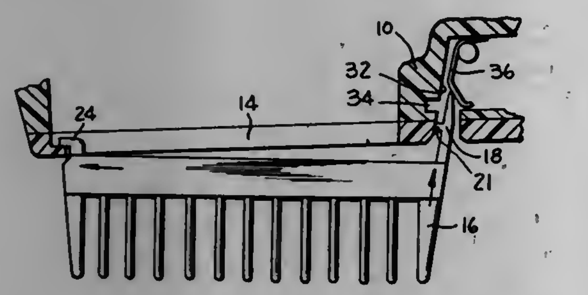
APPLIANCE ACCESSORY ATTACHMENT MEANS

William Robert Hicks, Spencerport, N.Y., assignor to General Electric Company, Bridgeport, Conn.

Filed May 15, 1974, Ser. No. 469,961

Int. Cl. A45d *1/00*

U.S. Cl. 132—9 **7 Claims**



1. In a personal care appliance, structure securing interchangeable styling attachments thereto comprising,
  an elongated attachment with hook means at one end directed away therefrom,
    a tab at the other end generally perpendicular to the hook having a projection spaced from the tab end,
  slot means in said appliance receiving said hook means in sliding overlapping engagement,
  a second slot within said appliance and a recess therein to engage the tab and projection respectively locking the attachment in place,
    spring means in said second slot shaped to bias the tab into locking position,
  whereby the attachment may be slid releasing the hook means and then pivoted about the tab end so the shaped spring then biases the tab from the slot to release the attachment.

3,890,986

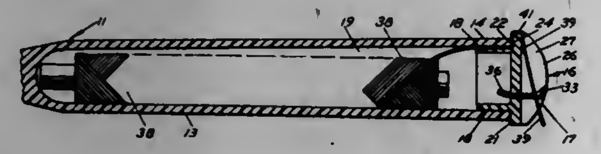
TEETH CLEANING UNIT

Irvin V. Gerlich, West Des Moines, Iowa, assignor to Den-Tal-Ez Mfg. Co., Des Moines, Iowa

Continuation of Ser. No. 346,139, April 29, 1973. This application July 12, 1974, Ser. No. 487,834

Int. Cl. A65d *44/18;* **A61l** *17/02*

U.S. Cl. 132—84 A **5 Claims**



1. A teeth cleaning unit including in combination:
a. an elongated body member having a brush section and a hollow cylindrical handle section open at the outer end thereof,
b. a cap member for said open outer end including a head section and a stem section, said head section having an under surface and said stem section receivable within said handle section through said open outer end to a closing position defined by the engagement of said under surface with the terminal face of said handle section outer end,
c. said stem section having an axial groove and said under surface a radial groove relatively arranged to form a single continuous groove,
d. said head section having an outer surface formed with a radial groove located laterally opposite the radial groove in said under surface,
e. a flat cutter member embedded in the outer surface of said head section extended transversely of the radial groove in said outer surface, including a cutting section located at the inner end of said last mentioned radial groove, and
f. a spool of dental floss within said hollow handle section having a leading end extendible through said continuous groove, and the radial groove in said outer surface for travel over said cutting section.

3,890,987

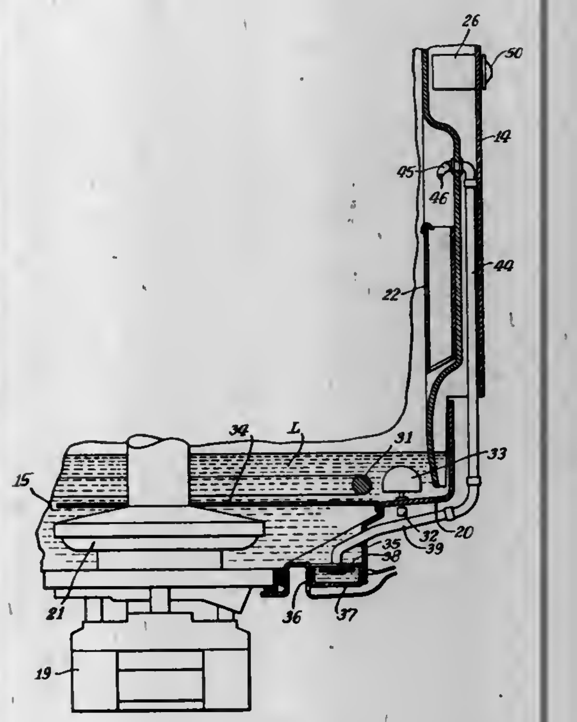
WASHING APPARATUS WITH AUXILIARY DISTRIBUTOR

Henry Marcussen, and Rogue D. Marcade, both of Stevensville, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed June 4, 1973, Ser. No. 366,370

Int. Cl. B08b *3/02*

U.S. Cl. 134—57 D **17 Claims**



1. A washing apparatus comprising: wall means defining a washing chamber having a lower sump; spray means for circulating washing liquid from a main body of washing liquid in said chamber sump against a first and a second group of objects to be washed disposed in said chamber and back to said sump; basket means for holding said second group of objects to be washed separate from said first group; collecting means for collecting a portion of the washing liquid from said sump during the circulation of the washing liquid; heating means for heating the collected portion of the washing liquid to a temperature higher than that of said main body in the chamber sump; and delivery means for delivering said portion of the washing liquid to substantially only said second group of objects in said basket means for high temperature washing of said second group of objects concurrently with the washing thereof by the washing liquid delivered by the spray means.

3,890,988

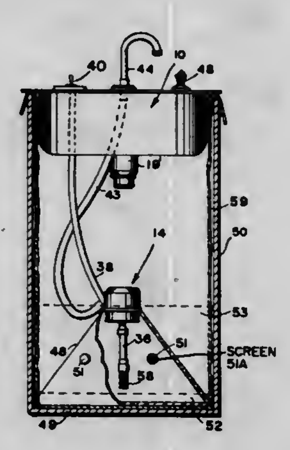
CLEANING ASSEMBLY FOR AUTOMOTIVE PARTS AND THE LIKE

Edward Lee, Winnipeg, Canada, assignor to Solv-X Inc., Rexdale, Canada

Continuation-in-part of Ser. No. 187,820, Oct. 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 167,109, July 29, 1971, abandoned. This application July 13, 1973, Ser. No. 378,953

Int. Cl. B08b *3/02, 3/08;* **C23g** *5/04*

U.S. Cl. 134—111 **8 Claims**



4. In a cleaning assembly for machine parts and the like which includes a container, a parts cleaning receptacle situated on the upper side of said container, nozzle means in said receptacle and a drain in said receptacle discharging into said container, a pump and pump motor in said container operatively connected to said nozzle means and a pump intake on said pump; means to support said pump and pump motor, said pump intake being spaced from the base of said container, primary separator means in said container and relatively fine secondary filter means on said pump intake, said means to support said pump and pump motor also constituting said primary separator means, said primary separator means receiving solvent from said drain and directing said solvent to adjacent the outer walls of said container, said primary separator means and said means to support said pump and pump motor comprising a frusto-conical support supported on the base of said container, said pump and pump motor engaging within the open apex of said conical support, and solvent intake means formed in the walls of said conical support.

3,890,989

CANOPY SUPPORTING FRAME AND CANOPY

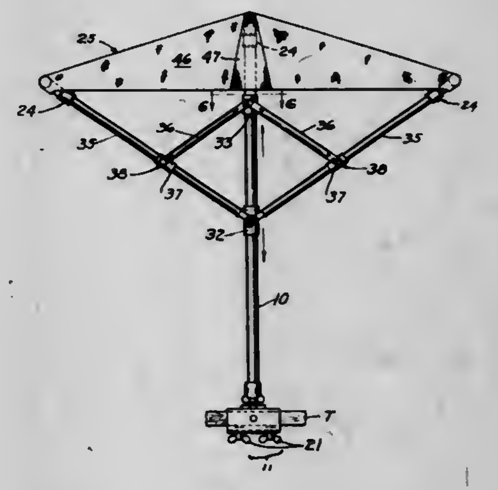
Benjamin Kuxhouse, 12203 16th Ave. South, and Russell R. Balzer, 1039 S. 146th St., both of Seattle, Wash. 98168

Filed Nov. 23, 1973, Ser. No. 418,543

Int. Cl. A45f *1/14*

U.S. Cl. 135—7.1 R **3 Claims**

1. A canopy supporting frame and canopy comprising two end frame assemblies of duplicate construction adapted to be supported in opposed, upright spaced apart relation when in use, each end frame assembly comprising an upright post, a lower sleeve and an upper sleeve each slidably movable on said post, means operable in releasably securing each sleeve in different adjusted positions on its post, two longer bow member supporting arms each having one end pivotally attached to the lower sleeve on each post, two shorter arms each having one end pivotally connected with the upper sleeve on each post and the other end pivotally connceted with one of the longer arms outwardly from the lower sleeve; a medial bow member supported by and extending between the upper ends of the two upright posts; two lateral bow members supported by said longer arms and extending between the outer ends of said longer arms and positioned parallel with and at opposite sides of said medial bow member, said medial bow member and each of said lateral bow members terminating at each end in a rigidly attached short end part which is substantially perpendicular to the main part of the bow member; a hinge pivotally connecting the shorter end part of said medial bow member with the upper end of one of said posts; other hinges pivotally connecting the short end parts at each end of each of the two lateral bow members with the outer end of one of said longer arms, the pivotal connection of the longer and shorter arms with each other and with said slidable and adjustable sleeves providing for the folding of said longer and shorter arms alongside of said posts and the hinges connecting the short terminal end parts of the medial bow member and the lateral bow members with the upper ends of the posts and the outer ends of the longer arms respectively providing for ninety degree inward folding of the end assemblies parrallel to the bow members; and a canopy of pliable material extending over said medial bow member and having opposite edges secured to the respective lateral bow members, the two adjustable sleeves on each post in cooperation with the shorter arms which connect each upper sleeve with two longer arms providing for movement of said longer arms in adjusting the pitch and tension of the areas of canopy on opposite sides of the medial bow member while always maintaining said two areas equal.



3,890,990

UMBRELLA FRAME

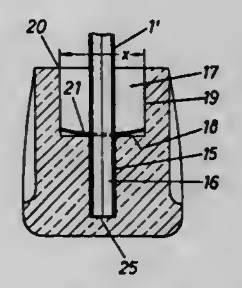
Josef Schafer, Solingen, Germany, assignor to Telesco Brophey Limited, Montreal, Canada

Filed July 7, 1972, Ser. No. 269,909

Claims priority, application Germany, July 10, 1971, 2134625

Int. Cl. A45b *9/02*

U.S. Cl. 135—20 R **2 Claims**

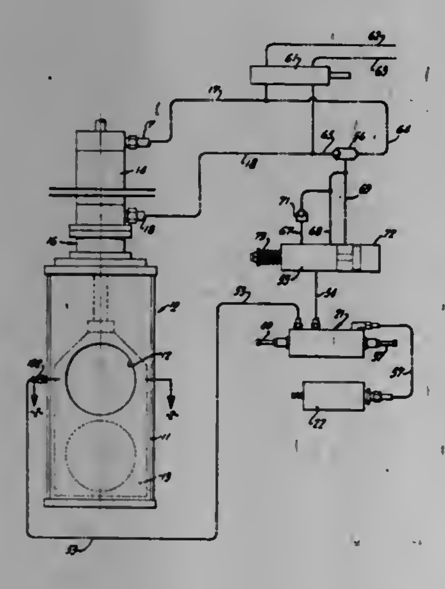


1. In an umbrella assembly for preventing relative movement between two elements comprising in combination a rod-like element a second element including a bore portion telescopically receiving one end of said rod-like element; and fastening means engaged between said elements and retaining them in assembled relation, the improvement in which said assembly fastening means comprises:
  a flat elongated, normally resilient plate element having a transverse aperture through which said rod-like element extends, said flat element being bowed under compression longitudinally intermediate its length about a trans-

verse axis passing through said transverse aperture and having single opposed edge portions of said aperture continuously and bitingly engaging opposed portions of said rod-like element, said plate being freely slidable along said rod-like element when in a flat unbowed condition, said second element having an axial recess surrounding said bore portion and said rod-like element with side walls projecting parallel to and uniformly from and defining a shoulder normal to said bore and recess, said recess having a longitudinal dimension less than a corresponding longitudinal dimension of said plate in the direction it is bowed, said plate being spring-bowed into said recess and having opposed, single transverse outer edges continuously and bitingly engaged with transverse adjacent opposed wall portions of said recess while the opposed edge portions of said aperture simultaneously bitingly engage the opposed portions of said rod-like element whereby the elements are continuously retained in assembled relation against relative or rotary movement, said rod-like element having a polygonal cross-section, said plate including longitudinal side edge portions substantially parallel to adjacent side portions of said recess side wall for further preventing relative rotation between the assembled rod-like and second elements.

3,890,991
VALVE APPARATUS AND METHOD

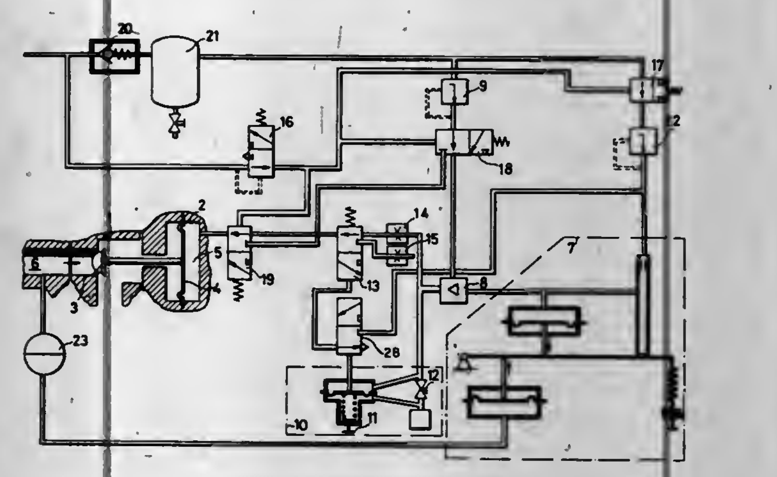
Marvin H. Grove, and Rodney A. Wailes, both of Houston, Tex., assignors to M & J Valve Company, Houston, Tex.
Division of Ser. No. 244,398, April 17, 1972, which is a continuation of Ser. No. 162,806, July 15, 1971, abandoned.
This application July 2, 1973, Ser. No. 375,846
Int. Cl. F16k *23/00*
U.S. Cl. 137—1 **1 Claim**



1. A valve method making use of a valve consisting of a body having aligned flow passages, a valve member within the body and movable between open and closed positions relative to the flow passages, at least one seat ring movably carried by the body and surrounding one of the flow passages, and means within the valve adapted to receive hydraulic fluid under pressure for jacking the ring against the valve member, the method comprising continuously directing hydraulic fluid under a predetermined substantially constant pressure from a separate external source of predetermined constant pressure to said last means when the valve is in closed position, and then when it is desired to operate the valve, overcoming such hydraulic fluid pressure applied to said lastnamed means by opposing the pressure from said source with a counter pressure applied between said source and said last-named means, to cause the thrust of the seat ring against the valve member to be substantially reduced.

3,890,992
METHOD AND APPARATUS FOR SAFEGUARDING PIPE-LINES AGAINST AN INADMISSIBLY HIGH INTERNAL COMPRESSIVE LOAD BY A CONTROL VALVE WITH A PNEUMATIC DRIVE

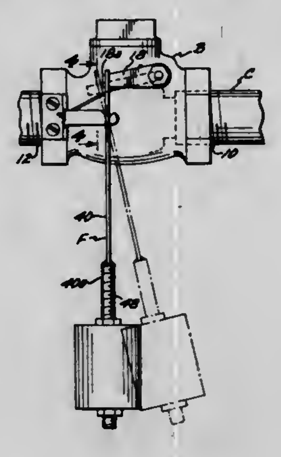
Werner Welz; Hans Bender, both of Mannheim, and Manfred Schmitt, Bobenheim-Roxheim, all of Germany, assignors to Fa. Gulde-Regelarmaturen KG, 67 Ludwigshafen-Oggersheim, Germany
Filed Sept. 27, 1973, Ser. No. 401,500
Int. Cl. G05d *7/06*
U.S. Cl. 137—14 **6 Claims**



1. A method for safeguarding a pipe-line against an inadmissibly high internal pressure and an inadmissibly large rate of pressure increase, comprising the following steps:
- a. generating a first, pressure, signal as a function of the momentary pressure in said pipe-line;
- b. continuously applying said first pressure signal to a pressure ratio regulator for generating, at an output of the pressure ratio regulator, a second signal as a function of said first signal;
- c. applying a presettable constant pneumatic pressure to the power input of a power amplifier;
- d. applying said second signal to the control input of said power amplifier for generating a third, pneumatic pressure, signal at the output of said power amplifier, said third pressure signal being a function of said second signal;
- e. applying said third signal to a drive chamber of a regulator valve connected to said pipe-line; the pressure in said drive chamber opposing the valve opening pressure constituted by the internal pressure in said pipe-line, whereby an increase of the internal pressure in the pipe-line causes an increase of pressure in said drive chamber until the pressure in said drive chamber reaches a threshold value set for said presettable constant pneumatic pressure, and whereby said internal pressure, upon exceeding said threshold value, causes opening of said regulator valve;
- f. differentiating said third signal with respect to time to obtain a pressure differential characterizing the rate of pressure change in the pipe-line;
- g. comparing said pressure differential with a reference value; and
- h. depressurizing said drive chamber if said pressure differential exceeds said reference value, whereby said regulator valve is opened by said internal pressure.

3,890,993
EARTHQUAKE ACTUATED FLUID FLOW OBSTRUCTING DEVICE

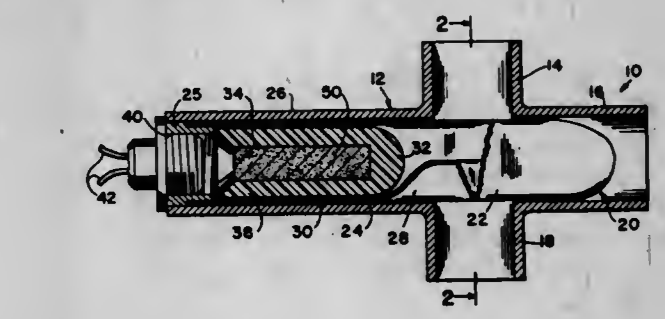
George C. MacNeilage, 9411 Cape Cod Dr., Huntington Beach, Calif. 92646
Filed Jan. 2, 1974, Ser. No. 430,164
Int. Cl. F16k *17/36*
U.S. Cl. 137—45 **4 Claims**



1. In combination with a tubular member that has a first end through which fluid enters to flow through said tubular member, a device for terminating the flow of said fluid through said tubular member when said device is subjected to an earthquake shock of greater than a predetermined magnitude, said device including:
- a. a hollow valve body having first and second spaced openings therein, with said body including an internal seat adjacent said first opening, said first end of said tubular member connected to said first opening in said tubular member, and said fluid being supplied to said tubular member through said second opening in said body;
- b. a transverse shaft rotatably and sealingly supported in said body, said shaft having a first end portion that projects from said body;
- c. a valve member pivotally movable in said body, and rigidly secured to said shaft, said valve member normally occupying a first position to permit fluid to flow through said body to said tubular member, but said valve member capable of occupying a second position in which it is in sealing contact with said seat to prevent fluid from flowing through said body to said first tubular member;
- d. a first arm secured to said first end portion of said shaft and normally disposed thereto, said arm having an outer end portion;
- e. spring means that at all times tend to pivot said arm, shaft and valve member in a direction to dispose said valve member in said second position;
- f. a second arm rigidly secured to said body, said second arm including an outer end portion adjacently disposed to said outer end portion of said first arm when said valve member is in said first position; and
- g. a pendulum assembly pivotally supported from said second arm and capable of pivoting both longitudinally and transversely relative to said body when said device is subjected to an earthquake shock, with said assembly removably engaging said outer end portion of said arm to maintain said valve member in said first position, and said pendulum assembly when subjected to an earthquake shock above a predetermined magnitude pivoting either longitudinally or transversely relative to said body to become disengaged from said outer end portion of said first arm to allow said spring means to pivot said first arm, shaft and valve member to dispose said valve member in said second position where it will so remain until said first arm, shaft and valve member are manually pivoted to dispose said valve member in said first position and said pendulum assembly in engagement with said outer end portion of said first arm.

3,890,994
NORMALLY OPEN VALVE CONSTRUCTION HAVING A DEFORMABLE BLADDER

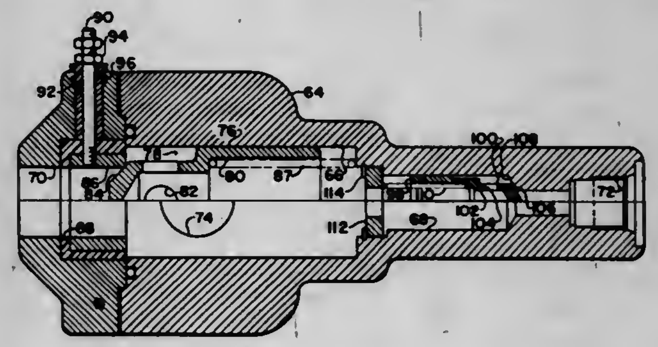
Charles R. Olsen, Box 851, West Chester, Pa. 19355
Filed Aug. 20, 1973, Ser. No. 390,075
Int. Cl. F16k *7/02, 7/10;* **F16l** *55/12*
U.S. Cl. 137—67 **17 Claims**



1. A normally open valve for a fluid system comprising:
- a valve housing defining first and second fluid ports and a fluid passageway extending between the ports;
- a deformable metallic bladder mounted in the valve housing with one portion in a crushed condition projecting into the passageway at a station between the first and second ports, the bladder in the uncrushed condition having an elongated tubular configuration which is closed at one end and forms an opening at the opposite end and having a tube wall defining a tube cross-section completely filling the fluid passageway at said station, and in the crushed condition having the tube wall in the crushed portion substantially collapsed upon itself whereby the fluid passageway is not fully obstructed between the ports and
- means mounted in the opposite end of the metallic bladder for movement through the bladder and for deforming the collapsed tube wall outwardly in the fluid passageway of the valve housing to close the passageway between the ports.

3,890,995
FLOW-SENSING SWITCH FOR BACKUP STEERING SYSTEM

Wayne Russel Miller, Dubuque, and Robert James Lucke, Jr., Bellevue, both of Iowa, assignors to Deere & Company, Moline, Ill.
Filed May 1, 1974, Ser. No. 465,836
Int. Cl. F16k *15/00;* **F15b** *20/00*
U.S. Cl. 137—113 **5 Claims**



1. A flow-sensing valve having components acting as electrical switch means for completing a circuit in response to a preselected flow condition, comprising: a valve body defining a valve bore; an inlet and an outlet port connected to the bore at axially spaced locations; an electrical conductive means extending through the valve body and including a valve seat located in the bore between the inlet and outlet; electrical insulating means surrounding the electrical conductive means for fixing the latter and insulating it from the valve body; a valve element axially shiftably mounted in the bore and having a seating surface located for engagement with said valve seat; axially yieldable means normally biasing said valve element to

a closed position wherein the seating surface thereof engages said valve seat; and said yieldable means being responsive to a predetermined pressure at said inlet port to yield axially so as to allow the valve element to shift to an open position wherein the inlet and outlet ports are in fluid communication.

3,890,996
INSTALLATION FOR FILLING SEVERAL PRESSURE RESERVOIRS, ESPECIALLY IN MOTOR VEHICLES

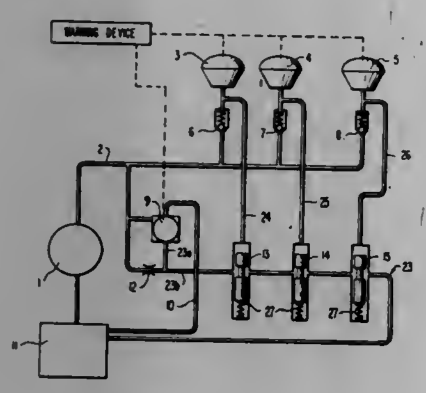
Manfred H. Burckhardt, Waiblingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 12, 1973, Ser. No. 339,990

Claims priority, application Germany, Mar. 10, 1972, 2211561

Int. Cl. G05d *11/02*

U.S. Cl. 137—119 **41 Claims**



1. An installation for filling a plurality of fluid pressure reservoirs which supply different pressure cycles associated with automotive vehicle operations and the like; said installation comprising:

common filling pipe means leading to all of said reservoirs by way of a check valve means between each reservoir and said filling pipe means,
storage tank means,
pump means for pumping fluid from said storage tank means to said filling pipe means,
return line means connected between said filling pipe means and said storage tank means,
switching valve means in said return line means for selectively blocking said return line means,
and control means for each reservoir for moving said switching valve means to a blocking position in response to a pressure drop in at least a corresponding one of the reservoirs.

3,890,997
AUTOMATIC PRESSURE-CONTROL VALVE, ESPECIALLY FOR A PRESSURIZED-GAS SUPPLY INSTALLATION

Helmut Dresler, Trostberg, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Mar. 2, 1973, Ser. No. 337,764

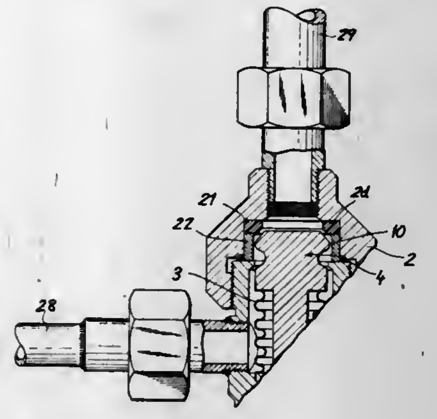
Claims priority, application Germany, Mar. 3, 1972, 2210362

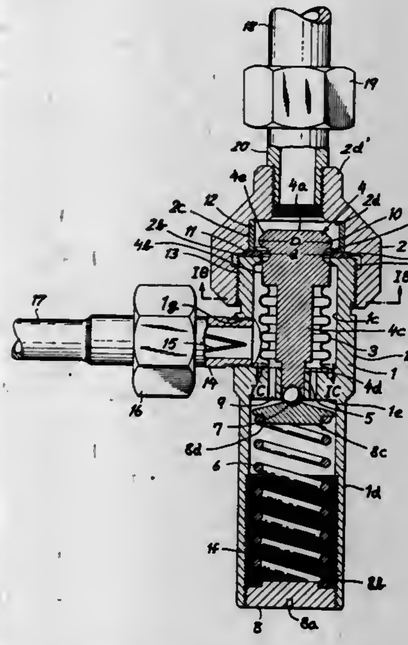
Int. Cl. F16k *51/00*

U.S. Cl. 137—271 **5 Claims**

1. A pressure-control comprising:

a valve body having two housing parts connected together and defining an elongated valve chamber, said body being formed with at least two longitudinally spaced-apart ports communicating with said chamber;
a poppet-type valve member linearly displaceable in said chamber longitudinally thereof and having a doubly-conical valve head defining a pair of oppositely converging sealing surfaces;
a seating ring of deformable polytetrafluorethylene clamped in said body between said housing parts and engageable with a selected one of said sealing surfaces upon displacement of said valve member and positioned interchangeably with a seating ring engageable with the other valve surface thereof;





a spring received in said body and acting upon said valve member to bias the latter in one linear direction against a fluid-pressure differential applied to said head, said valve forming a pressure-buildup controller upon insertion of one of said rings into said body and a pressure-drop controller upon introduction of the other of said rings into said body; and
a spacer sleeve in said body and bearing axially upon said ring, said sleeve being axially engaged by one of said housing parts and urging said ring annularly against the other housing part;
one of said housing parts including a casing receiving said spring, a disk threaded into said casing and forming a seat for said spring, a partition in said one of said parts separating said casing from said chamber and formed with a throughgoing bore slidably receiving an end of said valve member remote from said head, at least one vent passage formed in said partition and communication between the interior of said casing and a space around said valve member, and an axially extensible and contractable bellows anchored at one end to said head and at the other end to said partition and enclosing said vent passage.

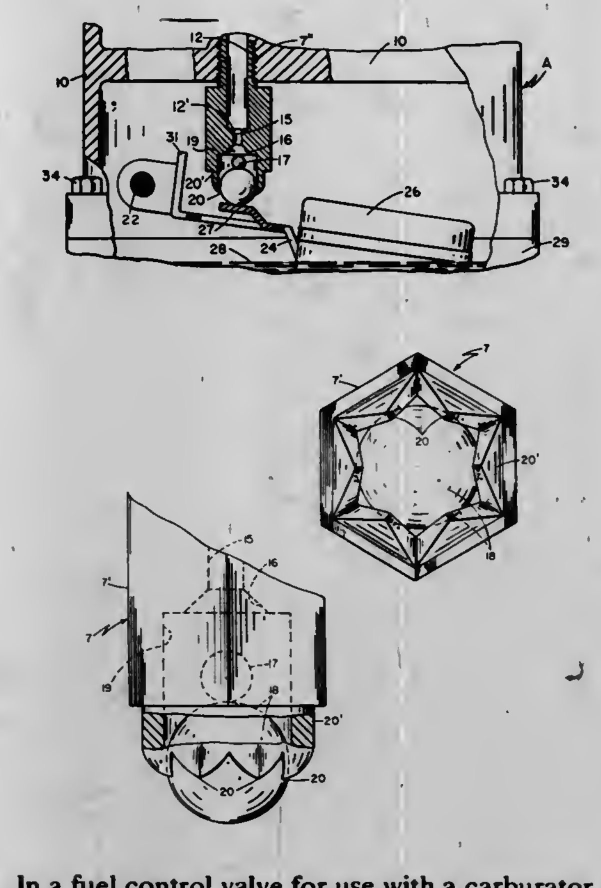
3,890,998
CONTROL VALVE

Ansel B. Grose, 8 Mt. Vernon St., Stoneham, Mass. 02180

Filed Aug. 23, 1973, Ser. No. 390,872

Int. Cl. F16k *31/26*

U.S. Cl. 137—436 **1 Claim**



1. In a fuel control valve for use with a carburator having a float chamber;

a main body portion having a central longitudinal passage comprising;
an upper passageway;
a generally conical passageway having a small end and a large end extending from said upper passageway and merging therewith at its small end;
an extension of reduced size on the main body portion having an enlarged passage extending from the conical passageway at its large end;
a small ball valve member in said enlarged passage;
a ball-shaped plunger in the enlarged passage in engagement with and supporting the small ball valve member;
said extension having inwardly turned prongs at its outer end engaging said plunger member and limiting its outer movement and providing passages between the prongs for fuel flow, whereby during passage of fuel a brisk washing and flushing action is accomplished, and splashing and turbulence in the float chamber is minimized, and said engaging is by point contact;
said extension being of hexagonal configuration on both its inner and outer surfaces, thus providing prongs with flat inner and outer surfaces to expedite inward deflection thereof;
the inner surfaces of said hexagonal extension being closely adjacent said ball shaped plunger providing a guide portion to guide it in a straight path while allowing paths for unimpeded flow of fuel between said guide portions.

3,890,999
FLUID PRESSURE REGULATOR

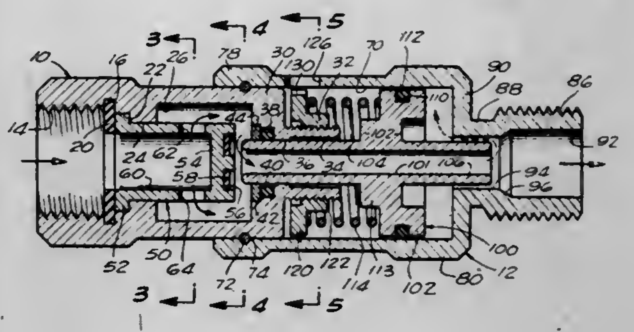
Eugene D. Moskow, 13243A Figi Way, Marina del Rey, Calif. 90291

Filed Dec. 15, 1972, Ser. No. 315,671

Int. Cl. F16k *31/36*

U.S. Cl. 137—505.25 **1 Claim**

1. A fluid pressure regulator comprising: a body having in-line flow means through the valve body comprising seat means and a valve member that is relatively movable; the valve member being a tubular member, the tubular member having a piston area whereby it is relatively positionable responsive to fluid outlet pressure to control flow and pressure at the discharge, said tubular member having annular ends exposed to pressure havng equal cross sectional areas, the body comprising a first section and a second section, means forming a joint whereby the sections are joined together in relatively rotatable relationship to allow free relative angular movement without relative axial movement, one section having a threaded inlet and one section having a threaded outlet which are in line whereby the regulator is adapted for relative rotation of the sections to facilitate making inlet and outlet couplings, the first section has a sealed aligned bore and the tubular member has a part extending through said bore in the first section and the tubular member piston portion is sealed to a bore in the second section whereby said joint is not exposed to fluid.



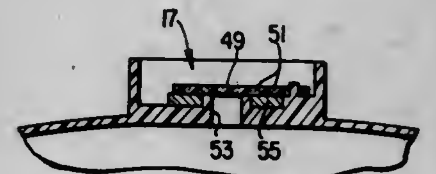
3,891,000
IMPREGNATED MAGNETIC FLAP VALVE

Irving Melnick, 324 Forest Cir., Danville, Va. 24541

Filed Nov. 19, 1973, Ser. No. 416,798

Int. Cl. F16k *15/14*

U.S. Cl. 137—525.3 **3 Claims**



1. A pressure-actuated one-way flap-valve assembly for allowing fluid to flow in a first direction through a valve port but not in a second direction, said flap-valve assembly comprising:

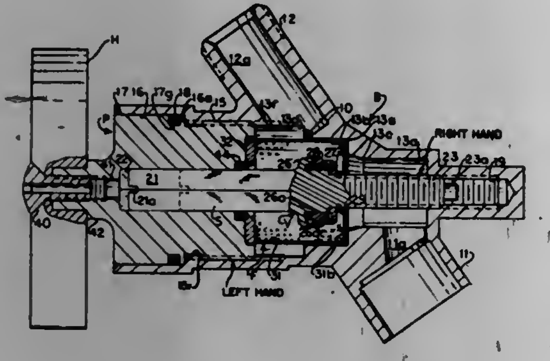
a valve-seat assembly for defining said valve port surrounded by a valve seat, said valve seat assembly including a ferromagnetic cylinder surrounding said valve port; and
a valve-closure member being hingedly attached to said valve-seat assembly adjacent to said valve port so as to be rotatable between a closed position flat against said valve seat and an open position rotated away from said valve seat, said valve closure member comprising a flat, resilient, membrane with freedom to flex and having a plurality of ferromagnetic particles embedded therein;
wherein, one of said valve-seat ferromagnetic cylinder and said valve-closure-member ferromagnetic particles are permanently magnetized to cause a magnetic attraction

therebetween for urging said flat resilient membrane portion toward said valve seat.

3,891,001
SHUTOFF VALVE WITH CLEANOUT FILTER
Irlin H. Botnick, 3155 Kersdale, Pepper Pike, Ohio 44124
Filed Dec. 14, 1973, Ser. No. 424,898
Int. Cl. E03b *7/07;* **F16k** *11/10*
U.S. Cl. 137—549 **18 Claims**

1. A shutoff valve with discharge line drainage capability comprising:

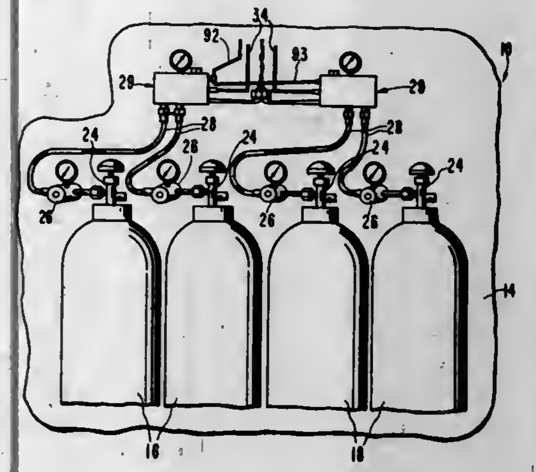
a hollow valve body as an integral structure having
  a main bore successively reduced in diameter from a counterbored open end of the body inwardly to form a valving chamber at an inner portion of the main bore, said main bore having an outer female-threaded reduced diameter portion inward of the counterbored end portion and spaced outwardly of said valving chamber,
    said valving chamber including an inner smaller diameter bore portion and an outer larger diameter bore portion,
  said body having an inlet connection with inlet passage opening to the inner portion of the said chamber and having an outlet connection with an outlet passage opening to the larger portion of the chamber;
a valving member axially shiftable, to and from a valve closing location in the inner bore portion and valve opening locations;
a rotatable and axially shiftable valving member operating shaft structure including
  a stem axially aligned with said valving member, and



  a stem-operating and body-closing rotatable plug having an inner male-thread and engaged in the said outer female threaded portion of the bore,
    and a larger diameter outer end portion guidably received in and rotationally and axially slideably sealing with said counterbored open end;
a valve drainage discharge passage in said plug opening exteriorly of said body for valve drainage discharge and opening interiorly of said body through a path opened and closed by axial positioning of a portion of said plug;
said operating structure adapted
  upon plug rotation in one direction to position said valving member into valve open position with said plug advanced into the body and sealing to said counterbored open end, and
  by plug rotation in the other direction controlling shift of said valving member to a flow blocking position in the valving chamber, with the plug retracted yet in threaded and sealing engagement with the body when the valve closes, and upon further plug retracting rotation axially positioning the plug to open said path for drainage, and with still further rotation to free the plug from the bore for removal with the inlet shut off.

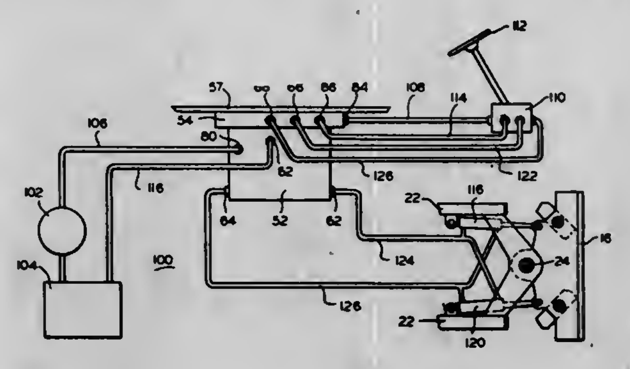
3,891,002
FLUID DELIVERY SYSTEM FOR VOLATILE FLUIDS
Ronald L. Mowrer; Robert W. Ebbler, both of Menlo Park, and Major F. Gates, Pacifica, all of Calif., assignors to Medental, Inc., Menlo Park, Calif.
Filed Apr. 30, 1974, Ser. No. 465,714
Int. Cl. F16k *37/00*
U.S. Cl. 137—557 **10 Claims**

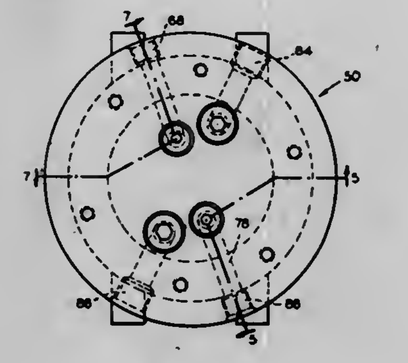
1. In a system for handling a volatile fluid in a confined space defined by a boundary, the improvement comprising: a cylinder containing a volatile fluid under pressure, said cylinder adapted to be positioned externally of said space; a terminal adapted to be coupled with fluid-actuated equipment usable in said space; manifold means adapted to extend through said boundary for coupling said cylinder and said terminal together to permit a flow of said fluid to said terminal; valve means externally of said space and responsive to a control signal for controlling the flow of fluid through said manifold means; and means in said space and coupled to said valve means for selectively providing a control signal therefor.

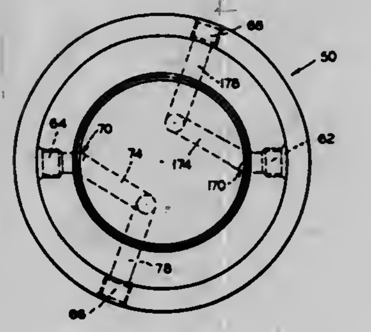


3,891,003
HYDRAULIC MANIFOLD
Ralph M. Duttarer, Buchanan, and Richard R. Hushower, St. Joseph, both of Mich., assignors to Clark Equipment Company, Buchanan, Mich.
Filed June 18, 1974, Ser. No. 480,327
Int. Cl. F16k *25/00*
U.S. Cl. 137—561 A **5 Claims**

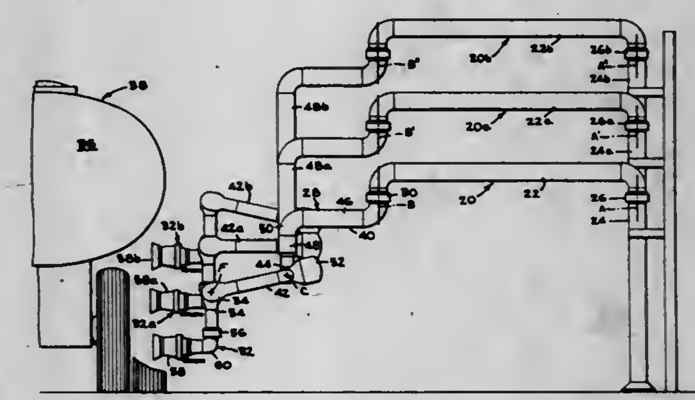
1. A manifold for reversing hydraulic connections comprising, an outer annular member, an inner circular member positioned in sealing relation within the said outer member and rotatable relative to the outer member at least a part of a complete revolution, a first pair of connection ports in the said outer member, a second pair of connection ports in the said inner member, a first pair of internal passages in the said inner member connecting the said second pair of ports to a pair of internal ports in register with the said first pair of connection ports, the said first pair of passages arranged so that rotating the said inner member a partial turn relative to the said outer member reverses the hydraulic connections between the said first pair of connection ports and the said second pair of connection ports, a third pair of connection ports axially spaced in the said outer member, a fourth pair of connection ports in the said inner member, and means for maintaining hydraulic connections between the said third pair of connection ports and the said fourth pair of connection ports respectively regardless of the rotative position of the said inner member relative to the said outer member, the said means comprising a pair of grooves in the said inner member in communication with the said third pair of connection ports respectively and a second pair of internal passages in the said inner member interconnecting the said grooves and the said fourth pair of connection ports respectively.







3,891,004
BOTTOM CROSS-OVER LOADING ARM
Houston W. Knight, Whittier, Calif., assignor to FMC Corporation, San Jose, Calif.
Filed Aug. 24, 1973, Ser. No. 391,415
Int. Cl. F17d *1/00*
U.S. Cl. 137—615 **9 Claims**

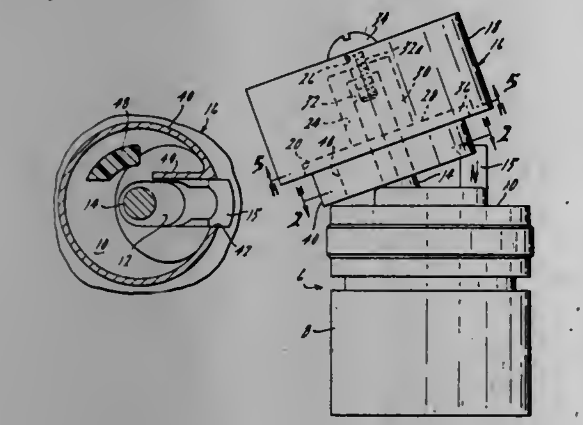


1. An articulated fluid loading arm especially for use in transferring fuel from a storage reservoir into a tank truck through a bottom-located cargo inlet, comprising
  a. an inboard arm section pivotally mounted on an upstanding riser for movement with respect thereto in a horizontal direction,
  b. an outboard arm section pivotally connected to the inboard arm section for movement with respect thereto in a horizontal direction, said outboard arm section including
    1. an inner horizontal pipe section extending from the inboard arm section,
    2. an intermediate vertical pipe section extending downwardly from the inner horizontal pipe section, and
    3. an outer pipe section pivotally connected at its inner end to the lower end of the intermediate pipe section by a first pipe swivel joint oriented on a horizontal axis,
    c. a swivelable coupling assembly for pivotally interconnecting the outer pipe section to a bottom-located tank truck cargo inlet, said coupling assembly having an inlet element and an outlet element, and
  d. a second pipe swivel joint oriented on a horizontal axis and interconnecting the outer pipe section and the coupling assembly such that the axis of the outer pipe section and the axis of the adjacent portion of the coupling assembly reside in a common plane that is transverse to the axis of said second swivel joint.

3,891,005
SINGLE HANDLE WATER FAUCET VALVE
Alex Manoogian, Groose Pointe Farms, and Eric V. Pullen, Southfield, both of Mich., assignors to Masco Corporation of Indiana, Taylor, Mich.
Filed May 28, 1974, Ser. No. 473,809
Int. Cl. F16k *11/00*
U.S. Cl. 137—625.4 **15 Claims**

1. A single handle hot and cold water mixing and flow control faucet valve of the type having a main body enclosing relatively movable valve means selectively operable to connect or isolate hot and cold water sources with water outlet means and an elongate manually movable operating stem operably connected to said valve means for movement therewith and projecting from said main body, said stem being swingable in a plane between an off position and a full volume position to vary the flow volume through said faucet valve and rotatable about its own axis between a cold water only posi-

tion and a hot water only position to vary the proportions of hot and cold water passing through said faucet valve, the improvement comprising: fixed stop means secured to and projecting from said main body adjacent said stem, first movable stop means secured to said stem for movement therewith and cooperating with said fixed stop means to prevent swinging movement of said stem to and from said off position unless said stem is in the cold water only position, second movable stop means secured to said stem for movement therewith and cooperating with said fixed stop means to prevent rotation of said stem in one rotational direction, and third movable stop means secured to said stem for movement therewith and cooperating with said fixed stop means to limit the extent of possible rotational movement of said stem in the other rotational direction.



3,891,006

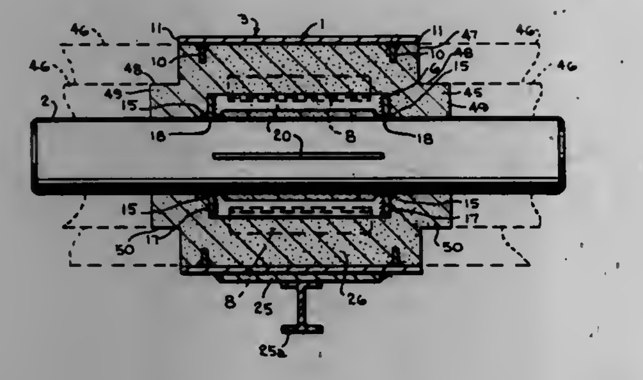
ANCHOR AND INSULATION ARRANGEMENT FOR CONDUIT

Harvey H. Lee, 1702 Roberts St., Houston, Tex.

Filed July 5, 1973, Ser. No. 376,313

Int. Cl. F16l ***3/02, 59/14***

U.S. Cl. 138—106 **9 Claims**



1. An anchor and insulation arrangement for a conduit including:
   a. a cage arrangement for securing to the conduit, said cage arrangement including:
      1. annular end members secured transversely to the conduit; and
      2. members, each including an opening therein, secured between said end members and extending therebetween in circumferentially spaced relation about the conduit;
   b. a short outer housing for surrounding the conduit;
   c. said outer housing including longitudinally extending, circumferentially spaced members secured to and extending inwardly of said housing, said longitudinally extending members being radially spaced from said cage arrangement to form a void therebetween;
   d. means connected to the outer housing for anchoring the housing to a support;
   e. polyurethane surrounding the cage and conduit and filling the void between said cage arrangement and outer housing for insulation of the conduit; and
   f. said housing including inwardly extending reinforcing rings spaced from said longitudinally extending members on said housing, said reinforcing rings on said housing and said cage arrangement end members being positioned relative to each other to act in an opposing manner toward each other to inhibit movement of the conduit anchor and insulation arrangement due to end thrust in either longitudinal direction thereon.

3,891,007

EXTERIORLY CORRUGATED HOSE OF COMPOSITE MATERIALS

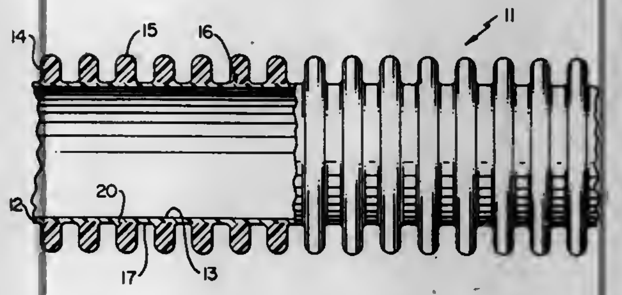
Donald L. Kleykamp, Springboro, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 268,298, July 3, 1972, abandoned. This application Aug. 23, 1973, Ser. No. 390,816

Int. Cl. F16l ***11/12***

U.S. Cl. 138—121 **5 Claims**

1. A single piece hose construction comprising, inner and outer surface portions, said inner portion made of a first elastomeric material and having a smooth inside surface, and said outer portion made of a second elastomeric material substantially harder than the first material, said first and second materials fused and integrally bonded together and free of defined fused surfaces, said outer portion comprising means of a solid cross section deeper than said inner portion, said means defining an undulating outside surface for said hose construction.



3,891,008

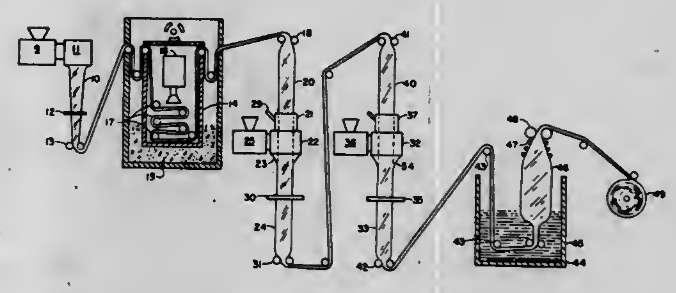
MULTI-LAYER THERMOPLASTIC FILM AND METHOD OF MAKING SAME

Donald J. D'Entremont, Greenville, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Filed Dec. 26, 1973, Ser. No. 428,541

Int. Cl.² B32B ***27/32;*** **B29D** ***9/08***

U.S. Cl. 138—146 **11 Claims**



1. A multi-layer thermoplastic film comprising:
   a. a substrate layer comprising an oriented, cross-linked polymer of ethylene; and,
   b. a coating layer comprising a blended mixture having a (1) major portion of an ethylene-propylene copolymer wherein the ethylene constituent of said copolymer is in the range of 0.1 to 10 percent by weight with a (2) minor portion of polybutene-1.

7. The multi-layer film of claim 1 wherein said substrate layer is a seamless tube and said coating layer is on the outside of said tube.

3,891,009

HIGH-TEMPERATURE HEAT-INSULATING STRUCTURE

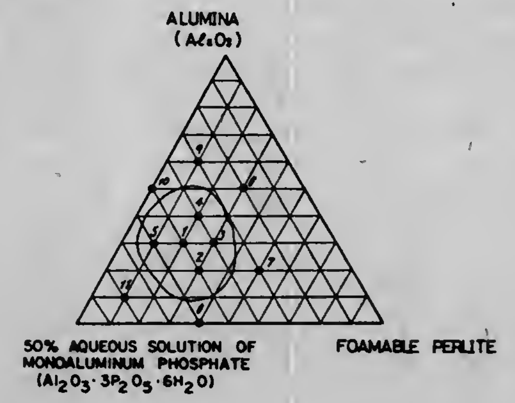
Fumiyoshi Noda, Toyota, and Yukihisa Takeuchi, Aichi-ken, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Feb. 20, 1974, Ser. No. 443,986

Claims priority, application Japan, Feb. 24, 1973, 48-022503

Int. Cl. C04b ***35/18;*** **F16l** ***59/14***

U.S. Cl. 138—149 **5 Claims**



1. A heat-insulating structure comprising a casing filled with a fired ceramic consisting essentially of monoaluminum phosphate, foamed perlite and alumina.

3,891,010

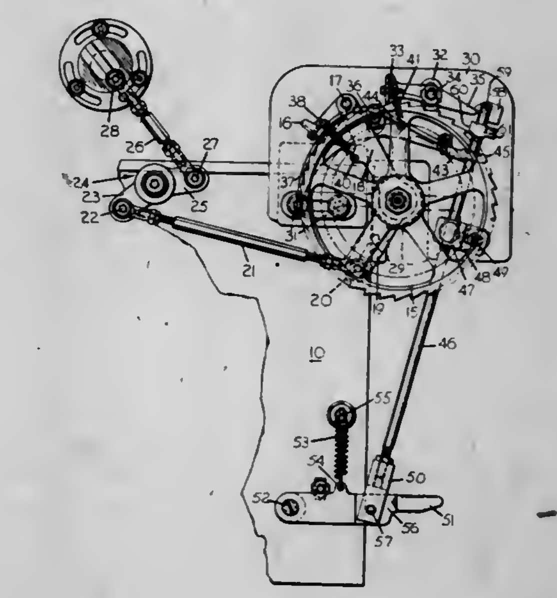
LET-BACK MECHANISM FOR LOOMS

Merton C. Lyman, Jr., Woodstock, Conn., and Ronald Berry, Hopedale, Mass., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 8, 1974, Ser. No. 449,512

Int. Cl. D03d ***49/00***

U.S. Cl. 139—313 **6 Claims**



1. In combination with a loom having a take-up roll to advance fabric as it is formed with means for rotating the take-up roll including a ratchet, an actuating lever having a feed pawl engageable with the ratchet and a hold-back pawl for maintaining the positions of the roll advanced by the feed pawl, an improved means for selectively controlling let back of the fabric in increments of single picks comprising:
   a. disengaging means mounted on the loom for movement between a rest position and first and second positions of operation;
      i. said disengaging means including means for disengagement of the hold-back pawl at the first position of operation and for disengagement of the feed pawl at the second position of operation;
   b. operating means linked to said disengaging means for moving the latter between its rest and operating positions; and
   c. biasing means operatively connected to the hold-back pawl for effecting its re-engagement with the ratchet after disengagement of the feed pawl therefrom.

3,891,011

FILLING DETECTING DEVICE FOR NARROW FABRIC LOOM

Robby R. Tisdale, Travelers Rest; Leon C. Rollison, Anderson, and Ben F. Hall, Easley, all of S.C., assignors to Southern Weaving Company, Greenville, S.C.

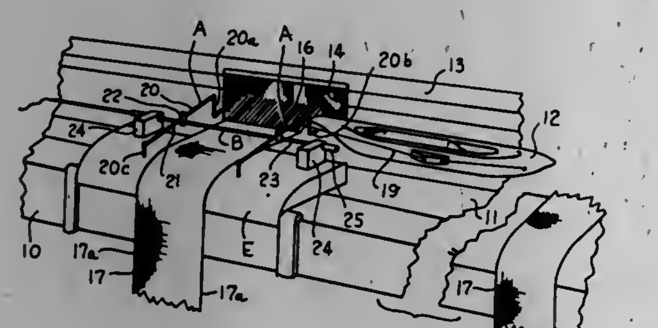
Filed Jan. 29, 1973, Ser. No. 318,916

Int. Cl. D03d ***51/38***

U.S. Cl. 139—372 **4 Claims**

1. A filling detecting device for a narrow fabric loom having a stationary support member and a lay carrying a plurality of shuttles each traversing a respective narrow fabric delivery supplying filling yarn thereto, said yarn extending beyond a

selvage of each delivery as the shuttles traverse comprising: a plurality of pairs of interconnected pivoted elongated drop wires spaced so that one drop wire of each pair is positioned adjacent a selvage of each delivery; means pivoting each pair of drop wires about a horizontal axis parallel to the lay in a medial portion thereof; means mounting said drop wires for movement responsive to a condition of filling yarn carried by the stationary member; said drop wires extending into engagement with said filling yarn adjacent a selvage; electrical means actuated by the drop wires producing a change in operating condition of the loom in the absence of filling yarn, and a yarn engaging portion carried adjacent one end of the drop wires and an electrical contact portion carried adjacent the other end of the drop wires.

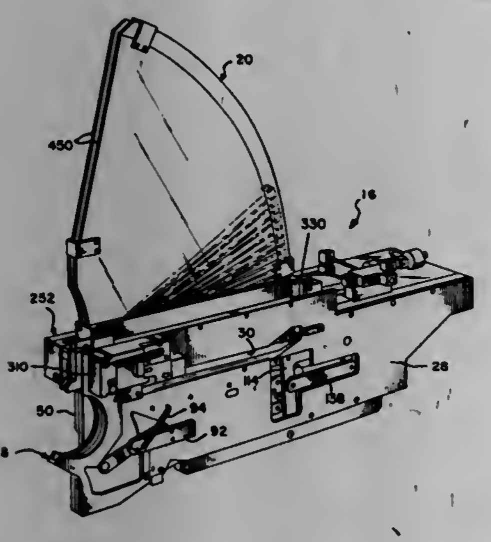


3,891,012

APPARATUS FOR APPLYING TIES TO BUNDLES

Johannes Cornelis Wilhelmus Bakermans, Elters, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 23, 1973, Ser. No. 408,898
Int. Cl. B21f *9/02*
U.S. Cl. 140—93 A **11 Claims**



1. Apparatus for applying a bundle tie to a bundle of conductors or the like, said bundle tie comprising an elongated relatively narrow strip having a leading end and a trailing end, an opening in said trailing end which is adapted to receive said leading end to permit intermediate portions of said tie to be drawn through said opening so that said tie can be drawn into embracing relationship with said bundle, said apparatus comprising:

frame means having a circular tie application zone,
tie supporting means for supporting said tie in preparation for application to said bundle, said tie supporting means extending tangentially from one side of said tie application zone,
tie feeding means for feeding an individual tie, leading end first, along a predetermined path which extends to, and around, said application zone, said path having a first rectilinear portion which extends along said support means tangentially towards said zone, an arcuate portion which extends partially around said zone, and a second rectilinear portion which extends from said arcutate portion and has an intersection with said first rectilinear portion,
a first reciprocable slide, said feeding means comprising pushing means on said first slide for pushing said trailing end of said tie thereby to advance said tie along said first rectilinear portion of said path and along said arcuate portion to said intersection,
tie tightening means comprising means for grasping said leading end and pulling said leading end away from said zone,
cut off means for cutting said tie adjacent to said opening after said tie has been drawn into snugly embracing relationship with said bundle,
a reciprocable actuator for reciprocating said slide, first rack means on said slide and a gear wheel on said actuator, said gear wheel meshing with said first rack means, said apparatus having second rack means extending parallel to said first rack means, said gear wheel meshing with said second rack means, said second rack means being resistant to linear movement whereby, said gear wheel is rotated during linear movement of said actuator and said first rack means is moved in the direction of movement of said actuator at a velocity which is greater than the velocity of said actuator whereby,

upon actuation of said actuator when a bundle is positioned in said zone, said tie will be fed along said path and its leading end will be fed through said opening at said intersection, and thereafter said leading end will be grasped by said tightening means and pulled away from said zone until said tie snugly embraces said bundle and said tie will thereafter be cut by said cut off means.

3,891,013

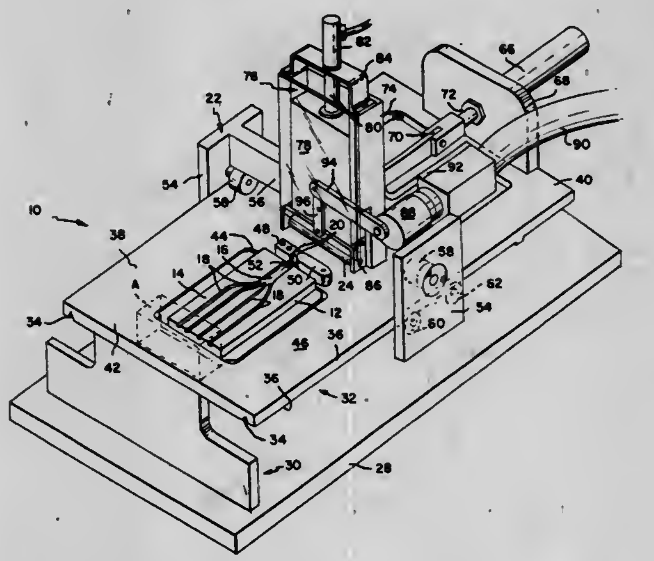
APPARATUS FOR POSITIONING LEADING PORTIONS OF INDIVIDUAL WIRES OF A PLURALITY OF WIRES IN SPACED APART RELATIONSHIPS WITH RESPECT TO EACH OTHER

Kenneth Foster Folk; Milton Dean Ross, and Walter Clifton Shatto, Jr., all of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 20, 1973, Ser. No. 389,924
Int. Cl. B21f *1/02;* H01r *43/00*
U.S. Cl. 140—147 **15 Claims**

1. Apparatus for positioning leading portions of individual detached flexible wires of a plurality of relatively movable wires in spaced apart relationships with respect to each other, said apparatus comprising:

first surface means having a primary groove defined therein capable of substantially accommodating a trailing portion of each of said wires in a bunched together condition and a plurality of secondary grooves defined therein which emanate from said primary groove along separate, spaced apart paths, each of said secondary grooves being capable of substantially accommodating therein said leading portion of only one of said wires;
holding means for positioning said trailing portions of said wires in said bunched together condition in said primary groove of said first surface means;
second surface means; and
force-applying means for introducing an application of compressive forces on said wires at said trailing portions thereof by bringing said second surface means and said primary groove of said first surface means into close proximity to each other while said trailing portions of said wires are so positioned in said primary groove of said first surface means by said holding means and for continuing said application of said compressive forces simultaneously along said wires by moving at least one of said first surface means and said second surface means relative to the other such that said application of said compressive forces simultaneously progresses along each of said wires from said trailing portion toward said leading portion of each of said wires whereby said leading portions of said wires are forced individually into respective secondary grooves of said first surface means and thereby positioned in spaced apart relationships with respect to each other.



3,891,014

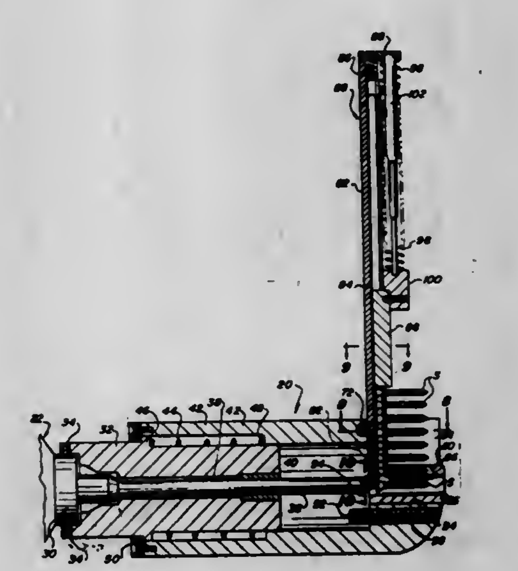
SCREW MAGAZINE MECHANISM FOR POWER SCREWDRIVER

David T. Gunn, 6203 Dover St. Apt. No. 5, Arvada, Colo. 80004

Filed Mar. 15, 1974, Ser. No. 451,532
Int. Cl. B25b *23/02*
U.S. Cl. 144—32 **26 Claims**

1. A screw magazine mechanism for use with a power driven screwdriver, said screwdriver having a case, a screwdriver bit rotatably mounted in said case and projecting forwardly therefrom for engagement with a screw to be driven, drive means for rotating said bit, and clutch means for drivingly coupling said drive means to said bit upon the application of a predetermined axially rearwardly directed force upon said bit; said screw magazine mechanism feeding screws in succession into operative alignment with said screwdriver bit, and comprising in combination:

an adaptor member fixedly mounted upon said case and projecting forwardly therefrom in coaxial alignment with said bit;
a housing mounted upon said adapter for axial sliding movement relative to said bit and said adapter between a forward end limit of movement wherein said bit is spaced rearwardly from the forward end of said housing by a distance greater than the length of a screw to be driven and a rearward end limit of movement wherein said bit projects from the forward end of said housing;
spring means engaged between said adapter and said housing biasing said housing toward said forward end limit;
screw magazine means detachably mounted upon the forward end of said housing operable when said housing is at said forward end limit to position a screw in a ready position wherein said screw is in axial alignment with said bit and with the head of said screw facing and spaced axially forwardly from the forward end of said bit; and
cooperating means on said bit and said magazine means operable upon rearward movement of said housing relative to said adapter and said bit for releasing said screw from said magazine as said bit moves into engagement with the head of said screw.



3,891,015

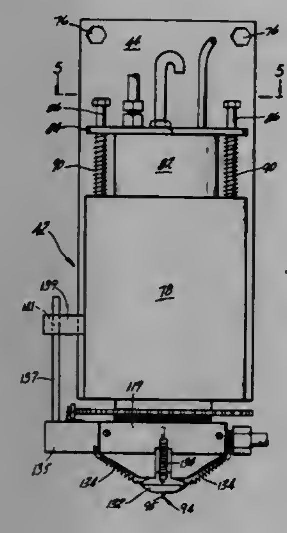
CONSTANT DEPTH CUTTER ASSEMBLY

Kenneth H. Calcagno, New Haven, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 286,378, Sept. 5, 1972, abandoned. This application Aug. 10, 1973, Ser. No. 387,399
Int. Cl. B27c *5/02;* B27m *3/00;* B23c *3/00*
U.S. Cl. 144—136 J **8 Claims**

1. In an apparatus for use with a cutter for controlling the depth of cuts made in a workpiece, said apparatus being of the

type comprising first means for contacting the surface of the workpiece, said first means including a planar portion the plane of which contains a point positioned so as to lie on an axis of the cutter whereby the cutter will project beyond said point a predetermined distance; and second means upon which said first means is mounted, said second means being operative to enable said first means to be freely universally pivoted about said point, the improvement comprising bearing means disposed vertically above said first and second means for maintaining said point substantially on the surface of the workpiece, said bearing means comprising a motor housing containing a motor for driving the cutter, and an annular bearing member in which said motor housing is vertically slidably mounted, said first and second means being secured to said motor housing for instantaneous vertically reciprocating movement concurrent with similar movement of said motor housing, an upward component of said vertically reciprocating movement being in response to a vertical force exerted upon said planar portion by vertically rising portions of the surface of the workpiece encountered by said planar portion, and said bearing means further providing instantaneous lowering of said planar portion in response to contact between said planar portion and vertically declining portions of the surface of the workpiece.



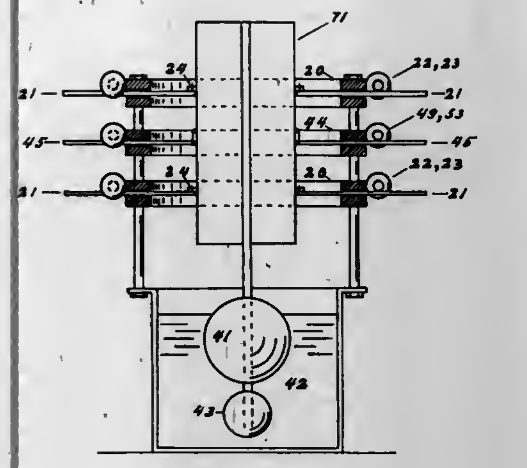
3,891,016
APPARATUS FOR CENTERING IRREGULAR PEELER LOGS

Reinhold Hermann Nilberg, 463 Beachview Dr., North Vancouver, Canada

Filed June 14, 1973, Ser. No. 369,837
Int. Cl. B27l *5/04*
U.S. Cl. 144—209 A **3 Claims**

1. An apparatus for centering peeler logs, on two movable supports, with substantially circular sweep, slight taper and two critical cross sections of irregular shape, comprising in combination:

a sensing unit for sensing the irregular peripheries of two critical cross sections of a log on movable supports for the purpose of duplicating these peripheries,
two duplicating units for duplicating seperately each of said peripheries at a desired ratio,
a cylinder unit in each of said two duplicating units, assigned to shift freely, for the purpose of finding the center point of the maximum circle in said duplicated periphery, whereby these two center points determine the peeling axis,
a center point sensing unit, as part of a periphery duplicating unit, for sensing the coordinates of said center point,
a servo unit, in each of said two movable log supports, for shifting the support in accordance with signals received from the corresponding center point sensing unit.

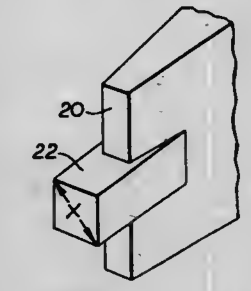


3,891,017
COMBINATION SCREW AND SCREWDRIVER WITH AXIAL GUIDE SPIGOT

Marian Iskra, 20 Little Sutton Rd., Four Oaks, Sutton Coldfield, Warwickshire, England

Filed Feb. 22, 1974, Ser. No. 444,867
Claims priority, application United Kingdon, Mar. 15, 1973, 12536/73
Int. Cl. B25b *15/02*
U.S. Cl. 145—50 A **5 Claims**

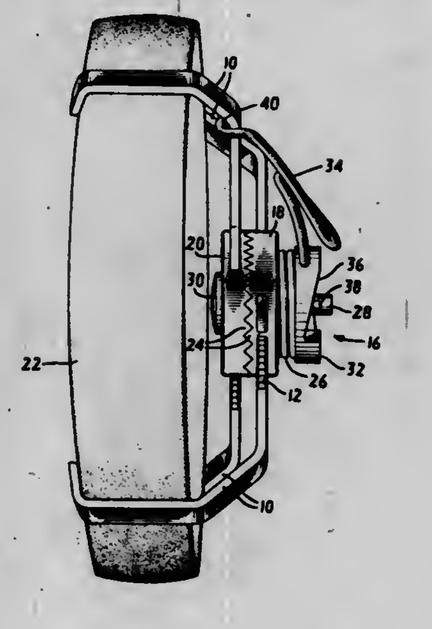
1. The combination of a screw having a head including a transverse parallel-sided slot and a central axial cylindrical bore of greater depth than the slot and of constant diameter throughout its length, which diameter is greater than the width of the slot; and a screwdriver blade comprising a straight edged diametrically extending blade tip for rotational driving engagement with said slot and a central guide spigot porjecting axially substantially beyond the blade tip for operative entry into said axial bore and having a square lateral cross-section substantially greater in width throughout its length than the width of said tip for engagement in said axial bore, the diagonal of said spigot being substantially equal to the diameter of the axial bore, and said spigot being slightly tapered toward its free end and dimensioned to have a press fit in said bore, whereby the corners of said spigot are adapted to have biting engagement with the wall of said axial bore.



3,891,018
GRIPPING SHOES FOR VEHICLE WHEELS

Egil Hyggen, Oslo, Norway, assignor to Elkem-Spigerverket A/S, Oslo, Norway

Filed Jan. 7, 1974, Ser. No. 431,314
Claims priority, application Norway, Jan. 11, 1973, 121/73
Int. Cl. B60c *27/02*
U.S. Cl. 152—225 **5 Claims**



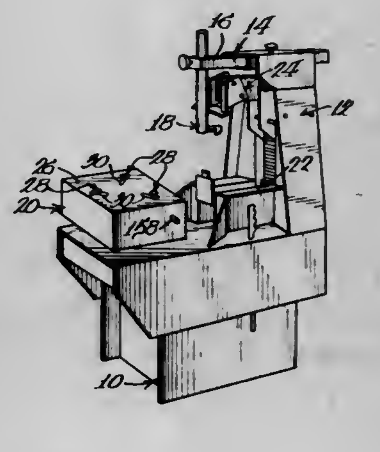
1. A gripping shoe for vehicle wheels comprising:

a. a central housing having at least two sections normally rotatable with respect to each other, said two sections having surfaces which face each other;
b. at least two gripping members associated with each said housing, said gripping members being J-shaped and having their hooked ends remote from said central housing;
c. means for drawing said gripping members together whereby they can be snugly drawn about a vehicle tire; and
d. means for locking said housing members to prevent them from rotating with respect to each other said means including corresponding protrusions and depressions on said facing surfaces of the two sections of the housing.

3,891,019
TIRE CHANGING APPARATUS

Jimmie L. Holladay, Antioch, Tenn., assignor to The Coats Company, Inc., LaVergne, Tenn.

Filed June 25, 1973, Ser. No. 373,491
Int. Cl. B60c *25/06*
U.S. Cl. 157—1.24 **4 Claims**

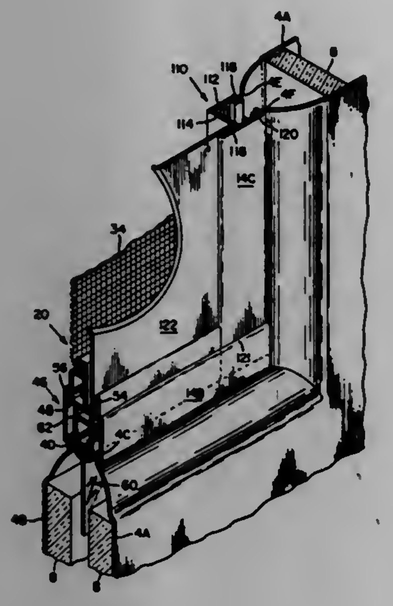


1. In a tire changing apparatus including a rim receiving table, means associated with said table for holding a tire rim stationarily thereon, a tire mounting and/or demounting tool and means for effecting relative rotary movement between a rim on said table and said tool, the improvement in said holding means comprising at least three rim engaging elements movably affixed to said table and extending upwardly from a rim receiving surface thereon and movable toward and away from a predetermined position on said table, each of said rim engaging members having downwardly canted surfaces facing said predetermined position; means mounting said rim engaging members for movement on said table toward and away from said predetermined position on said table and providing for a limited amount of movement toward and away from said rim receiving surface in a direction generally non-parallel thereto; and means for moving said rim engaging members toward said predetermined position whereby when said rim engaging members engage the flange of a rim received on said surface, the same will exert a downward force on said rim to cause the same to frictionally lock against said surface to preclude rotation of said rim relative to said table when relative movement is being effected between said tool and said table; said mounting means including slots in said surface, said rim engaging members extending through said slots, and a plurality of links, one for each of said rim engaging members, beneath said slots having one end mounting an associated one of said rim engaging members and the other end pivotally secured to said table; said one end of each of said links being free for limited movement toward and away from said slots in a direction transverse to said surface.

4. A tire changing apparatus including a rim receiving table; said apparatus being adapted to be associated with a tool for use in mounting and demounting tires from rims received on said table; said apparatus further including means for effecting relative rotational movement between the tool associated therewith and said table, said movement effecting means including a fluid actuated, double acting cylinder having an internal dashpot whereby said relative movement may be effected bidirectionally and the rate of movement controlled by said internal dashpot, said internal dashpot having a closed, restricted flow fluid circuit wholly within said cylinder; said double acting cylinder and internal dashpot including a cylindrical sleeve having a pair of end walls and an approximately central wall to provide two compartments; a pair of pistons, one in each of said compartments; a piston rod having an end extending exteriorly of at least one of said end plates and passing through an opening in said central plate and mounting both of said pistons; said opening being slightly larger than said piston rod; and a body of fluid trapped between said pistons to define a dashpot, said opening defining the restriction to the flow of said body fluid in said closed, restricted flow fluid circuit from one side of said central plate to the other side thereof to control the rate of movement of said piston rod.

3,891,020
DOOR ASSEMBLY INCLUDING INSERT STORING MEANS

Anthony R. Mennuto, 769 Pascack Rd., Paramus, N.J. 07652
Filed Jan. 4, 1974, Ser. No. 430,727
Int. Cl.^{2} E06B *3/32*
U.S. Cl. 160—37 5 Claims



1. In a door assembly of the type including a pair of panels and a core sandwiched between the panels, the panels having portions which surround a substantially rectangular opening in the upper part of the door, and a frame adjacent the panel portions for defining the opening and for supporting a removable insert therein, the improvement comprising:

the frame including top, bottom and a pair of side members adjacent corresponding panel portions for defining the opening and for supporting the removable insert therein, the top and side members are stationary in the opening and the bottom frame member is removable for exposing a portion of the core in the lower part of the door and which removable frame member separates the upper and lower parts of the door;

the exposed core portion arranged for providing a channel which receives the insert for storage when the insert is removed from the frame;

the stored insert is disposed between the panel portions adjacent the bottom frame member and includes a portion which extends beyond the panel portions;

the bottom frame member includes a downwardly extending first channel portion and an upwardly extending second channel portion;

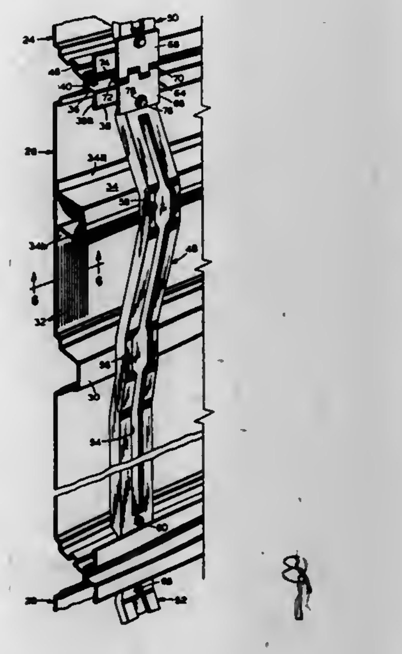
the first channel portion receives the portion of the stored insert which extends beyond said panel portions adjacent the bottom frame member, and is adjacent said insert and panel portions;

the second channel portion cooperates with the top and side frame members for retaining an interchangeable second insert in the opening when the first mentioned insert is in storage; and

the second channel portion, top and side frame members and second insert cooperate to retain a decorative member in front of said insert when the insert is retained in the opening.

3,891,021
GARAGE DOOR WITH ROLLED OVERLAPPING JOINT FOR ADJACENT PANELS

David Charles Geoffrey, Warren, Mich., assignor to The Stanley Works, New Britain, Conn.
Filed Oct. 1, 1973, Ser. No. 402,580
Int. Cl.^{2} E06B *3/12*
U.S. Cl. 160—235 9 Claims



1. A metal door of sectional construction comprising:

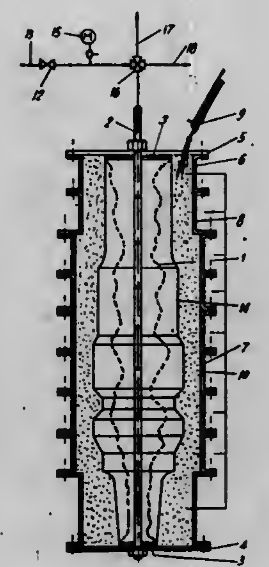
a. at least one continous, integrally formed sheet metal panel section having a body portion with edge portions extending along each of the horizontal edges thereof, one of said edge portions being a roll form including a lip portion of arcuate cross section projecting therefrom in a plane spaced from the plane of said body portion and defining a concave recess in the inner surface thereof, said one edge portion including a rail portion on the inner end of said arcuate lip portion projecting away therefrom;

b. at least one other continuous, integrally formed sheet metal panel section having a body portion with edge portions extending along each of the horizontal edges thereof, one of said edge portions being formed with a cooperating shoulder portion of arcuate configuration spaced from the plane of said body portion thereof and cooperatively configured to slidably seat the outer surface of said arcuate lip portion of said one panel section, said shoulder portion and said lip portion being slidable relative to each other during movement of the door between open and closed positions, said one edge portion including a rail portion on the inner end of said shoulder portion projecting away therefrom; and

c. hinge means including a first leaf hinge portion secured to said rail portion of said one panel section and a second leaf hinge portion secured to said rail portion of said other panel section, said hinge means further including a barrel positioned within said concave recess provided by said lip portion when said panels sections are pivoted relative to each other, said lip portion and said shoulder portion slide relative to each other and said hinge portions pivot relative to each other.

3,891,022
PROCESS FOR MANUFACTURING CORES AND MOULDS

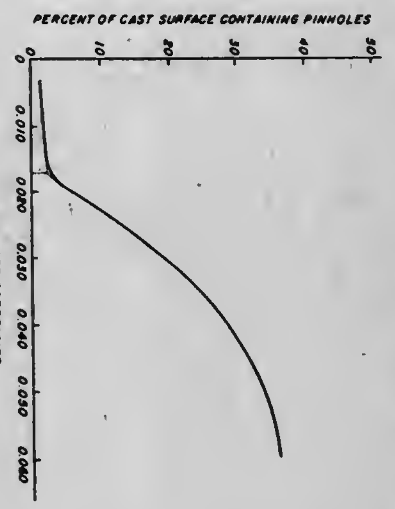
Giorgio Cola, Rome, Italy, assignor to Centro Sperimentale Metallurgico S.p.A., Rome, Italy
Continuation of Ser. No. 70,282, Sept. 8, 1970 abandoned. This application May 29, 1973, Ser. No. 364,239
Claims priority, application Italy, Sept. 11, 1969, 21930/69
Int. Cl. B22c *9/28*
U.S. Cl. 164—41 9 Claims



1. In the process of forming moulds for castings, comprising the steps of filling a pattern having preshaped and dimensioned walls with fluid wherein the pattern is of an extendible material selected from at least one member of the group consisting essentially of natural and synthetic rubbers which in the unfilled condition lacks shape and rigidity but which upon filling has the shape, dimensioned walls and the rigidity to define the desired profile of the mould, pouring fluidal moulding material about and in contact with the pattern while the pattern is being concurrently filled with fluid to maintain its preshaped and dimensioned walls, and thereafter contracting the pattern by withdrawing the fluid therefrom for removal of the contracted pattern from the set moulding material.

3,891,023
CONTROLLED FLUX ADDITION FOR MINIMIZING SURFACE DEFECTS ON CONTINUOUSLY CAST STEEL

Edward S. Szekeres, Edgewood Boro, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.
Filed Oct. 31, 1972, Ser. No. 302,465
Int. Cl. B22d *27/18*
U.S. Cl. 164—55 4 Claims



1. In the method of continuously casting of steel, which includes the addition of a readily fusible flux onto the meniscus of the molten steel, in an amount sufficient to aid in the assimilation of scum, said flux comprising a prefused mixture of, in weight percent,

CaF_2	20 to 60%
CaO	5 to 30%
K_2O/Na_2O	10 to 30%
B_2O_3	5 to 20%
SiO_2	15% max.
Al_2O_3	3% max.
C	10% max.

and exhibiting a melting point within the range of about 1400° to 1900°F,

the improvement which comprises, feeding said flux at a rate below that given by the equation:

$$F_{max} = 0.017(C.S.A.)$$

in which, F_{max} is pounds of flux per ton of steel, and C.S.A. is the calculated surface area, in square feet, of a one ton steel billet being cast and being covered by an essentially liquid flux.

3,891,024

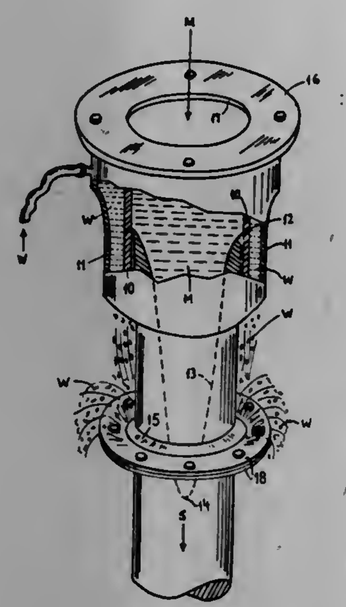
METHOD FOR THE CONTINUOUS CASTING OF METAL INGOTS OR STRIPS

Edouard Gervais, Montreal; Henri Levert, Lachine, and Pierre Chollet, Pierrefonds, all of Canada, assignors to Noranda Mines Limited, Toronto, Canada

Filed June 13, 1973, Ser. No. 369,534

Int. Cl. B22d *11/12*

U.S. Cl. 164—89 **12 Claims**



1. A method for the continuous casting of zinc-aluminum billets of about 5 inches in diameter at relatively high speed comprising the steps of:

a. continuously supplying a molten zinc-aluminum alloy containing about 25% aluminum, 5% copper, 0.05% magnesium, the balance being zinc with incidental impurities, to a relatively short mold;
b. continuously applying a liquid coolant to the outer surface of the mold to form an outer shell of solidified metal within the mold;
c. withdrawing the solidified metal in the form of a billet from the bottom of the mold at a casting speed of about 12 in/min;
d. continuously applying a liquid coolant to the surface of the billet emerging from the mold to cool the billet; and
e. effectively removing all of the liquid coolant from the surface of the billet at a distance from the bottom of the mold which varies between 3¾ and 5¼ inches.

3,891,025

APPARATUS FOR WITHDRAWING A CASTING AND FEEDING A DUMMY BAR IN A CONTINUOUS CASTING MACHINE FOR STEEL

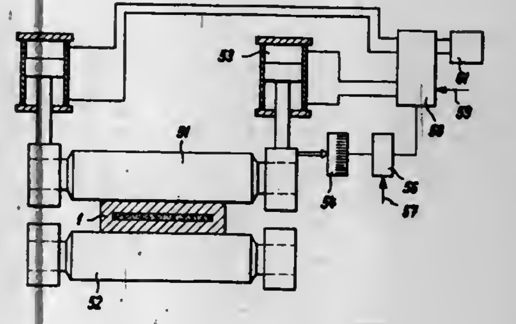
Georg Bollig, Buderich; Horst Grothe, Kaarst, both of Germany; Bernhard Knell, Thawil, Switzerland; Armin Thalmann, Uster, Switzerland, and Josef Zeller, Wessen, Switzerland, assignors to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany and Concast AG, Zurich, Switzerland

Division of Ser. No. 267,531, June 29, 1972, Pat. No. 3,812,900. This application Feb. 28, 1974, Ser. No. 446,902

Int. Cl. B22d *11/12*

U.S. Cl. 164—154 **10 Claims**

1. An apparatus for operating a multiple-roll machine, especially a multiple-roll withdrawing machine or a multiple-roll combination withdrawing and straightening machine in a continuous steel casting plant, comprising cooperating pairs of rolls, at least one of said rolls constituting a driven roll, means for adjusting the gap between the cooperating pairs of rolls, stop means for limiting adjustment of the gap between the cooperating pairs of rolls to the prescribed thickness of the casting, means for moving at least one roll of the pairs of rolls towards the casting beyond the stop means defining the prescribed thickness of the casting, said moving means generating a thrust which is smaller than that generated by the adjusting means and said thrust substantially corresponding to the requisite contact pressure for generating the necessary withdrawal force for the casting, and wherein said moving means comprise thrustor means.



8. An apparatus for operating a multiple-roll machine, in particular a multiple-roll withdrawing machine or a multiple-roll combination withdrawing and straightening machine, in a continuous steel casting plant, comprising opposing rolls defining therebetween a gap for the throughpassage of the casting, means for adjusting the gap between said opposing rolls, position reporting means for monitoring the actual thickness of the casting, comparator means for receiving signals from said position reporting means and for comparing such signals with a reference signal, and a servo-control unit for controlling operation of said adjusting means as a function of the operation of said comparator.

3,891,026

APPARATUS FOR BENDING CONTINUOUS CAST SLABS

Kurt Reinfeld, and Emmanuel V. Gouye, both of Pittsburgh, Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Division of Ser. No. 104,817, Jan. 7, 1971, Pat. No. 3,730,256, which is a division of Ser. No. 837,851, Jan. 30, 1969, Pat. No. 3,590,908. This application Dec. 29, 1972, Ser. No. 319,269

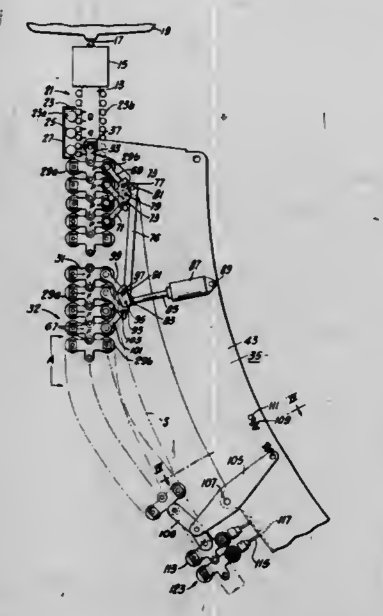
Int. Cl. B22d *11/12*

U.S. Cl. 164—282 **2 Claims**

1. In a continuous casting apparatus, the combination comprising:

a. a roll bracket that supports a pair of rollers includes:
  i. a first bearing fixedly mounted thereto,
  ii. a second bearing adjustably mounted thereto, and
  iii. a screw jack mounted to said bracket and connected to said second bearing whereby said second bearing is movable relative to said first fixed bearing;

b. means on said bracket for connecting said bracket to an adjacent similar bracket;
c. a roller journaled in said fixed bearing;
d. a roller journaled in said movable bearing;
e. an elongate equalizing arm;
f. a first proportioning bracket pivotally mounted to said equalizing arm;
g. a first arm pivotally mounted to said proportioning bracket;
h. means pivotally connecting said first arm to said roll bracket;
i. a second arm pivotally mounted to said proportioning bracket;



j. means pivotally connecting said second arm to said adjacent roll brackets;
k. a second proportioning bracket pivotally mounted to said equalizing arm and arranged in spaced apart relation to said first proportioning bracket, said second bracket including:
  i. first and second housings pivotally connected together,
    ii. a third arm pivotally mounted to said first housing, and
  iii. a fourth and pivotally mounted to said second housing;
    1. means pivotally connecting said third and fourth arms each to one of several brackets.

3,891,027

AIR CONDITIONING SYSTEM AND METHOD UTILIZING HUMIDIFICATION OF THE AIR

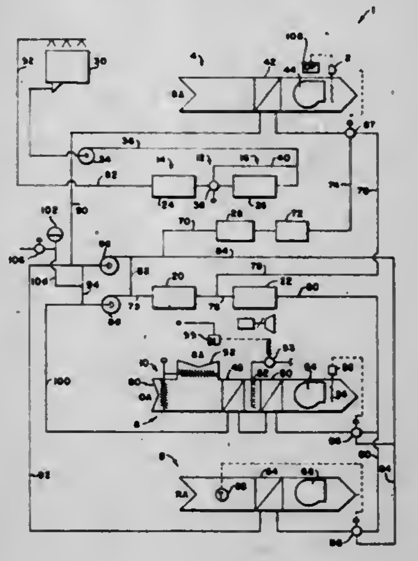
Edward Russell McFarlan, Westfield, N.J., assignor to Alden I. McFarlan, Westfield, N.J.

Continuation of Ser. No. 177,415, Sept. 2, 1971, abandoned. This application Oct. 15, 1973, Ser. No. 406,471

Int. Cl. F24f *3/14*

U.S. Cl. 165—2 **5 Claims**

5. In the art of maintaining acceptable ambient conditions within an air conditioned space having a plurality of zones in which one zone may require cooling while other zones may require heating or cooling, and wherein heat is transferred from a zone requiring cooling to a zone requiring heating and wherein heat is discharged from the system only when there is an excess of heat for the entire system and auxiliary heat is added to the system only when there is a deficiency of heat for the entire system, that improvement which comprises as an alternative to discharging excess heat from the system the step of utilizing that excess heat to vaporize water into air passing to a zone or zones to thereby provide cooling for the zone or zones and increase the relative amount of heat in the air while maintaining acceptable temperature conditions, and the step of reducing the relative humidity of the air in the system when changes in the operating conditions create a net heating load for the system thereby to maintain comfort conditions throughout the system while making it unnecessary to add the



amount of auxiliary heat equal to said excess heat utilized to evaporated the water as an alternative to discharging that excess heat.

3,891,028

REGENERATIVE HEAT EXCHANGER

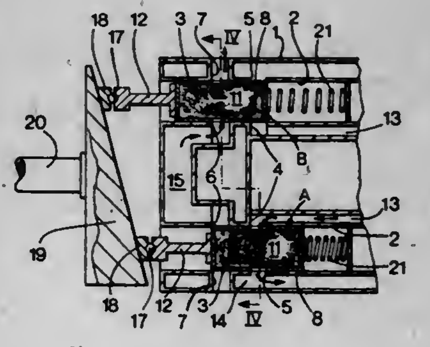
Robert Noel Penny, 12 Alderbrook Rd., Solihull, Warwickshire, England

Filed Nov. 12, 1973, Ser. No. 414,723

Claims priority, application United Kingdom, Nov. 28, 1972, 54896/72

Int. Cl. F28d *17/00*

U.S. Cl. 165—6 **6 Claims**



1. A regenerative heat exchanger comprising a housing, a plurality of cylinders contained in the housing and arranged with their longitudinal axes parallel with each other and circumferentially spaced apart around an imaginary pitch circle in the housing, a piston-like matrix contained in each cylinder and reciprocatable therein, each cylinder having a first pair of inlet and outlet ports with which the matrix therein co-operates when it occupies a first position in the cylinder, and a second pair of inlet and outlet ports with which the matrix therein co-operates when it occupies a second position in the cylinder, whereby relatively hot and cold fluid streams passed through the respective pairs of ports will pass alternately through each matrix as each matrix alternately occupies its first and second positions, reciprocating means for reciprocating the matrix in each cylinder such that sequentially one matrix is open to the relatively hot fluid and one matrix is open to the relatively cold fluid, and means for effecting relative rotation between said reciprocating means and said housing, whereby the matrices are reciprocated in their respective cylinders in cyclic order during said relative rotation.

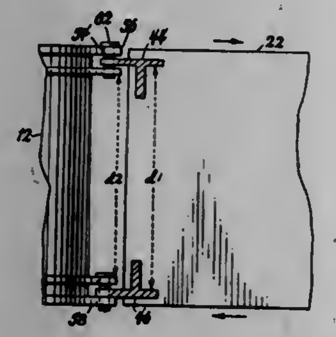
3,891,029
ROTOR ASSEMBLY FOR VERTICAL SHAFT AIR PREHEATER

Robert E. Mahoney, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,506

Int. Cl. F28d *19/00*

U.S. Cl. 165—8 **10 Claims**



1. Rotary regenerative heat exchange apparatus having a central rotor post disposed about a vertical axis, a plurality of independent sector-shaped baskets arranged in side-by-side relation to comprise an annular rotor around the rotor post, a mass of heat absorbent material contained in the several baskets of the rotor, housing means surrounding the rotor having inlet and outlet openings that direct a heating fluid and a fluid to be heated through the heat absorbent material of the rotor, means for rotating the rotor about its vertical axis, pivot means for attaching the element baskets to the rotor post comprising a tension fitting connecting the upper extremity of each rotor basket and the rotor post and a compression fitting intermediate the lower extremity of each basket and the rotor post whereby each basket is held in position adjacent the rotor post by a combination of forces transmitted by the tension member and the compression member.

3,891,030
CYLINDRICAL HEATING-SURFACE SUPPORT STRUCTURE FOR REGENERATIVE AIR PREHEATERS

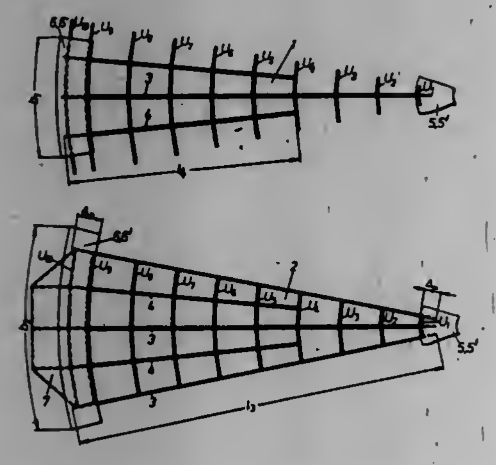
Siegfried Hans-Dietmar Schluter, Wenden-Biggetal, and Erich Kraft, Huttseifen, both of Germany, assignors to Apparatebau Rothemuhle Brandt & Kritzler, Rothemuhle, Germany

Filed June 16, 1972, Ser. No. 263,553

Claims priority, application Germany, June 18, 1971, 2130196

Int. Cl. F28d *17/00, 19/04*

U.S. Cl. 165—10 **5 Claims**



1. Regenerative heat exchange support structure for supporting a plurality of heat exchange element packs in a generally cylindrical cellular arrangement comprising, in combination, a pair of core plates extending in respective planes perpendicular to the axis of the cylindrical structure, a pair of annular ring flanges extending in the same respective planes, the core plates being at a radially inner peripheral region of the structure and the ring flanges at a radially outer peripheral region of the structure, a plurality of pairs of prefabricated sector units, each of said units comprising a full length radial supporting wall extending from radially within an outer periphery of the core plates to radially beyond an inner periphery of the ring flanges and a plurality of chordal connecting sheets carried on the wall, one unit of each of said pairs comprising only one full length radial wall, the plurality of chordal connecting sheets attached thereto defining laterally open-ended volumes and the other unit of each of said pairs comprising an additional full length radial wall extending along each sector edge defining a dividing wall between the units of said pair of units and closing the said lateral open ends of said volumes, the said full length walls being welded between the core plates at their inner ends and the ring flanges at their outer ends, by welds extending radially of the axis.

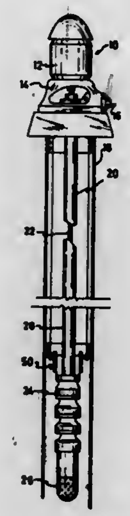
3,891,031
SEALING MEANS FOR DEEP-WELL

Carlos Mayer Ortiz, Blas Pascal 135-1002, Mexico City, Mexico

Filed Feb. 4, 1974, Ser. No. 439,040

Int. Cl. E21b *43/00*

U.S. Cl. 166—68.5 **7 Claims**



1. In a sealing means for a wall of a deep-well, a well head, a pump device having an upper end, the sealing means being suitable to connect the wall in a tight manner to the upper end of the pump device, a supporting string supporting the pump device;

a seal carrier means solidarily coupled to the upper end of said pump device and in fluid-flow relationship with the interior thereof;

an outer sealing device arranged to cover said carrier means;

a plurality of O-ring seals carried by said carrier means;

said O-rings being disposed to make a tight joint between said carrier means and said outer sealing device;

an elastic sealing device coupled to said outer sealing device, being disposed to extend from the latter toward the wall of the well, and uniting in a tight manner said outer sealing device and said wall; and

elastic sealing means located at the uppermost point of the well; whereby a section of the wall interposed between said elastic sealing means and the wellhead is isolated from the bottom of the well and disposed to be employed as a discharge casing.

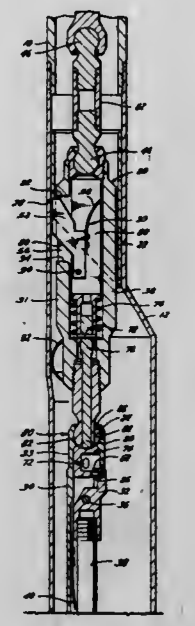
3,891,032
APPARATUS FOR INSTALLING AND REMOVING FLOW CONTROL DEVICES

Gilbert H. Tausch, and Ronald E. Pringle, both of Houston, Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Mar. 29, 1974, Ser. No. 456,094

Int. Cl. E21b *7/06*

U.S. Cl. 166—117.5 **8 Claims**



1. A flow control device handling apparatus adapted for use in placing a flow control device in a selected offset pocket in a mandrel having an orientating sleeve in a well tubing and for removing said device therefrom comprising,

a body adapted to be moved through the well tubing,

a flow control device handling arm supported from the body,

means for laterally shifting said handling arm into position over a selected pocket when the body is oriented,

orientating means connected to the body for coacting with the orientating sleeve for orientating the handling arm relative to the pocket, and

universal joint means in the body between the orientating means and the handling arm for allowing the body to pivot about the universal joint for allowing movement of the body through curved well tubing, but maintaining the orientating means and the handling arm in a predetermined rotational alignment for providing orientation of the handling arm.

3,891,033
ANNULUS PRESSURE CONTROLLED TESTING APPARATUS

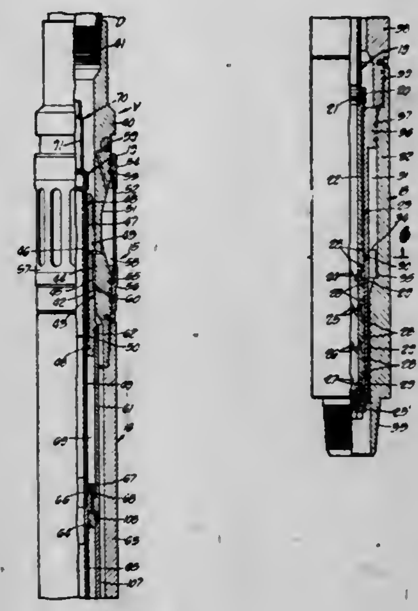
Lyle B. Scott, Los Angeles, Calif., assignor to Byron Jackson Inc., Long Beach, Calif.

Filed Jan. 4, 1974, Ser. No. 430,989

Int. Cl. E21b *49/00*

U.S. Cl. 166—133 **28 Claims**

1. Apparatus for performing a drill stem test in a well bore traversing an earth formation in which casing is set comprising: a test string adapted to be connected to a string of pipe and run into the well casing, said test string including a packer having anchor means and packing means expansible into anchoring and sealing engagement with said well casing above said earth formation to anchor said test string in said casing and separate said formation from the casing above said packer, test instrument means associated with said packer and in communication with said earth formation, and shut-in valve means above said packer for controlling the flow of fluid from said formation through said test string, said shut-in valve means including a body connected in said test string, said body having therein a tubular mandrel shiftable longitudinally of said body, valve means including a valve member carried by said mandrel and shiftable therewith to a plurality of successive open and closed positions for enabling and for shutting off the flow of fluid from said formation through said mandrel a plurality of times as said tubular mandrel is shifted longitudinally in one direction, and escapement control means responsive to the pressure of fluid in said well casing above said packer for controlling the progressive movement of said mandrel and said valve member in said one direction through said plurality of successive positions.



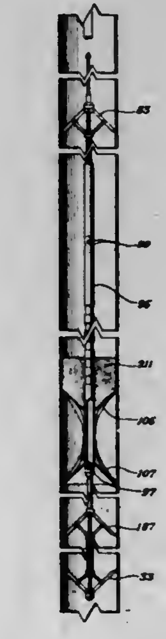
3,891,034
THROUGH-TUBING BRIDGE PLUG HAVING COVERED EXPANSIBLE PACKER

Harrold D. Owen, and Jamie B. Terrell, both of Fort Worth, Tex., assignors to Gearhart-Owen Industries, Inc., Fort Worth, Tex.

Filed Jan. 8, 1974, Ser. No. 431,711

Int. Cl. E21b *33/00, 23/00, 33/12*

U.S. Cl. 166—285 **25 Claims**



1. A method of emplacing a bridge plug in a wellbore penetrating subterranean formation, said wellbore having casing and tubing therein, comprising the steps of:

a. running a packer assembly containing a covered and collapsed packer and locking dogs downwardly through the tubing to a predetermined depth in said casing in said wellbore;

b. releasing a first set of dogs that engage said casing for holding against an upward force;

c. lifting the cover upwardly from around and expanding said packer and a second set of dogs that engage said casing for holding against a downward force and removing said cover from said wellbore; said packer expanding outwardly into contact with said casing with sufficient force and disposition so as to sustain a cement slurry dumped thereonto;

d. providing an open passageway through said packer to allow fluids to flow through said passageway during curing of any cement slurry dumped onto said packer;

e. removing apparatus including a dog release assembly and a cover tube from said wellbore;

f. dumping a predetermined batch of cement slurry on top of said expanded packer and allowing said cement slurry to set up and partially cure;

g. providing an open passageway through said cement slurry such that said passageway communicates and is maintained open to fluid flow during curing of said cement slurry to set cement;

h. closing said open passageway and pulling from said wellbore a tattle-tail demonstrating that said open passageway has been satisfactorily closed; and

i. thereafter dumping additional cement slurry on top of said cement and said closed passageway and allowing it to set forming a complete bridge plug without requiring removal of said tubing.

19. A through-tubing bridge plug comprising:

a. a vent tube;

b. a collapsible and extensible packer basket carried by said vent tube, said basket being made up of a plurality of leaves; and

c. a bag covering said packer basket; said bag being of loosely fitting sleeve-like configuration and extending over both the interiorly facing surfaces of said leaves and the exteriorly facing surfaces of said leaves so that the bag is expanded by said leaves when they expand.

3,891,035

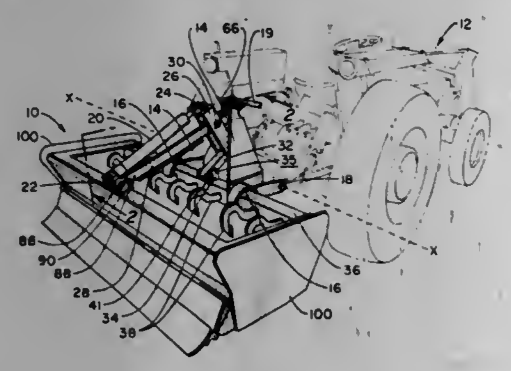
SCARIFIER AND SCRAPER ATTACHMENT FOR A TRACTOR

Laurence B. Miller, Van Nuys, and James D. Crook, Redlands, both of Calif., assignors to Digmor Equipment & Engineering, Van Nuys, Calif.

Filed Mar. 28, 1974, Ser. No. 455,851

Int. Cl. A01b *49/02*

U.S. Cl. 172—197 **10 Claims**



1. A scarifier and scraper attachment for a tractor, and the like, comprising:

a frame including means for coupling the attachment to the tractor;

a stop member mounted on said frame;

bearing means mounted on the frame;

a transverse shaft rotatably mounted in said bearing means;

a series of scarifier teeth mounted on said shaft at spaced locations along the length of the shaft and extending radially outwardly with respect to the axis of rotation of the shaft;

a bracket mounted on said shaft;

linkage means including a toggle link pivotally coupled to said bracket and a lever arm having one end pivotally coupled to said toggle link;

a control element coupled to said linkage means to turn said shaft in said bearing means about its axis of rotation, said teeth being turned between an operational position and a retracted position when said shaft is turned by said control element in said bearing means about its axis of rotation;

a scraper bucket rotatably attached to said transverse shaft for angular movement about the axis thereof; and

further bracket means coupling said scraper bucket to said linkage means and adjustable to set the scraper bucket at predetermined angular positions about the axis of rotation of said transverse shaft with respect to said teeth.

3,891,036

CONTROL ARRANGEMENT FOR THE FORWARD AND BACKWARD MOVEMENT OF PERCUSSIVE BORING RAMS

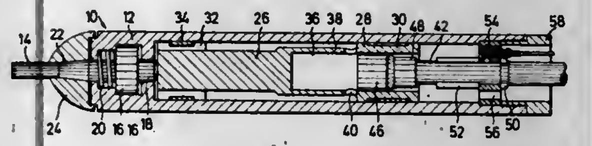
Paul Schmidt, Lennestadt, Germany, assignor to Tracto Technik Paul Schmidt, Germany

Filed July 29, 1974, Ser. No. 492,753

Claims priority, application Germany, Aug. 11, 1973, 2340751

Int. Cl. B25d *9/00;* **E21b** *1/00*

U.S. Cl. 173—91 **17 Claims**



1. In a self-propelled, pneumatically operated, percussive boring ram of the kind comprising a hollow housing, a chisel mounted at the boring end of said hollow housing, a percussion piston reciprocably mounted in said hollow housing, a back stop in said housing for limiting rearward movement of said percussion piston in said housing, said chisel forming a front stop for limiting forward movement of said percussion piston in said housing, means defining a cylindrical chamber in said percussion piston, a tubular valve member having a piston head and located in said housing with said piston head received in said cylindrical chamber, said tubular valve member being adapted to admit compressed air into said cylindrical chamber for reciprocating said percussion piston and thereby driving said boring ram, and means whereby said tubular valve member can be adjusted between two operative axial positions relative to said housing to determine whether said percussion piston acts to drive said boring ram forwards or backwards, the improvement wherein said boring ram includes a guide member attached in said housing and said tubular valve member extends through said guide member, and means for locking said tubular valve member in either of said two operative positions during operation of said boring ram, said locking means comprising axially inter-engaging stops on said tubular valve member and on said guide member, and a releasable catch which, when engaged, prevents rotation of said tubular valve member relative to said guide member, said stops being arranged whereby, on release of said catch, said tubular valve member can be rotated into a position in which said stops are misaligned and allow said tubular valve member to be moved axially from one of said operative positions to the other.

3,891,037

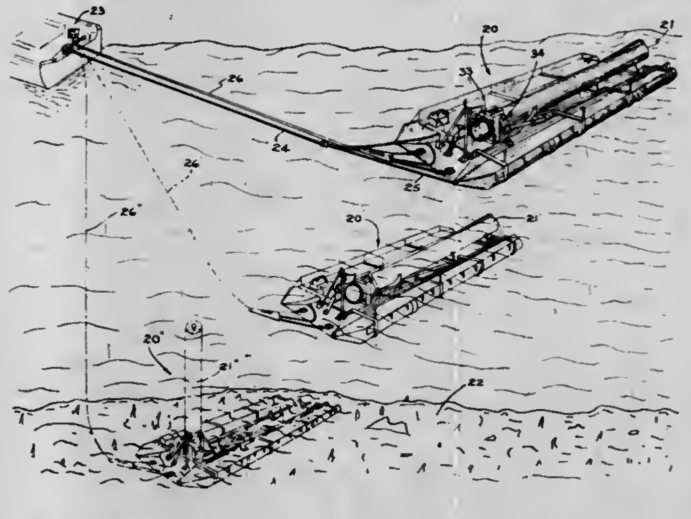
REMOTELY OPERATED SEAFLOOR CORING AND DRILLING METHOD AND SYSTEM

Dale E. Well, 3902 Lincolnshire St., Pascagoula/Miss. Calif. 39567, and Kenneth C. Marley, 1074 Valley Forge Dr., Sunnyvale, Calif. 94087

Filed Dec. 26, 1972, Ser. No. 318,114

Int. Cl.^{2} E21B *7/12*

U.S. Cl. 175—6 **3 Claims**



1. An apparatus for emplacing a core barrel, casing, piling or other type of structure having one end thereof adapted for cutting material in the floor of a body of water, including the combination of a support frame, ballast container means on the support frame, means to introduce ballast into said container means to create negative bouyancy for said apparatus, means to remove ballast from said container means to creat-positive buoyancy for said apparatus, means on the frame to support a length of said structure for movement to a position with its longitudinal axis oriented along a predetermined angle of entry with respect to said floor and with said cutting end disposed lowermost, and means to move said one end of the structure to cause the structure to cut into and advance toward said floor along said angle of entry, means to cause said core barrel, casing, piling or other type of structure of oscillate about its longitudinal axis through a pre-determined arc, said means to include a combination of clamping means to releasably engage the outer periphery of said core barrel, casing, piling or other type of structure, means to impart rotary motion to said clamping means when the latter is in clamping engagement with said core barrel, casing, piling, or other type of structure, means to oscillate said clamping means, core barrel, casing, piling or other type of structure through a pre-determined arc about the latters longitudinal axis to include means forming a gear track on said clamping means with said gear track extended about the longitudinal axis of said core barrel, casing, piling or other type structure and means to drivingly engage said gear track with one or more sector gears engaging said gear track and means to oscillate said sector gears through a pre-determined arc and impart rotary motion to said gear track, said clamping means, said core barrel, casing, piling or other type of structure.

3,891,038

DEVICE FOR MEASURING THE POSITION AND SPEED OF A BORING TOOL

André Delestrade, Viroflay, and Roger Marce, Fourqueux, both of France, assignors to Compagnie Francaise des Petroles and Compagnie Generale d'Automatisme, both of Paris, France

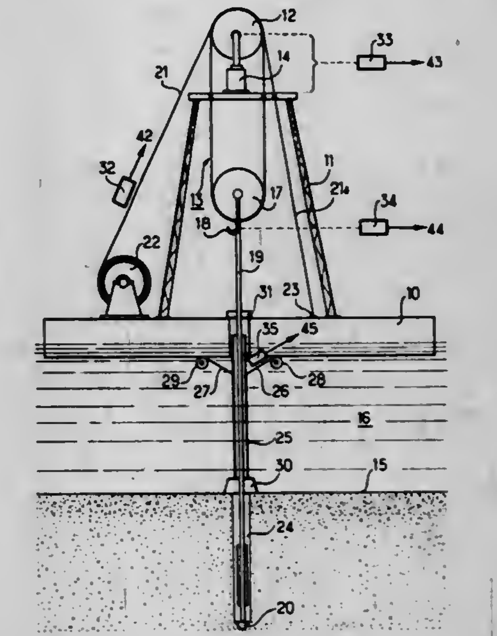
Filed June 19, 1974, Ser. No. 480,798

Claims priority, application France, June 28, 1973, 73.23712

Int. Cl. E21b *47/02*

U.S. Cl. 175—7 **14 Claims**

1. In a device for measuring the position of a boring tool supported through a line of rods by supporting means situated on a floating craft, said supporting means including a tackle adapted to hoist and lower said boring tool in response to winding and unwinding of a first cable on a winch fixed on said craft, means for compensating for variations in the vertical position of said floating craft in relation to the bottom of the water, and a tubular member surrounding said line of rods between the opening of a well being bored and said craft, the lower end of said tubular member being adapted to be anchored to the bottom of the water, said tubular member being further held near its upper end by means of at least two second cables which are stretched by their associated winches fixed on said craft, the improvement comprising:



first signalling means associated with said first cable for providing a first signal representative of motion of said first cable along its length;

second signalling means associated with said compensating means for providing a second signal representative of the variation in the vertical position of said craft in relation to the bottom of the water;

third signalling means associated with said second cables for providing a third signal representative of the relative vertical positions of said tubular member and said craft; and

processor means responsive to said first, second and third signals for providing a signal indicative of the position of said boring tool.

3,891,039

METHOD AND DEVICE FOR DRILLING TO A PREDETERMINED SURFACE

Gunnar Lagerstrom, Ektorp, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed May 2, 1974, Ser. No. 466,300

Claims priority, application Sweden, May 15, 1973, 7306858

Int. Cl. E21b *47/04*

U.S. Cl. 175—40 **13 Claims**

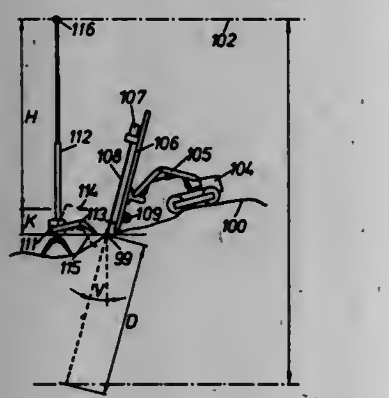
2. A device for rock-drilling and/or earth boring of a number of drill-holes to an imagined and preferably plane bottom surface comprising:

a drilling machine drivable along a feed device to drill holes to the bottom surface,

a registering device connected to the feed device to register the forward feed of the drilling machine along the feed device,

a device for generating a reference surface, defined by electromagnetic radiation, parallel to said bottom surface, and

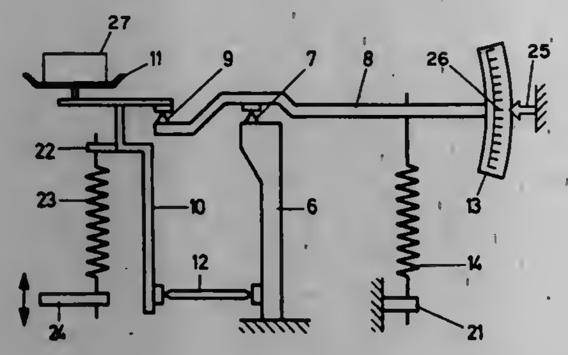
means associated with the registering device for registering the sum of the distance in a predetermined direction between said reference surface and the point at which



drilling is to be initiated and the component in said direction of the depth of the drill-hole.

3,891,040
INCLINATION SPRING BALANCE

Albert Schmitter, Grueningen, Switzerland, assignor to Mettler Instrumente AG, Greifensee-Zurich, Switzerland
Filed Jan. 26, 1973, Ser. No. 326,820
Claims priority, application Switzerland, Feb. 25, 1972, 2714/72
Int. Cl.^{2} G01G *1/18*
U.S. Cl. 177—230 **9 Claims**

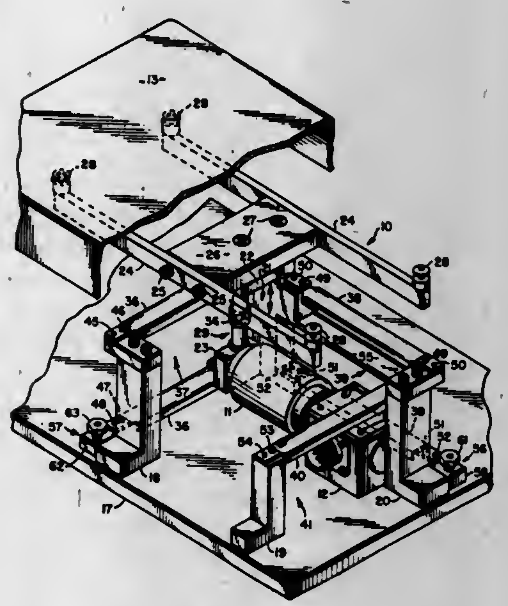


1. An inclination balance comprising, in combination:

a. a support, said support being stationary in the normal operating condition of said balance;
b. a balance beam mounted on said support for angular movement about a main bearing axis horizontal in said condition,
   1. said beam having two arms extending from said axis in opposite directions;
c. pan carrier means adapted to carry an object to be weighed;
d. outer bearing means connecting said pan carrier means to one of said arms for pivotal movement about an outer bearing axis spacedly parallel to said main bearing axis, said axes jointly defining a plane;
e. yieldably resilient means opposing angular movement of said beam about said main bearing axis under the weight of said object and including
   1. a helical weighing spring having an axis and two axially spaced terminal portions,
   2. first fastening means fastening one of said terminal portions to said support, and
   3. second fastening means fixedly fastening the other terminal portion to the other arm of said beam,
   4. said second fastening means including means preventing movement of said other terminal portion relative to said beam; and
f. indicating means for indicating the angular position of said beam as a measure of said weight, said indicating means including a scale member and an index member,
   1. one of said members being fixedly mounted on said support, and the other member being fixedly fastened on said other arm,
   2. said scale member carrying a row of numerical weight marks spaced for sequential alignment with said index member during said angular movement of said beam,
   3. said row of marks including a central mark and two groups of marks extending from said central mark in opposite directions and including respective terminal marks farthest from said central mark and respectively constituting a zero mark and a full-load mark,
   4. said index member and said zero mark being aligned in said condition when said pan carrier means carries no object to be weighed,
   5. said index member and said full-load mark being aligned in said condition when said pan carrier means carries an object having the full rated weight of said balance,
   6. said index member and said central mark being aligned in said condition when said pan carrier means carries an object having one half of said full rated weight,
   7. said plane being obliquely inclined relative to the horizontal when said index member and said central mark are aligned.

3,891,041
WEIGHING SCALE

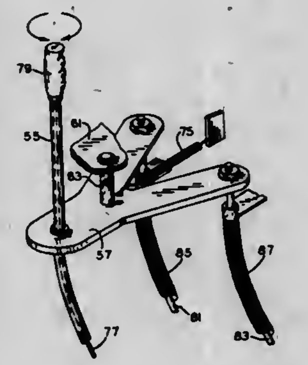
Donivan L. Hall, and Walter E. Kupper, both of Toledo, Ohio, assignors to Reliance Electric Company, England
Division of Ser. No. 407,659, Oct. 18, 1973. This application May 15, 1974, Ser. No. 470,149
Int. Cl. G01g *21/24*
U.S. Cl. 177—255 **6 Claims**



1. A weighing scale comprising, in combination, stationary frame means, movable load receiving means, transducer means for producing weight signals in accordance with movement of the load receiving means, check link means connecting the frame and load receiving means for movement of the load receiving means in a substantially vertical path, the check link means forming with the frame and load receiving means a plurality of parallelograms located in intersecting planes, and means for so adjusting the check link means to cancel errors caused by shifting loads upon the load receiving means parallel to each of said parallelograms that adjustments made to cancel errors caused by shifting loads parallel to any one parallelogram are independent of adjustments made to cancel errors caused by shifting loads parallel to any other parallelogram.

3,891,042
CONTROL ARRANGEMENT FOR A HYDRAULICALLY POWERED VEHICLE

Gerald W. Braun, Rt. 1, Avilla, Ind. 46710
Filed Jan. 21, 1974, Ser. No. 435,279
Int. Cl. B62d *11/04*
U.S. Cl. 180—6.48 **9 Claims**

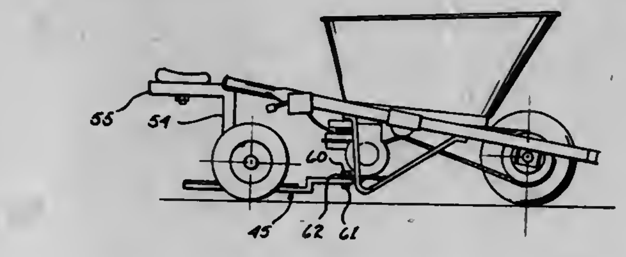


1. In a hydraulically powered utility vehicle having at least first and second hydraulic motors permanently connected to drive laterally separated ground engaging locomotion producing means, a primary energy source, pump means coupled to the primary energy source and to the hydraulic motors, and control means for controlling the rate and direction of hydraulic flow from the pump means individually through the hydraulic motors, a mechanism for providing single lever operator control for both speed and direction comprising:

a control lever supported on the vehicle and exhibiting at least 2 degrees of mechanical freedom in response to operator actuation;
first and second hydraulic control arms for individual ones of said motors, associated with said control means and movable in a continuous manner between full ahead and full reverse positions;
a control plate pivotably supported on the vehicle for 2 degrees of mechanical freedom;
means coupling the control lever to the control plate;
means coupling the first and second arms to distinct points on the control plate, each point being distinct from the point of coupling of the control lever; and
the control lever having 3 degrees of mechanical freedom, the third degree being a twisting movement, and further comprising a cable coupled to the control lever and to the primary energy source for controlling the primary energy source.

3,891,043
SELF-PROPELLED EARTH MOVING DEVICE

George L. Valdez, 3374 E. Pennsylvania Ave., Tucson, Ariz. 85714
Filed May 8, 1974, Ser. No. 467,914
Int. Cl. B62d *53/02*
U.S. Cl. 180—13 **5 Claims**

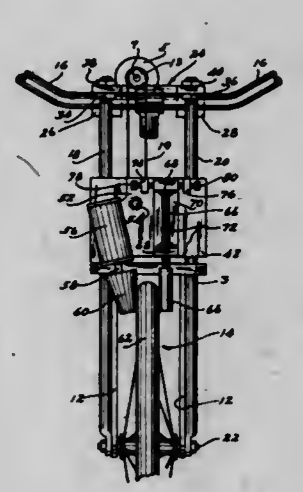


2. In a single wheel manually directed vehicle for transporting material over smooth or rough terrain, said vehicle including an A-frame shaped framework having an apex and a pair of hand grips extending rearwardly therefrom, a single wheel rotatably secured in proximity to the apex, a pair of legs depending from the framework intermediate the wheel and the hand grips and a bucket mounted upon the framework for carrying material and extending laterally coincident with the legs and at least partially laterally coincident with the wheel, the improvement comprising in combination:

a. mounting means extending intermediate the legs beneath the framework at or below the center of gravity of said vehicle;
b. a motor attached to said mounting means at the approximate center of gravity of said vehicle, said motor including an output shaft, said motor and said output shaft being shielded in the vertical axis by the bucket;
c. a front wheel sprocket secured to the wheel;
d. a drive train disposed intermediate said output shaft and said front wheel sprocket for driving the wheel in response to energization of said motor, said gear means being fully shielded in the vertical axis by the bucket;
e. means secured to one of the hand grips for regulating the operation of said motor;
f. a platform mounted upon a pair of wheels for supporting an operator of said vehicle;
g. a tongue extending forwardly from said platform;
h. nut and bolt means for connecting said tongue to said mounting plate, said nut and bolt means including pivot means for accommodating pivotal movement of said tongue in the horizontal and vertical plane; and
i. means for supporting the operator upon said platform rearwardly of said pair of wheels; whereby, the operator of said vehicle is transported by said vehicle in a manner such that the weight of the operator will tend to exert an upward force acting through said tongue upon said mounting plate to lift the legs of said vehicle off the ground without impeding lateral relative pivotal movement between said vehicle and said platform.

3,891,044
BICYCLE PROPELLING MEANS

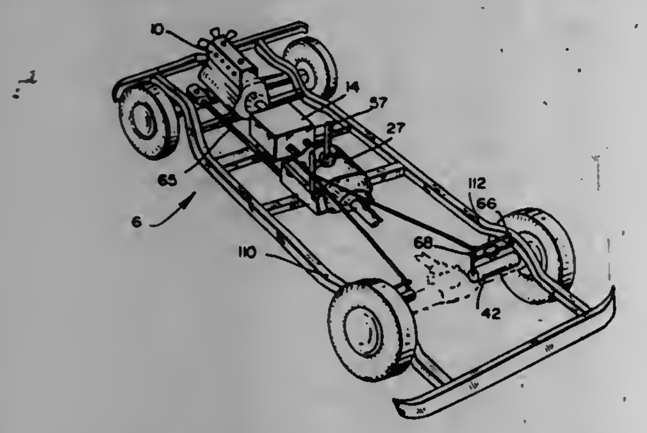
Clair L. Tiede, Rt. No. 3, Box 227 E, Muckwonago, Wis. 53149
Filed Nov. 7, 1973, Ser. No. 413,705
Int. Cl. B62k *11/02*
U.S. Cl. 180—31 **2 Claims**



1. In a vehicle having a frame, a wheel supported on an axle on said frame and a tire on said wheel, in combination, a propelling means for said vehicle comprising a power unit on said frame comprising a motor mounted on a support and having a shaft, said support being shiftable relative to said frame in a direction normal to said axle, the axis of said shaft being directed downwardly-convergent toward said wheel and relative to a plane normal to said axle, a cone-shaped roller integral with said shaft and positioned in engagement with said tire, said roller having a degree of taper providing substantially invariable frictional contact pressure with said tire during shifting of said power unit normal to said axle.

3,891,045
HYDRAULIC TRANSMISSION MOTOR VEHICLE

Vincent A. Pancella, 68 First Pl., Brooklyn, N.Y. 11231
Filed Apr. 5, 1974, Ser. No. 458,286
Int. Cl. B60k *17/10*
U.S. Cl. 180—66 R **8 Claims**



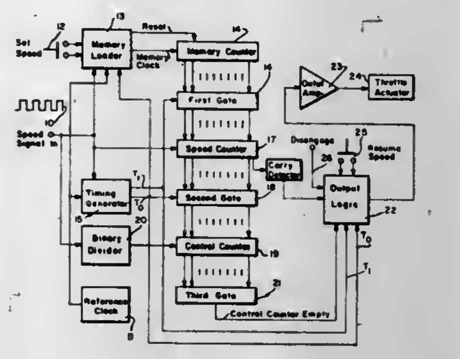
1. A hydraulic transmission motor vehicle comprising a wheel chassis, a pair of ground engaging wheels for said chassis hydraulic motor means for driving said wheels, hydraulic power means for driving the motor means, control means for controlling said hydraulic power means, combustion power means for operating said hydraulic power means, control means for said combustion power means, and brake means for locking the hydraulic motor means in an immovable position, a frame mounted on said chassis, said control means for controlling said hydraulic power means including a pair of three-position open center directional valves mounted on either side of said frame, said three-position open center directional valves being connected to said hydraulic power means and said hydraulic motor means, a pair of bypass variable orifice valves mounted on said chassis said orifice valves being located in conduits which by-pass said motor means, diverting the pressure fluid back to the hydraulic power means and provided with levers, respectively, and connected intermediate said hydraulic power means and said three position open center directional valves, a control stick displaceable in forward, neutral reverse and left and right directions, means operably connecting said stick to said three-position open center directional valves, means operably connecting said stick to said bypass variable orifice valves, respectively, said connecting means being arranged to open and close said bypass orifice valves proportionally to the steering direction said connecting means comprising a pair of upper cables each having one end secured to an upper end of said stick and one end to one of said levers, respectively, a pair of lower cables secured to the lower end of said stick and one end, respectively, to said levers, said control stick when moved forward or backward restricting the by-pass flow, thereby increasing the power applied to the wheel motors, said control stick, when moved to one side, effecting a restriction of the by-pass flow from the wheel motor disposed on the opposite side.

3,891,046
DIGITAL SPEED CONTROL

Jeffrey A. Oicles, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Continuation of Ser. No. 1,448, Jan. 8, 1970, abandoned. This application Feb. 3, 1972, Ser. No. 223,318
Int. Cl. B60k *31/00*
U.S. Cl. 180—105 E **7 Claims**

1. A digital speed control for maintaining a motor vehicle at a preselected constant speed comprising:

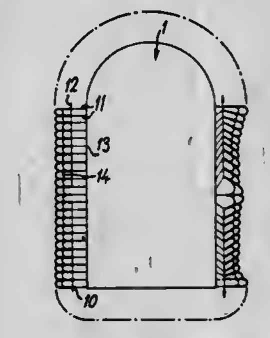
a. means for generating a first digital signal responsive to the actual speed of the vehicle comprising a series of speed signal pulses having a pulse repetition frequency proportional to the speed of the vehicle;
b. means for generating a second digital signal responsive to a constant preselected vehicle speed comprising a digital reference clock, a first digital counter and means for clocking said first digital counter in response to said first digital signal during a first given reference clock period, thereby storing in said first digital counter a first digital number responsive to the preselected speed of the vehicle;
c. means for digitally comparing the first digital signal responsive to the actual speed of the vehicle and the second digital signal responsive to the constant preselected vehicle speed to produce a digital error signal comprising;
d. second digital down counter means clocked by said first signal responsive to the actual speed of the vehicle;
e. means for generating a first and a second timing pulse at the beginning of each reference clock period;
f. first AND gate means gating, upon receipt of a second timing pulse, the first digital number responsive to the speed of the vehicle stored in said first digital counter means to the second digital counter means, said second digital counter means being a down counter clocked by the first digital signal pulse train to count down for one reference clock period, so that if the actual speed of the vehicle is greater than the preselected speed of the vehicle the second counter will count down through zero, and if the actual speed of the vehicle is less than the preselected speed of the vehicle a second digital number will remain stored on the second digital counter;



g. means for generating a "carry" signal when the second digital counter counts down through zero;
h. binary means for dividing the first digital signal responsive to the actual speed of the vehicle;
i. third digital counter means clocked by the divided binary signal responsive to the actual speed of the vehicle;
j. second AND gate means gating, upon receipt of a first timing pulse, the second digital number stored in the second digital down counter to the third digital counter means, said third digital counter means being a down counter clocked by the divided binary signal responsive to the actual speed of the vehicle counting down during one reference clock period, so that if the actual speed of the vehicle is less than the preselected speed of the vehicle the third counter may count down through zero;
k. third AND gate means producing an output whenever the third counter counts down through zero;
l. means for producing a pulse width modulated error signal having a pulse width proportional to the difference in speed between the preselected constant speed and an actual vehicle speed lower than the preselected speed; and
m. means for adjusting the speed of the vehicle in response to said pulse width modulated error signal to maintain the preselected constant speed.

3,891,047
SKIRTS OF GAS CUSHION VEHICLES

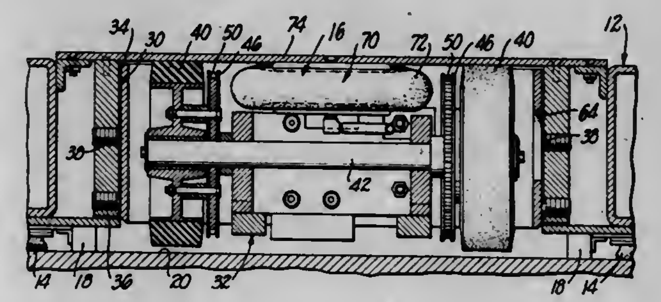
John Edward Rapson, Southampton, England, assignor to Hovercraft Development Limited, London, England
Filed June 5, 1973, Ser. No. 367,121
Claims priority, application United Kingdom, June 6, 1972, 26324/72
Int. Cl. B60v *1/00*
U.S. Cl. 180—117 **10 Claims**



1. A skirt for a gas cushion vehicle comprising upper and lower parts of flexible sheet material, the upper part being connected to the vehicle body so as to be deflectable relative thereto, at least the lower part comprising a contiguous succession of independently deflectable flexible wall members each having an outer portion which faces the gas cushion and a pair of inwardly extending side portions, tie means connecting the side portions to the vehicle body, and adjusting means for causing angular movement of at least inner portions of the tie means in a substantially horizontal plane about substantially vertical axes passing through their attachments to the vehicle, and thereby result in the outer portions of the wall members being moved laterally in a direction towards or away from the vehicle body.

3,891,048
AIR BEARING TRANSPORTER HAVING MULTIDIRECTIONAL DRIVE UNIT

Robert E. Burdick, Goleta, Calif., assignor to Rolair Systems, Inc., Santa Barbara, Calif.
Filed July 30, 1973, Ser. No. 384,090
Int. Cl. B60v *1/00*
U.S. Cl. 180—119 **6 Claims**

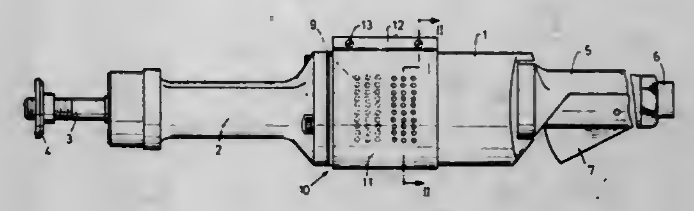


1. In a multidirectional drive unit for an air bearing transporter which includes a platform carrying air bearings on its lower side and having a recess in such lower side, the combination of:

a. a drive unit supporting structure in said recess and rotatable therein about a vertical axis;
b. two drive wheels rotatably mounted on said supporting structure and spaced from said vertical axis, said drive wheels being in coaxial relation and spaced apart by 180° about said vertical axis;
c. motor means on said supporting structure for selectively driving said wheels in the same or opposite directions;
d. whereby said wheels either propel the transporter in a given direction, dependent on the orientation of said wheels, or rotate said supporting structure relative to the transporter to reorient said wheels preparatory to propelling the transporter in a different direction at an angle to the first direction mentioned;
e. with said supporting structure vertically movable in said recess between a lower, extended position in which said drive wheels are engageable with a transporter supporting surface and an upper, retracted position, and the drive unit including actuating means for extending and retracting said supporting structure; and
f. locking means on the transporter and said supporting structure for locking said supporting structure against rotation in any of at least two positions angularly spaced apart by 90°, said locking means including means providing for vertical movement of said supporting structure relative to the transporter.

3,891,049
PNEUMATIC TOOL CONSTRUCTION

Reinhold Stroezel, Leinfelden-Oberaichen; Alfred Hettich, Stetten, and Alfredo Civarella, Leinfelden, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Aug. 24, 1973, Ser. No. 391,289
Claims priority, application Germany, Sept. 28, 1972, 72-35753[U]
Int. Cl. F01r *1/08*
U.S. Cl. 181—36 A **5 Claims**

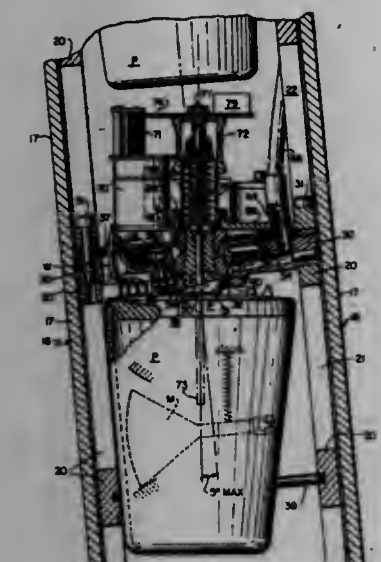


1. In a pneumatic tool, a combination comprising a housing having an axis and including a curved portion having an external surface and provided with outlet openings for spent pneumatic fluid; and a muffler including a curved body dimensioned to embrace said curved portion and comprising a curved strip of sheet metal having an internal surface facing said external surface and defining therewith an annular clearance extending axially of said housing, and at least one shaped member of elastically yieldable foamed synthetic plastic material located in said clearance and interposed between and in contact with said surfaces and defining therewith at least one enclosed tortuous channel for the passage of the spent fluid therethrough, said surfaces bounding said channel in the radially inward and outward directions, and said shaped member having first portions extending in said clearance at circumferentially spaced locations in axial directions of said housing, axially spaced curved section portions connecting respective ends of said first portions, and third portions extending intermediate said first portions away from the respective second portions towards but short of one another so as to define a gap between their adjacent ends, said channel having a first axial section provided with one end portion communicating with said outlet openings, a second axial section having an other end portion spaced in circumferential direction of said clearance from said one end portion, and a circumferentially extending curved third section which extends through said gap and connects said first and second section, said curved strip being provided in the region of said other end portion with a plurality of discharge apertures communicating said enclosed channel with the exterior of said muffler, whereby the spent fluid is restricted to movement in a tortuous path in said channel from said outlet openings through said first, third and second sections to said discharge openings.

3,891,050
BORE HOLE INSTRUMENT PACKAGE SELF-LEVELER

Burnard M. Kirkpatrick, Dallas, and James C. Moore, Rockwall, both of Tex., assignors to Teledyne Industries, Inc., Dallas, Tex.

Filed Mar. 6, 1974, Ser. No. 448,627
Int. Cl. G01d *11/02*
U.S. Cl. 181—102 11 Claims



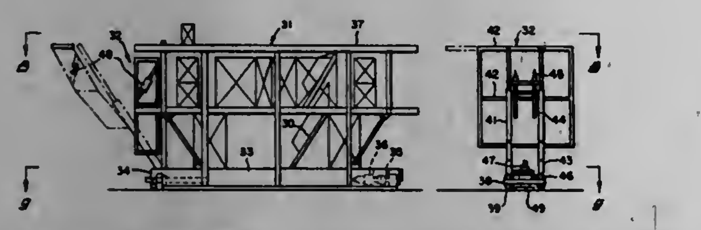
1. Apparatus for supporting and leveling an instrument package within a housing adapted to be lowered into a borehole, comprising:
- a. a controllable source of gas under pressure;

and
- b. gas bearing means including a first bearing member fixed within the housing and a second bearing member attached to said instrument package and supporting the latter pendulously within the housing, and the bearing means including a gas plenum coupled to said source and operatively located with respect to said first and second bearing members to provide, when pressurized, a film of gas therebetween.

3,891,051
SCAFFOLDING UNIT FOR SHIPBUILDING

Senji Takenouchi, Tokyo; Tautomu Yanai, Matsudo; Takamasa Matsumoto, Tokyo, and Hiroyoshi Ohtani, Niiza, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kubushiki, Tokyo, Japan

Division of Ser. No. 219,084, Jan. 19, 1972, abandoned. This application Sept. 28, 1973, Ser. No. 401,955
Int. Cl. E04g *1/18*
U.S. Cl. 182—63 1 Claim

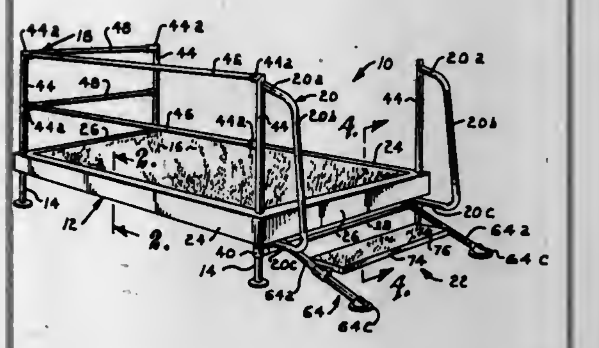


1. A shipbuilding scaffolding unit comprising a movable main body having a plurality of working platforms mounted thereon and also having a pair of opposite sides, a pair of wings each of which is detachably connected to one of said sides, each of said wings having a wheeled carriage to provide a separate mobile unit when a wing is detached from the side to which it is connected, means for raising and lowering said carriage, means for rotating the carriage when raised, each of said wings including a pair of telescopic columns having the lower ends thereof pivoted to the associated carriage, work area means including an upper working platform fixed to the upper ends of said pair of columns, and means for raising and lowering said columns.

3,891,052
ADJUSTABLE PORCH AND STEPS

Herschel D. Lee, Sr., and Herschel D. Lee, Jr., both of 2608 N.W. 66th St., Kansas City, Mo. 64151

Filed Aug. 16, 1974, Ser. No. 497,860
Int. Cl.² E04F *11/04;* **E06C** *9/00;* **E04G** *1/30*
U.S. Cl. 182—88 10 Claims

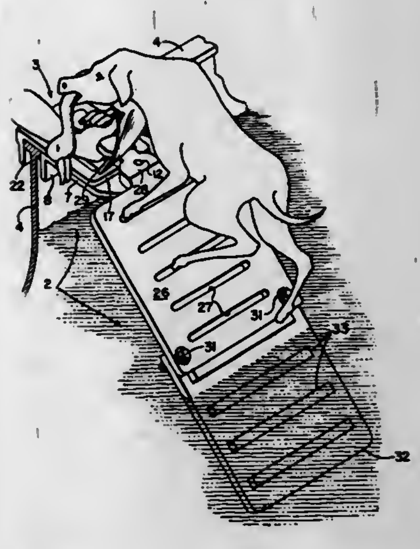


1. Elevated platform structure comprising:
- a framework adapted to support a platform member;
- stanchion means for supporting said framework at different elevations;
- first and second spaced apart leg means coupled with said framework at one side of the latter for movement between a retracted position wherein said legs are disposed substantially to one side of an imaginary vertical plane coplanar with said one side to an extended position wherein said legs project from said plane away from said one side, each of said first and second legs being movable in at least two directions independent of the other;
- means for holding said first and second leg means at different acute angles relative to said imaginary vertical plane; and
- means for presenting a step extending between said first and second leg means.

3,891,053
DOG LADDER FOR BOATS

Henry A. Burton, 855 Harrigan Rd., Fallon, Nev. 89406

Filed Mar. 6, 1974, Ser. No. 448,558
Int. Cl. E06c *1/08, 7/48*
U.S. Cl. 182—97 8 Claims



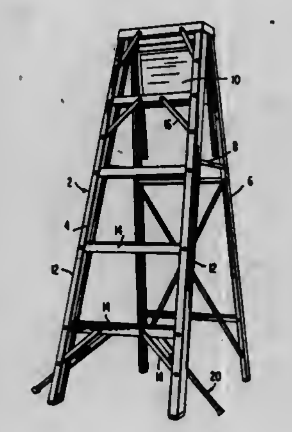
1. A ladder assembly adapted to facilitate egress from a body of water onto a structure on which the ladder is supported, comprising:

- a. an adjustable base member detachably mountable on a supporting structure;
- b. pivot means mounted on the base member;
- c. a ramp assembly pivotally mounted on said pivot pin and adapted to extend at a relatively steep angle downwardly from said base member;
- d. said base member including a pair of relatively adjustable base and clamp plates including parallel flanges adjustable to receive a supporting structure; and
- e. adjustable means mounted on one of said flanges and adapted to impinge against said supporting structure to clamp the base member thereto.

3,891,054
LADDER STABILIZERS

Clayton E. Larson, Brooklyn, N.Y., assignor to White Metal Rolling & Stamping Corporation, Brooklyn, N.Y.

Filed July 9, 1974, Ser. No. 486,811
Int. Cl. E06c *7/42*
U.S. Cl. 182—107 7 Claims



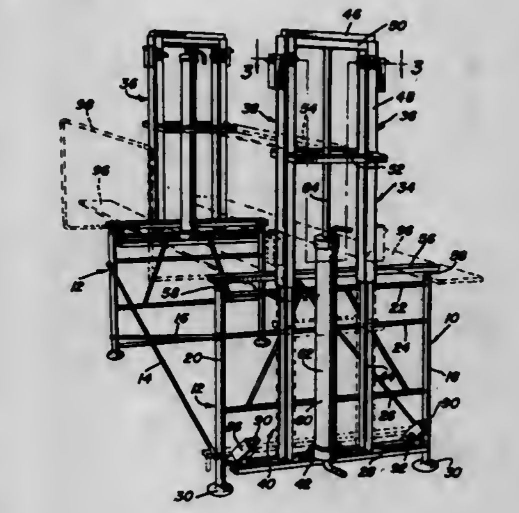
1. In combination with a ladder having a pair of side rails bearing step members, a stabilizer comprising:
- a pair of channel members each fixed at its top end to the lowest step member of the ladder and at its bottom end to one of the side rails of the ladder between the point of juncture of said lowest step member with said side rail and the foot of said side rail, the channel members being angled downward with respect to said lowest step member,
- a bar telescopically carried by each channel member to move between a retracted position where the lower end of the bar is adjacent the corresponding side rail and an extended position where the lower end of the bar engages the plane defined by the feet of the ladder side rails,
- a hole extending through each channel member adjacent the corresponding side rail, the axis of the hole being perpendicular to the face of the channel member,
- lock means carried by each channel member comprising a pin slidably extending through said channel hole and spring means urging said pin into said channel hole, and a pair of holes extending through each of said bars through which said pin may extend, one of said bar holes being located in the bar so that when the pin extends therethrough the bar is held in said retracted position and the other bar hole being located in the bar so that when the pin extends therethrough, the bar is held in said extended position.

3,891,055
SELF-ELEVATING SCAFFOLD CONSTRUCTION

Alfred A. Medlock, P.O. Box 627, Ocean Springs, Miss. 39564

Filed Dec. 18, 1973, Ser. No. 425,775
Int. Cl. E04g *1/18*
U.S. Cl. 182—141 12 Claims

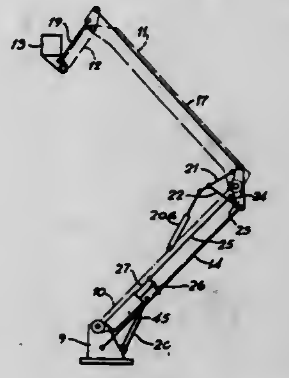
1. A scaffold construction including a pair of end frames each having upper and lower sections guidingly supported from each other for relative vertical shifting, motor means connected between said upper and lower sections for shifting the latter relative to each other, scaffold board support means carried by said upper sections for supporting the opposite ends of boards extending therebetween, said upper and lower sections including anchor structure for releasable engagement with and support from upper and lower portions of adjacent conventional scaffold end sections, the anchor structure of said lower sections also being provided for releasable engagement with and support from upper portions of adjacent conventional scaffold end sections.



3,891,056
HYDRAULICALLY ELEVATABLE PLATFORMS

Denis Henry Ashworth, Dudley, England, assignor to Simon Engineering Dudley Limited, Cheshire, England

Filed Feb. 7, 1974, Ser. No. 440,552
Claims priority, application United Kingdom, Feb. 21, 1973, 8526-73
Int. Cl. B66f *11/04*
U.S. Cl. 182—148 11 Claims

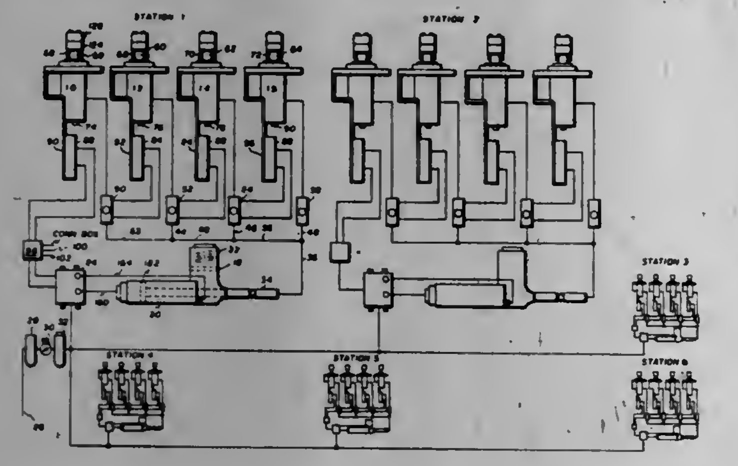


1. Access equipment comprising an articulated boom structure comprising a first boom pivotally mounted at one end on a vehicle or like supporting structure and at least a second boom pivotally connected to the free end of said first boom, hydraulic actuating cylinders connected for effecting pivoting movement of the second boom relative to the first boom and both booms relative to said supporting structure, control valves for said cylinders, movably mounted stops for controlling actuation of said valves, and means associated with each of said booms and movable therewith for transmitting movements thereof individually and collectively to said stops to actuate said control valves, said stops being so arranged that in response to movements of said booms and in accordance with permitted degrees of pivotal movement thereof operation of said actuating cylinders is controlled as appropriate to prevent the boom structure assuming a potentially unstable configuration.

3,891,057
SEMI-AUTOMATIC BEARING LUBRICATOR WORK CENTER

Orlando J. Stevens, Jacksonville, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 11, 1974, Ser. No. 432,713
Int. Cl. F16n *7/40, 13/22, 25/00*
U.S. Cl. 184—7 D **5 Claims**



1. A bearing lubricator work center comprising
- a. a common lubricant storage means and a common lubricant pump for storing a specific lubricant and for pumping said lubricant under pressure,
- b. a plurality of lubricant metering means each connected to said common pump to receive said lubricant under pressure and each having lubricant volume adjusting means for passing a specific desired volume of lubricant,
- c. a plurality of bearing adapters each sized and shaped to accommodate one of a range of bearing types and sizes,
- d. a plurality of lubricant dispensing means each connected to receive lubricant input from an associated of said metering means and each having a connector sized and shaped for receiving selectively each of said bearing adapters,
- e. an air filter, air regulator, air line lubricator means and a four-way solenoid operated air valve connected to said pump,
- f. said lubricant dispensing means including a slide valve having a spring biasing said valve to normal "off" position, said valve being moveable to a depressed "on" position when a bearing is pressed on its bearing adapter and against said slide valve spring bias, and
- g. an electrical system including a micro switch means engageable by said slide valve in "on" position of the latter and connected to operate said solenoid air valve to actuate said lubricant pump and through said metering and lubricant dispensing means to lubricate said bearing when said slide valve is depressed.

3,891,058
DEVICE FOR OILING AND DE-OILING COMPRESSED AIR

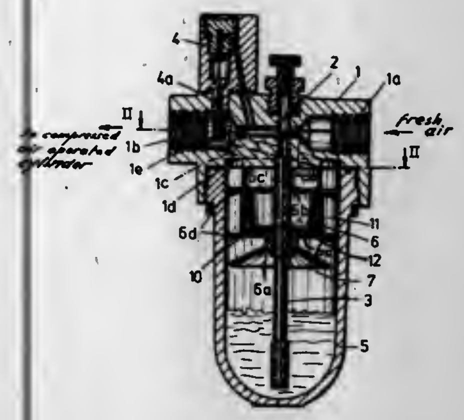
Hans Scharfen, Meerbusch; Karl Heinz Schmitz, Lank-Latum; Theo Strerath, Buttgen-Vorst, and Dragutin Jenko, Roselen-Schlicherum, all of Germany, assignors to Paul Forkardt Kommanditgesellshcaft, Dusseldorf, Germany

Filed June 3, 1974, Ser. No. 475,806

Claims priority, application Germany, June 1, 1973, 2327940

Int. Cl. F16n *7/32*
U.S. Cl. 184—55 A **5 Claims**

1. A device for oiling and de-oiling compressed air for compressed air operated cylinder-piston systems with reversible piston movement, which includes: housing means having compressed air inlet and means for connection to a supply of fresh air and also having compressed air outlet means for connection to a compressed air operable cylinder-piston system with reversible piston movement, and oil reservoir connected to said housing means for receiving and storing oil, riser means extending from the inside of said reservoir to said housing means, said housing means being provided with passage means communicating with said riser means, control valve means associated with said passage means for selectively varying the free cross section thereof to thereby control the quantity of oil drawn per time unit into said passage means through said riser means, said housing means also comprising a mixing chamber, atomizing nozzle means communicating on one hand with said control valve means and on the other hand with said mixing chamber, that side of said housing means which faces said oil reservoir being provided with annular twist passage means open toward the interior of said oil reservoir, said housing means also being provided with tangential bore means effecting communication between said twist passage means and said mixing chamber, and thereby said outlet means, insert means arranged within said oil reservoir and connected to that side of said housing means which has said twist passage means provided therein, said insert means comprising an annular wall surrounding said riser means and having its outside surface together with the inner wall of said oil reservoir define annular chamber means communicating with said twist passage means, the inner wall surface of said annular wall defining an inner chamber with perforated bottom and intermediate walls, filter means inserted in said inner chamber so that fluid passing through the perforations of said bottom wall must pass through said filter prior to passing through the perforations of said intermediate wall, conduit means for communication of said inner chamber with said inlet means, and check valve means associated with said conduit means and adapted, by back flowing discharge air of said system to be discharged through said conduit means to partially close said conduit means and said check valve means further adapted to fully open said conduit means in response to entry of fresh air through said inlet means.

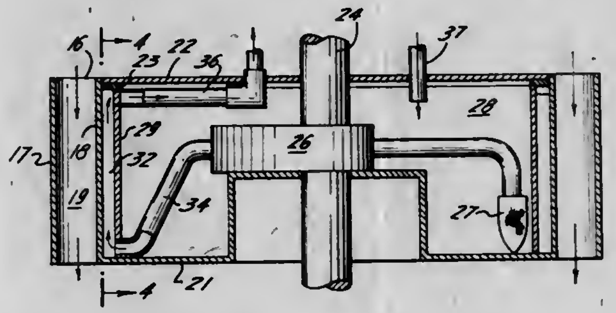


3,891,059
AIR-COOLED OIL SUMP WITH FINS FOR RECEIVING OIL IN A HEAT EXCHANGE RELATIONSHIP

Charles Jones, Hillsdale, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Mar. 14, 1974, Ser. No. 451,055
Int. Cl. F16n *13/00;* **F01m** *5/00*
U.S. Cl. 184—104 B **11 Claims**

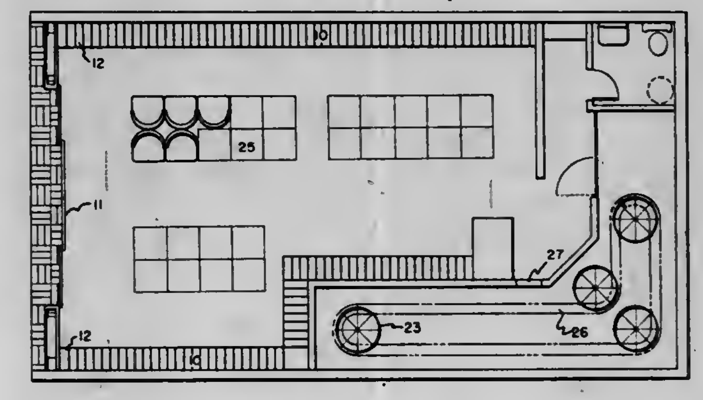
1. A coolable oil sump for use with an internal combustion engine, comprising a generally annular body member having external fins extending radially from the periphery thereof for flow of cooling air thereover, a generally annular insert disposed within the body member, the insert having a hollow interior defining a pump chamber receiving hot oil from the said engine and its exterior periphery defining with the inner periphery of the body member elongated replicate oil passage means in communication with the pump and disposed between the body member and the insert, the replicate oil passage means being in contact with the inner periphery of the cooled body member in heat exchange relationship therewith, an oil pump disposed within the pump chamber and having means for taking in oil, the pump discharging hot oil into the said replicate oil passage means for cooling, and output passage means receiving the cooled oil from the replicate oil passage means and delivering the cooled oil to the said engine for recirculation therethrough.



3,891,060
SHOE STORE AND SHOE SELECTION SYSTEM

Warren L. Woods, Salt Lake City, Utah, assignor to Wilwood Inc., Salt Lake City, Utah

Filed Jan. 11, 1974, Ser. No. 432,509
Int. Cl.² E04H *3/02*
U.S. Cl. 186—1 R **2 Claims**



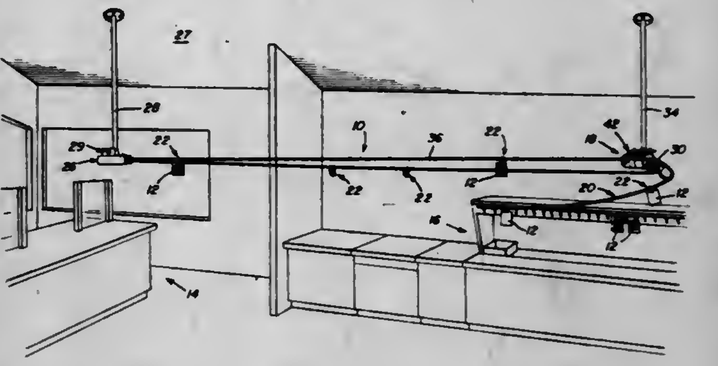
1. A novel compact shoe store comprising:
- a. a store entrance;
- b. a shoe display area located proximate said store entrance;
- c. shoe display means in said shoe display area comprising support means to support at least one row of shoe display bags;
- d. an enclosed shoe inventory area remotely located from said store entrance;
- e. shoe retrieval means in said shoe inventory area comprising an overhead conveyor for supporting shoe bags of substantially the same size and number as said shoe display means.

3,891,061
CONVEYOR SYSTEM

Daniel W. Grogan, 832 South Main, Dyersburg, Tenn. 38024

Filed Nov. 19, 1973, Ser. No. 416,841
Int. Cl. B61b *9/00*
U.S. Cl. 186—14 **5 Claims**

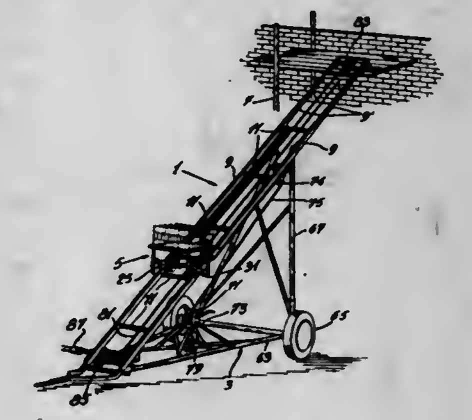
1. Apparatus for conveying food orders from a service area to an order filling area, comprising, in combination:
- a. first conveying means for providing a first conveyor path from a first area to a second area, and a separate second conveyor path from the second area to the first area, the first conveying means including:
  - i. a first end pulley arranged in the service area and mounted for rotation about a substantially vertical axis;
  - ii. a second end pulley arranged at the order filling area and mounted for rotation about a substantially horizontal axis;
  - iii. an endless belt arranged about the first and second pulleys for movement therewith and forming a pair of runs, each of the runs forming one of the first and second conveyor paths; and
  - iv. means for rotating one of the first and second pulleys;
- b. second conveying means for receiving an order from the first conveyor path at the second area and moving the order to an associated work station, the second conveying means being a downwardly inclined track arranged forming a gravity conveyor, an end of the track arranged adjacent the belt at the juncture thereof with the second end pulley for forming a continuous conveyor path in cooperation with the belt run forming the first conveyor path; and
- c. means for guiding the order along the first and second conveyor means, the means for guiding being a clip including an article gripping portion and a hook portion connected to the article gripping portion and arranged for selectively engaging the belt and track, the article gripping portion and hook portion forming a clip that is balanced when suspended on the belt and track, the article gripping portion including a spring element, jaws connected to the spring element for being biased thereby toward an article gripping position, and a pair of members arranged for selectively applying a counter-bias to overcome the spring element bias and move the jaws to an article releasing position, the hook portion being connected to one of the members, an eye hook being associated with the first pulley and arranged with the run forming the second conveyor path passing thereby for stopping the clip when same is being moved on the second conveyor path.



3,891,062
TELESCOPIC LIFT FOR CONSTRUCTION WORKS

Georges Geneste, Route 52, P.O. Box 597, Bedford, Quebec, Canada

Filed Jan. 7, 1974, Ser. No. 431,306
Int. Cl. B66b *9/20*
U.S. Cl. 187—10 **2 Claims**



1. A brick lift comprising:
- a. a rectilinear elongated guide formed of two spaced parallel straight rails defining, in transverse cross-section,

upper and lower flat tracks and flat inner and outer side runways;

b. wherein each rail is formed of a lower hollow part and an upper part of smaller cross-section than that of said lower part and slidably received therein, said parts thereby defining a shoulder at their junctions;

c. a brick carrier movably mounted on said guide and having a rolling undercarriage displaceable on said guide and having a brick carrying platform pivoted at one end to said undercarriage, and means to adjust said platform to hold it horizontal, said undercarriage further comprising: first rollers mounted for rotation about axes extending transversely of the longitudinal axis of said guide and riding on said flat upper tracks;
  second rollers mounted for rotation about an axis extending transversely of the longitudinal axis of said guide and riding on said lower tracks;
  third rollers mounted for rotation about axes perpendicular to said guide and riding on said flat outer side runways;
  a rattle preventing device comprising:
    rigid frames between said rails and adjacent said flat inner side runways;
    levers mounted, intermediate the ends thereof, at the ends of said frames for pivotal movement about upright axes;
    fourth rollers with upright pivotal axes mounted at the ends of said levers away and distant from said frames, and
    resilient means between the other ends of said levers and said frames to bias said last-mentioned rollers resiliently constantly against said inner side runways, and

d. a support for adjustably holding the said guide in upwardly inclined position, said support comprising a base wheeled at one end and pivotally mounted at the other end to the lower end of said guide; a stay pivotally mounted at one of its ends on the wheeled end of said base, and means interconnecting the other end of said stay and said guide to allow relative sliding motion therebetween.

3,891,063
PORTABLE ELEVATOR APPARATUS

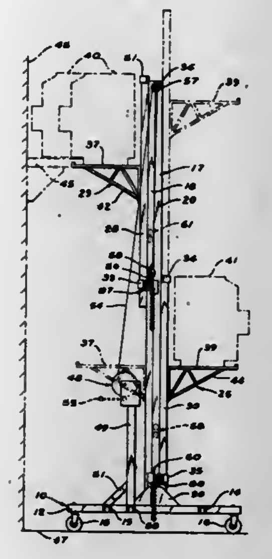
Joseph A. Lucasey, Alameda, and William L. Boscacci, Oakland, both of Calif., assignors to Lucasey Manufacturing Corporation, Oakland, Calif.

Filed Nov. 15, 1972, Ser. No. 306,627

Int. Cl. B66b *9/20, 5/16*

U.S. Cl. 187—11 **7 Claims**

1. Portable elevator apparatus for moving relatively heavy articles such as television receivers and the like from one location to another and for placing the same upon and removing the same from an elevated support therefor at any such location, comprising: a roller-equipped base adapted to be moved manually from one location to another; a standard carried by said base at a generally central position therealong and extending upwardly therefrom; a pair of coequal platform compositions respectively supported by said standard in oppositely facing orientations along opposite sides thereof for reciprocable displacements therealong between lowermost positions generally adjacent said base and elevated positions spaced upwardly therefrom, each of said platforms further including quide structure for reciprocable displacements of said platforms between the lowermost and elevated positions thereof; and mechanism effectively operative between said base and platforms, for selectively displacing either of the latter upwardly from the lowermost position thereof into any selected elevated positions for placement of such article upon and removal thereof from such support.



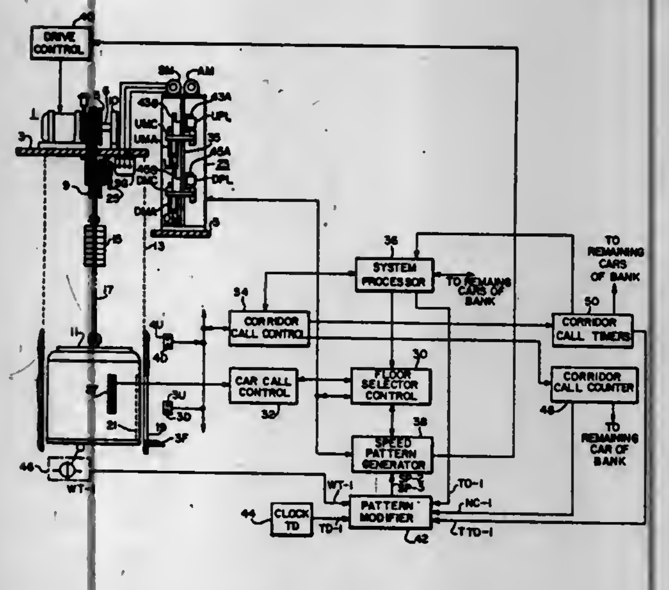
3,891,064
ELEVATOR SYSTEM

James O. Clark, Short Hills, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 16, 1974, Ser. No. 461,332

Int. Cl. B66b *1/30*

U.S. Cl. 187—29 R **41 Claims**



1. An elevator system, comprising:
an elevator car mounted for movement in a structure having a plurality of floors,
motive means for moving said elevator car to serve the floors,
means for registering requests for elevator service,
control means providing a speed pattern signal for said motive means, to direct the movement of the elevator car with respect to time in accordance with the speed pattern signal,
and modifying means related to the intensity of demand for elevator service, modifying the speed pattern signal provided by said control means in response to the intensity of demand for elevator service.

3,891,065
MOVABLE FRAME FIXING DEVICE

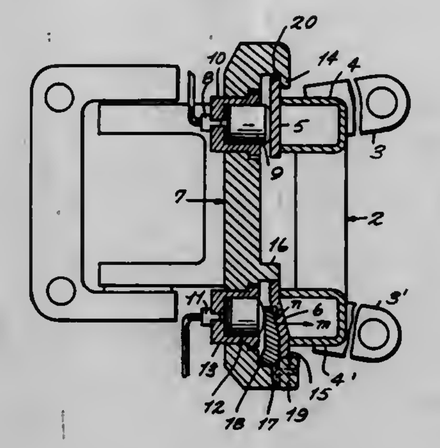
Katsuhiko Iijima, Tokyo, and Katsuhiko Yoshida, Sagamihara, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1974, Ser. No. 471,059

Claims priority, application Japan, May 31, 1973, 48-62256

Int. Cl. B61h *7/00*

U.S. Cl. 188—41 **1 Claim**



1. A movable frame fixing device for fixing a movable frame, which can move horizontally, to a support frame on a fixed side by fastening with a hydraulic pressure; characterized in that a wedge member is interposed upwardly between a hydraulic cylinder mounted horizontally in the lower portion of the movable frame and a lower guide member so as to be freely rockable, and that the surface of said lower guide member to be contacted with the wedge member is inclined along the inclined surface of the wedge member to generate a vertical fastening force *n* and a horizontal fastening force *m* from a horizontal thrust pressure of a piston produced by said hydraulic cylinder, whereby the movable frame may be fixed to the support frame of the fixed side.

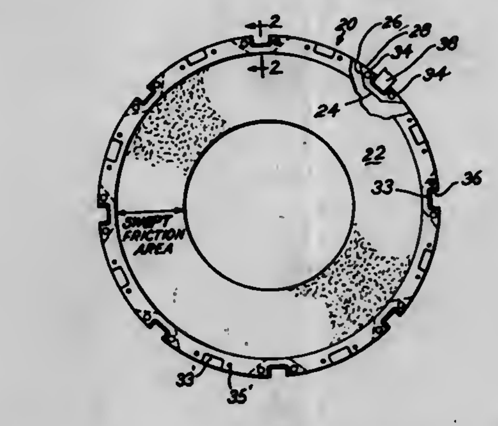
3,891,066
KEYWAY DRIVE FOR MULTIPLE DISC BRAKE

Bruce W. Anderson, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Continuation of Ser. No. 168,273, Aug. 2, 1971, abandoned. This application May 14, 1973, Ser. No. 359,809

Int. Cl. F16d *65/12*

U.S. Cl. 188—73.2 **7 Claims**



1. Key slot apparatus for a multiple disc brake comprising:
a unitary, one piece, annular friction disc provided with a plurality of peripheral spaced-apart axially extending notches having inclined sides defining a generally v-shaped slot;
  a plurality of circumferentially spaced-apart axially extending wedge-shaped members each having inclined sides bearing against said inclined sides of said notches in force transmitting relationship wherein the angle of inclination of said sides is selected to effectively minimize the force per unit area imposed on said friction disc and maximize the radially directed force component derived therefrom and imposed on said friction disc; and
first and second integral annular retaining rings abutting opposite side portions of said annular friction disc;
said wedge-shaped members being interposed between said first and second annular retaining rings, said annular retaining rings being fixedly secured soley to said wedge-shaped member to provide the sole force transmitting medium between said annular friction disc and said first and second annular retaining rings.

3,891,067
CLEARANCE-SENSING SLACK ADJUSTER FOR A VEHICLE BRAKE-ACTUATING PNEUMATIC CYLINDER-PISTON UNIT

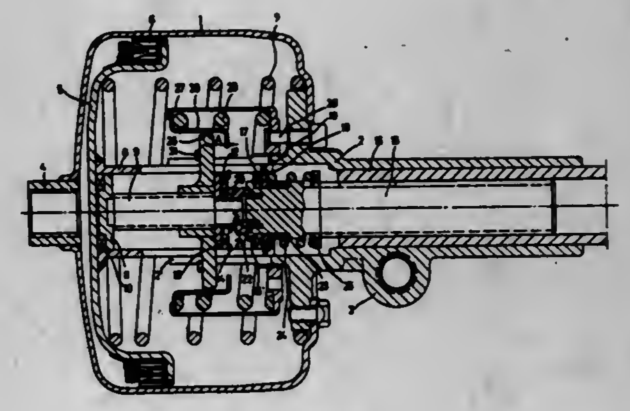
Lars Bengt Axelsson, Malmo, Sweden, assignor to Svenska Aktiebolaget Bromsregulator, Malmo, Sweden

Continuation-in-part of Ser. No. 423,676, Dec. 11, 1973, abandoned. This application June 17, 1974, Ser. No. 480,035

Claims priority, application United Kingdom, Dec. 15, 1972, 57896/72

Int. Cl. F16d *65/56*

U.S. Cl. 188—196 D **6 Claims**



1. A clearance-sensing slack-adjuster having a force delivering stroke direction, preferably built into a vehicle brake-actuating pneumatic cylinder-piston unit, including a force-receiving piston rod and a force-delivering push rod, both rods being substantially tubular and only axially movable in a fixed adjuster housing comprising in combination, an externally screw-threaded adjuster spindle rotationally journalled in the piston rod, a rotationally immovable adjuster nut in said housing about and threadingly engaging said spindle for axial movement therealong, an externally screw-threaded push spindle threadingly engaging the push rod, the diameter of the adjuster spindle being so much less than that of the push spindle that the engagement between the adjuster spindle and the adjuster nut is non-self-locking whereas the engagement between the push spindle and the push rod is self-locking, and means joining the two spindles and transmitting rotational movement from the adjuster spindle to the push spindle at their axial movement in the direction opposite the force delivering direction provided that the axial movement of the adjuster nut has exceeded a set control threshold distance (A) during the preceding force delivering stroke.

3,891,068
AUTOMATIC SLACK ADJUSTER

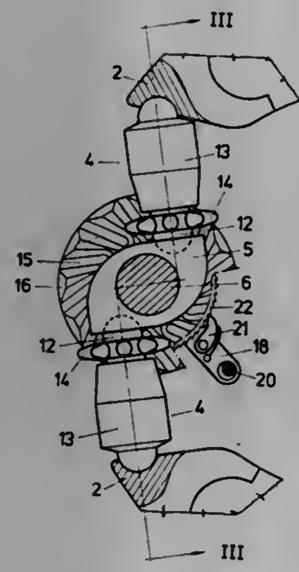
Sven Erik Camph, Nya Agnesfridsvagen 186, S-213 75 Malmo, Sweden

Filed Apr. 2, 1974, Ser. No. 457,252

Claims priority, application Sweden, Apr. 6, 1973, 7304863

Int. Cl. F16d *65/56*

U.S. Cl. 188—196 BA **5 Claims**



1. An automatic slack adjuster for a brake of the type comprising two brake shoes which during activating of the brake are forced against the inside of a brake drum by means of a key mounted on a rotating key shaft, and in which a brake force transmitting slack take-up element is mounted between each side of the said key and a movable end of each brake shoe, said element comprising two telescopically displaceable parts interconnected by screw threads causing an increase in the length of the element upon relative rotation of said parts in one direction of rotation, characterised in that one of said parts of each said element is connected to a common single clutch part of a one-way clutch comprising two clutch parts capable of performing relative angular movements in one direction in case of excessive movements of said key, characterised in that rotatable parts of the take-up elements are engaging the sides of the said key and that parts of the take-up elements prevented from rotation are engaging the ends of the brake shoes, the said common single clutch part being journalled on the key shaft.

3,891,069
BRAKE SHOES

Raymond Keith Lawrence, Birmingham, England, assignor to Girling Limited, Birmingham, England

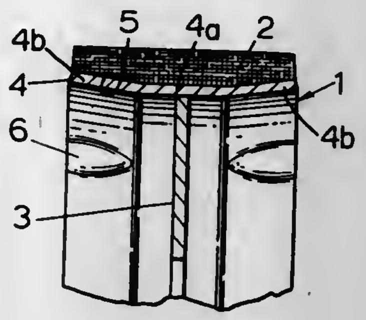
Continuation of Ser. No. 281,404, Aug. 17, 1972, abandoned, which is a continuation of Ser. No. 82,703, Oct. 21, 1970, abandoned. This application Nov. 26, 1973, Ser. No. 418,874

Claims priority, application United Kingdom, Nov. 21, 1969, 57010/69

Int. Cl. F16d *69/04*

U.S. Cl. 188—250 G **4 Claims**

1. A brake shoe for use in an internal shoe drum brake comprising a rigid carrier generally arcuate in a peripheral direction and including a platform part and at least one web, said platform part being generally concave in transverse cross-section and including a flat central portion to which said web is attached, and outwardly sloping inclined wings, unbroken radial inward depression means in at least one of the wings, said depression means not extending transversely to the center of the platform part, and lining material attached to said platform part solely by direct moulding thereto, the outer surface of said lining material being transversely flat and with the inner portion occupying said concave cross-section and said depression means to key said lining material to said platform part against transverse and arcuate displacement when said material is applied by the carrier to a drum during application of the brake.



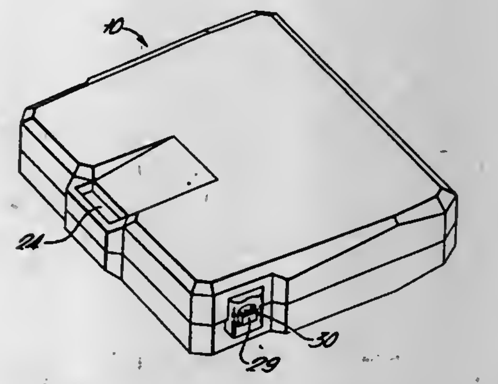
3,891,070
ASSEMBLY TYPE FILING SYSTEM COMPRISING PORTFOLIOS AND FILING CABINETS THEREFOR

Sergio Montanari, Via Leopoldo Nobili 11, Rome, Italy

Division of Ser. No. 195,276, Nov. 3, 1971. This application June 19, 1973, Ser. No. 371,508

Int. Cl. A45c *3/02*

U.S. Cl. 190—41 R **6 Claims**



1. A one-piece plastic, briefcase type portfolio comprising: a first half having a bottom, a front wall, a rear wall and two side walls which, near the union with the front wall, have two recessed parts; and

a second half having a bottom, a front wall, a rear wall and two side walls which, near the union with the front wall, have two recessed parts matching the recessed parts of the side walls of the first half, the edge of said side and front walls being extended and slightly inclined inwardly, on which are superposable the edges of the matching walls of the first half;

said two halves having mating hand and closure portions defining handle and closure members, and being joined by a strip which is unitary with the rear walls thereof but of less thickness than the walls of said halves wherein, at the bottom of each half thereof, there is affixed a part of a sheet of stiffening material the front part of which is detached from the bottom of said half, said detached part having a transverse fold such as to divide said detached part into a first portion forming a predetermined angle with the glued part and a second end portion forming with said first portion a more obtuse angle, said angles being such that when the portfolio is closed, the two end portions are close together so as to press resiliently between them the free edges of sheets which may be contained in the portfolio; said detached part of said sheets having affixed thereto a pad of expanded, spongy material, said pad acting between the detached part and the front part of the bottom of the respective portfolio half so as to increase the resilient holding of the free edges of the sheets between the detached parts of the sheets.

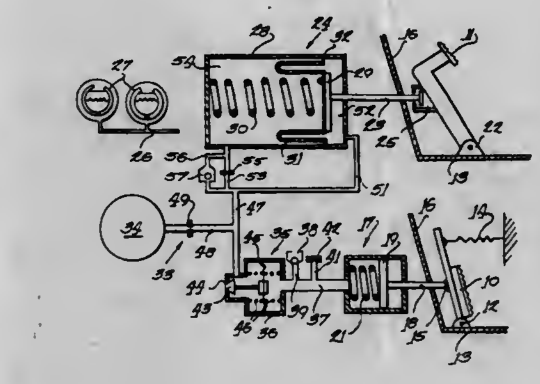
3,891,071
TRANSIENT BRAKE APPLICATION UPON ACCELERATOR RELEASE

John J. Tuzson, Evanston, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 10, 1973, Ser. No. 423,382

Int. Cl. B60k *29/02*

U.S. Cl. 192—3 TR **11 Claims**



2. A transient brake control system as set forth in claim 1, including a dashpot operatively connected to said engine control means, a conduit extending between said dashpot and the opposite end of the valve housing, and a restricted ambient air inlet communicating with said conduit.

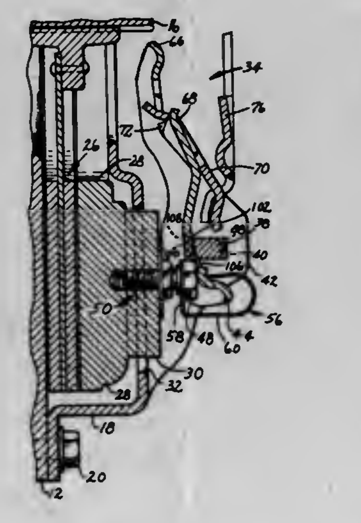
3,891,072
CLUTCH LEVER WITH LOW FRICTION PIVOT

William Howard Sink, Auburn; and Richard Allen Flotow, Ft. Wayne, both of Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Sept. 5, 1973, Ser. No. 394,539

Int. Cl. F16d *13/38*

U.S. Cl. 192—99 A **5 Claims**



1. An improvement in a clutch having a central axis and including: a drive member; a clutch cover; a driven member; a pressure plate disposed adjacent the driven member and adapted to be moved axially into and out of engagement with the driven member; means for urging the pressure plate into engagement with the driven member; lever means pivotally connected to said cover for moving said pressure plate into and out of engagement with the driven member; the improvement in said clutch comprising: fixed pivot means carried on said cover and having a pivot axis, said pivot means including a sharp knife-edge on said pivot axis and at least one integral lug having a radially inward axially extending surface extending therefrom parallel to the axis of said clutch the plane of said surface including said pivot axis, said lever connected to said pressure plate and including a flat bearing surface engaging said knife-edge on said pivot means, at least one opening in said bearing surface having spaced inner and outer edges, said lug on said pivot means extending into said opening on said lever, and said inwardly directed surface of said lug engaging said inner edge of said opening to thereby define coacting restraint means along said pivot axis constantly engageable for preventing relative sliding movement between said pivot means and lever.

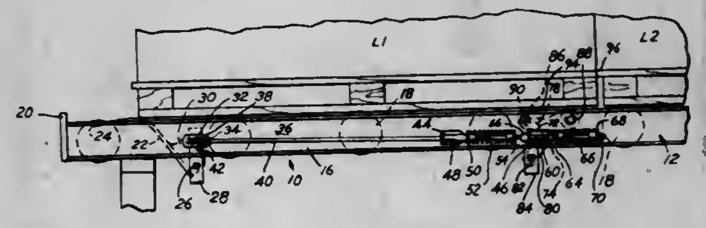
3,891,073
CONVEYOR STOP

Bestor P. Coleman, Willow Springs, and Kennedy McConnell, Riverdale, both of Ill., assignors to Interlake, Inc., Chicago, Ill.

Filed May 7, 1973, Ser. No. 358,118

Int. Cl. B65g *13/00*

U.S. Cl. 193—35 A **12 Claims**



1. A load spacing mechanism for a load conveyor including an actuating member movable between extended and retracted positions in response to the absence of presence of a load thereon respectively, stop means movable between retracted and extended stop positions, said actuating member and stop means being longitudinally spaced from each other in the direction of movement of the load on the conveyor, elongate linkage means continuously extending between said longitudinally spaced actuating member and stop means, said elongate linkage means being mounted for longitudinal movement toward and away from said spaced actuating member and stop means, and first and second pivotal mounting means for pivotally mounting said actuating member and stop means respectively for movement between said positions, wherein the improvement comprises in combination therewith:

first urging means acting between said elongate linkage means and said stop means urging said stop means to said extended stop position in response to a force exerted on said first urging means by and upon said longitudinal movement of said elongate linkage means in a first direction due to movement of said actuating member to said retracted position, but permitting said stop means to remain in said retracted position in the event that a load is positioned on both said stop means and actuating member, and

second urging means urging said linkage means to longitudinally move in a second direction opposite said first direction to move said actuating member to said extended position and said stop means to said retracted position in the absence of a load on said actuating member, but being overcome by said actuating member when a load is positioned on said actuating member.

3,891,074
TABLES FOR PLAYING GAMES

Derek Leonard Barnes, 600 Halstead Rd., Enfield, England

Filed Jan. 11, 1974, Ser. No. 432,632

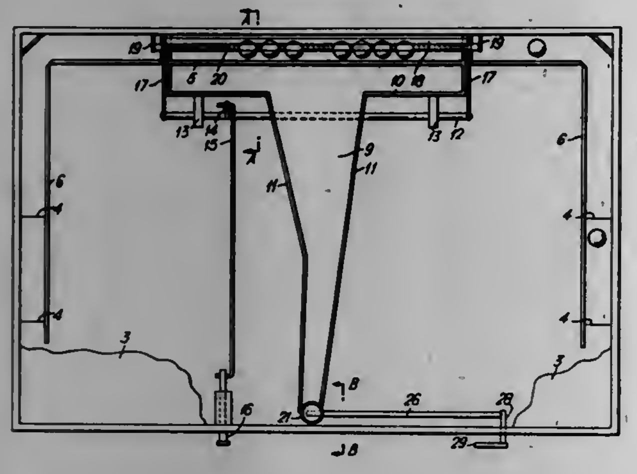
Claims priority, application United Kingdom, Jan. 25, 1973, 3733/73

Int. Cl. G07f *17/32*

U.S. Cl. 194—1 R **13 Claims**

1. A table for playing a game with a plurality of balls normally used on at a time, comprising a storage space for all the balls after they have been lost from play; a lifting component located in the base of the storage space and mounted between pivoted supporting arms rockable by a mechanism operable from outside the table to raise said component in the storage

space in order to lift all the balls assembled therein and deliver them simultaneously to a higher, intermediate surface, on which the balls pass to a device actuable to deliver the balls one by one to a yet higher playing surface.



3,891,075

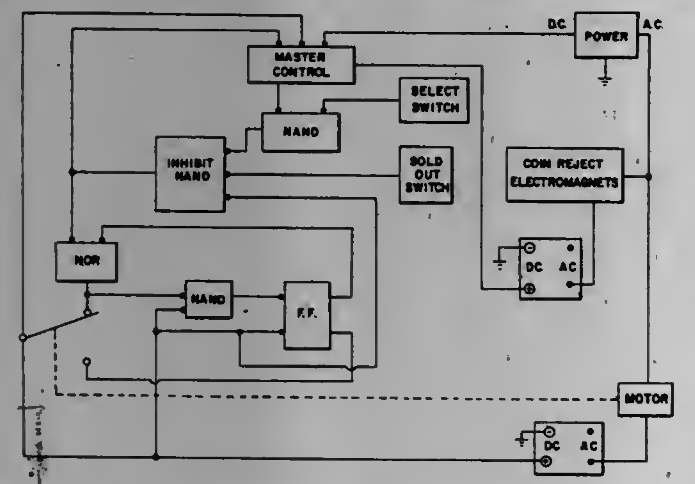
SOLID STATE CONTROL CIRCUIT FOR VENDING DEVICES

William James House, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 12, 1973, Ser. No. 415,039

Int. Cl. G07f *5/18*

U.S. Cl. 194—9 R **8 Claims**



1. A solid state control circuit for vending devices comprising:

a coin changer mechanism including a coin actuated switch; an AC to DC pulse converter coupled to and controlled by said coin actuated switch,

a bistable latch circuit having first and second stable states coupled to said AC to DC pulse converter and switchable between said first and second stable states in response to pulses from said AC to DC pulse converter,

a first relay coupled between said coin changer mechanism and said bistable latch circuit for selectively enabling and disabling said coin changer mechanism in response to signals from said bistable latch circuit,

a plurality of article vending stages coupled to said bistable latch circuit,

an article selection switch in each article vending stage,

a two input logic gate in each article vending stage having one input coupled to said bistable latch circuit and one input coupled to said article selection switch whereby said two input logic gate generates an enabling output upon receiving inputs from both said bistable latch circuit and said article selection switch,

a vend motor control circuit coupled to said two input logic gate for activation upon receipt of said enabling output therefrom,

a first feedback circuit coupled between each of said article vending stages and said bistable latch circuit for resetting said latch circuit; and,

a second feedback circuit coupled between each of said article vending stages and said coin changer mechanism for rendering said coin changer mechanism inoperative upon detection of a predetermined condition in each of said vending stages.

3,891,076

MANUALLY ACTIVATED APPARATUS FOR TIMING INTERVALS OF DIFFERENT LENGTH

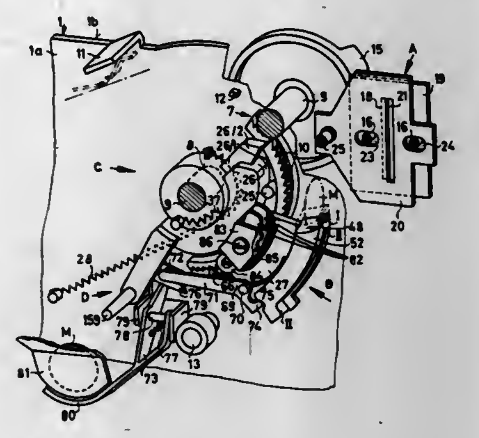
Ortwin Woköck, Schwenningen, and Bernhard Kaiser, Villingen, both of Germany, assignors to Kienzle Apparate GmbH, Villingen, Germany

Filed May 9, 1974, Ser. No. 468,447

Claims priority, application Germany, May 10, 1973, 2323567

Int. Cl. G07f *17/24*

U.S. Cl. 194—102 **26 Claims**



1. In a manually activated apparatus for timing with a timer intervals of different length which are selected in dependence upon a characteristic of an inserted coin which is identified by a coin tester, particularly in a parking meter, the improvement wherein said coin tester comprises a combination of a coin receiver adapted to receive coins of different diameters; first and a second normally blocked levers biased for movement in mutually opposite directions about a joint axis of rotation, into detecting engagement with a plurality of angularly spaced points on the circumference of a coin in said receiver, so as to detect the diameter of such coin; manually operable means for unblocking said levers for said movement, and for subsequent joint angular displacement through a distance which is dependent upon the detected coin diameter; and control means on one of said levers for setting the timer to an interval whose length is a function of said distance.

3,891,077

HIGH-SPEED PRINTER

Wolfgang Sauerbrunn, Gerlingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

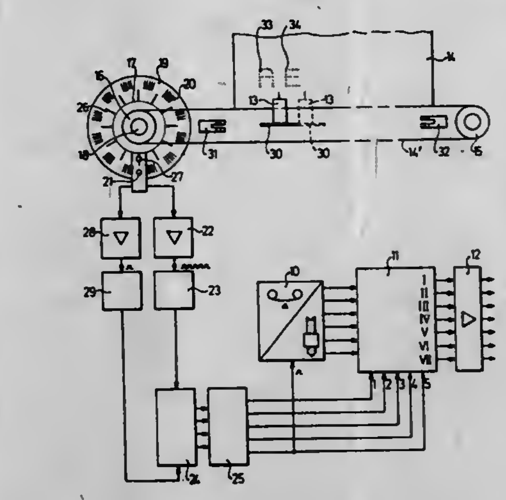
Filed Oct. 24, 1973, Ser. No. 409,336

Claims priority, application Germany, Oct. 27, 1972, 2252767

Int. Cl. B41j *3/05*

U.S. Cl. 197—1 R **20 Claims**

1. A high-sped printer for alphanumerical characters, comprising a printing head driven back and forth along a band-shaped character record by means of a reversible drive motor and comprised of *r* printing elements adapted to print as many as *r* dots in a column; a character generator for registering characters in the form of a dot matrix composed of *c* columns and *r* rows and provided with *r* information outputs and *c* column-selection inputs and operative for presenting at said *r* outputs signals representing the dots in the column corresponding to whichever one of said *c* inputs has a selecting signal applied thereto, said *r* outputs being connected to said *r* printing elements; and reading means for reading out said character generator column-by-column and for causing said *r* printing elements to print the corresponding dot-matrix alphanumerical character column-by-column, by cyclically applying selecting signals to successive ones of said *c* inputs, said reading means comprising a coded disk mounted on and rotating in synchronism with the output shaft of the drive motor and provided with synchronizing markings arranged in first and second concentric tracks, the first track containing at least one group of *c* equiangularly spaced markings respectively corresponding to said *c* column-selection inputs, and the second track containing at least one reset marking, first and second detectors respectively detecting the markings in the first and second tracks and generating corresponding first and second synchronizing signals, a binary counter having a clock input and a reset input respectively connected to the outputs of said first and second detectors for receipt of said first and second synchronizing signals, respectively, and a binary-to-decimal decoder havings its inputs connected to the binary counter outputs and having *c* outputs respectively connected to said *c* column-selection inputs for applying selecting signals to the latter, and wherein said reset marking in said second track is angularly offset relative to said group of markings in said first track such that resetting of said binary counter occurs subsequent to the printing by said printing head of a complete character.



3,891,078

RIBBON SHIFTING ARRANGEMENT

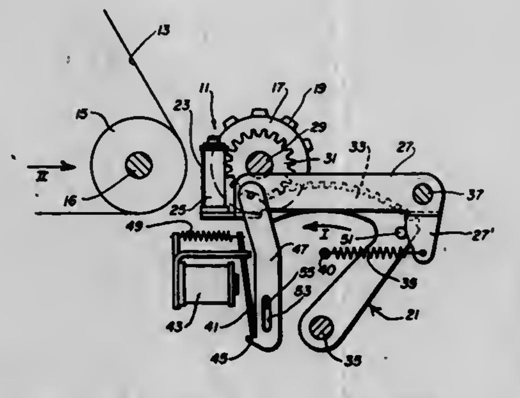
Friedrich Jung, Erlangen, Germany, assignor to Triumph Werke Nurnberg A.G., Nurnberg, Germany

Filed Mar. 13, 1974, Ser. No. 450,560

Claims priority, application Germany, Apr. 27, 1973, 7316036

Int. Cl. B41j *35/22*

U.S. Cl. 197—156 **6 Claims**



1. In a printer, the combination comprising:

a print wheel supported for rotation about an axis and having a plurality of characters on the periphery with associated gear means for rotation therewith,

a gear segment cooperating with the gear means of said print wheel and being pivotally movable relative to a rest position for rotating the print wheel to position the different characters for printing,

a ribbon fork pivotally supported for movement from a rest position to a first raised position and a second raised position to bring different portions of the ribbon into printing relation with a selected character on the print wheel,

resilient biasing means urging said ribbon fork to a raised position,

a control pawl connected to said ribbon fork,

an armature of a control magnet normally located in blocking relation to the movement of said control pawl to limit the movement of said ribbon fork to said first raised position and being movable from blocking relation with said control pawl for enabling movement of said ribbon fork to the second raised position, and

said gear segment having an abutment thereon engaging said ribbon fork in the rest position preventing movement of said ribbon fork to a raised position and permitting movement of said ribbon fork to a raised position only as the gear segment moves from its rest position to rotatably position a type character for printing.

3,891,079

BULK MATERIAL UNLOADER

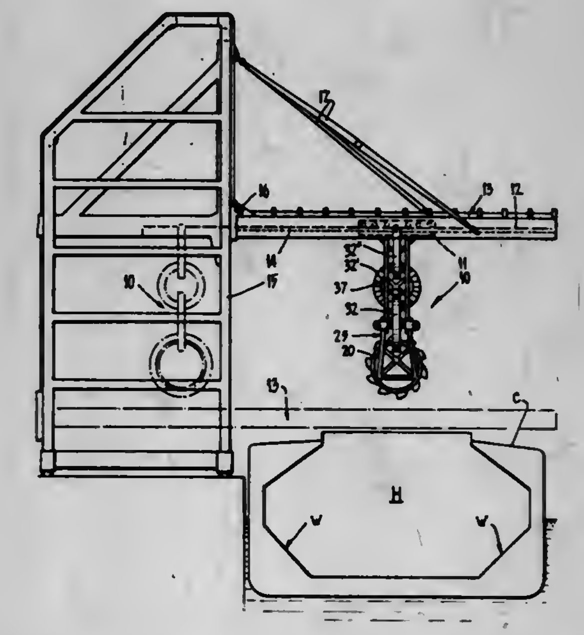
Howard Frank Roper, Upwey, Australia, assignor to The Broken Hill Proprietary Company Limited, Melbourne, Australia

Filed July 1, 1974, Ser. No. 484,928

Claims priority, application Australia, July 2, 1973, 3894/73

Int. Cl. B65g *63/00*

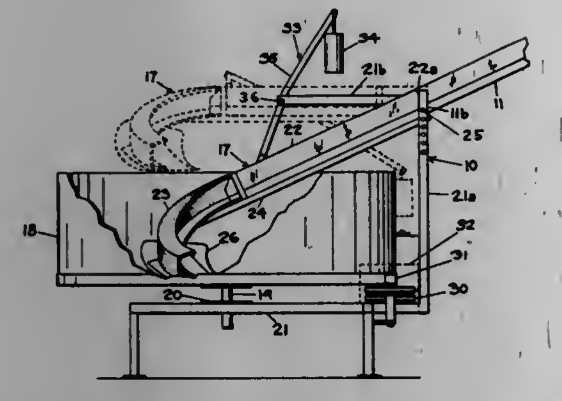
U.S. Cl. 198—36 **10 Claims**



1. A bulk material unloader including means for digging the material from a bulk supply, said digging means being arranged to discharge the collector material into an elevator means for raising the material to an elevated position with respect to the digging means, characterised in that said elevator means comprises a plurality of elevator wheels of rigid open channel cross section divided into a plurality of material retaining pockets, each wheel being rotatably mounted on a supporting frame in ascending relationship with respect to each other and each wheel being arranged to discharge the contents of its pockets by gravity into the pockets of the next most elevated wheel with the lowermost wheel receiving material from said collecting means, driving means for rotating said wheels at a substantially common speed, and means for collecting the material discharged from the uppermost elevator wheel.

3,891,080
BOTTLE RECEIVING APPARATUS

Reuben J. Neises, Wisconsin Dells, Wis., assignor to Leroy F. Stertz, Marshfield, Wis., a part interest
Filed Oct. 29, 1973, Ser. No. 410,957
Int. Cl.² B65G *47/00*
U.S. Cl. 198—43 **4 Claims**

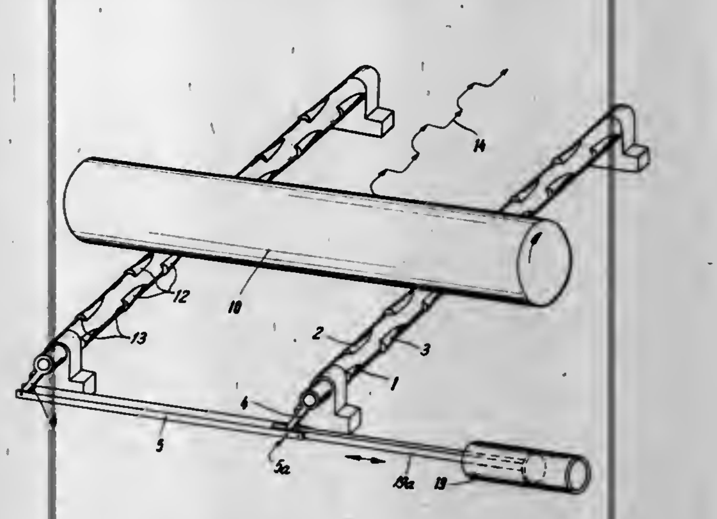


1. A bottle receiving apparatus comprising:
a. guideway means for receiving bottles at an upper location and permitting said bottles to slide downwardly by gravity to a lower location;
b. said guideway means having an upper receiving end, a lower discharge end and a lower curved channel means for increasing the frictional forces on downwardly sliding bottles to cause substantial deceleration of said bottles before discharge thereof from said discharge end;
c. a bottle receptable beneath the discharge end of said guideway means, said receptacle having a bottle receiving surface which is movable beneath said discharge end in the direction of bottle discharge;
d. a sled plate pivotally mounted to said guideway means, said sled plate being positioned to support said lower curved channel means on said bottle receiving surface, said sled plate having an upward curvature in a direction opposite to that of the underlying bottle receiving surface movement to permit the sled plate to ride over bottles; and
e. said lower curved channel means and said sled plate mounted thereto being upwardly movable, said sled plate being normally biased against the bottle receiving surface of the bottle receptacle and riding on top of discharged bottles in said receptacle as the quantity of bottles in said receptacle increases.

3,891,081
REVERSIBLY MOVING ELONGATED STOCK IN TRANSVERSE DIRECTION

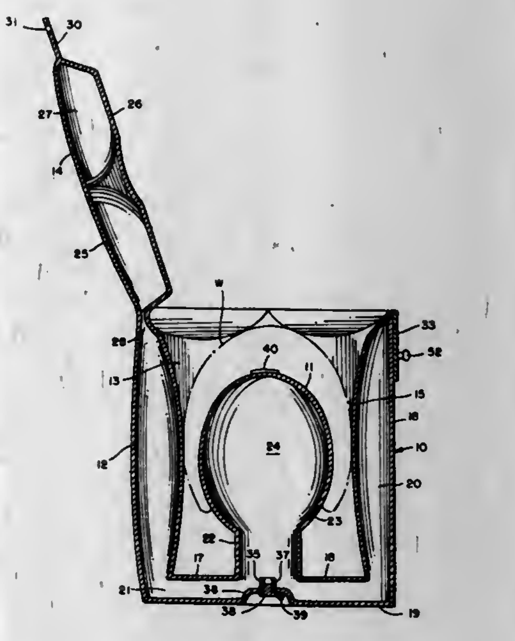
Klaus-Peter Schirmag, Lintorf, Germany, assignor to Mannesmannrohren-Werke Aktiengesellschaft, Dusseldorf, Germany
Filed Aug. 12, 1974, Ser. No. 496,574
Claims priority, application Germany, Aug. 28, 1973, 2343769
Int. Cl.² B65G *25/04*
U.S. Cl. 198—218 **6 Claims**

1. Device for moving elongated work-pieces, such as rolled stock (tubes, pipes or the like) in direction transverse to the direction of elongated extension, comprising:
a plurality of elongated rolls, arranged parallel to each other and extending in the direction of desired transverse direction;
a first pair and a second pair of rows of cams on each of the rolls, the cams of one of the rows of the first pair arranged staggeredly with regard to the cams of the other one of the rows of the one pair, each cam of the one and of the other row having a rather steep axially facing stop surface and a less inclined running surface in the opposite axial direction, the rows of cams of the second pairs having also staggeredly arranged cams with steep and less steep surfaces facing respectively in the opposite direction as the cams of the first pair;
and means for synchronously turning the rolls back and forth, whereby a first range covered has the rows of cams of the first pair alternatingly in upright position to move a work-piece axially in steps in the axial direction in which the less inclined cam surfaces of the first pair face, and whereby a second range covered by back and forth movement of the rolls has the rows of cams of the second pair alternatingly in upright position to move a work-piece axially in steps in the opposite direction.



3,891,082
INFLATABLE WIG TOTE

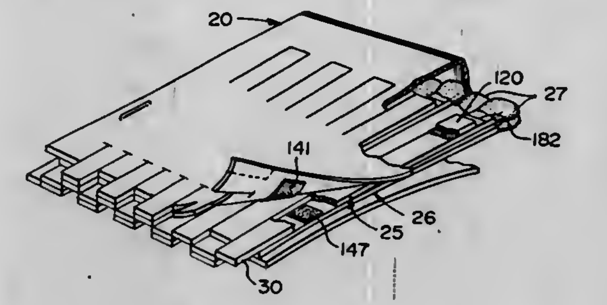
Janet E. Fall, R.R. No. 2 Box 84, Plainfield, Ind. 46168
Filed Oct. 11, 1973, Ser. No. 405,317
Int. Cl. A45c *3/00, 13/00;* **B65d** *85/18*
U.S. Cl. 206—8 **5 Claims**



1. An inflatable wig support and carrying case comprising an inflatable bladder adapted to be inserted to form a support for a wig and a case portion, the case portion including spaced-apart inner and outer side walls forming a side air chamber and a base having upper and lower spaced-apart walls forming a bottom air chamber, the bladder being secured to the upper wall of the base and the interior of the bladder communicating with the bottom air chamber so that inflation of the bladder inflates the bottom air chamber, and valve means for inflating the bladder and the side air chamber.

3,891,083
MATCHBOOK WITH PULL MATCHES

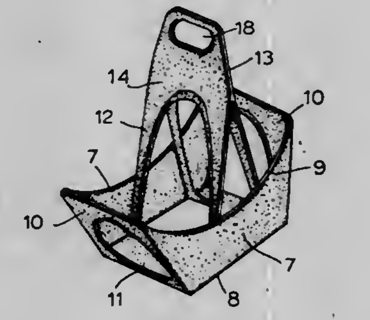
Edwin H. Roth, 321 Rear Adelia St., Middletown, Pa. 17057
Filed Dec. 19, 1973, Ser. No. 426,354
Int. Cl. A24f *27/20, 27/00*
U.S. Cl. 206—98 **22 Claims**



1. A matchbook comprising
a paperboard comb having a plurality of matches, each match having an ignition head at one end and a pull tab formed at the other end, said plurality of matches being joined by tear portions adjacent the pull tabs,
a paperboard cover folded over the ignition heads of the paperboard comb and secured together on opposite lateral edges of the paperboard comb,
an igniting strip on the inside of the folded paperboard cover transverse to the plurality of matches and adjacent the other ends of the plurality matches, and
said paperboard cover having a plurality of tabs cut therein to extend longitudinally along portions of selected matches with portions of the cover tabs glued to the selected matches.

3,891,084
BASKET FOR THE CARRYING OF ALL TYPES OF BOTTLES

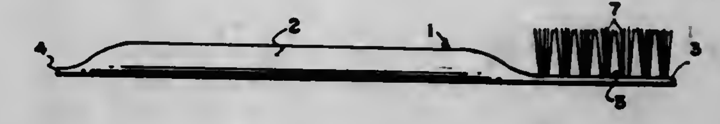
Javier Elizondo-Garcia, Monterrey, Mexico
Filed Mar. 15, 1973, Ser. No. 341,557
Int. Cl. B65d *1/38*
U.S. Cl. 206—143 **3 Claims**



1. A basket for carrying bottles forming deposit sections for holding bottles, comprising in combination,
a basket portion having a generally rectangular bottom portion from which extends as a unitary piece two side walls of generally trapezoidal shape and two diverging end walls of generally rectangular dimensions, thereby forming an upper opening larger than said bottom portion for receiving bottles therein,
bottom structure for supporting the bottles comprising two narrow transverse rectangular strips both united to said two side walls and each respectively united to one said end wall,
a handle portion attached to the center region of said bottom of the basket portion with two converging substantially vertical walls leading to a centrally disposed handle arranged between two bottle deposit sections for carrying the basket and
means in said end walls and said converging walls defining apertures on either side of said handle portion with contoured flanges closely fitting a predetermined bottle shape to hold it in place without play.

3,891,085
TOOTHBRUSH

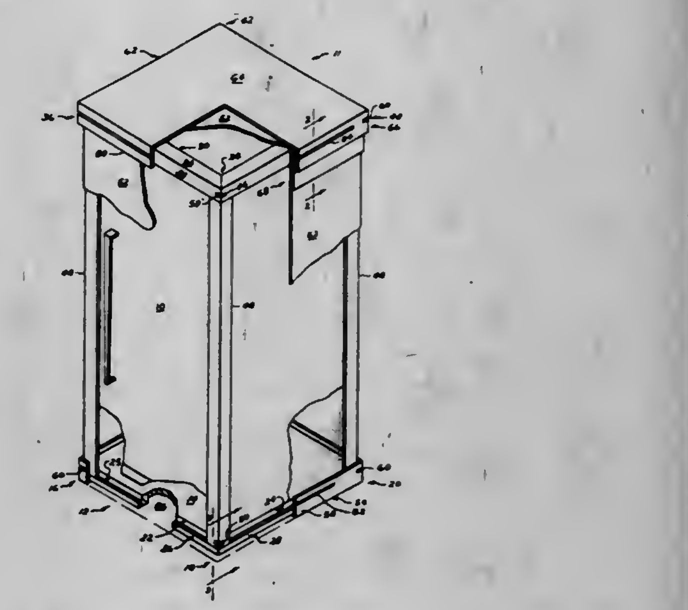
Leon H. Boger, 2523 S.E. 71st Ave., Portland, Oreg. 97206
Filed May 15, 1973, Ser. No. 360,607
Int. Cl. B65d *79/00*
U.S. Cl. 206—229 **1 Claim**



1. A disposable toothbrush for one time use, said toothbrush comprising in combination,
a main body including a tubular section of a compressible nature constituting a handle and adapted to store a quantity of dentifrice, said tubular section terminating at one end in a flattened portion to seal said one end, said main body terminating at its opposite end in a flattened head section interiorly coated with an adhesive for the purpose of retaining the head section in a flattened, sealed configuration, said tubular section of the main body defining an opening adjacent the head section for the discharge of the dentifrice from the tubular section upon the latter being manually compressed, and
tape mounted bristles affixed to said flattened head section to receive dentifrice from the discharge opening.

3,891,086
COMPOSITE PACKAGE

Jack L. Isaacs, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed June 17, 1974, Ser. No. 479,795
Int. Cl. B65d *15/00, 65/10, 85/30*
U.S. Cl. 206—320 **6 Claims**



1. A composite package, comprising:
a base element having first and second flanges and a base supporting a packaged item;
a top element having first and second top flanges and first flanges having notches;
a plurality of posts each having notches adjacent ends thereof and being positioned with one end contacting the base and the other end contacting a respective second top flange inwardly of the respective first top flange;

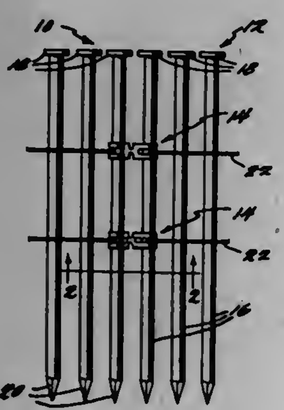
an organic material sheet encasing the base element, top element and posts, being shrunk thereabout, and forming a shrink-wrapped composite;
a bottom cap having a base element and a peripheral bottom cap flange and being positioned over the lower portion of the shrink-wrapped composite, said bottom cap flange having notches associated with the post notches;
first means extending into the notches of the posts and the bottom cap flange encompassing the bottom cap flange, and urging the posts toward the shrink-wrapped composite;
a top cap having a cap-top element and a flange having an infolded portion extending toward the bottom cap between adjacent posts forming a pocket opening in a direction toward the bottom cap, said peripheral flange having notches associated with the post notches; and
second means extending into the notches of the posts, top element, and top cap flange encompassing the flange of the top cap and urging the top cap flange toward the shrink-wrapped composite, said second means being positioned along a lower end portion of said pocket.

3,891,087

NAIL PACKAGE IMPROVEMENTS FOR INTERCONNECTING THE TRAILING NAIL OF ONE NAIL PACKAGE WITH THE LEADING NAIL OF ANOTHER NAIL PACKAGE

George A. Maynard, Coventry, R.I., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 217,461, Jan. 13, 1972. This application Aug. 15, 1973, Ser. No. 388,623
Int. Cl. B65d *85/24*
U.S. Cl. 206—346 **4 Claims**



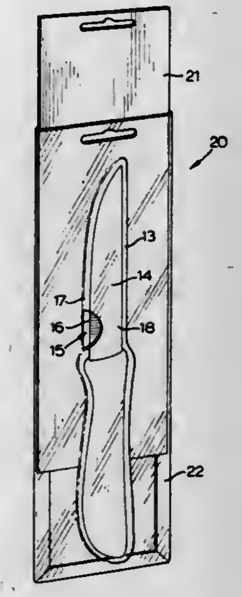
1. In a nail package of the type including a multiplicity of similar nails, each having a shank and a round head on one end thereof, and flexible elongated means extending transversely across and secured to the shanks of said nails interconnecting the same in series in a packaged condition so that said nails are operable to be handled as a unit and positioned in an operative relation with a nail driving device wherein a trailing portion is supported in said packaged condition and a leading portion extends therefrom in row formation with the shanks thereof in generally parallel relation with respect to each other and with the leading nail in a driving position so that upon operation of the nail driving device successive leading nails are separately driven longitudinally from said driving position and the nails in said trailing portion are successively moved into said leading portion, the improvement which comprises in combination therewith coupling element means separate from said flexible elongated means for operatively connecting the trailing nail of said nail package when positioned in operative relation with the nail driving device with the leading nail of a similar nail package in a parallel relationship the same as the parallel relationship of the nails in said row formation so that the leading portion of said similar nail package is moved by said separate means into a similar operative relation with the nail driving device upon continued operation thereof.

3,891,088

DISPLAY CARD FOR KNIVES AND THE LIKE

Karl Heinz Huebner, 9, Colonial Ave., Scarborough, Ontario, Canada

Filed July 30, 1973, Ser. No. 383,819
Int. Cl.² B65D *85/54*
U.S. Cl. 206—349 **8 Claims**



1. A package for displaying a cutting utensil having a cutting edge, comprising a generally flat backing piece and a transparent cover of relatively stiff material, said cover having a generally flat peripheral portion adjacent said backing piece and a raised generally central portion integral with said flat peripheral portion, said raised portion and said backing piece defining an enclosure sufficiently large for holding said cutting utensil therein; said raised portion having a side wall and a top section, a testing hole being provided in said raised portion and lying partly in said top section and partly in said side wall such that the edge defining said testing hole is nonplanar, said cutting edge of the utensil being placed adjacent said testing hole to allow diagonal movement of the thumb or finger across said testing hole and cutting edge for testing said cutting edge.

3,891,089

PEELABLE HEAT SEALS FOR PACKAGES

Charles C. Goodwin, Broadway; David L. Rounsaville, and James H. Grimm, both of Milford, all of N.J., assignors to Rexham Corporation, New York, N.Y.

Filed Aug. 1, 1972, Ser. No. 276,941
Int. Cl. B65d *81/20*
U.S. Cl. 206—439 **6 Claims**

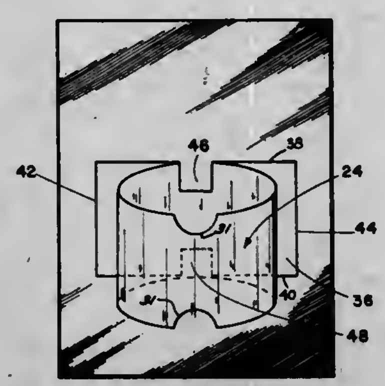
1. A readily openable flexible package for use in containing objects which may be sterilized after sealing of the package, comprised of two layers in facing contact sealed only along a continuous peripheral seal to form said package, said seal being readily rupturable in the absence of destruction of the matrix of said layers, the combination consisting essentially of a first layer of paper and a second layer of ethylene-vinyl acetate copolymer film having a vinyl acetate content within the range of between about 9 and 28%, said first and second layers being heat sealed together in facing contact to form an object containing pocket.

3,891,090

ADHESIVE AND MECHANICALLY SECURED CARDED PACKAGE

William Spiegel, Southampton; Jacob Spiegel, Philadelphia, both of Pa., and Albert Miller, Somerdale, N.J., assignors to Gilbreth Company, Philadelphia, Pa.

Filed Jan. 10, 1973, Ser. No. 319,112
Int. Cl. B65d *73/00*
U.S. Cl. 206—478 **5 Claims**



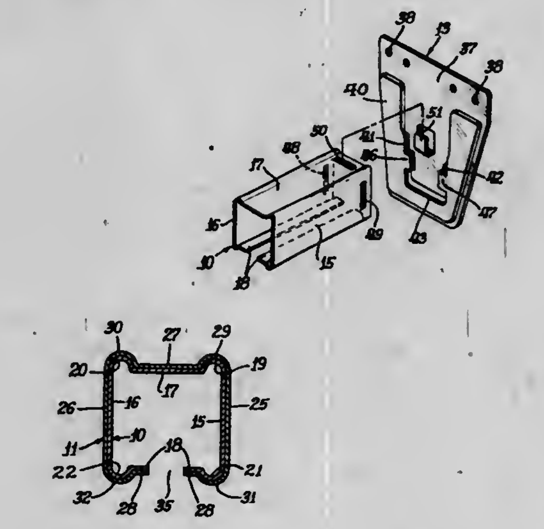
1. In a carded package comprising a card, a heat shrinkable tube adhesively affixed to the card and an article disposed within the tube and secured to the card by the tube, the improvement comprising first and second projections extending from the card and in contact with the article for enhancing the securement of the article to the card by enhancing the securement of the tube to the card, said tube including a first portion which is interposed between the first projection and the card and a second portion interposed between the second projection and the card, said projections being integral with the card, said card comprising a base portion to which said tube is adhesively affixed and one flap portion folded over said base portion, said flap portion including a window into which said first and said second projections extend such that the first portion of the tube is interposed between the first projection and said base portion and the second portion of the tube is interposed between the second projection and said base portion.

3,891,091

CLOSET ROD

William J. Anderson, Swor St. & Mayhaw St. P.O. Box 537, Taylorsville, Miss. 39168

Filed Oct. 25, 1973, Ser. No. 409,371
Int. Cl.² A47H *1/08, 1/142*
U.S. Cl. 211—105.3 **7 Claims**



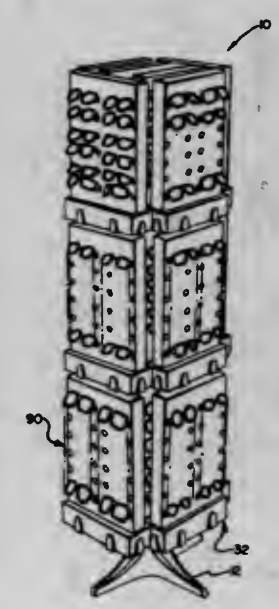
1. In a closet rod apparatus or the like comprising an extensible rod having devices at each end for supporting the rod, said rod comprising two telescoping members having relatively thin walls such as sheet metal, one member being inside the other member, the improvement comprising: throughout the length thereof the walls of each member as seen in transverse cross-section comprising left and right straight and vertical side portions spaced from each other a given distance, a top horizontal portion centered between said side portions and at approximately the level of the tops thereof, a bottom horizontal portion centered between said side portions and at approximately the level of the bottoms thereof, the width of said top and bottom horizontal portions being less than said given distance, top externally convex portions connecting the tops of the side portions and the top portion, said convex portions extending above the top portion, bottom externally convex portions connecting the bottoms of the side portions and the bottom portion, said bottom externally convex portions extending below said bottom portion, all of said portions of said one member being in immediate juxtaposition to the corresponding portions of the other member.

3,891,092

SUNGLASS DISPLAY STAND

Richard H. Surrette, Hudson, and Alfred M. Braga, Fitchburg, both of Mass., assignors to Foster Grant Co., Inc., Leominster, Mass.

Filed Aug. 22, 1973, Ser. No. 390,662
Int. Cl.² A47F *7/00, 5/02*
U.S. Cl. 211—13 **26 Claims**



1. A rotary display stand for sunglasses comprising:
a pedestal;
an axial shaft extending substantially vertically upwards from said pedestal;
at least one rotary support member rotatably mounted on said axial shaft, said support member having opposing front and rear walls and a bearing portion supporting it on said shaft for rotation;
at least one holding member removably connected to one of said walls of said rotary support member; and
a sunglass display member removably supported by said holding member, said display member including means for removably displaying a plurality of sunglasses thereon.

3,891,093

CLAMPING DEVICE

Gordon D. Petrie, 11428 Snowdrop Ave., Fountain Valley, Calif. 92708

Filed Mar. 12, 1973, Ser. No. 340,443
Int. Cl. A47f *7/16*
U.S. Cl. 211—46 **16 Claims**

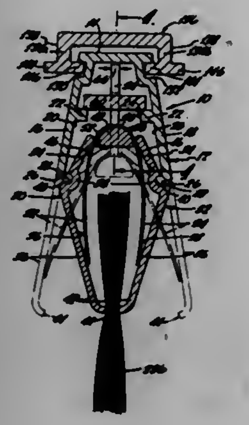
1. A clamping device for holding sheet material comprising: a support member having an upper portion and a lower portion;

a pair of clamp jaws pivotally attached to said lower portion of said support member and having a pair of interior flanges;

an actuator element slideably mounted within said support member and having a cam slot;

means located between said actuator element and said pair of clamp jaws for pivoting said pair of clamp jaws in response to the slideable movement of said actuator element, said means for pivoting said pair of clamp jaws comprises a cam rod mounted below said interior flanges of said pair of clamp jaws and a cam blade attached to said cam rod, said cam blade having an inclined cam surface and slideably extending into said cam slot; and

means attached to said actuator element for controlling said slideable movement of said actuator element.



3,891,094

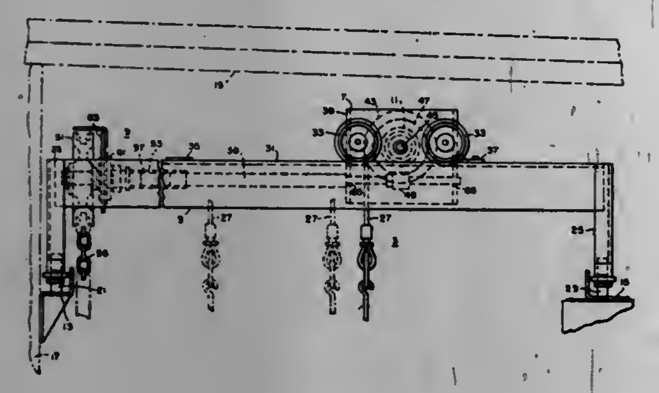
OVERHEAD TRAVELING CRANE WITH A TELESCOPIC HOIST DRIVE

John H. Angus, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 8, 1974, Ser. No. 468,338

Int. Cl. B66c *17/00*

U.S. Cl. 212—20 7 Claims



1. An overhead traveling crane comprising a pair of elevated tracks, a horizontal frame extending between the pair of tracks, means comprising first wheels for moving the frame along the pair of tracks, a carriage supported on and movable along the frame, a winch journaled on the carriage and having a lifting cable having one end thereof wound around the winch and the other end depending therefrom, reversible means rotatably mounted in said horizontal frame for turning the winch and including a manually rotatable wheel and a telescopic rotatable shaft extending between the rotatable wheel and the winch, one end of the telescopic shaft being operatively connected to the winch, and the manually rotatable wheel being mounted on the other end of the telescopic shaft.

3,891,095

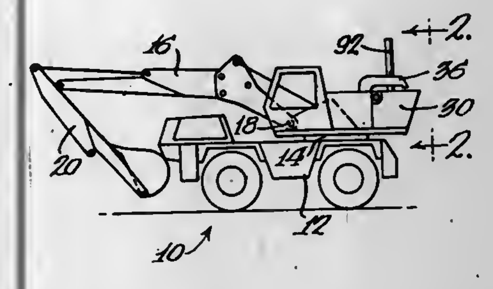
REMOVABLE COUNTERWEIGHT MOUNTING MECHANISM

William D. Symmank, Schofield, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 22, 1974, Ser. No. 462,888

Int. Cl. B66c *23/72*

U.S. Cl. 212—48 8 Claims



1. In combination with a machine having a rotatable platform mounted thereon with a boom pivotally supported for movement about a horizontal pivot on said platform; a counterweight; means defining a recess in said counterweight; a permanent pin extending across said recess; means mounted on said platform for engaging said permanent pin; a bearing hanger on said platform adapted to be received in said recess, said hanger having an opening, said counterweight having end walls with a bore extending from one end wall across said recess, said bore having an enlarged portion adjacent said one end wall and a reduced portion extending across said recess; and removable pin means received into said bore and extending through said opening in said hanger for supporting said counterweight on said platform, said removable pin means including a pin portion corresponding in size to said reduced portion and a handle portion of a different size connected to said pin portion.

3,891,096

TRANSFERRING DEVICE FOR OBJECTS IN WHICH A REDUCED PRESSURE IS APPLIED CONTINUOUSLY

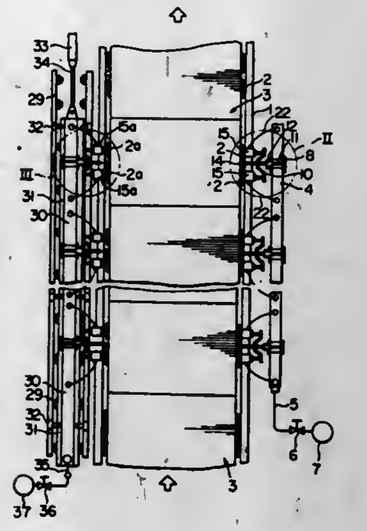
Hideto Terada, Toyokawa, Japan, assignor to Sintokogio, Ltd., Aichi-ken, Japan

Filed Mar. 22, 1974, Ser. No. 453,925

Claims priority, application Japan, Mar. 29, 1973, 48-35927; June 21, 1973, 48-73865

Int. Cl. B65g *25/08*

U.S. Cl. 214—1 BB 10 Claims



1. A transferring device for objects in which a reduced pressure is applied continuously comprising a transporting means for advancing intermittently a plurality of said objects connected to one another in single file in the direction of said file; a first normally closed valve means provided on one side of each said object and adapted to apply the reduced pressure in each said object; a second normally closed valve means provided on the other side opposite to said one side of each said object and adapted to apply the reduced pressure in each said object; a first normally closed push valve means provided substantially in parallel relation to said file and along said one side of each said object and adapted to connect to and communicate with said first normally closed valve means of the predetermined numbers of said objects in which the reduced pressure is to be applied thereby connecting said predetermined numbers of them to a vacuum source; a second normally closed push valve means provided substantially in parallel relation to said file and along said other side of each said object and adapted to move along and in parallel to said file when said objects advance for connecting to and communicating with said second normally closed valve means of the predetermined numbers of said objects thereby connecting them to a vacuum source; a first operating means which operates only when said objects are stopped to connect said first normally closed push valve means to said first normally closed valve means; a second operating means adapted to connect said second normally closed push valve means to said second normally closed valve means and to release this connection only when said first operating means is operating; and a restoring means for restoring said second normally closed push valve means which have moved with the advance of said objects to the original position from which said second normally closed push valve means started to move.

3,891,097

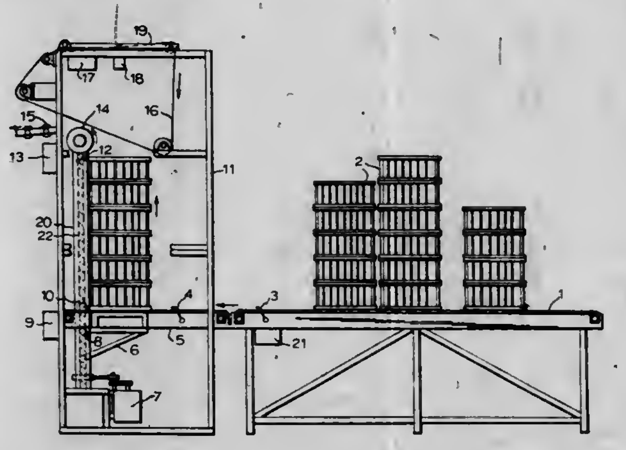
CHICKEN COOP UNSTACKING MACHINE

Albert D. Shackelford, Athens; John H. Holladay, Winterville, and E. J. Lloyd, Athens, all of Ga., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed July 6, 1973, Ser. No. 376,973

Int. Cl. B65g *59/02*

U.S. Cl. 214—8.5 H 2 Claims



1. An apparatus for transporting tiered rectangular solids from external to internal areas of warehousing or processing plants therein to unstack each transported tier, the apparatus comprising a tower structure for providing support and rigidity to all components and containing a first and a second horizontal feed conveyor which support and convey a stack-at-a-time of reactangular solids; a plurality of limit switches to provide limit control to each stack as it is being transported horizontally and vertically; a lift platform, driven vertically by a vertically positioned ball bearing screw (jackscrew), the function of which platform being to lift a stack to a predetermined elevation therein to discharge the top rectangular solid from the top of each stack horizontally upon making contact with a plurality of moving springloaded endless conveyor elements; a plurality of springloaded endless conveyor elements which yield slightly to the upward force of the elevating stack of rectangular solids thereby providing the time-lapse and yielding quality required for overcoming the inertia of the topmost rectangular solid; the said endless conveyor elements being located near the top of the tower support structure and providing the force required to expel each solid as it comes in contact with and under the endless conveyor elements a plurality of discharge wheels the laterial traveling movement of said endless conveyor elements assisted in the expelling of the topmost rectangular solid by the complementing rotational movement of said plurality of discharge wheels onto and over which each rectangular solid is driven; and power means for energizing the forward, reverse, and repositioning motions of the conveyors, feed discharge wheels, the lift platform, endless conveyor elements, and said limit switches.

3,891,098

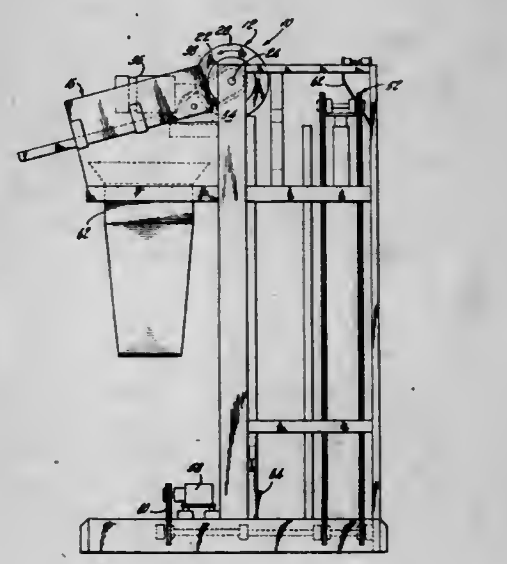
APPARATUS FOR INVERTING CONTAINERS

Andrew T. Koch, 1 Upper Mountain Ave., Montclair, N.J. 07042

Filed Oct. 5, 1973, Ser. No. 403,777

Int. Cl. B65g *59/02*

U.S. Cl. 214—8.5 H 7 Claims



1. In an apparatus for individually removing and thereafter inverting containers or the like having opening means therein from a stack of such containers, including means for delivering said stack of said containers to a work station and means for receiving the inverted containers from the work station, an improved de-stacking and inverting mechanism at the work station which comprises:

rotating drum means having a generally cylindrical surface positioned so as to approximately peripherally contact one side of the uppermost container in said stack of containers delivered thereto;

projection means fixedly mounted to said cylindrical surface of said drum means for rotation therewith,

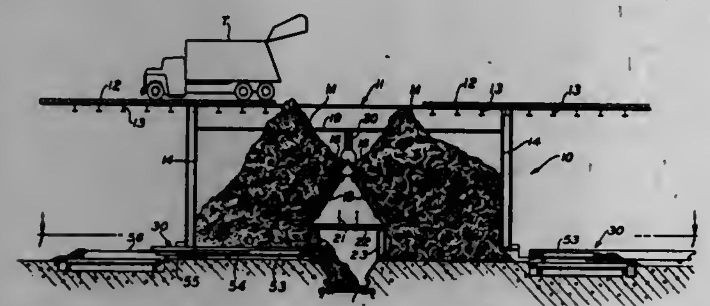
said projection means being mounted at an angle of approximately 45° to said cylindrical surface and inclined outwardly therefrom in the direction of rotation of said drum means; and

said projection means adapted to extend through said opening means in said uppermost container upon rotation of said drum means to thereby releasably engage said uppermost container between said projection means and said cylindrical surface of said drum means,

whereby said drum means removes said uppermost container from said stack and thereafter rotates said uppermost container therewith for delivery and release to the receiving means in an inverted position.

3,891,099
MATERIAL STORAGE AND TRANSFER DEVICE

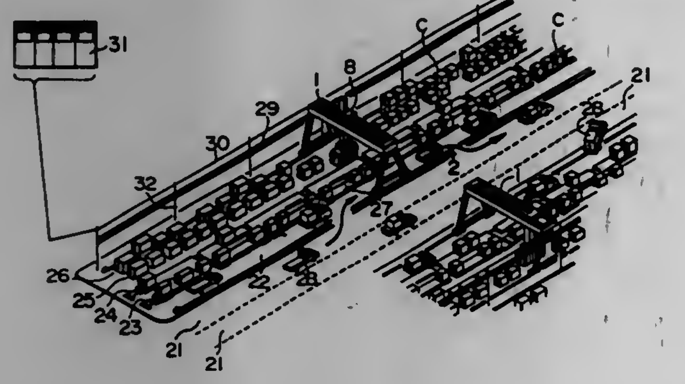
Gordon C. Smith, Richfield, Ohio, assignor to Glaus, Pyle, Schomer, Burns and DeHaven, Inc., Akron, Ohio
Filed Jan. 31, 1974, Ser. No. 438,342
Int. Cl. B65g *65/44*
U.S. Cl. 214—17 DA **12 Claims**



1. A material storage and transfer system comprising, storage means extending in a longitudinal direction for receiving quantities of material, conveying means extending in said longitudinal direction receiving material from said storage means and transferring the material out of said storage means, means to transfer the material from said storage means to said conveying means, said means to transfer including at least one pusher assembly located at each side of and outside of said storage means when in a retracted position and movable laterally into said storage means when in an extended position, and a plurality of adjacent guide means dividing said storage means into bays along said longitudinal direction, said pusher assembly being located within a bay between adjacent guide means thereby being operable to move the material to said conveying means at various points along said longitudinal direction.

3,891,100
STORAGE WITH AUTOMATIC HANDLING MEANS FOR STORING ARTICLES

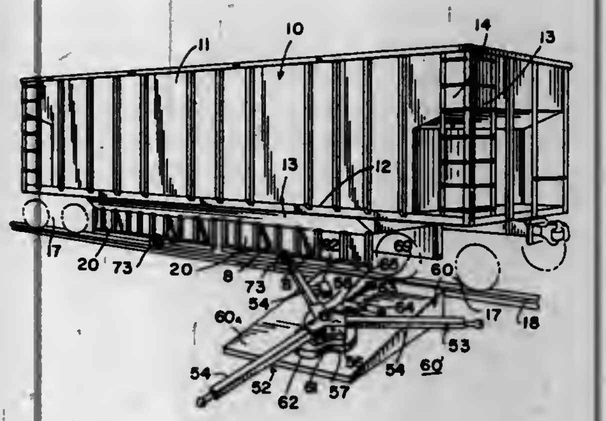
Mituo Tamaki, Urawa; Yasumasa Ninomiya; Tatsuo Koyama, both of Tokyo, and Ryouhei Ishige, Kashiwa, all of Japan, assignors to Hitachi, Ltd. and Japanese National Railways, Japan
Filed Oct. 12, 1973, Ser. No. 405,900
Claims priority, application Japan, Oct. 18, 1972, 47-103569
Int. Cl. B65g *67/10*
U.S. Cl. 214—38 CA **5 Claims**



1. A storage for storing articles comprising track for a freight car unit consisting of a plurality of freight cars each carrying articles spaced from each other by a predetermined distance, each of said freight cars having a detected element, a plurality of fixed points disposed on the ground along said track and spaced from each other by a predetermined distance so that each fixed point corresponds to an individual freight car, an article storing area consisting of a plurality of article storing spots disposed along said track and positioned relative to said fixed points, means for detecting relative displacement of said fixed points and the standing position of the corresponding ones of said freight cars, said detecting means including means for recognizing each said detected element, means for temporarily memorizing the displacement, and an automatic crane means for carrying out loading and unloading of desired articles between said freight cars and said article storing area according to instructions from said memorizing means.

3,891,101
HOPPER CAR DOOR CLOSURE IMPROVEMENT

William H. Peterson, Homewood, Ill., assignor to Pullman Incorporated, Chicago, Ill.
Filed June 24, 1974, Ser. No. 482,733
Int. Cl. B61d *7/30*
U.S. Cl. 214—63 **12 Claims**

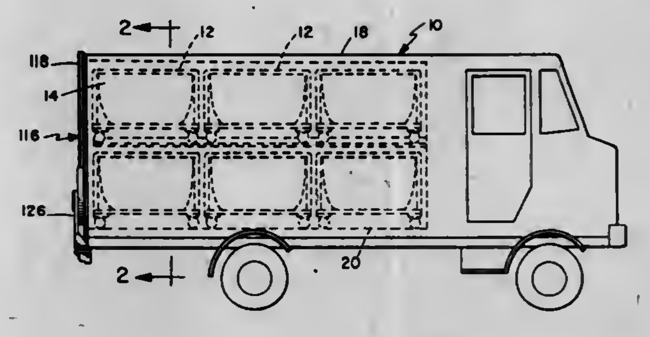


1. For a hopper car having a hopper positioned between a pair of side sills and door means supported on said car for hinging movement on longitudinal axis parallel to said sills from an open substantially vertical position to a closed substantially horizontal position beneath said hopper, the improvement comprising:

- a door closing mechanism including a support stationarily positioned to one side of a track on which said car is positioned,
- closing arm means having actuating means thereon,
- means supporting said arm means for pivotal movement about an axis on said support whereby said actuating means is movable in a generally circular path around said axis,
- engageable means on said door means,
- means positioning said arm means whereby said actuating means is in actuating position to engage said engageable means on said door means when said car is moved on said track alongside said support thereby rotating said arm to provide a lateral force moving said door means inwardly to a closed position,
- means urging said arm means again into said actuating position,
- said arm means including a plurality of radially extending arms spaced from one another arcuately,
- each arm having a movable resiliently supported end portion for selective engagement with said engageable means,
- stop means mounted on said support and limiting circular movement of said arm means, and
- said stop means being positioned on said support for abutting engagement with said arm means to prevent its movement in a circular path when said arm means is in position for engagement with the associated engageable means.

3,891,102
VEHICLE LOADING AND STORAGE SYSTEM FOR WHEELED CONTAINERS

Bobby J. Blount, 530 La Rue Way, El Cajon, Calif. 92021
Division of Ser. No. 126,136, March 19, 1971, Pat. No. 3,752,336. This application Mar. 7, 1973, Ser. No. 338,839
Int. Cl. B60p *1/44*
U.S. Cl. 214—75 T **4 Claims**



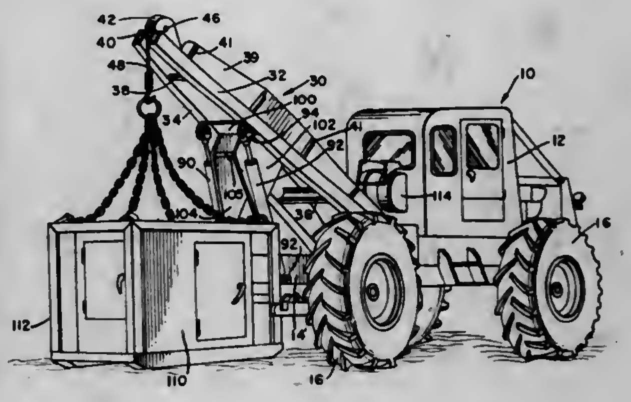
1. A vehicle loading and storage system for loading and storing containers within the body of a vehicle comprising:

- track means for storing at least one additional level of containers above a level of containers supported on the floor of said vehicle body;
- elevator means for raising containers from at least the floor level of said vehicle to said additional level;
- said track means having at least one row;
- each of said rows being capable of supporting a plurality of containers;
- said track means having a supported position and a stowed position;
- said stowed position making substantially the entire interior of said vehicle open for cargo;
- at least one of said track means is retained in said supporting position by a plurality of vertical members removably secured to an overhead bar mounted along the roof of said vehicle;
- at least one track of said track means is supported in said stowed position by said plurality of vertical members removably secured to at least one overhead bar mounted along the roof of said vehicle adjacent at least one side thereof;
- said track means comprise at least one pair of channels;
- the first channel in said pair being carried by a side wall of said vehicle body;
- and the second channel in said pair being carried by said vertical member,
- said vertical members are prevented from side to side movement within said vehicle body when in said supporting position, by a retainer mounted on the floor of said vehicle.

3,891,103
HEAVY EQUIPMENT HANDLER

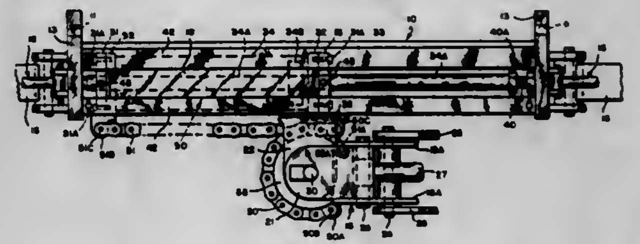
James E. Harris, and Patrick E. Regan, c/o Legal Dept., The Anaconda Company, both of Butte, Mont. 59701
Filed Nov. 2, 1973, Ser. No. 412,408
Int. Cl. B60p *1/50*
U.S. Cl. 214—75 H **1 Claim**

1. In combination, a vehicle including a chassis, hoist means mounted on said chassis for lifting an article, said hoist means comprising an elongated boom including a pair of side members, a pair of support members, one of said support members being mounted on one side of said chassis and the other of said support members being mounted on the other side of said chassis, both support members having a portion extending above said chassis, means for pivotally mounting one end of each of said side members to said upper extending portions of respective ones of said support members, a pulley, each of said side members extending relative to the other in converging relation toward an apex, means connecting said converged ends of said side members and said pulley, winch means mounted on said chassis, said winch means including a cable having securing means at one end and connected at the other end to a drum of said winch means, said cable being trained over said pulley to be let out and drawn up by said winch means, pressure responsive means including at least one pressurizable cylinder and a pressure responsive member carried by and movable relative to said cylinder, said pressure responsive means connected between said chassis and said elongated boom and controlled to cause said side members to pivot about said support members so that pivotal movement of said elongated boom in concert with operation of said winch means will result in movement of said article through space, protection means carried by said elongated boom, said protection means including at least one plate cooperable with each pressure responsive means, each plate extending from said elongated boom in a plane substantially perpendicular to a plane including said pivot points, each plate extending outwardly of said elongated boom beyond the disposition of said pressurizable cylinder for protecting the same against contact by said article when lifted, and a support frame for supporting said article, said support frame including a pair of spaced parallel arms, an element connecting said arms at one end, positioning means on said support frame providing abutments against the movement of said supported article on said support frame, said support members having a portion extending below said chassis, and means mounting said support frame to said chassis so that said arms extend rearwardly thereof and in alignment with movement of said boom, said mounting means including a lower extending portion of said side members connected to said spaced arms.



3,891,104
SWING MECHANISM FOR EARTH-MOVING APPARATUS

John S. Pilch, Ware, Mass., assignor to Ware Machine Service, Inc., Ware, Mass.
Filed Apr. 11, 1974, Ser. No. 459,920
Int. Cl.^{2} B66F *9/14*
U.S. Cl. 214—132 **13 Claims**



1. In swing mechanism for an earth-moving apparatus comprising,

- a main frame adapted to be carried by a vehicle,
- swing frame means, and
- substantially vertical pivot means connecting said main frame and said swing frame means for swinging move-

ment of said swing frame means about said substantially vertical pivot means,

the improvement comprising,

a single, double-acting ram-type hydraulic motor means, comprising a portion having a cylindrical bore and a piston rod having at least one end supported by at least one laterally spaced member of said main frame,

a pair of elongate flexible means, one end of each of said flexible means being attached to said swing frame means, the other end of one of said flexible means being attached to said portion having a cylindrical bore adjacent to one end thereof and the other end of the other of said flexible means being attached to said portion having a cylindrical bore adjacent to the end thereof,

means on the main frame and on said portion having a cylindrical bore for guiding said portion having a cylindrical bore and at least portions of said flexible means for rectilinear movement, and

said swing mechanism being free from any sheaves for coaction with said elongate flexible means,

whereby rectilinear movement of said portion having a cylindrical bore by said motor means causes said swing frame means to swing about said substantially vertical pivot means and longitudinal movement of both of said elongate flexible means.

3,891,105

SYSTEM FOR RECOVERING AND TREATING USEFUL ELEMENTS FROM WASTE MATERIALS

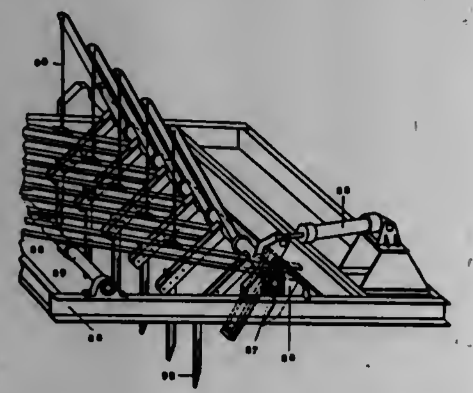
Manlio Cerroni, Via Bruxelles 53, Rome, Italy

Filed May 9, 1973, Ser. No. 358,516

Claims priority, application Italy, Feb. 22, 1973, 48411/73; Apr. 20, 1973, 49595/73

Int. Cl. B65g *65/04*

U.S. Cl. 214—305 **4 Claims**



1. Device for use in the recovery and treatment of useful substances contained in solid urban wastes where the wastes are contained within bags formed of a tearable material, such as plastic, paper, or combination of plastic and paper, comprising means for moving the bags filled with solid urban wastes along a path of travel, a frame located above the path of travel, means for supporting the frame and for moving it into the path of movement of the bags on said moving means, laterally spaced spikes fixedly secured to said frame and arranged to depend from the frame into and across the path of movement of the bags for blocking movement of the bags, and knives dependently and movably supported on said frame for performing a cyclic oscillating movement, said knives arranged in laterally spaced relationship for depending into and across the path of movement of the bags, in each cycle of movement said knives are initially spaced upstream from said spikes relative to the path of travel of the bags and moved toward and past said spikes effecting a tearing action on the bags held by said spikes and exposing the material within the bags, said knives spaced laterally relative to said spikes and effecting a scissors-like action therebetween as they pass said spikes, and then reversing direction and moving in the direction opposite to the movement of the bags on said moving means and through the bags and material therein to the initial position.

3,891,106

DETACHABLE TRASH BOX AND TRAILER

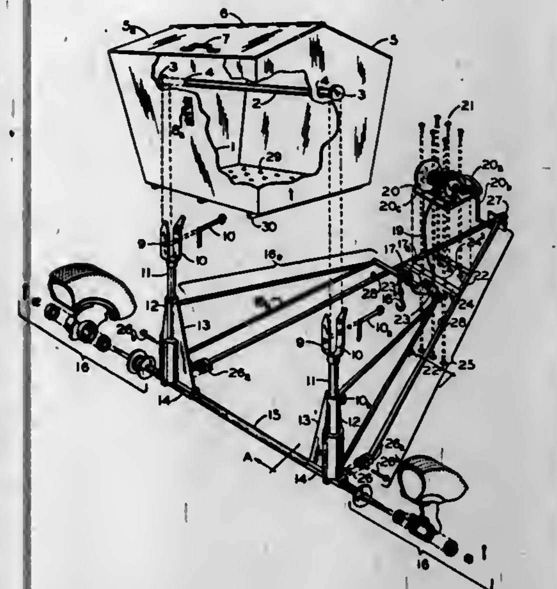
Eduardo V. Alcanzare, 27 San Miguel St., Kapitolyo, Pasig, Rizal, Philippines

Continuation of Ser. No. 321,919, Jan. 5, 1973, abandoned. This application Nov. 23, 1973, Ser. No. 418,775

Claims priority, application Philippines, Jan. 6, 1972, 13160

Int. Cl. B65g *65/04*

U.S. Cl. 214—318 **12 Claims**



1. A trailer for lifting and transporting a container comprising, in combination, an axle; wheel means mounted on said axle for rotation; frame means attached to said axle and having a trailer hitch; support means mounted on said axle so as to be displaceable between an engaging position and a lifted position and operative for tiltably engaging the container and lifting the same; and single means for moving said support means between said engaging and said lifted positions thereof whereby to lift the container, for holding said support means and the container in said position, and for tilting the container into a dumping position thereof with said support means being in said lifted position whereby to discharge the contents of the container, said single means further being connectable to the container at two distinct locations, one of said distinct locations being used for said holding and the other being used for said dumping, and said single means further being connectable to said support means for said lifting.

3,891,107

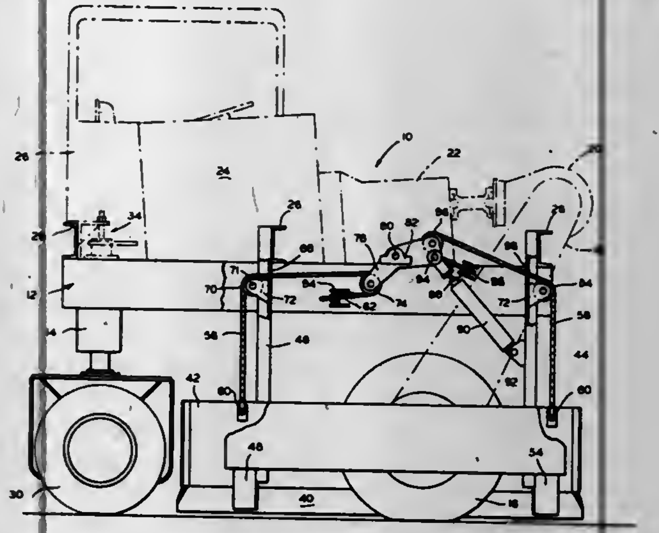
STRADDLE CARRIER LIFTING MEANS

Glen W. Burgess, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed June 20, 1974, Ser. No. 481,021

Int. Cl. B60p *3/00*

U.S. Cl. 214—392 **2 Claims**



1. In a straddle carrier having a pair of load hooks located at opposite sides in the bay thereof, means for lifting at least one of said load hooks which comprises a single bell crank mounted for pivotal movement from one side of the carrier at a location above and intermediate the ends of said load hook, first sheave or sprocket wheel means mounted at each end of the bell crank, second sheave or sprocket wheel means mounted from said one side of the carrier above each end portion of said load hook, first and second cable or chain means each secured to the one side of the carrier and to the respective end of the one load hook and reeved on said first and second sheave or sprocket wheel means, and a single actuator cylinder connected to the one side of the carrier and to one end portion of the bell crank for actuating the bell crank and cables or chains on said sheave or sprocket wheel means for lifting the one load hook.

3,891,108

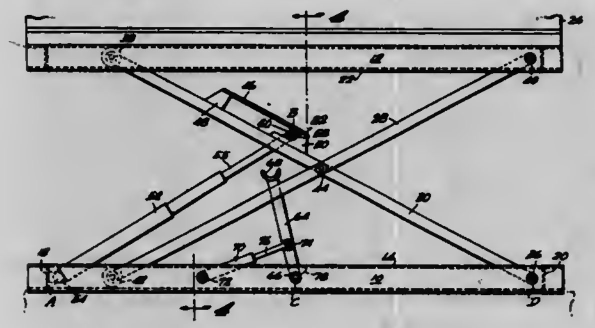
HIGH LIFT MECHANISM

Charles Traficant, 1350 N.W. 42nd Ave., Miami, Fla. 33126

Filed Feb. 14, 1973, Ser. No. 332,516

Int. Cl. B60p *1/02*

U.S. Cl. 214—512 **8 Claims**



1. A high lift mechanism, for mounting on a truck chassis, to move a cargo body fixed thereto between a retracted, down position and an elevated position comprising,

- A. a lower frame for fixed engagement with the truck chassis;
- B. an upper frame to carry the cargo body threatop;
- C. lever means interconnecting said frames comprised of,
  - 1. a first combination of levers, and
  - 2. a second combination of levers;
- D. fluid actuated ram means for moving said upper frame between said positions;
- E. means to drivingly engage the extended end of said ram means to said first combination of levers to elevate said upper frame to a predetermined, intermediate, level, in a first phase operation, when pressurized fluid is delivered to said ram means;
- F. means to disengage said means to engage from said first combination of levers at said intermediate level and to simultaneously engage same with said second combination of levers to elevate said upper frame to its maximum elevated position in a second phase of operation;

said interconnecting lever means includes a pair of scissors type lift levers interconnecting each of the respective sides of said upper and lower frames and a link means pivotally attached at a first end to said lower frame, intermediate the opposed ends of said scissors levers; said scissors levers and link means comprising said first combination of levers and said scissors levers comprising said second combination of levers;

said means to drivingly engage comprises a bearing plate, fixed to and spanning a portion of one corresponding pair of said scissors levers, and a yoke means at the second end of said link means to receive a tip end portion of said ram; said bearing plate being sized and positioned to maintain said tip end portion in said yoke through said first phase of operation during which forces are directed upwardly by the movement of the ram and the resulting pivotal movement of said link means.

3,891,109

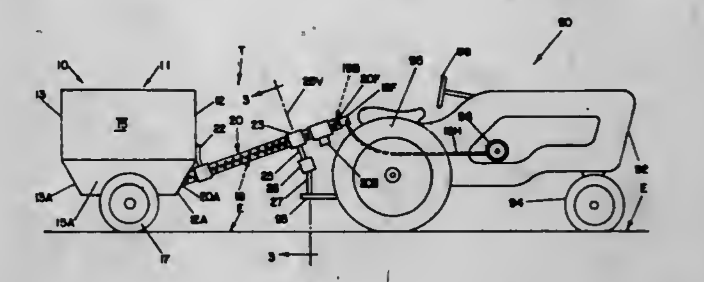
WAGON WITH ELONGATE CONVEYOR HOUSING AS UNLOADER AND DRAYAGE HITCH

Carroll G. Olson, Rural Rt. No. 1, Atkinson, Nebr. 68713

Filed Sept. 19, 1974, Ser. No. 507,564

Int. Cl.^{2} B60P *1/40*

U.S. Cl. 214—519 **7 Claims**



1. In combination with an overland tractor vehicle, a cargo-carrying rollable wagon having a cargo-storage compartment and including an elongate forwardly and upwardly extending power actuated conveyor lying along a vertical plane and having a rearward intake-end communicating with the wagon at the bottom front portion of the cargo-storage compartment and a forward discharge-end, said conveyor being provided with an external tubular housing connected to the wagon and also including a forward outlet spout depending from the housing adjacent the conveyor discharge-end, said conveyor tubular housing nearer the outlet thereof than to its rearward wagon connection having means for being removably pivotably attached to the tractor hitch for towing purposes, said means including a revolvable stud depending from the housing and lying along the hitch-axis and providing the pivotal connection to the forward tractor means.

3,891,110

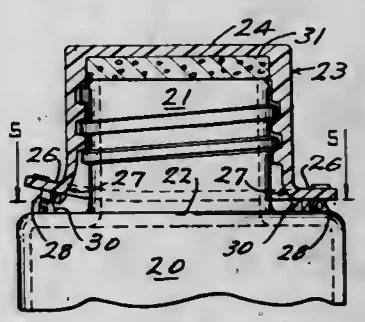
CHILD-RESISTANT CLOSURE FOR A CONTAINER HAVING A THREADED NECK

Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Oct. 15, 1973, Ser. No. 406,676

Int. Cl. B65d *55/02, 85/56;* **A61j** *1/00*

U.S. Cl. 215—216 **8 Claims**



1. A substantially leak-proof and child-resistant closure combination, said combination comprising,

- a. a container having a tubular neck, a hollow body and a generally inwardly extending shoulder between the upper portion of said body and the base of said neck,
- b. a one-piece cap for said container, said cap having a disc-like top and a tubular skirt,
- c. cooperating threads on said neck and said cap skirt for retaining said cap on said neck,
- d. circular sealing means on the interior of said cap and engageable with said tubular container neck for sealing said container neck when said cap is in normal closed position on said container,
- e. and cooperating child-resistant locking means on said cap and said container shoulder engageable when said cap is rotated at least to normal closed position relative to said

container neck, said child-resistant locking means consisting of

f. a plurality of circumferentially spaced radially extending first elements integral with and at the lower margin of said cap skirt and

g. a circumferentially extending plurality of opposed elements formed on said container shoulder and engageable with said neck to at least normal closed position thereon,

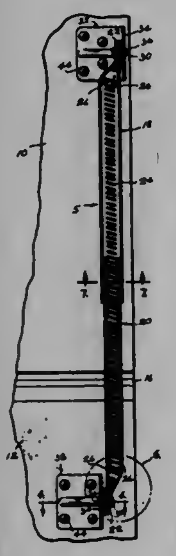
h. the elements in one of said plurality of elements being offset circumferentially from diametric opposition,

i. the element-comprising portion of said container skirt being resiliently deformable upwardly for disengaging said locking means.

3,891,111
SPRING BIASED PROP FOR A PIVOTED MEMBER

Vladimir R. Snazuk, Britt Ave., Rt. 6, Box 135, Elkhart, Ind. 46514

Filed Oct. 11, 1973, Ser. No. 405,254
Int. Cl.^{2} B65D *43/24*
U.S. Cl. 217—60 F **4 Claims**

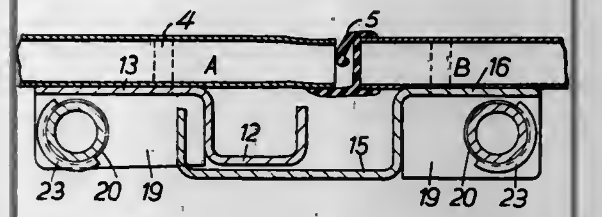


1. A prop for a pivoted member, said pivoted member being connected to a support part by hinge means and being pivotal about a horizontal axis, said prop comprising inner and outer telescopically interfitting tubular members, each tubular member having an outer end, a helical spring having opposite ends and fitting longitudinally within said tubular members, means anchorine one end of said spring to said inner tubular member inwardly from the outer end thereof, means anchoring the other end of said spring to said outer tubular member inwardly from its outer end, said tubular members being shiftable telescopically between an extended position wherein said spring is in an expanded state and a retracted position wherein said spring is in a compressed state, means pivotally anchoring one tubular member outer end to said pivoted member spaced from said horizontal axis, means pivotally anchoring the other tubular member outer end to said support part spaced from said horizontal axis, said spring constituting means for urging said tubular members from their retracted position into their extended position and supporting said pivoted member in a raised position, both said spring anchoring means constituting a pair of tab parts formed in said side wall of each tubular member, each pair of tab parts being bent into the interior of the tubular member in an opposed relationship interlocking with said spring between the turns thereof.

3,891,112
DOORS FOR CONTAINERS AND THE LIKE

Peter Lycett, and Kenneth William Kempson, both of Staffordshire, England, assignors to The Bloxwich Lock and Stamping Company Limited, Staffordshire, England

Filed Oct. 3, 1972, Ser. No. 294,541
Int. Cl. B65j *1/02;* **B65d** *7/48;* **E05c** *7/00*
U.S. Cl. 220—1.5 **5 Claims**

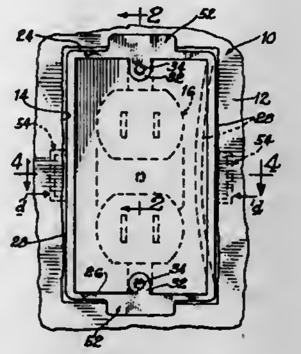


1. A freight container in which one end of the container is closed by two co-operating doors hinged at their vertical outer edges to sides of the container and the free edges of the doors are provided with first and second reinforcing members of channel cross-section of which one fits within the other in the closed position of the doors, wherein the said reinforcing members are separately formed members secured to the doors adjacent to their free edges and extending the full height of the doors, each reinforcing member comprising a portion of channel cross-section having a web and spaced parallel flanges and an attachment portion which extends laterally from one of said flanges parallel to said web and lies against and is secured to a door, and the first of said members is secured to one door adjacent to the free edge of said one door and the second of said members is secured to the other door in such a position that when the doors are closed the channel-section portion of said second member overlaps the adjacent edge of said one door to receive the channel-section portion of said first member, each of said reinforcing members incorporating abutment means, the abutment means of one reinforcing member being engageable with abutment means of the second reinforcing member to prevent relative vertical movement of the free edges of the doors when they are in closed position and the channel section portion of said first member is engaged within the channel-section portion of said second member.

3,891,113
ELECTRICAL BOX

George Salg, River Forest, Ill., assignor to Reflect-O-Lite Manufacturing Company, Chicago, Ill.

Filed Nov. 9, 1973, Ser. No. 414,385The portion of the term of this patent subsequent to Nov. 19, 1991, has been disclaimed.
Int. Cl.^{2} H02G *3/08*
U.S. Cl. 220—3.6 **7 Claims**

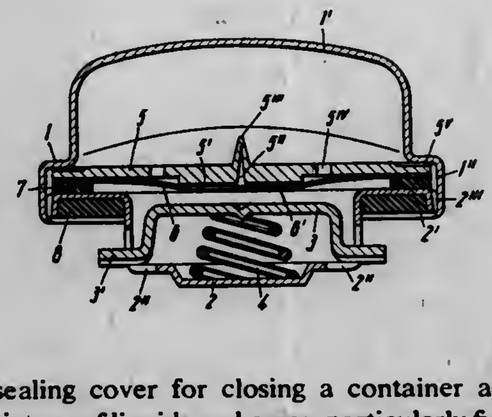


1. A molded plastic, hollow electrical box adapted to be inserted in an opening in a wall panel and to be secured thereto without extraneous fasteners, said box being a integral, one-piece structure and comprising an integral back wall and a sidewall forwardly of said back wall and forming with said back wall an open box structure defining an expansive open front forwardly of said back wall and circumscribing a hollow space therewithin, a plurality of knock-out portions formed with said box along weakened lines of connection, and an integral wall panel mounting means comprising panel face contactors for controlling the depth of entry of said box structure when it is inserted through a wall panel opening from the front of said wall panel into the space behind the wall panel and for engaging the front face of said wall panel when the box is secured to said wall panel, said mounting means further comprising panel locking means mounted on, and integral with a portion of the sidewall of said box and spaced rearwardly of said contactors and laterally away from said contactors and providing a front edge for engaging the back surface of said wall panel when the box is secured to said wall panel, said panel locking means merging with said sidewall and said sidewall being continuous, and without breaks or slits in said sidewall portion adjacent said panel locking means, said panel locking means and said contactors extending outwardly of said box and away from said hollow space, said locking means being positioned to be cammed inwardly of the hollow space and to flex the portion of the sidewall carrying said locking means in a region remote from said contactors and without flexing the sidewall portions located at said contactors inwardly of the hollow space as said box is inserted into and pushed through said wall panel opening and then resiliently to be moved outwardly when said contactors have engaged the front face of said wall panel, said locking means defining a forwardly and outwardly sloping camming surface to engage the periphery of said wall panel opening so that as said box is pushed through said opening said locking means will cause the portion of said sidewall carrying said locking means to be deflected inwardly of said hollow space, said locking means being proportioned and positioned to return to an original position outwardly of said hollow space so that said front edge is positioned behind said panel to prevent removal of said box forwardly of said wall panel opening, so that when a wall panel is disposed between said contactors and said locking means, said box may not readily be moved either inwardly or outwardly of said wall panel.

3,891,114
SEALING COVER WITH PRESSURE COMPENSATION CHANNEL

Theo Gerdes, Langenfeld, Rhineland, Germany, assignor to Blau K. G. Fabrik Fuer Kraftfahrzeugteile, Langenfeld, Rhineland, Germany

Filed Sept. 13, 1973, Ser. No. 397,093
Claims priority, application Germany, Sept. 29, 1972, 2248033
Int. Cl. B65d *51/16*
U.S. Cl. 220—209 **5 Claims**

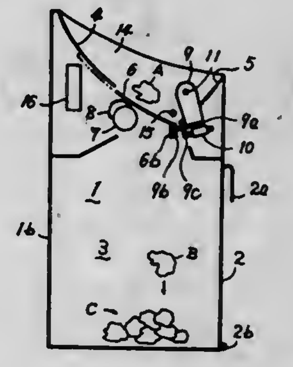


1. In a sealing cover for closing a container adapted to contain a mixture of liquids and gases, particularly fuel storage tanks or the like, a combination comprising a housing defining an enclosed space; wall means provided within said housing and subdividing said enclosed space into a first compartment adapted to communicate with the ambient atmosphere and a second compartment adapted to communicate with the container, said wall means being formed with a centrally located projection extending into said second compartment and with an outer portion having a plurality of apertures extending therethrough; a flexible pretensioned diaphragm provided within said housing and having an outer marginal portion overlying said outer portion of said wall means defining an annular space therewith which communicates with said apertures and an inner marginal portion overlying said centrally located projection and normally sealingly engaging the latter and bounding a center opening of said diaphragm; a groove-shaped channel formed in said projection and having an inlet communicating with said second compartment by means of said central opening in said diaphragm and dimensioned to allow entry of gas but to substantially restrict the entry of liquid into said channel, said channel having at least one outlet communicating with said annular space, whereby a force is exerted on said inner marginal portion of said diaphragm disengaging the latter from said projection when the pressure of the ambient atmosphere exceeds the pressure in said container so that the atmosphere may be admitted via said second compartment into the container, and an oppositely directed force is exerted on said inner marginal portion to urge the latter against said projection when the pressure in said container exceeds the pressure of the atmosphere so that the gaseous component of said mixture may enter said groove-shaped channel for discharge to the ambient atmosphere, whereby the pressure in said container may be automatically equalized.

3,891,115
WASTE PAPER CONTAINER

Taiichi Ono, 4-88 Biwajima-dori, Nishi-ku, Nagoya-shi, Japan

Filed July 11, 1973, Ser. No. 378,058
Claims priority, application Japan, July 12, 1972, 47-82300; July 12, 1972, 47-82301; July 14, 1972, 47-70932
Int. Cl. B65f *1/16;* **B65d** *43/26*
U.S. Cl. 220—260 **3 Claims**



1. A waste material container comprising:

a body made of sheet material having a top portion and a hollow inner portion wherein crumpled waste material can be collected;

a valley shaped recessed portion defined by a pair of oppositely disposed slants in said top portion and a pair of oppositely disposed substantially vertical walls disposed adjacent said slants, said slants and said walls further defining a lower extremity of said recessed portion;

a photo electric element disposed in substantially said lower extremity of said recessed portion and including a light projector and a photo-electric receiver, said projector continuously projecting a beam of light at said receiver;

a door disposed in one of said slants, said door being normally closed;

a door operating means to open said door upon interruption of said beam of light by said waste material and to close the door after said waste material has entered said hollow inner portion; and

said door operating means including:

a blind, pivotally mounted on one of said substantially vertical walls, said blind being pivoted in conjunction with the opening of said door thereby interrupting said beam of light when said door opens, but before said waste material enters said hollow inner portion, a driving means for opening said door in response to the interruption of said beam of light, said driving means being operative to open said door a predetermined amount as long as said beam of light is interrupted, and releasing means releasing said door after said door is opened said predetermined amount thereby allowing said door to close under the weight thereof.

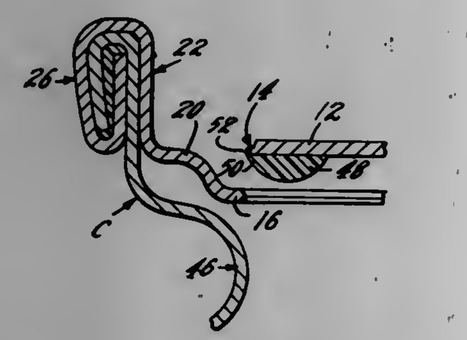
3,891,116
FULL-OPEN EASY-OPEN CONTAINER

Alvin Mansfield Schane, Elmhurst, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Dec. 14, 1972, Ser. No. 315,088

Int. Cl. B65d *41/32*

U.S. Cl. 220—270 **1 Claim**



1. In a metal easy-opening container of the type wherein a full-open end closure is double seamed to a container body, wherein the end closure includes a perpheral countersink wall, a full-open removable central panel section defined by a full-open score line adjacent the countersink wall and having a land portion, and an opening tab secured to the central panel near the score line so that the tab nose can rupture the score to leave a central panel rim between the countersink wall and the score, and wherein the container body sidewall has a radially inwardly-protruding annular bead underlyingly adjacent the central panel score to protect the rim edge once the score is ruptured, the improvement which comprises:

a substantially semi-spherical plastisol bead adhered to the undersurface of the removable full-open central panel section adjacent and along the score, said bead having its thickest portion radially inward of the score and at least the thickness of the central panel, and said bead having an outer radial edge which extends to but not beyond the outer radial edge of the score land portion such that the bead does not interfere with the downward arcuate path of the tab nose during its rupturing of the score, the thicknesses of the central panel section and bead which remains adhered thereto, in combination, providing a blunt edge which protects the edge of the removable panel section once the score is ruptured.

3,891,117
EASY-OPENING CAN END CONSTRUCTION

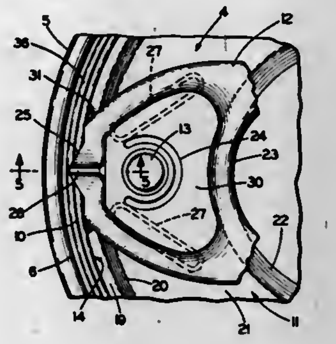
John D. Dragomier, and Edgar H. Zysset, both of Canton, Ohio, assignors to Van Dorn Company, Cleveland, Ohio

Filed May 24, 1974, Ser. No. 473,009

Int. Cl. B65d *17/20*

U.S. Cl. 220—270 **9 Claims**

1. In a metal can end member for an easy opening metal can of a type in which the can end is adapted to be seamed to the can, in which the end member has a removable panel portion having a hazard-eliminating protective endless annular triple metal fold formation defined by a main score line, in which a pull ring is connected by rivet means to the removable panel portion, and in which the pull ring has a nose overlying the score line with the axis of the pull ring which passes through the rivet means and nose extending radially of the end member; the improvement including angularly arranged reinforcing control beads located beneath and covered by the pull ring and having inner and outer ends formed in the removable panel portion, one on either side of the rivet means; the control beads diverging inward with respect to the panel center from the outer bead ends located outboard of the rivet means and adjacent the triple fold formation to inner bead ends located inboard of and spaced a considerable distance from the rivet means; and the triple fold formation having a relieved Z-shaped fold zone extending beneath and to either side of the pull ring nose and having ends located adjacent the outer bead ends.



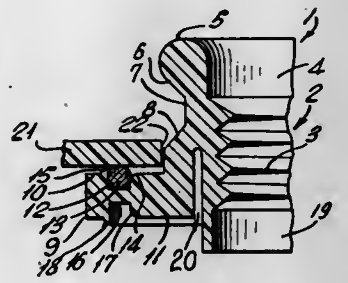
3,891,118
PLASTIC BONDED CLOSURE

Jeremiah J. Laurizio, New Providence, N.J., assignor to American Flange & Manufacturing Co., Inc., New York, N.Y.

Filed July 2, 1973, Ser. No. 375,451

Int. Cl. B65d *41/04*

U.S. Cl. 220—288 **2 Claims**



1. A closure flange molded of synthetic plastic material adapted for thermoplastic bonding to a plastic container wall opening, comprising an upstanding cylindrical neck, a screw thread formed on the interior of said neck, pilot means formed on said neck for centering said flange within a container wall opening, a laterally extending annular collar surrounding said neck having upper and lower surfaces, an axially opening annular groove formed in one of said surfaces spaced radially outwardly of said neck, an electrical conductor element retained within said groove to facilitate thermoplastic bonding of said collar to a plastic container wall section surrounding said opening, an annular protrusion positioned radially outwardly of said conductor extending axially away from said groove and a circumferentially enlarged bead at the uppermost end of said cylindrical neck displaced completely radially inwardly of said groove and adapted to receive an overlying tamperproof cap seal.

3,891,119
MANHOLE COVER LOCK

Edward W. Hunter, Port Franks, Canada, assignor to Emco Limited, London, Canada

Filed June 24, 1974, Ser. No. 482,744

Int. Cl. B65d *45/16*

U.S. Cl. 220—324 **2 Claims**

1. A closure for a tank opening with an inwardly directed circumferentially extending catch flange comprising

a cover adapted to seat over said opening, said cover having a filling passage and a vent passage therethrough,

at least one latch shaft mounted on said cover for accessibility on the upper side of said cover and extending downwardly to the underside of said cover,

said latch shaft being mounted on said cover as aforesaid for movement longitudinally of its longitudinal axis and for movement of rotation about its longitudinal axis,

yieldable resilient means urging said latch shaft longitudinally of itself and towards the underside of said cover,

a latch extending radially of said latch shaft and having a series of locking flats in echelon arrangement, each locking flat being separated from its neighbouring locking flat by a shoulder,

said latch shaft being mounted for rotation as aforesaid adjacent the edge of said cover and said series of locking flats being formed on said latch to cause the locus of the shoulder of each locking flat to cross the downward projection of the marginal portion of said cover in succession starting with the shoulder at the lower most locking flat as the shaft is rotated,

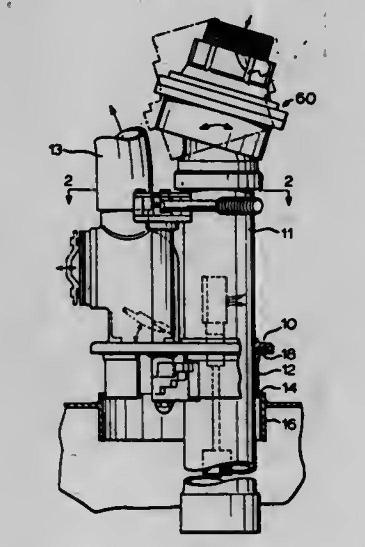
a release-turn lever pivotally mounted adjacent the upper end of said latch shaft about an axis transverse to the longitudinal axis of said latch shaft and having a gripping end and a bearing end,

a reaction surface on said cover for the bearing end of said lever,

said gripping end of said lever being manually depressible to move said latch shaft downwardly against said yieldable means and being turnable to rotate said latch shaft about its longitudinal axis,

said cover having a peripheral seal on its underside,

said locking flats being adapted in use to engage with the inwardly directed flange of a manhole through manipulation of said release-turn lever.



3,891,120
OPERATION MONITOR FOR AIR PRESSURE TYPE SEED PLANTER

Leo J. Loesch, and Claude E. Loesch, both of Kimball, Minn. 55353

Filed Mar. 19, 1973, Ser. No. 342,611

Int. Cl. G07f *11/00*

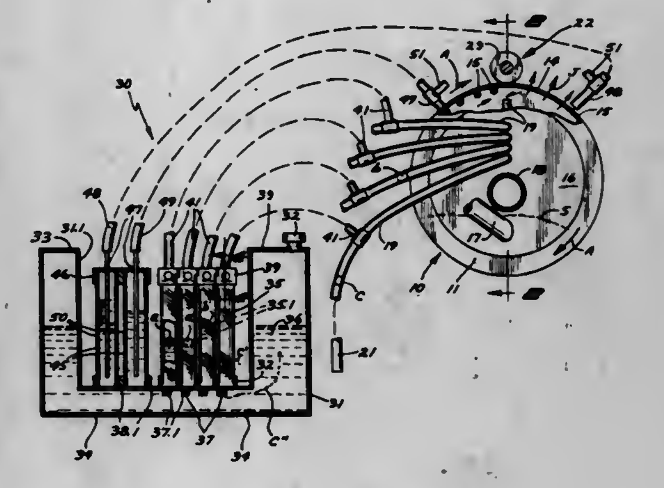
U.S. Cl. 221—2 **12 Claims**

1. In combination with a seed dispenser including a revolving drum containing superatmospheric air and a supply of seeds and the receiving ends of stationary discharge tubes located out of the seed supply and in confronting relation to peripheral apertures in which the seeds are carried until released at the discharge tubes through which the superatmospheric air sweeps the seeds for discharge from the drum,

an air flow a combined, continuously acting obstruction detector and indicator for such discharge tubes comprising a reservoir of liquid,

a sight glass with its lower end in liquid flow communication with the reservoir of liquid to equalize the liquid level in the glass and reservoir, the sight glass having a closed top, and

a pressure transfer tube communicating with the sight glass through the closed top thereof, and the transfer tube also being connected to one of the seed discharge tubes in air pressure communicating relation to apply the air pressure from the discharge tube with the sight glass for application against the liquid therein and produce a liquid level which will subsequently change in response to pressure changes in the discharge tube caused by obstructed air flow therethrough.



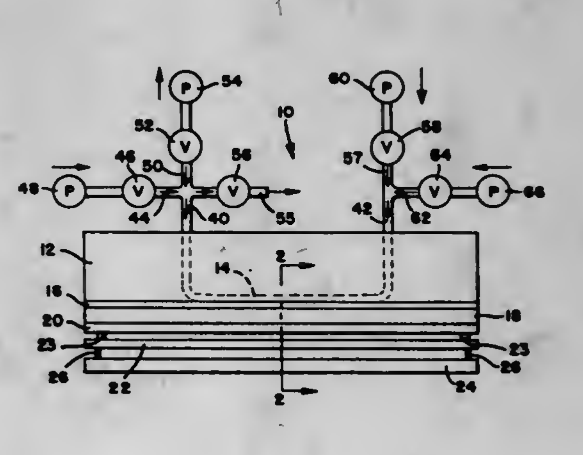
3,891,121
METHOD OF OPERATING A DROP GENERATOR THAT INCLUDES THE STEP OF PRE-PRESSURIZING THE LIQUID MANIFOLD

Leonard G. Stoneburner, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Aug. 4, 1972, Ser. No. 277,998

Int. Cl. B87b *7/00*

U.S. Cl. 222—1 **10 Claims**



1. A method of commencing operation of a drop generator which includes orifice defining means and a manifold communicating with said orifice defining means for providing a supply of liquid coating material thereto comprising:

a. pressurizing said manifold with a gas to a pressure above the coating pressure necessary to cause said coating material to be ejected from said orifice defining means as a free standing filament which forms a series of discrete drops, and

b. thereafter introducing said coating material into said manifold at a pressure no less than said coating pressure.

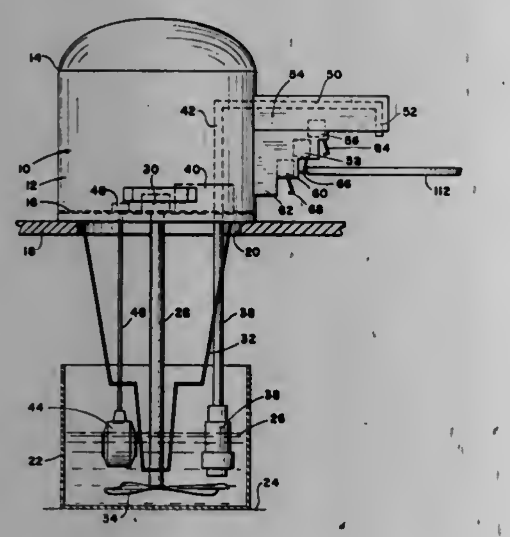
3,891,122
AUTOMATIC FLUID DISPENSING APPARATUS

Archie V. Paranto, Dallas, Tex., assignor to Barco International Corporation of Texas, Dallas, Tex.

Filed Dec. 2, 1969, Ser. No. 881,521

Int. Cl. B67d *5/30*

U.S. Cl. 222—17 **6 Claims**



1. An automatic fluid dispensing apparatus comprising a housing disposed in substantial alignment with a stationary fluid reservoir, a rotatable shaft carried by the housing and extending into the fluid reservoir, power means provided in the housing and operably connected with the shaft for continuous rotation thereof during operation of the apparatus, an impeller provided on the outer end of the rotatable shaft and disposed in the proximity of the bottom of the fluid reservoir for agitating the fluid therein to maintain a substantially homogeneous solution, pump means disposed within the fluid reservoir and open to the fluid therein, power means provided in the housing and operably connected with the pump for selective intermittent actuation thereof, discharge conduit means connected with the pump for delivery of the fluid from the reservoir for dispensing thereof, control means operably connected with the pump power means for intermittent operation thereof in predetermined time cycles for the dispensing of predetermined quantities of the fluid from the discharge conduit means, selective switching means carried by the housing and operably connected with the control means for selectively timed operation thereof whereby a variable preselected quantity of fluid is automatically dispensed through the discharge conduit in accordance with the desired quantity of fluid required.

3,891,123
AUTOMATIC FLUID DISPENSING SYSTEM

Donald Blackburn, 21 Gale Ave., Apt. 436, Toronto, Ontario, Canada

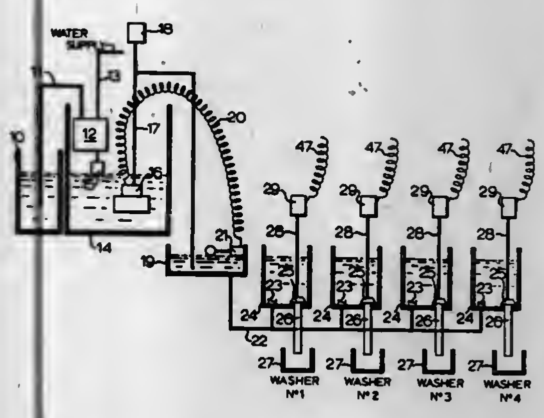
Continuation of Ser. No. 237,373, March 23, 1972, abandoned. This application Nov. 27, 1973, Ser. No. 419,476

Int. Cl. B67d *5/14*

U.S. Cl. 222—64 **10 Claims**

1. A system for supplying metered quantities of a liquid to a plurality of receiving stations including:

- a source of liquid including a holding reservoir;
- a head tank, said head tank having an inlet connected to said holding reservoir;
- inlet control means for maintaining a predetermined level of liquid in said head tank;
- means to insure that said head tank fills only to the predetermined level when the liquid is supplied to said head tank irrespective of the head pressure of the liquid in said holding reservoir;
- said insuring means including:
  - pump means to transfer liquid from said holding reservoir to said head tank;
  - and means to prevent siphoning of liquid from said holding reservoir to said head tank when said pump means is inactive;
- said inlet control means including means to terminate said pump means when the level in said head tank reaches the predetermined level;
- a plurality of dispensing tanks;
- means connecting each of said dispensing tanks to said head tank to cause the liquid in each of said dispensing tanks to be at the same level as the level of said head tank, each of said dispensing tanks having a predetermined volume of liquid therein in accordance with the size of said dispensing tank and the level of liquid therein;
- separate check valve means cooperating with each of said dispensing tanks to prevent back flow of the liquid from any of said dispensing tanks while allowing said head tank to communicate therewith through said connecting means;
- individual conduit means connecting each of said dispensing tanks with one of the receiving stations to allow gravity flow of the liquid from said dispensing tank to the receiving station;
- separate means to control the flow of liquid through each of said individual conduit means to each of the receiving stations;
- and means to activate each of said separate control means when the liquid is to be supplied to the receiving station to which said separate control means controls flow of the liquid, said activating means activating each of said separate control means for a sufficient period of time to allow the predetermined volume of liquid within said dispensing tank to flow by gravity through said individual conduit means to the receiving station to which said separate control means controls flow of the liquid from said dispensing tank.



3,891,124
MEANS FOR STORING AND DISPENSING HEATED LIQUID WITH EXPANSION CHAMBER MODULE AND SYSTEM THEREFOR

Richard C. Dreibelbis, Fair Lawn, N.J., assignor to Emerson Electric Co., Cedar Grove, N.J.

Filed Aug. 16, 1974, Ser. No. 498,073

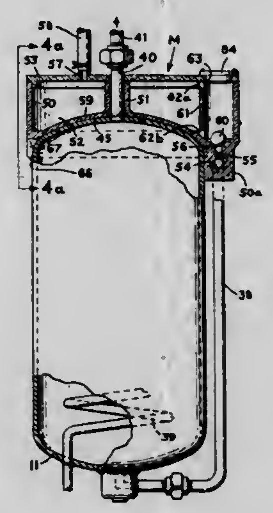
Int. Cl. B67d *5/62;* **F24h** *1/20*

U.S. Cl. 222—66 **19 Claims**

1. An expansion module made for use in a liquid heating and dispensing system operating at atmospheric pressure comprising:

- a. means forming an expansion chamber for accumulating expansion and backflow liquid from the heating and dispensing system,
- b. a combined overflow and vent means on said expansion module communicating at one end with said expansion chamber and at the end remote therefrom open to atmosphere,

- c. outlet port means disposed at the lower section of the expansion module communicating at one end with the expansion chamber,
- d. aspirator means on said expansion module communicating with the other end of said port means, and having an inlet, and an outlet,
- e. said aspirator means having said inlet and outlet operatively connected to the heating and dispensing system



whereby on dispensing of heated liquid from the system the aspirator means will withdraw collected expansion and backflow liquid from the expansion chamber, and
- f. outflow cut-off means responsive to the level of collected liquid in the expansion chamber operative to close the outlet port means when the level of the liquid in the expansion chamber drops to a predetermined minimum level.

3,891,125
DEVICE FOR STORING TWO PRODUCTS SEPARATELY AND SUBSEQUENTLY MIXING THEM

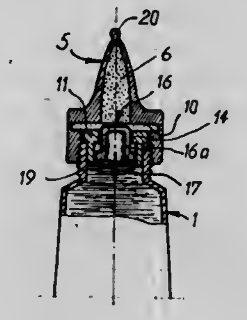
Bruno Morane, and Jean Louis Gueret, both of Paris, France, assignors to Societe Anonyne dite: L'Oreal, Paris, France

Filed Dec. 20, 1973, Ser. No. 426,689

Claims priority, application France, Dec. 28, 1972, 72.46588

Int. Cl. B65d *1/04*

U.S. Cl. 222—129 **11 Claims**



1. Device for storing and dispensing a misture of a first product and at least one additional product, said device comprising:

- a container for holding said first product, said container being provided with a neck,
- a hollow spout-shaped dispensing cap defining a recess for holding said at least one additional product, said cap being provided at one end with a skirt adapted to fit onto the outside of said neck, with an annular surface between said skirt and the edge of said recess, and with integral means at its other end adapted to create a dispensing orifice when removed from said cap,
- a capsule which acts as a closure for said recess when said capsule is located therein, said capsule having a first end which is a force fit in said recess and a second end provided with a supporting flange which projects radially outward therefrom,
- a cup having sides adapted to be received in said neck and a bottom defining an opening through which said first end of said capsule projects into said recess, so that the bottom of said cup is gripped between the supporting flange on said capsule and the annular surface on said cap,
- the outer diameter of said capsule being less than that of the opening in the bottom of said cup so that said capsule is slidable with respect to said opening and the outer diameter of said supporting flange being greater than the diameter of the opening in the bottom of the cup but less than the inner diameter of the sides of the cup, and
- means for frictionally retaining the sides of said cup in the neck of said container, whereby when said cap is moved away from said container along said neck said capsule is prevented by said flanges from being removed with said cap, but is instead separated from said cap so as to be free to fall into said container.

3,891,126
INJECTION CYLINDERS OF DIE CAST MACHINES

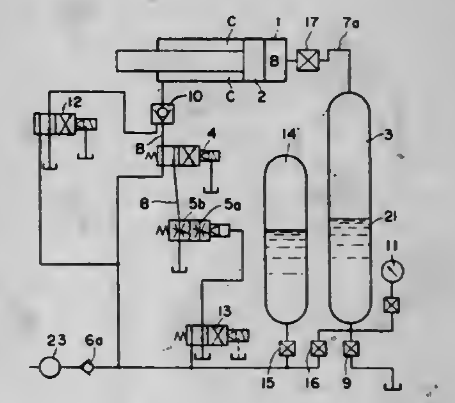
Kazuyoshi Segawa, Tokyo, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1973, Ser. No. 412,548

Claims priority, application Japan, Nov. 14, 1972, 47-114482

Int. Cl. B22d *17/04*

U.S. Cl. 222—334 **6 Claims**



1. In an injection cylinder of a die cast machine of the class wherein the piston of the cylinder is moved in forward and rearward directions by admitting and discharging pressurized fluid into and out of said cylinder, the improvement which comprises a gas accumulator containing pressurized gas and a predetermined quantity of liquid, said predetermined quantity of liquid being used for adjusting the pressure of the gas contained in said accumulator, said gas accumulator having substantially larger volume than said cylinder, a flow control valve connected between said cylinder and said gas accumulator for admitting said gas into said cylinder thereby moving said piston in the forward direction by the expansion of said pressurized gas for performing die casting, a source of pressurized liquid, means operatively coupled for admitting said pressurized liquid into said cylinder on the opposite side of said piston to move the same in the rearward direction thereby compressing the gas in said gas accumulator, and means operatively coupled for controlling the flow rate of said pressurized liquid while the liquid is discharged from said cylinder when said piston is moved in the forward direction.

3,891,127

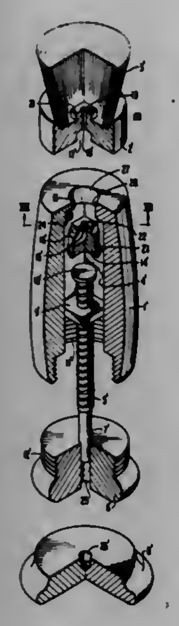
MATERIAL APPLYING DISPENSER HAVING SCREW ACTUATED FEED

Alberto Fernandez, and Eduardo Quintero, both of Carrera 5 No. 15-11, Bogota, Colombia

Filed Dec. 4, 1973, Ser. No. 421,725

Int. Cl. B67d *5/42*

U.S. Cl. 222—387 **1 Claim**



1. The construction of a device for dispensing and applying paste material, comprising:

a. a handle portion having a hollow chamber polygonal in cross-sectional area axially arranged along said handle, said chamber having a narrower axial cylindrical opening in its front end so defining a circumferential shouldered portion on said chamber, being it provided through said shoulder portion an angular passage with a leg thereof rearwardly opening into said chamber and with its other leg laterally opening toward said narrower cylindrical opening;

b. a coupling member having a polygonal hub portion at its front end, which coupling member is lodged and rotably retained within said narrower cylindrical opening, with said polygonal hub portion protruding from the front end surface of said handle portion, an angular passage being provided through said coupling member, with said angular passage being formed with an axially directed leg and the other leg thereof laterally opens at the same plane as does it the laterally opening leg of said passage provided through said shouldered portion;

c. a head portion for applying paste material having an axially arranged passage therethrough, the underside of which head portion is provided with a polygonal recess into which is push fitted said polygonal hub in said coupler member for rotably coupling said head portion on the front surface of said handle portion;

d. a worm screw axially housed within said polygonal cross-sectional chamber, the rear end portion of said worm screw being rotably supported through a central opening in said cap member and with its exposed end being provided with an engaged element preventing the backward sliding of said worm screw and which allows the rotation thereof; and

e. a plunger member, having correspondingly polygonal perimeter, being centrally and threadably mounted on said worm screw for travelling therealong in running fit along the inner side walls of said chamber, with the forward stroke of said plunger member being limited by a stop means fixedly provided on the front end of said screw.

3,891,128

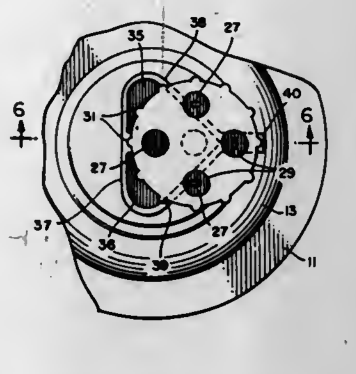
ACTUATOR FOR AEROSOL CAN VALVE

Thomas J. Smrt, 31 W. 300 W. Bartlett Rd., Bartlett, Ill. 60103

Continuation-in-part of Ser. No. 193,433, Oct. 28, 1971, Pat. No. 3,817,429, which is a continuation-in-part of Ser. No. 152,903, June 14, 1971, abandoned, which is a continuation-in-part of Ser. No. 118,351, Feb. 24, 1971, Pat. No. 3,700,144. This application Aug. 29, 1973, Ser. No. 392,618. The portion of the term of this patent subsequent to June 18, 1991 has been disclaimed.

Int. Cl. B65d *83/14*

U.S. Cl. 222—402.17 **3 Claims**



1. An actuator for an aerosol can valve comprising a base portion and an orifice portion, the base portion having a pair of ends and a bore extending therethrough from one end to the other, the orifice portion having a plurality of rectangular spraying orifices of various sizes and being rotatably mounted on one end of the base portion for rotation about an axis extending parallel to the bore at said one end, the spacing between the spraying orifices and the axis of rotation being substantially the same as the spacing between the bore at said one end and the axis of rotation whereby the spraying orifices can be selectively aligned with the bore at said one end, the base portion haivng a flat aligning side surface adapted to be engaged with aligning means of a spray apparatus for rotating the actuator on the aerosol can valve when the flat aligning side surface of the base portion is engaged with the aligning means of the spray apparatus, each of the rectangular spraying orifices having a long dimension extending tangentially to an arc drawn with respect to the axis of rotation of the orifice portion, the flat side surface of the base portion extending parallel to the long dimension of the spraying slot which is aligned with the bore and parallel to the axis of the bore at said one end whereby the long dimension of the spraying orifice which is aligned with the bore may be aligned with respect to the spraying apparatus by engaging the aligning means of the spraying apparatus with the flat side surface of the base portion.

3,891,129

PROCESS FOR FOLDING SHIRTS OR SIMILAR ARTICLES OF CLOTHING

Heinrich Knappe, Eidinghausen; Karl Heinz Notle, Vlotho, and Reinhold Kempelmann, Bad Salzuflen, all of Germany, assignors to Herbert Kannegiesser Kommanditgesellschaft, Vlotho/Weser, Germany

Filed Nov. 5, 1974, Ser. No. 521,120

Claims priority, application Germany, Nov. 10, 1973, 2356262

Int. Cl. A41h *33/00*

U.S. Cl. 223—37 **1 Claim**

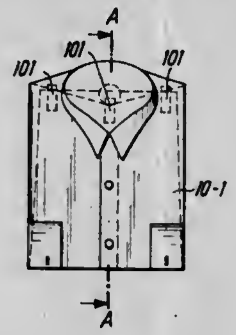
1. A process for folding shirts or similar articles of clothing for packing wherein the shirt is placed front down on a table, comprising the steps of:

a. placing a rigid insert on the back of the shirt adjacent the neck portion of the shirt, said insert having at least one opening therethrough;

b. folding said shirt longitudinally about said insert such that the shoulder portions of said shirt are adjacent to the opening through said insert;

c. inserting a first clip through said opening in said insert and over said shoulder portions so as to retain said shoulder portions in position with respect to said insert;

d. folding said shirt transversely such that a lower portion of said shirt overlies said shoulder portions; and



e. inserting at least a second clip over said lower portion and said shoulder portions of said shirt to retain the lower portion in its folded position.

3,891,130

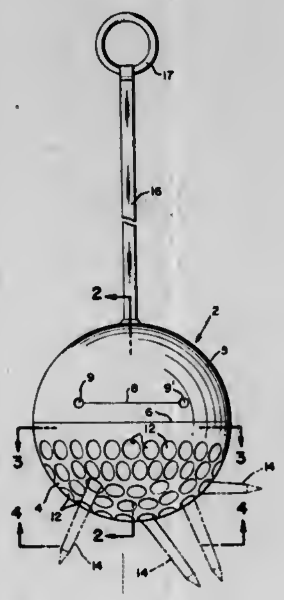
GOLF TEE CARRYING AND DISPENSING DEVICE

Edward N. Brennan, 1490 Windsor Dr., Thousand Oaks, Calif. 91360

Filed Aug. 2, 1973, Ser. No. 384,983

Int. Cl. A45c *1/04*

U.S. Cl. 224—5 C **4 Claims**



3. A golf tee carrier and dispensing device comprising:

a. a body fabricated in spherical form from a deformable plastic material and having a hollow interior defined by a resiliently deformable wall;

b. means formed in said wall adapted to selectively provide an opening into the interior of said hollow body;

c. a multiplicity of apertures formed in said wall through each of which the shank of a golf tee may freely project; and

d. means secured to said hollow body for suspending the carrier and dispensing device.

3,891,131

DIVER'S HARNESS FOR COMPRESSED AIR TANK

Kazuo Tabata, 1-3-17, Higashi, Komagata, Sumida-Ku, Tokyo, Japan

Filed Apr. 24, 1973, Ser. No. 353,935

Int. Cl. A45f *3/10;* **B63c** *11/02*

U.S. Cl. 224—25 A **1 Claim**

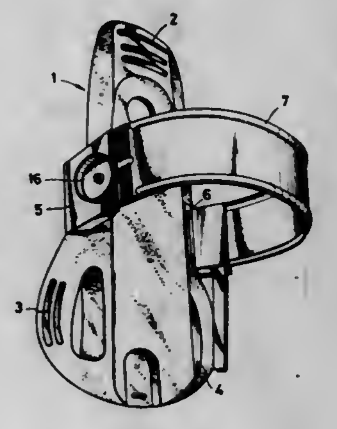
1. A diver's harness comprising in combination:

a substantially flat elongated vertically-oriented body having upper and lower portions, said upper and lower portions having a series of elongated holes therein which are adapted to receive a support-type belt member;

first and second connecting members, each of said first and second connecting members having a shape of the letter L and the horizontal part of each of the letters L-shaped connecting members being fixedly secured at approximately the medial point of said elongated body and the vertical part of each of the letters L-shaped connecting members being outwardly extended from said elongated body;

a C-shaped clamping member, one of the terminal ends of which being fixedly attached to said first L-shaped connecting member;

slot and bolt means adjustably connecting the other said terminal end of said C-shaped clamping member to said second L-shaped connecting member whereby compressed air tanks of various sizes may be selectively accomodated within the enclosure formed by the C-shaped clamping member and the median section of the elongated body;



said first L-shaped connecting member being provided with a supporting element; and

a lever means mounted on said supporting element and pivoting about a fixed point adjacent to said first L-shaped connecting member to selectively assist in attaining locked and unlocked conditions between said C-shaped clamping member and said elongated body, said C-shaped clamping member including a bent portion positioned between said lever means and the horizontal parts of said first L-shaped connecting member, said lever means having a circular arc portion on one end and a handle portion on the other end, said circular arc portion having a groove on the periphery thereof, said peripheral groove making a sliding contact with said supporting element and circular arc portion making camming contact with said bent portion to attain said locked condition.

3,891,132

APPARATUS FOR TRANSPORTING A BICYCLE ON A VEHICLE

Roy L. Chandler, Arlington, Tex., assignor to Red Ant Products, Inc., Mansfield, Tex.

Filed Jan. 29, 1973, Ser. No. 327,426

Int. Cl. B60r *9/10*

U.S. Cl. 224—42.03 B **6 Claims**

1. A bicycle carrier for transporting a bicycle at one end of a vehicle such as an automobile or truck or the like, comprising:

a. a bracket adapted to be mounted on a bumper at one end of the vehicle and to transfer generally vertical loads to the frame of the vehicle;

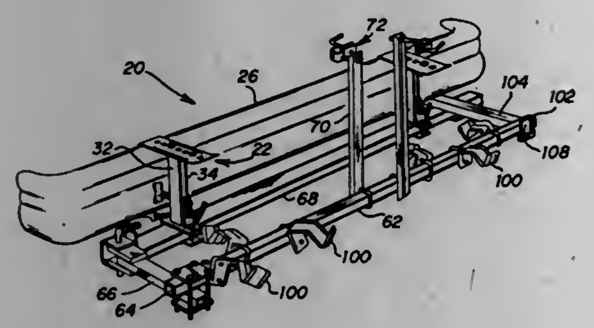
b. structural means including an elongated cantilevered rail for supporting the weight of the bicycle at least partially through the bicycle's wheels when the bicycle is in a normally erect position;

c. structural means for pivotally connecting the proximate end of the rail to the bracket, with the pivot axis being generally vertical such that the rail may be selectively swung outwardly away from the vehicle;

d. an upright post for rigid attachment to the rail at a selected position near the center of the rail;

e. a frame clamp;

f. means for mounting the frame clamp near the top of the upright post, including means for adjustably locating the clamp adjacent some portion of the bicycle frame when the bicycle is supported in an erect position over the rail, whereby at least part of the weight of the bicycle is adapted to be transferred from the wheels to the rail and



the frame clamp is adapted to maintain the bicycle erect;

g. generally horizontal support means adapted to be mounted on the bumper for supporting the distal end of the rail during transportation of the bicycle; and

h. means for adjusting the inclination of the axis of rotation of the rail with respect to the vehicle, whereby the distal end of the cantilevered rail can be selectively raised or lowered with respect to the support means to effect a desired distribution of the weight which is being transferred from the rail to respective portions of the bumper during transportation of the bicycle.

3,891,133

FASTENING ELEMENT FEED MECHANISM FOR AN EXPLOSION CHARGE-DRIVEN SETTING GUN

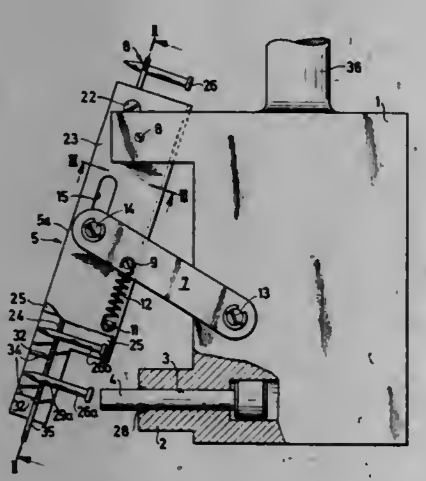
Elmar Maier, Feldkirch-Tsis, Austria; Robert Tilg, and Karl Walser, both of Schaan, Liechtenstein, assignors to Hilti Aktiengesellschaft, Liechtenstein

Filed July 30, 1973, Ser. No. 384,098

Claims priority, application Germany, Aug. 2, 1972, 2238105

Int. Cl. B25c *1/14*

U.S. Cl. 227—10 **14 Claims**



1. Explosive charge-driven setting gun for inserting fastening elements, such as bolts, nails and the like into a receiving material, preferably a hard material, including a gun body having a muzzle opening, driving means mounted within said gun body and displaceable through said muzzle opening from a driving position rearwardly of said muzzle opening for inserting fastening elements one at a time into the receiving material, a feed mechanism arranged for feeding a magazine containing spaced fastening elements so that the fastening elements are successively positioned in alignment with and within the muzzle opening in said gun body for insertion into the receiving material, wherein the improvement comprises means for pivotally connecting said feed mechanism to said gun body for pivotally displacing said feed mechanism relative to said gun body between a first position in which a fastening element is aligned with and extends into the muzzle opening and displaces said driving means into the driving position with the magazine extending perpendicularly to the axis of the muzzle opening and a second position pivotally displaced outwardly from the muzzle opening with the magazine extending at an oblique angle to the axis of the muzzle opening, said feed mechanism comprises a housing forming a guideway for directing the passage of the magazine therethrough, said feed mechanism includes means actuated by the pivotal movement of said feed mechanism for controlling the movement of the magazine and disposing the fastening elements through the feed mechanism into position for alignment with said muzzle opening so that one fastening element can be positioned within the muzzle opening, said means for controlling the movement of the magazine comprises a control element mounted in said housing and displaceably positionable within said guideway, said housing has an opening alignable with the muzzle opening in said gun body when said feed mechanism is in the first position so that a fastening element positioned within the muzzle opening and any parts of the magazine associated with the fastening element located within the muzzle opening can be displaced from said feed mechanism during the insertion operation.

3,891,134

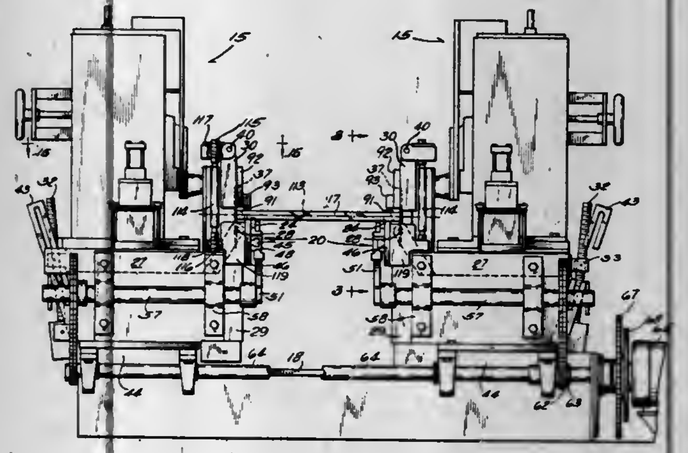
FURNITURE PIECE FABRICATING MACHINE

Henry W. Kratsch, Oshkosh, and Theodore W. Doehling, Larsen, both of Wis., assignors to Medslist Industries, Inc., Milwaukee, Wis.

Filed Nov. 21, 1973, Ser. No. 417,874

Int. Cl. B27f *4/00*

U.S. Cl. 227—14 **12 Claims**



1. In a furniture piece fabricating machine for setting a dowel in a workpiece to project substantially at a right angle from a cut surface thereof, said machine having a workpiece holder, a cutoff saw to cut said surface, a tool bed adjacent the workpiece and tilting mechanism by which the bed can be tilted to vary the path of approach of a tool on said bed to the workpiece, the improvement in said machine by which the approach path of the tool to the workpiece will intersect the cut face of the workpiece at substantially a right angle in any of a variety of tilt angles of said bed without requiring adjustment of the workpiece or tool after change in tilt angle, said improvement comprising both said cutoff saw and said tool being mounted on said bed to partake of tilt motion thereof, bed pivot means which defines a bed tilt axis disposed substantially in the plane of said saw whereby the said axis will also be disposed substantially in the plane of the cut surface of the workpiece, said tool having a path of approach to the workpiece substantially at a right angle to the plane of said saw whereby siad path will also be disposed substantially at a right angle to the cut surface of the workpiece.

3,891,135

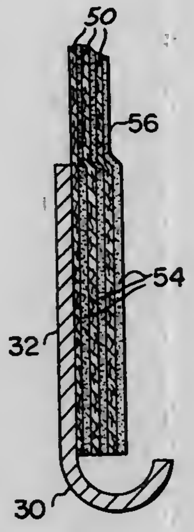
CONVOLUTE WOUND FIBRE DRUM WITH THERMOPLASTIC ADHESIVE

Richard R. Szatkowski, Western Springs, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Nov. 24, 1972, Ser. No. 309,561

Int. Cl.^{2} B65D *3/04, 3/22*

U.S. Cl. 229—4.5 **5 Claims**



1. In a fibre drum container having a tubular body member and a closure attached to at least one end by deformation of the tubular body member, the improvement comprising:

a. several plies of convolutely wound paperboard; and

b. a layer of thermoplastic adhering the plies of paperboard to one another, means for permitting deformation of the body member adjacent said one end without rupture of the paperboard, said means including said thermoplastic adjacent the deformed end having a greater elasticity than the remaining thermoplastic.

3,891,136

CONTAINER FOR ROLLED WEBS OF GOODS

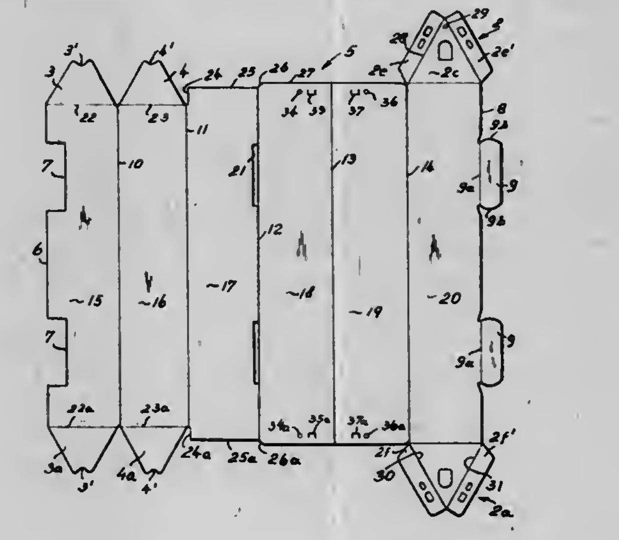
Dieter Woeste, Kestnerstrasse 42, 3 Hannover, Germany

Filed Jan. 23, 1974, Ser. No. 435,839

Claims priority, application Germany, Jan. 24, 1973, 2303240

Int. Cl. B65d *5/00*

U.S. Cl. 229—22 **10 Claims**



1. A tubular container for receiving and storing rolled-up paper webs, drawings, and similar material, which includes a one-piece web having parallel free end edges and being folded along substantially parallel folding lines into a rigid tubular container having an outer polygonal cross-sectional contour, said folding lines extending in the longitudinal direction of said tubular container and defining substantially parallel inner and outer wall strips therebetween while those ones of said folding lines which are closest to said free end edges define therewith end strips, one of said end strips having its free end edge provided with cut-out means and forming an inner wall of said container, and the other one of said end strips having its free end edge provided with tongue means, that one of said folding lines of said tubular container which is closest to said free end edge with said tongue means being provided with slot means aligned with said tongue means, said tongue means extending through said slot means and being located within said cut-out means.

3,891,137

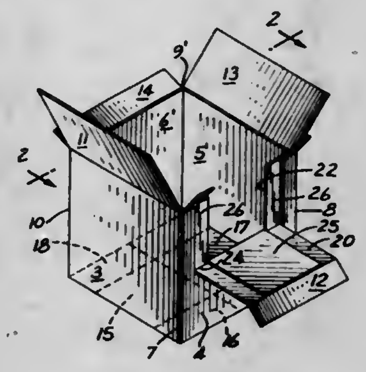
CORRUGATED CONTAINER HAVING ACCESS DOOR

Donald E. Ellison, Clayton, and Larry C. Davenport, Indianapolis, both of Ind., assignors to Inland Container Corporation, Indianapolis, Ind.

Filed May 11, 1973, Ser. No. 359,345

Int. Cl. B65d *5/66*

U.S. Cl. 229—44 R **5 Claims**



1. A fiberboard container of generally rectangular parallepiped shape comprising a unitary outer blank of corrugated fiberboard and a separate and distinct inner liner of corrugated fiberboard which is laminated to at least a major portion of the inner vertical surface area thereof, vertical score means dividing said outer blank into four sidewall panels, said inner liner having a vertical height substantially equal to that of said sidewall panels and being laminated to all four sidewall panels at locations flanking said vertical score means to contribute substantially to the stacking strength of the container, means in at least one of said sidewall panels defining a generally rectangular access door therein located with a first horizontal edge of said access door being colinear with the upper edge of said panel and with a second edge of said door being the horizontal line along which said door is hinged to the remainder of said outer blank, and an access opening being provided in said inner liner of narrower horizontal dimensions than the horizontal dimensions of said access door so that a positive stop is provided by said inner liner at both vertical edges of said access door.

3,891,138

MULTI-COMPARTMENT PACKAGE FOR REACTIVE COMPOSITIONS

Willi Glas, Renningen, Germany, assignor to Fr. Hesser Maschinenfabrik AG, Stuttgart-Bad Cannstatt, Germany

Filed Mar. 12, 1973, Ser. No. 340,471

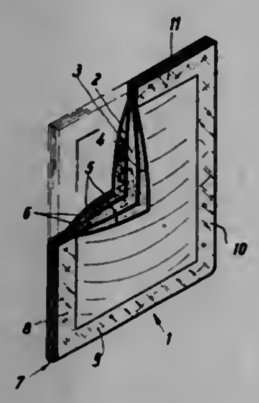
Claims priority, application Germany, Mar. 16, 1972, 7209949[U]

Int. Cl. B65d *31/12, 73/00, 77/00*

U.S. Cl. 229—56 **4 Claims**

1. A package for reactive multi-component compositions having a multi-layer sandwich-like construction composed of a first heat seal responsive packaging material initially folded lengthwise substantially in V-shape form, a second heat seal responsive material constituting a dividing wall also initially folded lengthwise in substantially V-shape form and disposed in substantially parallel relationship within the opening of the first packaging material;

- a continuous first seal extending all along the fold line to bond or adhere together the adjacent surfaces at said fold line of the first and second flexible material;
- a continuous second and third seal extending substantially at right angle to the first seal and axially spaced relative to each other joining at one end said first seal;
- and a continuous fourth seal extending substantially vertically spaced parallel to said first seal and between and connecting to said second and third seal, all of said seals



being of substantially identical construction and located as a margin along the periphery of the package; each of the packaging material surfaces facing each other establishing, except for the seal areas, a non-adhesive relationship to provide three separate and sealed compartments each for containing a dissimilar reacting material.

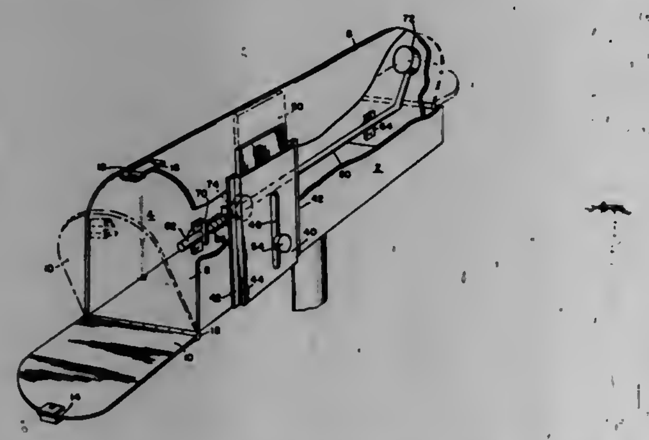
3,891,139

MAILBOX APPARATUS

Anthony E. Redling, 1727 Kalakava Ave., Apt. A-4, Honolulu, Hawaii 96814

Filed Jan. 30, 1974, Ser. No. 437,806
Int. Cl.^{2} B65B ***91/00***

U.S. Cl. 232—35 **10 Claims**



1. Mailbox apparatus having an elongated enclosure formed by a base and a mounting means connected to the base, parallel side walls extending upward from the base, a top connecting the parallel side walls, an imperforate rear wall rearwardly connected to the base, the parallel side walls and the top, a door mounting means connected to the mailbox apparatus and a door connected to the door mounting means for selectively opening and closing the mailbox, an indicator mounting means connected externally to the mailbox, and a indicator connected to the indicator mounting means for moving between positions indicative of state of contents of the mailbox apparatus, wherein the improvement comprises actuator means mounted for movement in the mailbox apparatus, directional means connected to the actuator means for urging the actuator means in a single direction, stop means connected to the actuator means for limiting permissive movement of the actuator means, magnet means connected to the actuator means and positioned in the mailbox apparatus for movements between a first position opposite the indicator means, and a second position remote from the indicator means, for holding the indicator means when the magnet means is in the first position and for releasing the indicator means when the magnet means is in the second position, wherein the indicator means is constructed of a magnetic material and wherein a remainder of the mailbox apparatus is constructed of a non-magnetic opaque material.

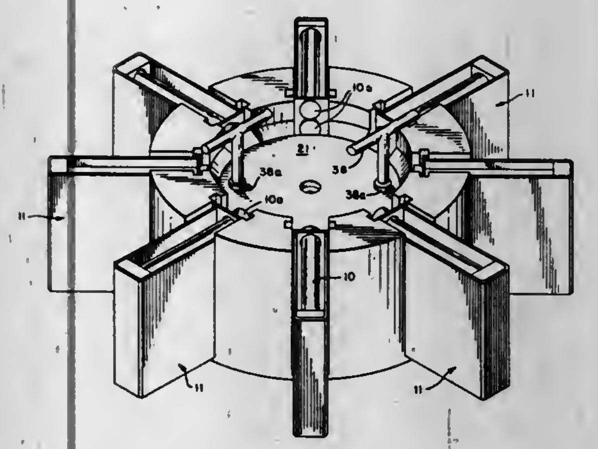
3,891,140

CENTRIFUGE

Waldemar A. Ayres, Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Feb. 27, 1974, Ser. No. 446,369
Int. Cl.^{2} B04B ***5/00***

U.S. Cl. 233—26 **7 Claims**



1. A centrifuge for liquid separator tubes comprising:
drive means,
a rotatable member mounted on the drive means,
said rotatable member having an even numbered plurality of uniformly spaced supports around the periphery of the rotatable member with opposite supports equidistant from the axis of the drive means,
a rack adapted to hold a plurality of separator tubes spaced from each other,
said rack having means to mount the rack in the said supports of the rotatable member in an attitude normal to the said axis, and
means to secure the racks in the supports,
said rack comprising:

- a. a pair of vertical side members spaced from each other by a distance greater than the diameter of said separator tubes and having a height less than the height of said separator tubes;
- b. a base member connecting the said side members and adapted to support the separator tubes during loading, unloading and centrifugation;
- c. a longitudinal guide member spaced from the base member and supported by the side members and adapted to evenly space the bottoms of the separator tubes; and
- d. a top rack member having a series of holes larger than the separator tubes and adapted to space said tubes;
- e. said top rack member being secured to bent over edge portions of said vertical side members to form a pair of flanges adapted to fit into cooperating slots in the said supports of the rotatable member and retain the rack in the rotatable member.

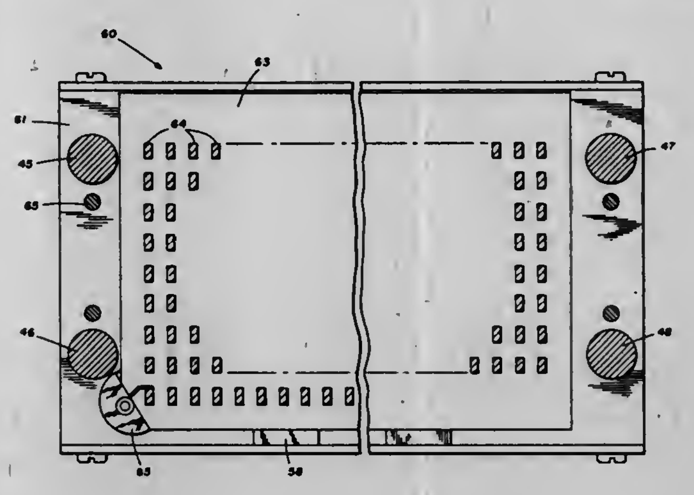
3,891,141

METHOD OF SEVERING CORNERS AND PUNCHING CARDS

Cothburn M. O'Neal, Dallas, and Alfred M. Mayo, Richardson, both of Tex., assignors to Riverside Press, Inc., Dallas, Tex.

Division of Ser. No. 309,192, Nov. 24, 1972. This application July 31, 1974, Ser. No. 493,214
Int. Cl. G06k ***1/02***

U.S. Cl. 234—1 **4 Claims**



1. The method of marking a data processing card in a machine having marking means associated therewith, said method comprising:
inserting the card into said marking means,
marking said card in a predetermined pattern to record the selected information thereon,
simultaneously marking the card with a coded pattern identifying the machine performing the marking operation,
severing a corner during the marking operation thereby establishing the proper orientation of said card for subsequent processing.

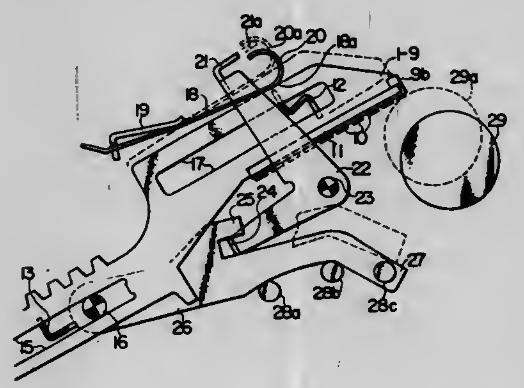
3,891,142

DEVICE FOR CALCULATING MACHINES WHEREIN THE PLATEN IS TAPPED AGAINST THE TYPES, TO ALLOW FOR AN UNIFORM IMPRESSION THEREOF

Gian Piero Barozzi, and Giancarlo Horeschi, both of Crema, Italy, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Dec. 28, 1973, Ser. No. 429,473
Claims priority, application Italy, Dec. 29, 1972, 33842/72
Int. Cl. G06c ***11/04***

U.S. Cl. 235—58 P **5 Claims**



1. A recording device for a calculating machine or the like in which a paper supporting platen is tapped against types, comprising:-

- a. a platen for supporting paper;
- b. a plurality of type carriers each mounted to be movable stepwise in relation to the platen to set individual ciphers carried by the type carriers in an impressing position relative to the platen, each type carrier being displaceable in a plane perpendicular to the axis of the platen;
- c. a plurality of resilient members associated respectively with the type carriers and urging the type carriers towards the platen, the resilient members each having a first operative condition in which the force urging the type carrier associated therewith towards the platen is greater than when the resilient member is in a second operative condition thereof;
- d. means operative when the resilient members are all in their second operative condition to suppress each cipher to the left of the leftmost significant cipher by displacing the type carriers carrying those ciphers away from the platen against the force of the resilient members associated with those type carriers; and
- e. a rigid member movable to a position in which it engages those resilient members which are associated with type carriers carrying the leftmost significant cipher and ciphers to the right thereof to place those resilient members in their first operative condition while leaving the resilient members associated with the type carriers carrying suppressed ciphers in their second operative condition.

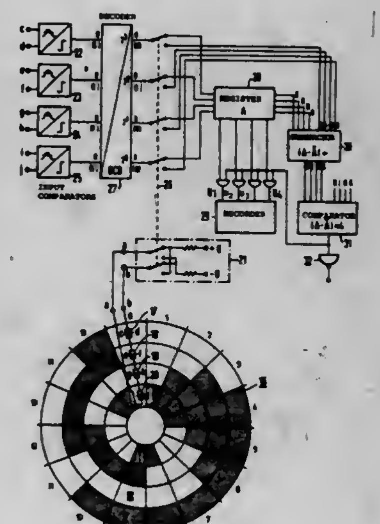
3,891,143

ENCODING APPARATUS HAVING AN IMPROVED CODE PERMITTING ERROR READING AND ERROR DETECTION

Jochen Haeusler, Nurnberg-Laufamholz, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 4, 1973, Ser. No. 421,683
Claims priority, application Germany, Dec. 27, 1972, 2263619
Int. Cl. G06k ***5/00;*** **G06f** ***11/08;*** **G08c** ***9/04***

U.S. Cl. 235—61.7 R **4 Claims**



1. Improved encoding apparatus which provides for error free reading and error detecting comprising:

- a. an index carrier having a plurality of coded tracks thereon;
- b. a plurality of pick-up elements arranged in a row adjacent said tracks;
- c. means for storing a representation of the reading detected by said pick up elements;
- d. means for obtaining the inverse of said reading;
- e. means for determining the absolute value of the difference between said reading and said inverse;
- f. means for comparing said absolute value with a constant value equal to the number of said plurality of tracks and to provide an output indicating whether or not said absolute value is equal to said constant value; and

g. the code on said index carrier being such that for each position the absolute value of the difference between the number represented by a direct reading of said code and its inverse is equal to said constant.

3,891,144

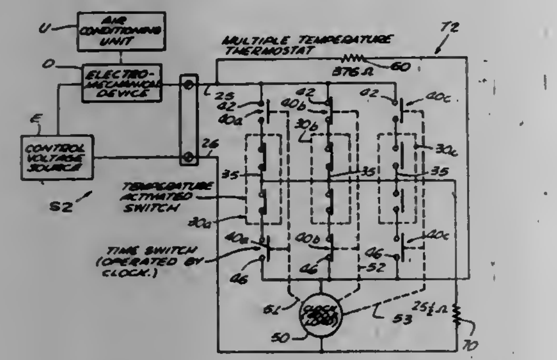
CLOCK CONTROLLED THERMOSTAT

Keith A. Sadler, 1505 Del Gado Dr., Sherman Oaks, Calif. 91403, and Ralph E. Phillips, Jr., 9154 Janice Pl., Beverly Hills, Calif. 90210

Division of Ser. No. 366,584, June 4, 1973, Pat. No. 3,825,872. This application Mar. 14, 1974, Ser. No. 451,006

Int. Cl. G05d *23/32*

U.S. Cl. 236—46 **4 Claims**


AIR CONDITIONING UNIT
ELECTRO-MECHANICAL DEVICE
CONTROL VOLTAGE SOURCE
MULTIPLE TEMPERATURE THERMOSTAT
376 Ω
TEMPERATURE ACTIVATED SWITCH
TIME SWITCH (OPERATED BY CLOCK)
72
60
25
42
40b
40c
52

1. An air conditioning system comprising:

an air conditioning unit;

a control voltage source;

an electromechanical device coupled to said air conditioning unit for selectively turning the same on or off, and having a pair of electrical connections; and

a temperature control device having a pair of electrical terminals coupled in a series loop with said voltage source and with said electrical connections of said electromechanical device;

said temperature control device including

a. multiple temperature-activated switches each of which is operable in response to a predetermined temperature level for turning said air conditioning unit on or off,

b. multiple time switch means operable for coupling a selected one of said temperature-activated switches across said terminals,

c. timing means coupled to said time switch means for selectively operating the same,

d. first resistor means coupled in a series loop with said timing means and said terminals when the selected temperature-activated switch is open, and

e. second resistor means coupled in parallel with said timing means between said terminals when the selected temperature-activated switch is closed.

3,891,145

HYDRAULIC TRACKING VALVE FOR TEMPLATES IN MACHINE TOOLS OR THE LIKE

Reiner Bartholomäus; Hubert Bernd, and Friedel Liedhegener, all of Lohr/Main, Germany, assignors to G. L. Rexroth GmbH, Lohr/Main, Germany

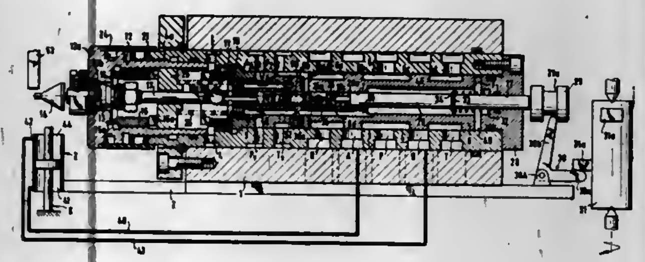
Filed July 26, 1973, Ser. No. 382,711

Claims priority, application Germany, July 27, 1972, 2236919

Int. Cl. F15b *13/042*; B23q *35/18*

U.S. Cl. 137—625.6 **2 Claims**

1. In a hydraulic tracking valve which controls the flow of a hydraulic fluid to and from a hydraulic motor, especially a motor which effects the movement of a tool-supporting carriage as a function of changes in the outline of a template, a combination comprising a housing; a main valve member reciprocably mounted in said housing and having a relatively large first radial surface and a relatively small second radial surface, said surfaces facing in opposite directions so that bodies of a pressurized fluid acting on said surfaces tend to move said main valve member in opposite directions and said second surface being under constant fluid pressure, said main valve member being further provided with an axial bore; a follower arranged to track the outline of a template; an axially movable pilot valve mounted in said axial bore of said main valve member and comprising a first end portion mechanically connected with said follower so as to be movable axially in first and second directions to thereby effect changes in fluid pressure acting against said first surface, said pilot valve member having a second end portion and fluid-regulating surfaces flanking a control chamber which communicates with a compartment provided in said housing adjacent to said first surface; adjustable resetting means for said pilot valve member coupled to said second end portion of the latter, said resetting means extending from said housing; and activating means for moving said pilot valve member by way of said resetting means.



3,891,146

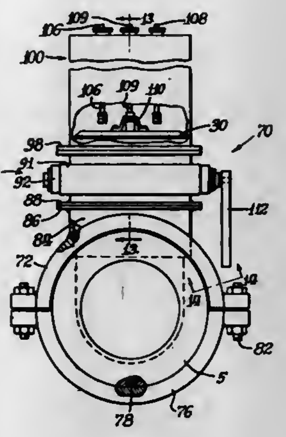
PIPELINE APPARATUS

George A. Blazek, Hinsdale, Ill., assignor to Advance Value Installations Inc., Hinsdale, Ill.

Filed Sept. 12, 1973, Ser. No. 396,510

Int. Cl. F16l *29/00*

U.S. Cl. 138—94.3 **12 Claims**



1. A fitting for a pressure pipe system, said fitting comprising a body having a flow passageway extending therethrough and having a slot thru the wall thereof for movement of a member into the body in a direction substantially at right angles to the flow passageway, a closure bar for closing the slot, means for releasably securing the bar in position closing the slot in the body, said body having a surface constituting a seat for an operating unit for performing mechanical operations within the fitting by access thereunto through the slot, said surface surrounding the slot and the closure bar and the bar securing means so that when the unit is on said surface and secured to the fitting the bar securing means may be released and together with the bar retracted from the slot while maintaining the fitting under pressure in the pipe system, to permit insertion or removal of such member by a movement thru the slot into or out of the body while the body is under pressure.

3,891,147

PROCESS FOR STORING A LIQUID FOR ITS DISTRIBUTION IN THE GASEOUS STATE

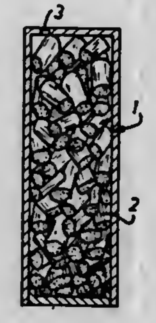
Jean Jacques Kleine, Letraz-Sevrier, France, assignor to S.T. Dupont, Paris, France

Division of Ser. No. 288,396, Sept. 12, 1972, Pat. No. 3,813,041. This application Jan. 10, 1974, Ser. No. 432,329

Claims priority, application France, Sept. 13, 1971, 71.32946; June 6, 1972, 72.20346

Int. Cl.^{2} A61L *9/04*

U.S. Cl. 239—6 **8 Claims**



1. A process for storing, in the liquid state, a liquefiable product with a view to its distribution in the gaseous state, into an atmosphere whose pressure is less than the storage pressure, said process comprising disposing in the storage enclosure, in conjunction with the liquid product to be distributed, a solid polymer with respect to which the liquid acts as a swelling solvent; said polymer being absorbative of the liquefied gas and having a limited solubility parameter with respect to said liquefied gas so as to undergo swelling and form a gel which releases the liquid only in gaseous state, said solubility parameter of the polymer differing at most from the liquified gas by ±2.0.

3,891,148

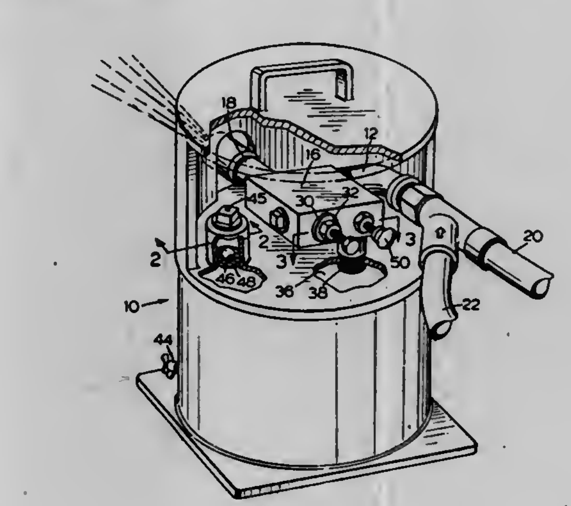
SPRAY DEVICE

Gilles Rousseau, North Bay, Canada, assignor to Patrick Harrison & Company Limited, Toronto, Canada

Filed Feb. 11, 1974, Ser. No. 441,360

Int. Cl. A01g *27/00*

U.S. Cl. 239—68 **7 Claims**



1. A device for spraying water with an automatic shut off comprising a body,

a nozzle,

a first passage through said body terminating at said nozzle through which water can be sprayed,

a piston free for movement in said first passage between an open position which permits flow through said first passage and a closed position which stops flow through said first passage,

said piston having a front end and a back end, said front end being adapted to enter said first passage to stop flow therethrough when it assumes a closed position as aforesaid,

a pressure chamber in said body in fluid communication with the back end of said piston,

said piston being responsive to a predetermined build up of fluid pressure in said pressure chamber to move from said open position to said closed position,

means responsive to the flow of water through said first passage to build up said predetermined pressure in said pressure chamber over a predetermined period of flow time.

3,891,149

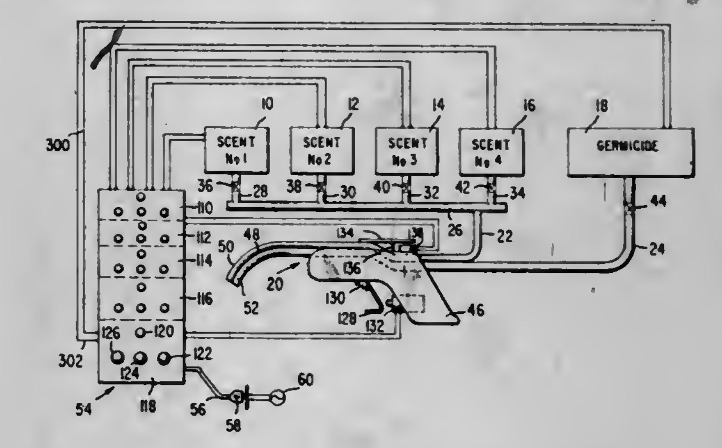
METHOD AND APPARATUS FOR SIMULTANEOUSLY DEODORIZING AND DISINFECTING THE INTERIORS OF VEHICLES

Louis Rendemonti, Point Pleasant Beach, N.J.

Continuation-in-part of Ser. No. 215,546, Jan. 5, 1972, abandoned. This application Sept. 18, 1973, Ser. No. 398,460

Int. Cl. B05b *1/16, 1/30, 7/02*

U.S. Cl. 239—70 **16 Claims**



1. Apparatus for dispersing fluid substances within a vehicle interior comprising:

a. a plurality of atomized fluid dispensing units;

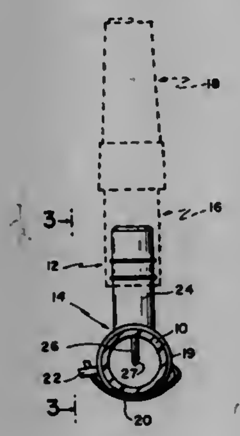
b. a plurality of electrical control units operatively connected with said atomized fluid dispensing units and comprising an electrical control panel;

c. each of said plurality of atomized fluid dispensing units being connected with one of each of said plurality of electrical control units; and

d. each of said electrical control units operable to actuate one of said plurality of fluid dispensing units in response to the closing of an included start switch and a simultaneous closing of a normally open switch mounted on a nozzle presented on a terminal end of an atomizing fluid supply conduit leading from said atomized fluid dispensing unit, one of said atomizing fluid dispensing units being connected with one nozzle, and a remaining plurality of the fluid dispensing units being connected with a second nozzle through a manifold common to all said remaining fluid dispensing units. said first and second nozzles being mounted together in a single structure having a pistol hand grip and formed of an arcuate configuration; e. a first switch actuator mounted on said nozzle structure and operable to close a circuit for actuating said one of said atomizing fluid dispenser units; and

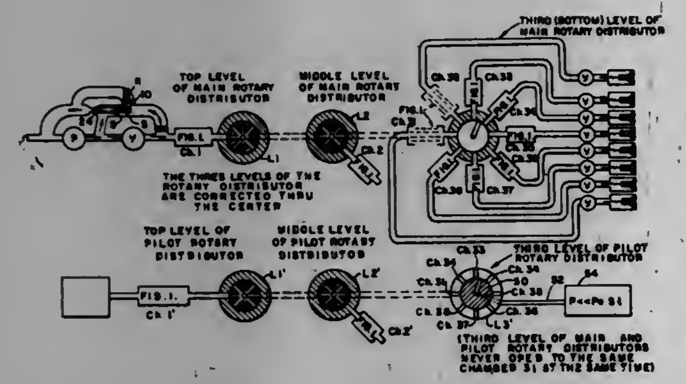
f. a second switch actuator mounted on said nozzle structure for closing an electrical circuit for actuating one unit of the remaining plurality of units to dispense an atomized fluid therefrom.

3,891,150
DRIP IRRIGATION DEVICE
John K. Hoff, Houston, and John B. Goss, Tomball, both of Tex., assignors to AG International, Houston, Tex.
Filed Apr. 29, 1974, Ser. No. 465,101
Int. Cl. A62c *23/06*
U.S. Cl. 239—272 **7 Claims**



1. An emitter apparatus for dispensing fluid from an irrigation system at a selected rate, including,
- a. a tubular emitter body cone having
  - 1. a hole in the wall of the emitter body cone allowing fluid to pass outwardly therethrough from the interior portion of the emitter body cone and
  - 2. At least one longitudinal groove on the exterior wall of the emitter body cone extending substantially the length of the emitter body cone and to the enclosed end of the emitter body cone, and
- b. a tubular emitter cap releasably secured to the emitter body cone for receiving the fluid from said emitter body cone, and, in conjunction with the groove of the emitter body cone, provides a volume restricting passageway.

3,891,151
PILOT INJECTION FUEL INJECTION PUMP
Merle Robert Showalter, 205 Robins Loop, Waco, Tex. 76705
Filed May 1, 1974, Ser. No. 466,036
Int. Cl. F02m *39/00*
U.S. Cl. 239—533 **7 Claims**

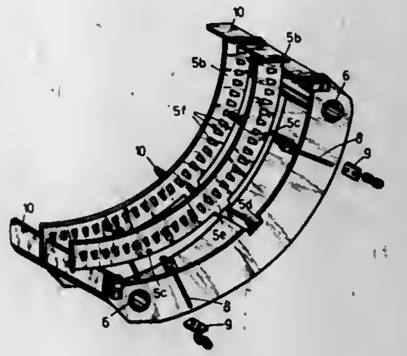

THIRD (BOTTOM) LEVEL OF MAIN ROTARY DISTRIBUTOR
TOP LEVEL OF MAIN ROTARY DISTRIBUTOR
MIDDLE LEVEL OF MAIN ROTARY DISTRIBUTOR
THE THREE LEVELS OF THE ROTARY DISTRIBUTOR ARE CONNECTED THRU THE CENTER
TOP LEVEL OF PILOT ROTARY DISTRIBUTOR
MIDDLE LEVEL OF PILOT ROTARY DISTRIBUTOR
THIRD LEVEL OF PILOT ROTARY DISTRIBUTOR
FIG. 1
Ch 1'
L1'
L2'
L3'
Ch 2'
30
32
34
(THIRD LEVEL OF MAIN AND PILOT ROTARY DISTRIBUTORS NEVER OPEN TO THE SAME CHAMBER 31 AT THE SAME TIME)

5. A timed, pulsed fuel injection system including a main injection system and a pilot injection system which injects fuel pulses through *n* lines L1, L2 ..., L*n* connected to *n* nozzles in a repeating sequence comprising:

means to inject main injection pulses through each of said *n* lines; and

wherein the pilot injection system comprises:
- a. pilot accumulator chambers (4) and (5);
- b. means to meter pressurized fuel flow continuously to pilot accumulator chamber (4);
- c. third switching means to open and close fluid flow between the pilot accumulator chambers (4) and (5) and a fourth switching means to open and close flow between pilot accumulator chamber (5) in succession to lines L1, L2, ...L*n*, where said third and fourth switching means open and close fluid contact between the chambers and lines in the sequence 4–5, 5–L1, 4–5, 5–L2, ...4–5, 5–Ln;
- d. where accumulator chambers (4) and (5) have a volume versus pressure function V_i (P_i) such that $dv_i/dp_i = 0$ if pressure p_i in chamber i is less than a set pressure p_{oi}, where dv_i/dp_i is large if $p_i > p_{oi}$ and where accumulator pressures p_{oi} are related so that $P_{o4} > P_{o5}$ and where p_{o5} is greater than the opening pressure of any of the *n* nozzles; and
- e. wherein said main injection system and said pilot injection system are timed so that chamber (5) is not in contact with a line Li when the main injection system is injecting fuel into said line Li.

3,891,152
GRATE BASKET FOR HAMMER CRUSHERS
Kurt Guggenheimer, Ennigerloh, Westphalia, Germany, assignor to Gebruder Hischmann Maschinenfabrik, Ennigerloh, Westphalia, Germany
Filed Aug. 8, 1973, Ser. No. 386,733
Claims priority, application Germany, Aug. 9, 1972, 2239099
Int. Cl. B02c *13/284*
U.S. Cl. 241—88.4 **8 Claims**

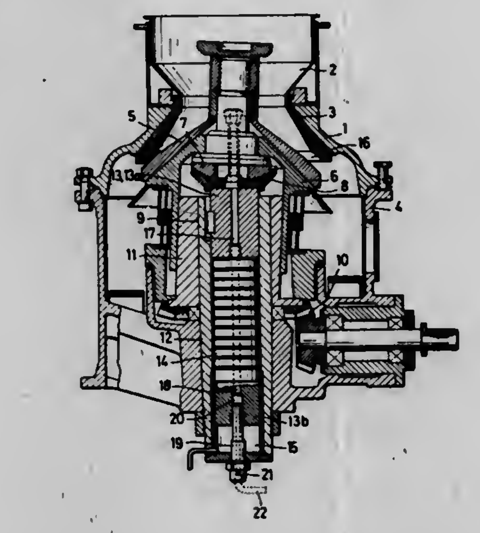


1. A grate basket for hammer crushers, which includes a rotor, at least two segmental members, each of said segmental members comprising a plurality of subdivided wall members arranged parallel and in spaced relationship to each other and being located coaxially with regard to said rotor, a plurality of grate bars extending substantially parallel to the axis of said rotor, connecting means extending in the axial direction of said grate basket and being exchangeably connected to said wall members, said subdivided wall members respectively comprising a base wall and bar carrier means, said connecting means supporting said base walls, and said grate bars being supported by said bar carrier means, and means for preventing said bar carrier means from moving in the circumferential direction of said rotor and from displacement in axial direction, said bar carrier means being readily interchangeable and detachably connected to said base walls.

3,891,153
LUBRICANT FEED MEANS FOR GYRATORY CRUSHERS
Hanns Decker; Heinz Hurtmanns, both of Cologne, and Helmut Stockmann, Wesseling, all of Germany, assignors to Klocker-Humboldt-Deutz, AG, Germany
Filed Dec. 29, 1970, Ser. No. 102,446
Claims priority, application Germany, Jan. 12, 1970, 2001073
Int. Cl. B02c *2/04*
U.S. Cl. 241—214 **1 Claim**

1. A gyratory crusher, comprising
- a. a housing having a feed opening at the top thereof,
- b. a crusher lining secured to said housing adjacent said top opening therein,

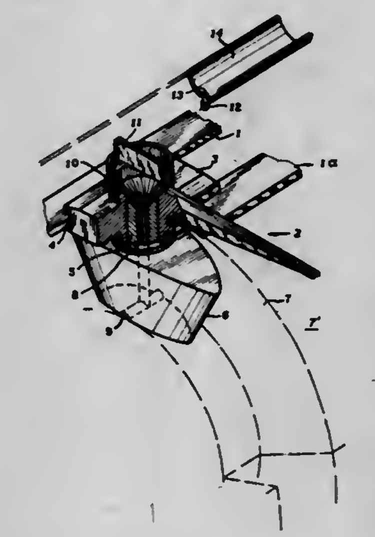
- c. a tubular support post stationarily mounted in an upright position within said housing and having a closed bottom end,
- d. a piston mounted in said tubular support post for movement axially thereof,
- e. a rotary crusher cone mounted on the upper end of said piston,
- f. a substantially dish-shaped friction bearing between said crusher cone and said upper end of the piston,
- g. eccentric means associated with said rotary crusher cone and support post to impart to said crusher cone a wobbling movement,



- h. means for supplying highly pressurized fluid to the variable size chamber formed by the bottom end of said piston and said closed bottom end portion of the support post to thereby control the size of the gap between the crusher lining and the crusher cone,
- i. a conduit extending axially through said piston from said friction bearing to the bottom end of the piston,
- j. a tubular member secured to the bottom closure of said support post and extending through said closure into said conduit in the piston in sealed slidable engagement with the wall of said conduit, and
- k. means for supplying low pressure lubrication fluid to the outer end of said tubular member and thereby to said friction bearing.

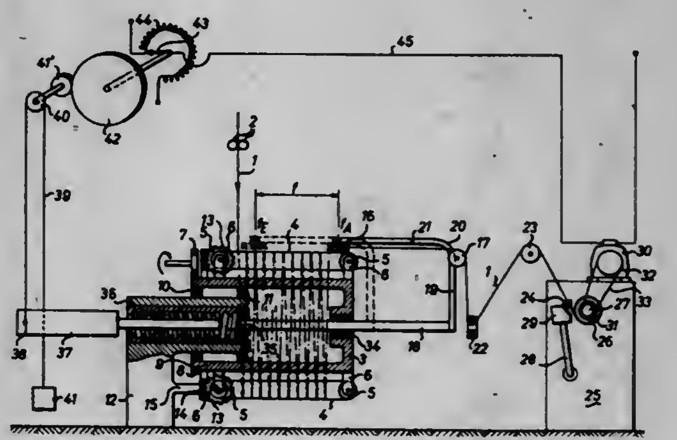
3,891,154
LUBRICATED YARN GUIDE FOR YARN SPOOLING MACHINE
Ernst Dietiker, Horgen, Switzerland, assignor to Maschinenfabrik Schweiter AG, Horgen, Switzerland
Filed Jan. 9, 1974, Ser. No. 431,929
Claims priority, application Switzerland, Feb. 1, 1973, 1438/73
Int. Cl. B65h *54/30*
U.S. Cl. 242—43 **7 Claims**

1. In yarn spooling traverse apparatus having yarn guide track means (1, 1*a*);
- a yarn guide track element (2, 3) movable along the guide means;
- means (7′) formed with a spiral track groove (7);
- and a rotatable follower (6) having one end engaged in the groove (7) and the other end connected to the guide element to move the guide element, upon rotation of the means (7′) formed with the groove (7) in a reciprocating traverse path;
- a lubrication system to lubricate the follower (6) in the groove (7) comprising
- a duct (8) formed in the follower (6) and extending through the follower and to the root of the spiral track groove (7); a lubricant supply (14) having a drip opening (13) therein of such dimension that lubricant drops will form thereat, and located adjacent the path of movement of the follower (6);



and drop strip-off means (11) located to move with the follower adjacent the end of the duct (8) remote from the groove (7) extending towards the drip opening, to strip off lubricant drops upon passage of the follower past the drip opening.

3,891,155
METHOD AND APPARATUS FOR CONTROLLING A WINDING DEVICE FOR A CONTINUOUSLY SUPPLIED FIBER SLIVER
Werner Naegeli, Winterthur, Switzerland, assignor to Pavena AG, Basel, Switzerland
Filed June 12, 1972, Ser. No. 262,028
Claims priority, application Switzerland, June 19, 1971, 9003/71
Int. Cl. B65h *59/38*
U.S. Cl. 242—45 **20 Claims**



1. A method of controlling the winding of a continuously supplied fiber sliver on a bobbin by a winding device wherein the winding phase is interrupted by a standstill phase of the winding device during a bobbin change, including the steps of:
- a. continuously building-up a fiber sliver reserve onto a moving drum surface from the continuously supplied fiber sliver without winding of the sliver during the standstill phase and moving said fiber sliver along the axis of the drum in the direction of said bobbin;
- b. controlling the tension of the fiber sliver during said standstill phase;
- c. reducing the built-up fiber sliver reserve during the winding phase; and
- d. controlling the winding tension during the winding phase as a function of the bobbin diameter and the rotational speed as a function of the reduction of the fiber sliver reserve.

3,891,156

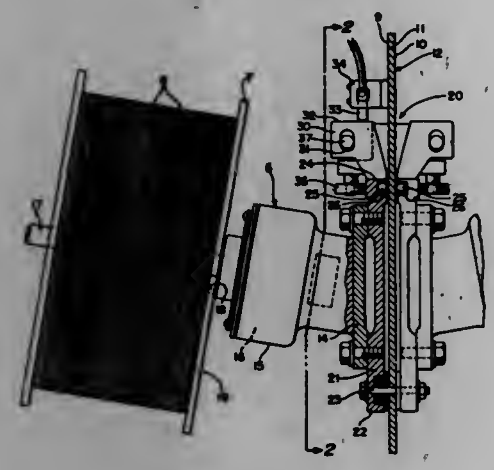
MECHANISM FOR DETECTING TRAPPED CORDS ON A CREEL

Edward E. Hunter, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 7, 1973, Ser. No. 395,330

Int. Cl. B65h *63/04, 59/04*

U.S. Cl. 242—54 R **22 Claims**



1. A mechanism for stopping rotation of a spool of cord on a creel when the cord paying out from the spool becomes trapped on the spool, comprising in combination:

- a. a support for the spool, including:
  - I. a rotatable pivot arm, and
  - II. a spindle carried by the pivot arm and having a longitudinal axis about which the spool rotates, the longitudinal axis of the spindle being angularly disposed to a vertical plane;
- aa. means for mounting the pivot arm for rotation in the direction which cord pays out from the spool, whereby the spool and spindle carried by the pivot arm, are displaceable from a position where the cord normally pays out from the spool;
- b. means for stopping rotation of the spool in response to displacement of the spindle and spool from the position where the cord normally pays out from the spool;
- c. a braking device carried by the support for producing an initial tension in the cord as it pays out from the spool; and
- d. means for exerting a predetermined, constant biasing force against the pivot arm to prevent displacement of the spindle and spool, until tension in the cord paying out from the spool reaches a predetermined level where it overcomes the effect of the constant biasing force against the support, the tension at said level being greater than the initial tension in the cord and lower than the tension required for breaking the cord.

3,891,157

SLITTING MECHANISM FOR WINDER

Edgar J. Justus, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

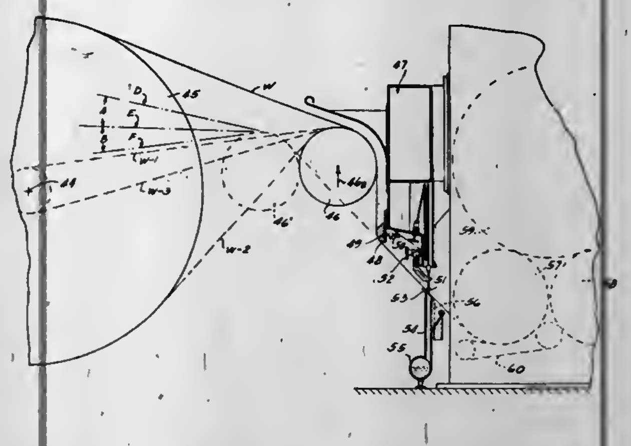
Filed June 4, 1973, Ser. No. 365,994

Int. Cl. B26f *3/00*

U.S. Cl. 242—56.2 **16 Claims**

1. A slitter winder for slitting and winding a web such as paper into a plurality of rolls comprising in combination:

- means suppling a traveling web;
- guide means for the web guiding it through a slitting zone;
  - a slitting means in the slitting zone having first and second jets on one side of the web for directing high velocity working fluid streams through the traveling web surface spaced laterally for removing a narrow kerf portion from the web to separate adjacent web strips;
- a winder positioned to receive and wind said strips into adjacent rolls;
  - and a receptacle means positioned on the opposite side of the web positioned for receiving the fluid of the jets and for receiving the narrow kerf portion removed from the web with the kerf carried toward the receptacle by the fluid streams.



3,891,158

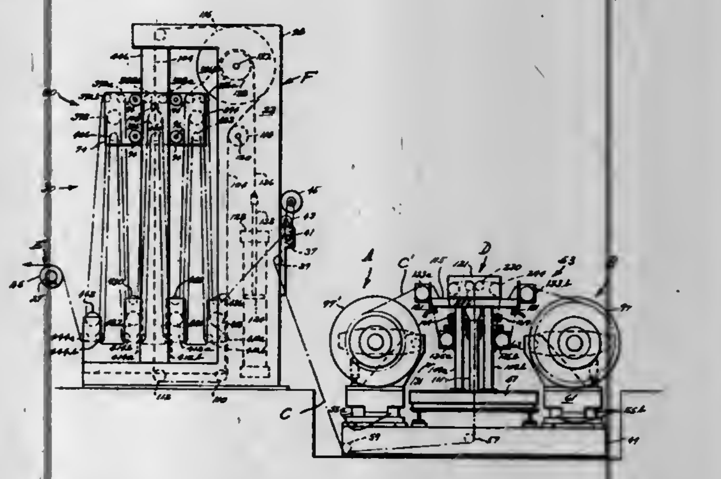
METHOD AND APPARATUS FOR SPLICING A STANDBY WEB TO A RUNNING WEB

Michael Hillas Shearon, Newark, Del., and Roland Leroy Besel, Lugoff, S.C., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed July 13, 1973, Ser. No. 378,968

Int. Cl. B65h *19/18*

U.S. Cl. 242—58.1 **13 Claims**



3. The method of claim 2 further comprising the step of maintaining the web speed substantially constant after said intermediate low value of web speed is reached until the web tail is grasped by the clamp means.

3,891,159

GUIDE ROLLER BIASING SHIM LINER

Norman E. Nelson, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 354,170, April 25, 1973, abandoned. This application Mar. 20, 1974, Ser. No. 452,725

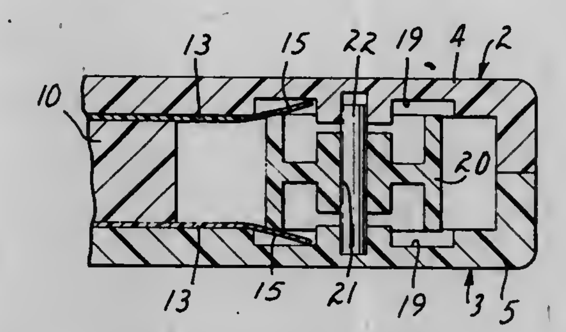
Int. Cl. G11b *23/10*

U.S. Cl. 242—199 **5 Claims**

1. A shim liner for a magnetic tape cassette having a case with spaced apart sidewalls, a pair of rotatable tape supporting spools, each journaled on cylindrical ribs at openings in said sidewalls, which sidewalls are formed with two pairs of opposed recessed areas, each pair adjacent one of said spools and positioned near one edge of the periphery of said case, and a tape guide roller rotatably mounted from the sidewalls at each pair of opposed recesses, which liner comprises:

- a resilient sheet positioned between the tape supporting spools and one of the sidewalls of said case and having a low friction surface facing said tape supporting spools,

said sheet having a pair of openings through which the ribs of said sidewalls protrude and a pair of integral, outwardly extending portions, each overlying at least part of one of the recessed areas of said sidewalls and extending between one end of one of said tape guide rollers and the sidewall at said recessed area for exerting a biasing force on said one of said rollers due to the resiliency of the sheet.



3,891,160

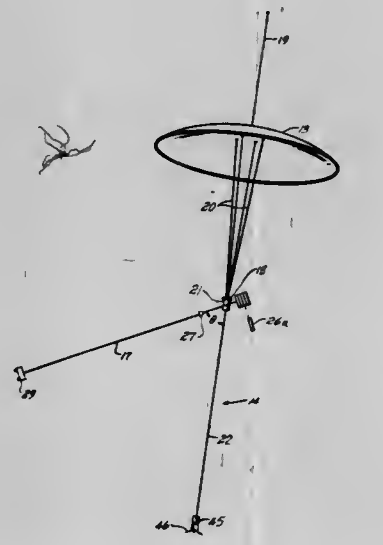
MICROWAVE POWERED REUSABLE ORBITING SPACE TUG

Michael A. Minovitch, 2832 St. George St., Los Angeles, Calif. 90027

Filed Mar. 21, 1973, Ser. No. 343,197

Int. Cl. B64g *1/00*

U.S. Cl. 244—1 SS **10 Claims**



1. A microwave powered reusable space tug comprising:

- a structural beam;
- means on one end of the structural beam for engaging and propelling another space vehicle;
- propulsion nozzle means on the structural beam for propelling the tug;
- an absorption chamber connected to the nozzle means;
- tank means on the structural beam for containing a propulsion fluid;
- means for conveying fluid from the tank means to the absorption chamber;
- a microwave antenna for receiving and concentrating a microwave beam;
- pivot means for interconnecting the antenna and the structural beam for pivoting about an axis transverse to the longitudinal axis of the beam and keeping the antenna pointed at the microwave beam independently of the direction of the propulsion nozzles; and
- wave guide means for conveying a concentrated microwave beam from the antenna focus through the pivot means to the absorption chamber for absorption by the propulsion fluid.

3,891,161

OPTICAL POSITION DETERMINING DEVICE FOR CONTROLLING A SPIN STABILIZED FLYING BODY

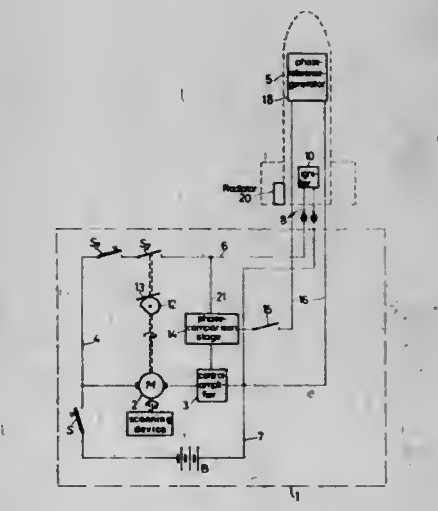
Joachim Hermann, Munich, Germany, assignor to Bolkow Gesellschaft mit beschrankter Haftung, Germany

Filed June 14, 1965, Ser. No. 464,270

Claims priority, application Germany, June 19, 1964, 77311

Int. Cl. F42b *15/04*

U.S. Cl. 244—3.12 **6 Claims**



1. In an optical position determining device controlling a spin stabilized flying body having electrical launch-initiating ignition means and a radiator to whose radiation the position determining device is responsive, the position determining device including an adjustable speed motor rotating its image field scanning means: apparatus for synchronizing the image field scanning with the spin of the flying body comprising, in combination, an ignition current circuit for said ignition means; switch means controlling closure of said circuit; and triggering means periodically operable by said motor at a rate corresponding to the motor speed, anad controlling said switch means in a manner such that said flying body, when launched, spins about its longitudinal axis with an angular velocity equal to that of said scanning means and with a predetermined phase relation to the latter.

3,891,162

DELAY DETONATOR WITH BY-PASS EXPLOSIVE BOLT SYSTEM

William G. Wolterman, Huntington Beach, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 4, 1974, Ser. No. 430,958

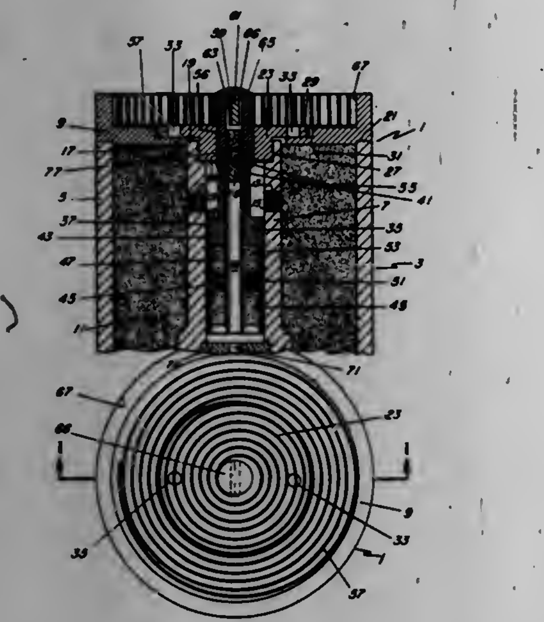
Int. Cl.^{2} F42B *25/10*

U.S. Cl. 244—3.25 **9 Claims**

1. In an explosive projectile comprising a hollow annular housing containing a main explosive charge and including an inner wall through which at least one explosive lead extends, a single igniting means and a dispensable element adapted to be separated from the projectile after it has performed its function but before the main explosive charge is exploded, a fuze comprising:

- A. a first firing train mounted within said inner wall and comprising combustible delay means and first explosive means interposed between and connecting said igniting means with said explosive lead, for initiating said main explosive charge at a predetermined time after ignition of said igniting means; and

B. a second firing train comprising second explosive means disposed adjacent to said dispensable element for separating said element from said projectile, and means connect-



ing said igniting means with said second explosive means for initiating the latter immediately after ignition of said igniting means.

3,891,163

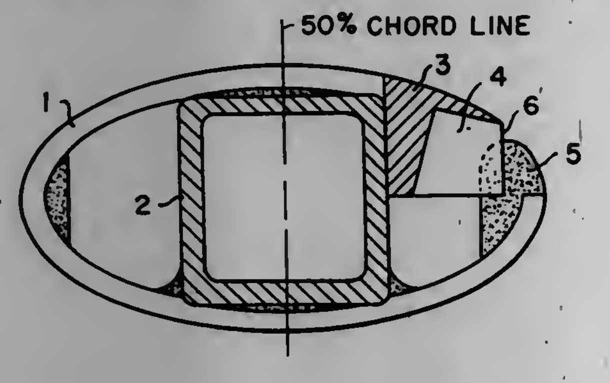
CIRCULATION CONTROL AIRFOIL

Joseph B. Wilkerson, Damascus, and Drew W. Linck, Gaithersburg, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 11, 1974, Ser. No. 460,004

Int. Cl. B64c *3/50*

U.S. Cl. 244—42 CD **1 Claim**



1. A circulation control airfoil comprising:

a longitudinal spar tapered in height, width, and wall thickness along its length to attain a tuned stiffness;

a blunt airfoil leading edge attached to said spar;

a blunt airfoil trailing edge attached to said spar;

a slot blade attached to said spar such that slot blade forms a smooth junction with one of said blunt airfoil edges;

one of said blunt airfoil edges further including a Coanda surface for receiving circulation control blowing;

said Coanda surface and said slot blade forming a blowing slot for said circulation control blowing;

said spar forming a plenum passage for supplying blowing fluid to said blowing slot and having a plurality of holes and slots along its length of such size and placement to attain a tuned stiffness and a controlled quantity of fluid to said blowing slot;

at least a part of said longitudinal spar located at the 50% chord location of said airfoil; and

a rib support structure attached to said slot blade and to a portion of said one of said blunt airfoil edges whereby said rib support maintains the geometric rigidity of said one of said blunt airfoil edges, said rib support structure including adjustment means for adjusting the height of said blowing slot.

3,891,164

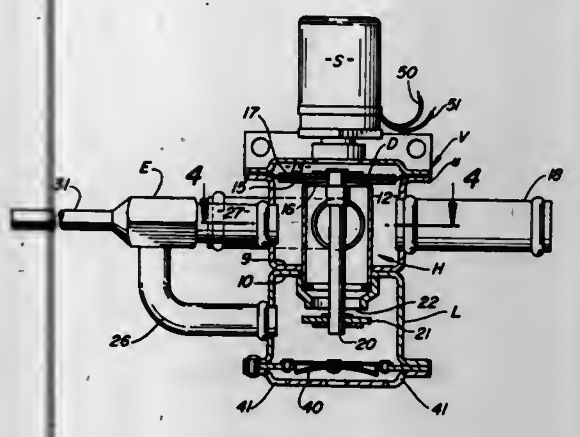
DUPLEX VALVE

Thomas P. Hertrick, 859 Sherwood Drive, Elyria, Ohio 44035; James L. Mitiska, 4397 Edgewater Drive, Vermilion, Ohio 44089, and Leo Tobacman, 2495 Eaton Road, University Heights, Ohio 44118

Filed Nov. 19, 1973, Ser. No. 416,922

Int. Cl. B64d *15/18*

U.S. Cl. 244—134 A **16 Claims**



1. A duplex valve for changing fluid pressure in a confined space quickly, said space including an inner cylindrical housing having ports spaced at opposite ends, a first port at one end and a second port at the opposite end, closures for said ports for opening said first port and closing the second, pressure responsive means for moving said closures, a first chamber embracing said means, one of said closures and a first of said ports and being divided into near and far portions by said means, a bleed orifice between said portions tending to balance the pressure therein, a second chamber embracing the other of said closures, and the second of said ports, a source of high pressure communicating with said near portion, a source of low pressure communicating with said second chamber, a controlled vent from said far portion to a region of relatively low pressure compared with said high pressure, means for opening said vent to bias the pressure exerted on said pressure responsive means to open said first port and admit fluid under high pressure to said housing and said space, and means for closing said vent to close said first port and open said second port to evacuate said space, each closure being removed from the flow of fluid through the opposite port.

3,891,165

RETRIEVAL ASSEMBLY

Douglas B. Day, and Welfred A. Stahl, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 11, 1973, Ser. No. 423,855

Int. Cl. B64d *3/00*

U.S. Cl. 244—137 R **8 Claims**

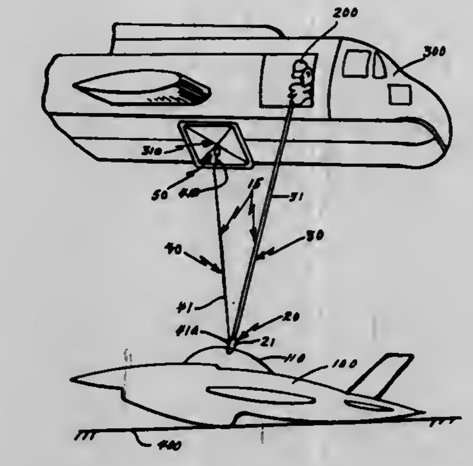
1. A retrieval assembly, in combination with an airborne vehicle capable of hovering, for use in retrieving a downed drone airborne vehicle having hookable means attached to it, wherein the hoverable airborne vehicle has a cargo hook and is capable of lifting, supporting, and carrying the downed drone airborne vehicle by suspension thereof, comprising:

a. a hook subassembly which includes a hook by which the hookable means of the downed drone airborne vehicle may be releasably hooked;

b. a pole subassembly which includes a pole having a fore end and an aft end, with said fore end removably attached to said hook of said hook subassembly;

c. a recovery cable subassembly which includes a recovery cable having a fore end and an aft end, with said fore end connected to said hook of said hook assembly;

d. and, a swivel subassembly which includes a swivel having a fore portion and an aft portion, with said fore portion connected to said aft end of said recovery cable, and with said aft portion of said swivel releasably connected to the



cargo hook of the hoverable airborne vehicle, and also with said aft portion removably attachable to said fore end of said pole of said pole subassembly;

whereby the hookable means of the downed drone airborne vehicle is hooked and secured by and with said hook of said hook subassembly, and thereby the downed drone airborne vehicle may be lifted, supported, and carried by the hoverable airborne vehicle by suspension thereof.

3,891,166

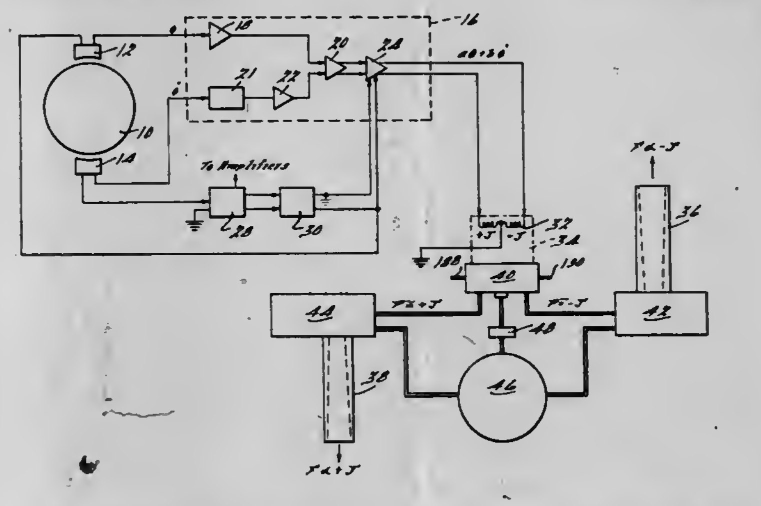
MISSILE DIRECTIONAL CONTROL SYSTEM

Robert F. May, Birmingham, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed May 28, 1963, Ser. No. 286,100

Int. Cl. F42b *15/02*

U.S. Cl. 244—3.22 **16 Claims**



1. An attitude control system for maintaining a missile on a launch predetermined path comprising means mounted on the missile for indicating a deviation from said predetermined path including means for providing an output signal representative of angular position change; and means for providing an output signal representative of angular rate change means for modifying said angular position change signal by multiplying it by a factor "*a*" whereby a $\cong[(T-D)/(k/p)-1\ ]$, an algebraic summation means responsive to said modified position and rate change signals and operable to provide a combined output representative of their algebraic summation, and means operatively connected to and controlled by the output of said summation means, said last mentioned means operable to provide a corrective force to return the missile to its predetermined path.

3,891,167

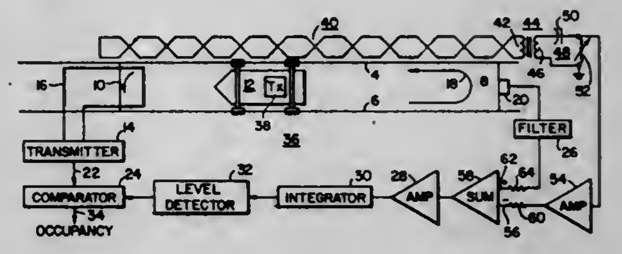
VEHICLE PRESENCE DETECTION IN A VEHICLE CONTROL SYSTEM

Robert H. Perry, Cannonsburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 31, 1974, Ser. No. 475,231

Int. Cl. B61l *25/02*

U.S. Cl. 246—34 R **11 Claims**



1. In a vehicle control system for determining the presence of a vehicle along a conductive track divided into a plurality of track circuit blocks, the combination comprising:

means for introducing a vehicle control signal into a given one of said track circuit blocks;

means for sensing the presence of the introduced vehicle control signal in said given one of said track circuit blocks, with the sensed vehicle control signal being at a given signal level during the absence of said vehicle and normally being at a reduced signal level during the presence of said vehicle;

means for transmitting a vehicle presence signal from said vehicle; and

means for altering the information content of the sensed vehicle control signal in response to sensing the transmission of said vehicle presence signal.

3,891,168

APPARATUS FOR SAFEGUARDING THE SPACING BETWEEN SUCCESSIVE BODIES, ESPECIALLY VEHICLES ON A TRACK

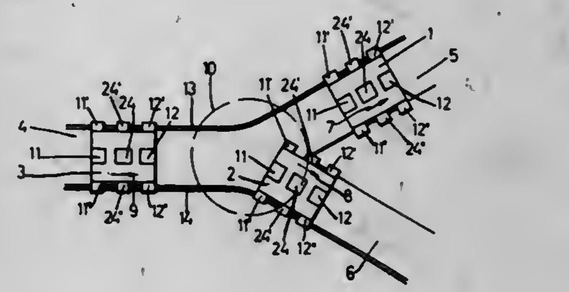
Peter Kraus, Munich, Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Germany

Filed Nov. 2, 1973, Ser. No. 412,254

Claims priority, application Germany, Nov. 9, 1972, 2254799

Int. Cl. B61 *3/22*

U.S. Cl. 246—167 R **10 Claims**



1. An apparatus for safeguarding the spacing between successive bodies, especially vehicles on a track including a track junction with track branches extending into different directions, comprising transmitter and receiver means on each body for measuring the spacing between adjacent bodies, first and second homogenous electrical conductor means having a predetermined signal attenuation, and extending along said track and including respective conductor portions extending along said track branches, coupling means operatively arranged for coupling said transmitter and receiver means to that electrical conductor means and portion thereof extending along the track branch on which the body is intended to travel, and further electrical conductor means interconnecting said first and second conductor means at predetermined intervals therealong, said further electrical conductor means starting at

least at the beginning of said junction in the track and continuing to the end of an area where a body leaves the junction, said signal attenuation determining the distance of signal transmission.

3,891,169

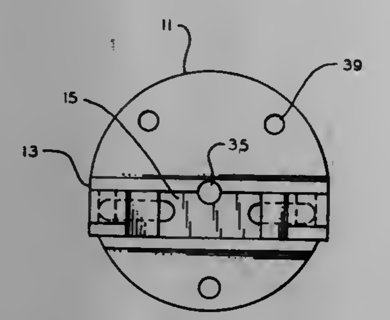
MODEL AIRPLANE ADJUSTABLE MOTOR MOUNT

Emelio Tremarco, 17 Speer Pl., Nutley, N.J. 07110

Filed Jan. 28, 1974, Ser. No. 437,309

Int. Cl. F16m *13/00*

U.S. Cl. 248—5 **14 Claims**



1. An adjustable motor mount for model airplane engines comprising:

- a. an essentially flat base member having a regular shape and having a first channel formed in the surface of one side thereof with an edge of the channel passing through the center of said base member;
- b. first and second jaws slidably mounted in said channel, said jaws extending outward perpendicular to said base member a distance sufficient to permit mounting a model airplane engine thereon; and
- c. means for securing said jaws in place within said channel.

3,891,170

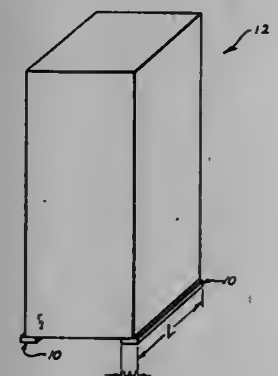
SHIPPING SKID

Francis G. Bricker, Shelbyville; Jack L. Isaacs, and Douglas C. Nobbs, both of Louisville, all of Ky., assignors to General Electric Company, Louisville, Ky.

Filed Aug. 19, 1974, Ser. No. 498,557

Int. Cl. B65d *19/00*

U.S. Cl. 248—119 **8 Claims**



1. A shipping skid comprising:

- an elongated rectangular body having a longitudinal axis, a base, and a peripheral edge flange extending in a first direction substantially normal to said base;
- first and second bosses each positioned adjacent a respective end of the body and extending in the first direction from the base;
- a plurality of spaced-apart minor flanges each extending laterally across the base and extending in the first direction and connecting opposed portions of the peripheral edge flange;
- a network of major flanges each extending in the first direction from the base, said network being spaced from the peripheral flange, extending generally along the axis, and connecting the bosses, said peripheral flange, bosses, and major flanges being of a substantially common height; and
- first and second end flanges each being connected to the peripheral flange and a respective boss and extending in the first direction from the base.

3,891,171

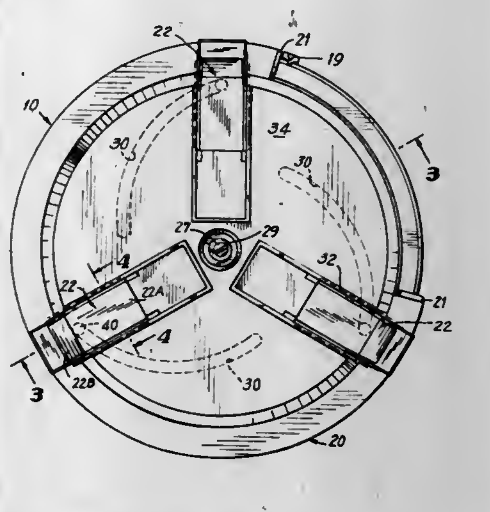
MULTI-BOWL SUPPORTING TABLE

Maurice P. Samuelian, West Hartford, and Benjamin Buckler, Manchester, both of Conn., assignors to General Signal Corporation, Rochester, N.Y.

Filed Apr. 15, 1974, Ser. No. 461,053

Int. Cl. B01f *9/10*

U.S. Cl. 248—131 **5 Claims**



1. A bowl-supporting turntable for a food mixer comprising in combination:

- at least two interfitting or nesting saucer-shaped members mounted for rotation together on a common axis in response to rotation of a mixing bowl, the upper one of said members being provided with guideways at its inner surface;
- a plurality of selectively adjustable retaining elements adapted to move continuously along said guideways in a radially inward or outward direction so as to contact, along the inner surface of the upper member, the periphery of a wide range of sizes of mixing bowls;
- means for so moving all of said adjustable retaining elements concurrently in equal increments, said means comprising a plurality of spaced spiral grooves formed in the lower of said members and, in cooperative fitted relationship therewith, a corresponding plurality of pins or projections on the retaining elements; and
- means, at the peripheries of said nesting members, for rotating one of said members relative to the other so that said spiral grooves formed in the lower member compel the pins or projections on the retaining elements to move radially inwardly or outwardly.

3,891,172

SUPPORT MEMBER HAVING A LOCKING CAM

Ruediger Einhorn, Katonah, N.Y., assignor to Coats & Clark, Inc., New York, N.Y.

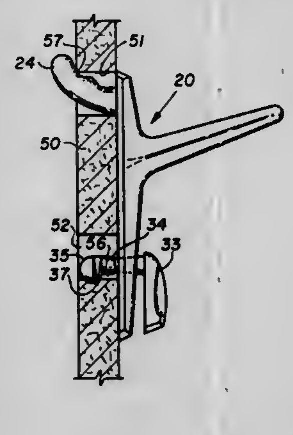
Filed Jan. 21, 1974, Ser. No. 435,193

Int. Cl. A47f *5/00;* **E06b** *7/28*

U.S. Cl. 248—223 **22 Claims**

1. A support member adapted for mounting on a multi-apertured panel, comprising a base member having a flat surface, article holding means extending from said base member on a side thereof away from said flat surface and spaced from one end of said base member, a projection extending from said flat surface, an aperture extending through said base member to said flat surface and spaced from said projection in a direction away from said one end of said base member, a shaft rotatably

mounted in said aperture, whereby one end of said shaft extends beyond said flat surface and the other end extends beyond said other surface of the base member, cam means on said one end of said shaft, said cam means having a substantially round cross-section in a plane normal to the axis of said shaft that is offset in one direction with respect to the axis of the shaft, a sharp radially extending circumferential edge on the portion thereof at the greatest distance from the shaft, and manually operable handle means on the other end of said shaft, said cam means having a surface toward said flat surface that is inclined with respect to said flat surface for wedging a panel upon which said support member is mounted between said flat surface and the inclined surface of said cam means upon rotation of said shaft.



3,891,173

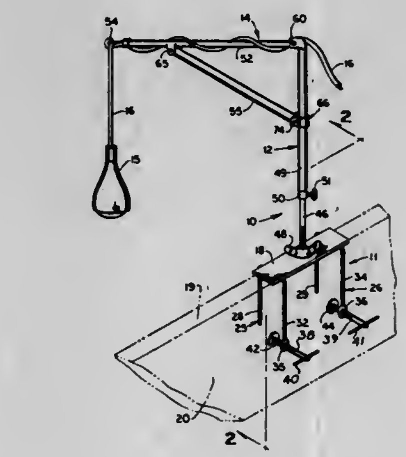
LIGHT SUPPORT FOR BOATS

James P. Ellis, 2550 Wedgefield Ct., Columbus, Ga. 31906, and William G. Ridgeway, 4321 Searcy St., Columbus, Ga. 31907

Filed Feb. 11, 1974, Ser. No. 441,230

Int. Cl. F16m *13/00*

U.S. Cl. 248—226 A **3 Claims**



1. A fishing light support for mounting on the upper horizontal surface of the bulkhead of a boat or the like comprising a base member for positioning on the upper horizontal surface of a bulkhead, a pair of approximately U-shaped clamp members each including approximately parallel leg segments and an interconnecting pin segment, said clamp members each being foldably connected to said base member at its interconnecting pin segment with its leg segments extending from opposite side portions of said base member whereby said clamp members are foldable between downwardly extending positions with their leg segments positionable on opposite sides of a bulkhead for mounting on the bulkhead and laterally extending positions with their leg segments folded approximately parallel to said base member for storage purposes, a stationary mast releasably connected at its lower end to and extending normal to said base member, a movable mast member mounted at its lower end on said stationary mast member and rotatable with respect to and axially movable with respect to said stationary mast member, locking means carried at the lower end of said movable mast member and constructed and arranged to lock said movable mast member in a fixed position with respect to said stationary mast member, a boom pivotally connected at one of its ends to the upper end of said movable mast member and normally extending laterally from the upper end of said movable mast member, a boom support strut pivotally connected at one of its ends to a fixed position on said boom and pivotally connected at the other of its ends to said movable mast member and movable along the length of said movable mast, and means for supporting a light element or the like at the distal end of said boom.

3,891,174

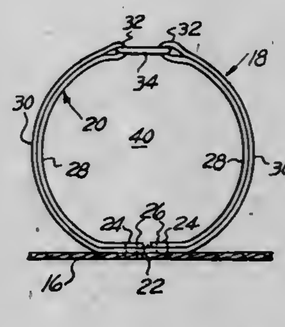
CARRIER-ATTACHED EXPANSIBLE CONTAINER HOLDER

Louis A. Harvey, 15107 Ilene, Detroit, Mich. 48238

Filed Sept. 30, 1974, Ser. No. 510,411

Int. Cl. A47k *1/08*

U.S. Cl. 248—313 **9 Claims**



1. An expansible container holder adapted to be attached to an article carrier, said holder comprising

- a container gripper adapted to flexibly embrace the container, said gripper including
  - an elongated flexible member having opposite ends and a midportion secured adjacent one another in a substantially common attachment portion adapted to be secured to a portion of the article carrier,
  - said flexible member including a pair of loops thereof extending away from said attachment portion,
  - and coupling means interconnecting said loops in slidable engagement therewith and dividing said loops into outer and inner sections thereof,
  - said coupling means being movable into a first position remote from said attachment portion disposing said outer and inner loop sections adjacent one another and thereby forming a single double-ply container-gripping loop,
  - said coupling means being movable into a second position near said attachment portion disposing said outer and inner loop sections remote from one another and thereby forming a pair of single-ply container-receiving loops disposed side by side.

3,891,175

TRAFFIC SIGNAL HANGER

William L. Hawley, Rexdale, and Terence E. Lewis, Mississauga, both of Canada, assignors to GTE International Incorporated, Stamford, Conn.

Filed Oct. 4, 1974, Ser. No. 511,992

Claims priority, application Canada, Mar. 19, 1974, 195416

Int. Cl.² B42F *13/00*

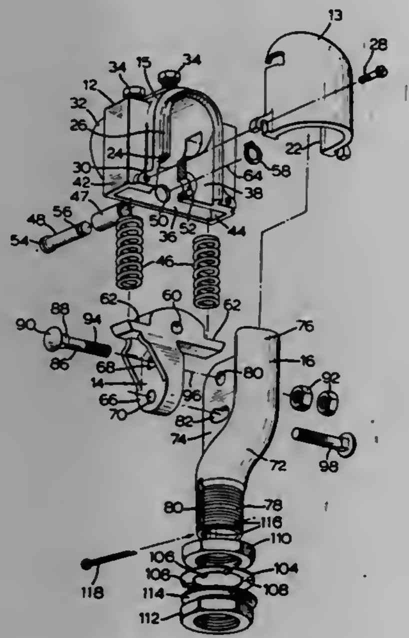
U.S. Cl. 248—317 **3 Claims**

1. A traffic signal hanger comprising:

- an elbow member having passage means extending therethrough, said passage means having openings at the first and second ends of said elbow member disposed substantially at right angles to one another, said passage means having a portion extending inwardly from said opening in said first elbow member end and being adapted to receive a support arm of a traffic signal standard whereby said elbow member may be mounted on a support arm of a traffic signal standard;

first hanger bracket means pivotably mounted on said elbow member for movement about a first generally horizontal axis, said first hanger bracket having a portion projecting downwardly from said second end of said elbow member;

return spring means operatively positioned between said elbow member and said first hanger member for interaction therebetween to resist rotation of said first hanger member with respect to said elbow member about said first generally horizontal axis and to return said first hanger bracket to its downwardly extending position with respect to said elbow member following deflection of said first hanger bracket means;



second hanger bracket means pivotably mounted on said first hanger bracket means for movement about a second generally horizontal axis disposed at right angles to said first generally horizontal axis, said second hanger bracket means having passage means opening therethrough, one end of said passage means of said second hanger bracket communicating with said passage means opening in said second end of said elbow member, the other end of said passage means of said second hanger bracket being disposed below said first hanger bracket;

releasable locking means for locking said second hanger bracket against rotation with respect to said first hanger bracket in a predetermined position; and

mounting means at said other end of said passage of said second hanger bracket means for securing a traffic signal housing thereto.

3,891,176

HANGER FOR SUSPENDING EXHAUST PIPES FROM A HORIZONTAL SUPPORT

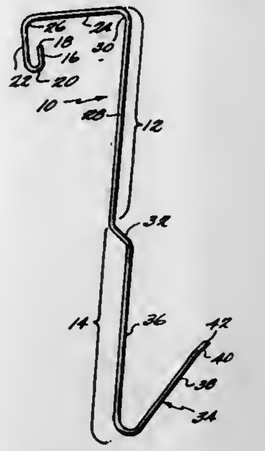
Todd R. Downing, and Robert K. Nolen, both of Chicago, Ill., assignors to Maremont Corporation, Chicago, Ill.

Filed Nov. 21, 1973, Ser. No. 418,035

Int. Cl. A47j *51/142;* **A47f** *5/00;* **A47j** *5/00*

U.S. Cl. 248—340 **14 Claims**

1. A hanger for suspending exhaust pipes and the like from a horizontally extending support comprising an elongated metallic member formed to provide a support engaging section and a pipe engaging section, said support engaging section being operable to be engaged in a generally downward direction over the support into an operative pipe suspending position with respect thereto, said support engaging section including a terminal end portion for engaging one side portion of the support when said support engaging section is disposed in said operative position, said terminal end portion including end surface means which faces generally upwardly when said support engaging section is disposed in said operative position, said support engaging section including integral portions disposed between said terminal end portion and said pipe engaging section which extend upwardly with respect to the aforesaid one side portion of the support transversely over an upwardly facing portion of the support and downwardly along an opposite side portion of the support when said support engaging section is disposed in said operative position, said integral portions having support engaging surface means operable in response to the suspension of a pipe or the like by engagement with said pipe engaging section for causing the downward force of the pipe load to be transmitted by said integral portions to said terminal end portion in such a way as to tend to move said end surface means in a direction upwardly and toward the one side portion of the support an extent which increases as the pipe load increases so that the resultant engagement of said end surface means with the one side portion of the support serves to prevent disengagement of said support engaging section from the support.



3,891,177

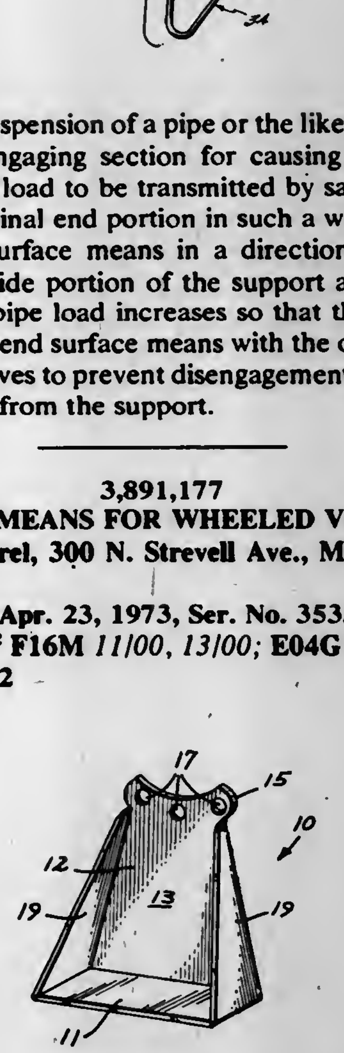
SUPPORT MEANS FOR WHEELED VEHICLES

Raymond M. Jerrel, 300 N. Strevell Ave., Miles City, Mont. 59301

Filed Apr. 23, 1973, Ser. No. 353,346

Int. Cl.² F16M *11/00, 13/00;* **E04G** *25/00*

U.S. Cl. 248—352 **6 Claims**



1. In the combination of a truck weighing more than three tons having at least one wheel removed, an exposed wheel hub assembly where a said wheel has been removed, at least three circular cross-section elongated fastening means for fastening the wheel to the exposed hub assembly, and a supporting means for maintaining the truck in a generally raised attitude with respect to the surface on which the truck rests, a support means which comprises:

a generally flat, horizontally extending base portion resting on the surface on which the truck rests,

an elongated multi-sided upright support member, integral with said base portion, extending upward from said base portion up to about the lower periphery of an exposed hub assembly of the truck, said multi-sided support member comprising a generally trapezoidal middle portion and two generally triangular side panels integral with and extending from the side edges of said middle portion, and an arcuate upper flange portion for fastening of said multi-sided upright support member to said exposed hub assembly, said upper flange portion having an arcuate arrangement of three circular holes therein, circumferentially equally spaced along an arc concentric with the center of the exposed hub,

said circular cross-section elongated fastening means being inserted through said circular holes, thereby securing said support means to said exposed wheel hub assembly.

3,891,178

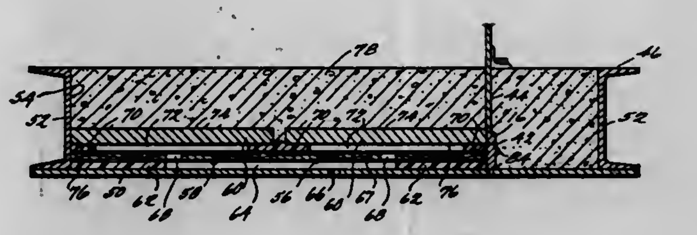
PRECAST PANELS WITH CORNER-DIVIDER PROJECTIONS

Paul S. Kelsey, P.O. Box 103, Forestdale, Mass. 02644

Filed July 16, 1973, Ser. No. 379,313

Int. Cl. B32b *3/08*

U.S. Cl. 249—91 **3 Claims**



1. In combination:

a. a casting box including:
  i. a floor and a plurality of upstanding sidewalls arranged about the outer periphery of the floor to define a closed space among them, bottomed by said floor;
  ii. a space-dividing wall upstanding from said floor within said space to provide a separator having its farthest extent from the floor closer to the floor than the farthest extent of the upstanding sidewalls is from the floor, the separator extending between two spaced points on said upstanding sidewalls to divide the part of said space nearest the floor into a larger portion on one side of the separator and a smaller portion on the other side of the separator;

b. a removable block means substantially filling the floor area of said larger portion of said space and up to less than the extent of said separator from said floor; whereby, a panel of facing material and hardenable panel backing composition may be cast in situ in the casting box to substantially fill the remainder of said space with said panel, with said panel having edges being molded against said casting box upstanding sidewalls and one face with a first larger portion formed against said block means on said one side of the separator, a second, smaller portion formed against the casting box floor on the other side of said separator and a groove molded therein extending between edges thereof by the inclusion of the separator thereinto between said larger and smaller portions thereof.

3,891,179

HOBBY CASTING MOLD

Morton Berman, Brooklyn, N.Y., assignor to Avalon Industries, Inc., Brooklyn, N.Y.

Filed Apr. 22, 1974, Ser. No. 462,731

Int. Cl. B28b *7/34;* **B29c** *1/00, 5/00*

U.S. Cl. 249—134 **20 Claims**

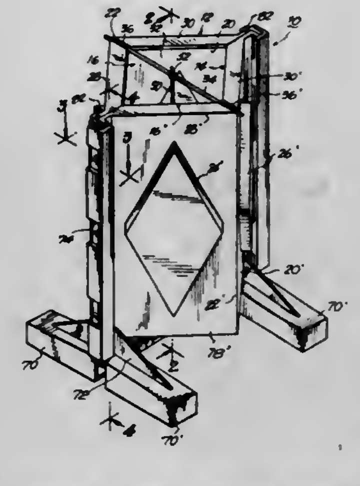
1. A two-piece hobby casting mold comprising:

A. two mold sections
  i. each having a cavity defining portion,
  ii. said cavity defining portions facing each other when the two mold sections are abutted so as to provide a complete mold cavity,
  iii. said mold sections mutually defining an open top for the mold cavity,

B. each of said sections having a flat web which extends laterally outwardly and downwardly from said cavity defining portion,

C. said webs being in face-to-face contact when the sections are mutually abutted,

D. and an essentially continuous labyrinth clamp seal extending down the sides and across the bottom of said mold,
  i. said seal constituting two halves of which one is in one piece with one of the sections and the other is in one piece with the other section,



  ii. a hinge joining at least one of the halves to its associated section,
  iii. a different base for each section,
  iv. said base being in one piece with the respective sections and having bottoms in a common plane,
  v. said sections being of synthetic plastic and the hinge being a living hinge,
  vi. in one piece with the respective section,

E. said plastic being translucent so that the level of material within the mold can be seen from outside without looking through the open top, and

F. the inner surface of said cavity defining portions being slick so that it will not adhere to material introduced into the mold cavity and set therein.

3,891,180

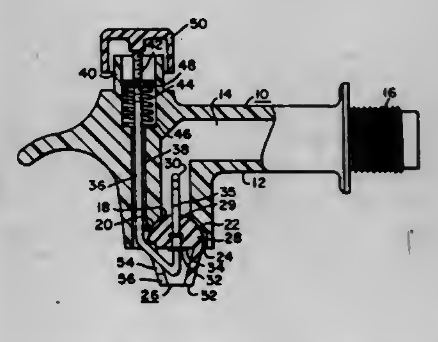
LOW PRESSURE LIQUID DISPENSING VALVE

Jack E. Bebinger, Columbus, Ohio, assignor to White-Westinghouse Corporation, Pittsburgh, Pa.

Filed Oct. 23, 1973, Ser. No. 408,964

Int. Cl. F16k *47/04*

U.S. Cl. 251—120 **3 Claims**

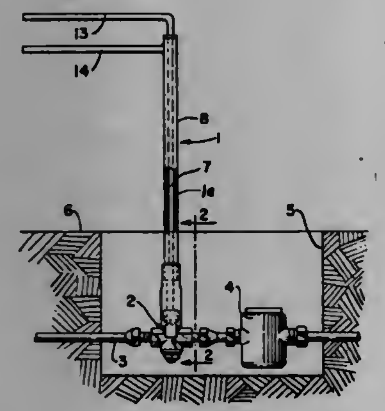


1. A low pressure liquid dispensing valve having a generally tubular body providing a fluid passage from an inlet end to a discharge end, said inlet end being adapted for attachment to a container and said discharge end defining a downwardly directing outlet, stopper means adjacent said outlet and means mounting said stopper means for guided movement between a first position blocking flow from said outlet and a second position spaced from said outlet and permitting liquid flow

therefrom, with the movement of said stopper means from said first to said second position being in the direction of said flow and said mounting means connected to said stopper at its lower end, said mounting means thereby having a portion extending through the flow path of said discharged liquid, resilient means for normally maintaining said stopper in said first position and manual means for moving said stopper means to said second position wherein the improvement comprises:

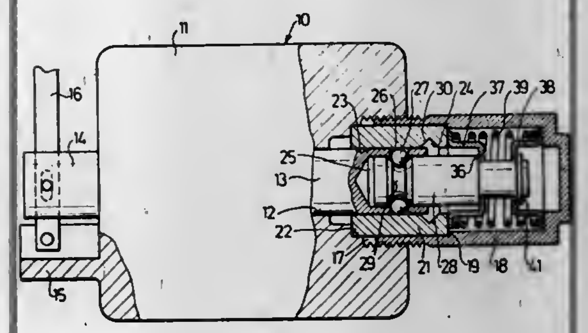
fluid directing means comprising a downwardly inwardly converging portion integral with said stopper means and extending therefrom in the direction of said fluid flow generally subadjacent said mounting means and exteriorly of said body for converging the flowing fluid subsequent to the stopper means and said mounting means and thereby concentrating the dispensed liquid into a unified stream.

3,891,181
PORTABLE VALVE ACTUATOR
Jerrell Sanders, P.O. Box 566, Hartselle, Ala. 35640
Continuation-in-part of Ser. No. 294,677, Oct. 3, 1972, abandoned. This application Mar. 12, 1974, Ser. No. 450,297
Int. Cl. F16k *31/00*
U.S. Cl. 251—128 **1 Claim**



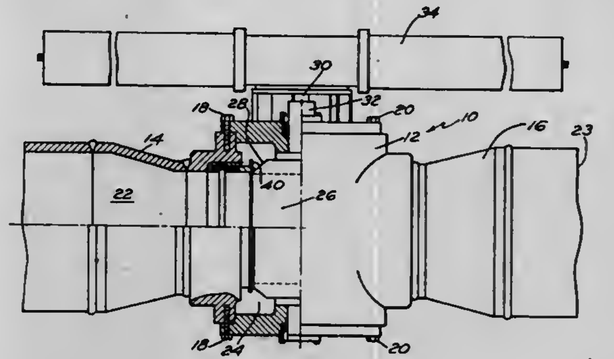
1. A portable valve actuator for a conventional underground curb stop of the type having an arcuate valve body and T-handle on the valve stem wherein the valve stem is adapted to be turned without large forces being transmitted to the valve body and underground pipes connected thereto to prevent damage thereof, the actuator comprising a pair of coaxial shanks, bushings mounted on each end of the outer shank, the inner shank being rotatably mounted within said bushings, the outer surface of the inner shank being spaced inwardly from the inner surface of the outer shank to thereby form an annular space therebetween, whereby the inner shank is freely slidable therein longitudinally of the outer shank, a pair of spaced, planar parallel, plates forming a bifurcation integrally connected to one end of the inner shank and adapted to straddle the T-handle on the curb stop, a pair of spaced, arcuate plates integrally connected to the corresponding end of the outer shank and extending longitudinally thereof, said arcuate plates having a length greater than the plates on the inner shank, said arcuate plates conforming to the side wall configuration of the valve body and adapted to straddle the valve body such that the arcuate portions engage opposite side walls of the valve body, and portions of the longitudinally extending edges of the arcuate plates engage the inlet and outlet portions of the curb stop, and a handle connected to the opposite end of each shank, whereby when applying the tool to the valve to be actuated, the inner shank is pulled upwardly relative to the outer shank and the upper end of the bifurcation is held against the face of the bushing on the lower end of the outer shank, the arcuate plates are positioned around the underground valve body, the inner shank is then released allowing the bifurcated end to fall freely to thereby straddle the valve T-handle, the curb stop being actuated by applying opposite turning forces to the shank handles while the valve body is held rigid by the arcuate plates and the valve head is rotated by the planar plates.

3,891,182
ARRANGEMENT FOR MAINTAINING A SHIFTABLE MEMBER IN A PLURALITY OF SHIFTED POSITIONS
Gunther Schwerin, Moglingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Oct. 17, 1973, Ser. No. 407,256
Claims priority, application Germany, Nov. 11, 1972, 2255270
Int. Cl. F15b *13/01*
U.S. Cl. 251—297 **8 Claims**



1. In an arrangement of the character described, a combination comprising a housing bounding an interior passage having a longitudinal axis; a first member coaxially accommodated in said passage and having an axially extending first sliding surface and an annular free end portion provided with at least one radially extending through hole; a second member coaxially accommodated in said passage and having an axially extending second sliding surface contacting said first sliding surface and provided with at least one arresting recess, one of said first and second members being stationary with respect to said housing and the other being mounted for movement with respect to said one member so that said sliding surfaces slide on one another; at least one arresting element of circular cross section received in said radial through hole and displaceable therein and having a diameter exceeding the length of the latter; means for moving said other member between at least one arresting position in which said through hole faces said arresting recess and said arresting element is partially received in the latter, and a rest position in which said through hole faces said second sliding surface and said arresting element bears against the same; a third member coaxially accommodated in said passage so as to have a limited degree of movement relative to said first member proportionate to the displacement of said arresting element, and having at least one flanking surface abutting against said arresting element and having a first surface portion closer to said first member and enclosing with said longitudinal axis a first acute angle, and a second surface portion farther away from said first member and enclosing with said longitudinal axis a second acute angle larger than said first acute angle; and means for biasing said third member toward said rest position with attendant abutment of said first surface portion with said arresting element when the latter is received in said arresting recess and of said second surface portion with said arresting element when the latter bears against said second sliding surface, whereby the radial forces acting between said arresting element and said second member when said second surface portion acts on the former are significantly lower than those occurring when said first surface portion acts on said arresting element so that the latter is reliably received in said arresting recess while the friction between the same and said second sliding surface is reduced.

3,891,183
SEALING AND SEAT ASSEMBLY FOR BALL VALVE CONSTRUCTION
Monroe J. Feiring, West Warwick, R.I., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.
Filed Jan. 10, 1974, Ser. No. 432,419
Int. Cl. F16k *25/00*
U.S. Cl. 251—315 **10 Claims**



1. A trunnion-type ball valve construction, comprising a housing, fluid inlet and discharge passages formed in said housing, a central chamber formed in said housing and normally communicating with said fluid inlet and discharge passages, a ball valve rotatably located in said central chamber for sealing communication between said inlet passage and central chamber, means for rotating said ball valve, said inlet passage having a notch formed therein that defines a rear shoulder, and a seat and sealing assembly located in said notch in said fluid inlet passage for receiving said ball valve in sealing engagement and sealing the fluid inlet passage against leakage into said housing, said seat and sealing assembly including a forward member having a seat formed thereon for receiving said ball valve in sealing engagement thereagainst, a rear member axially spaced from said forward member and firmly engaging said shoulder formed in said notch in said fluid inlet passage, a plurality of sealing rings mounted on said forward member in coaxial, parallel relation for sealing said forward member against said housing, an intermediate member bridging the space between said forward and rear members and engaging said sealing rings, a plurality of springs interposed between said rear and intermediate members for urging said intermediate member into firm engagement with said sealing rings, wherein said sealing rings seal said seat and sealing assembly against said housing.

3,891,184
MULTI-PURPOSE LIFT DEVICE
Meredith Fields, 515 E. 7th St., Newport, Ky. 41071
Filed July 1, 1974, Ser. No. 484,715
Int. Cl. B60p *1/02, 1/22;* **B66c** *23/60*
U.S. Cl. 254—4 R **7 Claims**

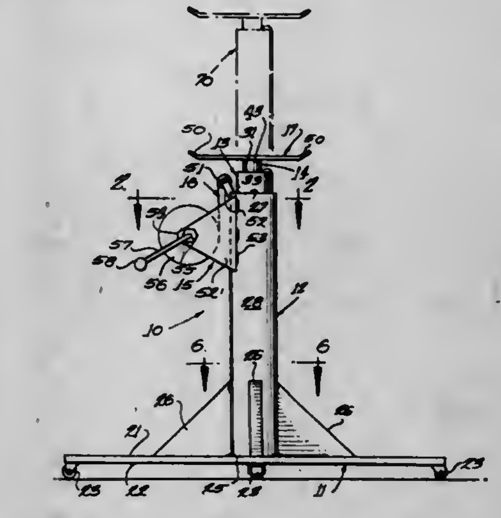
1. A multi-purpose lifting device for easy and convenient lifting of heavy, bulky objects, said device comprising, in combination:

a base;

an outer hollow open ended tube having a top end and bottom end, said tube vertically mounted on the base with the bottom end thereof afixed to said base, a passage way extending axially through said tube, said outer tube being generally cylindrical in cross section and having a first pulley afixed to the top end thereof;

a middle hollow open ended tube having a top end and a bottom end, said middle tube being telescopically received through said top end of said outer tube in said outer tube passage way, the middle tube having a passage way extending axially therethrough, said middle tube being of a generally cylindrical configuration, said middle tube having a second pulley afixed to the bottom end portion thereof in vertical alignment with said first pulley; an inner hollow open ended tube having a top end and a bottom end, said inner tube telescopically received in said middle tube passage way through said top end thereof, a third pulley in alignment with said second pulley and spaced vertically thereabove and rotatably mounted in said middle tube passage way, a fourth pulley in horizontal alighment with said second pulley and a fifth pulley rotatably mounted on the top end of said middle tube in vertical alignment with said fouth pulley, an aperture adjacent said bottom end of said inner tube and disposed substantially vertically beneath said fifth pulley;

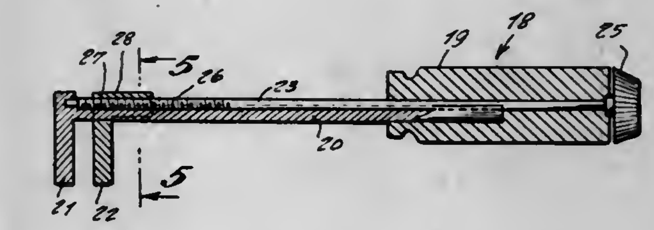
spacer means maintaining said middle tube in spaced relation with respect to said inner and outer tubes and maintaining said inner tube in spaced relation with respect to said middle tube;



winch means mounted to the exterior of said outer tube and rotatably supporting a drum thereon; and

a cable having one end thereof afixed to said drum, said cable being wrapped thereabout with the opposite end thereof being reeved over the top end of said outer tube and about the bottom end of said middle tube and over the top end of said middle tube and afixed to the bottom end of said inner tube such that rotation of said drum in a first direction will effect the simultaneous telescopic outwardly movement of said middle and inner tubes relative to said outer tube while also effecting the simultaneous telescopic movement of said inner tube out of said middle tube, and rotation of said drum in the opposite direction will effect the telescopic retraction of said inner and middle tubes into said outer tube.

3,891,185
BRAKE SHOE HOLD DOWN SPRING TOOL
Laurence W. Lett, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007
Filed June 25, 1973, Ser. No. 372,990
Int. Cl. B66f *11/00;* **B25b** *27/00*
U.S. Cl. 254—10.5 **1 Claim**



1. A brake shoe spring tool, comprising a cylindrical shank having a handle mounted encompassingly on one end of said shank and a fixed spur mounted at right angles to the opposite end of said shank, in combination with a rod mounted rotatably through the axis of said handle and having knob affixed

to said rod externally of said handle, wherein the shank includes an eccentric slot extending from the first said end to the spur, said rod being rotatably mounted partially in said slot and projecting externally from said slot beyond the shank perimeter engaging rotatably said handle thereby keying the handle to the shank preventing relative rotation between said handle and said shank, said rod having a threaded end adjacent the said spur, in further combination with a longitudinally movable spur having a curved inner surface encompassing a longitudinal bore, said spur being mounted encompassingly on the shank and threaded end of said rod, a portion of said curved inner surface having threads coacting with the threaded end of said rod and the remainder of the curved inner surface slidingly engaging said shank, whereby rotation of said rod will cause the movable spur to move slidably longitudinally over the shank to vary the spacing from the fixed spur.

3,891,186

DEVICE FOR INSERTING DRAINS INTO THE GROUND

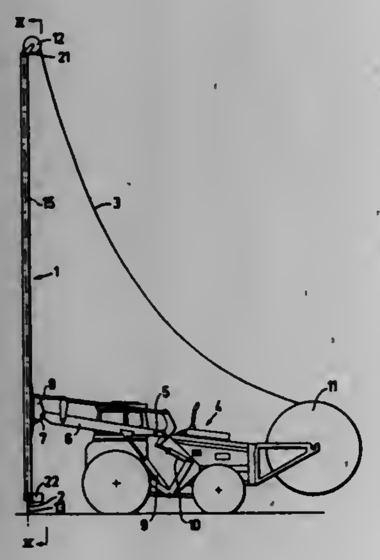
Sven Torgny Thorsell, Skelleftea, Sweden, assignor to Linden-Alimak AB, Skelleftea, Sweden

Filed Nov. 26, 1973, Ser. No. 419,005

Claims priority, application Sweden, Nov. 27, 1972, 15426/72

Int. Cl. E21b *19/00*

U.S. Cl. 254—29 R **1 Claim**



1. In the known type of device for inserting flexible drain members downwardly into the earth and which includes
   a. an earth penetrating tube that is adapted to annularly surround and protect a flexible drain member as the tube penetrates downwardly into the earth,
   b. mast means which is designed to initially position said earth penetrating tube vertically above the earth,
   c. means to move said earth penetrating tube from its initial vertical position downwardly with respect to said mast so that said tube and the drain member it protects will penetrate into the earth,

the improvement which comprises
1. said mast means comprising two rectangular tubes that are rigidly spaced apart from each other by rigid interconnecting means which thereby form an interior rectangular channel for the downward passage of said earth penetrating tube,
2. said means for moving said penetrating tube downwardly comprises two spaced apart roller chains each of which loops around one of said two rectangular tubes forming the mast means,
3. spaced apart ears adjacent the upper portion of said earth penetrating tube engaged by said spaced apart roller chains,
4. said spaced apart roller chains each being operatively connected to a motor means which is located adjacent the lower end of said mast means and
5. attachment means on said mast means for readily attaching and detaching said mast means to a suitable carrier vehicle.

3,891,187

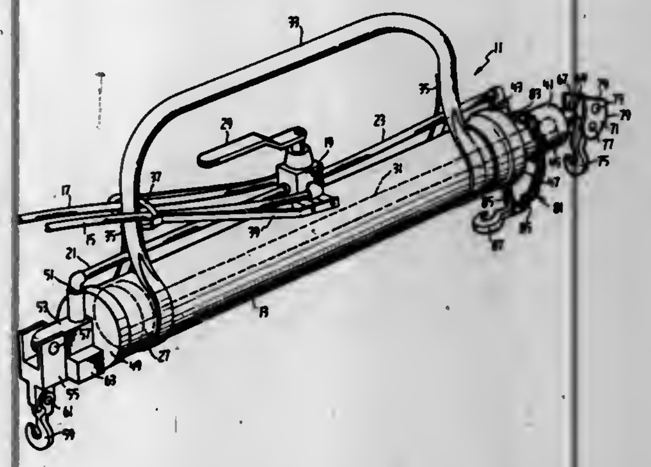
PORTABLE RESCUE DEVICE

Richard D. Bearden, Jr., 8817 Granby St., Norfolk, Va. 23503

Filed Oct. 19, 1973, Ser. No. 407,850

Int. Cl. B66f *11/04;* **A62b** *3/00;* **B21d** *1/12*

U.S. Cl. 254—93 R **10 Claims**



1. A portable rescue device of the type which is activated by a pressurized fluid received from a fluid source, said device comprising:
- an elongated cylinder having basically closed first and second ends, but with first and second fluid transfer openings located respectively at said first and second ends, and an axially located piston-rod opening located at said first end;
- a piston means mounted inside said elongated cylinder and being movable along said elongated cylinder by pressure differentials inside said elongated cylinder;
- a piston rod attached to said piston means, said piston rod having an attachment end portion extending through said axially located piston-rod opening at said first end to outside said elongated cylinder;
- a fluid activating system comprising a control valve for receiving fluid of positive pressure from said fluid source and applying said positively pressurized fluid selectively to said respective first and second fluid transfer openings thereby causing pressure differentials across said piston to move said piston along with said attached piston rod, in selective directions along said cylinder;
- a cylinder swivel block attached at one end thereof, to said second end of said cylinder, said cylinder swivel block having freedom of movement to rotate in a plane in which the axis of the elongated cylinder lies so that it can selectively be in a position generally aligned with said axis or in a position skew to said axis, with a second end of said cylinder swivel block extending beyond the side of the cylinder when it is in said position skew to said axis; and
- a cylinder tether-attaching means for selectively attaching and releasing a tether to and from said second end of said cylinder swivel block, said cylinder tether-attaching means having freedom of movement to rotate in the same plane of rotation as said cylinder swivel block so that said cylinder tether-attaching means can extend away from said cylinder swivel block in a first direction generally aligned with said elongated-cylinder axis when said cylinder swivel block is in a position aligned with said elongated-cylinder axis and in a substantially opposite direction along said cylinder when said cylinder swivel block is in a position skew to said axis;

wherein, said elongated cylinder includes a supporting means which, when said cylinder swivel block is in a position skew to said axis, supports said cylinder swivel block against further rotation and wherein a surface of said cylinder swivel block which faces away from said cylinder when said cylinder swivel block is in said position skew to said axis forms a relatively flat bearing surface which is approximately perpendicular to said cylinder axis.

3,891,188

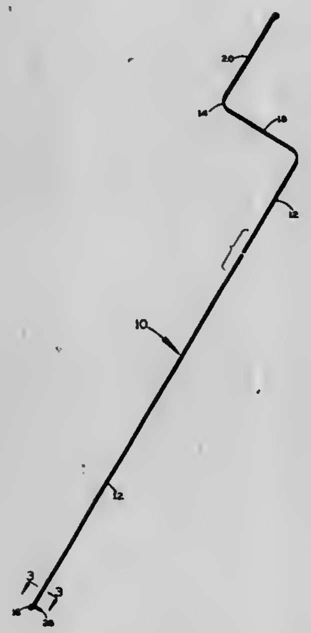
TOOL FOR PULLING A LINE THROUGH A CONDUIT

Benjamin F. Peirce, Jr., 1040 S.W. 67th Ter., Plantation, Fla. 33317

Filed Feb. 25, 1974, Ser. No. 445,631

Int. Cl.² E21C *29/16*

U.S. Cl. 254—134.3 R **2 Claims**



1. A tool for pulling a line through a conduit comprising an elongated wire having a long flexible shank, handle means at one end of said shank to be grasped manually by a person, and hook means at the other end of said shank comprising a first bight curving outward from said shank substantially in the plane of said shank through a turn of approximately 90°, and a second bight curving from said first bight through a turn of at least 90° and at a slight inclination back toward said one end of the shank in a plane approximately at 90° to said first named plane, said second bight terminating in a tip disposed toward said one end of the shank from said first bight, said tip having a tapered edge which merges smoothly with the outside circumference of said second bight and makes a distinct corner with the inside circumference of said second bight.

3,891,189

LINK CHAIN SUPPORT POST

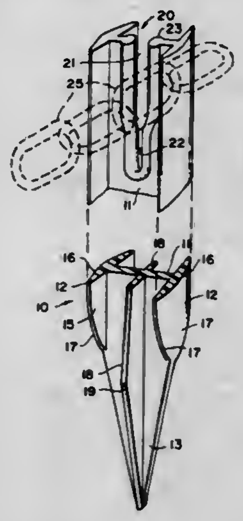
Michael T. Russo, 1805 Larchwood St., Bloomfield Hills, Mich. 48084

Filed Jan. 28, 1974, Ser. No. 437,427

Int. Cl. E04h *17/00*

U.S. Cl. 256—1 **7 Claims**

1. A vertically elongated plastic post comprising:
- an H-shaped in cross-section body portion formed of a substantially flat web and opposite side flanges integrally joined together to form the H-shape;
- with the lower end of the web being extended a distance beneath the lower end of the flanges to form a downwardly pointed spike portion on the lower end of the post;
- a central flange formed on each of the opposite faces of the web and extending from the lower point of the web upwardly and centrally between and parallel to the side flanges;
- the lower ends of the side flanges terminating at the upper end of the extension of the web, and
- a vertically elongated, central opening slot formed in the upper end of the web, and centrally between the side flanges, the slot being formed with an elongated upper



portion and an elongated narrower lower portion; and the web portion defining the edges of the slot being slightly springy; the slot portion widths being of a size for the slot portions each to snugly receive and frictionally grip a single chain link arranged in the vertical plane, with the lower slot portion sized to receive a smaller link than the upper slot portion.

3,891,190

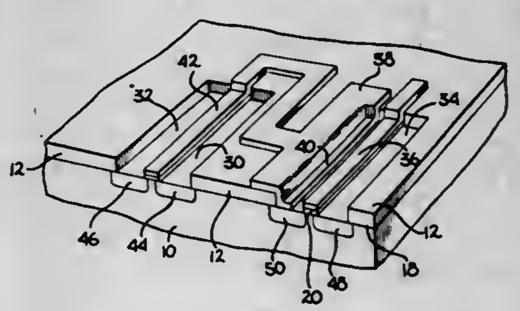
INTEGRATED CIRCUIT STRUCTURE AND METHOD FOR MAKING INTEGRATED CIRCUIT STRUCTURE

Leslie L. Vadasz, Sunnyvale, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 269,735, July 7, 1972, abandoned, which is a division of Ser. No. 101,805, Dec. 28, 1970, Pat. No. 3,699,646. This application Feb. 15, 1974, Ser. No. 443,010

Int. Cl. H01l *11/00*

U.S. Cl. 357—41 **3 Claims**



1. An integrated circuit which includes a plurality of gate type devices wherein each such device includes a separated source and drain in a semiconductor body and a gate spaced insulatively above and between the source and drain, the improvement comprises:
- a silicon contact member to provide electrical coupling to one of said source and drain in a first gate type device, said silicon contact member being contiguous to said semiconductor body at one of said source and drain in said first gate type device;
- a silicon gate member to form said gate insulatively spaced above and between the source and drain of a second gate type device; and
- a silicon interconnect member to provide electrical coupling between said silicon gate member and said silicon contact member, said interconnect member being inte-

grated with and contiguous to said contact and gate members,

whereby one of said source and drain of said first gate type device is electrically coupled to said gate of said second gate type device and high density circuits achieved.

3,891,191
VIBRATORY APPARATUS

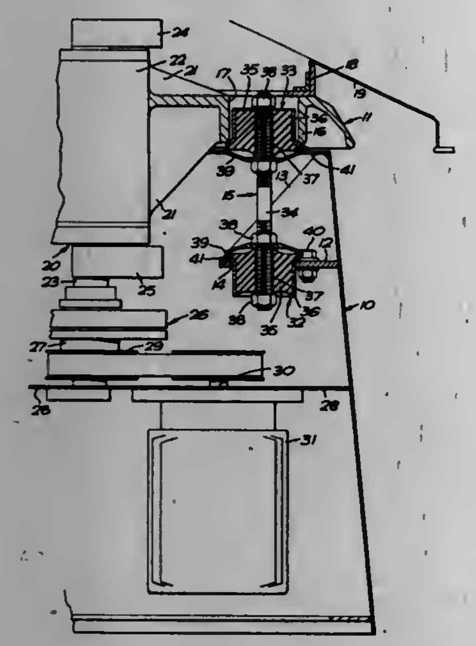
Marcel Henry Choules, London, and Alan William Hare, Ashford, both of England, assignors to Russell Finex Limited, London, England

Filed May 7, 1973, Ser. No. 357,644

Claims priority, application United Kingdom, May 18, 1972, 23522/72

Int. Cl. B01f *11/00*

U.S. Cl. 259—1 R **7 Claims**



1. A vibratory apparatus comprising a base, a vibratory frame superimposed on the base, and means for mounting the frame on the base for vibration with respect thereto, which means is provided by a plurality of mounting devices each located between the frame and the base, and comprising a pair of opposed elastomeric bushes which are spaced from one another at a substantial distance and are secured by their outer peripheries one to the frame and the other to the base, an elongate member extending in a generally vertical direction between the bushes, the lower end of the member being attached to the bush secured to the base and the upper end of the member being attached to the bush secured to the frame, whereby the bushes can deform in shear to accommodate large vertical components of vibration and whereby the elongate member acts as a lever extending between the bushes to permit the absorption of large movement of the frame relative to the base with the bushes being subjected to only relatively small deflections, each bushing having a bore in which the respective end of the corresponding member is secured and the bore of the bushing being of uniform cross-section and being bonded to a cylindrical sleeve, the elongate member passing through and being secured in the sleeve.

3,891,192
PRE-MIXER FOR ALIMENTARY PASTE

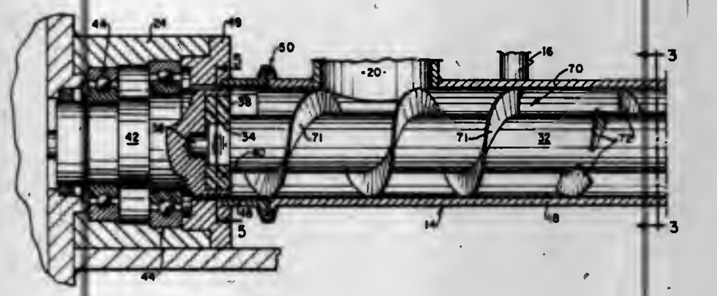
Ignatius Bontempi, Douglaston, and Peter Giemisch, Central Islip, both of N.Y., assignors to De Francisci Machine Corporation, Brooklyn, N.Y.

Filed Apr. 24, 1974, Ser. No. 463,724

Int. Cl.² B01F *7/08*

U.S. Cl. 259—110 **5 Claims**

1. Apparatus for pre-mixing alimentary paste ingredients comprising: a longitudinally extending, unitary housing having first and second ends; a longitudinally extending shaft having first and second ends being positioned within said housing; a motor; means for connecting the output of said motor to said shaft first end including a rectangular projection being formed on said shaft first end, a cylindrical bushing having a rectangular keyway formed therein, said bushing being positioned directly adjacent said shaft first end; means for supporting said shaft second end for rotational movement; said unitary shaft extending at least as far as said shaft second end supporting



means, a first paddle being formed on said shaft adjacent said shaft first end, said first paddle being the shape of a solid helical plane generated about the outer surface of said shaft, said first paddle being inclined so as to induce flow toward said shaft second end, a plurality of second paddles being formed on said shaft, said second paddles comprising helical segments spaced about the outer surface of said shaft, said second paddles being inclined so as to induce flow toward said shaft second end.

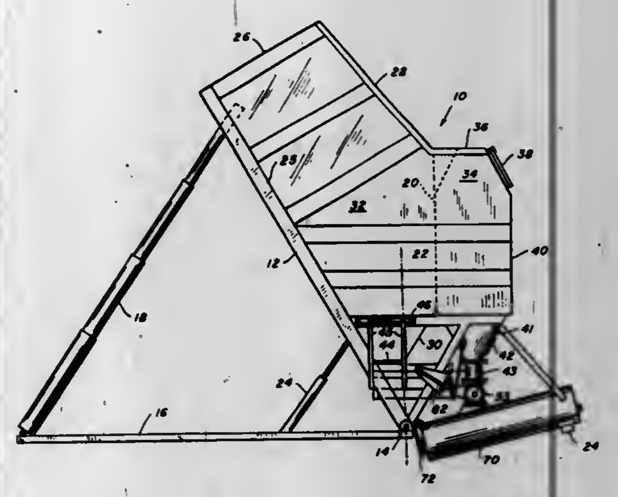
3,891,193
MOBILE APPARATUS TO MIX AND DELIVER CONCRETE COMPOSITIONS OR THE LIKE

L. F. Perry, Jr., Georgetown, Tex., assignor to Century Industries, Inc., Georgetown, Tex.

Filed Mar. 4, 1974, Ser. No. 447,650

Int. Cl. B28c *7/04*

U.S. Cl. 259—165 **10 Claims**



1. A mobile storage and delivery system for a plurality of dry fluent particulate materials, comprising:

a. a mobile frame

b. a body mounted on said frame and hinged at the rearward end of said frame and means to lift and rotate said body through a selected angle;

c. said body including two tanks, a large tank resting on said frame and a small tank resting on said large tank, such that when said body is lifted and rotated through said selected angle, the common wall between said two tanks will be substantially vertical with the small tank rearward of said large tank;

d. the bottom ends of both tanks in the raised position comprising hoppers, adapted to feed fluent material from the bottoms of said tanks;

e. first flow metering means comprising horizontal belt means below the hopper of said large tank, the belt surface moving rearwardly and overhanging the forward end of a mixing and delivery means and including means to control the level of fluent material carried on said belt;

f. second flow metering means controlling the flow of fluent material from said small tank and delivering said material from said small tank into said mixing and delivery means; and wherein

g. said first and second metering means are driven in fixed speed relation.

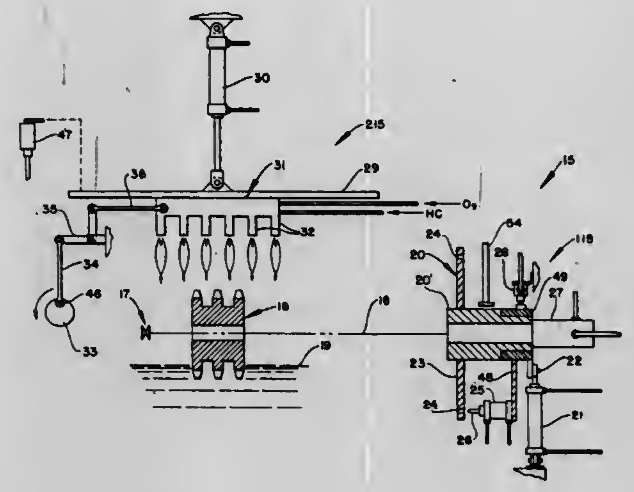
3,891,194
FLAME HARDENER

James David Carrigan, Odessa, Tex., assignor to Vance Industries, Inc., Odessa, Tex.

Filed Oct. 15, 1973, Ser. No. 406,141

Int. Cl. C21d *9/32*

U.S. Cl. 266—4 A **8 Claims**



1. Flame hardening apparatus for tempering gear teeth comprising:

quench means for rapidly cooling a gear tooth to a temperature which avoids the formation of decomposition products; a heat source for raising the temperature of a gear tooth to a temperature which promotes the formation of an austenitic structure;

mount means for rotatably supporting a gear wherein the gear has circumferentially spaced gear teeth thereon which are to be simultaneously placed in heat transfer relationship with said quench means and said heat source; said heat source and said quench means being circumferentially spaced about said mount means so that the teeth of a gear supported by said mount means has one tooth thereof in heat transfer contact relationship with said heat source, another tooth thereof in heat transfer contact relationship with said quench means, and with there being a plurality of teeth located between said one tooth and said another tooth;

means for rotating said mount means an amount which moves the one gear tooth directly from the heat source to the quench means; said means for rotating said mount means includes an index means, said index means being connected to cause a gear supported on said mount means to be rotated an amount equal to the circumferential distance about the gear measured from said heat source to said quench means so that each and every time the index means causes a gear to be rotated a tooth of the gear is moved directly from the heat source to the quench means; said index means further providing that all of the individual gear teeth are subjected to the action of the heat source and quench means a single time before any one tooth can be subjected to the action of the heat source and quench means a second time.

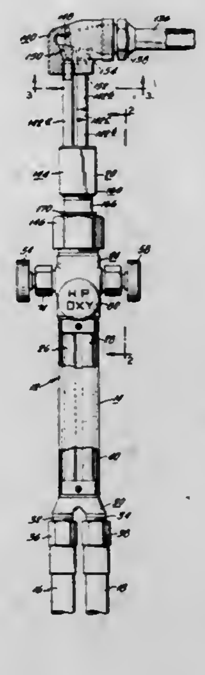
3,891,195
CUTTING-WELDING TORCH

Justin W. Mills, Jr., Cinnaminson, N.J., and Mark H. Betzler, Wilkes-Barre, Pa., assignors to Lif-O-Gen, Inc., Cambridge, Md.

Filed May 14, 1974, Ser. No. 469,842

Int. Cl. B23k *7/02*

U.S. Cl. 266—23 P **4 Claims**



1. A cutting-welding torch comprising a handle assembly, a gaseous fuel needle valve in said handle assembly, means for connecting a source of gaseous fuel under pressure with said fuel needle valve, an oxygen needle valve in said handle assembly, means for connecting a pressurized source of oxygen with said oxygen needle valve, a high pressure oxygen valve in said handle assembly, means for connecting said high pressure oxygen valve with said pressurized source of oxygen, a cutting tip adapted for demountable attachment to said handle assembly, said cutting tip comprising a mixing head, means for connecting said mixing head with each of said fuel and oxygen needle valves and said high pressure oxygen valve, a welding tip adapted for demountable attachment to said handle assembly, said welding tip including a mixer, connecting means for connecting said fuel and oxygen needle valves to said mixer, and means in said welding tip for blocking flow from said high pressure oxygen valve when said welding tip is attached to said handle assembly.

3,891,196
APPARATUS FOR TREATING A MELT

Eckehard Förster; Helmut Richter; Edgar Spetzler; Jochen Wendorff, all of Oberhausen; Wilhelm Klapdar, Essen, and Heinrich-Wilhelm Rommerswinkel, Mulheim-Ruhr, all of Germany, assignors to Thyssen Niederrhein AG Hutten- und Walzwerke, Oberhausen, Germany

Filed Jan. 21, 1974, Ser. No. 435,096

Int. Cl. C21c *7/00*

U.S. Cl. 266—34 T **6 Claims**

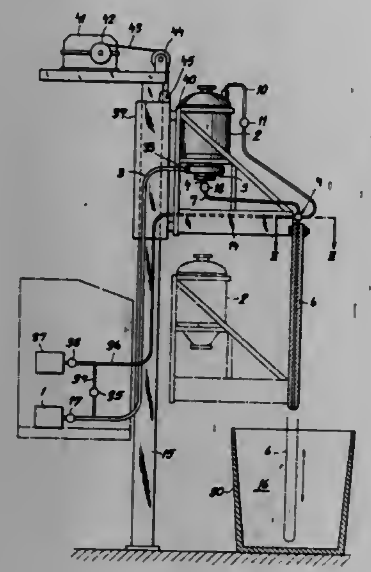
1. An apparatus for introducing particulate solids into a molten-metal melt, comprising:

a supply vessel receiving solid particles and formed at its bottom with a suspending device for forming a solid/gas suspension, means for admitting a carrier gas into said suspending device, and an outlet at said suspending device for discharging said suspension from said vessel;

a lance immersibly in said bath;

a suspension-feed line connecting said outlet with said lance;

a mixing chamber along said feed line for admitting a pressure gas to the suspension stream traversing said feed line; and



a bypass duct provided with a control valve connecting the top of said vessel with said mixing chamber, said mixing chamber comprising a cylindrical housing spacedly surrounding said feed line, said bypass duct opening tangentially into said housing and said feed line being provided within said housing with at least one carrier gas opening.

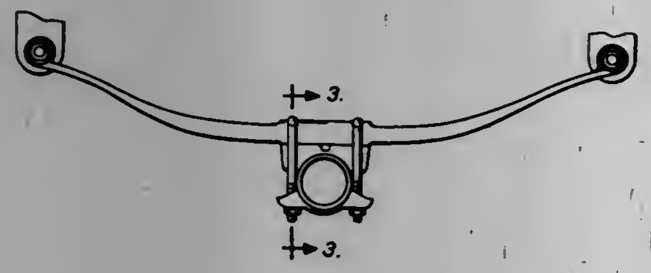
3,891,197
SINGLE LEAF SPRING

Gus L. Poulos, Rt. 1, Winamac, Ind. 46996

Filed Oct. 15, 1973, Ser. No. 406,572

Int. Cl. B60q *11/10*

U.S. Cl. 267—47 **5 Claims**



1. A single leaf spring used in conjunction with a pair of shackle means and an axle, said spring comprising a central portion and two elongated end portions extending integrally outwardly from opposite ends of said central portion, said central portion having a thickened cross section exceeding the thickness of the cross sections of said end portions, said central portion having first and second oppositely located side faces extending between said ends thereof, said first side face supporting said axle in a transverse relationship, said second face having a pair of spaced grooves formed therein, said grooves extending transversely across said second face, a pair of U-bolt means, each bolt means including generally parallel legs interconnected at corresponding ends by an intermediate part, each bolt means having its legs straddling said spring central portion with the intermediate part thereof fitting lockingly in a said groove, means engaging each bolt means at the legs thereof securing said axle to said spring at said spring central portion.

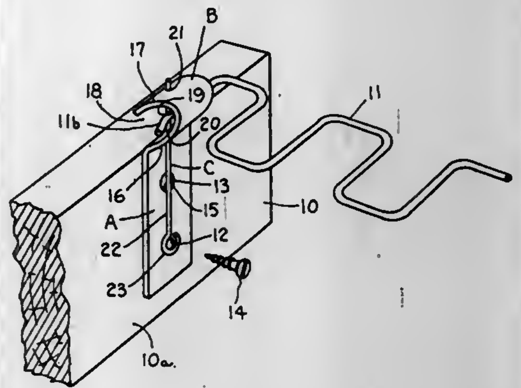
3,891,198
FURNITURE UPHOLSTERY SPRING SECURING BRACKET

Kenneth G. Bible, 201 Butler Dr., Greenville, S.C. 29611

Filed Sept. 23, 1974, Ser. No. 508,189

Int. Cl.² F16F *3/02*

U.S. Cl. 267—110 **3 Claims**



1. A bracket for securing a spring strip beneath upper upholstery fabric and padding to a wooden furniture frame rail member having interior side surface accessible from the bottom of the frame comprising:

a. a straight flat lower shank portion having spaced holes formed therein for receiving fastening means mounting said bracket to the interior vertical side surface of said rail member;

b. an upper substantially U-shaped hook portion having one leg integral with said shank portion and another leg thereabove extending substantially on one side of said shank portion remote from said frame member forming an opening for receiving one end of said spring strip; and

c. locking means for containing one end of said spring strip received in said hook portion;

whereby said bracket can be easily attached to said interior vertical side surface from the bottom of said furniture frame without removing the upper fabric and padding therefrom for securing said spring strip across the frame member.

3,891,199
HYDRAULIC SHOCK ABSORBER

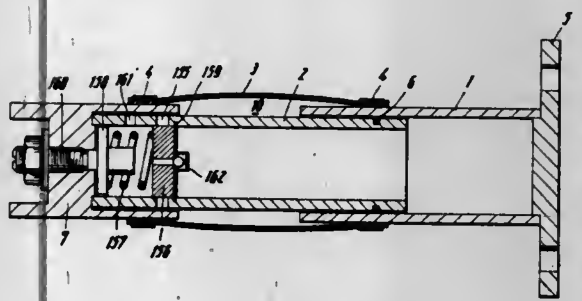
Jean Herbert Willich, and Christian Pfeil, both of Ennepetal, Germany, assignors to Firma August Bilstein, Ennepetal-Altenvoerde, Germany

Filed Sept. 21, 1972, Ser. No. 290,854

Claims priority, application Germany, Aug. 2, 1972, 2237914

Int. Cl. F16f *9/08, 9/342*

U.S. Cl. 267—139 **9 Claims**



1. A hydraulic shock absorber comprising two telescopically engageable tubes containing damping liquid, a resilient bag disposed exteriorly of said tubes and attached to spaced-apart portions of said tubes in fluid-sealing engagement and encircling outer peripheral portions of said tubes interposed the points of bag attachment to said tubes so as to define a damping liquid storage chamber therewith, said storage chamber communicating with said damping liquid in said tubes by means of a throttling port whereby said damping liquid is received in said storage chamber during telescopic movement of one of said tubes into the other in the course of a tube compression stroke, and means for adjusting the effective fluid-conveying cross-section of the throttling port disposed adjacent said throttling port and extending sealingly from the interior of one of said tubes so as to be engageable exteriorly of said shock absorber; said resilient bag acting to return said damping fluid to said tubes through said throttling port and to return said tubes to the extended condition following said compression stroke.

3,891,200
BUFFER STRUCTURE

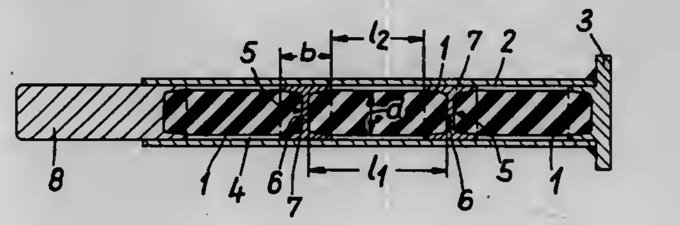
Wilhelm Schwarz, Wilhelmshaven, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Mar. 12, 1974, Ser. No. 450,309

Claims priority, application Germany, Mar. 17, 1973, 2313389

Int. Cl. F16f *7/08*

U.S. Cl. 267—140 **4 Claims**



1. A buffer structure for relatively large buffer strokes, which includes: a tubular member having hollow chamber space therein, a plurality of buffer bodies including ends thereof arranged axially one behind the other in said tubular member, said buffer bodies comprising cellular elastic material and when under no load having a radial play with regard to the inner surface of said tubular member so as to be able to radially expand when being subjected to an axial load, closure means including hollow space therewith connected to and closing one end of said tubular member, a plurality of intermediate elements slidably arranged within said tubular member and respectively interposed between each two adjacent ones of said buffer bodies, the other end of said tubular member being open, and push rod means with hollow space at an end thereof slidably guided by said open end of said tubular member and adapted to engage the respective adjacent end portion of the respective adjacent buffer body for elastically compressing the latter, and the other buffer bodies in said tubular member in response to an axial load acting upon said push rod means in the direction toward said closure means, said intermediate elements comprising discs with annular flange means slidably engaging the inner wall surface of said tubular member, said ends of the buffer bodies being inserted in the hollow chamber space formed by the discs and flange means as well as in the hollow space of the closure means on one end of said tubular member and into hollow space of the end of said push rod means extending into said tubular member, said annular flange means extending on opposite sides of the pertaining discs.

3,891,201
COMPRESSION HOLD-DOWN ELEMENTS

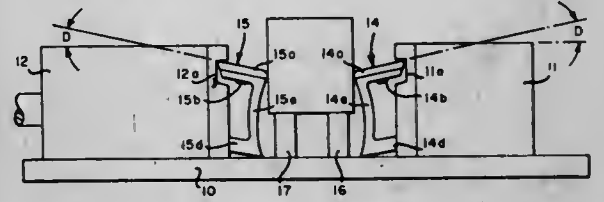
Robert G. Clugage, P.O. Box 5021, Incline Village, Nev. 89450

Continuation-in-part of Ser. No. 273,971, July 21, 1972, Pat. No. 3,791,640. This application Jan. 16, 1974, Ser. No. 433,898The portion of the term of this patent subsequent to Feb. 12, 1991, has been disclaimed.

Int. Cl. B23q *3/06*

U.S. Cl. 269—136 **2 Claims**

1. A compression hold-down and clamping device for holding a work-piece down upon supporting means interposed between the jaws of the clamping device, the combination comprising a hold-down element having an elongated top member, said top member having a rounded forward surface for engaging the workpiece, an elongated bottom member, the forward parts of said members being joined by a web, a clamping device comprising a pair of jaws and means to move one jaw toward the other to effect a clamping action, the jaws of the clamping device each having a horizontally extending recess for receiving the rear part of said top member to prevent said top member from slipping when pressure is applied thereto, said bottom member engaging said jaw of the clamping device near the bottom of said jaw, said top member being tilted at a predetermined angle with respect to the side of the workpiece engaged thereby, said predetermined angle is slightly reduced when pressure is applied to said top member and said rear parts of said top member and said bottom member are moved away from each other as said web is flexed whereby the workpipece is pressed down on the supporting means.



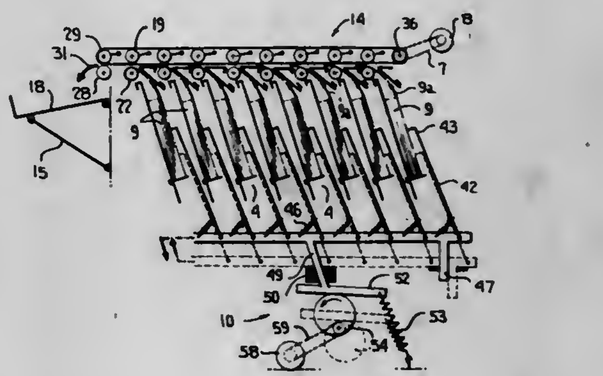
3,891,202
COLLATING MACHINE

Melvin D. Kircher, 449 Jefferson St., Lansdale, Pa. 19446

Filed May 1, 1972, Ser. No. 248,828

Int. Cl. B65h *39/02*

U.S. Cl. 270—58 **13 Claims**



1. A machine for collating sheet material into desired order from individual stacks, including:

a. a plurality of storage compartments disposed at an angle to the vertical for storing individual stacks of sheet material, and

b. feed means for simultaneously separating the outer sheet of each stack in each storage compartment whereby said sheets can be collected into individual sets of properly ordered sheet material,

c. said feed means comprising a push member extending upwardly within each compartment and which includes a frictional device which rests on the top sheet of the stack contained therein, said push member having an end pivotally attached to an elongated carrier member which is part of a rigid single unit assembly comprising:

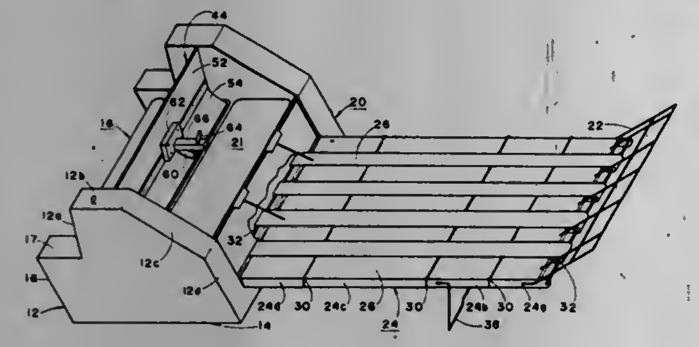
  1. a follower arm positioned below and parallel to the said carrier member,
  2. an extension which rigidly joins said carrier member and said follower arm, and
  3. guide means which slidingly engage said extension to constrain said extension to move at a constant angle essentially parallel to the angle of the storage compartments,

said assembly being driven up and down by drive means operatively connected to said follower arm.

3,891,203
OFFICE MACHINE INCLUDING FLAT ARTICLE FEEDER

Joseph Schiff, 5 Lipski St., Tel Aviv, Israel

Filed Dec. 27, 1973, Ser. No. 428,867
Int. Cl. B65h *29/16, 5/06*
U.S. Cl. 271—4 **14 Claims**



1. An office machine comprising a machine casing, means within the casing for processing a plurality of flat articles, an input feeder feeding the flat articles from a supply station at the input side of the casing to a processing station within the casing, and an output feeder at the output side of the casing for feeding the articles away from the processing station, at least one of said feeders comprising a conveyor belt and a conveyor platform supporting the belt, said conveyor platform including a plurality of hinged sections permitting the platform and the conveyor belt supported thereby to be disposed in either an extended operating position wherein the hinged platform sections are extended for conveying the flat articles, or in a folded non-operating position wherein the hinged platform sections are folded to conform to the configuration of the machine casing and the conveyor belt disposed within the machine casing.

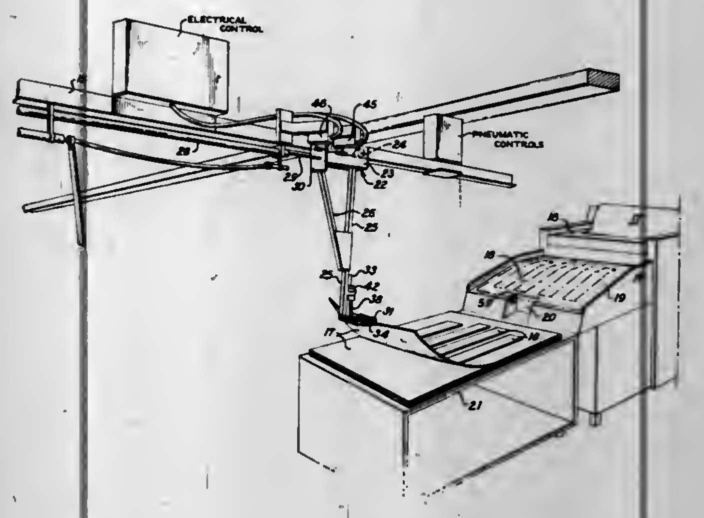
11. An office machine including a feeder for feeding flat articles from the bottom of a stack, comprising:
- a rotatable web for supporting the stack of flat articles;
- a roller disposed in alignment with the rotatable web at the end thereof in the direction of feed of the flat articles;
- drive means for rotating said roller and web;
- a rigid plate spaced above said roller;
- and a stripper member including a flexible strip supported by said rigid plate above the roller with the lower end of the flexible strip resiliently urged against the upper surface of the roller and bowed in the direction of feed of the flat articles;
- said roller, flexible strip and rigid plate being of a width at least equal to the width of the flat articles to be fed, the surface friction of the roller being greater than that of the lower free end of the flexible strip;
- whereby the machine may be continuously loaded without adjusting for the width, length or thickness of the flat articles, the flat articles being fed one at a time from the bottom of the stack and being maintained in a stack by the rotation of the web without the need for rear or side walls.

3,891,204
TRANSFER MECHANISM FOR SHEET MATERIAL

Julian Mager, Baltimore, Md., assignor to The Londontown Manufacturing Co., Baltimore, Md.

Filed Dec. 27, 1973, Ser. No. 428,729
Int. Cl. B65h *29/10*
U.S. Cl. 271—85 **3 Claims**

1. A sheet material linear transfer and stacking apparatus comprising an overhead guide and support track positioned at an elevation well above the heads of workers on a factory floor or the like, a carriage mounted on said track and movable in opposite directions thereon toward and away from a source of sheets requiring transfering and stacking at a new location spaced from the source, a depending substantially vertical arm structure secured to the carriage and movable therewith along said track, a sheet gripping means carried by the lower end of the arm structure at an elevation to engage sheets at said source and transfer them to said new location, said sheet gripping means comprising a relatively stationary upper jaw fixedly secured to the arm structure substantially at right angles thereto and projecting forwardly thereof, and a lower cooperating vertically swingable jaw below the fixed jaw and pivotally secured to the arm structure, a first fluid-pressure operated cylinder unit on the arm structure having a connection with said vertically swingable lower jaw to shift the latter between open and closed positions with relation to the upper fixed jaw, a second fluid-pressure operated cylinder unit mounted adjacent to and lengthwise of said overhead track and having a connection with said carriage to reciprocate the carriage on the track, a pair of solenoid valves operatively connected with said first and second named cylinder units to cyclically control the operation thereof, a pair of electrical limit switches on said overhead track and spaced apart longitudinally of the track and both having actuators in the path of movement of the carriage, said limit switches electrically connected with said solenoid valves in such a way that engagement of said carriage with the actuator of one limit switch while moving in one direction causes opening movement of said lower jaw by the first-named cylinder unit followed by a reversal of the direction of movement of said carriage on said track by the second cylinder unit in response to engagement of the carriage with the actuator of the second limit switch, and another switch mounted adjacent said source of sheets and electrically coupled with said solenoid valves in such a way that successive actuations of the last-named switch by successive sheets at said source produces closing of the lower jaw by the first cylinder unit and gripping of each sheet and substantially simultaneous retraction of said carriage from said source and toward said new location by said second cylinder unit.

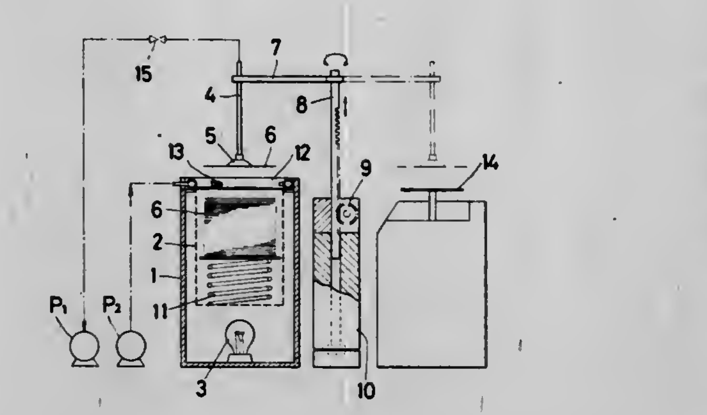


3,891,205
METHOD FOR PAPER FEEDING AND DEVICE THEREFOR

Hiroshi Sunahara, Seto, and Yoshio Kimura, Kyoto, both of Japan, assignors to Agency of Industrial Science & Technology, Japan

Filed Nov. 14, 1973, Ser. No. 415,800
Claims priority, application Japan, Nov. 15, 1972, 47-114440
Int. Cl. B65h *3/08, 3/48*
U.S. Cl. 271—98 **5 Claims**

1. A method for feeding paper stacked within a magazine comprising:
- disposing a support means above said paper magazine;
- moving said support means vertically downwardly by a reciprocable drive means;
- causing the uppermost sheet of paper of said paper stack stored in said magazine to be drawn vertically upwardly onto a sucker, supported upon said support means, by virtue of vacuum produced therein by a suction pump;
- moving said support means and said sheet of paper vertically upwardly so as to remove said sheet of paper from said paper stack for transferring the same;
- blowing air toward said sheet of paper in a peripheral manner from a fixed position disposed above said magazine as said support means and said sheet of paper passes said position during said vertical movement of said support means and said sheet of paper for thereby blowing down any extra sheets of paper entrained by said uppermost sheet held in direct contact with said sucker;
- transferring said support means and said uppermost sheet of paper held fast on said sucker to a required position;
- returning said support means to said position disposed above said magazine; and



- repeating said method until said stack of paper is depleted.

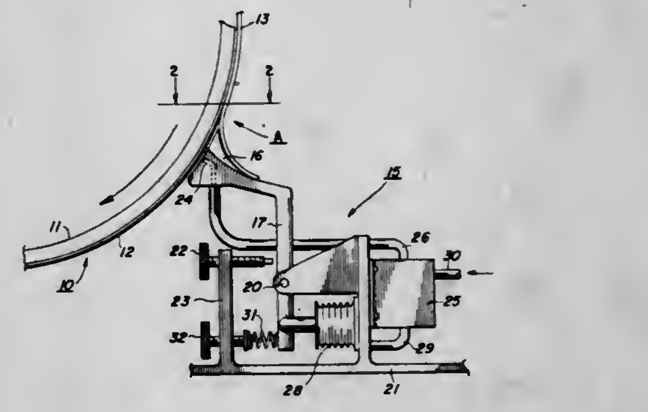
4. A device for feeding paper comprising in combination:
- a magazine for storing a stack of paper;
- a sucker disposed upon elongated support means and above said stack of paper, adapted to draw the uppermost sheet of paper of said paper stack vertically upwardly from said stack in said magazine as a result of vacuum produced within said sucker by means of a suction pump;
- driving means for imparting vertical reciprocable motion to said elongated support means and said sucker sufficient to permit said support means and said sucker to reach the lowermost sheet of paper of said stack as well as to clear the upper portion of said magazine, and rotary motion when said sucker is clear of said magazine, as required; and
- means fixedly disposed peripherally about and above said magazine for directing a forced current of air toward said uppermost sheet of paper drawn fast against said sucker thereby causing any extra sheets of paper entrained by said uppermost sheet to be blown down onto said stack of paper.

3,891,206
SHEET STRIPPING APPARATUS

Ari Bar-On, Brighton, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 2, 1973, Ser. No. 375,392
Int. Cl. B65h *29/56*
U.S. Cl. 271—174 **5 Claims**

1. Apparatus for removing a sheet of final support material from a moving photosensitive surface including:
- sheet stripping means having a stripper element adapted to move between the support material and the moving photosensitive surface and a lever arm for movably supporting said stripper element adjacent to but spaced from the moving photosensitive surface,
- said stripper element having an air passageway formed therein terminating in a port adjacent said photosensitive surface, said passageway being provided with a source of air, variation in the distance between said port and said photosensitive surface causing a variation in the air pressure within the passage in said stripper element,
- means to movably support said lever arm whereby said stripper element is positionable relative to said moving photosensitive surface,

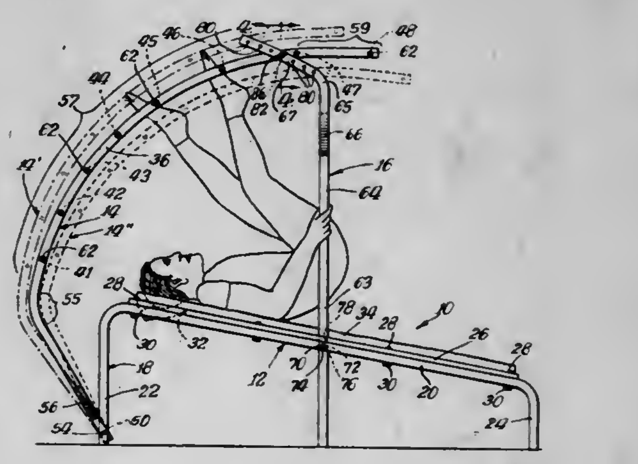


- pneumatic means operatively connected to said lever arm for positioning said arm whereby said stripper element is supported in a predetermined position adjacent to but spaced from said moving photosensitive surface, and
- control means operatively connected to said air passageway for actuating said pneumatic means in response to the pressure in said passageway whereby said lever arm is maintained in said predetermined position.

3,891,207
EXERCISER DEVICE

Merle M. Helliwell, Winchester, Ill. 62694

Filed Jan. 11, 1974, Ser. No. 432,668
Int. Cl. A63b *17/00*
U.S. Cl. 272—58 **9 Claims**



1. An exerciser device particularly useful in exercising the back and legs of a person, said exerciser device comprising a back support member upon which the person may lie, said back support member having a head end and an opposite end, a curved ladder member having one end attached to the head end of said back support member, said ladder member rising above said back support member and over the top of said back support member and curving toward the opposite end of said back support member, the other end of said ladder member terminating above said back support member, said ladder member having a plurality of spaced rungs for engagement by the feet of the person, and support means for supporting said other end of said ladder member, said support means being secured to said back support member and extending generally upwardly and being detachably connected to the other end of said ladder member.

3,891,208

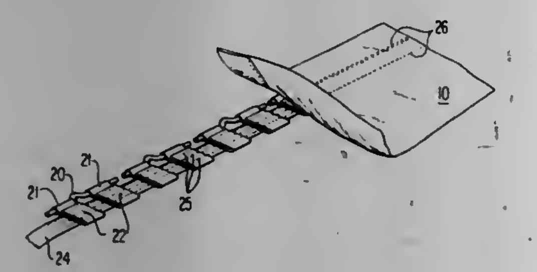
CONCEALED SPRING ANCHORING MEANS FOR TRAMPOLINES AND METHOD OF PRODUCING SAME

Bruce C. Sidlinger, 208-214 International Rd., Garland, Tex. 75040

Continuation-in-part of Ser. No. 201,376, Nov. 23, 1971, Pat. No. 3,767,009. This application June 18, 1973, Ser. No. 370,681

Int. Cl.² A63B *5/18*

U.S. Cl. 272—65 **18 Claims**



4. In a trampoline of the type wherein a flexible bed is supported by an encircling frame by means of a series of coil spring means connected in stressed condition between a series of short tapes secured at spaced intervals along the marginal areas of the bed and said frame, the improvement which consists of a plurality of first securing means respectively connecting each of said short tapes only to an elongated second tape extending along a margin of the bed, and second securing means to attach the second tape extending along the marginal area of the trampoline bed on the underside thereof and thereby to cover and protect said first securing means from exposure to forces acting from above said trampoline bed whereby a failure of the second securing means at a given location will not result in the complete loss of spring support at that location.

9. Method of attaching spring anchors to the margin of a trampoline bed comprising the steps of preparing a length of flexible tape to receive a plurality of metal anchors at spaced locations along the length of the tape, and securing said prepared tape to said trampoline bed adjacent a margin thereof.

3,891,209

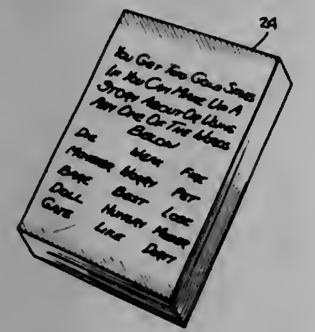
PSYCHOLOGICAL TESTING AND THERAPEUTIC GAME DEVICE

Nathan I. Kritzberg, Tenafly, N.J., assignor to Psychotherapeutic Devices, Inc., New York, N.Y.

Filed Dec. 14, 1973, Ser. No. 424,683

Int. Cl. A63f *9/00*

U.S. Cl. 273—1 R **10 Claims**



1. A psychological testing and therapeutic game device adapted to be employed to evoke fantasizing for purposes that include psychological testing and therapy comprising:

a first set of cards, each having a first indicia thereon and each card of said first set containing a set of words,

a second set of cards, each having a second indicia and each card of said second set containing a set of words,

a spinner board having a spinable pointer and a plurality of zones, said pointer when at rest designating one of said zones,

a first set of said zones, each having a first indicia thereon corresponding to said first indicia on said first set of cards,

a second set of said zones, each having a second indicia thereon corresponding to said second indicia on said second set of cards,

the predominant portions of the words on said cards of said first and second sets of cards each tending to evoke a significant primary emotion,

said words comprising a plurality of subsets of words, each of the words in any one of said subsets tending to evoke the same primary emotion,

each of said cards in said first set of cards containing at least one word tending to evoke a significant primary emotion, all of said evoking words on any one of said cards of said first set of cards belonging to only one of said subsets,

each of said cards of said second set of cards containing at least one word from each of the sub-sets represented by said first set of cards.

3,891,210

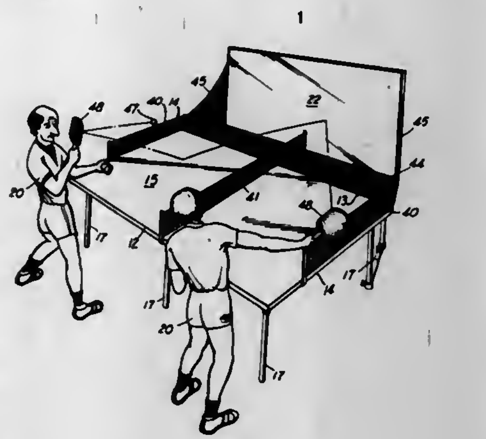
DEFLECTOR BALL GAME APPARATUS

William J. Van Horne, P.O. Box 39113 Bolton Station, Atlanta, Ga. 30318

Filed Aug. 8, 1973, Ser. No. 386,531

Int. Cl. A63b *67/04*

U.S. Cl. 273—30 **3 Claims**



2. Deflector ball game apparatus comprising a table having a substantially flat top surface, front, rear and side edges, said table providing a playing court of sufficient length to enable two players to stand side by side adjacent said front edge of said table; a deflector board mounted substantially parallel, behind and in spaced relation with said rear edge of said table in a generally upright position; a pair of side barriers mounted uprightly along at least a portion of said edges of said table; a net mounted uprightly over the center of said table substantially parallel and between said side barriers with an end thereof jutting over said rear edge of said table into abutment with said deflector board.

3,891,211

TENNIS RACKET WITH INTERCHANGEABLE STRING FRAME

Peter C. Diefenbach, 65 South Main St., Southampton, N.Y. 11968

Filed June 13, 1974, Ser. No. 479,003

Int. Cl.² A63B *49/02*

U.S. Cl. 273—73 L **2 Claims**

1. A tennis racket comprising:

a first bow portion having a base at one end;

a handle including a throat portion and having said base of said first bow portion integrally formed on said throat portion;

a second bow portion pivotally coupled to said first bow portion at another end thereof;

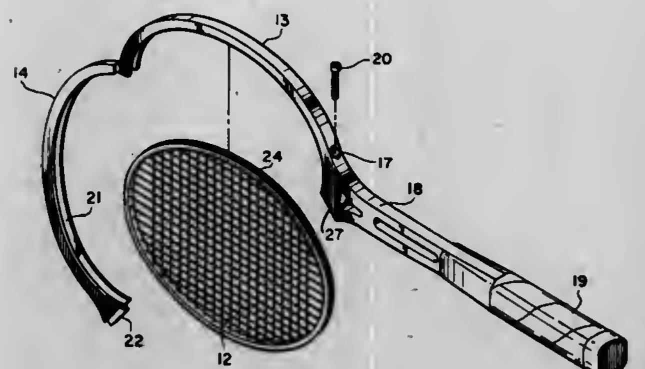
an annular and continuous groove formed on the inside periphery of said first and second bow portions;

a string frame removeably disposed in said groove;

said base having an arcuate inner periphery extending continuously with that of said first bow portion and abutting said string frame, said base having a lateral side formed with a straight inclined portion forming an acute angle with respect to the longitudinal axis of said handle, said inclined portion being formed with a central channel extending along its length;

said second bow portion having a free end formed with an inclined edge and having a central projecting flange extending therefrom along its length, said inclined edge and said projecting flange complementary fitting together with said inclined portion and said central channel, respectively, of said base of said first bow portion in a closed position, said second bow portion having an arcuate inner periphery extending continuously from that of said base portion in said closed position and abutting said string frame, said base and said free end of said second bow portion being formed with a hole extending perpendicularly to the longitudinal axis of said handle and through said projecting flange with that portion of the hole in the second bow portion being threaded; and

a set screw disposed in said hole for releasably threadably coupling said base and said free end in said closed position.



3,891,212

PORTABLE KIT FOR ASSEMBLING GOLF CLUB

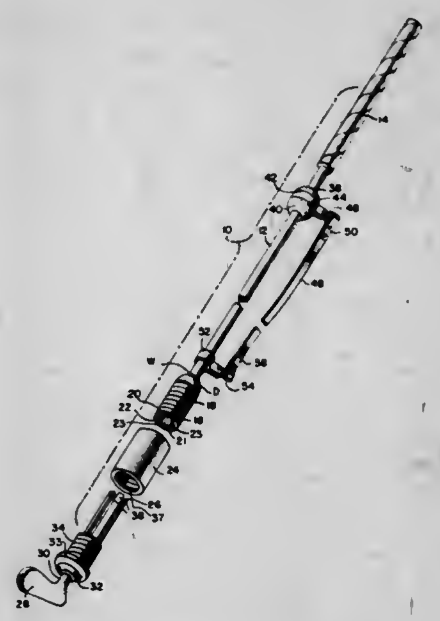
Johnnie P. Hill, 700 Maxfield, Waco, Tex. 76705

Filed Dec. 19, 1973, Ser. No. 426,012

Int. Cl. A63b *53/02*

U.S. Cl. 273—80.1 **10 Claims**

1. A portable kit for assembling a golf club for executing various golf strokes such as teeing off, chipping, putting, or the like, said kit comprising a shaft, a plurality of club heads or spoons any one of which may be assembled upon a lower end of said shaft, and a carrying case for said club heads or spoons, characterized in that said shaft comprises a handle or grip at its upper end, coupling means at the lower end thereof in the form of a tubular member with alternate splines and recesses therein and a threaded portion externally thereof and which in assembly cooperates with a club head or spoon member selected from said kit with a similarly threaded portion and spline elements extending from the end thereof and in said recesses of said tubular member and a sleeve with internal threads engaged with both said threaded portion of said tubular member and said threaded portion of said club head or spoon member.



3,891,213

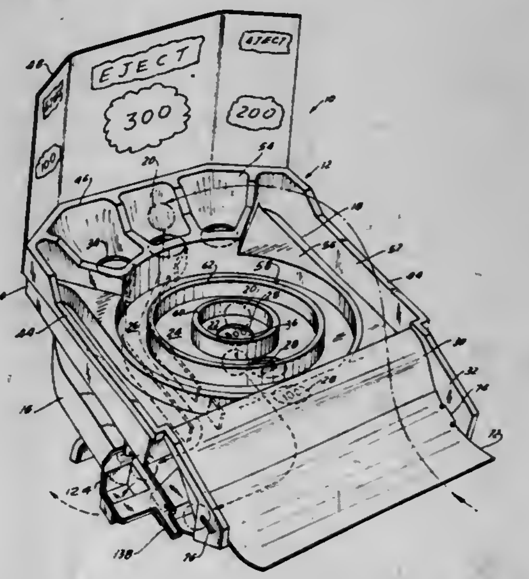
SKEE-BALL APPARATUS INCLUDING BALL EJECTION TARGETS

Julius Cooper, New Hyde Park, and Tormod K. Reinertsen, East Northport, both of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed July 9, 1973, Ser. No. 377,467The portion of the term of this patent subsequent to Feb. 11, 1992, has been disclaimed.

Int. Cl. A63b *71/02*

U.S. Cl. 273—95 D **22 Claims**



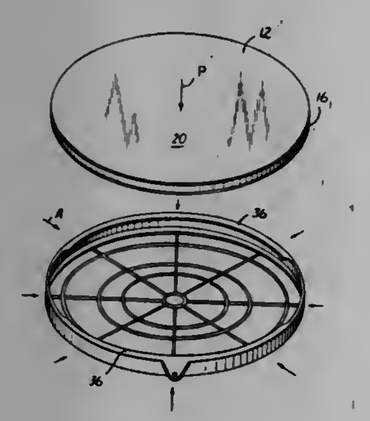
1. A game for use with a plurality of projectiles which are adapted to be rolled or otherwise projected into the game which comprises a frame having first and second sets of apertures formed therein, said sets respectively defining a plurality of independent projectile ejection and scoring openings and a plurality of independent actuator members mounted on said frame, said actuator members being respectively operatively and independently associated between individual apertures in said first and second sets; and each independent actuator including stop means for preventing a projectile from passing through its associated scoring opening and associated means for removing only its associated stop means from its associated scoring opening in response to the projection of a projectile into the associated ejection opening, thereby to permit a

projectile to fall through said scoring opening, without affecting the stop means of any other actuator in the game.

3,891,214

HEAT SHRINKING DARTBOARD CAGE AND ONE PIECE CORE

Francis E. Scullin, Havertown, Pa., assignor to Crown Recreation, Inc., Hollis, N.Y.
Filed Dec. 10, 1973, Ser. No. 424,336
Int. Cl. F41j *3/00*
U.S. Cl. 273—102 B **14 Claims**



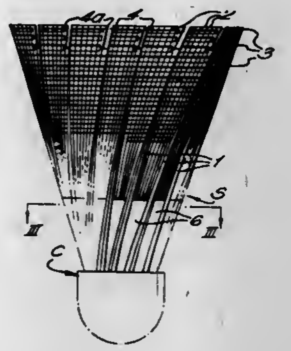
1. A dartboard comprising a target core having a front target face, a peripheral side wall, and a rear face; and a one-piece cage operatively secured to said core, said cage including a plurality of integrally formed operatively interconnected ribs located in a common plane and superimposed on at least a portion of said front face of the core to define therebetween a plurality of target areas on said front target face, a peripheral rim integrally connected to at least one of said ribs and extending about the periphery of said core perpendicularly to said plane, and flange means integrally connected to said rim and extending perpendicularly thereto and extending over at least a portion of said rear face of the core whereby said core is held in and operatively secured to said cage between said bars and said flange means; said core comprising a relatively stiff one-piece member; said cage and core being generally complementary in plan, and said cage being formed of a thermoplastic material having the characteristic of shrinking upon cooling whereby said one-piece relatively stiff core is adapted to be readily inserted in said cage between said ribs and said flange means as one flat piece when said cage is formed and is tightly held in the cage upon shrinkage thereof.

3,891,215

SHUTTLECOCKS

Ian Christy Maconachie, Sandwich, England, assignor to Reinforced Shuttlecocks Limited, London, England
Continuation-in-part of Ser. No. 458,012, April 4, 1974, abandoned. This application Oct. 29, 1974, Ser. No. 518,886
Claims priority, application United Kingdom, Apr. 5, 1973, 16351/73
Int. Cl. A63b *67/18*
U.S. Cl. 273—106 A **14 Claims**

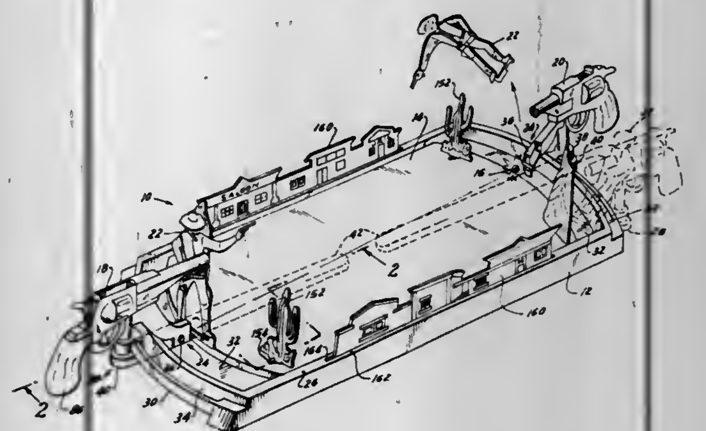
1. A shuttlecock having a base and a frusto-conical skirt extending from said base, in which said skirt, which is formed of plastics material, comprises a truncated conical lattice structure made up of longitudinal main stems and subsidiary stems joined by transverse ribs, wherein said skirt is provided at its wide end with slits which extend from the wide end generally towards the base, said slits being at least three times as long in the longitudinal direction of the shuttlecock as they are wide, and having a width no greater than 1/5th the distance between main stems at the wide end of said skirt, there being only one slit between any adjacent pair of main stems.



3,891,216

GUNFIGHT GAME

Burt Ensmann, Flushing; Michael Ieda, Ft. Solanga, L.I., and Madhusudan Joshi, Hempstead, all of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.
Division of Ser. No. 376,990, July 6, 1973. This application Aug. 21, 1974, Ser. No. 499,385
Int. Cl. A63f *9/02*
U.S. Cl. 273—119 R **22 Claims**



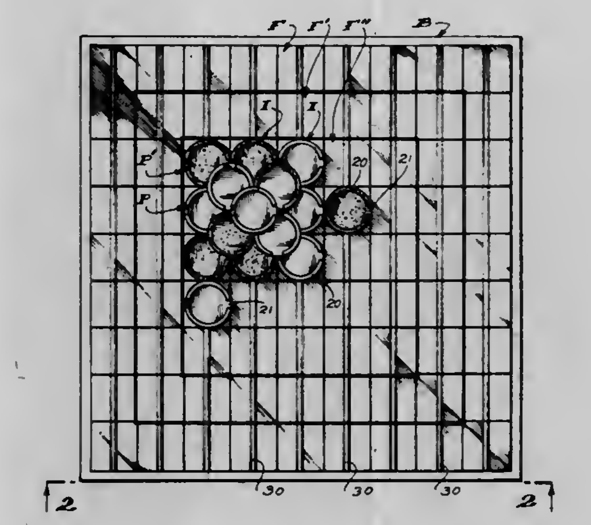
1. A game comprising a frame having a playing surface formed thereon and at least two toy guns operatively associated with said frame for movement with respect thereto, said guns each including a housing, means in said housing for discharging a projectile onto said playing surface and across said surface towards the other of said toy guns, a target member operatively engaged with said housing, and means in said housing responsive to an impact against its associated target member by a projectile discharged from the other toy gun for indicating that said target member has been hit.

3,891,217

BOARD GAME APPARATUS

Riley R. Geary, and Dennis G. Mehaffey, both of 6202 N. Ivar, Temple City, Pasadena, Calif. 91780
Filed Oct. 9, 1974, Ser. No. 513,416
Int. Cl.² A63F *3/00*
U.S. Cl. 273—130 R **9 Claims**

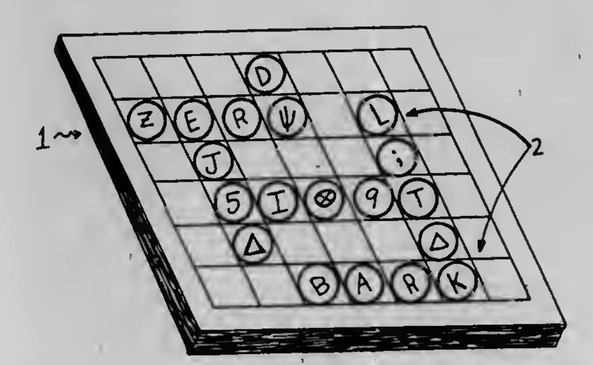
1. Game structure for playing a checkers-type game wherein a multiplicity of game pieces are pyramidally stacked on and above a playing field, said structure comprising a substantially flat, horizontal, squarely gridded playing field, said gridded field defining adjacent game piece accommodating stations, a plurality of sets of structurally similar game pieces, the game pieces of each set including identifying means to distinguish those pieces from the pieces of other sets of pieces, each piece comprising a disc-shaped body with a cylindrical peripheral side and substantially flat, horizontal top and bottom surfaces and substantially corresponding in diametric extent with the lateral extent of the stations defined by the field, said pieces adapted to be arranged in a pyramidal vertical stacked relationship wherein each upper piece is arranged centrally of a related group of four, adjacent, squarely arranged lower pieces with four quarter portions of said upper piece opposing and in supported engagement with the inner quarter portions of said related group of four adjacent lower pieces and interengageable orienting means projecting vertically from said pieces to orient each upper piece centrally of its related group of lower pieces and to retain those related pieces against lateral displacement.



3,891,218

DECODING CROSSWORD-TYPE GAME

Carol H. Hilgartner, and Stephen H. Hilgartner, both of 307 Berkeley St., Rochester, N.Y. 14607
Filed May 13, 1974, Ser. No. 469,233
Int. Cl. A63f *3/00*
U.S. Cl. 273—130 E **6 Claims**



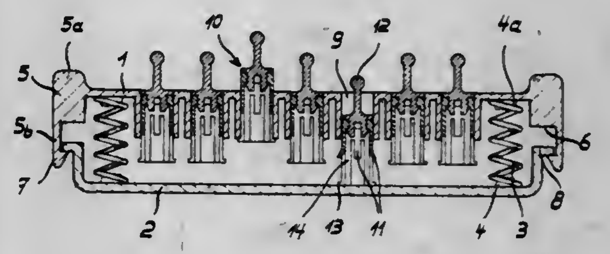
1. A decoding crossword-type game apparatus comprising, in combination,

- a. game support means having a pattern thereon for receiving marker means bearing thereon the various letters of an alphabet and for maintaining said marker means positioned on said game support means so as to define a crossword array composed of said letters;
  - i. said alphabet being in one to one correspondence with a first code of symbols, each symbol thereof uniquely representing a said letter of said alphabet;
  - ii. said alphabet also being in one to one correspondence with a second code of symbols, each symbol thereof also uniquely representing a letter of said alphabet;
  - iii. said first code being different from said second code;
- b. a first plurality of marker means,
  - i. each of said marker means having thereon a letter of said alphabet;
  - ii. each of said marker means having thereon a symbol of said first code, the last said symbol thereon being said first code's symbol representing the said letter thereon;
  - iii. each of said marker means being positionable on said game support means by a player and being operable by said player for exposing, to the view of an observer of said game support means, only the said first code's said symbol thereon;
  - iv. each of said marker means also being operable by said player for exposing, to the view of said observer, the said alphabet's said letter thereon;
- c. A second plurality of marker means substantially equal in number to the first plurality of marker means
  - i. each said second plurality's marker means having thereon a letter of said alphabet which identically corresponds to the letter of said alphabet appearing on each corresponding one of the first said marker means
  - ii. each of said second plurality's marker means having thereon a symbol of said second code, the last said symbol thereon being said second code's symbol representing the said alphabet's said letter thereon;
  - iii. each of said second plurality's marker means being positionable by a player on said game support means and being operable by the last said player for exposing, to the view of said observer, only the said second code's said symbol thereon;
  - iv. each of said second plurality's marker means also being operable by said last said player for exposing, to the view of said observer, the said alphabet's said letter thereon;
- d. said marker means being sufficient in number, and each of said several letters of said alphabet being represented on as many said marker means as is necessary to allow said players to compose said crossword array;
- e. the symbol disposed on each of the said first plurality's marker means being different from the symbol which is disposed on each of the said second plurality's marker means whenever the letter of the alphabet disposed on each of the said first plurality's marker means is identical to the corresponding letter of the alphabet disposed on each of the said second plurality's marker means;
- f. each of said first plurality's marker means also having thereon a characteristic means for identifying each marker means as belonging to said first plurality of marker means, each of said second plurality's marker means also having thereon a characteristic means different from the characteristic means on said first plurality's marker means for identifying each marker means as belonging to said second plurality's marker means.

3,891,219

GAME BOARD WITH COLOR DISTINGUISHABLE PLAY PINS AND BORES

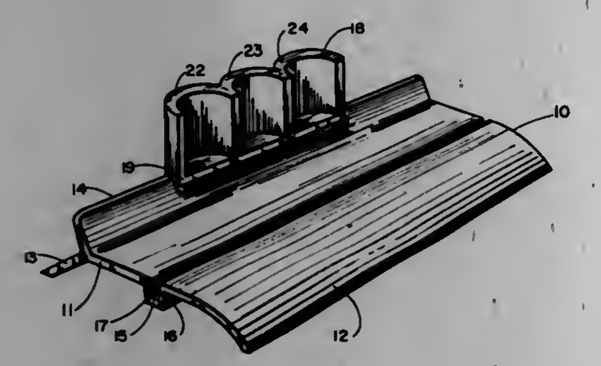
Reiner Foerst, Bickenbachstr. 57, 527 Gummersbach 1 - Karlskamp, Germany
Filed Dec. 19, 1973, Ser. No. 426,104
Int. Cl. A63f *3/00*
U.S. Cl. 273—136 F **3 Claims**



1. A game board which includes in combination: a bottom section, a top section, spring means interposed between said top section and said bottom section, said top section and said bottom section being movable relative to each other, said spring means continuously urging said top section away from said bottom section, abutment means associated with said top and bottom sections and operable during a movement of said top section toward and away from said bottom section to limit the minimum and maximum distance respectively therebetween, said top section being provided with a plurality of bores

defined by walls having a lower end face directed toward said bottom section, and a plurality of play pin means projecting above the game board and respectively frictionally slidable in said bores with said play pin means being axially displaceable toward and away from said bottom section, each of said pin means having a skirt with resilient portions having the tendency to bend outwardly for frictional engagement with the wall of the pertaining bore, the improvement therewith comprising a side surface of said bores having a color different from that of the top section of the board, said play pin means being shiftable into two distinct extreme positions and a distinct intermediate base position in each of which three positions said play pin means are frictionally held, each play pin means comprising a slidable part and a handle for pushing and pulling thereof which projects just above said board in the base position of said play pin means, said handle and said slidable part being differently colored such that the surface of the handle and surface of the top section of the board are uniquely colored whereas the surface of the slidable part and the side surfaces of the openings in the board are differently colored.

3,891,220
COMBINED CARD AND POKER CHIP HOLDER
Anna P. Driver, 7400 Troon Way, Sacramento, Calif. 95822
Filed Aug. 2, 1974, Ser. No. 494,066
Int. Cl.² A63F *1/10*
U.S. Cl. 273—150 **4 Claims**

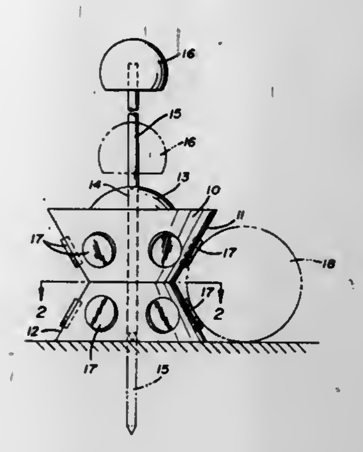


1. A combined card and poker chip holder comprising, in combination:

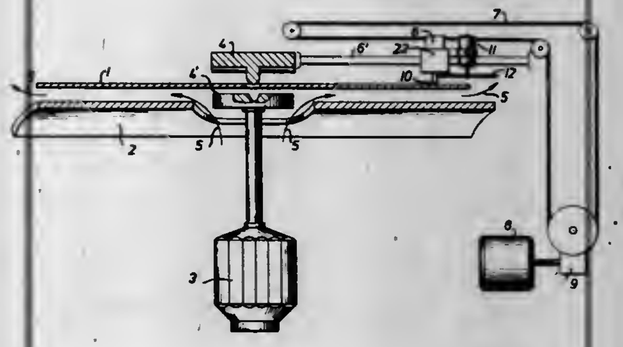
a card holder including a base, having a longitudinal extent, a longitudinally extending integral curved front supporting leg, a longitudinally extending integral outwardly and downwardly inclined rear supporting leg, a longitudinally extending upwardly and outwardly inclined lip portion disposed at the rear of the base, a longitudinally extending slot in said base disposed approximately medially of said front and rear legs; and a poker chip attachment for storing poker chips including a base, a pair of spaced depending projections to removably receive the lip portion on the card holder and a plurality of semi-circular upwardly extending poker chip holders that are integral with the poker chip attachment base and with each other.

3,891,221
MAGNETIC GOLF GAME
Harold L. Gordon, 1592 First St., Youngstown, Ohio 44509
Filed July 22, 1974, Ser. No. 490,902
Int. Cl. A63b *69/36*
U.S. Cl. 273—177 R **4 Claims**

1. A magnetic target and a ball having magnetically attractable material therein, the magnetic properties of the target and the ball being such that the ball will be held in place against the target upon impact of the ball therewith, said target being circular and having at least one flat surface forming a base, the upper half of the circular target being frustum shaped with the largest diameter at the top and the lower half of the circular target being a reverse frustum shape relative thereto with its larger diameter end forming said flat surface and base.



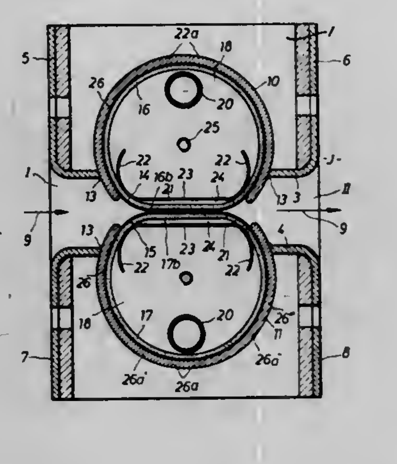
3,891,222
STYLUS RECONDITIONING DEVICE
Gunter Wimmer; Jürgen Wilisch, and Jurgen Heller, all of Berlin, Germany, assignors to TED Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec, Zug, Switzerland
Filed Aug. 29, 1974, Ser. No. 502,235
Claims priority, application Germany, Aug. 29, 1973, 2344105
Int. Cl. G11b *31/00*
U.S. Cl. 274—1 R **6 Claims**



1. In a signal reproducing apparatus including means for supporting a signal carrier body; a signal pickup stylus mechanically contacting the signal carrier body during signal reproduction; a mechanism for moving the stylus with respect to the signal carrier body during signal reproduction; and grinding means, including a grinding member, for reconditioning the stylus during pauses of signal reproduction, the improvement comprising

a. a carriage forming part of said mechanism for moving the stylus;
b. a holder supporting said stylus and mounted on said carriage;
c. means for securing said grinding member to said carriage; and
d. means for relatively moving said stylus and said grinding member into engagement with one another for reconditioning those parts of said stylus that contact the signal carrier body during signal reproduction.

3,891,223
SEAL FOR TREATMENT CONTAINERS, ESPECIALLY FOR WIDTH OF TEXTILE GOODS
Rudolf Sonnen, Krefeld, Germany, assignor to Kleinewefers Industrie Companie GmbH, Germany
Filed June 20, 1974, Ser. No. 481,242
Claims priority, application Germany, June 20, 1973, 2331367
Int. Cl. D06f *39/00;* **F16j** *15/54*
U.S. Cl. 277—32 **8 Claims**

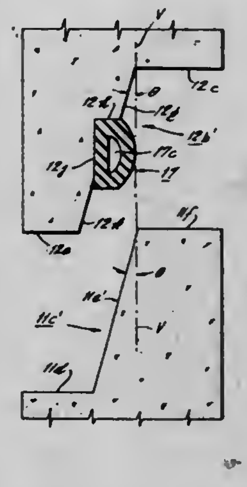


1. In combination in a treatment container having oppositely located side walls with an inner slot and an outlet slot respectively for introducing a width of goods into and withdrawing it from said container, and also having oppositely located end walls, a pair of substantially cylindrical rim means having their ends supported by some of said walls and being arranged in substantially parallel adjacent relationship to each other, those peripheral portions of said rim means which in the longitudinal direction thereof are adjacent to each other being provided with slot means facing each other, two inflatable hoses respectively located in said rim means and approximately parallely to each other bridging the respective pertaining slot means while across said slot means forming yieldable sealing bead means adapted to receive therebetween the width of goods to be treated, sealing disc means arranged at substantially the ends of said hose means and tightly closing the pertaining ends of said hose means, wear-resistant flexible foil means respectively having an inner contour substantially corresponding to the outer contour of said hoses, and while being interposed between the pertaining rim means and the respective pertaining hose surrounding the latter, and conduit means respectively leading into and out of said hoses for selectively and respectively introducing a pressure medium into and releasing it from said hoses.

3,891,224
JOINT ASSEMBLY FOR VERTICALLY ALIGNED SECTIONALIZED MANHOLE STRUCTURES INCORPORATING D-SHAPED GASKETS
John Ditcher, Langhorne, Pa., assignor to A-Lok Corporation, Trenton, N.J.
Filed Mar. 20, 1974, Ser. No. 452,677
Int. Cl. F16j *15/10*
U.S. Cl. 277—207 **13 Claims**

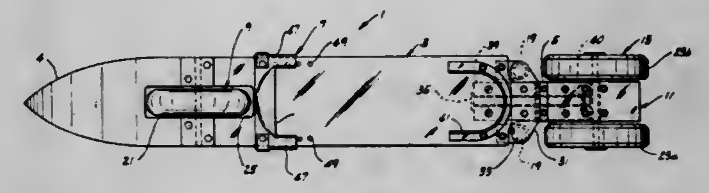
1. A watertight joint assembly for cooperating sections of manhole structure;

a first cylindrical section having a male end;
a second cylindrical section having a cooperating female end;
said female end having a flat interior annular load bearing surface spaced inwardly from one end and an inclined interior surface extending between said end and said load bearing surface;
said male end having an exterior annular shaped surface along the exterior surface of said first section, said surface being spaced inwardly from the adjacent end of said first section;
said adjacent end of said first section being flat;
said first section further including an inclined exterior surface extending between said exterior annular surface and said flat end, said inclined surface having an L-shaped notch positioned between said exterior annular surface and said flat end one surface of said notch forming a shoulder;
a closed-loop resilient gasket having a substantially D-shaped cross-section so that the interior surface of said gasket is substantially straight;



said gasket being positioned in said notch;
said gasket being compressed against said female end inclined surface when said fenale end flat interior annular surface and the flat end surface of said male end are in contact thereby cooperating to form the load bearing surfaces of said joint whereby the weight of the upper section urges said sections into engagement and urges said gasket into its compressed state.

3,891,225
WHEELED SKI SKATE
Raymond V. Sessa, 34 Girard St., Marlboro, N.J. 07746
Filed Apr. 22, 1974, Ser. No. 462,873
Int. Cl. A63c *1/28*
U.S. Cl. 280—11.19 **4 Claims**



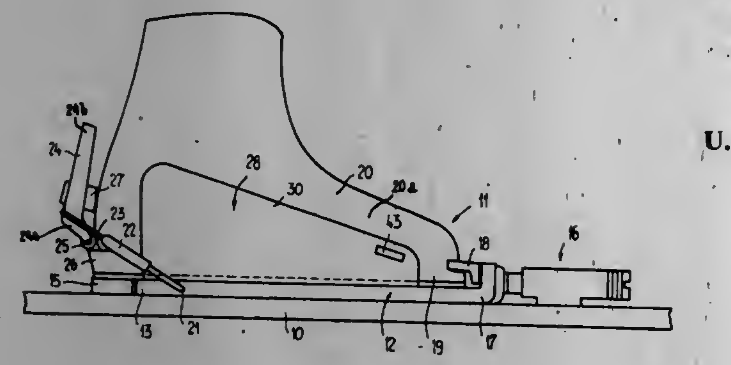
1. Apparatus for simulating skiing including a pair of ski skates, each ski skate comprising an elongate first platform, means on said first platform for securement to the foot of a skier, first roller means carried by said first platform, a second platform, second roller means carried by the second platform, and means interconnecting said first and second platforms for enabling rotation of the first platform relative to the second platform about a longitudinal axis of the ski skate, said interconnecting means including an axial hinge interconnecting said platforms and permitting relative rotation of the platforms about said longitudinal axis, and spring means interposed between said platforms for biasing said platforms to a generally neutral position in which said platforms are generally coplanar, whereby said skier shifting his weight on the first platform causes relative rotation of the first platform relative to the second platform, wherein one of said platforms has a first bracket secured thereto extending out over the adjacent end of the other of said platforms and said other platform has a second bracket secured thereto having a portion thereof in spaced vertical relation to a portion of said first bracket, said spring means comprising a pair of compression coil springs, one on one side of the axis of said axial hinge and the other

on the other side thereof, said springs being interposed between said portions of said first and second brackets.

3,891,226
RELEASABLE SKI BINDING

Ernest Gertsch, Wegen, and Ulrich Gertsch, Interlaken, both of Switzerland, assignors to Gertsch AG, Interlaken, Switzerland

Filed Apr. 9, 1973, Ser. No. 349,286
Claims priority, application United Kingdom, Apr. 17, 1972, 17569/72
Int. Cl. A63c *9/086*
U.S. Cl. 280—11.35 K **10 Claims**

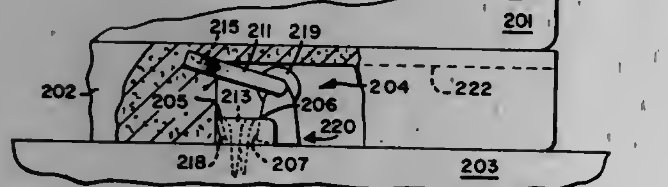


1. A releasable ski binding having a release plate which can be releasably retained at the ski by locking elements anchored at the ski, clamping elements for clamping the sole of a ski boot having an upper to the binding, said release plate having a support surface and lengthwise extending sides, at both lengthwise extending sides of the release plate there are provided lateral impact members extending over the major portion of the length of the ski boot and protruding upwardly from the support surface of the release plate, means for rigidly yet adjustably securing said lateral impact members at the release plate, each of said lateral impact members forming at least two lateral impact points for engagement with the upper of the ski boot which is to be clamped at the binding, said lateral impact members cooperating with said release plate such that lateral forces acting upon the leg of the skier are transmitted by the skier's leg via the ski boot to the release plate through the lateral impact members.

3,891,227
RELEASABLE SKI BINDING

Richard G. Spademan, 933 Addison Ave., Palo Alto, Calif. 94301

Continuation-in-part of Ser. No. 136,826, April 23, 1971, abandoned, which is a continuation-in-part of Ser. No. 868,271, Oct. 7, 1969, Pat. No. 3,606,370, which is a continuation-in-part of Ser. No. 769,682, Oct. 22, 1968, abandoned. This application Jan. 29, 1974, Ser. No. 437,719
Int. Cl. A63c *9/08*
U.S. Cl. 280—11.35 R **19 Claims**

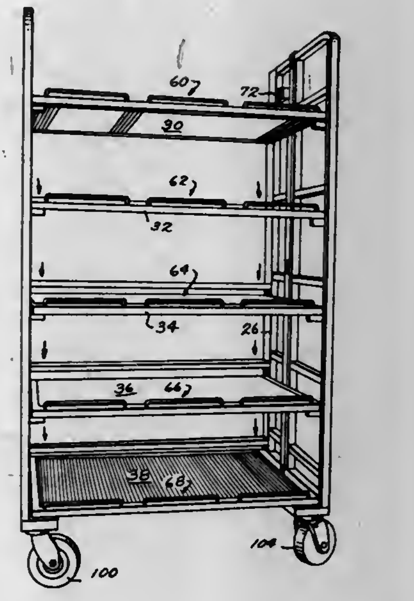


1. A releasable ski binding for releasably securing a ski boot to a ski comprising:
- a first engaging means located on one of said ski boot and said ski;
- a second engaging means located on the other of said ski boot and said ski;
- a third means coupled to said first engaging means for resiliently biasing said first engaging means into releasable engagement with said second engaging means for releasably securing said ski boot to said ski at a point interior of the side and rear edges of said ski boot; and
- a fourth means for permitting upon disengagement of said first and said second engaging means a separation of said ski boot from said ski without requiring heel lifting movement of said ski boot relative to said ski.

3,891,228
CARRIER

Vance E. Rhinehart, Apison, and Floyd G. Yother, Daisy, both of Tenn., assignors to Cumberland Corporation, Chattanooga, Tenn.

Filed Sept. 17, 1973, Ser. No. 397,979
Int. Cl. B62b *11/00*
U.S. Cl. 280—36 R **10 Claims**

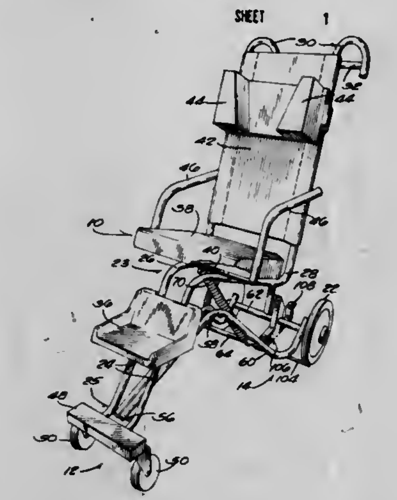


1. A carrier for containers or the like comprising:
- a frame including first and second hollow, vertical, tubular members each having a groove on the side facing the other hollow member,
- a plurality of shelves mounted on said frame and each having an extending surface,
- a back bar extending along one side of each of a number of said shelves,
- means mounting each said back bar on said frame so that each said bar can be moved from a position slightly above said extending surface of that shelf to a position substantially flush with said extending surface of said shelf,
- means mounted on said frame for urging each said back bar toward said position slightly above said extending surface including further members each movable in one of said vertical members and having a portion extending through said groove and engaging an end of said back bar, and a spring within each said vertical member and connected to said further member in that vertical member exerting a force on that further member to urge that member and that back bar to said position substantially flush with said extending surface of said shelf.

3,891,229
TRAVEL CHAIR

Edward J. Gaffney, Pewaukee, Wis., assignor to Orthokinetics, Inc., Waukesha, Wis.

Filed Mar. 14, 1974, Ser. No. 451,251
Int. Cl. B62b *11/00*
U.S. Cl. 280—41 B **11 Claims**

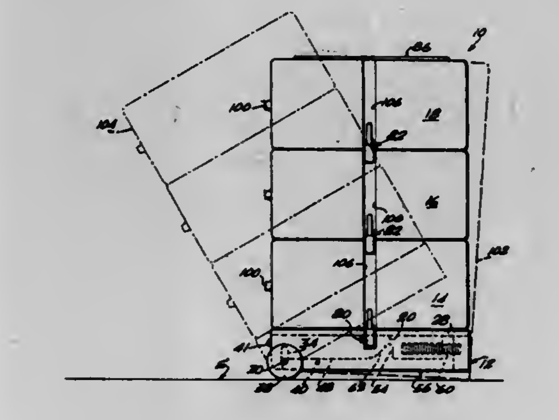


1. In a wheel chair having a seat portion, a front leg portion, and a rear wheel assembly, the improvement wherein said front leg portion is so dimensioned as to be insertable through the space between the doorframe of an automobile and one of the seats thereof whereby said front leg portion is placed in support relation to the automobile and will support the seat portion from the automobile in the course of subsequent movement of the wheel chair into the automobile, and means for retracting said rear wheel assembly upwardly independently of any change in the position of the front leg portion with respect to the seat portion and to a position which clears the space beneath the rear end of the chair and permits the chair seat portion and retracted rear wheel assembly to be swung over and set upon said automobile seat.

3,891,230
WHEELED CART SUPPORTED LUGGAGE

Fred Mayer, 7080 N.W. 37th Ct., Miami, Fla. 33147

Filed Aug. 5, 1974, Ser. No. 494,468
Int. Cl. B62d *33/08*
U.S. Cl. 280—43.24 **8 Claims**

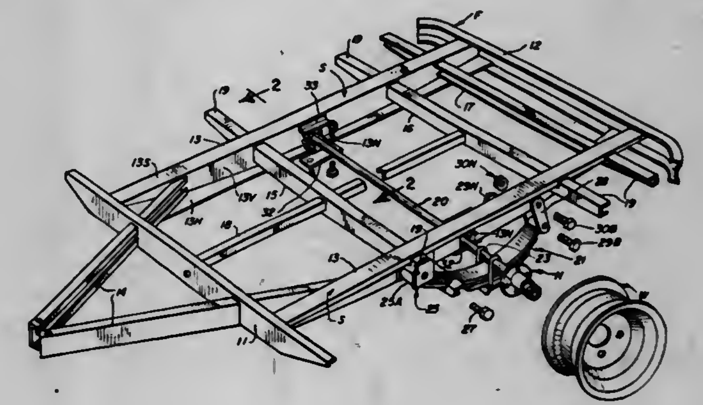


1. A mobile carrier and luggage for fixed, removable attachment thereatop in a stacked arrangement, the combination comprising;
- A. a cart including,
  1. a top wall,
  2. a peripheral skirt comprising depending front, back, and opposed side walls,
  3. a transverse axle spanning the width of said cart adjacent to said front wall and extending outwardly through vertical slots in said opposed side walls,
  4. a pair of front wheels fixed respectively to the opposed axle end portions, and
  5. leg means to selectively maintain said wheels in supporting engagement with a support surface or to simultaneously disengage said supporting wheel engagement and to extend substantially forwardly of said cart into engagement with said support surface to counterbalance a forwardly overbalanced condition of the luggage;
- B. a plurality of luggage carriers such as suitcases, each including
  1. front, back, top, bottom and opposed end walls defining an interior chamber,
  2. a drawer, including releasable lock means to maintain said drawer in a normally closed position slidable into and out of said interior chamber through said front wall,
  3. latch means to interconnect said cart and plurality of suitcases in a vertically aligned, stacked relation.

3,891,231
TRAVEL TRAILER FRAME AND SUSPENSION

Robert C. Snoberger, Goshen; Thomas C. Delker, South Bend, and Richard L. Reschly, Goshen, all of Ind., assignors to Travel Equipment Corporation, Goshen, Ind.

Filed Oct. 21, 1974, Ser. No. 516,351
Int. Cl.² B60G *11/04*
U.S. Cl. 280—106.5 R **5 Claims**



1. A multi-purpose support frame and axle suspension assembly for trailer type vehicles and comprising a pair of trusslike horizontal main rails, providing planar box support surfaces, each rail tapering vertically forwardly and rearwardly of an intermediate axle mounting section thereof; each intermediate mounting section having a downwardly opening mounting notch; a straight axle extending between and projecting beyond the main rails; a leaf spring assembly for supporting each rail from a corresponding end of the axle; and mounting means for connecting each leaf spring assembly to the corresponding rail to position the axle ends within the mounting notches for accommodating relative vertical travel therebetween.

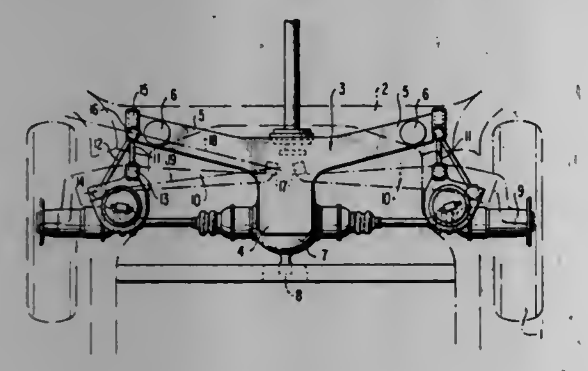
3,891,232
INDEPENDENT WHEEL SUSPENSION FOR MOTOR VEHICLES

Helmut Flemming, Kemnat, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Dec. 21, 1973, Ser. No. 427,308
Claims priority, application Germany, Dec. 23, 1972, 2263356
Int. Cl. B60g *11/16*
U.S. Cl. 280—124 A **30 Claims**

1. An independent wheel suspension for supporting a wheel at a vehicle body comprising:
- a wheel carrier means for directly rotatably supporting a wheel, said wheel carrier means being movable with said wheel,

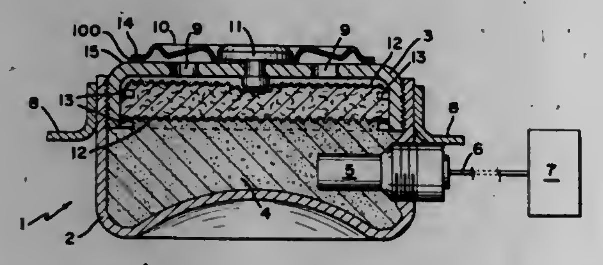
a cross guide means fixedly connected to said wheel carrier means and pivotally mounted at a vehicle body by a first pivot mounting.
an upper longitudinal guide means pivotally mounted at said wheel carrier means by a second pivot mounting and pivotally mounted at said vehicle body by a third pivot mounting,



and a lower longitudinal guide means separate from said upper guide means and pivotally mounted at said wheel carrier by a fourth pivot mounting and pivotally mounted at said vehicle body by a fifth pivot mounting.

3,891,233
INFLATOR SEAL

William H. Damon, Newhall, Calif., assignor to Allied Chemical Corporation, New York, N.Y.
Filed June 20, 1974, Ser. No. 481,293
Int. Cl. B60r *21/10*
U.S. Cl. 280—150 AB **5 Claims**

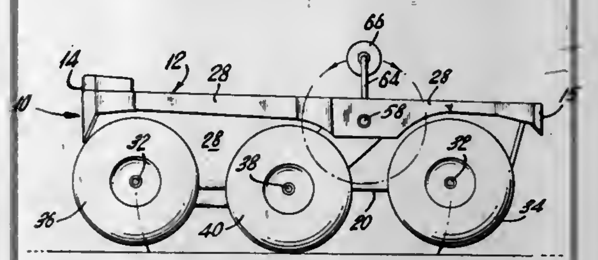


1. A source of gas including a chamber from which inflating gas is developed, exit ports at one side of said chamber, a seal means overlying said exit ports, said seal means including a seal disc and adhesive, said seal disc containing at least one convolution, said seal disc attached to said source by said adhesive binding the outer extent of said seal disc to said source, said adhesive rupturing at a pressure lower than the pressure of the inflating gas exiting from said source, said gas directed by said seal disc on exiting from said exit ports to pass through said adhesive on rupture thereof, and said seal disc further attached to said source at a location separate from the area of adhesion to said source.

3,891,234
TOY VEHICLE FOR TRANSPORTING AT LEAST THE VEHICLE OPERATOR

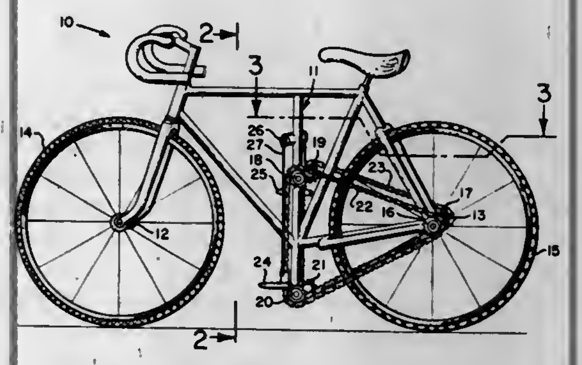
Robert Thomas Auer; Laurie Jay Campbell; Raymond J. Lohr, and James Smith, all of Erie, Pa., assignors to Marx Toys Division of The Quaker Oats Company, Stamford, Conn.
Continuation of Ser. No. 234,120, March 13, 1972, abandoned. This application Feb. 19, 1974, Ser. No. 443,878
Int. Cl. B62m *1/14*
U.S. Cl. 280—211 **2 Claims**

1. In a toy vehicle a molded chassis for carrying at least an operator of the vehicle the rear end of said chassis forming the back of a seat on which the operator can be seated, the seat extending at a front wall thereof upwardly from a floor portion, said floor portion being formed with a central portion which defines two openings in said floor said central portion providing structural support to said chassis and the openings defined thereby providing sufficient clearance for the hands of an operator seated in the seat of said chassis and wheel means located at opposite sides of said chassis for supporting the latter for traveling movement, said wheel means including a pair of intermediate coaxial wheels respectively located at opposite sides of said chassis means between opposed ends thereof, a single shaft common to said pair of intermediate coaxial wheels and rotatably supporting same for free rotary movement independently of each other, a pair of drive means carried by said chassis and operatively connected to said pair of intermediate coaxial wheels, respectively, for driving said intermediate coaxial wheels independently of each other, and a pair of control means accessible to the operator and respectively connected operatively with said pair of drive means for controlling the latter as selected by the operator to propel the vehicle in a selected direction said wheel means further including at least two pairs of coaxial wheels respectively situated forwardly and rearwardly of said pair of intermediate coaxial wheels, said front and rear wheels respectively having peripheries situated with respect to the periphery of said pair of intermediate coaxial wheels at elevations which provide for said chassis means a rocking movement around the common axis of said intermediate coaxial wheels forwardly onto said front wheels or rearwardly onto said rear wheels said chassis including inner opposed side walls which extend substantially perpendicular to said seat and floor portion at opposite sides thereof, said side walls defining restraining walls for an operator seated therebetween, and also includes two pairs of tubular portions formed with transverse openings therein, the first pair of said tubular portions being rearward of said single shaft and said other pair of tubular portions being forward of said single shaft, and a forward shaft and rearward shaft for respectively supporting said front and rear wheels, said shafts being rotatably supported in said pairs of tubular portions transverse openings, said openings being disposed to provide said rocking movement to said forward and rearward wheels about said intermediate wheels, by being at a higher elevation than said single shaft.



3,891,235
BICYCLE WHEEL DRIVE

Jacques Shelly, Venice, Calif., assignor to James De Cordova, Santa Monica, Calif.
Filed July 2, 1974, Ser. No. 485,297
Int. Cl.^{2} B62M *1/04, 9/02*
U.S. Cl. 280—252 **3 Claims**

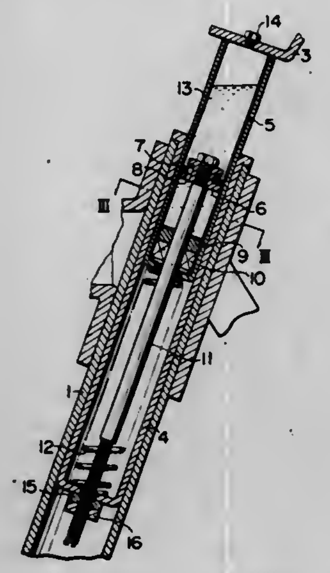


1. A wheel drive for a bicycle having a frame rotatably supporting the axles of front and rear bicycle wheels, including, in combination:

- a. left and right rear wheel sprockets on either side of the rear wheel rotatably mounted to said frame;
- b. left and right ratchet means coupling said sprockets to opposite ends respectively of the rear wheel axle such that rotation of either one of said sprockets in a first direction drives the rear wheel in a like direction and rotation of either one of the sprockets in a second opposite direction results in a decoupling of the ratchet means associated with the particular sprocket rotated in said opposite direction so that said wheel is unaffected by said particular sprocket;
- c. upper and lower pairs of pedal sprockets each comprising individually rotatable left and right pedal sprockets on either side of said frame rotatably mounted at upper and lower portions of said frame respectively, said pairs being in substantial vertical alignment;
- d. left and right bicycle chains passing respectively over the left upper and lower pedal sprockets and left rear wheel sprocket and over the right upper and lower pedal sprockets and right rear wheel sprocket;
- e. left and right pedals respectively coupled to intermediate portions of said left and right chains between the upper and lower pairs of pedal sprockets, whereby a downward driving force alternately exerted on said pedals by a bicycle rider will drive the rear wheel of said bicycle in said first direction to propel said bicycle forwardly;
- f. left and right generally vertically disposed guide means coupled to said frame, the chain portion to which said pedals are coupled passing within said guide means such that the pedals are constrained to move in rectilinear paths, said guide means supporting said upper and lower pairs of pedal sprockets; and
- g. mounting means for coupling said guide means to said frame for tilting movement fore or aft whereby the direction of rectilinear motion of the pedals can be altered slightly from a vertical direction.

3,891,236
SHOCK ABSORBER FOR BICYCLES

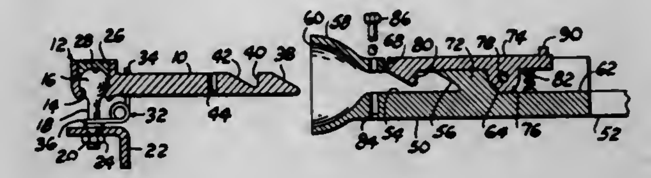
Nobuyori Kuwano, and Yasutomo Tajima, both of Gyoda, Japan, assignors to Showa Manufacturing Co., Inc., Tokyo, Japan
Filed Jan. 24, 1973, Ser. No. 326,468
Claims priority, application Japan, Aug. 31, 1972, 47-87399
Int. Cl. B62k *21/14*
U.S. Cl. 280—283 **2 Claims**



1. In combination, a bicycle and a shock absorber comprising a bottom cylinder having a circular outside surface and a polygonal inside surface fitted into the upper end of a pipe forming part of the frame of said bicycle, an oil cylinder having a polygonal outside surface mated to said polygonal inside surface of said bottom cylinder and a circular inside surface fitted slidably but nonrotatably in said bottom cylinder by virtue of said mated polygonal surfaces of said bottom and oil cylinders and connected at its upper end to a passenger-engaging element of said bicycle, piston means co-acting with said bottom cylinder and said oil cylinder, damping means provided on said piston means to generate a damping force in said oil cylinder, spring load means stretched between the bottom surface of said bottom cylinder and the oil cylinder, adjustable fastening means fitted to said piston means at its lower end and cooperating with a mating portion at the bottom surface of said bottom cylinder so that the spring set load is adjustable.

3,891,237
TRAILER HITCH

Bill Allen, 711 S. Austin, Marietta, Okla. 79088
Filed Mar. 29, 1974, Ser. No. 456,512
Int. Cl. B60d *7/00*
U.S. Cl. 280—477 **4 Claims**



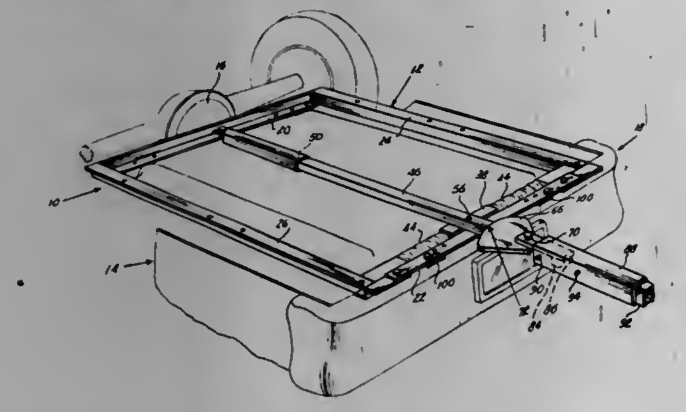
1. A trailer hitch for automatically coupling a traction vehicle to a towed vehicle, comprising:
an elongated shank having a keeper notch adjacent one end;
an elongated socket member having an axial bore in one end portion for receiving the notched end portion of said shank,
said socket member having a bell-shaped flange coaxial with the axial bore and having a lateral opening communicating with the axial bore,
said socket member having an upwardly open elongated recess in its end portion opposite the axial bore forming opposed upstanding walls and a transverse upstanding stop section between the axial bore and the recess,
said stop section forming the inward limit of the socket member axial bore;
a pawl pivotally connected with said socket member and engageable with the keeper notch,
said pawl being disposed between said walls within the elongated recess in overlying relation intermediate its ends with respect to said stop section and having a part-cylindrical portion abutting said stop section opposite said shank; and,
a spring normally biasing said pawl into the socket member lateral opening,
whereby said stop section, by being disposed between the rearward limit of said shank and said pawl part-cylindrical portion, prevents forward or rearward movement of a towed vehicle with respect to a towing vehicle.

3,891,238
TRAILER HITCH

Elmer R. Ehlert, 308 Independence, Pella, Iowa 50219
Filed Feb. 6, 1974, Ser. No. 439,897
Int. Cl. B62d *53/00*
U.S. Cl. 280—446 R **5 Claims**

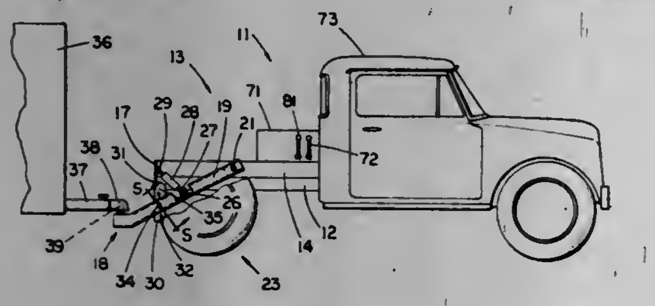
1. A trailer hitch for attachment to a towing vehicle, said hitch comprising:
a hitch frame secured to the underside of the vehicle at the rear thereof with said hitch frame including a rear rail in juxtaposition to the rear extremity of the vehicle and disposed transversely of the direction of forward vehicle travel,
an elongated tongue having a forward and rear end,
means for pivotally securing the forward end of said tongue to said hitch frame forwardly of the rear end of said vehicle so that the rear end of said tongue extends rear-

wardly beyond the rear extremity of the vehicle and can swing laterally in two opposite directions relative to the rear of the vehicle,
means slidable on said hitch frame adjacent said rear rail and operatively connected to said tongue to guide said tongue in its lateral swing movements,
a plate disposed at the underside of the rear end of said tongue and pivotally secured at one end thereto,
hitch means operatively secured to said plate so as to be movable therewith,
releasable lock means operable relative to said tongue and said plate for normally maintaining said hitch means in longitudinal alignment with said tongue,



lock actuating means on said rear rail at spaced points thereon at opposite sides relative to the center line of the towing vehicle whereby in the swing movement of said tongue said releasable lock means is engageable with and acted upon by said lock actuating means to release the same so that said plate is pivoted to effect the pivotal movement of said hitch means out of longitudinal alignment with said tongue, and
means on said rear rail cooperating with said releasable lock means to effect the transfer of its interlocking effect between said tongue and said plate to interlocking engagement between said tongue and said rear rail.

3,891,239
HYDRAULICALLY OPERATED HITCH FOR TOWING AND POSITIONING MOBILE HOMES
Jack D. Leo, 2045 Winton Ave., Speedway, Ind. 46224, and Lee Benedict, R.R. 2, Box 167, Camby, Ind. 46113
Filed Apr. 15, 1974, Ser. No. 460,713
Int. Cl. B62d *53/04*
U.S. Cl. 280—479 R **11 Claims**

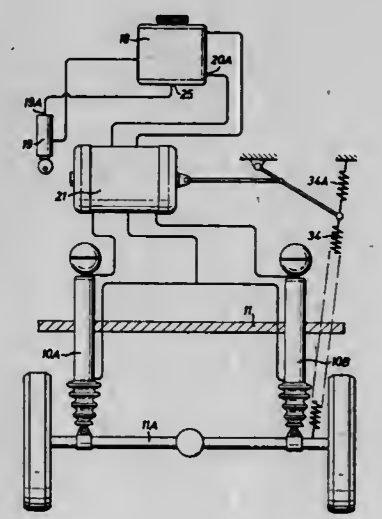


1. Apparatus for towing and positioning mobile homes, comprising:
a tractor truck having a rear axle;
a hitching ball;
a towing frame pivotably mounted to said truck, said frame having said ball mounted to the rear end thereof behind said truck, and said frame having its pivotal mounting to said truck ahead of the rear axle of the truck;
a fluid driven actuator connected to said truck and to said frame and operable to raise said frame for lifting a towing tongue of a mobile home when connected to said ball;
the pivotal mounting of said frame to said truck being ahead of the rear axle and sufficiently above the rear axle to locate said ball close to the rear end of said truck and enable said fluid driven actuator to raise and lower said ball through various levels near the level of the rear axle of said truck, without interference of said frame with said axle.

3,891,240
BOOK COVER
Gerard M. Du Corday, 10871 Thorley Rd., Santa Ana, Calif. 92705
Filed Apr. 30, 1973, Ser. No. 355,654
Int. Cl. B42d *3/00*
U.S. Cl. 281—29 **6 Claims**

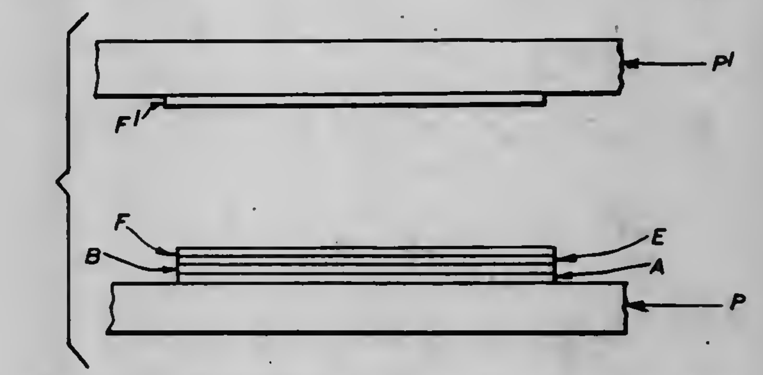
1. A custom fitted book protector for use with a book having front and back covers and a spine, comprising:
a. a protector sheet having inner and outer surfaces and having a score line for severing said protector sheet into first and second protector parts,
said score line being in said outer surface of said protector sheet and comprising a depth, V-shaped groove significantly attenuating the strength of said protective sheet, whereby when said protector sheet is severed along said groove into said first and second protector parts, said first and second protector parts will each have a beveled edge,
said first protector part having a first pocket for receiving one of said book covers and having a first body section adapted to extend from the front of said book along the outside of said one cover and over and around said spine of said book, and including a return portion adapted to extend along the outside of the other of said covers,
said first body section having an extent considerably greater than the extent of said first pocket, and terminating in an edge lying along a line intermediate to the front and back of said other cover, said edge initially being adjacent to said score line of said protector sheet and being beveled to slope toward said other cover and the front of said book,
said second protector part having a second pocket for receiving said other book cover and having a second body section adapted to extend from the front of said book along the outside of said other cover toward said spine,
said second body section having an extent slightly greater than the extent of said second pocket and terminating in an edge intermediate to the back of said other cover and the beveled edge of said first body section, whereby said return portion of said first body section overlaps said edge of said second body section for a portion of their common extend along said outside of said other cover when said first and second body sections are pulled tightly and closely along the outside of said covers of said book, said edge of said second body section initially being adjacent to said score line of said protector sheet and being beveled to slope from said other cover and toward the back of said book, and
b. adhesive means for interconnecting said overlapped areas of said first and second body sections, comprising an adhesive strip secured to the inside of said first body section adjacent said beveled edge thereof,
said adhesive strip being adhesively secured to the outside of said overlapped area of said second body section, whereby said covers and spine of said book are covered by said first and second protector parts and whereby said beveled edge of said first body section provides a snag-proof joint between said first and second parts minimizing subsequent peeling of said adhesive interconnection.

3,891,241
VEHICLE SUSPENSION SYSTEMS
Wilfred Nicholas Bainbridge, and David Parsons, both of Warwickshire, England, assignors to Automotive Products Co., Ltd., Leamington SPA, England
Filed Feb. 20, 1973, Ser. No. 333,627
Claims priority, application United Kingdom, Feb. 21, 1972, 7921/72
Int. Cl. B60g *11/26*
U.S. Cl. 280—124 F **11 Claims**



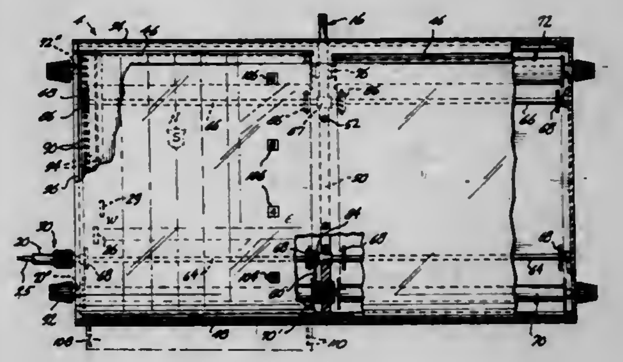
1. A vehicle suspension system including two telescopic struts comprising one strut element for connection to a respective axle of the vehicle and another strut element for connection to the body of the vehicle, a liquid reservoir, a liquid pump arranged to draw liquid from the liquid reservoir and to feed it under pressure through one non-return valve to the interior of one of the telescopic struts and through another non-return valve to the interior of the other of the telescopic struts, and a control valve operable in accordance with relative movement between an axle and the body of the vehicle, the control valve, which connects the pump output to the reservoir normally, being disposed to increase the pressure of liquid supplied by the pump to the non-return valves when the loading of the vehicle is increased so that liquid under the increased pressure is fed through the non-return valves to the interior of the telescopic struts, and to place the interior of the telescopic struts in communication with the reservior when the loading of the vehicle is decreased, so that liquid is discharged from the telescopic struts, said pump being disposed to supply liquid to each non-return valve through said control valve, the said control valve having a valve spool coupled to an axle of the vehicle and slidable in a bore in a valve body which is fixed to the vehicle body, and including damping means incorporated in the control valve, the damping means being arranged to damp movement of the valve spool away from the normal position in which it connects pump output to the reservoir, the arrangement being such that return movement of the valve spool to the normal position is relatively free, said bore being a through bore and said valve spool is longer than said bore, each end of said valve spool being fixed to a respective movable wall, and each movable wall and the adjacent end of said valve body comprising opposite walls of a respective variable volume chamber which is in restricted communication with the reservoir at least when said valve spool is in the said normal position, or is moved theretowards from said normal position.

3,891,242
TRANSFER MATERIALS
Raymond Mills Arnold, and Alec Walter George Stubbings, both of 195-203 Waterloo Rd., London, England
Filed May 24, 1973, Ser. No. 363,726
Claims priority, application United Kingdom, May 24, 1972, 24485/72
Int. Cl. B42d *15/00*
U.S. Cl. 283—6 **6 Claims**



1. A transfer material which comprises a base sheet, at least one non-transferable indicium on a surface of said base sheet, a transferable opaque layer covering at least a portion of said non-transferable indicium, an adhesive layer upon an area of said transfer material which can be juxtaposed above said transferable opaque layer, said adhesive layer being effective to remove said transferable opaque layer upon contact therewith from its original position to thereby expose said non-transferable indicium.

3,891,243
AUTOMATIC ROUTE INFORMATION DISPLAY
Charles Pelin, P.O. Box 98245, Eastsound, Wash.
Division of Ser. No. 265,647, June 23, 1972. This application July 2, 1973, Ser. No. 375,629
Int. Cl.^{2} G09B *22/00*
U.S. Cl. 283—35 **1 Claim**



1. In an automatic route information display device, a pair of elongated, relatively superposed roadway route information strips, each having longitudinally successive indicia of a roadway route thereon, the roadway of which route in actuality undergoes a turn at an intermediate point in the space between spaced points thereon, but said spaced points and said intermediate point of said roadway being represented by the indicia as lying on a rectilinear course of travel lengthwise of the strip, and the distances between the respective spaced points and the intermediate point of the roadway represented on the lower of the strips, being represented in accordance with different scales of distance lengthwise of the course of travel thereon, mutually coincident tooth engaging means on the strips at longitudinally successive intervals thereof, and longitudinally successive magnetic tracks on the lower strip, coordinated with the change between the scales of distance thereon, to indicate the change in scale to an electromagnetic detection means used therewith, the scale of distance of the upper strip being the same as one of the scales of distance on the lower strip.

3,891,244

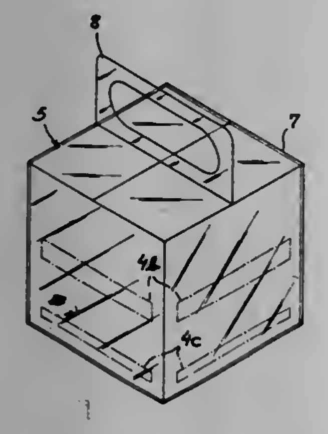
NOTEPAD

Karl Hermann Ritter, Sachenstr. 5, and Johannes Andreas Ritter, Thuringersr. 5, both of 61 Darmstadt-Eberstadt, Germany

Continuation-in-part of Ser. No. 232,749, March 8, 1972, abandoned. This application Sept. 4, 1973, Ser. No. 393,800

Int. Cl. G09f *23/10*

U.S. Cl. 283—56 **2 Claims**



1. A binderfree notepad comprising:
a multiplicity of congruent substantially square sheets arrayed one atop the other coextensively in a generally cubical stack having a height equal generally to the length of a sheet side, said stack having a plurality of lateral faces defined exclusively by the coestensive edges of said sheets;
an adhesive bond on one of said faces securing said sheets together at said one face by the sheet edges forming said one face, said sheets being readily separable from said stack at said edges forming said one face;
a screen-printed pattern on each of said faces extending over substantially all of the sheet edges forming said faces; and
a synthetic resin wrapping conforming to the stack and completely surrounds same said wrapping being provided with a handle and being transparent, said patterns each including a background color completely covering the respective face.

3,891,245

LUGGAGE TROLLEYS

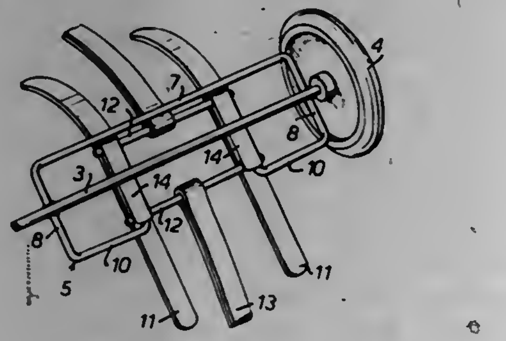
Tibor Elsas, London, England, assignor to Norland Gazelle Travel Goods Limited, Middlesex, England

Filed May 17, 1973, Ser. No. 361,369

Claims priority, application United Kingdom, May 17, 1972, 23090/72

Int. Cl. B62b *1/12*

U.S. Cl. 280—47.13 R **1 Claim**



1. A trolley for attachment to a corner of a suitcase to provide a support therefore, said trolley comprising an angled support assembly shaped to receive said corner of said suitcase, means for releasably securing said support assembly to said suitcase, a chassis assembly including a pair of ground-engaging wheels, and connecting means detachably securing said chassis assembly to said support assembly, said connecting means comprising inherently resilient projection means fast with said chassis assembly and socket means cooperating with said projection means and fast with said supporting assembly, and means for preventing disengagement of said cooperating projection means and socket means when said projection means and socket menas are fully engaged in a first position with said projecting means unstressed, wherein said projection means are movable against said inherent resilience to a second position clear of said means for preventing disengagement and in which said projection means and socket means can be disengaged to release said chassis assembly from said support assembly, said projection means comprising two parallel, spaced-apart projecting members which extend transversely of an axis of rotation of said ground-engaging wheels and which form part of a frame, and said socket means comprising a pair of correspondingly spaced-apart tubular socket members fast with said support assembly, and said means for preventing disengagement comprising a portion of said frame which is parallel with said axis of rotation of said ground engaging wheels, said frame portion being normally aligned with the ends of said socket members when said socket members and projection members are interengaged, said projection members being movable against said inherent resilience sufficiently to spring said socket members out of line with said frame portion to permit disengagement of said socket members and said projection members.

3,891,246

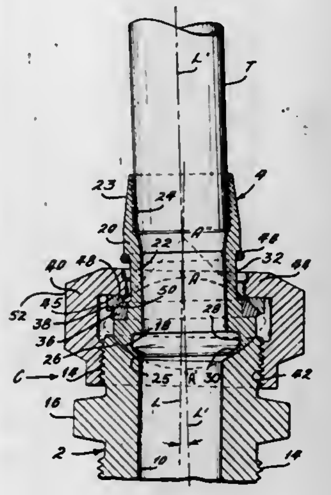
FLUID LINE COUPLING

Richard A. Hopper, Florissant, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Dec. 3, 1973, Ser. No. 421,024

Int. Cl. F16l *17/00*

U.S. Cl. 285—110 **11 Claims**



1. A fluid line coupling comprising: a first tubular element having a fluid channel and concave spherical seating surface surrounding the end of the fluid channel, the concave seating surface being metal and being in a fixed position on the first element; a second tubular element having a fluid channel therein and a convex spherical seating surface surrounding the end of the fluid channel, the convex surface being metal and being in a fixed position on the second element, the convex surface further being of the same curvature as the concave surface of the first element and being abutted against that concave surface, whereby the spherical seating surfaces have a common center of curvature; a convex spherical bearing surface carried by the second tubular element in a fixed position thereon, the bearing surface away from the convex seating surface, the center of curvature for the bearing surface being offset from the common center of curvature for the seating surfaces; a slip ring surrounding the second element and having a beveled surface against the spherical bearing surface on the second element; and clamping means containing the slip ring and being engaged with the first tubular element for applying an axially directed force to the slip ring to urge the slip ring against the bearing surface and thereby force the convex and concave seating surfaces tightly together, the clamping means loosely receiving the slip ring in the radial direction so that the slip ring may slide laterally within the clamping means and is located in the radial direction by the convex bearing surface.

3,891,247

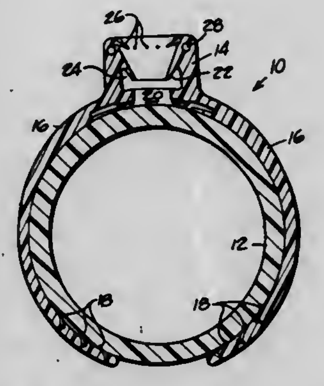
PLASTIC ONE-PIECE SADDLE FOR PLASTIC PIPE

Lynn Elwyn Smith, Box A-E, San Luis Obispo, Calif. 93401

Filed Apr. 8, 1974, Ser. No. 458,827

Int. Cl. F16l *5/00*

U.S. Cl. 285—110 **14 Claims**



1. A plastic saddle for plastic pipe and comprising,
a central boss for a branch pipe,
at least one side band depending from each side of the central boss,
each side band having a molded in diameter somewhat smaller than the outside diameter of the plastic pipe, and holding means including sharp points projecting from the inside surface of each band near the lower end of the band and effective to grip into the outer surface of the plastic pipe.

3,891,248

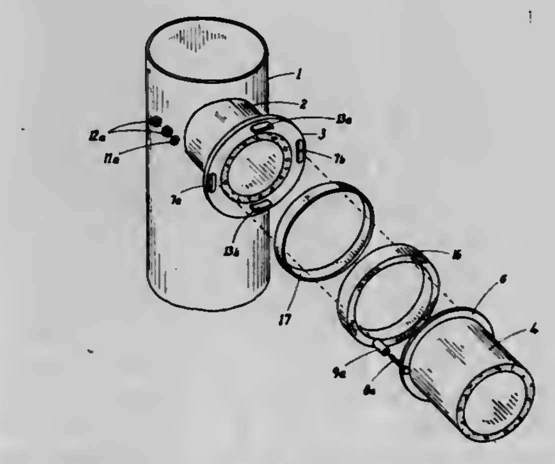
EXPANSION JOINT

David H. Kannapell, Prospect; Philipp P. Schupp, La Grange; David L. Amrein, Louisville, all of Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed May 9, 1974, Ser. No. 468,556

Int. Cl. F16l *41/00, 51/00*

U.S. Cl. 285—156 **7 Claims**



1. An expansion device which allows for expansion and contraction along an axis longitudinal to said device and along an axis normal to said device comprising: first and second longitudinally extending conduit members joined in flow communication one with the other; said first conduit member having a radially outward extending flange at one end thereof, said flange having a pair of opposed spaced vertically extending slotted openings, with respect to said longitudinally extending conduit members, therein and stop means thereon extending outwardly therefrom substantially parallel with the longitudinal axis of said first conduit member; said second conduit member having a radially outward extending flange on one end thereof facingly opposed to said flange on said first conduit, said flange on said second conduit having a pair of opposed apertures therein, said apertures spaced from and in alignment with said slotted openings on the flange of said first conduit; flexible packing means disposed between said opposed flanges and in communication with said first conduit flange and said second conduit flange in fluid tight relation, said stop means extending a preselected distance, said distance being less than the thickness of said packing means in a noncompressed state; and, fastening means extending through said slotted openings of said first conduit flange and said apertures of said second conduit flange whereby said conduits are held together in a flow through fluid tight connection.

3,891,249

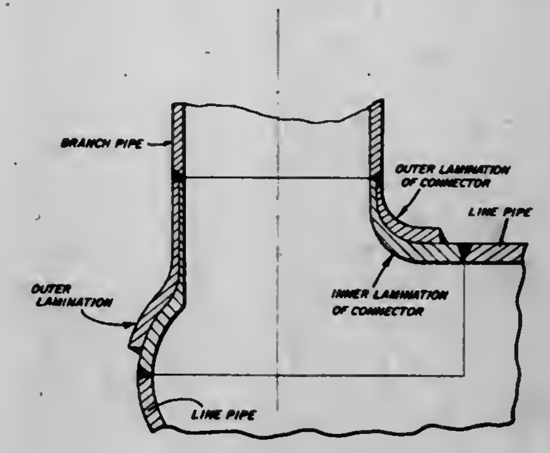
DOUBLE PLATE WELDED OUTLET FITTING AND METHOD OF OBTAINING THE SAME

Charles H. Moore, 645 Matanzas Ct., Fort Myers Beach, Fla. 33931

Filed Feb. 16, 1973, Ser. No. 333,011.

Int. Cl. F16l *13/02*

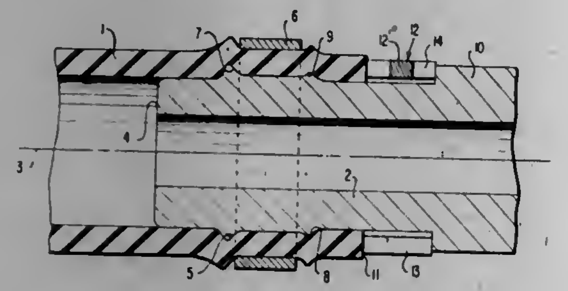
U.S. Cl. 285—189 **3 Claims**



1. A dual thickness metallic outlet fitting adapted to be welded to an opening in a main tubular member at one end and welded to a branch pipe at the other end, comprising a passageway through the fitting for providing communication between the main tubular member and the branch pipe
a. said fitting being composed of two centrally apertured initially circular metallic plates of different outside diameters which are welded together to form a composite work-piece that is thereafter forged into a generally dome-shaped base member
b. the periphery of the smaller metallic plate being inwardly spaced at all points from the periphery of the larger metallic plate
c. an annular portion extending outwardly from the generally dome-shaped base member and adapted to be welded at its outer end to a branch pipe
d. said annular outwardly-extending portion, including the terminus thereof being formed from the metal of both of the aforementioned circular metallic plates
e. that portion of the fitting which is adapted to be welded to the main tubular member being formed by the metal of the larger metallic plate only.

3,891,250
HOSE CONNECTION

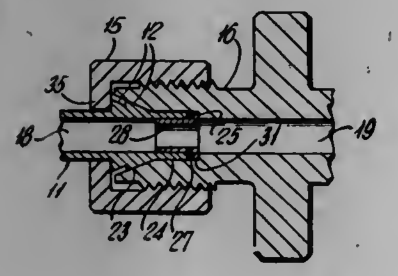
Hans Oetiker, 21 Oberdorfstrasse, Horgen, Switzerland
Filed Jan. 2, 1973, Ser. No. 320,625
Claims priority, application Switzerland, Dec. 30, 1971, 19166/71
Int. Cl. F16l *33/00*
U.S. Cl. 285—242 **31 Claims**



1. A connection between a hose and a tubular member having a mouth portion, which includes an enlargement on the tubular member near the mouth portion thereof as well as a closed, unbroken ring means which surrounds the hose, in turn surrounding the tubular member, and which presses the hose against the flank of the enlargement opposite the mouth portion, the movement of said ring means in the direction toward the mouth portion being limited by the hose within the area of said last mentioned flank, characterized in that a second enlargement is provided on the tubular member which is arranged remote from the mouth portion thereof, the ring means having an inner diameter which will pass over the end of the hose inward of the second enlargement and so sized that with the fluid flow of the material of the hose, the ring means will pass over the second enlargement but not over the first enlargement, the ring means, with an established connection, being disposed axially between the two enlargements, at least the inner surface of the ring means being approximately cylindrical and the inner diameter of the ring means being so selected that the ring means at least closely surrounds the hose with an established connection and is movable in the axial direction within the area of the second enlargement against the deformation resistance of the material of the hose.

3,891,251
SWAGED-TUBE COUPLING

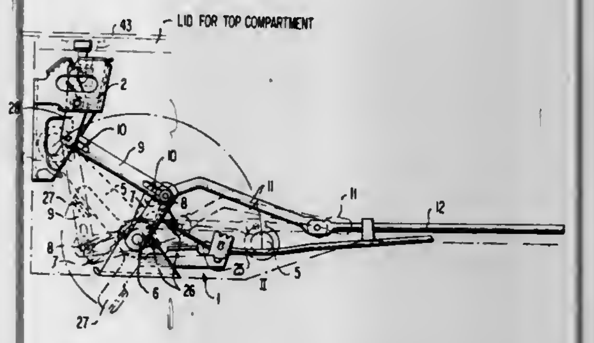
Albert P. Richter, Jr., Houston, Tex., assignor to Texaco Inc., New York, N.Y.
Filed Mar. 13, 1974, Ser. No. 450,912
Int. Cl. F16l *19/02*
U.S. Cl. 285—338 **2 Claims**



1. A swaged-tube coupling including a coupling nut and comprising in combination,
a tube end having a swaged ferrule integrally formed on the exterior of said tube end and comprising a plurality of tapered protrusions located circumferentially around the tube end and having a flat radial surface spaced a predetermined axial distance from said end,
said coupling nut being situated on said tube end on the far side of said swaged ferrule from said tube end,
said nut having an integral flange extending radially inward forming a close fit over said tube end for contacting said ferrule against said flat radial surface,
a resilient-material O-ring having an inside diameter equal to the inside diameter of said tube end,
a cylindrical hollow sleeve supporting said O-ring and having an outside diameter less than the inside diameter of said tube end making a sliding fit therein,
an integrally formed flange on one end of said sleeve and extending outward so that the maximum diameter thereof is equal to the outside diameter of said tube end to accommodate said O-ring between it and said tube end, and a threaded fitting cooperating with said nut and having an inside diameter passageway equal to the inside diameter of said tube end,
said threaded fitting having wall means defining a coaxial bore facing said tube end and forming a radial shoulder for contacting the outside of said sleeve flange, said passageway and said bore forming a passageway through said fitting,
said O-ring being axially between said tube end and the inside edge of said sleeve flange so that when said nut is tightened, said O-ring is squeezed into sealing engagement with said wall means and said tube end.

3,891,252
LOCK MECHANISM

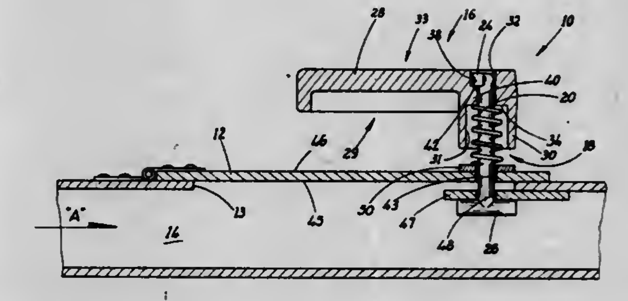
Adolf Lehmann, Schonaich, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany
Filed May 30, 1974, Ser. No. 474,811
Claims priority, application Germany, May 30, 1973, 2327487
Int. Cl. E05c *5/00*
U.S. Cl. 292—6 **20 Claims**



1. A closure and locking mechanism for a foldable top compartment lid of a compartment receiving a foldable top and for a fabric retaining member forming the rear termination of the foldable top, which includes a remote control means arranged in the passenger space of the vehicle, two locking means disposed opposite one another in the vehicle transverse direction for releasably locking the compartment lid and a lock means for the fabric retaining member, said locking means as well as said lock means being operatively connected with said remote control means for transfer into an unlocked position, characterized in that the remote control means includes a pivot shaft having two entrainment means, one of said entrainment means being operatively connected with the nearer locking means by way of a push rod means having elongated aperture guide means, the other entrainment means being operatively connected with a bell crank means and both the other more remote locking means as well as said lock means being operatively connected with said bell crank means.

3,891,253
DOOR HANDLE AND LATCH DEVICE

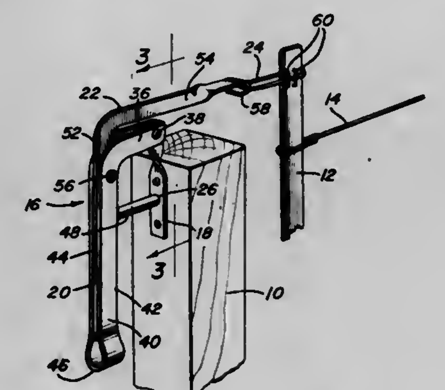
Alan E. Revell, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.
Filed Sept. 26, 1974, Ser. No. 509,665
Int. Cl. E05b *3/00*
U.S. Cl. 292—59 **10 Claims**



1. A combination door handle and latch device, comprising:
a. a latch portion comprising: a stem adapted to be received through a hole in a door to be latched; an arm connected to one end of said stem, said arm projecting generally transversely outwardly of said stem; and striker engaging means connected to the other end of said stem;
b. a handle portion comprising: a resilient means retaining pocket formed therein and one side of said handle portion; a latch stem receiving aperture formed therein and open to said pocket and cooperating therewith to form a resilient means abutment shoulder; a latch arm clearance notch formed in a wall of said stem receiving aperture and open to said pocket; a latch arm engagement cavity formed in a wall of said stem receiving aperture; and an arm abutment shoulder separating said cavity from said pocket; and,
c. resilient means disposed in said pocket between the door and said resilient means abutment shoulder to urge said handle portion generally away from said stem portion and cause said stem arm to move into said cavity and force said stem abutment shoulder against said stem arm.

3,891,254
WIRE GATE LATCH

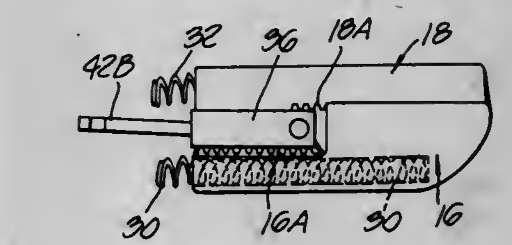
Pleasant M. Lile, Box No. 38, 3536 Beecraft Ln., R.R. No. 2, Billings, Mont. 59101
Filed Jan. 11, 1974, Ser. No. 432,640
Int. Cl. E05c *5/00*
U.S. Cl. 292—113 **6 Claims**



1. In combination with an upright post adapted to have one end of a wire gate drawn toward one side thereof, a wire gate latch comprising a bracket mounted from the upper end portion of said post and including an upper portion disposed slightly above the upper end of the opposite side of said post, a first inverted L-shaped lever disposed outwardly of said opposite side and including a short upper horizontal arm projecting toward said post at an elevation above the upper end thereof and a long lower upstanding arm extending downwardly along said post, the free end portion of said horizontal arm being pivotally supported from said upper bracket portion for swinging of said lever about a first axis generally normal to a plane containing said arms, a second horizontal L-shaped lever including a long horizontal leg disposed above and extending across the upper end of said post and a short upstanding leg projecting downwardly along said opposite side, means pivotally securing the free lower end of said short leg to the upper base end of said long arm adjacent said short arm for pivotal movement about a second axis generally paralleling the first axis and with said short leg defining an extension of the base end of said long arm and said long leg elevated at least slightly above, generally paralleling and extending beyond the free end portion of said short arm, said long leg and said bracket including coactive abutment means limiting swinging movement of the free lower end portion of said long arm toward said post to a position with said second axis swung slightly downwardly through a line extending between the free end of said long leg and said first axis, said long leg including anchor means on its free end remote from said short leg adapted for removable anchoring to said one end of said wire gate, the lower free end of said long arm being swingable outwardly and upwardly from said opposite side of said post and thereafter upwardly and inwardly over the upper end of said post to thereby shift said second axis over the top of said post toward said one side thereof.

3,891,255
DOOR LOCK ASSEMBLY

James A. Millett, 18143 Fivestone Ct., Fountain Valley, Calif. 92708
Filed Mar. 28, 1974, Ser. No. 455,576
Int. Cl. E05c *1/16*
U.S. Cl. 292—169.13 **6 Claims**

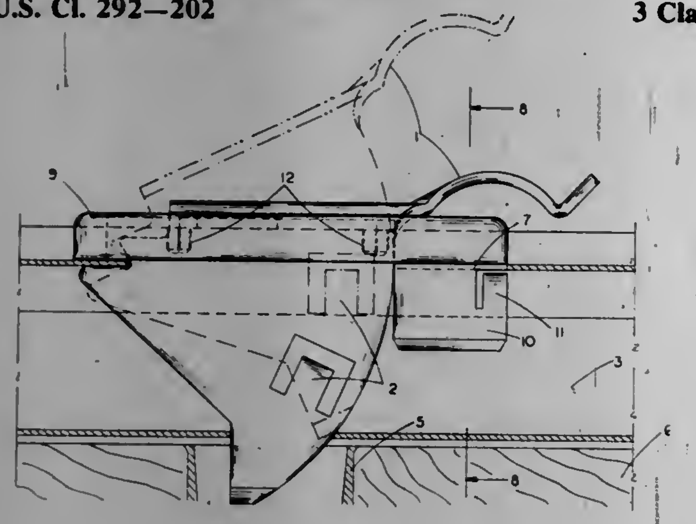


1. A latch bolt assembly comprising: a housing; a latch bolt slidable in said housing and having a toothed rack formed at the inner end thereof; a dead latch slidable in said housing adjacent said latch bolt and having a toothed rack formed at the inner end thereof in facing relationship with the toothed rack of said latch bolt; a carriage slidable in said housing and interposed between the inner end of the latch bolt and the dead latch; a pinion rotatably mounted on said carriage and engaging the toothed racks formed on said latch bolt and on said dead latch; a linkage member coupled to said carriage to move said carriage in said housing and thereby withdraw said dead latch and latch bolt from an extended position to a retracted position; a pawl formed on the outer end of said linkage member in position to engage the pinion in a ratchet relationship therewith to permit rotation of said pinion in one direction and to arrest rotation of said pinion in the other direction when the linkage member is released; and resilient means interposed between said linkage member and said carriage normally to bias said pawl into engagement with said pinion.

3,891,256
SELF-RETAINING LATCH WITH INSERT STRENGTHENER

Morris E. Johnson, Batavia, and Josef Princ, Glen Ellyn, both of Ill., assignors to Nichols-Homeshield, Inc., West Chicago, Ill.

Filed Jan. 17, 1974, Ser. No. 434,046
Int. Cl.^{2} E05C *3/04*
U.S. Cl. 292—202 **3 Claims**

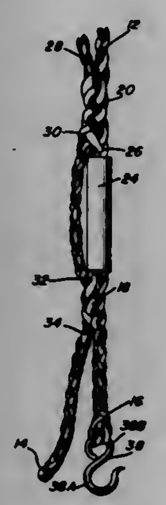


1. A retention device for retaining a frame to a structure comprising a frame having a latch receiving slot and a plurality of apertures; an insert adapted to be coupled to said frame overlying said slot, said insert having a slot complementary to the latch receiving slot when coupled to said frame; retention means carried by said insert for coupling said insert to said frame, said retention means including an inwardly extending leg adapted to extend through said slot in said frame and a plurality of pin members projecting from said insert and offset from a center line of said insert, said pin members adapted to be received within said apertures in said frame; a latch pivotal about said frame member extending through said slot in said insert and said frame slot, adapted to engage a support structure whereby said latch and said insert coact to distribute force applied to said latch over an extended area.

3,891,257
ADJUSTABLE WOVEN ROPE ASSEMBLY

William P. Wilson, 2820 W. Fuller, Ft. Worth, Tex. 76133

Filed Sept. 21, 1973, Ser. No. 399,616
Int. Cl. E05c *17/04*
U.S. Cl. 292—262 **6 Claims**

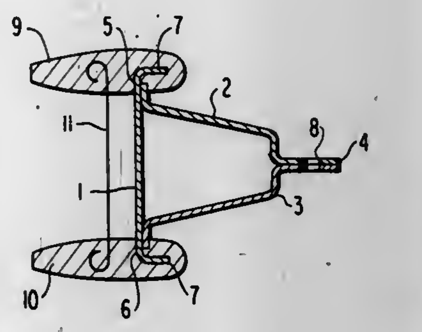


1. An adjustable connector assembly comprising a flexible elongated rope of tubular braided construction having a free end, said free end adapted to be bent upon itself to form a loop intermediate the ends of said rope, said free end sequentially entering into and exiting from the interior of said tubular braided rope at spaced apart points along the length of said rope to define between each point of entrance and exit a lengthwise extending tubular sleeve comprised of the braids of the rope, said rope including at least two such sleeves spaced apart along its length spaced from said free end and an elongated tubular handle slidably threaded onto said rope between said sleeves.

3,891,258
BUMPER FOR MOTOR VEHICLES

Béla Barényi, Maichingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Feb. 17, 1972, Ser. No. 227,491
Claims priority, application Germany, Feb. 18, 1971, 2107701
Int. Cl. B60r *19/08*
U.S. Cl. 293—98 **37 Claims**



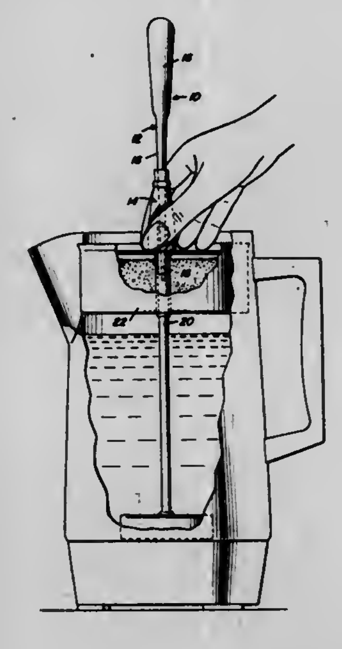
1. A bumper for motor vehicles, especially for passenger motor vehicles, having a vehicle support structure with a front and rear end, the bumper being disposed beyond the respective ends of the support structure, the bumper comprising: at least one hollow profile member having upper and lower wall portions tapering in the direction of the vehicle support structure, said hollow profile member including a front wall portion having an approximately vertical smooth surface and extending between said upper and lower wall portions, a first web means provided on said profile member for mounting the same on the vehicle support structure, said first web means being disposed in a substantially horizontally extending plane and extending substantially over the entire width of the vehicle, a second web means provided on said front wall portion, said second web means being an extension of said front wall portion and spaced from said first web means in a direction away from the vehicle support structure, at least one protective profile means mounted on said second web means, and lateral parts provided on both lateral edges of said hollow profile member.

3,891,259
DEVICE FOR REMOVING COFFEE BASKET AND STEM

Vernon Dale Griffin, Midland, Tex., assignor to Chancellor Chair Company, Midland, Tex., a part interest

Filed Sept. 13, 1973, Ser. No. 396,692
Int. Cl. A47j *45/10*
U.S. Cl. 294—33 **6 Claims**

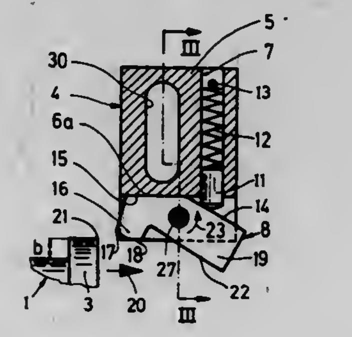
1. A device for removing the coffee basket and stem from coffee making apparatus, said device comprising an elongated shaft, a manually flexible gripping sleeve mounted generally coaxially on and completely about said shaft, said sleeve having a first end engaged about and sealed to said shaft and a second enlarged end positionable about the perk stem of coffee making apparatus and selectively manually flexible into gripping engagement with the stem, said shaft projecting through said sleeve to at least the second end of the sleeve, the shaft being selectively introducible into the upper discharge end of a perk stem with the sleeve positioned in surrounding relation to said perk stem.



3,891,260
TONGS FOR USE IN A MULTI-STAGE FORGING PRESS

Hans Kuhn Basel, Switzerland, assignor to F. B. Hatebur A.G., Basel, Switzerland

Filed May 29, 1973, Ser. No. 364,479
Claims priority, application Germany, May 27, 1972, 2225878
Int. Cl. B66c *1/66*
U.S. Cl. 294—90 **6 Claims**



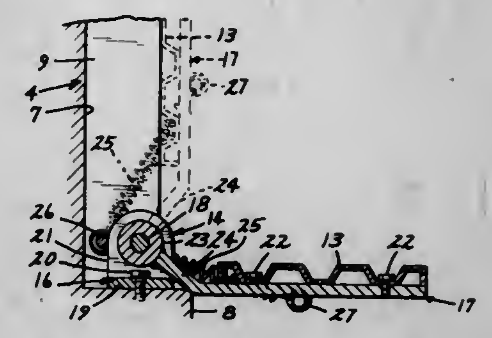
1. In a multi-stage forging press in which a forging having a collar projecting at right angles to the axis of the press and which is downstream relative to the direction of the ejection from the press is to be automatically transported by tongs, said tongs comprising:

- a. a plurality of cooperating tong jaws for gripping and transporting a forging ejected from the press,
- b. each tong jaw including a lever pivotably mounted at the jaw end face where the forging is gripped,
- c. said lever having first and second arms arranged at an angle with respect to each other,
- d. said lever being pivotable between an open position and a gripping position about an axis at right angles to said direction of ejection,
- e. the lever being effective to pivot to the gripping position when the arm remote from the press is contacted by the forging being transported,
- f. the position of the pivotal axis and the dimensions of the lever being effective to cause the arm remote from the press to engage the circumference of the collar and to cause the arm nearest the collar to engage a surface of the forging behind the collar.

3,891,261
CATWALK FOR VEHICLE BOXES

Erwin F. Finneman, Anamoose, N. Dak. 58710

Filed Jan. 4, 1974, Ser. No. 430,648
Int. Cl. B62d *39/00*
U.S. Cl. 296—1 R **2 Claims**



1. A catwalk for vehicle mounted load carrying boxes having laterally spaced side walls, comprising:

- a. an elongated catwalk element disposed adjacent one side wall of a vehicle box structure;
- b. a plurality of longitudinally spaced hinges for mounting said catwalk element on the box structure for movements about a common generally horizontal axis extending parallel to the sidewall of the vehicle box structure between a generally vertically disposed inoperative storage position generally parallel to and engaging the sidewall and a generally horizontal load carrying position wherein the catwalk element projects laterally outwardly from the sidewall, said hinges each including:
  1. a hinge bracket structure having a base portion adapted to be secured to a portion of the box structure and a pintle supporting portion projecting laterally from the base portion, said pintle supporting portion having an opening therethrough;
  2. pintle means extending through said opening;
  3. and a hinge plate having one end mounted on said pintle means for swinging movements relative to said hinge bracket structure, a plate-like portion for connection to said catwalk element, and a connecting portion between said plate-like portion and said one end, said connecting portion being disposed at an angle to the plane of said plate-like portion and disposed to engage a portion of one of said structures when mounted on the vehicle, to limit swinging movement of said catwalk element in a downward direction beyond said operative position thereof;
- c. one of said hinges including a pair of anchoring elements one on its respective hinge bracket structure and the other on its respective hinge plate;
- d. and a coil spring having opposite ends each connected to a different one of said anchoring elements;
- e. said anchoring elements being so disposed on said hinge bracket structure and hinge plate relative to the axes of said pintle means that said anchoring element on the hinge plate moves through an over center relationship with said pintle means axis and the other of said anchoring elements during movement of said hinge plate and catwalk element between operative and inoperative positions thereof, whereby said spring yieldingly holds said hinge plate and catwalk element in said operative and inoperative positions.

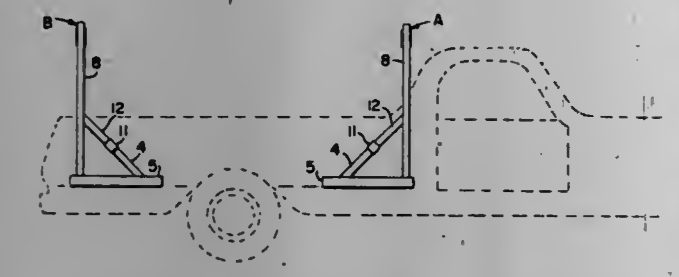
3,891,262
FOLDING CARRIER RACK FOR PICK-UP TRUCKS

John R. Brunel, 5887 Greenridge Rd., Castro Valley, Calif. 94546

Continuation-in-part of Ser. No. 309,368, Nov. 24, 1972, abandoned. This application Dec. 17, 1973, Ser. No. 425,260

Int. Cl. B60p *3/00*

U.S. Cl. 296—3 **4 Claims**



1. A folding rack for a pick-up truck comprising:

a. a pair of spaced parallel base members each consisting of a flat plate member permanently attached to the bed of said truck and a channel member having upturned flanges releasably connected to said flat plate;

b. holding means consisting of a plurality of load spreading members carried on the underside of said pick-up bed and a plurality of threaded bolts and nuts releasably connecting said base members to said load spreading members;

c. a pair of post members pivotally attached to said base members and movable from a first stored position, wherein they are substantially in a horizontal position, to a second load-carrying position wherein they are substantially in a vertical position;

d. bracing means constructed so as to fold within the upturned flanges of said base members including a first member pivotally connected at one end to said base member and connected at the other end in a rotatable connection to a second member which is attached at its other end in a pivotal connection to said post member;

e. means rigidly connecting said bracing members together in general alignment when said post members are in the second position; and f. a cross member connecting the upper ends of said post members forming a load-carrying elevated surface.

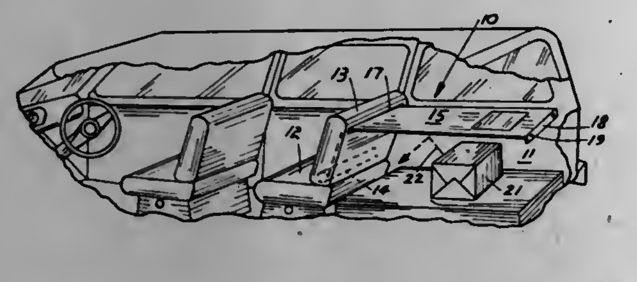
3,891,263
SAFETY SHIELD AND COMPARTMENTIZER

Joseph Orsulak, 1908 Carol St., Bossier City, La. 71010

Filed Jan. 14, 1974, Ser. No. 433,391

Int. Cl. B60r *21/02;* **B62d** *33/04*

U.S. Cl. 296—24 R **2 Claims**



1. A safety shield and compartmentizer for mounting in a vehicle comprising:

a. A rotatably mounted spindle positioned in the seat back rest of said vehicle, said seat back rest being fitted with a longitudinal back rest slot across the width thereof;

b. A flexible panel, positioned in said seat back rest one end of which is attached to said spindle, said panel being adapted to selectively roll up on and retract from said spindle; and

c. Fastening means attached to the opposite end of said panel for fastening said panel to preselected areas of said vehicle.

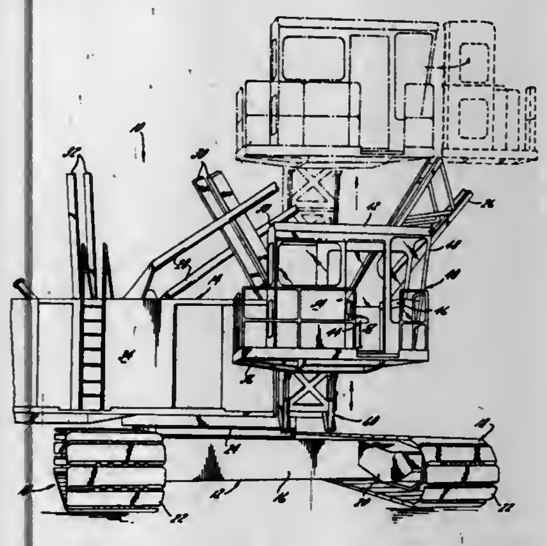
3,891,264
SELECTIVELY POSITIONABLE OPERATOR'S CAB

Charles A. Hunter, II; David J. Pech, and James G. Morrow, Sr., all of Manitowoc, Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Filed May 6, 1974, Ser. No. 467,196

Int. Cl. B62d *27/00*

U.S. Cl. 296—28 C **7 Claims**



1. A support mechanism for a selectively positionable control module for a load handling device having a frame on which a movable, load handling boom is mounted comprising, in combination:

a subframe attached to the frame independent of the boom; an articulated support having inner and outer members pivotally connected at their remote ends to said subframe and the control module, respectively;

means including a parallelogram linkage pivotally connected at its ends to said subframe and the control module, respectively, for maintaining said module substantially horizontally disposed as said support is raised, lowered and articulated;

means including a first linear actuator pivotally connected at one end to said subframe and at the other end to said inner member for raising and lowering said articulated support and control module as a unit; and,

means including a second linear actuator, a rocker arm and a link interconnecting said remote ends of said articulated support for folding said outer member and control module in and out with respect to said inner member, said rocker arm being interposed between said second actuator and said link and pivotally mounted on said inner member; whereby movement of said load handling boom may be controlled by a person operating controls in said control module.

3,891,265
FAIRING FOR ATTACHMENT TO THE HANDLEBARS OF A BICYCLE

James R. Blackburn, 2071 Rosswood Dr., San Jose, Calif. 95124

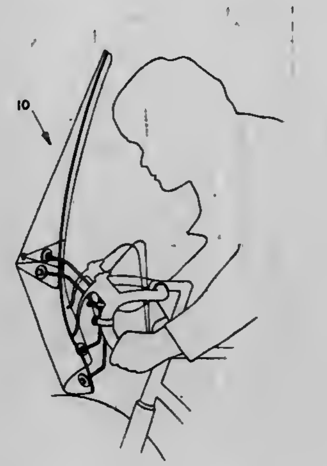
Filed July 1, 1974, Ser. No. 484,616

Int. Cl. B62j *17/00*

U.S. Cl. 296—78.1 **10 Claims**

1. A wind screen fairing for attachment to the handlebars of a bicycle to protect the hands, torso and face of a bicycle rider, comprising:

a sheet comprised of a clear, flexible material and including a top edge and a bottom edge, each aligned in a substantially horizontal direction, and arranged such that a line bisecting said top and bottom edges defines a vertical reference line and a line passing through said sheet intermediate said top and bottom edges and normal to said vertical reference line defines a horizontal reference line, said sheet further including first and second slots, respectively extending along said horizontal reference line from the respective side edges of said sheet inwardly toward one another, said sheet additionally including a first pair of apertures respectively disposed above and below said first slot and a second pair of apertures respectively disposed above and below said second slot; and



mounting means for aligning the apertures of said first pair and for aligning the apertures of said second pair and for securing said sheet to the handlebars, the respective alignments of said pairs of apertures being operative to produce a cross-curvature of said sheet along said horizontal reference line and said vertical reference line, bowing said sheet into a generally concave configuration, whereby said fairing provides a smooth outline and serves to protect the body of the bicycle rider.

3,891,266
ROOF FOR MOTOR VEHICLES

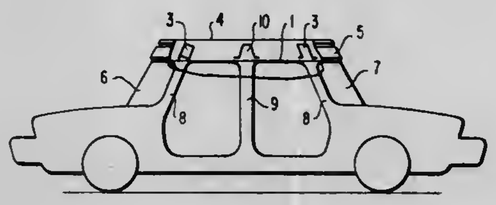
Karl Wilfert, Gerlingen-Waldstadt; Béla Barényl, Maichingen, and Hermann Renner, Magstadt, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Nov. 24, 1972, Ser. No. 309,357

Claims priority, application Germany, Nov. 26, 1971, 2158707; Nov. 27, 1971, 2158962

Int. Cl. B60q *3/00*

U.S. Cl. 296—137 R **66 Claims**



1. A roof for a motor vehicle comprising a roof structure means including a roof plate means for defining the upper extent of a vehicle interior space and a roof frame means including longitudinal girder means and cross girder means, said longitudinal and cross girder means being formed into said structure with said roof plate means with said longitudinal and cross girder means being on the exterior side of said roof plate means from said vehicle interior space, and separate cover plate means for separately covering the exterior of said structure of longitudinal and cross girder means, said separate cover plate means being movably secured to at least one of the roof plate means and the girder means.

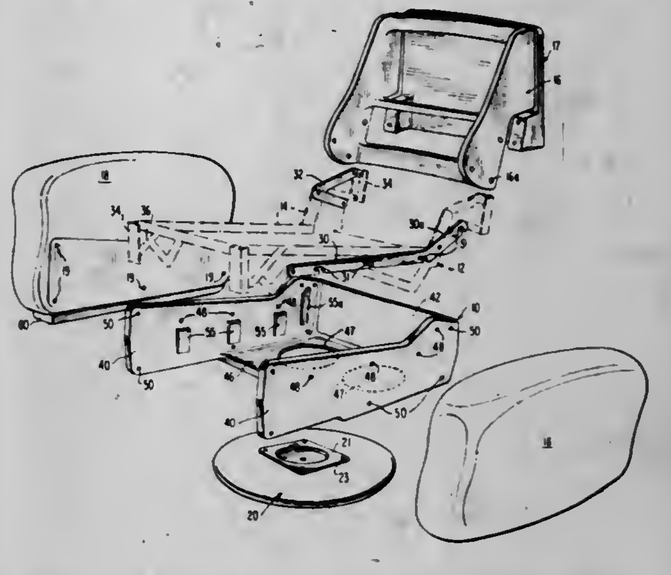
3,891,267
RECLINING CHAIR ASSEMBLY

William P. Taylor, Glencoe, Ill., assignor to Burris Industries, Incorporated, Lincolnton, N.C.

Filed Nov. 9, 1973, Ser. No. 414,594

Int. Cl. A47c *1/32*

U.S. Cl. 297—68 **28 Claims**



1. A reclining chair assembly comprising in combination, a seat, a backrest, and linkage means for supporting and moving the seat and backrest relative to each other between a normal or upright position and a inclined reclining position, a main frame for supporting the linkage means, said main frame including opposite sides and a cross piece interconnecting said sides, said sides having preformed apertures therein located at predetermined locations for securing said linkage means relative thereto, said linkage means having fastening areas adapted to be aligned with said apertures in said sides of the main frame, said linkage means including a pair of mounting links to be rigidly secured to the opposite sides of the frame respectively, said main frame further including abutments for supporting and locating said linkage means on the frame prior to securement thereto with said fastening areas aligned with said apertures in said sides of the main frame, said abutments projecting inwardly from inner surfaces of the opposite sides of said frame at elevations spaced below top surface portions of the frame to receive and position the mounting links below the top surfaces of the frame, said sides of the main frame further including a second number of apertures for securing arm rests thereto, and wherein there is further included a pair of arm rests adapted to be secured to said sides of the main frame through said second number of apertures therein.

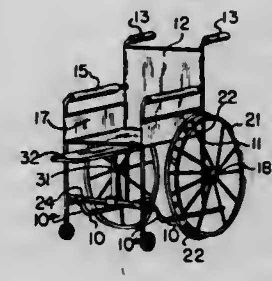
3,891,268
RAMP ATTACHMENT FOR WHEEL CHAIR

A. Hadley Taylor, 37846 Sharpe Ave., Willoughby, Ohio 44094

Filed May 10, 1974, Ser. No. 468,745

Int. Cl. A47c *7/62*

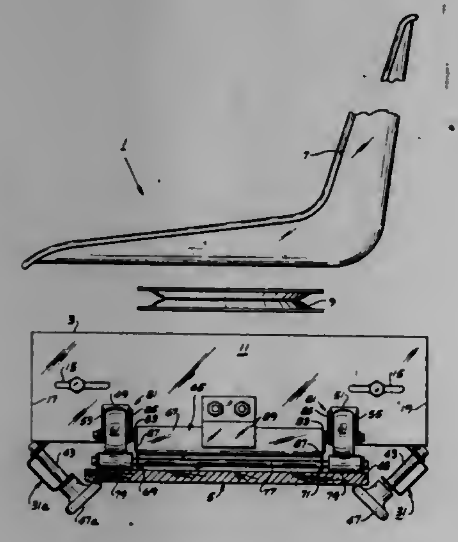
U.S. Cl. 297—217 **6 Claims**



1. A ramp attachment for a wheel chair which has a frame supporting a seat at a predetermined height above a floor

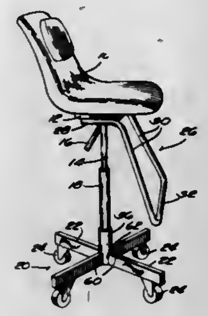
support and having wheel means associated with said frame for moving said chair over said floor support and said frame including two generally parallel rigid frame members running from front to rear respectively at opposite sides of the chassis of said chair; the combination for use therewith of an elongated ramp having a width less than that of said seat and having a length not over a few feet; a ramp support base consisting of rod means of a length to just reach between said two quickly removable rigid frame members when said chair is in operating condition; two connecting means one at each end of said ramp support base respectively adapted to firmly connect said support base on said two rigid frame members; and a ramp support including a vertical rigid strut having means at its lower end for detachable connection to said ramp support base and having means at its upper end for attachment to one end of said ramp; said ramp support being of a length to hold said one end of said ramp approximately at the level of said seat of said chair.

3,891,269
SEAT MOUNTING MECHANISM
Denis S. Moeser, P.O. Box 9108, Clayton, Mo. 63117
Filed Mar. 16, 1973, Ser. No. 341,876
Int. Cl. A47c *15/00*
U.S. Cl. 297—252 **23 Claims**



1. A mounting mechanism for a seat reciprocally movable along a flat surface comprising a support for said seat having wheels for rolling engagement on said surface, locking means selectively movable between a locking position in which said locking means concurrently releasably wngages at least one of said wheels and said surface to prevent movement of said support on said surface in one direction and a releaed position in which said locking means is not engaged with both said one wheel and said surface thereby to permit movement of said support along said surface in said one direction, said locking means comprising a roller normally biased toward the locking position and of a circumference substantially less than that of the wheel, and means for moving said locking means to said released position.

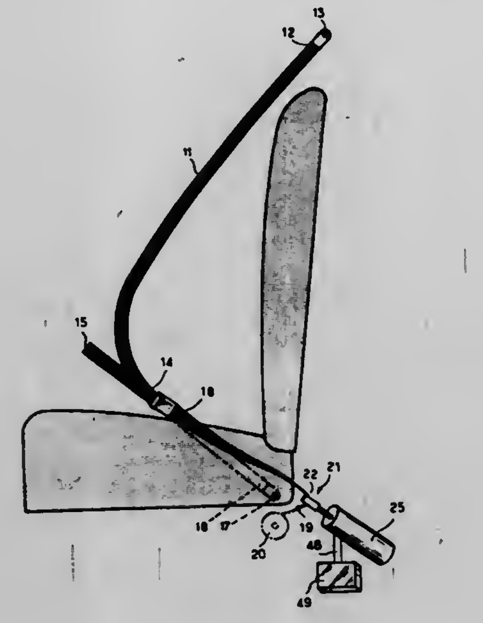
3,891,270
PNEUMATIC STOOL WITH FOOT REST CONNECTED TO SEAT BASE
Philip Edgar Crossman, and Richard Jerome Resch, both of Green Bay, Wis., assignors to Krueger Metal Products, Inc., Green Bay, Wis.
Filed May 10, 1974, Ser. No. 468,714
Int. Cl. A47c *3/30*
U.S. Cl. 297—347 **4 Claims**



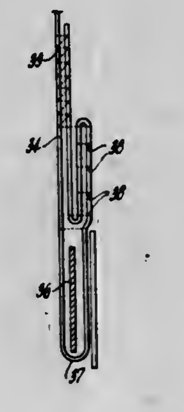
1. A swivel stool comprising a base including a hollow cylindrical column, a pneumatic cylinder enclosed at its lower end within the upper end of said column, a flat retainer member for supporting the lower end of said pneumatic cylinder, at least two horizontal slots formed in said column for receiving and supporting said retainer member, a thrust bearing positioned between the upper surface of said retainer member and the lower end of said pneumatic cylinder, a mounting spider attached to the upper end of said pneumatic cylinder, and a seat attached to the upper side of said mounting spider and wherein a shaft extends downwardly from the lower end of said pneumatic cylinder, and wherein one side of said retainer member is forked to embrace said shaft.

3,891,271
SAFETY BELT SYSTEM
Walter Fieni, Paris, France, assignor to Societe Anonyme Francaise du Ferodo, France
Filed Jan. 10, 1973, Ser. No. 322,496
Claims priority, application France, Jan. 11, 1972, 72.00825
Int. Cl. A62b *35/00*
U.S. Cl. 297—386 **3 Claims**

1. A safety belt system for restraining a passenger in a vehicle upon sudden deceleration of the vehicle, comprising: a strap belt extending across and in front of the passenger; a stationary cylinder housing mounted in the vehicle; a piston rod and a piston operatively connected to said belt; said piston being movably mounted within said cylinder housing while said piston rod is rigid with said piston; a slidable connection between said piston and an intermediate portion of said belt; a slide member located within said housing and surrounding said piston rod, said slide member being connected between said piston and said connection to the belt; a ring frictionally mounted within said housing for displacement by said piston when the latter is moved forwardly, toward said connection, upon a sudden deceleration of the vehicle, and adapted to surround said slide member; spring means urging said slide member constantly backwards, away from said connection; and retaining means within said ring and in said slide member for at least one ball initially lodged therein; wherein a backward rebound movement of said belt is prevented after the latter has reached its maximum degree of deformation, due to the backward movement of said slide member under the action of said spring means, while said ring remains in the forwardly displaced position, so that said ball wedges itself between said piston and said ring, while said piston rod remains stationary.

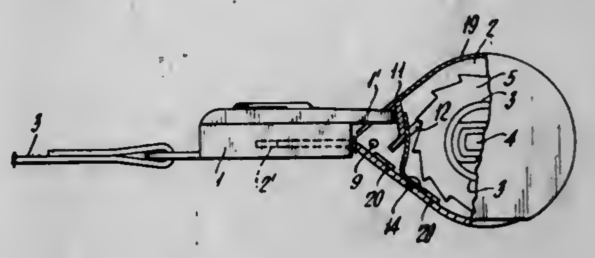


3,891,272
MOTOR VEHICLE SAFETY DEVICES
Takezo Takada, Hikone, Japan, assignor to Takata Kojyo Co., Ltd., Tokyo, Japan
Division of Ser. No. 157,562, June 28, 1971, Pat. No. 3,804,192. This application Jan. 16, 1974, Ser. No. 433,926
Claims priority, application Japan, July 14, 1970, 45-69730[U]; Aug. 27, 1970, 45-84724[U]; Oct. 6, 1970, 45-87139; Oct. 14, 1970, 45-90684
Int. Cl. A62b *35/00*
U.S. Cl. 297—386 **8 Claims**



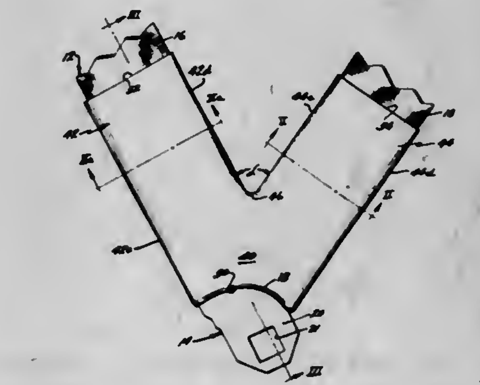
1. A vehicle safety belt comprising a first elongated belt having an end section folded back along said belt and secured at its end portion to said belt to form a closed loop and means separable under a predetermined load joining longitudinally spaced portions of said belt end section to shorten the length of said belt end section forming a leg of said loop, said means separating under said predetermined load to permit the elongation of said loop without effecting the opening thereof.

3,891,273
AUTOMATIC WITHDRAWAL CONTROL MECHANISM FOR VEHICLE SAFETY
Takezo Takada, Hikone, Japan, assignor to Takata Kojyo Co., Ltd., Tokyo, Japan
Filed Sept. 10, 1973, Ser. No. 395,797
Claims priority, application Japan, Sept. 11, 1972, 47-090341
Int. Cl. A62b *35/00*
U.S. Cl. 297—388 **7 Claims**



1. A vehicle safety belt mechanism comprising a pair of separable first and second coupling members movable between relatively coupled and uncoupled positions, a retractable belt reel device connected to said first coupling member and including a spring biased belt retracting reel and a belt connected to said reel and withdrawable from and normally retracted by said reel and locking means mounted on said first coupling member and separate from said second coupling member and alternatively movable between a first position locking said belt against withdrawal from said reel and a second position releasing said belt and normally urged to said second position and means responsive to the coupled position of said coupling members and actuated by said second coupling member for transferring said locking means to said first position.

3,891,274
HOUSING FOR COMBINATION LAP AND SHOULDER BELTS
William J. Cook, Rockford, and Gordon A. Ellens, Grand Rapids, both of Mich., assignors to U.S. Industries, Inc., New York, N.Y.
Filed Aug. 23, 1973, Ser. No. 390,888
Int. Cl. A62b *35/00*
U.S. Cl. 297—389 **11 Claims**



1. A protective grip and cover for the latch plate of a dual lap-shoulder safety belt comprising a flexible, one-piece, molded plastic tubular body having a tubular first leg and a tubular second leg; said legs being divergent from each other at an angle less than 90°; a latch plate receiving pocket common to both of said legs and forming the apex of said body; the end of said pocket opposite from said legs being open to provide an aperture through which a latch plate may be projected.

3,891,275
MOBILE MINE ROOF SUPPORT WITH MINING APPARATUS

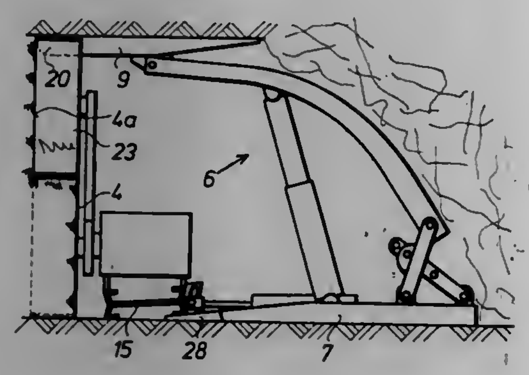
Kalus Spies, Dortmund-Wellinghofen, Germany, assignor to Bochumer Eisenhütte Heintzmann & Co., Bochum, Germany

Filed Nov. 26, 1973, Ser. No. 418,855

Claims priority, application Germany, Nov. 25, 1972, 2257828

Int. Cl.^{2} E21D *17/08, 23/06*

U.S. Cl. 299—32 **12 Claims**



1. A mobile mine roof support for use in mine galleries of greatly different height, comprising elongated sole plate means arranged to rest on the floor of a mine gallery and having a front end directed to the face of the mine gallery and a rear end; a rear shield member having one end in the region of said rear end of said sole plate means and extending from said one end upwardly and forwardly towards the mine face; an elongated roof supporting cap member attached to the other end of said rear shield member pivotable about a pivot axis substantially parallel to said sole plate means, said cap member having a front end projecting forwardly beyond said front end of said sole plate means and adapted to be arranged closely adjacent to the mine face; extensible and collapsible prop means pivotally attached at opposite ends, respectively, to a portion of said sole plate means intermediate the ends of the same and to one of said member for pressing said cap member against the mine roof; means for pivotally and forwardly and rearwardly shiftable connecting said one end of said rear shield member to said rear end of said sole plate means so that regardless of the extension of said prop means, said front end of said cap member can be maintained closely adjacent to the mine face; elongated conveyor means extending transverse to said sole plate means and located between said front end of said sole plate means and the face of the mine gallery; moving means extending between and connected to said conveyor means and said sole plate means for moving said mine roof support and said conveyor means relative to each other toward and away from the mine face; and rigid extension means releasably connectable to said front end of said sole plate means to form, when connected, a rigid forward extension of the latter in engagement with the floor of the mine gallery to prevent tipping of the mine roof support under the pressure of the roof of the mine gallery on said cap member.

3,891,276
WHEEL AND WHEEL TRIM ASSEMBLY

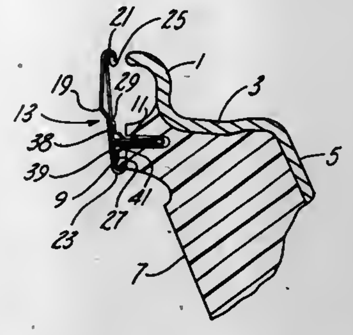
Edward G. Spisak, Westland, Mich., assignor to S & S Product Engineering Service, Inc., Wyandotte, Mich.

Filed Aug. 2, 1973, Ser. No. 386,389

Int. Cl. B60b *7/00*

U.S. Cl. 301—37 R **6 Claims**

1. A wheel structure comprising a tire receiving rim assembly having an outer radial flange and having an ornamental plastic portion attached thereto and extending radially adjacent said outer radial flange, said portion having an outer face provided with circumferentially extending groove means, said groove means also axially extending inward from the outer face of the portion, ornamental wheel time having inner and outer faces, a plurality of circumferentially spaced attaching finger means axially extending from the inner face into said groove means, said finger means having groove engaging means thereon detachably contacting the opposite surfaces of the groove means and acting to hold the wheel trim attached to the portion.



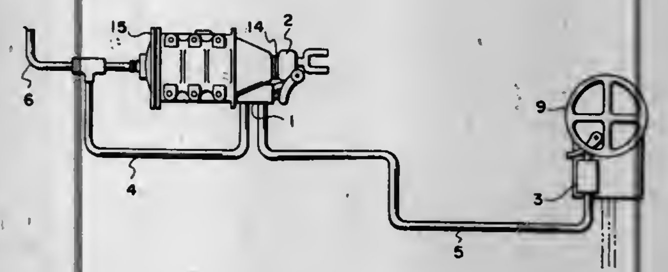
3,891,277
HAND BRAKE AUTOMATIC RELEASE ASSEMBLY

Geoffrey Wilton Cope, Williamsville, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sept. 26, 1974, Ser. No. 509,622

Int. Cl.^{2} B60T *7/00*

U.S. Cl. 303—2 **4 Claims**



1. A hand brake automatic release assembly for railway cars comprising an air brake cylinder having a pipe means at one end connected thereto for receiving air, and a reciprocable piston disposed at the other end, a normally closed actuating valve disposed adjacent the cylinder with means for opening the valve, said valve having an inlet and outlet with inlet and outlet conduits connected thereto, the inlet conduit communicating with the brake cylinder pipe means, the outlet conduit communicating with a hand brake release cylinder having a plunger extending therefrom for engagement with a hand brake release lever; upon application of air brakes, the normally closed actuating valve being opened by the opening means for only a finite portion of the piston travel permitting air from the pipe means and inlet conduit to pass through the actuating valve and outlet conduit to the hand brake release cylinder extending the plunger to operate the hand brake release lever thereby freeing the hand brake.

3,891,278
BRAKING SYSTEM WITH DUAL INDEPENDENT CIRCUITS

Albert Grosseau, Chaville, France, assignor to S. A. Automobiles Citroen, Paris, France

Filed July 2, 1973, Ser. No. 375,851

Claims priority, application France, July 3, 1972, 72.24395

Int. Cl. B60t *8/06*

U.S. Cl. 303—21 F **8 Claims**

1. In a braking system for a vehicle having at least one wheel,

first and second brake actuator means, at least the first actuator means being arranged to brake the said wheel, first and second independent fluid circuits operative to

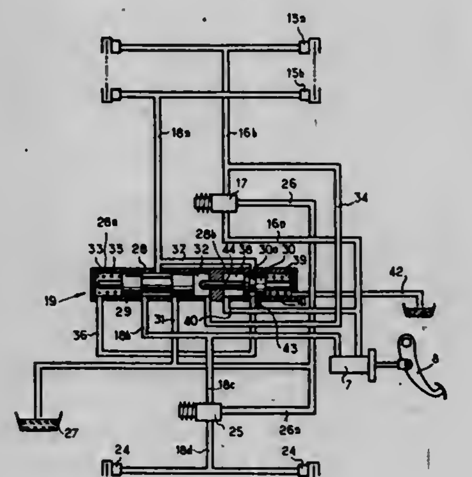
feed pressurized fluid to the first and second actuator means, respectively,

first valve means controlled in dependence on the dynamic state of the wheel and incorporated in the first fluid circuit, and

second valve means controlled in dependence on the pressure downstream of the first valve means, the second valve means being incorporated in the second fluid circuit and the second valve means being a quantity-regulating valve and comprising

a first movable member subjected to a control force determined by the pressure downstream of the first valve means and to an opposing force determined by the pressure of fluid delivered by the second valve means, the first movable member being arranged to place the second actuator means in communication with the second fluid circuit or with a fluid outlet, according to the position of the first movable member, and

a second movable member controlled in dependence on the pressure of the first circuit upstream of the first valve means, and means controlled by said second movable member for locking said first movable member in a position to provide permanent free supply of fluid to the second actuator means when the said first circuit pressure upstream of the first valve means is zero.



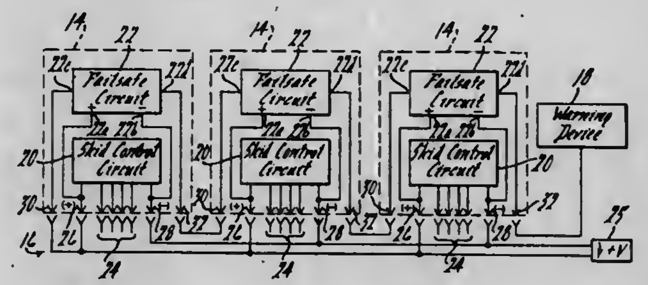
3,891,279
FAILSAFE SYSTEM FOR SKID CONTROL SYSTEMS AND THE LIKE

John S. Fralt, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Oct. 19, 1973, Ser. No. 408,104

Int. Cl. B60t *8/00*

U.S. Cl. 303—21 AF **18 Claims**



1. In a multi-axle wheeled vehicle having a plurality of skid control modules with each skid control module being operatively associated with one of the axles of the vehicle, each said skid control module comprising a skid control circuit means for skid controlling the wheels of the associated axle and first and second supply terminals to which first and second reference potentials are intended to be respectively supplied, and including supply means for supplying said first and second reference potentials, the invention wherein each said skid control module further includes a failsafe circuit means having an input terminal to which an input signal is intended to be supplied and an output terminal which is intended to supply an output signal, means for supplying an input signal to the input terminal of one of said failsafe circuit means, means for operatively coupling the output terminal of each preceding failsafe circuit means to the input terminal of the succeeding failsafe circuit means whereby an output signal from the failsafe circuit means of a preceding skid control module is supplied as the input signal to the failsafe circuit means of a succeeding skid control module, each said failsafe circuit means comprising means responsive to the presence of an input signal at its input terminal and the presence of the respective reference potentials at the respective supply terminals of its module for providing an output signal at its output terminal only when all of said input signal and said respective reference potentials are present, and warning means operatively coupled with the output terminal of failsafe circuit means of the last succeeding skid control module for providing a warning when an output signal does not appear at the output terminal of said last-mentioned failsafe circuit means so as to indicate when one of said input signal and said respective reference potentials is not present at any one of said failsafe circuit means.

3,891,280
DEVICE RESPONSIVE TO VEHICLE LOADING WITH SIGNAL GENERATING MEANS FOR BRAKE ACTUATION

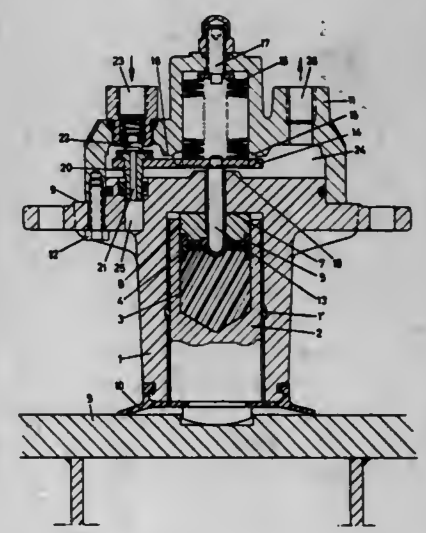
Lars Mattis Severinsson, Malmo, and Gert Artur Persson, Oxie, both of Sweden, assignors to Svenska Aktiebolaget Bromsregulator, Malmo, Sweden

Filed Nov. 28, 1972, Ser. No. 310,116

Claims priority, application United Kingdom, Dec. 4, 1971, 56416/71

Int. Cl. B60t *8/18*

U.S. Cl. 303—22 R **2 Claims**

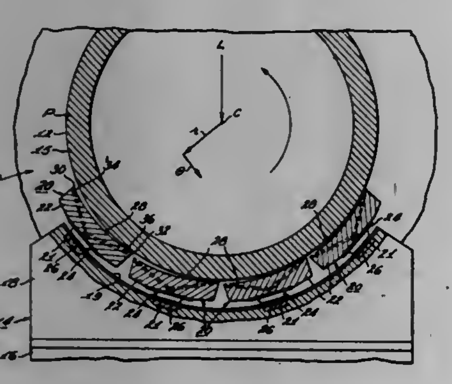


1. A device for transmitting a signal in response to an actuating force acting on the device such as weight of an object, comprising in combination, a housing, a piston movable in said housing, means transmitting said force to bear upon said housing and said piston to tend to move said piston in said housing as a function of the force, an enclosed plastic deformable body movable by said piston, a rod contacting said body to produce a movement thereby with said piston which is a function of said force, spring threshold means biasing said rod against said movement until said force exceeds a predetermined value overcoming the spring bias, and signal generating means actuated by movement of said rod, wherein said signal generating means comprises means supplying compressed air into a signal passageway for said compressed air in response to a valve member movable by said rod upon a movement of said piston by said actuating force, wherein said signal passageway includes a pressure chamber, and means controlled

by movement of said rod to decrease pressure in said chamber when said force is at a predetermined value.

3,891,281
PIVOTED PAD BEARING APPARATUS AND METHOD FOR BIDIRECTIONAL ROTATION

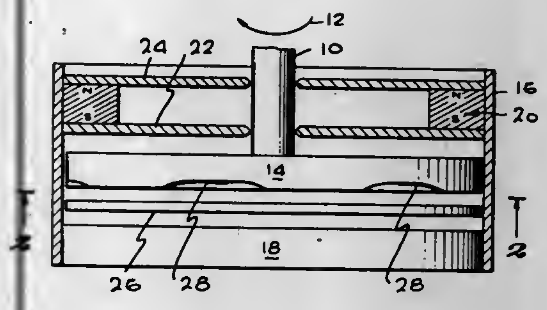
Raymond C. Jenness, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Apr. 8, 1974, Ser. No. 459,119
Int. Cl. F16c *17/06*
U.S. Cl. 308—1 R **10 Claims**



1. In combination, a rotatable journal, a pivoted bearing pad in supporting relation to said journal for bidirectional rotation, of said journal, stationary structure supporting said pivoted bearing pad for pivotal movement, said pivoted bearing pad including a journal bearing surface extending in a generally circumferential and also in a generally axial direction of said journal whereby to support said journal for bidirectional rotation, said journal bearing surface including opposite circumferentially spaced first and second edges, said first and second edges being respectively the leading and the trailing edges for one direction of rotation of said journal, said first and second edges being respectively the trailing and the leading edges for the opposite direction of rotation of said journal, said leading edge being at the circumferential end of said pivoted bearing pad first reached by a given point on the periphery of said journal for any given direction of rotation of said journal, said trailing edge being at the circumferential end of said pivoted bearing pad last reached by said given point for any given direction of rotation of said journal, said bearing pad including a pivotal support located substantially midway between said first and said second edges, a first and a second lubricant discharge means in the journal bearing surface of said pivoted bearing pad respectively contiguous but spaced from said first and said second edges, means effective on both directions of rotation of said journal for simultaneously connecting a supply of lubricant through substantially equal resistance flow paths to both said first and said second lubricant discharge means, the normal tilting movement of said pivoted bearing pad due to lubricant film development providing a larger clearance space between said bearing pad and the rotating journal contiguous the leading edge of said bearing pad for any given direction of rotation of said journal than contiguous the trailing edge for said given direction of rotation, whereby to provide a power frictional loss lubricant flow channel contiguous said leading edge for said given direction of rotation than contiguous the trailing edge for said given direction of rotation, and thus to promote substantially greater flow of lubricant through the lubricant discharge means contiguous said leading edge for said given direction of rotation than through the lubricant discharge means contiguous said trailing edge for said given direction of rotation.

3,891,282
LUBRICATED ASSEMBLIES

Robert H. Tuffias, Los Angeles, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.
Filed Dec. 12, 1973, Ser. No. 424,087
Int. Cl.² F16C *7/04*
U.S. Cl. 308—9 **25 Claims**



1. An assembly, comprising:

first and second elements mounted for relative rotational motion one with respect to the other selectively in one sense and the opposite sense, the elements forming a gap therebetween;

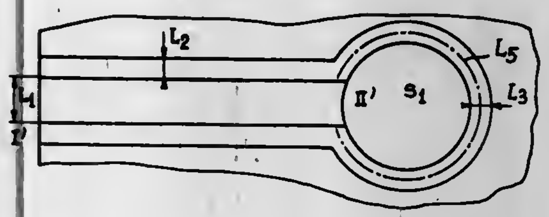
means displaceably positioned within the gap for separating, one from the other, a first space adjacent the first element and a second space adjacent the other element;

means for maintaining lubricant in the gap; and

pressure control means for producing across the separating means a pressure drop whose orientation depends upon the sense of rotational motion, to thereby cause displacement of the separating means selectively toward the first element and toward the second element as a function of the sense of rotational motion.

3,891,283
SELF-FEEDING HYDROSTATIC

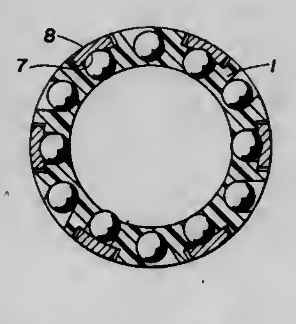
Francois C. Pruvot, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt, France and Automobiles Peugeot, Paris, France
Filed Oct. 16, 1972, Ser. No. 297,737
Claims priority, application France, Oct. 18, 1971, 71.37334
Int. Cl. F16c *17/00*
U.S. Cl. 308—5 R **4 Claims**



1. Hydrostatic bearing comprising a first surface element being a rotary body of revolution and at least three identical bearing elements having a surface registering with said body of revolution and having a short gap left between their surfaces, and to which a relative speed tangent at all points of the first surface element is imparted, a recess bounded by each of said bearing elements and adapted to be filled with a fluid under pressure liable to leak between said first element and said bearing elements, said bearing elements constituting a sealing surface surrounding said recess, each bearing having said recess supplied with fluid under pressure from a thin-walled orifice at one end of a feed groove disposed in the direction of the relative motion between said first surface element and said bearing element, said groove being formed on each of said bearing elements and being of moderate width and relatively shallow in relation to the dimensions of said recess and bounded laterally by sealing surfaces pertaining to said bearing element, said thin-walled orifice limiting the fluid output in said groove to a value lower than that of the fluid output normally carried along by the first sealing surface when the pressure in said bearing recess is equal to the supply pressure in said groove, said bearing elements being disposed preferably at spaced intervals around said body or revolution, the position of at least one of said bearing elements being adapted to be modified in relation to that of the other elements to permit the adjustment of the clearance left between said bearing elements and said body.

3,891,284
LONGITUDINALLY MOVING SHAFT BEARING

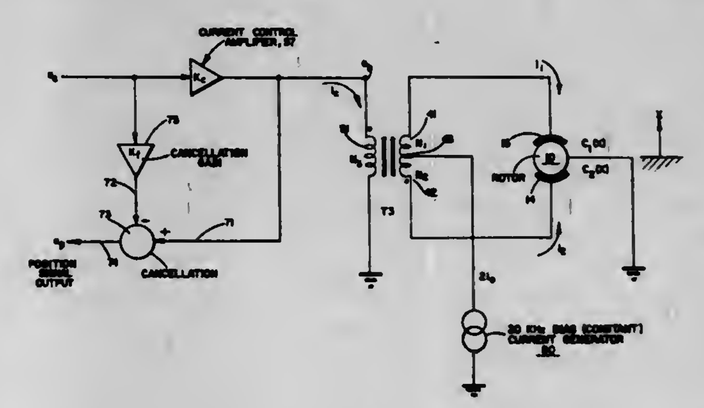
Horst Ernst, Eltingshausen; Manfred Brandenstein, Aschfeld, and Armin Olschewski, Schweinfurt, all of Germany, assignors to SKF Industrial Trading and Development Company, B.V., Amsterdam, Netherlands
Filed Apr. 15, 1974, Ser. No. 461,244
Claims priority, application Germany, Apr. 17, 1973, 2319340
Int. Cl. F16c *29/06*
U.S. Cl. 308—6 C **21 Claims**



1. A ball bearing for journalling longitudinally moving shafts, axles or the like comprising a hollow cylindrical cage having an inner bore adapted to receive said shaft, said cage having a plurality of closed end ball guide paths uniformly spaced about its circumference, each guide being formed of at least one axial groove in which the balls are retained, said axial groove being open to the inner bore of the cage to engage the shaft therein and open to the outer surface of said cage, each axial groove having a rail located in the outer opening, said rail having a race surface engaging the balls in said groove, the rails for all of said grooves being interconnected at only one end to each other to form a cylindrical cover for said cage.

3,891,285
ELECTROSTATIC BEARING SENSING AND CONTROL CIRCUITRY

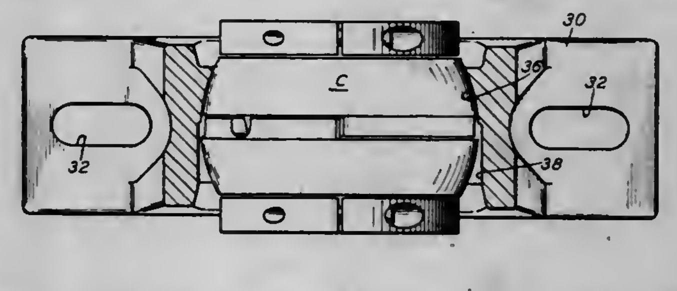
James L. Atkinson, La Mirada, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed May 13, 1974, Ser. No. 469,165
Int. Cl.² F16C *39/00*
U.S. Cl. 308—10 **5 Claims**



1. In an electrostatic suspension, force-rebalance type inertial instrument in which the suspension plates of the electrostatic bearing are further used in a capacitive bridge to provide inertial data read-out, non-magnetic circuit means for decoupling the force-rebalance signal component and the inertial data signal components.

3,891,286
ROLLER BEARING ASSEMBLY

George A Zimmer; Charles M. Allaben, Jr., and William K. Weidman, all of Ithaca, N.Y., assignors to Borg-Warner Corporation, Chicago, Ill.
Continuation of Ser. No. 267,307, June 29, 1972, abandoned. This application Feb. 15, 1974, Ser. No. 443,079
Int. Cl. F16c *13/00*
U.S. Cl. 308—207 **6 Claims**



1. In combination with a housing adapted to be fixed to a support and having a central opening therethrough defined by an arcuate surface, a self-aligning roller bearing assembly comprising:

a pair of rows of rollers;

an inner race having a cylindrical opening for receiving and supporting a shaft;

said inner race having a pair of raceways, each having a conical surface for contact by the rollers of a row;

an outer race;

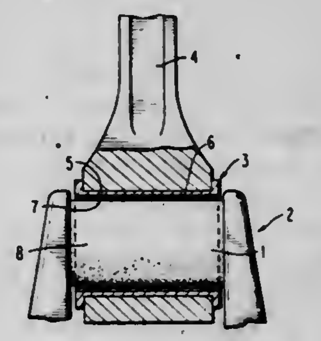
said outer race being formed of a pair of substantially like members welded together;

each member of said outer race having an interior raceway, each of said interior raceway having a conical surface for contact by the rollers of a row, and an outer arcuate surface engaging the arcuate surface of said housing opening to permit relative arcuate movement of said outer race members and said housing;

said bearing assembly being insertable and removable as a unit with respect to said housing opening, and being self-aligning by such relative movement of said outer race members and said housing to thus accommodate shaft misalignment with respect to said support.

3,891,287
SLIDING BEARING

Ulrich Vogt, Reutlingen-Sondelfingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany
Filed Sept. 13, 1973, Ser. No. 396,715
Claims priority, application Germany, Sept. 14, 1972, 2245039
Int. Cl. F16c *9/02*
U.S. Cl. 308—237 A **11 Claims**

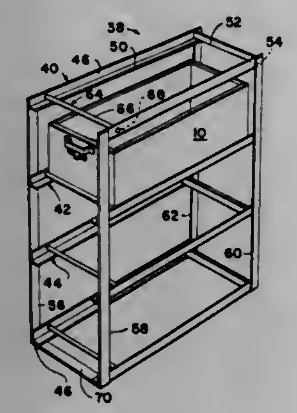


1. A slide bearing which includes a bearing shell that is provided with a running layer of a soft bearing metal, in which

is journalled a pin of a shaft, characterized in that a thin layer of copper is applied over the pin.

3,891,288
PLUG-IN EQUIPMENT SHIPPING CONTAINER AND RACK SYSTEM

John L. Marquette, 126 E. Green St., Westminster, Md. 21151
Filed Dec. 27, 1973, Ser. No. 428,731
Int. Cl.² B62B *05/00*
U.S. Cl. 312—338 **5 Claims**



5. A shipping container system comprising: a container having a bottom with upstanding interconnected left and right sides and front and back ends, a rack having structure defining a horizontal aperture therein proportioned to receive said container as a drawer inserted in the front of the horizontal aperture, said rack structure including: a horizontal support for receiving and holding the container at a predetermined level, guide means positioned for aligning the container during and after insertion of the container in the rack, a stop member located in position to limit rearward movement of the container when the container is fully inserted in the rack; a roller, means rotatably mounting the roller to the rack, said roller extending horizontally across the front of the horizontal aperture proximately in front of the fully inserted position of the container and proximately tangent at the lower circumference thereof to the level of the horizontal support, for thereby serving as a rolling support for the bottom of the container during insertion and for a retainer contacting the front end of the container after insertion, said container having a handle protrusive from each end thereof, each said protrusive handle comprising in plan view a straight portion and first and second spaced shanks extending from the container parallel with the sides thereof and connecting the straight portion with the container, and a one-hand disconnectable carrying handle in the form of a longitudinal grip extending the length of the container, first and second legs extending divergently downward at each end of the longitudinal grip, the end of each first leg turning outward and upward forming a hook proportioned for engagement with the first shank with the first leg inside the first shank, the end of each second leg turning inward toward said hook of the first leg; the divergence between said legs being proportioned for engaging the turned end of the second leg with the second shank on said engagement of the first leg with the first shank.

3,891,289
LOCKABLE ELECTRICAL OUTLET

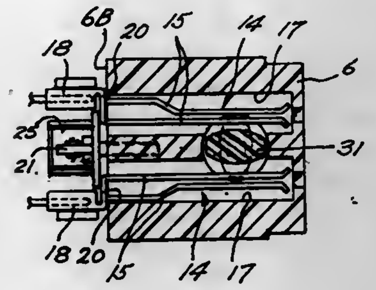
Edward F. Hanke, 550 E. 33rd St., Eugene, Oreg. 97405
Filed Feb. 7, 1974, Ser. No. 440,397
Int. Cl. H01r *13/54*
U.S. Cl. 339—14 P **2 Claims**

1. An electrical outlet for the lockable reception of both two and three prong plugs of the type associated with household appliances, the latter type plug having a ground prong, said outlet comprising,

a main housing defining multiple cavities each for the reception of contact finger assemblies, an internally threaded bore within said housing extending intermediate a pair of said cavities and terminating in communication with an additional cavity within the housing,

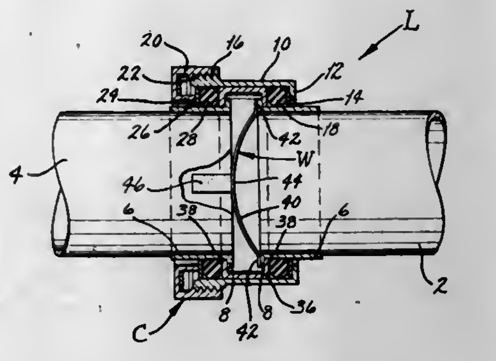
contact finger assemblies disposed within each of said cavities and adapted for engagement with the inserted prongs of an electrical plug,

a threaded locking member rotatably mounted within the housing bore and terminating outwardly of the housing in an exposed fingergrip, said locking member threaded for a portion of its length, cam surfaces oppositely formed on said locking member for laterally biasing a pair of contact finger assemblies into positive contact with plug prongs, said locking member terminating inwardly in an end portion disposed within said additional cavity for biasing a ground contact finger against the ground prong of a plug whereby the plug prongs are frictionally engaged by each contact finger assembly and by a ground contact finger assembly to assure positive electrical contact and to prevent inadvertent plug separation from the outlet.



3,891,290
WASHER FOR ELECTRICALLY CONNECTING THE TUBES OF A FLUID LINE

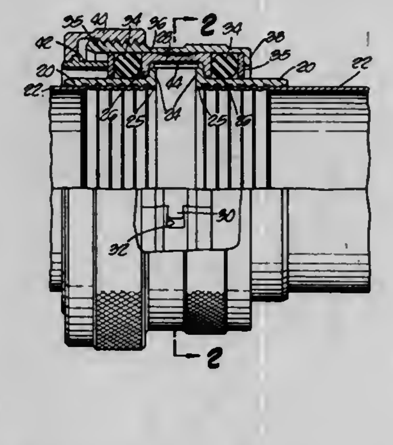
Tommy G. Marshall, Florissant, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.
Filed Oct. 15, 1973, Ser. No. 406,540
Int. Cl. H01r *3/04;* **H02g** *15/08*
U.S. Cl. 339—15 **9 Claims**



6. In a fluid line for carrying a flammable fluid and including first and second metal tubes of circular cross-section having outwardly directed flanges at their ends, a coupling arrangement connecting the tubes at their ends, said coupling arrangement comprising: a collar bridging the ends of the tubes and having inwardly directed first and second flanges which extend behind the outwardly directed flanges on the ends of the first and second tubes, respectively, and prevent the tubes from being withdrawn from each other, the collar being split so that it can be expanded and emplaced over the flanges at the ends of the tubes; first and second annular elastomeric seals encircling the first and second tubes, respectively, behind the flanges on the collar; a first coupling element extended over the collar and having an inwardly disposed portion located behind the first seal with the first seal being between the first flange of the collar and the inwardly disposed portion of the first coupling element; a second coupling element having an inwardly disposed portion located behind the second seal element with the second seal element being disposed between the second flange of the collar and the inwardly disposed portion of the second coupling element, the coupling elements being threaded together with the axial spacing between the inwardly disposed portions of the coupling elements being decreased compressing the seal elements in the axial direction between the flanges of the collar and the inwardly disposed portions of the coupling elements; and a washer located within the collar, the washer being formed from a resilient electrically conductive material and being undulated, forming lobes, the lobes on the washer being in contact with the flanges on the ends of the tube electrically connecting the tubes.

3,891,291
TUBING COUPLING INCORPORATING BRIDGING CONDUCTOR

Clarence A. Nadsady, Downey, and Clifford D. Cannon, Lahabra, both of Calif., assignors to E. B. Wiggins, Inc., Los Angeles, Calif.
Filed Feb. 5, 1974, Ser. No. 440,084
Int. Cl. H01r *3/04;* **H02g** *15/08*
U.S. Cl. 339—15 **14 Claims**



1. In a coupling joining two tubing ends, each of which is equipped with a radial end flange, wherein the coupling includes annular retainer structure straddling the radial end flanges with said flanges being in confronting spaced relation mechanically interconnecting the two tubing ends,

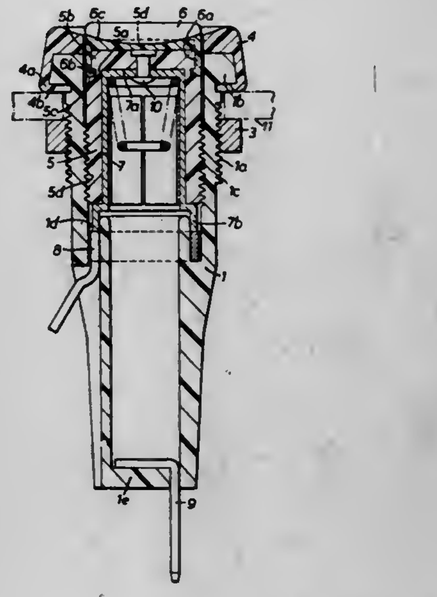
an improvement electrically interconnecting the two tubing ends, comprising:

electrically conductive means inside the annular retainer structure and of a width extending between and contacting said spaced apart radial end flanges of the two tubing ends and serving as a conductor bridge between the two tubing ends.

3,891,292
ELECTRICAL COMPONENT

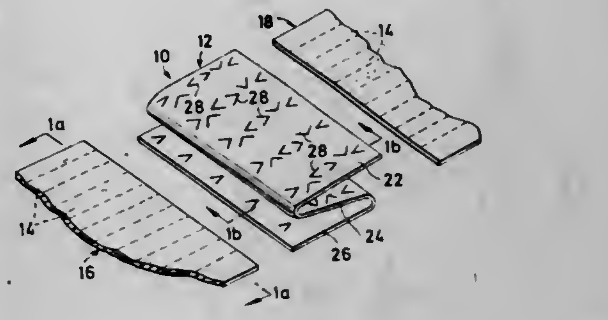
Dennis Jack Blight; David Frederick Miller, and John Trevor Morgan, all of Enfield, England, assignors to Belling & Lee Limited, Enfield, England
Filed Sept. 24, 1973, Ser. No. 399,917
Claims priority, application United Kingdom, Sept. 26, 1972, 44451/72
Int. Cl. H01r *13/54*
U.S. Cl. 339—36 **11 Claims**

1. In an electrical component including a structural member having a stem portion and a flange portion extending radially outward from said stem portion to an outer edge and serving to locate said structural member in an aperture in a mounting panel the improvement comprising a removable cover member of insulating material for applying over said structural member of said component said cover member extending over said flange portion and formed with portions thereof extending over said outer edge of said flange portion and resiliently engaging beneath said flange portion to secure said cover member releasably thereon.



3,891,293
FLAT CABLE TERMINATING

Allan F. Jones, Milland, England, assignor to ITT Industries, Inc., New York, N.Y.
Filed May 17, 1974, Ser. No. 470,812
Claims priority, application United Kingdom, June 21, 1973, 29501/73
Int. Cl.² H01R *11/20*
U.S. Cl. 339—97 C **4 Claims**



1. A method of terminating a flat cable having a plurality of parallel, spaced conductive tracks thereon covered with insulation comprising the steps of:

providing a termination device comprising a deformable flat metallic sheet bent to a U-shaped configuration providing a pair of flat spaced legs, said legs having generally parallel rows of barbs thereon, said rows being spaced apart a distance corresponding to the spacing of said conductive tracks;

inserting the end of said cable between said legs with said tracks aligned with said rows of barbs;

crimping said legs onto said cable end so that said barbs pierce said insulation and contact said conductive tracks; and

removing the metal of said termination device between said tracks to electrically isolate said tracks from each other.

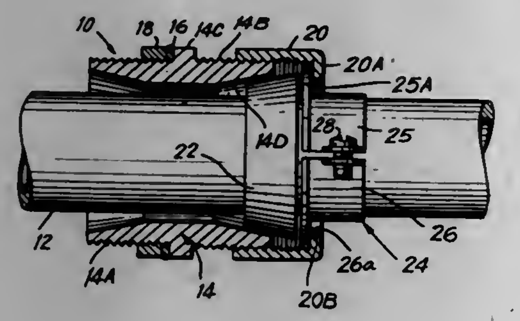
3,891,294
CORD GRIP CONNECTOR

Robert A. Philibert, Burlington, Conn., assignor to General Signal Corporation, Rochester, N.Y.

Filed Jan. 9, 1974, Ser. No. 431,827

Int. Cl. H01r *13/58*

U.S. Cl. 339—103 R **2 Claims**



1. An electrical fitting adapted to grip a cable or cord, comprising:

a connector body having threads at both of its ends;

a locking collar having threads adapted to engage with threads at the outer end of said connector body, said locking collar being provided with a radially inwardly directed flange and an opening in said connector body defined by said flange;

a clamping device adapted to be inserted within the interior of said locking collar from the outside, said clamping device being formed in two parts, semi-annular in shape, each of said parts having a radially outwardly extending flange adapted to engage the inner surface of the flange on said locking collar;

said clamping device being so shaped as to fit around a cable or the like and being provided with a pair of outstanding ears on each of the semi-annular parts, said parts being held in spaced relationship and being brought together so as to clamp said cable, each of the flanges on said clamping parts terminating in straight edge portions, the perpendicular distance between said edge portions at opposite ends of each of the respective flanges being less than said opening in the locking collar.

3,891,295
FIXING DEVICE FOR A SUPPORT MEANS

Jean Debaigt, Maisons-Laffitte, France, assignor to C.G.E.E.-Alsthom, Levallois-Perret, France

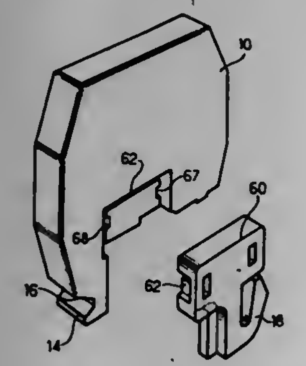
Continuation of Ser. No. 243,962, April 14, 1972, abandoned.

This application Oct. 25, 1973, Ser. No. 409,669

Claims priority, application France, Apr. 15, 1971, 71.13295

Int. Cl. H01r *9/00*

U.S. Cl. 339—198 GA **2 Claims**



1. A terminal block assembly comprising, in combination: a channel-shaped metallic mounting bar having first and second opposed flanges; a plurality of stacked insulative support elements, arranged side by side, each having a base and upstanding first and second side and first and second end walls and an integral rigid projection depending beneath said first side wall, and a slot between said first side wall and said projection about each of which respective one of said insulative support elements have been rotated into assembly with said first flange of said mounting bar; a plurality of separate, removable, insulative bases assembled respectively with respective ones of said support elements and each base further including a flexible arm portion extending towards respective ones of said second side walls and diametric to associated ones of said slots, each said arm portion including a camming surface adapted to lock each respective said arm portion in engagement with said second flange of said mounting bar, wherein said plurality of stacked insulative support elements exceed numerically said plurality of insulative bases, some of said insulative support elements being free of insulative bases so as not to increase undesirably force required to engage fixedly said insulative support elements to said mounting bar whereby the plurality of stacked insulative support elements may be arranged in the form of a multiple block before being fixed onto the metallic mounting bar, each said support element including a recess in each said first end wall, wherein each of said bases is arranged to be inserted into said recess provided in respective ones of said first end walls, wherein each of said bases further includes interlocking means formed complementally to means provided in at least some of said recesses of each of said insulative support elements, and wherein said interlocking means comprises diametrically placed flexible latching tongues on each said base which engage complementary slots in walls of at least some of said recesses.

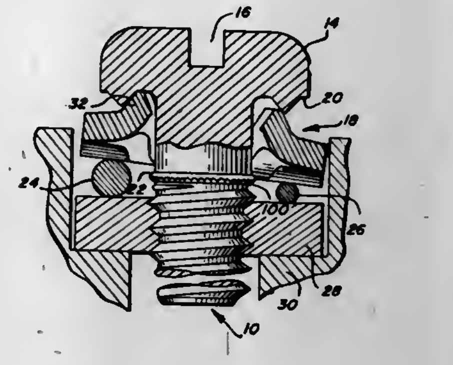
3,891,296
TEETER TERMINAL CLAMP

Charles E. Gutshall, Rockford, Ill., assignor to Elco Industries, Inc., Rockford, Ill.

Filed Oct. 9, 1973, Ser. No. 404,805

Int. Cl. H01r *9/10*

U.S. Cl. 339—246 **9 Claims**



1. A teeter terminal clamp for removably securing the terminal portion of at least one conductor comprising in combination:

a. a threaded shank having a head at one extremity and an entering end portion at the other extremity, said head being configured to cooperate with a tool whereby the shank may be rotated into or out of a threaded aperture, said head having an underhead surface with at least one, integral frustoconical section extending outwardly from said underhead surface concentric with the shank axis and between the inner and outer extremities of the underhead surface;

b. a clamping plate apertured to loosely and teeterably receive said shank, said plate having on the side adjacent said head a generally-annular inner section with inner surface flaring radially outwardly towards said head, a marginal outer section axially displaced from the head and radially displaced from the shank relative to said inner section, and a generally-frustoconical connecting section joining said inner and outer sections, said connecting section accommodating said frustoconical section on the undersurface of said head whereby the extremity of said frustoconical section on the undersurface of said head registers with an intermediate portion of said connecting section when said frustoconical section on the undersurface of said head and said connecting section are aligned and in contact, said plate also having on the other side generally complementary inner, outer and connecting surfaces and including a plurality of spaced ribs extending radially from said connecting surface to the central aperture of said clamping plate so as to define the inner limits of the central aperture in said plate; said plate also having conductor-engaging, anti-slip surface irregularities on said other side thereof; and

c. means for retaining said plate on said shank spacedly adjacent said head.

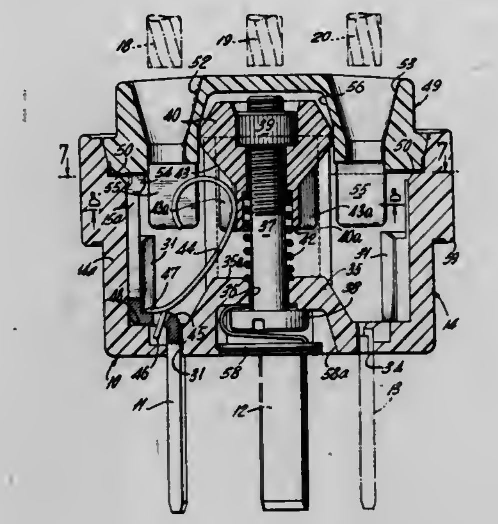
3,891,297
ELECTRICAL CONNECTOR FOR ATTACHMENT TO MULTI-CONDUCTOR CABLE

John M. Poliak, East Meadow, and Juan M. Lopez, New York, both of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.

Filed Apr. 10, 1974, Ser. No. 459,702

Int. Cl.² H01R *7/06*

U.S. Cl. 339—270 R **10 Claims**



1. In an electrical connector for attachment to conductors of a multi-conductor cable, the improvement comprising:

a. a hollow connector body of insulating material;

b. said body having upstanding side walls defining a cavity;

c. a plurality of electrical contacts mounted in said cavity in spaced relation to each other;

d. each of said contacts having a terminal portion located within said cavity and extending lengthwise along one of said side walls of the body;

e. means for clamping bare ends of several conductors of a cable in electrical engagement with said terminal portions of said contacts;

f. said means including spaced clamping members rockably mounted within said connector body and having resilient and compressible free ends opposing wire-engaging faces of said terminal portions of the respect contacts;

g. a wiring insert mounted in said cavity for axial movement therein;

h. a plurality of spaced cams carried by said insert and engaging with each of said free ends of the clamping members;

i. said cam members being adapted to urge the free ends of the clamping members toward the wire-engaging faces and into compressive clamping engagement with the bare ends of the wires in movement of the insert in one direction relative to said body;

j. threaded means extending into said body and threadably engaging with said insert for moving said insert axially relative to said body; and

k. stop means located within said cavity for engaging with and limiting movement of the insert in said one direction.

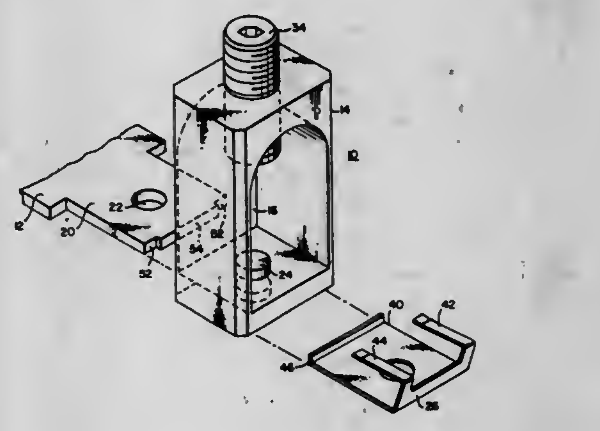
3,891,298
CLIP CONNECTED TERMINAL LUG

Nick Yorgin, Ambridge, and Alfred E. Maier, both of Beaver Falls, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 17, 1973, Ser. No. 398,022

Int. Cl. H01r *7/12*

U.S. Cl. 339—272 R **14 Claims**



1. A terminal lug for connecting an electric cable conductor to an electric bus conductor comprising:

a body member being generally rectangular shaped and having a passage formed therethrough in which a portion of the electric bus conductor and a portion of the electric cable conductor are to be disposed;

a boss formed in the passage of said body member for engaging the electric bus conductor portion which is disposed in the passage of said body member;

spring means for maintaining said boss in engagement with the electric bus conductor and for fastening the terminal lug to the electric bus conductor;

a terminal screw passing through the top end of said body member for forcing the portion of the electric cable conductor disposed in the passage of said body member into good electrical contact with the portion of the electric bus conductor disposed in the passage of said body member;

said spring means comprises a lug clip having a generally U-shaped cross sectional area and being constructed from a spring material;

said lug clip disposed so that one leg of the U-shaped lug clip extends into the passage of said body member above the portion of the electric bus conductor disposed in the passage and the other leg of the U-shaped lug clip extends over the outside end of said body member to hold the portion of the electric bus conductor which is disposed in the passage formed in said body member against the inner surface of the passage at one end of said body member; the portion of the electric bus disposed in the passage is flat and has an opening formed therethrough;

said boss formed in the passage of said body member projects into the opening formed through the electric bus which in cooperation with said U-shaped lug clip secures said terminal lug to the electric bus conductor and prevents any substantial movement of the terminal lug with respect to the electric bus conductor;

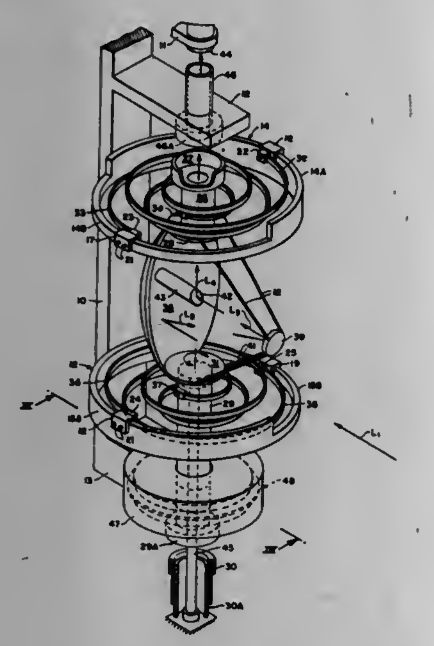
the leg of the U-shaped lug clip which is disposed against the outside end of said body member being flat and slightly longer than the width of the end of said body member;

a lip formed at the free end of the outside leg of said U-shaped portion; and,

said lip extending over the end of said body member and engaging a portion of one side of said body member to tightly hold said U-shaped lug clip in place.

3,891,299
BEARINGLESS OSCILLATING SCANNER

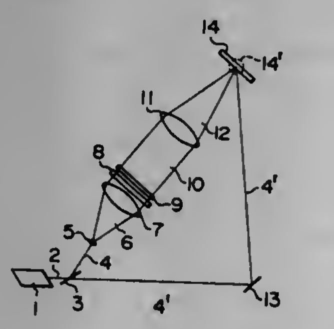
Frank C. Rushing, Columbia, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Oct. 3, 1972, Ser. No. 294,731
Int. Cl. G02b *17/00*
U.S. Cl. 350—6 **9 Claims**



1. A bearingless oscillating scanner of the type for scanning a scene, comprising:
- a stationary sensor for producing a signal in response to energy rays having varying energy levels,
- multiple mirror means positioned for receiving said rays from a scene and directing such rays to a pathway leading to said sensor,
- a mirror support structure carrying said multiple mirror means and arranged for oscillation about a predetermined axis aligned with said pathway,
- a stationary member,
- a plurality of spring means arranged at axially-spaced-apart locations along said predetermined axis, each of said spring means being interconnected between said stationary member and said mirror support structure in a manner to provide an elastic restoring force to said mirror support structure when displaced during oscillation, and drive means for delivering oscillation-sustaining torque forces intermittently to said mirror support structure.

3,891,300
APPARATUS FOR MAKING HOLOGRAM

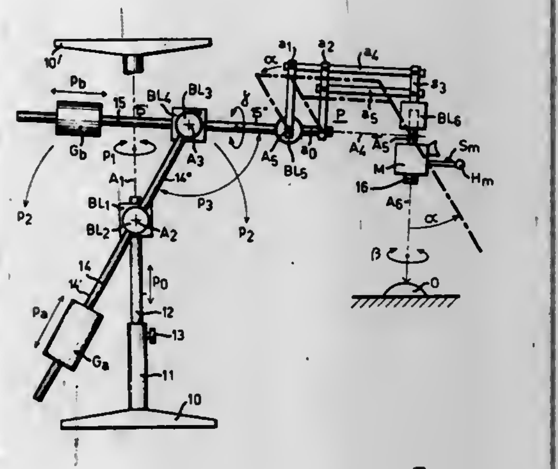
Yoshito Tsunoda, Hachioji, Japan, assignor to Hitachi, Ltd., Japan
Filed Sept. 5, 1973, Ser. No. 394,439
Claims priority, application Japan, Sept. 9, 1972, 47-90788; Sept. 22, 1972, 47-94534; Jan. 24, 1973, 48-9507
Int. Cl. G02b *27/38*
U.S. Cl. 350—3.5 **15 Claims**



1. An apparatus for making a Fourier transform hologram, comprising
- a. a light source for producing a coherent light beam;
- b. a source of analog picture information to be recorded as a hologram;
- c. means for directing a part of the light beam to the analog picture information source;
- d. means for causing interference between the output light of the analog picture information source and another part of the light beam on a light sensitive medium; and
- e. a phase shifting plate disposed in the vicinity of the picture information source in which at least two kinds of unit phase-change-giving regions having different thicknesses are distributed irregularly and discontinuously with a pitch lower than the resolution of the human eye on a transparent substrate for varying the phase of the output light of the analog picture information source irregularly.

3,891,301
ADJUSTABLE SUPPORT OR STAND FOR AN OPTICAL OBSERVATION INSTRUMENT

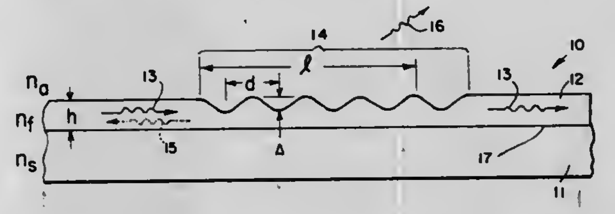
Rudolf Heller, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland
Continuation of Ser. No. 379,194, July 13, 1973, abandoned. This application Sept. 9, 1974, Ser. No. 504,539
Claims priority, application Switzerland, Aug. 18, 1972, 12251/72
Int. Cl. G02b *23/16*
U.S. Cl. 350—85 **4 Claims**



1. Adjustable stand for an optical observation instrument, the position and orientation of which can be freely adjusted and fixed in a spatial area, comprising an observation instrument, an instrument carrier for having the observation instrument affixed thereto, a stationary support, an elongated balance beam having a fulcrum defining two arms and supported at its fulcrum on the stationary support by means of two first blockable bearings having respective vertical and horizontal converging axial directions, one arm of the balance beam being equipped with a first adjustable compensation weight, an elongated intermediate member having a fulcrum defining two arms and supported at its fulcrum on the other arm of the balance beam by means of two second blockable bearings having respective axial directions converging and oriented transversely to each other, one axial direction being horizontal and the other being oriented substantially lengthwise to the intermediate member, one arm of the intermediate member being equipped with a second adjustable compensation weight while the instrument carrier is supported on the other arm of the intermediate member by means of an articulated rod arrangement.

3,891,302
METHOD OF FILTERING MODES IN OPTICAL WAVEGUIDES

Franklin Winston Dabby, Ewing Twsp., and Ami Kestenbaum, East Windsor Twsp., Mercer County, both of N.J., assignors to Western Electric Company, Inc., New York, N.Y.
Filed Sept. 28, 1973, Ser. No. 401,731
Int. Cl. G02b *5/14*
U.S. Cl. 350—96 WG **32 Claims**

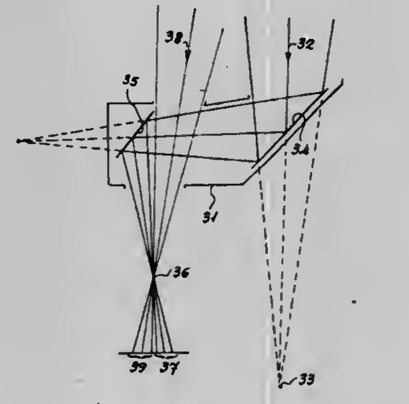


1. A method of mode filtering light of a given frequency propagated through an optical waveguide having a refractive index n_f in a first portion of a cross section thereof and a refractive index n_s in a second portion of the cross section, where $n_f > n_s$, which comprises:

selecting and providing variation in a region of the optical waveguide extending along the propagation axis of the waveguide to divert an unwanted mode of the light from forward propagation, the period of the variation being less than $\lambda/n_e - n_s$, where λ is the free-space wavelength of the light and n_e is the effective refractive index in the waveguide of the unwanted mode, the periodic variation extending to at least a portion of the cross section of the waveguide where the field of the unwanted mode substantially exists.

3,891,303
COMBINED SYSTEM OF OPTICAL DEVICES FOR PHOTOGRAPHY AND STEREOSCOPIC VISION

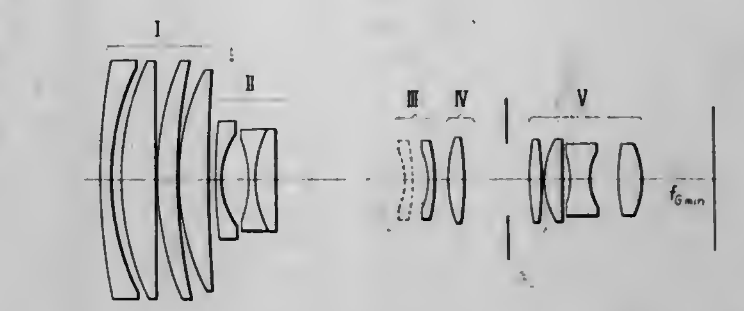
Joaquin Gomez Barquero, 23, Madrid-8, Ibiza, Spain
Filed Aug. 14, 1972, Ser. No. 280,553
Int. Cl. G02b *27/24*
U.S. Cl. 350—132 **2 Claims**



1. An attachment for use with photographic, television and cinema cameras that simultaneously produces in a unit frame a pair of transposed stereographic images from light reflected by an object, which images can be photographed, televised, or cinematographed with conventional equipment, said attachment comprising:
- a housing adapted for mounting at the front of the camera, said housing having two horizontally spaced front apertures for the receipt of the pair of light images and a rear aperture for transmitting said images into the object lens of the camera;
- first mirror means mounted at an angle within said housing at the right of the front aperture for reflecting the light image received through the right aperture of said pair of front apertures toward the interior of the housing at substantially a right angle to the entering image; and
- second mirror means mounted at the left side of said housing at an angle with respect to said first mirror means for reflecting light inciding from said first mirror means to the left half of said rear aperture, the light image entering at the left aperture of said pair of front apertures crossing the light image reflected from said first mirror means within said housing and passing directly through the right half of the rear aperture without deviation, rotation or inversion of the light image whereby the right image is displayed at the right side of the film plane of the camera and the left image is displayed at the left side of the film plane.

3,891,304
PANCRATIC OBJECTIVE

Trude Muszumanski, Vienna; Gunter Kurz, Voesendorf, and Irngard Wendisch, Vienna, all of Austria, assignors to Karl Vockenhuber, Vienna 18 and Raimund Hauser, Vienna 4, both of, Austria
Filed Jan. 12, 1973, Ser. No. 323,093
Claims priority, application Austria, Jan. 13, 1972, 282/72
Int. Cl. G02b *15/16*
U.S. Cl. 350—184 **4 Claims**



2. A varifocal objective comprising a positively refracting rear lens group and an afocal front lens assembly of variable magnification ratio, satisfying the relationship $f_{II} > f_{G\min} - 6y$, $f_{G\min}$ being the minimum overall focal length of the objective and $2y$ being its image diagonal, said afocal lens assembly including:
- a positive first component consisting of four air-spaced singlets each having a forwardly convex surface, all but the first of said singlets being positively refracting;
- axially shiftable negative second and third components, f_{II} being the individual focal length of said second component; and
- an axially fixed positive fourth component;
- said first, second, third and fourth components and said rear lens group having individual focal lengths f_I, f_{II}, f_{III}, f_{IV} and f_V, respectively, of substantially the following numerical values referred to a mean focal length of numerical value unity:

$f_I = +2.168$
$f_{II} = -0.600$
$f_{III} = -2.093$
$f_{IV} = +1.237$
$f_V = +1.030$.

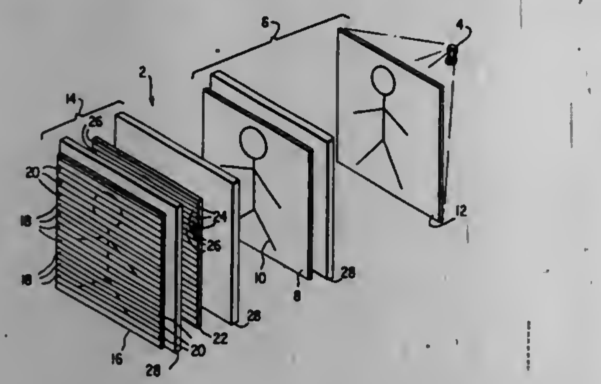
3,891,305
APPARATUS FOR SIMULATING A THREE-DIMENSIONAL IMAGE BY USE OF PLURAL IMAGE PRODUCING SURFACES

Lester Fader, 1402 Bardstown, Ann Arbor, Mich. 48105
Filed May 8, 1973, Ser. No. 358,322
Int. Cl. G02b *27/22*
U.S. Cl. 350—144 **16 Claims**

1. Apparatus for producing a pseudostereoscopic light image when viewed from a predetermined viewing area, comprising

a. first image producing means for directing a first light pattern corresponding to said image toward the viewing area, said first image producing means including a first generally planar surface having said image permanently recorded therein, and

b. second image producing means for directing a second light pattern toward the predetermined viewing area, said second image producing means including a second generally planar surface positioned forward of, parallel to and in axial alignment with said first generally planar surface,



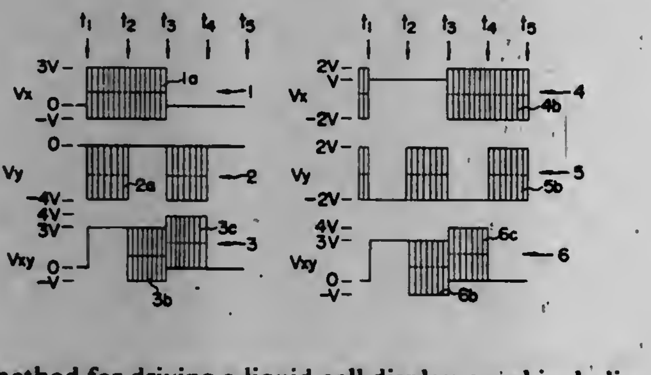
said second generally planar surface including at least one portion of said image permanently recorded in an area axially aligned with a corresponding portion of said image recorded on said first generally planar surface and further including a transparent area axially aligned with the remaining corresponding portion of said image recorded on said first generally planar surface, said second planar surface permitting the first light pattern to pass therethrough to said predetermined viewing area, whereby a three dimensional sensation is created when said first and second patterns are visually integrated.

3,891,306

METHOD FOR DRIVING LIQUID CELL DISPLAY PANEL

Isamu Mitomo, Hachioji; Tetsunori Kaji, and Masakazu Fukushima, both of Kokbunji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed July 20, 1973, Ser. No. 381,003
Claims priority, application Japan, July 21, 1972, 47-73119
Int. Cl. G02f *1/28*
U.S. Cl. 350—160 LC **6 Claims**



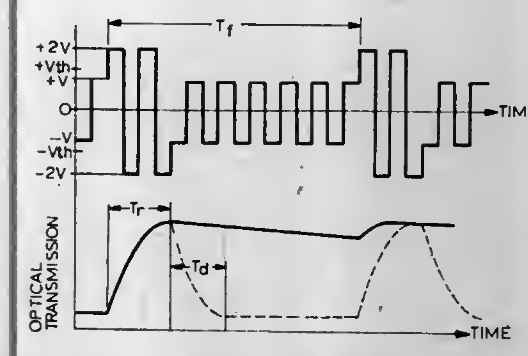
1. A method for driving a liquid cell display panel including a plurality of first electrodes arranged in parallel to each other, a plurality of second electrodes respectively intersecting with each of said first electrodes and arranged in parallel to each other, and liquid cells of nematic type disposed at the respective intersections of said first electrodes with said second electrodes, said method comprising the step of applying a voltage to a predetermined liquid cell of said liquid cells through said first and second electrodes to drive said predetermined liquid cell, wherein said voltage includes a DC voltage and a high frequency voltage superimposed thereon during periods of two types of semi-selection of said liquid cell and said voltage includes at least a DC voltage during a period of full selection thereof, an amplitude ratio of said high frequency voltage to DC voltage during the period of at least one of said two types of semi-selection being in the range of at least 1 and not more than 2.

3,891,307

PHASE CONTROL OF THE VOLTAGES APPLIED TO OPPOSITE ELECTRODES FOR A CHOLESTERIC TO NEMATIC PHASE TRANSITION DISPLAY

Masahide Tsukamoto, and Tetsuro Ohtsuka, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 12, 1974, Ser. No. 450,450
Claims priority, application Japan, Mar. 20, 1973, 43-32308; Apr. 20, 1973, 48-45332
Int. Cl. G02f *1/16*
U.S. Cl. 350—160 LC **9 Claims**



1. An electro-optical device comprising:

1. a liquid crystal cell having a first electrode and a second electrode for appling a voltage ot a liquid crystal layer between said first and said second electrodes and having a threshold voltage Vth above which its optical transmission changes, at least one of said first and second electrodes being light-transparent, said liquid crystal being cholesteric liquid crystal having positive dielectric anisotropy and consisting of nematic liquid crystal of 30 to 99 weight % having positive dielectric anisotropy and a compound of 70 to 1 weight % selected from steroidal compounds and optically active compounds; and
2. a means for changing optical transmission of said liquid crystal cell, comprising;
   a. a first circuit connected to said first electrode which generates a.c. voltage pulse having amplitude v, frequency *f*, phase ϕ_1 time duration T_1 and d.c. bias voltage of the same amplitude as that of said a.c. voltage pulse, said amplitude V being higher than a half of said threshold voltage Vth and equal to or lower than said threshold voltage Vth, said frequency *f* being within a range from 10 Hz to 1 KHz, and
   b. a second circuit connected to said second electrode which generates an a.c. voltage having the same amplitude V, the same frequency *f*, the same bias voltage as those of said a.c. voltage pulse, respectively and phase ϕ_1 switchable to another phase ϕ_2 for time interval T_2, said time interval T_2 being varied from O to T_1 for changing the optical transmission, whereby, an a.c. bias resulted from the difference between said d.c. bias voltage generated by said first circuit and said a.c. voltage generated by said second circuit keeps an excited light-transparent state of said liquid crystal cell and reduces fliker.

3,891,308

ACOUSTOOPTIC MODULATOR

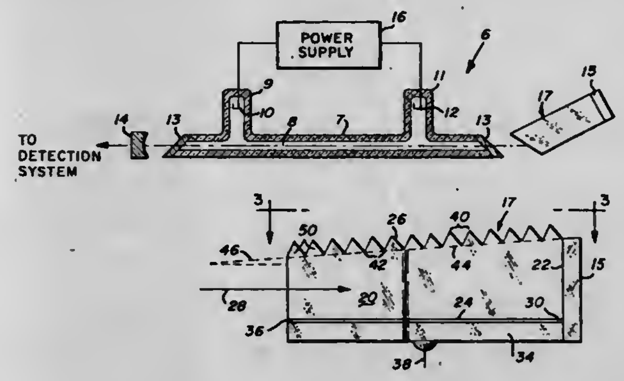
Joseph D. Hawkins, Los Altos, Calif., assignor to Liconix, Mountain View, Calif.

Filed Aug. 5, 1974, Ser. No. 494,491
Int. Cl. G02f *1/28*
U.S. Cl. 350—161 **15 Claims**

1. An acoustooptic modulator for modulating a light beam comprising:

an acoustooptic body having a first planar surface and a second surface opposite and effectively nonparallel to said first surface, said second surface having scores therein; and

an acoustooptic transducer coupled to said first surface for transmitting an acoustic wave into said body through said first surface for propagation to said second surface, said scores randomizing the reflection component of said acoustic wave from said second surface for preventing said reflection component from destructively combining with the forward propagating component of said acoustic wave.

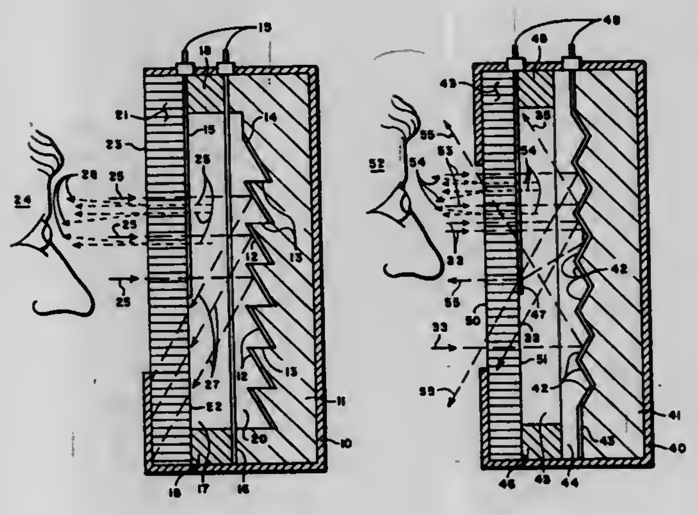


3,891,309

REFLECTIVE ALTERABLE STATE MATERIAL DISPLAY

Ulrich Bonne, Hopkins, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Dec. 19, 1973, Ser. No. 426,173
Int. Cl. G02f *1/28*
U.S. Cl. 350—160 R **29 Claims**



1. A display device containing therein an alterable state material capable of having a material state thereof selectively altered locally to thereby alter, at that location, scattering properties of said alterable state material with respect to impinging light, said device comprising:

a transparent wall having a transmitting surface therein;

reflecting surface means joined substantially across its surface to a first electrode by a solid body extending therebetween and exposed to said light passing through said transmitting surface, said reflecting surface means reflecting that light which has passed substantially perpendicularly through said transmitting surface to impinge on said reflecting surface means from an incident direction in directions other than said incident direction; and

said alterable state material disposed between said transparent wall and said reflecting surface means so that light in passing perpendicularly through said transmitting surface to impinge on said reflecting surface means also passes through said alterable state material.

18. A display device containing therein an alterable state material capable of having a material state thereof selectively altered locally to thereby alter, at that location, scattering properties of said alterable state material with respect to impinging light, said device comprising:

a transparent wall having a transmitting surface therein;

reflecting surface means, serving also as a first electrode, exposed to said light passing through said transmitting surface, said reflecting surface means reflecting that light which has passed substantially perpendicularly through said transmitting surface to impinge on said reflecting surface means from an incident direction in directions other than said incident direction; and

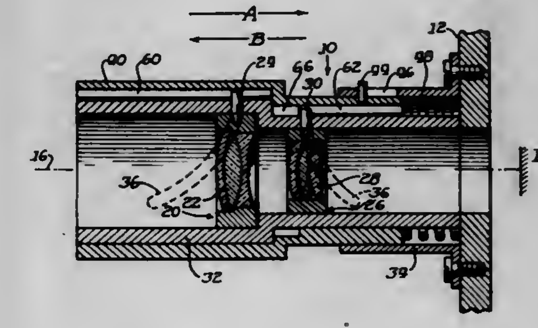
said alterable state material disposed between said transparent wall and said reflecting surface means so that light in passing perpendicularly through said transmitting surface to impinge on said reflecting surface means also passes through said alterable state material.

3,891,310

MACRO FOCUSING DEVICE FOR VARIABLE FOCAL LENGTH LENS

Hirokawa Hideo, Tokyo, and Mizuki Yoshiaki, Iruma, both of Japan, assignors to Bell & Howell Company, Chicago, Ill.

Filed Feb. 8, 1974, Ser. No. 440,910
Claims priority, application Japan, Feb. 9, 1973, 48-17782
Int. Cl.^{2} G02B *7/10*
U.S. Cl. 350—187 **6 Claims**



1. In a lens mount for a variable focal length objective lens defining an optical axis and being capable of close focusing relative to a camera housing, the lens having a variator lens cell and a compensator lens cell, the improvement comprising: a barrel fixed to the camera housing and having first and second cam slots formed therein;

an operating sleeve arranged for rotational and axial movement relative to the optical axis for causing focal lenght varation by simultaneous adjustment of said variator and compensator lens cells and close focusing by adjustment of said variator lens cell alone including:

an elongated groove for driving said variator lens cell relative to said barrel upon rotation when said sleeve is in either a first axial position for focal length variation or a second axial position for close focusing;

an elongated groove for driving said compensator lens cell relative to said barrel upon rotation when said sleeve is in said first axial position;

the variator lens cell having a guide pin cooperating with one of said cam slots in said barrel and one of said elongated groove in said sleeve; and

the compensator lens cell having a guide pin cooperating with another of said cam slots in said barrel and another of said elongated grooves in said sleeve;

the sleeve further including:

a relief groove for selectively receiving said guide pin of said compensator lens cell when said sleeve is in one of said axial positions so that only said variator lens cell is driven axially in said barrel upon rotation of said sleeve.

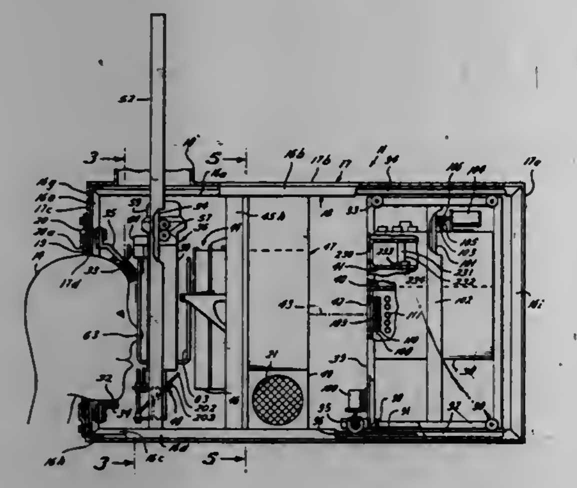
3,891,311
MULTIPARAMETER VISION TESTING APPARATUS

James C. Fletcher, Deputy Administrator of the National Aeronautics and Space Administration, with respect to an invention of Stacy R. Hunt, Jr., King of Prussia; Robert J. Homkes, Willow Grove; Wilmer B. Poteate, West Chester, and Andrew C. Sturgis, Exton, all of Pa.

Continuation of Ser. No. 160,371, July 7, 1971, abandoned. This application Sept. 10, 1973, Ser. No. 395,495

Int. Cl. A61b *3/00*

U.S. Cl. 351—38 **12 Claims**



1. A multiparameter vision tester for measuring a plurality of physiological characteristics of the eyes and visual system of a human object, comprising:

a box-like housing having a vertical extending compartment at one end, a subject viewing port located in the vertical compartment end of said housing, means about the viewing port to maintain the housing light-tight when a subject's head is positioned in testing position;

a pair of vertical rails located in the housing, adjacent the viewing port and extending into the vertical compartment;

an optical assembly mounted on said rails;

means to move said optical assembly along said vertical rails to position the optical assembly in the subject's line of sight and out of said line of sight into the vertical compartment;

a pair of horizontal rails located in the housing and extending along the bottom wall, thereof;

a carriage mounted on said horizontal rails;

means to move said carriage along said horizontal rails;

a pair of vertical rails in said carriage;

a film cassette unit having a screen mounted on said vertical carriage rails;

means to move said film cassette unit along said vertical carriage whereby the screen of said film cassette unit is alignable with the subject's line of sight through the optical assembly;

projector means to selectively provide a variety of different visual targets on said screen;

visual depth perception testing means formed of a Dolman rod assembly located on top of the film cassette unit, the Dolman rod assembly being alignable with the subject's field of view during testing for depth perception by vertical movement of the carriage, and means for manipulating said Dolman rod assembly;

means within the housing for determining the visual critical fusion frequency of the subject said visual critical fusion frequency testing means including the screen of said film cassette unit and a signal generator cooperatively associated therewith to project signals onto the screen;

field mapping means pivotally mounted on a structure within the forward end of the housing for mapping the visual field of the subject, said means stowable in a position out of the field of vision and moveable into the field of vision when the optical assembly is in the vertical compartment and field mapping is being performed;

control means for selectively performing the tests including electrical circuitry and energizing means cooperatively associated with all of said testing means for moving the selected testing means into the selected test configuration; and

tabulating means cooperatively associated with the testing means for automatically recording test results.

3,891,312
ELECTRICAL DRIVING DEVICE FOR FILM MECHANISM

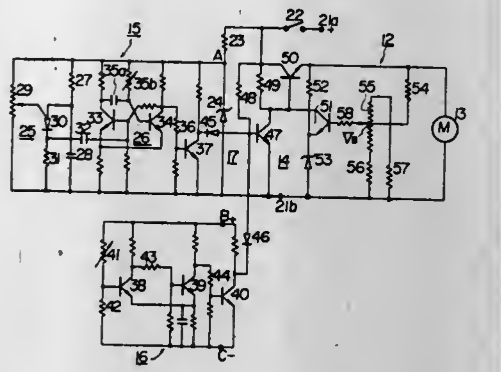
Hiroshi Aizawa, Tokyo; Tadashi Ito; Fumio Itoh, both of Yokohama; Kiyoshi Takahashi, Tokyo, and Yasuo Isobe, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Dec. 14, 1973, Ser. No. 424,705

Claims priority, application Japan, Dec. 18, 1972, 47-127425; Dec. 18, 1972, 47-145677

Int. Cl. G03b *21/48*

U.S. Cl. 352—180 **11 Claims**



1. For a camera, an electrical drive system operable from a current source comprising:

a. an electromotor;

b. a switching means for supplying a voltage from the current source to said motor; a voltage control means for controlling the voltage of said current source, said voltage control means being connected between said current source and said switching means;

c. a rectangular wave generating means for producing output pulses and controlling the switching operation of said switching means; and

d. speed regulating means including means for adjusting the voltage of said voltage control means and means for setting the duty cycle of said rectangular generating means for driving the electromotor freely within a range from lower speed up to higher speed.

3,891,313
STEREO ACCESSORY FOR PROJECTORS

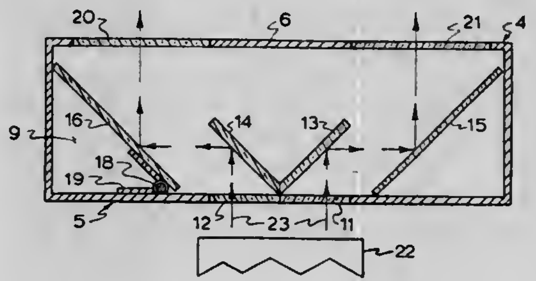
Gregory I. Murphy, 4042 Phoenix St., Concord, Calif. 94521

Continuation-in-part of Ser. No. 375,539, July 2, 1973, abandoned. This application Sept. 14, 1973, Ser. No. 397,226

Int. Cl.² G03B *21/00, 35/18;* **G02B** *27/26*

U.S. Cl. 353—8 **1 Claim**

1. A stereo accessory for a projector comprising (a) a housing having a front and a rear wall in spaced relationship; (b) polarizing means comprising two windows made of polarizing material and having axes oriented perpendicular to each and positioned adjacent to one another in the rear wall of said housing for dividing a light beam from the projector into separate parts having polarization axes oriented perpendicular to each other as it passes into said housing (c) separating means inside said housing for separating said divided and oriented light into its own separate beams, said separating means comprising a set of two reflectors mounted at approximately a 45° angle to the back wall of said housing with the backmost edge of said reflectors forming approximately a 90° angle vertically adjacent to each other at the adjacent line of said back windows, said reflectors being located to receive the light rays projected into said housing through said back windows and reflect said light rays, (d) superimposing means inside said housing for superimposing said separated beams on a viewing screen, said superimposing means being located to receive the light reflected by said separating means and comprising two reflectors mounted inside said housing one of which is adjustably mounted and the other is fixadly mounted; (e) adjusting means for adjusting the adjustably mounted reflector manually from outside of said housing; (f) shielding means for eliminating an undesired excess image which appears on the side of the desired projected picture; comprising a pair of slideable wall segments that act to extend outwardly the inside edge of said front windows and being positioned in slots located in the front wall of said housing; (g) a pair of windows located in said front wall of said housing through which said separated light beams can pass out of said housing.



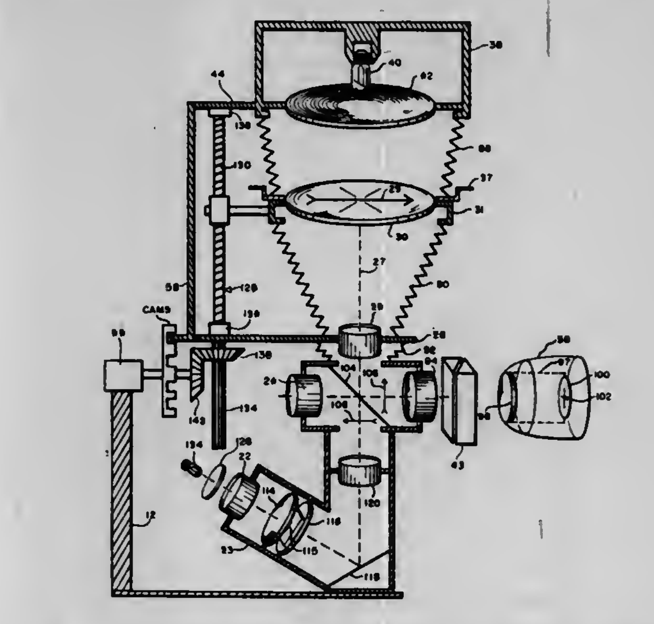
3,891,314
REFERENCE INSERTION DEVICE

Charles T. Lakin, Winter Park, and William J. Leighty, Orlanda, both of Fla., assignors to Martin Marietta Corporation, Orlando, Fla.

Continuation-in-part of Ser. No. 63, Jan. 2, 1970, abandoned. This application Nov. 16, 1972, Ser. No. 307,308

Int. Cl. G03b *5/00, 21/14*

U.S. Cl. 353—101 **24 Claims**



1. An optical device for providing a linearly expanding representation of a scene to simulate radical changes in range, comprising a mounting member, with respect to which an internal image of the scene can be formed, an enlarging lens mounted for extensive, nonlinear movements with respect to said member, a scene source mounted in optical relationship to said enlarging lens, and movable linearly with respect thereto, and means including a pair of cams, rotatable at different speeds about the same axis of rotation cooperating to provide motion between the scene source and said enlarging lens concurrently with providing motion between said enlarging lens and the internal image, such that because of preascertai optical relationships involving the characteristics of said enlarging lens, the location of the internal image will be essentially stationary with respect to said member, throughout a substantial size variation of the internal image.

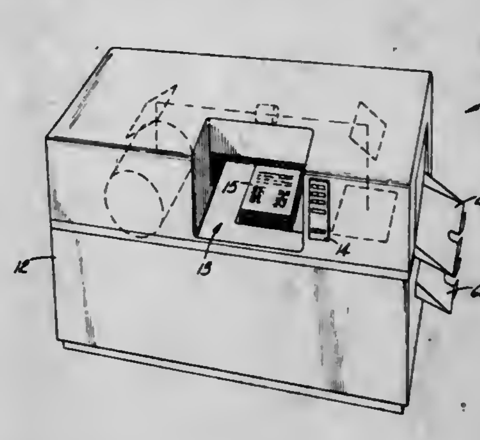
3,891,315
ELECTROPHOTOGRAPHIC REPRODUCTION APPARATUS

James Andrew Kolibas, Broadview Heights, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Dec. 3, 1973, Ser. No. 421,121

Int. Cl. G03g *15/00*

U.S. Cl. 355—8 **6 Claims**



1. An electrophotographic reproduction apparatus for producing sheet copies of original documents, said apparatus comprising:

a housing,

radiation sensitive means at a first location in said housing for receiving a focussed image of the original document to be copied,

radiation means for irradiating the original document at a second location in said housing spaced from said first location,

an access opening formed in said housing,

a loading station for receiving original documents to be copied in face-up orientation, said loading station being disposed in said access opening at a location generally intermediate said first and second locations,

transport means for controlled movement of each original document from said loading station to said second location in face-up orientation,

optical means for providing said focussed image to said radiation sensitive means including an optical path between said radiation sensitive means and said radiation means passing generally above said loading station and access opening, and

an original document output station adjacent said second location for receiving original documents in face-up orientation,

said transport means moving the original documents from said second location to said output station in face-up orientation subsequent to irradiation.

3,891,316
MULTI-PROCESS CONTROL SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

Charles A. Whited, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

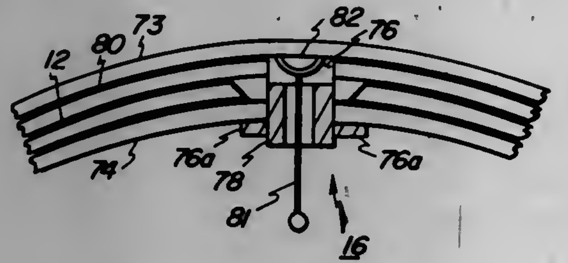
Filed Mar. 18, 1974, Ser. No. 452,023

Int. Cl. G03g *15/00*

U.S. Cl. 355—14 **16 Claims**

1. An electrophotographic printing machine of the type having a plurality of processing stations, including:

a photoconductive member mounted movably in the printing machine and arranged to pass through each of the processing stations; and probe means mounted on said photoconductive member and arranged to be located in a preselected position along the length thereof, said probe being adapted to simulate



said photoconductive member for generating an electrical signal indicative of the instantaneous condition of said photoconductive member as said probe passes through each processing station.

3,891,317

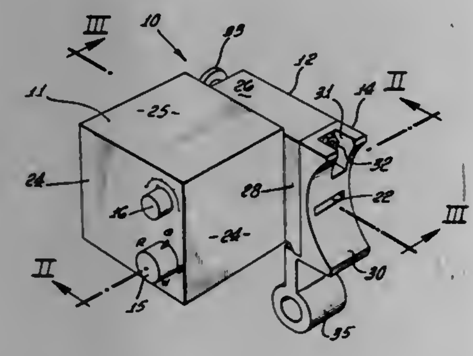
PHOTOMETRIC DEVICE FOR PRINTER LIGHT SOURCE AND THE LIKE

Richard A. Walker, Woodland Hills, Calif., assignor to Kollmorgen Corporation, Hartford, Conn.

Continuation of Ser. No. 204,820, Dec. 6, 1971, abandoned. This application July 2, 1973, Ser. No. 375,802

Int. Cl. G03b *27/76*

U.S. Cl. 355—68 **5 Claims**



1. In combination with an optical printer having a light source and having an exit port transmitting unmodified light from said source for exposure of print stock to be later located at and covering the plane of said port:

an electro-optical device for measuring characteristics of light transmitted through and at said plane of said uncovered exit port and in the absence of print stock comprising

a photometer means and an adaptor means for operatively associating said photometer means with said optical printer;

said adapter means including an entrance aperture alignable and in proximate relation with the plane of said exit port to receive and pass all of the light transmitted through the uncovered exit port;

said photometer means including

a biprism elememt at said entrance aperture to collect and reimage all of said light passing through said uncovered exit port;

a photovoltaic cell means including a plurality of separate electrically isolated cell elements in proximate relation to receive and respond to all of said light transmitted by said prism element in reimaging light at said exit port on said cell means;

each of said cell elements having an area responsive to light transmitted through corresponding incremental areas of said exit port and said entrance aperture;

and circuit means connected with each cell element and having switch means to independently select the response of each cell element and to summate response of all of said cell elements;

said cell elements being calibrated to respond equally to a selected light source whereby differences in response of each of said cell elements correspond to differences in characteristics of light passing through the incremental areas of said exit port and entrance aperture.

3,891,318

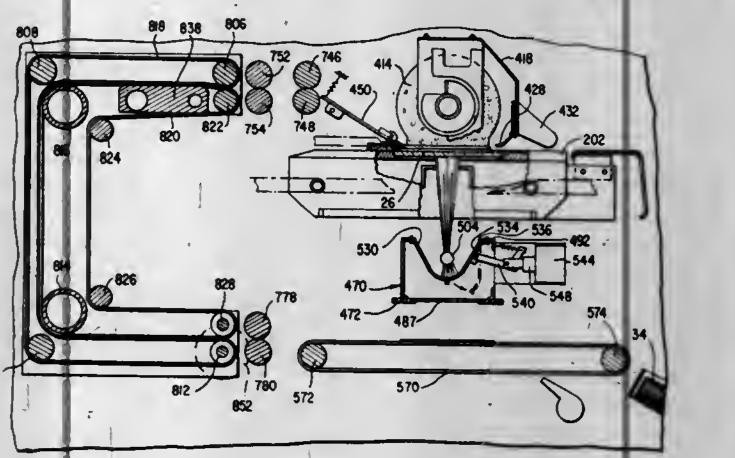
METHOD AND APPARATUS FOR REGISTERING, FEEDING AND SEPARATING ORIGINAL AND COPY SHEETS IN A DUPLICATOR

Albert F. Touchette, Shutesbury, Mass., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Feb. 7, 1974, Ser. No. 440,457

Int. Cl. G03b *27/30*

U.S. Cl. 355—100 **14 Claims**



12. A sheet separator for a microfiche duplicator including:

1. an exposure station having a source of actinic radiation;
2. a copyboard having leading and trailing edges relative to said exposure station and comprising a radiation-transmissive plate adapted to carry thereon superposed original microfiche and copy sheets, said original sheet being adjacent said radiation-transmissive plate and between said plate and said copy sheet, the upper surface of the leading edge of said copyboard being covered with a compressible material with the leading edge of the original sheet abutting the trailing edge of the compressible material and separated from the leading edge of the copy sheet by an overhanging member extending over the leading edge of the original sheet, said copyboard being movable between a loading station and said exposure station where said copy sheet is exposed to said radiation through said original sheet;
3. means for separating the exposed copy sheet from the original sheet;
4. means for developing the exposed copy sheet; and
5. means for feeding the separated, exposed copy sheet to said developing means;

the improvement in said separating means (3) comprising:

a linear cam on said copyboard and disposed ahead of the leading edge of said copyboard, said cam having a first upper surface and a second lower surface formed by a recess therein;

a spring-loaded flat member pivoted about a horizontal axis and having an arm riding on said first surface of said cam as said copyboard advances from the loading station to the exposure station, the height of said first surface causing the leading edge of said flat member nearest the leading edge of the copyboard to be disposed at a distance above the superposed original and copy sheets;

said recess being located in said cam such that when the superposed original and copy sheets initially are advanced past said exposure station, said arm rides into said recess causing the leading edge of said flat member to be pivoted against the leading edge of said copyboard against said compressible material and under the leading edge of the exposed copy sheet but over the overhanging member, wherein as said copyboard advances further past said exposure station, said arm rides out of said recess and onto said first upper surface thereby positively separating the leading edge of the exposed copy sheet from the leading edge of the original sheet, with the further movement of said copyboard past said exposure station resulting in positive separation of the entire exposed copy sheet from the original sheet and the feeding of the separated, exposed copy sheet to the developing means.

3,891,319

RECEIVER FOR IMPULSE-SHAPED LIGHT SIGNALS

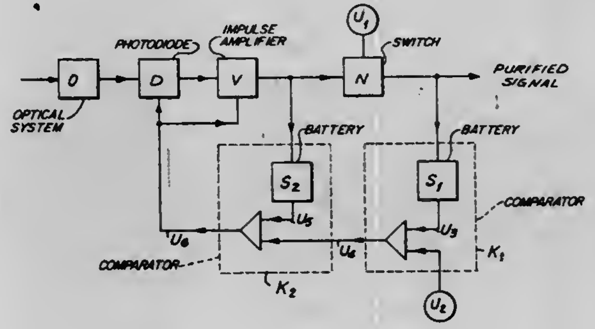
Hans Heinrich Meinke, Gauting; Gerhard Flachenecker; Friedrich Landstorfer, both of Munich; Heinz Lindenmeier, Planegg, and Karl Fastenmeier, Munich, all of Germany, assignors to Eltro GmbH Gesellschaft Fuer Strahlung Stechnik, Heidelberg, Germany

Filed Jan. 14, 1974, Ser. No. 433,383

Claims priority, application Germany, Jan. 16, 1973, 2301945

Int. Cl. G01c *3/08*; **H03f** *1/26*

U.S. Cl. 356—5 **15 Claims**



1. A receiver for impulse-shaped light signals in which the time interval between successive light signals considerably exceeds the duration of the individual light signals, means for effecting a first regulating sequence comprising zero-point suppressing means for reducing interference voltages occurring at the output of the receiver, sensitivity regulating means and amplifying regulating means for imparting a predetermined magnitude to remaining disturbance impulses, and means for effecting a second accelerated regulating sequence in addition to said first regulating sequence, said last-mentioned means having a regulating voltage dependent upon the output voltages of said receiver preceding said zero-point suppressing means.

3,891,320

LIGHT INTERFERENCE GAUGE AND FLATNESS TESTER

Yoshiaki Kimura; Masanori Kawai; Tatsuo Yajima, and Taneji Morishita, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1973, Ser. No. 417,204

Claims priority, application Japan, Mar. 31, 1973, 48-36176

Int. Cl. G01b *9/02*

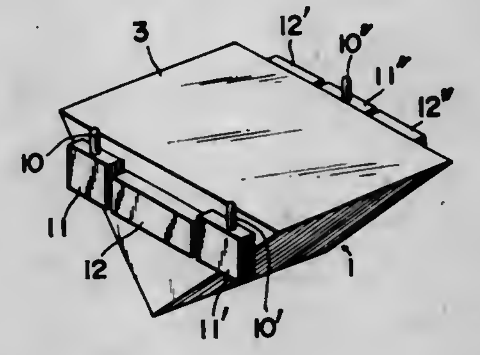
U.S. Cl. 356—109 **9 Claims**

1. A light interference gauge comprising:

a block having a reference surface with a high degree of flatness for receiving light beams projected obliquely thereto, said block having further surfaces intersecting said reference surface;

three supporting pieces secured to said intersecting surfaces; and

three pins individually anchored to said supporting pieces,



each pin having a top portion which juts beyond said reference surface.

3,891,321

OPTICAL METHOD AND APPARATUS FOR MEASURING THE RELATIVE DISPLACEMENT OF A DIFFRACTION GRID

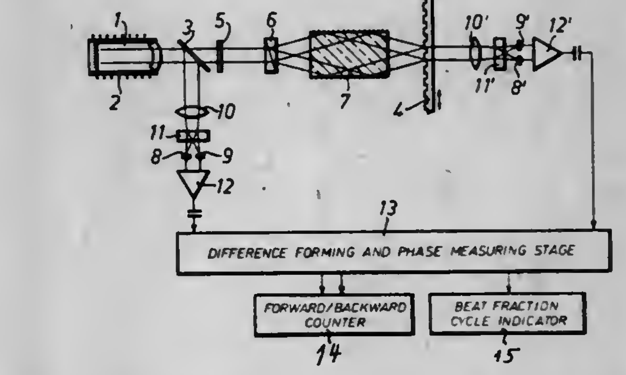
Fromund Hock, Wetzlar, Germany, assignor to Ernst Leitz GmbH, Wetzlar, Germany

Filed Aug. 20, 1973, Ser. No. 389,713

Claims priority, application Germany, Aug. 21, 1972, 2240968

Int. Cl. G01b *9/02*

U.S. Cl. 356—111 **20 Claims**


1
3
5
6
10'
9'
12'
2
7
4
11'
8'
10
11
8
9
12
13
DIFFERENCE FORMING AND PHASE MEASURING STAGE
FORWARD/BACKWARD COUNTER
BEAT FRACTION CYCLE INDICATOR
14
15

1. In an optical method for measuring the relative displacement of a diffraction grating in its plane of division along at least one coordinate, with illumination of a grating by a light flux in a defined solid angle zone which is smaller than the corresponding angles of diffraction of the grating, and with evaluation of the partial light fluxes diffracted on the grating, the improvement comprising:

a. projecting an illuminating beam with two approximately equally intensive polarization components, which are polarized complementary to each other and each has a differing light frequency and, producing an electric reference signal which is phase-correlated to the difference signal of these components;

b. dividing the illuminating ray beam, by means of an optical component, into at least two mutually inclined partial beams, combining by means of a further optical component, at least two partial beams into at least one pair of parallel partial beams consisting of mutually complementary partial waves having different optical destinations wherein said diffraction grating is used as the dividing or combining component;

c. forming as a measuring signal by means of photoelectric transducers from each pair of parallel, recombined, complementarily polarized partial beams of different frequency, the difference frequency, modulated by a displacement of the grating in accordance with phase and frequency, between the complementary partial beams, after the pair of partial beams has passed through a polarization analyzer; and

d. comparing the reference signal and the measuring signal with each other in an electric comparison device, wherein the relative phase of the two signals is determined as a measure for the respective displacement component of the grating, and the number of beats is stored with the correct arithmetic sign in accordance with the sign of the difference frequency.

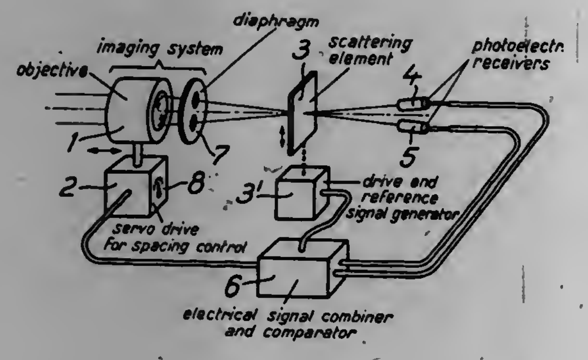
3,891,322
METHOD OF LOCATING THE PLANE OF SHARP FOCUSSING OF AN IMAGE AND APPARATUS THEREFOR

Fromund Hock, Wetzlar, Germany, assignor to Ernst Leitz GmbH, Germany

Filed Nov. 27, 1973, Ser. No. 419,430

Int. Cl. G01b *9/00*

U.S. Cl. 356—126 **18 Claims**


diaphragm
imaging system
objective
3
scattering element
photoelectr receivers
4
1
7
2
8
3'
5
drive and reference signal generator
servo drive for spacing control
6
electrical signal combiner and comparator

1. A method of photoelectrically locating the plane of sharp focusing of an image formed by an imaging system comprising the steps of providing scattering structures moved relative to the image in a measuring field, the widths and lengths of the structures containing spatial frequencies which correspond to the spatial frequency range of the image structures to be optimized during the sharp focusing operation in order to make usable for evaluation components of all azimuths and spatial frequencies of image structures in the plane of the measuring field; and varying the spacing between the imaging system and the plane of the measuring field with respect to its magnitude and direction until the magnitude of the modulation transfer function in the evaluated image field segment becomes a maximum.

3,891,323
APPARATUS FOR DETECTING CHANGES IN THE ORIENTATION OF A MORTAR GUN TUBE

Maurice A. Ryan, Rock Island, Ill., and Morton A. Barron, Potomac, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

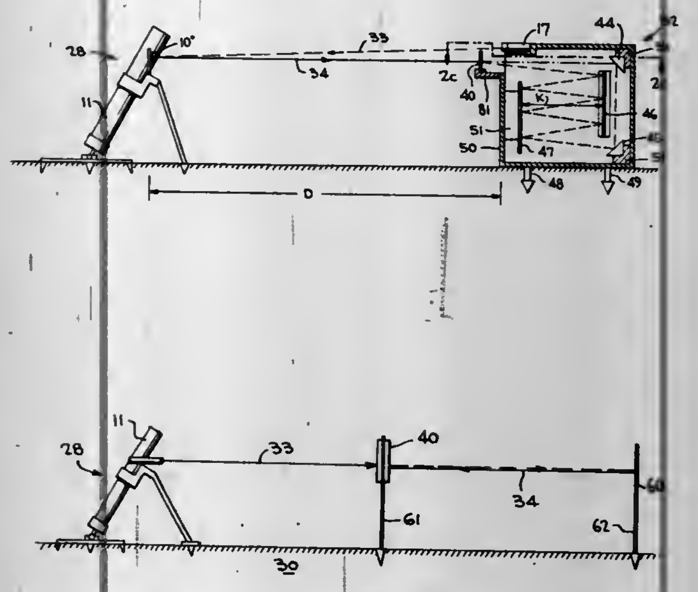
Filed Sept. 7, 1973, Ser. No. 395,119

Int. Cl.^{2} G01B *11/27*

U.S. Cl. 356—154 **8 Claims**

1. Apparatus for detecting and correcting orientation of a gun barrel mounted in the earth comprising:

- first means mounted in the earth for emitting a beam of light;
- second means mounted in the earth comprised of a screen having a front and back surface having clear, translucent and opaque portions for
- showing a first portion of the emitted beam by reflecting from the front surface of said screen the portion of the emitted beam impinging upon said opaque portion,
- permitting a second portion of the emitted beam to pass through said clear portion after which said second portion undergoes at least one change of direction and is finally directed to the back surface of said screen,
- showing the second portion of the emitted beam on said translucent portion of said screen



- third means attached to said screen for avoiding reflection of sunlight

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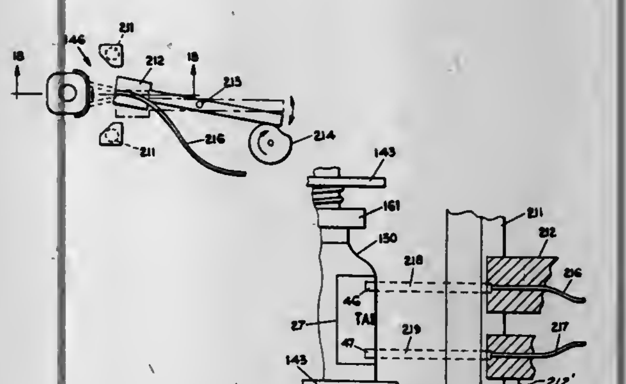
3,891,324
METHOD AND APPARATUS FOR INSPECTING POSITION OF LABELS ON PRODUCT SURFACES

John R. Davies, Grand Rapids, Mich., assignor to Oliver Machinery Company, Grand Rapids, Mich.

Division of Ser. No. 238,433, May 1, 1972, Pat. No. 3,843,440. This application May 6, 1974, Ser. No. 467,373

Int. Cl. G01b *11/00*

U.S. Cl. 356—156 **7 Claims**



1. An improved inspection means for inspecting labels on product surfaces in order to verify the exact alignment of said labels after said labels are positioned on said surfaces by a label applying apparatus, said labels including verification dots and said inspection means including photo-scanning means and a control unit for inspecting and verifying the position of said labels on said product surfaces, said photo-scanning means being adapted to pivotally scan the face of each label in order to pick up and transmit light from said verification dots to said control unit, said control unit being adapted to automatically measure the distance from the beginning of each scan to said dots in order to indicate the horizontal and skew positions of said labels on said product surfaces, and to measure the intensity of light from said dots at a certain horizontal level in order to indicate said vertical positions.

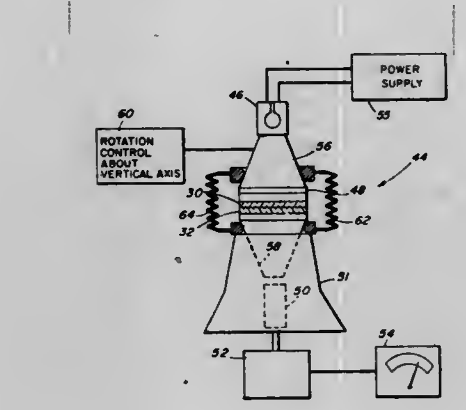
3,891,325
MUCUS SAMPLING AND MEASURING SYSTEMS, DEVICES AND PROCESSES

Samuel R. Schuster, Wellesley, and Louis Kopito, Brookline, both of Mass., assignors to Ovutime, Inc., Wellesley, Mass.

Filed Sept. 20, 1973, Ser. No. 399,145

Int. Cl. G01n *21/24*

U.S. Cl. 356—205 **12 Claims**



1. A system for determining the phase of a menstrual cycle for use with a first plate and a second plate, said system comprising first means for contacting one face of said first plate with a sample of bodily mucus, second means for uniformly applying a pressure across said first plate and said second plate when superposed to produce a mucus stratum between said faces, at least one of said plates being at least partially transparent to certain radiation, and third means for transmitting said radiation through one of said plates and said mucus stratum in order to produce a signal functionally related to absorptivity of said mucus stratum with respect to said radiation.

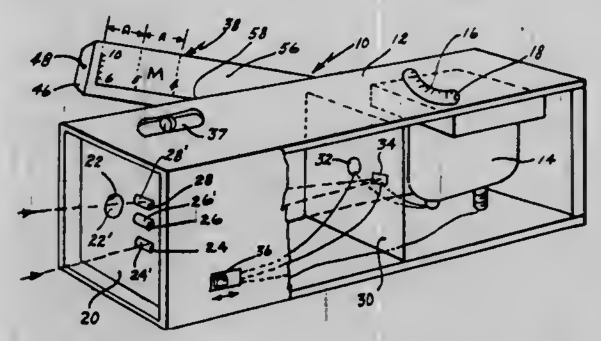
3,891,326
MULTI-CHANNEL SUN PHOTOMETER

Frederic E. Volz, 24 Tyler Rd., Lexington, Mass. 02173

Filed Jan. 14, 1974, Ser. No. 433,175

Int. Cl. G01j *1/42*

U.S. Cl. 356—222 **9 Claims**



1. A multi-channel photometer comprising a housing, said housing having a front portion, a rear portion, a side portion and a top portion, said side and top portion forming an edge therebetween, said front portion having a plurality of openings therein, a different filter means optically aligned with each of said openings for filtering a beam of light passing through each of said openings, means optically aligned with each of said filter means for detecting the amount of light passing through each of said filter means, means operably connected to said detecting means for indicating the amount of light detected by said detecting means and means pivotally connected to said side portion of said housing for determining the angular relationship of said beam of light with respect to the horizontal, said angle determining means having a scale thereon whereby said angular relationship is determined by the intersection of said scale and said edge of said housing.

3,891,327
MOUNTED SLIDES AND METHOD OF SECURING A COVER GLASS TO A GLASS SLIDE HAVING A SPECIMEN THEREON

Mary Jeanne Welch, Timonium, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 411,933, Nov. 1, 1973, abandoned. This application Nov. 23, 1973, Ser. No. 418,519

Int. Cl. G01n *21/16, 1/00;* G02b *21/34*

U.S. Cl. 356—244 **4 Claims**

1. The method of securing a cover glass to a glass slide having a specimen thereon which comprises covering the glass slide in the region of the specimen with a substantially uniformly thick layer of a liquid photosensitive composition consisting essentially of an optically transparent liquid photosensitive material having a viscosity in the range 50 to 2,000,000 centipoises at 25°C and 0.0005 to 50 percent by weight of the photosensitive material of a photoinitiator, positioning a cover glass over the specimen in contact with the photosensitive composition and thereafter exposing said photosensitive composition to UV radiation to form a solid, optically transparent bond holding the cover glass and the specimen in a fixed position on the glass slide.

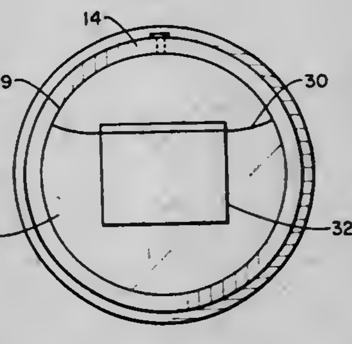
3,891,328
ELECTRO-OPTICAL LIQUID ARTIFICIAL HORIZON

William P. Hall, 1783 Marison Dr., Ventura, Calif. 93003, and George R. Maupin, USNS, Box 22, FBPO, Norfolk, Va. 23593

Filed Oct. 3, 1973, Ser. No. 403,132

Int. Cl. G01c *9/18*

U.S. Cl. 356—249 **9 Claims**



1. An instrument for generating an artificial horizon line comprising:

- a vidicon tube having a face;
- a volume of fluid; and
- an enclosed, transparent, leak-proof fluid container positioned adjacent to said face of said vidicon tube such that light rays, incident upon said vidicon tube, pass first through said fluid container, said fluid container being partially filled with said fluid so that a horizontal fluid surface forms in said container at a fluid-air interface, said fluid surface interfering with a portion of an image being optically resolved by said vidicon tube creating an artificial horizon line capable of being visually observed on a television monitor.

3,891,329
WRITING IMPLEMENT

Kazue Kato, Tomioka, Japan, assignor to Platinum Pen Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1974, Ser. No. 464,644

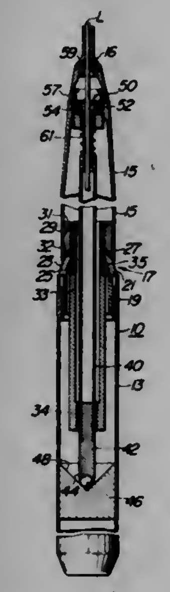
Claims priority, application Japan, Aug. 24, 1973, 48-99273

Int. Cl. B43k *21/16*

U.S. Cl. 401—65 **7 Claims**

1. A writing implement comprising a casing, an elongated tubular member axially movable within said casing, and a chuck mechanism within said casing adjacent to the writing end of said implement, said chuck mechanism being adapted

normally to hold an elongated writing material against retraction from said writing end, said chuck mechanism including jaws connected to one end of said tubular member, wherein said casing is flexible when a force is exerted to said casing generally transversely of the axis thereof, means being provided for converting the flexion movement of said casing into a force to move said tubular member and said jaws toward said writing end whereby said writing material is projected a distance from said writing end, said casing comprising first and second sleeve members connected together by coupling means so that one of said sleeve members is angularly displaced with respect to the other, said converting means comprising a cam surface provided within one of said first and second sleeve members remote from said writing end, said tubular member having its other end disposed in sliding engagement with said cam surface, said tubular member carrying a ball of a hard material disposed in rolling contact with said cam surface, said tubular member having an end piece detachably mounted on said other end thereof, said ball being rotatably mounted on said end piece, said coupling means including an annular recess formed in one of said first and second sleeve members and a first coupling member secured to the other sleeve member and being movably received in said annular recess, said one sleeve member carrying a second tubular coupling member secured to said one sleeve member and having an outer peripheral surface in which an annular groove is formed, said elongated tubular member extending through said second coupling member, said annular groove forming a part of said annular recess, and said coupling member on the other sleeve member being tapered and extending into said annular recess.



3,891,330
SEALING GLAND FOR PRODUCT CONTAINER

Martin M. Vasas, Fairfield, Conn., assignor to The Bridgeport Metal Goods Manufacturing Company, Bridgeport, Conn.
Filed Apr. 5, 1973, Ser. No. 348,103
Int. Cl. A46b *11/00*
U.S. Cl. 401—122 **9 Claims**

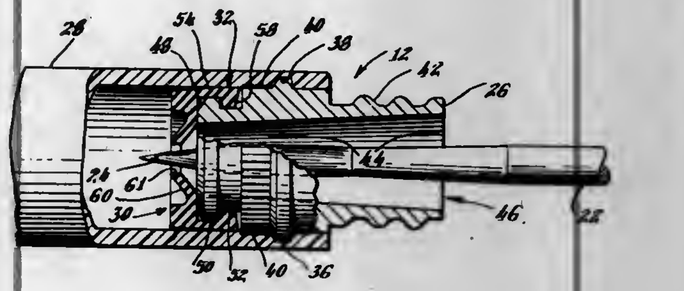
1. A sealing gland for providing a peripheral seal between a portal bushing and a reservoir body within a reservoir assembly and a portal seal about an applicator passing therethrough when the reservoir assembly is utilized as part of a product container, said fabricated gland being facricated of elastic material and comprising:

a tubular frame including a conical taper on the exterior thereof, said taper being effective to centrally locate said sealing gland within the reservoir assembly and to establish a symmetrically distributed interface therein;

an annular lip disposed on the interior wall of said tubular frame and to one longitudinal end thereof, said annular lip being engageable with an annular groove on the portal bushing to interlock said sealing gland thereto and being compressible within the reservoir assembly to develop a seal between the portal bushing and the reservoir body;

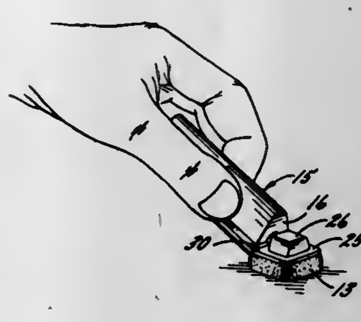
means for sealing about and wiping against the applicator, said sealing and wiping means being disposed on said tubular frame at the opposite longitudinal end from said annular lip, said tubular frame being of minimum diameter at the sealing and wiping means end and of maximum diameter at the annular lip end; and

a raised rim disposed about the external periphery of said tubular frame on the sealing and wiping means end thereof.



3,891,331
UNIT FOR DISPENSING LIQUID FROM A FRANGIBLE AMPOULE

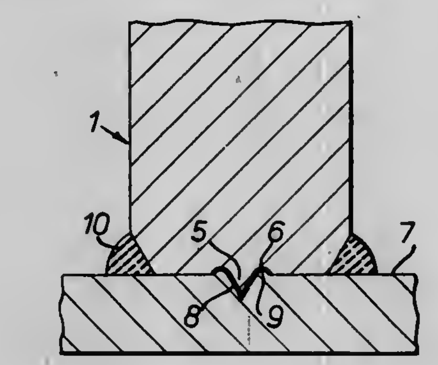
Carl Frederick Avery, Rockford, Ill., assignor to Marion Health & Safety, Inc., Rockford, Ill.
Filed June 14, 1974, Ser. No. 479,354
Int. Cl. A45d *34/00;* **A61m** *35/00*
U.S. Cl. 401—132 **6 Claims**



1. A unit for dispensing liquid, said unit comprising a one-piece body made of non-porous flexible material capable of retaining its shape, said body including an elongated blister having a top, sides, ends and an open bottom, a frangible ampoule filled with liquid and housed within said blister, a sheet of non-porous material bonded to said body and covering the bottom of the blister to retain the ampoule therein, said body having means located outwardly of one end of said blister and defining a chamber having an open bottom, a pad of porous material covering the bottom of said chamber, and a passage establishing communication between said blister and said chamber whereby, when the sides of said blister are squeezed inwardly to break said ampoule, the liquid therein may flow out of said blister and through said passage into said chamber from where the liquid may be dispensed through said pad.

3,891,332
WELDED ANCHORAGE STUD

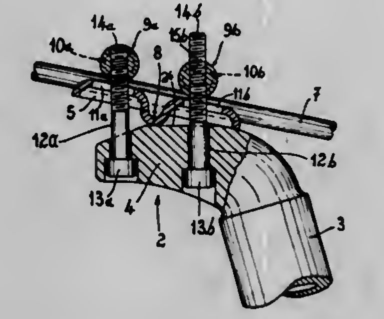
George Molyneux, and George Walter Molyneux, both of Gloucester, England, assignors to Molyneux Engineering Company Limited, Gloucester, England
Filed Feb. 11, 1972, Ser. No. 225,577
Claims priority, application United Kingdom, Feb. 11, 1971, 4418/71; Sept. 3, 1971, 41160/71
Int. Cl. F16b *35/00*
U.S. Cl. 403—13 **1 Claim**



1. In a welded stud construction comprising a metal stud and a metal base member, the base member having in a flat surface thereof a punched depression around which is formed a crater lip, and the stud having an end face with a central projection for locating the stud by reception of said projection within said depression; the improvement in which said stud end face has an annular groove around said projection to accommodate the crater lip, an annuular flat land area around said groove which sits on said surface when the projection is engaged in said recesses, and a peripheral cutaway portion for accommodating a fillet weld.

3,891,333
MOUNTING ASSEMBLY FOR BICYCLE SADDLE OR THE LIKE

Maurice Louis Paul Jean Corderac'k, 64, rue Alsace Lorraine, Bron, Rhone, France
Filed Jan. 17, 1974, Ser. No. 434,246
Claims priority, application France, Feb. 5, 1973, 73/04557
Int. Cl. F16c *11/00;* **F16l** *27/00*
U.S. Cl. 403—84 **10 Claims**



1. A mounting assembly for securing a saddle having a pair of transversely spaced and longitudinally extending mounting rods to a support head with an upwardly directed support face, said assembly comprising:

a plate formed with a pair of longitudinally extending and transversely spaced seats receiving said rods and having a face turned toward said support face;

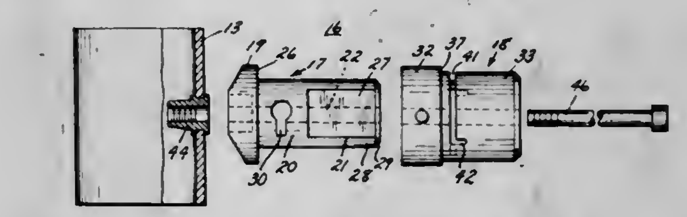
at least one securing member overlying said rods on said plate;

a transverse boss forming an elongated rounded cross section ridge on one of said faces and resting against the other face, said other face being generally flat; and

a pair of longitudinally spaced adjustment means flanking said boss and each including an adjustment element spanned between said member and said head for tilting said plate and said saddle relative to said head by shortening of one of said elements and lengthening of the other element.

3,891,334
CROSS BRACE INTERLOCK

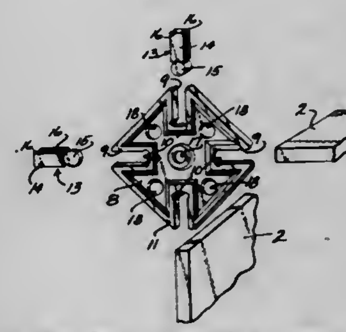
Frank Loikitz, Middletown, N.J., assignor to Buildex Incorporated, Huntington, N.Y.
Filed Sept. 26, 1973, Ser. No. 401,017
Int. Cl. F16b *7/04*
U.S. Cl. 403—234 **10 Claims**



1. A structural assembly comprising a first structural member, a coupling member mounted on and projecting from said first structural member and including an axially extending expander section of non-circular transverse cross section and an expansion collar engaging said expander section and having a non-circular bore with a minor transverse dimension less than the major transverse dimension of said expander section and being expandable and contractable in response to angular variation between said expander section and expansion collar, and a second structural member having a bore axially slideably engaging said collar, said collar being rotatable relative to said expander member between a collar contracted condition with the major axis of said expander section and said collar bore coinciding permitting relative axial movement between said coupling member and said second structural member and a collar expanded condition locking said second structural member to said coupling member with the major axes of said collar bore and said expander section being relatively angularly offset.

3,891,335
RETAINING CLIP

Fred W. Feil, Racine, Wis., assignor to Continental Display Corporation, Racine, Wis.
Filed Oct. 25, 1973, Ser. No. 409,475
Int. Cl. F16b *5/06*
U.S. Cl. 403—173 **7 Claims**



1. A retaining clip for connecting plate members, comprising:

a generally flat rigid body having a plurality of elongated slots formed therein, the slots extending from the edges of the body toward the center of the body, each slot having a rounded socket portion at the inner end of the slot, and the slots being of a width generally corresponding to the thickness of the plate members to receive the plate members in assembly.

6. A retaining clip for connecting plate members, comprising a generally flat body having a generally square configuration provided with slots extending from each corner diagonally toward the center of the body, the slots being elongated

and having a width generally corresponding to the thickness of the plate members, said body having raised rim portions extending between slots along the four edges of the flat body and along the edges of the slots.

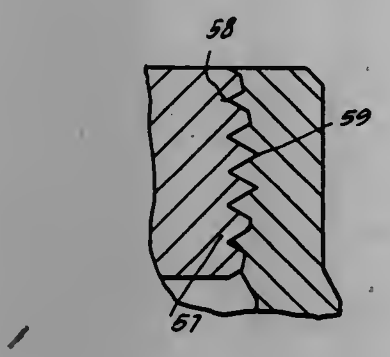
3,891,336
BALL JOINT AND METHOD OF MANUFACTURE THEREOF

Edward J. Herbenar, Detroit, Mich., assignor to TRW Inc., Cleveland, Ohio

Division of Ser. No. 40,316, May 25, 1970. This application May 10, 1972, Ser. No. 252,023

Int. Cl. F16b *29/00*

U.S. Cl. 403—320 **2 Claims**



1. A joint structure comprising a housing having an open-ended cavity therein, a plug closing off said cavity, said plug having male threads around its periphery, said housing having female threads at each end swedged into engagement with said male threads, the ends of said plug having tapered male threads of lesser diameter than the threads mating with said lesser diameter threads thereby increasing the torque required to withdraw the plug from said housing thru said open end and to thread the plug tighter into the housing.

3,891,337
METHOD AND MEANS FOR ADJUSTING THE ELEVATION OF MANHOLE COVERS

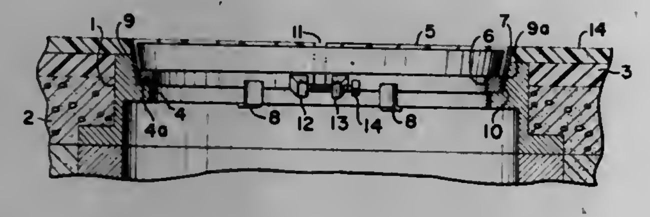
Archibald Henry Richard McCoy, R.R. No. 1, Troy, Ontario, Canada

Filed Oct. 17, 1973, Ser. No. 407,354

Claims priority, application Canada, Oct. 16, 1972, 154481

Int. Cl. E02d *29/14*

U.S. Cl. 404—26 **5 Claims**



1. An elevating band for supporting a manhole cover in an elevated relationship to an inverted frusto conical recess defined in a manhole frame by an internal annular lip defining a manhole opening and a flange extending upwardly from the lip, the band being split at a single point on its periphery and comprising an expansible base ring seatable on said lip, an expansible inverted frusto conical rim welded to the out periphery of the base ring and engageable on expansion with said upwardly extending flange, abutments on the base ring adjacent the split in the periphery of the band, screw means acting between said abutments to expand the band, and lugs depending from said band and bendable beneath said lip.

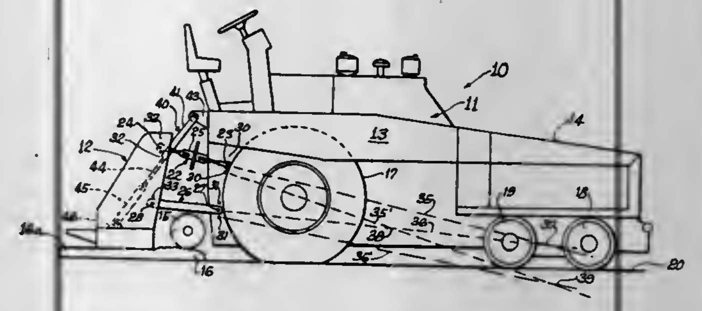
3,891,338
CONVERGENT LINK SYSTEM FOR CONNECTING A SCREED TO THE TRACTION UNIT OF A PAVING MACHINE

Fred T. Smith, Dearborn Heights, Mich.; Julian M. Munyon, Big Rock, and James J. Gebhardt, Jr., Lisle, both of Ill., assignors to Barber-Greene Company, Aurora, Ill.

Filed Apr. 30, 1973, Ser. No. 355,931

Int. Cl. E01c *19/00*

U.S. Cl. 404—84 **7 Claims**



7. In a paving machine of the type including a self-propelled traction unit having traction means for supporting and propelling the paving machine over the existing surface, and a screed disposed rearwardly of the traction unit adjacent the rear end of the latter, the improvement comprising:

a. upper, longitudinally extending, link means connected at forward and rearward extremities to the rear and of the traction unit and to the screed for pivoting movement about respective, horizontally extending, transverse axes;
b. lower, longitudinally extending, link means connected to forward and rearward extremities to the rear end of the traction unit and to the screed for pivoting movement about respective, horizontally extending, transverse axes;
c. the imaginery extensions of said upper and lower link means converging to define an effective tow axis extending transversely of the traction unit adjacent said existing surface and forwardly of the rearwardmost extremity of the traction means;
d. said upper link means including a pair of links which are horizontally spaced apart transversely of the traction unit and are connected to the latter adjacent respective sides thereof;
e. said lower link means also including a pair of links which are spaced apart transversely of the paving machine and are connected to the traction unit adjacent respective sides thereof;
f. first adjustable pivot means mounted on the rear end of the traction unit adjacent one side thereof and connected to the forward ends of the adjacent upper and lower links for moving the respective pivot axes thereof up and down in unison;
g. second adjustable pivot means mounted on the rear end of the traction unit adjacent the other side thereof and connected to the forward ends of the adjacent upper and lower links for moving the respective pivot axes thereof up and down in unison;
h. automatic grade control means including a grade sensor and first power means activated thereby;
i. automatic slope control means including a slope sensor and second power means activated thereby;
j. means connecting said first adjustable pivot means with said first power means for being actuated thereby; and
k. other means connecting said second adjustable pivot means with said second power means for being actuated thereby.

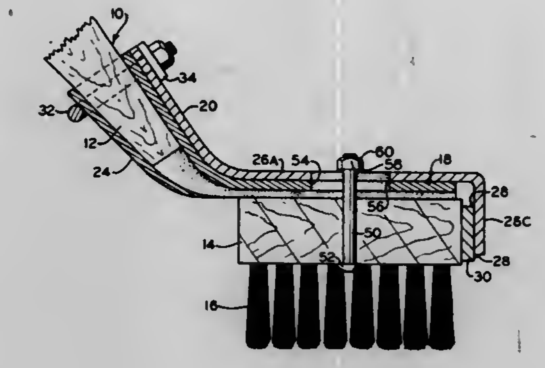
3,891,339
PUSH BROOM HANDLE CLAMP

Carl H. Jeffers, 1021 W. Main St., Louisville, Ohio 44641

Filed Sept. 26, 1974, Ser. No. 509,332

Int. Cl. B25g *3/00*

U.S. Cl. 403—192 **3 Claims**



1. Apparatus to mount a handle to a push broom head which comprises

a. a large flat plate having a conically tapered handle receiving flange projecting from one end thereof, said plate adapted to be securely received in snug fitting relation to a recessed groove on the top central surface of the broom head,
b. a reinforcing bracket including means at one end thereof to connect it to the handle receiving flange and squeeze the handle therein, and means to connect it at the other end to the front face of the broom head, and
c. means to secure the bracket and plate together and to the broom head.

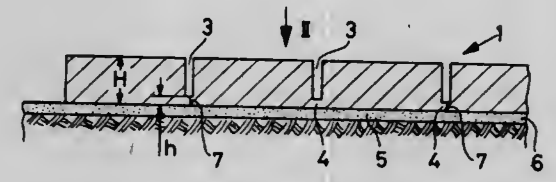
3,891,340
PAVING STONE UNIT HAVING INTEGRAL CONNECTING WEBS

Hans Bolli, Weinberglistrasse 46, CH-60050 Lucerne, Switzerland

Filed Feb. 15, 1974, Ser. No. 443,093

Int. Cl. E01c *5/00*

U.S. Cl. 404—38 **6 Claims**



1. A paving stone unit comprising a plurality of individual concrete paving stones spaced apart from each other in a predetermined pattern, said stones all being of substantially uniform thickness, and a plurality of webs joining said stones together, said webs also being of concrete and being integral with said stones and being of thickness not greater than one quarter of the thickness of said stones the distance by which each stone is spaced from adjacent stones being small relative to the lateral dimensions of said stones, whereby when individual stones in said unit are supported only by said webs and are subjected to normal traffic, the webs connecting such stones to the remainder of said unit will fracture while leaving all said stones intact.

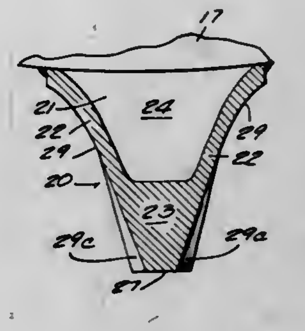
3,891,341
WEAR BALANCED CLEAT FOR COMPACTION WHEEL

Maurice J. Trainor, Milwaukee, and Charles F. Riddle, Brookfield, both of Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Filed Aug. 13, 1973, Ser. No. 388,334

Int. Cl.^{2} E01C *19/26*

U.S. Cl. 404—121 **6 Claims**



1. In a wheel for a vehicle used to compact sanitary land fill, said wheel comprising:

a. a rigid cylinder forming a rim;
b. hub mounting means upon which the cylinder is secured; and
c. ground engaging substantially V-shaped, symmetrical inverted cleats secured to the cylinder in circumferential rows, the cleats of adjacent rows being circumferentially offset and each cleat having
   i. an approximately square base,
   ii. opposite triangular ends generally normal to the wheel axis,
   iii. convergent wedge faces intermediate said ends, and
   iv. a working face opposite said base and intermediate said ends and said wedge faces,

the improvement wherein:

1. said working face has relatively wider end portions adjacent the radially outer corners of the cleat and a narrower intermediate portion, the length and width of the end portions in the axial and circumferential directions each being between one-fifth and one-tenth of the length and width of said base and the width of the intermediate portion being one-half or less the width of the end portions and
2. said wedge faces have end and intermediate portions which merge with the corresponding portions of said working face, the intermediate portions of said wedge faces being recessed relative to the end portions thereof.

4. In a cleat for a wheel of a vehicle used to compact sanitary land fill, said cleat having:

a. an approximately square base,
b. opposite generally triangular ends,
c. convergent wedge faces intermediate said ends, and
d. a working face opposite said base and intermediate said ends and said wedge faces,

the improvement wherein

i. said working face has relatively wider end portions adjacent said generally triangular ends and a narrower intermediate portion, the length and width of the end portions each being between one-fifth and one-tenth of the length and width of said base and the width of the intermediate portion being one-half or less the width of the end portions and
ii. said wedge faces have end and intermediate portions which merge with the corresponding portions of said working face, the intermediate portions of said wedge faces being recessed relative to the end portions thereof.

3,891,342

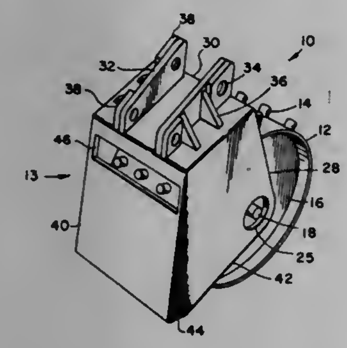
BACKHOE COMPACTOR/SCRAPER APPARATUS

Harry James Roe, Richardson, Tex., assignor to Track Pack Corporation, Dallas, Tex.

Filed Feb. 15, 1974, Ser. No. 442,763

Int. Cl. E01c *19/00*

U.S. Cl. 404—128 **15 Claims**



1. A backhoe compactor for moving and compacting fill material in a construction excavation including a hydraulically-actuated boom assembly mounted on said backhoe, comprising

- scraping means pivotally connected to said boom assembly for moving said fill material into said excavation,
- a freely-rotatable compaction roller connected to said scraping means and having radially projecting roller teeth spaced around the roller circumference, and
- comb means attached to said scraper means for cleaning said roller teeth as said compaction roller rotates,
- said scraping means including an attachment member partially encompassing said roller therein, one side of said attachment member forming a scraping member.

3,891,343

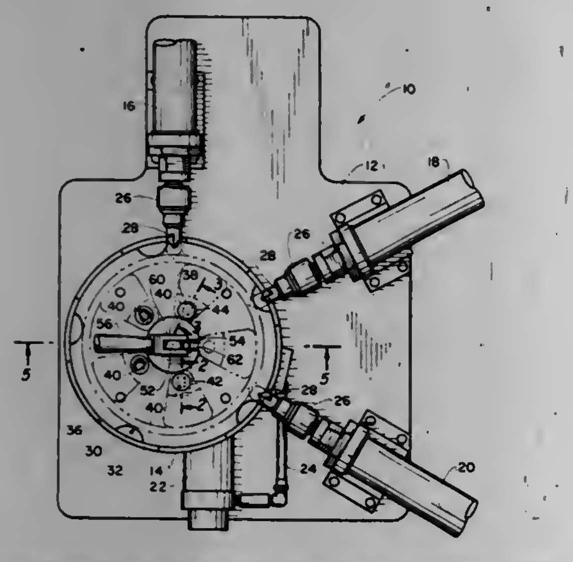
SPIDER MACHINING APPARATUS

Dalton M. Davis, Palo Verdes Estates, Calif., assignor to E-T ~~Industries, Inc., Benicia, Calif.~~

Filed Mar. 11, 1971, Ser. No. 123,218

Int. Cl. B23b *39/20*

U.S. Cl. 408—42 **1 Claim**



1. A machining apparatus to form depressions within the circumference of a spider of a vehicle wheel assembly, the apparatus comprising:

- a housing;
- support means adapted to position the spider upon said housing, said support means being capable of incremental rotational movement relative to said housing;
- forming means attached to said housing adapted to produce a plurality of separate spaced apart groups of depressions within the spider, said forming means includes a plurality of separate drilling units, the number of said drilling units and the number of said depressions within each of said groups being equal; and
- a pin assembly included within said support means adapted to cooperate with mounting holes located within the spider to retain the spider in position, said pin assembly includes a first pin and a second pin, said first pin having an eccentrically mounted head which is to cooperate with one of said mounting holes.

3,891,344

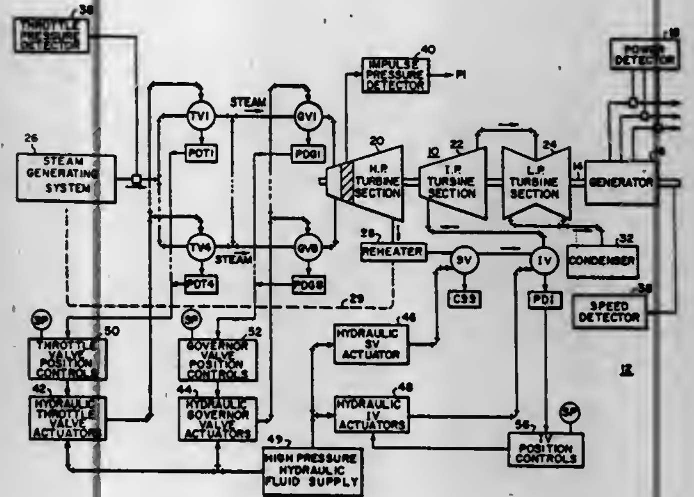
STEAM TURBINE SYSTEM WITH DIGITAL COMPUTER POSITION CONTROL HAVING IMPROVED AUTOMATIC-MANUAL INTERACTION

Andrew S. Braytenbah, Pennsauken, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 80,710, Oct. 14, 1972, Pat. No. 3,741,246. This application Oct. 16, 1972, Ser. No. 298,081

Int. Cl. F01d *17/00*

U.S. Cl. 415—1 **3 Claims**



1. A method for operating a steam turbine system for controlling power output to a generator connected to said turbine as a function of the position of the series of governor valves said method comprising: establishing individual governor valve setpoints for each respective valve during a sequential mode of operation; establishing a single valve setpoint applied in parallel to all of said governor valve controls during a single valve control; applying a single common manual control signal to all of said valves in parallel during a manual mode of operation, said single valve control signal and said manual control signal being switchably combined through an automatic-manual control; and summing the switchably combined automatic and manual control signal with the individual sequential governor valve control signal to form a composite governor valve control signal suitable for application to respective governor valve actuators.

3,891;345

SUPPORTING FOOT MEANS FOR A SEPARATELY COUPLED CENTRIFUGAL PUMP

John H. Doolin, New Providence, N.J., assignor to Worthington Pump International, Inc., Mountainside, N.J.

Continuation-in-part of Ser. No. 418,431, Nov. 23, 1973, abandoned, which is a division of Ser. No. 257,583, May 30, 1972, Pat. No. 3,841,791. This application Mar. 8, 1974, Ser. No. 449,366

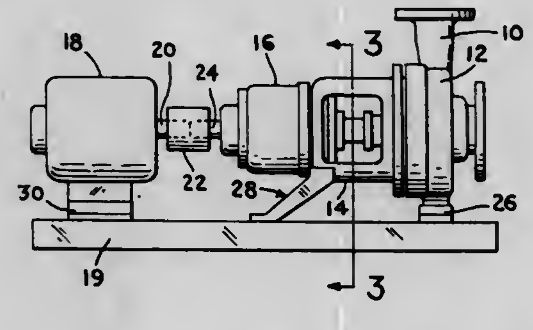
Int. Cl. F04b *35/04*

U.S. Cl. 415—121 R **3 Claims**

1: A support means in combination with a separately coupled centrifugal pump means including a bearing cartridge for a driven pump shaft, a pump casing with an impeller therein connected to and rotatable with the driven pump shaft, and an adaptor surrounding the driven pump shaft and spaced therefrom and operatively disposed to connect the bearing cartridge to the pump casing, said support means comprising:

a. a body member having means for connecting the body member to said separately coupled centrifugal pump medially therealong,

b. said body member including, a flat section forming leg means at the lower end,



c. flange means at the upper end contoured to snugly engage the outer surface of the centrifugal pump in assembled position,

d. and said flange means disposed at an angle to the body member and the connecting means operatively associated with the flange means whereby the support means will be disposed at an angle to the longitudinal line of the centrifugal pump in assembled position.

3,891,346

FANS

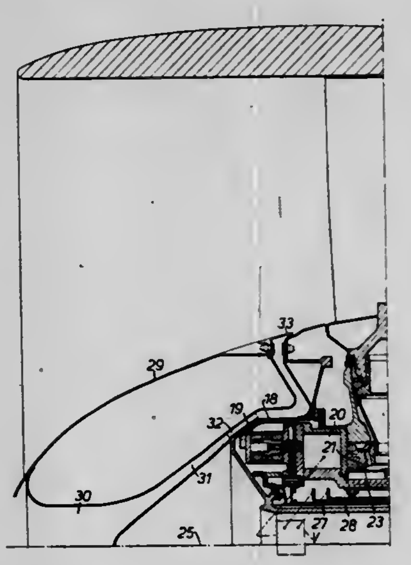
John Gregory Keenan, Cheltenham; John Alfred Chilman, Stroud, and Ivor Harold Brooking, both of Gloucester, all of England, assignors to Dowty Rotol Limited, Gloucester, England

Filed Feb. 15, 1974, Ser. No. 443,144

Claims priority, application United Kingdom, Feb. 17, 1973, 7887/73

Int. Cl.² F01D *7/00*

U.S. Cl. 415—129 **13 Claims**



1. A fan assembly, for attachment to the front of a main gas turbine engine assembly to provide an engine of the ducted-fan by-pass type, constructed as a unitary assembly which can be fitted and removed as such and comprising a non-rotative sub-assembly, which includes a non-rotative main body and a non-rotative by-pass duct supported by the main body, and a rotative sub-assembly which is supported in bearings by the non-rotative sub-assembly and which includes a hub, carrying variable-pitch fan blading, positioned and rotatably supported within the by-pass duct, said hub including, disposed wholly therein so as to be rotatable all as one therewith, (a) a liquid reservoir, (b) at least one pump operable upon rotation of the rotative sub-assembly to draw liquid from said reservoir, (c) a liquid-pressure-operable actuator connected to said fan blading for effecting adjustment thereof, and (d) control valve means by way of which liquid discharged under pressure by said pump is directed to operate the actuator, and said main body being adapted to provide for said attachment of the fan assembly to the engine assembly.

3,891,347

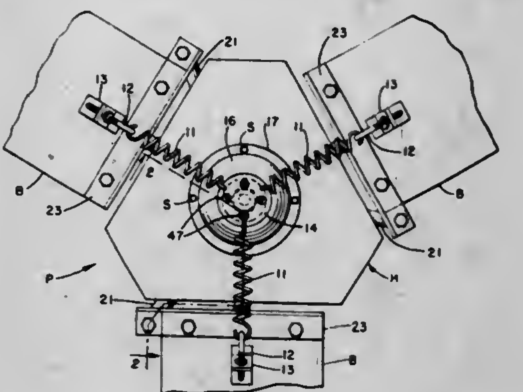
CLUTCH-CONTROLLED, WIND-OPERATED, POWER PRODUCING PROPELLER

Marcellus L. Jacobs, and Paul R. Jacobs, both of Rt. 11, Box 722, Fort Myers, Fla. 33901

Filed June 10, 1974, Ser. No. 477,757

Int. Cl. F03d *7/04*

U.S. Cl. 416—32 **18 Claims**



1. A clutch-controlled, wind-operated, multiblade propeller comprising a hub means rotatable upon a power output shaft, a plurality of propeller blades mounted on the hub means for rotation about the shaft, clutch means connected between the hub means and power output shaft to selectively transmit and interrupt rotation of the hub means to the shaft, clutch operating means connected with the clutch to cause engagement of the clutch when wind velocity and thus speed of rotation of the propeller reaches a predetermined value, and detent means connected with the clutch to prevent engagement of the clutch until said predetermined value is reached.

3,891,348

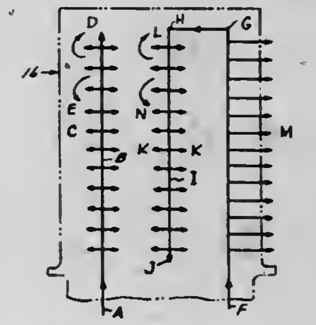
TURBINE BLADE WITH INCREASED FILM COOLING

Thomas A. Auxier, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Apr. 24, 1972, Ser. No. 246,778

Int. Cl. B63h *1/14*

U.S. Cl. 416—97 **7 Claims**



1. In a turbomachine, an air-cooled blade comprising:

- a blade shell having an outer surface, first, second and third inner surfaces, and a leading edge and a trailing edge;
- a first cavity in said shell proximate said trailing edge and formed by said first inner surface of said shell;
- a second cavity in said shell remote from said trailing edge and formed by said second inner surface of said shell;
- a third cavity in said shell proximate said leading edge and formed by said third inner surface of said shell;
- means for introducing cooling air into said first cavity for cooling said first inner surface;

means for introducing cooling air into said third cavity for cooling said third inner surface;

a plurality of passageways formed through said trailing edge and communicating with said first cavity for efflux of a first portion of said first cavity cooling air therefrom;

means for directing the remainder of said first cavity cooling air from said first cavity into said second cavity for cooling said second inner surface; and

means for directing all of said cooling air delivered to said second cavity in a film from said second cavity onto said outer surface for cooling said outer surface.

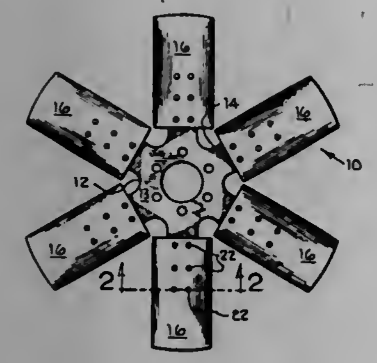
3,891,349
COOLING FAN CONSTRUCTION AND METHOD OF MAKING SAME

William E. Woollenweber, Jr., Indianapolis, Ind., assignor to Wallace-Murray Corporation, New York, N.Y.

Filed Feb. 22, 1972, Ser. No. 227,922The portion of the term of this patent subsequent to June 24, 1991, has been disclaimed.

Int. Cl. F04d *29/38*

U.S. Cl. 416—132 **8 Claims**



1. A fan blade construction adapted for use in cooling systems for automotive and truck applications, said construction including,

a. an elongated spider arm,

b. a pair of sheet metal, elongated sheets of generally rectangular configuration, each sheet having a leading lengthwise edge and a trailing lengthwise edge,

c. said sheets being of a width greater than the width of said spider arm,

d. said sheets each being secured to said spider arm, to sandwich the spider arm, the longitudinal axis of the arm and the said sheets being substantially parallel,

e. at least one of said sheets being convex with respect to said spider arm,

f. at least one of said leading lengthwise edges of said pair of sheets resiliently abuting the other sheet of said pair of sheets,

g. whereby force would have to be exerted to displace the resiliently abutting leading lengthwise edge from the sheet against which it bears.

3,891,350
IMPELLER WHEEL FOR TORQUE CONVERTER OR FLUID COUPLING AND MANUFACTURING METHOD THEREOF

Kazuma Adachi, Yao; Masayoshi Tokunaga, Takatsuki, and Shigeru Takeshita, Neyagawa, all of Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Neyegawa-shi, Japan

Filed Mar. 26, 1973, Ser. No. 344,539

Claims priority, application Japan, July 5, 1972, 47-67827

Int. Cl. F01d *5/04*

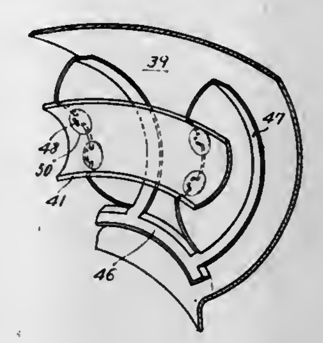
U.S. Cl. 416—180 **4 Claims**

1. Impeller wheel for torque converter or fluid coupling, comprising

a shell;

an integral array of ribbed blades attached to the inner surface of said shell;

a core ring attached to the radially inner ends of said blades, each said blade having an integral radial rib extending along the entire outer periphery of said blade,



an integral annular rib in the form of a ring-like band integral with one end of each of said radial ribs on said array of blades;

said array of blades being connected with the inner surface of said shell by means of said radial ribs along their entire length.

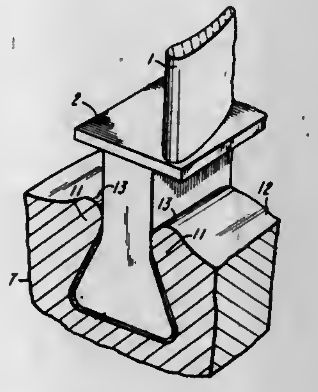
3,891,351
TURBINE DISC

Theodore J. Norbut, 3141 Claydor Dr., Dayton, Ohio 45431

Filed Mar. 25, 1974, Ser. No. 454,372

Int. Cl. F01d *5/30*

U.S. Cl. 416—219 **11 Claims**



1. A turbine machinery disc having bore, web and rim portions, the rim portion of which is comprised of:

a plurality of circumferentially arranged symmetrical slots for accommodating blades, each slot having blade tang-accommodating portions of given radius of curvature;

a set of symmetrical rim lugs adjacent to each slot, each lug having raised outer portions which are substantially of the same height and gradual radius of curvature, which radius of curvature exceeds that of said blade-tang accommodating slot portions; and

lower symmetrical rim portions of approximately equal diameter between said raised rim lugs;

said disc being further characterized as avoiding direct sharing of tension and compression between adjacent blades.

3,891,352
LIQUID-PISTON TYPE SLURRY PUMPING SYSTEM

Junya Tsukamoto, Hyogo, Japan, assignor to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1973, Ser. No. 409,809

Claims priority, application Japan, Nov. 2, 1972, 47-126937

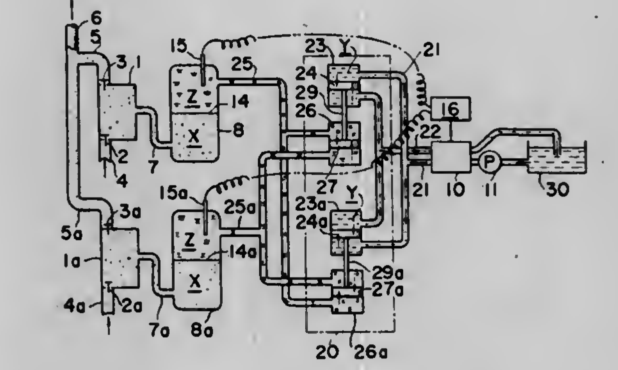
Int. Cl. F04f *11/00;* **F04b** *15/02*

U.S. Cl. 417—101 **4 Claims**

1. A liquid-piston type slurry pumping system operable in a slurry pipe line, said system comprising: a pump unit of a type continuously delivering a pressurized operating fluid which is

of a specific gravity different from that of slurry to be pumped and is substantially immiscible with, insoluble in, and unreactive with the slurry; at least two valve boxes each including a suction valve and a discharge valve connected respectively to the pipe line; at least a pair of liquid containers connected respectively to the valve boxes; passage means connecting said containers and said pump unit; means for changing over said passages between the pump unit and the liquid containers, thereby to introduce the operating fluid into the liquid containers alternately; detecting means provided in each of the containers for detecting any displacement in excess of a predetermined value of a boundary surface formed between the fluid and the slurry coexisting in the containers; a controller for controlling the operation of the fluid-passage changeover means in response to signals from said detecting means, whereby the pulsations of the boundary surfaces in the containers are controlled in response to the detected results of the detecting means, and the operation of the pumping system is thereby stabilized; and

a piston-cylinder device provided between the liquid containers and said fluid-passage changeover means, said device being comprised of means isolating the operating



fluid from the slurry but transmitting hydraulic displacement between the operating fluid and the slurry, first and third cylinders respectively including pistons connected together operatively, and second and fourth cylinders respectively including pistons connected together operatively, the first side of the piston in the first cylinder and the second side of the piston in the second cylinder being connected to a passage in said fluid passages changing over means, the second side of the piston in the first cylinder and the first side of the piston in the second cylinder being connected to another passage in said fluid passages changing over means, the first side of the piston in the third cylinder and the second side of the piston in the fourth cylinder being connected to one liquid container, the second side of the piston in the third cylinder and the first side of the piston in the fourth cylinder being connected to the other liquid container, said operating fluid occupying both sides of each of the first and second cylinders, and the interiors of the third and fourth cylinders being occupied by an additional operating fluid which forms a boundary surface in each of the liquid containers between itself and the slurry.

3,891,353
JET BOOSTERS

John Joseph Templeman, Solihull, England, assignor to British Gas Corporation, London, England

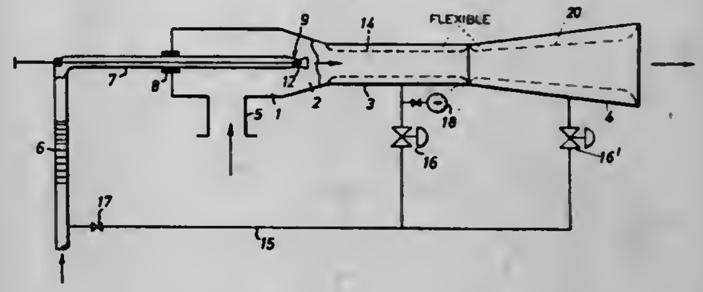
Filed Mar. 7, 1973, Ser. No. 338,928

Claims priority, application United Kingdom, Mar. 9, 1972, 10921/72

Int. Cl. F04f *5/48*

U.S. Cl. 417—183 **8 Claims**

1. A jet booster of the kind in which high pressure driving fluid is used to entrain low pressure fluid induced into said booster and compress it to an intermediate pressure, comprising an inlet opening for low pressure fluid, an axial driving nozzle within said inlet opening and open to a supply duct for high pressure driving fluid, said driving nozzle defining a nozzle throat and having a nozzle exit by which said driving fluid enters said booster, a plug which is longitudinally movable in said nozzle throat and which varies in cross-section along its length so as to change the effective area of said nozzle throat when said plug is moved longitudinally, a cylindrical portion forming the mixing throat of said booster which



is variable in cross-section, first control means for longitudinally moving the plug in said nozzle throat and second control means independent of said first control means and simultaneously but independently variable therewith for varying the cross-section of said cylindrical portion, said second control means including a conduit leading to said supply duct for high pressure driving fluid, said conduit including a pressure controller therein.

3,891,354
REGULATING SYSTEM FOR PUMPS

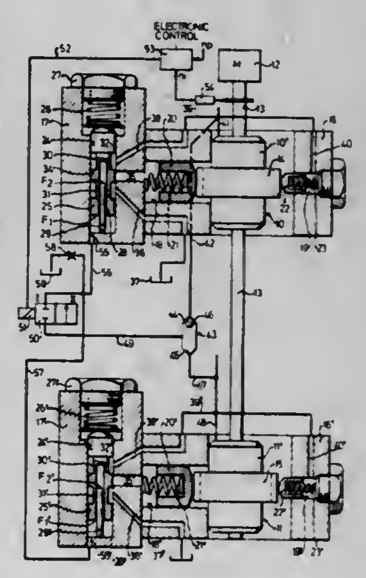
Paul Bosch, Ludwigsburg, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed June 11, 1974, Ser. No. 478,392

Claims priority, application Germany, June 22, 1973, 2331617

Int. Cl. F04b *49/00*

U.S. Cl. 417—216 **8 Claims**



1. In a pump system wherein at least two pumps are coupled to a single drive motor for pumping fluid under pressure through a discharge system, a regulating arrangement for preventing overloading and stalling of the drive motor, said regulating arrangement comprising at least two displacement control regulating means, one for each pump, and each having control slide means having a first and a second surface adapted to be subjected to the fluid pressure in the discharge system for moving the respective displacement control regulating means to thereby regulate the amount of fluid pumped by the respective pump; signalling means cooperating with

said drive motor for producing a signal in response to a predetermined high load on the motor; and means for subjecting said first surface to the fluid pressure in the discharge system in response to one of said signals so as to move the control slide means of at least one of said pumps to thereby reduce the amount of fluid delivered by said at least one pump.

3,891,355
COOLING ARRANGEMENT FOR A MOTOR DRIVEN COMPRESSOR

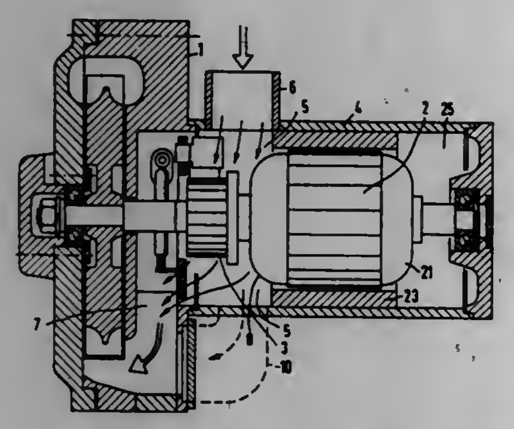
Gert Hecht, Brendlorenzen; Rudolf Schöning, Bad Neustadt, Saale, and Wolfgang Pieper, Wurzburg, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 29, 1973, Ser. No. 364,276

Claims priority, application Germany, June 9, 1972, 2228326

Int. Cl. F04b *39/06*

U.S. Cl. 417—371 **5 Claims**



1. In a side channel compressor including a compressor housing having a compressor medium inlet disposed therein, and driven by an electric motor disposed in a motor casing mounted on said compressor housing, said motor including an armature disposed within said casing, and said compressor housing inlet opening into the interior space of said casing on one side of, and adjacent one end of, said motor armature, the improvement comprising a compressor medium inlet pipe stub, coupled to and opening into said interior space of said casing, and extending radially outwardly therefrom with respect to said armature, said inlet stub being disposed adjacent said one end of said armature on the side opposite said one side thereof, for directing the compressor medium transversely through said motor casing across said one end of said armature and into said compressor medium inlet, for cooling said motor.

3,891,356
FLUID GUIDE PLUNGER SYSTEM

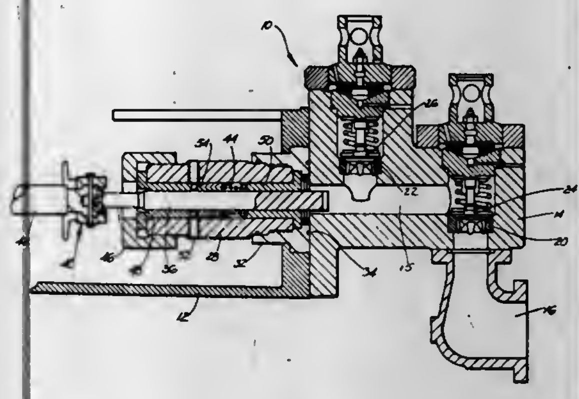
Frederick C. Christ, Long Beach, Calif., assignor to Armco Steel Corporation, Middletown, Ohio

Filed Nov. 21, 1973, Ser. No. 417,941

Int. Cl. F04b *19/22*

U.S. Cl. 417—437 **7 Claims**

1. A pumping mechanism for pumping fluids having a fluid end containing an intake and an outlet provided with an intake valve and an outlet valve, respectively, at least one cylinder communicating with said fluid end, said cylinder having a packing element, a plunger axially mounted within said cylinder and movable therein in an extended position and in a retracted position, a power source including an associated power member, and coupling means joining said plunger and said power member, said pump pulling fluid through said intake valve into said fluid end and said cylinder when said plunger moves from its extended position to its retracted position and discharging fluid through said outlet valve when said plunger moves from its retracted position to its extended position; characterized by said coupling means being a floating connection comprising a hollow housing with openings at the forward and rearward ends thereof, said housing having an annular interior groove sized to just nicely receive the end of said power member, means securing the end of said power member in said housing, the opening of the forward end of said housing being defined by an annular rim, a disc secured to one end of said plunger by screw means, said disc being adapted to be received within said housing and maintained in abutment with the forward end of said power member, and spring means abutting the forward end of said disc and said annular rim to maintain said disc in abutment with said power member, whereby said floating connection provides a solid connection for the high load pushing-discharge stroke of said plunger, a moderate spring loading connection for the pulling-suction stroke of said plunger, and only minor restraint for limited radial movement, permitting said plunger to seek its natural packing element center, thus giving longer plunger and packing element life and adjusting for misalignment possible within said pumping mechanism.



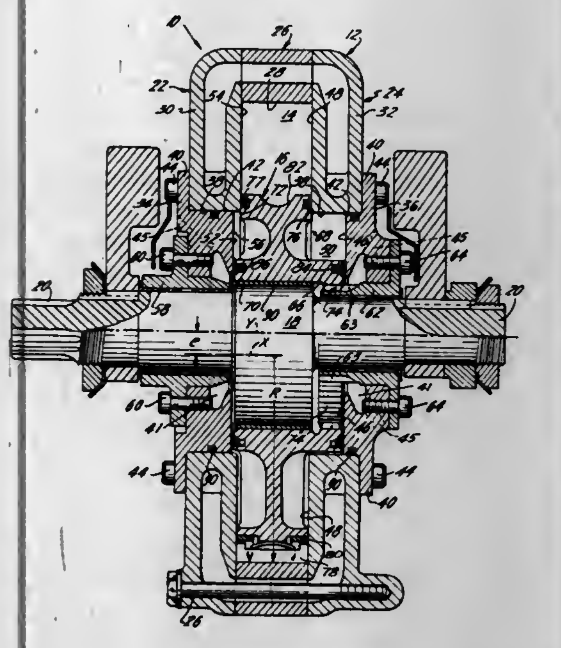
3,891,357
ROTARY MECHANISM OF THE TYPE HAVING A PLANETATING ROTOR

Robert C. Davis, Ramsey, and Winthrop B. Pratt, Haledon, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed May 3, 1974, Ser. No. 466,634

Int. Cl. F01c *1/02, 19/00;* **F04c** *27/00*

U.S. Cl. 418—61 A **9 Claims**



1. An improved rotary mechanism of the type having a housing comprising two end walls spaced in substantial parallelism by an intermediate peripheral wall to define therebetween a cavity and having a rotor supported for planetary movement within said cavity on an eccentric portion of a mainshaft supported for rotation in said two end walls, the improvement comprising

a. at least one of said end walls consisting of an outer portion and a separate central portion detachably secured to said outer portion;
b. said outer portion having a first inner sealing surface partly defining said cavity;
c. said central portion having a second inner sealing surface located radially inwardly of said first inner sealing surface and being so dimensioned and secured to said outer portion that the second inner sealing surface is in a plane substantially parallel to and axially outwardly offset from the plane of said first inner sealing surface to thereby define an axial recess communicating with said cavity;
d. the rotor having a face portion disposed in close spaced substantially parallel relation to said first sealing surface and having a tubular hub portion extending into said axial recess and with an end face in close spaced substantially parallel relation with said second inner sealing surface;
e. side gas seal means disposed to seal the interstices between said rotor face and said first seal surface as the rotor orbits within said cavity;
f. lubricant passageway means disposed radially inwardly of said end face of the tubular hub portion and said second inner surface for conducting oil to or from the eccentric portion of the mainshaft; and
g. side oil seal means disposed to seal the interstices between said end face of said tubular hub portion of the rotor and said second inner sealing surface as the rotor orbits within said cavity and thereby prevent the escape of oil from said lubricant passageway means.

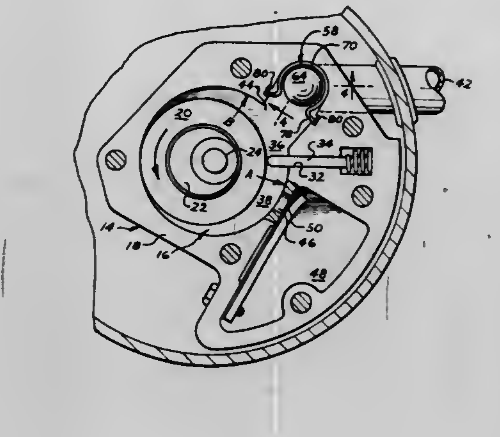
3,891,358
SUCTION VALVE FOR ROTARY COMPRESSOR

William T. Ladusaw, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Continuation-in-part of Ser. No. 373,188, June 25, 1973, abandoned. This application Apr. 29, 1974, Ser. No. 464,893

Int. Cl. F01c *1/02*

U.S. Cl. 418—63 **7 Claims**



1. A rotary compressor comprising:
a cylindrical wall member and upper and lower end plate members defining an annular compression chamber for receiving a charge of refrigerant;
an inlet chamber in said cylindrical wall member extending between said upper and lower end plates and communicating with said compression chamber;
a suction port in said lower end plate including a valve seat communicating with said channel;
a valve member arranged for vertical movement in said inlet area between said valve seat and said upper plate when a refrigerant charge is introduced into said compression chamber during the operation of said compressor;
valve member holding means having a film of lubricant being formed in said upper plate in communication with the upper extremities of said inlet area for receiving a portion of said valve during operation of said compressor; and
said valve member holding means having a predetermined surface area relative to said portion of said valve member being dimensioned so that the surface tension of said lubricant between said valve and said holding means surface area is sufficient to retain said valve in said holding means during operation of said compressor and for releasing said valve to close against said valve seat when said compressor operation terminates.

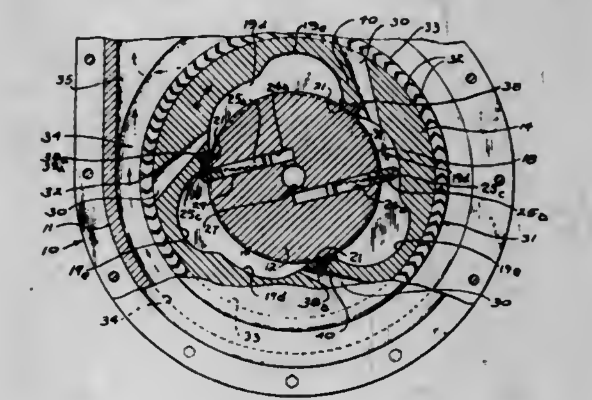
3,891,359
ROTARY ENGINE

George W. Meacham, 2021 Edgewater Dr., Clearwater, Fla. 33515

Continuation-in-part of Ser. No. 237,815, March 24, 1972, Pat. No. 3,778,199. This application Apr. 9, 1973, Ser. No. 349,904

Int. Cl. F01c *19/00*

U.S. Cl. 418—104 **8 Claims**



1. A fluid-pressure operated rotary engine comprising: a relatively fixed hollow housing; a hub non-rotatably affixed to said housing, and having an outer cylindrical surface defining an annular chamber within said housing; an annular rotor mounted in said housing for relative rotation in said annular chamber, and having therein a plurality of peripherally spaced, camming cavities defining cam surfaces between intermediate bearing lands in rotational engagement with said cylindrical surface; said hub having therein peripherally spaced slots, of predetermined inward depth from said cylindrical surface, opening toward said chamber and being disposed in planes at angles to radial planes passing through the axis of said hub; slide plates slidably received in said slots, and having end portions presented to ride over said lands and said cam surfaces between the lands upon forward rotation of said rotor in said annular chamber; conduit means for providing a continuous supply of fluid-pressure medium through said relatively fixed hub to said slots for urging said slide plates radially outwardly toward engagement with said cam surfaces and said lands with rotation of said rotor; said slide plates having passage means for passage of predetermined proportions of fluid-pressure medium through said slide plates from said slots to the leading sides of the plates to create a pressure build-up within the corresponding said camming cavities, thereby to rotate said rotor in forward direction; and outlet passage means provided in said rotor for conducting the expended fluidpressure medium from said camming cavities at the trailing sides of said slide plates.

3,891,360
GEAR MACHINE WITH AXIALLY MOVABLE END WALL SEAL

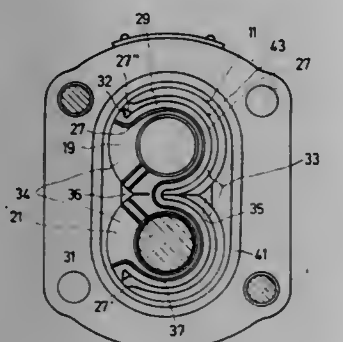
Wilhelm Dworak, Stuttgart; Claus Jons, Munich, and Jan Vlemmings, Hochdorf, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Feb. 4, 1974, Ser. No. 439,020

Claims priority, application Germany, Mar. 6, 1973, 7308439[U]

Int. Cl. F01c *19/08;* **F03c** *3/00;* **F04c** *15/00*

U.S. Cl. 418—132 **10 Claims**



1. In a fluid machine having a high pressure side and a low pressure side, a combination comprising a housing having a chamber which is bounded by a circumferential wall and two opposite end walls; a pair of meshing gears mounted in said chamber for rotation about axially parallel shafts, said gears each having two opposite axail ends; a plurality of shaft-journalling members, each associated with one of said shafts and each having one axial end face directed towards the associated gear for sealing engagement therewith and an other axial end face directed towards one of said end walls and away from the associated gear, at least some selected ones of said journalling members having limited freedom of axial movement relative to the associated gear; a recess formed in each of said other axial end faces of said selected journalling members and having substantially the contour of a numeral three the open side of which communicates with said low-pressure side; a pair of sealing elements accommodated in and corresponding to the contour of each of said recesses, each sealing element having free end portions having a nose-like projection and extending to said circumferential wall; and a small pressure space formed gradually adjacent and behind each of said free end portions intermediate the same and the associated recess and being in communication with said high-pressure side so that the pressure of fluid from said high-pressure side will constitute a force to urge said nose-like projections against said circumferential wall and thereby seal said chamber.

3,891,361
OIL SEAL MEANS OF A ROTARY PISTON ENGINE

Joji Miyake, and Takeshi Nakakobara, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

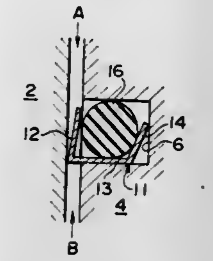
Filed Dec. 13, 1973, Ser. No. 424,327

Claims priority, application Japan, July 18, 1973, 48-80285; July 18, 1973, 48-80287; July 18, 1973, 48-80288; July 18, 1973, 48-80289

Int. Cl. F01c *19/00;* **F04c** *27/00;* **F16f** *1/34*

U.S. Cl. 418—142 **16 Claims**

1. An oil seal means of a rotary piston engine comprising an oil seal ring and an annular elastic sealing element operatively associated therewith, both being mounted in combination in an annular oil seal groove formed as cut at a side wall portion of a rotor, characterized in that said oil seal ring is composed of a first annular portion made of a relatively thin plate extending over a substantially conical surface, said first annular portion being urged against an oppositely arranged inner wall of a side housing of the engine to contact said inner wall at its radial inner annular edge portion, a second annular portion made of a relatively thin plate extending over a substantially cylindrical surface and connected at an annular edge thereof with said radial inner annular edge of said first annular portion, said second annular portion slidably fitting over a radially inner side wall of said annular oil seal groove, and a third substantially annular portion made relatively thin and extending over a substantially conical surface and connected at an annular edge thereof with the other annular edge of said second annular portion, said third annular portion being separated into a plurality of sectoral elements arranged in series to provide as a whole a substantially annular element, said sectoral elements each acting as a spring means to urge said radially inner annular edge portion of said first annular portion against said inner wall of said side housing.



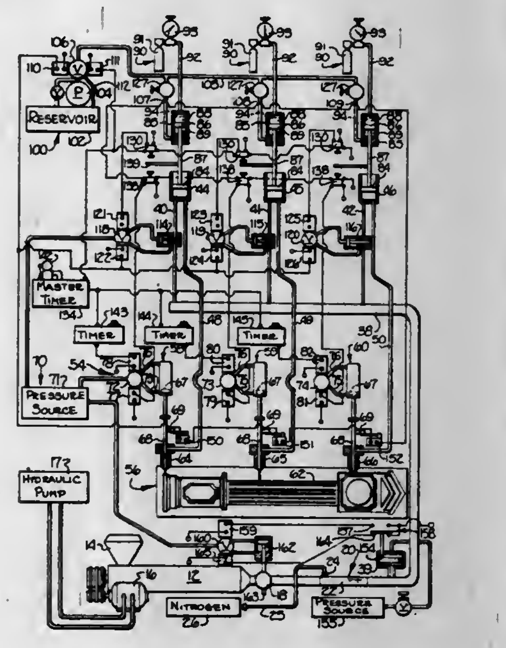
3,891,362
APPARATUS FOR MOLDING FOAMED THERMOPLASTIC ARTICLES

William R. DeVita, Matthews, N.C., assignor to Structural Foam Products, Inc., Pineville, N.C.

Continuation-in-part of Ser. No. 152,612, June 14, 1971, Pat. No. 3,746,492. This application May 30, 1973, Ser. No. 365,079

Int. Cl. B29d *27/04*

U.S. Cl. 425—4 R **16 Claims**



1. An apparatus for molding foamed thermoplastic articles comprising

accumulation means including a plurality of expansible and contractible chambers for receiving a predetermined amount of a mixture of thermoplastic material and blowing agent therein,

means for heating thermoplastic material and for mixing the thermoplastic material and a blowing agent and for conveying the resulting mixture under a first pressure sufficient to preclude the premature foaming thereof into each of said expansible and contractible chambers in said accumulation means,

mold means connected to each of said chambers in said accumulation means for receiving the mixture of thermoplastic material and blowing agent from said accumulation means under conditions of reduced pressure to permit the foaming of the mixture received therein,

means connected to said accumulation means for applying an expansion resisting pressure to each of said chambers during the receipt of the mixture therein to maintain the mixture under said first pressure in said chamber, and for applying a contracting pressure considerably higher than said expansion resisting pressure to said chamber to rapidly discharge the mixture from each of said chambers into said mold means, and

means for selectively establishing and terminating communication between each of said chambers and said mold means and comprising an independent discharge line extending from each accumulation chamber and terminating in an injection port, means for establishing communication through each of said discharge lines in a variably timed predetermined sequence upon all of said accumulation chambers having received their predetermined amount of the mixture, and means for independently teminating communication through each of said discharge lines upon the associated accumulation chamber being exhausted of its predetermined amount of the mixture.

3,891,363
MOLD SEGMENT FOR VULCANIZING MOLDS

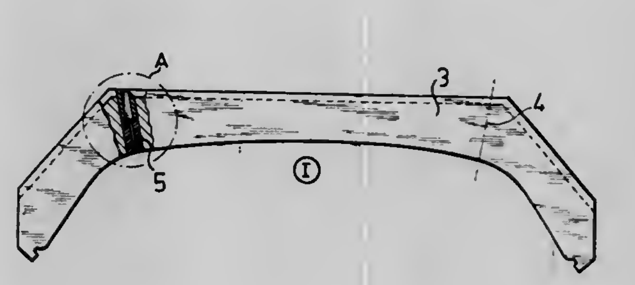
Willi Sievers, Korbach, and Andre Van Steenput, Arolsen, both of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

Filed Aug. 22, 1974, Ser. No. 499,531

Claims priority, application Germany, Aug. 23, 1973, 2342614

Int. Cl. B29r *1/00*

U.S. Cl. 425—28 R **7 Claims**



1. A mold segment for a vulcanizing mold comprising a plurality of radially movable segments, which comprises venting bores extending from the inside of said segment through said segment to the outside thereof, and tubular insert means of a fluor carbon inserted into said venting bores and extending from the inside of said segment along at least a portion of the length of said venting bores.

3,891,364
APPARATUS FOR THE CONTINUOUS VULCANISATION OF ENDLESS BELTS

Alexander Muller, Hoxter, Germany, assignor to Hoxtersche Gummifadenfabrik Emil Arntz K.G., Hoxten, Germany

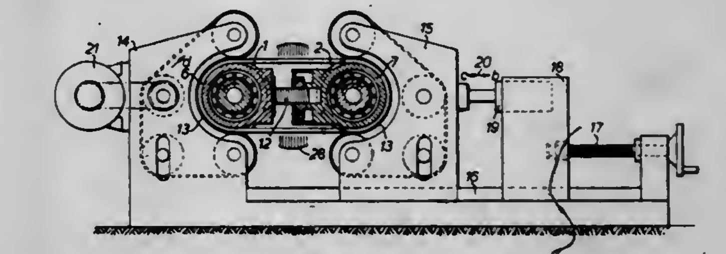
Filed July 22, 1974, Ser. No. 490,496

Claims priority, application Germany, July 25, 1973, 2337749

Int. Cl. B29h *5/28, 7/22*

U.S. Cl. 425—28 B **7 Claims**

1. Apparatus for the continuous vulcanisation of an endless belt, the apparatus having a vulcanising zone, and two heatable, parallel, equidirectional and synchronously drivable vulcanising drums therein, the drums each having a helical groove therein, the grooves in the two drums being of the same sense and pitch, and arranged to move the belt continuously through the vulcanising zone.



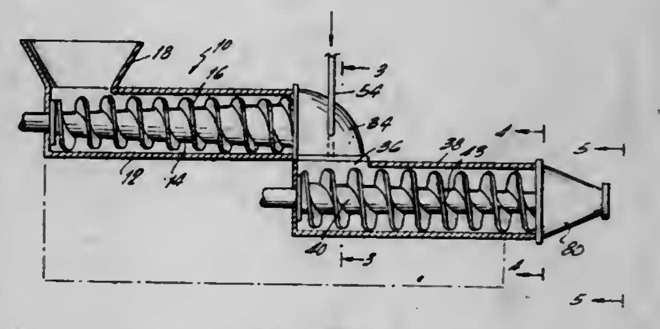
3,891,365
APPARATUS FOR MAKING A STRIATED SOAP BAR

Charles F. Fischer, Jersey City, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed July 30, 1973, Ser. No. 384,085

Int. Cl. B29f *3/12*

U.S. Cl. 425—131.1 **3 Claims**



1. An apparatus for producing striated soap bars on a double barrel soap plodder comprising a first barrel and a second barrel arranged in superposed position, first auger means in said first barrel, means for feeding soap into said first barrel at one end of said first barrel, a compression plate assembly for forming soap pellets at the other end of said first barrel a vacuum chamber at said other end of said first barrel communicating with said second barrel, second auger means including a pair of counter rotating screws in said second barrel, a pair of dye injection tips for injecting dye into said vacuum chamber and nozzle means at the other end of said second barrel for discharging striated soap bars, one of said screws rotating in a clockwise direction, the other of said screws rotating in a counter clockwise direction, each of said dye tips being disposed outwardly of the centerline of one of said screws and on the climb side thereof, said injection tip associated with said clockwise rotating screw being located at a position corresponding to a clock position of about 10:00 to 10:30 o'clock, said injection tip associated with said counter clockwise rotating screw being located at a position corresponding to a clock position of about 1:30 to 2:00 o'clock.

3,891,366
PELLETING OF CARBON BLACK

Wilson H. Rushford, London, England, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 13, 1974, Ser. No. 450,576

Int. Cl. B01j *2/12;* **C09c** *1/58*

U.S. Cl. 425—140 **3 Claims**

1. Apparatus for pelleting carbon black comprising:

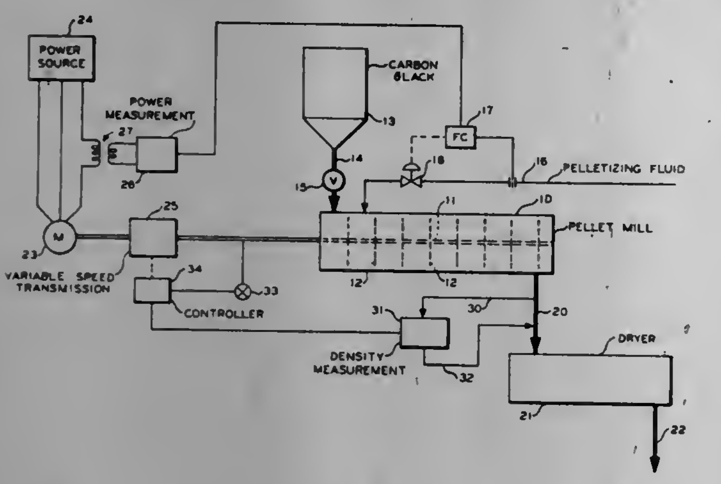
a generally horizontal pellet mill having a carbon black inlet, a pellet outlet, and axial rotary pin agitator mixing means positioned with said pellet mill;

conduit means communicating with said pellet mill to introduce a pelletizing liquid;

a motor;

a variable speed drive means connected said motor to said mixing means;

means to measure the bulk density of a volume of pellets removed from the outlet of said pellet mill and to establish a signal representative of the measured bulk density; and



means responsive to said signal to control said variable speed drive means to adjust the speed at which said mixing means is rotated in response to changes in the measured density said responsive means actuating said mixing means at a lower rate of speed if the measured bulk density increases above a predetermined value and at a higher rate of speed if the measured bulk density decreases below said predetermined value.

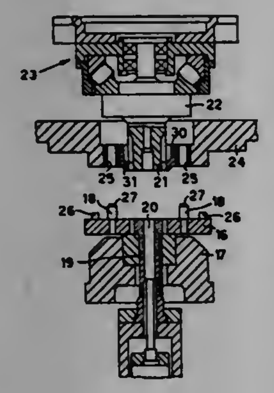
3,891,367
APPARATUS FOR MOULDING HELICAL GEARS BY COMPRESSION OF POWDERS

Maurizio Signora, Palazzo Canavese, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Torino), Italy

Filed May 8, 1973, Ser. No. 358,426

Int. Cl. B22f *3/02; 5/08*

U.S. Cl. 425—78 **5 Claims**



1. Apparatus for moulding helical gears by compression of a powder, comprising a die member having a toothed internal profile corresponding to that of the gear to be moulded, a movable punch having an externally toothed portion adapted to enter the die member to compress the powder, a guide member adapted to cause said portion to move with a helical motion with the same pitch as the said profile, said guide member comprising a female threaded member directly in engagement with the portion of the punch, and being movable towards the die member, and means for angularly positioning the guide member in an angular position fixed with respect to said die member, wherein said means for effecting angular positioning comprises at least one pin adapted to be introduced into a corresponding hole during movement of said guide member towards said die member, one of said members being provided with said pin and the other of said members being provided with said hole, stop means for the guide means being carried by one of said members and being such that when the guide is arrested by the stop means, the means for effecting angular positioning align the toothing of the punch portion with the toothing of the die.

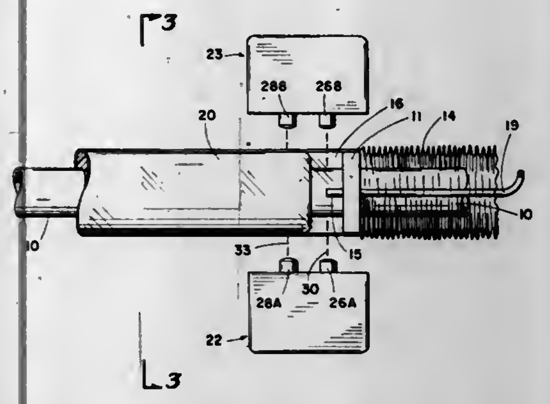
3,891,368
SYSTEM FOR CONTROLLING THE DEPOSITION OF A COATING MATERIAL ONTO A PIPE OR THE LIKE

Milburn L. Hart, P.O. Box 15822, Tulsa, Okla. 74115

Filed Mar. 22, 1974, Ser. No. 453,706

Int. Cl. B29c *3/06*

U.S. Cl. 425—114 **9 Claims**



1. In an apparatus wherein a foamable material is deposited into an annular cavity formed around an elongated object and wherein the material is deposited into said cavity from a deposition assembly which is moved longitudinally relative to said object, the combination with said deposition assembly of two material presence detectors spaced apart longitudinally along said object to increase the relative deposition rate if the material is not detected at the detector furthermost from the deposition assembly and to decrease the relative deposition rate if the material is detected at the closestmost detector to the deposition assembly.

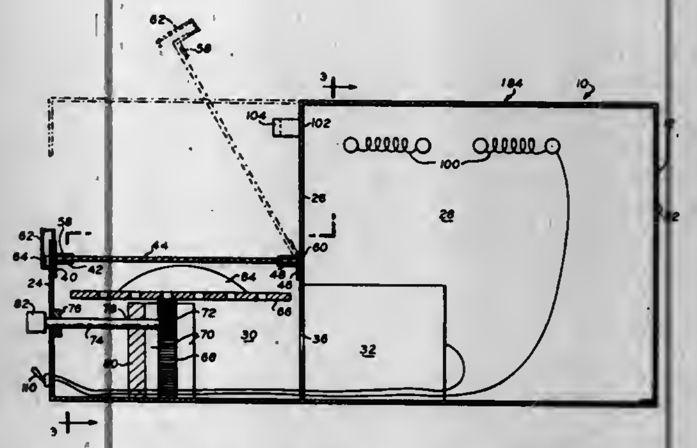
3,891,369
APPARATUS FOR TEACHING VACUUM FORMING AND PRESSURE FORMING

Francis Paul Pracilio, Pelham Manor, N.Y., assignor to Educational Machinery Corporation, New Rochelle, N.Y.

Filed Dec. 21, 1972, Ser. No. 317,135

Int. Cl. B29c *17/04*

U.S. Cl. 425—174 **10 Claims**



1. A unitary apparatus for giving instruction in vacuum forming and pressure forming and adapted for selectively actuating either, comprising:

a. a housing defining a pump chamber and a pressure chamber;

b. a platen in said pressure chamber for supporting a mold thereon;

c. means for supporting a thermoplastic sheet in overlying relation with said pressure chamber;

d. means for holding the thermoplastic sheet in said overlying relation with said pressure chamber;

e. means for heating said sheet when in said overlying relation for softening said sheet:

f. a pressure pump in said pump chamber;

g. a vacuum pump in said pump chamber;

h. passage means for connecting both said pumps to said pressure chamber; and

i. means for selectively energizing said pressure pump and said vacuum pump, whereby to selectively pressure form and vacuum form said thermoplastic sheet.

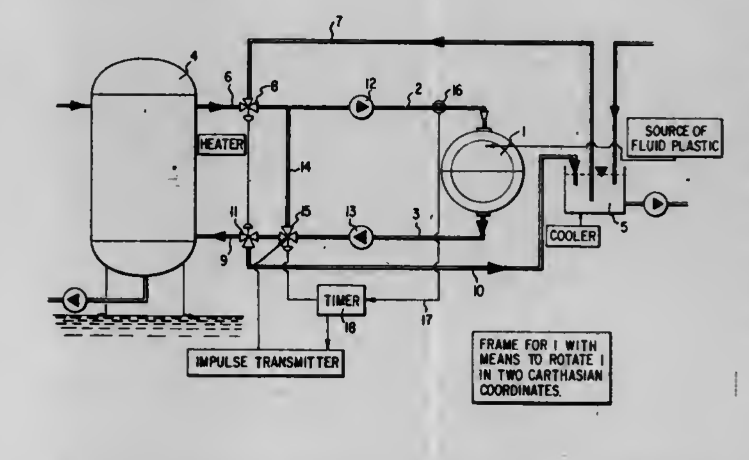
3,891,370
APPARATUS FOR MAKING HOLLOW BODIES FROM THERMOPLASTIC MATERIALS BY ROTATION-MELTING

Herbert Giehler, Dautphe-Wilhelmshutte, Germany, assignor to Elkamet-Werk Lohn-Kunststoff, Biedenkopf/Lahn, Germany

Filed May 28, 1974, Ser. No. 474,006

Int. Cl. B29c *5/04*

U.S. Cl. 425—144 **7 Claims**



1. An apparatus for producing hollow thermo-plastic bodies by rotation-melting, comprising:

a frame;

at least one mold;

said mold having double walls spaced from each other to define at least one heat exchange chamber;

means to rotate said mold about two axes in Carthasian coordinates;

a cooling tank and a heating tank for a fluid heat transfer medium;

a forward flow cycle pipe line for the heating fluid and a return flow cycle pipe line for the cooling fluid; and

means to connect said cycle lines through said chamber alternatingly with said heating and cooling reservoirs;

including a three-way forward valve and forward flow pump in the forward flow cycle pipe line and a three-way return valve and a return flow conveyor in the return flow cycle pipe line;

said pump and said conveyor, each being interposed between said mold and its respective three-way valve;

a mixing line connected to said return flow line between the mold and the return flow valve and ending in the forward flow line between the centrifugal pump and its three-way valve, to connect the forward flow and the return flow lines;

a mixing valve interposed in said mixing line;

a timer programmer;

a thermometer probe interposed between the mold and the mouth of the mixing line in the forward flow line;

an electric circuitry connecting the thermometer probe with said programmer;

an impulse transmitter connected to actuate said mixing valve;

said timer-programmer connected to actuate said impulse transmitter.

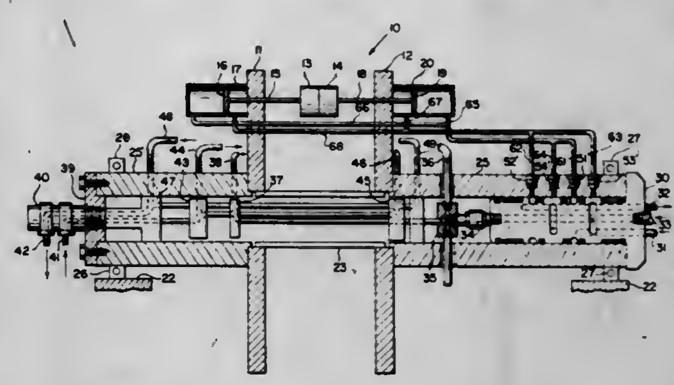
3,891,371
FLUID DISTRIBUTOR FOR ROTARY BLOW MOLDING

Nicholas N. Sokolow, Roscoe, Ill., assignor to Plasti-Mac, Inc., Longwood, Fla.

Filed Apr. 30, 1973, Ser. No. 355,657

Int. Cl. B29c *5/00*

U.S. Cl. 425—233 **32 Claims**



1. A blow molding apparatus comprising: a base, a pair of opposed spaced apart plates rotatably mounted on the base for rotation about an axis in synchronism with each other, at least one pair of opposed mold dies having recesses which form a blow mold cavity when the dies are closed against each other, said mold dies being operatively connected to the plates for rotation therewith and mounted between the plates for movement towards and away from each other, to close and open the mold cavity, respectively, power means for closing said mold dies, said power means being operatively connected to the plates to rotate therewith, and a distributor means for distributing oil to and from the said power means, said distributor means comprising:

a hollow sleeve coaxial with said axis and operatively connected to the plates for rotation therewith, said sleeve including apertures therethrough,

a stationary fluid distributing shaft within the sleeve,

first passage means for delivering pressurized fluid into the distributor shaft,

second passage means for removing low pressure fluid from the distributor shaft,

axially spaced grooves in said shaft selectively mating with said apertures in the sleeve for communicating said power means with said first and second passage means,

the tolerance between the surface of the distributor shaft and the interior of the sleeve being too large to serve as a fluid seal between the respective grooves, and including O ring seals on the distributor shaft separating the grooves from fluid communication with each other,

and bearing means for forming the sole wear surface between the distributor shaft and the hollow sleeve, said bearing means comprising a pair of bearing rings removably mounted on one of said distributor shaft or hollow sleeve so as to form the sole wear surface of that member with the other of said distributor shaft or hollow sleeve.

3,891,372
APPARATUS FOR THE HIGH-PRESSURE CROSS-LINKING MOLDING OF POLYMERS

Mamoru Takiura, Kawasaki, Japan, assignor to Ikegai Tekko Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 206,030, Dec. 8, 1971, abandoned. This application Mar. 15, 1973, Ser. No. 341,783

Claims priority, application Japan, Dec. 18, 1970, 45-113124; June 14, 1971, 46-42456

Int. Cl. B29f *1/06*

U.S. Cl. 425—244 **8 Claims**

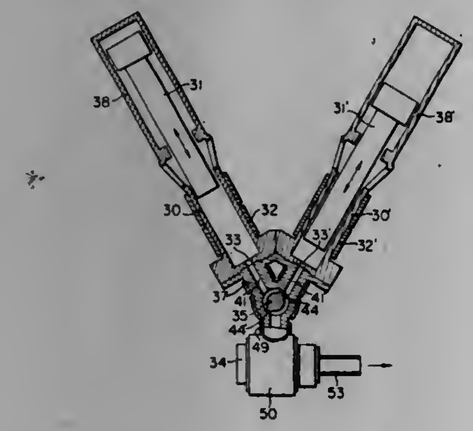
7. A high-pressure fluid cross-linking molding apparatus for molding polymers, comprising:

first extruder means for melting and kneading a mixture composed of a polymer and a cross-linking agent by applying such temperature and pressure as will not give rise to a cross-linking reaction;

a reaction unit having a reaction chamber adapted to receive therein the mixture from the extruder means and a relatively movable reaction plunger associated therewith, said reaction unit having means associated therewith for applying a temperature and a pressure on said mixture which is higher than the internal temperature and pressure developed within the extruder means so as to cause a cross-linking reaction to occur when the molten mixture is contained within the reaction compartment;

a first passageway providing communication between the discharge end of said extruder means and said reaction compartment for permitting flow of molten mixture from said extruder means to said reaction compartment;

second extruder means for receiving therein the molten mixture after occurrence of the cross-linking reaction;



a second passageway providing communication between said reaction compartment and said second extruder means for permitting the mixture, after the cross-linking reaction has occurred, to be transferred from said reaction compartment to said second extruder means;

a molding head assembly for permitting discharge therefrom of the cross-linked polymer, and a third passageway providing communication between said molding head assembly and the discharge end of said second extruder means; and

transfer valve means associated with said first and second passageways for alternately opening and closing said first and second passageways to provide for the intermittent and alternating flow between (1) said first extruder means and said reaction compartment and (2) said reaction compartment and said second extruder means.

3,891,373
MOLDING APPARATUS AND CHOPPER FOR FORMING RUBBER SLUGS

Gordon L. Newby, 320 Industrial St., Bakersfield, Calif. 93307
Division of Ser. No. 224,115, Feb. 7, 1972, Pat. No. 3,758,249. This application July 23, 1973, Ser. No. 381,530
Int. Cl.² B29H *3/06*; B29C *15/00*
U.S. Cl. 425—301 **8 Claims**

1. An improved chopper for forming slugs from a continuous length of a resilient, flexible stock material comprising:

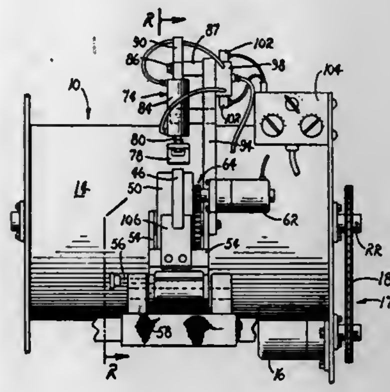
A. a pair of adjacently disposed, counter-rotating rollers having defined therebetween a bite through which is fed a continuous band of stock material adhered to the peripheral surface of one roller of said pair;

B. means including a pair of cutting disks pressed against the periphery of said one roller for severing a substantially uniform, continuous strip of material from said band;

C. a third rotating roller disposed adjacent to said one roller for receiving and transporting said strip about a portion of the peripheral surface thereof;

D. severing means including a knife disposed adjacent to said third roller, and means supporting said knife for rectilinear reciprocatory motion along a path extended in substantially radial directions with respect to said third roller;

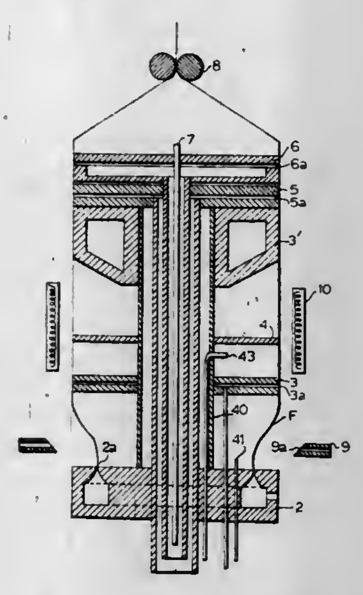
E. means for imparting rectilinear reciprocatory motion to said knife at a substantially constant cyclic rate, whereby said continuous strip is severed at substantially uniform intervals as the strip is conveyed about the surface of said third roller; and



F. means for driving said pair of counter-rotating rollers at a first constant rate, whereby a first constant angular velocity is imparted to the peripheral surfaces thereof, and means for driving said third roller at a second constant rate such that a second constant angular velocity substantially greater than the first constant angular velocity is imparted to the peripheral surface of the third roller, whereby the strip of material is subjected to tension as it is received and transported about the peripheral surface of said third roller.

3,891,374
APPARATUS FOR IMPARTING AN OBLIQUE ORIENTATION TO TUBULAR FILM

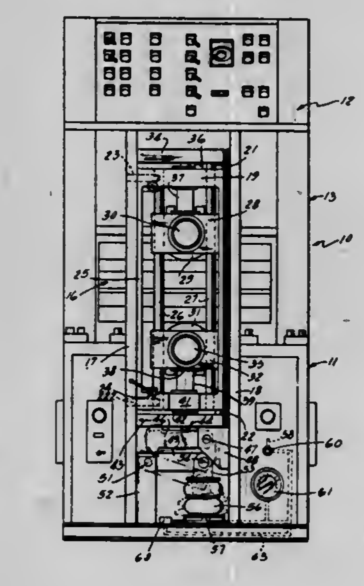
Tomokazu Ninomiya, Iwakuni, and Nobuhiro Hirata, Otake, both of Japan, assignors to Mitsui Petrochemical Industry Ltd., Tokyo, Japan
Filed Mar. 27, 1973, Ser. No. 345,369
Claims priority, application Japan, Mar. 31, 1972, 47-32228
Int. Cl. B29d *23/04*
U.S. Cl. 425—326 R **2 Claims**



1. An apparatus for producing a tubular film which comprises: an extruder and an annular die for extruding a tubular film of a thermoplastic resin; means located adjacent said die for cooling said film; a fixed mandrel mounted above said die coaxially therewith and including a slit on its peripheral surface for sucking said film to secure it firmly to said fixed mandrel; a rotating mandrel mounted above said fixed mandrel coaxially therewith and including a slit on its peripheral surface for sucking said film to secure it firmly to said rotating mandrel, said rotating mandrel being capable of imparting torsion to said film between it and said fixed mandrel thereby to orient said film obliquely; a heating zone located between said fixed mandrel and said rotating mandrel; heating means located exteriorly between said fixed and rotating mandrels for heating the tubular film in said heating zone to its orientation temperature; and a pair of nip rollers mounted above said rotating mandrel for pulling out the oriented film, said nip rollers being capable of rotating synchronously and concentrically with said rotating mandrel.

3,891,375
TABLET PRESS

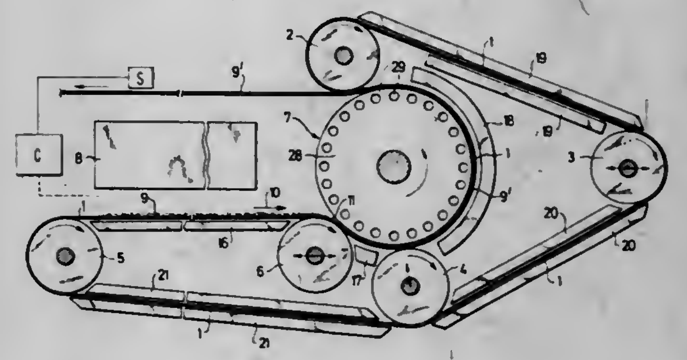
John J. Pilewski; Lawrence F. Plotz, and Richard A. Pruisman, all of Cedar Rapids, Iowa, assignors to Vector Corporation, Hiawatha, Iowa
Filed Jan. 21, 1974, Ser. No. 435,302
Int. Cl.² B29C *3/00*
U.S. Cl. 425—344 **9 Claims**



1. A high speed press comprising a frame structure, a rotor rotatably supported by said frame structure on a vertical axis and carrying a plurality of dies and coacting first and second plurality of punches receivable in said dies, driving means connected to drive said rotor, cam means for moving said punches relative to said dies, material feed means furnishing material to be formed to said dies, and a movable door support means pivotally attached on said frame structure by a vertical shaft and a pair of vertically adjustable pressure rolls rotatably supported on a pair of support columns and engageable respectively with said first and second plurality of punches and both of said pressure rolls cantileverly supported on horizontal axes by said movable door support means wherein said door support means is movable about said vertical shaft to a first position where said pair of pressure rolls respectively engage said first and second plurality of punches and movable about said pair of support columns to a second position where said pair of pressure rolls do not engage said first and second plurality of punches.

3,891,376
APPARATUS FOR THE CONTINUOUS PRODUCTION OF CHIPBOARD OR LIKE MATERIAL

Rolf Gersbeck, Hannover; Berndt Greten, and Hans-Peter Steininger, both of Springe, all of Germany, assignors to Bison-werke Bahre and Greten GmbH and Co. KG, Springer/Deister and Hermann Berstorff Maschinenbau GmbH, Hannover-Kleefeld, both of Germany
Filed Oct. 9, 1973, Ser. No. 404,387
Claims priority, application Germany, Oct. 6, 1972, 2249146
Int. Cl. B29j *5/04*
U.S. Cl. 425—373 **32 Claims**



1. Apparatus for the continuous production of boards such as chipboards, fibreboards and the like; said apparatus comprising:

an endless band,

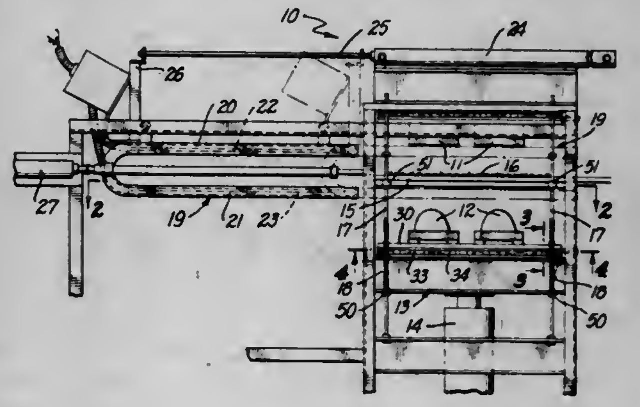
pressing means,

guiding and moving means for guiding and moving said band with a surface of said band in facing relationship to a pressing surface of said pressing means over a material pressing portion of the travel path of said band such that material forming said boards can be conveyed by and compressed between said band and said pressing surface along said material pressing portion,

a plurality of heat transfer elements disposed adjacent portions of the travel path of said band, said heat transfer elements being spaced from one another in a direction transverse to the travel path of said band, and temperature control means for maintaining said elements at different temperatures with respect to one another for accommodating transfer of different heat levels between the respective elements and respective width portions of the band.

3,891,377
APPARATUS FOR FABRIC MOLDING

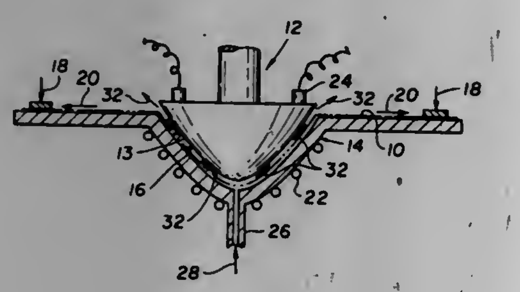
Jack E. Howard, Los Angeles, Calif., assignor to International Fabric Molders, Inc., Los Angeles, Calif.
Filed June 22, 1973, Ser. No. 372,652
Int. Cl. B29c *3/00*, *17/02*
U.S. Cl. 425—383 **3 Claims**



1. In an apparatus for molding flat thermoplastic fabric material into three dimensional contours which includes a

hydraulic press having complementary male and female molds disposed in alignment with each other and means for moving said molds into engagement with each other with said fabric disposed between said molds, the improvement which comprises means for heating said molds, independent means for simultaneously radially heating said fabric immediately prior to molding, and means for controlling said heating and molding, both said molds and fabric being heated to a lesser degree of heat than if either the molds or the fabric were heated alone to such a degree for an adequate shaping as in conventional hot and cold molding, whereby said fabric, when molded with said lesser degree of heat, in both the molds and fabric, has better laundering qualities than conventional cold molded fabric and a softer feel and less distortion than conventional hot molded fabric.

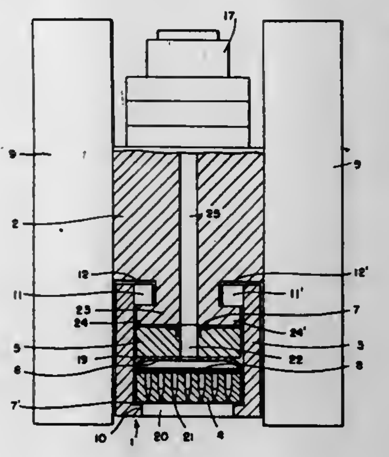
3,891,378
APPARATUS FOR MOLDING A BRASSIERE CUP SHAPE
Harold Belmuth, 8 Highwood Ln., Westport, Conn. 06880, and Alfred R. Leto, 1541 Parker St., Springfield, Mass. 01129
Filed May 9, 1974, Ser. No. 468,242
Int. Cl.² B29C *17/00, 1/00*
U.S. Cl. 425—398 **1 Claim**



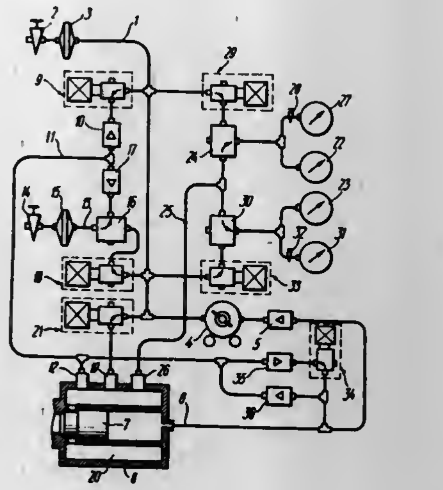
1. An apparatus for molding a brassiere cup shape in a plastic fabric comprising a first body having a shaping surface bounding a conical volume serving as one molding member, a vertically reciprocating second body having a conically shaped surface serving as another molding member and arranged for descending movement into said conical volume in close proximate relation to said shaping surface of said first body so as to define a shaping compartment of conical configuration between said molding members, and pressure air means operatively connected to inject pressure air into said shaping compartment at the apex of said conical configuration thereof at the conclusion of the molding operation of said molding members, whereby said injected pressure air radiates from said point of entry circumferentially throughout said conical shaping compartment to stabilize the shaped fabric therein preparatory to the parting of said molding members.

3,891,379
SPINNING HEAD WITH AN EXCHANGEABLE, SELF-SEALING NOZZLE ASSEMBLY
Erich Lenk, Remscheid, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany
Filed Sept. 27, 1973, Ser. No. 401,540
Claims priority, application Germany, Oct. 5, 1972, 2248756
Int. Cl. B29f *3/04*
U.S. Cl. 425—464 **10 Claims**

1. A spinning head for the spinning of thermoplastic polymers around a vertical axis, including a relatively stationary feed member supplying the melt, a nozzle assembly laterally withdrawable from and insertable in said spinning head and connectable to said feed member in self-sealing relationship under the action of the melt pressure, said nozzle assembly comprising a casing member and, supported by and retained in said casing member, spinning elements including at least a die plate, elongated cooperating guideways being respectively provided on said feed member and said casing member for the withdrawal and insertion of said casing member with said spinning elements therein, said guideways being disposed so that the self-sealing forces due to the action of the melt pressure give rise, in a direction parallel to the vertical axis of said spinning head, substantially to only tensional stresses in said casing member.



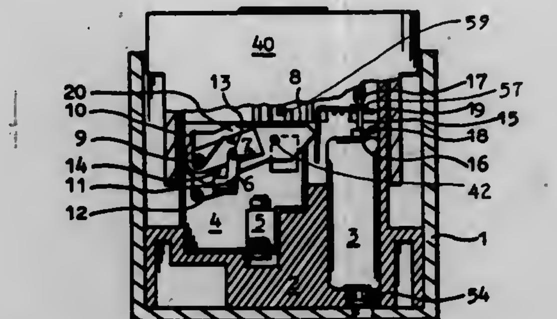
3,891,380
FUEL-FEED SYSTEM OF COMBUSTION CHAMBER IN AN IMPULSE-EFFECT MACHINE FOR PLASTIC METAL WORKING
Vadim Grigorievich Kononenko, ulitsa Chkalova, 15, kv. 12; Vitaly Evgenievich Strizhenko, ulitsa Osnovyanskaya, 56; Stanislav Anisimovich Maznichenko, Saltovsky Massiv, 521 mikroraion, 68, kv. 188; Vladimir Nikolaevich Sarancha, ulitsa Kosmonavtov, 7a, kv. 71; Viktor Alexeevich Stelmakh, ulitsa Kirova, 18, kv. 2; Igor Pavlovich Komnatny, ulitsa Cheljuskintsev, 6, kv. 1; Serafim Vasilievich Schekochikhln, Pervaya Lesoparkovaya, 5, kv. 76; Viktor Vasilievich Bozhko, ulitsa Chkalova, 15, kv. 1; Nikolai Borisovich Ponomarenko, ulitsa Chkalova, 15, kv. 1; Valeria Mikhailovna Danilenko, ulitsa Lenina, 12, kv. 150, and Sergei Vasilievich Yatsenko, Moskovsky prospekt, 204/1, kv. 36, all of Kharkov, U.S.S.R.
Filed Mar. 12, 1974, Ser. No. 450,495
Int. Cl. F23c *3/02*
U.S. Cl. 431—1 **2 Claims**



1. A fuel-feed system of the combustion chamber in an impulse-effect machine for plastic metal working, comprising in combination the following components: a high pressure air line (1); a shut-off device (7) of said combustion chamber; a pressure governor (4); a non-return valve (5) positioned in the direction of the air stream flow; a pneumoelectric valve (9); a non-return valve (10); an admission valve (12) provided on a shell (8) of said combustion chamber; said high pressure air line (1) communicating through said pressure

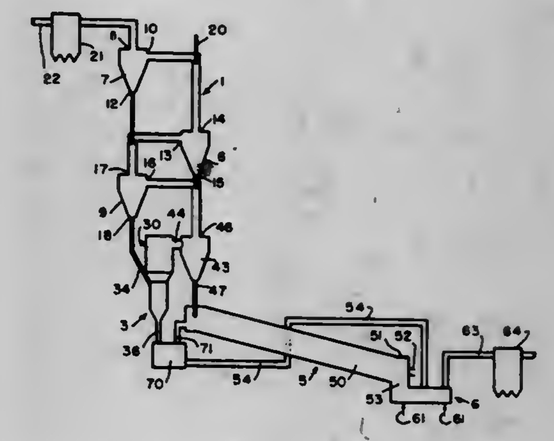
governor (4) and said non-return valve (5) with the air side of said shut-off device (7) and being series-connected (with respect to the direction of the air stream flow) to said admission valve (12) through said pneumoelectric valve (9) and said non-return valve (10); a low pressure gas line (13); an air-operated valve (16); a non-return valve (17); said low pressure gas line (13) being communicated in series (with respect to the direction of the combustible gas flow) with said admission valve (12) through said air-operated valve (16) and said non-return valve (17); a compression release valve (19) provided on the shell (8) of said combustion chamber to communicate the interior space (20) thereof with the atmosphere; a pneumoelectric valve (21) to communicate said compression release valve (19) with said high pressure air line (1); a pressure relief valve (26), provided on the shell (8) of said combustion chamber; a pneumoelectric valve (29); an air-operated valve (24) controlled by compressed air from said high pressure air line (1) through said pneumoelectric valve (29); a meter (22) to measure combustible gas pressure inside the interior space (20) of said combustion chamber, said meter being connected, through said pressure relief valve (26) and said air-operated valve (24) to said interior space (20) of said combustion chamber; a pneumoelectric valve (33); an air-operated valve (30) controlled by compressed air from said high pressure air line (1) through said pneumoelectric valve (33); a meter (23) to measure combustible mixture pressure inside said interior space (20) of said combustion chamber, said meter being connected through said pressure relief valve (26) and said air-operated valve (30) to said interior space (20) of said combustion chamber; a pipeline (6) communicating, through said admission valve (12), said interior space (20) of said combustion chamber with said air side of said shut-off device.

3,891,381
SPARK IGNITABLE CIGARETTE LIGHTER
Nobuyoshi Moriya, Urawa, Japan, assignor to Mansei Kogyo Kabushiki Kaishya, Kawaguchi-shi, Japan
Filed Mar. 28, 1974, Ser. No. 455,866
Claims priority, application Japan, Mar. 31, 1973, 48-39329
Int. Cl. F23q *2/28*
U.S. Cl. 431—255 **18 Claims**



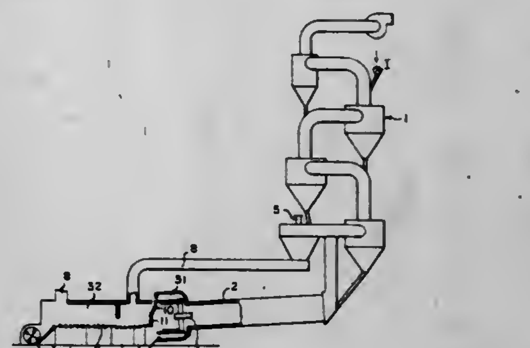
1. A piezoelectrically energizable spark ignitable cigarette lighter comprising a casing, piezoelectric means for generating a high voltage, a striker operatively engageable with said piezoelectric means, an actuator member for effecting displacement of said striker, a pair of spaced electrodes defining a spark gap connectable to said piezoelectric voltage generating means, a fuel tank disposed within said casing, a burner assembly including a burner nozzle connected in fuel transfer relation with said fuel tank and a burner housing member disposed around said burner, said burner housing having a top wall with a flame opening therein and a peripheral wall having at least one aperture therein, and an air deflecting wall disposed in radial alignment with said aperture to shield said burner nozzle from direct flow of combustion supporting air passing through said aperture.

3,891,382
APPARATUS FOR CALCINING RAW MATERIAL
Thomas R. Lawall, Emmaus, and Edward S. Porter, Bethlehem, both of Pa., assignors to Fuller Company, Catasauqua, Pa.
Filed Feb. 27, 1974, Ser. No. 446,435
Int. Cl. F27b *15/00, 15/10*
U.S. Cl. 432—58 **6 Claims**



1. Apparatus for calcining raw material comprising:
a vessel having an inlet for raw material to be calcined, means for producing a combustion zone in said vessel, as inlet for combustion air and an outlet for spent combustion air and calcined material whereby the direction of combustion air flow is from said inlet for combustion air to said outlet for spent combustion air through said vessel;
said inlet for raw material and combustion air being located upstream of said inlet for fuel and said outlet for spent combustion air in the direction of combustion air flow.

3,891,383
ROTARY KILN APPARATUS WITH SUSPENSION PREHEATER HAVING BURNER FOR CALCINING
Toshihiro Kobayashi, Tokyo, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 3, 1973, Ser. No. 421,329
Claims priority, application Japan, Dec. 6, 1972, 47-12164
Int. Cl. F27b *7/02, 7/38*
U.S. Cl. 432—80 **3 Claims**



1. Apparatus of the type having a suspension preheater to which powdery raw materials are supplied and also having a calcining burner, a rotary kiln for receiving the raw materials and including a burner for burning the raw materials to cement clinker and also including a discharge end for the clinker, and a planetary type multicylinder precooler associated with said discharge end comprising a plurality of cylinders arranged in a circle concentric with the kiln, said cylinders extending parallel to the kiln longitudinal axis and having means at its outlet ends to provide direct communication with the atmosphere and having its inlet ends communicating with said discharge end, the outlet ends of each cylinder being

provided with an upstanding weir means arranged to allow discharge of clinker only when the cylinders approach the highest position of rotation and a main cooler having an inlet for receiving clinker from the outlet ends of the cylinders and a vent port connected with the calcining burner.

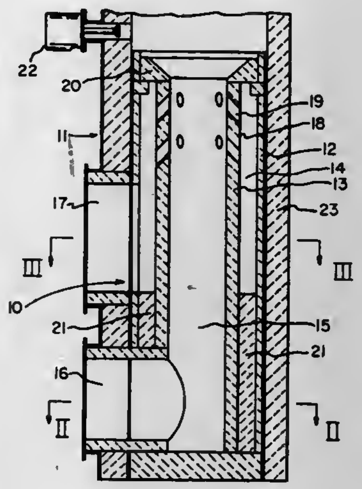
3,891,384
STOVE BURNER

James E. Hovis, Jefferson Twp., Allegheny County; James E. Johns, and Harry P. Finke, both of Pittsburgh, all of Pa., assignors to Bloom Engineering Company, Inc., Pittsburgh, Pa.

Filed Nov. 5, 1973, Ser. No. 412,667
Int. Cl. F23l *9/04*

U.S. Cl. 432—217 **6 Claims**

1. In combination, a vertical hot blast stove combustion chamber and a refractory burner spaced inwardly and independently of and concentrically within said combustion chamber, said refractory burner comprising an annular exterior wall in axial alignment with and positioned at substantially the bottom of the combustion chamber, a concentric inner vertical wall forming an annular chamber between said walls and a central mixing chamber, a gas inlet extending into the mixing chamber near a bottom end thereof, a combustion air inlet extending into the annular chamber, a baffle formed in the inner wall spaced upwardly of the air inlet and having at least one row of combustion air apertures extending through the vertical inner wall and into the mixing chamber, said apertures being skewed relative to the mixing chamber so as to be inclined both upwardly and obliquely thereinto to form a swirling flow pattern in a convergent manner.



CHEMICAL

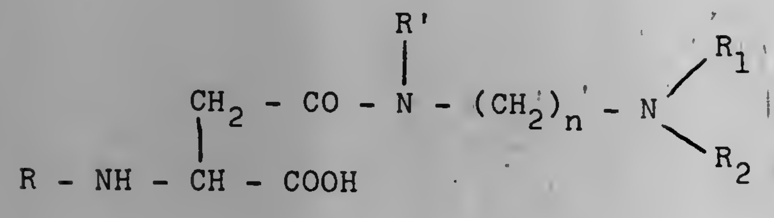
3,891,385
HAIR SOFTENING DYE COMPOSITIONS CONTAINING SURFACE-ACTIVE ASPARAGINE DERIVATIVES

Gregoire Kalopissis; Andre Viout, both of Paris, and Guy Vanlerberghe, Montjay-la-Tour, all of France, assignors to Societe Anonyne dite: L'Oreal, Paris, France

Division of Ser. No. 12,477, Feb. 12, 1970, which is a continuation-in-part of Ser. No. 424,846, Jan. 11, 1965, Pat. No. 3,534,032. This application Sept. 6, 1972, Ser. No. 286,698
Int. Cl. A61k *7/12*

U.S. Cl. 8—10.1 **3 Claims**

1. A hair and dye softening composition comprising an effective amount of an asparagine compound having the formula:



$$R-NH-CH(COOH)-CH_2-CO-N(R')-(CH_2)_n-N(R_1)(R_2)$$

or its sodium potassium, or ammonium salt, wherein R and R′ are selected from the group consisting of alkyl having 10 to 18 carbon atoms and alkenyl having 10 to 18 carbon atoms;

R_1 and R_2 are lower alkyl or together with the nitrogen atom on which they are attached constitute morpholino;

and *n* is an integer of 2 to 5,

which has an acid pH, and a hair coloring amount of a hair dye.

3,891,386
PROCESS FOR CONTINUOUSLY TREATING SPUNLACED NONWOVEN POLYESTER TEXTILES ON A TENTER FRAME

James P. Reid, Jr., and Bobby L. McConnell, both of Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed June 13, 1973, Ser. No. 369,592
Int. Cl. D06p *5/00*

U.S. Cl. 8—18 **7 Claims**

1. A process for dyeing a spunlaced nonwoven polyester fabric which comprises padding said fabric with an aqueous pad liquor including disperse polyester dye, leveling agent and ammonium polyacrylate and then passing the thus padded fabric through a tenter frame at 350° to 400°F for 20 to 90 seconds whereby said fabric is continuously and simultaneously dyed and heat set said fabric being overfed to the tenter frame.

3,891,387
METHOD FOR CHECKING THE YARN PATTERN IN A FABRIC

Bruce M. Latta, Bloomingdale, and John J. Willard, Jr., Fair Lawn, both of N.J., assignors to J. P. Stevens and Co., Inc., New York, N.Y.

Filed Oct. 30, 1972, Ser. No. 301,928
Int. Cl. D06p *5/00*

U.S. Cl. 8—18 **6 Claims**

1. A process for checking a pattern of a greige fabric containing yarns having different dyeing properties and different oleophilic properties, after a plurality of adjacent yarns have broken during production of said fabric on a knitting machine or loom and said broken yarns have been rethreaded using fugitive tints on the yarns for identification, said process comprising applying an emulsion of an oil and either an alkanol or water to an area of fabric containing said rethreaded yarns without removing said area from the fabric being produced by said knitting machine or loom, allowing said fabric to at least partially dry whereby the emulsion breaks and different amounts of oil migrate to the yarns having different oleophilic properties, applying a solution of a fugitive tint to said fabric and drying said fabric whereby a color pattern is developed by the overtinting in which the color is dependent on the amount of oil on each yarn.

3,891,388
EXHAUST PROCESS FOR THE DYEING OF SYNTHETIC FIBRE MATERIALS

Rütger Neeff, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Continuation of Ser. No. 161,282, July 9, 1971, abandoned. This application Nov. 19, 1973, Ser. No. 416,867
Claims priority, application Germany, July 10, 1970, 2034264; May 18, 1971, 2124495; May 18, 1971, 2124496
Int. Cl. C09b *5/62*

U.S. Cl. 8—39 **12 Claims**

1. Process for dyeing synthetic fiber material by exhaustion comprising introducing synthetic fiber material into a dyebath which is a dispersion consisting essentially of

A. organic solvent
B. anthraquinone dyestuff containing 1 to 3 sulfonamide groups and largely insoluble in said dyebath; and
C. up to 1% by weight of said organic solvent of water; said organic solvent consisting of water immiscible aliphatic halogented hydrocarbon;

dyeing at a temperature of 60° to 170°C for 10–60 minutes until the dyebath is exhausted;

said anthraquinone dyestuff free of reactive groups, acid groups and carboxamide groups having the formula

$$[A]\,(X-Y-D)_n$$

in which

A is an unsubstituted anthraquinone radical or an anthraquinone radical substituted with halogen, hydroxy, C_1–C_4-alkoxy, nitro, amino, C_1–C_4-alkylamino, cycloalkylamino, arylsulfonylamino or C_1–C_4-alkylsulfonylamino groups;

D is a sulfonamide group;

X is a single C—C-bond, —NH—, —O—, —S—, $-SO_2-$ or $-SO_3-$;

Y is a single C—C-bond, arylene, C_1–C_4-alkylene, C_1–C_4-alkylene-arylene, C_1–C_4-alkylene-oxyarylene or alkylene-thioarylene; and

n is 1 or 2.

3,891,389
SHRINKAGE-CONTROL TREATMENT FOR KNITTED FABRICS

Gerald B. Verburg, Metairie; John G. Frick, Jr., and John D. Reid, both of New Orleans, all of La., assignors to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 31, 1973, Ser. No. 328,199
Int. Cl. D06c *1/02*

U.S. Cl. 8—149.2 **7 Claims**

1. In the process of producing finished, durable-pressed, knitted, cotton-containing garments wherein cotton-containing knit fabric is crosslinked to impart durable-press characteristics to the fabric and then formed into garments, the improvement comprising agitating the fabric in a slack condition after said fabric is crosslinked but before it is formed into a garment.

3,891,390
BASIC DYE-BATH AND METHOD FOR DYEING ACRYLIC FIBERS THEREWITH

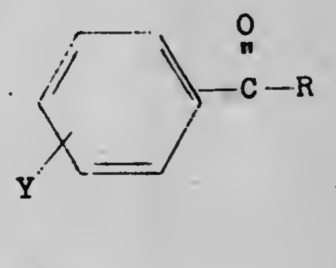
Sadaharu Abeta, Toyonaka, Japan, assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 14, 1971, Ser. No. 134,056
Int. Cl. D06p *3/76*

U.S. Cl. 8—173 **5 Claims**

1. A process for dyeing acrylic fibers obtained from a long-chain synthetic polymer composed of at least 70 percent acrylonitrile units by weight which comprises treating said fibers with a dyebath consisting essentially of:

a. a basic dyestuff containing a pentavalent nitrogen atom;
b. an aromatic ketone of the formula



wherein Y is selected from the group consisting of hydrogen, halogen and alkyl of 1–4 carbon atoms and R is alkyl of 1–4 carbon atoms; and

c. a dye-dissolving agent selected from the group consisting of acetic acid, formic acid, thio-diethylene glycol, diethylene glycol, and ethylene glycol; wherein said (b) constitutes the major portion of said dye-bath and said (c) constitutes a minor portion of the total dye-bath composition;

and thereafter subjecting the treated fiber to heat treatment.

3,891,391
FLUID FLOW MEASURING SYSTEM USING IMPROVED TEMPERATURE COMPENSATION APPARATUS AND METHOD

George R. Boone, 4730 Ridgebury Dr., Dayton, Ohio 45440

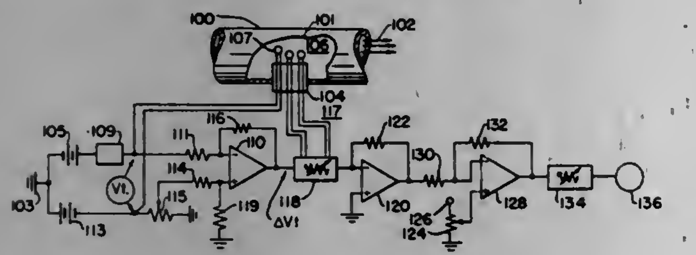
Filed May 14, 1973, Ser. No. 360,134
Int. Cl. G01f *1/00;* **G01p** *5/10*

U.S. Cl. 73—204 **29 Claims**

1. A method for processing the electrical signal generated by a self-heated flow responsive thermal element in a fluid flow measuring apparatus to obtain therefrom a flow indicative output signal that is substantially invarient with respect to fluid temperature, said method comprising the steps of:

exciting a fluid immersed thermal element with a signal generating constant current that is independent of fluid temperature and flow rate and selected to operate the element at a temperature above the fluid temperature;

subtracting from said thermal element signal a constant offset signal that is greater than zero and smaller than the smallest magnitude of said thermal element signal during any condition to be measured and wherein said offset signal has the same value for all flow rates and temperatures of the fluid being measured and selected in accordance with the properties of the measuring apparatus and the flowing fluid, thereby forming a corrected signal;



selecting a predetermined different fractional part of said corrected signal for use as said flow indicative output signal at each fluid temperature;

whereby removing said constant offset signal prior to selecting a fractional part of the corrected thermal element signal for use as an output signal allows said output signal to be selected from said corrected signal independently of flow rate.

3,891,392

METHOD OF MAINTAINING A COLUMN OF LIQUID WITHIN AN OPEN-ENDED TUBE, AND A TUBE DEVICE FOR CARRYING OUT THE METHOD

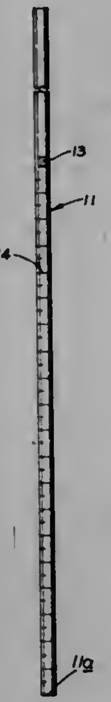
Peter Alan Betts, 40 Oldfield Rd., Chesire, Sandbach, and Kenneth Stephenson, 18 Hodder Ave., Littleborough, both of England

Filed Jan. 24, 1973, Ser. No. 326,233

Claims priority, application United Kingdom, July 4, 1972, 31127/72

Int. Cl. B01l *3/02;* **G01f** *13/00;* **G01n** *1/10*

U.S. Cl. 23—230 R **1 Claim**



1. A method of maintaining a column of liquid within an open-ended tube comprising the steps: placing within the tube a plug of porous material having a capillary attraction for a liquid, positioning the plug at a predetermined distance from one end of the tube corresponding to the height of the desired column of liquid, placing the one end of the tube in communication with a supply of liquid, applying to the other end of the tube suction sufficient to draw a column of liquid from the liquid supply into the tube to a position wherein its surface level lies above the plug, terminating the suction to lower the column of liquid until the liquid surface contacts the plug, and maintaining the remaining column of liquid by capillary attraction between the liquid and the plug.

3,891,393

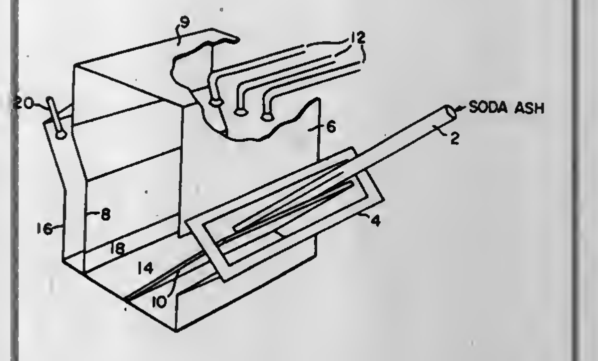
APPARATUS FOR SLURRYING SODA ASH

Lorne E. Weeks, Kenmore, and Ronald W. Doran, Tonawanda, both of N.Y., assignors to Intermountain Research and Development Corporation, Green River, Wyo.

Division of Ser. No. 143,062, May 13, 1971, Pat. No. 3,802,848. This application Dec. 3, 1973, Ser. No. 421,278

Int. Cl. C01d *7/00;* **B01f** *3/12;* **B01d** *5/20*

U.S. Cl. 23—271 R **3 Claims**



1. An apparatus for slurrying soda ash comprising an enclosed housing, an inclined divergent injection nozzle extending through an opening in one side of said housing for dispersing soda ash particles in substantially a flat plane, an inclined splash plate attached along its lower edge to the base of said housing and substantially parallel to and below the plane of soda ash particles introduced through said nozzle, a plurality of liquid spraying means located above said nozzle for dispersing fluid downwardly onto the soda ash particles and splash plate, and an opening in the base of said housing running alone the lower edge of said splash plate to permit the resulting soda ash slurry to exit from the lower end of the splash plate into a storage tank, said storage tank being located directly below and in sealing relationship with said opening.

3,891,394

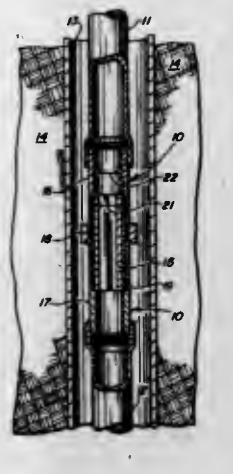
CRYSTAL GENERATOR TO INHIBIT SCALE FORMATION AND CORROSION IN FLUID HANDLING SYSTEMS

Owen Smith, and James F. Holder, both of Scottsdale, Ariz., assignors to Love Oil Company, Inc., Scottsdale, Ariz.

Filed Apr. 10, 1974, Ser. No. 459,548

Int. Cl. B01d *9/02;* **C23f** *13/00*

U.S. Cl. 23—273 R **10 Claims**



1. An apparatus for generating crystals in a fluid flow line to inhibit scale formation and corrosive action comprising: a fluid flow pipe,

a hollow core snugly fitting into said fluid flow pipe in a well having a bore configuration, the internal cross-sectional area of which is less than the cross-sectional area of the fluid flow pipe, said core being formed of an alloy comprising substantially 54 to 69 percent of copper, 1 to 23 percent of zinc, 9 to 27 percent of nickel, 0.9 to 11 percent of lead, and 1 to 7 percent of tin.

an insulating sleeve mounted around said core to prevent electrolytic action between said core and said fluid flow pipe,

the upstream end of said core, being mounted in said fluid flow pipe, providing a flange extending inwardly of the surface of the fluid flow pipe in which it is mounted to provide a means for creating a high velocity and turbulence of the fluid as it enters the bore of said core,

said high velocity and turbulence creating an abrupt disturbance which aids in crystal formation in the fluid which are washed away by the violent action of the fluid before additional crystals can grow around the initial crystals and form scale on adjacent equipment surfaces.

3,891,395

CRYSTALLISER WITH INTERGRAL PUMPING MEANS

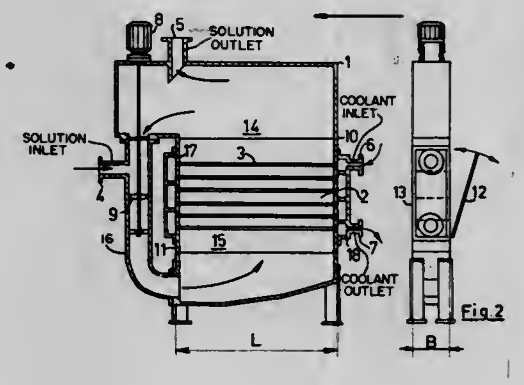
Robert Winkler, Wallisellen, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Continuation of Ser. No. 205,142, Dec. 6, 1971, abandoned. This application Apr. 29, 1974, Ser. No. 465,092

Claims priority, application Switzerland, Dec. 17, 1970, 18692/70

Int. Cl. B01d *9/00*

U.S. Cl. 23—273 **10 Claims**



1. A crystalliser comprising

a. a generally prismatic container including first and second pairs of parallel planar walls which bound a heat exchanger space in the form of a duct of rectangular cross section, portions of the walls of the first of said pairs being formed as tube plates,

b. the container also containing two free spaces at its opposite ends which are enclosed in part by portions of the second of said pairs of walls and which communicate with each other through said duct of rectangular cross section;

c. a plurality of straight, parallel heat exchange tubes extending between said tube plates;

d. conduit means for circulating a coolant through said tubes;

e. duct means, including a pump, interconnecting said end spaces and providing therebetween a second, confined flow path separate from the confined flow path through the heat exchanger space, the duct means and the container spaces defining a definite recirculation loop for solution to be cooled which forces the solution to flow in series through the first end space, the heat exchanger space, the second end space and the duct means, and then return to the first end space; and

f. inlet and outlet passages serving, respectively, to conduct said solution into and out of the container.

3,891,396

ELASTIC HOLDER FOR CERAMIC MONOLITHIC CATALYST BODIES

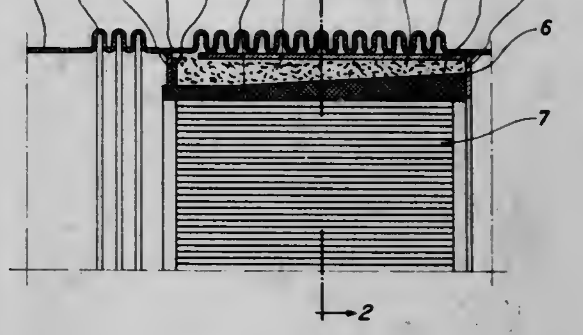
Reimar Musall, and Wilhelm Wolsing, both of Hannover, Germany, assignors to Kali-Chemie AG., Hannover, Germany

Filed Feb. 20, 1973, Ser. No. 333,714

Claims priority, application Germany, Feb. 29, 1972, 2209487; Feb. 29, 1972, 2209488

Int. Cl. F01n *3/14;* **B01j** *9/04*

U.S. Cl. 23—288 F **3 Claims**



1. An elastic holder, for use in holding a monolithic catalyst body suitable for removing toxic gases from an exhaust gas passage, such holder comprising:

a metallic corrugated tube forming the outer wall of said exhaust gas passage;

a ceramic sleeve having two end portions and being positioned within said corrugated tube surrounding, and being rigidly connected to, said catalyst body;

one end portion of said sleeve being of cylindrical external shape and the sleeve increasing in diameter towards the other end portion;

an annular space defined between said metallic, corrugated tube and said ceramic sleeve filled with ceramic wadding; and

end bearings for said catalyst body composed of annular flanges rigidly secured to said corrugated tube, each flange being disposed near an end portion of said sleeve, said corrugated tube being provided with an initial tension adapted for pressing one of said annular flanges against said ceramic sleeve at the other end portion thereof to restrain sleeve movement in one axial direction, the other flange surrounding the cylindrical end portion of said ceramic sleeve with clearance, whereby the wadding will be compressed and in cooperation with the increasing diameter of the sleeve, will restrain sleeve movement in the opposite axial direction.

3,891,397

CRYSTALLIZATION OF SODIUM CHLORIDE OF REDUCED CALCIUM SULFATE CONTENT IN PRESENCE OF ABOUT 5 TO ABOUT 500 PPM

Howard W. Fiedelman, Woodstock, Ill., assignor to Morton-Norwich Products, Inc., Chicago, Ill.

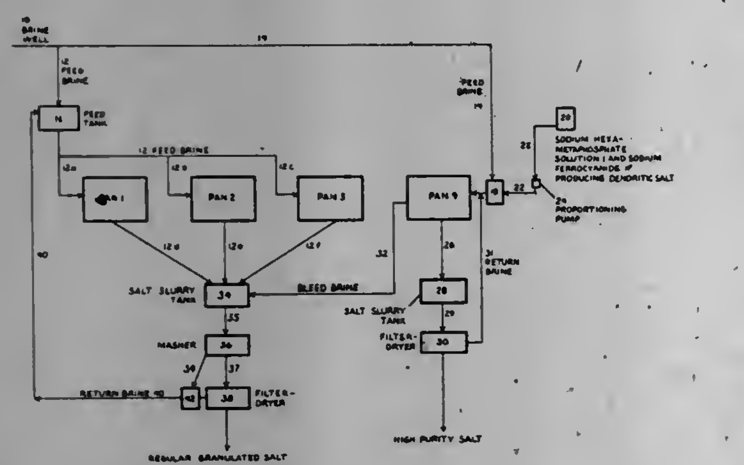
Filed June 19, 1974, Ser. No. 480,615

Int. Cl.^{2} C01C *3/06;* **C01D** *3/16*

U.S. Cl. 23—300 **5 Claims**

1. A process for preparing a high purity cubic crystalline sodium chloride having a reduced calcium sulfate content which comprises continuously feeding raw sodium chloride brine containing dissolved calcium sulfate in an amount of from about 0.5 to about 5.5 grams per liter into an evaporating and crystallizing chamber, concentrating and evaporating said brine at an elevated temperature below about 260°F. and at reduced pressure in the presence of no more than from about 5 to about 500 parts per million on a saturated brine basis of an additive consisting of an alkali polyphosphate to produce a crystalline sodium chloride, concomitantly bleeding brine from said evaporating chamber at a rate such that the maxi-

mum calcium sulfate content the brine reaches is from about one and one half to about twice that of its concentration in the raw brine, the rate of feed of raw brine to said evaporating chamber and the rate of bleed of brine therefrom being adjusted to maintain calcium sulfate in solution, and concomitantly withdrawing solid sodium chloride crystals from said evaporating chamber, said sodium chloride containing not more than about 30 ppm of calcium expressed as calcium.



3,891,398
DISC BRAKE PADS FORMED FROM TWO SINTERED METALLIC LAYERS
Jean Odier, Antony, France, assignor to Ferodo Limited, Manchester, England
Filed Jan. 19, 1973, Ser. No. 325,034
Claims priority, application France, Jan. 20, 1972, 72.01843
Int. Cl. B22f *1/00, 7/02, 5/00*
U.S. Cl. 29—182.2 **15 Claims**

1. A monolithic self-supporting disc brake pad consisting essentially of two consolidated layers of sintered metallic powder, wherein (i) a first of said layers forms the friction lining of the pad, (ii) the second of said layers forms the carrier plate of the pad, (iii) the matrix of each layer comprises a sintered wear-resistant metal powder common to both layers, and (iv) the first layer comprises a smaller percentage by weight of the sintered wear-resistant metal powder than the second layer and also comprises a friction enhancing or lubricant additive compatible with the sintered wear-resistant metal powder.

3,891,399
SINTERED GLASS CONTAINING FERROUS MATERIAL
Terence M. Cadle, Coventry, England, assignor to Bries Engineering Ltd., Coventry, England
Filed Aug. 31, 1972, Ser. No. 285,120
Claims priority, application United Kingdom, Sept. 15, 1971, 42961/71
Int. Cl. C22c *1/05*
U.S. Cl. 29—182.5 **11 Claims**

1. A sintered ferrous material made by powder metallurgy, the material including iron in an amount of at least 50 percent by weight and from 0.125 to 0.5 percent by weight of glass.

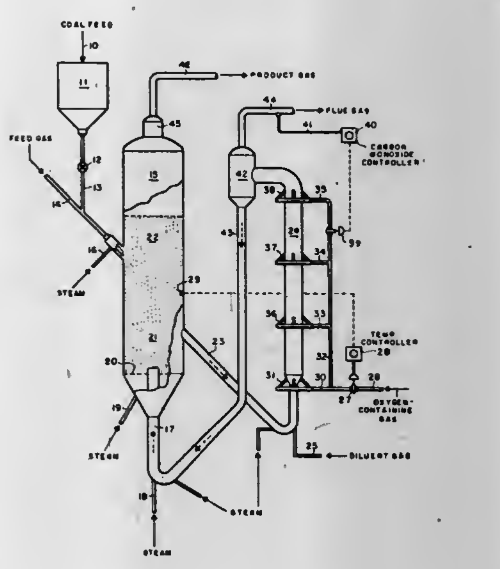
3,891,400
ALUMINUM VACUUM BRAZING SHEET
Ivan B. Robinson, Livermore, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.
Filed Feb. 8, 1973, Ser. No. 330,709
Int. Cl. B32b *15/00*
U.S. Cl. 29—197.5 **6 Claims**

1. An aluminum vacuum brazing sheet comprising an aluminum alloy core, clad on at least one side of said core is a layer of an aluminum brazing alloy consisting essentially of about 5–15 percent by weight silicon, about 0.5–5 percent by weight magnesium and the balance aluminum and inconsequential amounts of other elements, and clad on said brazing alloy layer is an essentially magnesium-free aluminum alloy layer, said core and said magnesium-free layer having a liquidus temperature considerably higher than the liquidus temperature of said brazing alloy layer.

3,891,401
REDUCING DEPOSITS AND SMOKE FROM JET FUELS
Roger William Watson, Batavia; John Henry Udelhofen, Glenwood, and Joseph Stephan Strukl, Hickory Hills, all of Ill., assignors to Standard Oil Company, Chicago, Ill.
Filed Mar. 1, 1971, Ser. No. 119,865
Int. Cl. C10l *1/24, 1/30*
U.S. Cl. 44—68 **4 Claims**

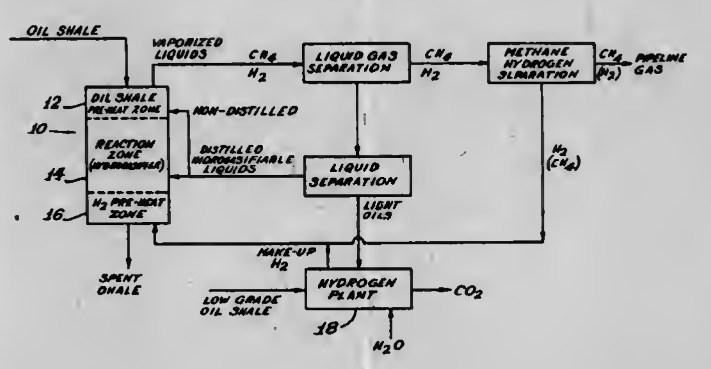
1. A composition, suitable as a deposit-reducing and smoke-inhibiting additive for jet fuels, comprising methylcyclopentadienyl manganese tricarbonyl and basic calcuim alkylphenol sulfide to provide 80–90 parts by weight manganese and 10–20 parts by weight calcium.

3,891,402
TRANSFER LINE BURNER SYSTEM
Nicholas C. Nahas, and Edward L. Wilson, both of Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.
Filed June 25, 1973, Ser. No. 373,554
Int. Cl. C10j *3/12*
U.S. Cl. 48—197 R **5 Claims**



1. In a process wherein a solids stream consisting essentially of carbonaceous particles withdrawn from a fluidized bed reactor is contacted with an oxygen-containing gas in a transfer line burner to burn carbon present in said particles and raise the temperature of said stream, wherein heated particles and combustion gases containing carbon monoxide are withdrawn overhead from said transfer line burner, and wherein said heated particles are separated from said combustion gases and returned to said fluidized bed reactor; the improvement which comprises introducing a first stream of oxygen-containing gas into said transfer line burner at a point near the lower end thereof in a quantity sufficient to initiate the combustion of carbon in said particles, introducing additional oxygen-containing gas into said burner at a second point near the upper end of said burner in a quantity sufficient to burn carbon monoxide present in the combustion gases reaching said second point and generate additional heat, monitoring the carbon monoxide content of the combustion gases withdrawn from said burner, regulating the relative quantities of oxygen-containing gas introduced into said burner at said first point and said second point in response to changes in the carbon monoxide content of said combustion gases withdrawn from said burner, and controlling the total amount of oxygen-containing gas introduced into said burner in response to changes in the temperature in said fluidized bed reactor.

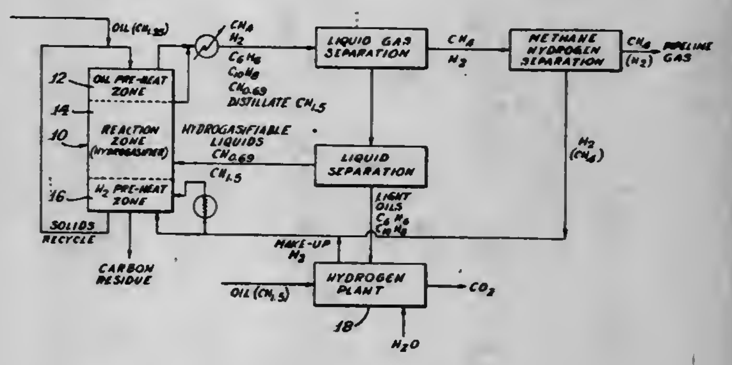
3,891,403
OIL SHALE HYDROGASIFICATION PROCESS
Sanford A. Weil, Chicago; Paul B. Tarman, Elmhurst, and Dharamvir Punwani, Chicago, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.
Filed Mar. 9, 1973, Ser. No. 339,547The portion of the term of this patent subsequent to June 24, 1992, has been disclaimed.
Int. Cl. C10j *3/06*
U.S. Cl. 48—197 R **10 Claims**



1. A process for producing a high methane content, synthetic pipeline quality gas from kerogen containing oil shale, wherein there is a minimal carbon residue formation resulting from the conversion of the kerogen to the pipeline quality gas which comprises the steps of:

- a. continuously flowing the kerogen containing oil shale through a preheat zone at a flow rate sufficient to provide at least ten minutes to gradually heat the oil shale from a temperature of 600° to a temperature of 1000°F.;
- b. continuously contacting the oil shale in the preheat zone during the gradual heating with a countercurrently flowing hydrogasification product gas stream as removed from a hereinafter defined hydrogasification zone;
- c. said hydrogasification gas stream containing at least stoichiometric amounts of hydrogen to achieve a high hydrogen to oil ratio in the preheat zone;
- d. withdrawing a preheated kerogen containing oil shale from the preheat zone and passing the preheated shale to a hydrogasification zone;
- e. hydrogasifying, in the hydrogasification zone, the preheated kerogen containing oil shale at a temperature of 1200°–1500°F. in the presence of a countercurrently flowing hydrogen rich gas stream containing at least stoichiometric amounts of hydrogen to achieve a high hydrogen to oil ratio and, to produce hot spent shale and a hydrogasification product gas stream;
- f. passing said hydrogasification product gas stream to said preheat zone of step (b) as said hydrogasification product gas stream;
- g. maintaining the hydrogen partial pressure in the preheat and hydrogasification zone at a pressure of at least 100 psig.;
- h. withdrawing a final product gas stream from said preheat zone comprising hydrogen, volatilized liquid products and gaseous hydrogasification products;
- i. separating said final product gas stream into a hydrogen rich gas stream, said high methane content synthetic pipeline gas, a hydrogasifiable liquid distillate fraction and a hydrogasifiable non-distillate fraction;
- j. recycling the hydrogen rich gas to said hydrogasification zone;
- k. passing the hydrogasifiable distillate fraction to the hydrogasification zone; and
- l. passing the non-distillate fraction to the preheat zone at a point where the shale is at a temperature of 600°–700°F. whereby a maximum net conversion of kerogen to substitute natural gas is obtained.

3,891,404
HEAVY OIL HYDROGASIFICATION PROCESS
Sanford A. Weil, Chicago; Paul B. Tarman, Elmhurst, and Dharamvir Punwani, Chicago, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.
Filed Mar. 9, 1973, Ser. No. 339,545
Int. Cl. C10g *13/16*
U.S. Cl. 48—213 **14 Claims**



1. A process for producing a high methane content, synthetic pipeline quality gas from heavy oil, wherein there is a minimal carbon residue formation resulting from the conversion of the heavy oil to the pipeline quality gas which comprises the steps of:

- a. continuously flowing absorbent inert solids and the heavy oil through a preheat zone at a flow rate sufficient to provide at least ten minutes to gradually heat the oil from a temperature of 600°F to a temperature of 1000°F.;
- b. continuously contacting the heavy oil and solids in the preheat zone during the gradual heating with a countercurrently flowing hydrogen rich gas stream;
- c. said hydrogen rich gas stream containing at least stoichiometric amounts of hydrogen to achieve a high hydrogen to oil ratio in the preheat zone;
- d. withdrawing preheated inert solids and heavy oil from the preheat zone and passing the preheated solids and heavy oil to a hydrogasification zone;
- e. hydrogasifying, in the hydrogasification zone, the preheated heavy oil at a temperature of 1200°–1500°F. in the presence of a countercurrently flowing hydrogen rich gas stream containing at least stoichiometric amounts of hydrogen to achieve a high hydrogen to oil ratio and to produce a gaseous product stream comprising hydrogen, volatized liquid products and gaseous hydrogasification products;
- f. maintaining the hydrogen partial pressure in the preheat and hydrogasification zone at a pressure of at least 100 psig.;
- g. separating the gaseous product stream produced in the hydrogasification zone to provide a hydrogen rich gas stream, said high methane content synthetic pipeline gas, and a distillate hydrogasifiable liquid fraction and a non-distillate liquid fraction;
- h. passing at least a portion of the distillate fraction to the hydrogasification zone;
- i. passing at least a portion of the non-distillate fraction to the preheat zone; and
- j. withdrawing the inert solids from said hydrogasification zone wherein less than 10% of the carbon in the heavy oil feed is deposited as carbon residue on the withdrawn solids.

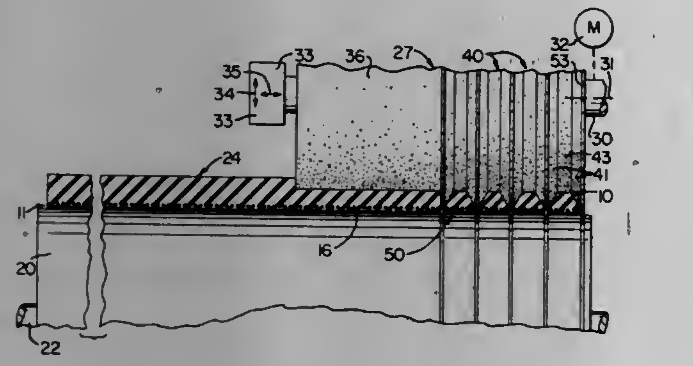
3,891,405
APPARATUS FOR MAKING AN ENDLESS POWER TRANSMISSION BELT

Walter E. Huber, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 310,053, Nov. 28, 1972, Pat. No. 3,882,516. This application Mar. 19, 1974, Ser. No. 452,873

Int. Cl.² B24B *7/20;* **B29H** *7/22*

U.S. Cl. 51—105 R **6 Claims**



1. An apparatus for grinding a belt sleeve to define an endless power transmission belt having a substantially trapezoidal cross-sectional configuration including opposed non-parallel side portions interconnected at their outer ends by a shorter one of the parallel sides of said substantially trapezoidal cross-sectional configuration; said apparatus comprising a mandrel for supporting a belt construction for rotation about a longitudinal axis; means for rotating said mandrel and belt construction about said longitudinal axis; a rotatable grinding wheel having a pair of substantially identical symmetrically arranged and outwardly diverging integral grinding surfaces with said pair of outwardly diverging integral grinding surfaces having inner edges adjoined by a right circular cylindrical grinding surface, said grinding wheel further comprising a pair of integral disc-like portions each adjoining an outer edge of an associated outwardly diverging integral grinding surface, said disc-like portions being particularly adapted to grind a pair of opposed wall portions in said belt which adjoin a longer one of the parallel sides of said belt; and means for moving said grinding wheel toward and away from said belt construction, said moving means being particularly adapted to urge said grinding wheel during rotation thereof against the rotating belt construction to simultaneously define said belt with said outwardly diverging integral grinding surfaces defining said non-parallel side portions and said right circular cylindrical grinding surface defining the shorter of the parallel sides of said belt.

3,891,406
INNER SURFACE HONING DEVICE WITH WORKPIECE TRANSFER MEANS

Tsutomu Yoshino, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

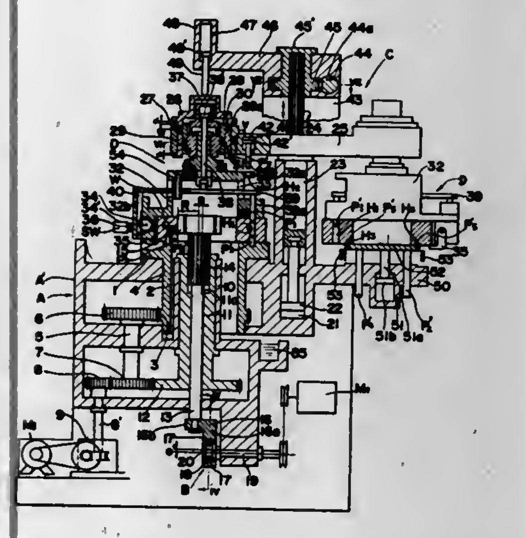
Filed Sept. 16, 1974, Ser. No. 506,049

Claims priority, application Japan, Sept. 22, 1973, 48-107391

Int. Cl. B24b *5/08;* **B65h** *65/00*

U.S. Cl. 51—105 R **4 Claims**

1. An inner surface working device for use in a working machine which comprises a centrally bored work table mounted on a main body so as to be rotatable about a fixed axis of said work table, driving means for rotating said work table, a main shaft which extends through said central bore of said work table and which is equipped with working tool means at an end thereof, driving means for rotating said main shaft, arm means provided adjacent to said work table for supplying a work piece to be worked onto said work table and for removing said work piece which has been worked form said work table, said arm means being provided with work piece attaching and releasing means for clamping and unclamping said work piece to and from said arm means, means for mounting said work piece attaching and releasing means to said arm means so that said work piece attaching and releasing means can be rotated on said arm means about a fixed axis of the former, means for positioning said work piece at a predetermined position on said work table, said positioning means being provided on said work piece attaching and releasing means and also on said work table, and means for preventing rotation of said work piece attaching and releasing means during positioning of said work piece onto said work table, said means for preventing rotation being provided between said arm means and said work piece attaching and releasing means and adapted to release said work piece attaching and releasing means for allowing rotation of the latter during working operation, whereby said work piece attaching and releasing means rotating together with said work table with said work piece clamped to said work piece attaching and releasing means during working operation.



3,891,407
METHOD FOR GRINDING BEVEL- OR HYPERBOLOID-HAPED GEARS

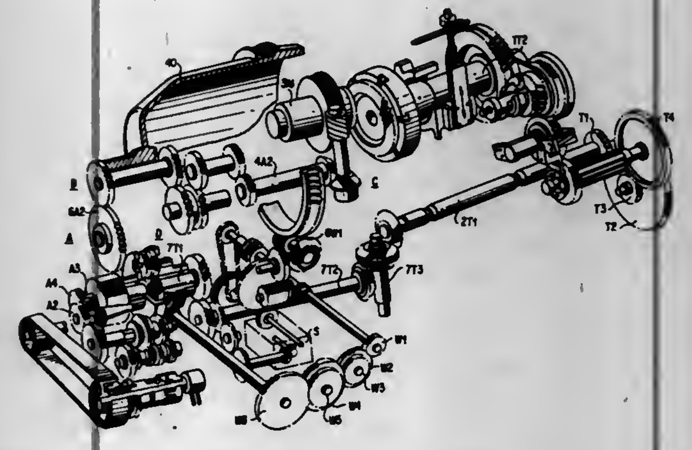
Erich Kotthaus, Kloten, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon Buhrle & Co., Zurich, Switzerland

Filed Oct. 16, 1972, Ser. No. 297,986

Claims priority, application Switzerland, Oct. 21, 1971, 15375/71

Int. Cl. B24b *3/00, 1/00*

U.S. Cl. 51—287 **2 Claims**



1. A method for grinding bevel- or hyperboloid- shaped gears with lengthwise curved teeth with the aid of a grinding head at which there are arranged a number of grinding bodies, said method comprising:

1. Simultaneously carrying out the following steps:
   - a. rotating the gear to be ground about its own axis;
   - b. rotating the grinding bodies about their own axes;

   - c. rotating the grinding head about its own axis; and
   - d. rotating the axis of the grinding head about a stationary axis.

3,891,408
ZIRCONIA-ALUMINA ABRASIVE GRAIN AND GRINDING TOOLS

Robert A. Rowse, Shrewsbury, Mass., and George R. Watson, Chippawa, Canada, assignors to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 287,489, Sept. 8, 1972, abandoned, which is a continuation-in-part of Ser. No. 249,204, May 1, 1972, abandoned, and Ser. No. 149,837, June 3, 1971, abandoned. This application Aug. 8, 1973, Ser. No. 386,718

Int. Cl.² B24D *3/28;* **C09C** *1/68;* **C09K** *3/14*

U.S. Cl. 51—295 **9 Claims**

1. Abrasive grits consisting essentially of co-fused alumina-zirconia, said alumina-zirconia abrasive having been solidified from the molten state at least as rapdily as is accomplished by casting molten alumina-zirconia abrasive into a mold filled with 1¾ inch diameter cast iron balls said alumina-zirconia being predominantly in the form of oriented eutectic colonies associated together as grains within said grits, the zirconia in said colonies being in the form of rods and/or platelets, the maximum average rod spacing and platelet spacing being 4000A, as measured at the colony centers by the random intercept technique, and the maximum average size of primary alumina or zirconia crystals, if any are present, being less than 50 microns, the zirconia content of the abrasive being from 35 to 50%, said abrasive grits having the characteristic that they will fracture along and across colony boundaries when subjected to grinding action while partially embedded in a cured thermoset resin, the fracture providing striated or columnar surfaces generally parallel to the long axes of the colonies and stepped fracture surfaces across said long axes.

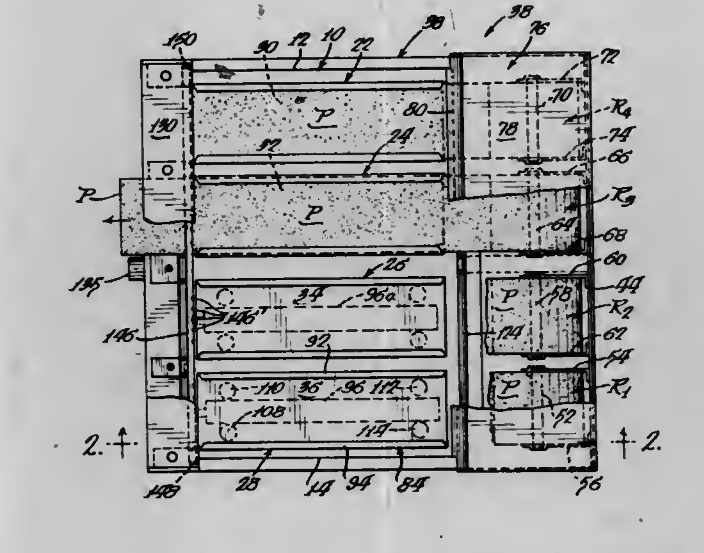
3,891,409
POLISHING APPARATUS

Marvin W. Keith, Jr., Evanston, Ill., assignor to Buehler Ltd., Evanston, Ill.

Filed Aug. 29, 1974, Ser. No. 501,694

Int. Cl. B24d *17/00;* **B24b** *55/02*

U.S. Cl. 51—361 **10 Claims**



1. In a polishing apparatus of the type where a length of abrasive paper is drawn over a platen to provide a polishing surface for the manual polishing of specimens, the improvement comprising, in combination, clamp means positioned under said platen and having clamp members which overlie edge portions of a length of paper drawn over said platen, expander water bag means disposed under said platen in engagement with said clamp means so that when in its expanded condition said water bag means applies a downward clamping force to said clamp means, water pipe means having at least one spray opening directed at said length of abrasive paper for wetting the same, common water supply means connected with said water pipe means and with said expander water bag means, and control valve means connected with said water supply means, whereby when said control valve means is open said water pipe means will spray water on said abrasive paper and said expander water bag means will be expanded causing said clamp members to clamp said length of paper down against said platen, and when said control valve means is closed siad water pipe means will discontinue spraying and said expander water bag means will collapse relieving the clamping pressure on said length of paper to permit advancement thereof.

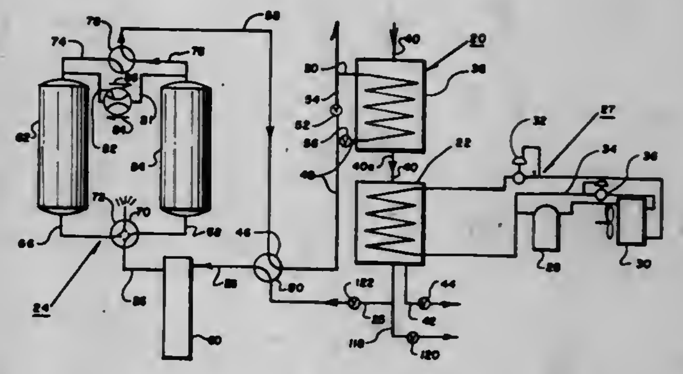
3,891,410
DEHYDRATING COMPRESSED AIR AND GASES

Paul M. Hankison, c/o Hankison Corporation, College & Pike, Canonsburg, Pa. 15317

Filed July 30, 1973, Ser. No. 384,006

Int. Cl. B01d *53/04*

U.S. Cl. 55—20 **8 Claims**



1. An apparatus for dehydrating air or gas, said apparatus comprising a condensor, a refrigerating system coupled to said condensor and capable of supplying a chilled refrigerant liquid thereto, said chilled liquid having an outlet temperature adjacent the freezing point of water, conduit means for conducting said air or gas through said condensor in heat exchange relation with said chilled liquid so that the dew point of said air or gas is reduced to within a few degrees above the freezing point of water, a desiccant dehydrating system coupled to said conduit means downstream of said condensor, said desiccant system being capable of lowering the dew point of said air or gas to a point below anticipated subfreezing temperatures, said conduit means including valved conduit means coupled to said desiccant system and to said condensor and said utilizing system so that the output of said condensor can be coupled selectively through said desiccant system and in by-passing relation thereto in dependence upon the presence of freezing and subfreezing ambient temperatures, a regenerative heat exchanger coupled to said conduit means upstream of said condensor, said conduit means coupling outputs of said desiccant system and of said condensor to said regenerative heat exchanger, a valved outlet conduit coupled to the outlet of said condensor in by-passing relation to said desiccant system and said regenerative heat exchanger for selective or simultaneous removal of low temperature partially dehydrated air or gas from said apparatus.

3,891,411

METHOD AND APPARATUS FOR THE PRODUCTION OF NITROGEN FOR USE AS AN INERT GAS

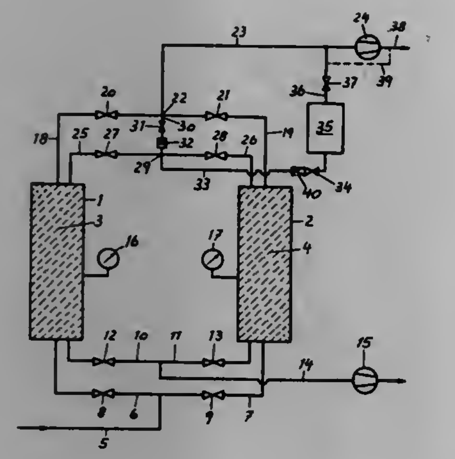
Georg Michael Meyer, Meerbusch Langst-Kierst, Germany, assignor to Deutsche Babcock & Wilcox Aktiengesellschaft, Oberhausen, Germany

Filed Dec. 11, 1973, Ser. No. 423,664

Claims priority, application Germany, Dec. 13, 1972, 2260872

Int. Cl.^{2} B01D *53/04*

U.S. Cl. 55—26 **6 Claims**



1. A method for producing nitrogen to be used as an inert gas comprising the steps of separating carbon dioxide and water vapor from a gas mixture comprised substantially of nitrogen and carbon dioxide by the adsorption of carbon dioxide in a molecular filter bed in a first one of two parallel-connected tanks, said adsorption being effected at a pressure substantially above atmospheric, desorbing simultaneously a molecular filter bed in the second tank, said desorption being effected at a pressure substantially below atmospheric, admitting a part of the nitrogen leaving said first tank into said second tank for desorbing the filter bed in said second tank, increasing the pressure of said second tank in which desorption is terminated to a pressure level prevailing in said first tank in which adsorption occurs, directing the gas flow to said second tank to effect adsorption in said second tank, directing a part of the nitrogen leaving said second tank into said first tank for desorbing the filter bed in said first tank, and directing the gas flow alternatingly through said tanks to provide for consecutive and alternate adsorption and desorption with the direction of flow in the tanks during desorption being opposite to the direction of flow during adsorption.

3,891,412

TRIMETHYLOLPROPANE USE OF MACRORETICULAR POLYMERS OF TRIMETHACRYLATE FOR MAKING CHROMATOGRAPHIC SEPARATIONS

Shashi Bhaishanker Dave, Lakewood, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed May 6, 1974, Ser. No. 467,165

Int. Cl. B01d *15/08*

U.S. Cl. 55—67 **9 Claims**

1. A method of separting a mixture of organic compounds into its individual compound components by passing vapors of the mixture through a packed column of porous resin particles, the improvement comprising using porous particles of a polar macroreticular polymer of trimethylolpropane trimethacrylate as the resin particles, at least 65 percent of said particles being of a size that will pass through a 60 mesh screen and be retained on a 120 mesh screen.

3,891,413

SEPARATION OF COMPOUNDS DIFFERING IN ISOTOPIC COMPOSITION

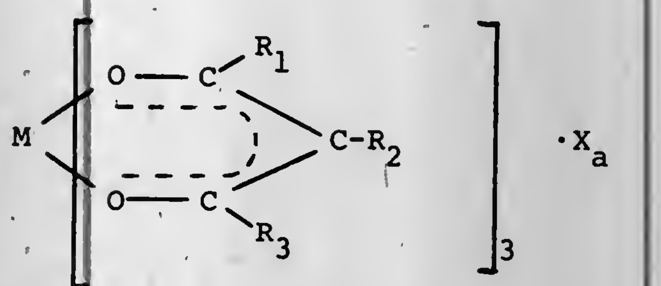
Robert E. Sievers, 2628 N. Emerald Dr., Fairborn, Ohio 45324, and Joseph J. Brooks, 1631 Beaver Ridge Dr., Kettering, Ohio 45429

Filed June 4, 1974, Ser. No. 476,179

Int. Cl. B01d *15/08*

U.S. Cl. 55—67 **14 Claims**

1. A process for separating organic compounds containing an electron donor group that differ in isotopic composition which comprises the steps of introducing a mixture of the compounds into a chromatographic column containing as a stationary phase a lanthanide chelate having the following structural formula:



wherein M is a rare earth element of the lanthanide series; R_1, R_2 and R_3 are individually selected from the group consisting of hydrogen, deuterium, alkyl and fluoroalkyl; or R_1 and R_2 together are d-camphor and R_3 is fluoroalkyl; X is water or an organic compound containing a donor group; and *a* is a numeral from zero to 4, inclusive; and withdrawing from the column a stream which is at least enriched with respect to one of the compounds of the mixture.

3,891,414

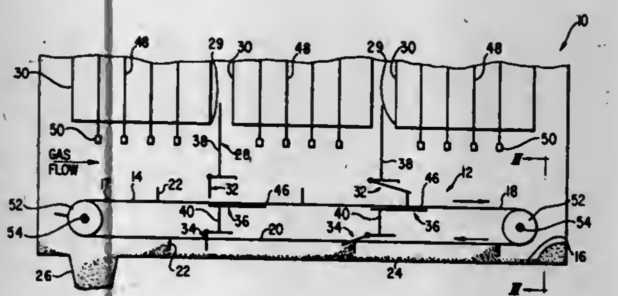
DRAG SCRAPER ASSEMBLY FOR ELECTROSTATIC PRECIPITATOR

Earle Stuart Snader, Pasadena, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Oct. 9, 1974, Ser. No. 513,419

Int. Cl.^{2} B03C *3/88*

U.S. Cl. 55—108 **6 Claims**



1. An improved drag scraper assembly for electrostatic precipitators of the type including:

endless chain means above a particle collection surface of said precipitator having a top flight advancing in the direction of gas flow through said precipitator and a bottom flight advancing in a direction opposite to said gas flow;

scraper means secured to said chain means transverse to the flow of said gas for pushing particles collected on said surface toward a collection hopper for said particles; and baffle means extending between lower portions of adjacent collector electrodes of said precipitator and said particle collection surface for obstructing the flow of gas between said lower portions and said collection surface, a first portion of said baffle means being pivotable by said scraper means advancing with said top flight to permit passage of said scraper means through said baffle means, a second portion of said baffle means being pivotable by said scraper means advancing with said lower flight to permit passage of said scraper means and said particles through said baffle means,

the improvement comprising:

plate means beneath said first portion of each of said baffle means

for preventing the flow of gas between said first portions and fixed portions of said baffle means during pivotable movement of said first portions.

3,891,415

ELECTROSTATIC DUST COLLECTOR FOR EXHAUST GASES CONTAINING FINE PARTICLES

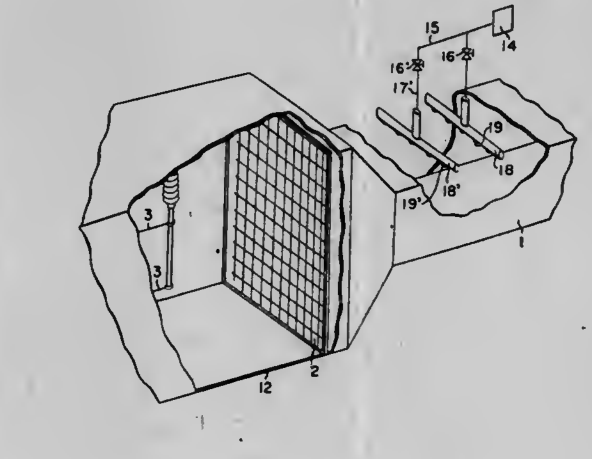
Tamotsu Watanabe, Tokyo, Japan, assignor to Nippon Kogei Kogyo Company, Limited, Tokyo, Japan

Filed Sept. 28, 1972, Ser. No. 292,974

Claims priority, application Japan, Jan. 14, 1972, 47-6500; Feb. 8, 1972, 47-14160

Int. Cl. B03c *3/01*

U.S. Cl. 55—122 **5 Claims**



1. An electrostatic dust collector for treating exhaust gas containing fine dust particles, comprising:

an exhaust gas passage means;

at least one charged electrode wire connected to a high-voltage D.C. generator;

a pair of insulator members supporting said at least one charged electrode wire in a substantially horizontally disposed relation within said exhaust passage;

said passage means including a dust collecting electrode maintained at earth potential and facing said at least one charged electrode wire so as to form an electrostatic field and dust collecting zone therewith;

particle aggregating electrode means forming an electrostatic field with the changed electrode transversely arranged within said exhaust gas passage and positioned far enough upstream of said charged electrode that the electrostatic intensity between said at least one charged electrode wire and said dust collecting electrode is greater than the electrostatic intensity between said at least one charged electrode wire and said particle aggregating means; and

a humidifying means including a liquid supply, means for spraying said liquid in the form of a mist through a plurality of nozzles connected to said supply and means for controlling the quantity of mist being sprayed connected to the nozzles, said nozzles being disposed upstream of said particle aggregating means in said passage means for humidifying the surfaces of said fine dust particles of said exhaust gas before said exhaust gas passes through said aggregating means.

3,891,416

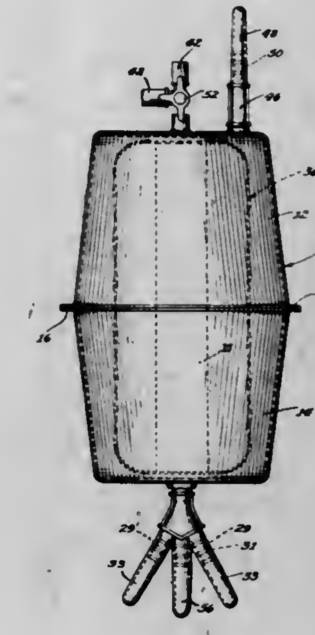
CARDIOTOMY RESERVOIR

Ronald J. Leonard, Elk Grove Village, and Jonathan Wayne Takagishi, Arlington Heights, both of Ill., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed July 20, 1973, Ser. No. 381,311

Int. Cl. B01d *19/02, 35/00*

U.S. Cl. 55—178 **9 Claims**



1. A reservoir for the collection, purification and storage of blood during surgical procedures, which comprises: a hollow blood storage casing having a first port positioned at one end thereof; a generally rigid, hollow member positioned within said casing and extending from end-to-end thereof, said hollow member having a bore positioned to communicate at one end thereof with said first port, said hollow member having a wall defining perforations for the flow of blood through said wall between the interior and exterior of said hollow member; said hollow member also carrying filter means for the purification of blood, a second port communicating through the casing, exterior to said hollow member, whereby a blood flow path is defined through said first port, said hollow member and filter means, and said second port; and a vent port defined at an end of said casing opposite to said one end, said vent port being in position to communicate with the bore of said hollow member at said end opposite said first port, to directly vent gas bubbles passing into said bore through said first port.

3,891,417

FILTER AND SORBENT CARTRIDGE

William D. Wade, Chelsea, Mich., assignor to King Engineering Corporation, Ann Arbor, Mich.

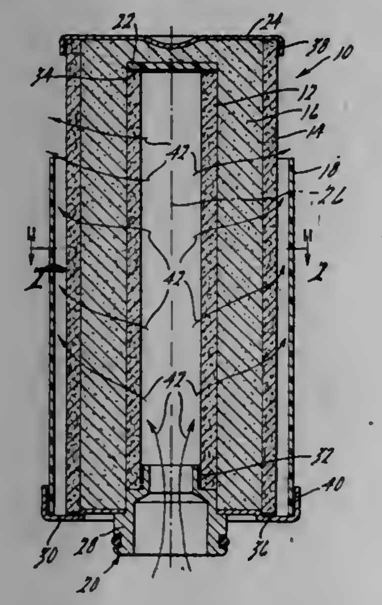
Filed Jan. 28, 1974, Ser. No. 437,467

Int. Cl. B01d *50/00*

U.S. Cl. 55—274 **18 Claims**

1. A filter cartridge for filtering a liquid contaminant from a gaseous fluid, comprising: a first tubular element formed of a filter medium capable of filtering said contaminant; a second tubular element formed of a filter medium capable of filtering said contaminant and surrounding and spaced from said first tubular element; an oil sorbent medium disposed in the annular space between said two tubular elements, both tubular elements being of substantially thickness integrally formed and of sufficient rigidity to support said sorbent medium, and comprising glass microfibers bonded together by a binder; a first sealing closure of one end of said filter cartridge; a second sealing closure at the other end of said cartridge; and a central entrance tube extending through said second sealing closure

and communicating with the interior of said first tubular element, whereby the gaseous fluid to be filtered will enter said

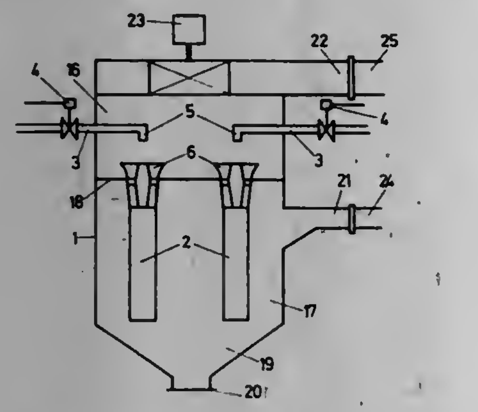


interior and pass outwardly through said tubular elements and sorbent medium.

3,891,418
GAS FILTER

Hans Burger, and Hans Riester, both of Schaffhausen, Switzerland, assignors to Georg Fischer Aktiengesellschaft, Switzerland

Filed Dec. 6, 1973, Ser. No. 422,290
Claims priority, application Switzerland, Dec. 7, 1972, 17810/72
Int. Cl. B01d *46/04*
U.S. Cl. 55—302 **20 Claims**



1. A gas filter with at least one filter element having an outlet, a clean gas outlet sleeve connected to said outlet of said filter element extending axially of said filter element, a flushing gas device with at least one flushing gas nozzle arranged above said outlet sleeve to introduce a pressurized back flushing gas surge through said outlet sleeve into said outlet of said filter element for cleaning it, wherein the improvement comprises that the smallest cross section of said sleeve transversely of its axis is at least equal to the flow cross section at the connection of said sleeve to said filter element, a hollow guide sleeve positioned within and extending in the axial direction of said outlet sleeve, said guide sleeve spaced radially inwardly from said outlet sleeve and dividing the interior of said outlet sleeve into an annular outer space and a central inner space, said guide sleeve having a first opening at one end directed toward said filter element and a second opening at its opposite end directed toward said flushing gas nozzle, said guide sleeve having a cross-sectional shape normal to its axis corresponding to the cross-sectional shape of said filter element, the transverse cross section of said guide sleeve varying between said first and second openings, and said guide sleeve having at least one other opening therethrough intermediate its ends and affording communication between the inner space and the annular outer space within said outlet sleeve.

3,891,419
GLASS-CERAMIC AND PROCESS THEREFOR

George A. Simmons, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 558,238, June 17, 1966, abandoned. This application May 17, 1971, Ser. No. 144,311The portion of the term of this patent subsequent to Mar. 3, 1987, has been disclaimed.
Int. Cl. C03c *21/00, 3/22*
U.S. Cl. 65—30 **8 Claims**

1. A process of making an article having a main body portion of glass-ceramic and an integral surface layer of glass-ceramic and having a lower coefficient of linear expansion than that of the main body portion which comprises:

1. forming an article from a thermally crystallizable glass, including at least 1 percent by weight, expressed as soda mole equivalent, of oxide of at least one alkali metal,
2. heat treating the article to in situ thermally crystallize the glass to form a glass-ceramic containing a multiplicity of finely-divided, randomly oriented crystalline species,
3. heating a surface layer of the article to convert the surface layer back to thermally crystallizable glass while maintaining the main body portion as a glass-ceramic,
4. treating the glass surface with a lithium salt ion exchanging material to substitute lithium for at least part of said alkali metal in the thermally crystallizable glass, and
5. heating the surface layer of the article to form a glass-ceramic in which β-eucryptite, β-spodumene or mixtures thereof is the predominant crystalline phase,

whereby the surface layer that is obtained is integral with the main body portion and has a lower coefficient of linear expansion than that of the main body portion, the article formed having a flexural strength greater than the initial article of glass-ceramic, said surface layer obtained having an overall composition substantially identical to that of the main body portion except that

- a. the lithia content is at least equal to the lithia content in the overall composition of the main body portion,
- b. the content of oxide of other alkali metal, having an ionic radius larger than lithium, is at a maximum equal to the content of that oxide in the overall composition of the glass-ceramic main body portion, and
- c. when the layer is a glass-ceramic with a lithia content equal to that of the main body portion the predominant crystal in the crystalline phase of the layer differs from that of the main body portion and provides the lower coefficient of linear expansion of the layer.

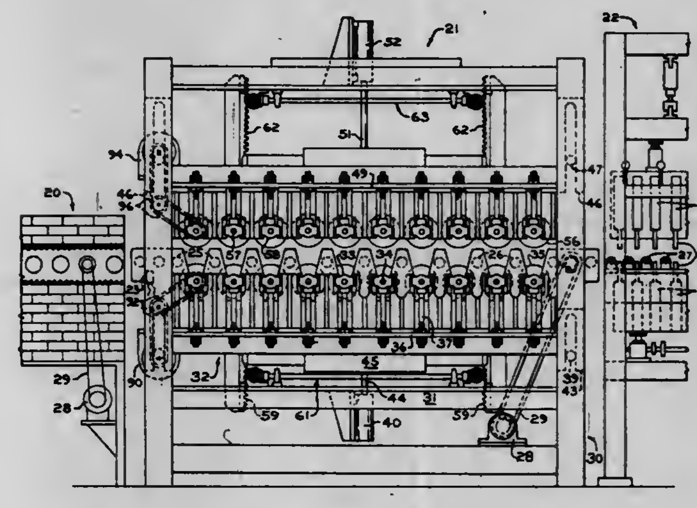
3,891,420
SHAPING HEAT SOFTENED GLASS SHEETS BY ROLL FORMING

Robert G. Frank, Murrysville, Pa., assignor to PPG Industries, Inc,, Pittsburgh, Pa.

Filed May 2, 1974, Ser. No. 466,343
Int. Cl. C03b *23/02*
U.S. Cl. 65—106 **4 Claims**

1. In the method of shaping sheets of heat-softenable material by roll forming wherein a series of heat-softened sheets is conveyed along a predetermined path and each sheet of said series in turn is moved continuously between a pair of sets of segmented forming rolls rotating about axes transverse to said path, each set comprising a series of segmented rolls spaced longitudinally along said path and adapted to engage one or the other major surfaces of said sheet and each roll in one of said sets corresponding to a roll of complementary curvature in the other of said sets, and providing said sets with relative motion toward one another while said sheet is moving therebetween to engage said moving sheet in sandwiching position between said sets of rotating forming rolls for sufficient time to impart the shape of said rolls onto said sheets,

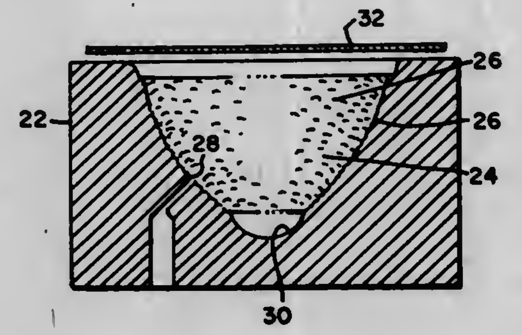
the improvement comprising independently controlling the rate of rotation of a preselected segment of the rolls of one set and independently controlling the rate of rotation of a corresponding preselected segment of the rolls of the other set in such a manner that the absolute sum of the differences in average peripheral speed of corresponding segments of opposing sets of rotating segmented forming rolls that engage the opposite surfaces of said glass sheet is kept sufficiently low to avoid observable scuff marks in the roll-formed sheet.



3,891,421
METHOD OF MAKING A CONTROLLED-DIFFUSION STIPPLED REFLECTOR BY SAG MOLDING

Robert E. Levin, South Hamilton, Mass., assignor to GTE Sylvania Incorporated, Salem, Mass.

Division of Ser. No. 319,321, Jan. 3, 1973, Pat. No. 3,825,742. This application Aug. 23, 1973, Ser. No. 390,871
Int. Cl. C03b *23/02*
U.S. Cl. 65—107 **9 Claims**



1. A method of making a stippled reflector for providing controlled diffusion of light, said method comprising:

providing a preheated concave mold having a stippled surface, said stippling on said mold surface comprising a pattern of localized zones of a change in the radius of curvature of the surface of said mold with respect to the large scale concave curvature thereof;

placing a flat blank of rigid material across the opening of said preheated mold, said material being of a type which may be heated to a plastic state for forming;

heating said material to a plastic state;

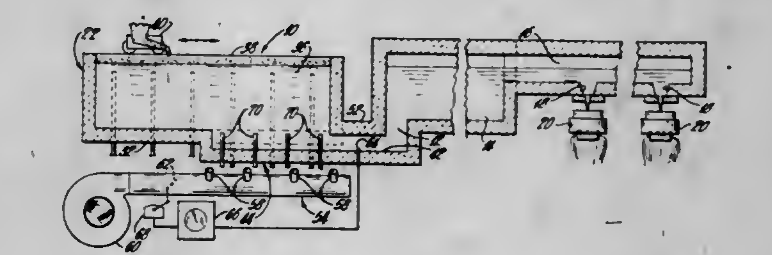
forcing said plasticized material to sag against the stippled surface of said mold without tools, whereby said material is formed to have an untooled concave surface with stippling thereon;

permitting said sag-molded material to cool to a rigid state; and applying a coating of reflective material on the stippled concave surface of said sag-molded material.

3,891,422
ELECTRICALLY-HEATED MELTING FURNACE WITH MELT COOLING MEANS

Magnus L. Froberg, Granville, and Robert F. Jackson, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 22, 1974, Ser. No. 445,036
Int. Cl. C03b *5/22*
U.S. Cl. 65—137 **9 Claims**



1. A furnace for melting a heat-softenable material, said furnace comprising a tank for holding molten material formed by a bottom, side walls, and end walls, means for supplying batch material over molten material in the tank, means extending into the molten material below the batch material for supplying heat to the molten material, wall means forming a cooling trough centrally located in the bottom of the tank and extending beyond an end wall thereof to discharge molten material from the tank, said wall means being exposed to ambient conditions below the bottom of said tank to dissipate heat from molten material in said trough, and a plurality of electrodes having portions extending into said trough in contact with molten material therein and having portions extending outside said trough through the tank bottom and in contact with moving cooler air thereunder, said electrodes being made of material which is capable of conducting heat away from molten material in said trough to ambient conditions below said tank bottom.

7. A method of operating an electrically-heated, melting furnace comprising establishing a pool of molten material, supplying batch material onto the surface of the pool to establish a layer of batch thereover, heating the molten material below the batch layer, collecting molten material in a trough below the pool, directing the molten material toward a location beyond the pool, cooling the molten material in the trough by projecting a heat-conducting body into the trough from a location outside the trough, and directing a cooling medium into heat-exchange relationship with the portion of the heat-conducting body located outside the trough.

3,891,423
SUBSTRATE HAVING A SLIGHTLY WATER SOLUBLE BINDER AND A HERBICIDE FOR RETARDING WEED GROWTH OVER A LONG PERIOD OF TIME

Leonard A. Stanley, and Loyd G. Kasbo, both of Charlotte, N.C., assignors to The Kendall Co., Walpole, Mass.

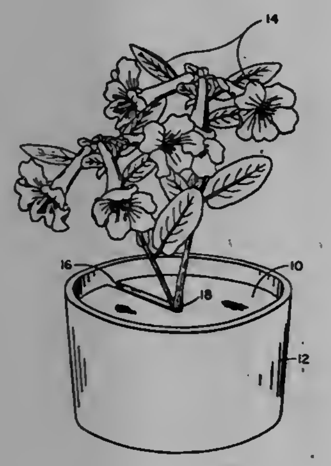
Continuation of Ser. No. 222,542, Feb. 1, 1972, abandoned. This application Feb. 25, 1974, Ser. No. 445,432
Int. Cl. A01n *9/36*
U.S. Cl. 71—86 **1 Claim**

1. In a weed growth retardant product for woody plants individually growing in containers of soil, comprising:

a sheetlike water-permeable fabric substrate adapted to fit within a container on the surface of the soil therein about the stem of a plant therein, the improvement comprising having adherent to said substrate a very slightly water soluble film-forming binder containing a pre-emergence herbicidal agent,

said binder being selected from the group consisting of vinyl based polymers, insolubilized carbohydrates, aminoplast resins, insolubilized proteins, polyesters, polyethers, polyamides, polyurethanes, and mixtures thereof,

said herbicide being selected from the group consisting of S-(O, O-diisopropyl phosphorodithioate) of N-(2 mercaptoethyl) benzenesulfonamide,; 2,3-dichloroallyl, N,N-diisopropylthiolcarbamate; tributyl, 2,4-dichlorobenzylphosphonium chloride; 3-(3,4-dichlorophenyl)1-methoxy-1-methylurea; 2-chloro-4-ethylamino-6-isopropyl-amino-1,3,5-triazine; N-(3-chloro-4-methylphenyl)-2-methyl-pentanamide; 3-amino-2,5-dichlorobenzoic acid; 4,6-dinitro-o-secbutylphenol alkanolamine salts; 1-



(2-methyl cyclohexyl)-3-phenyl urea; 3-(hexahydro-4,7-methanoindan-5-yl)-1,1-dimethylurea; 4-methylsulfonyl-2,6-dinitro-N,N-dipropylaniline; α,α,α,-trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine,

said herbicidal agent being released at a slow rate over a period of several months to prevent weed growth during plant development.

3,891,424
HERBICIDAL 1-CARBONAMIDOTHIO-3-ARYL UREAS

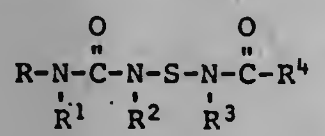
Melancthon S. Brown, deceased, late of Berkeley, Calif., and by Gustave K. Kohn, special administrator, Berkeley, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 88,229, Nov. 9, 1970, Pat. No. 3,824,281. This application Dec. 17, 1973, Ser. No. 425,672

Int. Cl. A01n *9/12*

U.S. Cl. 71—98 **18 Claims**

1. A method for controlling the growth of undesirable vegetation which comprises applying an herbicidally effective amount of a urea of the formula



$$R-\underset{R^1}{N}-\overset{O}{\overset{\|}{C}}-\underset{R^2}{N}-S-\underset{R^3}{N}-\overset{O}{\overset{\|}{C}}-R^4$$

wherein R is phenyl or phenyl substituted with 1 to 4 halogen atoms of atomic number 9 to 35 (fluorine, chlorine or bromine), trifluoromethyl, trichloromethyl, nitro groups, alkyl groups individually of 1 to 4 carbon atoms or alkoxy groups individually of 1 to 4 carbon atoms; R^1 is hydrogen or alkyl of 1 to 4 carbon atoms; R^2 is hydrogen or alkyl of 1 to 4 carbon atoms; R^3 is alkyl of 1 to 10 carbon atoms, alkyl of 1 to 10 carbon atoms substituted with 1 to 4 halogen atoms of atomic number 17 to 35 (chlorine or bromine), cycloalkyl of 3 to 10 carbon atoms or cycloalkyl of 3 to 10 carbon atoms substituted with 1 to 4 halogen atoms of atomic number 17 to 35; R^4 is hydrogen, alkyl of 1 to 10 carbon atoms, alkyl of 1 to 10 carbon atoms substituted with 1 to 4 halogen atoms of atomic number 17 to 35, cycloalkyl of 3 to 10 carbon atoms or cycloalkyl of 3 to 10 carbon atoms substituted with 1 to 4 halogen atoms of atomic number 17 to 35.

3,891,425
DESULFURIZATION OF TRANSITION METAL ALLOYS

Michael McCarty, New Hartford, N.Y., assignor to Special Metals Corporation, New Hartford, N.Y.

Filed Feb. 27, 1974, Ser. No. 446,447

Int. Cl. C22d *7/00;* **C21c** *7/10*

U.S. Cl. 75—10 V **7 Claims**

1. A process for desulfurizing a transition metal alloy comprising maintaining said alloy in a molten state, substantially in the absence of an oxygen-containing atmosphere and in contact with a calcium alloy selected from a calcium-nickel alloy and a calcium-aluminum alloy.

3,891,426
METHOD OF MAKING COPPER-NICKEL ALLOYS

Wolfgang Stawicky, and Horst Ossig, both of Altena, Germany, assignors to Vereinigte Deutsche Metallwerke AG, Frankfurt am Main, Germany

Filed Aug. 12, 1974, Ser. No. 496,905

Claims priority, application Germany, Aug. 11, 1973, 2340766

Int. Cl. C22d *7/06;* **C21c** *7/10;* **C22c** *1/00*

U.S. Cl. 75—10 R **5 Claims**

1. A process for the production of a copper-nickel alloy comprising the steps of:

smelting nickel oxide with addition of graphite in an electric-arc furnace and adjusting the addition of graphite until the resulting melt has a carbon content of about 0.5% by weight;

superheating the melt to a temperature of about 1700°C; and

introducing preheated copper into the superheated melt.

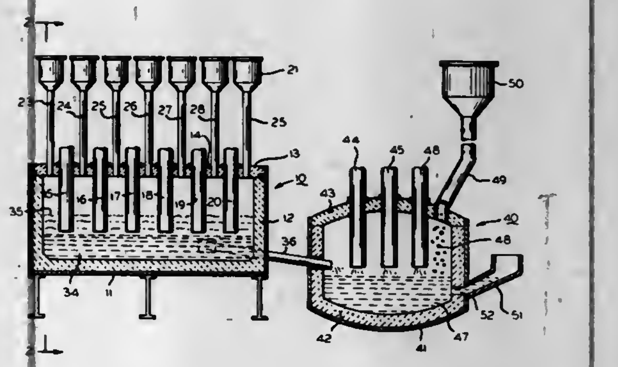
3,891,427
METHOD FOR MELTING PREREDUCED ORE AND SCRAP

John A. Persson, Gibsonia, Pa., assignor to Lectromelt Corporation, Pittsburgh, Pa.

Filed Oct. 12, 1972, Ser. No. 296,908

Int. Cl. C22d *7/04*

U.S. Cl. 75—12 **5 Claims**



1. A continuous steel making process comprising the step of:

providing a first electric furnace having a plurality of electrodes,

feeding into said first electric furnace a quantity of prereduced ore which comprises a major portion of elemental iron and minor portion of gangue that has a low concentration of iron compounds and that is meltable to produce electrically resistive slag,

energizing said electrodes to melt said ore,

forming a layer of molten metal at the bottom of said furnace and a layer of molten slag on the top of said metal layer,

immersing the end portions of said electrodes in said slag layer and spaced from said molten metal layer, passing electric current from said electrodes through said electrically resistive slag layer to generate heat which is substantially confined to the highly resistive path provided by said slag,

feeding additional prereduceed ore into said slag layer and melting the same whereby the metallic portion thereof passes through said slag into said molten metal layer and the gangue portion of said prereduced ore becomes a part of the slag, and

conducting a quantity of said molten metal from said first furnace and beneath the slag layer thereof to a second electric furnace having a plurality of electrodes,

and further refining said metal in said second electric furnace.

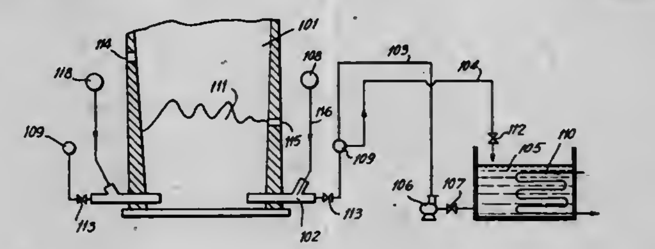
3,891,428
METHOD FOR TREATING NON-FERROUS METAL SLAG

Yordan Todorov Yordanov; Georgi Ivanov Abrashev; Georgi Tenev Georgiev; Velyo Dimitroy Zhekov; Yancho Hristov Yanev; Ivan Georgiev Rossenov; Velcho Angelov Prodanov, and Yordan Todev Roussey, all of Plovdiv, Bulgaria, assignors to Kombinat Za Zvetni Metali "Dimiter Blagoev", Plovdiv, Bulgaria

Continuation-in-part of Ser. No. 67,286, Aug. 26, 1970, abandoned, which is a division of Ser. No. 625,850, March 24, 1967, Pat. No. 3,608,881. This application Oct. 30, 1972, Ser. No. 302,565

Int. Cl. C21b *3/04*

U.S. Cl. 75—24 **8 Claims**



1. A method of treating non-ferrous slag in a furnace, said method comprising heating and reducing molten slag by injecting liquid fuel and air into the slag, said injecting of liquid fuel and air including the steps of discharging a liquid fuel reduction agent under a pressure of at least 12 atmospheres through a nozzle to produce an atomized stream of the fuel forming a narrowing annular passageway coaxially around the outlet of said nozzle, introducing the thus atomized stream of fuel into a stream of air in said passageway for mixing the stream of air and the atomized stream of fuel and carrying the mixed streams of air and fuel into the slag as a reducing agent.

3,891,429
METHOD FOR SELECTIVE DECARBURIZATION OF ALLOY STEELS

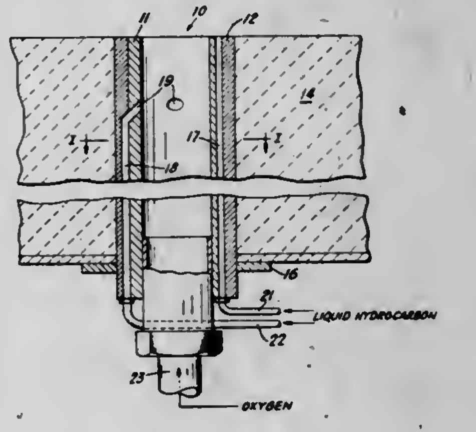
Gordon L. Cox, Mount Lebanon, and Olin E. Williams, Fox Chapel, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed June 7, 1973, Ser. No. 367,839

Int. Cl. C21c *5/34*

U.S. Cl. 75—60 **4 Claims**

1. A method of selective decarburization of a chromium-alloy steel melt, said decarburization being carried out in a refining vessel having at least one double tuyere submerged below the surface of the melt, said method comprising: injecting into said melt through a central tube of said tuyere a gas selected from the group consisting of oxygen and a mixture of oxygen and fuel oil for a period of time sufficient to reach the carbon-chromium-temperature equilibrium, while injecting, during the entire said period, fuel oil maintained in the liquid state to the tuyere-melt interface into said melt through said tuyere and peripherally of said central tube; injecting through said central tube into said melt a mixture of fuel oil and oxygen in a volumetric gas ratio of from about 2:1 to 6:1, until said melt is decarburized, while continuing said peripheral flow of fuel oil into said melt; and thereafter discontinuing the injection of fuel oil and said mixture of fuel oil and oxygen.



and injecting into said melt an inert gas to purge the melt of hydrogen.

3,891,430
RECOVERY OF LEAD

Ernest R. Cole, Jr.; Waldemar M. Dressel, and Lawrence L. Smith, all of Rolla, Mo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed June 25, 1973, Ser. No. 371,019

Int. Cl. C22b *13/00*

U.S. Cl. 75—77 **2 Claims**

1. A process of recovery of lead from a lead sulfide-containing material comprising (1) vaporization of lead sulfide at a temperature of about 900° to 1200°C in a first reaction zone, (2) separation of the vaporized lead sulfide from said reaction zone and (3) vapor phase reduction of the lead sulfide with hydrogen at a temperature of about 750° to 1200°C in a second reaction zone to form metallic lead and hydrogen sulfide.

3,891,431
METHOD OF(AND APPARATUS FOR(CONTROLLING THE CRYSTALLINE STRUCTURE OF ALLOYS, AND ALLOYS SO PRODUCED

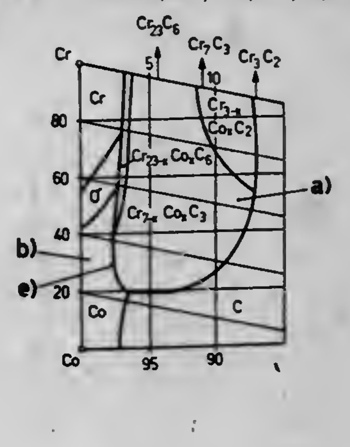
Peter Sahm, Nussbaumen, and Renata Sebalj-Novosel, Neuenhof, both of Switzerland, assignors to Aktiengesellschaft Brown, Boveri & Cie., Baden, Switzerland

Filed Apr. 17, 1972, Ser. No. 244,652

Claims priority, application Switzerland, May 10, 1971, 6882/71

Int. Cl. C22c *19/00, 33/00, 1/00*

U.S. Cl. 75—122 **3 Claims**



1. In a method of controlling by heat treatment the crystalline structure of an at least partially eutectic alloy having a crystalline (Cr, Me)$_7C_3$ phase embedded in a Me-chromium-carbon matrix phase, wherein Me is selected from the group consisting of Fe, Co, Ni, Mn and combinations thereof, wherein one of said phases is at least substantially isotropic, and the other phase is characterized by a highly anisotropic crystalline structure, the improvement comprising symmetriz-

ing said structure by passing said body through a melting zone and a solidification zone, wherein the temperature gradient between the melting zone and the solidifcation zone is at least 2,500°C/cm, and wherein the speed of said body is advanced through said zones is a rate of from 1–100cm/hr.

3,891,432
HIGH TOUGHNESS SPHEROIDAL GRAPHITE CAST IRON AND METHOD FOR PRODUCING THE SAME

Hideo Nakae, Kashiwa, and Akihiro Goto, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 4, 1974, Ser. No. 430,681

Claims priority, application Japan, Jan. 24, 1973, 48-9530

Int. Cl. C22c *37/04*

U.S. Cl. 75—130 R **13 Claims**

1. A high toughness spheroidal graphite cast iron which comprises, by weight, 3.2–4.0% of C, 2.0–3.8% of Si, not more than 1.0% of Mn, not more than 0.1% of a spheroidizing element, 0.0035–0.02% of N and the balance Fe and incidental impurities, said cast iron having a matrix structure which comprises ferrite and pearlite.

3,891,433
INDUCTION-TYPE REACTION RAILS FOR HIGH SPEED TRAINS

Heinz F. Bichsel, Neuhausen am Rheinfall; Peter Furrer, Neunkirch, both of Switzerland, and Jorg Maier, Steisslingen, Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Feb. 12, 1974, Ser. No. 441,761

Claims priority, application Switzerland, Feb. 16, 1973, 2323/73

Int. Cl. C22c *21/00, 21/02;* **C22f** *1/04*

U.S. Cl. 75—147 **8 Claims**

1. Induction-type reaction rail which can be easily shaped and welded and has a high electrical resistance, for use in conjuction with linear motors which power high speed trains, characterised in that the reaction rail is made out of an alloy with the composition 0.7–3.5 % Mn, the rest being aluminium which has a purity of at least 99.5 % in particular with a maximum impurity content of 0.1 % Fe and 0.15 % Si.

3,891,434
POROUS MATERIAL IN A LIQUID DEVELOPMENT METHOD

Herbert Taege, Oberheidkamperstrasse, Bergisch-Gladbach; Friedrich Flus, Lindenstrasse 28, 5161 Merzenich Krs. Duren, and Gunther Mertens, Buchloerstr. 26, Kaufbeuren, Allgau, all of Germany

Filed Dec. 8, 1972, Ser. No. 313,295

Int. Cl. G03g *13/10, 13/22*

U.S. Cl. 96—1 LY **4 Claims**

1. An electrostatic copying method including the steps of negatively charging a zinc oxide coated side of a substrate, thereafter partially discharging said zinc oxide coated side in accordance with and as a function of the light intensity of an optical image obtained from an original to be copied, contacting said zinc oxide coated side with a fabric and submerging said substrate and said fabric in contact with said substrate in a developer which includes a carrier liquid and positively charged toner particles to tone certain zones of said zinc oxide coated side and to leave other untoned zones of the substrate, thereby to supply said zinc oxide coated side with toner particles from a portion of the fabric overlying a given zone of said zinc oxide coated side and substantially to prevent the attraction of toner particles from other portions of the fabric whereby substantially uniformly toned zones are obtained, said fabric being formed of a material which has a slight negative charge relative to said developer with which it is soaked.

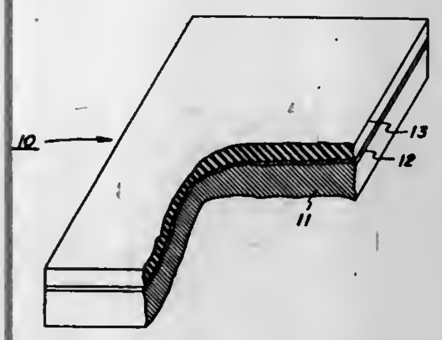
3,891,435
HETEROPHASE ADHESIVE COMPOSITIONS CONTAINING CHLOROSULFONATED POLYETHYLENE FOR METAL-SELENIUM COMPOSITES

Lieng Huang Lee, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 17, 1973, Ser. No. 389,283

Int. Cl. G03g *5/04*

U.S. Cl. 96—1.5 **12 Claims**



1. A xerographic member which comprises a conductive substrate having thereon an interfacial barrier layer having a thickness of about 0.5 to 3.0 microns, said barrier layer comprising a polymer blend or mixture of a polycarbonate, a polyether-ester-urethane, and a chlorosulfonated polyethylene, with the polycarbonate being present in a concentration of about 30 to 80 weight percent and the poly-urethane and chlorosulfonated polyethylene being present in a combined concentration of about 20 to 70 weight percent, with said interfacial layer having a composite resistivity of about 10^{11} to 10^{14} ohm-cm., and a photoconductive layer about 10 to 200 microns in thickness overlaying said interfacial layer.

3,891,436
BLEACHED PHASE HOLOGRAMS AND METHOD OF PRODUCING THE SAME

Nobuo Nishida, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Feb. 22, 1973, Ser. No. 334,770

Claims priority, application Japan, Mar. 1, 1972, 47-21859; May 31, 1972, 47-54475; May 31, 1972, 47-54479; June 1, 1972, 47-54938; Aug. 4, 1972, 47-78529

Int. Cl.² G03C *5/04, 5/32*

U.S. Cl. 96—27 H **1 Claim**

1. A method of producing a bleached phase hologram comprising the steps of:

exposing a silver halide photographic film to an interference pattern formed between an object light beam and a reference light beam, and developing and fixing the pattern on said photographic film material,

contacting said photographic film with an aqueous solution of potassium ferricyanide thereby forming silver ferrocyanide on said film, and then immersing said photographic film in a solution containing a mixture of a first aqueous solution of a metal nitrate selected from the group consisting of nickel, lead, copper and zinc nitrates, a second aqueous solution of potassium citrate, and a third solution of dilute nitric acid, thereby producing a bleached phase hologram.

3,891,437
METHOD OF MAKING CUTTING AND SCORING DIES

Albert J. Sarka, Cleveland, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 159,961, July 6, 1971, abandoned. This application Dec. 22, 1972, Ser. No. 317,614

Int. Cl. G03f *7/00;* **C23f** *1/02*

U.S. Cl. 96—36.3 **11 Claims**

1. The method of providing a parallel-sided and longitudinally extending linear land on the surface of a chemically-

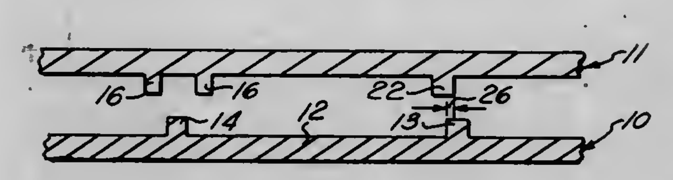
etchable homogeneous metallic member wherein the areas on each side of the land are to be etched downwardly and to a depth which inherently results in side-etching including the steps of:

providing said metallic member with a planar surface,

providing a thin transparent backing sheet with an opaque scribable surface thereon,

scribing a longitudinally extending linear line of a first width in said scribable surface with a scribing tool to produce a first transparency,

placing said scribed transparency in contact with an unexposed film sheet and exposing said film sheet while moving said first transparency and film sheet relative to each other to produce a second transparency having a linear and longitudinally extending exposed area with a width which is greater than said first width and the width of the linear land to compensate for side-etching which results from achieving the desired etching depth below the surface of said metallic member,



providing said planar surface with a light-hardenable sensitized coating material,

exposing to light those areas of said coating corresponding with said exposed areas of said second transparency to harden those areas of said coating,

removing the unhardened coating material from said surface, and

chemically etching said member.

3,891,438
AQUEOUS DEVELOPING COMPOSITION FOR LITHOGRAPHIC DIAZO PRINTING PLATES

Leon Katz, Springfield, N.J., and Eugene Golda, Monsey, N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Nov. 2, 1972, Ser. No. 303,072

Int. Cl. G03c *5/34;* **G03f** *7/08*

U.S. Cl. 96—49 **4 Claims**

1. A developer composition adapted for developing an exposed diazo-sensitized photosensitive coating on a substrate to remove therefrom non-image areas which comprises an aqueous solution of from 5 percent to 50 percent by weight of the sodium salt of a 2-alkyl-1-(ethyl beta oxipropanoic acid) imidazoline and up to 30 percent by weight of a water-miscible solvent, all percentages being based on the total weight of the ingredients in the developer solution.

3,891,439
AQUEOUS DEVELOPING COMPOSITION FOR LITHOGRAPHIC DIAZO PRINTING PLATES

Leon Katz, Springfield; William Rowe, Westfield, both of N.J., and Eugene Golda, Monsey, N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Nov. 2, 1972, Ser. No. 303,071

Int. Cl. G03c *5/34;* **G03f** *7/08*

U.S. Cl. 96—49 **21 Claims**

1. A developer composition for lithographic printing plates which comprises;

- a. An aqueous solution comprised of;
  1. from 5% by weight to 30% by weight of an amphoteric 2-alkyl substituted imidazoline surfactant with 1-position substitution containing a halogen atom, carboxyl, phosphoric or sulfonic acid group, wherein the alkyl group contains from 6 to 20 carbon atoms; and
  2. from 5% by weight to 25% by weight of a water soluble organo-lithium salt, which is the water soluble lithium salt of an organic compound having from 1 to 36 carbon atoms and at least 1 acidic hydrogen; and
- b. said aqueous composition having a pH of from about 5 to about 12 and being capable, when applied to an exposed diazo-sensitive photosensitive coating of a lithographic plate, of removing the non-image areas therefrom, all percentages being based on the total weight of the ingredients in the developer solution.

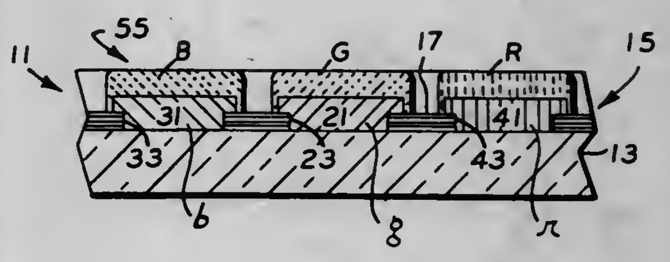
3,891,440
PROCESS FOR FABRICATING A COLOR CATHODE RAY TUBE SCREEN STRUCTURE INCORPORATING OPTICAL FILTER MEANS THEREIN

Anthony V. Gallaro, Auburn, and Robert A. Hedler, Seneca Falls, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 2, 1973, Ser. No. 412,145

Int. Cl. G03g *13/22*

U.S. Cl. 96—36.1 **8 Claims**



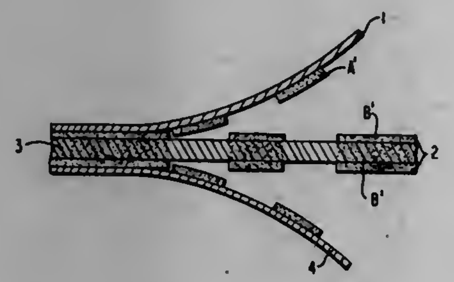
3. In the viewing panel of a color cathode ray tube having diverse phosphors disposed as a plural patterned cathodoluminescent screen upon a multi-windowed webbing of a substantially opaque material formed contiguous to the inner surface of said panel in accordance with a spatially related multiple-apertures pattern mask, a process for disposing a pattern of first optical filter elements in the window areas of said webbing associated with the first pattern of said screen prior to the deposition of the phosphor materials thereon, said process comprising the steps of:

- a. coating said panel with a first heat formable optical filter material;
- b. heating said coated panel in a controlled oxygen atmosphere to transform and adhere said first optical filter material thereto;
- c. coating said panel with a covering of a first acid-resistant negative photosensitive resist material;
- d. exposing said coated panel by directing actinic radiation emanating from a first exposure source through the apertures in said pattern mask to light-polymerize first pattern areas thereon;
- e. developing said light-exposed coating by removing the unexposed acid-resistant photosensitive resist to provide a primary deposition of polymerized first pattern areas protectively covering areas of said first optical filter material disposed in the first window pattern of said screen webbing;
- f. removing the extraneous first optical filter material from those areas not protected by said primary deposition of polymerized said first pattern areas to provide a defined first pattern of optical filter elements therebeneath;
- x. heating said panel to volatilize said first pattern of polymerized primary areas to provide a basic screen structure having discrete first pattern optical filter elements associated with the first pattern windows in the webbing of said screen structure.

3,891,441
LIGHT-SENSITIVE STENCIL PRINTING MATERIAL WITH POROUS SUPPORT AND COVER SHEETS

Nobuo Tsuji, and Eiichi Hasegawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara-shi, Japan

Continuation of Ser. No. 60,233, Aug. 3, 1970, abandoned.
This application Jan. 22, 1973, Ser. No. 325,780
Claims priority, application Japan, Aug. 1, 1969, 44-60807
Int. Cl. G03c *1/76, 3/00, 5/00, 1/90, 1/86, 1/68*
U.S. Cl. 96—68 **18 Claims**



1. A light-sensitive stencil printing material comprising a porous support having impregnated therein a thixotropic photopolymerizable composition containing a thixotropic photopolymerizable monomer, a photopolymerization initiator and finely divided solid particles having a particle diameter of from 5 millimicrons to 50 microns, and cover films provided on both sides of said support.

3,891,442
LITHOGRAPHIC MATERIALS CONTAINING METAL COMPLEXES

Dorothy Johnson Beavers, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 312,159, Dec. 4, 1972, abandoned. This application Sept. 18, 1973, Ser. No. 398,515
Int. Cl. G03c *1/48, 1/06, 1/28*
U.S. Cl. 96—76 R **15 Claims**

1. A photographic element comprising a support having coated thereon at least one layer comprising a photographic silver halide emulsion and in said layer or in a second layer adjacent thereto from about 0.2 to about 5.0 grams per mole of silver of each of (a) at least one azaindene and (b) at least one hexacoordinated trivalent cationic complex comprising a trivalent metal ion selected from the group consisting of cobalt (III) and chromium (III) in combination with at least one ligand selected from the group consisting of ammonia, ethylenediamine, trimethylenediamine, diethanolamine and dipropanolamine; said silver halide emulsion comprising silver halide grains in which the halide consists of at least about 50 mole percent chloride, up to about 10 mole percent iodide and any remaining halide being bromide.

3,891,443
MAT FINISH PHOTOSENSITIVE RELIEF PLATES

Gregory Halpern, Tarrytown, N.Y., and William Rowe, Westfield, N.J., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Feb. 1, 1973, Ser. No. 328,632
Int. Cl. G03c *1/72*
U.S. Cl. 96—79 **2 Claims**

1. A photosensitive plate for the preparation of relief printing plates which photosensitive plate has a layer of a photopolymerizable composition and, in conjunction therewith, a strippable material with a mat or grained surface in intimate contact with the photopolymerizable layer whereby a mirror image mat or grained surface has been imparted to the surface of the photopolymerizable layer, said strippable material being adapted for removal before exposure of the photopolymerizable composition without disturbing the mat surface of the photopolymerizable layer, by being coated, at least on the surface adjacent said photopolymerizable composition, with a release agent.

3,891,444
MOTION PICTURE FILM MATERIALS CONTAINING MAGNETIC RECORDING STRIPES

August Jean Van Paesschen, Antwerp; and Joseph Antoine Herbots, Edegem, both of Belgium, assignors to Agfa-Gavaert Aktiengesellschaft, Mortsel, Belgium.

Filed June 3, 1974, Ser. No. 475,934
Claims priority, application United Kingdom, June 4, 1973, 26581/73
Int. Cl. G03c *1/84, 1/72, 1/78, 5/14*
U.S. Cl. 96—84 R **6 Claims**

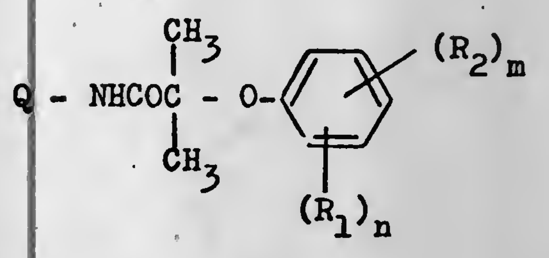
1. Multilayer motion picture film material comprising a support, at least one light-sensitive emulsion layer at one side of said support, and at the opposite side of said support an antihalation layer comprising an alkali-soluble polymeric binder capable of being detached from said support in the presence of an alkaline medium, and deposited upon said antihalation layer stripes of a coating composition of magnetizable material dispersed in an alkali-insoluble binder in admixture with a carbodiimide as cross-linking agent for the alkali-soluble polymeric binder of said antihalation layer.

3,891,445
COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Atsuaki Arai, and Yasushi Oishi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed June 18, 1974, Ser. No. 480,456
Claims priority, application Japan, June 20, 1973, 48-69383
Int. Cl. G03c *1/40*
U.S. Cl. 96—100 **12 Claims**

1. A color photographic light-sensitive material which comprises a support having thereon at least one silver halide emulsion layer containing a coupler represented by the general formula



wherein Q represents a coupler residue forming a dye upon reaction with an oxidation product of an aromatic primary amino developing agent; R_1 represents an alkyl group, an aralkyl group, an alkoxy group, an alkoxyalkyl group, an acylamido group or an alkoxycarbonyl group, each having from 4 to 20 carbon atoms; R_2 represents a hydrogen atom, a chlorine atom, a hydroxy group, an alkyl group having from 1 to 5 carbon atoms or an alkoxy group having from 1 to 5 carbon atoms; m represents an integer of 1 to 4; n represents an integer of 1 to 4; and the sum of $m+n$ is 2 to 5; and R_1 and R_2 can form a non-metallic atom-containing five membered ring or a six membered ring.

3,891,446
SENSITIZING SOLID SILVER HALIDE EMULSION LAYER WITH HOT HYDROGEN

Gaile A. Janusonis, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 20, 1973, Ser. No. 334,183
Int. Cl. G03c *1/28*
U.S. Cl. 96—107 **6 Claims**

1. A process for increasing the sensitivity of a solid radiation-sensitive negative-forming layer containing at least one radiation-sensitive silver halide, which process comprises the step of contacting said layer with a gaseous atmosphere containing at least about 2 volume percent of hydrogen and at most about 5 volume percent moisture at a temperature of at least about 35°C. and for at least about 5 seconds until the sensitivity of said layer is increased; said process being performed without subjecting said layer to an evacuation step prior to said contacting with hydrogen; any other gases in said contacting gaseous atmosphere being non-reactive with said layer.

3,891,447
BATH FOR PLATING GOLD ON TITANIUM METAL

George F. Nordblom, Yardley, Pa., assignor to ESB Incorporated, Philadelphia, Pa.

Filed Dec. 12, 1973, Ser. No. 424,173
Int. Cl. C23c *3/00*
U.S. Cl. 106—1 **2 Claims**

1. An aqueous bath for plating gold on metal by displacement which comprises:

a. monovalent gold ion, the concentration of gold ion being between the limits of about 25 gms per liter and about 1 gm per liter;
b. citrate ion, the concentration of citrate ion being about 50 gms per liter;
c. ammonium fluoride, the concentration of the ammonium fluoride being about 7½ gms per liter;
d. ammonium acid fluoride, the concentration of the ammonium acid fluoride being about 6 gms per liter; and
e. tungstic acid, the concentration of the tungstic acid being about 10 gms per liter.

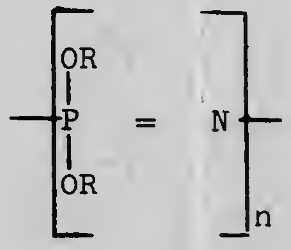
3,891,448
MODIFIED PHOSPHAZENE FLAME RETARDANT

Henry G. Braxton, Jr., Franklin, and U. Albert Lehikoinen, Detroit, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Filed Mar. 5, 1973, Ser. No. 337,828
Int. Cl. C09d *5/18*
U.S. Cl. 106—15 FP **10 Claims**

1. Process for the preparation of a modified phosphazene fire retardant, said process comprising reacting a substantially fully hydrocarbyloxylated phosphazene and a partially hydrocarbyloxylated phosphazene; said phosphazene reactants being composed of at least about 65% cyclics and having a number average molecular weight of from about 400 to about 10,000

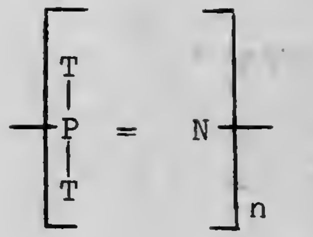
a. said substantially fully hydrocarbyloxylated phosphazene having the formula



$$\left[-\overset{\displaystyle OR}{\underset{\displaystyle OR}{P}}=N-\right]_n$$

wherein n is at least 3, such that the number average molecular weight is as stated above and each R is a hydrocarbyl radical of up to about seven carbon atoms and is selected from the class consisting of alkyl, cycloalkyl, alkenyl, alkaryl, aralkyl, and aryl,

b. said partially hydrocarbyloxylated phosphazene having the formula



$$\left[-\overset{\displaystyle T}{\underset{\displaystyle T}{P}}=N-\right]_n$$

wherein each T is selected from the class consisting of chlorine, bromine, and —OR such that from about 80 to about 95 per cent of said T groups are —OR and the remainder is halogen, and wherein n and R have the same significance as above; said process being conducted by heating said phosphazenes at from about 90° to about 190°C. such that said modified phosphazene fire retardant is formed by splitting out RX by-product wherein R and X have the same significance as above.

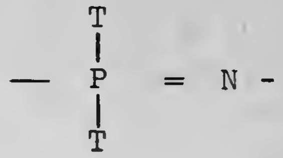
3,891,449
MODIFIED PHOSPHAZENE FIRE RETARDANTS

Henry G. Braxton, Jr., Franklin; Margaret E. Griffing, Southfield, and James G. Jolly, Lathrup Village, all of Mich., assignors to Ethyl Corporation, Richmond, Va.

Filed Mar. 5, 1973, Ser. No. 338,145
Int. Cl. C09d *5/18*
U.S. Cl. 106—15 FP **9 Claims**

1. A modified phosphazene having at least two entities crosslinked by a P—O—P bond, said modified phosphazene being characterized by having less than about 38 weight percent cyclics, and further characterized by being the reaction product formed by heating, until organic halide is evolved,

a. an organophosphazene with a reactant selected from the class consisting of (b) a phosphonitrilic halide, and (c) a partially substituted, halogen-containing phosphazene, each of (a), (b), and (c) being characterized by having less than about 38 weight percent cyclics, and (b) having a number average molecular weight of from about 900 to about 400,000, and (a) and (c) being derived therefrom, each of (a), (b) and (c) having the repeating unit



$$-\overset{\displaystyle T}{\underset{\displaystyle T}{P}}=N-$$

such that in

a. each T is a hydrocarbyloxy radical —OR wherein R is a hydrocarbyl radical of up to about 7 carbons selected from the class consisting of alkyl, cycloalkyl, aryl, alkaryl and aralkyl; in
b. each T is selected from the class consisting of chlorine and bromine; and in
c. each T is selected from the class consisting of chlorine and bromine and —OR wherein R is the same as above, such that from about 80–95 percent of said T groups are —OR and the remainder is halogen;

the amount of said reactant being such that the weight percent of halogen in the reaction mixture is from about 2 to about 20 weight percent.

3,891,450
SOLVENTS AND VEHICLES FOR MICRO-CIRCUITRY PASTES AND PASTES MADE THEREFROM

Ralph E. Trease, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 159,452, July 2, 1971, abandoned. This application Apr. 2, 1973, Ser. No. 347,311

Int. Cl. C08h *17/34, 17/66;* **C09d** *11/14*

U.S. Cl. 106—26 **10 Claims**

1. A printing paste comprising by weight:

a. about 26% of a liquid carrier vehicle consisting essentially of a liquid solvent system consisting essentially of polypropylene glycol and butyl carbitol acetate and ethyl cellulose dissolved therein; and

b. about 74% of a particulate solids component consisting essentially of a glass binder consisting of about 75% by weight of a lead-borosilicate glass and about 25% by weight Bi_2O_3 and a conductor material comprised of Ag, said solids component consisting essentially of by weight about 82% of said conductor material and about 18% of said glass binder.

3,891,451
THERMOPLASTIC TRAFFIC PAINT

Hiroyuki Okazaki; Isao Yuji, both of Toyonaka, and Masayuki Yui, Ikoma, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Mar. 13, 1974, Ser. No. 450,683

Claims priority, application Japan, Nov. 1, 1973, 48-123643

Int. Cl. C08f *45/66;* **E01f** *9/08*

U.S. Cl. 106—30 **6 Claims**

1. In a thermoplastic traffic paint containing at least one pigment, at least one filler and at least one natural and/or synthetic resin, an improvement which comprises using as the pigment an aged product obtained by heating 4,4′-bis-[acetoacet(2″,5″-dimethoxy-4″-chloro)anilido-2-azo]-3,3′-dichlorodiphenyl in an organic solvent or an aqueous alkali solution, under atmospheric or increased pressure.

3,891,452
REFRACTORY PORCELAIN ENAMEL PASSIVE CONTROL COATING FOR HIGH TEMPERATURE ALLOYS

George M. Low, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Herman Levin, Canoga Park; Byron H. Auker, Hermosa, and Michael N. Gardos, Torrance, all of Calif.

Filed Apr. 11, 1973, Ser. No. 350,250

Int. Cl. C03c *7/00, 3/14*

U.S. Cl. 106—48 **5 Claims**

1. A porcelain enamel coating composition which exhibits a low absorptance and a high emittance of solar radiation and a high coefficient of thermal expansion, and maintains its physical integrity upon subjection to severe thermal cycling, comprising:

a frit comprising:

	Weight Percent
SiO_2	35 to 50
B_2O_3	4 to 9
Al_2O_3	6 to 9.5
ZrO_2	10 to 20
Na_2O	6 to 7
CaO	1 to 2
BaO	8.5 to 9.8
ZnO	2 to 6
LiF	4 to 10.2

and a disperse phase of cubic-stabilized, submicron-particle-size zirconium oxide, the amount of the disperse phase is 10–50 weight percent of said frit.

3,891,453
ASBESTOS-FREE JOINT COMPOUNDS

Terrance L. Williams, Crystal Lake, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed July 26, 1973, Ser. No. 382,973

Int. Cl. C04b *11/16*

U.S. Cl. 106—85 **12 Claims**

1. A composition which when mixed with water forms a non-leveling joint compound having properties suitable for use in finishing joints between wallboards even when free of asbestos fibers, comprising the following ingredients in amounts based on the total dry weight of the composition:

a filler selected from the group consisting of calcium carbonate and calcuim sulfate in an amount of between about 37 and 92 percent;

a binder in an amount of between about 1 and 7 percent;

attapulgus clay in an amount of between about 0.5 and 6 percent; and

at least one ingredient selected from the group consisting of:

a water-holding agent in an amount of between about 0.1 and 2.0 percent; and

a slip-inducing colloid in an amount of between about 0.1 and 2.9 percent selected from the group consisting of modified montmorillonite clay gel and xanthan gum.

3,891,454
COMPOSITION AND METHOD FOR CEMENTING WELLS IN LOW TEMPERATURE FORMATIONS

Willis C. Cunningham; Charles R. George, both of Duncan, Okla., and Stanley H. Shryock, Brea, Calif., assignors to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 129,983, March 31, 1971, abandoned, which is a continuation-in-part of Ser. No. 821,946, May 5, 1969, abandoned. This application June 28, 1973, Ser. No. 374,609

Int. Cl.² C04B *7/02*

U.S. Cl. 106—89 **20 Claims**

1. A hydraulic cement composition capable of setting at low temperatures without freezing consisting essentially of:

A Portland cement, gypsum, a monovalent chloride salt, and a setting time retarding agent;

wherein said Portland cement is present in said composition in the range of about 15 to about 35 pounds per 75 pounds of dry solids, the weight ratio of said gypsum to said Portland cement in said composition is in the range of about 1:1 to about 3:1, said monovalent chloride salt is present in said composition in the range of about 1 to about 3.5 pounds per 75 pounds of dry solids, and said setting time retarding agent is present in said composition in the range of about 0.01 to about 0.525 pounds per 75 pounds of dry solids.

3,891,455
PHYTHLOCYANINE PIGMENTS

Robert Langley, Newton Mearns, and Ronald Barraclough, Paisley, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 26, 1973, Ser. No. 336,097

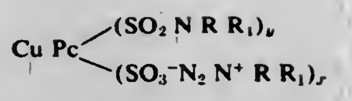
Claims priority, application United Kingdom, Mar. 14, 1972, 11742/72

Int. Cl. C08h *17/14*

U.S. Cl. 106—288 Q **12 Claims**

1. A process for preparing a pigment which comprises incorporating into a metal phthalocyanine green compound, from 5 to 15% by weight of a copper phthalocyanine derivative having either the formula: $CuPc(SO_3H)_{3-4}$ II

or



$$\mathrm{Cu\,Pc}\begin{cases}(\mathrm{SO_2\,N\,R\,R_1})_x\\(\mathrm{SO_3^-N_2\,N^+\,R\,R_1})_y\end{cases}\qquad \mathrm{I}$$

wherein Cu Pc represents a copper phthalocyanine residue, which is halogenated or unhalogenated, R represents a cyclic or acyclic alkyl group having from 1 to 20 carbon atoms, or an aryl group, R_1 represents hydrogen, a cyclic or acyclic alkyl group having from 1 to 20 carbon atoms or an aryl group, the alkyl or aryl groups being either unsubstituted or substituted by hydroxyl, amino, alkylamino or amide substituents, and x and y each represent 1, 2 or 3 with the proviso that the sum of x and y is 2, 3 or 4.

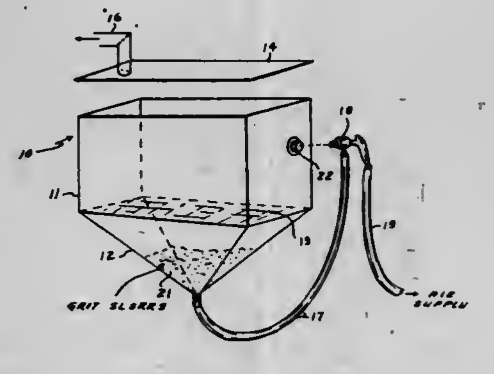
3,891,456
SURFACE TREATMENT OF TITANIUM AND TITANIUM ALLOYS

Alvin E. Hohman, Dallas, and Gerald W. Lively, Arlington, both of Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 17, 1973, Ser. No. 407,380

Int. Cl. B08b *3/02*

U.S. Cl. 134—3 **6 Claims**



1. A process for treating an oxidized surface of a titanium or titanium alloy part which comprises directing a stream consisting essentially of a slurry of aluminum oxide grit in an aqueous hydrofluosilicic acid solution onto the surface for a period of time sufficient to obtain about 3 to 15 minutes; washing the surface with water to remove grit and terminate acid reaction; and drying the part. an oxide-free, uniform, matte surface free from gloss, provided that the total period of time the surface is allowed to remain in contact with the slurry is.

3,891,457
ELECTROCHEMICAL CELL

James J. Auborn, Groton, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 29, 1973, Ser. No. 420,125

Int. Cl. H01m *43/06*

U.S. Cl. 136—6 LN **26 Claims**

1. An electrochemical cell comprising an oxidizable active anode material; a solid, non-consumable, electrically conducting inert cathode current collector; said anode material being more electropositive than said cathode current collector and thus said anode material is oxidized during operation of said cell; and an electrolytic paste between and in contact with said anode and said cathode current collector, said electolytic paste comprising a liquid, electrochemically reducible, covalent inorganic oxyhalide or thiohalide solvent, a solute dissolved in said solvent, and a sufficient quantity of small carbon particles suspended in said solvent to give the electrolyte paste-like consistency; said carbon particles in said electrolyte paste catalyzing the electrochemical reduction of said inorganic solvent, whereby said inorganic solvent in conjunction with said oxidizable anode material serves as a source of electrical energy during operation of said cell.

3,891,458
ELECTRIC CURRENT PRODUCING GALVANIC CELL

Morris Eisenberg, Mountain View, Calif., assignor to Electrochimica Corporation, Mountain View, Calif.

Filed Nov. 15, 1973, Ser. No. 416,073

Int. Cl. H01m *43/06*

U.S. Cl. 136—6 LN **13 Claims**

1. A galvanic cell comprising:

A. a porous solid cathode;

B. an anode including a metal less noble than zinc selected from the group consisting of lithium, sodium, magnesium, calcium and aluminum; and

C. an electrolyte for electrolytic conduction between said anode and cathode consisting essentially of thionyl chloride in which is dissolved

a. a first solute consisting essentially of a salt of the selected anode metal in a concentration of between 0.5 and 3.0 moles per liter, and

b. a second solute selected from the group of compounds consisting of phosphoryl chloride, sulfolane, sulfur dioxide, and mixtures thereof in a concentration of between 0.5 and 6.0 moles per liter.

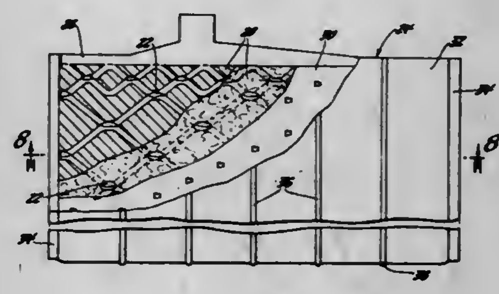
3,891,459
NEGATIVE LEAD-ACID BATTERY PLATES WITH EXPANDED LEAD SHEET GRIDS

Charles P. McCartney, Jr., Yorktown, and Norman L. Willmann, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 20, 1973, Ser. No. 399,109

Int. Cl. H01m *35/04*

U.S. Cl. 136—26 **2 Claims**



1. A negative lead-acid storage battery plate of the Faure-type comprising:

a paste-supporting skeleton of lead material defining a flat, top current-collecting header of sheet lead having a predetermined thickness and an upstanding connector lug, a reticulated portion depending from the header over substantially the entire length thereof and including a plurality of nodes from which skeletal elements project to define a plurality of polygonal paste-retaining cells there being significantly more nodes, skeletal elements and paste-retaining cells per unit area of reticulated portion contiguous to the header than in reticulated portions more remote from the header said header-contiguous cells having significantly smaller paste-retaining areas than the cells remote from the header, said nodes angling from one face of the reticulated portion to the other face thereof and having a polygonal cross-section in the vertical transverse plane with two opposing sides of each polygon in planes substantially parallel to the faces of the pasted plate and spaced one from the other by a distance greater than said predetermined thickness but substantially less than twice said predetermined thickness, and said skeletal elements angling from one side of each node to the opposite side of the adjacent node to which it connects; and a fiber-laden, leady active material paste embedding the reticulated portion of the skeleton and together therewith defining a substantially flat plate having substantially parallel faces and a thickness at least equal to the distance between said opposing sides of said nodes whereby the skeletal elements angle through and are substantially covered by the paste and support the same over substantially the entire thickness thereof without substantially interrupting continuity of the paste from one polygonal paste-retaining cell to the next.

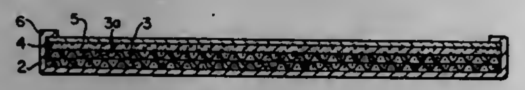
3,891,460
THERMAL BATTERY AND MOLTEN METAL ANODE THEREFORE

George C. Bowser, Baltimore, Md.; James R. Moser, deceased, late of Shrewsbury, Pa., and Patricia Karen Moser, administratrix, Shrewsbury, Pa., assignors to Catalyst Research Corporation, Baltimore, Md.

Filed May 14, 1973, Ser. No. 360,162

Int. Cl. H01m *21/00*

U.S. Cl. 136—83 T **16 Claims**



1. A thermal battery comprising a plurality of stacked cell elements including an anode assembly consisting essentially of an anode having substantially parallel inner and outer surfaces and a side surface, said anode consisting of a foraminous metal substrate wettable by and filled with a metal selected from the group consisting of alkali metals, alkaline earth metals and alloys thereof melting below the operating temperature of the battery, and a housing covering the outer surface and side of said anode and consisting of an impervious metal portion in electrical contact with said anode and a porous portion in sealing engagement against the periphery of said metal portion and in contact with said anode, said porous portion being formed from refractory fibers.

3,891,461
CHEMICAL PROTECTION OF ASBESTOS

Yoshiro Harada, Skokie, and A. Z. Hed, Chicago, both of Ill., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 5, 1973, Ser. No. 404,091

Int. Cl. H01m *27/00*

U.S. Cl. 136—86 E **2 Claims**

1. A method for producing an activatable hydrogen-oxygen type fuel cell characterized by having an operational feasibility over extended periods of time which comprises the steps of:

a. providing said cells with an electrolyte system which comprises a mixture of (1) potassium hydroxide in concentration range of from 40 percent to 60 percent and (2) asbestos fibers for retaining said electrolyte; and

b. adding potassium silicate to said electrolyte system to stabilize the corrosive chemical reaction occurring between said hydroxide and said asbestos at temperatures in excess of 100°C.

3,891,462
GALVANIC CELL STRUCTURE

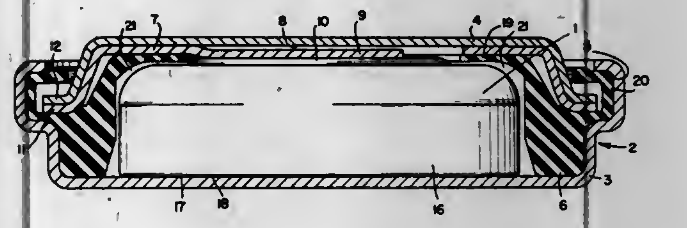
John Frank Langkau, Lakewood, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Oct. 29, 1973, Ser. No. 410,883

Int. Cl. H01m *1/00*

U.S. Cl. 136—111 **14 Claims**

1. A galvanic cell structure comprising at least one miniature sized galvanic button cell having an anode, a cathode of depolarizer material and an electrolyte assembled in a first sealed button housing which comprises a first conductive container, a first conductive cover for the container, and a first insulating member interposed between the first cover and the upper inner wall of the first container such that a seal is formed between said first container and said first cover; said at least one button cell disposed in a second housing which comprises a second conductive container, a second conductive cover for the container, and a second insulating member interposed between the second cover and the upper inner wall of the second container such that a seal is formed between said second container and said second cover; and contact means disposed between at least one of said first button cells and said second button housing for maintaining electrical contact between one of said first containers and said second container, and between one of said first covers and said second cover so as to adopt said second cover and said second container as the electrical terminals for said at least one cell enclosed in said second housing.



3,891,463
LEAK-PROOF GALVANIC CELL

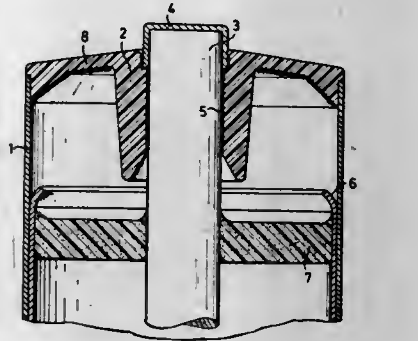
Ernst Karobath, and Leopold Rippel, both of Vienna, Austria, assignors to Telephon-und Telegraphen-Fabriks Aktiengesellschaft Kapsch & Sohne In Wien, Vienna, Austria

Filed Dec. 19, 1973, Ser. No. 426,239

Claims priority, application Germany, Dec. 21, 1972, 2262670

Int. Cl. H01m *1/02*

U.S. Cl. 136—134 R **2 Claims**



1. A leak-proof galvanic cell comprising a plastic sleeve, a cover on said sleeve having an opening with a surrounding flange, a positive bar electrode disposed in said opening and defining an annular gap with said flange, a sealing material in said annular gap between the flange and the bar electrode, said sealing material consisting essentially of elastomeric atactic polypropylene having a softening range above a temperature of 100°C.

3,891,464
ELECTRIC ACCUMULATOR WITH CHIEFLY PLANE PLATES

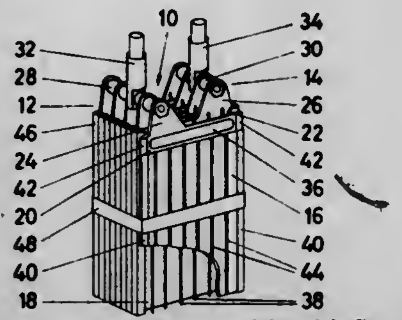
Verner Elof Johannes Kinnerud, and Bernt Oskar Gerhard Svensson, both of Oskarshamn, Sweden, assignors to Svenska Ackumulator Aktiebolaget Jungner, Oskarshamn, Sweden

Filed Nov. 7, 1973, Ser. No. 413,742

Claims priority, application Sweden, Nov. 14, 1972, 14787/72

Int. Cl. H01m *39/02*

U.S. Cl. 136—145 **4 Claims**



1. In an electric accumulator with chiefly plane plates (16,18) which in their upper part have chiefly plane terminal lugs (20,22) and which are arranged in parallel with alternately placed positive and negative plates with intermediate flexible separator rods (38) which extend up between the terminal lugs (20,22), the improvement characterized in that the terminal lugs (20,22) have one or more portions (36) projecting from the plane surface which subject the separator rods (38) to a bending moment such that through the generated forces of friction between said projecting portions and said separator rods the separator rods (38) are held in a fixed position between the plates (16,18).

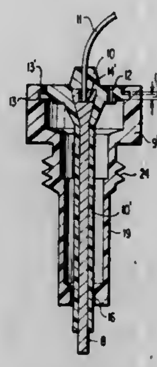
3,891,465
BATTERY EQUIPPED WITH AN INDICATOR FOR THE LOWERING OF THE ELECTROLYTE LEVEL

Eiji Muto; Tsuneo Kawarabayashi; Koichi Matsumura, and Hitoshi Tamura, all of Kyoto, Japan, assignors to Japan Storage Battery Co., Ltd., Kyoto-shi, Japan

Filed Aug. 16, 1973, Ser. No. 389,037

Int. Cl. H01m *31/04*

U.S. Cl. 136—182 **3 Claims**



1. In a vent plug of a battery having an electrolyte level-detecting electrode, the improvement wherein the plug comprises: an upper hollow cap portion and a lower, vertically extending fume-protecting tube which extends into the electrolyte-containing portion of the battery, said tube containing a slot for passing gas generated within the battery through the interior of said tube to a gas vent in said cap; and an electrolyte level-sensing electrode supported in said hollow cap portion for rotation relative thereto and extending interiorly through and beyond the lower end of said tube, whereby the lower end of said electrode is in contact with the battery electrolyte when the electrolyte is at an acceptable level; so that said electrode remains stationary when the vent plug is rotated for removing it from, or inserting it in, an electrolyte filling hole of the battery.

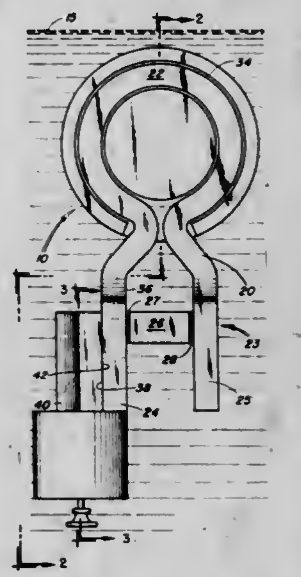
3,891,466
ATTACHMENT DEVICE

Porter W. Erickson, and Alvin G. Hellfritzsch, both of Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 2, 1968, Ser. No. 742,975

Int. Cl. H01h *47/26*

U.S. Cl. 136—200 **10 Claims**



1. A magnetic device attachable to a ferromagnetic surface comprising:

a core;

coil means for said core;

thermocouple means energizing said core

said thermocouple means having a "hot" junction and a "cold" junction;

chemical charge means for producing heat energy and coupled to said "hot" junction;

said chemical charge means being selectively activated to produce sufficient heat at said "hot" junction to cause current to flow through said coil means and magnetize said core.

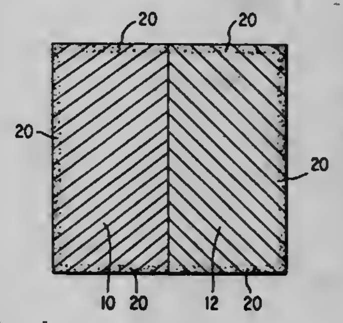
3,891,467
THERMOCOUPLE WITH A DIFFUSED CHROMIUM CASING

Hugh J. Tyler, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 29, 1973, Ser. No. 364,588

Int. Cl. H01v *1/04*

U.S. Cl. 136—233 **8 Claims**



1. A thermocouple adapted for sensing a flame comprising an electropositive element,

an electronegative element joined to the electropositive element to form a thermocouple junction,

at least one of the elements containing a metal which causes formation of carbon desposits on the one element when exposed to burning fuel, and a casing of chromium diffused in the exposed surfaces of the joined elements,

said casing decreasing in chromium content from essentially pure chromium at the surface of the elements to a substantially less chromium content within the elements.

3,891,468
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

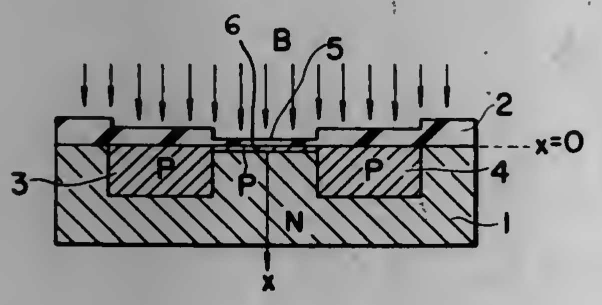
Katsuhiko Ito, Kokubunji and Takashi Tsuchimoto, Kodaira, both of Tokyo, Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 20, 1973, Ser. No. 399,115

Claims priority, application Japan, Sept. 20, 1972, 47-93600

Int. Cl. H01l *7/54*

U.S. Cl. 148—1.5 **10 Claims**



2. A method of manufacturing a semiconductor device, comprising the steps of:

a. selectively introducing an impurity of a first conductivity type into a semiconductor substrate through a surface portion thereof, said substrate having a second conductivity type opposite said first conductivity type, so that the concentration gradient of said impurity of said first conductivity type in said substrate is at a prescribed maximum value substantially at the surface of said substrate and decreases therefrom into said substrate; and

b. selectively introducing an impurity of said second conductivity type into said substrate through said surface portion thereof, so that the concentration gradient of said impurity of the second conductivity type in said substrate increases from a first prescribed level at the surface of said substrate, reaches a prescribed maximum value at an established distance from said surface and decreases therefrom into said substrate, said prescribed maximum value of the concentration gradient of said second conductivity type impurity being relatively smaller than the prescribed maximum value of the concentration gradient of the impurity of said first conductivity type;

whereby a resultant impurity concentration distribution from the combined effects of steps (a) and (b) is formed in said substrate, said resultant distribution having said first conductivity type at the surface of said substrate and decreasing to a defined distance within said substrate at which a P-N junction is formed.

3,891,469
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

Hideki Moriyama, and Seiichi Tachi, both of Tokyo, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 4, 1973, Ser. No. 403,661

Claims priority, application Japan, Oct. 4, 1972, 47-99008

Int. Cl. H01l *7/54*

U.S. Cl. 148—1.5 **13 Claims**

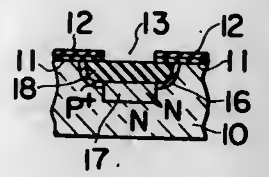
1. A method of manufacturing a semiconductor device, comprising:

a. forming an oxidation-resisting film on a silicon substrate of a first conductivity type in conformity with a predetermined pattern;

b. diffusing an impurity of a second conductivity type opposite to that of said silicon substrate through an opening in said oxidation-resisting film, to form a first region;

c. implanting impurity ions of said first conductivity type through said opening to form a second region having a depth deeper than and a width narrower than said first region; and

d. oxidizing the resultant silicon substrate by employing said oxidation-resisting film as a mask, to form a silicon dioxide region in said silicon substrate in the vicinity of said opening.



3,891,470
FERROUS METALS TREATED WITH IMIDAZOLE COMPOUNDS FOR CORROSION RESISTANCE

Akira Kotone, Nara; Masahiro Hoda, and Takeshi Hori, both of Sakai, all of Japan, assignors to Sakai Chemical Industry Company, Ltd., Osaka, Japan

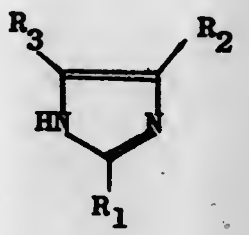
Filed Jan. 23, 1973, Ser. No. 326,002

Claims priority, application Japan, July 29, 1971, 46-56898

Int. Cl. C23c *13/02;* **C23f** *11/14*

U.S. Cl. 148—6.14 **5 Claims**

1. A ferrous metal treated for resistance to corrosion, said resistance to corrosion resulting from the application to said ferrous metal of a volatile corrosion inhibiting composition containing an imidazole compound of the formula



wherein each of R_1, R_2 and R_3 is independently hydrogen, methyl, ethyl, propyl or isopropyl.

3,891,471
METHOD OF MAKING PROTECTED GALVANIZED STEEL SHEETING

John E. Summers, Pittsburgh, Pa., and Gerhard Rose, Neukirchen, Germany, assignors to Robertson Bauelemente G.m.b.H., Germany

Continuation-in-part of Ser. No. 402,710, Oct. 2, 1973, abandoned, which is a continuation of Ser. No. 249,414, May 1, 1972, abandoned. This application June 7, 1974, Ser. No. 477,203

Int. Cl. C23f *7/26*

U.S. Cl. 148—6.16 **5 Claims**

1. The method of making a protected metal sheet having a post-formable, oxidative-polymerizable polyester resin outer coat, comprising:

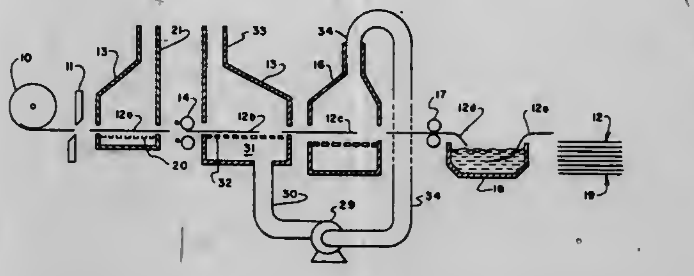
a. preheating a sheet of galvanized steel to a temperature of 60° to 100°C;

b. applying a film of wash primer dispersion in volatile solvent to at least one surface of the preheated sheet;

c. concurrently (*i*) volatilizing the solvent of the wash primer dispersion film; (*ii*) curing the wash primer film; and (*iii*) reheating the sheet to a temperature of 60° to 105°C;

d. applying, at a temperature of 180° to 220°C, a weather-resistant, hot-melt, oxidative-polymerizable polyester resin coating having a softening temperature of 105° to 120°C, ball-and-ring, to at least one wash primer-coated surface of the said sheet which is at a temperature of 60° to 105°C;

e. cooling the hot-melt, resin-coated sheet to set the hot-melt resin coating at least 50°C below the softening temperature of the resin coating.



3,891,472
RELIEF-PATTERNED METAL ARTICLE AND A METHOD OF MAKING SAME

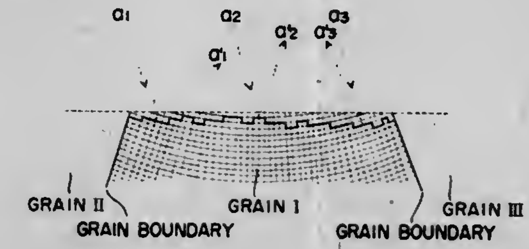
Kiyota Yoshida, and Mizuo Ejima, both of Tokyo, Japan, assignors to Rikagaku Kenkyusho, Wako-shi, Japan

Filed May 29, 1973, Ser. No. 364,406

Claims priority, application Japan, May 29, 1973, 48-53218

Int. Cl. C22f *1/00, 1/04*

U.S. Cl. 148—11.5 R **9 Claims**



1. A relief-patterned metal article comprising a crystal pattern composed of a plurality of crystal grains, at least some of which are large-sized crystal grains visible to the naked eye, at least selected of the large-sized crystal grains having a curved crystal lattice which is curved with respect to an outer surface of the article, said surface being etched and the curvature of the crystal lattice being sufficient for providing a visible relief pattern in the surface appearance of the article.

3,891,473
HEAT TREATING ATMOSPHERES

Henry F. Latva, Dearborn, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed May 17, 1973, Ser. No. 361,082

Int. Cl. C21d *1/74*

U.S. Cl. 148—16.7 **5 Claims**

1. A method of controlling the carbon content of a steel alloy containing about 0.18% to 0.85% by weight carbon, comprising:

providing ammonia and methane in a volume ratio ranging from about 60/40 for the lower C contents to 20/80 for the higher C contents while maintaining the ammonia and methane separate from each other,

dissociating the ammonia and combusting the methane while maintaining the separation,

mixing the constituents resulting from the dissociation and combustion of the ammonia and methane together,

introducing the mixed constituents into a heat treating environment, and

heat treating the alloy in the heat treatment environment in the presence of the mixed constituents.

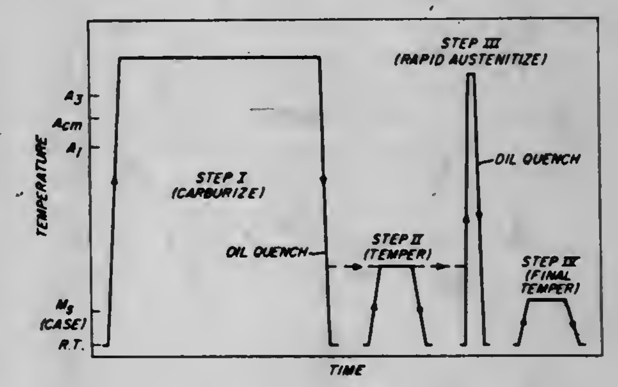
3,891,474
METHOD FOR THE CASE CARBURIZING OF STEEL

Raymond A. Grange, Washington Twp., Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 214,956, Jan. 3, 1972, abandoned. This application Nov. 9, 1973, Ser. No. 414,545

Int. Cl. C23c *11/12;* **C21d** *1/20*

U.S. Cl. 148—16.5 **10 Claims**



1. A method for the case carburizing of a steel article with carbon content within the range of about 0.1 to about 0.3 percent, which comprises,

a. carburizing said article at a temperature in excess of 1800°F but not greater than 2000°F in contact with a carbon containing substance for a time sufficient to diffuse carbon into said article to a desired case depth, said carburization producing a maximum carbon content greater than 0.9 percent to about 1.2 percent in the outer portion of the resultant carburized case,

b. quenching said article to a temperature below the M_s of the case, said case still having a maximum carbon content greater than 0.9 percent,

c. reheating the article to a temperature within the bainite region for a time sufficient to transform substantially all the austenite which is retained after said quench,

d. thereafter, reaustenitizing the lower carbon core of said article by rapidly heating to a temperature within the range A_3 to A_3=100°F of said core, and

e. maintaining the article within said A_3 temperature range only for a time sufficient to substantially equalize the temperature throughout the cross-section of the article, and

f. immediately thereafter, cooling the article to produce a martensitic case.

3,891,475
POLE PIECE FOR PRODUCING A UNIFORM MAGNETIC FIELD

Sadami Tomita, Katsuta; Akio Chiba, Hitachi, and Goh Miyajima, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 25, 1973, Ser. No. 354,467

Claims priority, application Japan, Apr. 26, 1972, 47-41328

Int. Cl. C04b *35/00*

U.S. Cl. 148—31.55 **6 Claims**

1. A pole piece for use in a magnetic circuit which comprises a soft magnetic alloy having a saturation magnetic flux density of at least 20,000 gauss when an external magnetic field of 100 oersted is applied and consisting essentially of 35 to 55 percent by weight of cobalt, 0.15 to 0.5 percent by weight of carbon, not more than 1 percent by weight of manganese, not more than 3 percent by weight of at least one of vanadium, titanium, chromium and niobium, not more than 0.2 percent by weight of silicon, not more than 0.2 percent by weight of aluminum, not more than 0.03 percent by weight of sulfur, not more than 0.03 percent by weight of phosphorus and the balance being substantially iron.

3,891,476
METHOD OF MAGNETIZING A BODY OF M$_5$R AT HIGH TEMPERATURES

Pieter Aart Naastepad, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 21, 1973, Ser. No. 418,124
Claims priority, application Netherlands, Dec. 15, 1972, 7217051
Int. Cl. H01f *1/02*
U.S. Cl. 148—103 **5 Claims**

1. A method of magnetizing a body consisting principally of a material of the composition M$_5$R, M consisting of an element selected from the group consisting of Co and Co in combination with one of the elements Fe, Ni, and Cu, and R being an element selected from the group consisting of Y, Th, and the rare earth metals comprising the steps of, subjecting said body to a magnetic field having a strength sufficient to magnetically saturate the material and less than twice the intrinsic coercive field strength of the material at a temperature between 200°C and 0.5 times the Kelvin temperature of the Curie point of said material.

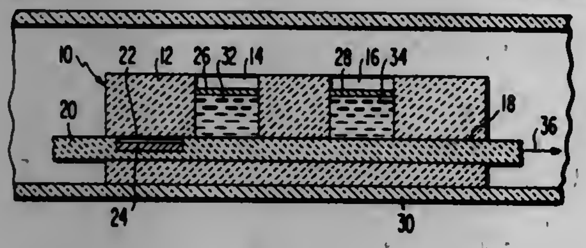
3,891,477
MATERIAL TREATMENT BY CRYOGENIC COOLING

James W. Lance, and Henry M. Jones, both of Stonewall, La., assignors to The Mangrove Enterprise, Incorporated, Wilmington, Del.
Filed Sept. 9, 1971, Ser. No. 179,218
Int. Cl. C22c *41/04*
U.S. Cl. 148—125 **8 Claims**

1. A method of treatment of materials consisting of metals by cryogenic cooling for improvement of the microstructure of such material comprising the steps of: reducing the temperature of said material to about −320°F. by supporting said material above a body of liquid nitrogen in a container and lowering said material toward said nitrogen at a rate less than the rate at which thermal fracturing of said material occurs, immersing said material into said liquid nitrogen for a predetermined period of time within the range of about 18 hours to about 30 hours; separating said material and said liquid nitrogen; and permitting said material to return to room temperature, wherein the step of reducing the temperature of said material is effected at temperature and time rates of reduction varying from a minimum range of about 2.8°–4°F per minute to a maximum range of about 10.7°–15°F per minute in accordance with the mass and nature of said material and is effected in at least two stages above and below a predetermined thermal fracture threshold for said material.

3,891,478
DEPOSITION OF EPITAXIAL LAYER FROM THE LIQUID PHASE

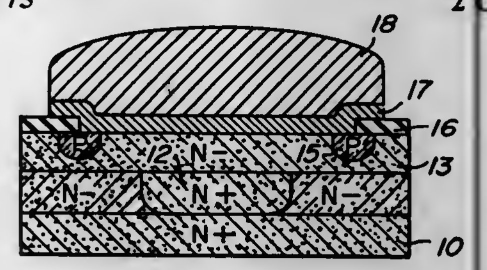
Ivan Ladany, Stockton, and Vincent Michael Cannuli, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.
Filed Aug. 16, 1973, Ser. No. 388,960
Int. Cl. H01l *7/38*
U.S. Cl. 148—171 **5 Claims**



1. A method of depositing on a substrate an epitaxial layer of a single crystalline compound or alloy having a volatile element comprising the steps of
depositing on a surface of said substrate from a first solution an epitaxial layer of the same material as that of the substrate by bringing the surface of the substrate into contact with the first solution, increasing the temperature of the first solution to melt some of the material of the substrate at said surface into the first solution, then cooling the first solution, and
immediately upon removing the substrate and the initial epitaxial layer from the first solution, depositing on the initial epitaxial layer from a second solution an epitaxial layer of the compound or alloy having the volatile element.

3,891,479
METHOD OF MAKING A HIGH CURRENT SCHOTTKY BARRIER DEVICE

Ross Zwernemann, Phoenix, Ariz., assignor to Motorola, Inc., Chicago, Ill.
Continuation of Ser. No. 190,494, Oct. 19, 1971, abandoned. This application Mar. 12, 1973, Ser. No. 340,642
Int. Cl. H01l *3/00, 5/00, 29/48*
U.S. Cl. 148—175 **2 Claims**

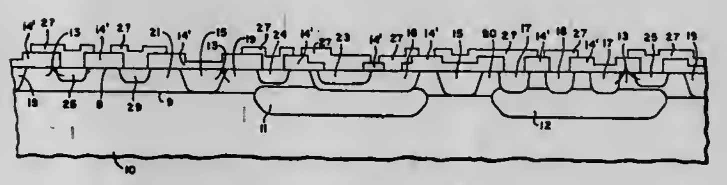


1. A method of constructing improved high current Schottky barrier devices including the steps of:
a. growing a first epitaxial layer, with a relatively light concentration of impurities for providing conductivity of a first type, on a substrate layer with a relatively heavy concentration of impurities for providing conductivity of the first type;
b. diffusing a relatively heavy concentration of impurities into a central portion of said first epitaxial layer for providing conductivity of the first type, said central portion extending through said first epitaxial layer into contact with said substrate layer;
c. growing a second epitaxial layer, with a relatively light concentration of impurities for providing conductivity of a first type, on said first epitaxial layer;
d. diffusing a guardring of impurities, for providing conductivity of a second type, into said second epitaxial layer in a relatively light concentration and substantially equally spaced about said central portion of said first epitaxial layer;
e. depositing a layer of insulating material on the surface of said second epitaxial layer and forming an aperture therethrough having an outer periphery located generally above and coextensive with said guardring, and exposing a portion of the surface of the second epitaxial layer; and
f. depositing barrier and contact metals on the exposed portion of the surface of the second epitaxial layer to form a Schottky barrier.

3,891,480
BIPOLAR SEMICONDUCTOR DEVICE CONSTRUCTION

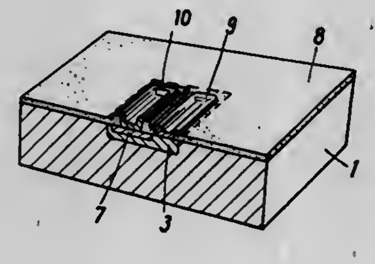
David E. Fulkerson, Minnetonka, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.
Filed Oct. 1, 1973, Ser. No. 402,550
Int. Cl. H01l *7/44*
U.S. Cl. 148—187 **9 Claims**

1. A method for providing a semiconductor device, said method comprising:
providing a semiconductor layer on a substrate, said semiconductor layer being of a first conductivity type having a first conductivity and further having an exterior major surface opposite an interior major surface thereof, said substrate with said semiconductor layer thereon having a first blocking region, of said first conductivity type with a second conductivity, located at least in part in said semiconductor layer and without said substrate with said semiconductor layer thereon having a region of a second conductivity type provided therein prior to said providing of said semiconductor layer for aiding in providing a first isolation region;
diffusing simultaneously a first active region and said first isolation region, both of said second conductivity type, into said semiconductor layer through said exterior major surface so said diffusing of said first isolation region occurs such that said first isolation region reaches said interior major surface and so said diffusing of said first active region occurs such that said first active region encounters said first blocking region before reaching said interior major surface, said first active region being enclosed by said first isolation region in said exterior major surface; and
diffusing a second active region of said first conductivity type into said first active region through said exterior major surface, such that said second active region is sufficiently close to said first blocking region and such that said first active region has a diffusant concentration of such a value that a bipolar transistor having a substantial current gain results with said first active region serving as a base and said second active region serving as an emitter.



3,891,481
METHOD OF PRODUCING A SEMICONDUCTOR DEVICE

Reinhold Kaiser, Heilbronn, Germany, assignor to Telefunken Patentverwertungsgesellschaft mbH, Ulm, Danube, Germany
Filed Dec. 1, 1969, Ser. No. 881,147
Claims priority, application Germany, Dec. 2, 1968, 1812059
Int. Cl. H01l *7/44*
U.S. Cl. 148—188 **4 Claims**



1. A method of producing a semiconductor device comprising covering a limited area of a semiconductor body with a layer containing diffusion impurities, and then diffusing said impurities into said semiconductor body in two stages, firstly diffusing only into the surface region of said semiconductor body in a prediffusion in an oxidising atmosphere to a depth short of the prescribed depth, secondly diffusing into said semiconductor body down to the prescribed depth in a subsequent diffusion likewise effected in an oxidising atmosphere and removing between said first and second stages said layer containing said impurities and an oxide layer formed during the prediffusion.

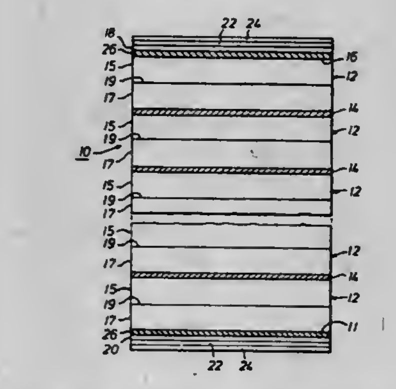
3,891,482
PROPELLANT INSTABILITY MODIFIER

Robert S. Brown, Santa Clara, and Raymond J. Muzzy, Saratoga, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Continuation of Ser. No. 32,432, April 27, 1970, abandoned. This application July 18, 1974, Ser. No. 489,871
Int. Cl.² C06B *45/34*
U.S. Cl. 149—7 **8 Claims**

1. In a propellant composition comprising an oxidizer and an organic binder component, the improvement wherein the oxidizer particle has been coated with ethylcellulose.

3,891,483
METHOD FOR ETCHING SEMICONDUCTOR SURFACES

Jurgen Messerschmidt, Letmathe, and Rigobert Schimmer, Belecke, both of Germany, assignors to Licentia-Patent-Verwaltungs G.m.b.H., Frankfurt am Main, Germany
Filed May 30, 1974, Ser. No. 474,865
Claims priority, application Germany, June 1, 1973, 2327878
Int. Cl. H01l *7/50*
U.S. Cl. 156—3 **22 Claims**



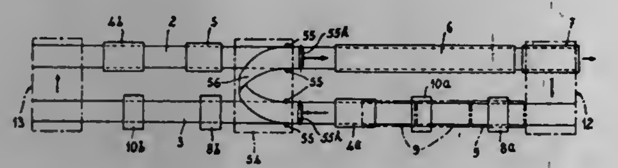
1. A method for etching semiconductor surfaces of a semiconductor body comprising:
a. soldering coated electrodes to the semiconductor body, said coated electrodes each comprising an electrode to which a nickel layer and then a layer of silver has been applied, to provide exposed semiconductor surfaces and protected semi-conductor surfaces covered by said coated electrodes,
b. contacting the semiconductor body with an etchant to etch the exposed semiconductor surfaces,
c. rinsing the etched semiconductor body surfaces with deionized water, and
d. treating the rinsed body with an ammoniacal hydrogen peroxide solution.

3,891,484
EQUIPMENT FOR MANUFACTURING STRATIFIED ISOTHERMAL PANELS

Paul Lamberet, Vonnas-Ain, France
Continuation-in-part of Ser. No. 248,538, April 28, 1972, Pat. No. 3,834,968. This application Sept. 6, 1973, Ser. No. 394,717
Claims priority, application France, May 9, 1973, 73.17424
Int. Cl. B32b *31/04*
U.S. Cl. 156—60 **7 Claims**

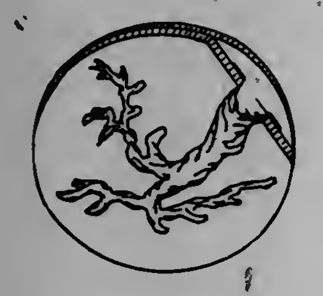
1. Apparatus for manufacturing isothermal panels of stratified matrial, which comprises a pair of parallel adjacent tracks including an outward track and a return track, platforms adapted to travel along said tracks, transfer means at the ends of said tracks for transferring said platforms from one track to the other track, a tubular oven adjacent one end of said outward track, and a plurality of treatment stations disposed along said tracks, one of said stations being located upstream of said oven and being adapted for laying expanded material

on said platforms, another of the stations being disposed on said return track and being adapted to distribute successively and continuously to each platform on the return track a resin mixture and a textile reinforcement for constituting a stratified sheet of an isothermal panel, and means for continuously



transferring said panel from said return track to the outward track by overturning said panel by guiding the same through a helical path, to bring said panel to a location disposed between the station where the expanded material is laid down and the tubular oven with the panel being superposed on the expanded material.

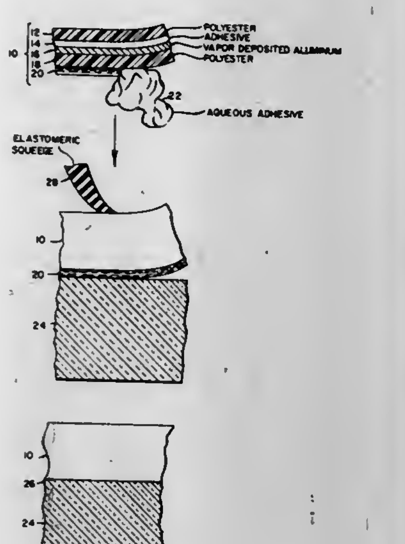
3,891,485
METHOD OF EMBOSSING WITH MANUALLY ADJUSTABLE PATTERNS OR DESIGNS
Din-Min Lin, 2-1, Alley 15 Ln. 68, Section 2 Hsin Sheng North Rd., Taipei, China /Taiwan
Filed July 24, 1974, Ser. No. 491,458
Int. Cl. B44c *5/00*
U.S. Cl. 156—63 1 Claim



1. A method of producing an embossing plate comprising the steps of:
   a. providing a background plate having a layer of fiber mounted on the front surface thereof and then punching the plate to form a desired punched pattern;
   b. passing a piece of cloth or fiber from the rear side of the plate through the punched holes and then protruding the same out of the fibered front surface of the plate to form thereon a raised pattern;
   c. adjusting or modifying the protruding cloth or fiber at one's will so as to obtain a creative and vivid pattern;
   d. gluing the cloth or fiber to the periphery walls of the punched holes on the background plate and then spraying the raised surface thereof with a liquid resin oil to thereby obtain a stiff raised pattern; and
   e. sandwiching the cloth or fiber with another plate by gluing the latter to the rear surface of the background plate.

3,891,486
PROCESS FOR PRODUCING SOLAR CONTROL WINDOW
Michael E. Willdorf, Malden, Mass., assignor to Material Distributors Corporation, Woburn, Mass.
Division of Ser. No. 113,426, Feb. 8, 1971, Pat. No. 3,775,226. This application Sept. 4, 1973, Ser. No. 393,806
Int. Cl. B32b *17/06*
U.S. Cl. 156—71 15 Claims

1. A process for producing a solar control window, said process comprising the steps of superposing a semi-transparent solar control film upon a window surface with an aqueous detergent interposed therebetween, said solar control surface comprising in laminated sequence, an optically clear silicone release stratum, an optically clear polyester support stratum, an optically clear polyester bonding stratum, a semi-transparent vapor deposited aluminum stratum, an optically clear polyester support stratum, and an optically clear pressure sensitive stratum being in contiguity with said window surface, said release stratum being remote from said window surface, squeegeeing said solar control film into intimate contact with said window surface while said pressure sensitive adhesive stratum is deactivated by said aqueous detergent, and permeating said aqueous detergent out of the interface between said pressure sensitive stratum said window surface in order to reactivate said pressure sensitive adhesive stratum.



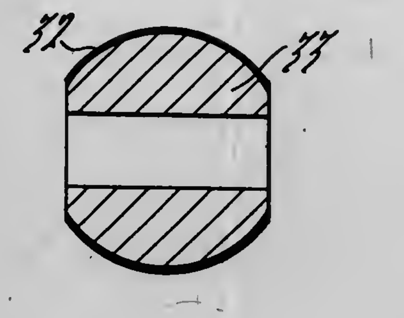
3,891,487
DECORATIVE LAMINATE
Charles E. Hoey, Marlton, N.J., assignor to Rohm and Haas Company, Philadelphia, Pa.
Filed Dec. 19, 1973, Ser. No. 426,298
Int. Cl. B32b *5/18*
U.S. Cl. 156—78 13 Claims

1. A process for making a decorative laminate which comprises:
   a. applying a foamed crosslinkable acrylic polymer having a Tg of −60° to 30°c. in a thickness of 10 to 150 mils to a substrate;
   b. drying the foam without causing thermosetting;
   c. placing a self-bonding solid (transparent) plastic film which is thermoplastic or thermoset on said foam;
   d. crushing the foam coated with said film to a thickness between 5 and 25 percent of its original dry thickness to give a density of about 0.2 to 3 g./cc and
   e. curing the laminate by heating at a suitable temperature whereupon the plastic film is self-bonded to the crushed foam.

3,891,488
STRUCTURAL BEARING ELEMENT HAVING A LOW FRICTION SURFACE AND METHOD
Charles S. White, 35815-42nd St. East, Palmdale, Calif. 93550
Continuation-in-part of Ser. No. 76,110, Sept. 28, 1970, abandoned. This application Dec. 20, 1972, Ser. No. 316,844
Int. Cl. B65h *81/00*; **B21d** *53/10*
U.S. Cl. 156—170 16 Claims

1. The method of producing a low friction bearing surface on a structural bearing element, characterized by the steps of helically winding a multiplicity of juxtaposed turns of a continuous strand of bondable low friction thread impregnated with a bonding resin in a solidified yet thermoplastic state onto a

surface of the element, said thread element being comprised of bondable filaments and low friction filaments, and treating



such wound element to coalesce the resin into a continuous solidified matrix bonding the turns of the thread to the element and to each other.

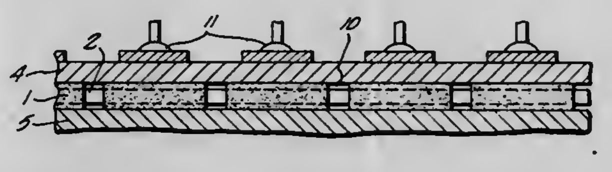
3,891,489
PRESSURE CURE METHOD OF MAKING RESIN PIPE
Dalton W. Bordner, Fullerton, and Harlan H. Kline, Diamond Bar, both of Calif., assignors to Ameron, Inc., Brea, Calif.
Filed Nov. 24, 1969, Ser. No. 879,337
Int. Cl. B65h *81/00*
U.S. Cl. 156—171 15 Claims

1. The improvement in the manufacture of resin pipe, comprising:

winding an uncured resin impregnated pipe on a mandrel, rapidly heating said pipe to a temperature in the range of from 200°F to 400°F from the interior of said mandrel to cure said resin, said heating being sufficiently rapid so that the heat-up profiles at different radii within said pipe are substantially uniform,

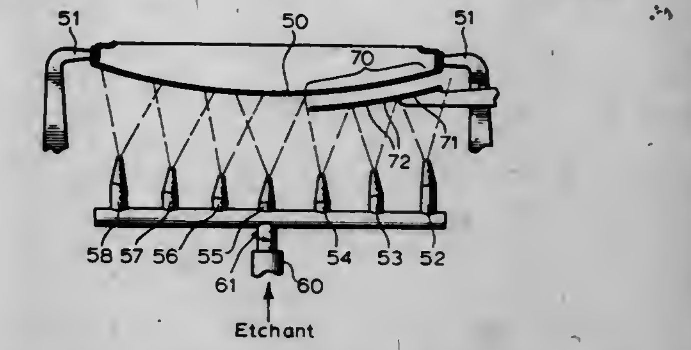
subjecting the unenveloped pipe, during said heating, to pneumatic pressure provided by exposing said pipe exterior directly to gas under pressure of at least 35 psig, and rotating said pipe and mandrel during said heating to prevent uncured resin from draining from said pipe.

3,891,490
WELDED POLYMERIC ARTICLES AND PROCESS
William H. Humphries, Fremont, Calif., assignor to Raychem Corporation, Menlo Park, Calif.
Filed June 6, 1974, Ser. No. 476,895
Int. Cl. B29c *19/00*; **B29d** *23/10*; **B32b** *31/00*
U.S. Cl. 156—295 9 Claims



1. A method of integrally joining abutting surfaces of cross-linked polymeric articles which comprises disposing between said surfaces a plurality of spaced inserts consisting essentially of thermoplastic polymeric composition containing an effective cross-linking amount of a heat activated cross-linking agent, and heating said surfaces and inserts under compression for a time and at a temperature sufficient to cause said inserts to flow and wet said surfaces and to activate said cross-linking agent, effecting formation of covalent cross-links between each of said surfaces and the polymeric constituent of said inserts, the modulus of the resulting cross-linked butt weld being at least equal to that of said articles.

3,891,491
APPARATUS FOR RE-ETCHING A COLOR CATHODE RAY TUBE SHADOW MASK
Martin L. Lerner, River Forest, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.
Division of Ser. No. 243,945, April 14, 1972, Pat. No. 3,808,071. This application Jan. 24, 1974, Ser. No. 436,243
Int. Cl. C23f *1/02*
U.S. Cl. 156—345 4 Claims

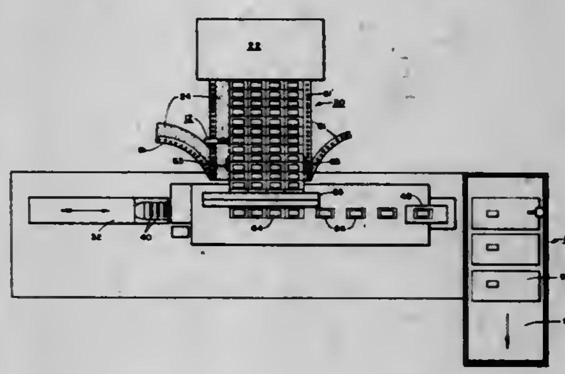


1. Apparatus for re-etching the apertures of a color cathode-ray tube shadow mask of the type which comprises a convex-concave configuration, a multiplicity of apertures arranged in a predetermined pattern and having an initial predetermined size relationship from aperture-to-aperture, a predetermined first set of said apertures being susceptible of enlargement at a faster rate than a predetermined second set of apertures upon exposure to an etchant capable of attacking said shadow mask, said apparatus comprising:

support means for supporting said shadow mask in air with the convex side down; and

spray means including a plurality of spray nozzles positioned beneath said mask for projecting vertically upward a varying quantity of said etchant to said second set of apertures relative to said first set of apertures such as to at least partially compensate for the greater susceptibility to enlargement by etching of said first set of apertures than said second set of apertures and promote equalization of enlargement of both sets of apertures.

3,891,492
ARTICLE LABELING APPARATUS AND LABEL FORM THEREFOR
Donald W. Watson, Arlington Heights, Ill., assignor to Xerox Corporation, Stamford, Conn.
Filed July 17, 1973, Ser. No. 379,977
Int. Cl. B32b *31/00*
U.S. Cl. 156—351 10 Claims



1. In combination with automatic article labeling apparatus wherein individual labels are derived from an array of printed labels and transferred to corresponding articles transported to a label applying station, the improvement comprising:

an array of printed labels including a label field and a label identifying field, said label field comprising a plurality of rows and at least one column of printed labels, and said label identifying field comprising indicia associated with corresponding rows of labels, the indicia associated with

a row serving to identify the information borne by at least one label in said associated row;
means for advancing said array of printed labels to said label applying station;
means for scanning said label identifying field as said array of printed labels is advanced to said label applying station to generate representations of said indicia;
means coupled to said scanning means and responsive to said generated representations for determining if the information borne by a label and identified by said indicia corresponds to preselected information; and
means for initiating a predetermined operation of said automatic labeling apparatus when it is determined that a predetermined label in a row bears information corresponding to said preselected information.

3,891,493

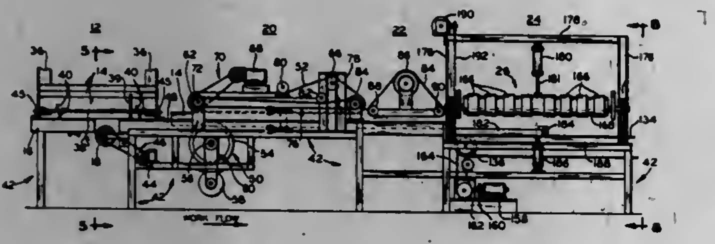
APPARATUS FOR SLITTING POSITIONING AND WRAPPING TUBULAR OBJECTS

Rupert Douglas Terry, Toledo, Ohio, assignor to Johns-Manville Corporation, Denver, Colo.

Division of Ser. No. 137,356, April 26, 1971, Pat. No. 3,755,039. This application Jan. 22, 1973, Ser. No. 325,698

Int. Cl. B31c *5/00;* **B65h** *81/00*

U.S. Cl. 156—455 **4 Claims**



1. Apparatus for jacketing cylindrical bodies comprising:
means for advancing a cylindrical body along a first path to wrapping station, said first path being parallel to the longitudinal axis of said cylindrical body;
means for slitting at least one wall of said cylindrical body parallel to the longitudinal axis of said cylindrical body as it is advancing along the first path so as to produce a longitudinal slot;
fixed guide means engagable within the slot of said cylindrical body to maintain a fixed circumferential orientation of the cylindrical body as it is passing from the slitting means to the wrapping station;
extensible guide means at said wrapping station engagable within the slot of said cylindrical body; means for retracting said extensible guide means;
means for advancing a tacky adhesively coated sheet of jacketing material along a second path in a direction toward said cylindrical body and said wrapping station;
means including said extensible guide means for effecting contact between an edge portion of said sheet of jacketing material and the outer peripheral surface of the cylindrical body so that said edge portion is adjacent and in parallel alignment with the longitudinal slot of the cylindrical body,; and
means for rotating the cylindrical body about its longitudinal axis in a direction substantially normal to the direction of advancement of the cylindrical body to effectively apply the sheet of jacketing material to the outer peripheral surface of the cylindrical body said rotating means being activated after said extensible guide means is retracted.

3,891,494

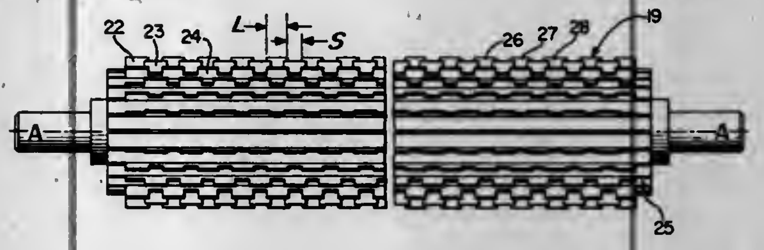
PRICKER ROLL

Edward E. Hunter, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 26, 1973, Ser. No. 354,575

Int. Cl. B29h *9/04;* **B32b** *25/02*

U.S. Cl. 156—437 **20 Claims**



1. A calender for embedding reinforcement cords in rubber material, comprising at least one rotatable roll for pricking configured openings in the rubber material prior to the contact of the material with the cords, the roll including a plurality of rows of spaced teeth extending from the roll for piercing the rubber material, the rows of teeth being spaced around the roll and extending longitudinally thereof, each tooth being designed to cut, in the rubber material, an elongated slot having its longitudinal axis angularly disposed to the longitudinal axis of the cord-reinforced material being formed, the teeth of adjacent rows being staggered longitudinally of the roll so as not to be in crosswise alignment, and the teeth of alternate rows at least spanning the spacing(s) between the teeth of rows therebetween.

3,891,495

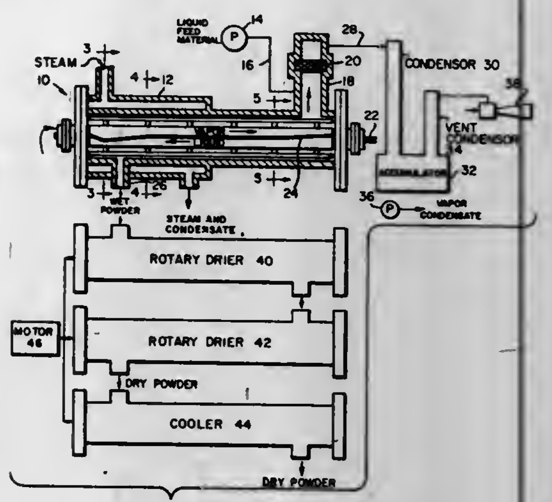
METHOD AND APPARATUS FOR RECOVERING POWDERS FROM LIQUIDS

James L. Baird, Winchester, Mass., assignor to Artisan Industries Inc., Waltham, Mass.

Continuation-in-part of Ser. No. 255,536, May 22, 1972, abandoned. This application Apr. 15, 1974, Ser. No. 461,163

Int. Cl. B01d *3/08, 3/00, 1/22*

U.S. Cl. 159—6 WH **17 Claims**



1. A thin-film evaporator, which evaporator comprises in combination:

a. a closed substantially horizontally axised steam-jacketed chamber characterized by an interior wall defining a surface of revolution;
b. a rotor shaft centrally positioned within the chamber;
c. means to rotate the rotor shaft;
d. a feed inlet at the one end of the chamber for the introduction of a liquid feed material into the chamber;
e. a product outlet at the other end of the chamber for the withdrawal of a slurry or powder material from the chamber;
f. a vapor outlet at the one end of the chamber for the removal of the vapor from the chamber; and

g. a plurality of rotor blades secured to the rotor shaft and adapted for rotation therewith, the blades having a one end and another end and coaxially arranged along the rotor shaft and extending into a close, thin-film-forming relationship with the interior wall of the closed chamber, the blades comprising a series of straight-edged sections skewed from the axis of the rotor shaft from one to the other end along the rotor shaft and comprising
i. first straight-bladed section pitched opposite to the direction of rotation of the rotor blades at a skew angle of about 1° to 15° with the axis of the rotor shaft, and extending from the region of the one end toward the product outlet, the first straight-bladed section adapted to impart a vector component to the liquid feed material introduced into the closed chamber toward the product outlet;
   ii. a second straight-bladed section aligned and coplanar with the axis of the rotor shaft;
   iii. a third straight-bladed section pitched at an angle opposite to the direction of rotation and at a skew angle from about 1° to 15° with the axis of the rotor shaft, and extending from just upstream of the product outlet to across and just downstream of the product outlet and adapted to impart a vector component to the material in the closed chamber toward the product outlet; and
   iv. a fourth straight-bladed section pitched in the direction of rotation and opposite to the pitch of the third-bladed section, and having a skew angle from about 1° to 15° with the axis of the rotor shaft, and extending from the end of the third section to the end of the rotor at the other end, and adapted to impart a vector component to the material toward the product outlet.

3,891,496

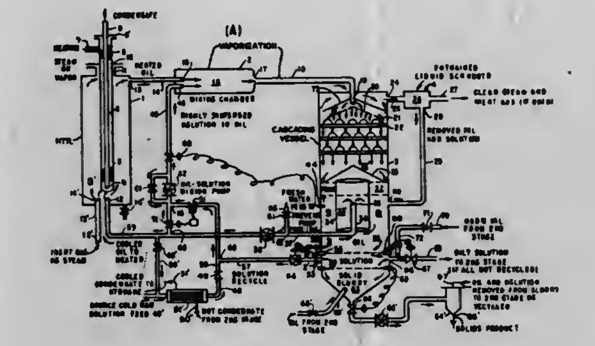
METHOD OF HEAT EXCHANGE AND EVAPORATION

Ransome W. Erwin, Ogden, Utah, assignor to Austral-Erwin Engineering Co.

Filed Nov. 14, 1972, Ser. No. 306,183

Int. Cl. B01b ; B01d *3/34, 19/00, 1/00, 3/00; 1/22;* **F28f** *13/18*

U.S. Cl. 159—47 R **5 Claims**



1. The improvement in the method of evaporating an aqueous solution containing dissolved solids to prevent adherence of precipitated solids to the contacting surface of the apparatus in which the method is carried out; which improvement consists in that the evaporation of the solution takes place in apparatus whose hot contacting surface is preferentially oil wettable and substantially zero adsorbent of water from the solution while continuously wetting the contacting surface with an organic liquid which is immiscible with the aqueous solution being evaporated, said contacting surface comprising a fluorocarbon polymer.

3,891,497

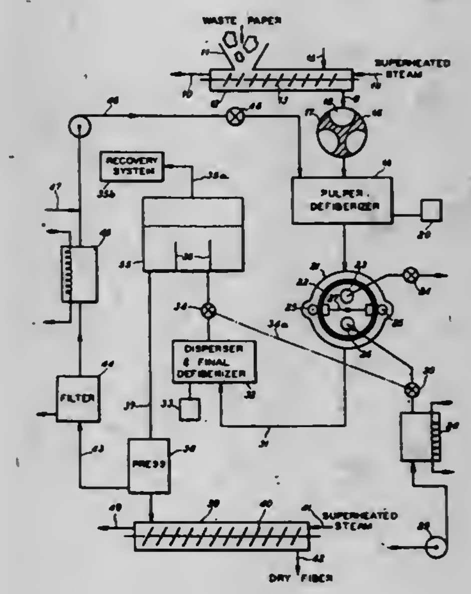
NON-AQUEOUS DEFIBERIZING PROCESS OF WASTE PAPER IN THE PRESENCE OF STEAM AND A LIQUID NONMISCIBLE IN WATER, E.G., TETRACHLORETHYLENE

Robert A. Daane, Rockton, and Shu Tang Han, South Beloit, both of Ill., assignors to Beloit Corporation, Beloit, Wis.

Filed Mar. 22, 1973, Ser. No. 343,841

Int. Cl. D21b *1/08;* **D21c** *5/02*

U.S. Cl. 162—6 **15 Claims**



1. A mechanism for the recovery of high quality dry pulp from waste paper comprising in combination:
first means adding a predetermined amount of aqueous moisture to said waste;
a defiberizer connected to said means receiving and defibering said waste;
means to pressurize the defiberizer;
second means connected to said defiberizer adding a liquid nonmiscible in water to said waste so that defibering forces in said defiberizer will be transmitted to the fibers in the waste through said liquid and through the aqueous moisture in the fibers;
an open demoisturizer chamber for operating at substantially atmospheric pressure connected to receive the waste from said second means for removing the aqueous moisture from the fibers to a predetermined dryness;
pressure release means between said defiberizer and said demoisturizer chamber so that the chamber will operate at said atmospheric pressure;
and a mechanical press connected to receive the waste from said chamber for substantially completely removing said nonmiscible liquid from the fibers.

3,891,498

METHOD OF INCREASING THE PRODUCTION RATE OF ASBESTOS FIBER CONTAINING ARTICLES AND PRODUCT THEREOF

Thomas Harry Sadler, Middlesex, N.J., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation of Ser. No. 206,211, Dec. 8, 1971, abandoned, which is a continuation of Ser. No. 699,285, Jan. 2, 1968, abandoned. This application July 19, 1974, Ser. No. 490,638The portion of the term of this patent subsequent to Feb. 6, 1990, has been disclaimed.

Int. Cl. D21h *5/18;* **D21f** *11/00*

U.S. Cl. 162—154 **13 Claims**

1. In the method of producing an asbestos-cement article from a slurry containing particulate material including asbestos fibers and hydraulic cement by depositing portions of said particulate material onto a surface to form a sheet of said

particulate material which sheet is then used to form said article, the improvement comprising increasing the production rate at which said articles are produced by including in said slurry a substantially non-foaming anionic sulfonated dispersant in an approximate amount of 0.01 to 0.5 percent by weight based upon the total dry weight of the solids of the slurry.

3,891,499
SYNTHETIC PAPERMAKING PULP AND PROCESS OF MANUFACTURE

Teiji Kato, Iwakuni, and Katsumi Okamoto, Kodaira, both of Japan, assignors to Crown Zellerbach International, Inc., San Francisco, Calif.

Filed May 30, 1972, Ser. No. 257,609

Claims priority, application Japan, June 3, 1971, 46-38260; Dec. 28, 1971, 46-105654

Int. Cl.^{2} D21F *11/00*

U.S. Cl. 162—157 R **1 Claim**

1. A process for forming a synthetic pulp of discrete polyolefin fibers comprising forming a solution of a crystalline polyolefin selected from the group consisting of polyethylene, polypropylene and copolymers of ethylene and propylene in a solvent the polyolefin being present in an amount between about 0.5 and 5 percent by weight of the solution, the solution being formed at autogeneous or higher pressure at a temperature above the melt dissolution temperature and at a temperature which will cause between about 20 percent and about 70 percent by weight of the solvent to vaporize upon adiabatic flashing into a zone of reduced pressure, rapidly passing the solution into said zone of reduced pressure to vaporize a portion only of said solvent and precipitate a fibrous polyolefin gel containing less than about 7 percent by weight of the polyolefin, and passing the fibrous polyolefin gel through a disc refiner to liberate discrete polyolefin fibers.

3,891,500
PAPER MACHINE HAVING A LONG TRANSPORT WIRE FOR MAKING TISSUE PAPER

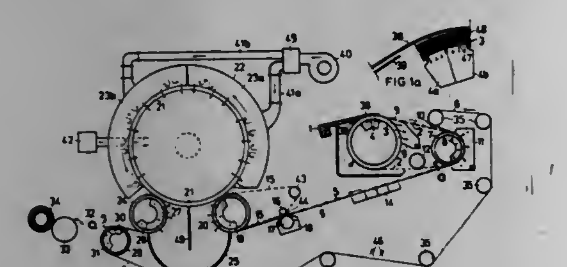
Matti Kankaanpää, Tapiola, Finland, assignor to Valmet O. Y., Helsinki, Finland

Filed Mar. 22, 1973, Ser. No. 343,781

Claims priority, application Finland, Mar. 29, 1972, 896/72

Int. Cl. D21f *9/00*

U.S. Cl. 162—274 **7 Claims**



1. Paper machine for manufacturing tissue paper from a web, comprising, in combination:

- a. a headbox with an outlet slit for fluid stock from which a web is formed,
- b. a forming section including a curved initial part and a forming wire receiving the web from said outlet slit,
- c. a return roll producing a centrifugal force dewatering the web, said forming wire passing over said return roll,
- d. a principal transport wire carried by a plurality of rolls and passing over said return roll, which deflects the web 120° to 180° while the web is interposed between said forming wire and said principal transport wire,
- e. a transfer roll and a second transport and support wire passing over said transfer roll, the web being interposed between said principal transport wire and said second transport and support wire,
- f. a perfusion-impingement drier assembly having a cylinder with a permeable mantle, said transfer roll conducting the web onto said cylinder, said principal transport wire being interposed between the web and said mantle, and
- g. a pick-off roll and a reeling apparatus, said pick-off roll detaching the web from said cylinder and transmitting it to said reeling apparatus, said principal transport wire traveling back to said return roll.

3,891,501
MULTILAYER PAPER MAKING MACHINE

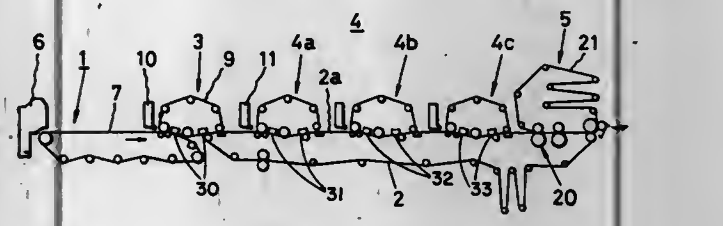
Teruhiko Oka, and Masamichi Fujii, both of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Feb. 23, 1973, Ser. No. 335,090

Claims priority, application Japan, Feb. 29, 1972, 47-24146

Int. Cl. D21f *9/00*

U.S. Cl. 162—290 **6 Claims**



1. Combination paper making machine which comprises a Fourdrinier wire comprising an endless foraminous belt defining a paper forming path, headbox means for supplying a first paper forming slurry to one end of said Fourdrinier wire, a looped conveying felt having one end adjacent the Fourdrinier wire and the other end away from said Fourdrinier wire, at least one inverform paper layer making endless wire means extending over and between said Fourdrinier wire and said looped conveying felt, and second headbox means adjacent to said Fourdrinier wire and before said inverform paper layer making means for supplying a second paper forming slurry on top of said first paper forming slurry on said Fourdrinier wire.

3,891,502
PRESSED BLOCK FUEL ELEMENTS FOR GAS COOLED HIGH TEMPERATURE POWER REACTORS AND PROCESSES FOR THEIR PRODUCTION

Karl-Gerhard Hackstein, Hanau, and Milan Hrovat, Rodenbach, both of Germany, assignors to Nukem G.m.b.H., Germany

Filed Aug. 1, 1972, Ser. No. 277,050

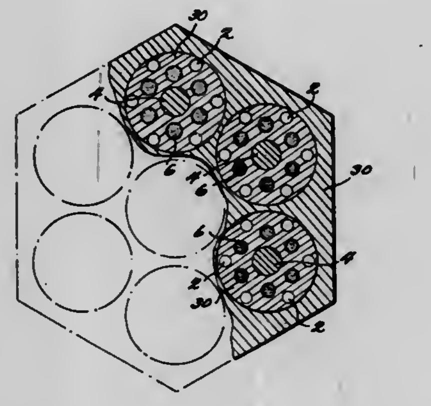
Claims priority, application Germany, Feb. 14, 1972, 2206843

Int. Cl. G21c *3/04, 3/22*

U.S. Cl. 176—71 **6 Claims**

1. A block fuel element for high temperature power reactors, said element being simple to reprocess and consisting essentially of (1) a fuel free zone consisting of a graphite matrix material, (2) cooling channels, (3) feed zones containing fissile uranium particles embedded in the same type of graphite matrix material, and (4) breed zones containing thorium particles embedded in the same type of graphite matrix material, whereby said cooling channels, said feed zones and said breed zones are all embedded within and surrounded by said fuel free graphite matrix material and together form the block fuel element, said feed zones and breed zones being disposed separately from one another in noncontiguous manner so that the feed zones and the breed zones can be separated independently from the surrounding graphite prior to reprocessing, whereby in the reprocessing operation uranium 233 bred from the thorium is provided from the breed particles and uranium 235 and fission products are

produced from the feed particles, there being a plurality of arrangements of feed zones, breed zones and cooling channels in repetitive sequence within the block fuel element, each of these arrangements consisting of a plurality of feed zones, said feed zones contain uranium and are disposed around and separate from a central thorium containing breed zone, and a plurality of cooling channels are disposed outside and around said feed zones.



3,891,503
METHOD FOR CULTIVATING YEASTS

Tadao Matubayashi, Ichihara; Taiichi Shiono, Chiba; Yositugu Hukuda, Ichihara, and Toshio Kimura, Chiba, all of Japan, assignors to Dainippon Ink & Chemicals Inc. and Dai-Nippon Suban Manufacturing Co. Ltd., both of Tokyo, Japan

Filed Jan. 28, 1974, Ser. No. 437,221

Claims priority, application Japan, Feb. 26, 1973, 48-22125

Int. Cl. C12b *1/00*

U.S. Cl. 195—28 R **9 Claims**

1. A method for cultivating yeasts comprising mix-cultivating hydrocarbon utilizable yeasts and hydrocarbon unutilizable yeasts under aerobic conditions in a medium containing hydrocarbons as a carbon source in a fermentor, recovering the yeast cells from the broth fed out of the fermentor and refreshing the residual broth with the nutrient consumed in the mix cultivation and then recycling the refreshed residual broth to the fermentor for mix cultivation.

3,891,504
PROCESS FOR THE MANUFACTURE OF ZEAXANTHIN

Arno Johannes Schocher, Benken, and Oswald Wiss, Reinach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 166,319, July 26, 1971, abandoned. This application Sept. 20, 1973, Ser. No. 399,019

Claims priority, application Switzerland, July 31, 1970, 11592/70

Int. Cl. C12d *13/02*

U.S. Cl. 195—28 R **15 Claims**

1. A process for the preparation of zeaxanthin containing cell-mass, comprising:

cultivating a microorganism selected from the group consisting of Flavobacter ATCC 21,081 and Flavobacter ATCC 21,588 in a nutrient media which contains a source of assimilable carbon and a source of assimilable nitrogen.

3,891,505
METHOD FOR PREPARATION OF A NEW ANTIFUNGAL ANTIBIOTIC

Danuta Maria Kotiuszko; Krystyna Maria Wituch; Danuta Janina Siejko; Halina Morawska; Natalia Porowska; Maria Teresa Horodecka; Maria Waclawa Wolkowicz; Marzena Nowacka; Zofia Eliza Makarowska-Płociennik, and Leszek Halski, all of Warsaw, Poland, assignors to Instytut Przcmyslu Farmaceutycznego, Warsaw, Poland

Continuation of Ser. No. 69,672, Sept. 4, 1970, abandoned. This application Aug. 14, 1973, Ser. No. 388,091

Claims priority, application Poland, Sept. 11, 1969, 135793

Int. Cl. C12d *9/00*

U.S. Cl. 195—80 R **5 Claims**

1. A method for the preparation of a polifungin antibiotic complex of at least three tetraenes obtained from the mycelium of a culture of Streptomyces noursei var. polifungin ATCC 21581 comprising cultivating said culture under aerobic conditions in an aqueous nutrient containing 1–10% by weight of a source of carbon, 0.1–5% by weight of a source of nitrogen and 0.1–3% by weight of a buffering agent at a temperature of 25°–35°C. under a pH of 6–7 for a period of 3 to 6 days, filtering off the mycelium so produced, washing said mycelium with water, extracting said mycelium with methanol at a temperature of 10°–50°C. three times, concentrating the cumulated extracts under a reduced pressure at a temperature not exceeding 50°C., filtering off the precipitate so formed and purifying the precipitate by elution of contaminants with solvents selected from the group consisting of ethylene chloride, ethyl acetate, 30% aqueous isopropanol with 1% sodium hexametaphosphate and 30% aqueous isopropanol at a temperature of 15°–60°C.

3,891,506
ANTIBIOTIC SUBSTANCE AND PROCESS FOR ITS PREPARATION

Katsura Munakata, Nagoya; Takeshi Oda, Tokyo; Toshito Mori, Tokyo, and Hisakatu Ito, Tokyo, all of Japan, assignors to Kowa Company, Ltd., Nagoya, Japan

Division of Ser. No. 200,524, Nov. 19, 1971, which is a continuation-in-part of Ser. No. 737,333, June 17, 1968, abandoned. This application Mar. 25, 1974, Ser. No. 454,606

Claims priority, application Japan, June 21, 1967, 42-39296; June 15, 1968, 43-40863

Int. Cl. C12d *9/00*

U.S. Cl. 195—80 R **19 Claims**

1. A process for preparation of antibiotic Quintomycin, which comprises culturing *Streptomyces lividus* or its mutant under aerobic conditions in a medium containing a carbon source and a nitrogen source, and recovering antibiotic Quintomycin from the culture broth.

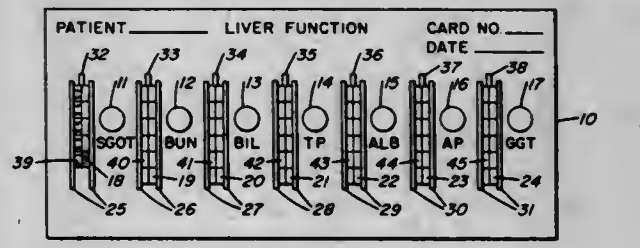
3,891,507
ORGAN FUNCTION TEST CARDS

Charles Benedict Breuer, Pearl River, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 30, 1974, Ser. No. 474,749

Int. Cl. C12k *1/04*

U.S. Cl. 195—103.5 R **6 Claims**



1. A diagnostic test card for the determination of organ function or status from the concentration of various biochemical and chemical constituents in blood, serum or plasma, which comprises a plurality of solid and dried diagnostic test

indicators mounted on said card, each of said test indicators comprising a bibulous carrier material impregnated with the dried residue of a chromogenic liquid reagent system capable of changing color in response to the concentration of said constituents in said blood, serum or plasma, when in contact therewith, each of said test indicators, in combination, indicative of the function or status of the same organ, and at least one corresponding color comparator control mounted on said card specific for each diagnostic test indicator thereon.

3,891,508
METHOD OF RAPID IDENTIFICATION OF GRAM-NEGATIVE BACTERIA

Joseph M. Merrick, 43 Exeter St., Williamsville, N.Y. 14221
Filed June 1, 1973, Ser. No. 366,303
Int. Cl. C12k *1/04*

U.S. Cl. 195—103.5 9 Claims

1. A method of rapid identification of Gram-negative bacteria comprising:
  culturing unknown bacteria on a nutrient medium:
  harvesting by centrifugation;
  sampling 0.1 mg as a minimum bacterial sample size;
  extracting and isolating lipopoly saccharides (LPS) from the bacteria;
  hydrolyzing of LPS into monosaccharide constituents; and determining the sugar composition of the polysaccharide fraction by gas-liquid chromatographic procedures and comparing the sugar composition of the unknown bacterial LPS with those of known bacteria for identification.

3,891,509
CO_2 GENERATING TABLET FOR CULTURE DEVICES

Don R. Warren, and Louis W. Busse, both of Madison, Wis., assignors to Clinical Convenience Products, Inc., Madison, Wis.
Filed May 6, 1974, Ser. No. 466,985
Int. Cl. C12b *1/00*

U.S. Cl. 195—109 10 Claims

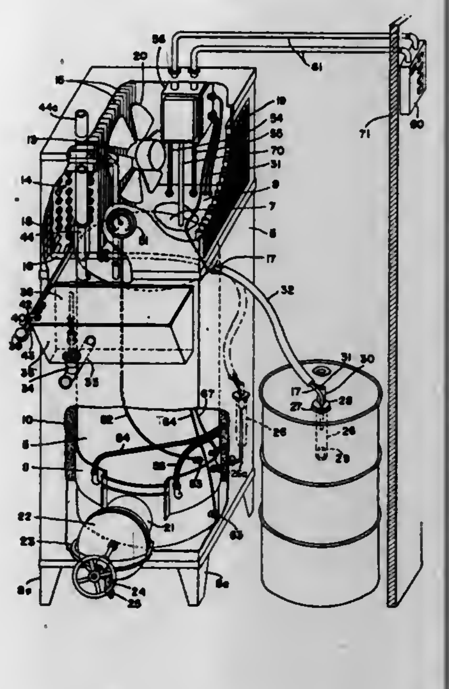
10. A method for generating and maintaining increased carbon dioxide tension in loosely capped culture vials utilizing an independent culture media support, which comprises inserting into such culture vials a tablet comprising about 25% to about 65% by weight of a carbon dioxide couple, about 30% to about 60% by weight of polyvinylpyrollidone and about 5% to about 15% by weight of a long chain fatty acid ester of a polyhydroxy alcohol.

3,891,510
INTEGRATED APPARATUS FOR DISTILLING BATCHES OF CONTAMINATED SOLVENTS

Frede Hilmar Drostholm, Vedbaek; Kaj Ditlev Frederik Petersen, Valby, and Ulf Raabo, Graested, all of Denmark, assignors to Frede Hilmar Drostholm, Denmark
Filed Apr. 18, 1973, Ser. No. 352,261
Int. Cl. B01d *3/42*

U.S. Cl. 202—206 3 Claims

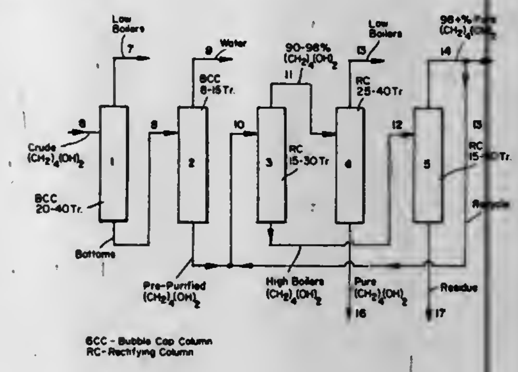
1. Equipment for cleaning solvents including a tank for containing a batch of liquid solvent for distillation at relatively lower pressure, and having an inlet for sequential introduction of batches of solvent to be distilled, means normally closing said inlet during distillation of the batches, electric heating means in heat exchange relation with a lower region of the tank, condensing means coupled to said tank, means providing for discharge of condensate into an associated condensate accumulation vessel, a power circuit for energizing said heating means, and safety control means for said power circuit, preventing energization of said heating means under abnormal conditions which might be hazardous to the equipment or its operator, said safety control means comprising: switch means responsive to the temperature of the liquid solvent in said tank, and operative to terminate the flow of current in said power circuit when the temperature exceeds a predetermined value; the condensate discharge means comprising a flexible condensate delivery connection having a discharge end portion adapted to be removably inserted into the top of an associated condensate accumulation vessel and a switch element carried by said discharge end portion of the flexible condensate delivery connection, the switch element being responsive to the accumulation of condensate in such an associated vessel, and operative to terminate the flow of current in said power circuit in response to rise in the level of the condensate accumulating in such vessel.



3,891,511
PRODUCTION OF VERY PURE BUTANEDIOL

Axel Danneil, Ludwigshafen; Erich Flickinger, Frankweiler; Heinz Graefje; Reinhold Plass, both of Ludwigshafen, and Rudolf Schnur, Frankethal, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Rhine, Germany
Filed July 17, 1972, Ser. No. 272,366
Int. Cl. B01d *3/00*

U.S. Cl. 203—81 2 Claims



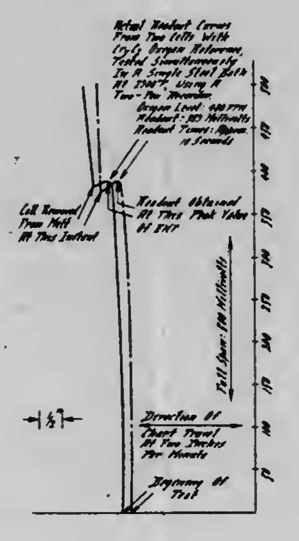
BCC - Bubble Cap Column
RC- Rectifying Column

1. In a process for the production of very pure butanediol-1,4 by distillation of crude butanediol containing as impurities water, methanol, propanol, butanol and small amounts of unsaturated compounds, aldehydes, cyclic ethers, acetals and triols and obtained by hydrogenation of an aqueous butyne-2-diol-1,4 solution and from which water and compounds having a boiling point of less than 120°C have been separated as distillate overhead to obtain a butanediol residue essentially free of water and compounds with boiling points of more than 120°C, the improvement which comprises separating said butanediol fraction in a first distillation column into an overhead fraction A constituting 60 to 90% by weight of said residue and containing butanediol and residual components having a lower boiling point than butanediol and a fraction B constituting 40 to 10 percent by weight of said residue and containing butanediol and components having a higher boiling point than butanediol, recovering very pure butanediol-1,4 by separating fraction A in a second distillation column into an overhead product consisting of the impurity components having a lower boiling point than butanediol and a bottoms product consisting of said very pure butanediol-1,4, and separating fraction B in third distillation column into an overhead product consisting of more than 98 percent by weight of butanediol and residual impurities having a higher boiling point than butanediol.

3,891,512
DETERMINATION OF OXYGEN IN MOLTEN STEEL

Paul L. Jackson, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Continuation-in-part of Ser. No. 312,444, Dec. 6, 1972, abandoned. This application June 24, 1974, Ser. No. 482,719
Int. Cl.² G01N *27/46*

U.S. Cl. 204—1 T 3 Claims



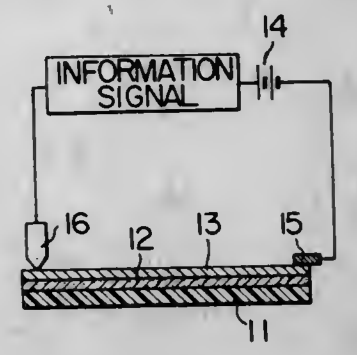
1. The process of determining the oxygen content of a molten metal comprising employing in an oxygen activity measuring ~~cell a solid~~ oxygen ion electrolyte; exposing said solid electrolyte on one side to molten metal and on the other to an oxygen reference material having a melting point higher than the melting point of the major component of the metal and which is a carbide selected from the carbides of silicon, titanium, chromium, niobium or tantalum; measuring the electrical potential developed across said solid electrolyte; and reading as a representation of the oxygen content of the molten metal, a single maximum value of the developed potential occurring within no more than 20 seconds after the oxygen activity measuring cell has been exposed to the molten metal.

3,891,513
ELECTRICAL COLORATION RECORDING SHEET

Akiyoshi Yasumori; Katsuichi Ohta, both of Yokohama; Makoto Kunikane, Tokyo, and Michiharu Abe, Kawasaki, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan
Filed July 27, 1973, Ser. No. 383,160
Claims priority, application Japan, Aug. 8, 1972, 47-79260
Int. Cl. B41m *5/20;* **G01d** *15/34*

U.S. Cl. 204—2 16 Claims

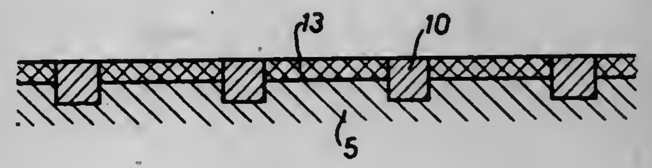
1. An electrical coloration recording sheet comprising an electrical coloration material layer and a thin electrically conductive material layer formed on said electrical coloration material layer, said electrical coloration material layer made of a material which changes color but is not destroyed at a point adjacent a point of the thin electrically conductive material layer to which a selected electrical signal is applied with a recording electrode whereby a recorded likeness of an original may be produced on said sheet by selected electric signals.



3,891,514
METHOD TO PREPARE MATRICES TO MANUFACTURE LATTICE OR GRID METAL LAYERS STRUCTURES BY ELECTROLYTIC DEPOSITION

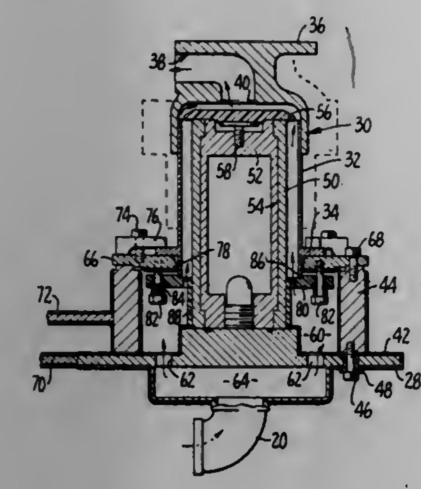
Martin Klemm, Gerlafingen, Switzerland, assignor to Fritz Buser AG. Maschinenfabrik, Utzenstorf, Switzerland
Filed Nov. 21, 1973, Ser. No. 417,978
Claims priority, application Switzerland, Nov. 28, 1972, 17330/72
Int. Cl. C23b *5/48, 7/00*

U.S. Cl. 204—15 15 Claims



1. In a method to prepare matrices for the manufacture of lattice or grid or mesh metal layer structures, having openings of predetermined shape and size, including the steps of
  forming a base body (5) with a surface having electrically conductive portions, in accordance with the solid portions of the grid or mesh structure, and electrically non-conductive portions in accordance with the interstitial openings between the solid portions of the grid and mesh structure, electrolytically depositing a metal layer on the conductive portions, and then removing said metal layer, the improvement wherein
the base body is of electrically conductive material;
and the step of forming said base body (5) comprises the steps of
forming depressions (6, 18) in the surface of the body (5) having a shape, size and surface distribution corresponding to the electrically conductive portions of the surface of the body by penetrating into the material of the base body (5);
substantially completely filling said depressions with electrically conductive filler material (10, 15, 19);
removing a portion of the material adjacent the filled depressions to form depressed portions (12, 16, 20) adjacent the filler material (10, 15, 19), which filler material will form projecting ridges;
filling the depressed portions (12, 16, 20), between said ridges (10, 15, 19), and corresponding to the electrically non-conductive portions with a layer of insulating material (13, 17) extending between the electrically conductive ridges of filler material filling said depressions;
and smooth working the surface of the body with said ridges and insulating material therebetween after said last filling step to provide a uniform, substantially smooth overall surface.

3,891,515
METHOD FOR PLATING AIRCRAFT CYLINDERS
Peter C. Paulson, Pinole; Henri H. Henderson, Oakland, and Richard L. Worstell, Moraga, all of Calif., assignors to Electro-Coatings, Inc., Moraga, Calif.
Filed Mar. 23, 1973, Ser. No. 344,142
Int. Cl. C23b *5/56;* **B01k** *1/00*
U.S. Cl. 204—26 **3 Claims**

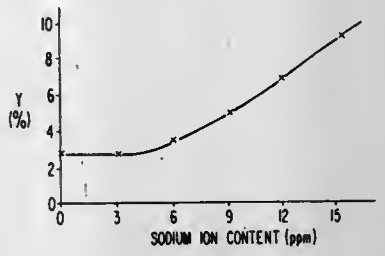


1. In the method of plating aircraft engine cylinder assemblies where said assemblies include a ferrous cylinder portion with an interior cylindrical surface and a head portion joined to said cylinder portion at one end thereof with said head portion having an interior surface which with the interior surface of said cylinder portion defines a combustion chamber, the improvement comprising supporting a substantially cylindrical anode in said cylinder assembly facing said interior cylindrical surface with said anode spaced away from said cylinder assembly to define an annular passageway with said anode having a free end facing said interior surface of said head portion, shielding said anode in the area of said head portion with a shield mounted on said free end of the anode and having edges projecting radially outwardly from the anode to a position closely adjacent to the end of said cylinder at the head to prevent current flow between the interior surfaces of said head portion and the surfaces of said anode adjacent thereto, pumping a chromium plating electrolyte into said annular passageway generally axially of said cylinder with said electrolyte contacting said interior surface of said head portion, and passing a direct electrical current between said anode and said cylinder assembly.

3,891,516
PROCESS OF ELECTROLYICALLY ANODIZING A MECHANICALLY GRAINED ALUMINUM BASE AND ARTICLE MADE THEREBY
Simon L. Chu, Dobbs Ferry, N.Y., assignor to Polychrome Corporation, Yonkers, N.Y.
Continuation of Ser. No. 60,625, Aug. 3, 1970, abandoned, which is a continuation-in-part of Ser. No. 670,403, Sept. 25, 1967, abandoned. This application May 21, 1973, Ser. No. 362,359
Int. Cl. C23b *9/02*
U.S. Cl. 204—33 **11 Claims**

1. A method for making an aluminum supporting base adapted to receive a light sensitive coating thereon to make a lithographic plate which comprises first graining a surface of an aluminum sheet with a wet graining mass comprised of fine abrasive particles of pumice, and then anodizing the grained surface of said aluminum sheet in a sulfuric acid solution having a concentration of about 8 to about 22 percent, by a direct current applied at a voltage of about 10 to 20 volts and at a current density of about 10 to about 20 amperes per square foot, to form a hard, substantially lusterless surface on said sheet.

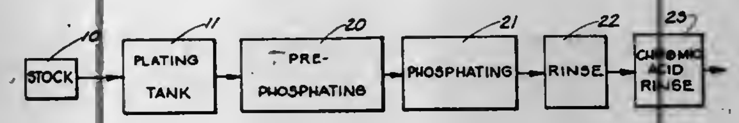
3,891,517
PROCESS FOR ELECTROLYTIC COLORING OF ALUMINUM CR ALUMINUM ALLOY ARTICLES
Kiyomi Yanagida; Tadashi Hirokane; Tadashi Tsukiyasu, and Tomoari Sato, all of Nagoya, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan
Filed Mar. 20, 1974, Ser. No. 453,122
Claims priority, application Japan, Mar. 20, 1973, 48-32027; Nov. 22, 1973, 48-13199
Int. Cl. C23b *5/52, 9/02*
U.S. Cl. 204—35 N **13 Claims**



1. In a process for coloring an anodic oxidized film on an aluminum or aluminum alloy article by subjecting said article to anodic oxidation in an aqueous anodic oxidation bath consisting essentially of sulfuric acid or an aromatic sulfonic acid to form an oxidized film of a thickness of at least 6 microns and electrolyzing said anodic oxidized article as a cathode immersed in an aqueous electrolytic coloring bath containing a water soluble nickel salt using a direct current, the improvement which comprises obtaining an anodic oxidized film colored a stable and uniform deep brown which comprises maintaining the sodium ion content in the electrolytic coloring bath below 12 ppm.

5. The process according to claim 1, wherein the content of said sodium ion in said aqueous electrolytic coloring bath is maintained at less than 12 ppm by passing said aqueous electrolytic coloring bath through a column of an Ni-type strongly acidic cation exchange resin to substantially remove sodium ion and recycling the aqueous electrolytic coloring bath having a low sodium ion content.

3,891,518
METHOD OF ELECTROPLATING UTILIZING ZINC DROSS ANODES
Edward R. Burwick, Miamisburg, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio
Filed Oct. 16, 1974, Ser. No. 515,353
Int. Cl. C23b *5/50, 5/58;* **B01k** *3/06*
U.S. Cl. 204—35 R **8 Claims**



1. In a method of electrodepositing zinc on steel wherein the steel stock is passed through a plating tank between zinc anodes submerged in an aqueous plating solution, with the stock acting as a circuit forming cathode, and an electrical charge is imposed through the anodes to effect plating, the improvement which comprises the step of plating the stock with zinc utilizing anodes consisting of zinc dross.

3,891,519
SURFACE TREATMENT OF ALUMINIUM AND ALUMINIUM ALLOYS
Bernard Grellet, Saint-Etienne, France, assignor to Centre Stephanois de Recherches Mechaniques Hydromecanique et Frottement, Andrezieux-Boutheon, France
Filed Sept. 9, 1974, Ser. No. 503,936
Claims priority, application France, Sept. 14, 1973, 73.33031
Int. Cl. C23b *5/52, 5/46;* **B23p** *3/00*
U.S. Cl. 204—37 R **10 Claims**

1. A process for the treatment of the surface of aluminium or an aluminium alloy, comprising the steps of

a. depositing a copper-indium alloy layer on the said surface by electrolysis in a bath containing, an alkaline solution, monovalent copper ions, trivalent indium ions, an alkali metal hydroxide, an alkali metal cyanide, an alkali metal gluconate, gluconic acid, and oxalic acid, and

b. subjecting the coated surface to a diffusion heat treatment at a temperature between 120° and 155°C.

3,891,520
ACID, GALVANIC ZINC BATH
Hans-Günther Todt, and Günter Voss, both of Berlin, Germany, assignors to Schering AG, Berlin & Bergkamen, Germany
Continuation of Ser. No. 27,164, April 9, 1970, abandoned. This application Jan. 29, 1973, Ser. No. 327,841
Int. Cl. C23b *5/12*
U.S. Cl. 204—55 R **4 Claims**

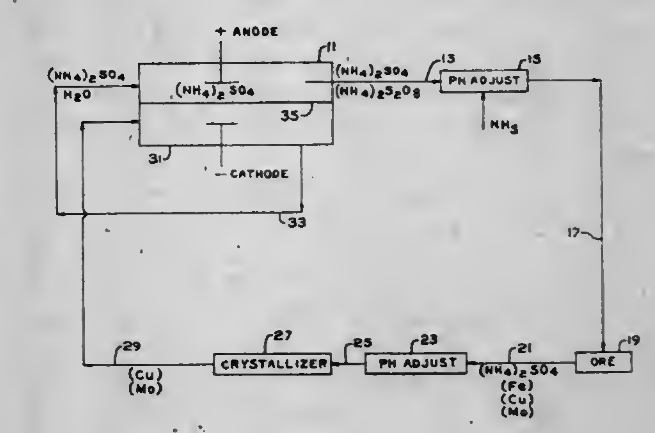
1. An acid, galvanic zinc bath for the deposition of bright to high luster zinc coats consisting essentially of an aqueous solution of pH from about 3.0 to 6.0 containing a zinc salt selected from the group consisting of zinc chloride, zinc sulfate, zinc acetate, zinc fluoborate and zinc sulfamate in a concentration from about 50 to 200 grams per liter, other conducting salts selected from the group consisting of ammonium chloride, ammonium sulfate, sodium chloride, and sodium sulfate in a concentration from about 50 to 300 grams per liter, and luster forming compounds selected from the group consisting of (a) polyethylene glycol of mean molecular weight from about 280 to 22,000, in a concentration from about 0.1 to 20.0 grams per liter and (b) at least one ketone selected from the group consisting of acetophenone, ethinylphenylketone, propiophenone, benzalacetone, 2-hydroxybenzalacetone, 3-methoxybenzalacetone, benzoylacetone, benzoylacetonitrile, 3-acetylpyridine, 2,4-dihydroxy-benzophenone, benzalacetophenone, dibenzalacetone, 2-benzolypyridine, 3-bezoylpridine, 4-benzolypyridine, benzoylacetic acid ethyl ester, 1-(2-furyl)-1′-buten-3-one, thienylideneacetone, di-thienylidene-acetone, 3-acetylcumarine, 4-acetylcumarine, and 6-acetylcumarine in a concentration of about 0.01 to 5.0 grams per liter.

3,891,521
OPENING OF MOLYBDENITE ORES AND THE ELECTROWINNING OF RHENIUM
William W. Carlin, Portland, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Division of Ser. No. 322,649, Jan. 11, 1973, Pat. No. 3,816,588. This application Feb. 7, 1974, Ser. No. 440,636
Int. Cl. C22d *1/00*
U.S. Cl. 204—105 R **1 Claim**

1. A method for recovery of rhenium in molybdenite bearing ores, which method comprises the steps of:

a. forming a rhenium concentrate as an essentially insoluble solid by contacting the molybdenite bearing ore with a solution of ammonium or a stable alkali metal or alkaline earth persulfate for a time sufficient to convert at least part of the molybdenum, and other persulfate soluble metals to their soluble form, and

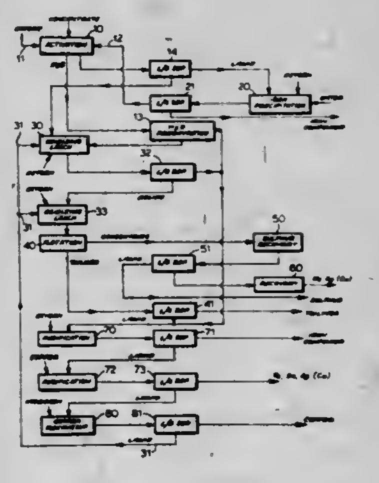
b. separating the insoluble rhenium concentrate from the persulfate solution, and



c. solubilizing the rhenium obtained from step (b), and

d. recovering rhenium from the solution of step (c) by electrodeposition.

3,891,522
HYDROMETALLURGICAL PROCESS FOR TREATING COPPER-IRON SULPHIDES
Donald R. McKay, and Godefridus M. Swinkels, both of Rossland, Canada, assignors to Cominco Ltd., Trial, Canada
Continuation-in-part of Ser. No. 229,737, Feb. 28, 1972, abandoned. This application Jan. 31, 1974, Ser. No. 438,314
Int. Cl. C22d *1/16;* **C22b** *15/08, 15/12;* **C01g** *3/12*
U.S. Cl. 204—108 **37 Claims**



1. A process for treating copper-iron sulphide concentrate for the recovery of copper and sulphur values whicih comprises leaching copper-iron sulphide concentrate with an acidic solution containing sulphuric acid in a concentration in the range of from about 15 g/l to about 250 g/l and metallic copper having a particle size smaller than 65 mesh to convert the copper-iron sulphides in said concentrate to insoluble simple copper sulphide and a solution of ferrous sulphate and recovering copper and sulphur values from said simple copper sulphide.

9. A process for treating copper-iron sulphide concentrate to extract copper values and elemental sulphur therefrom which comprises the steps of:

1. reacting said concentrate sulphide with an acidic solution containing sulphuric acid in a concentration in the range of from about 15 to 250 grams per litre and metallic copper having a particle size smaller than 65 mesh in an activation leach at a temperature in the range of from about 60°C. to the boiling point of the reaction mixture, and maintaining the amount of metallic copper to soluble iron at a molar ratio of about unity, for the production of

an insoluble simple copper sulphide and a solution of ferrous sulphate;
2. separating the solution of ferrous sulphate from the insoluble copper sulphide;
3. concurrently oxidizing and hydrolyzing the ferrous sulphate for the precipitation of iron compounds and the regeneration of acidic solution containing sulphuric acid;
4. separating the precipitated iron compounds from the regenerated acidic solution;
5. returning regenerated acidic solution to said activation leach;
6. subjecting the insoluble copper sulphide to an oxidizing leach for oxidation of sulphide sulphur to elemental sulphur and for dissolution of copper as cupric ion to form a copper-bearing solution;
7. discharging a mixture of copper-bearing solution, elemental sulphur and residual solids from the oxidizing leach; and
8. recovering copper values from said copper-bearing solution.

35. In a process as claimed in claim 9, recovering copper values from said copper-bearing solution by electrowinning for the production of metallic copper and return acid.

3,891,523

PHOTOPOLYMERIZABLE, ISOCYANATE-CONTAINING PREPOLYMERS

Hiroyoshi Hisamatsu, Saitama-ken; Katutoshi Takahashi, and Masanori Takase, both of Urawa, all of Japan, assignors to Dainippon Ink & Chemicals Inc., Tokyo, Japan

Continuation of Ser. No. 107,515, Jan. 18, 1971, abandoned. This application July 3, 1974, Ser. No. 485,636

Claims priority, application Japan, Jan. 19, 1970, 45-4451

Int. Cl. B01j *1/10;* **C08d** *1/10;* **B01l** *1/12*

U.S. Cl. 204—159.15 **7 Claims**

1. A photopolymerizable composition consisting essentially of:

a. photopolymerizable prepolymer having isocyanate group and at least one unsaturated addition-polymerizable double bond, said prepolymer being obtained by reacting
  i. a polyisocyanate compound selected from organic di- and triisocyanates, with
  ii. a polyhydroxy compound selected from the group consisting of diols, trihydric polyols, tetrahydric polyols, polyester type polyols, polyether type polyols and partially esterified products having at least two hydroxyl groups obtained by reacting a tri-tetrahydric polyol with a monocarboxylic acid, at such a ratio that the hydroxyl group is less than one equivalent with respect to one equivalent of the isocyanate group, and then reacting the reaction product with
  iii. an unsaturated addition-polymerizable compound having a hydroxyl group selected from the group consisting of partially esterified products obtained by reacting a diol with acrylic acid or methacrylic acid, partially esterified products obtained by reacting a diol with acrylic acid or methacrylic acid, partially esterified products obtained by reacting a tri- or tetrahydric polyol with acrylic acid or methacrylic acid, partially esterified products obtained by reacting a polyether type polyol with acrylic acid or methacrylic acid, N-hydroxy-methyl-acrylamide and N-hydroxymethyl-methacrylamide,

at such a ratio that the hydroxyl group is less than one equivalent with respect to one equivalent of the isocyanate group remaining in the reaction product; and

b. 0.001 to 15 parts by weight of a photosensitizer per 100 parts by weight of (a), the amount of isocyanate groups contained in said prepolymer being 0.3 to 15% based on the total weight of said components (a) and (b).

3,891,524

BUTYRIC ACID DERIVATIVES AS PHOTOSENSITIZERS FOR UNSATURATED COMPOUNDS

Hans Rudolph, Krefeld-Bockum; Hans-Georg Heine; Karl Fuhr, both of Krefeld, and Hermann Schnell, Krefeld-Uerdingen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

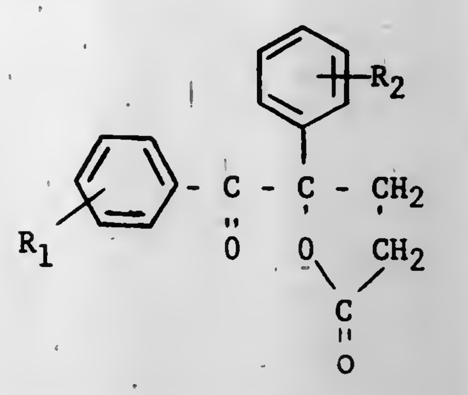
Division of Ser. No. 411,422, Oct. 13, 1973, which is a division of Ser. No. 867,939, Oct. 20, 1969, Pat. No. 3,824,284. This application Aug. 27, 1974, Ser. No. 501,188

Claims priority, application Germany, Nov. 6, 1968, 1807301

Int. Cl. B01j *1/10, 1/12*

U.S. Cl. 204—159.15 **10 Claims**

1. In the process of preparing coatings and molded bodies by photopolymerizing a mixture of at least one ethylenically unsaturated polymerizable compound and a photosensitizer by irradiating said mixture with a radiation source, the improvement which comprises employing 0.1 to 5 percent by weight, based on said ethylenically unsaturated compound, of a photosensitizer of the formula



wherein R_1 and R_2 are identical or different and are selected from the group consisting of hydrogen, alkyl having 1 to 4 carbon atoms, methoxy and halogen.

3,891,525

METHOD OF ELECTRO-DEPOSITING COMPOSITIONS CONTAINING HYDROLYZED POLYEPOXIDES

James Irwin, New Kensington, and J. Alden Erikson, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 5, 1970, Ser. No. 61,498

Int. Cl. B01k *5/02*

U.S. Cl. 204—181 **10 Claims**

1. A method of coating a conductive substrate which comprises passing electric current between an electrically conductive anode and an electrically conductive cathode in contact with a water-dispersed coating composition comprising:

a. from about 95 percent to about 50 percent by weight, based on the total of (a) and (b) herein, of an at least partially neutralized interpolymer of from about 1 percent to about 20 percent by weight of a hydroxyalkyl ester of an alpha, beta-ethylenically unsaturated carboxylic acid, from about 1 percent to about 20 percent by weight of an unsaturated acid, and at least one other copolymerizable ethylenically unsaturated monomer;
b. from about 5 percent to about 50 percent by weight of an aminealdehyde condensation product; and
c. from about 1 percent to about 25 percent by weight based on the total of (a) and (b) of hydrolyzed polyepoxide consisting essentially of a polyol obtained by hydrolysis of a polyepoxide so as to convert the oxirane rings thereof into hydroxyl groups.

3,891,526

METHOD OF ELECTROCOATING ELECTRIC WIRE

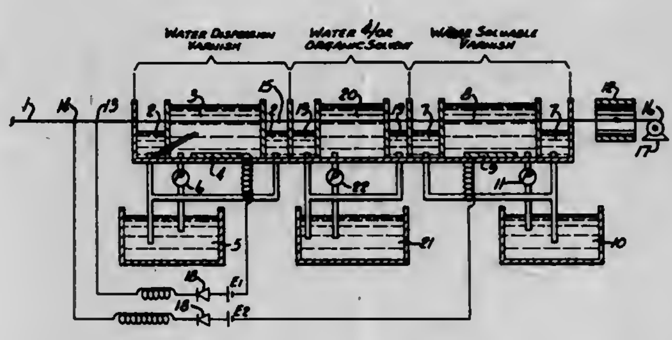
Shigeo Masuda, Osaka, and Toshihiko Tanaka, Nagoya, both of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 11, 1971, Ser. No. 114,475

Claims priority, application Japan, Feb. 14, 1970, 45-12443; Aug. 19, 1970, 45-72646

Int. Cl. B01k *5/02*

U.S. Cl. 204—181 **2 Claims**



1. The method of manufacturing insulated electric wire comprising the steps of coating a conductor with a water dispersion varnish by electrophoresis, then treating the film coating with a liquid selected from the group consisting of an organic solvent and a mixed liquid of water and water-soluble organic solvent, and further coating the conductor with a water-soluble varnish by electrophoresis, and then baking the coated conductor.

3,891,527

WATER-DISPERSIBLE CATIONIC POLYURETHANE RESINS

Kazys Sekmakas, Chicago, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 162,659, July 14, 1971, Pat. No. 3,804,786. This application Mar. 29, 1972, Ser. No. 239,305

Int. Cl. B01k *5/02*

U.S. Cl. 204—181 **10 Claims**

1. A method of electrodepositing a hard impact resistant and corrosion resistant film on the cathode of a unidirectional electrical system comprising passing a unidirectional electrical current through an aqueous coating composition comprising water having dispersed therein an hydroxy functional cationic resin comprising an adduct of a resinous polyepoxide having a molecular weight in the range of about 600 to about 6000 and an hydroxy value of from about 0.2 to about 0.4, a stoichiometric deficiency of organic polyisocyanate and a monosecondary amine in an amount to consume substantially all of the epoxy functionality of said polyepoxide, said cationic resin being dispersed in the water by means of an acid, and then through said cathode to deposit a resin film thereon, and baking said film to cure the same.

3,891,528

ELECTROSTATIC FILTERING FOR CLEANING DIELECTRIC FLUIDS

Edward A. Griswold, Pasadena, Calif.

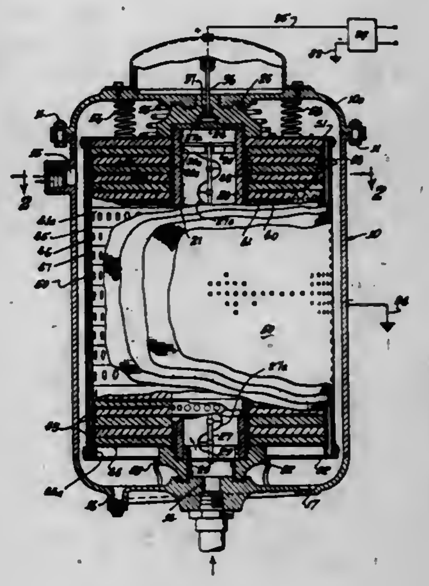
Division of Ser. No. 93,363, Nov. 27, 1970, which is a continuation-in-part of Ser. No. 538,275, March 29, 1966, Pat. No. 3,544,441, which is a division of Ser. No. 190,457, April 26, 1962, Pat. No. 3,252,885. This application Feb. 26, 1973, Ser. No. 335,554

Int. Cl. B03c *5/00*

U.S. Cl. 204—186 **17 Claims**

1. The method of removing electrically charged particles suspended in a stream of a dielectric fluid in a porous region laterally bounded by spaced and housed electrodes, that includes the steps of:

a. flowing the stream of fluid with particles suspended therein along a path within said porous region;
b. maintaining a high-intensity unidirectional electrostatic field across the fluid path between surfaces of the laterally spaced electrodes;
c. effecting a change in velocity of the fluid stream by controlling the net cross-sectional area of the porous region



available to the fluid stream in said field wherein the suspended particles migrate toward a boundary of the region;
d. receiving the migrating particles on stationary structure defining the porous region; and
e. maintaining at least a substantial portion of said surfaces coated with material exposed to said fluid stream and having a high dielectric value and electrical resistance.

3,891,529

ELECTROCHEMICAL OXYGEN SENSOR, ESPECIALLY FOR MOTOR EXHAUST GAS ANALYSIS

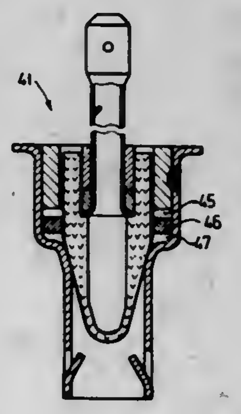
Otto Beesch, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Jan. 10, 1974, Ser. No. 432,248

Claims priority, application Germany, Jan. 30, 1973, 2304359

Int. Cl. G01n *27/46*

U.S. Cl. 204—195 S **2 Claims**

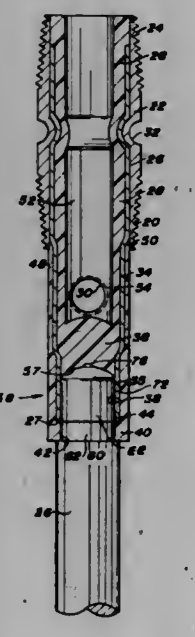


1. Electrochemical sensor for determination of the oxygen content of hot gas, such as engine exhaust gas, comprising:

a tube (11) of solid electrolyte closed at one end;
electron conducting layers, one on the inner surface and one on the outer surface of said tube, forming inner and outer electrodes respectively;
a connection member (32) electrically connected to said inner electrode and of a form of construction such as to admit ambient air to the inner surface of said tube;

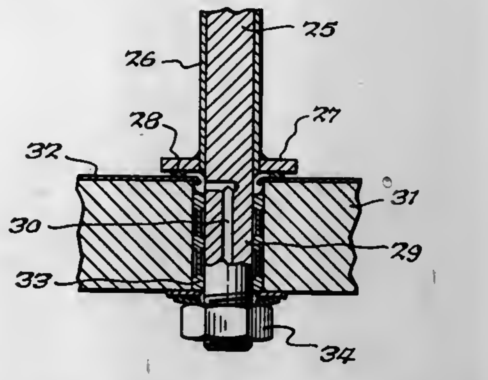
- a casing (21) electrically connected to said outer electrode and surrounding the circumference of said tube over at least a major part of its length;
- a first seal (35) of an electrically conducting sealing material between said connection member and said inner surface encircling said connection member;
- a second seal (27) consisting of an annular mass of graphite powder between said casing and said outer surface encircling said tube, and
- at least one annular pressure applying means for compressing at least said second seal, said first and second seals being stable over a range of temperature including the temperature range of the gas being examined,
- said second seal (27) being of a yielding character even after compression by said pressure applying means and providing an electrical connection between said outer electrode and said casing.

3,891,530
ANODE-FITTING ASSEMBLY
Sam Alewitz, Painesville, Ohio, assignor to Perfection Corporation, Madison, Ohio
Filed Nov. 29, 1972, Ser. No. 310,561
Int. Cl. C23f *13/00*
U.S. Cl. 204—197 **15 Claims**



1. An anode-fitting assembly for a water heater or the like comprising in combination:
- a fitting member adapted to be secured to the wall of such water heater in electrical contact therewith, said fitting member having an interior wall defining a recess at one end thereof;
- an anode member comprising:
  - an electrode,
  - a joining member received about one end of said electrode,
  - said joining member and said one end of said electrode being disposed in said recess of said fitting member,
  - said joining member having a cylindrical portion the inner wall of which is in physical and electrical contact with the exterior surface of said electrode and the exterior wall of which is in physical and electrical contact with said wall defining said recess of said fitting member such that with said electrode assembled to said fitting member said cylindrical portion is entirely received within said recess and, in a radial direction, is located between said electrode and said fitting member and provides an electrical interconnection between said electrode and said fitting member,
- the relationship of said anode member to said fitting member being such that with said joining member received within said recess fluid in such water heater is substantially prohibited from contact with said one end of said electrode, said joining member and said wall defining said recess of said fitting member.

3,891,531
ELECTROLYTIC DIAPHRAGM CELLS INCLUDING CURRENT CONNECTION MEANS BETWEEN THE CELL BASE AND ANODE
Pierre Bouy, Enghien-les-Bains; Daniel Masure, La Madeleine; Paul Collon, Autreville; Jean-Marie Pigeaud, Martigues, and Bernard Sartre, Levallois-Perret, all of France, assignors to Rhone-Progil, Paris, France
Filed Dec. 19, 1972, Ser. No. 316,515
Claims priority, application France, Dec. 23, 1971, 71.46296
Int. Cl. B01k *3/10*
U.S. Cl. 204—263 **4 Claims**



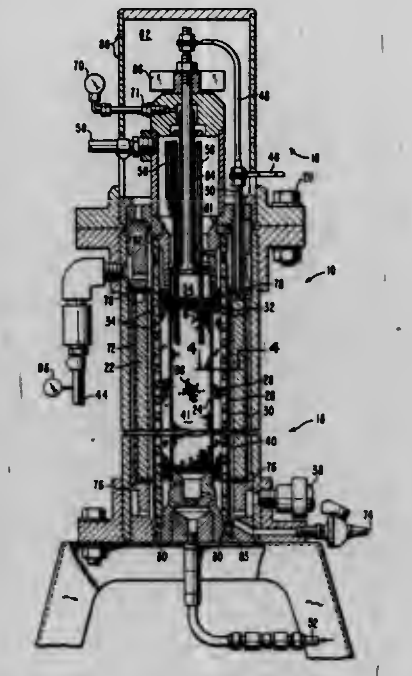
1. An electrolytic diaphragm cell comprising a plurality of vertical substantially flat and hollow anodes formed, as regards at least one of their two substantially parallel faces, by a sheet of a film-forming metal, said anodes being secured to the base of the cell by means of extended portions which pass through the base, characterized in that the extended portions comprise a core made of a metal which is a good electrical conductor, which core is covered by a sheath made of a film-forming metal, a good electrical contact being ensured between the sheath and the core, said base of the cell being of metal, which base is covered with a sheet of film-forming metal, said core of said extended portions is exposed where it passes through the base of said cell, the electrical connection is made by means of metal parts arranged between said core and said base and resting resiliently against said core and said base.

3. An electrolytic diaphragm cell according to claim 1, wherein said extended portion is provided with a channel communicating with the top of said base and a point of discharge below said base.

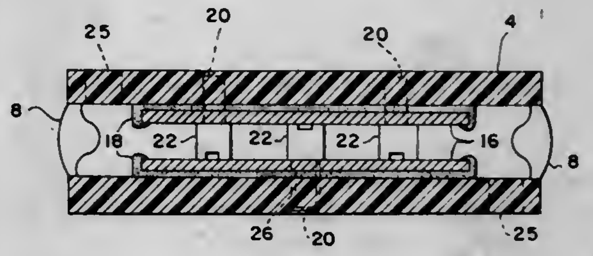
3,891,532
ELECTROLYTIC CHEMICAL REACTION APPARATUS
Gerald A. Jensen, Wayzata, Minn., and Harry N. Parsonage, Washington Twp., Montgomery County, Ohio, assignors to The Mead Corporation, Dayton, Ohio
Filed Nov. 30, 1973, Ser. No. 420,699
Int. Cl. B01k *3/10*
U.S. Cl. 204—260 **22 Claims**

19. Apparatus for the electrolytic regeneration of alkali ferrocyanide bleach to alkali ferricyanide bleach comprising:

1. a cylindrical outer housing
2. an annular anode, having an inside diameter of approximately four inches and a height of approximately three feet, located within said housing, only the interior surface of said anode being active, said interior surface having approximately three square feet of active surface area,
3. a cation exchange membrane arranged concentrically within and spaced from said anode,
   - said membrane and said interlock surface of said anode defining an anode chamber for flowing said bleach,
   - said membrane being supported by a porous tubular support member which has a fiberglass layer thereon, said membrane and said fiberglass layer being attached to said porous tubular support member by a nylon cord wrapping,
   - said member being non-porous at its ends and having an annular elastomeric insert at each end, said membrane being laid over said inserts, a fine nylon cord wrapped over said membrane and around said member in the area of said inserts so as to compress the membrane tightly against said inserts and effectively seal the ends of said membrane to said member, and said membrane defining the outside of a cathode chamber,
4. a hollow cylindrical cathode two inches in diameter and three feet high positioned within said cathode chamber and spaced from said membrane and said support, both surfaces of said cathode being active, providing approximately three square feet of active surface area,
5. wetproofed catalyst particles arranged on both sides of said hollow cylindrical cathode and confined inside said membrane support member,
6. sealing means at the ends of said outer housing, annular anode, membrane support member, and cathode so as to form a closed system,
7. inlet means, to said anode chamber, for introducing an aqueous solution of an alkali ferrocyanide bleach into said anode chamber,
8. outlet means, from said anode chamber for the exit of the regenerated bleach,
9. pressure gauges attached to both said inlet and outlet means,
10. valve means attached to said anode chamber outlet to control the back pressure within said anode chamber,
11. inlet means to said cathode chamber for introducing oxidizing air into the cathode chamber for reaction with any hydrogen gas by-product produced at said cathode during electrolysis,
12. outlet means from said cathode chamber for exit of any by-products produced as well as any excess air introduced,
13. pressure gauges attached to both said cathode chamber inlet and cathode chamber outlet,
14. valve means attached in said cathode chamber outlet to control the back pressure within said cathode chamber, whereby it is possible to maintain a back pressure within said cathode chamber which is less than the back pressure within said anode chamber and, thus, keep said cation exchange membrane tight against said membrane support member, and
15. electrical means for supplying an electrical potential across said anode and said cathode.



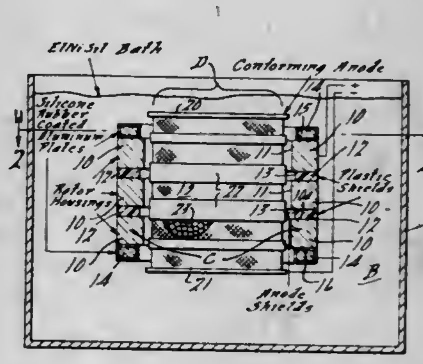
3,891,533
ELECTROLYTIC CELL STRUCTURE
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of David F. Putnam, Myrtle Creek, Oreg., and Richard L. Vaughan, Long Beach, Calif.
Filed Feb. 8, 1974, Ser. No. 440,916
Int. Cl. B01k *3/00*
U.S. Cl. 204—267 **5 Claims**



1. In an electrolytic cell assembly comprising a plurality of spaced parallel insulating plates, with adjacent plates defining flow paths therebetween, said plates having electrically conductive sheets secured thereto, the improvement comprising: adhesive means for securing said conductive sheets to said plates and for sealing edges of said conductive sheets thereby protecting said conductive sheets from electrolytic attack;

headed screw means of insulating material for securing each of said conductive sheets to its respective plate and for preventing buckling of said conductive sheet by maintaining adhesion between said conductive sheet, said adhesive means and said insulating plate and for maintaining a predetermined spacing between said plates; and resilient gasket means between said adjacent plates defining predetermined flow paths therebetween.

3,891,534
ELECTROPLATING SYSTEM FOR IMPROVING PLATING DISTRIBUTION OF ELNISIL COATINGS
Leonard G. Cordone, Allen Park; William A. Donakowski; John R. Morgan, both of Dearborn Heights, and Karl Roemming, Detroit, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Nov. 5, 1973, Ser. No. 413,154
Int. Cl.^{2} C25B *9/00;* **C25D** *7/04*
U.S. Cl. 204—272 **15 Claims**

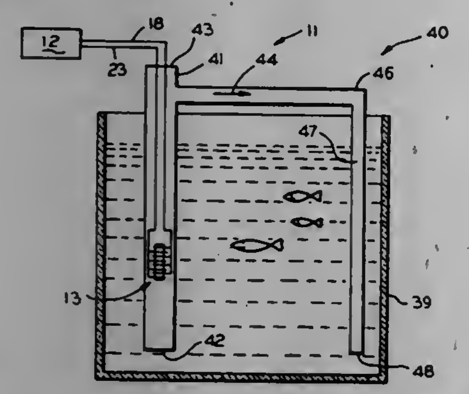


1. In an electroplating system for cathodically electroplating an article wall having a uniform curvature interrupted by a reverse curvature at least at one location, a semi-conforming anode assembly, comprising:

a. an anodically inert enclosure having a conductive foraminous wall predominantly conforming proportionately to the wall of said article excepting said reverse curvature when disposed adjacent thereto, said foraminous wall having at least one portion shaped predominantly to conform with said uniform curvature of said article wall and at least one other portion which extends adjacent the reverse curvature and extends beyond the start of said reverse curvature of said article, said other portion progressively deviating away from conformity with said reverse curvature and having a maximum deviation at a station aligned with an extension of a radius of said reverse curvature passing through the mid-point of said reverse curvature, and

b. a plurality of anodically active metal pieces in said enclosure in interengagement with each other and with said enclosure.

3,891,535
AQUARIUM WATER TREATMENT APPARATUS
Arnold Wikey, 5040 W. Newport, Chicago, Ill. 60641
Continuation of Ser. No. 123,342, March 11, 1971, Pat. No. 3,720,014. This application July 9, 1973, Ser. No. 377,597The portion of the term of this patent subsequent to Oct. 30, 1990, has been disclaimed.
Int. Cl. C02b *1/82;* **B01k** *3/00;* **C02b** *3/00*
U.S. Cl. 204—275 **4 Claims**



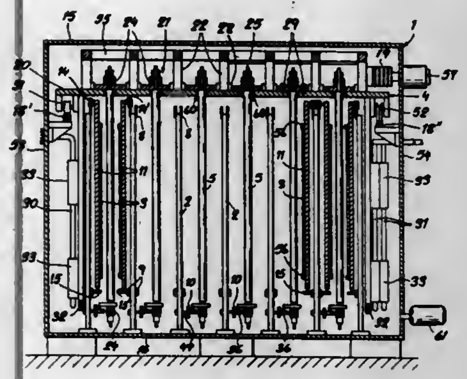
1. Water treatment apparatus for aerating and sterilizing fish tanks,

said apparatus comprising at least one pair of electrodes immersed in said fish tank,
said electrodes being juxtaposed but non-contiguous to one another,
a low voltage source for oppositely polarizing said electrodes to cause electrolysis of the water to release gases for simultaneously sterilizing and aerating the water,
means for periodically changing polarization to maintain the gaseous discharge at said electrodes,
tube means surrounding said electrolysis unit in said fish tank,
said tube means comprising a first vertical tube opened at the bottom thereof,
said tube means further comprising a second vertical tube, said second vertical tube closed at the top and open at the bottom thereof,
a horizontal tube joining said first and second vertical tubes, and
said horizontal tube being located so as to be below the surface of the water when said fish tank is in operation, whereby circulation for aeration is accomplished by the electrodes being energized to force water from said first vertical tube through said horizontal tube and said second vertical tube to aerate the lower levels of said fish tank.

3,891,536
SPUTTER-COATING APPARATUS
Hans-Joachim Gläser, Gelsenkirchen, and Hans-Werner Brandt, Witten, both of Germany, assignors to Flachglas Aktiengesellschaft DELOG-DETAG, Auf der Rhine, Germany
Filed Oct. 9, 1973, Ser. No. 404,677
Claims priority, application Germany, Oct. 7, 1972, 2249297; Oct. 7, 1972, 7236940
Int. Cl. C23c *15/00*
U.S. Cl. 204—298 **4 Claims**

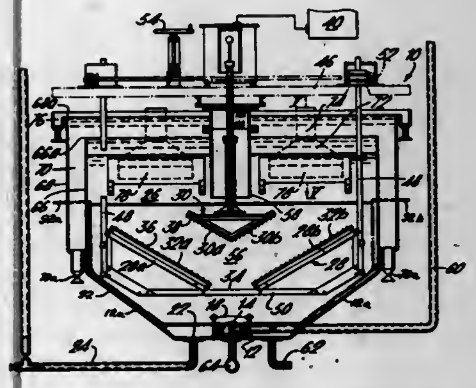
1. A sputter-coating apparatus comprising:

a gastight chamber having a bottom wall;
suction means connected to said chamber for at least partially evacuating same;
an upright workpiece support in said chamber including at least one upper horizontal rail, at least one lower horizontal rail below and parallel to said upper rail and secured to said bottom wall, and a plate suspended rollingly on said upper rail and bearing laterally on said lower rail, a sheet-like workpiece being retainable in an upright position on said plate between said upper rail and said lower rail;
a horizontal guide on said support below said lower rail;
a horizontally displaceable carriage in said chamber above said upper rail;



a rack of sputter-coating electrodes having an upper end attached to said carriage and a lower end engaged with said guide; and
means for displacing said carriage horizontally in said chamber with said lower end riding along said guide and thereby moving said electrodes past said sheet-like workpiece while sputtering a coating thereon, said electrode rack including a plurality of elongated vertical electrodes and upper and lower cross members interconnecting said electrodes at said upper and lower ends of said rack, said lower cross members being provided with a plurality of laterally projecting rollers rotatable about vertical axes and engaging said guide beneath said plate.

3,891,537
ELECTROSTATIC SEPARATING APPARATUS
Toshiyuki Tokumoto, 1994-3 Icchome, Nakatomigaka, Nara, Japan
Filed Oct. 30, 1973, Ser. No. 411,156
Claims priority, application Japan, Nov. 1, 1972, 47-109971; Nov. 9, 1972, 47-112339; Nov. 15, 1972, 47-115081
Int. Cl. B03c *5/02, 5/00*
U.S. Cl. 204—308 **4 Claims**



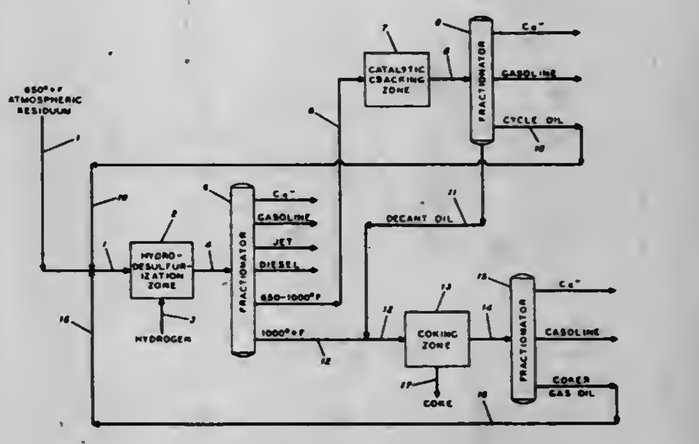
1. An electrostatic separating apparatus for separating oil, floatable foreign bodies and water from waste liquid, comprising:

a separator tank adapted to contain a liquid dielectric solvent,
being capable of dissolving oil, having a specific gravity greater than that of water and capable of defining a substantially distinct level at its upper surface;
inlet means in said separator tank at its bottom adapted to introduce said waste liquid into said separator tank as a multiplicity of droplets;
a pair of electrodes in said separator tank, positionable to be within said solvent and defining an interelectrode space, said electrodes connectable to a substantially high voltage D.C. potential in order to produce an electrostatic field in said interelectrode space such that when waste liquid is introduced through said inlet means, said waste liquid is separated into oil, floatable foreign bodies and water due to an electrophoretic effect of said electrostatic field, said oil being substantially dissolved in said solvent near said upper surface thereof, said floatable foreign bodies forming a substantially distinct layer above the level of said solvent and said water forming a substantially distinct layer aobve the layer of floatable foreign bodies;
first outlet means positionable on said separator tank slightly below the upper surface of said solvent for discharging oil-containing solvent;
second outlet means disposed above the upper surface of said solvent for discharging floatable foreign bodies separated from said waste liquid in said separator tank;
third outlet means disposed above the level of said floatable foreign bodies for discharging water separated from said waste liquid in said separator tank; and
a drain conduit assembly in communication with said first outlet means, said drain assembly comprising:
an upflow conduit in direct flow communication with said first outlet means,
a downflow conduit,
a plurality of intermediate branch conduits positionable above the upper surface of the solvent and connecting said upflow conduit and said downflow conduit in flow communication with each other at different levels above the upper surface of said solvent, and
ON-OFF valves in said branch conduits for selectively opening and closing said branch conduits in order to maintain the upper surface of said solvent at a substantially fixed level regardless of inflow of waste liquid into the tank, such that said floatable foreign bodies are discharged through said second outlet means, said water is discharged through said third outlet means and said oil-containing solvent near the upper surface of said solvent is discharged through said first outlet means in flow communication with said drain conduit assembly.

3,891,538
INTEGRATED HYDROCARBON CONVERSION PROCESS
John E. Walkey, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Filed June 21, 1973, Ser. No. 372,117
Int. Cl. C10g *37/06*
U.S. Cl. 208—50 **2 Claims**

1. In a process wherein an atmospheric residuum hydrocarbon stock containing sulfur and substantial quantities of materials boiling above 1000°F. is hydrotreated in a hydrotreating zone, a low sulfur gasoline product and a low sulfur jet fuel product are recovered from the effluent from said hydrotreating zone, a low sulfur portion of said effluent is catalytically cracked in a catalytic cracking zone; at least a portion of said effluent boiling above 1000°F. is coked in a coking zone, a gasoline product is recovered from the effluent from said catalytic cracking zone, a portion of the effluent from said catalytic cracking zone is recycled to said hydrotreating zone, and a gasoline product is recovered from the effluent from said coking zone, the improved method of optimizing the operating efficiency of the combination of said hydrotreating, catalytic cracking and coking zones which comprises:

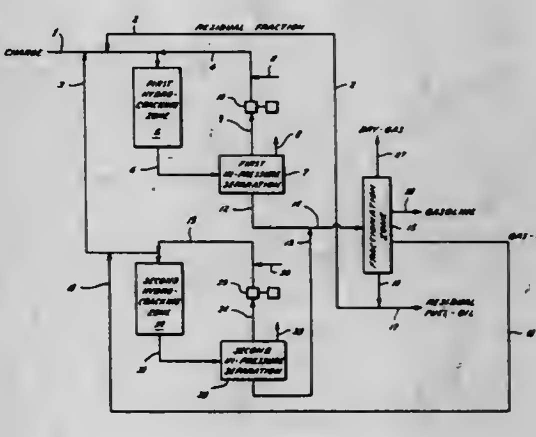
1 limiting to 800°F. the end point of said portion of said effluent from said catalytic cracking zone that is recycled to said hydrotreating zone;
2 passing to said coking zone and coking the portion of said effluent from said catalytic cracking zone that boils above 800°F.;
3 recovering coke from said coking zone in increased yield compared with the yield if the portion of said effluent from said catalytic cracking zone boiling above 800°F. were not coked in said coking zone;



4 recycling from said coking zone to said hydrotreating zone a coker gas oil in increased amount compared with the amount available for such recycle if the portion of said effluent from said catalytic cracking zone boiling above 800°F. were not coked in said coking zone;

whereby there is obtained increased coke yield, increased coker gas oil for recycle to said hydrotreating zone, and improved desulfurization efficiency in said hydrotreating zone, with a resulting increased efficiency of operation of the combination of said hydrotreating, catalytic cracking and coking zones.

3,891,539
HYDROCRACKING PROCESS FOR CONVERTING HEAVY HYDROCARBON INTO LOW SULFUR GASOLINE
Gerald Verdell Nelson, Nederland, Tex., and Glenn Cooper Wray, Dyersburg, Tenn., assignors to Texaco Inc., New York, N.Y.
Continuation-in-part of Ser. No. 212,565, Dec. 27, 1971, abandoned. This application Feb. 25, 1974, Ser. No. 445,365
Int. Cl. B01j *11/82;* **C10g** *13/02*
U.S. Cl. 208—59 **13 Claims**



1. A hydrocracking process wherein heavy hydrocarbon oil charge containing 0.1 to 8 percent sulfur, 100 to 1000 ppm

and more nitrogen, and 100 ppm and more compounds of nickel, vanadium, iron, and copper, and comprising from about 10 to 50 volume percent residual fraction boiling above 1000°F. are converted into a major portion of gasoline containing less than 100 ppm sulfur and nitrogen, and a minor portion of residual fuel oil containing about 1 percent or less sulfur; which process comprises:

- a. hydrocracking heavy hydrocarbon oil charge, in a first hydrocracking zone, with molecular hydrogen at a temperature in the range of from about 700°–850°F. in the presence of a sulfur and nitrogen resistant hydrocracking catalyst comprising a hydrogenation component supported upon a cracking base consisting of an amorphous inorganic oxide having pore size distribution in the range of at least **20-200** angstrom units for conversion of said heavy hydrocarbon oil charge into not more than about 5 percent gasoline fraction, a major portion of gas-oil fraction boiling in the range of 430°–1000°F., and at least about 10 percent residual oil fraction boiling above 1000°F. containing about 1 percent or less sulfur;
- b. separating, in a separation zone, the gas-oil fraction from the residual oil fraction;
- c. recovering at least a portion of said residual fraction as low sulfur heavy fuel oil product; and
- d. hydrocracking the gas-oil fraction in a second hydrocracking zone with molecular hydrogen at a temperature in the range of about 700°F. to about 780°F., in the presence of a sulfur and nitrogen resistant hydrocracking catalyst to produce gasoline boiling in the range of 55°–430°F. and containing 100 ppm or less sulfur and nitrogen.

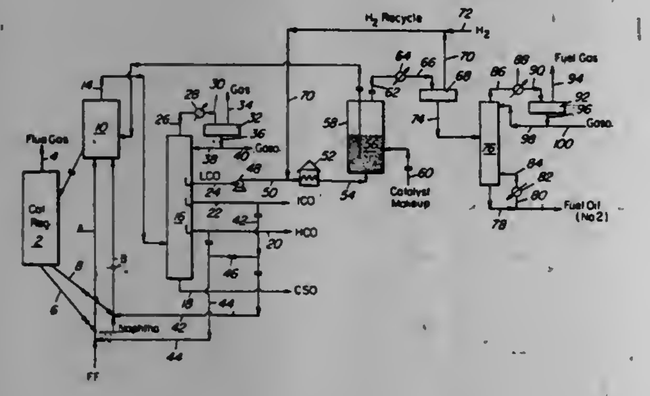
3,891,540

COMBINATION OPERATION TO MAXIMIZE FUEL OIL PRODUCT OF LOW POUR

Edward J. Demmel, Pitman; Donald M. Nace, Woodbury; Hartley Owen, Belle Mead, and Edward J. Rosinski, Deptford, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 2, 1974, Ser. No. 457,310
Int. Cl. C10g *37/06;* **C01b** *33/28*

U.S. Cl. 208—77 **16 Claims**



1. A method for improving the yield of low pour light fuel oil product which comprises,

catalytically cracking a mixture comprising fresh gas oil feed and heavy cycle oil product of cracking in a first conversion zone under conditions selected to restrict conversion to less than 45 volume percent,

separating the product of said first conversion zone to recover gasoline and lower boiling components from a light fuel oil fraction, an intermediate cycle oil fraction and a heavy cycle oil fraction, recycling the heavy cycle oil fraction to said first conversion zone,

passing the intermediate cycle oil fraction to a second conversion zone and restricting catalytic conversion thereof to increase the yield of desired light fuel oil,

separating the product of the intermediate cycle oil conversion operation to recover gasoline and lower boiling components from light fuel oil and higher boiling cycle oil and

reducing the pour point of the light fuel oil fraction of the combination catalytic cracking operation by contacting it with a ZSM-5 type crystalline zeolite under hydrodewaxing conditions.

3,891,541

PROCESS FOR DEMETALIZING AND DESULFURIZING RESIDUAL OIL WITH HYDROGEN AND ALUMINA-SUPPORTED CATALYST

Stephen M. Oleck, Moorestown; Thomas R. Stein, Cherry Hill; Howard S. Sherry, Cherry Hill, and Donald Milstein, Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 29, 1973, Ser. No. 392,708
Int. Cl. C10g *23/02*

U.S. Cl. 208—89 **7 Claims**

1. A process for catalytically demetalizing and desulfurizing a residual oil comprising contacting said oil with hydrogen under the following hydroprocessing conditions: a hydrogen pressure of about 500 to 3000 psig, a hydrogen circulation rate of about 1000 to 15,000 scf/bbl of feed, a temperature of about 600° to 850°F, a space velocity of 0.1 to 5.0 LHSV, in the presence of a catalyst comprising the oxides or sulfides of a Group VIB metal and an iron group metal on an alumina support, said catalyst having not less than about 55 to 75% of its pore volume in pores having a diameter range of about 180A to about 300A, and having a surface area in the range of 40 to 70 m^2/g.

3,891,542

METHOD FOR INSURING HIGH SILICON CARBIDE CONTENT IN ELNISIL COATINGS

Leonard G. Cordone, Allen Park; William A. Donakowski; John R. Morgan, both of Dearborn Heights, and Karl Roemming, Detroit, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 5, 1973, Ser. No. 413,155
Int. Cl.² C25D *5/02, 3/12*

U.S. Cl. 204—16 **5 Claims**

1. A method for electrolytically depositing a highly uniform wear-resistant dispersion coating onto a cast substrate, comprising:

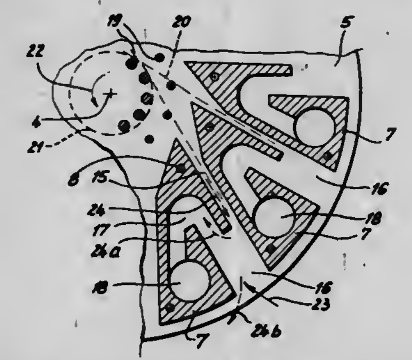
- a. providing an aqueous acidic solution containing at least one nickel salt selected from the group consisting of nickel sulfate, nickel chloride, nickel fluoroborate, and nickel sulfamate and any mixtures thereof, said salt being present in a concentration of at least 600 grams/liter, said solution containing also a suspension of inert wear-resistant particles in a concentration of about 150 grams/liter and a predominant particle size no greater than 3 microns and having a shape which is spherical or acicular so as to disperse quickly through said solution, said solution being maintained at a temperature no less than 160°F,
- b. introducing an inert gaseous medium into said solution at a plurality of stations disposed uniformly throughout a bottom horizontal zone of said solution and at a flow rate of between 75–125 c.c./minute/cm^2 to turbulate said solution in a manner for preventing laminar conditions in said solution, and
- c. applying an electrical potential between a nickel containing anode assembly and said cast substrate to provide a current density at said cast substrate of about 400 amps/ft^2.

3,891,543

CENTRIFUGAL SIFTER APPARATUS

Josef Wessel, Am Sonnenhof 154, 8131 Aufkirchen, Germany
Continuation of Ser. No. 256,415, May 24, 1972, abandoned. This application Oct. 7, 1974, Ser. No. 512,744
Claims priority, application Germany, Feb. 3, 1971, 2104967
Int. Cl. B07b *7/83*

U.S. Cl. 209—144 **21 Claims**



1. Centrifugal sifter apparatus comprising a housing having an air inlet for sifting air and outlets for coarse and fine materials, respectively; a rotor mounted within said housing for rotation about an axis; means for introducing material to be sifted to said rotor at an inlet zone in the vicinity of said axis; and means establishing a plurality of circumferentially spaced material distributing passages in said rotor and extending outwardly from said inlet zone to a sifting zone and a plurality of circumferentially spaced fine material discharge passages alternating with said distributing passages and extending inwardly from said sifting zone toward but terminating short of said inlet zone, each of said distributing passages having a fine material discharge opening therein extending axially of said rotor, each of said discharge openings occupying a position closer to the rotor's periphery than to its axis of rotation.

3,891,544

PROCESS FOR THE SEPARATE RECOVERY OF POTASSIUM CHLORIDE AND SODIUM CHLORIDE FROM A SOLID MIXTURE THEREOF

Alan M. Becker; Joseph A. Epstein; Michael S. Lupin, and Shaul Zolotov, all of Beer-Sheba, Israel, assignors to Dead Sea Works Ltd., Beer-Sheba, Israel

Filed July 11, 1973, Ser. No. 378,309
Claims priority, application Israel, July 28, 1972, 40016
Int. Cl. B03d *1/02*

U.S. Cl. 209—166 **4 Claims**

1. A method for the separate recovery of potassium chloride and sodium chloride from a solid mixture thereof, comprising preparing an aqueous slurry of said solid mixture embodying at least one sodium chloride crystal habit modifier, selected from the group consisting of sodium ferrocyanide, potassium ferrocyanide, sodium ferricyanide, potassium ferricyanide, manganese chloride, citric acid, sodium citrate, nitrilo-triacetamide hydrochloride, nitrilo-triacetamide hydrosulfate, 3,5-dioxo-1-piperazine acetamide, nitrilo-diacetamide monoacetic acid, nitrilo-diacetamide monoacetonitrile, monosodium glutamate, methyl cellulose, gum arabic agitating said slurry and allowing said modifier to act on the sodium chloride for at least five minutes, adding flotation reagents to the slurry, inducing a froth flotation separation to occur, and recovering a potassium enriched fraction from the top and a sodium chloride enriched fraction from the bottom.

3,891,545

IMINOPHENOLS AS FROTH FLOTATION REAGENTS FOR METALLIC ORES

Vojislav Petrovich, 1929 W. Schiller St., Chicago, Ill.

Filed Apr. 30, 1974, Ser. No. 465,412
Int. Cl.² B03D *1/02*

U.S. Cl. 209—166 **3 Claims**

1. A method of beneficiating ores selected from the groups consisting of oxide of iron, oxide, silicate, and sulfide of copper, oxide, silicate, sulfide, arsenide, and antimonide of nickel, oxide, sulfide, arsenide, and antimonide of cobalt, the vanadate of heavy metals by froth flotation process to produce a froth concentrate of desired metal values which comprises effecting the froth flotation of the said ores and minerals in the presence of methyliminodihydroxybenzoic acid as collector in a pulp of mineral slurry having a pH of 8 to 12; and recovering the desired metal value in an enriched froth concentrate, leaving a tailings poor in the desired metal value.

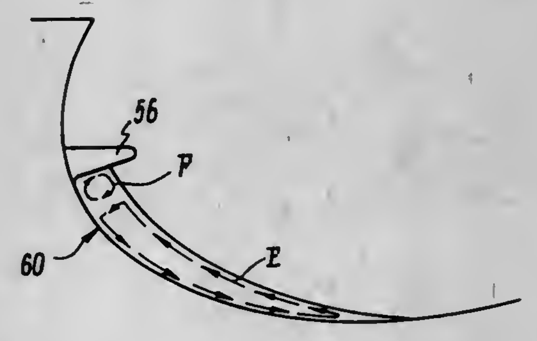
3,891,546

HELICAL CHUTE CONCENTRATOR AND METHOD OF CONCENTRATING

Ira B. Humphreys, 910 American National Bank Bldg., Denver, Colo. 81802

Filed Sept. 8, 1971, Ser. No. 178,638
Int. Cl. B03b *3/04*

U.S. Cl. 209—211 **4 Claims**



1. An apparatus for concentrating and separately collecting from a mass of intermixed particles of different specific gravities those particles having like specific gravity comprising, a stationary downwardly inclined helical chute, means for feeding an intermixture of liquid and particles of said mass as a stream to the upper end of said chute, said chute having an inner low concave side wall terminating only a little beyond the lowermost point of the chute bottom and an outer side wall defined by an upstanding abutment projecting at approximately 90° from the chute bottom, and the bottom of the chute in spaced relationship lengthwise thereof and in substantially the said lowest portion thereof being provided with outlet openings for the discharge of a portion of said stream and the particles therein.

3,891,547

PERMEABLE HOLLOW FIBER FILTER

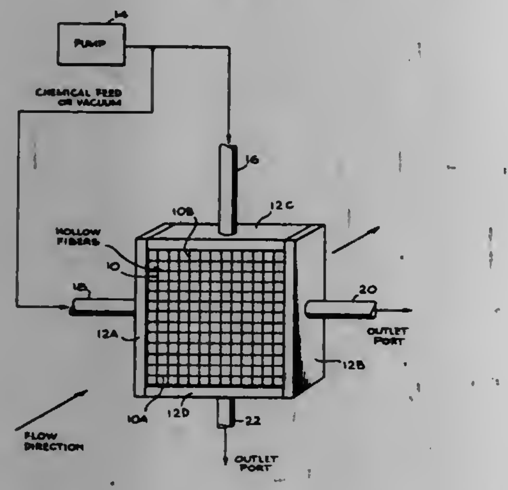
Daniel P. Y. Chang, Davis; Sheldon K. Friedlander, Pasadena, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 296,097, Oct. 10, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 458,795
Int. Cl. B01d *13/00*

U.S. Cl. 210—23 **4 Claims**

1. A method of improving the particulate matter collection efficiency of a hollow fiber mesh filter comprising

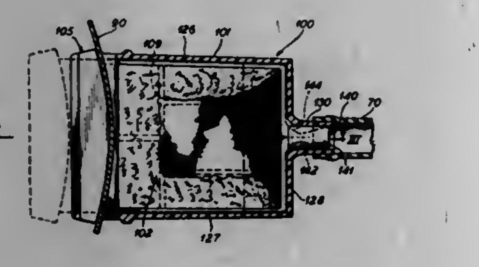
flowing a carrier solution containing particulate matter to be collected between the fibers of said hollow fiber mesh filter, said fibers being substantially nonpermeable to said particulate matter and being constructed and arranged to permit the passage of the carrier fluid therebetween while intercepting the particulate matter,



modifying the outer wall surface of said hollow fibers and the region immediately therearound to increase the efficiency of particulate matter collection by passing a fluid through said hollow fibers to which said hollow fiber walls are slightly pervious, where said fluid is one of the group consisting of a solution of an electrolyte, a solution of a polyelectrolyte, and water.

3,891,548
MANUAL SCREEN FILTER FOR AUTOMATIC WASHER AND METHOD

Henry Marcussen, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Sept. 13, 1973, Ser. No. 396,890
Int. Cl. B01d *37/04*
U.S. Cl. 210—65 **12 Claims**

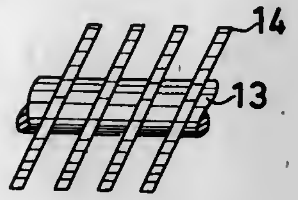


1. A method of filtering suspended lint from a flow of laundry liquid in an automatic washer which comprises the steps of circulating laundry liquid in the form of a stream through a recirculating circuit, directing liquid in the stream through a filter to separate particles from said flow by said filter, said filter having an inclined surface with a storage area adjacent thereto, retaining the separated particles on the inclined surface of said filter, at one point in the circuit changing a pressure head in the stream to a velocity head, directing the flow at increased velocity against said inclined surface of the filter and moving said separated particles imparted by said flow off of the said surface to the storage area of said filter, and retaining the particles in the storage area.

7. A filter assembly comprising: a housing having an inlet, nozzle means disposed at the inlet for directing a flow of fluid through the housing, and a removable filter element disposed in the housing, said filter element having a contour to provide a first portion and second portion, said first portion being received in the housing adjacent the inlet at a shallow angle to the direction of flow of fluid from the nozzle to provide a primary filtering area, said second portion having a U shape with legs with a portion of the first portion extending between said legs, said second portion extending from the first portion to a level in the housing below the level of an adjacent portion of the first portion to provide a storage area spaced from the inlet for receiving particles separated by the primary filtering area and moved by the flow of fluid therefrom.

3,891,549
METHOD AND AN APPARATUS FOR DEWATERING A SUSPENSION

Amichai Meir Carmel, Nynashamn, and Bengt Olov Lundh, Hedemora, both of Sweden, assignors to Rederiaktiebolaget Nordstjernan, Stockholm, Sweden
Filed Apr. 9, 1973, Ser. No. 349,360
Claims priority, application Sweden, Apr. 13, 1972, 4778/72
Int. Cl. B01d *37/04*
U.S. Cl. 210—66 **4 Claims**



1. In the known method of separating a mixture of liquid and solid materials by bringing said mixture into contact with a moving filtering means of the endless belt type which permits passage of the liquid but which denies passage to the solids, with the result that due to the compressibility of said mixture a substantially impermeable layer of solids is built upon the filtering means, the improvement which comprises increasing the permeability of said impermeable layer of solids which has built up on the filtering means by:

a. the application of a plurality of spaced disk means, inclined from the vertical and constructed and arranged to create layer-disrupting rotating forces at spaced apart points across the width of said filtering means, each of said rotating disk means penetrating said layer to a point immediately adjacent to the surface of the filtering means in such a manner that the combined action of the rotating disks will be to raise at least some of said impermeable layer laterally up to and above said impermeable layer and in so doing form a plurality of essentially parallel ditches and ridges extending longitudinally with respect to the direction of movement of the moving filtering means, and
b. thereafter subjecting said layer with its plurality of longitudinally extending ditches and ridges to a surface leveling means which is constructed and arranged to move the top of each ridge laterally into adjacent ditches and so that the ditches will be eliminated and a layer of substantially uniform thickness produced, thereby increasing the permeability of said layer.

3,891,550
PROCESS AND APPARATUS FOR RECOVERING BITUMEN FROM BITUMINOUS SANDS

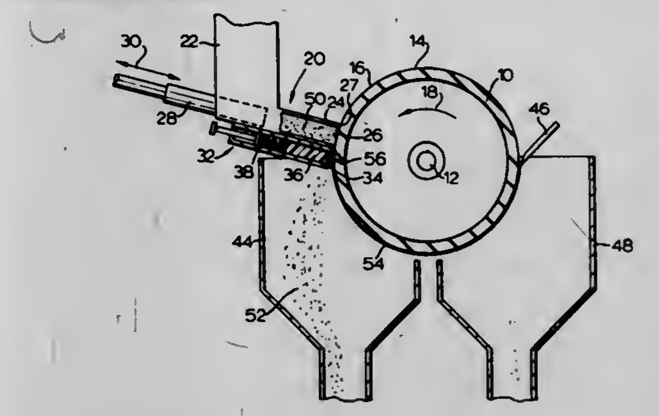
Frank Alexander Gray, and John Adam Gray, both of 169 Fifth St., Toronto, Ontario, Canada (M8V 2Z7)
Continuation of Ser. No. 194,304, Nov. 1, 1971, abandoned. This application Dec. 17, 1973, Ser. No. 425,085
Int. Cl. B01d *33/02*
U.S. Cl. 210—67 **20 Claims**

1. In a process for recovering bitumen from an admixture of bitumen, sand and water derived from a bituminous sand deposit of the type described, the steps of

a. compacting a mass of the admixture,
b. directing the compacted mass against an oleophilic surface displaceable generally transversely to the direction of application of the mass,
c. constraining the mass against the surface in the region of application only to apply a thin layer of the mass thereonto,
d. driving the surface at a rate of displacement sufficient to and in a direction to apply the layer and to dislodge sand from the applied layer of the admixture following release from constraint and
e. recovering the residue adhered to the surface.

9. In apparatus for separating sand from an admixture of oil or bitumen sand and water derived from a bituminous sand deposit of the type described and recovering an oil or bitumen enriched residue therefrom, the combination of

a. means presenting a smooth endless oleophilic surface of substantial width;



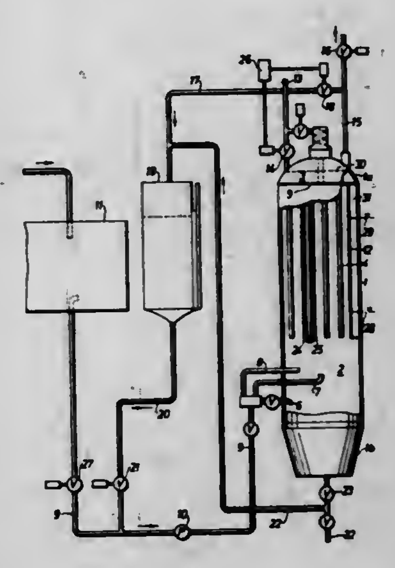
b. means for delivering a mass of admixture against a selected region of said surface, including a charging apparatus terminating in a discharge orifice;
c. means for supporting said discharge orifice in closely spaced relation to said surface in the region of application of the mass to said surface, thereby defining a restricted passageway to constrain the mass to be applied thereonto to a thin layer of substantially uniform thickness;
d. means associated with said charging apparatus for displacing the mass therewithin to said surface through said discharge orifice;
e. means for continuously displacing said surface at a rate sufficient and in a direction to constrain the mass and apply the thin layer and to dislodge sand from the applied layer respectively after emerging from said restricted passageway; and
f. means for removing the adhered residue of the mass from said surface.

3,891,551
METHOD OF CLEANING A LIQUID FILTER, AND FILTER FOR PERFORMING THE METHOD

Wolfgang Otto Tiedemann, Sigtuna, Sweden, assignor to Sibtec, AB, Stockholm, Sweden
Filed Sept. 14, 1973, Ser. No. 397,304
Int. Cl. B01d *23/24*
U.S. Cl. 210—82 **12 Claims**

1. In a method of filtering solids from a liquid suspension thereof wherein the suspension flows under pressure into an inlet zone, then from said inlet zone through filter elements into an outlet zone causing said solids to be deposited on said filter elements while a filtrate passes into said outlet zone, then permitting said filtrate to flow from said outlet zone, the method of cleaning said filter elements to remove deposited solids which comprises:

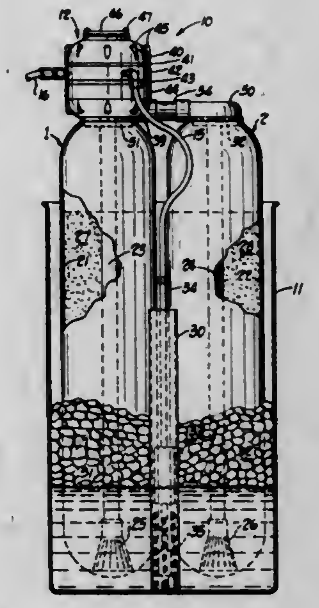
a. providing an air pocket confined in said inlet zone;
b. stopping filtration by simultaneously stopping the flow of suspension to the inlet zone and the flow of filtrate from the outlet zone;
c. briefly admitting compressed air under high pressure into the outlet zone to cause a momentary, intense reversal of flow of liquid through the filter element into the inlet zone, thereby simultaneously dislodging deposited solids from said filter elements, increasing the pressure of liquid in the inlet zone, and compressing the air in the aforementioned air pocket; and



d. immediately thereafter rapidly releasing the pressure in the outlet zone to cause the compressed air in said air pocket to expand to its initial volume and cause a momentary, intense flow of liquid through the filter elements from the inlet zone to the outlet zone, thereby breaking up the deposits removed from the filter elements.

3,891,552
CONTROL VALVE FOR WATER SOFTENERS

William C. Prior, 9482 Fairmount Blvd., Novelty, Ohio 44072, and James W. Kewley, 13681 Auburn Rd., Newbury, Ohio 44065
Filed Apr. 12, 1974, Ser. No. 460,292
Int. Cl. B01d *15/04*
U.S. Cl. 210—88 **21 Claims**



1. A control device for use in a water conditioning apparatus of the type including a pair of ion-exchange water softener tanks connectable with a source of pressurized water and with a water system to supply softened water to the water system, the tanks each being capable of regeneration by flushing with a regeneration solution to replenish depleted ions, comprising:
a. a housing adapted for connection to the softener tanks, to

the source of pressurized water, to the water system, and to a source of regeneration solution;

b. water usage monitoring means carried by said housing for monitoring the flow of softened water supplied to the water system and including an output which moves in response to the supply of softened water to the water system;

c. control means carried by said housing for movement along a predetermined path from a first position to a second position, said control means being responsive to the movement of said monitoring means output through a first movement to effect an initial movement from said first position toward said second position;

d. a control valve carried within said housing and being responsive to said initial movement to provide a controlled flow of softened water to a passage formed with said housing;

e. regeneration drive means carried within said housing and having an output which moves in response to the flow of softened water through said passage, said drive means output being connected to said control means to continue the driven movement of said control means along said path from said first position to said second position; and

f. valve means carried by said housing and being responsive to said continued movement to connect a first one of the softener tanks on-line with the source of pressurized water and the water system, and to take the second softener tank off-line and effect its regeneration by flushing said second softener tank with regeneration solution.

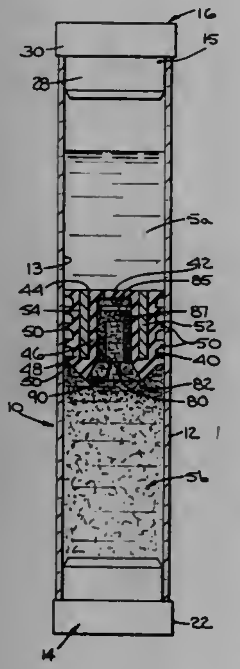
3,891,553
SERUM AND PLASMA SEPARATOR — CONSTRICTIONLESS TYPE

Waldemar A. Ayres, Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Feb. 27, 1974, Ser. No. 446,363

Int. Cl. B01d *21/26*

U.S. Cl. 210—136 **3 Claims**



1. A self-contained fluid separator assembly capable of separating blood into its component light phase of plasma or serum and heavy phase or cellular portion comprising:

a. a container having a first open end which is adapted to receive blood for subsequent separation into a light phase and a heavy phase and a second open end for removing the separated light phase;

b. closures sealing the open ends of the container, the closures being formed of a self sealing elastomeric material which is penetrable by a cannula;

c. a piston having a specific gravity relatively greater than the cellular portion of the blood and slidably mounted in the container and having means on an outer surface for providing sealing engagement with an inner surface of the container;

d. pressure responsive valve means associated with said piston, said valve means being constructed and arranged to be normally closed when there is a minimum of pressure differential on opposite sides of the valve means and which automatically opens in response to a substantial pressure differential so that when said container is subjected to moderate centrifugal force the blood separates into its light phase and heavy phase but the piston stays in the upper portion of the container, and subsequently when increased centrifugal force is used the valve means automatically opens with the light phase passing up through the valve means enabling the piston to move down through the light phase while retaining sealing engagement with the inner surfaces of the container; and

e. filter and stop means associated with said piston which comprises a first filter member which has a porosity selected such that it will pass red blood corpuscles and serum therethrough but will not pass fibrin and fibrous constituents of blood and a second filter member which has a porosity selected such that it will pass serum but will not pass red blood corpuscles therethrough; said first filter being mounted on said piston in a position wherein the light phase of the blood which is filtered passes therethrough before contacting said second filter member.

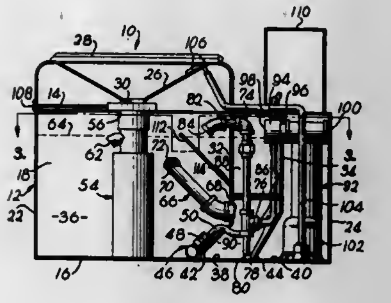
3,891,554
SELF CONTAINER TOILET AND SEWAGE TREATMENT UNIT

Carlos M. Cooper, Lake Forest, Bonner Springs, Kans. 66012, and Francis M. Gladson, Jr., 2432 South 63rd Ter., Kansas City, Kans. 66104

Filed Mar. 12, 1974, Ser. No. 450,303

Int. Cl.^{2} B01D *35/02*

U.S. Cl. 210—152 **18 Claims**



1. A self-contained toilet and sewage treatment unit comprised of:

a container adapted for receiving sewage and having a supply of water therein,

said container having a first sewage-receiving compartment containing a portion of said water with which the sewage mixes;

means operable coupled with a source of pressurized air for introducing and normally continuously circulating a supply of air through the sewage and water mixture in said first compartment whereby the compartment defines an aeration chamber,

said air introduction and circulation means including air discharge structure arranged in said compartment to direct and circulate air through the mixture such that the same is agitated with the sewage therein being in substantially complete suspension in the water at all times;

a second compartment within said container in flow communication with said first compartment and defining a settling chamber for clarifying the sewage and water mixture therein;

filtration means located within said container and in flow communication with said second compartment for receiving and removing from the clarified water substantially all sewage particles remaining therein;

a third compartment within said container in flow communication with said filtration means for receiving the filtrate therefrom and defining a holding chamber for the filtered water; and

recycling means disposed within said container and adapted for returning the filtered water from said third compartment to said first compartment on demand.

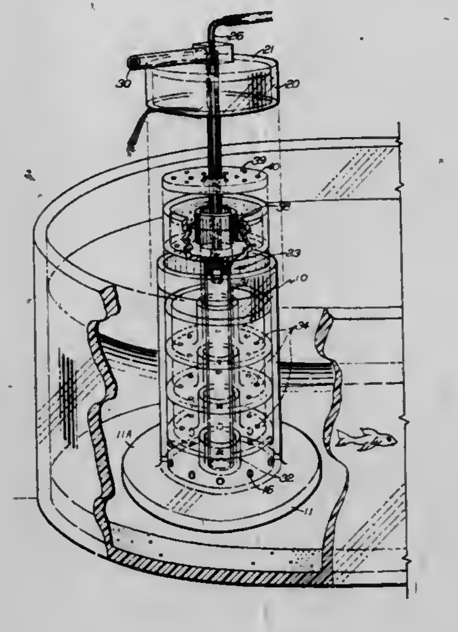
3,891,555
AQUARIUM FILTER WITH REPLACEABLE CARTRIDGE

John P. Bennett, Portola Valley; George D. Bliss, Palo Alto, both of Calif., and Michael New, Marlow, England, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Feb. 4, 1974, Ser. No. 439,094

Int. Cl. E04h *3/20*

U.S. Cl. 210—169 **7 Claims**



1. A filter device adapted to be introduced into the liquid in an aquarium and the like and positioned in said aquarium for the purification and aeration of the aquarium liquid, comprising, in combination:

a. an elongated tubular container member, said container member having an outer wall and an inner wall concentric therewith and defining an annulus, both walls being integral with a bottom wall and extending upward therefrom about the same distance and at least one annular filter cartridge in said annulus, the lower portion of said outer wall of said container member being provided with a plurality of openings to admit aquarium liquid therethrough and the interior of said inner wall defining a sump for receiving filtered liquid;

b. a hollow cap or closure member of the same configuration as said container, and means for attaching or removing said cap to or from said container located at the upper end of said container;

c. said cap or closure member having integrally connected thereto in its central portion a downwardly extending tubular member which is open at its lower end and which extends to near the bottom of said sump, thus providing means for collecting and discharging filtered aquarium liquid, and air inlet conduit means coaxially positioned in the interior of said liquid discharge means and extending to near the bottom of said discharge means.

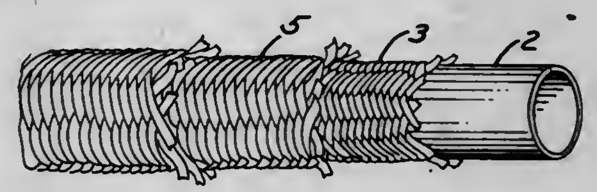
3,891,556
MULTI-LAYER BRAIDED TUBULAR MEMBRANE REINFORCEMENT

John L. Richardson; Alexander O. Brodie, both of Orange, and Clarke H. Lewis, Fountain Valley, all of Calif., assignors to Oxy Metal Industries (Intra) Inc., Lyndhurst, N.J.

Filed Nov. 15, 1971, Ser. No. 198,612

Int. Cl. B01d *31/00*

U.S. Cl. 210—490 **2 Claims**



1. A tubular assembly adapted for use in ultrafiltration or reverse osmosis systems comprising a thin and mechanically fragile semipermeable tubular membrane surrounded only by a reinforcing fibrous braided structure to enable the semipermeable membrane to withstand high internal hydraulic pressures, said reinforcing fibrous braided structure including at least one layer of braided fiber supporting the semipermeable membrane, said fibers of said one layer being arranged at a locking angle with the axis of the tubular membrane when said membrane is under said high internal hydraulic pressure such that the said one layer makes the tubular assembly dimensionally stable in both axial and radial directions under said hydraulic pressure but which permits said assembly to be bent around comparatively small radius while pressurized at a pressure lower than said high internal hydraulic pressure without localized loss of support of the semi-permeable membrane and further including between said one layer of braided fiber and said semipermeable membrane an initial braided fibrous layer having a lower denier than the denier of the fiber of said one layer, said lower denier fiber being braided at an angle greater than the locking angle to obtain a higher density of braided material adjacent the semipermeable membrane to act as a support therefore at times when said internal pressure within the membrane is lower than said high internal pressure.

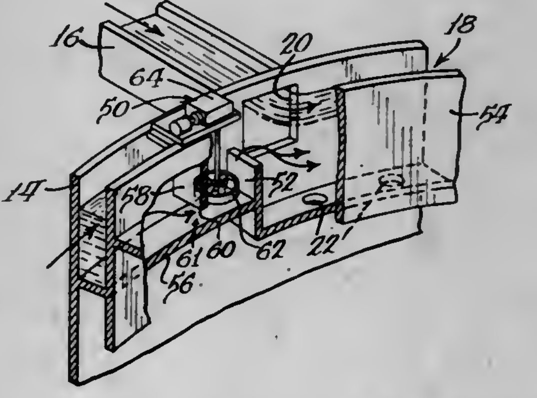
3,891,557
PERIPHERAL FEED CLARIFICATION TANK

Philip Edgerton, Holicong, Pa., assignor to FMC Corporation, Chicago, Ill.

Filed Feb. 11, 1974, Ser. No. 441,456

Int. Cl. B01d *21/00*

U.S. Cl. 210—519 **7 Claims**



1. In a clarification tank having effluent means located therein for receiving clarified liquid, influent means for supplying a mixed liquor including a liquid having suspended solids therein, said influent means including an elongated channel within said tank and inlet means to said channel for supplying mixed liquor to the channel, said channel having side walls and a bottom wall, one of said walls having openings therein in communication with said tank to supply mixed liquor to said tank, and a pump means within said channel

spaced from said inlet means for increasing the velocity of said mixed liquor in said channel to a point which is greater than the velocity of said mixed liquor through said inlet means.

3,891,558

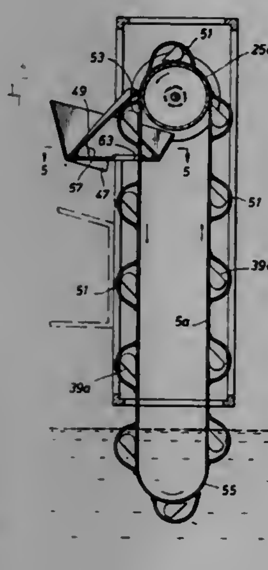
OIL AND DEBRIS REMOVAL UNIT

Paul Condit, Jr., 11327 Sage Park, Houston, Tex. 77034

Filed Dec. 6, 1972, Ser. No. 312,605

Int. Cl. B01d *43/00*

U.S. Cl. 210—526 **8 Claims**



1. In an endless belt conveyor apparatus for removing polluting fluids and debris from a body of water comprising:
   - a rotatable shaft position above a body of water for supporting thereon said endless belt conveyor,
   - an endless belt disposed on said shaft and extending by gravity only and freely downwardly into contact with said body of water,
   - drive means operatively associated with said rotatable shaft for mobilizing said endless belt so as to bring successive areas of the belt into contact with the polluted water and a wiper blade positioned in intimate contact with the exterior surface of the belt so as to remove polluting fluids therefrom,
   - said endless belt being characterized by flight means affixed to the exterior surface thereof for collecting and transporting debris from the water and toward a receptacle area, and
   - track means affixed to said belt adjacent each said flights for lifting said wiper blade thereover as the blade passes by.

3,891,559

DYE LASER TRANSMITTER-RESONANT FLUORESCENT DETECTOR SYSTEM FOR OPTICAL COMMUNICATIONS

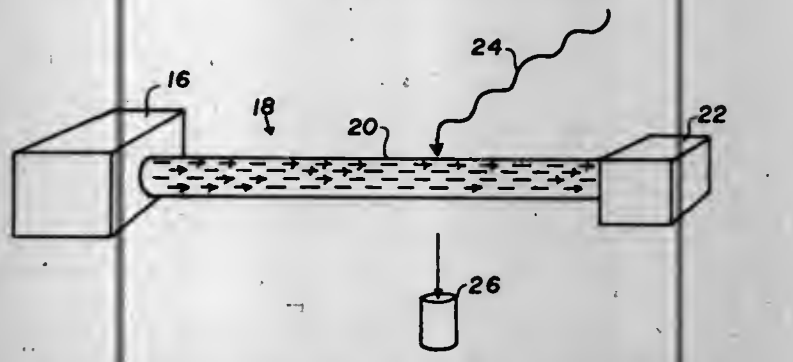
Howard E. Rast, Solana Beach, and Hubert H. Caspers, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 2, 1974, Ser. No. 494,102

Int. Cl.² H04B *9/00*

U.S. Cl. 250—199 **3 Claims**

1. In an optical communication system the combination comprising:
   - a. an optical transmitter for transmitting an electrooptically modulated CW laser beam at a predetermined frequency;
   - b. filter means for intercepting the optically transmitted signal, said filter means including a molecular beam intersecting said incoming signal for absorbing and re-emitting energy at the frequency of said transmitted beam, said filter means being variable from a high pass filter to a low pass filter by changing the angle of incidence between said molecular beam and said intercepted signal;



   - c. detecting means positioned to intercept said re-emitted energy for detecting said incoming signal.

3,891,560

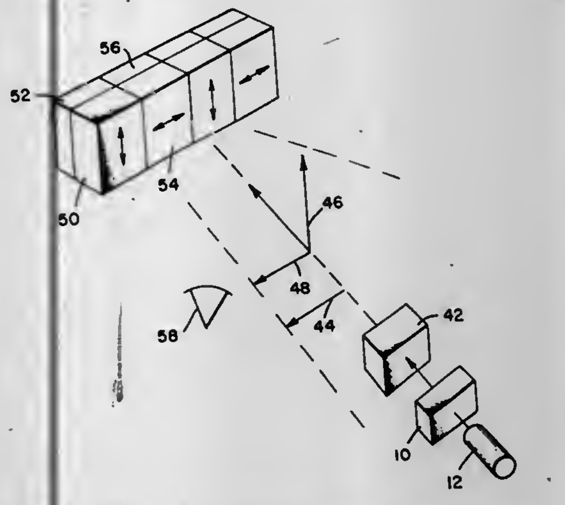
LARGE SCREEN COLOR DISPLAY

Arthur N. Chester, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 28, 1974, Ser. No. 437,421

Int. Cl.² G01N *21/38*

U.S. Cl. 250—461 **9 Claims**



1. A large screen color laser display comprising:
   - a screen;
   - a light source for producing a beam with specific wavelength;
   - a deflection means for deflecting the beam on said screen; said screen comprising:
   - a polarizing layer comprising a plurality of small first areas polarized in a first direction and a plurality of small second areas polarized in a second direction;
   - said layer consisting of a solid substrate material to which an optical coating is applied;
   - a scattering coating beneath said first polarizing areas for scattering selected colors; and
   - a phosphor beneath said second polarizing areas for producing a color of other than said wavelength of said light source.

3,891,561

CORONA GENERATOR APPARATUS

Frank E. Lowther, Phelps, N.Y., assignor to Purification Sciences Inc., Geneva, N.Y.

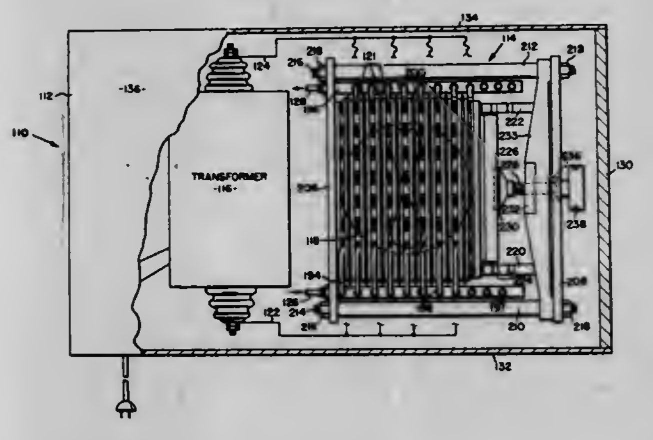
Division of Ser. No. 141,148, May 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 709,485, Feb. 29, 1968, abandoned, which is a continuation-in-part of Ser. No. 612,751, Jan. 4, 1967, abandoned, said Ser. No. 830,248. This application Sept. 7, 1973, Ser. No. 395,180. The portion of the term of this patent subsequent to Mar. 19, 1991, has been disclaimed

Int. Cl. C01b *13/12*

U.S. Cl. 250—541 **8 Claims**

1. An ozone generator comprising:
   - a. a corona generating core including a plurality of separate, individual corona generating cells;
   - b. each of said corona generating cells comprising:

     1. a pair of adjacent, spaced-apart, electrodes;
     2. a continuous, air-tight dielectric spacer gasket of corona and ozone resistant material, positioned between and in contact with the internal facing surface of each electrode of said pair of electrodes of each cell around the entire periphery of each of said electrodes, for defining a corona generating chamber between said internal facing surfaces of said electrodes and interiorly of said gasket;
     3. means for feeding an oxygen-containing gas into and ozone out of said chamber;
     4. means for sealing said chamber air-tight and for maintaining said chamber air-tight;



     5. a fired-on coating of porcelain enamel dielectric material covering the entire internal surface in said chamber of each of said electrodes said coating being fired on at a temperature greater than 1,000° F;
   - c. spacer means positioned between adjacent cells in said core for spacing said cells a predetermined distance apart, said spacer means having cooling passageways therethrough, and each of said electrodes having substantially all of its external surface in heat-exchange relationship to at least one of said cooling passageways; and
   - d. the total thickness of both coatings of dielectric material together being less than 20 mils.

3,891,562

ARRANGEMENT IN A REACTOR FOR PLASMA-CHEMICAL PROCESSES

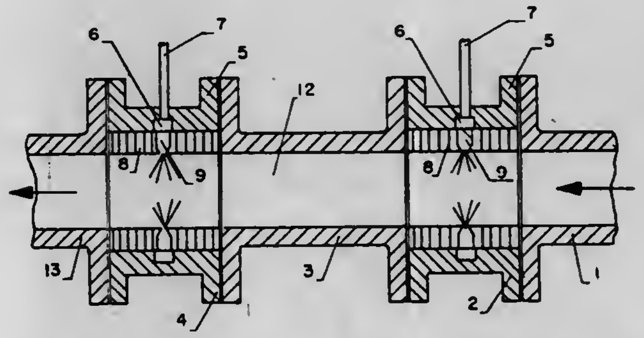
Palne Mogensen, Jarfala, and Mats J. Kaij, Solna, both of Sweden, assignors to AGA Aktiebolag, Sweden

Filed Oct. 9, 1973, Ser. No. 404,657

Claims priority, application Sweden, Oct. 13, 1972, 13196/72

Int. Cl. C22d *7/08;* **C07c** *3/24*

U.S. Cl. 250—547 **4 Claims**



1. In a reactor for a plasma-chemical process, said reactor including an arc-chamber containing electrodes for the transmission of an arc therethrough; and means for supplying a plasma gas stream through said arc, the improvement which comprises a plurality of reactors provided downstream from said arc chamber for the receipt of said plasma gas stream, and a plurality of means for imparting alternating clockwise and counterclockwise tangential velocity components to said plasma gas stream passing therethrough.

2. The reactor of claim 1 including a plurality of cooling chambers provided downstream from said arc chamber, and alternating with said plurality of reactors, and wherein said means for imparting alternating clockwise-and counter-clockwise tangential velocity components to said plasma gas stream are associated with said alternating reactors and cooling chambers, respectively.

3,891,563

SOFTERGENT COMPOSITION CONTAINING N-ALKYL-,3-PROPYLENE DIAMINE

Adolph Renold, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Sept. 11, 1972, Ser. No. 287,834

Int. Cl. D06m *13/34*

U.S. Cl. 252—8.8 **11 Claims**

1. A softergent composition comprising the reaction product of an N-higher alkyl-1,3-propylene diamine and maleic anhydride, said N-higher alkyl group having from 12 to 22 carbon atoms, and a detergent, said detergent selected from the group consisting of nonionic non-soap, anionic, cationic, and amphoteric detergents, and soap and mixtures thereof.

3,891,564

PROCESS FOR PREPARING MIXED LITHIUM-CALCIUM SOAP THICKENED GREASES

Don A. Carley, Nederland, and Fred T. Crookshank, Port Arthur, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Feb. 14, 1972, Ser. No. 226,304

Int. Cl. C10m *5/16, 5/14, 5/12*

U.S. Cl. 252—40 **5 Claims**

1. A nonmelt process for preparing mineral oil-based greases combining good lubrication properties, good resistance to water and a smooth nongrainy appearance, said greases being thickened by a mixture of calcium soaps and lithium soaps, formed in situ through the saponification of a saponifiable fatty material with a mixture of calcium hydroxide and lithium hydroxide with the provisos
   - a. that during the in situ saponification step between the fatty materials and the calcium and lithium hydroxide materials said saponification always takes place in the presence of excess mineral oil of lubricating viscosity, the excess of oil to fat not to exceed a ratio of 2:1 to 4:1 and
   - b. that during said saponification step and throughout the entire preparative process the saponification temperature shall not exceed the melting point of the calcium and lithium soaps formed during the saponification process, said non-melt process consisting essentially of:
     1. admixing from about 4.5 parts by weight to 20 parts by weight of the saponifiable fatty material with from about 0.1 to 1.6 parts by weight of calcium hydroxide and from about 0.1 to 1.3 parts by weight of basic lithium hydroxide materials in the presence of sufficient mineral oil to maintain the ratio of said mineral oil to said fatty materials ranging from 2:1 to 4:1, and to form a saponification mixture;
     2. heating said saponification mixture up to but not exceeding the melting point of the calcium and lithium soap until the calcium and lithium soap are formed;
     3. adding from 5.0 to 0.1 parts by weight of a copolymer of polyoxyethylene and poly-1,2-oxypropylene having a molecular weight of from about 2300 to 2500 to said heated saponification mixture, and
     4. adding to the heated mixture of mineral oil, calcium and lithium soaps from 7.0 to 0.5 parts by weight of grease adjuvants while maintaining the temperature of the saponification mixture below the melting point of said lithium and calcium soap while optionally adding sufficient mineral oil to said saponification mixture

until a grease of the desired consistency having good lubrication properties, good resistance to water and good appearance is produced.

3,891,565
GRAVEL PACKING FLUID

Patrick J. Colpoys, Houston, Tex., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 17, 1973, Ser. No. 324,374

Int. Cl. E21b *33/12*

U.S. Cl. 252—8.55 R **5 Claims**

1. A gravel packing fluid consisting essentially of a base liquid, (a solid particle weighting agent) iron oxide suspended in said base liquid and chrysotile asbestos fibers incorporated therein such that enough (weighting agent) iron oxide can be suspended in said base liquid to provide a packing fluid having a density greater than 11.8 ppg, said chrysotile asbestos fibers incorporated in said iron oxide having a solubility of at least about 90 weight percent in hydrochloric acid.

3,891,566
FLUID LOSS ADDITIVE

Curtis W. Crowe, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 249,085, is a continuation-in-part of Ser. No. 177,680, Sept. 3, 1971, abandoned. This application Sept. 20, 1973, Ser. No. 399,214

Int. Cl. E21b *43/25*

U.S. Cl. 252—8.55 R **1 Claim**

1. A low fluid loss additive dispersible in aqueous fluids employed for treating subterranean formations comprising:
   a. a liquid mono or polyhydric alcohol and a heterogeneous mixture of discrete particles consisting essentially of;
   b. a particulate oil soluble pliable resin ranging in size from about 0.05 to about 30 microns dispersed in said alcohol; and
   c. a particulate oil soluble friable resin ranging in size from about 0.5 to about 300 microns dispersed in said alcohol, said friable and pliable particles being present in a weight ratio to each other ranging from about 1:20 to 20:1 and said composition being essentially free of an oil in which said particles are soluble.

3,891,567
CARBOXY VINYL POLYMER AND PARTIALLY HYDROLYZED POLYACRYLAMIDE MOBILITY CONTROL AGENT AND PROCESS

Charles J. Norton, and David O. Falk, both of Denver, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Division of Ser. No. 238,143, March 27, 1972, Pat. No. 3,825,069. This application Oct. 23, 1973, Ser. No. 408,711

Int. Cl. E21b *43/22, 43/16*

U.S. Cl. 252—8.55 D **10 Claims**

1. Compositions comprising aqueous solutions of about 0.001% to about 10% of partially hydrolyzed polyacrylamide and about 0.001% to about 10% of carboxy vinyl polymers, the percents based on total weight of the solution.

3,891,568
METHOD AND COMPOSITION FOR CONTROL OF CORROSION AND SCALE FORMATION IN WATER SYSTEMS

Kazuo Nishio, Chicago, and Paul G. Bird, Wheaton, both of Ill., assignors to Wright Chemical Corporation, Chicago, Ill.

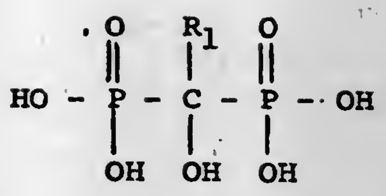
Filed Aug. 25, 1972, Ser. No. 283,937

Int. Cl.² C02B *5/00;* **C23F** *11/08*

U.S. Cl. 252—181 **14 Claims**

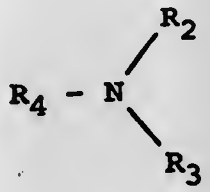
1. A method for controlling corrosion and scale deposition in an aqueous system, comprising adding to said system:

A first constituent selected from the class consisting of (a) compounds having the general formula

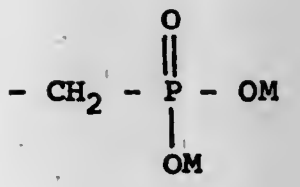


$$HO-\underset{\underset{OH}{|}}{\overset{\overset{O}{\|}}{P}}-\underset{\underset{OH}{|}}{\overset{\overset{R_1}{|}}{C}}-\underset{\underset{OH}{|}}{\overset{\overset{O}{\|}}{P}}-OH$$

wherein R_1 is alkyl having from 1 to 5 carbon atoms, and alkali metal and ammonium salts of said compounds, and (b) compounds having the general formula

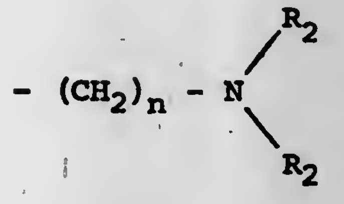


wherein R_2 is



$$-CH_2-\underset{\underset{OM}{|}}{\overset{\overset{O}{\|}}{P}}-OM$$

R_3 is selected from the class consisting of R_2 and $—CH_2CH_2OH$, and R_4 is selected from the group consisting of R_2, $—CH_2CH_2OH$, and



wherein each M is independently selected from the group consisting of H, NH_4 and alkali metal, and *n* is an integer from 1 to 3 inclusive;

a second constituent selected from the group consisting of alkali metal molybdate and ammonium molybdate salts; and

a third constituent selected from the group consisting of benzotriazole and the alkali metal and ammonium salts of mercaptobenzothiazole, said first, second and third constituents being added in relative amounts sufficient to provide said aqueous system with a concentration of said first constituent of at least 0.8 ppm, a concentration of said second constituent of at least 7 ppm, and a concentration of said third constituent of at least 1 ppm if said third constituent is benzotriazole and of at least 2 ppm if said third constituent is a mercaptobenzothiazole salt.

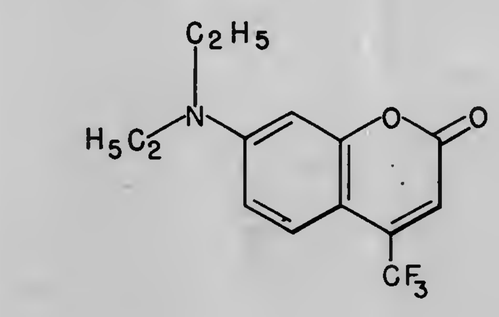
3,891,569
LASING DYES

Erhard J. Schimitschek, San Diego; John A. Trias, LaMesa, and John E. Celto, San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 11, 1974, Ser. No. 441,720

Int. Cl.² C09K *11/00;* **H01S** *3/00*

U.S. Cl. 252—301.2 R **5 Claims**



1. A liquid dye laser composition comprising a 7-amino coumarin compound having a trifluoromethyl group in the 4-position and dissolved in a low polar, non-quenching liquid solvent.

3,891,570
PROCESS FOR PREPARING MICROCAPSULES

Mitsuru Fukushima; Yoshihito Inaba; Sadami Kobari, and Masataka Morishita, all of Shizuoka, Japan, assignors to Toyo Jozo Co., Ltd. and Fuji Photo Film Co., Ltd., Japan

Filed Jan. 26, 1973, Ser. No. 326,844

Claims priority, application Japan, Jan. 26, 1972, 47-10068

Int. Cl. B01j *13/02;* **B44d** *1/02*

U.S. Cl. 252—316 **17 Claims**

1. A process for preparing microcapsules, which comprises preparing a dispersion or a solution of a core substance in a solution of a wall material dissolved in a solvent having a dielectric constant of about 10 or less, emulsifying the thus prepared dispersion or solution in the form of fine droplets within a liquid vehicle consisting essentially of a polyhydric alcohol which is poorly miscible with said solvent and evaporating the solvent from solution through said vehicle.

3,891,571
FOAM PRODUCING COMPOSITION CONTAINING WHEY SOLIDS

Madeline G. Lambou; James J. Spadaro, both of New Orleans, and Eunice M. Rusch, Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 26, 1973, Ser. No. 410,052

Int. Cl. B01f *17/30*

U.S. Cl. 252—354 **7 Claims**

1. A foam precursor composition that can be generated to a foam capable of retaining its configuration at or below 36°F for a period of time up to about 8 days, said foam precursor composition consisting of a homogenous suspension of water containing about from 1 to 2 percent of whey solids, the protein content of which is about from 7.5 to 51 percent; about from 0.5 to 1 percent of animal hide glue, a collagenous component; about from 0.3 to 2 percent of a surfactant selected from the group consisting of:

an anionic ammonium lauryl trioxyethylene
sulfate, and
an ammonium substituted C_{12} to C_{18} alkyl sulfate; and about from 0.1 to 0.3 percent of a viscosity builder selected from the group of water dispersible polymers consisting of:
hydroxyethyl cellulose,
hydroxypropyl cellulose,
xanthan gum, both food grade and industrial
grade, and
mixtures of industrial grade xanthan gum and
locust bean gum.

3,891,572
PRODUCTION OF STABLE DISPERSION OF SOLID PARTICLES ENCAPSULATED IN SYNTHETIC POLYMER

Anthony Gifford Moody, Alvanley, and Desmond Wilfrid John Osmond, Windsor, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 555,989, June 8, 1966, abandoned. This application Oct. 30, 1969, Ser. No. 871,767

Claims priority, application United Kingdom, June 10, 1965, 24607/65

Int. Cl.² B01J *13/02;* **B05D** *1/02, 3/10*

U.S. Cl. 252—316 **5 Claims**

1. A process of producing a stable dispersion of solid particles encapsulated in synthetic polymer comprising

forming a dispersion of said particles in a solution of an undercoating polymer and a stabilizing material and modifying said solution so that said undercoating polymer becomes insoluble therein, thereby forming particles undercoated with the undercoating polymer,

carrying out dispersion polymerization of monomer in an organic liquid containing 0 to 25 percent by weight water in which the monomer is soluble to the extent of at least about twice the highest free monomer content arising during the polymerization, and in which the resulting polymer is insoluble, the organic liquid also containing (i) a dispersion stabilizer comprising (a) an anchoring component which is a polymer or copolymer of at least one ethylenically unsaturated monomer and which is insoluble in the liquid and is associated with said encapsulating polymer by London or vander Waals interaction and (b) a pendant chain-like component of at least twelve covalently linked atoms in length which is solvated by the organic liquid and provides a stabilizing sheath around the encapsulated particles and (ii) said undercoated particles,

said stabilizing material comprising an anchoring component which is associated with said undercoating polymer and a chain-like component which is solvated by said organic liquid and provides a stabilizing sheath around the undercoated particles,

said dispersion polymerization forming an encapsulating layer of said resulting polymer on said undercoated particles and said dispersion stabilizer stabilizing said encapsulated particles in said organic liquid.

3,891,573
AQUEOUS CHOLESTEROL STANDARD SOLUTION

Emil Stary, Hamburg; Peter Röeschlau, Tutzing, Obb, and Erich Bernt, Munich, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

Filed Apr. 30, 1974, Ser. No. 465,640

Claims priority, application Germany, May 14, 1973, 2324386

Int. Cl. G01n *33/16*

U.S. Cl. 252—408 **22 Claims**

1. Cholesterol standard solution comprising in aqueous solution
   a. a defined amount of cholesterol;
   b. 1 to 20 volume percent, based on the standard solution, of a primary or secondary aliphatic alcohol of up to 4 carbon atoms;
   c. 5 to 20 volume percent of hydroxy-polyethoxydodecane or 40 to 60 volume percent of diethyleneglycol monobutyl ether; and
   d. at least one of

i. 0.5 to 5 weight percent of sodium chloride; and

ii. 0.01 to 0.5 weight percent of alkyl dimethyl benzyl ammonium chloride of from 8 to 18 carbon atoms in the alkyl moiety.

3,891,574

HOLLOW SPHERES OF ACTIVATED CARBON AND METHOD FOR MANUFACTURE THEREOF

Kazuo Kobayashi; Shinjiro Watari; Tsütomu Kato; Minoru Shiraishi, and Yoshio Kawana, all of Kawaguchi, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Aug. 31, 1972, Ser. No. 285,509

Claims priority, application Japan, Nov. 15, 1971, 46-91287

Int. Cl. C01b *31/08*

U.S. Cl. 252—421 **1 Claim**

1. A method for the manufacture of a hollow sphere of activated carbon, which method consists essentially of:

A. blending finely pulverized coal with a hydrophilic binder selected from the group consisting of pitch emulsion, spent sulfite pulp liquor and carboxymethylcellulose;

B. coating a layer of the blend from Step (A) on a 2 to 5 mm diameter spherical core of styrene resin having a lower melting point than said coal, the coated sphere having a 7 to 12 mm diameter;

C. drying the coated sphere of Step (B);

D. subjecting the coated sphere of Step (C) to heat treatment in a nitrogen atmosphere at a temperature higher than the decomposition temperature of the core, the heat treatment being at a rate such that inner pressure of the coated sphere is below the pressure that will crack or disintegrate the layer of finely divided coal, thereby causing the core to be decomposed and evacuated within the shell of carbon and, at the same time, allowing gas emanating from the decomposed core to form fine pores extending from the inner to the outer surface of the shell;

E. sintering the resulting hollow sphere of coal from Step (D) at temperatures between the first-order decomposition temperature of the raw material coal and 550°C.;

F. dehydrogenating the sintered hollow sphere of carbon from Step (E) in an atmosphere of inert nitrogen gas at a temperature of from 600° to 1,100°C.; and

G. activating both the inner and outer surfaces of the hollow sphere of carbon from Step (F) in a current of reactive gas consisting essentially of steam at temperatures exceeding 750°C.

3,891,575

CATALYST FOR PURIFYING EXHAUST GASES

Hans Bräutigam, Grossburgwedel; Günter Weidenbach, Anderten, and Karl Hermann Koepernik, Hannover, all of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Filed Jan. 25, 1974, Ser. No. 436,726

Claims priority, application Germany, Jan. 27, 1973, 2304001; Jan. 30, 1973, 2304351; Oct. 12, 1973, 2351237

Int. Cl.^{2} B01J *29/06*

U.S. Cl. 252—455 R **28 Claims**

1. In a process for the preparation of a highly heat resistant, thermal shock resistant and break resistant catalyst suitable for the purification of exhaust gases, comprising the steps of coating a non-rusting, scale-free highly heat resistant metal skeleton with a layer of a catalytically active carrier material, calcining the coated skeleton at a temperature of from about 600° to 1200°C. and distributing one or more catalytically active metals or metal oxides upon the layer of catalyst carrier, the improvement which comprises coating said skeleton with an elastic primer layer comprising aluminum silicate prior to applying said layer of catalytically active carrier material.

18. In a highly temperature resistant, thermal shock resistant and break resitant catalyst suitable for the purification of exhaust gases, comprising a non-rusting, scale-free, highly heat resistant metallic skeleton having thereon an outer layer comprising a catalytically active carrier material and one or more catalytically active metals or metal oxides distributed on said carrier layer, the improvement comprising an elastic priming layer comprising aluminum silicate between said skeleton and said outer layer.

3,891,576

PROCESS

Hendrik Adrian Jacobus Battaerd, North Clayton; Brian Alfred Bolto, Mitcham, and Pir Ghulam Samadani Shah, East Kew, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia and Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed May 14, 1973, Ser. No. 360,188

Claims priority, application Australia, May 31, 1972, 9168/72

Int. Cl. C08f *15/00*

U.S. Cl. 260—2.1 R **10 Claims**

1. A process of manufacturing a polymeric composition which process comprises reacting in the presence of a free radical initiator a heterogeneous mixture comprising an aqueous solution of an allylamine salt containing more than one allyl substituent of a strong acid and a compound selected from the group consisting of ethylenically unsaturated acids and organic derivatives of ethylenically unsaturated acids said mixture being characterised in that a major proportion of the said compound is present in a separate phase finely dispersed in the aqueous solution.

3,891,577

PROCESS OF PREPARING VESICULATED POLYMERS

Robert William Kershaw, South Blackburn; Frederick John Lubbock, Beaumaris, and Livia Polgar, Caulfield, all of Australia, assignors to Balm Paints Limited, Melbourne, Australia

Filed Dec. 1, 1970, Ser. No. 94,171

Claims priority, application Australia, Dec. 1, 1969, 64565/69

Int. Cl. C08f *47/08*

U.S. Cl. 260—2.5 R **7 Claims**

1. A process of preparing vesiculated polymer which comprises converting to solid non-porous polymer the liquid medium of a dispersion in which particles of another polymer are dispersed, the dispersed particles being swollen by a liquid swellant, whereby there is formed solid polymer containing said swollen polymer particles,

and thereafter removing at least part of said swellant from said swollen polymer particles to form a plurality of isolated vesicles within a matrix of solid non-porous polymer.

3,891,578

CARBODIIMIDE-ISOCYANURATE FOAMS CONTAINING URETHANE LINKAGES

Peter T. Kan, Plymouth, and Moses Cenker, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

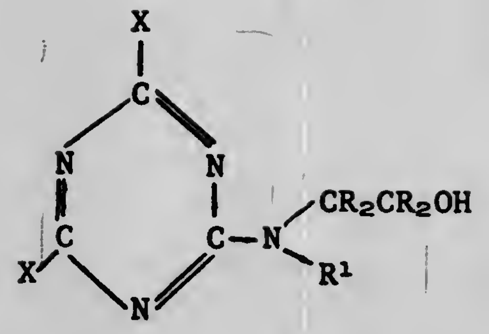
Filed Dec. 17, 1973, Ser. No. 425,270

Int. Cl. C08g *22/36, 22/34, 33/04*

U.S. Cl. 260—2.5 AC **10 Claims**

1. A process for the preparation of a cellular foam characterized by carbodiimide-isocyanurate-urethane linkages which comprises reacting an organic polyisocyanate and a polyol in the presence of a catalytically sufficient amount of a catalyst system comprising

a. an s-triazine compound selected from the group consisting of 2,4,6-tris(diethanolamino)-s-triazine, 2,4,6-tris(-diisopropanolamino)-s-triazine, 2,4,6-tris(-dibutanolamino)-s-triazine, 2,4,6-tris(N-methylethanolamino)-s-triazine, and unsymmetrically substituted triazines of the formula:



wherein R is hydrogen or lower alkyl of from 1 to 10 carbon atoms, R^1 is CR_2CR_2OH or lower alkyl of from 1 to 12 carbon atoms, X is NR_2, alkoxy of from 1 to 12 carbon atoms, phenoxy atoms, alkyl of from 1 to 12 carbon atoms, phenyl, hydroxyl, halogen, aziridyl, pyrrolidyl, piperidyl, or N-alkylpiperazyl, and

b. a compound which promotes urethane linkages.

3,891,579

PROCESS FOR THE PREPARATION OF ISOCYANURATE FOAMS EMPLOYING HALOGENATED ALIPHATIC ALKANOL ACCELERATORS

Moses Cenker, Trenton, and Thirumurti L. Narayan, Riverview, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Feb. 25, 1974, Ser. No. 445,110

Int. Cl. C08g *22/44, 33/02*

U.S. Cl. 260—2.5 AW **8 Claims**

1. A process for the preparation of a cellular foam characterized by isocyanurate linkages which comprises condensing an organic polyisocyanate in the presence of:

a. a blowing agent,

b. a catalytically sufficient amount of a tertiary amine trimerization catalyst, and

c. from 0.1 part to 10 parts by weight based on the weight of the organic polyisocyanate of a monohydric halogenated alkanol having from 1 to 6 carbon atoms.

3,891,580

REACTION OF FINE MEDIA MILLER STRACH OR PROTEIN WITH A POLYMER OR POLYMERIZABLE MONOMER

Horton Harold Morris, Macon; Richard Jacob Drexel, Jr., Irwinton, and Kenneth Lamar Turner, Gordon, all of Ga., assignors to Freeport Minerals Company, New York, N.Y. Division of Ser. No. 14,244, Feb. 25, 1970, Pat. No. 3,804,653, which is a continuation-in-part of Ser. No. 817,258, April 10, 1969, abandoned, which is a continuation of Ser. No. 599,372, Dec. 6, 1966, abandoned. This application Oct. 26, 1973, Ser. No. 410,161

Int. Cl. C08h *7/00*

U.S. Cl. 260—8 **16 Claims**

1. A process for preparing a polymeric material which comprises subjecting an aqueous mixture comprising (1) a starch having hydroxyl, aldehyde or ketonic groups, or a protein having amino or amido groups, and (2) grinding media, to an agitation thereby milling the starch or protein, said grinding media comprising about 30 to 70 volume percent of the total mixture and being smaller than one-half inch in overall diameter and larger than 400 mesh, and reacting the milled starch or protein with a polymer or polymerizable monomer which is reactive with the hydroxyl, aldehyde or ketonic groups of the starch or the amido or amido groups of the protein.

3,891,581

WATER DILUTABLE TRANSFER INK COMPOSITIONS

Domenic Argenio, 5 Briarwood Ct., West Paterson, N.J. 07424

Filed Mar. 21, 1973, Ser. No. 343,361

Int. Cl.^{2} B41M *3/12;* **C08L** *1/26;* **D06P** *1/44;* **C08L** *93/04*

U.S. Cl. 260—16 **6 Claims**

1. A water-dilutable, heat transfer ink composition comprising:

A. 5–60% by weight of water as a solvent component;

B. 1–35% by weight of at least one disperse dye capable of sublimation at temperatures in the range of about 375°F to 425°F;

C. 5–40% by weight of a thermoplastic resin produced by reacting a polyol partially esterified rosin with a diabasic acid selected from the group consisting of maleic anhydride, fumaric acid, or a combination of maleic anhydride and fumaric acid, said resin having an acid number between about 75 and 300 and a melting pont between about 90°C and 190°C;

D. 1–10% by weight of a water or alkali-soluble polymer selected from the group consisting of methyl cellulose, sodium carboxymethyl cellulose, carboxymethyl cellulose, carboxymethylhydroxyethyl cellulose and hydroxypropyl cellulose; and

E. An amount of an alkaline component compatible with said remaining components to maintain the pH of said ink composition in the range of about 8 to 9.

3,891,582

JOINT CEMENT COMPOSITIONS UTILIZING WATER-INSOLUBLE CARBOXYMETHYLATED CELLULOSE DERIVATIVES AS ASBESTOS SUBSTITUTES

Armand J. Desmarais, New Castle, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 26, 1973, Ser. No. 354,834

Int. Cl.^{2} C08F *45/18;* **C04B** *31/36, 11/08*

U.S. Cl. 260—17 R **1 Claim**

1. A joint cement composition consisting essentially, by weight, of 20 to 44 parts of a binder selected from the class consisting of poly(vinyl acetate), polyacrylamide, and copolymers of acrylamide and acrylic acid, 30 to 90 parts of mica, 0 to 100 parts of clay, and 190 to 350 parts of limestone as its principal dry ingredients, and containing about 0.5 to 1.5% by weight, based on the total weight of the dry components, of a fibrous, substantially water-insoluble carboxymethylated cellulose derivative having a fiber length of about 0.03 to 0.007 inch and selected from the class consisting of cross-linked carboxymethylcellulose, carboxymethylcellulose having a D.S. of about 0.2 to 0.5 and a carboxymethyl hydroxyethyl cellulose having carboxymethyl D.S. of about 0.1 to 0.4 and a maximum combined carboxymethyl D.S. and hydroxyethyl M.S. of about 0.7.

3,891,583

QUICK SETTING ADHESIVE FOR APPLICATION UNDERWATER

Richard W. Drisko, Oxnard, and Joseph B. Crilly, Camarillo, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 25, 1974, Ser. No. 445,171

Int. Cl. C08q *51/72*

U.S. Cl. 260—18 EP **9 Claims**

1. A rapid-curing, epoxy adhesive for application on underwater structures and use underwater, comprising:

a. approximately 100 parts by weight of a viscous liquid epoxy polymer;

b. approximately 100 parts by weight of a high functionality liquid polymercaptan resin;

c. 6 to 10 parts by weight of 2,4,6-tri (dimethylaminomethyl)phenol;

- d. 18 to 20 parts by weight of blown fish oil;
- e. 0.01 to 0.05 parts by weight of carbon black;
- f. 0 to 2 parts by weight of beta-(3,4-epoxycyclohexyl-ethyltrimethoxysilane; and
- g. a thixotropic agent;
- h. said viscous liquid epoxy polymer consisting of a polyfunctional polymer derived by the condensation polymerization of bisphenol A and epichlorohydrin, having an epoxide equivalent of approximately 190, a viscosity of about 125 poises at 25°C, and specific gravity of about 1.18 at 25°C;
- i. said components being mixed together to a uniform blend immediately prior to use, and not being activated by water;
- j. said adhesive compound displacing water and adhering well to cleaned surfaces or underwater structures when applied thereto and spread thereon underwater; and
- k. said adhesive curing at from approximately 0°F to 80°F in from about 5 to 30 minutes to form a strong bond, and forming a very strong bond within 2 hours.

3,891,584
WATER-DISPERSIBLE HOT MELT ADHESIVES AND PRODUCTS USING SAME

Dilip K. Ray-Chaudhuri, Somerville; Jules E. Schoenberg, Scotch Plains, and Thomas P. Flanagan, Green Brook, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.
Filed Feb. 22, 1974, Ser. No. 444,780
Int. Cl. C08d *9/12;* **C09j** *3/26*
U.S. Cl. 260—27 R **17 Claims**

1. A water-dispersible hot melt adhesive composition comprising

- A. 75–95 parts by weight of graft copolymer of
  - i. about 40–80% by weight of vinyl monomer; and
  - ii. about 20–60% by weight of water-soluble polyalkylene oxide polymer having a molecular weight of about 3,000–20,000 and a polymerized ethylene oxide content of at least 50% by weight; and
- B. 5–25 parts by weight of tackifying resin.

3,891,585
ELASTOMERIC PAVEMENT REPAIR COMPOSITION FOR PAVEMENT FAILURE AND A METHOD OF MAKING THE SAME

Charles H. McDonald, 3130 W. Pierce St., Phoenix, Ariz. 85009
Continuation-in-part of Ser. No. 589,190, Oct. 21, 1966. This application July 5, 1973, Ser. No. 376,919
Int. Cl. C08c *11/68, 17/22;* **C08d** *9/00*
U.S. Cl. 260—28.5 AS **20 Claims**

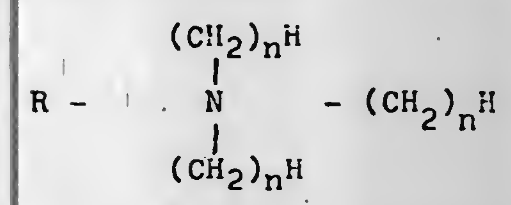
1. An elastomeric pavement repair material which consists essentially of paving grade asphalt with a penetration range of 10 through 300 and particulate non-oil resistant asphalt soluble rubber which have been mixed in a ratio of about two to about three parts asphalt to about one part rubber and which have been heated together at a temperature within the range of about 350° and about 500°F to form a jellied composition.

3,891,586
PRODUCT AND METHOD FOR REDUCING WATER IONS THROUGH SOIL BY SEEPAGE

Frank L. Califano, Hackensack; George Stepien, Jr., Montclair, and Thomas E. Russell, Whippany, all of N.J., assignors to The Flintkote Company, White Plains, N.Y.
Division of Ser. No. 296,114, Oct. 10, 1972, Pat. No. 3,831,382. This application Apr. 4, 1974, Ser. No. 457,969
Int. Cl. C08c *11/70*
U.S. Cl. 260—28.5 AS **6 Claims**

1. A composition for reducing the loss of water through the permeable ground surface of a water containment body such as a reservoir, pond, canal and the like, comprising:

- a. a 25 to 50% by weight aqueous, cationic emulsion of a petroleum asphalt having a softening point of 90°F. to 200°F. and a penetration at 77°F. of from 4 dmm to 205 dmm, 90 percent of the particles of which are less than about 10 microns in size;
- b. a mixture of at least two cationic emulsifiers in from 0.3 to 1.2 percent by weight of said emulsion, said emulsifiers including
  1. a basic emulsifier selected from the group consisting of N-alkyl polyethylene diamines of the formula R—NH(CH$_2$)$_w$NH$_2$ where *w* is an integer of from 2 to 4 and R represents an aliphatic hydrocarbon containing from 8 to 22 carbon atoms; and
  2. an emulsification aid-break suppressant selected from the group consisting of alkyl quaternary ammonium compounds of the formula



$$R-\overset{\displaystyle (CH_2)_nH}{\underset{\displaystyle (CH_2)_nH}{N}}-(CH_2)_nH$$

  where *n* is from 1 to 2 and R represents an aliphatic hydrocarbon containing from 8 to 22 carbon atoms, said basic emulsifier and said emulsification aid-break suppressant being present in a weight ratio to one another of from 1:2 to 2:1;
- c. a non-ionic surface active agent in from 0.1 to 1.5 percent by weight of said emulsion, selected from the group consisting of alkyl aryl polyether alcohols, polyethoxylated nonylphenols (average ethylene oxide content of 4–12 mols per mol of nonylphenol), benzyl ethers of octyl phenol and linear organic alcohols;
- d. from 1 to 10 percent by weight of said emulsion of an elastomeric material; and
- e. an acid in sufficient quantity to set the pH of said composition at from 5 to 7.

3,891,587
SYNERGISTIC ANTIBLOCK SYSTEMS FOR AN ETHYLENE/VINYL ACETATE COPOLYMER

William A. Watts, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Apr. 29, 1974, Ser. No. 465,391
Int. Cl. C08c *11/70*
U.S. Cl. 260—28.5 AV **4 Claims**

1. A thermoplastic composition which comprises 100 parts by weight of an ethylene/vinyl acetate copolymer, characterized by having a melt index in the range of about 1.2 to about 20 grams/ten minutes according to ASTM No. D 1238, resulting from the reaction of about 72 to about 80 parts by weight ethylene and, correspondingly, about 28 to about 20 parts by weight vinyl acetate wherein said thermoplastic composition contains about 0.15 to about 3 total parts of a combination containing about 0.02 to about 1 part by weight of each individual modifier, said combination selected from (1) stearamide and behenamide, (2) stearamide, behenamide and stearic acid, (3) stearamide, stearic acid and paraffin wax, (4) behenamide, stearic acid and paraffin wax and (5) stearamide, behenamide, stearic acid and paraffin wax, where said paraffin wax is characterized by having a softening point of about 45°C to about 55°C.

3,891,588
NONSETTLING RUBBER CHEMICAL COMPOSITION AND METHOD OF PREPARING SAID COMPOSITION

Harry W. Tausch, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Apr. 21, 1969, Ser. No. 818,080
Int. Cl. C08d *7/04;* **C08f** *45/00;* **C08g** *51/00*
U.S. Cl. 260—29.7 R **14 Claims**

1. A process of preparing a compounded polymer latex containing a rubber chemical comprising (A) preparing a resin/rubber chemical composition by grinding in an aqueous medium, containing a dispersing agent and consisting essentially of water, a mixture of tackifying friable hydrocarbon resin and a friable rubber chemical the friable hydrocarbon resin and weight ratio of the friable hydrocarbon resin to the friable rubber chemical being selected to produce, on grinding, particles, the average specific gravity of the particles differing by a lesser degree from the specific gravity of the latex serum than does the specific gravity of the friable rubber chemical, and grinding the friable mixture for a time sufficient to produce dispersible particles, over half of the particles possessing a particle size of from 0.01 micron to 100 microns and wherein the weight ratio of the friable hydrocarbon resin to the friable rubber chemical is determined by the following relationship:

$$\frac{x}{SG_A} + \frac{SG_C - x}{SG_B} = 1$$

wherein x/SG$_C$ is the weight fraction of the hydrocarbon resin, SG$_C$−x/SG$_C$ is the weight fraction of the friable rubber chemical, SG$_C$ is the specific gravity of the combination, SG$_A$ is the specific gravity of the friable hydrocarbon resin, and SG$_B$ is the specific gravity of the friable rubber chemical and wherein SG$_C$ is closer to the specific gravity of the latex serum than is SG$_B$, and (B) combining the polymer latex and the resin/rubber chemical composition under agitation wherein the resin/-rubber chemical composition is added in an amount sufficient to provide an additive amount of the rubber chemical.

3,891,589
PROCESS FOR PREPARING STABLE HIGH SOLIDS AQUEOUS SOLUTION OF CATIONIC THERMOSETTING RESINS

Dilip K. Ray-Chaudhuri, Somerville, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.
Continuation-in-part of Ser. No. 317,424, Dec. 21, 1972, abandoned. This application Aug. 29, 1974, Ser. No. 501,483
Int. Cl.^{2} C08L *63/00;* **C08G** *69/48*
U.S. Cl. 260—29.2 EP **7 Claims**

1. A process for preparing an aqueous solution of a cationic thermosetting resin having a total solids content of 15–55% by weight of the solution, said solution having improved storage stability, said process comprising the steps of:

A. reacting at 110°–250°C.

i. at least one polyalkylene polyamine corresponding to the formula:

$$H_2N-[(CH_2)_n-NR]_mH$$

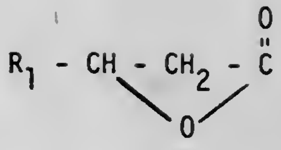
wherein *n* is an integer having a value of from 2 to 6 inclusive, *m* is an integer having a value of from 1 to 6 inclusive, and R is selected from the group consisting of hydrogen atoms and alkyl radicals, or

ii. the reaction product of at least one polyalkylene polyamine corresponding to the formula:

$$H_2N-[(CH_2)_n-NR]_mH$$

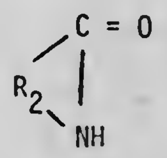
wherein *n* is an integer having a value of from 2 to 6 inclusive, *m* is an integer having a value of from 1 to 6 inclusive, and R is selected from the group consisting of hydrogen atoms and alkyl radicals with at least one compound selected from the group consisting of:

a. a beta-lactone corresponding to the formula:



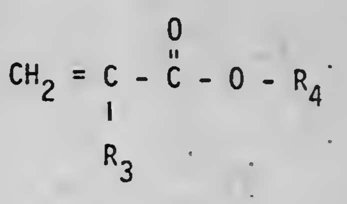
wherein R$_1$ is selected from hydrogen atoms and saturated, aliphatic straight chain hydrocarbon radicals containing from one to 16 carbon atoms;

b. a lactam corresponding to the formula:



wherein R$_2$ is a divalent radical selected from the group consisting of aliphatic hydrocarbons containing from three to 18 carbon atoms; and

c. an ester corresponding to the formula



$$CH_2=\underset{\displaystyle R_3}{\underset{|}{C}}-\overset{\displaystyle O}{\overset{\|}{C}}-O-R_4$$

wherein R$_3$ is a hydrogen or methyl, and R$_4$ is an alkyl radical having from one to four carbon atoms;
with at least one saturated dicarboxylic acid, dialkyl ester or anhydride thereof containing from two to 20 carbon atoms, in a molar ratio of polyamine to acid reagent ranging from 0.9 to 1.5, to produce a copolyamide-polyamine intermediate having a reduced specific viscosity at 1% by weight resin solution in methanol at 25°C. of 0.05 to 0.18; and

B. reacting, in aqueous medium, resultant (co)-polyamidepolyamine intermediate from step A with epichlorohydrin in a concentration ranging from 1.25 to 4.0 moles of epichlorohydrin per equivalent weight of copolyamide-polyamine intermediate to form the aqueous cationic thermosetting resin solution, said reaction of the intermediate with the epichlorohydrin being conducted initially at temperatures from 25° to 40°C. for a period of 1 to 4 hours and thereafter at 50° to 90°C. for a period of 2 to 10 hours.

3,891,590
CURABLE AMINO RESINS

Richard D. Sundie, Montvale, and Walter L. Pennie, Morristown, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.
Continuation of Ser. No. 210,160, Dec. 20, 1971, abandoned. This application Jan. 7, 1974, Ser. No. 431,535
Int. Cl. C08g *51/24*
U.S. Cl. 260—29.4 R **19 Claims**

1. A composition consisting essentially of:

- a. urea present in an amount ranging from about 15 to about 25 weight percent;
- b. formaldehyde present in an amount ranging from about 30 to about 70 weight percent;
- c. melamine present in an amount ranging from about 4.5 to about 10 weight percent;
- d. water present in an amount ranging from about 10 to about 30 weight percent; and
- e. a stabilizer present in an amount ranging from about 0.05 to about 4.0 weight percent, said stabilizer comprising a buffering agent which maintains the pH of the composition at a value ranging from about 4.0 to about 7.5.

3,891,591
COATING COMPOSITIONS

David Chi-kung Chang, Springfield, and Maurice James McDowell, Media, both of Pa., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Aug. 13, 1973, Ser. No. 388,061

Int. Cl. C08f *37/18, 45/24*

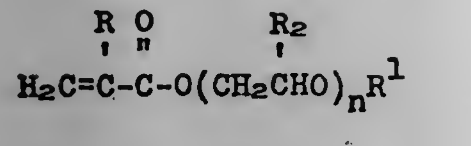
U.S. Cl. 260—29.6 WB **20 Claims**

1. An aqueous coating composition comprising:

a. an aqueous dispersion of at least one particulate water insoluble copolymer of ethylenically unsaturated monomers of 2 to 20 carbon atoms containing a water-soluble non-ionic surfactant, said copolymer containing about 0.5 to 10% by weight of ethylenically unsaturated acid monomer units and having a number average molecular weight of at least 50,000;

b. about 0.2 to 10% by weight, based on total solids, of a thickener selected from the group consisting of

1. a copolymer of 99–50% by weight of an α,β-ethylenically unsaturated carboxylic acid and 1–50% by weight of at least one alkyl acrylate or alkyl methacrylate wherein the alkyl group is from 10 to 30 carbon atoms,
2. a copolymer of 15–99% by weight of acrylic acid or methacrylic acid, 0–30% by weight of an alkyl acrylate or alkyl methacrylate wherein the alkyl group is from 10 to 30 carbon atoms and 1–55% by weight of an ester of the formula



$$H_2C{=}\overset{R}{C}-\overset{O}{\overset{\|}{C}}-O(CH_2\overset{R_2}{C}HO)_nR^1$$

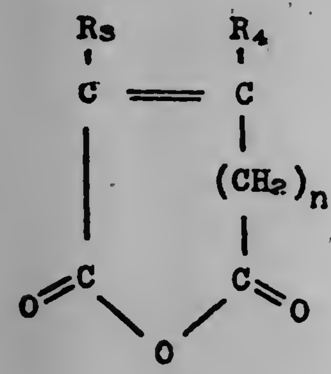
wherein

R^2 and R are hydrogen or methyl,

n is an integer of 6 to 80, and

R^1 is alkyl of 1 to 20 carbon atoms or alkylphenyl where the alkyl is from one to 20 carbon atoms,

3. a mixture of (i) 1 to 50 parts by weight of a copolymer of about 2–50% by weight of itaconic anhydride or a compound of the formula

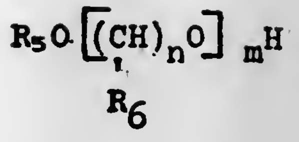


wherein

R_3 and R_4 are hydrogen, halogen, —CN, alkyl of one to six carbons, phenyl, benzyl or a cycloaliphatic radical of three to six carbons, and

n is 0 to 3 and

about 98–50% by weight of an alkene of two to nine carbons, vinyl acetate, styrene, vinyl chloride, methyl vinyl ether, ethyl vinyl ether, indene, cinnamic acid alkyl ester, acenaphthalene, acrylonitrile or an alkyl ester of acrylic acid or methacrylic acid wherein the alkyl group is one to 18 carbon atoms, with (ii) 1 part by weight of a compound of the formula



$$R_5O\left[(\underset{R_6}{C}H)_nO\right]_mH$$

wherein

R_5 is alkyl of one to 18 carbons or aryl of six to 20 carbons,

R_6 is H or methyl,

n is a positive integer of 2 or 3, and

m is a positive integer of 1 to 100, and

(4) mixtures thereof; and

c. about 0.01–5% by weight, based on total solids, of a segmented, hybrid fluorine-containing compound, [H] — [F], comprising a balance of the following:

1. one or more [H] segments containing at least one water-solvatable polar group and substantially free from fluorinated aliphatic pendant groups of at least three carbon atoms terminated by trifluoromethyl groups, and in which at least 10% by weight of the [H] segments are the water-solvatable polar groups, and
2. one or more [F] segments substantially free from water-solvatable polar groups, containing from 2 to 85% by weight of three to 30 fully fluorinated carbon atoms terminated by trifluoromethyl groups and providing in the fluorocarbon at least 1% by weight of bound fluorine, the intraconnecting structure of the [F] segments being substantially free of fluorine,

said composition having a pH in the range of about 7 to 10.5.

3,891,592
PROCESS FOR PRODUCING RUBBER POLYMER LATICES WITH LARGE PARTICLES

Bernard Chauvel, Ermont, and Jean-Claude Daniel, Fontenay-sous-Bois, both of France, assignors to Rhone-Progil, Courbevoie, France

Filed July 10, 1974, Ser. No. 487,217

Claims priority, application France, July 11, 1973, 73.25393

Int. Cl.² C08L *9/04, 9/08*

U.S. Cl. 260—29.7 E **11 Claims**

1. A process for the preparation of rubber polymer latices having large particles, which comprises polymerizing in aqueous emulsion a conjugated aliphatic diolefin containing from four to eight carbon atoms, alone or in mixture with at least one copolymerizable monomer, in the presence of 1–100,000 parts per million of an agglomerating agent, characterized in that the agglomerating agent which is represented by a polyalkyleneglycol is introduced in the course of polymerization, i.e., before polymerization has been completed, at a temperature of from 25° to 90°C when at least 40% by weight of a polymer or copolymer, which is slightly cross-linked, is formed.

3,891,593
METHOD AND APPARATUS FOR DISSOLUTION OF POLYMER IN SOLVENT

Chester L. Smitherman, Jr.; Robert H. Overcashier, and Vitold R. Kruka, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 8, 1972, Ser. No. 279,132

Int. Cl. B01f *1/00;* **C08f** *45/28;* **F17d** *1/16*

U.S. Cl. 260—34.2 **14 Claims**

1. A method for dissolving an essentially undegraded polymer in a solvent comprising:

introducing the essentially undegraded polymer into the solvent to form a slurry of small undegraded solid particles in the solvent;

providing a vapor zone above a liquid zone in a vessel which is partitioned into at least two compartments which are in liquid communication with each other both above and below the partition;

dispersing the slurry in the liquid zone;

admitting a dispersed stream of gas into at least one but less than all of the compartments, whereby the slurry content of each compartment into which gas is flowing is caused to rise in the compartment, flow into another compartment over the top of the partition, descend into the other compartment and flow back into each of the compartments into which the dispersed stream of gas is introduced;

recycling gas from the vapor zone; and

removing dissolved essentially undegraded polymer and solvent from the liquid zone.

3,891,594
DIRECT SYNTHESIS OF COMPOSITE MATERIALS

Lynn J. Taylor, 3704 Dewlawn Dr., Toledo, Ohio 43614

Continuation of Ser. No. 242,132, April 7, 1972, Pat. No. 3,817,911. This application Apr. 19, 1974, Ser. No. 462,321

Int. Cl. C08g *51/04*

U.S. Cl. 260—37 N **11 Claims**

1. A process for preparation of a composite material of at least one organic polymer having at least one inorganic oxide dispersed therein, which process comprises:

a. mixing together at least one non-polymeric organic precursor and at least one inorganic-oxide hydrolyzable precursor;

b. polymerizing the non-polymeric organic precursor;

c. synthesizing the inorganic oxide from the hydrolyzable precursor so as to prepare the inorganic oxide in situ of the previously synthesized organic polymer; and

d. recovering the resulting composite material.

3,891,595
FRICTION MATERIAL

James Derek Birchall, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 24, 1973, Ser. No. 391,515

Claims priority, application United Kingdom, Aug. 30, 1972, 40189/72

Int. Cl. C08g *51/04*

U.S. Cl. 260—38 **19 Claims**

1. A friction material comprising from 40 to 85 percent by weight of a synthetic inorganic polycrystalline refractory metal oxide fibre having an average fibre diameter of from 0.5 to 10 microns having a shot content of less than 5 percent by weight,

and from 15 to 35 percent by weight of a binder.

3,891,596
THERMOPLASTIC INGREDIENT FOR MOLDING COMPOUNDS

Michael G. Roberts, Heath, and Michael L. Matuszak, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 361,663, May 18, 1973, Pat. No. 3,843,750. This application July 1, 1974, Ser. No. 484,641

Int. Cl. C08g *51/04*

U.S. Cl. 260—40 R **10 Claims**

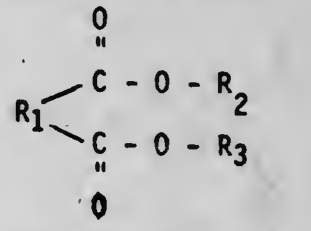
1. A thermosetting molding compound comprising the following materials in approximate percentages by weight:

Glass fiber reinforcement	5–40%
Alkaline earth oxide gelling agent	0.01–10%
Polymerization catalyst	0.05– 5%
Fillers	10–50%
Resin matrix forming material	40–95%

wherein said resin matrix forming material comprises the following mixture in percent by weight:

Thermosetting resin polymer	60–90%
Thermoplastic resin polymer	5–50%
Unsaturated solvent for said polymer and prepolymer	0–45%

and wherein said thermoplastic polymer is a heteropolymer of a mixture of alkene radical containing monomers which include from approximately 5% by weight to approximately 95% by weight of a material having the formula:



wherein: R_1 is a chlorinated or brominated divalent organo radical devoid of ethylenic unsaturation, R_2 is a saturated monovalent organo radical or substituted organo radical, and R_3 is an alkene radical or substituted alkene radical.

3,891,597
ROTATIONAL MOLDING OF CROSSLINKABLE POLYMERS

Donald G. Needham, Ramona, and George R. Hill, Bartlesville, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 100,442, Dec. 21, 1970, abandoned. This application Aug. 2, 1973, Ser. No. 384,997

Int. Cl. C08f *47/04, 27/00, 27/22*

U.S. Cl. 260—42.21 **7 Claims**

1. In the rotational molding of homopolymers and copolymers of ethylene and olefin hydrocarbonshaving 3 to 8 carbon atoms per molecule, which polymers contain a crosslinking agent selected from the group consisting of 2,5-dimethyl-2,5-di(t-butylperoxy)-hexyne-3 and 2,5-dimethyl-2,5-di(peroxybenzoate)hexyne-3 and a colorant selected from the group consisting of ultramarine blue and phthalocyanine green, the method of increasing the gel time of the polymer composition in the mold which comprises adding to the composition at least one material selected from the group consisting of 2-hydroxy-4-n-octoxybenzophenone and N,N-bis(hydroxyethyl) alkylamine, said material being added in an amount in the range of about 0.05 to about 0.5 weight percent of the composition.

3,891,598
BUBBLE-FREE, HIGH BARRIER VINYLIDENE CHLORIDE POLYMER FILMS AND PROCESS OF PREPARATION

Richard T. Marzolf, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 323,315, Jan. 12, 1973, abandoned. This application Feb. 11, 1974, Ser. No. 441,541

Int. Cl. C08f *37/02, 45/04, 45/56*

U.S. Cl. 260—42.56 **3 Claims**

1. An improved process for preparing extruded vinylidene chloride polymer film containing modifying amounts of an ethylene-vinyl acetate copolymer, said film being substantially free from bubbles, holes and white specks which process comprises

1. preparing a blend of (a) a dry, powdered, nonplasticized normally crystalline vinylidene chloride polymer con-

taining from about 70 to about 95 percent by weight of vinylidene chloride interpolymerized with from about 30 to about 5 percent by weight of at least one monoethylenically unsaturated monomer copolymerizable with vinylidene chloride, with (b) from about 0.05 to about 1 percent based on polymer weight of magnesium oxide having an average particle size of less than about 0.5 micron and wherein said blend is prepared by introducing said magnesium oxide beneath the surface of the mass of dry vinylidene chloride polymer particles while said particles are maintained in motion and where said magnesium oxide coats said particles prior to contact of said magnesium oxide with a metal surface,

2. removing from said blend any agglomerate having a diameter in excess of about 500 microns, then
3. admixing said blend with said ethylene-vinyl acetate copolymer in an extruder which is used to thermally fabricate the admixture into film form.

3,891,599
FIRE RETARDANT POLYMER COMPOSITIONS

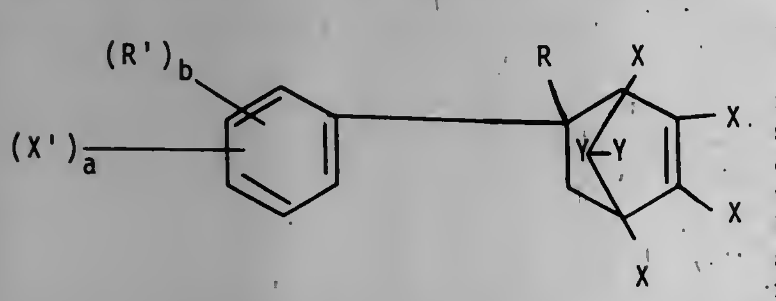
Harry W. Marciniak, Tonawanda; Richard D. Carlson, Grand Island, both of N.Y., and James L. Dever, Bedford, Ohio, assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 199,035, Nov. 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 65,663, Aug. 20, 1970, abandoned, which is a continuation-in-part of Ser. No. 51,008, June 29, 1970, abandoned. This application Nov. 14, 1973, Ser. No. 415,915

Int. Cl. C08d *7/10*

U.S. Cl. 260—45.7 R **27 Claims**

1. A fire retardant polymer composition comprising a polymer selected from the group consisting of thermoplastic and thermosetting polymers and elastomers and an effective fire retardant proportion of a compound of the formula:



wherein X is a halogen selected from the group consisting of fluorine, chlorine, bromine and mixtures thereof; Y is a substituent selected from the group consisting of chlorine, bromine and fluorine, alkyl of 1 to 10 carbon atoms, halogen substituted alkyl of 1 to 10 carbon atoms, alkoxy of 1 to 10 atoms, and halogen substituted alkoxy of 1 to 10 carbon atoms, wherein the halogen is chlorine, fluorine or bromine; X′ is a halogen independently selected from the group consisting of chlorine, bromine and mixtures thereof; R and R′ are independently selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms and halogen substituted alkyl of 1 to 6 carbon atoms wherein said halogen is selected from the group consisting of fluorine, chlorine and bromine; *a* is about 4 to 5, *b* is 0 to about 1, and *a* + *b* is 5.

3,891,600
HALOGEN CONTAINING FIRE RETARDANT ADDITIVE WITH IMPROVED HEAT STABILITY

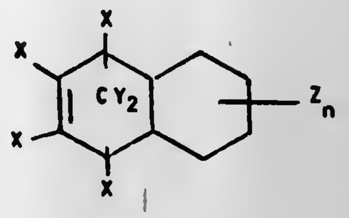
James J. Maul, and Richard D. Carlson, both of Grand Island, N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Division of Ser. No. 388,703, Aug. 15, 1973. This application Jan. 2, 1974, Ser. No. 429,608

Int. Cl. C08f *45/58*

U.S. Cl. 260—45.75 R **14 Claims**

1. A fire retardant polymeric composition comprising a polymer and an effective fire retardant amount of a compound of the formula



wherein X is a halogen independently selected from the group consisting of fluorine, chlorine, and bromine, Y is independently selected from the group consisting of fluorine, chlorine, bromine, alkyl of 1 to 10 carbon atoms, alkyloxy of 1 to 10 carbon atoms, mono-haloalkyl and alkyloxy wherein said alkyl group contains 1 to 10 carbon atoms wherein said halo is fluoro, chloro, or bromo, Z is a halogen selected from the group consisting of chlorine, bromine, and mixtures thereof, and n is 1 to 8.

3,891,601
PROCESS FOR PRODUCING WATER SOLUBLE POLYAMIDE RESINS

Marvin A. Peterson; Adrian J. Good, and Thaddeus P. Kurek, all of Fort Wayne, Ind., assignors to Valspar Inc., Minneapolis, Minn. and General Electric Company, Ft. Wayne, Ind.

Continuation of Ser. No. 122,050, March 8, 1971, abandoned. This application June 4, 1973, Ser. No. 366,649

Int. Cl. C08j *20/32*

U.S. Cl. 260—47 CP **11 Claims**

1. A process for producing a polyamide resin from an aromatic dianhydride and an aromatic diamine comprising the steps of adding to a reaction vessel an essentially anhydrous organic solvent having functional groups which are nonreactive with the polymer-forming reactants and a solvent for at least said aromatic dianhydride; adding to the solvent an anhydrous aromatic dianhydride in powder form; and thereby forming a slurry of such aromatic dianhydride within said solvent by combining therewith a measured amount of the aromatic dianhydride which is in excess of its solubility limits within said solvent; charging to said vessel a quantity of aromatic diamine in close succession to the formation of said slurry before said slurry precipitates into an insoluble mass; converting by condensation reaction a difunctional diprimary diamine and aromatic carbocyclic dianhydride to form a diorthoamic acid precrusor compound having a greater solubility in said solvent than either of said reactants; said compound being of molar proportions consisting of two parts of one of said reactants to one part of the other of said reactants; and controlling the temperature of the mixture within said reaction vessel by cooling the reaction mass to maintain a temperature below the imidization temperature of such reaction product.

3,891,602
EPOXY SCALE-RESISTANT COATING

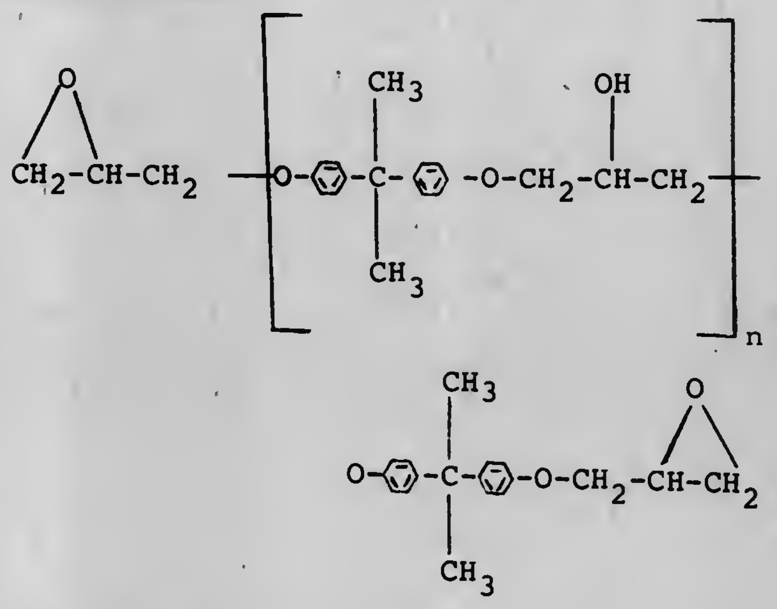
James W. Hughes, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 212,631, Dec. 27, 1971, Pat. No. 3,799,797. This application Sept. 24, 1973, Ser. No. 399,906

Int. Cl. C08g *30/14*

U.S. Cl. 260—47 EN **4 Claims**

1. A novel scale-resistant modified epoxy resin made by the curing reaction of an epoxy resin prepared by combinind epichlorohydrin and p,p′-isopropylidene diphenol having the structural formula:



where $n = 0$ to 30

and a monohydric polyether which is represented by the formula

$R—0—(CH_2—CHR'—0—)_nH$

wherein R= alkyl, aryl, or other radical which is non-reactive with isocyanate functional groups, R′=alkyl and *n*=about 3 to about 50″,with a blocked polyisocyanate selected from the group consisting of toluene disocyanate 1,5-napththalene diisocyanate, m-and p-phenylene diisocyanates, 4,4′ diphenylisopropylidene diisocyanate, 4,4′-diphenysulfone diisocyanate, 4,4′ diphenylmethane diisocyanate, and 4,4′,4″triphenylmethane triisocyanate, the isocyanate being blocked with agents selected from the group consisting of hydrogen cyanide, ethyl malonate, acetylacetone, hydroxylamine, aryl mercaptans, monomethylaniline, diphenylamine, phenols, σ-pyrrolidone and caprolactam.

3,891,603
REMOVING HEAT OF REACTION IN COPOLYMERIZATION OF ETHYLENE IN AQUEOUS DISPERSION

Eduard Heil, Limburgerhof; Karl Kuchner, Ludwigshafen; Wolfgang Sliwka, Weinheim, and Harald Smits, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen/Rhine, Germany

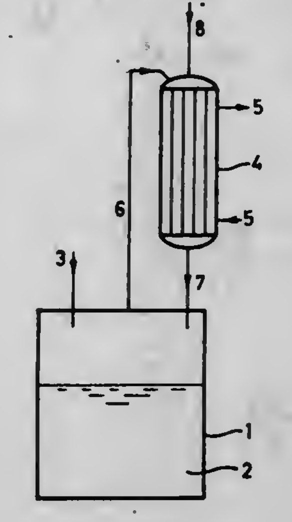
Filed Dec. 28, 1973, Ser. No. 429,090

Claims priority, application Germany, Jan. 3, 1973, 2300111

Int. Cl. C08f *1/11, 1/98*

U.S. Cl. 260—63 R **7 Claims**

1. Method for manufacturing copolymers of ethylene with 10 to 98 percent by weight of one or more of a vinyl ester of an organic alkanoic acid containing 1 to 12 carbon atoms in the alkyl group, an olefinically unsaturated carboxylic acid with 1 to 12 carbon atoms, an alkyl ester of said olefinically unsaturated acid, an amide of said olefinically unsaturated acid, a nitrile of said olefinically unsaturated acid, vinyl chloride, vinylethylketone, vinylsulfonic acid, or a hydroxyalkyl acrylate, by polymerization thereof in aqueous dispersion, at least a part of the heat of polymerization being removed by evaporation of the ethylene, the ethylene vapors being cooled by a cooling medium, by indirect heat exchange, in an indirect heat exchanger in a cooling zone situated above the polymerization vessel and in communication with the latter, the cooled vapors being returned to the polymerization vessel, wherein the vapors are fed to the upper end of the cooling zone and cooled while they are flowing downward.



3,891,604
SEGMENTED THERMOPLASTIC COPOLYESTER ELASTOMER

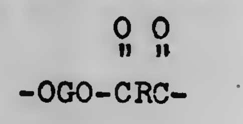
James Richard Wolfe, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Nov. 29, 1973, Ser. No. 419,975

Int. Cl. C08g *17/08*

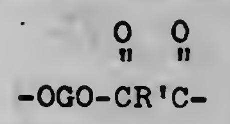
U.S. Cl. 260—75 R **11 Claims**

1. A segmented thermoplastic copolyetherester having improved tear strength consisting essentially of a multiplicity of recurring long chain ester units and short chain ester units joined head-to-tail through ester linkages, said long chain ester units being represented by at least one of the formulae:


$-OGO-\overset{\overset{O}{\|}}{C}R\overset{\overset{O}{\|}}{C}-$

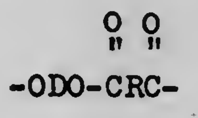
(a)

or


$-OGO-\overset{\overset{O}{\|}}{C}R'\overset{\overset{O}{\|}}{C}-$

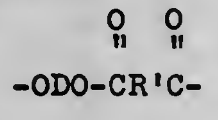
(a′)

and said short chain ester units being represented by the formula:


$-ODO-\overset{\overset{O}{\|}}{C}R\overset{\overset{O}{\|}}{C}-$

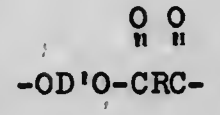
(b)

and at least one other formula selected from the group consisting of:


$-ODO-\overset{\overset{O}{\|}}{C}R'\overset{\overset{O}{\|}}{C}-$

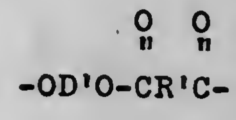
(c)

,


$-OD'O-\overset{\overset{O}{\|}}{C}R\overset{\overset{O}{\|}}{C}-$

(d)

and


$-OD'O-\overset{\overset{O}{\|}}{C}R'\overset{\overset{O}{\|}}{C}-$

(e)

wherein:

- G is a divalent radical remaining after the removal of terminal hydroxyl groups from a long chain glycol having a molecular weight of about 400–6000 and a carbon-to-oxygen ratio of about 2.0–4.3;
- R is a divalent radical remaining after removal of carboxyl groups from a dicarboxylic acid having a molecular weight less than about 300;
- R′ is a divalent radical, containing at least one side chain of 7 to about 25 carbon atoms in length, remaining after removal of carboxyl groups from an aliphatic dicarboxylic acid, said aliphatic dicarboxylic acid having a molecular weight of less than about 300 neglecting the side chains;

D is a divalent radical remaining after removal of hydroxyl groups from a diol a molecular weight less than about 250; and D' is a divalent radical, having at least one side chain of 7 to about 25 carbon atoms in length, remaining after removal of hydroxyl groups from a low molecular diol, said diol having a molecular weight of less than about 250 neglecting the side chains; provided, (a) said short chain units amount to about 25 to 90 percent by weight of said copolyester; (b) about 5 to 55 percent of the total number of said short chain ester units contained in said copolyetherester have said side chains; and (c) a homopolymer in the fiber-forming molecular weight range formed solely from the short-chain ester units without side chains has a melting point of at least 150°C.

3,891,605

BROMINATED PENTAERYTHRITOLIC POLYESTERS AND PROCESS THEREFOR

Eric R. Larsen, and Ernest L. Ecker, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 4, 1974, Ser. No. 457,951

Int. Cl. C08g *17/003, 17/12*

U.S. Cl. 260—75 H **20 Claims**

1. A process for preparing brominated pentaerythritolic polyesters comprising reacting pentaerythritol with hydrogen bromide and a dicarboxylic acid having at least 4 carbon atoms in the molecule, in the liquid phase, at a temperature of from about 85° to about 220°C., the water produced in the reactions being removed at such a rate that the weight ratio of hydrogen bromide to water in the reaction mixture is at least about 0.9 until the hydrobromination is substantially complete, at a mole ratio of hydrogen bromide to pentaerythritol of from about 1.8 to 1 to about 2.4 to 1.

3,891,606

CURING WITH COMPLEXES OF SELECTED DIAMINES AND ALKALI METAL SALTS

Irving Charles Kogon, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed July 12, 1973, Ser. No. 378,551

Int. Cl. C08g *22/00*

U.S. Cl. 260—77.5 AM **30 Claims**

1. A process for curing an amino curable polymer or prepolymer which comprises curing said polymer with a curing agent consisting essentially of (a) a source of active hydrogen having one or more Zerewitinoff active hydrogens and an ionization constant such that its pK_a is greater than 6.0, and (b) a complex of 4,4'-methylene dianiline and a salt, the salt being selected from the group consisting of sodium chloride, sodium bromide, sodium iodide, sodium nitrite, lithium chloride, lithium bromide, lithium iodide, lithium nitrite and sodium cyanide, or a complex of racemic 2,3-di(4-aminophenyl)butane with a salt, said salt being selected from the group consisting of sodium chloride, sodium bromide, sodium iodide, potassium chloride, potassium bromide, potassium iodide, rubidium chloride, rubidium bromide, rubidium iodide, cesium chloride, cesium bromide and cesium iodide; the ratio of said dianiline or said butane to said salt in said complex being 3 moles to 1 mole.

3,891,607

PROCESS FOR THE PRODUCTION OF THERMOREVERSIBLE COACERVATES

Rainer Kuhn, Bergisch, Gladbach, and Nikolaus Schon, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Aug. 21, 1973, Ser. No. 390,203

Claims priority, application Germany, Dec. 9, 1970, 2060571

Int. Cl. C08f *15/02*

U.S. Cl. 260—80.3 N **4 Claims**

1. A process for the production of a thermoreversible coacervate which comprises copolymerizing from 30 to 50 mol percent of acrylic acid and from 70 to 30 mol percent of acrylamide in aqueous solution in the presence of a free-radical catalyst and in the absence of a water-soluble inorganic salt at a temperature between the coacervate transition temperature and 100°C., lowering the pH-value of the solution either prior to, during or after polymerization to below 3.3 and adjusting the temperature of the solution to below the coacervate transition temperature.

3,891,608

RUBBER MIXTURES SHOWING IMPROVED SURFACE TACK

Harro Petersen, Frankenthal; Paulus Erhard, Weinheim; Hubertus Queins, Friedelsheim, and Hubert Schoeppl, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Rhine, Germany

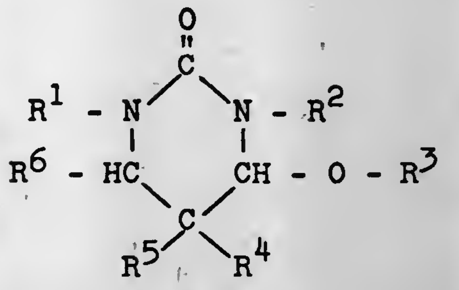
Filed July 5, 1974, Ser. No. 485,805

Claims priority, application Germany, July 10, 1973, 2334915

Int. Cl. C08c *1/40;* **C08d** *1/00*

U.S. Cl. 260—80.78 **1 Claim**

1. Rubber mixtures containing from 1 to 20 parts, based on 100 parts of rubber, of a 2-oxohexahydropyrimidine of the general formula



in which the radicals R^1 to R^6 may be the same or different and each individually denotes hydrogen or alkyl of from 1 to 20 carbon atoms, optionally substituted by further functional groups.

3,891,609

PROCESS TO MINIMIZE YELLOWNESS IN ARTICLES FORMED FROM ACRYLONITRILE-STYRENE COMPOSITIONS

Paul Dillon Wolfe, Wilmington, Del.; Ronald Luther Saxton, West Grove, Pa., and Donald Dean Cameron, Wilmington, Del., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed May 2, 1974, Ser. No. 466,308

Int. Cl. C08f *41/12*

U.S. Cl. 260—85.5 HC **5 Claims**

1. In a process for forming a shaped article made from a composition containing a polymer formed from acrylonitrile and styrene, a styrene derivative or combinations thereof, said composition comprising

A. 65 to 100 percent by weight of a polymer consisting essentially of 67 to 85 percent by weight acrylonitrile polymerized units and 33 to 15 percent by weight polymerized units derived from styrene, a styrene derivative, or combinations thereof wherein said styrene derivative is selected from 4-methyl styrene; 4-(t-butyl) styrene; 3-methyl styrene; 2,4-dimethyl styrene; 2,6-dimethyl styrene; 2,4-diisopropyl styrene and α-methyl styrene; and

B. 0 to 35 percent by weight grafted rubber, the grafted rubber consisting essentially of 30 to 50 percent by weight of a graft polymer consisting of 61 to 85 percent by weight acrylonitrile polymerized units and 39 to 15 percent by weight polymerized units of styrene, said styrene derivative or combinations thereof, and 50 to 70 percent by weight rubber;

wherein the shaped article is formed by

1. emulsion polymerizing in the presence of a free radical generator to form said composition;
2. coagulating said composition;
3. melt processing to form a shaped article at a temperature of 200°C. to 260°C.; wherein said improvement comprises
   - I. coagulating said polymer composition in an environment maintained at a pH of 6.0 to 7.5; and
   - II. melt processing said polymer composition at:
     - a. an initial moisture content of 0.2 to 1.5 weight percent and releasing volatiles to yield a shaped article containing a moisture content of 0.15 to 0.4 weight percent immediately prior to solidification or
     - b. a moisture content of 0.15 to 0.4 weight percent without a substantial release of volatiles;

whereby yellowness is minimized in an essentially bubble free article.

3,891,610

POLYOLEFIN FIBERS AND PROCESS OF FORMATION DURING POLYMERIZATION

Robert W. Fowells, Vancouver, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 874,687, Nov. 6, 1969, abandoned, which is a continuation-in-part of Ser. No. 769,501, Oct. 22, 1968, abandoned. This application Nov. 8, 1972, Ser. No. 304,883

Int. Cl.² C08F *210/02, 110/06, 110/02, 4/64*

U.S. Cl. 260—88.2 R **17 Claims**

1. A process of producing fibers of polyolefins having high molecular weight comprising polymerizing a monomeric olefin at an apparent specific reaction rate greater than about 0.05 $sec.^{-1}$ and at a temperature less than the melt dissolution temperature of the polyolefin to be formed in the presence of a coordination catalyst system in a suitable reaction medium whose solubility parameter approaches the solubility parameter of the polyolefin to be formed while subjecting the reaction medium to a shear stress greater than about 0.1 lbs. (force)/sq.ft. to effect formation of a polyolefin in the form of individually separable fibers having a gross morphology and size similar to natural cellulosic papermaking fibers.

3,891,611

PROCESS FOR POLYMERIZING OLEFINS

Toshizo Abe; Seiho Sakamoto; Shigeo Go; Koichi Maekuma; Yoshitaka Yamada, and Yasumasa Hirashima, all of Kurashiki, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed June 25, 1973, Ser. No. 373,254

Claims priority, application Japan, June 24, 1972, 47-63470

Int. Cl. C08f *1/66, 3/02, 15/04*

U.S. Cl. 260—88.2 B **9 Claims**

1. In a process for polymerizing an olefin in the presence of a first catalyst component of chromium oxide on a support and a second catalyst component of an organo-aluminum compound in a hydrocarbon diluent, the improvement which comprises:

adding an aromatic hydrocarbon containing at least four double bonds and a $—CH_2$ group which provides acidic hydrogen atoms within the molecule, as a molecular weight regulator to the reaction mixture, wherein 0.01 –100 ppm of said aromatic hydrocarbon is present in the hydrocarbon diluent.

3,891,612

POLYMERIZED ROSIN PRODUCT AND PROCESS FOR THE PRODUCTION OF SAME

Bernard A. Parkin, Jr., and Walter H. Schuller, both of Lake City, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 5, 1973, Ser. No. 337,792

Int. Cl.² C08H *11/00;* **C09F** *1/00*

U.S. Cl. 260—99.5 **10 Claims**

1. A process for the production of a polymerized composition which process comprises:

dissolving a material selected from the group consisting of rosin, resin acids and a resin acid in a mixture of acetic acid, sulfuric acid, and water and reacting said material in said mixture, wherein the proportions of acetic acid, sulfuric acid and water in said mixture are such that the unreacted material is soluble and the polymerized products of the reaction have only limited solubility and separate from the mixture in the form of a polymer-rich layer as the reaction proceeds.

3,891,613

PROCESS FOR SEPARATION OF WHOLE WHEAT KERNEL COMPONENTS TO ISOLATE THE GLUTEN EMPLOYING WATER

Ganta V. Rao, and Oliver B. Gerrish, Sr., both of Hutchinson, Kans., assignors to Far-Mar-Co., Inc., Hutchinson, Kans.

Filed Nov. 20, 1972, Ser. No. 307,869

Int. Cl. A23j *1/12*

U.S. Cl. 260—112 G **6 Claims**

1. A process for separating wheat gluten from the nongluten components of the whole wheat kernel comprising the steps of:

- a. tempering whole wheat kernels in water to a moisture content, by weight, in the range from 15 to 22%;
- b. flaking the whole wheat kernels to a flake thickness in the range from 0.0005 to 0.025 inches;
- c. hydrating the flakes in a quantity of water from 65 to 75% by weight of the flakes and agitating the flakes and water to form a thick, dough-like mass; and
- d. mechanically working the dough-like mass in the presence of water to wash the non-gluten wheat kernel components from the gluten.

3,891,614

SOLID PHASE SYNTHESIS OF CALCITONINS ON BENZHYDRYLAMINE TYPE RESINS

Kyoichi Sakakibara, Chigasaki; Masaaki Gondoh, Kawasaki; Eiichirou Shimazawa, Sagamihara, and Nobuo Izumiya, Fukuoka, all of Japan, assignors to Teikoku Hormone Mfg. Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1973, Ser. No. 421,825

Claims priority, application Japan, Dec. 7, 1972, 47-121973

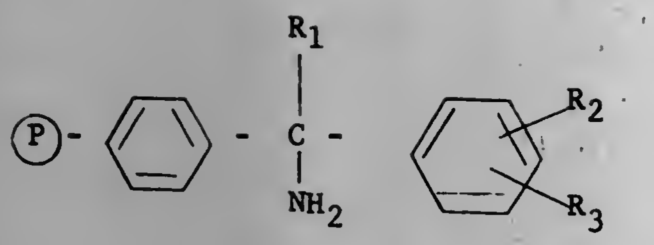
Int. Cl. C07c *103/52;* **C07g** *7/00;* **C08h** *1/00*

U.S. Cl. 260—112.5 **14 Claims**

1. A process for synthesizing calcitonins composed of 32 amino acid units, which comprises

A. bonding a proline residue through an amide linkage to a resin support selected from the group consisting of

1. Benzohydrylamine containing polymers of the formula

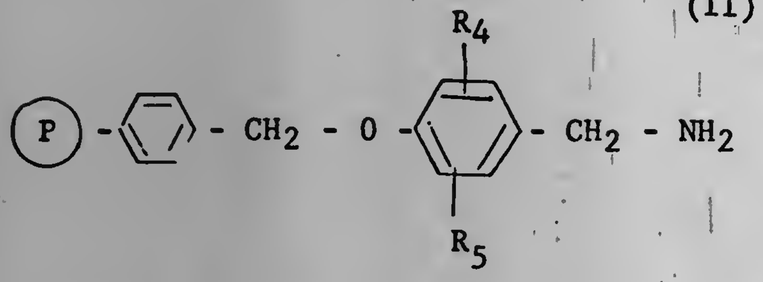


(I)

wherein P represents a styrene-divinylbenzene copolymer, R_1 is a hydrogen atom or lower alkyl group, and R_2 and R_3 are the same or different and each represent a hydrogen atom, a lower alkyl group or a lower alkoxy group,

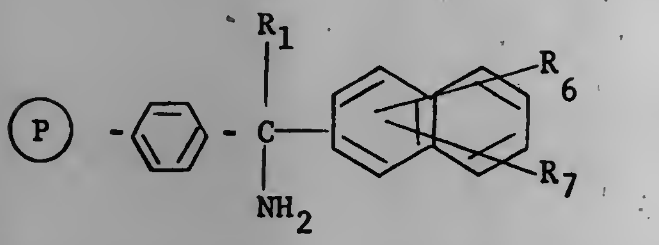
2. p-Methoxybenzylamine containing polymers of the formula

(II)



wherein P is the same as defined in the formula (I), and R_4 and R_5 are the same or different and each represent a hydrogen atom, a lower alkyl group or a lower alkoxy group, and,

3. Naphthyl benzylamine containing polymers of the formula



(III)

wherein P and R_1 are the same as defined in the formula (I), and R_6 and R_7 are the same or different and each represent a hydrogen atom, a lower alkyl group or a lower alkoxy group, B. successively introducing the remaining 31 constituent amino acid residues of calcitonin into the proline residue on the resin support according to the solid phase synthesizing method to form a calcitonin precursor,

C. splitting off the resin support from the calcitonin precursor by treating the calcitonin precursor with anhydrous hydrogen fluoride in the presence of a phenol or a mixture of a phenol and alkyl ether of a phenol, and

D. thereafter oxidizing the resulting dotriacontapeptide with an oxidizing agent selected from air, hydrogen peroxide, iodine or potassium ferricyanide, to bond the mercapto group of the cystein unit at the N terminal to the mercapto group of the cystein unit at the seventh position from the N terminal to form a cyclic disulfide structure.

3,891,615

RECOVERY OF BACITRACIN AS THE CALCIUM OR MAGNESIUM COMPLEX OF AN ALKYLBENZENESULFONIC ACID

Edward B. Hodge, Terre Haute, Ind., and John A. Riddick, Baton Rouge, La., assignors to Commercial Solvents Corporation, Terre Haute, Ind.

Filed Oct. 25, 1973, Ser. No. 409,537

Int. Cl. C07c *103/52;* **C07g** *7/00;* **A61k** *27/00*

U.S. Cl. 260—112.5 **11 Claims**

1. An alkaline earth metal-bacitracin-alkylbenzene-sulfonate complex wherein said metal is calcium or magnesium and the alkyl group contains from 10 to 14 carbon atoms.

3,891,616

HYPOTENSIVE β-HOMOAMINOACID NONAPEPTIDES

Miguel Angel Ondetti, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 17, 1974, Ser. No. 461,669

Int. Cl.² C07C *103/52;* **C07G** *7/00;* **A61K** *37/00*

U.S. Cl. 260—112.5 **3 Claims**

1. A nonapeptide of the formula Arg-A-Pro-Gly-B-Ser-A-B-Arg wherein A is Pro or βH-Pro and B is Phe or βH-Phe, wherein βH-Pro represents β-homoproline and βH-Phe represents β-homophenylanine, provided at least one of A or B is a β-homoaminoacid, all amino acids thereof being of the L-configuration.

3,891,617

METALLIZED AND NON-METALLIZED DIPHENOL METHANE CONTAINING AZO DYESTUFFS

Andre Louis Sailer, and Pierre Frank, both of Saint-Clair du Rhone, France, assignors to Pechiney Ugine Kuhlmann, Paris, France

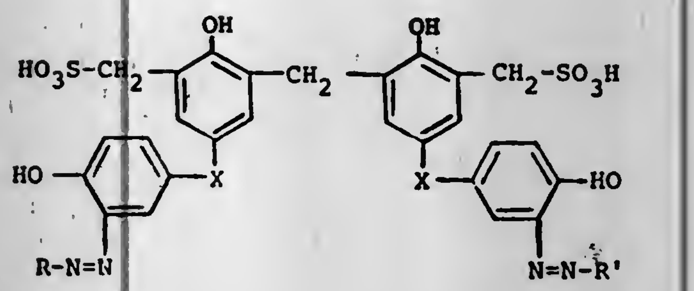
Filed Jan. 26, 1973, Ser. No. 326,728

Claims priority, application United Kingdom, July 23, 1968, 35075/68

Int. Cl. C09b *33/04, 45/28*

U.S. Cl. 260—148 **6 Claims**

1. A dyestuff of the formula



(I)

in which X is $-SO_2-$ or $-C(CH_3)_2-$, and R and R′ are the same or different, and are selected from the group consisting of substituted and unsubstituted phenyl, naphthyl, diphenyl and phenylazophenyl where the substituents are selected from the group consisting of nitro, chloro, sulpho, hydroxy and carboxy.

3,891,618

AZO-DYESTUFFS CONTAINING α,β-DICHLOROPROPIONYLAMINO OR α,β-DIBROMOPROPIONYLAMINO GROUPS

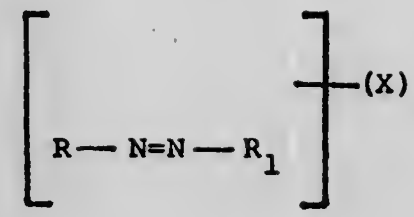
Rene De Montmollin, Riehen, and Henri Riat, Arlesheim, both of Sweden, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 876,069, Nov. 12, 1969, Pat. No. 3,755,390, which is a continuation-in-part of Ser. No. 753,829, Oct. 22, 1968, abandoned, which is a continuation of Ser. No. 608,710, Nov. 1, 1966, abandoned, which is a division of Ser. No. 305,539, Aug. 29, 1963, abandoned, which is a continuation-in-part of Ser. No. 731,097, April 28, 1958, abandoned. This application June 1, 1972, Ser. No. 258,774

Int. Cl. C09b *62/40, 62/50;* **D06p** *1/38*

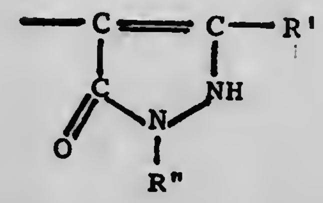
U.S. Cl. 260—163 **7 Claims**

1. The 1:2 or 1:1 chromium, cobalt or copper complex of a monoazo dyestuff containing at least 2 and at most 3 sulfonic acid groups which dyestuff corresponds to the formula



$$\left[R-N{=}N-R_1 \right]-(X)_n$$

wherein R is unsubstituted o-hydroxybenzene, unsubstituted o-hydroxynaphthalene or such groups substituted by lower alkyl, lower alkoxy, trifluoromethyl, chlorine, bromine or sulfo, R_1 is



wherein R′ is methyl or carboxy, R″ is hydrogen, phenyl, sulfophenyl, disulfophenyl, sulfochlorophenyl, sulfodichlorophenyl, sulfonaphthyl, disulfonaphthyl, 2-sulfostilbenyl, or 2,3-tetramethylene-4-sulfophenyl, X is α,β-dichloropropionylamino or α,β-dibromopropionylamino bound to a ring carbon atom of the benzene and naphthalene rings R and R″ and *n* is 1 or 2.

3,891,619

PHENYL-AZO-INDOLE COMPOUNDS

Richard Sommer; Manfred Wiesel; Hans-Günter Otten, and Edgar Siegel, all of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

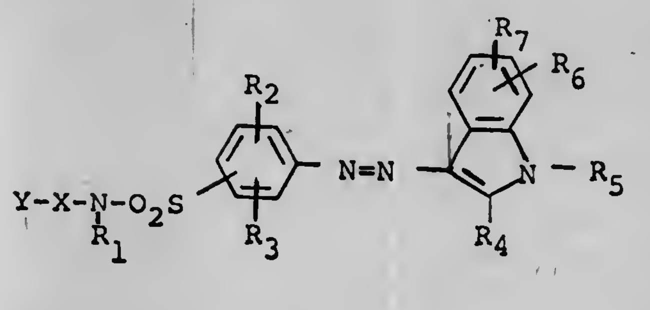
Filed Dec. 1, 1972, Ser. No. 311,414

Claims priority, application Germany, Dec. 2, 1971, 2159802

Int. Cl. C09b *29/36;* **D06p** *3/24*

U.S. Cl. 260—165 **4 Claims**

1. Monoazo dyestuff which in the form of the free acid corresponds to the formula



wherein

- R_1 is hydrogen or C_1–C_4-alkyl;
- R_2 is hydrogen, chloro, bromo, trifluoromethyl, nitro, cyano, carbonamido, C_1–C_4-alkoxy, C_1–C_4-alkyl, or C_1–C_4-alkyl substituted by chloro, bromo, cyano, carbamoyl, C_1–C_4-alkoxy, or alkoxycarbonyl of 1–4 carbon atoms in the alkoxy portion;
- R_3 is hydrogen, chloro, bromo, C_1–C_4-alkoxy, C_1–C_4-alkyl, or C_1–C_4-alkyl substituted by chloro, bromo, cyano, carbamoyl, C_1–C_4-alkoxy, or alkoxycarbonyl of 1–4 carbon atoms in the alkoxy portion;
- R_4 is C_1-C_4-alkyl, phenyl, biphenylyl, naphthyl;
- R_5 is hydrogen, C_1–C_4-alkyl, or C_1–C_4-alkyl substitued by cyano, amino, carbamoyl, or carboxyl;
- R_6 is hydrogen, chloro, bromo, or C_1-C_4-alkyl,
- R_7 is hydrogen, chloro, bromo, cyano, C_1–C_4-alkoxy, or C_1–C_4-alkyl;
- X is C_2–C_4-alkylene, methylenephenyl, ethylenephenyl, phenylene, or phenylene substituted by C_1–C_4-alkyl, benzyl, phenyl, C_1–C_4-alkoxy, benzyloxy, chloro, bromo, cyano, or nitro;
- Y is $-SO_3H$, or when X is phenylene or substituted phenylene, Y is $-SO_3H$ or $-SO_2-NH-SO_2-R_8$; and
- R_8 is C_1–C_4-alkyl, phenyl, dimethylamino or C_1–C_4-alkylphenyl.

3,891,620

MODIFIED NATURAL GUMS

Donald R. Cushman, Wenonah, and John W. Schick, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 4, 1974, Ser. No. 430,970

Int. Cl. C08b *19/00, 19/10*

U.S. Cl. 260—209.6 **11 Claims**

1. A process for preparing a modified natural gum which comprises subjecting a natural gum to hydrolysis in the presence of a hydrolyzing agent selected from the group consisting of inorganic acids, alkali metal hydroxides and enzymes in an amount from about 0.1 to about 2 percent, by weight of water present during hydrolysis and at a temperature from about 80°F. to about 212°F.

3,891,621

CARBOHYDRATE-BORON ALKOXIDE COMPOUNDS

Jett C. Arthur, Jr., Metairie, and Malkait S. Bains, New Orleans, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 256,021, May 23, 1972, Pat. No. 3,790,562. This application Oct. 15, 1973, Ser. No. 406,408

Int. Cl. C07c *47/18*

U.S. Cl. 260—210 R **21 Claims**

2. A process for making methyl-alpha-D- glucoside-boron isopropoxide having the empirical formula $[CH_3]\ [C_6H_7O_6]\ [B(OC_3H_7)_2]_4$, the process comprising

a. mixing 8 g of methyl-alpha-D-glucoside with about 25 ml of boron isopropoxide and 100 ml of benzene,

b. refluxing the mixture and removing the isopropanol formed by azeotropic distillation, and

c. removing the remaining volatiles by distilling at 100°C/0.3 torr, to obtain the dry methyl-alpha-D-glucoside-boron isopropoxide.

3,891,622

HEPARIN ESTERS

Jean Mardiguian, and Pierre Fournier, both of Paris, France, assignors to Societe anonyme dite: MAR-PHA, Societe d'Etude et d'Exploitation de Marques, Paris, France

Filed Aug. 14, 1972, Ser. No. 280,175

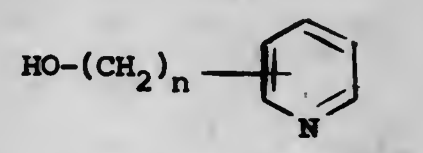
Claims priority, application United Kingdom, Aug. 16, 1971, 38371/71

Int. Cl. C08b *19/03*

U.S. Cl. 260—211 R **14 Claims**

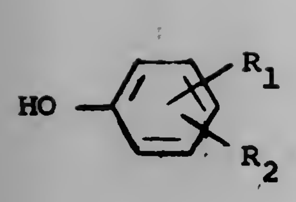
1. A heparin ester in which the carboxyl groups of heparin are esterified, partially or completely, by an alcohol or phenol chosen from the following categories:

A. pyridylalkanols of the formula:



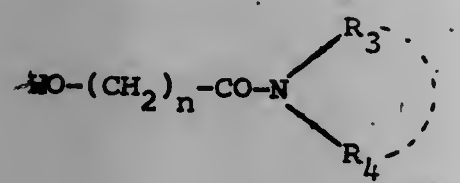
in which *n* is 1, 2 or 3;

B. optionally substituted phenols of the formula:



in which R_1 and R_2 each denote H, NO_2 or COOR where R is H or alkyl of 1 to 4 carbon atoms; and

C. ω-hydroxy-amides of the formula:



in which *n* is 1, 2 or 3, and R_3 and R_4, taken separately, are each alkyl of 1 to 4 carbon atoms, or R_3 and R_4, taken together with the nitrogen atom to which they are attached, form a nitrogen-containing heterocyclic ring with 5 or 6 ring atoms which can contain a second hetero-atom of nitrogen or oxygen.

3,891,623
PROCESS FOR PREPARING CYTIDINES

Helmut Vorbrüggen, and Ulrich Niedballa, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

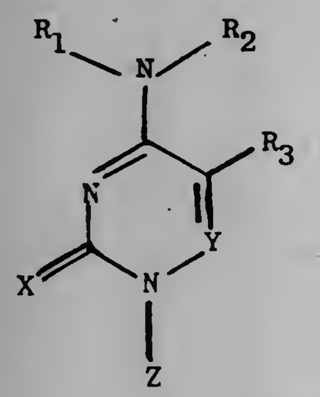
Filed May 3, 1972, Ser. No. 250,045

Claims priority, application Germany, May 4, 1971, 2122991

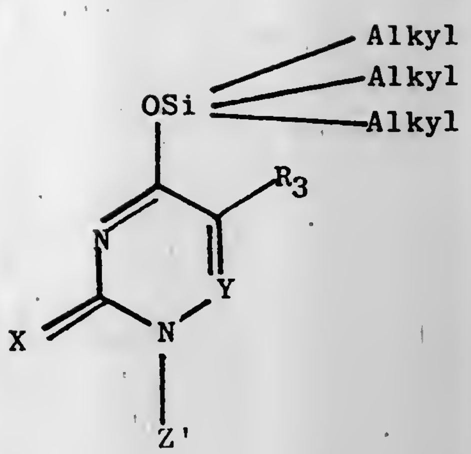
Int. Cl. C07d *51/52*

U.S. Cl. 260—211.5 R **24 Claims**

1. In a process for the preparation of pharmaceutically useful cytidines of the formula



wherein R_1 and R_2 are both hydrogen or alkyl of 1 to 6 carbon atoms; or R_1 is hydrogen and R_2 is hydroxyl, amino, alkyl of 1 to 6 carbon atoms, phenyl or phenyl-lower alkyl optionally ring substituted with hydroxyl or amino, or amino alkyl N-substituted with alkyl of 1 to 4 carbon atoms; or R_1 and R_2; together with the N-atom, collectively represent a heteromonocyclic ring selected from the group consisting of pyrrolidino, 2-methylpyrrolindino, 2,5-dimethylpyrrolindino, 3-ethylpyrrolindino, piperindino, homopiperidino, morpholino, imidazolyl, triazolyl, piperazino, indolyl and anilino; R_1 is hydrogen, halogen or alkyl of 1 to 6 carbon atoms; X is oxygen or sulfur; Y is nitrogen or CH; and Z is a free or masked monosaccharide residue, the improvement which comprises reacting a 4-trialkyl-silyloxyuridine derivative of the formula



wherein Alkyl is of 1 to 3 carbon atoms, Z′ is a hydrolyzable silylated, or hydrolyzable O-acylated masked monosaccharide residue Z, wherein acyl is lower alkanoyl, benzoyl, p-chlorobenzoyl, p-nitrobenzoyl, touyl, or benzyl and R_3, X, Y and Z have the above-indicated meanings, with ammonia or with a primary or secondary amine of the formula H N R_1 R_2, or with a salt of said primary or secondary amine in the presence of 1 to 5 moles of a tertiary amine per mole of amine salt to form said cytidine.

3,891,624
PREPARATION OF REDISPERSIBLE HYDROPHOBIC STARCH DERIVATIVES

Douwe Johannes Boonstra, Veendam, and Frans Berkhout, Vries, both of Netherlands, assignors to Scholten-Honig Research N.V., Netherlands

Filed July 9, 1971, Ser. No. 161,922.

Claims priority, application United Kingdom, July 14, 1970, 33990/70

Int. Cl. C08b *19/06*

U.S. Cl. 260—233.3 R **9 Claims**

1. A process for the manufacture of dry hydrophobic starch derivatives which are dispersible as subgranule particles in water at a temperature ranging from ambient temperature up to 100°C to provide a stable colloidal aqueous suspension of hydrophobic starch particles having a weight average size of less than 1 micron, which comprises subjecting a granular water-insoluble hydrophobic starch derivative containing ether-linked or ester-linked hydrophobic groups selected from the group consisting of aliphatic groups of 3–17 carbon atoms, alicyclic groups of 6–12 carbon atoms and aromatic groups of 6–12 carbon atoms, having a degree of substitution of 0.1 to 1.0 and having a moisture content of 4 to 15 percent, to mechanical shear and compression at a pressure of from 10 atm. to 250 atm. with attendant heating to temperatures in the range of 100°C to 250°C, forcing the resultant mass through a die and discharging said mass from said die, said discharge from said die being accompanied by a sudden release of pressure to atmospheric pressure, whereby said hydrophobic starch derivative is expanded to a porous mass consisting of fragmented granules.

3,891,625
TERTIARY PERFLUORO-AMINO ETHERS

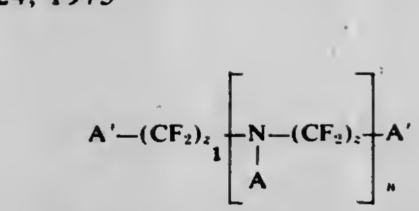
Siegfried Benninger, Schwalbach, Taunus, and Siegfried Rebsdat, Neuotting, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 9, 1973, Ser. No. 386,856

Int. Cl. C07d *51/70*

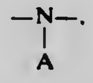
U.S. Cl. 260—239 A **24 Claims**

1. A compound of the formula



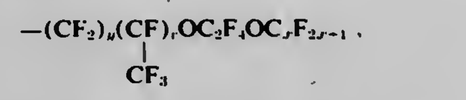
$$A'-(CF_2)_{z_1}\left[-\underset{\substack{|\\A}}{N}-(CF_2)_z-\right]_n A'$$

where the radicals A′ each are $—NA_2$ or together form the radical



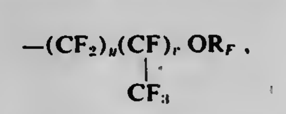
$$-\underset{\substack{|\\A}}{N}-,$$

from 0 to 2 radicals A each represent



$$-(CF_2)_n\underset{\substack{|\\CF_3}}{(CF)}_v OC_2F_4OC_yF_{2y+1},$$

from 0 to 2 radicals A each represent R_F.
all other radicals A, but at least one, each represent



$$-(CF_2)_n\underset{\substack{|\\CF_3}}{(CF)}_v OR_F,$$

R_F is a linear perfluoro-alkyl radical having from one to three carbon atoms,
z_1 is an integer of from 1 to 6,
z represents the same or different integers of from 1 to 6,
n is 0, 1, 2, 3, 4, 5 or 6,
y is 1, 2 or 3,
v is 0 or 1 and
x is 2 or 3.

3,891,626
1-SUBSTITUTED BENZO(B) AZOCINE DERIVATIVES AND THEIR ACID ADDITION SALTS

Tadashi Okamoto, Ashiya; Tsuyoshi Kobayashi, Minoo, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Japan

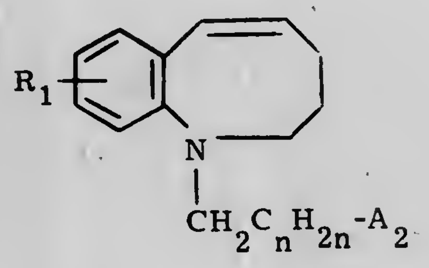
Division of Ser. No. 80,801, Oct. 14, 1970, abandoned. This application Nov. 1, 1973, Ser. No. 411,922

Claims priority, application Japan, Apr. 30, 1970, 45-37361; Apr. 30, 1970, 45-37362; May 18, 1970, 45-42636; May 27, 1970, 45-45920

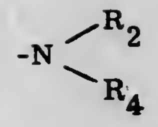
Int. Cl. C07d *41/00, 57/00, 87/83*

U.S. Cl. 260—239 BB **18 Claims**

1. A 1-substituted benzo[b]azocine derivative of the formula:



wherein R_1 is a hydrogen atom or halogen atom, A_2 is a piperidino group, a morpholino group or a group of the formula:



wherein R_2 is a hydrogen atom or a lower alkyl group and R_4 is a hydrogen atom or a lower alkyl group and *n* is an integer from 1 to 3, and pharmaceutically acceptable additional salts thereof.

3,891,627
6-(ALPHA-[AMIDINOTHIOACYLAMIDO)ACYLAMIDO]-PENICILLANIC ACIDS

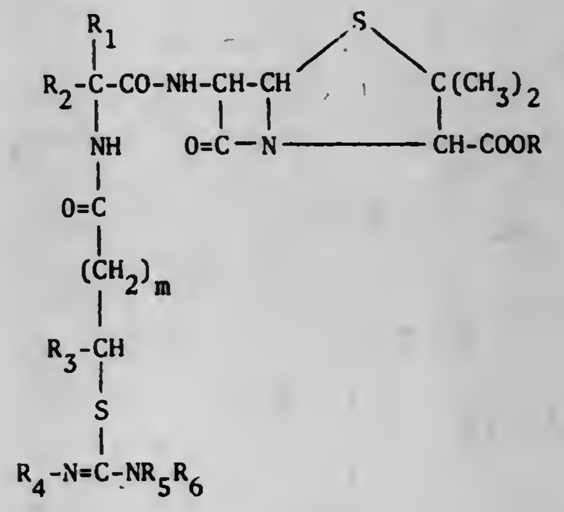
Robert L. Rosati, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed May 18, 1972, Ser. No. 254,524

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 **12 Claims**

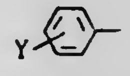
1. A compound of the formula



and the pharmaceutically-acceptable metal and amine salts thereof wherein

R is selected from the group consisting of hydrogen and acyloxy lower alkyl wherein acyloxy is selected from the group consisting of lower alkanoyloxy, benzoyloxy and substituted benzoyloxy wherein the substituent is selected from the group consisting of chloro, bromo, fluoro, lower alkyl, lower alkoxy and trifluoromethyl;

R_1 is selected from the group consisting of hydrogen, alkyl of from 1 to 6 carbon atoms, cycloalkyl of from 3 to 6 carbon atoms, 1,4-cyclohexadienyl, 2,4,6-cycloheptatrienyl, naphthyl, benzyl, phenethyl, indolylmethyl, furyl, thienyl and



wherein

Y is selected from the group consisting of hydrogen, nitro, di(lower alkyl)amino, lower alkanoylamino, lower alkyl, lower alkoxy, hydroxy, sulfamyl, chloro, bromo, fluoro, iodo and trifluoromethyl;

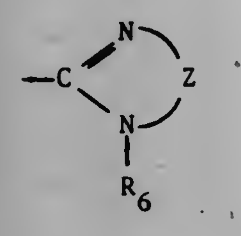
R_2 is selected from the group consisting of hydrogen and lower alkyl;

R_1 and R_2 when taken together with the carbon atom to which they are attached are cycloalkylidene of 3 to 10 carbon atoms;

R_3 is selected from the group consisting of hydrogen and methyl;

each of R_5 and R_6 is selected from the group consisting of hydrogen and lower alkyl;

R_4 is selected from the group consisting of hydrogen, lower alkyl, carboxymethyl, carbamoylmethyl and amidino;
R_4 and R_5 when taken together with the amidino group to which they are attached form a heterocyclic ring of the formula



wherein
Z is selected from the group consisting of —N=CH—, alkylene of from 2 to 5 carbon atoms, —C(O)—CH=CH— and —CH_2—C(O)—; and
m is 0 or 1.

3,891,628
PROCESS FOR PREPARING PENICILLINS

Peter Max Smid, Delft, and Jan Kalter, Zevenhuizen, both of Netherlands, assignors to Koninklijke Nederlandsche Gist-en Spiritusfabrieken N.V., Delft, Netherlands

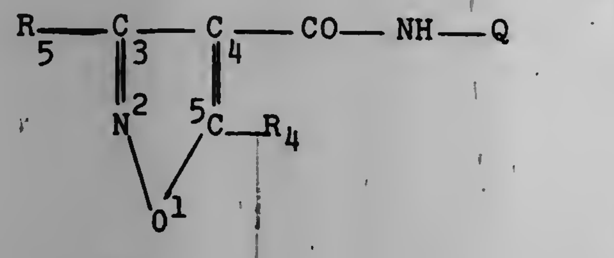
Filed June 14, 1972, Ser. No. 262,786

Claims priority, application United Kingdom, June 15, 1971, 28075/71

Int. Cl. C07d *99/16, 99/24*

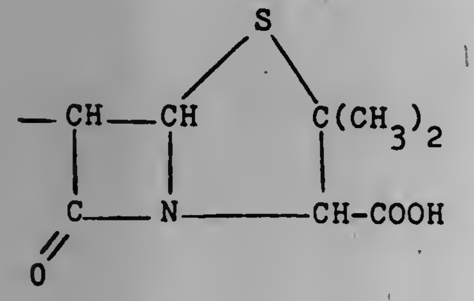
U.S. Cl. 260—239.1 5 Claims

1. A process for the preparation of penicillins of the formula



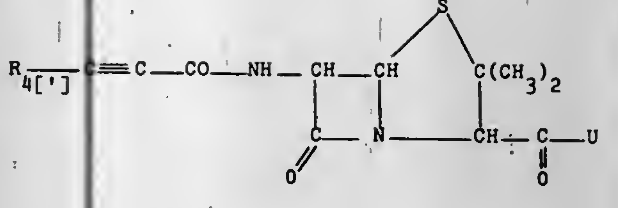
VII

wherein Q is a penicillanic acid group of the formula



IX

wherein R_1 is selected from the group consisting of hydrogen, lower alkyl optionally substituted, phenyl optionally substituted, lower alkoxy, benzyl optionally substituted on the phenyl ring, cycloalkyl of 5 to 8 carbon atoms optionally substituted and carboxy and esterified carboxy, said optional substituents being selected from the group consisting of hydroxy, lower alkoxy, carboxy, alkoxycarbonyl, halogen and diloweralkylamino and R_5 is phenyl optionally carrying at least one substituent selected from the group consisting of lower alkyl, lower alkoxy, di(lower)alkylamino, nitro and halogen, or R_5 is a tertiary lower alkyl or adamantyl, which comprises reacting a compound of the formula



XI

wherein U is selected from the group consisting of hydroxy, imido and OE in which E is selected from the group consisting of a silyl, benzyl, benzhydryl, 2,2,2-trichloroethyl and optionally halosubstituted phenacyl with a nitrile oxide of the formula

$$R_5—C \equiv N \rightarrow O \qquad \text{XIII}$$

wherein R_5 has the above definition in the presence of at least one aprotic dipolar organic solvent and optional amounts of hexamethylphosphontriamide to form the corresponding isoxazole and converting the group U in the resulting product into a hydroxy group in the resulting product.

3,891,629
PROCESS FOR THE PREPARATION OF 6-[D-2-AMINO-2(1,4-CYCLO-HEXADIENYL-) ACETAMIDO] PENICILLANIC ACID

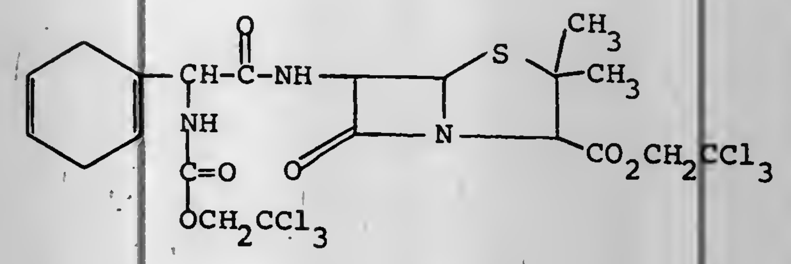
Patrick Andrew Diassi, Westfield, N.J., and Manmohan Singh Atwal, New York, N.Y., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 16, 1973, Ser. No. 333,264

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 4 Claims

1. A compound of the formula



3,891,630
SUBSTITUTED PYRAZOLO[3,4-E][1,4]THIAZEPINES AND ISOXAZOLO[5,4-E][1,4]THIAZEPINES

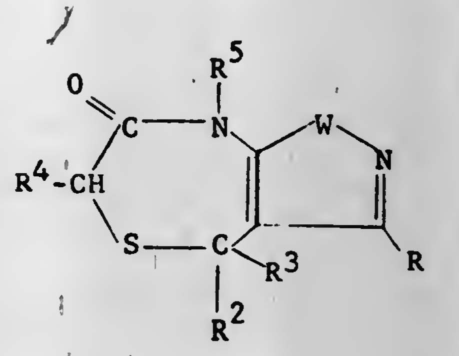
Leo Ralph Swett, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 4, 1974, Ser. No. 448,086

Int. Cl. C07d *99/10, 99/00*

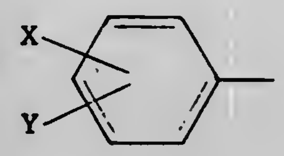
U.S. Cl. 260—239.3 B 11 Claims

1. The process of preparing an isoxazolo[5,4-e]-[1,4]- or a pyrazolo[3,4-e] [1,4]thiazepinone of the formula:



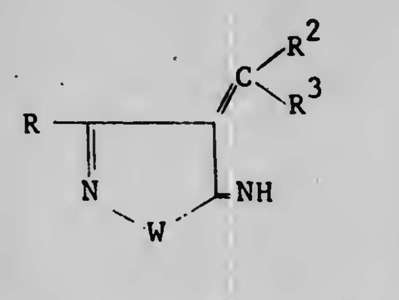
I

wherein W is >0 or >N-R^1, and wherein R is hydrogen, loweralkyl or phenyl, R^1 is hydrogen, loweralkyl, phenyl or cyclohexyl, R^2 is loweralkyl, cyclopropyl, 2-furyl or



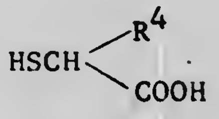
II

wherein X is hydrogen, halogen, trifluoromethyl, hydroxy, loweralkoxy or dimethylamino and Y is hydrogen, chlorine or loweralkoxy, R^3 is hydrogen or loweralkyl, R^4 is hydrogen, loweralkyl or carboxyloweralkyl and R^5 is hydrogen, consisting essentially in condensing a compound of the formula:



III

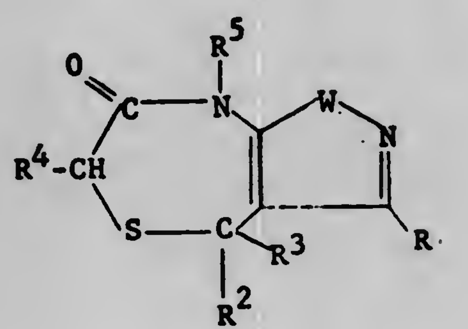
wherein W, R, R^2 and R^3 have the above meanin with a thioglycolic acid of the formula:



IV

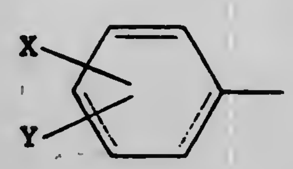
wherein R^4 has the above meaning, in the presence of an inert solvent boiling above 50° C. at a temperature between 60° and 150° C. for a period of at least 30 minutes.

5. A substituted pyrazolo[3,4-e] [1,4]thiazepinone or an isoxazolo[5,4-e] [1,4]thiazepinone of the formula:



I

wherein W is >0 or >NR^1, R is hydrogen, loweralkyl or phenyl, R^1 is hydrogen, loweralkyl, phenyl or cyclohexyl, R^2 is lower-alkyl, cyclopropyl, 2-furyl or



II

wherein X is hydrogen, halogen, trifluoromethyl, hydroxy, loweralkoxy or dimethylamino and Y is hydrogen, chlorine or loweralkoxy, R^3 is hydrogen or loweralkyl, R^4 is hydrogen, loweralkyl or carboxyloweralkyl and R^5 is hydrogen, loweralkyl or diloweralkylaminoloweralkyl.

3,891,631
PROCESS FOR PREPARING 17α-MONOESTERS OF 17α, 21-DIHYDROXY-20-OXO STEROIDS

Gordon Hanley Phillipps, Wembley; Brian MacDonald Bain, Chalfont St. Peter, and Graham Durrant, London, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Filed Aug. 10, 1973, Ser. No. 387,487

Claims priority, application United Kingdom, Aug. 11, 1972, 37655/72

Int. Cl.^{2} C07C *173/00*

U.S. Cl. 260—239.55 R 23 Claims

1. A process for the preparation of 17α-carboxylate or neutral phosphate or carbonate esters of 17α,21-dihydroxy-20-oxo-steroids which comprises reacting a 21-carboxylate or neutral phosphate or carbonate ester of a 17α,21-dihydroxy-20-oxo-steroid with a non-hydroxylic base in an anhydrous aprotic medium to remove a proton selectively from the 17α-hydroxyl grouping without elimination of the 17α-oxygen function, and subsequently neutralising or acidifying the reaction mixture whereby the intermediate product is protonated to produce the desired 17α-ester.

3,891,632
TRIAZOLYLSTYRYL COMPOUNDS

Fritz Fleck, Bottmingen, Basel Land, and Hans Rudolf Schmid, Riehen, Basel Stodt, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

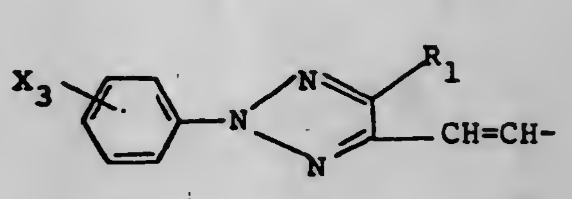
Continuation-in-part of Ser. No. 41,055, May 27, 1970, abandoned. This application Mar. 28, 1973, Ser. No. 345,677

Claims priority, application Switzerland, June 6, 1969, 8647/69; June 11, 1969, 8889/69

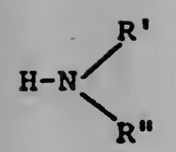
Int. Cl. C09b *23/14*

U.S. Cl. 260—240 D 12 Claims

1. A triazolyl compound of formula



where
R_1 stands for hydrogen; alkyl with 1–6 carbon atoms, which may bear as substituents hydroxy, halogen or alkoxy with 1–6 carbon atoms; or phenyl, which may bear as substituents halogen, nitrile, alkyl or alkoxy with 1–6 carbon atoms, phenyl, the sulphonic or carboxylic group or the sulphonic or carboxylic amide group,
R_2 stands for a phenyl or naphthyl radical, which may be substituted,
X_3 stands for hydrogen, halogen or alkyl or alkoxy with 1–6 carbon atoms
and the ring B may bear a substituent,
provided that the substituents of the ring B and of phenyl radicals occurring in R_2 are alkyl or alkoxy with 1–6 carbon atoms; halogen; nitrile; unsubstituted or substituted phenyl or phenoxy; carboxylic or sulphonic acid; carboxylic or sulphonic acid phenyl, substituted phenyl or optionally substituted alkyl (C_{1-6}) ester; carboxylic or sulphonic acid amide; optionally substituted phenylsulphonyl; or alkylsulphonyl with 1–6 carbon atoms; where alkyl may bear as substituents hydroxy, halogen or alkoxy with 1–6 carbon atoms and phenyl and phenoxy may bear as substituents alkyl (C_{1-6}), alkoxy (C_{1-6}) or halogen; and wherein the amides are derived from amines of formula



where
R′ stands for hydrogen, alkyl with 1–6 carbon atoms, hydroxyalkyl with 2–4 carbon atoms, alkoxyalkyl with 3–6 carbon atoms, phenyl, methylphenyl, halogenphenyl, methoxyphenyl or phenylalkyl where alkyl is of 1–6 carbon atoms
and R″ stands for hydrogen, alkyl with 1–6 carbon atoms or hydroxyalkyl with 2–4 carbon atoms.

3,891,633
METHOD OF PRODUCING DIANHYDRIDES OF AROMATIC TETRACARBOXYLIC ACIDS

Alfred Anisimovich Berlin, Leninsky prospekt, 57, kv. 9; Boris Izrailevich Liogonky, ulitsa 26 Bakinskikh Komissarov, 7, korpus 4, kv. 45, and Boris Isaakovich Zapadinsky, prospekt Vernadskogo, II/19, kv. 221, all of Moscow, U.S.S.R.

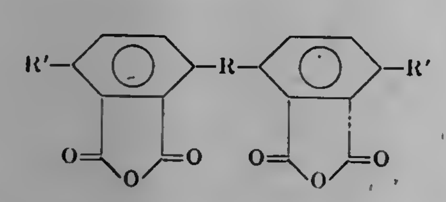
Continuation of Ser. No. 102,911, Dec. 30, 1970, abandoned. This application Sept. 17, 1973, Ser. No. 397,736

Claims priority, application U.S.S.R., Jan. 7, 1970, 1386176; 1386177; 1386178; 1386182; 1386186

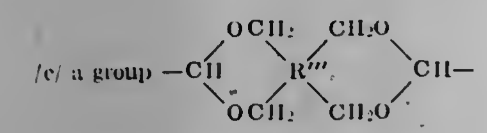
Int. Cl. C07c *63/18*

U.S. Cl. 260—240 G **14 Claims**

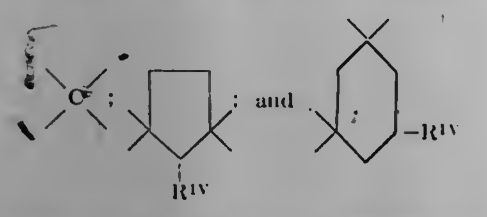
1. A dianhydride of aromatic tetracarboxylic acids, of the formula:



where R is
a. arylene selected from the group consisting of p-phenylene, m-phenylene, 4,4′-diphenylene, 3,3′-dimethyl-4,4′-diphenylene, 4,4′-diphenylenoxide, 4,4′-diphenylene, -diphenylenoxide, 4,4′-diphenylene-methane, and 4,4-diphenylenesulphone;
b. a group —CH=N—R″—N=CH—, where R″is arylene selected from the group consisting of p-phenylene, m-phenylene, 4,4′-diphenylene, 3,3′-diphenylene, 3,3′-dimethyl-4,4′-diphenylene, 3,3′-dimethoxy-4,4′-diphenylene, 4,4′-diphenylenoxide, 4,4′-diphenylenemethane, 4,4′-diphenylenesulphone, 4,4′-diphenylenesulphide, 1,4-napthylene, 1,5-naphthylene, 2,6-naphthylene, 2,7-naphthylene, and 1,4-anthrylene;
c. a group



where R‴ is selected from the group consisting of



where R^{IV} is selected from the group consisting of H, OH, and =O; or
d. a group $-CH_2OCO-R^V-COOCH_2-$, where R^V is selected from the group consisting of p-phenylene, m-phenylene, 4,4′-diphenylene, 1,4-naphthylene, 1,5-naphthylene, 2,6-naphthylene, and 2,7-naphthylene; and
R′ is selected from the group consisting of hydrogen, phenyl, and naphthyl with the proviso that when R is p1phenylene or m-phenylene, R′ is selected from the group p-phenylene of phenyl and naphthyl.

3,891,634
P-HYDROXYMETHYLPHENYLACETAMIDOCEPHALOSPORINS

George L. Dunn, Wayne, and John R. E. Hoover, Philadelphia, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

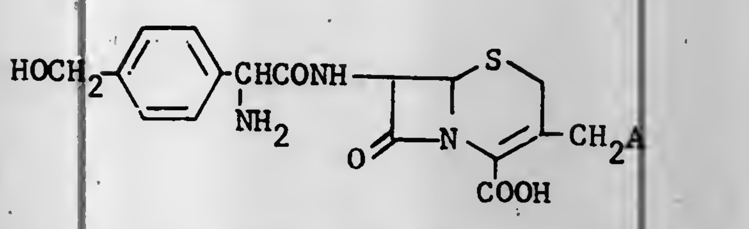
Continuation-in-part of Ser. No. 262,903, June 14, 1972, and a continuation-in-part of Ser. No. 289,499, Sept. 15, 1972, said Ser. No. 262,903, is a continuation-in-part of Ser. No. 116,598, Feb. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 99,296, Dec. 17, 1970, abandoned, said Ser. No. 289,499, is a continuation-in-part of Ser. No. 262,903 and Ser. No. 116,599, Feb. 18, 1971, abandoned, which is a continuation-in-part of said Ser. No. 99,296. This application May 11, 1973, Ser. No. 359,566

application May 11, 1973, Ser. No. 359,566

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **4 Claims**

1. A compound of the formula:



where A is monocyclic heterocyclic thio selected from the group consisting of 1,2,3-triazolyl, 1,2,4-triazolyl, 1,3,4-thiadiazolyl, 1,3,4-oxadiazolyl, or tetrazolyl, each such heterocyclic group being unsubstituted or substituted with methyl, or a phaımaceutically acceptable salt thereof.

3,891,635
7-[3-(PHENYL)-ISOXAZOL-5-YL]ACETAMIDO-CEPHALOSPORANIC ACIDS

Peter Wolfgang Henniger, Leiden, and Peter Max Smid, Delft, both of Netherlands, assignors to Koninklijke Nederlandsche Gist-en Spiritusfabrieken N.V., Delft, Netherlands

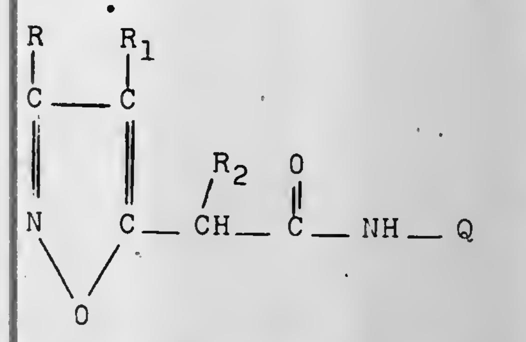
Filed Nov. 3, 1971, Ser. No. 195,482

Claims priority, application United Kingdom, Nov. 6, 1970, 53040/70

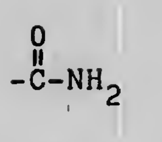
Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **10 Claims**

1. A compound of the formula

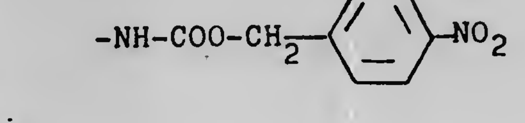


wherein R is selected from the group consisting of mono aminophenyl, mononitro phenyl, phenyl and phenyl substituted with one to three members of the group consisting of chlorine, fluorine, and lower alkyl of 1 to 4 carbon atoms, R_1 is selected from the group consisting of hydrogen, lower alkyl of 1 to 4 carbon atoms, cyano amino,

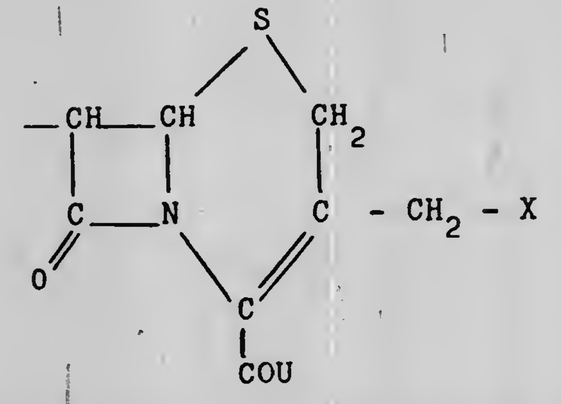


$$-\overset{\overset{O}{\|}}{C}-NH_2$$

and chlorine, R_2 is selected from the group consisting of hydrogen, amino, lower alkyl of 1 to 4 carbon atoms, bromo, chloro and



and Q is



X is selected from the group consisting of hydrogen, hydroxy and lower alkanoyloxy and U is OY, wherein Y is selected from the group consisting of hydrogen, non-toxic pharmaceutically acceptable salt forming groups and alkyl of 1 to 4 carbon atoms.

3,891,636
10-(PIPERIDINO-ALKYL) -PHENOTHIAZINES

Pierre Henri Derible, Le Perreux, and Jean-Paul Lavaux, Paris, both of France, assignors to Roussel Uclaf, Paris, France

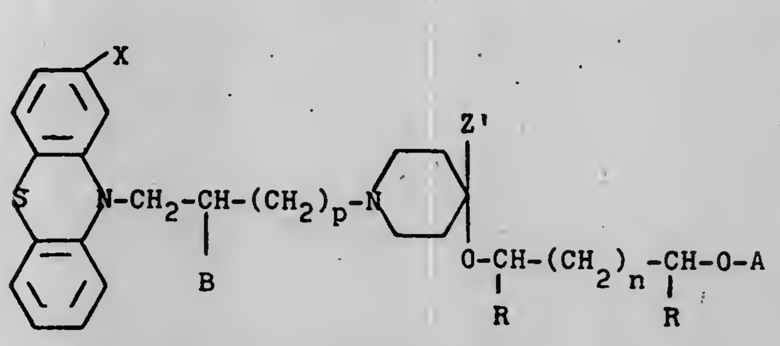
Continuation-in-part of Ser. No. 252,461, May 11, 1972, abandoned. This application Oct. 19, 1973, Ser. No. 407,995

Claims priority, application France, Nov. 9, 1972, 72.39673

Int. Cl. C07d *279/26, 279/28*

U.S. Cl. 260—243 A **24 Claims**

1. A compound selected from the group consisting of 10-(piperidino-alkyl)-phenothiazines of the formula



wherein X is selected from the group consisting of hydrogen, chlorine, $—CF_3$, $—OCH_3$ and $—SCH_3$, B and R are individually selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms, Z′ is selected from the group consisting of hydrogen and alkyl of 1 to 10 carbon atoms, *p* is 0 or 1, *n* is 0, 1 or 2 and A is selected from the group consisting of hydrogen, $—COOR_2$ and $—COR_1$, R_2 is linear alkyl of 1 to 15 carbon atoms and R_1 is selected from the group consisting of alkyl, alkoxyalkyl and alkenyl of 1 to 18 carbon atoms and 3,4,5-trimethoxyphenyl and their non-toxic, pharmaceutically acceptable acid addition salts.

3,891,637
PROCESS FOR THE PRODUCTION OF CARBOXAMIDES OF OXO-1,2-BENZOTHIAZINE-1,1-DIOXIDES

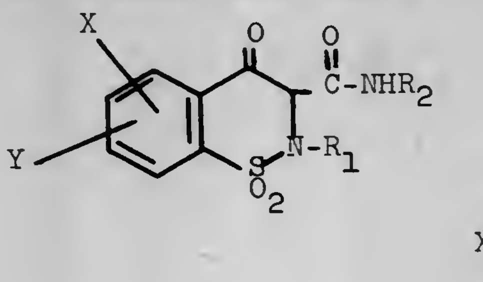
Joseph G. Lombardino, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Oct. 1, 1974, Ser. No. 510,892

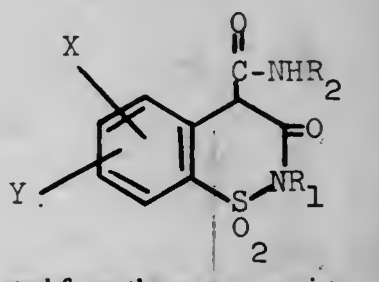
Int. Cl. C07d *93/02*

U.S. Cl. 260—243 R **10 Claims**

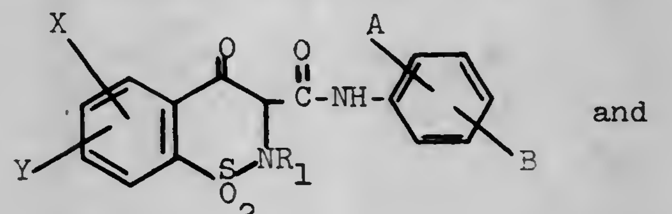
1. A process for preparing a 3,4-dihydro-2H-1,2-benzothiazine 1,1-dioxide of the formula:



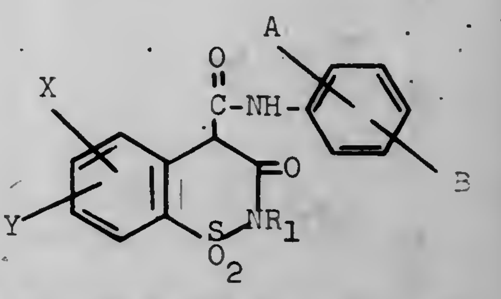
or



wherein X and Y each are selected from the group consisting of hydrogen, fluorine, chlorine, bromine, nitro, trifluoromethyl, and alkyl and alkoxy of up to five carbon atoms;
R_1 is a member selected from the group consisting of hydrogen, lower alkyl and alkenyl of up to four carbon atoms and phenyl alkyl of up to three carbon atoms in the alkyl moiety,
and R_2 is a member selected from the group consisting of 2-pyridyl, 3-methyl-2-pyridyl, 4-methyl-2-pyridyl, 5-methyl-2-pyridyl, 6-methyl-2-pyridyl, 4,6-dimethyl-2-pyridyl, 5-chloro-2-pyridyl, 5-bromo-2-pyridyl, 5-nitro-2-pyridyl, 3-hydroxy-2-pyridyl, 5-carboxamido-2-pyridyl, 2-pyrazinyl, 2-pyrimidyl, 4,5-dimethyl-2-pyrimidyl, 4-pyrimidyl, 5-methyl-3-pyrazinyl, 6-methoxy-3-pyridazinyl, 1-phenyl-3-pyrazolonyl, 2-thiazolyl, 4-methyl-2-thiazolyl, 4-phenyl-2-thiazolyl, 5-bromo-2-thiazolyl, 4,5-dimethyl-2-thiazolyl, 3-isothiazolyl, 2-benzothiazolyl, 6-methyl-2-benzothiazolyl, 4-chloro-2-benzothiazolyl, 6-bromo-2-benzothiazolyl, 5-chloro-2-benzoxazolyl, 1,3,4-thiadiazolyl, 5-methyl-1,2,4-thiadiazolyl, 5-methyl-1,3,4-thiadiazolyl, 1,2,4-triazolyl and 6-phenyl-1,2,4-triazolyl;
which comprises contacting a corresponding carboxanilide compound of the formulae:



and



wherein A and B are each selected from the group consisting of hydrogen, fluorine, chlorine, bromine, nitro, trifluoromethyl and alkyl and alkoxy of up to three carbon atoms, with at least a substantially equimolar portion of an amine of the formula R_2NH_2wherein R_2 is as previously defined in reaction-inert organic solvent medium at a temperature between about 75°C. and about 200°C. until the reaction is substantially complete.

3,891,638

FUSED QUINAZOLINONES

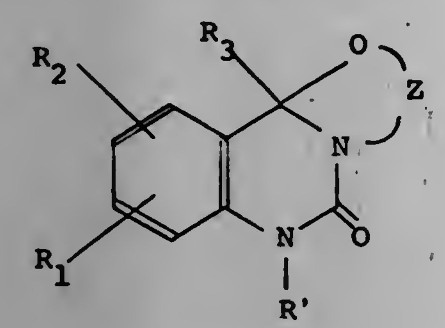
Shigeho Inaba, Takarazuka; Michihiro Yamamoto, Toyonaka; Kikuo Ishizumi, Ikeda; Kazuo Mori, Kobe; Masao Koshiba, Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 172,562, Aug. 17, 1971, abandoned. This application July 23, 1973, Ser. No. 381,571

Int. Cl. C07d *87/20*

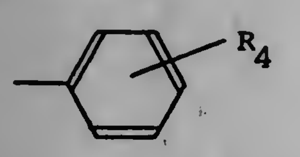
U.S. Cl. 260—244 R **21 Claims**

1. A quinazolinone derivative of the formula,



(I-a)

wherein R_1 and R_2 are individually a hydrogen atom, a C_{1-4} alkyl group, a C_{1-4} alkoxy group, a nitro group, a C_{1-4} alkylsulfonyl group or a halogen atom; R_3 is a pyridyl group, a thienyl group or a group of the formula



wherein R_4 is a hydrogen atom or a halogen atom; Z is ethylene or propylene, and R′ is aralkyl selected from the group consisting of benzyl, phenethyl, methoxybenzyl, chlorobenzyl and fluorobenzyl.

3,891,639

4-[(3-AMINO-2-ACYLOXYPROPOXY])-1,2,5-THIADIAZOLE COMPOUNDS

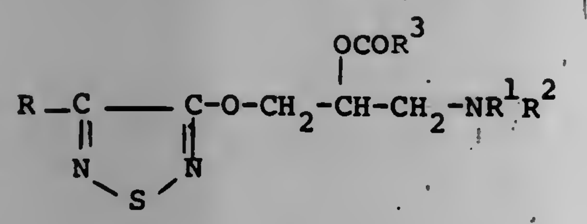
Burton Kendall Wasson, Valois, Canada, assignor to Merck Sharp & Dohme (I.A.) Corporation, Rahway, N.J.

Filed Apr. 19, 1973, Ser. No. 352,765

Int. Cl. C07d *91/54*

U.S. Cl. 260—247.1 H **8 Claims**

1. A racemic product or an optically active isomer thereof having the structure



or an acid addition salt thereof wherein R represents morpholino, piperidino and hydroxypiperidino R^1 represents hydrogen and C_{1-5} alkyl; R^2 represents C_{1-10} alkyl, hydroxy C_{1-10} alkyl, lower alkenyl, lower alkynyl; the radical NR^1R^2 can represent morpholino; and R^3 represents a mono- or polysubstituted lower alkyl wherein the alkyl group contains from 2 to 6 carbons and the substituent groups are selected from halogen, a phenyl, phenoxy or carboxy.

3,891,640

APOVINCAMINIC ACID AMINES AND ACID ADDITION SALTS THEREOF

Michel Marie Penee Plat; Monique Plat, nee Berry, both of Antony; Jean Cahn, Montrouge, and Pierre Georges Christian Tisseyre, Alencon, all of France, assignors to Synthelabo, France

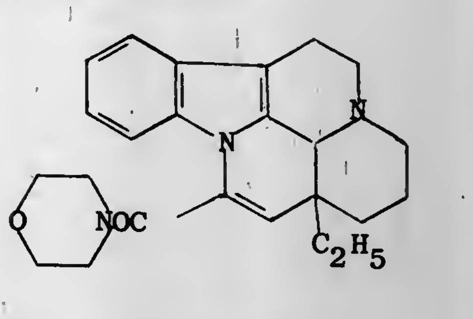
Filed Mar. 22, 1973, Ser. No. 343,681

Claims priority, application France, Mar. 22, 1972, 72.09951

Int. Cl. C07d *57/06*

U.S. Cl. 260—247.5 FP **2 Claims**

1. A compound of the formula



and the non-toxic addition salts thereof.

3,891,641

3-AMINOALCOXY-6-HYDRAZINO PYRIDAZINES

Giorgio Pifferi, Milan, Italy, assignor to I. S. F. S.p.A., Milan, Italy

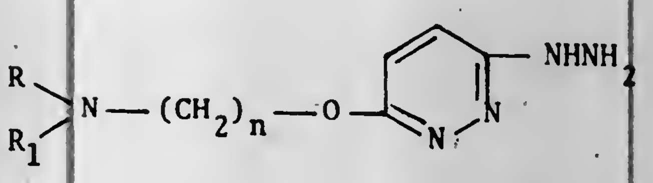
Filed Jan. 17, 1972, Ser. No. 218,531

Claims priority, application Italy, May 29, 1971, 25230/71

Int. Cl. C07d *51/04*

U.S. Cl. 260—250 A **4 Claims**

1. A compound of the formula:



wherein *n* is an integer from 2 to 3, R is hydrogen, methyl or ethyl and R_1 is methyl, ethyl or phenyl or its pharmaceutically acceptable acid addition salts.

3,891,642

O-ALKYL-O-6(P-HALOPHENYL)-PYRIDAZINYL-(3)-THIONO-PHOSPHORIC (PHOSPHONIC) ACID ESTERS

Walter Lorenz, Wuppertal, and Ingeborg Hammann, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

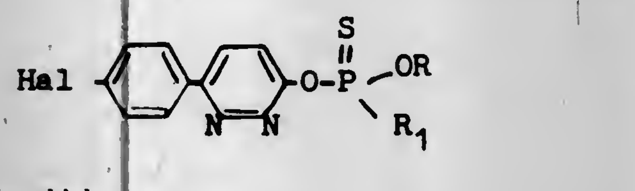
Filed Mar. 14, 1973, Ser. No. 341,189

Claims priority, application Germany, Mar. 23, 1972, 2214059

Int. Cl. C07d *51/04*

U.S. Cl. 260—250 AP **7 Claims**

1. An O-alkyl-O-6-[p-halogenophenyl]-pyridazinyl-[3]thionophosphoric(phosphonic) acid ester of the formula



(I)

in which

R is alkyl of 1 to 6 carbon atoms,

R_1 is alkyl or alkoxy of 1 to 6 carbon atoms or phenyl, and

Hal is chlorine and bromine.

3,891,643

PYRROLO([1,2,3-DE)QUINOXALIN-2-(3H])-ONES AND RELATED COMPOUNDS

John H. Sellstedt, Pottstown, and Milton Wolf, West Chester, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 252,990, May 15, 1972, Pat. No. 3,813,392, which is a division of Ser. No. 831,723, June 9, 1969, abandoned. This application Jan. 25, 1974, Ser. No. 436,570

Int. Cl. C07d *57/24*

U.S. Cl. 260—250 Q **1 Claim**

1. 7,8,9,10-tetrahydro-8-methyl-1H-pyrido[3′,4′:4,5]pyrrolo[1,2,3-de]quinoxalin-2(3H)-one.

3,891,644

10,10-DISUBSTITUTED-2,3,4,10-TETRAHYDRO-AND 1,2,3,4,10A-HEXAHYDROPYRIMIDOL [1,2-A]INDOLE DERIVATIVES

Alan Chapman White, Windsor, England, assignor to John Wyeth and Brother (Ltd.), Maidenhead, England

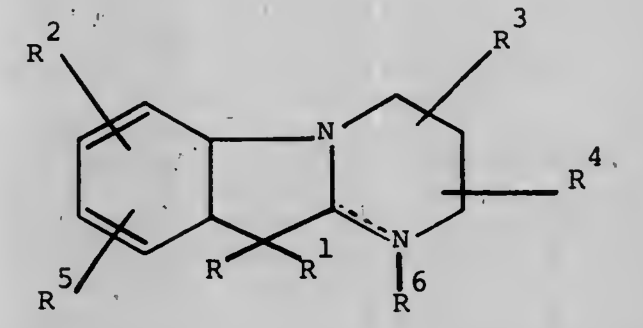
Continuation-in-part of Ser. No. 211,105, Dec. 22, 1971, abandoned. This application May 18, 1973, Ser. No. 361,701

Claims priority, application United Kingdom, Jan. 11, 1971, 1250/71; Sept. 2, 1971, 40959/71

Int. Cl. C07d *51/46*

U.S. Cl. 260—251 A **12 Claims**

1. A compound selected from the group consisted of indole derivatives having the formula:



the methiodides thereof and the acid addition salts thereof with pharmaceutically acceptable acids, in which R represents hydroxyl, acetoxy, propionoxy or butyryloxy, R^1 represents a member of the group consisting of phenyl, lower alkyl, lower alkynyl, benzyl, naphthyl, thienyl, pyridyl, monohalophenyl, dihalophenyl, lower alkyl phenyl, di(lower alkyl)phenyl, lower alkoxyphenyl, and trifluoromethylphenyl, R^2 and R^5 (which may be the same or different) represent hydrogen, halogen or lower alkoxy, R^3 and R^4 (which may be the same or different) represent hydrogen or lower alkyl, the dotted line represents an optional bond in the position indicated, and R^6, which is present only when the optional bond represented by the dotted line is absent, represents hydrogen or lower alkyl.

3,891,645

PYRIMIDYL-ANTHRAQUINONE DYES

Trevor James Smith, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

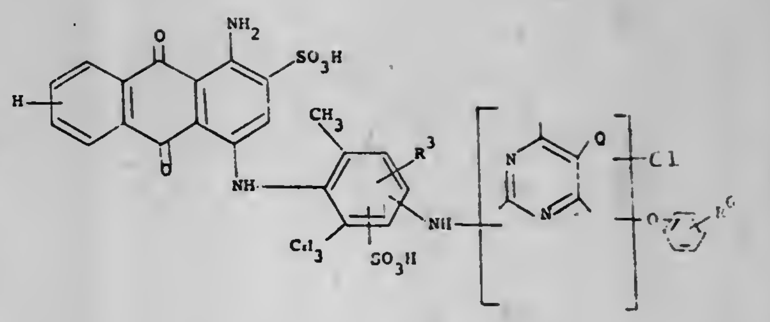
Division of Ser. No. 183,637, Sept. 24, 1971, Pat. No. 3,763,159. This application May 22, 1973, Ser. No. 362,921

Claims priority, application United Kingdom, Oct. 15, 1970, 49061/70

Int. Cl. C07d *51/36*

U.S. Cl. 260—256.5 R **1 Claim**

1. A water soluble anthraquinone dye having the formula:



wherein R^3 is hydrogen or methyl, R^6 is alkyl having 2–15 carbon atoms and Q is hydrogen, chlorine or cyano.

3,891,646

5-(2-AMINOETHYL)-2,3-DIOXOPIPERAZINES

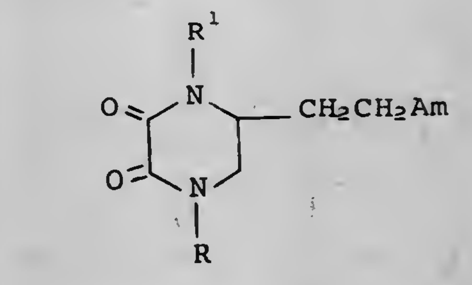
Carl Dalton Lunsford, Richmond, and Albert Duncan Cale, Jr., Mechanicsville, both of Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Continuation-in-part of Ser. No. 32,346, April 24, 1970, abandoned. This application Feb. 29, 1972, Ser. No. 230,460

Int. Cl. C07d *51/72*

U.S. Cl. 260—268 DK **5 Claims**

1. A compound selected from 5-(2-aminoethyl)-2,3-dioxopiperazines having the formula:



wherein;

R is selected from the group consisting of lower-alkyl and cyclohexyl,

R^1 is phenyl,

Am is selected from the group consisting of methylamino, isopropylamino and dimethylamino and

pharmaceutically acceptable acid addition salts thereof.

3,891,647

2-TRIFLUOROMETHYL-SULPHONYL-11-SUBSTITUTED-PIPERAZINYL-DIBENZ [B,F][1,4] OXAZEPINE

Jean Schmutz, Muri; Fritz Hunziker, and Franz Martin Künzle, both of Bern, all of Switzerland, assignors to Wander Ltd., Bern, Switzerland

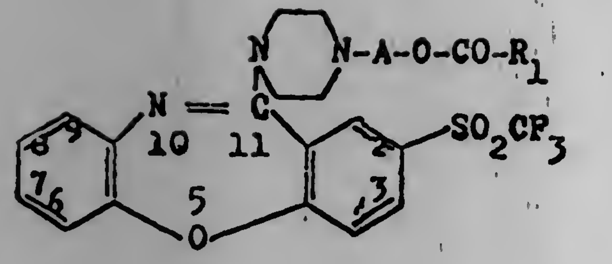
Continuation-in-part of Ser. No. 166,997, July 28, 1971, abandoned. This application Jan. 23, 1973, Ser. No. 326,121

Claims priority, application Switzerland, Aug. 6, 1970, 11922/70; June 1, 1971, 07915/71; June 6, 1972, 08441/72; Oct. 20, 1972, 15415/72; Oct. 20, 1972, 15416/72

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 TR **14 Claims**

1. A compound of the formula:



wherein

A is alkylene of 1 to 3 carbon atoms, and

R_1 is alkyl of 3 to 18 carbon atoms or alkenyl of 3 to 18 carbon atoms,

or a pharmaceutically acceptable acid addition salt thereof.

3,891,648
2-[(1,4-BENZODIOXAN)-2-YL]-ACETAMIDINES

Marcell Descamps, Crainhem, and Alex Areschka, Brussels, both of Belgium, assignors to Labaz, Paris, France

Filed May 14, 1973, Ser. No. 360,142

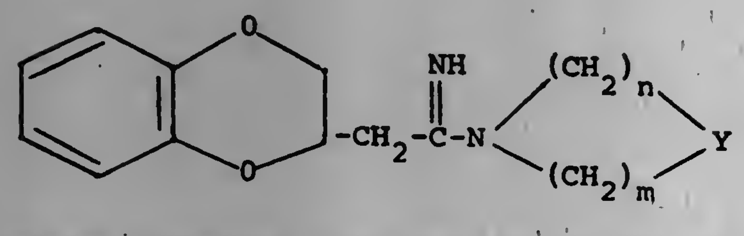
Claims priority, application United Kingdom, June 1, 1972, 25697/72

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 BC **3 Claims**

1. A compound of the formula:

I



wherein Y represents an oxygen atom, CH_2, $CH—CH_3$, NH or NR wherein R is branched- or straight-chain lower alkyl containing 1–4 carbon atoms, lower hydroxyalkyl containing 1–4 carbon atoms, carbethoxy, phenyl, chlorophenyl, fluorophenyl, trifluoromethylphenyl, benzyl, or pyridyl, *n* represents an integer from 1 to 3 and *m* represents one of the integers 2 and 3, and the pharmaceutically acceptable acid addition salts thereof.

3,891,649
1,4-DICHLORO-2,2,5,5-TETRASUBSTITUTED-3,6-PIPERAZINEDIONES

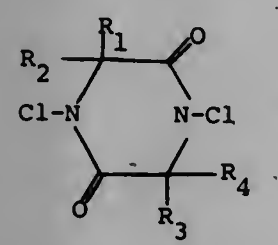
Nicolae S. Bodor, and James J. Kaminski, both of Lawrence, Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

Filed Apr. 1, 1974, Ser. No. 456,743

Int. Cl.^{2} C07D *51/72*

U.S. Cl. 260—268 DK **6 Claims**

1. A compound having the following formula:



wherein R_1, R_2, R_3 and R_4 are the same or different, and represent alkyl of from 1 to 20 carbon atoms, phenyl or naphthyl.

3,891,650
PROCESS FOR PREPARING ANTHRAQUINONE-1-ACETIC ACID AND ESTERS THEREOF

Giuseppe Ribaldone, Gallarate, and Giampietro Borsotti, Novara, both of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed May 9, 1973, Ser. No. 358,725

Claims priority, application Italy, May 10, 1972, 24170/72

Int. Cl. C09b *1/00*

U.S. Cl. 260—376 **3 Claims**

1. Process for the preparation of anthraquinone-1-acetic acid and esters thereof, characterized in that an anthraquinone-1-diazonium sulphate is reacted with 1,1-dichloroethylene in the presence of cuprous salts and H_2O or alkanols containing from 1 to 5 carbon atoms, at temperatures between 25° and 35°C, at atmospheric pressure and after the removal of any unreacted 1,1-dichloroethylene, the anthraquinone-1-acetic acid or ester thereof is separated from the reaction medium in solid form.

3,891,651
COMPOUNDS DERIVED FROM TETRAHYDRO-ISOQUINOLINE AND GAMMA-BENZOPYRONE

Rolland Robert Blaise, Paris, France, assignor to Societe Anonyme pour l'Industrie Chimique, Mulhouse-Dornach, France

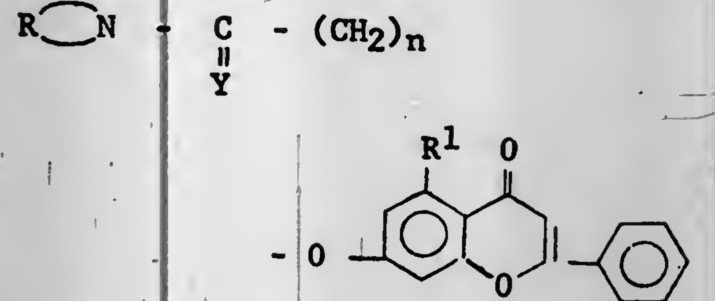
Filed Oct. 24, 1972, Ser. No. 299,895

Claims priority, application France, Oct. 21, 1971, 71.37850; July 13, 1972, 72.25542

Int. Cl. C07d *33/48*

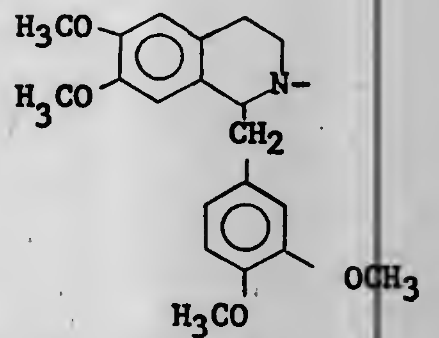
U.S. Cl. 260—287 R **2 Claims**

1. A compound derived from 1-(3,4-dimethoxy benzyl) 6,7-dimethoxy 1,2,3,4-tetrahydro isoquinoline and 2-phenyl gammabenzopyrone, of formula

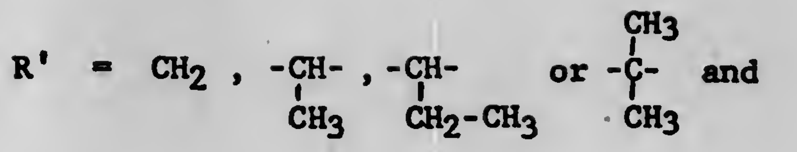


(I)

wherein R⌒N- is

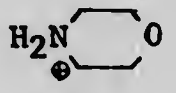


n is 1, Y is an oxygen atom, and R^1 is the group $-O-(R')-COO^-B^+$ wherein



$$R' = CH_2\ ,\ \underset{CH_3}{-CH-}\ ,\ \underset{CH_2-CH_3}{-CH-}\ \text{or}\ \overset{CH_3}{\underset{CH_3}{-C-}}\ \text{and}$$

$B^+ = Na^+, K^+, H_3N^+—CH_2—CH_2OH, H_2N^+(CH_2—CH_2OH)_2, HN^+(CH_2—CH_2OH)_3$ or



3,891,652
ANTIANGINAL ARYLDECAHYDROPYRROLO[3,4-F]QUINOLINES

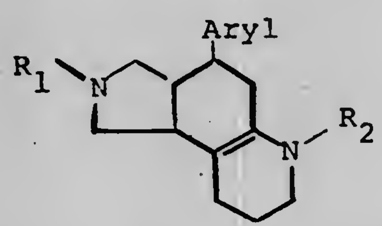
Frederic Peter Hauck, Somerville, and Joseph E. Sundeen, Trenton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed June 28, 1973, Ser. No. 374,593

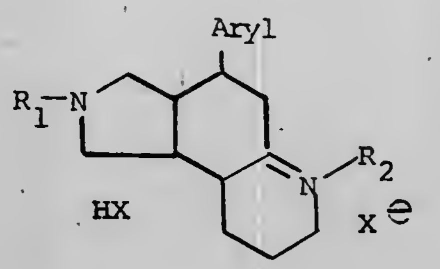
Int. Cl. C07d *33/52*

U.S. Cl. 260—288 R **5 Claims**

1. A compound of the formula



wherein Aryl is selected from the group consisting of phenyl, naphthyl, substituted phenyl and substituted naphthyl, wherein said substituent is selected from the group consisting of lower alkyl, lower alkoxy, di(lower alkyl)amino, halogen and trifluoromethyl, and R_1 and R_2 are selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, aryl-lower alkyl and styryl, and acid addition salts thereof having the formula:



3,891,653
SUBSTITUTED 4-5 DEHYDRO-TETRAZOLO(1,5-A)QUINOLENES

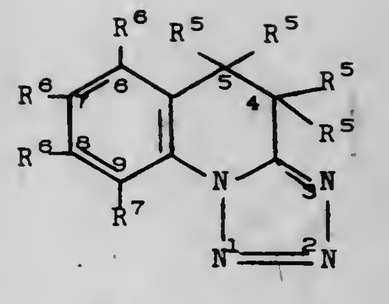
Barry A. Dreikorn, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 53,320, July 8, 1970, Pat. No. 3,764,681. This application June 29, 1973, Ser. No. 375,213

Int. Cl. C07d *33/50*

U.S. Cl. 260—288 CF **4 Claims**

1. The compounds of the formula



and the phytologically-acceptable mineral acid addition salts of those compounds wherein R^7 represents amino or R^6 represents $—CH_2Y$ wherein Y is amino or loweralkylamino; wherein, in the above formula

each R^5 independently represents hydrogen, halo, cyano, or loweralkyl of C_1–C_3;

each R^6 independently represents R^5, R^8, loweralkoxy of C_1–C_3, or substituted methyl of the formula

$$—CH_2Y$$

wherein Y, as above, represents amino, loweralkylamino of C_1–C_3, cyano, hydroxy, halo, or loweralkoxy of C_1–C_3;

R^7 represents R^6, amino, or acetamido; and

R^8 represents alkenyl of C_2–C_3 or alkynyl or C_2–C_3,

subject to the limitation that no more than one R^6 or R^7 substituent represents R^8, that no more than one of the R^5, R^6, and R^7 substituents represents cyano, aminomethyl or cyanomethyl, and that at least five but not more than seven of the R^5, R^6, and R^7 substituents represent hydrogen.

3,891,654
6,7 SUBSTITUTED 3-HYDROXYMETHYL- 1 PHENYL, BENZYL OR PHENYLETHYL SUBSTITUTED ISOQUINOLINES

Raymond Valette, Saulx Les Chartreux, France, assignor to Albert & Rowland S.A., Paris, France

Filed Sept. 21, 1972, Ser. No. 290,813

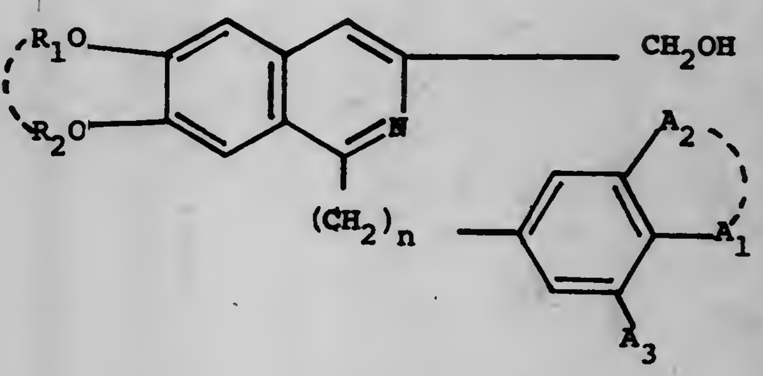
Claims priority, application United Kingdom, Sept. 22, 1971, 44240/71

Int. Cl. C07d *33/38*

U.S. Cl. 260—289 C **5 Claims**

1. A compound of the group consisting of

a. isoquinolines of the formula



in which *n*, is 0, 1 or 2, R_1 is CH_3, C_2H_5, R_2 has the same meaning as R_1, R_1 and R_2 together with the oxygen atoms to which they are bonded being able to form a methylenedioxy chain, where A_1 is OCH_3, OC_2H_5; A_2 is OCH_3, OC_2H_5, A_1 and A_2 considered together being able to form a methylenedioxy chain; A_3 is H, OCH_3, and,

b. non-toxic acid addition salts thereof.

3,891,655
OXYALKYLATED QUINOLINES

Harold A. Palmer, and Thomas E. Sample, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 303,170, Nov. 2, 1972, which is a division of Ser. No. 160,142, July 6, 1971, Pat. No. 3,731,741. This application Mar. 15, 1974, Ser. No. 451,641

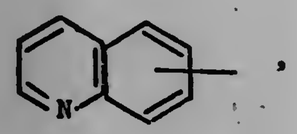
Int. Cl. C07d *33/38*

U.S. Cl. 260—289 R **2 Claims**

1. A water-soluble, oxyalkylated, nitrogen-containing aromatic compound of the formula:

$R(OR')_mOH$,

wherein R is



wherein R′ is alkylene of from 2 to 4 inclusive carbon atoms, and m is an integer of 5 to 50.

3,891,656
ARYLATION PROCESS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 674,087, Oct. 10, 1967, abandoned, which is a continuation-in-part of Ser. No. 597,553, Nov. 29, 1966, abandoned. This application July 6, 1970, Ser. No. 52,709

Int. Cl. C07c *1/00, 15/12, 15/14;* **C07d** *31/20*

U.S. Cl. 260—290 R **12 Claims**

1. An arylation process comprising:

a. charging to a reaction zone a feed mixture of nitrobenzene, and an aromatic cylic co-reactant selected from the group consisting of methyl benzoate, pyridine, dimethyl phthalate, benzonitrile, thiophene, phenol, toluene, o-xylene, and chlorobenzene, in the mole ratio of about 1:1 to about 1:100 respectively;

b. heating in the presence of an inert gas, the feed mixture to a temperature of about 400° to about 1,000°C for a time sufficient for reaction to occur; and

c. maintaining during the heating period a pressure in the reaction zone of about 0.01 to 1,000 atmospheres.

3,891,657
9BETA-HYDROXY-5-METHYL-6,7-BENZOMORPHANS

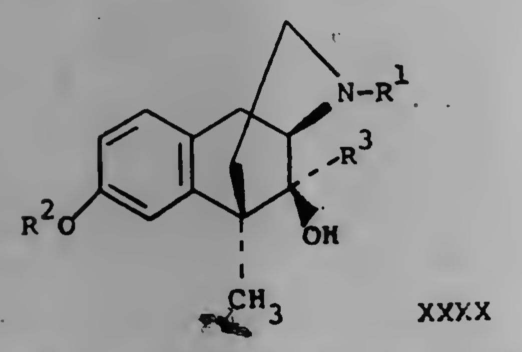
Ivo Monkovic, Candiac; Michel Saucier, Dorval, both of Canada, and Thomas Alfred Montzka, Manilus, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 301,049, Oct. 26, 1972, abandoned. This application Sept. 26, 1973, Ser. No. 400,861

Int. Cl. C07d *39/00*

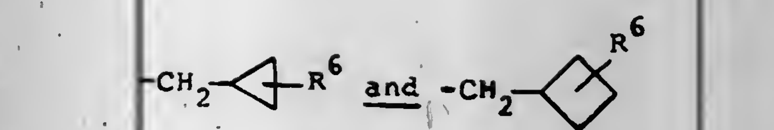
U.S. Cl. 260—293.54 **6 Claims**

1. A compound having the formula

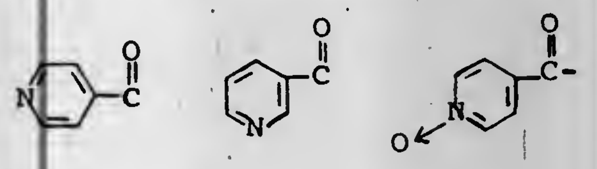


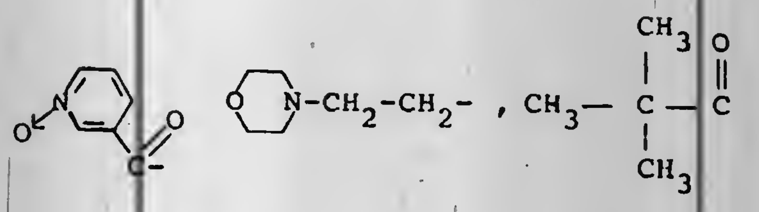
XXXX

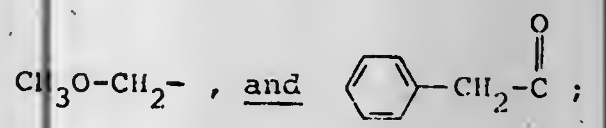
wherein R¹ is selected from the group consisting of



in which R⁶ is H or CH_3; R² is selected from the group consisting of H, (lower) alkyl, (lower)alkanoyl,







R³ is H, CH_3, C_2H_5, n-C_3H_7, and $—CH_2—CH{=}CH_2$, or a pharmaceutically acceptable acid addition salt thereof.

3,891,658
N-PHENETHYL TRIALKYLMETHANOBENZ-AZOLINES

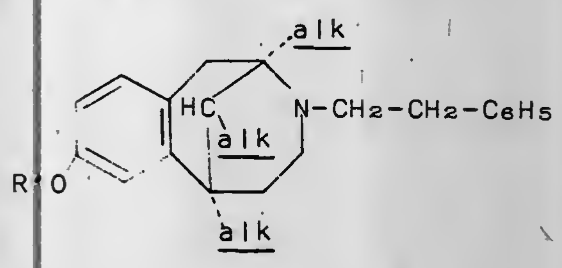
Stephen I. Sallay, Fort Wayne, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Continuation-in-part of Ser. No. 392,844, Aug. 29, 1973. This application Mar. 20, 1974, Ser. No. 452,852

Int. Cl. C07d *39/00*

U.S. Cl. 260—293.54 **3 Claims**

1. A substituted benzazocine of the formula



wherein each alk is independently C_1–C_3 alkyl and R′ is H or alk and pharmaceutically-acceptable acid additive salts thereof formed with non-toxic acids.

3,891,659
HALOPYRIDYL THIOALKYLTHIOCYANATES

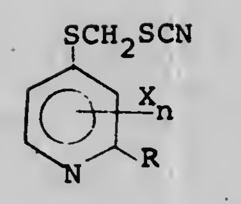
Penelope B. Domenico, Fairfax, Va., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 15, 1974, Ser. No. 460,835

Int. Cl. C07d *31/48, 31/50*

U.S. Cl. 260—294.8 F **6 Claims**

1. A compound corresponding to the formula



wherein X represents chloro or bromo; n represents an integer of from 2 or 3 and R represents trichloromethyl, trifluoromethyl or methylsulfonyl.

3,891,660
DERIVATIVES OF 1H-IMIDAZO([4,5-C])PYRIDINE-7-CARBOXYLIC ACIDS AND ESTERS

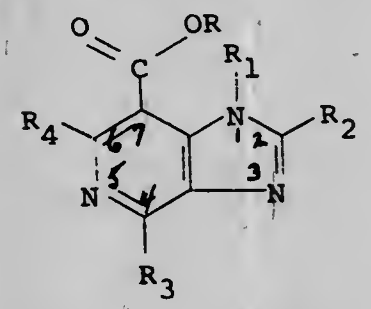
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 7, 1974, Ser. No. 440,620

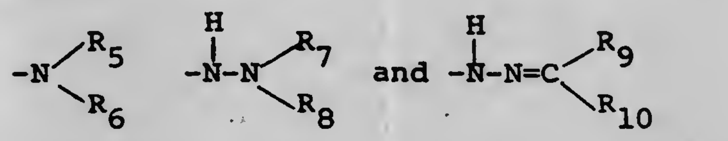
Int. Cl. C07d *39/00*

U.S. Cl. 260—295.5 B **15 Claims**

1. A compound of the formula



where R is selected from the group consisting of hydrogen and lower alkyl; R_1 is selected from the group consisting of hydrogen, lower alkyl, phenyl, phenyl-lower alkyl, and substituted phenyl and phenyl-lower alkyl wherein said phenyl substituent is selected from the group consisting of lower alkyl, lower alkoxy, halogen, CF_3, amino, and carboxy; R_2 is selected from the group consisting of hydrogen, lower alkyl, phenyl, and lower alkyl-phenyl; R_3 is selected from the group consisting of lower alkoxy,



wherein R_5 and R_6 are independently selected from the group consisting of hydrogen and lower alkyl, R_7, R_8 and R_9 are independently selected from the group consisting of hydrogen, lower alkyl, and phenyl, and R_{10} is selected from the group consisting of lower alkyl and phenyl; R_4 is selected from the group consisting of hydrogen, lower alkyl, and phenyl; and pharmaceutically acceptable acid addition salts thereof.

3,891,661
PROCESS FOR PREPARATION OF BENZOYLPYRIDINES AND DERIVATIVES

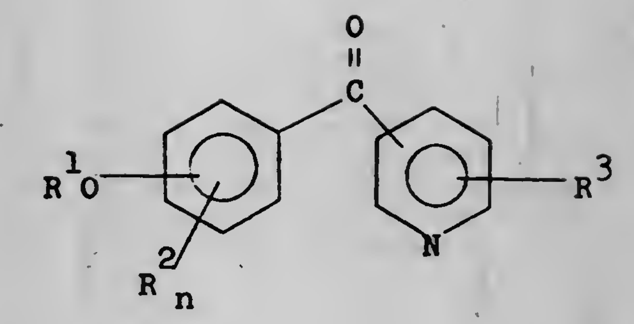
Nobuyuki Sugisaka, Cottage Grove, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Filed Feb. 8, 1974, Ser. No. 440,806

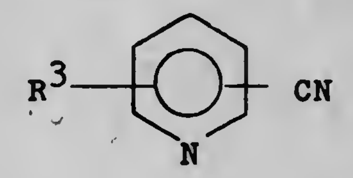
Int. Cl. C07d *31/32*

U.S. Cl. 260—297 R **6 Claims**

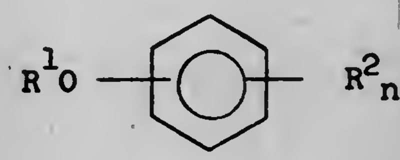
1. A process for the preparation of benzoylpyridines of the formula:



wherein R¹ is hydrogen or lower alkyl; n is zero, one or two; R³ is hydrogen, lower alkyl, phenyl, phenyl lower alkyl, phenoxy-lower alkyl or halogen; and R² is hydroxy, lower alkoxy or lower alkyl, except when R¹ is hydrogen and n is one R² is not hydroxy oriented ortho to -R¹O; which comprises reacting a cyanopyridine of the formula



wherein R³ is as defined above, with a benzene derivative of the formula



wherein R¹ and R² as are defined above in the presence of a Lewis acid catalyst and hydrogen chloride gas under anhydrous conditions at a temperature between 30°C. and 210°C., in an inert solvent, followed by hydrolysis.

3,891,662
N-(3,4,4-TRIFLUOROBUTENE-3)THIAZALODINE DIONE

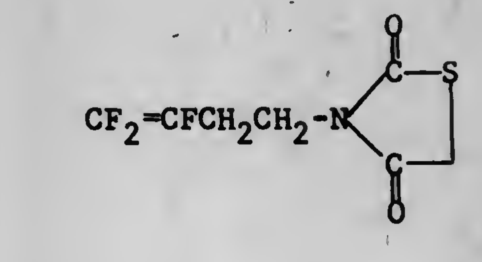
Mervin E. Brokke, Moraga, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 208,032, Dec. 8, 1971, Pat. No. 3,780,050, which is a division of Ser. No. 877,538, Nov. 20, 1969, Pat. No. 3,697,536, which is a division of Ser. No. 490,664, Sept. 27, 1965, Pat. No. 3,513,172. This application Apr. 27, 1973, Ser. No. 355,254

Int. Cl. C07d *91/16*

U.S. Cl. 260—306.7 R **1 Claim**

1. The compound of the formula



3,891,663

PEROXY COMPOUNDS AND PROCESSES FOR THEIR PREPARATION

Edwin George Edward Hawkins, Lower Kingswood, England, assignor to BP Chemicals (U.K.) Limited, England

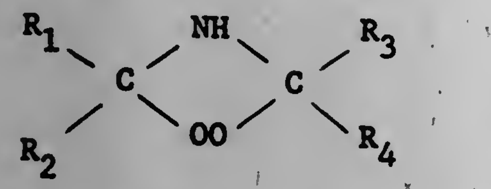
Filed July 10, 1967, Ser. No. 651,969

Claims priority, application United Kingdom, July 13, 1966, 31380/66; Mar. 2, 1967, 9963/67; Mar. 2, 1967, 9973/67; May 20, 1967, 23546/67; May 20, 1967, 23547/67

Int. Cl. C07d *85/06*

U.S. Cl. 260—307 F **50 Claims**

1. A compound of the formula



(II)

wherein R_1 and R_3 are alkyl of 1 to 5 carbon atoms and R_2 and R_4 are hydrogen, alkyl of 1 to 5 carbon atoms or phenyl.

3,891,664

NAPHTH[2,1-D]ISOXAZOLYL-3-DIAZOMETHYL KETONES

Yasushi Suzuki, Yokohama; Toshihisa Itaya; Nobuyoshi Minami, both of Kawasaki; Masaaki Tarutani; Tokutaro Miki, both of Tokyo, and Katsuhiko Miyasaka, Kawasaki, all of Japan, assignors to Teikoku Hormone MFG Co., Ltd., Tokyo, Japan

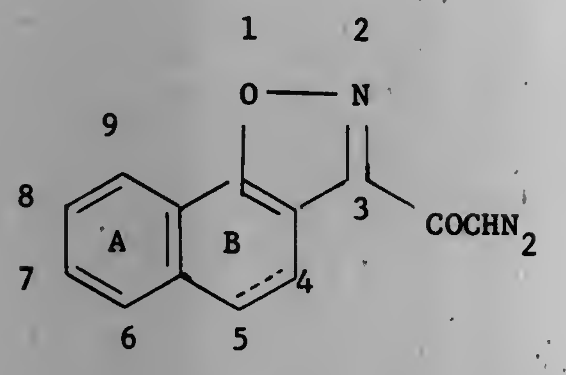
Division of Ser. No. 864,163, Oct. 6, 1969, abandoned. This application Jan. 13, 1972, Ser. No. 217,631

Claims priority, application Japan, Oct. 8, 1968, 43-72990; Oct. 8, 1968, 43-72991; Apr. 26, 1969, 44-32241; Apr. 26, 1969, 44-32242; Apr. 26, 1969, 44-32243

Int. Cl. C07d *85/22*

U.S. Cl. 260—307 D **3 Claims**

1. A compound of the formula



wherein ring A has 0 to 2 substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and halogen, provided that when the substituents are alkyl, they are not adjacent if tertiary butly.

3,891,665

α,3-DIPHENYL-2-OXAZOLIDINEMETHANOL COMPOUNDS

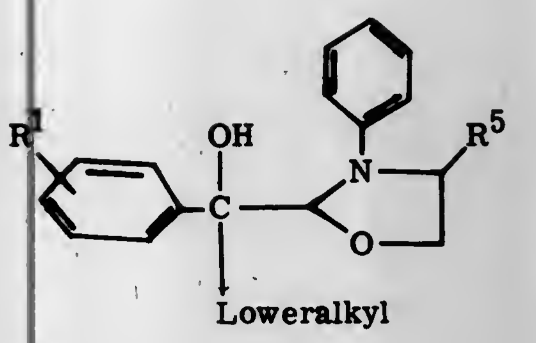
Daniel M. Teller, Devon; Charles J. Guinosso, Abington; Stanley C. Bell, Penn Valley, and George H. Douglas, Paoli, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 204,715, Dec. 3, 1971, Pat. No. 3,817,994. This application Dec. 28, 1973, Ser. No. 429,223

Int. Cl. C07d *85/26*

U.S. Cl. 260—307 F **2 Claims**

1. A compound of the formula



in which

R^1 is a member of the group consisting of —H and —CH_3;

R^5 is a member of the group consisting of —H and lower alkyl.

3,891,666

6-PHENYL-S-TRIAZOLO[4,3-A][1,3,4]-BENZOTRIAZEPINES AND THEIR PREPARATION

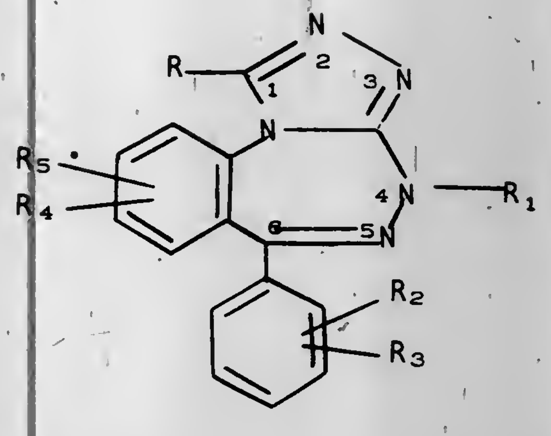
Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 27, 1973, Ser. No. 391,647

Int. Cl. C07d *55/06, 57/02*

U.S. Cl. 260—308 B **11 Claims**

1. A compound of the formula



wherein R is hydrogen or alkyl of 1 to 3 carbon atoms, inclusive, or cycloalkyl of 3 to 7 carbon atoms, inclusive; wherein R_1 is hydrogen and alkyl defined as above; and wherein R_2, R_3, R_4, and R_5 are hydrogen, alkyl defined as above, fluorine, chlorine, bromine, nitro, or alkylthio of 1 to 3 carbon atoms, inclusive, and the pharmacologically acceptable acid addition salts thereof.

3,891,667

PHOSPHORAMIDATE DERIVATIVES

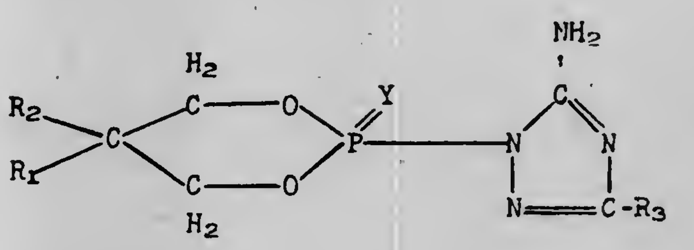
Vincent C. Lintzenich, Collinsville, Ill., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 251,624, May 9, 1972, Pat. No. 3,846,317, and a continuation-in-part of Ser. No. 115,868, Feb. 16, 1971, abandoned, and a continuation-in-part of Ser. No. 803,078, Feb. 27, 1969, abandoned, and a continuation-in-part of Ser. No. 200,217, Nov. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 66,606, Aug. 24, 1970, abandoned. This application Aug. 15, 1974, Ser. No. 497,778

Int. Cl. C07d *105/04*

U.S. Cl. 260—308 R **6 Claims**

1. A compound having the formula



wherein R_1 and R_2 are each selected from the group consisting of hydrogen and C_{1-20} alkyl groups, R_3 is selected from the group consisting of hydrogen, alkyl, aryl and alkaryl, said alkyl, aryl and alkaryl groups having from 1 to 12 carbon atoms, and Y is selected from the group consisting of oxygen and sulfur.

3,891,668

SYNTHESIS OF 1-SUBSTITUTED-2-(P-FLUOROPHENYL)-5-NITROIMIDAZOLES

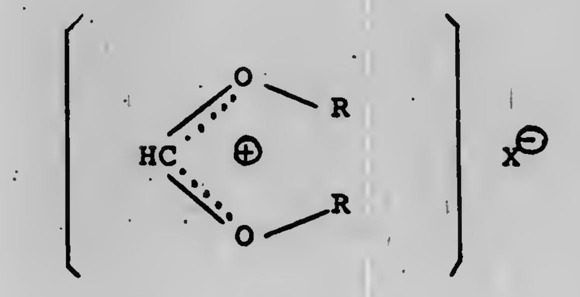
Janos Kollonitsch; Alan N. Scott, both of Westfield, and George A. Doldouras, Fanwood, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 289,498, Sept. 15, 1972, abandoned, which is a continuation-in-part of Ser. No. 40,448, May 25, 1970, abandoned. This application May 15, 1974, Ser. No. 470,237

Int. Cl. C07d *49/36*

U.S. Cl. 260—309 **4 Claims**

1. A process for alkylating 2-(p-fluorophenyl)-4(5)-nitroimidazole which comprises reacting in a solvent free from protons bonded to any oxygen or nitrogen atoms of said solvent, at a temperature of from −10°C. to the reflux temperature of the solvent employed, one molar equivalent of 2-(p-fluorophenyl)-4(5)-nitroimidazole with from 1–5 molar equivalents of a dialkoxycarbonium salt of the formula:



wherein R is loweralkyl of from 1–6 carbon atoms and X^- is BF^-_4, $SbCl^-_6$, or SbF^-_6.

3,891,669

THIOL-GROUP DETECTING FLUORESCENCE REAGENTS

Yuichi Kanaoka, and Minoru Machida, both of Sapporo, Japan, assignors to Yuichi Kanaoka, Tokyo, Japan

Filed Sept. 11, 1973, Ser. No. 396,321

Claims priority, application Japan, Apr. 2, 1973, 48-37584

Int. Cl. C07d *27/18*

U.S. Cl. 260—326.34 **1 Claim**

1. A thiol-group detecting fluorescence reagent selected from the group consisting of:

N-3-(4-methyl-7-dimethylaminocoumarinyl)maleimide, and

N-6-(4-methyl-7-dimethylaminocoumarinyl)maleimide.

3,891,670

N-(1-ANILINO NAPHTHYL-4) MALEMIDE THIOL-GROUP DETECTING REAGENT

Yuichi Kanaoka; Mikiko Machida, and Minoru Machida, all of Sapporo, Japan, assignors to Yuichi Kanaoka, Tokyo, Japan

Filed Sept. 11, 1973, Ser. No. 396,320

Claims priority, application Japan, Oct. 5, 1972, 47-100122

Int. Cl. C07d *27/18*

U.S. Cl. 260—326.5 FM **1 Claim**

1. A thiol-group detecting reagent consisting of N-(1-anilinonaphthyl-4)maleimide.

3,891,671

N-(2-PYRROLIDYL OR PIPERIDYL ALKYL)-4-HYDROXY BENZAMIDES

Michel Leon Thominet, Paris, France, assignor to Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France, Paris, France

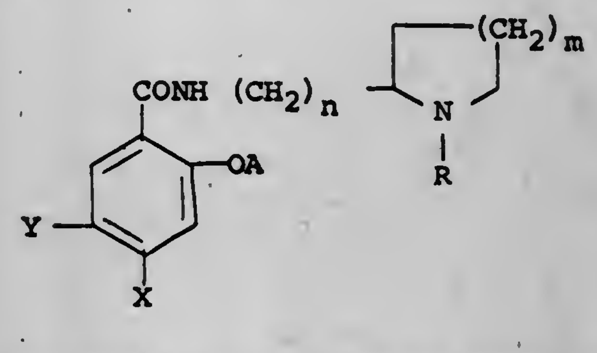
Continuation of Ser. No. 145,871, May 21, 1971, abandoned, which is a continuation-in-part of Ser. No. 845,523, July 28, 1969, abandoned. This application July 24, 1973, Ser. No. 382,251

Claims priority, application France, Aug. 1, 1968, 68.161593; Oct. 29, 1968, 68.171761

Int. Cl. C07d *27/04*

U.S. Cl. 260—326.47 **8 Claims**

1. A compound selected from the group consisting of heterocyclic benzamides and their pharmaceutically acceptable acid addition salts and quaternary ammonium salts, said heterocyclic benzamides having the formula:



in which A is allyl or lower alkyl; R is allyl or lower alkyl; X is hydroxy; Y is halogen, *m* is a whole number less than 3 and *n* is a whole number less than 4.

3,891,672

PROCESS FOR PREPARING R-SULTONES

Charles David Broaddus, Cincinnati, and Medford Dwight Robbins, Fairfield, both of Ohio, assignors to Procter & Gamble Company, Cincinnati, Ohio

Filed Sept. 26, 1972, Ser. No. 292,354

Int. Cl. C07d *89/06*

U.S. Cl. 260—327 S **7 Claims**

1. A process for preparing γ-sultones comprising admixing a gaseous mixture comprising monomolecular SO_3 and an

inert gas with a gaseous mixture comprising an olefin having at least a four carbon atom chain and an inert gas at a temperature of from about 100°C to about 150°C the ratio of a monomolecular SO_3-to-olefin being about 1:2.

3,891,673

HINDERED PHENOLIC S-TRITHIANE 1,1,3,3,5,5-HEXAOXIDES

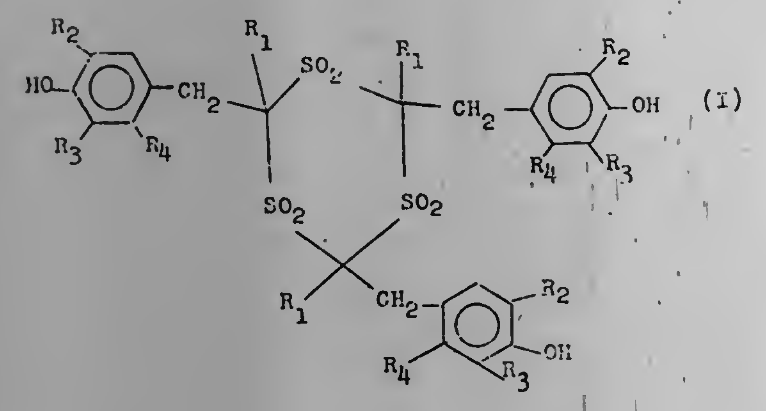
John F. Stephen, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 23, 1974, Ser. No. 472,557

Int. Cl. C07d *77/02*

U.S. Cl. 260—327 T **6 Claims**

1. A compound having the formula



wherein

R_1 is independently hydrogen or alkyl of 1 to 18 carbon atoms,

R_2 and R_3 are the same or different alkyl groups of from 1 to 8 carbon atoms, cycloalkyl of from 5 to 6 carbon atoms or one of R_2 and R_3 is hydrogen, and

R_4 is hydrogen or lower alkyl of from 1 to 6 carbon atoms and providing that when R_1 is alkyl, R_1 is hydrogen.

3,891,674

ESTERS OF ARYL-ALIPHATIC ALCOHOLS

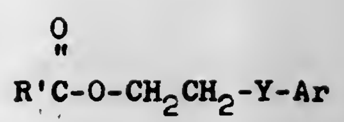
Guy D. Diana, Stephentown, and William B. Hinshaw, Jr., Sand Lake, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Jan. 17, 1973, Ser. No. 324,543

Int. Cl. C07d *13/10*

U.S. Cl. 260—340.5 **7 Claims**

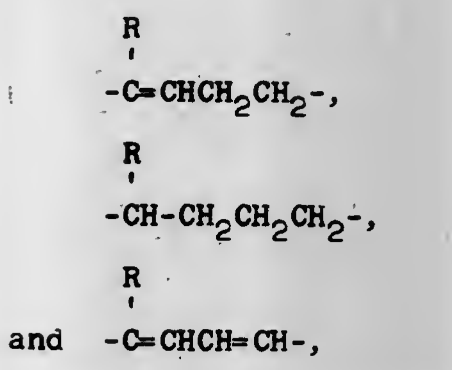
1. A compound of the formula



$$R'\overset{O}{\overset{\|}{C}}-O-CH_2CH_2-Y-Ar$$

wherein

Y is selected from the group consisting of



$$-\overset{R}{\overset{|}{C}}=CHCH_2CH_2-,\quad -\overset{R}{\overset{|}{C}}H-CH_2CH_2CH_2-,\quad \text{and}\quad -\overset{R}{\overset{|}{C}}=CHCH=CH-,$$

R′ is hydrogen, 3,4-methylenedioxyphenyl or a saturated or mono-olefinic hydrocarbon moiety having from 1 to 10 carbon atoms selected from the group consisting of alkyl, alkenyl, cycloalkyl, cycloalkenyl, alkylcycloalkyl, alkylcycloalkenyl and alkenylcycloalkyl,

R is hydrogen or lower-alkyl of 1 to 4 carbon atooms; and

Ar is phenyl substituted by 3,4-methylenedioxy or one or two monovalent substitutents selected from the group consisting of carbo-lower-alkoxy of 2 to 4 carbon atoms, halogen, trifluoromethyl and trifluoromethoxy.

3,891,675

DIOXOLANYL CARBONYL UREAS AND THIOUREAS

Eirlys R. Isaac, Sittingbourne, and Peter Kirby, Maidstone, both of England, assignors to Shell Oil Company, Houston, Tex.

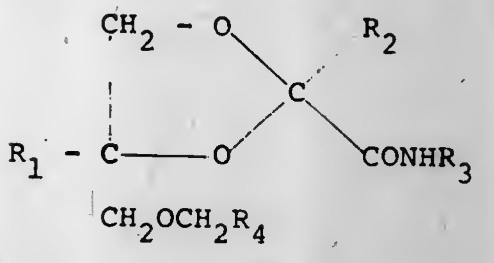
Filed June 25, 1974, Ser. No. 482,936

Claims priority, application United Kingdom, July 3, 1973, 31604/73

Int. Cl. C07c *127/22, 157/22*

U.S. Cl. 260—340.9 **4 Claims**

1. An amide derivative of the formula



wherein R_1 and R_2 each represents an alkyl group of 1–6 carbon atoms, R_3 represents a carbamoyl, or thiocarbamoyl group N-substituted by alkyl, haloalkyl or cycloalkyl of up to 6 carbon atoms, by phenyl, alkylphenyl, nitrophenyl, alkoxyphenyl, or fluoro- or chlorophenyl of up to 8 carbon atoms, or by alkenyl of up to 6 carbon atoms, and R_4 represents a phenyl group optionally substituted by fluorine or chlorine or by an alkyl group of 1–6 carbon atoms.

3,891,676

2-ALPHA-CARBOXY-3-ALPHA(HYDROXYETHYL)-5-OXOCYCLOPENTANE DERIVATIVES

Chan-Hwa Kuo, South Plainfield; David Taub, Metuchen, and Norman L. Wendler, Summit, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 290,590, Sept. 20, 1972, Pat. No. 3,850,952. This application Oct. 15, 1973, Ser. No. 406,714

Int. Cl. C07d *13/04*

U.S. Cl. 260—340.9 **6 Claims**

1. 2α-Carboxy-3α-(1,1-dihydroxyethyl)-5-oxocyclopentaneheptanoic acid carboxymethyl ester, γ-lactone 5-cyclic ethylene acetal.

3,891,677

17α,20,20,21-BISMETHYLENEDIOXY-4,5-SECO-3-PREGNYNE-5-ONES

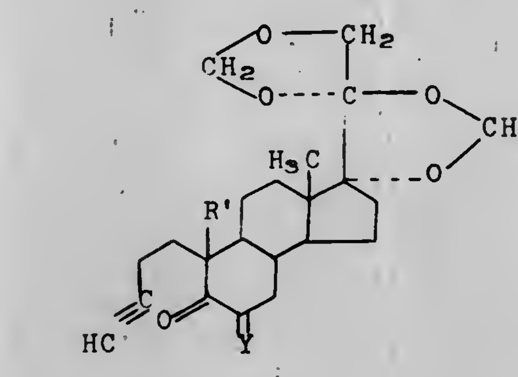
Masato Tanabe, Palo Alto, Calif., assignor to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 102,095, Dec. 28, 1970, Pat. No. 3,796,728, which is a division of Ser. No. 647,315, June 20, 1967, Pat. No. 3,835,160, which is a continuation-in-part of Ser. No. 644,761, June 6, 1967, abandoned. This application July 18, 1973, Ser. No. 380,319

Int. Cl. C07d *13/04*

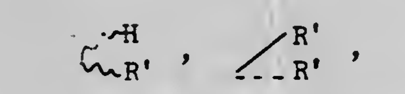
U.S. Cl. 260—340.9 **4 Claims**

1. A compound selected from the group consisting of 5-keto-4,5-seco-3-pregnynes having the following formula:



wherein R′ is a member selected from the group consisting of hydrogen and alkyl having up to 12 carbon atoms; said alkyl being saturated or unsaturated;

Y is a member selected from the group consisting of hydrogen,



and polymethylene having from 2 to 8 carbon atoms;

and the 11-keto analogs thereof.

3,891,678

PREPARATION OF ALKYLATED OR NON-ALKYLATED DIHYDROCOUMARIN TOGETHER WITH THE CORRESPONDING ALKYLATED, OR NON-ALKYLATED, COUMARIN

Egidius J. M. Verheijen; Jozef A. Thoma, both of Sittard, and Johannes J. M. Deumens, Limbricht, all of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

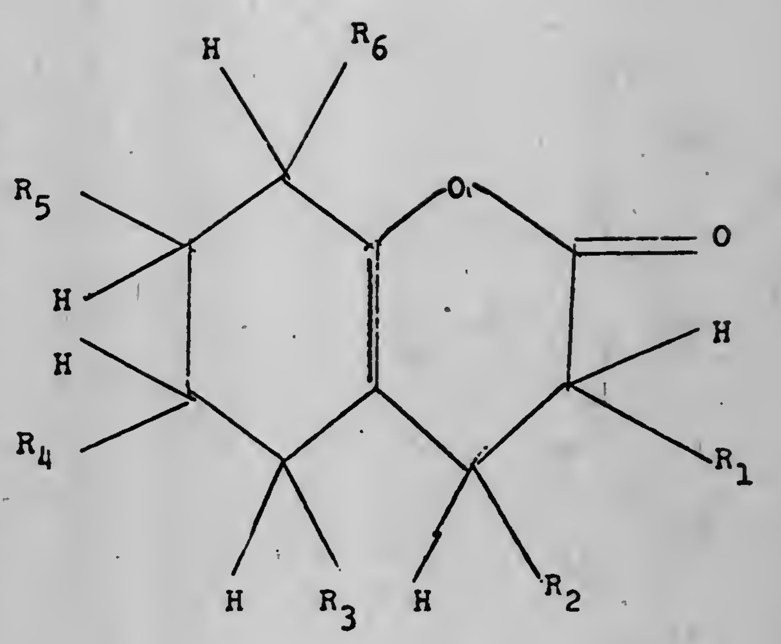
Filed Aug. 24, 1973, Ser. No. 391,516

Claims priority, application Netherlands, Aug. 31, 1972, 7211839

Int. Cl. C07d *7/26*

U.S. Cl. 260—343.2 R **8 Claims**

1. In a process for dehydrogenating a first compound of the formula



where R_1, R_2, R_3, R_4, R_5 and R_6 each independently represent hydrogen or lower alkyl, provided that the total number of carbon atoms in R_1–R_6 inclusive is at most 10, at a temperature of 150° to 400°C in contact with a catalytic amount of a metal dehydrogenation catalyst, wherein the metal is at least one metal of Group VIII of the Periodic Table to produce second compounds selected from the group consisting of dihydrocoumaurin and alkylated derivatives thereof, the improvement comprising conducting the dehydrogenation process in the liquid phase and at a temperature of 200° to 375°C while removing hydrogen from the reaction zone, and contacting the catalyst and the starting material at about the dehydrogenation temperature, whereby said first compound is obtained in the resulting reaction mixture in a molar ratio of said first compound: said second compound of at least 1:5.

3,891,679

PRODUCTION OF 2,2-DISUBSTITUTED PROPIOLACTONES

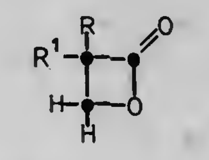
Robert P. Allen, and Hugh J. Hagemeyer, Jr., both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 3, 1972, Ser. No. 303,570

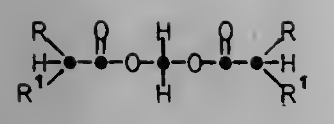
Int. Cl. C07d *3/00*

U.S. Cl. 260—343.9 **22 Claims**

1. A process for producing 2,2-disubstituted propiolactone having the formula



which comprises the steps of pyrolyzing a methylene diester having the formula



wherein R is alkyl having 1-4 carbon atoms and R¹ is alkyl of from 1-4 carbon atoms or phenyl at a temperature of from about 240°C. to about 360°C. in the presence of a catalyst selected from the group consisting of silica-alumina, silica gel, sodium carbonate on Celatom, potassium hydroxide on Celatom, lanthanum oxide on silica gel, 12-tungstosilicic acid on silica gel, and titania.

3,891,680
MALEIC ANHYDRIDE RECOVERY USING NONAQUEOUS MEDIUM
Kiyoshi Katsumoto, El Cerrito, and Wilton H. Lind, Petaluma, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Nov. 29, 1972, Ser. No. 310,320
Int. Cl. C07c ***57/14***

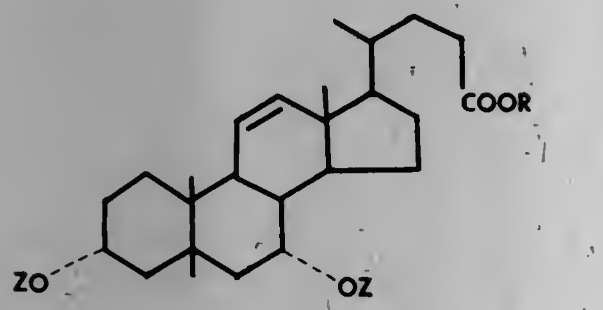
U.S. Cl. 260—346.8 M **16 Claims**

1. The method for the recovery of maleic anhydride from a gaseous mixture containing the anhydride, which comprises. contacting said mixture with a scrubbing agent in the liquid phase at a temperature below about 260°C. and at a pressure sufficient to effect maleic anhydride absorption into the liquid phase, said agent being one or more dialkyl phthalates having from 4 to 8 carbon atoms in each alkyl group and a total of 10 to 14 carbon atoms in both alkyl groups, and said pressure being in the range from about 0.07 to 7 atmospheres.

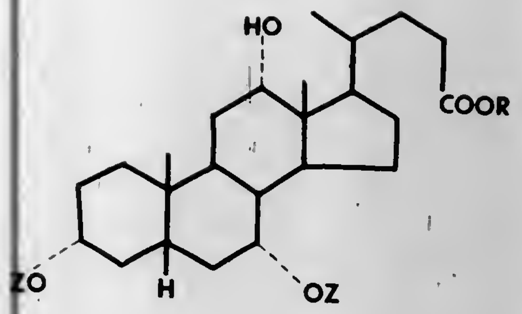
3,891,681
SYNTHESIS OF STEROIDS
William H. Saltzman, New Rochelle, N.Y., assignor to Intellectual Property Development Corporation, New Rochelle, N.Y. Continuation of Ser. No. 307,060, Nov. 16, 1972, Pat. No. 3,833,260. This application Nov. 26, 1973, Ser. No. 419,014
Int. Cl.² C07J ***9/00***

U.S. Cl. 260—397.1 **8 Claims**

1. The method of producing compounds of the formula



which comprises reacting a compound of the formula



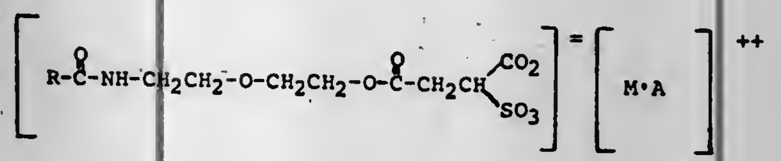
wherein each Z is hydrogen or acyl; and R is hydrogen or lower alkyl, with a dehydrating agent selected from the group consisting of methane sulfonyl chloride, methyl chlorosulfite; and thionyl chloride.

3,891,682
ACYLAMIDOETHOXYETHYL SULFOSUCCINATE SALTS, METHODS OF PRODUCING THE SAME AND FROTH-FORMING COMPOSITIONS CONTAINING THE SAME
Robert Ernst, Los Angeles, and Eugene J. Miller, Huntington Beach, both of Calif., assignors to Textilana Corporation, Hawthorne, Calif.

Filed Aug. 30, 1973, Ser. No. 392,976
Int. Cl.² C07C ***143/90;*** **C11D** ***1/28***

U.S. Cl. 260—401 **12 Claims**

1. A compound having the constitutional formula



$$\left[R-\overset{O}{\overset{\|}{C}}-NH-CH_2CH_2-O-CH_2CH_2-O-\overset{O}{\overset{\|}{C}}-CH_2CH\begin{matrix}CO_2\\SO_3\end{matrix} \right]^{=} \left[M\cdot A \right]^{++}$$

where R is an alkyl or an alkenyl group having from 7–19 carbon atoms in an uninterrupted carbon-carbon chain, M may be an alkali metal or alkaline earth cation which results in a soluble salt, A may be M or ammonia or a water soluble salt forming amine, or H.

3,891,683
PROCESS FOR MANUFACTURING POLYOL ESTERS OF CARBOXYLIC ACIDS
Hiroshi Isa, Funabashi; Takeo Inagaki, Yachiyo; Yasuhiro Kiyonaga, Narashino, and Masuzo Nagayama, Tokyo, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1974, Ser. No. 439,271
Claims priority, application Japan, Feb. 7, 1973, 48-015268
Int. Cl. C07c ***67/00***

U.S. Cl. 260—410.6 **6 Claims**

1. In a process for preparing polyol esters of carboxylic acids, comprising reacting an olefin having from 3 to 30 carbon atoms and a polyhydric alcohol, wherein the molar ratio of said olefin to the reactive hydroxyl groups of said polyhydric alcohol is about 1/1 or more, with an excess of carbon monoxide at a pressure in the range of from 60 to 300 kg/cm², the reaction being carried out at a temperature of from 90° to 250°C., in the presence of a first catalyst of cobalt, nickel or rhodium, and a second catalyst of pyridine, alkylated pyridine or vinyl pyridine, the improvement which comprises the steps of:

contacting said first and second catalysts with said carbon monoxide and said olefin, in the absence of said polyhydric alcohol, at a temperature and a pressure within the aforesaid ranges to obtain a pretreated catalyst composition, and then adding said polyhydric alcohol to the reaction system and carrying out said polyol ester manufacturing process using said pretreated catalyst composition.

3,891,684
PREPARATION OF ORGANOMETALLIC COMPLEXES
Herbert A. Jung, New York, N.Y., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Nov. 4, 1971, Ser. No. 195,845
Int. Cl. C07c ***15/00***

U.S. Cl. 260—429 R **15 Claims**

4. A method of preparing organometallic complexes of palladium or platinum in a zerovalent state which comprises contacting in the liquid phase and in the substantial absence of oxygen;

a. a palladium or platinum compound selected from the group consisting of salts, chelates and coordination compounds containing palladium or platinum ions having a valence state of at least +1 with;

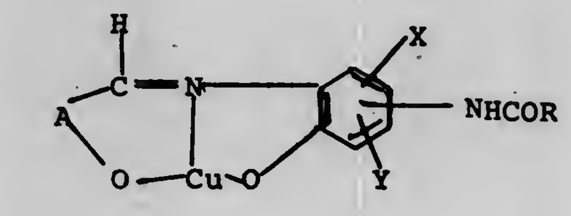
b. complexing ligands having the formula $R_1R_2R_3L$ wherein R_1, R_2 and R_3 are independently selected from the group consisting of alkyl radicals having from 1 to 5 carbon atoms, phenyl radicals, alkaryl radicals having from 7 to 10 carbon atoms and aralkyl radicals having from 7 to 10 carbon atoms and L is phosphorus, arsenic or antimony; said complexing ligands being present in at least the stoichiometric amount, said contacting to be carried out at a temperature in the range of from about 40°C. to about 150°C. and in the presence of an alkanol having from 1 to 12 carbon atoms.

3,891,685
AZOMETHINE COPPER COMPLEX DYES AND PROCESS FOR THEIR PREPARATION
Stefan Hari, Allschwil, and Karl Ronco, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

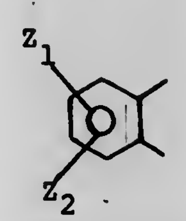
Filed Dec. 12, 1972, Ser. No. 314,283
Claims priority, application Switzerland, Dec. 13, 1971, 18146/71
Int. Cl. C07f ***1/08***

U.S. Cl. 260—438.1 **5 Claims**

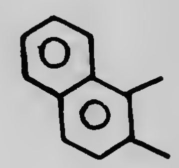
1. A copper complex of an azomethine dyestuff of the formula



wherein A is



or



R is alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenyl, benzyl, phenylethyl, styryl or phenylamino unsubstituted for substituted by chloro, bromo, alkyl of 1 to 4 carbon atoms, or alkoxy of 1 to 4 carbon atoms,

X, Y, Z_1 and Z_2 is hydrogen, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, or nitro.

3,891,686
PREPARATION OF ALUMINUM HYDRIDE TRIALKYLAMINATES
Robert Ehrlick, Morristown, and Archie R. Young, II, Montclair, both of N.J., assignors to Thiokol Corporation, Bristol, Pa.

Filed May 6, 1963, Ser. No. 278,802
Int. Cl. C07f ***5/06***

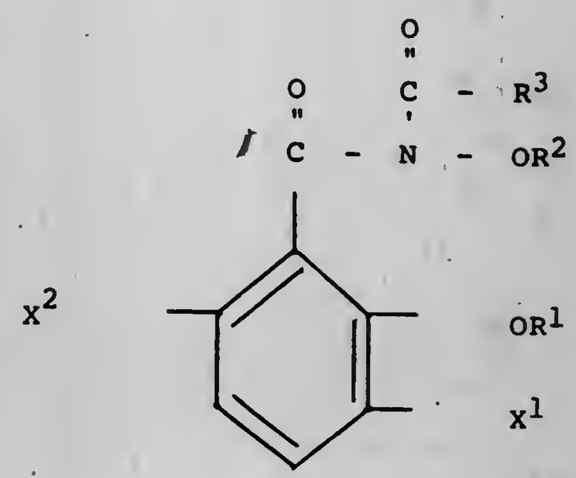
U.S. Cl. 260—448 R **11 Claims**

1. A process for preparing aluminum hydride trialkylaminates which comprises contacting lithium aluminum hydride, an aluminum halide and a trialkylamine in an inert solvent under substantially anhydrous conditions until an aluminum hydride trialkylaminate is formed.

3,891,687
2-ALKOXY 3,5-DIHALO-BENZALDOXIMES
Sidney B. Richter, and Eugene F. Barnas, both of Chicago, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill. Division of Ser. No. 779,247, Nov. 26, 1968, Pat. No. 3,597,467. This application Oct. 19, 1970, Ser. No. 82,181
Int. Cl.² C07C ***119/18***

U.S. Cl. 260—453 R **1 Claim**

1.

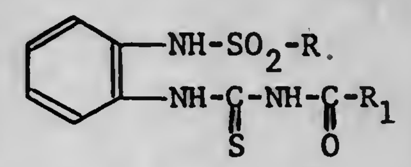


wherein X¹ and X² are halogen; R¹ and R² are lower alkyl; and R³ is lower alkyl.

3,891,688
THIOUREIDO SULFONANILIDE COMPOSITIONS
Alexander Mihailovski, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn. Division of Ser. No. 217,697, Dec. 29, 1971, Pat. No. 3,832,384. This application June 12, 1974, Ser. No. 478,492
Int. Cl.² C07C ***155/02***

U.S. Cl. 260—455 A **3 Claims**

1. Compounds corresponding to the generic formula:



wherein R is lower alkyl or phenyl and R_1 is lower thioalkyl.

3,891,689
CONTINUOUS SULPHONATION PROCESS

Alan Pryce, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Jan. 19, 1972, Ser. No. 218,880

Claims priority, application United Kingdom, Jan. 20, 1971, 2766/71

Int. Cl. C07c *141/02, 143/02, 143/24*

U.S. Cl. 260—458 **2 Claims**

1. A continuous process wherein a liquid organic material selected from the group consisting of:

a. linear- and branched-chain alkyl benzenes, the alkyl chains of which contain from about 10 to about 18 carbon atoms;

b. linear unsubstituted monohydric alcohols containing from about 8 to about 20 carbon atoms, and

c. linear unsubstituted alpha-olefins containing from about 10 to about 20 carbon atoms; is reacted with sulphur trioxide in a sulphur trioxide-air mixture in two separate steps, the initial step being conducted by passing the sulphur trioxide-air mixture and the liquid organic material longitudinally through an initial longitudinally extending reaction chamber with a superficial gas velocity of from about 5 to about 30 feet per second, the second step being conducted by passing the material emerging from said initial reaction chamber longitudinally through a second longitudinallyextending reaction chamber cross-section with a superficial gas velocity which is higher than the superficial gas velocity in said initial reaction chamber and which is from about 15 to about 90 feet per second, the initial concentration of sulphur trioxide in the sulphur trioxide-air mixture being from about two percent to about 15 percent by volume, the initial mole ratio of the sulphur trioxide to the liquid organic material being from about 0.9:1 to about 1.5:1, the pressure under which the reaction is conducted being from about 5 to about 30 psia, and the superficial gas velocity in each reaction chamber being defined as the velocity at which gaseous reactants would pass through the reaction chamber in the absence of any liquid reactants and which may be calculated from the expression

$$S = V/A$$

wherein S is the superficial gas velocity in the reaction chamber, expressed in feet per second, V is the volume of gas at STP which is fed into the reaction chamber per second, expressed in cubic feet, and A is the transverse cross-sectional area of the reaction chamber expressed in square feet.

3,891,690
PROCESS FOR THE PREPARATION OF METAL AND METAL FLUORIDE PRODUCTS

Gilbert S. Layne, and James O. Huml, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 445, Jan. 2, 1970, abandoned. This application June 23, 1972, Ser. No. 265,783

Int. Cl. C01f *7/54;* **C01b** *31/18;* **C21b** *15/00*

U.S. Cl. 423—465 **2 Claims**

1. A process which comprises:

a. reacting $NaAlO_2$, carbon, NaF or Na_2O, and FeF_2, at a temperature of at least about 900°C, said reactants being provided in an amount to provide a fluoride atom to oxygen atom ratio ranging from about 0.01 to about 10 and a carbon atom to oxygen atom ratio of at least about 1, thereby to produce products of Na_3AlF_6, Fe and CO, and

b. separating said products from each other,

3,891,691
STYRYL DYES

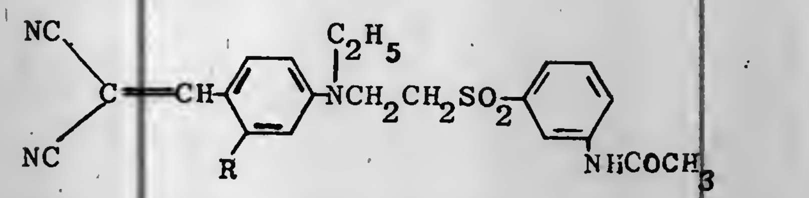
Guido R. Genta, Snyder, N.Y., assignor to American Aniline Products, Inc., Lock Haven, Pa.

Continuation-in-part of Ser. No. 227,296, Feb. 17, 1972, Pat. No. 3,756,778. This application June 7, 1973, Ser. No. 367,826

Int. Cl. C07c *121/70*

U.S. Cl. 260—465 D **2 Claims**

1. A compound of the formula



wherein R is hydrogen, methyl, chlorine or bromine.

3,891,692
N-(CYCLOPROPYLALKOXYCARBONYL)AMINO ACIDS

Daniel F. Veber, and Stephen F. Brady, both of Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 3, 1972, Ser. No. 249,975

Int. Cl. C07c *125/06*

U.S. Cl. 260—471 C **3 Claims**

1. A compound selected from the group consisting of N-(cyclopropylmethoxycarbonyl) and N-(1-cyclopropylethoxycarbonyl) derivatives of the α-amino grouping of glycine, alanine, valine, leucine, isoleucine, phenylalanine, tyrosine, serine, threonine, aspartic acid, glutamic acid, arginine, lysine, and ornithine; and lower alkyl, benzyl, phenylethyl; phenyl and p-nitrophenyl esters thereof.

3,891,693
METHOD FOR MAKING ALKYLENE-BIS(NITROBENZOATE)S

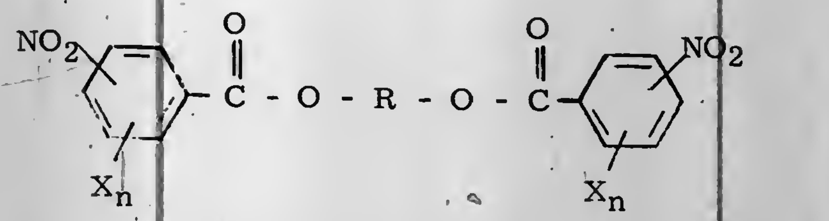
Jack Preston, Raleigh, N.C., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 353,285, April 23, 1973. This application Aug. 1, 1974, Ser. No. 494,019

Int. Cl. C07c *101/68*

U.S. Cl. 260—471 R **4 Claims**

1. A method of producing an alkylene-bis(nitrobenzoate) of the formula:



wherein X is a halogen, n is an integer of 0–4 and R is a C_2–C_8 alkylene or cycloalkylene radical characterized by:

a. bringing into reacting contact at an elevated temperature a nitrobenzoic acid and a saturated aliphatic or alicyclic glycol in substantially stoichiometric amounts to produce the corresponding hydroxycycloakyl or hydroxyalkyl nitrobenzoate;

b. after the production of the hydroxycycloalkyl or hydroxyalkyl nitrobenzoate is substantially completed, adding to the reaction mixture additional nitrobenzoic acid;

c. reacting the hydroxycycloalkyl or hydroxyalkyl nitrobenzoate with the added nitrobenzoic acid to produce the alkylene-bis(nitrobenzoate); and

d. separating the resulting benzoate product from the reaction mixture.

3,891,694
PLASTICIZER PURIFICATION

Robert H. Mills, St. Louis, and Richard R. Raube, Ballwin, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed May 18, 1970, Ser. No. 38,499

Int. Cl. C07c *69/44, 69/60, 69/80*

U.S. Cl. 260—475 B **9 Claims**

1. In a method for purifying a plasticizer for synthetic resins which is an alkyl, aryl or mixed alkyl-aryl ester of an organic acid the improvement which comprises simultaneously treating said ester with steam and an aliphatic or aromatic peracid at a temperature of at least about 120°C.

3,891,695
BROMINE-CONTAINING ESTERS

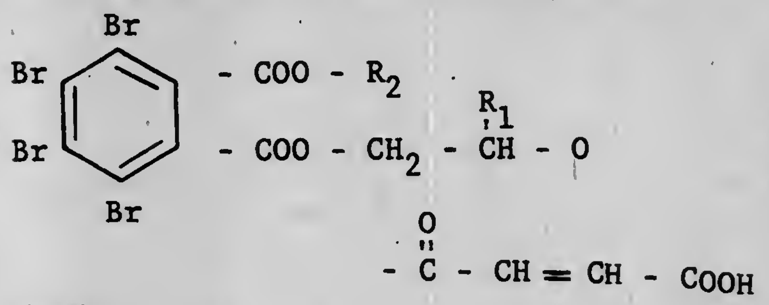
Dilip K. Ray-Chaudhuri, Somerville; Paul C. Georgoudis, Dunellen, and Hans H. Stockmann, Plainfield, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 169,072, Aug. 4, 1971, Pat. No. 3,793,293. This application Nov. 23, 1973, Ser. No. 418,169

Int. Cl.² C07C *69/80, 69/54*

U.S. Cl. 260—475 N **1 Claim**

1. A bromine-containing, ethylenically unsaturated maleate ester corresponding to the general structural formula



wherein:

R_1 = H, or CH_3, and

R_2 = alkyl radical having 1 to 4 carbon atoms.

3,891,696
NOVEL, TRANSIENT PRO-DRUG FORMS OF L-DOPA

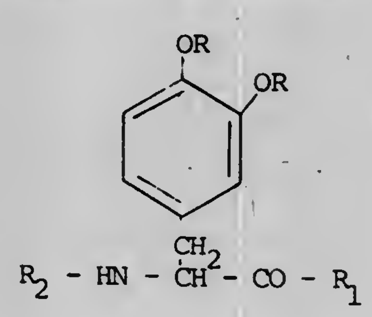
Nicolae S. Bodor; Kenneth B. Sloan, and Anwar A. Hussain, all of Lawrence, Kans., assignors to Interx Research Corporation, Lawrence, Kans.

Filed Nov. 2, 1973, Ser. No. 412,419

Int. Cl. C07c *67/08, 103/52, 101/72*

U.S. Cl. 260—479 R **7 Claims**

1. A novel, transient, pro-drug compound of the formula:



wherein R represents a member selected from the group consisting of a hydrogen atom a $—COCH_3$ group, a $—COC_2H_5$ group, a $—COOC_2H_5$ group, and a $—CO—C(CH_3)_3$ group; wherein R_1 represents a member selected from the group consisting of a hydroxyl group, and a —OM group, wherein M represents a member selected from the group consisting of an alkali metal and an ammonium ion; and wherein R_2 represents a $(R_5)CO—CH{=}C(R_4)—$ group, wherein R_4 represents a methyl group or ethoxy group, and wherein R_5 represents a member selected from the group consisting of a methyl group, a $—C_6H_5$ group, and a $—OC_2H_5$ group.

3,891,697
COMPOSITIONS USEFUL FOR TREATING PARKINSONISM

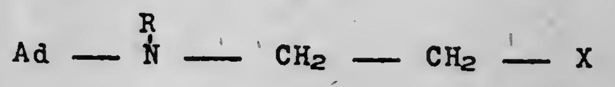
Elijah H. Gold, West Orange, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Filed Oct. 19, 1973, Ser. No. 408,021

Int. Cl. C07c *101/14*

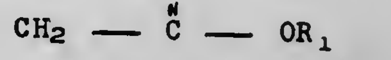
U.S. Cl. 260—468 G **7 Claims**

1. Compounds of the formula:



$$\mathrm{Ad} — \overset{R}{N} — CH_2 — CH_2 — X$$

wherein Ad is 1-adamantyl; R is H or CH_3; X is COOM or



$$CH_2 — \overset{O}{\overset{\|}{C}} — OR_1$$

wherein M is H or a pharmaceutically acceptable acid addition cation, and R_1 is lower n-alkyl; and the pharmaceutically acceptable salts thereof.

3,891,698
ω-(3-HYDROXYPHENYL)SUBSTITUTED AMIDINES AND DERIVATIVES THEREOF AS ANTHELMINTIC AGENTS

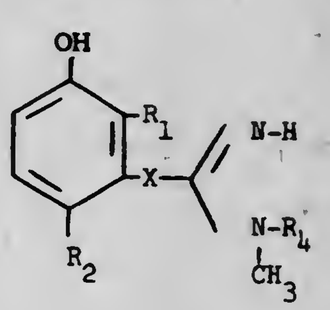
James W. McFarland, Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 664,258, Aug. 30, 1967, Pat. No. 3,579,510. This application Sept. 25, 1970, Ser. No. 75,776

Int. Cl. C07c *123/00*

U.S. Cl. 260—501.14 **6 Claims**

1. A compound of the formula:



and the non-toxic acid addition salts thereof wherein each of R_1 and R_2 is selected from the group consisting of hydrogen, methyl, chloro, bromo and iodo, with the proviso that at least one of R_1 and R_2 is hydrogen; R_4 is selected from the group consisting of methyl, ethyl, methoxy, methylamino and allyl and X is trans-vinylene.

3,891,699
BIPHENYLENEALKANOIC ACIDS

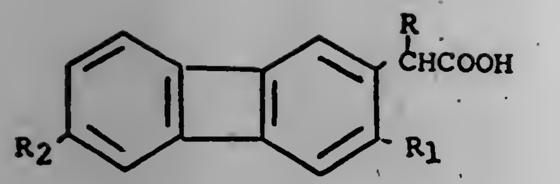
Bruce E. Witzel, and Tsung-Ying Shen, both of Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 72,531, Sept. 15, 1970, abandoned. This application Apr. 21, 1972, Ser. No. 246,487

Int. Cl. C07c *63/52, 63/54*

U.S. Cl. 260—515 R **3 Claims**

1. A compound of the formula:



where

R is hydrogen or methyl;

R_1 is hydrogen, C_{1-7} alkyl, halogen, dialkylamino wherein the alkyl group contains 1–7 carbon atoms, C_{1-7} alkylthio, hydroxy, phenyl or benzyl;

R_2 is hydrogen, halogen, trifluoromethyl, hydroxy or C_{1-7} alkoxy.

3,891,700
PROCESS FOR THE PURIFICATION OF CRUDE TEREPHTHALIC

Herbert Jenkner, Cologne, Germany, assignor to Chemische Fabrik Kalk GmbH, Germany

Filed June 21, 1973, Ser. No. 372,317

Claims priority, application Germany, Sept. 29, 1972, 2247749

Int. Cl. C07c *63/26, 51/42*

U.S. Cl. 260—525 **9 Claims**

1. A process for the purification of crude terephthalic acid containing carboxybenzaldehyde as an impurity to substantially pure terephthalic acid useful in the production of fibers, which comprises dissolving said crude terephthalic acid in an aqueous alkaline hydroxide solution selected from the group consisting of sodium hydroxide, potassium hydroxide and ammonium hydroxide solutions; adding an elemental halogen selected from the group consisting of bromine and chlorine to the resultant solution; maintaining said resultant solution at a reaction temperature of about 20°–120°C. for a period of time sufficient for said halogen to react with said impurity; acidifying the reaction mixture; and separating the purified terephthalic acid from said acidified mixture.

3,891,701
COMPOSITIONS OF MATTER

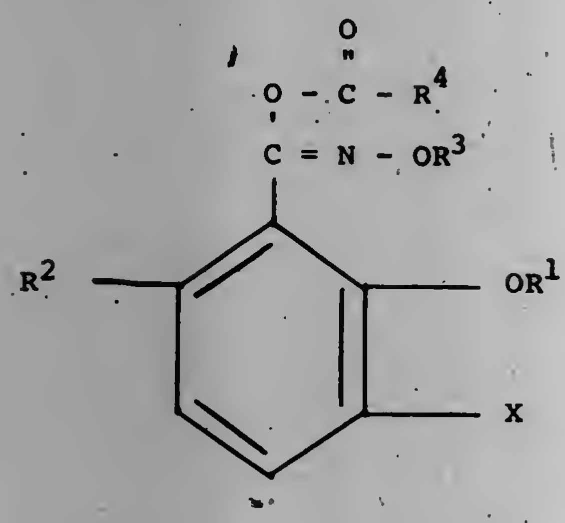
Sidney B. Richter, and Eugene Barnas, both of Chicago, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 148,197, May 26, 1971, Pat. No. 3,840,874, which is a division of Ser. No. 765,962, Oct. 8, 1968, Pat. No. 3,649,664. This application Oct. 20, 1972, Ser. No. 299,497

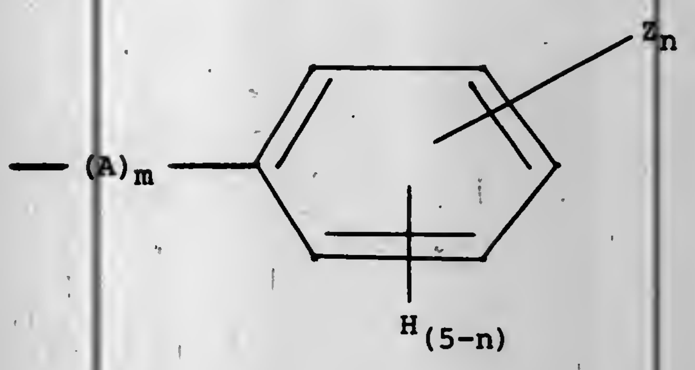
Int. Cl. C07c *131/00*

U.S. Cl. 260—545 R **2 Claims**

1. A compound of the formula



wherein X is halogen; R^1 and R^3 are lower alkyl; R^2 is selected from the group consisting of lower alkyl and lower alkoxy; R^4 is selected from the group consisting of lower alkyl and lower alkenyl.



3,891,702
1-UREIDO-5-AMINOCAPRONAMIDE

Geertrudes H. Suverkropp, Geleen, and Werner Reichrath, Stein, both of Netherlands, assignors to Stamicarbon, N.V., Geleen, Netherlands

Division of Ser. No. 348,519, April 6, 1973, which is a continuation of Ser. No. 211,713, Dec. 23, 1971, abandoned. This application Apr. 8, 1974, Ser. No. 459,207

Int. Cl. C07c *127/14, 99/00, 101/24*

U.S. Cl. 260—553 R **1 Claim**

1. 1-ureido-5-aminocapronamide.

3,891,703
SULFAMIDE PROCESS

John D. Catt, and William L. Matier, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Sept. 20, 1973, Ser. No. 399,025

Int. Cl. C07c *143/72*

U.S. Cl. 260—556 N **7 Claims**

1. The process for preparing an N-substituted sulfamide bearing at least one hydrogen atom and from 1 to 3 organic groups attached to the sulfamide nitrogen atoms thereof, said organic groups being stable under the reaction conditions to trifluoroacetic acid and having molecular weights of from 17 to 300 which comprises contacting a sulfamide bearing at least one tert.-butyl group and said organic groups on the sulfamide nitrogen atoms thereof with at least a molecularly equivalent amount of trifluoroacetic acid relative to said tert.-butyl group at a temperature of from −15°C. to 40°C. for a time period sufficient to result in replacement of said tert.-butyl group with hydrogen.

3,891,704
PSEUDOTHIURONIUM COMPOUNDS

Julius Diamond, Lafayette Hill, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 102,515, Dec. 29, 1970. This application Dec. 26, 1972, Ser. No. 318,302

Int. Cl. C07c *123/00*

U.S. Cl. 260—564 E **2 Claims**

1. The compound which is 2-(2,6-dibromo-4-trifluoromethylbenzyl)-2-pseudothiuronium bromide.

3,891,705
S-TRIAZINES

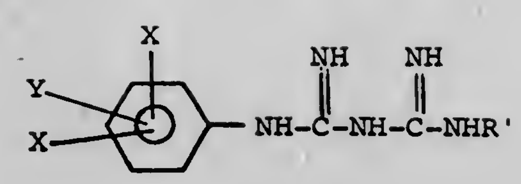
Julius Diamond, Lafayette Hill, and George H. Douglas, Paoli, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 189,191, Oct. 14, 1971, Pat. No. 3,767,656. This application Mar. 15, 1973, Ser. No. 337,055

Int. Cl. C07c *129/08*

U.S. Cl. 260—565 **4 Claims**

1. A process for the preparation of a biguanide compound of the formula:



where:

X, Y and Z may be substituted at any position of the ring and

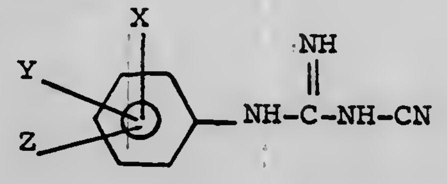
X is hydrogen,
  fluoro,
  chloro,
  bromo or
  iodo or haloloweralkyl;

Y is hydrogen,
  loweralkyl,
  halo,
  nitro,
  amino,
  loweracylamino,
  mono- & diloweralkylamino,
  haloloweralkyl,
  haloloweralkoxy,
  loweralkoxy,
  hydroxy,
  cyano or
  loweralkylsulfonyl;

Z is haloloweralkoxy,
  diloweralkylsulfonamido
  haloloweracyl,
  haloloweralkylsulfonamido,
  cyano
  haloloweralkyl,
  fluoro,
  iodo,
  bromo or
  chloro; and

R′ is hydrogen,
  loweralkyl,
  loweralkenyl,
  cycloloweralkyl or
  arloweralkyl;

which comprises
intimately contacting a 1-cyano-3-substituted phenyl guinidine of the formula



where X, Y and Z are as described above with an aliphatic amine of the formula

$$NH_2R'$$

where R′ is as described above in the presence of a phenolic solvent selected from the group consisting of

phenol,
cresol and
xylol;

at temperatures from about 25° to 150°C and isolating said biguanide.

3,891,706
2-AMINO-2,6-DINITROPHENYLHYDRAZINES

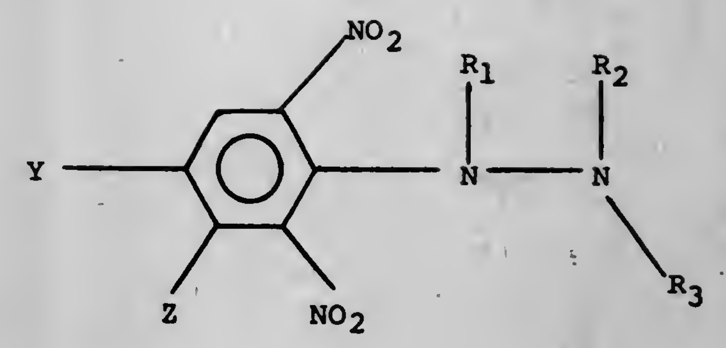
Merrill Wilcox, 2911 N.W. 30th Ter., Gainesville, Fla. 32601

Filed Oct. 2, 1972, Ser. No. 294,147

Int. Cl. C07c *109/04*

U.S. Cl. 260—569 **10 Claims**

1. A compound of the formula



wherein Y is halogen or trifluoromethyl; Z is amino or mono or di-lower alkylamino; R_1 is H, lower alkyl or lower alkenyl; and R_2 and R_3 are independently H, lower alkyl, or lower alkenyl.

3,891,707
HYDROGENATION PROCESS

Dhafir Yusuf Waddan, Blackley, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 22, 1972, Ser. No. 255,669

Claims priority, application United Kingdom, June 4, 1971, 19008/71

Int. Cl. C07c *85/10*

U.S. Cl. 260—583 K **7 Claims**

1. A process for the manufacture of hexamethylene diamine which comprises hydrogenating adiponitrile or 1,4-dicyanobutene by heating with hydrogen at a temperature of 50° to 200°C at a pressure of 1 to 500 atmospheres in the presence of a reduced cobalt borate catalyst.

3,891,708
PURIFICATION OF DIMETHYLAMINOPROPYLCHLORIDE HYDROCHLORIDE

Guy Thomas Woodrum, Canonsburg, and Richard E. Barnett, Corapolis, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Mar. 28, 1974, Ser. No. 455,707

Int. Cl. C07c *87/127*

U.S. Cl. 260—583 N **6 Claims**

1. The process for purifying aqueous solutions of 3-dimethylaminopropylchloride or the hydrochloride salt thereof which comprises passing an aqueous solution containing from 1 to 99 percent by weight of 3-dimethylaminopropylchloride or the hydrochloride salt thereof through an adsorption column packed with activated carbon having a mesh size between 8 to 325 mesh at a treatment level of from 1 to 3500 pounds of 3-dimethylaminopropylchloride or hydrochloride salt thereof per pound of activated carbon.

3,891,709
POLYOXYALKYLENE AMINES

Masaru Higuchi, and Kouichi Ohnaka, both of Ohimachi, Japan, assignors to Daicel, Ltd., Osaka, Japan

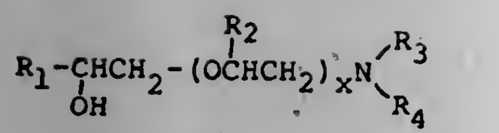
Filed June 13, 1973, Ser. No. 369,469

Claims priority, application Japan, June 27, 1972, 47-64316

Int. Cl.^{2} C07C *93/10*

U.S. Cl. 260—584 B **4 Claims**

1. An antistatic agent of the formula



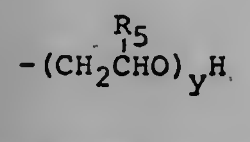
$$R_1-\underset{OH}{CH}CH_2-(O\overset{R_2}{CH}CH_2)_xN\begin{matrix}R_3\\R_4\end{matrix}$$

wherein

R_1 is alkyl having from 7 to 29 carbon atoms,

R_2 is H or alkyl having 1 or 2 carbon atoms,

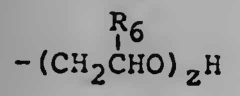
R_3 is lower alkyl having from 1 to 4 carbon atoms or hydroxyalkyl of the formula



$$-(CH_2\overset{R_5}{C}HO)_yH$$

in which R_5 is H or alkyl having 1 or 2 carbon atoms and y is an integer of from 1 to 3,

R_4 is lower alkyl having from 1 to 4 carbon atoms or hydroxyalkyl of the formula



$$-(CH_2\overset{R_6}{C}HO)_zH$$

in which R_6 is H or alkyl having 1 or 2 carbon atoms and z is an integer of from 1 to 3, and

x is an integer of from 1 to 3.

3,891,710

NOVEL 3-THIA ALKANE-1,4-DIONES

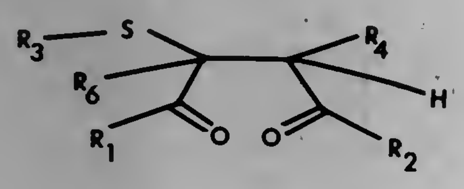
William J. Evers, Atlantic Highlands; Howard H. Heinsohn, Jr., Hazlet, and Bernard J. Mayers, Cliffwood Beach, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 386,454, Aug. 7, 1973, Pat. No. 3,836,563. This application May 1, 1974, Ser. No. 466,066

Int. Cl.^{2} C07C *49/04*

U.S. Cl. 260—593 R **3 Claims**

1. A compound having the structure:



wherein R_1 and R_2 are each lower alkyl, R_3 is hydrogen, and each of R_4 and R_6 is lower alkyl or hydrogen.

3,891,711

PRODUCTION OF KETONES

Peter G. S. Field, Bebington, and David A. Lock, Heswall, both of England, assignors to Burmah Oil Trading Limited, Swindon, England

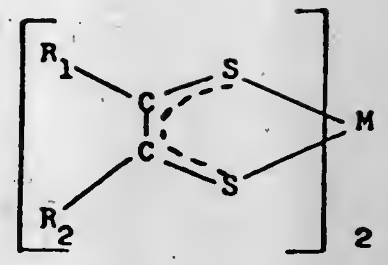
Filed Jan. 21, 1974, Ser. No. 435,035

Claims priority, application United Kingdom, Jan. 24, 1973, 3694/73

Int. Cl. C07c *45/02*

U.S. Cl. 260—597 R **16 Claims**

1. A process for producing a ketone which comprises oxidizing an olefinically unsaturated hydrocarbon containing from three to 24 carbon atoms with an organic hydroperoxide of the formula R′—OOH, wherein R′ is a hydrocarbyl group containing up to 12 carbon atoms and which is unsubstituted or substituted by one or more substituents selected from halogen, alkoxy groups containing up to six carbon atoms, nitro groups and —OOH groups, at a temperature of from ambient temperature to 180°C, in the presence as a catalyst of a metal complex of the formula:



3,891,712

D 2-(6-SUBSTITUTED-2-NAPHTHYL)-PROPANALS

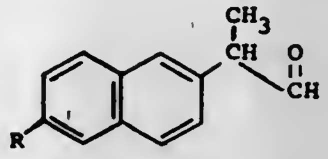
John H. Fried, and Ian T. Harrison, both of Palo Alto, Calif., assignors to Syntex Corporation, Panama

Continuation of Ser. No. 865,216, Oct. 9, 1969, abandoned, which is a continuation-in-part of Ser. No. 741,900, July 2, 1968, Pat. No. 3,626,012, and a continuation-in-part of Ser. No. 814,855, April 9, 1969, Pat. No. 3,663,713. This application Oct. 27, 1972, Ser. No. 301,595

Int. Cl. C07c *47/48*

U.S. Cl. 260—599 **6 Claims**

1. A d 2-(6-substituted-2-naphthyl)propanal selected from the group of compounds represented by the formula



wherein R is methyl, ethyl, isopropyl, cyclopropyl, trifluoromethyl, vinyl, ethynyl, fluoro, chloro, methoxy, methoxymethyloxy, difluoromethoxy, methylthio, methoxymethylthio or difluoromethylthio.

3,891,713

METHOD FOR PRODUCING AROMATIC SULFONES

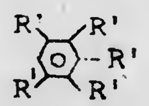
Michael F. Farona, Cuyahoga Falls, and James F. White, Akron, both of Ohio, assignors to The University of Akron, Akron, Ohio

Division of Ser. No. 339,637, March 9, 1973, Pat. No. 3,832,403, which is a continuation-in-part of Ser. No. 119,908, March 1, 1971, abandoned. This application Apr. 10, 1974, Ser. No. 459,484

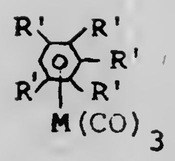
Int. Cl. C07c *147/06*

U.S. Cl. 260—607 A **9 Claims**

1. The process of reacting an aryl sulfonyl halide with an aromatic substrate to form an aromatic product comprising the steps of: charging a reaction vessel with a metallic hexacarbonyl compound having the general formula $M(CO)_6$ wherein M is selected from the group consisting of Cr, Mo and W, adding an aromatic substrate having the general formula



wherein R′ is selected from the group consisting of hydrogen, alkyl groups having from 1 to about 6 carbon atoms, alkoxide groups having from 1 to about 4 carbon atoms, hydroxide, aryl and aryloxide groups having from 6 to about 12 carbon atoms including alkyl substituents, reacting said metallic hexacarbonyl compound with part of said aromatic substrate to yield an arene metal tricarbonyl catalyst having the general formula



charging the reaction vessel with an aryl sulfonyl halide having the general formula $R—SO_2—X$ wherein R is selected from the group consisting of an alkyl group having from 1 to about 20 carbon atoms and an alkyl substituted phenyl group having from 7 to about 12 carbon atoms, and X is selected from the group consisting of bromine, chlorine and fluorine, heating said reaction vessel from ambient temperatures to a temperature sufficient to cause said catalyst to remove the halide from said aryl sulfonyl halide with generation of a sulfonium ion from said organic halide so that said sulfonium ion will attack the remaining part of said aromatic substrate to yield the aromatic product.

3,891,714

PHENOXY CONTAINING BRANCHED CHAIN ALKYL SULFIDES

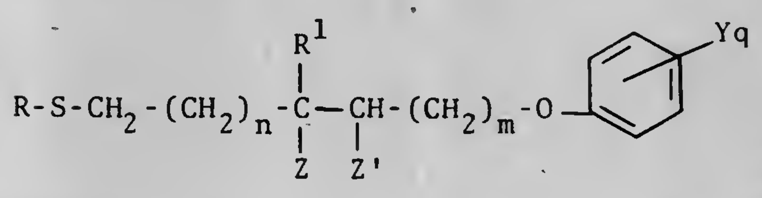
John W. Baum, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. Nos. 170,387, Aug. 9, 1971, abandoned, and Ser. No. 197,952, Nov. 11, 1971, Pat. No. 3,737,442. This application May 29, 1973, Ser. No. 364,459

Int. Cl.^{2} C07C *149/32*

U.S. Cl. 260—609 F **6 Claims**

1. A compound selected from the following formula:



wherein,

m is zero or one;

n is zero, one or two;

R^1 is methyl or ethyl;

R is a branched lower alkyl of three to six carbon atoms;

Y is lower alkyl;

q is zero, one, two or three; and

each of Z and Z′ is hydrogen or Z and Z′ together form a carbon-carbon bond.

3,891,715

PROCESS FOR POLYMERIZATION OF TETRAHYDROFURAN

Kazuo Matsuda, Wakayama; Yoshiaki Tanaka, Osaka, and Takeyo Sakai, Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1972, Ser. No. 307,237

Claims priority, application Japan, Nov. 22, 1971, 46-93933

Int. Cl. C07c *47/02*

U.S. Cl. 260—615 B **4 Claims**

1. A process for the polymerization of tetrahydrofuran which comprises polymerizing tetrahydrofuran at a temperature in the range of −20°C to +10°C, in the absence of water, and in the presence of (1) from 5 to 50 percent by weight, based on the weight of tetrahydrofuran, of fuming sulfuric acid containing from about 15 to about 43 weight percent of SO_3 and (2) from about 0.05 to less than 50 percent by weight, based on the weight of said fuming sulfuric acid, of metal salt of perchloric acid selected from the group consisting of magnesium perchlorate, barium perchlorate, sodium perchlorate, lithium perchlorate and iron perchlorate, until a polymer is formed and then hydrolyzing the terminal groups of the polymer to obtain a polytetramethylene glycol product having hydroxyl groups at both terminal ends of the molecule.

3,891,716

TEREPHENYLYL-BUTADIENOLS

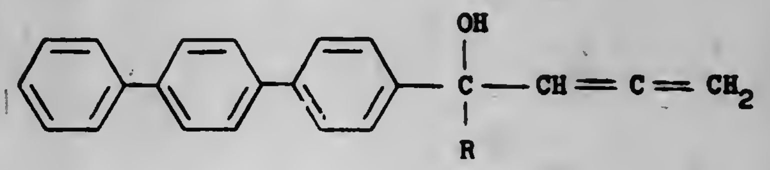
Paul L. Anderson, Dover, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Dec. 28, 1973, Ser. No. 429,401

Int. Cl. C07c *33/02*

U.S. Cl. 260—618 R **2 Claims**

1. A compound of the formula



wherein

R is a hydrogen atom, methyl or ethyl.

3,891,717

PREPARATION OF O-CHLOROPHENOLS

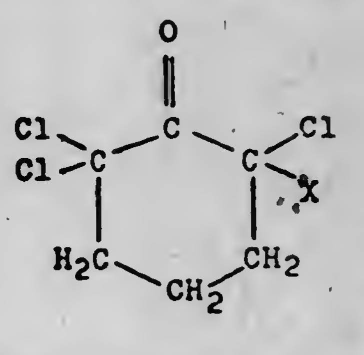
Eugene C. Gilbert, Hanover Park; Robert E. Jones, Arlington Heights, both of Ill., and Edward Sherman, Genoa City, Wis., assignors to The Quaker Oats Company, Chicago, Ill.

Continuation-in-part of Ser. No. 115,772, Feb. 16, 1971. This application Mar. 11, 1974, Ser. No. 449,710

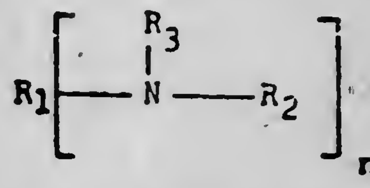
Int. Cl. C07c *39/27, 39/30*

U.S. Cl. 260—623 R **14 Claims**

1. A process for making an ortho chlorinated phenol which comprises: contacting a chlorinated alicyclic ketone and a nitrogen-containing catalyst at a temperture between 100°C. and 250°C; said ketone of the general formula:



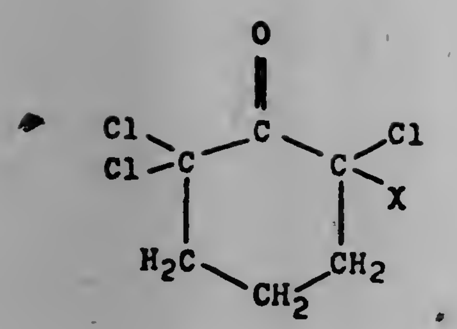
wherein X is hydrogen or chlorine; said nitrogen-containing catalyst being selected from the group consisting of collidine, pyridine, quinoline, lutidine, picoline, pyrazine, a compound of the formula:



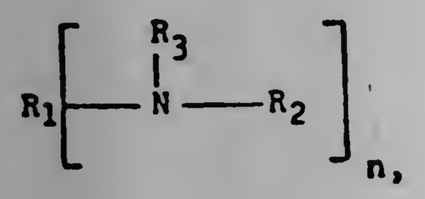
$$R_1\left[-\overset{R_3}{N}-R_2\right]_n,$$

and acid salts thereof selected from the group hydrochloric acid salts and acetic acid salts; wherein n is a whole integer 1 or 2; R_1 is alkyl having between 1 and 4 carbon atoms, phenyl, or acyl selected from the group formyl, acetyl and propionyl when n is 1, and R_1 is carbonyl when n is 2; and R_2 and R_3 are independently either a hydrogen or alkyl having between 1 and 4 carbon atoms, or phenyl or alkyl substituted phenyl.

9. The process for making an ortho chlorinated phenol which comprises contacting a chlorinated alicyclic ketone of the general formula:



wherein X is a hydrogen or a chlorine with a nitrogen-containing catalyst which is a meteroaromatic amine a compound of the formula:



$$R_1\left[-\overset{R_3}{\overset{|}{N}}-R_2\right]_n,$$

wherein *n* is a whole integer 1 or 2; R_1 is an alkyl, phenyl, or acyl group when *n* is 1, and R_1 is a carbonyl group when *n* is 2; and R_2 and R_3 are independently either a hydrogen, phenyl or alkyl group, said contacting taking place at a temperature between 100°C. and 250°C., said phenyl being unsubstituted and alkyl substituted, said alkyl having from 1 to 4 carbon atoms, said acyl having from 1 to 3 carbon atoms.

3,891,718

SHAPED ARTICLES MADE OF ACRYLONITRILE POLYMERS CONTAINING ANTISTATIC ADDITIVES

Gerhard Dieter Wolf, Dormagen; Francis Bentz, Cologne, and Gunther Nischk, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

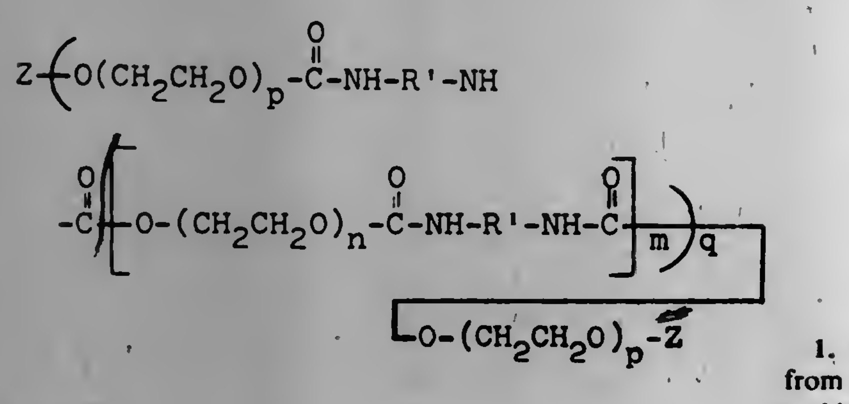
Filed July 5, 1974, Ser. No. 486,186

Claims priority, application Germany, July 7, 1973, 2334602

Int. Cl. C08g *41/04*

U.S. Cl. 260—859 R **5 Claims**

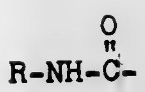
1. A shaped article of an acrylonitrile polymer containing at least 60% by weight of acrylonitrile in copolymerized form containing as an antistatic additiv from 0.5 to 15 % by weight, based on the total mixture, of at least one polyether polyurethane compound of the general formula



$$Z\left(O(CH_2CH_2O)_p-\overset{\overset{O}{\|}}{C}-NH-R'-NH-\overset{\overset{O}{\|}}{C}\left[O-(CH_2CH_2O)_n-\overset{\overset{O}{\|}}{C}-NH-R'-NH-\overset{\overset{O}{\|}}{C}\right]_m\right)_q O-(CH_2CH_2O)_p-Z$$

in which

Z represents the radical

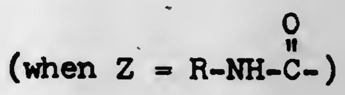


$$R-NH-\overset{\overset{O}{\|}}{C}-$$

or R, where R denotes a C_{1-18}-alkyl, cycloalkyl, aryl, aralkyl or alkaryl radical said radical being substituted by halogen or alkyl or not,

R′ represents an alkylene, cycloalkylene, arylene, aralkylene or alkarylene radical, said radical being substituted by halogen or alkyl or not,

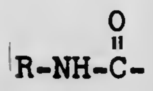
p and *n* denote integers of from 5 to 50 being identical



$$(\text{when } Z = R-NH-\overset{\overset{O}{\|}}{C}-)$$

or different (when Z = R) and

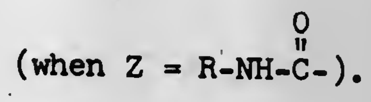
m represents an integer of from 0 to 10 when Z denotes the group



$$R-NH-\overset{\overset{O}{\|}}{C}-$$

or it represents an integer of from 1 to 10 when Z denotes the group R, and

q represents the integer 1 (when Z = R) or an integer of from 0 or 1



$$(\text{when } Z = R-NH-\overset{\overset{O}{\|}}{C}-).$$

3,891,719

THERMOPLASTIC MOULDING COMPOSITIONS OF A POLYCARBONATE AND A GRAFT COPOLYMER OF STYRENE AND ACRYLONITRILE ON AN ACRYLIC ACID ESTER POLYMER

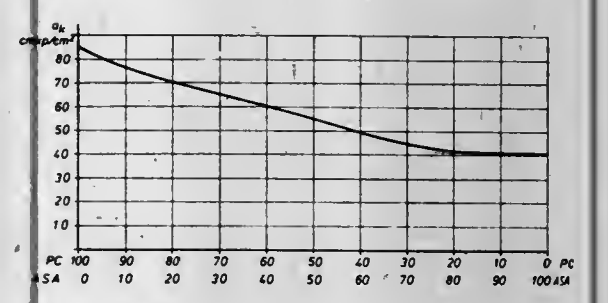
Hermann Schirmer, Krefeld; Gunter Peilstocker, Krefeld-Bockum, and Herbert Schuster, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Dec. 3, 1973, Ser. No. 421,645

Claims priority, application Germany, Dec. 6, 1972, 2259564; Oct. 25, 1973, 2353429

Int. Cl. C08g *39/10*

U.S. Cl. 260—873 **8 Claims**



1. A thermoplastic moulding composition comprising: a. from 95 to 5 % by weight of a dihydric phenol polycarbonate; and b. from 5 to 95 % by weight of a graft styrene and acrylonitrile copolymer on an acrylic acid ester homopolymer and/or copolymer.

3,891,720

GRAFT POLYMERS OF VINYL CHLORIDE ON UNSATURATED OLEFINIC ELASTOMERS AND PROCESS FOR THE PREPARATION THEREOF

Febo Severini; Alberto Valvassori, both of Milan, and Alberto Pagliari, Saronno, all of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed Sept. 25, 1972, Ser. No. 292,159

Claims priority, application Italy, Sept. 23, 1971, 28984/71

Int. Cl. C08f *15/00, 29/12*

U.S. Cl. 260—878 R **11 Claims**

1. An impact resistant polymeric composition comprising a mixture of the following components:

a. a vinyl chloride homopolymer,

b. a graft copolymer of 15–60% by weight of vinyl chloride on an olefinic elastomer which comprises a copolymer of ethylene, an α-olefin and a minor amount of a cyclic or acyclic diene or polyene, and

c. an unmodified olefinic elastomer;

said composition having a melt index (determined according to ASTM D 1238 at 185°C with a load of 23.5 kg) greater than 1 when the composition contains from 5 to 15% of total rubber, which is defined as the sum of the amounts of olefinic elastomer contained in components (b) and (c).

3,891,721

BLOCK POLYMERS OF STYRENE-BUTADIENE-2-VINYLPYRIDINE

Robert T. Prudence, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 15, 1973, Ser. No. 415,870

Int. Cl. C08d *1/20, 3/06*

U.S. Cl. 260—879 **6 Claims**

1. A triblock polymer of polystyrene-polybutadiene-2-vinylpyridine formed by the process of contacting sequentially styrene, butadiene and 2-vinylpyridine with an organolithium catalyst corresponding to the formula R-Li wherein R is selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl, and aryl alkyl and characterized by the molecular weight of the polystyrene block ranging from about 10,000 to about 15,000, the molecular weight of the polybutadiene block ranging from about 30,000 to about 80,000 and the molecular weight of the poly-2-vinylpyridine block ranging from about 5,000 to about 15,000, and further characterized in that the ultimate tensile of the triblock polymer is at least 5200 psi, displays at least 650 percent elongation and the end blocks of polystyrene and poly-2-vinylpyridine together comprise at least 30 percent by weight of the said triblock polymer molecular weight.

3,891,722

PROCESS FOR MANUFACTURE OF IMPACT-RESISTANT POLYMERIZATES OF OLEFINIC NITRILES AND DIENE RUBBERS

William J. Miloscia, Macedonia; John J. Weisz, Solon, and Paul E. Planz, North Randall, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

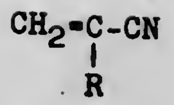
Filed Feb. 16, 1970, Ser. No. 11,924

Int. Cl. C08f *15/36, 15/40*

U.S. Cl. 260—879 **5 Claims**

1. In the process for preparing an impact-resistant resinous polymer comprising polymerizing in an aqueous medium in the substantial absence of oxygen and in the presence of a polymerization initiator and a polymer modifier 100 parts by weight of

A. at least 50% by weight of at least one nitrile having the structure

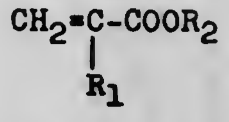


$$CH_2=\underset{\underset{R}{|}}{C}-CN$$

wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms or a halogen and

B. up to 50% by weight based on the combined weight of (A) and (B) of

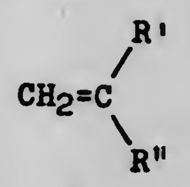
1. an ester having the structure



$$CH_2=\underset{\underset{R_1}{|}}{C}-COOR_2$$

wherein R_1 is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R_2 is an alkyl group having from 1 to 6 carbon atoms, or

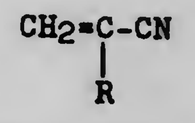
2. an alpha-olefin having the structure



$$CH_2=C\begin{matrix}R'\\ R''\end{matrix}$$

wherein R′ and R″ are alkyl groups having from 1 to 7 carbon atoms in the presence of from 1 to 40 parts by weight of

C. a rubbery polymer of a conjugated diene and a comonomer having the structure



$$CH_2=\underset{\underset{R}{|}}{C}-CN$$

wherein R has the foregoing designation, said rubbery polymer containing from 50 to 90% by weight of polymerized conjugated diene and from 10 to 50% by weight of comonomer,

the improvement consisting of carrying the polymerization reaction to at least about 5% conversion before adding any of the polymer modifier.

3,891,723

EMULSION POLYMERIZATION OF VINYL CHLORIDE, AND A COPOLYMER OF α-METHYL STYRENE AND ACRYLIC ACID ESTER

Rene Nicolet, and Walter Gutmann, both of Fribourg, Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

Filed June 8, 1973, Ser. No. 368,100

Claims priority, application Switzerland, June 8, 1972, 8491/72

Int. Cl. C08f *15/00, 19/00*

U.S. Cl. 260—884 **16 Claims**

1. A process for the production of transparent impact-resistant and weather-resistant polymers of vinyl chloride by polymerizing vinyl chloride, optionally together with other copolymerisable monomers, in an aqueous dispersion by an emulsion polymerisation process in the presence of copolymers of acrylic acid esters, characterised in that vinyl chloride or monomer mixtures containing at least 80 percent by weight of vinyl chloride are polymerised in the presence of a dispersion of at least one copolymer of 65 to 95 percent by weight of at least one acrylic acid ester containing 3 to 18 carbon atoms in the ester group with 35 to 5 percent by weight of α-methyl styrene, the copolymer having a mean particle diameter of 30 to less than 120 mμ, determined by soap titration, and being used in such an amount that the final polymer contains 4 to 20 percent by weight of acrylic acid ester units.

3,891,724
ETHYLENE-PROPYLENE TERPOLYMER AND CRYSTALLINE 1,2 POLYBUTADIENE

Yasuyuki Yaeda; Yoshishige Chikatsu; Noriaki Ando, all of Yokkaichi, and Ryuichi Sakata, Kobe, all of Japan, assignors to Japan Synthetic Rubber Co., Limited, Tokyo, Japan

Filed Dec. 11, 1973, Ser. No. 423,851

Claims priority, application Japan, Dec. 12, 1972, 47-124680

Int. Cl. C08f *29/12, 45/54*

U.S. Cl. 260—889 **9 Claims**

1. An ethylene-propylene rubber composition comprising 3 to 50 % by weight of at least one 1,2-polybutadiene having a 1,2-addition unit content of at least 70 %, a crystallinity of at least 5 % and an intrinsic viscosity of at least 0.7 dl/g as measured in toluene at 30°C, and 97 to 50 % by weight of at least one ethylene-propylenediene terpolymer rubber.

3,891,725
VULCANIZABLE CHLORINATED ELASTOMER COMPOSITION

Harold Howard Klever, Munroe Falls, Ohio, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Oct. 4, 1974, Ser. No. 512,045

Int. Cl. C08f *29/12, 37/18*

U.S. Cl. 260—889 **8 Claims**

1. In a vulcanizable composition of a chlorinated hydrocarbon elastomer selected from the group consisting of chlorinated polyethylene, chlorosulfonated polyethylene, or chloroprene polymers, the improvement which comprises said chlorinated hydrocarbon elastomer containing from about 3–20 parts, based on 100 parts of chlorinated elastomer, of a sulfur-curable copolymer having ethylene units, propylene units, units derived from a monoreactive non-conjugated diene having only one polymerizable double bond, and units derived from a C_3—C_{22} direactive nonconjugated diene having two polymerizable double bonds.

3,891,726
HETEROCYCLIC PHOSPHORUS COMPOUNDS

John Scotchford Elliott; Bryan Terence Davis, and Monty Frederick Crook, all of London, England, assignors to Edwin Cooper & Company Limited, London, England

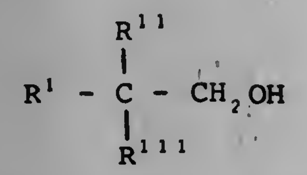
Filed Feb. 13, 1973, Ser. No. 332,125

Claims priority, application United Kingdom, Feb. 18, 1972, 7582/72

Int. Cl.² C07F *9/32*

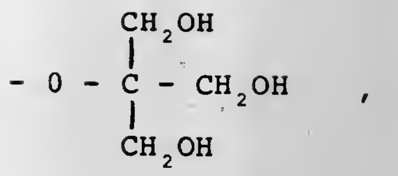
U.S. Cl. 260—927 R **5 Claims**

1. A heterocyclic phosphorus mono- or polyester product prepared by reacting a polyol of the formula:



$$R^1 - \underset{R^{111}}{\overset{R^{11}}{\underset{|}{\overset{|}{C}}}} - CH_2OH$$

wherein R^1 is selected from the group consisting of hydrogen, methyl, ethyl, methylol, the group $-O-R''''-O_\nu H$ where R'''' is ethylene or propylene and ν is zero or an integer of from 1 to 10, and



$$-O-\underset{CH_2OH}{\overset{CH_2OH}{\underset{|}{\overset{|}{C}}}}-CH_2OH\ ,$$

R'' and R''' are the same or different and each is selected from the group consisting of hydrogen, methyl, ethyl and methylol, and the combination of R', R'' and R''' is such that at least two hydroxyl groups are present; or a monoether, oxide, oxetane or carbonate which yields said polyol on hydrolysis; with a heterocyclic phosphorus compound prepared by reacting an olefin polymer or copolymer having a molecular weight in the range of about 700 to 3500 and containing olefinic unsaturation with a phosphorus trihalide in the presence of a Friedel-Crafts catalyst to form a reaction product having hydrocarbon and halogen attached to phosphorus, and thereafter reacting the reaction product with water or methanol to remove one or both of the halogen atoms from the phosphorus atom.

3,891,727
FIRE RETARDANT PHOSPHORUS OLIGOMER COMPOSITIONS

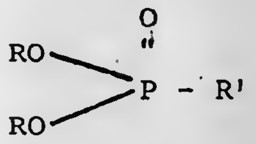
Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. Nos. 153,075, June 14, 1971, Pat. No. 3,822,327, Ser. No. 187,575, Oct. 7, 1971, and Ser. No. 410,583, Oct. 29, 1973. This application Dec. 17, 1973, Ser. No. 425,675

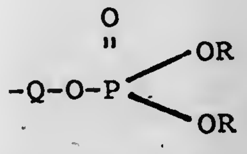
Int. Cl. C07f *9/08;* **C07d** *105/04;* **C08f** *45/58*

U.S. Cl. 260—928 **34 Claims**

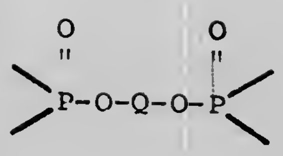
1. Condensation products of a phosphorus ester material comprising a phosphorus ester of the formula



wherein R is 2-haloalkyl of 2 to 20 carbon atoms or alkyl of from 1 to 20 carbon atoms, aryl, aralkyl, alkaryl, alkenyl of from 2 to 20 carbon atoms, alkadienyl, alkynyl, cycloalkyl, cycloalkenyl, cycloalkadienyl, aralkenyl, and the alkoxy, aryloxy, cyano and haloaryl substituted derivatives thereof or:



wherein Q represents vicinal carbon atoms of an alkylene radical containing from 2 to 20 carbon atoms, and R' is R or OR, with the proviso that at least one R in the above formula is a 2-haloalkyl radical, said condensation products being essentially free of five-membered phosphorus ester rings and being prepared by a process comprising heating to a temperature between about 100° and about 250°C. said phosphorus ester material, removing alkyl halide, forming:



linkages wherein Q is as defined above and five-membered phosphorus ester rings, and converting said rings to open chain phosphorus esters by reaction at a temperature from about 20° to about 180°C. with a reagent of the formula:

$$YOH$$

in which Y is hydrogen, alkyl of from 1 to 20 carbon atoms or alkyl of from 1 to 20 carbon atoms substituted with non-interfering substituents selected from the group consisting of aryloxy, halogen, alkoxy, alkenyl, aryl, acyl, acyloxy, hydroxyl, amido, alkylthio, arylthio, carbalkoxy, carboxamido, cyano or nitro.

2. Condensation products according to claim 1 obtained by a process comprising the additional step of substantially neutralizing the acid structures by heating at a temperature from about 25° to about 225°C. the condensation product with an epoxide selected from the group consisting of C_2–C_8 alkylene oxides, epichlorohydrin, epibromohydrin, styrene oxide, glycidyl ether cyclohexenylmethyl cyclohexene carboxylate diepoxide, butadiene diepoxide, vinyl cyclohexene diepoxide, 4,4,4-trichloro-1,2-epoxybutane or an ortho ester selected from the group consisting of radicals having the formula:

$$—C(OR)_3$$

wherein R is alkyl of from 1 to 6 carbon atoms.

3,891,728
O-ALKYL-S-ALKYL-O-SUBSTITUTED PHENYL-THIOPHOSPHORIC ACID ESTERS

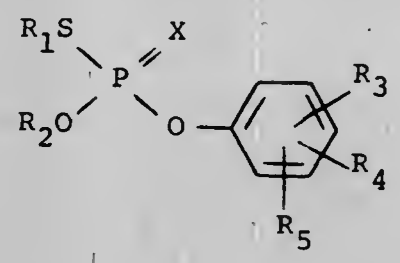
Jozef Drabek, Allschwil, and Denis Varsanyi, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 292,218, Sept. 25, 1972, Pat. No. 3,839,509. This application July 15, 1974, Ser. No. 488,867

Int. Cl. A01n *9/36;* **C07f** *9/18*

U.S. Cl. 260—955 **3 Claims**

1. A compound of the formula



wherein

R_1 is C_3–C_5 alkyl,

R_2 is methyl or ethyl,

R_3 is trihalomethyl in which at least 1 halogen is fluorine,

R_4 and R_5 are each independently hydrogen, chlorine or bromine, and

X is oxygen or sulphur.

3,891,729
DEVICE FOR AERATING LIQUIDS

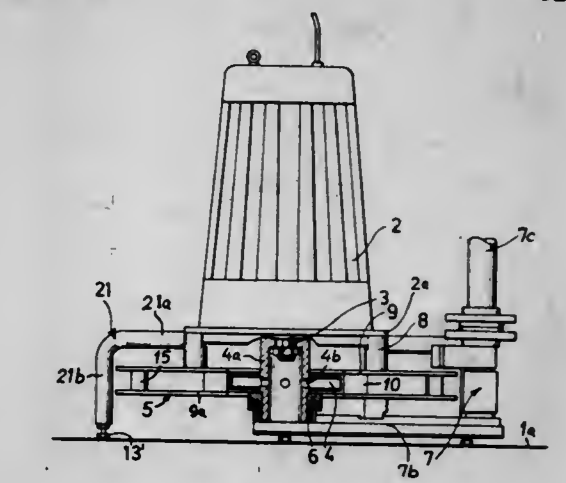
Heinrich Ebner, Bonn-Ippendorf, and Anton Enenkel, Bonn-Roettgen, both of Germany, assignors to Firma Heinrich Frings, Bonn, Germany

Filed Aug. 31, 1973, Ser. No. 393,439

Claims priority, application Germany, Sept. 1, 1972, 2243161

Int. Cl. B01f *3/04*

U.S. Cl. 261—87 **12 Claims**



1. A device for aerating liquids, which device includes a hollow vaned rotor arranged near the bottom of a tank or container for rotation about a vertical axis, a stator encircling said rotor, and a drive motor for rotating said rotor, the latter having from 4 to 8 vanes, each vane being provided at its trailing side with an air outlet opening facing away from the direction of rotation of the rotor and at its leading side with a vertical imperforate impeller facing in in the direction of rotation and inclined non-radially away from said direction so as to form an acute angle with a radial plane extending through the apex edge of that vane, said rotor thereby having a like plurality of peripherally spaced chambers defined between successive vanes and each open at both its top and its bottom, and the stator having 2 vertically spaced, flat horizontal rings and at least 12 vertical guide plates secured between said rings at peripherally spaced locations and each inclined non-radially of the rotor/stator combination so as to form an acute angle with a radial plane passing through the innermost edge of that guide plate; the improvement wherein

- a. said rotor has a vertical, downwardly open, tubular hub the interior of which is in communication with the interior of said rotor;
- b. said drive motor is constructed for immersion in the liquid being aerated, is positioned above said rotor and in close proximity thereto, and has a short output shaft drivingly connected to said hub;
- c. spacer means are interposed between and rigidly connected to both the upper one of said stator rings and an adjunct of the superposed housing of said drive motor, thereby to provide above said rotor between said upper stator ring and said drive motor housing a space of predetermined height through which liquid can flow in a controlled manner to enter from above into said chambers defined between said rotor vanes;
- d. a stationary air intake duct which has an intake end located exteriorly of said tank or container and laterally adjacent thereto extends from there into said tank or container and then first downwardly to a level below that of said rotor and then transversely over to the lowermost end of said hub, said air intake duct at its discharge end is in communication with the interior of said hub, and a labyrinth packing or like rotary coupling establishes a liquid-tight seal between said hub and said discharge end of said air intake duct; and
- e. a supporting structure for the entire device is provided with a plurality of leveling screws resting on the bottom of said tank or container, said supporting structure being constructed and arranged to dispose the lower one of said

stator rings so as to leave sufficient space therebelow to accommodate the transverse section and the discharge end section of said air intake duct and to permit liquid to enter from below into said chambers.

3,891,730

METHOD FOR MAKING METAL POWDER

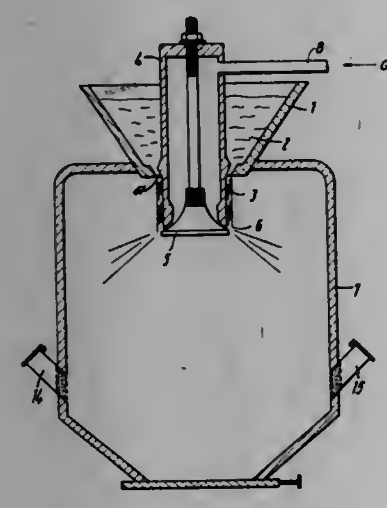
Otto Wessel, Duisburg; Georg Hofmann, Krefeld; Hartmut Gesell, and Werner Scholz, both of Duisburg, all of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed May 24, 1972, Ser. No. 256,386

Claims priority, application Germany, May 27, 1971, 2126856

Int. Cl. B01j *2/02*

U.S. Cl. 264—11 **3 Claims**



1. In a method for producing metal powder by atomizing molten metal upon impact by a pressurized atomizing fluid and permitting resulting droplets to cool and to solidify, the improvement comprising:

a. causing said molten metal to flow as a downflowing film over the outer surface of a hollow mandrel and leaving the lower end of said mandrel as an annular stream; and

b. directing said pressurized fluid through said mandrel and as radially outward jet flow from the lower end of said mandrel to impinge upon and atomize the surrounding annular stream of molten metal into droplets and to displace said droplets in radial outward directions from said mandrel.

3,891,731

METHOD OF PRE-STRESSING FORM TIE SYSTEMS

Chester I. Williams, 347 Greenbriar, S.E., Grand Rapids, Mich. 49506

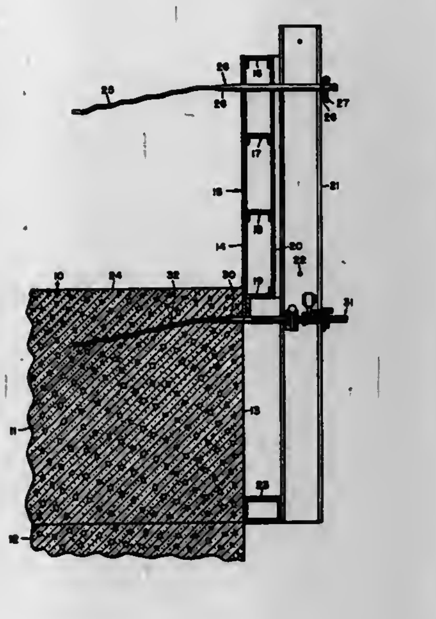
Filed Oct. 20, 1969, Ser. No. 867,508

Int. Cl. E04g *11/28*

U.S. Cl. 264—33 **4 Claims**

1. A method of securing a form structure to an existing mass of concrete, said method including attaching in threaded engagement an anchor rod to a dummy bolt mounted in a form panel and projecting inwardly therefrom, pouring concrete around said anchor rod and the inner extremity of said dummy bolt device, removing said dummy bolt, attaching a stress bolt to said anchor in threaded engagement, and securing a form panel for the succeeding pour by securing the same to said stress bolt, wherein the improvement comprises:

generating predetermined pre-stress in said anchor rod at least to the extent of the working load to be applied thereto by tightening the threaded engagement of said stress bolt therewith prior to the securing of said form panel to said stress bolt, said stress bolt remaining in axially substantially fixed position with respect to said concrete mass during said generation of pre-stress.



3,891,732

METHOD OF SEALING SHUTTERING AGAINST A DEFORMABLE SECTION OF AN EXTERNAL WATERSTOP FOR USE IN FORMING JOINTS IN CONCRETE

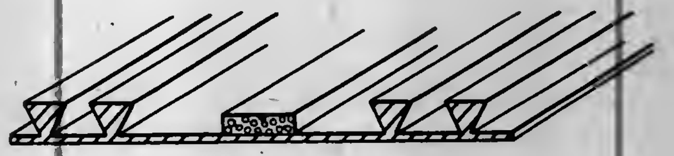
John Hurst, London, England, assignor to W. R. Grace & Company, Cambridge, Mass.

Division of Ser. No. 328,994, Feb. 1, 1973, Pat. No. 3,808,762, which is a division of Ser. No. 217,676, Jan. 13, 1972, Pat. No. 3,758,650, which is a continuation of Ser. No. 4,379, Jan. 20, 1970, abandoned. This application Jan. 9, 1974, Ser. No. 431,808

Claims priority, application United Kingdom, Jan. 22, 1969, 3699/69

Int. Cl. E04b *1/16*

U.S. Cl. 264—34 **3 Claims**



1. The method of forming a water-impervious seal at a concrete joint formed by two adjacent and separately poured masses of concrete, said method comprising the steps of:

1. providing a strip of moisture or water-resistant flexible material not sufficiently deformable by shuttering placed thereon to effect a grout-tight seal therewith, said strip having a longitudinally extending center line, and at least one keying formation projecting laterally from said strip on each side of the center line thereof, said keying formations all projecting from the same face of said strip and running longitudinally along the length thereof, said keying formations being structured such that the formations broaden out from the point at which they project from said strip, said strip further having substantially at said center line a raised, foam portion having a plurality of closed cells more easily deformable than said strip and running longitudinally along the length of said strip and projecting laterally from the same surface as said keying formations; said foam portion being sufficiently deformable by shuttering placed thereon to effect a grout-tight seal therewith;
2. placing the surface of said strip which is opposite to the surface from which said formations project against a base or shuttering, on or against which base or shuttering said concrete masses are to be poured;
3. placing stop-end shuttering against said deformable section of said strip whereby said section is deformed by the pressure of said stop-end shuttering and conform tightly in sealing relationship to the configuration of said shuttering;
4. pouring a first mass of concrete so that the or each keying formation on one side of the center line of said strip becomes embedded in the concrete; removing said shuttering; and
5. pouring a second mass of concrete so that the exposed keying formation or formations on the opposite side of said center line of said strip becomes embedded therein.

3,891,733

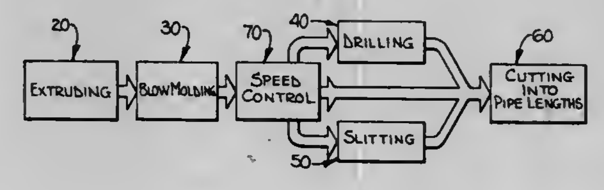
METHOD OF MAKING CORRUGATED PLASTIC PIPE WITH INTEGRAL COUPLER COLLARS

Ernest J. Maroschak, Box 878, Roseboro, N.C. 28382

Filed July 13, 1972, Ser. No. 271,225

Int. Cl.² B29C *5/06;* **B29D** *23/03, 23/04*

U.S. Cl. 264—40 **20 Claims**



1. A method of making plastic pipes each having an elongate tubular corrugated body and an integral enlarged coupler collar on one end of each body; said method comprising

continuously extruding a tube of hot plastic material into a blow molding zone defined by a series of cooperating pairs of forwardly moving die blocks, while

molding annular corrugations of alternating ribs and valleys along successive closely spaced, elongate portions of the tube to produce predetermined corrugated lengths of the tube during forward movement thereof through the molding zone, while also

molding each of those portions of the tube between the corrugated lengths into an enlarged relatively short sleeve of an inner shape and size capable of circumscribing a circle of a diameter greater than the outer diameter of the ribs during forward movement of the tube through the molding zone, and while molding a plurality of spaced latch members integral with and projecting inwardly around the interior of each sleeve adjacent opposite sides of the median longitudinal center thereof and wherein the latch members are of such size and shape as to fit in at least one valley of a cut-end portion of the corrugated lengths,

transversely severing said tube intermediate the ends of the respective sleeves to form each sleeve into a pair of separate collars integral with and projecting axially from the proximal ends of adjacent corrugated lengths so that some of said latch members are positioned within both of the separate collars formed by severing each sleeve, and transversely severing each of said corrugated lengths intermediate the ends thereof so that each pipe thus formed has a collar on one end only thereof adapted to receive therein the corrugated opposite end portion of anoter like pipe.

3,891,734

PROCESS FOR THE MANUFACTURE OF LIGHT GRANULATES

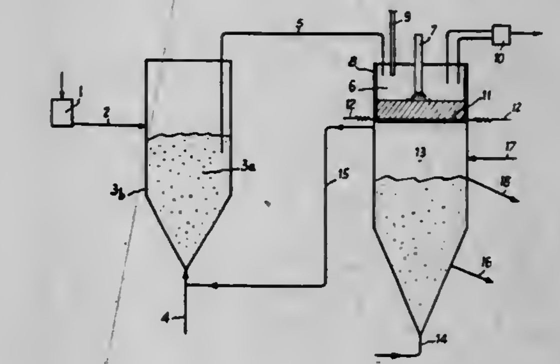
Raymond Chauvin, Verneuil-en-Halatte, France, assignor to Charbonnages de France, Paris and Houilleres du Bassin du Nord et du Pasde-Calais, Douai, both of, France

Continuation-in-part of Ser. No. 159,275, July 2, 1971, abandoned. This application Aug. 22, 1973, Ser. No. 390,345

Claims priority, application France, July 10, 1970, 70.25915

Int. Cl. C04b *33/32, 35/64*

U.S. Cl. 264—43 **12 Claims**



1. A process for the manufacture of lightweight aggregate from fusible silico-aluminous mineral capable of evolving gases by internal reaction of disassociation, comprising the following steps:

a. melting at a temperature between 700° and 1,550°C. said fusible silico-aluminous material, selected from the group consisting of shale, fusible clay and ash, in an atmosphere at a pressure in the vicinity of the atmospheric pressure, b. restraining the release of liberated gas from the melt by maintaining above the melt the partial pressure of at least one of the gases normally liberated from the molten mineral at an elevated pressure no lower than the pressure at which said gas is formed in the resultant molten mineral, said gases being selected from the group consisting of oxygen, carbon dioxide, carbon monoxide, sulfur dioxide-trioxide;

c. dividing said molten mineral into drops of 3 to 15 mm;

d. simultaneously bringing said drops into contact with an atmosphere, different from said controlled atmosphere, wherein the partial pressure of said evolving gas is reduced to the vicinity of zero, thereby expanding said drops; and

e. rapidly cooling the expanding drops to effect freezing of said drops to thereby form cooled expanded granules.

3,891,735

SINTERED ARTEFACTS AND THE LIKE

John Malcolm North, and Ronald Spencer Wilks, both of Newbury, England, assignors to United Kingdom Atomic Energy Authority, London, England

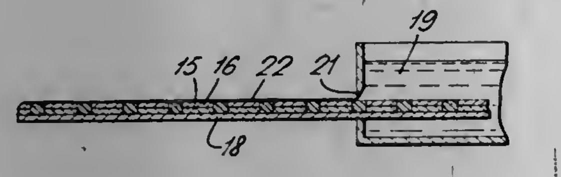
Filed Dec. 27, 1972, Ser. No. 318,747

Claims priority, application United Kingdom, Dec. 29, 1971, 60575/71

Int. Cl. C04b *35/64*

U.S. Cl. 264—59 **2 Claims**

1. In a method of manufacturing a sintered artefact or like artefact the manufacture of which involves firing a refractory material, which method comprises stacking layers of sheet material capable of burning readily and without deleterious ash formation, with intervening layers of composite plastics material in preformed sheets comprising powdered refractory material and a binder which provides thermosetting properties, providing ribs or walls of composite plastics material and effecting bonding such that the ribs or walls connect together the sheets of composite plastics material, the thickness of the layers of burnable material defining the separation between adjacent sheets of composite plastics material, heating the stack to cure the binder, further heating to burn off the burnable material, and firing the stack to form the sintered or like artefact from the powdered refractory material, a method of fabricating a sheet component comprising securing a sheet of said readily burnable material to a support sheet with adhesive, forming said adhesively secured readily burnable sheet and support sheet with slots corresponding to wanted structural features in a finished aretfact, securing a further support sheet with adhesive to the slotted burnable sheet on the side remote from the slotted support sheet, whereby the slots become troughs, filling the troughs with a mixture of powdered refractory material, a binder capable of providing thermosetting properties and a solvent for the binder, evaporating the solvent, and removing the support sheets, the resultant composite plastics material comprising powdered refractory material and binder extending through the slots at least to the surface on each side of the slotted sheet of burnable material so as to form said ribs or walls, said adhesive being insoluble in said solvent for the binder.



3,891,736

PROCESS FOR SHAPING POLYTETRAFLUOROETHYLENE SHEET

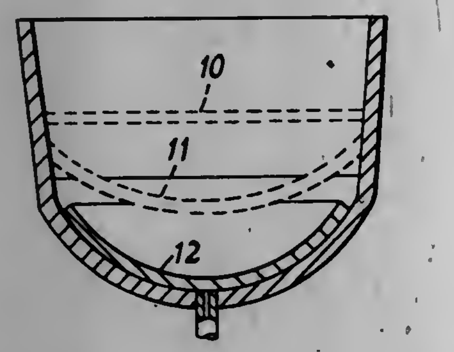
Arthur Trevor Voaden, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 8, 1971, Ser. No. 187,648

Claims priority, application United Kingdom, Oct. 16, 1970, 49285/70; Jan. 26, 1971, 3166/71

Int. Cl. B29c *17/04*

U.S. Cl. 264—92 **5 Claims**



1. A process for the manufacture of shaped articles of polytetrafluoroethylene wherein a sheet of polytetrafluoroethylene is heated to a temperature at which it is shapeable by fluid pressure and is positioned wholly inside a concave mold essentially free of convex portions and is subjected to the effect of atmospheric pressure across substantially the whole of its surface directed away from the mold cavity by the application of an at least partial vacuum between the sheet and the mold so as to cause the sheet to conform to the shape of the mold surface by the free drawing-in of the sheet into the mold during which the periphery of the sheet is allowed to move freely over the mold surface without restraint, the sheet being subsequently held in the mold until it has cooled sufficiently to be form stable.

3,891,737

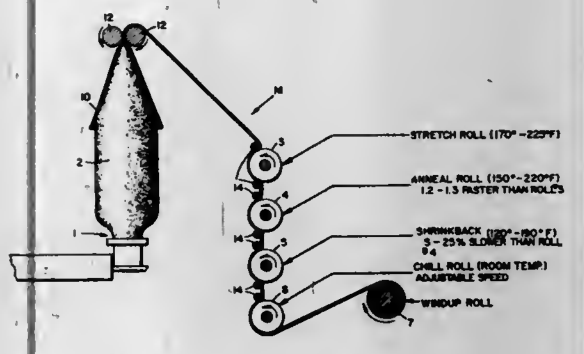
METHOD OF MAKING A HEAT SHRINKABLE FILM OF POLYETHYLENE COPOLYMERS THEREOF AND ARTICLE PRODUCED THEREFROM

Alexander J. Marsh, Republic, and Henry O. Sargent, Harrisonburg, both of Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Nov. 21, 1973, Ser. No. 419,164

Int. Cl. B29c *17/02, 17/07, 25/00*

U.S. Cl. 264—95 **1 Claim**



1. A method of making a preferentially oriented heat shrinkable film of polyethylene or polyethylene containing copolymers thereof having a shrink characteristic generally controlled by the heat applied to effect shrinking compring the steps of

a. inflating said film in tubular form after said film is extruded from an extrusion die,
b. collapsing said film without fusion thereof,
c. passing said collapsed film over a stretch roll while maintaining said stretch roll at a temperature from about 170°F. to about 225°F.,
d. stretching said film along its longitudinal axis by a factor between about 1.2:1 and 1.3:1 by effecting a speed differential of said factor between said stretch roll and an anneal roll,
e. maintaining the temperature of said anneal roll from about 150°F. to about 220°F. to anneal said film,
f. effecting shrinking back of said film between said anneal roll and a shrink back roll by driving said shrink back roll at a speed from about 5% to about 25% slower than said anneal roll,
g. maintaining the temperature of said shrink back roll from about 120°F. to about 190°F.,
h. cooling said film to about room temperature,
i. and winding up said film on a windup roll.

3,891,738

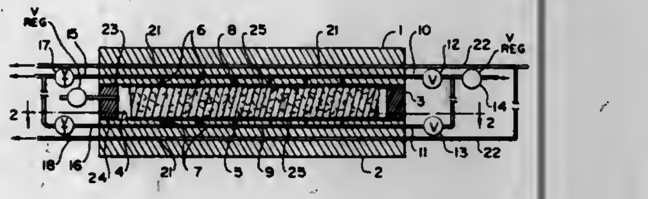
METHOD AND APPARATUS FOR PRESSING PARTICLEBOARD

Kuo-Cheng Shen, Ottawa, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada

Filed Nov. 10, 1972, Ser. No. 305,531

Int. Cl.^{2} B29J *5/00*

U.S. Cl. 264—101 **5 Claims**



1. A process for pressing particleboard in a press including a pair of platens wherein each platen has apertures opening to one surface thereof which is adjacent to the other platen and

chamber defining means enclosing the region between said platens, comprising the steps of:

a. compressing a mat comprising wood particles and a thermosetting adhesive binder between said platens to the desired particleboard thickness;
b. introducing steam under pressure into the compressed mat through the apertures of one platen with sufficient pressure to pass through the mat from one surface thereof to the other surface thereof, and exhausting the steam through the apertures of the other platen, restricting the exhaust rate to provide an elevated and substantially uniform pressure and temperature condition within the chamber while steam is passed through the mat, for a length of time sufficient to cure the adhesive binder; and
c. releasing the steam pressure from the chamber and separating the platens for removal of the particleboard.

3,891,739

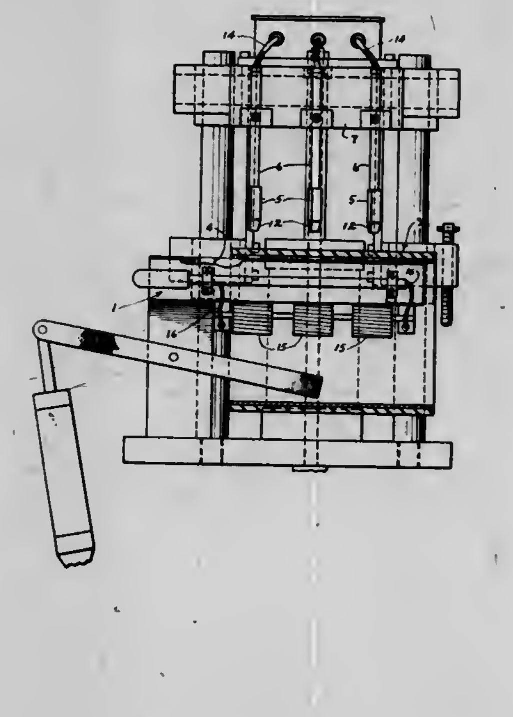
METHOD OF FORMING PRECISELY DIMENSIONED APERTURES

Richard Lawson, Lafayette, N.J., assignor to Ames Rubber Corporation, Hamburg, N.J.

Filed Oct. 1, 1974, Ser. No. 511,084

Int. Cl.^{2} B29C *17/10*

U.S. Cl. 264—155 **3 Claims**



1. The method of forming a precisely dimensioned aperture in a coating of elastomeric material on the cylindrical surface of a hollow rigid roller having a preformed aperture therein of given contour and dimensions, which comprises preheating a die of similar contour and dimensions to a predetermined temperature sufficient to melt said elastomeric material, passing said heated die through said coating and through said preformed aperture to form an aperture in said coating in register with said preformed aperture which conforms roughly to the contour and dimensions of said preformed aperture, reheating said die to said predetermined temperature, and again passing said reheated die through said apertures in the reverse direction to reform the aperture in said coating to the precise contour and dimensions of said preformed aperture.

3,891,740

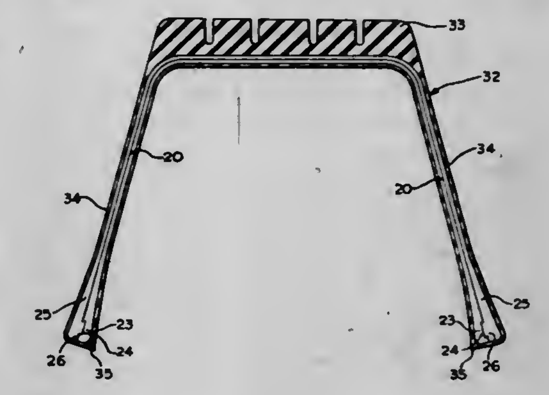
METHOD FOR FORMING AN INJECTION MOLDED TIRE USING MOLDED REINFORCING PLIES

Frederick F. Vannan, Jr., Danville, Va., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 5, 1972, Ser. No. 250,702

Int. Cl. B29h *17/00*

U.S. Cl. 264—263 **6 Claims**



1. A method of building a tire consisting essentially of molding a ply of the desired angle, placing at least one ply in a tire mold in the desired spaced relationship relative to the tire mold and any other ply present in the mold to leave a space between the other ply and the tire mold when closed and positioning a bead portion of said one ply in a corresponding recess of said second ply to lock the plies together, filling said space with an elastomeric precursor and heating to set the precursor around each ply to give a cured tire when removed from the tire mold.

3,891,741

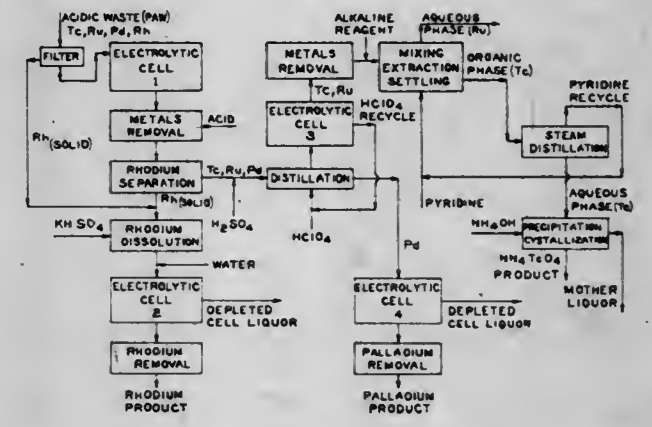
RECOVERY OF FISSION PRODUCTS FROM ACIDIC WASTE SOLUTIONS THEREOF

William W. Carlin, Portland; William B. Darlington, and Donald W. Dubois, both of Corpus Christi, all of Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 24, 1972, Ser. No. 309,377

Int. Cl. C01g *55/00, 57/00*

U.S. Cl. 423—2 **23 Claims**



1. A process for separating rhodium, palladium and technetium from aqueous, acidic solutions containing said metal values and other fission product metal values said solution resulting from processing irradiated nuclear fuel, which comprises electrolyzing said solution having an acid concentration no greater than about 1 molar in an electrolytic cell under controlled cathodic potential conditions and at a potential at which rhodium, palladium and technetium are deposited on the cathode of the cell, removing metal depleted waste solution from the cell, dissolving metal deposited on the cathode in strong acid to provide an acid solution of deposited metal values, and separating undissolved rhodium metal from the solution.

3,891,742

METHOD OF PURIFYING GASES CONTAINING ACID IMPURITIES USING STABILIZED 2-(2-AMINOETHOXY)ETHANOL

Ernest Leon Yeakey, and Philip Hotchkiss Moss, both of Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

Division of Ser. No. 350,003, April 11, 1973, Pat. No. 3,829,494. This application Apr. 10, 1974, Ser. No. 459,547

Int. Cl. B01d *47/00*

U.S. Cl. 423—229 **6 Claims**

1. In a method for removing impurities of acid gases from natural gas comprising contacting natural gas with a material capable of adsorbing or absorbing said impurities from said natural gas, the improvement comprising:

employing as said material an improved composition having improved resistance against degradation in the presence of the acid gas impurities, said improved composition consisting essentially of 2-(2-aminoethoxy)ethanol and from 1 to about 50 wt. percent, based upon the weight of said 2-(2-aminoethoxy)ethanol of a trialkanolamine, said trialkanol-amine being a tri(lower alkanol)amine having 2 to about 4 carbon atoms per lower alkanol group.

3,891,743

FREE-FLOWING SULFUR PRODUCT

Michael J. Block, and Donald C. Young, both of Fullerton, Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Aug. 30, 1972, Ser. No. 285,040

Int. Cl. C01b *17/02*

U.S. Cl. 423—267 **8 Claims**

1. A method for producing finely ground sulfur free of any tendency to form cakes upon storage from sour gas sulfur having the tendency to form cakes on storage and containing hydrogen sulfide in an amount up to about 0.1 weight percent and sufficient to cause the formation of said cakes upon storage of finely ground sulfur prepared directly from said sour gas sulfur, which method comprises contacting said sour gas sulfur in a molten state and at a temperature from 119° to about 200°C. with a hydrogen sulfide oxidizing agent selected from the class consisting of nitric acid, sulfuric acid, perchloric acid, sulfur dioxide, molecular oxygen, nitric oxide, nitrogen dioxide, nitrogen tetroxide, ozone and mixtures thereof in amounts from about 0.2 to about 10 weight parts of oxidizing agent per 100 weight parts of sulfur, and for a period of from 1 to about 500 minutes sufficient to oxidize said hydrogen sulfide, removing the sulfur from the oxidation step, solidifying the sulfur and thereafter pulverizing and comminuting the sulfur to a particle size from .001 to about .01 inch to form said finely ground sulfur having a substantially reduced tendency to form cakes upon storage.

3,891,744

PROCESS FOR PRODUCING CARBON MONOXIDE AND HYDROGEN

Glenn E. Handwerk, Golden, Colo., assignor to Colorado School of Mines Research Institute, Golden, Colo.

Filed Sept. 12, 1973, Ser. No. 396,498

Int. Cl. C01b *31/00, 15/16, 1/00*

U.S. Cl. 423—415 **33 Claims**

1. A continuous process for the production of carbon monoxide and hydrogen which comprises the following steps:

- a. oxidizing elemental phosphorus by contacting it with steam at a temperature between about 500°F – 1400°F to produce hydrogen, and phosphorus oxides;
- b. separating the gaseous hydrogen and phosphorus oxides and recovering them;
- c. reducing the phosphorus oxides with carbon or carbonaceous material at a temperature between about 1500°F and the softening point of the ash contained in the carbon or carbonaceous material to form carbon monoxide and elemental phosphorus;
- d. separating the carbon monoxide and phosphorus formed in step (c) and recovering them; and
- e. recycling the phosphorus recovered in step (d) to step (a) for reuse in the continuous process.

3,891,745

PROCESS FOR PRODUCING BASIC ALUMINUM CHLORIDES

Alfred Bellan, and Klaus Deneke, both of Luisdorf, Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

Continuation of Ser. No. 184,221, Sept. 27, 1971, abandoned. This application Apr. 15, 1974, Ser. No. 460,868

Int. Cl. C01f *7/56*

U.S. Cl. 423—462 **3 Claims**

1. In the process for producing basic aluminum chlorides having the general formula

$$Al_2(OH)_{6-n}Cl_n,$$

wherein n represents a number between 1 and 5 by reacting under exclusion of air aluminum with hydrochloric acid, the improvement which comprises continuously passing the hydrochloric acid at a concentration of about 5 to 15% by weight downwardly through an elongated fixed bed of aluminum of a packing density of about 0.3 to 0.8 kg/liter, adding aluminum to the top of said fixed bed at approximately the same rate it is consumed, heating the fixed bed externally progressively to an increasing extent downwardly to maintain the temperature at about 70° to 95°C so as to promote continued reaction, the hydrochloric acid being added at such rate as to establish a contact time of about 2 to 8 hours with the aluminum bed, the concentration of hydrochloric acid, its rate of addition and the extent of external heating being controlled to impart to the resulting solution of end product a pH of about 3 to 4, and withdrawing from the bottom of the bed a solution of the basic aluminum chloride of substantially constant composition.

3,891,746

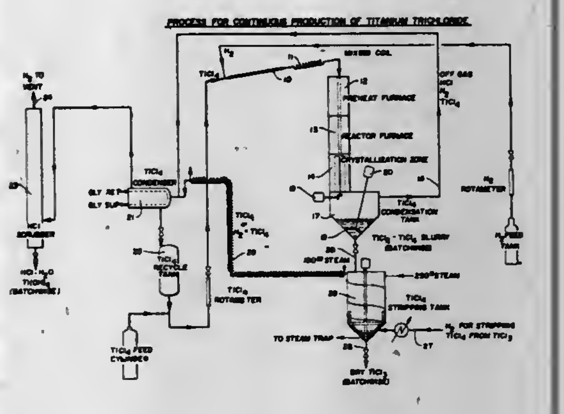
PROCESS FOR PREPARING ALPHA-TRICHLORIDE PARTICLES

Royce D. Laffitte, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 30, 1973, Ser. No. 383,637

Int. Cl. C01g *23/02*

U.S. Cl. 423—492 **8 Claims**



1. A process for producing alpha-titanium trichloride particles wherein at least a majority of said particles have an average particle size greater than 20 microns which comprises passing a mixture of hydrogen and titanium tetrachloride at a mole ratio of 0.5 to 1 to 10 to 1 through a reaction zone at a temperature within the range of about 800°C. to about 1200°C. and thereafter passing the reactor effluent into a crystallization zone in the absence of any quenching medium, the ratio of hydrogen to titanium tetrachloride in the reactants and the reaction temperature being regulated such that said reactor effluent entering said crystallization zone contains at least about 1.75 mole percent titanium trichloride vapor, the temperature in said crystallization zone being within the range of above the dew point of titanium tetrachloride and below the sublimation temperature of titanium trichloride and regulated such that predominately heterogeneous nucleation of titanium trichloride occurs, and thereafter recovering the crystallized titanium trichloride having an average particle size greater than 20 microns and up to 100 microns.

3,891,747

CHLORATE REMOVAL FROM ALKALI METAL CHLORIDE SOLUTIONS

Glenn E. Galecki, La Grange, Ill., and Sonia R. Oberson, West Haven, Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 11, 1973, Ser. No. 405,376

Int. Cl. C01d *3/14*

U.S. Cl. 423—499 **10 Claims**

1. A process for reducing the chlorate impurities in an aqueous solution of an alkali metal chloride which comprises admixing said aqueous solution with a chlorate reducing proportion of an alkali metal hydrosulfite to form an aqueous solution of an alkali metal chloride containing an alkali metal sulfate, wherein said chlorate reducing proportion is a weight ratio of said alkali metal hydrosulfite to said chlorate of from about 0.5:1 to about 10:1.

3,891,748

CONTINUOUS PROCESS FOR PRODUCTION OF HYDROGEN PEROXIDE

Rudolph Rosenthal, Broomall, and Joseph A. Kieras, Lincoln University, both of Pa., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed June 18, 1973, Ser. No. 370,902

Int. Cl. C01b *15/02*

U.S. Cl. 423—587 **7 Claims**

1. In a process for the production of hydrogen peroxide by the acid catalyzed hydrolysis of tertiary butyl hydroperoxide, the improvement which comprises continuously contacting said tertiary butyl hydroperoxide with water in the presence of an acid in a contacting zone maintained at a temperature in the range of from 85°C. to 110°C. while separately and continuously removing as overhead from said contacting zone the tertiary butyl alcohol formed during said hydrolysis reaction and recovering the hydrogen peroxide product as bottoms.

3,891,749

DIGESTIVE PHARMACEUTICAL COMPOSITION COMPRISING S-CARBOXYMETHYL CYSTEINE FOR REDUCING VISCOSITY OF RESPIRATORY TRACT SECRETIONS, AND METHOD OF TREATING THEREWITH

Maurice L. Joullie, Saint-Germain-en-Lave; France; Gabriel Maillard, Paris, France; Lucien Lakah, Paris, France, and Pierre Muller, Paris, France, assignors to Recherche Pharmaceutiques et Scientifiques, Paris, France

Continuation of Ser. No. 010,999, Feb. 12, 1970, abandoned. This application Aug. 17, 1973, Ser. No. 389,325

Claims priority, application France, Oct. 7, 1969, 69.34139

Int. Cl. A61k *27/00*

U.S. Cl. 424—311 **14 Claims**

12. A method of reducing the viscosity of secretions of the respiratory tract, which comprises

administering to a patient an effective amount of S-carboxymethyl cysteine, by the digestive route, said effective amount being a dialy dosage of at least 1.5 grams.

3,891,750

11-DEOXOGLYCYRRHETINIC ACID AMIDES USEFUL AS ANTIULCER AGENTS

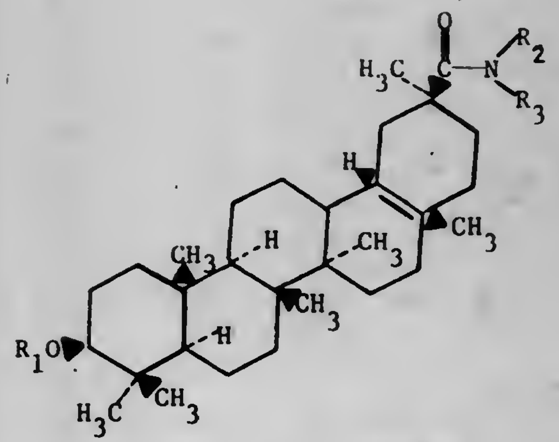
Hans-Jurgen E. Hess, Old Lyme, and Roger P. Nelson, Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 195,495, Nov. 3, 1971, Pat. No. 3,814,766. This application Dec. 20, 1973, Ser. No. 426,856

Int. Cl. A61k *27/00*

U.S. Cl. 424—80 **6 Claims**

1. A method for the control of peptic ulcers in animals which comprises administering intraperitoneally or orally to said animals an effective antipeptic ulcer amount of a composition containing a diluent amount of a pharmaceutically-acceptable carrier and, as the essential active ingredient, an effective amount of a compound having the formula



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wherein R_1 is selected from the group consisting of hydrogen, alkanoyl having from two to six carbon atoms and ω-carboxyalkanoyl having a total of from four to five carbon atoms; R_2 and R_3 together with the nitrogen atom to which they are attached are selected from the group consisting of piperazino, N-alkylpiperazino having from one to four carbon atoms in the alkyl moiety, N-ω-(hydroxyalkyl) piperazino having from two to four carbon atoms in the alkyl moiety and N-(carbalkoxy)piperazino having from one to four carbon atoms in the alkoxy moiety;

the pharmaceutically-acceptable alkali metal salts of those compounds having at least one carboxy group; or

the pharmaceutieally-acceptable acid addition salts of those compounds having a basic group.

3,891,751

VACCINES AND PROCESSES FOR THEIR PREPARATION

Charles Pilet, Alfortville, and Marc Bonneau, Tassin, both of France, assignors to Institut Merieux, Lyon, France

Continuation of Ser. No. 827,930, May 26, 1969, abandoned. This application Sept. 30, 1971, Ser. No. 185,345

Claims priority, application Luxembourg, May 28, 1968, 56161

Int. Cl. C12k *5/00*

U.S. Cl. 424—87 **1 Claim**

1. A non-agglutinogenic non-pathogenic vaccine effective for use in the immunization against brucellosis comprising an immunizing amount of a non-pathogenic antigen corresponding to brucellosis, said antigen being inactivated whole Brucella bacteria, said antigen having essentially all its agglutinogenic sites saturated with an immune serum containing antibodies corresponding to said antigen, said serum being present in amounts essentially just sufficient to saturate said sites.

3,891,752

POLYENIC MACROLIDE COMPOSITIONS AND METHODS OF USE

Harry W. Gordon, Bronx, N.Y., and Carl P. Schaffner, Trenton, N.J., assignors to Schmid Laboratories, Inc., Little Falls, N.J.

Continuation-in-part of Ser. No. 796,919, Feb. 5, 1969, abandoned, each is a continuation-in-part of Ser. No. 623,847, March 17, 1967, Pat. No. 3,584,118, and a continuation-in-part of Ser. No. 544,712, April 25, 1966, abandoned, and a continuation-in-part of Ser. No. 838,706, July 2, 1969, abandoned. This application Oct. 13, 1970, Ser. No. 80,509

Int. Cl.^{2} A61K *27/00*

U.S. Cl. 424—117 **18 Claims**

17. A method of treating intestinal moniliasis in a mammal afflicted with intestinal moniliasis which comprises orally administering to said mammal an effective dose for treating intestinal moniliasis of a composition in solid form comprising (1) about 25 to about 200 mg of candicidin, and (2) in inorganic salt or base material selected from the group consisting of calcium carbonate, aluminum hydroxide, magnesium hydroxide, magnesium trisilicate, magnesium carbonate, and magnesium oxide, said composition having a pH between about 6 and about 8.5.

3,891,753

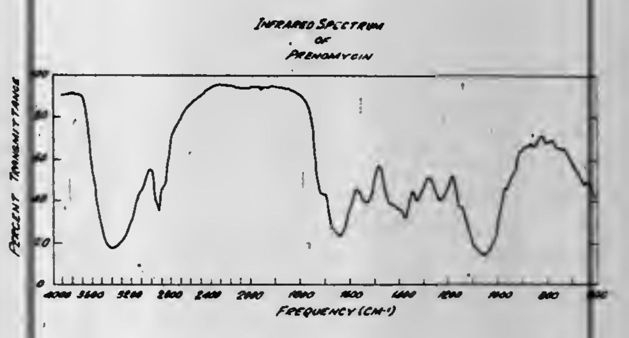
ANTIBIOTIC PRENOMYCIN AND PROCESS OF PRODUCING THE SAME

Justo Martinez Mata, Madrid, Spain, and Edward O. Stapley, Metuchen, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 7, 1974, Ser. No. 440,423

Int. Cl. A61k *21/00*

U.S. Cl. 424—118 **4 Claims**



1. An antibiotic, Prenomycin, or its pharmacologically acceptable salts thereof effective as a growth promoting agent and in inhibiting the growth of gram-positive and gram-negative microorganisms which sodium salt has an ultraviolet adsorption peak at 246 mμ in a 0.1N hydrochloric acid solution and an ultraviolet adsorption peak at 258 mμ in a 0.1N sodium hydroxide solution having an infrared spectrum in potassium bromide as shown in FIG. 1, and an elemental analysis of its free acid as follows: C = 48.5 percent; H = 7.00 percent; N = 4.9 percent; phosphorus = 1.7 percent; and O = 37.9 percent (by difference) with the said free acid having an approximate empirical for formula of: $C_{72}H_{125}N_6O_{42}P$ with a molecular weight of 1778, a measured equivalent weight of 613 and a pH one-half of 4.6.

3,891,754

ANTIBIOTIC ENSANCHOMYCIN AND PROCESS OF PRODUCING THE SAME

Edward O. Stapley, Metuchen, N.J., and Justo Martinez Mata, Madrid, Spain, assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 12, 1973, Ser. No. 415,185

Int. Cl. A61k *21/00*

U.S. Cl. 424—118 **7 Claims**

1. An antibiotic, Ensanchomycin, or its pharmacologically acceptable salts thereof effective in inhibiting the growth of

both gram-positive and gram-negative microorganisms which has an ultraviolet adsorption peak at 247 mμ in an acid solution and an ultraviolet adsorption peak at 258 mμ in a basic solution having an infrared spectrum in a Nujol mull as shown in FIG. 1, and an elemental analysis of its ammonium salt as follows: C = 47.11 percent; H = 6.90 percent; N = 7.67 percent; phosphorus = 1.93 percent; and O = 36.39 percent (by difference) with the said ammonium salt having an approximate empirical formula of: $C_{63}H_{110}N_9O_{36}P$ and a measured equivalent weight of 1477, and a pK_a of 4.6.

3,891,755

DOSAGE FORMULATION FOR ERYTHROMYCIN CETYL SULFATE

Shashi Pal Mehta, Waukegan, Ill., assignor to Abbott Laboratories, Chicago, Ill.

Continuation-in-part of Ser. No. 378,297, July 11, 1973, abandoned. This application May 20, 1974, Ser. No. 471,391

Int. Cl. A61j *3/10;* **A61k** *21/00*

U.S. Cl. 424—157 **10 Claims**

1. The process of preparing pharmaceutical tablets producing high blood levels of erythromycin, comprising uniformly blending 4 parts of an aliphatic carboxylic or sulfate salt of erythromycin with 0.5 – 6 parts of magnesium hydroxide, uniformly blending said mixture with 0.25 – 6 parts of a binder, granulating this mixture in known fashion, drying the granules, uniformly blending the granules with minor optional portions of a lubricant and other commonly used excipients and compressing this mixture into tablets.

3,891,756

AGRICULTURAL PESTICIDE COMPOSITION

Hiroshi Kasugai, Tokyo; Shozo Motojima, Kawasaki, and Kazuhiko Inoue, Machida, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 428,619

Claims priority, application Japan, May 21, 1973, 48-56603

Int. Cl.^{2} A61K *27/00*

U.S. Cl. 424—177 **13 Claims**

1. An agricultural pesticide composition which comprises: at least one biopolymer having prevention effects on plant diseases selected from the group consisting of alginic acid, carrageenan, casein, β-globulin, α-globulin, lact-globulin, albumin, gluten, pectin, starch, gelatin and water-soluble salts thereof;

at least one carbonate selected from the group consisting of calcium carbonate, sodium carbonate, sodium bicarbonate, potassium carbonate, potassium bicarbonate and ammonium carbonate;

at least one organic acid selected from the group consisting of tartaric acid, citric acid, succinic acid, fumaric acid, lactic acid, malic acid, maleic acid, phthalic acid, acetic acid and lauric acid; and

1–10 percent, based on the weight of the bipolymer, of silica or a silica-containing material;

the carbonate and organic acid being present in a combined amount of 10 to 50 percent by weight based on the biopolymer.

3,891,757

ANAESTHETIC TOPICAL AND PERCUTANEOUS ADMINISTRATION WITH SELECTED PROMOTERS

Takeru Higuchi, Lawrence, Kans., assignor to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 197,919, Nov. 11, 1971, Pat. No. 3,787,571. This application Oct. 12, 1973, Ser. No. 406,011

Int. Cl. A61k *27/12*

U.S. Cl. 424—310 **4 Claims**

1. In a method for producing local, topical anesthesia, the improvement consisting of the step of administering cutaneously a pharmaceutical composition consisting of a first ingredient selected from the group of topical absorption promoters consisting of trichloroethanol, trifluoroethanol and mixtures thereof, a second ingredient consisting of about 0.01 to 30 percent by weight of a topical, local anesthetic drug, and wherein the first ingredient is an absorption promoter for increasing the retention and percutaneous absorption of an effective amount of the second ingredient during topical administration thereof.

3,891,758

FUNGICIAL AND ANTHELMINTIC 1-PHOSPHORYLATED BENZIMIDAZOLES

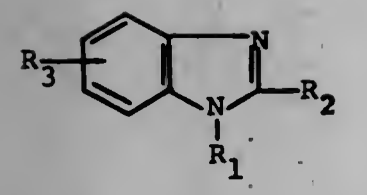
John Hannah, Matawan; Edward F. Rogers, Middletown, and Donald W. Graham, Mountainside, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 226,976, Feb. 16, 1972, Pat. No. 3,806,514. This application Dec. 27, 1972, Ser. No. 318,803

Int. Cl. A01n *9/36*

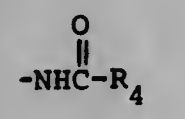
U.S. Cl. 424—200 **3 Claims**

1. An antifungal composition comprising an inert carrier and a fungicidal quantity of a compound having the formula:



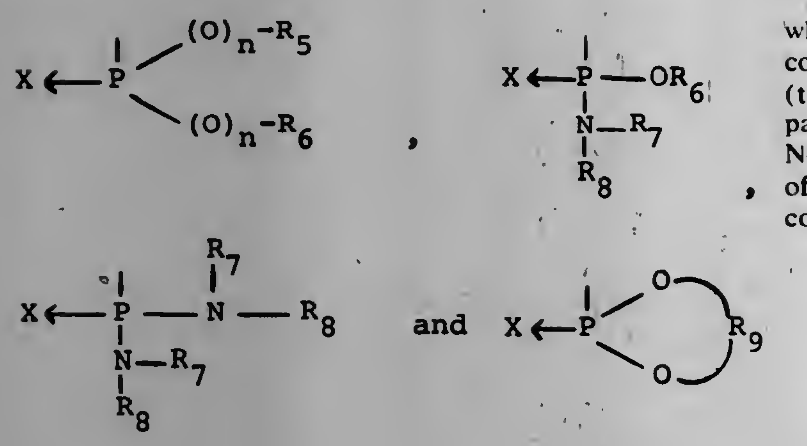
wherein

- R_2 is a member selected from the group consisting of phenyl, naphthyl, orthofluorophenyl, thienyl, furyl, pyridyl, thiazolyl, isothiazolyl, pyrazinyl, 1-pyrazolyl, oxazolyl and thiadiazolyl;
- R_3 is in the 5(6) position of the molecule, and is a member selected from the group consisting of hydrogen and



$$-NH\overset{O}{\overset{\|}{C}}-R_4$$

- R_4 is a member selected from the group consisting of loweralkoxy, phenyl, and parafluorophenyl;
- R_1 is a member selected from the group consisting of:



n is 0 or 1;

- R_5 is a member selected from the group consisting of alkyl, phenyl and naphthyl;
- R_6 is a member selected from the group consisting of alkyl of from 2 to 10 carbon atoms, phenyl, naphthyl, an alkali metal, ammonium and loweralkyl ammonium;
- R_7 and R_8 are members selected from the group consisting of hydrogen and loweralkyl, provided that at least one of R_7 and R_8 is loweralkyl;
- R_9 is a loweralkylene radical of from 2 to 4 carbon atoms; and
- X is a member selected from the group consisting of oxygen and sulfur, provided that when X is sulfur, R_3 is hydrogen.

3,891,759

STABILIZED SLOW RELEASE DDVP COMPOSITION

Robert Aries, 69 Rue de la Faisanderie, Paris, 16e France

Continuation of Ser. No. 45,600, June 11, 1970, abandoned. This application July 27, 1973, Ser. No. 383,095

Int. Cl. A01n *9/36*

U.S. Cl. 424—219 **1 Claim**

1. An insecticidal composition useful against houseflies, said composition consisting of

dimethyl dichlorovinyl phosphate	45%
isobutyl benzoate	20%
dibutyl maleate	10%
ethyl maleate	10%
dibutyl fumarate	5%
isoamyl isobutyrate	5%
epoxidized soybean oil	3%
tribasic aluminum stearate	2%.

3,891,760

NEMATICIDAL COMPOSITIONS COMPRISING 2-CHLORO-6-METHOXY-4-(TRICHLOROMETHYL)-PYRIDINE AND 2,2-DIMETHYL-2,3-DIHYDROBENZOFURANYL-7-N-METHYL CARBAMATE

Frances C. O'Melia, Pleasant Hill, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 25, 1974, Ser. No. 454,204

Int. Cl. A01n *9/20, 9/22*

U.S. Cl. 424—263 **6 Claims**

1. A synergistic nematicidal composition for use in soil which comprises an inert carrier and a mixture of toxicants consisting of about 1 part by weight of 2-chloro-6-methoxy-4-(trichloromethyl)pyridine and from about 1/32 to about 16 parts by weight of 2,2-dimethyl-2,3-dihydrobenzofuranyl-7-N-methyl carbamate, said mixture being present in an amount of from about 0.00001 to 90 percent by weight of the total composition.

3,891,761

N-METHYL-D-GLUCAMINE SALT OF 2(2-METHYL-3'-TRIFLUORO-METHYLANILINO) NICOTINIC ACID IN THE TREATMENT OF PAIN

Margaret H. Sherlock, Bloomfield, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Continuation of Ser. No. 345,608, March 28, 1973, Pat. No. 3,839,344. This application Apr. 8, 1974, Ser. No. 458,920

Int. Cl. A61k *27/00*

U.S. Cl. 424—266 **1 Claim**

1. The method for eliciting an analgesic effect in a mammal suffering from pain which comprises parenterally administering to a mammal a therapeutically effective quantity of 2(2'-methyl-3'-trifluoromethylanilino)nicotinic acid in the form of its N-methyl-D-glucamine salt.

3,891,762

METHOD FOR COMBATTING BACTERIAL PLANT DISEASES USING 2-AMINO-1,3,4-THIADIOZOLES

Osamu Wakae; Kunito Yakushiji, both of Kyoto, and Yoshiyuki Okada, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Continuation-in-part of Ser. No. 191,101, Oct. 21, 1971, which is a continuation of Ser. No. 824,251, May 13, 1969, abandoned. This application Jan. 8, 1974, Ser. No. 431,601

Claims priority, application Japan, May 13, 1968, 43-32098; Sept. 2, 1968, 43-62866; Apr. 14, 1969, 44-28826

Int. Cl. A01n *9/12, 9/20*

U.S. Cl. 424—270 **8 Claims**

1. A method for combatting bacterial plant diseases caused by bacteria of the genus Xanthomonas or of the species *Pseudomonas solanacearum*, which comprises applying to said bacteria a bactericidally effective but non-phytotoxic amount of 2-amino-1,3,4-thiadiazole.

3,891,763

SYNTHETIC PENICILLINS

Shiro Morimoto, Kobe; Hiroaki Nomura, Osaka; Takeshi Fugono, Kawanishi; Kihachiro Maeda, Itami, and Toshihiro Ishiguro, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

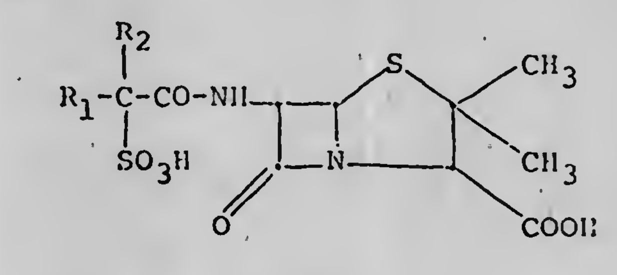
Division of Ser. No. 218,689, Jan. 18, 1972, which is a division of Ser. No. 862,018, Sept. 29, 1969, Pat. No. 3,660,379. This application Dec. 7, 1973, Ser. No. 422,779

Claims priority, application Japan, Sept. 28, 1968, 43-70572

Int. Cl. A61k *27/00*

U.S. Cl. 424—271 **12 Claims**

1. A method for combatting bacterial infections which comprises administering to a patient infected with the bacteria an antibacterially effective amount of a compound of the formula



wherein R_1 and R_2 are selected from the group consisting of hydrogen, alkyl having 1–12 carbon atoms, cycloalkyl having 3–12 carbon atoms, aralkyl having 7–10 carbon atoms and substituted and unsubstituted phenyl, pyridyl, naphthyl or thienyl, the substituent being one or more members selected from the group consisting of nitro, sulfo, carboxyl, halo, lower alkyl, lower alkoxy and cycloloweralkyl, or R_1 and R_2 together represent polymethylene having 4–6 carbon atoms, or a pharmaceutically acceptable salt thereof.

3,891,764

METHOD OF INHIBITING HISTAMINE ACTIVITY WITH AMIDINE DERIVATIVES

James Whyte Black, Hemel Hempstead, and Graham John Durant, Welwyn Garden City, both of England, assignors to SmithKline & French Laboratories Ltd., Welwyn Garden City, England

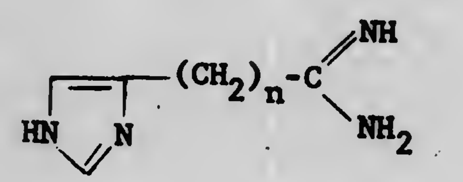
Continuation of Ser. No. 306,948, Nov. 15, 1972, abandoned, which is a continuation-in-part of Ser. No. 80,792, Oct. 14, 1970, abandoned. This application May 28, 1974, Ser. No. 473,547

Claims priority, application United Kingdom, Oct. 29, 1969, 52892/69

Int. Cl. A61k *27/00*

U.S. Cl. 424—273 **5 Claims**

1. A method of inhibiting H-2 histamine receptors, said H-2 histamine receptors being those histamine receptors which are not inhibited by mepyramine but are inhibited by burimamide, which comprises administering internally to an animal requiring inhibition of said H-2 histamine receptors in an amount sufficient to inhibit said H-2 histamine receptors a compound of the formula:



where n is 3 or 4 or a pharmaceutically acceptable acid addition salt thereof.

3,891,765

ANTI-INFLAMMATORY AND ANALGESIC L-HYDROXYPROLINE DERIVATIVES

Paul Coirre; Bertrand Coirre, both of Ville d'Avray; Jean-Claude Denis; Jerome Rambaud, and Jean Cahn, Paris, all of France, assignors to Franco Chimie S.a.r.l., Paris, France

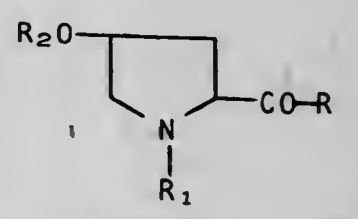
Continuation-in-part of Ser. No. 81,499, Oct. 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 756,410, Aug. 20, 1968, abandoned. This application Apr. 12, 1972, Ser. No. 243,397

Claims priority, application France, Sept. 14, 1967, 67.121020; May 16, 1968, 68.152048

Int. Cl. A61k *27/00*

U.S. Cl. 424—274 **4 Claims**

1. A pharmaceutical composition suitable for anti-inflammatory and analgesic use in dosage unit form comprising from 100 milligrams to 200 milligrams of a compound having the formula:



in which R is selected from the group consisting of OH, m-trifluoromethylanilido and p-trifluoromethylanilido; R_1 is selected from the group consisting of acetyl, p-isobutylphenylacetyl and 2,4-dinitrophenyl; R_2 is hydrogen or p-isobutylphenylacetyl with the proviso that when R_1 is acetyl and R_2 is hydrogen, then R cannot be OH; and a pharmaceutical carrier.

3,891,766

METHODS OF USING SUBSTITUTED XANTHONE CARBOXYLIC ACID COMPOUNDS

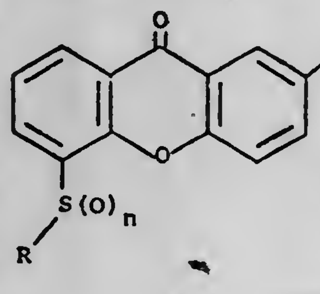
Jurg R. Pfister, Los Altos; Ian T. Harrison, and John H. Fried, both of Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 174,261, Aug. 23, 1971, Pat. No. 3,801,598. This application Nov. 8, 1973, Ser. No. 413,979

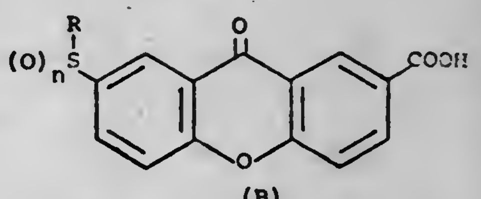
Int. Cl. A61k *27/00*

U.S. Cl. 424—283 **12 Claims**

1. A method for inhibiting the symptoms of the asthmatic condition resulting from an antigen-antibody reaction in a host susceptible to said reaction which comprises administering to said host an effective amount of from about 0.005 to about 100 mg. per kg. of body weight per day sufficient to produce said inhibition of a compound selected from those represented by the formulas:



(A)



(B)

or a pharmaceutically acceptable, non-toxic lower alkyl ester unsubstituted, monolower alkyl, or dilower alkyl substituted amide or salt thereof; wherein n is the integer 1 or 2; R is lower alkyl when n is 1; R is lower alkyl, hydroxy, amino, monoloweralkylamino or diloweralkylamino when n is 2; and wherein said lower alkyl group contains 1 to 5 carbon atoms.

3,891,767
CERTAIN TRIARYL TIN COMPOUNDS AS CHEMOSTERILANTS

Eugene E. Kenaga, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 422,554, Dec. 31, 1964, Pat. No. 3,577,548, which is a continuation-in-part of Ser. No. 244,917, Dec. 17, 1962, abandoned. This application Jan. 2, 1970, Ser. No. 5,400The portion of the term of this patent subsequent to May 4, 1988, has been disclaimed.

Int. Cl. A61k *27/00*

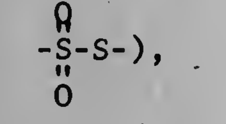
U.S. Cl. 424—288 **21 Claims**

1. A method useful in controlling population growth which comprises administering to an animal which reproduces gamically a minimal sterilant amount of a triaryltin compound selected from the group consisting of

$R_3\text{-Sn-Z}$ and

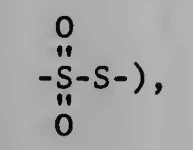
$(R_3\text{-}S_n\text{— }Y$

wherein, in all of its occurrences in any given triaryltin compound, R represents the same member selected from the group consisting of phenyl, and mono-substituted phenyl wherein the substituent is a member selected from the group consisting of halo, loweralkyl, and loweralkoxy; Z represents a monovalent moiety selected from the group consisting of (phenylloweralkyl), a 2 to 12 carbon alkenyl, a 4 to 12 carbon alkadienyl, a 5 to 6 carbon cycloalkenyl, a 5 to 6 carbon cycloalkadienyl, halo, hydroxy, mercapto, hydrogen, a 2 to 18 carbon alkanoate, a 3 to 18 carbon alkenoate, loweralkoxy, loweralkylthio, diloweralkylcarbamate, diloweralkylthiocarbamate, diloweralkyldithiocarbamate, radical of the formula (loweralkyl



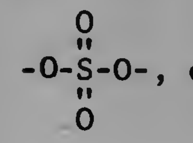
$\text{-}\overset{\text{O}}{\underset{\text{O}}{\text{S}}}\text{-S-)},$

radical of the formula (phenyl

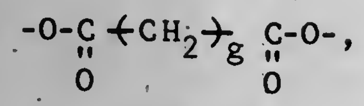


$\text{-}\overset{\text{O}}{\underset{\text{O}}{\text{S}}}\text{-S-)},$

and radical of the formula -Sn-R_3; Y represents a divalent moiety selected from the group consisting of -O-, -S-, methylene, ethylene,



$\text{-O-}\overset{\text{O}}{\underset{\text{O}}{\text{S}}}\text{-O-}$, carbonyl, 1,3-butadien-1,



4-xylene, and $\text{-O-}\underset{\text{O}}{\text{C}}(\text{CH}_2)_g\underset{\text{O}}{\text{C}}\text{-O-}$,

wherein g is an integer of from 1 to 10, both inclusive.

3,891,768
TREATMENT OF PARKINSON'S DISEASE

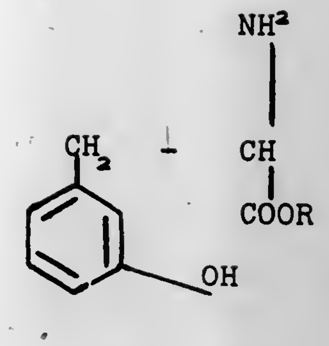
Per Arvid Emil Carlsson, Grotenborg, and Hans Rudolf Corrodi, Askim, both of Sweden, assignors to Aktiebolaget Hassle, Goteborg, Sweden

Continuation-in-part of Ser. No. 387,370, Aug. 10, 1973, abandoned, and Ser. No. 190,682, Oct. 19, 1971, abandoned. This application Aug. 20, 1973, Ser. No. 390,126

Int. Cl. A61k *27/00*

U.S. Cl. 424—309 **29 Claims**

1. A method for mitigating symptoms of Parkinson's disease, comprising administering to a subject having the symptoms thereof, a therapeutically active amount of a compound of the formula



I

in which R denotes a lower, straight or branched alkyl group having one to three carbon atoms either as a racemate or as an optically active L-form as such or in the form of a salt of a pharmaceutically acceptable acid.

3,891,769
PSYCHOTHERAPEUTIC METHODS EMPLOYING THIOUREAS

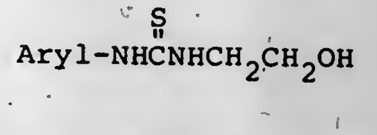
Philip J. Shea, and Abdulmuniem H. Abdallah, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 1, 1974, Ser. No. 438,926

Int. Cl. A61u *27/00*

U.S. Cl. 424—322 **42 Claims**

1. A method of treating depression which comprises: administering to a depressed mammal an effective amount of a compound of the formula:



$\text{Aryl-NH}\overset{\text{S}}{\text{C}}\text{NHCH}_2\text{CH}_2\text{OH}$

wherein aryl represents 2,4-dimethylphenyl, 2,4-dimethylbenzyl, 4-methoxy-2-methylphenyl, 2,4-dimethoxyphenyl, 2-methylphenyl, 3,5-dimethylphenyl, 2,5-dimethylphenyl, 2,6-dimethylphenyl or 2,4,6-trimethylphenyl.

3,891,770
PROCESS FOR RECOVERING FATS, OILS AND PROTEINS FROM WASTE LIQUOR

Takaaki Sato, Soka, and Kengo Ishida, Zama, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed July 23, 1973, Ser. No. 381,402

Claims priority, application Japan, July 26, 1972, 47-74151

Int. Cl. A23j *1/06, 3/00*

U.S. Cl. 426—32 **9 Claims**

1. A process for the treatment of waste liquor resulting from processing marine products and livestock which comprises:

adding polyacrylate to said waste liquor;

subjecting said waste liquor to microfine aeration to develop a froth;

denaturing said froth by adjusting the pH thereof to about 8.0 to 11.0;

subjecting said froth to enzymatic decomposition by adding a protease enzyme thereto; and

thereafter separating and recovering the fats and oils from said froth.

3,891,771
METHOD OF MANUFACTURING FERMENTED VEGETABLE PRODUCTS

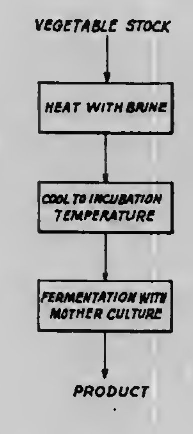
Dan E. Green, and L. Mark Hanover, both of Rockford, Ill., assignors to Dean Foods Company, Rockford, Ill.

Filed Nov. 1, 1973, Ser. No. 411,685

Int. Cl. A23b *7/10*

U.S. Cl. 426—52 **24 Claims**

1. A method for the production of fermented vegetables comprising the steps of contacting a finely divided vegetable with hot water to heat the vegetable to its pasteurization temperature and to leach fermentable carbohydrates therefrom and thereby form an aqueous extract; cooling the vegetable and the aqueous extract to a temperature for incubation of lactic acid producing bacteria; inoculating the vegetable in contact with the aqueous extract with a mother culture produced by blanching a vegetable, subsequently inoculating the blanched vegetable with lactic acid producing bacteria and incubating the resulting mother culture until the titratable acidity as lactic acid of the mother culture is up to 0.5 percent by weight; and incubating the vegetable in contact with the aqueous extract in the presence of the mother culture until fermentation is complete.


VEGETABLE STOCK
HEAT WITH BRINE
COOL TO INCUBATION TEMPERATURE
FERMENTATION WITH MOTHER CULTURE
PRODUCT

3,891,772
EXTRACTION OF UNDESIRABLE FLAVOR AND ODOR COMPONENTS FROM MICROBIAL CELLS

John A. Ridgway, Jr., La Porte, Ind., and Kwei C. Chao, Naperville, Ill., assignors to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 442,247, Feb. 13, 1974, which is a continuation-in-part of Ser. No. 285,848, Sept. 1, 1972, abandoned, which is a continuation-in-part of Ser. No. 64,866, July 24, 1970, abandoned. This application May 3, 1974, Ser. No. 466,673

Int. Cl. A23j *1/18;* **C12c** *11/28, 11/30*

U.S. Cl. 426—60 **23 Claims**

1. A process for improving the flavor characteristics of single-cell microbial organisms, comprising the steps of:

a. drying said single-cell microbial organisms to a moisture content no greater than about 8 wt. percent;

b. preparing a slurry of the dried single-cell microbial organisms with an aqueous alcoholic solution containing 60 to 80 vol. percent of an aliphatic alcohol having 1 to 3 carbon atoms per molecule in an amount to provide a weight ratio of alcoholic solution to single-cell microbial organisms within the range from 3:1 to 7:1, whereby the viable cells are killed when mixed with said alcoholic solution;

c. agitating the slurry at a temperature in the range from 20° to 100°C. for a period of 0.1 to 2.0 hours;

d. filtering the slurry to recover extracted single-cell microbial organisms; and

e. drying the extracted single-cell microbial organisms to yield a substantially solvent-free product.

3,891,773
CULTURE OF SOUR DOUGH BACTERIA

Leo Kline, Richmond, and Takashi F. Sugihara, Pinole, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 26, 1971, Ser. No. 119,381

Int. Cl. C12k *3/00;* **A21d** *8/00, 8/04*

U.S. Cl. 426—61 **5 Claims**

1. The process for preparing a product useful in the production of sour dough bakery products which comprises:

a. providing a liquid nutrient medium containing water, maltose, an unsaturated fatty acid derivative, and fresh yeast extractives, and having a pH of 6 or below,

b. inoculating the nutrient medium with viable cells of the sour dough bacteria, *Lactobacillus sanfrancisco, and*

c. holding the inoculated nutrient medium at a temperature of about 25°–35°C. until a substantial growth of the bacteria has taken place.

3,891,774
SOFT TEXTURED DRY PROTEIN PRODUCT AND METHOD FOR FORMING SAME

Richard J. Baker, St. Louis; Timothy A. Miller, Ferguson; Gary K. Erlinger, St. Charles; Stephanus F. Loepiktie, St. Louis, and Larry R. Hanselman, Affton, all of Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Continuation of Ser. No. 38,601, May 18, 1970, abandoned. This application Oct. 17, 1973, Ser. No. 407,370

Int. Cl. A23j *3/00*

U.S. Cl. 426—104 **34 Claims**

1. A method of treating a protein-containing vegetable material to form a soft dry textured expanded food product comprising the steps of: providing a protein source material of the group consisting of oilseed meals, animal, fish and poultry by-product meals, and microbial protein having an equilibrium moisture content and a protein content between about 30 and 75% by weight; mixing an organic plasticizing solvent which is selected from the group consisting of glycerol, propylene glycol and mixtures thereof at a level of between about 10 and 50% by weight of the mixture and thereafter said mixture is heated to an elevated temperature above 212° F. and while applying elevated pressures for a time period sufficient to convert said mixture into a flowable substance; then forcing the heated, pressurized, plasticized, mechanically worked material through first restricted orifice means, maintaining the material under elevated temperatures and pressures as it emerges from said first restricted orifice means; and then extruding the material through second restricted orifice means into an environment of a pressure substantially lower than said elevated pressures causing expansion of the product with evaporation of at least part of the moisture and the formation of the expanded soft dry food product having a residual water content of between about 3–7% by weight as it emerges from the extruder.

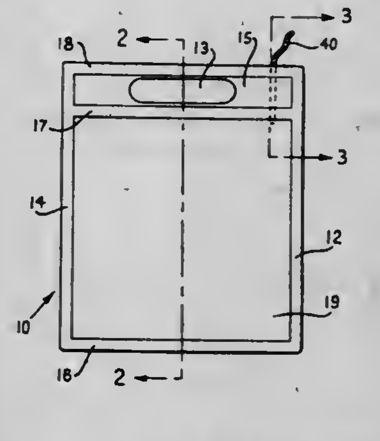
3,891,775
VENTABLE TOASTER PACKAGE

Edward J. Murray, 6104 California St., Apt. 1, San Francisco, Calif. 94121, and Andrew C. Piggot, 289 Miramontes Rd., Woodside, Calif. 94062

Filed Oct. 23, 1973, Ser. No. 408,622

Int. Cl. B65b *25/22*

U.S. Cl. 426—107 **4 Claims**



1. A food packet, for use as both a food storage and heating container, comprising:

a. two opposed substantially rectangular panels of laminated heat sealable sheets which are heat sealed together at their edges to form a container having a cavity in which the foodstuffs prepared for consumption are contained,

b. the laminated sheets having an aluminum outer sheet, a mylar intermediate layer, and a polyethylene inner layer, and the aluminum outside surface having a heat absorbing coating to provide a non-tearable sheet which readily passes heat therethrough,

c. the sheets being dimensioned so that the entire food packet can be placed within the receiving slot of a heater unit,

d. the upper periphery of the container having an integral handle section formed therewith,

e. a pull type venting element of small cross section having its central portion sealed between the opposed laminated sheets along the upper heat sealed section immediately above the food containing cavity, with its lower end extending into the food containing cavity and having an upper section extending out of the food packet and of sufficient length to be grasped by the user to that the entire element can be pulled free of the packet to provide a venting passageway at the top of the packet.

3,891,776

PROTEIN PRODUCT

Roland Paul Carpenter; William Pirie Cowie, both of Aberdeen, Scotland; Alan Heyes, Oakley, England, and Anthony Hubert Sutton, Stonehaven, Scotland, assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 2, 1972, Ser. No. 303,177

Int. Cl. A23j *3/00*

U.S. Cl. 426—573 **7 Claims**

1. A protein-containing food product suitable for use as an ingredient in savoury or unsweetened foodstuffs, which food product is in the form of a thermostable gel and consists essentially of:

a. about 0.3 to 3.0% by weight of a cellulose ether selected from edible water-soluble alkyl, hydroxyalkyl and carboxyalkyl celluloses the alkyl radicals of which contain from 1 to 3 carbon atoms;

b. about 0.2 to 5.0% by weight of a calcium salt of an edible alginic acid; and

c. the balance comprising water and an edible protein ingredient selected from the group consisting of finely divided or chemically concentrated fish, meat, poultry and vegetable protein.

3,891,777

METHOD OF MAKING PROTEIN FOOD PRODUCTS RESEMBLING CHEESE

Robert Allan Boyer, Creve Coeur, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 40,365, May 25, 1970, abandoned. This application Apr. 28, 1971, Ser. No. 138,304

Int. Cl. A23j *3/00*

U.S. Cl. 426—573 **18 Claims**

1. A process for producing a smooth textured food product from isolated vegetable protein comprising: forming an aqueous slurry of an isolated vegetable protein and water, homogenizing the slurry to form a uniform slurry of proteinaceous material, compressing the uniform slurry to substantially hold the proteinaceous material together and heat setting the protein to impart a smooth texture to the product.

3,891,778

METHOD OF MAKING PROTEIN FOOD PRODUCTS RESEMBLING CHEESE

Robert Allan Boyer, Creve Coeur, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 40,365, May 25, 1970, abandoned. This application Nov. 18, 1970, Ser. No. 9 ,839

Int. Cl. A23j *3/00*

U.S. Cl. 4 6—573 **10 Claims**

1. A process for forming a smooth, textured food product from soybean protein comprising: forming a dispersion of defatted soybean meal and water at an elevated pH above the iso-electric point of the soy protein thereby extracting the protein from the soybean meal, removing the suspended solids from the aqueous protein extract, adjusting the pH of the separated aqueous extracted protein dispersion to between about 8 to 11 and heating the dispersion to between about 160° to 3 0° F. for between about 5 seconds to 30 minutes to produce a viscous hydrated heat-treated aqueous protein solution, precipitating the protein by adjusting the pH of the solution to about the isoelectric point of the protein, separating the precipitated protein from the solution to recover a viscous, hydrated, heat-treated aqueous protein, homogenizing the viscous hydrated heat-treated aqueous protein to form a uniform slurry, compressing the uniform slurry to hold the proteinaceous material together and heat setting the protein to impart a smooth texture to the product.

3,891,779

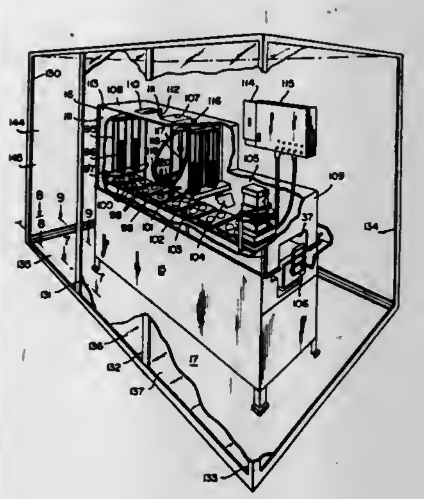
ASEPTIC PACKAGING OF FOODS

David V. Robinson, Laurel, Md., assignor to Donald A. Roslni, Shamokin, Pa., a part interest

Division of Ser. No. 53,087, July 8, 1970, abandoned. This application Nov. 8, 1971, Ser. No. 196,837

Int. Cl. A23l *3/02*

U.S. Cl. 426—399 **10 Claims**



1. A method for the production of an aseptic packaged food product which comprises disposes a filling maching having a covered filling zone in a completely walled pressure-sealed clean room, spraying the atmosphere and all surfaces of the clean room and of said filling zone with a liquid solution of a microorganism-killing agent for a time long enough to kill all microorganisms present, and maintaining said agent on said surfaces throughout the course of said method; then flowing filtered presterilized air through the clean room in a path across outer surfaces of said machine and over and past an operator adjacent thereto, thereby picking up any microorganisms from the operator and carrying the same away from the machine, removing said air through a closable opening in the room, flowing filtered presterilized air through said covered filling zone and removing the same from the product discharge end of the machine and from said room, maintaining air pressure in said room at a slightly superatmospheric value to prevent entry of microorganisms from the atmosphere outside the clean room, maintaining air pressure in the filling zone higher than in said clean room, and continuing said air flows as long as the operator attends said machine; coincidently with said air flows, flowing said food product through a heating zone, heating the food therein at a temperature sufficiently high and for a time sufficiently long as to kill microorganisms contained therein, flowing the sterile food through a presterilized cooling zone, flowing the cooled food to said filling machine in the clean room, aseptically introducing a stack of presterilized containers and a stack of presterilized container lids to said filling zone of the machine, aseptically filling each container with sterile food and capping and sealing the same in said machine, and removing sealed containers from the machine and from the clean room through a closable exit in the latter while maintaining the air pressure therein at said superatmospheric value; said food product in the non-sterile state being perishable if not refrigerated, and said sealed containers of sterile food product being storable without refrigeration for a period of time at least twice as long as the storage period of the refrigerated non-sterile food.

3,891,780

CRUSTACEAN WASTE WATER PRODUCT RECOVERY PROCESS

Leo J. Novak, 2941 S. Dayton-Lakeview Rd., New Carlisle, Ohio 45344, and William A. Myers, III, 4950 Feliciana Dr., New Orleans, La. 70126

Filed Apr. 13, 1973, Ser. No. 350,921

Int. Cl. A23b *1/10*

U.S. Cl. 426—657 **7 Claims**

1. In the canning of crustacean seafood including shrimp which comprises peeling and aqueous washing using water jets to remove the hull or shell portions prior to canning, and the resultant production of cannery waste water, the steps comprising subjecting the resultant washings to screening to remove coarse solids and additionally filtering the washings after the screening operation to remove insolubles which would clog the jets, recycling the filtered washings through the peeling operation for at least two times, acidifying the resultant washings to bring about precipitation of the water soluble protein components, settling the precipitated protein to recover a supernatant liquid, thereafter filtering the supernatant liquid on a precoat vacuum filter, and then subjecting the resultant filtrate to reverse osmosis to recover a protein concentrate and substantially pure water.

3,891,781

PROCESS FOR THE EXTRACTION OF HOPS

Kurt Bauer; Helmut Findeiss, and Alfred Krempel, all of Holzminden, Germany, assignors to Haarmann & Reimer GmbH, Holzminden, Germany

Filed Sept. 6, 1973, Ser. No. 394,899

Claims priority, application Germany, Sept. 8, 1972, 2244065

Int. Cl. C12c *9/02*

U.S. Cl. 426—429 **33 Claims**

1. Process for substantially separating the essential ingredients of hops, which process comprises subjecting a primary extract of hops in an organic solvent, containing as components (i) neutral substances, (ii) bitter substances and (iii) tannins, to a first liquid-liquid extraction with a second organic solvent different from said primary extract solvent whereby either (iii) the tannins or (i) the neutral substances are substantially separated off, leaving a residual solution of (i and ii) neutral and bitter substances or (iii and ii) tannins and bitter substances, and subjecting the residual solution to a second liquid-liquid extraction with an organic solvent different from said second organic solvent to separate said solution into its components.

3,891,782

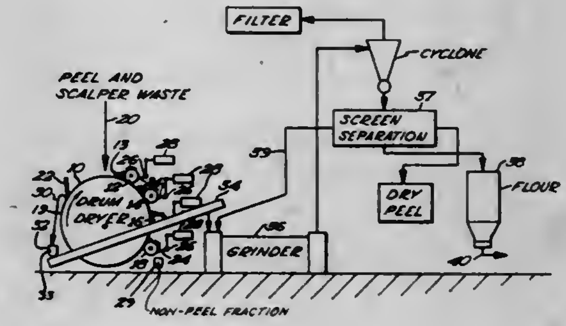
METHOD OF EXTRACTING POTATO FLOUR FROM WASTE PEEL AND DEHYDRATOR WASTE

Max G. Wilhelm; William Truman Manning, and James D. O'Neil, all of Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Oct. 12, 1973, Ser. No. 405,946

Int. Cl. A23b *7/03*

U.S. Cl. 426—455 **12 Claims**



1. A method of preparing potato flour from potato waste mash comprising a mixture of potato pulp and specks, said specks being waste made up of a peel fraction and a non-peel fraction, with a drying drum and a plurality of longitudinally extending applicator rolls spaced circumferentially thereabout with each applicator roll located a selected distance on the order of a fraction of an inch from the surface of the drying drum, said distance also being less than that which allows potato on the rolls to fall off and greater than that wherein the potato will not transfer to the dryer drum, said process comprising: heating the drying drum to a temperature between about 310°–360°F., applying the potato waste mash containing specks to the drying drum, rotating the drying drum and the applicator rolls to cause the mash to form a layer on the drying drum and to cause primarily the non-peel fraction of the specks to accumulate on each of the applicator rolls, removing the non-peel fraction of the specks from each of the applicator rolls, removing dried potato containing specks primarily in the form of said potato peel from the drying drum in sheet form, periodically ascertaining the peel contamination of the finished potato flour to determine the amount of peel therein, conditioning the sheet by maintaining or adjusting the moisture content of the potato thus removed in sheet form between about 10 to 14 percent by weight, grinding the sheet by subjecting the sheet to mechanical impact, said moisture conditioning to between 10–14 percent and said mechanical impact grinding coacting to cause the dried potato sheet to fracture on the cleavage planes at the interface between the peel waste and the pulp, the fracturing at said interface being due to the physical characteristics of the sheet resulting from said conditioning and thereafter separating the pulp from the peel waste.

3,891,783

METHOD AND APPARATUS FOR CHEESE MANUFACTURE

Peter Struan Robertson, and Raymond Bysouth, both of Palmerston North, New Zealand, assignors to New Zealand Dairy Research Institute, Palmerston North, New Zealand

Continuation of Ser. No. 271,236, July 13, 1972, abandoned. This application Mar. 4, 1974, Ser. No. 448,025

Claims priority, application New Zealand, July 13, 1971, 164291

Int. Cl. A23c *19/02*

U.S. Cl. 426—478 **27 Claims**

1. A method of cheesemaking using a vertical curd fusion chamber with an upper admitting portion having sides which are substantially parallel and a lower tapered portion terminating at its lower end in a discharging portion so that curd is admitted to said upper portion and is discharged from said lower portion, said curd fusion chamber in said tapered portion having a horizontal cross section which diminishes gradu-

ally in area between said admitting portion and said discharging portion, said method comprising the steps of:

a. elevating adequately drained curd through pneumatic conveying apparatus to said upper admitting portion of said fusion chamber;

b. feeding the curd to said upper admitting portion through a horizontal nozzle arranged tangentially with respect to the walls of said upper admitting portion;

c. allowing the curd to remain in the fusion chamber until a desired hydrogen ion concentration is developed therein;

d. draining the curd by drains both in the external wall of said curd fusion chamber and by internal slotted vertical pipes which in use also serve to resist downward movement of the curd as it passes downwardly through the chamber;

e. discharging the curd from said discharging portion such that curd first admitted to said fusion chamber is first discharged therefrom, causing consolidation to occur in a substantially vertical direction during passage of the curd through said curd fusion chamber;

f. dividing the descending curd into a plurality of separate columns prior to discharge from said curd fusion chamber;

g. cutting the discharged columns of curd into blocks as it is discharged from said fusion chamber; and

h. delivering the discharged blocks of curd to a curd mill for further milling in a manner such that the blocks are oriented so that milled fingers of curd are formed with the length of each finger substantially parallel to the direction of curd flow.

7. Apparatus for use in making cheese, said apparatus comprising: a vertical curd fusion chamber with an upper admitting portion having sides which are substantially parallel and a lower tapered portion having a cross section which decreases gradually in area from top to bottom of said lower portion; pneumatic feeding means for elevating drained curd to said upper admitting portion; said feeding means terminating at said admitting portion in a horizontal nozzle arranged tangentially with respect to said admitting portion so that the curd is deposited in the vicinity of the walls of the chamber on top of curd already in said curd fusion chamber; said curd fusion chamber having dimensions such that curd may be held therein for a period of time sufficient to permit a required hydrogen ion concentration to be obtained after a suitable period of time of holding; an external draining system including members defining apertures in the walls of said curd fusion chamber leading to passageways outside the curd fusion chamber; an internal draining system including a plurality of slotted vertical pipes disposed internally within the curd fusion chamber so as to be surrounded by curd in use; delivery means in the bottom of said lower portion for delivering curd from said curd fusion chamber in a manner such that curd first fed to the curd fusion chamber is first discharged therefrom, said delivery means including a plurality of delivery tubes which separate the descending curd into a plurality of separate columns; means for cutting the discharged columns of curd into blocks as it is discharged from said fusion chamber; and means for delivering the discharged blocks of curd to a curd mill for further milling, such that the blocks are oriented so that milled fingers of curd are formed with the length of each finger substantially parallel to the direction of curd flow.

3,891,784

METHOD OF PREPARING OXIDATION RESISTANT BRAZED JOINTS

Gordon E. Allardyce, Dearborn Heights; Roy Amedee, and Claude Belleau, both of Troy, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Division of Ser. No. 316,145, Dec. 18, 1972, Pat. No. 3,797,087. This application Nov. 1, 1973, Ser. No. 411,965

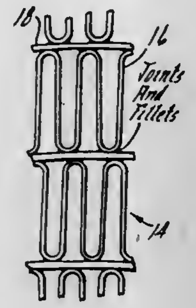
Int. Cl. C23c *9/00*

U.S. Cl. 427—295 **5 Claims**

1. A method of preparing oxidation resistant brazed joints comprising the steps of:

providing a structure having a copper brazed joint;

coating the copper joint with aluminum and heating the structure at an elevated temperature for a time sufficient to cause diffusion of aluminum substantially throughout the copper joint and the alloying of the aluminum therewith; the heating step being accomplished with an atmosphere selected from the group consisting of inert, reducing and vacuum atmospheres.



3,891,785

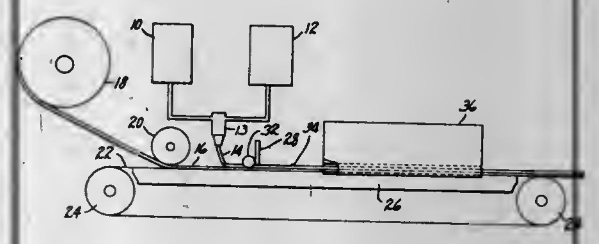
PROCESS FOR FORMING A FLEXIBLE POLYURETHANE COATING

John C. Zemlin, Reading, Mass., assignor to USM Corporation, Boston, Mass.

Filed Mar. 20, 1973, Ser. No. 343,177

Int. Cl.^{2} B44D *1/14*

U.S. Cl. 427—359 **5 Claims**



1. The process for forming a flexible polyurethane coating or film including the steps of continuously introducing polyurethane-forming reagents from supply containers to a mixing zone under temperature conditions maintaining said reagents in liquid condition, mixing said reagents in said zone, continuously discharging the mixed reagents from said zone as a substantially solvent free liquid continuous stream of a mixture of said reagents, said reagents comprising a polyisocyanate, a difunctional amine in amount equivalent to from about 5 to about 35 percent of the reactive —NCO of said polyisocyanate and a diol having a molecular weight of from about 500 to about 3,000, the reactive hydrogen of said diol and amine being substantially equivalent to the reactive —NCO groups of said polyisocyanate and said mixture being reactive to form a pseudoplastic intermediate stage material having an extremely high viscosity at which it will not dive into porosities on a casting surface at shear rates approaching zero and a very much lower viscosity suitable for blending, spreading and coating under shearing agitation, depositing said stream of mixed reactants on a continuously moving surface whose path leads beneath a spreader element and then through a heated

curing zone, said spreader element extending across said surface and being disposed relative to said surface to form a layer on said surface by allowing passage between said element and said surface of a thickness of said mixture on said surface determined by the desired thickness of said coating or film and to hold back passage of mixed reactants on said surface greater than said determined thickness above said surface, reacting successive portions of said mixture of reagents to said pseudoplastic intermediate state while being moved toward said spreader element, collecting on said surface mixed material held back by said spreader element as a bank, the relative movement between said surface and said spreader element creating shearing agitation in and a rolling movement of said bank to provide said lower viscosity state in the material in said bank, continuously incorporating and blending further mixture from said surface into the mass of reactive mixture in said bank, spreading mixture from said bank on said surface by said spreader element, withdrawing portions of the blended material on said surface from the agitated mass in said bank as a layer passing beneath said spreader element while the mass remains spreadable through balance of freshly mixed against previously mixed reagents and does not set up, controlling the size of the agitated mass in said bank by correlation of the rate of supply of the mixture of reagents to said surface and the rate of withdrawal to provide dwell time of reactive mixture in said bank, the viscosity of said mixture in said layer becoming extremely high when the layer has left the spreader element and shearing agitation ceases, and then heating said layer to curing temperature during passage on said surface through said heated curing zone.

3,891,786

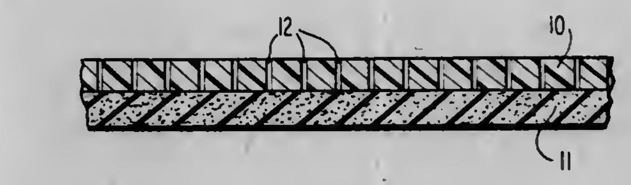
ELECTRICALLY CONDUCTIVE SHEETING

Christine Conklin, Newark, N.J., assignor to Herculite Protective Fabrics Corporation, New York, N.Y.

Filed Oct. 5, 1973, Ser. No. 403,730

Int. Cl.^{2} H05F *3/00;* **B32B** *25/02, 25/08, 3/24*

U.S. Cl. 428—136 **32 Claims**



1. A flexible, electrically conductive sheeting having a surface resistivity and a volume resistivity, each below 10^6 ohms comprising:

a first solid layer of a polymeric film material which, prior to incorporation in said sheeting has a surface resistivity of at least above 10^6 ohms,

a second layer of rubber bonded to one surface of said polymeric film material, said rubber being filled with from about 25 to about 40 by weight of the rubber of electrical grade carbon black, and

said first layer of polymeric film material having micro-perforations in a density of from about 5 to about 25 micro-perforations per square inch, the micro-perforations having a diameter of from about 0.003 to about 0.012 inch.

3,891,787

ELECTROSTATIC RECORDING MEMBER

Seizi Ueyama, Osaka, Japan, assignor to General Company Ltd., Tokyo, Japan

Continuation of Ser. No. 197,756, Nov. 11, 1971, abandoned. This application Dec. 3, 1973, Ser. No. 421,143

Int. Cl. B32b *5/16;* **B41m** *5/00*

U.S. Cl. 428—409 **7 Claims**

1. An electrostatic recording member which comprises an electrically low resistant substrate having a recording layer thereon which consists essentially of an inorganic pigment or a metal soap dispersed in a resin film which is composed of at least 30% by weight, based on the weight of the resin film, of a fatty acid modified epoxy resin ester having a degree of esterification of from 30% to 90% and up to 70% by weight of a member selected from the group consisting of polyvinyl chloride and polymers of acrylic acid esters and methacrylic acid esters, wherein the surface resistivity of the recording layer is at least about 10^{12} ohm-cm.

3,891,788

ETHYLENE-VINYL CHLORIDE EMULSION COATED PLASTIC LAMINATE

William M. Karszes, Coshocton, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 13, 1973, Ser. No. 424,514

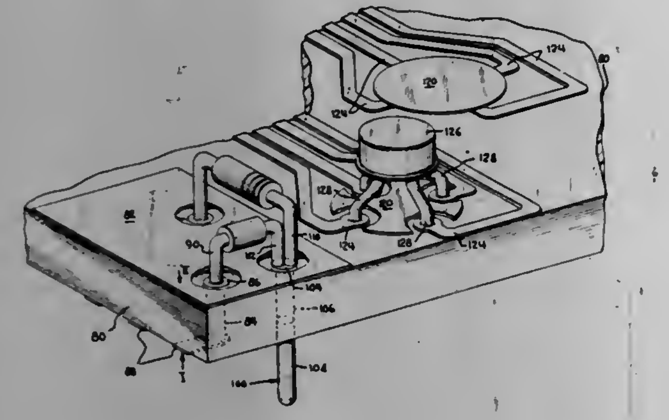
Int. Cl.^{2} B32B *27/10*

U.S. Cl. 428—511 **6 Claims**

1. A plastic laminate comprising at least one resin impregnated paper sheet and wherein there is enhanced adhesion with adhesives to substrates without roughening, said laminate having at least on its adhering surface a coating comprising polymerized ethylene vinyl chloride emulsion emplaced before heat and pressure consolidation of the laminate, said ethylene vinyl chloride polymer emulsion comprising a blend of, by weight, from about 55 to 80 percent of ethylene vinyl chloride having carboxyl pendant groups and from about 45 to 20 percent of ethylene vinyl chloride polymer having amide pendant groups.

3,891,789
WELDING METHOD AND MEANS USING FOIL ELECTRODE

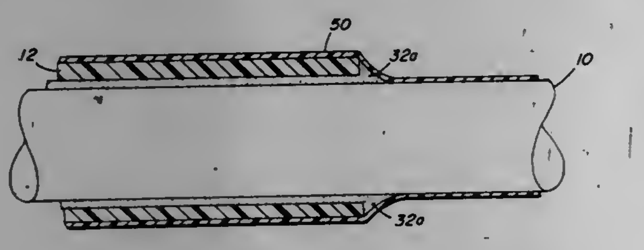
Robert Charles Swengel, Sr., Hellam, and J. A. Crumley, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Division of Ser. No. 55,614, July 16, 1970, which is a continuation of Ser. No. 720,777, April 12, 1968, abandoned. This application Nov. 9, 1972, Ser. No. 305,192
Int. Cl. H05k *1/18*
U.S. Cl. 174—68.5 **1 Claim**



1. As an article of manufacture a connecting device including at least one insulating member, at least one conductive member carried therein with a surface portion proximate a surface portion of said insulating member, a foil-like member carried on the surface portion of said insulating member, in engagement with said surface portion of said insulating member whereby to receive a further conductive member positioned thereagainst with the foil-like member interposed between said further conductive member and said one conductive member, the said surface portion of the one conductive member having an area and configuration whereby upon the application of a current to a circuit across said one conductive member and said foil-like member, the said foil-like member will be vaporized to be isolated from said one conductive member and said further conductive member to permit direct fused contact between said one conductive member and said further conductive member.

3,891,790
SPLICING AND REPAIRING INSULATED ELECTRICAL WIRE

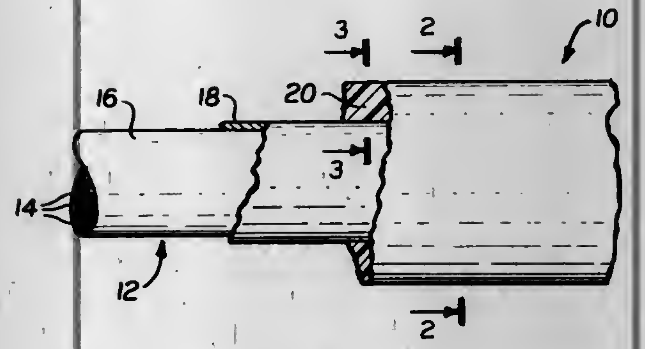
William L. Kierstead, Newton Centre, Mass., assignor to Electronized Chemicals Corporation, Burlington, Mass.
Filed Mar. 4, 1974, Ser. No. 447,645
Int. Cl. H02g *15/08*
U.S. Cl. 174—93 **5 Claims**



1. An improved, covered electrical wire comprising in combination:
a. an electrical wire;
b. an adhesive material which is workable at elevated temperatures disposed around a portion of the electrical wire;
c. a heat-recoverable sleeve disposed around the adhesive material and the wire portion, said sleeve being shrunk around the wire portion and forcing some of the adhesive to flow out of the ends of the sleeve and forming an adhesive bead thereat; and
d. two heat-recoverable tubes one disposed over each of the adhesive bead at each end of the sleeve, each tube extending around a segment of the sleeve and a segment of the wire which are adjacent to the bead each tube being heat shrunk forming a tight-fitting cover around the end of the sleeve and compressing and shaping the adhesive bead to enhance its adhesive contact with the wire and the edge of the sleeve.

3,891,791
COMMUNICATION CABLE WITH IMPROVED COATED SHIELD

Gertraud A. Schmidt, Long Branch, N.J., assignor to General Cable Corporation, Greenwich, Conn.
Filed May 10, 1974, Ser. No. 469,012
Int. Cl. H01b *7/22*
U.S. Cl. 174—107 **7 Claims**



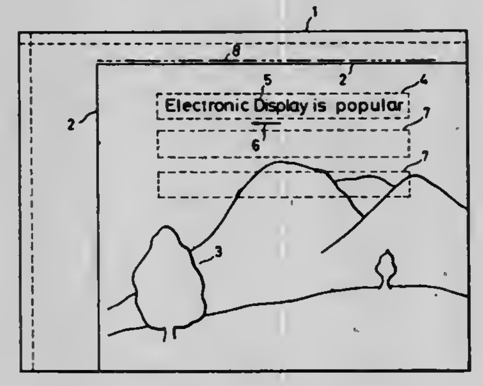
1. An electric communication cable comprising a cable core, insulation on the cable core, a shield of corrosive metal around the core, a corrosion protecting coating on the shield including a mixture of polyethylene and an adhesive copolymer, the adhesion of the mixture to the metal of the shield being sufficiently strong to prevent delamination of the coating and the shield when the cable is buried and exposed to ground water, but the adhesion being limited to such a value that the coating can be peeled from the surface of the shield when an edge of the coating is broken loose from the metal the coating containing sufficient adhesive copolymer to require a force of between 1 and 2.5 pounds to separate a one inch wide strip of the coating from the metal shield at 10 inches per minute, and the maximum ratio of polyethylene to copolymer being about 4:3.

3,891,792
TELEVISION CHARACTER CRAWL DISPLAY METHOD AND APPARATUS

Hisao Kimura, Kyoto, Japan, assignor to Asahi Broadcasting Corporation, Osaka, Japan
Filed June 25, 1974, Ser. No. 482,922
Int. Cl. G08b *5/36*
U.S. Cl. 178—5.8 R **17 Claims**

1. The method of displaying characters upon a television screen in addition to displaying a television image, which includes the steps of;
a. incrementally formulating character-forming information (8) during the interval of time not required for forming television image information,
b. temporarily storing said character-forming information,
c. gating-out said stored character-forming information at a time other than during said interval of time,

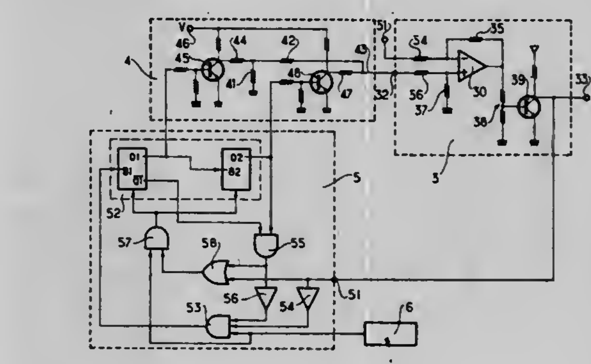
d. combining the gated-out character-forming information with said television image information, and



e. displaying said characters and said television image for simultaneous viewing.

3,891,793
BINARY CODING DEVICE

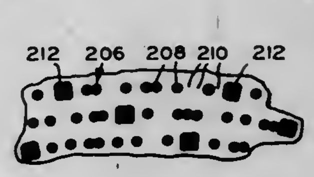
Martin De Loye, Paris, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France
Filed May 10, 1974, Ser. No. 468,980
Claims priority, application France, May 11, 1973, 73.17087
Int. Cl. H04n *1/40*
U.S. Cl. 178—6 **18 Claims**



1. A device for the binary coding of data on a document to be reproduced with different tints comprising scanning means for scanning a document by successive elementary points to generate an analog reading voltage for each point examined, generating means for generating a variable comparison voltage, said generating means being connected with a control means, and comparison means for comparing said analog reading voltage and said variable comparison voltage, said comparison means generating a binary 0 or 1 signal from the comparison,
said control means including a binary counter connected with a control clock synchronized with the scanning element, and a logic means for connecting said clock to said binary counter,
said logic means comprising first means for controlling the evolution of the counter from a first state up to a second state, said first means receiving a first binary signal from said output binary comparison signal of said comparison means, second means for ensuring the forced setting of said binary counter to said first state, and third means for controlling said second means through an OR gate to ensure the coding of said second state of said binary counter, said second means further controlling said binary counter upon the appearance of a second binary comparison signal at the output of said comparison means by controlling the evolution of said variable comparison voltage between a first predetermined level and a second predetermined level corresponding respectively to said first and second states of said binary counter.

3,891,794
METHOD AND APPARATUS FOR SYNCHRONIZING PHOTOGRAPHIC RECORDS OF DIGITAL INFORMATION

James T. Russell, Richland, Wash., assignor to Battelle Development Corporation, Columbus, Ohio
Division of Ser. No. 202,539, Nov. 26, 1971, Pat. No. 3,795,902, which is a continuation-in-part of Ser. No. 857,474, Sept. 12, 1969, Pat. No. 3,624,284, which is a division of Ser. No. 576,580, Sept. 1, 1966, Pat. No. 3,501,586. This application July 2, 1973, Ser. No. 375,336
Int. Cl. G06k *7/14*
U.S. Cl. 178—6.7 R **16 Claims**



1. A signal recording and playback system comprising:
input means for generating electrical pulses which form a first digital coded electrical signal,
optical recorder means including a light source connected to said input means so that the pulses of said first digital signal are transmitted in series to said light source for producing a beam of light pulses which form a digital coded light signal corresponding to said first digital signal, means for scanning said light pulses across a photographic record element to produce a photo record of said digital coded light signal in the form of a series-recorded track of a plurality of small spots representing digital bits recorded at a high density, said spots being approximately all of the same size,
optical playback means including at least one light detector and light deflection means for scanning said record element along said track of spots to transmit a light signal to the light detectors for producing electrical pulses which form a second digital coded electrical signal corresponding to the digital light signal recorded on said photographic record,
and output means connected to said light detector for transmitting substantially all of the pulses of said second digital signal,
wherein said digital signal as represented by said plurality of spots has a data configuration indicative of word groups of said spots, said output means having means for detecting the last mentioned data configuration for synchronizing the second digital electrical signal relative to word groups.

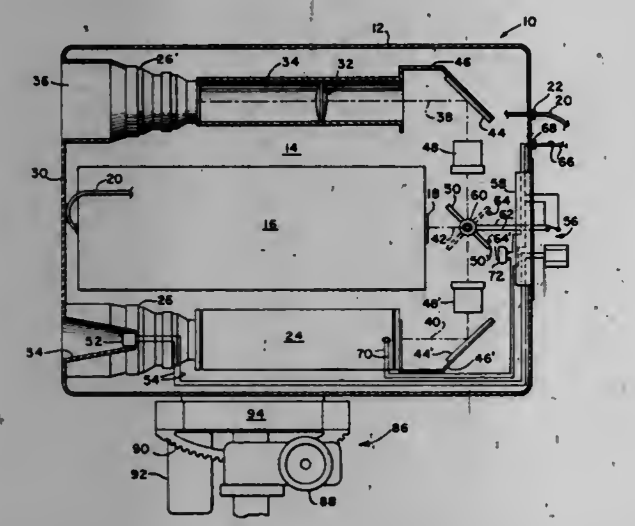
3,891,795
AUTOMATIC DAY-NIGHT TELEVISION SURVEILLANCE SYSTEM

Quentin S. Johnson, 703 W. Nettletree Rd., Sterling, Va. 22170, and Edward H. Pignone, 2537 Villanova Dr., Vienna, Va. 22180
Filed Apr. 11, 1974, Ser. No. 460,089
Int. Cl. H04n *5/38*
U.S. Cl. 178—7.2 **10 Claims**

1. A closed circuit television surveillance system for night-viewing at scene illumination levels as low as 10^{-5} ft-candles and day-viewing at scene illumination levels as high as 10^4 ft-candles, capable of automatically switching between a night-viewing mode and a day-viewing mode, and having a single daylight television camera receiving a scene image along a viewing axis, comprising:
a night-viewing optical system including an image intensifier and a first objective lens disposed at one end of said

image intensifier for receiving and transmitting the image along a first optical axis;

a day-viewing optical system including, in optical alignment, a second objective lens and a field lens for receiving and transmitting the image along a second optical axis;



aligning means for automatically and selectively placing one or the other of said optical systems in optical alignment with the viewing axis of the daylight television camera depending upon the average scene illumination level thereby to adapt the system for day or night viewing; and means for supplying power to said image intensifier and said aligning means.

3,891,796
POSITIONING AND MOUNTING MEANS FOR A FLEXIBLE VIDEO DISK

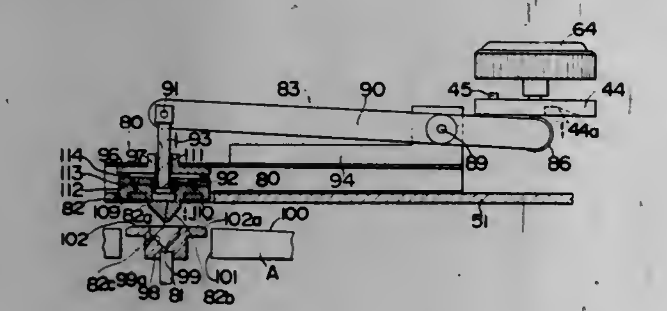
Ichiro Takahara; Tadahiko Yabu, and Jihei Fujita, all of Osaka, Japan, assignors to Sanyo Electric Company, Ltd., Osaka, Japan

Filed Dec. 7, 1973, Ser. No. 422,865

Claims priority, application Japan, Dec. 8, 1972, 47-123551

Int. Cl. H04n *3/00*

U.S. Cl. 178—6.6 DD **3 Claims**



1. A video disc player for use with a flexible foil-type disc, said player comprising:

a stationary table;

a motor-coupled rotatable spindle positioned with respect to said table for driving said flexible foil-type disc record about its center at a predetermined high speed while it hovers on a rotation-induced air cushion above the stationary table during the rotation thereof;

a record mount rigidly mounted on said rotatable spindle for supporting the disc record thereon in alignment with a central portion of the disc record while the remaining portion of the disc record rests on the stationary table when said record mount is not rotated, said record mount having a top surface positioned above the plane of said stationary table, said top surface having a peripheral portion radially downwardly inclined such that the inclined peripheral portion thereof is substantially contiguous with the plane of said stationary table, said record mount further having an inwardly recessed socket formed therein in alignment with the longitudinal axis of the rotatable spindle;

a cylindrical block for movement between engaged and disengaged positions and having an axially extending cavity formed therein, said cylindrical block further having one end formed with a downwardly extending projection engageable into said socket in said record mount, when said cylindrical block is moved to said engaged position, so as to clamp said disc record between said record mount and said cylindrical block for rotation together with said record mount;

an annular magnetic element embedded in either said block or said record mount and positioned to face the other of said record mount or said cylindrical block for effecting magnetic attraction between said block and said record mount thereby permitting said cylindrical block to rotate together with said record mount with said disc record sandwiched therebetween;

control means including an operating rod for movement between first and second positions such that when said operating rod is in said first position, said cylindrical block is in said disengaged position and when said operating rod is in said second position, said cylindrical block is in said engaged position, said operating rod having a land of a diameter greater than the diameter of said rod integrally formed on one end thereof, said cylindrical block having the other end formed with an opening, said opening having a diameter smaller than that of said land and through which a portion adjacent said one end of said rod loosely extends with said land situated inside said cavity, wherein when said rod is in said second position said land is suspended in the space within said cavity clear of the inside surface of said other end of said cylindrical block, and as said rod is upwardly moved towards said first position said land contacts said inside surface of said other end of said cylindrical block, said cylindrical block being upwardly shifted towards said disengaged position when said block is upwardly moved by said land of said operating rod as it moves to said first position; and

a smoothing member operatively positioned between said operating rod and said cylindrical block for providing a low frictional contact between said rod and said block such that said cylindrical block is permitted to rotate under an inertial force substantially independent of said operating rod after said cylindrical block has been disengaged from said record mount rotated at the predetermined high speed.

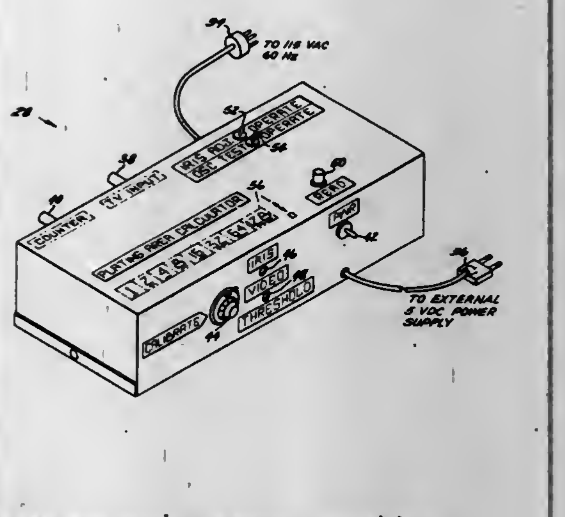
3,891,797
PLATING AREA MEASURING SYSTEM

Joseph C. Finnell, Fountain Valley, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Dec. 26, 1973, Ser. No. 427,565

Int. Cl.² G01B *19/58;* **H04N** *7/18*

U.S. Cl. 178—6.8 **7 Claims**



1. An area mmasuring system comprising:

a facimile of a region including areas distinguishable into first and second general types by illumination;

means for illuminating said region;

means for viewing and scanning said illuminated region and producing a signal characteristic to said areas of said region;

means responsive to said characteristic signal and producing digital signals arranged in groups corresponding in size to respective portions of said first type of said areas, said grouped digital signal producing means being selectively operable for a predetermined duration; and

means for counting said grouped digital signals whereby a measurement of the aggregate area of said first type of said areas is obtained, said grouped digital signal producing means including an oscillator for generating a series of high rate digital signals, means for producing a control signal of predetermined duration, said control signal being applied to said oscillator to control output of said digital signals therefrom, and gate means responsive to those portions of said characteristic signal representative of portions of said first type of said areas to pass said digital signals in corresponding size groups to said counting means.

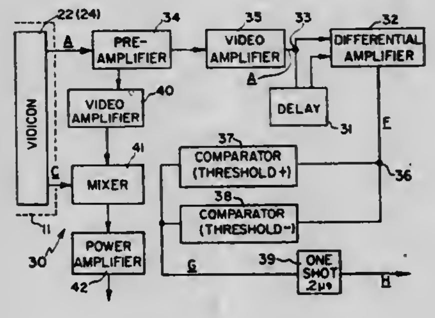
3,891,798
TRACKER UNIT

Thomas J. Marcus, Gahanna, Ohio, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 19, 1971, Ser. No. 126,288

Int. Cl.² H04N *7/18*

U.S. Cl. 178—6.8 **6 Claims**



1. In a tracking system tracker unit which develops tracking error correction signals from a single television camera sensor video signal, in combination:

a. Differential amplifier means having an inverting input terminal, a ion-inverting input terminal, and an output terminal, and producing a difference signal at said differential amplifier means output terminal that represents the amplitude difference of the signals then existing at said differential amplifier means input terminals,

b. Video signal delay means,

c. Conductor means transmitting a single television camera sensor video signal to one of said differential amplifier means input terminals delayed in time by said video signal delay means and transmitting said single television camera sensor video signal to the other of said differential amplifier means input terminals not delayed in time by said video signal delay means; and

d. Tracking logic means coincidence gating target marker pulses with tracking gate pulses to develop tracking error correction signals,

said target marker pulses being derived from the amplitude of said differential amplifier means difference signal produced at said differential amplifier means output terminal.

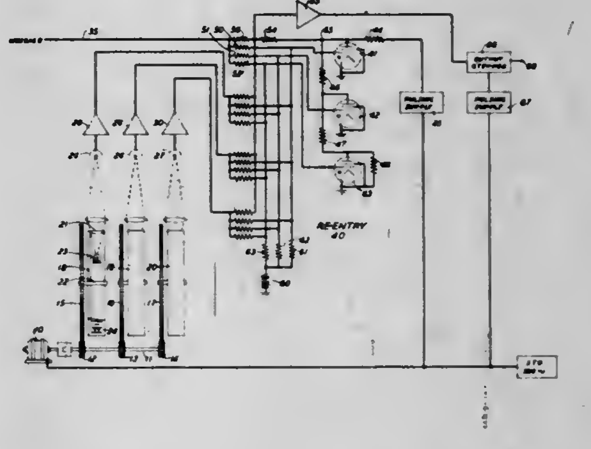
3,891,799
CODING DEVICE WITH LIGHT RESPONSIVE KEY GENERATOR

Alfred E. Melhose, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 27, 1944, Ser. No. 555,912

Int. Cl. H04l *9/02*

U.S. Cl. 178—22 **4 Claims**



1. In a code pulse generating system, a plurality of rotatable opaque members, circular rows of holes through said members, said rows being concentric with the axis of rotation in the case of each member, means to project light through said holes as they pass a given point in the rotation of the member, means to translate the light transmitted through said holes into electrical pulses, said holes in each row having a non-uniform distribution around the row, the spacing between any two adjacent holes being either equal to, or an integral multiple of, the smallest spacing between adjacent holes, such spacing and number of such points differing slightly among the different members, means to rotate each member with a slightly different rotational period from the others, the smallest angular spacing between adjacent holes in the case of all members being proportional to the speed of rotation to cause the pulses that are generated under control of different members to coincide in time, and means to maximize the length of the code cycle between repetitions comprising means to combine the pulses generated under control of the different members into a continuous sequence of pulses, interspersed with spaces in highly irregular order.

3,891,800
LINE TIME BASE IN A TELEVISION RECEIVER

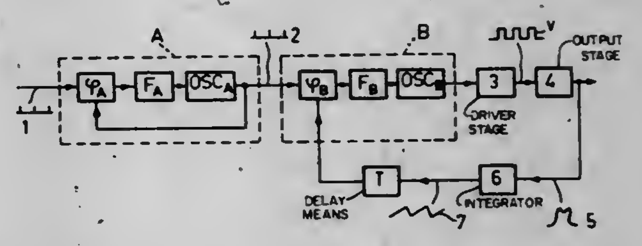
Peter Johannes Hubertus Janssen; Johannes Simon Albert van Hattum, and Jan Abraham Cornelis Korver, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 228,982, Feb. 24, 1972, abandoned. This application Oct. 2, 1973, Ser. No. 402,845

Claims priority, application Netherlands, Mar. 16, 1971, 7103465

Int. Cl. H04n *5/04*

U.S. Cl. 178—69.5 TV **11 Claims**

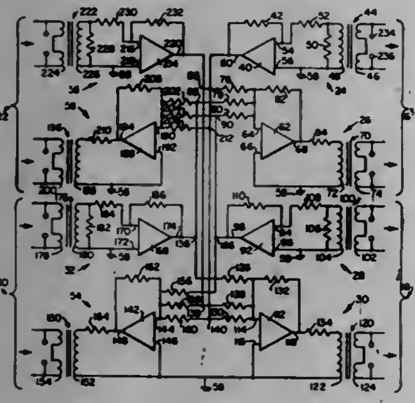


1. A circuit for synchronizing a sawtooth output signal of a television line output stage in accordance with a pulsatory line

synchronization signal, said circuit comprising said television line output stage comprising sweep means for producing said sawtooth output signal; a first synchronizing circuit including a first phase comparison stage having inputs for respectively receiving said synchronization signal and a first reference signal, a first low pass filter means having a first time constant coupled to said comparison stage and a first oscillator means coupled to said low pass filter means for producing a pulsatory output signal; and means for eliminating phase shifts due to load variations on said line stage comprising a second synchronizing circuit including a second phase comparison stage having a first input means coupled to said first low pass filter to receive said pulsatory output signal and a second input means for receiving said sawtooth output signal, and a second low pass filter having a second time constant substantially smaller than said first time constant and coupled to said second comparison stage, and control means responsive to said second low pass filter to control said sweep means, said second synchronizing circuit having a synchronized state wherein said pulsatory output signal pulses substantially occur at the middle of said sawtooth signal.

3,891,801
FOUR-WAY FOUR-WIRE ACTIVE BRIDGE
Kuei-Seng Wang, Flemington, N.J., assignor to Quindar Electronics, Inc., Springfield, N.J.

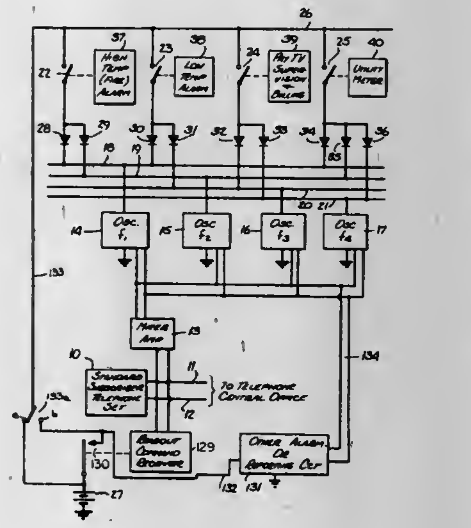
Filed Jan. 21, 1974, Ser. No. 434,938
Int. Cl. H04m *3/56*
U.S. Cl. 179—1 CN **11 Claims**



1. An active four port bridge comprising:
a. first, second, third, and fourth distribution amplifier means, each of said distribution amplifier means adapted to receive an input signal; and
b. first, second, third and fourth summing amplifier means, each of said summing amplifier means adapted to transmit an output signal related to said input signal, one of said distribution amplifier means and one of said summing amplifier means coupled to each port for transmitting and receiving signals;
c. said first distribution amplifier means connected only to said second, third, and fourth summing amplifier means;
d. said second distribution amplifier means connected only to said first, third, and fourth summing amplifier means;
e. said third distribution amplifier means connected only to said first, second and fourth summing amplifier means;
f. said fourth distribution amplifier means connected only to said first, second, and third summing amplifier means;
g. said first summing amplifier means operative to sum signals from said second, third and fourth distribution amplifier means, said second summing amplifier means operative to sum signals from said first, third and fourth distribution amplifier means, said third summing amplifier means operative to sum signals from said first, second and fourth distribution amplifier means, said fourth summing amplifier means operative to sum signals from said first, second and third distribution amplifier means;
h. said input signal applied to one of said distribution amplifier means is fed only to said summing amplifier means operatively connected to said distribution amplifier means to which said input signal is applied.

3,891,802
APPARATUS AND METHOD FOR AUGMENTING A TELEPHONE NETWORK
Everhard H. B. Bartelink, Concord, N.H., assignor to Northeast Electronics Corporation, Concord, N.H.

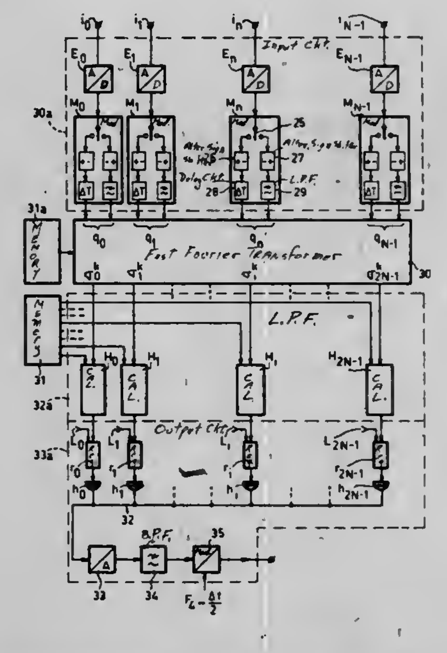
Continuation-in-part of Ser. No. 798,625, Feb. 12, 1969, abandoned. This application Jan. 15, 1971, Ser. No. 106,711.
Int. Cl. H04m *11/06*
U.S. Cl. 179—2 A **18 Claims**



14. In a telephone system comprising a central office having connected thereto over circuits individual thereto a plurality of subscriber's telephone stations, each located within premises provided with facilities subject to abnormal variations including at least one of the group consisting of heat, power and water, the method of repetitively monitoring from said central office a condition of said premises subject to abnormal variation, said method comprising: sensing at said station the occurrence of a preselected variation of said condition from a preselected value thereof; generating at said station in response to said variation, a distinctive tone frequency signal within the transmission frequency band of said station; transmitting said signal over said subscriber's circuit to said central office, while repetitively scanning said plurality of circuits at said central office, and upon receipit of said tone signal over any said subscriber's circuit, idenetifying the circuit over which said tone signal is received; and indicating the said variation in said condition occurring at said subscriber's station.

3,891,803
SINGLE SIDEBAND SYSTEM FOR DIGITALLY PROCESSING A GIVEN NUMBER OF CHANNEL SIGNALS
Jacques Lucien Daguet, St. Maur; Maurice Georges Bellanger, Antony, and Guy Pierre Lepagnol, Sceaux, all of France, assignors to Telecommunications Radioelectriques T.R.T., Paris, France

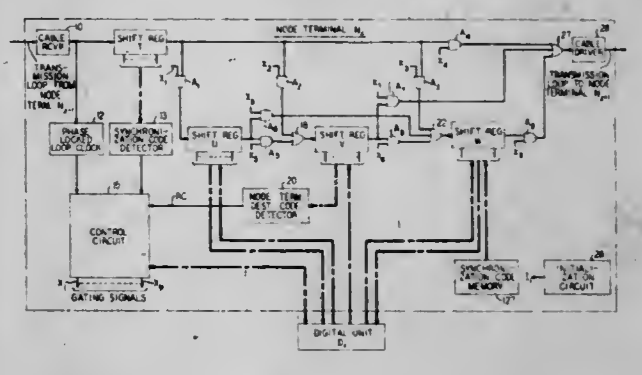
Filed June 1, 1973, Ser. No. 366,073
Claims priority, application France, June 15, 1972, 72.21646
Int. Cl. H04j *1/18*
U.S. Cl. 179—15 FS **4 Claims**



1. A single sideband system for digitally processing a given number of analog channel signals each having a given bandwidth, said system comprising an input circuit including a converter means for sampling and converting the channel signals into a number of digital signals; a cascade arrangement coupled to said input circuit and including a Fast Fourier transformer means and a digital filter coupled to said transformer means, said digital signals being applied to said cascade arrangement; a source for generating signals representative of a given number of filter coefficients coupled to said digital filter, said filter coefficients characterizing the transfer function of a lowpass filter having a cut-off frequency which is equal to half the bandwidth of said channel signals; a source for a given number of carrier signal functions coupled to said transformer means, said number of carrier signal functions being at least equal to twice the number of channel signals, said carrier functions representing carrying frequencies each being an even multiple of the cut-off frequency of said lowpass filter said analog channel signals comprising a given number of baseband channel signals, said input circuit including a number of parallel signal channels, said number corresponding to the number of baseband signal channels, each of said channels including a converter means for sampling each baseband channel signal with the associated Nyquist frequency, said signal channels each including a modulator coupled to said converter means, the transformer means having inputs coupled to said modulators for generating a number of first sum signals each being proportional to the sum of products of output signals from said modulator and carrier signal functions, said transformer means having a number of output leads which number is equal to the number of first sum signals, said output leads being coupled to the digital filter, said filter having a number of signal channels said number corresponding to the number of output leads, each signal channel being coupled to the number of output leads and each including a convolution means coupled to said filter coefficient source for generating a second sum signal which is proportional to the sum of products of first sum signals and filter coefficients applied to said convolution means, means for applying said second sum signals in the rhythm of successively occurring read signals to a common output lead for generating a frequency division multiplex signal in an auxiliary frequency band, an output circuit, means for applying said multiplex signal to said output circuit, said output circuit comprising a digital-to-analog converter and a second modulator means coupled to said digital to analog converter for transposing said frequency division multiplex signal from the auxiliary frequency band to said given frequency band.

3,891,804
ASYNCHRONOUS DATA TRANSMISSION ARRANGEMENT
Victor Hachenburg, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 12, 1973, Ser. No. 397,122
Int. Cl. H04j *3/08*
U.S. Cl. 179—15 AL **8 Claims**

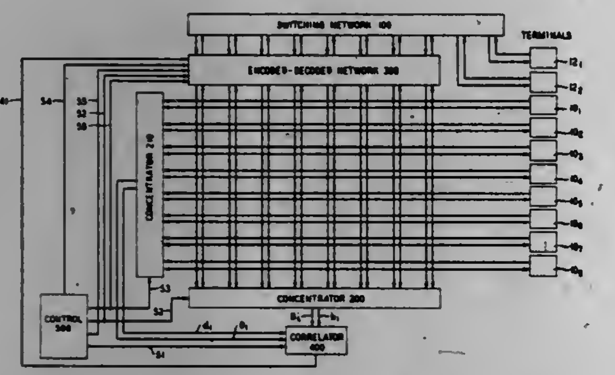


2. In a transmission arrangement for serially communicating digital messages each comprising a destination address portion, a source address portion, and a data portion between a plurality of transmission terminals serially connected in a transmission loop, a transmission terminal having a unique identification code comprising:
an input port;
an output port;
a first serial storage means comprising a serial input terminal and a serial output terminal;
means for connecting said serial input terminal of said first storage means to said input port;
a second serial storage means, having less storage capacity than required to store an entire one of said digital messages, comprising a serial input terminal and a serial output terminal;
first gating means for gating signals from the output terminal of said first serial storage means to the input terminal of said second storage means;
detector means responsive to signals stored in said second serial storage means for generating local destination code control signals indicating that the destination address of a received message is the unique identification code of the respective transmission terminal;
second gating means connected to said serial output terminal of said second storage means for gating signals to said output port;
serial information storage means having sufficient capacity to store the source address portion and data portion of a digital message;
means responsive to said local destination code control signals for inhibiting said first gating means from gating signals to said second serial storage means and for inhibiting said second gating means from gating signals to said output port;
third gating means responsive to said local destination code control signals for gating signals from the output terminal of said first storage means to said serial information storage means.

3,891,805
DIGITAL SIGNAL DETECTION IN TELEPHONIC COMMUNICATION SYSTEMS

James Loton Flanagan, 20 Sage Dr., Warren, N.J. 07060, and Nuggehally Sampath Jayant, 30 Elm St., Morristown, N.J. 07960

Filed Nov. 21, 1973, Ser. No. 417,880
Int. Cl. H04j *3/14*
U.S. Cl. 179—15 BF **16 Claims**



1. In a communication system including signal terminals and means for exchanging information therebetween, apparatus for detecting information exchange among said signal terminals comprising:

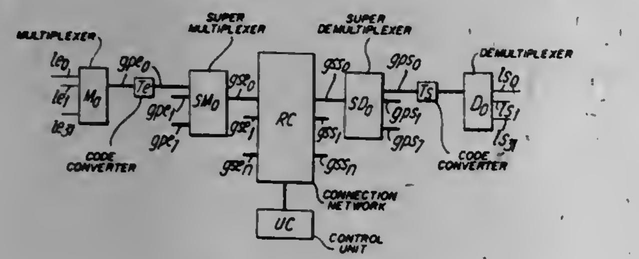
concentrator means connected to said signal terminals for multiplexing the signals of said signal terminals; and

correlator means responsive to both the output signal of said concentrator means and to the signal of a selected one of said signal terminals for correlating said concentrator's output signal with the signal of said selected signal terminal to develop a signal indicative of which of said signal terminals exchange information with said selected signal terminal.

3,891,806
SYSTEM FOR PREVENTING INTELLIGIBLE CROSSTALK IN TDM SWITCHING SYSTEMS

André Edouard Joseph Chatelon, Montrouge, and André Lucien Coudray, Buzenval Par Rueil-Malmaison, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 28, 1973, Ser. No. 419,550
Claims priority, application France, Dec. 15, 1972, 72.44665
Int. Cl. H04j *3/10*
U.S. Cl. 179—15 AN **3 Claims**

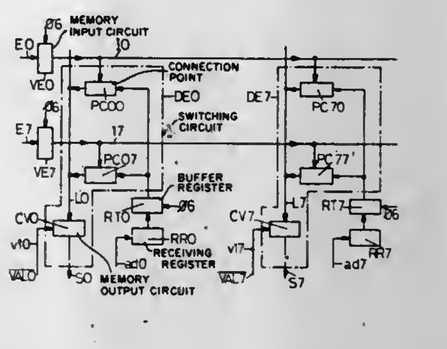


1. A protective system to prevent the occurrence of intelligible crosstalk between time division channels comprising, code conversion means coupled near the inputs of a time division switching center, said code conversion means receiving incoming time division signals including a polarity bit and coded combinations of amplitude bits, said code conversion means transmitting the polarity bit unchanged, said code conversion means responding to a polarity bit of a first value to transmit the amplitude bits unchanged and to a polarity bit of the opposite value to invert the amplitude bits and then transmit them, and, complementary code conversion means coupled at the outputs of the center, said complementary code conversion means transmitting the polarity bit unchanged and inverting the amplitude bits of the coded combinations when the polarity bit has said particular value, whereby when one channel is silent, the coded combinations inserted into the center are never null or almost null, but on the contrary take values adapted to mask at least partly possible disturbing signals, and destroy intelligibility of said disturbing signals.

3,891,807
ELECTRONIC SWITCHING MODULE

Pierre Charransol; Jacques Hauri, and Claude Athenes, all of Paris, France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 9, 1973, Ser. No. 358,628
Claims priority, application France, May 9, 1972, 72.16447
Int. Cl. H04j *3/06*
U.S. Cl. 179—15 BS **4 Claims**



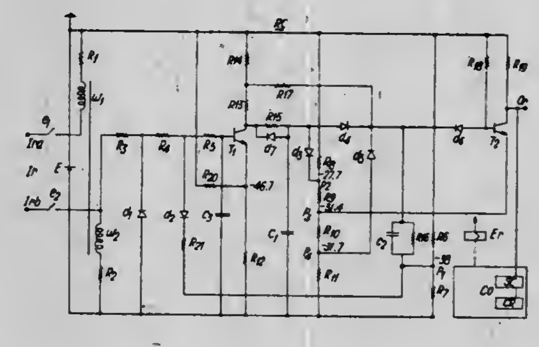
1. A switching module for time division multiplex signals comprising: a plurality of first circuits including switching means of a first type forming inputs; a plurality of second circuits including switching means of a second type forming outputs; multistage switching circuits for connecting each of the inputs to any one of the outputs for the selective transmission of data signals; said first circuits including an input memory stage for receiving a data signal during a relatively short time interval corresponding to a relatively short fraction of a channel time slot and thereafter storing it and holding it during a relatively long fraction of a channel time slot; said input memory stage thereby disassociating reception of the data signal from retransmission and preparing the data signal to be connected step-by-step and stage-by-stage through the multistage switching circuits to the outputs.

3,891,808
DIAL PULSE RECEIVER

Marcel A. Van Brussell, Hoboken, Belgium, and Raymond Louis Julia-Pollé, Sydney, Australia, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 5, 1973, Ser. No. 337,829
Claims priority, application Belgium, Mar. 6, 1972, 780235
Int. Cl. H04q *1/36*
U.S. Cl. 179—16 EA **23 Claims**

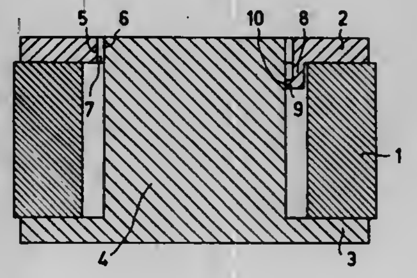
1. A two-level signalling system for providing output pulses at an output corresponding to DC pulses of a prescribed duration received on its input and for preventing DC pulses of shorter than a prescribed duration reaching the output comprising first and second input terminals coupled respectively between battery and ground potentials to receive input pulses, means coupled to said input terminals to eliminate input pulses having less than a predetermined duration and to transmit pulse having a predetermined duration, said means to eliminate input pulses including first means responsive to input pulse signals to energize first and second delay means, said delay means being able to effectively react to positive and negative level changes and to provide output signals to trigger a bistate device to a first or a second state respectively, indicating pulses have been received on the input terminals or not, said first and second delay means producing output signals only when the level changes occur during predetermined first and second time durations.



3,891,809
MAGNET SYSTEM FOR AN ACOUSTIC TRANSDUCER

Derk Kleis, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 19, 1972, Ser. No. 273,299
Claims priority, application Netherlands, July 29, 1971, 7110445
Int. Cl. H04r *9/02*
U.S. Cl. 179—119 R **8 Claims**



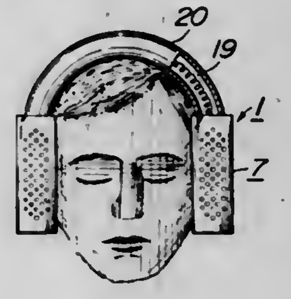
1. A magnet system for an acoustic transducer comprising, a main magnet and a ferromagnetic circuit which cooperates with the main magnet, said ferromagnetic circuit including a centrally arranged ferromagnetic core and a ferromagnetic upper plate having an opening therein which; together with the centrally arranged core, defines an annular effective air gap, said upper plate including a centering member integral therewith and made of the same ferromagnetic material as the upper plate and comprising at least three circumferentially arranged reentrant projections on the inner edge of the upper plate with a part of each projection being dimensioned so that in operation said projection part is magnetically saturated, said core being centered wtih respect to the upper plate by means of the centering member the larger part of which is located at the lower end of the effective air gap.

4. A magnet system for an acoustic transducer comprising, a main magnet and a ferromagnetic circuit which cooperates with the main magnet, said ferromagnetic circuit including a centrally arranged ferromagnetic core and a ferromagnetic upper plate having an inner portion approximately coaxial with the core and adjacent to one end of said centrally arranged core and a peripheral portion with an opening that defines an annular effective air gap separatingg the inner and peripheral portions of the upper plate, said upper plate including a centering member for centering the core with respect to the upper plate and comprising at least three circumferentially spaced bridge members integral with the inner and peripheral portions so that the parts of the upper plate form a unitary piece and with all parts thereof made of the same ferromagnetic material.

3,891,810
HEADPHONE

Naotake Hayashi, No. 25-5, 1-chome, Zoshigaya, Toshima-ku, Tokyo, Japan

Filed Aug. 28, 1973, Ser. No. 392,370
Claims priority, application Japan, Sept. 1, 1972, 47-87623
Int. Cl. H04m *1/05*; **H04r** *1/10*
U.S. Cl. 179—156 R **3 Claims**



1. A headphone set including a pair of headphones adapted to fit over the ears of a user and connected by a head band, each headphone comprising:

a sound box having a front wall defining an opening therein, upper and lower walls, an outer side wall, and a rear wall, the sound box being adapted to fit over the ear of a user such that the inner peripheral edges of the front wall, the rear wall, and the upper and lower walls make intimate contact with the head and cheek of a user, and

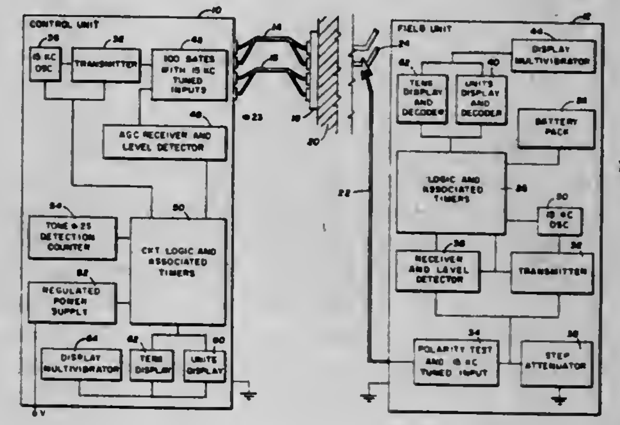
a generally planar electro-acoustic transducer mounted within the front wall opening and having a perforated exterior face,

said electro-acoustic transducer having an axis generally perpendicular to the plane of the transducer inclined outwardly from the front-rear axis of the users head at an angle of between 20° to 30°.

3,891,811
WIRE PAIR IDENTIFICATION SYSTEM

Arthur O. Miller, Dallas, Tex., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 16, 1973, Ser. No. 389,011
Int. Cl. H04b *3/46*
U.S. Cl. 179—175.3 A **56 Claims**


CONTROL UNIT
15 KC OSC
TRANSMITTER
100 GATES WITH 15 KC TUNED INPUTS
ASC RECEIVER AND LEVEL DETECTOR
TONE & 25 DETECTION COUNTER
CKT LOGIC AND ASSOCIATED TIMERS
REGULATED POWER SUPPLY
DISPLAY MULTIVIBRATOR
TENS DISPLAY
UNITS DISPLAY
FIELD UNIT
DISPLAY MULTIVIBRATOR
TENS DISPLAY AND DECODER
UNITS DISPLAY AND DECODER
BATTERY PACK
LOGIC AND ASSOCIATED TIMERS
15 KC OSC
RECEIVER AND LEVEL DETECTOR
TRANSMITTER
POLARITY TEST AND 15 KC TIMED INPUT
STEP ATTENUATOR

1. A system for remotely identifying individual wire pairs in a multipair cable, comprising in combination:

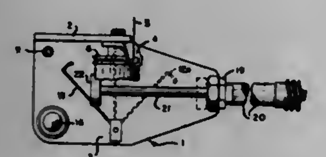
control means electrically connected to each individual wire pair of the multipair cable for sequentially scanning the pairs for a frequency signal and generating an identifying code in response thereto; and

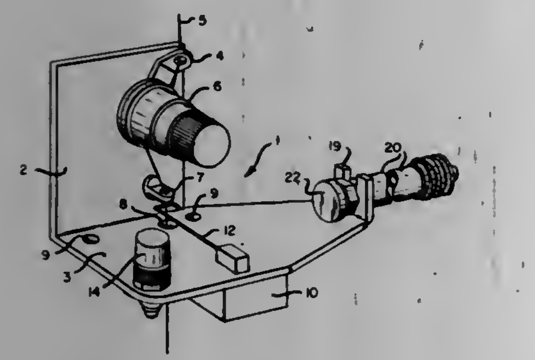
test means electrically connected to a selected wire pair of the multipair cable, said test means comprising: means for transmitting a frequency signal over the selected wire pair to said control means, means for receiving from said control means over the selected wire pair the identifying code generated thereby, and display means for converting said identifying code into a numerical display representing the selected wire pair.

3,891,812
DETECTOR DEVICE OF THREAD BREAKAGE ON A SEWING MACHINE

Nerino Marforio, Milan, Italy, assignor to Virginio Rimoldi & C. S.p.A., Milan, Italy

Filed Apr. 18, 1974, Ser. No. 461,842
Claims priority, application Italy, May 22, 1973, 24370/73
Int. Cl. B65h ***25/14***
U.S. Cl. 200—61.18 3 Claims





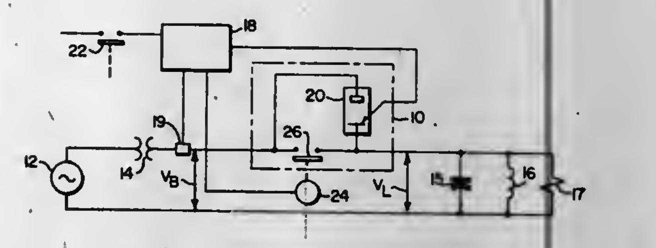
1. In an electrically operated sewing machine having circuitry for operating the machine depending upon the presence or absence of fabric at the sewing station the combination of means to detect the presence of sewing thread at the sewing station and to cause stopping of the sewing machine only after no fabric is present at the sewing station and after no sewing thread is present, said means comprising, thread detecting means mounted for movement from an inoperative position to a plurality of operative positions, one of said positions being one in which contact between the detecting means and the thread occurs, when thread is present, switching means operated by said thread detecting means to close and to open the operating circuit of the sewing machine, and means for holding said thread detecting means in an operative position when fabric is present at the sewing station and for permitting said detecting means to move to an inoperative position if no thread is present and after all fabric is gone from the sewing station.

3,891,813
EHV CIRCUIT BREAKER UTILIZING GALLIUM CATHODE IGNITRONS FOR SYNCHRONOUS CLOSING

Kue H. Yoon; Robert E. Friedrich, and Andreas M. Sletten, all of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 4, 1973, Ser. No. 357,437
Int. Cl. H01h ***33/16***
U.S. Cl. 200—144 AP 10 Claims

1. A high voltage synchronous closing circuit breaker for use on an alternating current circuit above 100 KV, comprising:
a housing,
main contact means disposed in said housing and being movable between an open and a closed position;
synchronous closing means connected in parallel with said main contact means for synchronously closing at substantially the voltage zero just prior to main contact closing and thereby completing an electrical circuit around said main contacts;

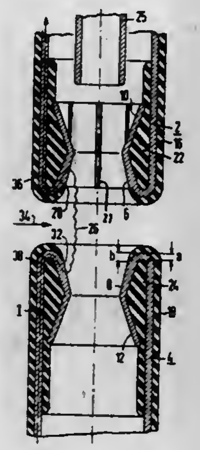


said synchronous closing means comprising a gallium cathode ignitron means having an anode, a cathode and a trigger disposed within a sealed housing;
said anode directly connected to one side of said main contact means and said cathode directly connected to the other side of said main contact means;
said gallium cathode ignitron means constructed to have greater than a 100 KV withstand level thereacross;
trigger actuating means connected to said trigger to trigger said gallium cathode ignitron within 100 microseconds of a voltage zero.

3,891,814
APPARATUS FOR ARC QUENCHING

Walter Hertz; Jürgen Mentel, and Jan Stroh, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 22, 1973, Ser. No. 334,936
Claims priority, application Germany, Feb. 28, 1972, 2209388
Int. Cl. H01h ***33/60***
U.S. Cl. 200—148 R 14 Claims

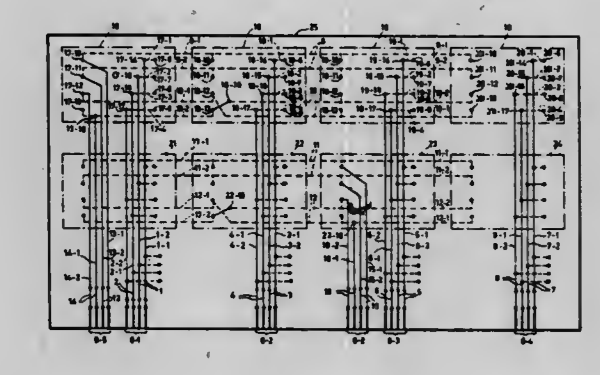


1. In a quenching medium flow circuit, breaker where at least one of the contacts is in the form of a nozzle tube comprising a cylindrical tube of a conductive material having a looped end consisting of a portion of the tube looped inside the tube to form a nozzle, wherein the improvement comprises; insulating means covering the outer surface of the cylindrical tube at least in the vicinity of the looped end, covering the looped end, and covering a small portion of the inside nozzle adjacent to the looped end for a distance equal to or greater than the thickness of said tube at said looped end, the portion of the outer surface being covered for a distance which is sufficiently greater than the small inside nozzle portion covered so that an arc is drawn inside said nozzle whereby a current path through said looped end will be followed to set up magnetic forces tending to extinguish the arc.

3,891,815
PRINTED CIRCUIT BOARD FOR A SWITCHING NETWORK

Adrianus Leonardus Hiele, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 17, 1973, Ser. No. 351,823
Claims priority, application Netherlands, Apr. 27, 1972, 7205680
Int. Cl. H01h ***3/02***
U.S. Cl. 200—175 2 Claims



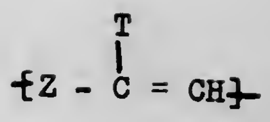
1. A circuit arrangement for switching network comprising: a supporting board; a plurality of groups of pairs of upper conductive tracks disposed on one surface of the board and extending substantially parallel to one another; input terminals connected to assigned groups of said upper conductive tracks, and output terminals connected to at least one remaining group; a plurality of multicontact switching means disposed on said one surface of the board and each having connection terminals for respective switching contacts; a plurality of interconnections passing through the board and arranged to form a first pattern for accommodating said connection terminals and a second pattern connected to respective upper conductive tracks in consecutive order to face corresponding interconnections of said first pattern; a plurality of lower conductive tracks disposed on the opposite surface of the board and connected between said interconnections for providing, together with said switching means, optional signal paths between said input and output terminals; two interconnections in said second pattern pertaining to a pair of tracks for a switching means having reversed order with respect to the order of interconnections on the adjacent pair of tracks in a group, for providing, by means of contacts of said switching means, a disconnectable cross-point between the conductive tracks for a selected signal path, and further comprising an additional interconnection passing through the board near a side of a track assigned to another switching means and being connected to a corresponding interconnection in said first pattern by a lower conductive track to form a permanent cross-point.

3,891,816
PREPARATION OF GRAFT, BLOCK AND CROSSLINKED UNSATURATED POLYMERS AND COPOLYMERS BY OLEFIN METATHESIS

Kenneth W. Scott, Cuyahoga Falls, and Nissim Calderon, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 882,270, Dec. 4, 1969, Pat. No. 3,692,872. This application June 5, 1972, Ser. No. 259,881
Int. Cl. C08d ***9/10***
U.S. Cl. 260—889 9 Claims

1. A chemical process involving exposure of two or more dissimilar polymeric substances that are characterized by being free of any non-aromatic conjunction and comprised of structural units of the general formula (V):



$$\left[Z - \overset{\overset{T}{|}}{C} = CH \right]$$

(V)

wherein:

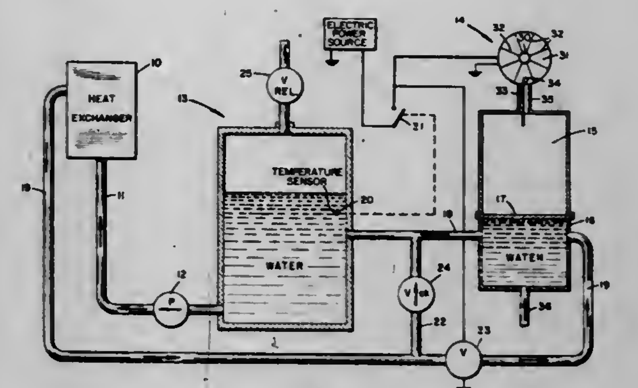
- A T is 1. hydrogen; or
  2. a substituent corresponding to the formula D—CH_2—, where D is any member of the group: alkyl, aryl, aralkyl, alkaryl, alkenyl, cycloalkyl, cycloalkenyl, bicycloalkyl, bicycloalkenyl, and hydrogen; and
- B. Z represents hydrogen or a structure having at least one carbon atom and any of the said Z carbons may be:
  1. interconnected by single or double bonds;
  2. substituted by one or more members of the group alkyl, aryl, aralkyl, alkaryl, alkenyl, cycloalkyl, bicycloalkyl, cycloalkenyl and bicycloalkenyl;
  3. constituents of aromatic, alicyclic or chlorinated alicyclic rings;

to a catalyst capable of inducting the olefin metathesis reaction and of inducing ring--opening polymerization, said catalyst which will convert 2-pentene into 2-butene and 3-hexene at temperatures lower than about 100°C, leading to products which are interpolymers of the starting reactant polymeric substances.

3,891,817
HYDRONIC HEATING SYSTEM

Harold Brown, 3629 Suitland Rd. S.E., Washington, D.C. 20020

Filed Feb. 1, 1974, Ser. No. 438,555
Int. Cl. H05b ***1/02, 9/06;*** **F24h** ***3/06***
U.S. Cl. 219—10.55 R 1 Claim



1. A hydronic heating system comprising a heat exchanger, a container for water, means for heating water in the container comprising a source of micro-wave energy, a guide means having walls which reflect micro-wave energy generated by the said source and direct the micro-waves towards the container, a wall common to said guide means and said container which is transparent to microwaves, means forming a closed circulation loop between the heat exchanger and the container, means for circulating the water in said closed loop between the heat exchanger and the container, a water storage means between the outlet of the container and the inlet of the heat exchanger and having means for accommodating expansion of water in the system and for the escape of air from the system, by-pass means in the circulation loop between the heat exchanger and the container for by-passing the container to allow water flowing from the heat exchanger to flow directly to the storage means, a check valve in said by-pass means which prevents flow of water from the container through the by-pass means, and means responsive to the temperature of the water in the system externally of the container for directing flow of water from the heat exchanger to the storage means while by-passing the container, said tempera-

ture responsive means comprising a valve in the circulation loop downstream of the by-pass means for diverting flow of water flowing from the heat exchanger towards the container into the by-pass, and thermostatic means for simultaneously activating the source of micro-wave energy and opening the last said valve for flow of water from the heat exchanger into the container when the temperature of the water in the system externally of the container is below a predetermined temperature and for simultaneously deactivating the source of micro-wave energy and closing said valve to divert the water from the heat exchanger through said by-pass means into the storage means when the temperature of the water in the system externally of the container is at least equal to said predetermined temperature.

3,891,818

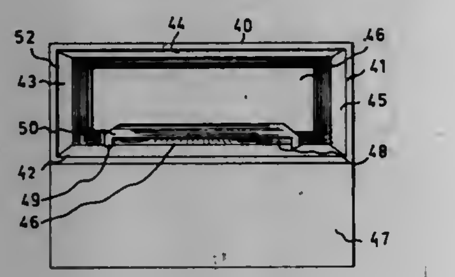
FILTERING DEVICE FOR RESTRICTIVELY PROPAGATING INCOMING HIGH-FREQUENCY WAVES

Bo Valtersson Valtersson, Hagersten, Sweden, assignor to Husqvarna Vapenfabriks AB, Huskvarna, Sweden

Division of Ser. No. 184,169, Sept. 27, 1971, abandoned. This application May 4, 1973, Ser. No. 357,280

Int. Cl. H05b *9/06*

U.S. Cl. 219—10.55 F **4 Claims**



1. A filter device operable upon incoming high-frequency electrical energy waves within a given frequency range in a microwave apparatus, said device comprising: a base, and a plurality of parallel spaced apart electrically conductive elements supported on said base, said spaced elements being arranged in groups and defining a structure which is periodic in the direction of wave propagation, said electrically conductive elements being shaped and oriented with respect to one another so as to constitute a predetermined mutual capacitance and inductance defining a high-pass filter means which propagates the incoming electrical energy waves within the given frequency range with counter-directional phase velocity and group velocity, the phase velocity of the waves in said high-pass filter means being at least as great as the phase-velocity at which the electrical energy waves are propagated in the vicinity of said filter means, and means connected to said filter device for receiving the incoming high-frequency electrical energy.

3,891,819

AUTOMATIC SET-UP ELECTROEROSION MACHINING METHOD

Werner Ullmann, Locarno; Bernd Schumacher, Losone; Arno Sieg; Silvano Mattei, both of Locarno; Hans-Ueli Fenner, Ascona; Gottlieb Wettstein, and Herbert Ruh, both of Locarno, all of Switzerland, assignors to A.G. fur industrielle Elektronik AGIE, Losone, Switzerland

Filed Jan. 21, 1974, Ser. No. 435,206

Claims priority, application Switzerland, Aug. 15, 1973, 11780/73

Int. Cl. B23p *1/08*

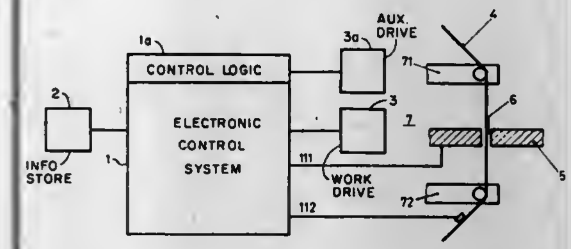
U.S. Cl. 219—69 M **9 Claims**

1. Method for electroerosion machining a workpiece having a starting bore by using as the machining tool a long drawn out flexible electrode capable of being gradually dispensed, comprising the steps of:

aligning said starting bore (9) of said workpiece (5) with an unencumbered straight line path provided for said electrode (4) by an electrode drive and guiding system (7);

dispensing said electrode (4) from an electrode supply by means of said electrode drive and guiding system (7);

threading said electrode (4) automatically by propelling it by said system in said straight line path into, through and out beyond said bore (9) of said workpiece (5) until the end of the electrode becomes firmly engaged in transport means (79) of a take-up mechanism (71) of said electrode drive and guiding system; and then



dispensing said electrode gradually through said workpiece (5) and said take-up mechanism (71) of said system (7) while applying electroerosion voltage thereto relative to said workpiece and subjecting said electrode and workpiece to relative movement under control of an automatic electronic machining drive system to machine a predetermined contour (8) in said workpiece.

3,891,820

WELD-PLATING OF STEEL

Werner Debray, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 17, 1972, Ser. No. 281,555

Claims priority, application Germany, Aug. 25, 1971, 2142460

Int. Cl. B23k *1/20*

U.S. Cl. 219—76 **4 Claims**

1. A process for weld-plating austenitic stainless steel on the surface of a hardenable carbon steel part; wherein the improvement comprises decarbonizing said surface and thereafter weld-plating the stainless steel thereon.

3,891,821

METHOD FOR REPAIRING IRON MOLDS USED IN STEEL MAKING, CASTING PLATES IN IRON MOLDS AND OTHER OBJECTS MADE OF CAST IRON

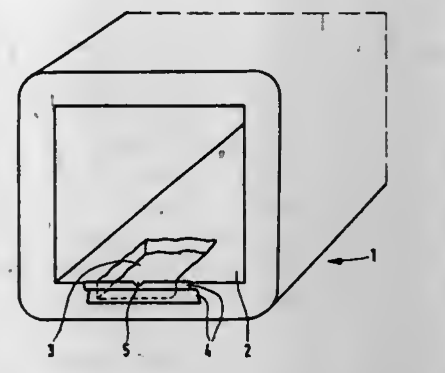
Egon Evertz, Vorlander Strasse 23, 565 Solingen, Germany

Filed May 24, 1973, Ser. No. 363,407

Claims priority, application Canada, May 24, 1972, 142869

Int. Cl. B23k *9/04;* **B22d** *19/10*

U.S. Cl. 219—76 **7 Claims**



1. A method of repairing damaged parts of iron molds used in steelmaking, or damaged casting plates in iron molds or damaged parts of other objects made of cast iron, such as hermatite, gray cast iron and steel pig which are subjected in use to heat, first removing all impurities adhering to the surface of damaged parts, applying by means of at least one sheathed welding steel electrode, a molten layer of steel to the damaged area, and then applying further molten layers onto said first-mentioned layer from current-carrying welding steel electrodes and gray cast iron electrodes, with at least the last layer to be applied being a molten gray cast iron layer from a current-carrying gray cast iron electrode in which a zone of at least cm² of said molten layer of steel is kept molten by a welding current of at least 1000 amperes.

3,891,822

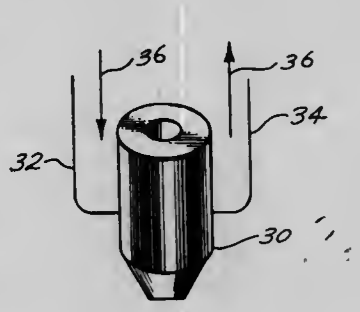
PULSE HEATED THERMOCOMPRESSION BONDING APPARATUS

Joseph L. Laub, Claremont, and John F. Hurst, San Gabriel, both of Calif., assignors to Unitek Corporation, Monrovia, Calif.

Continuation of Ser. No. 135,722, April 20, 1971, abandoned. This application Apr. 2, 1973, Ser. No. 347,225

Int. Cl. B23k *1/02*

U.S. Cl. 219—85 **9 Claims**



1. A pulse-heated thermocompression wire bonding apparatus comprising;

a capillary bonding tip having a wire to be bonded threadedly extending therethrough;

a holder supported by the bonding apparatus for receiving the tip in a thermal transfer relationship therewith;

electric power supply means connected to the holder;

means for moving the holder and tip such that the wire is contacted to a bonding location;

temperature control means connected to the power supply for limiting the amount of electric current heating energy supplied to the holder to an amount sufficient to raise the tip to a predetermined bonding temperature;

temperature monitoring means disposed in a sensing relationship with respect to the holder connected to the power supply means for interrupting the supply of electric current heating energy upon attainment of the predetermined bonding temperature at the holder and tip;

timing means responsive to the sensing of a predetermined temperature of the holder by the temperature monitoring means for maintaining contact of the wire of the bonding location for a predetermined interval of time;

feedback means interconnecting the power supply and temperature monitoring means for causing additional electric current heating energy to be supplied to the holder to maintain the temperature of the tip at the predetermined bonding temperature during the interval of contact of the wire at the bonding location; and

means for interrupting the supply of electric current heating energy to the tip responsive to termination of the bonding interval.

3,891,823

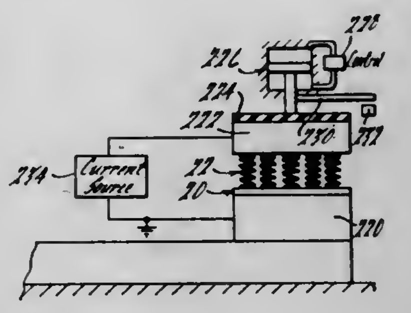
METHODS FOR THE MANUFACTURE OF SPRING ASSEMBLIES

Donald O. Dulude, and Paul H. Winbigler, both of Coldwater, Mich., assignors to Kuhlman Corporation, Troy, Mich.

Division of Ser. No. 331,750, Feb. 13, 1973, which is a division of Ser. No. 203,534, Dec. 1, 1971, Pat. No. 3,782,708. This application Nov. 23, 1973, Ser. No. 418,686

Int. Cl. B23k *1/04*

U.S. Cl. 219—85 **2 Claims**



1. The method of manufacturing a spring assembly including a sheet metal annular base and a plurality of springs disposed on and extending in free and unrestrained spaced parallelism from the base which comprises the steps of disposing a thin annulus of brazing material on the base and placing the plurality of springs in spaced parallelism and projecting in one direction from the annular base and seated on the annulus of brazing material, applying clamping compressive forces to the assembly to maintain the springs in position on the brazing material and base, and heating the clamped assembly to a temperature which is sufficient to both braze the plurality of springs to the base and to stress relieve the springs.

3,891,824

METHOD OF PLASMA-MIG-WELDING

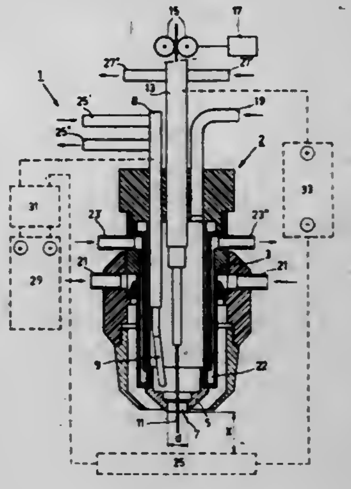
Wilhelmus Gerardus Essers, and Gerardus Jelmorini, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 237,391, March 23, 1972, abandoned. This application Nov. 23, 1973, Ser. No. 418,296

Claims priority, application Netherlands, Apr. 1, 1971, 7104337

Int. Cl. B23k *9/00*

U.S. Cl. 219—121 P **4 Claims**



1. A method of plasma-MIG welding a workpiece, comprising the steps of feeding a stream of inert gas through a nozzle aperture towards said workpiece, generating a plasma stream by connecting a non-consumable electrode to the positive side of a current supply means and by maintaining a continuous

plasma arc between said non-consumable electrode and said workpiece within said stream of inert gas, feeding a consumable weld wire axially into said plasma stream, maintaining a continuous MIG arc between said consumable wire electrode and said workpiece by connecting said electrode to the positive side of a current supply means and flowing current therethrough, while maintaining said plasma stream substantially concentrically about said MIG-arc, and varying the current through said consumable weld wire for varying the character of the MIG arc and material transfer from said weld wire.

3,891,825
LINED BRAKE SHOES

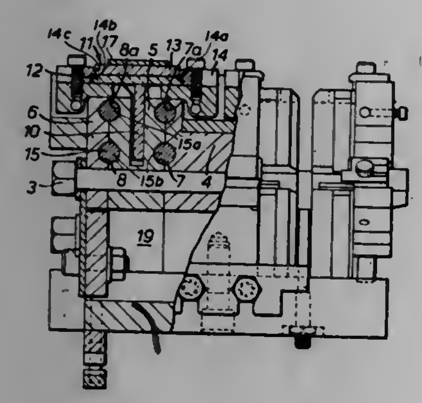
Gethyn James Pritchard, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed Nov. 28, 1973, Ser. No. 419,661

Claims priority, application United Kingdom, Nov. 28, 1972, 54955/72

Int. Cl. H05b *3/02*

U.S. Cl. 219—243 **5 Claims**



1. An apparatus for bonding a layer of friction material to a brake shoe including an arcuate platform having a convex surface for receiving said layer of friction material and an opposed concave surface and a web extending from said concave surface of said platform, said apparatus comprising shoe support means, means for positioning said shoe on said support means comprising a plurality of abutment members each having a clamping portion arranged to clamp said shoe platform against said support means and an abutment portion for locating said layer of friction material on said platform, retaining means for holding said layer of friction material against said convex surface of said shoe platform, and a pair of electrical heating elements disposed one on each side of said web of the shoe, each heating element having a heating portion and at least one tail portion connected thereto, wherein said heating portions extend adjacent said web of said shoe along the whole length of said web.

3,891,826
ELECTRICALLY HEATED SMOKE OR STEAM GENERATOR

Eberhard Seuthe, deceased, late of Uhingen, Germany, and by Ellen Seuthe, executrix, 60 Romerstrasse, Uhingen, Germany

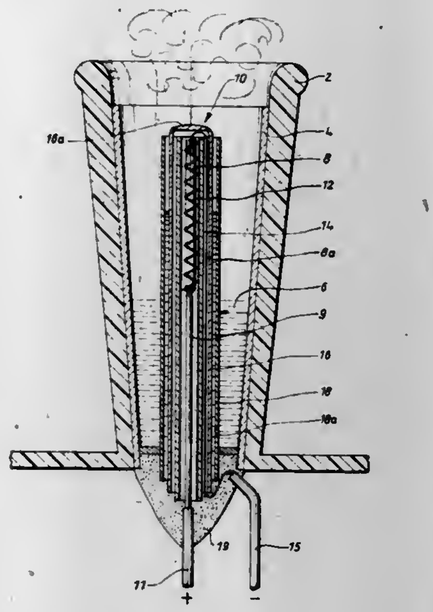
Filed July 30, 1973, Ser. No. 383,829

Claims priority, application Germany, Aug. 5, 1972, 2238733

Int. Cl. H05b *3/00;* **A63h** *33/28;* **F22b** *1/28*

U.S. Cl. 219—273 **3 Claims**

1. A smoke producing device for toys including a container for holding a chemical evaporating medium and having a closed bottom end; a first imperforate tube of electrically insulating material constructed as a capillary, mounted in the said bottom of the container and extending longitudinally from said bottom end towards the opposite end of the container; an electrical heating resistance coaxially mounted within the bore of said first tube and having electrical connections thereto extending from each end of the first tube; a second imperforate tube of electrically insulating material substantially co-extensive in length with said first tube and spaced from and coaxially mounted by its lower end relative to the first tube in the bottom end of the container; a connection to the upper end of the heating resistance extending between the walls of the first and second tubes and through the bottom end of the container; a connection to the lower end of the heating resistance extending through the bottom of the container; a pair of electrically conductive wires mounted externally of the bottom end of the container connecting said electrical connections to a voltage source; a third tube surrounding the first and second tubes being spaced from and coaxially mounted with the second tube, the spacing between the second and third tube being independent of the spacing between the first and second tubes and being open at the top; and means provided in the third tube and located towards the closed bottom end of the container for admitting evaporating medium in the container into the space between the second and third tubes, wherein when the pair of conductive wires is connected to a source of voltage the temperature of the heating resistance increases to evaporate the evaporating medium in the space between the second and third tubes to provide smoke or steam which is emitted from the open upper end of the third tube.



3,891,827
ELECTRICAL HEATING DEVICE FOR USE WITH AEROSOL CONTAINERS

Harold G. Wyse, Dayton, Ohio, assignor to Gad-Jets, Inc., Dayton, Ohio

Filed Jan. 12, 1973, Ser. No. 323,037

Int. Cl. H05b *1/02;* **B67d** *5/62;* **F24h** *1/12*

U.S. Cl. 219—302 **21 Claims**

1. An electrically and heat insulated heater comprising:

a. a heat exchanger,

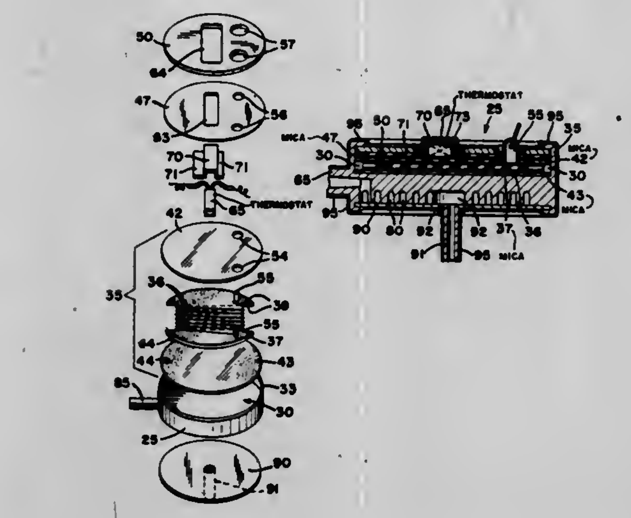
b. means forming a heating element cavity within a portion of said heat exchanger,

c. electric heating element means in said heating element cavity in thermal contact with said heat exchanger,

d. temperature control means, including a low mass, sealed thermostat mounted upon and in thermal contact with said heating element means and substantially free of contact with said heat exchanger, to control the supply of electrical current to said heating element for controlling the temperature of said heat exchanger,

e. an electrically and heat resistant material sealing said heating element and said thermostat in said cavity to insulate and isolate them electrically and from electrically conductive fluids, and

f. a heating element cover plate mounted on said heat exchanger between said electrical heating element means and said heat resistant material, said cover plate being free from contact with said thermostat.



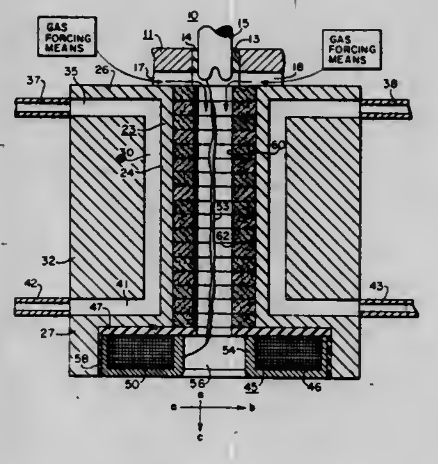
3,891,828
GRAPHITE-LINED INERT GAS ARC HEATER

Serafino M. De Corso, Media, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 18, 1973, Ser. No. 407,724

Int. Cl. H05b *7/18*

U.S. Cl. 219—383 **13 Claims**



1. An arc heater comprising, first and second spaced electrodes adapted to have an electrical arc struck therebetween for heating gas, said electrodes being electrically insulated from each other, a hollow housing means having an elongated arc chamber disposed between said electrodes and electrically insulated therefrom, pressure means for admitting gas to be heated by said electric arc into said chamber and means for exhausting gas from said chamber, a pyrolytic graphite liner for the inner wall of said chamber, said graphite liner being characterized by high thermal conductivity in a direction transverse to the longitudinal axis of said arc chamber and by relatively low thermal conductivity in the direction parallel to the axis of the chamber, said graphite liner being characterized by high electrical resistance in the direction parallel to said longitudinal axis of said arc chamber compared to the electrical resistance in a direction transverse to the axis of said arch chamber, mounting means for supporting together the elements of the arc heater.

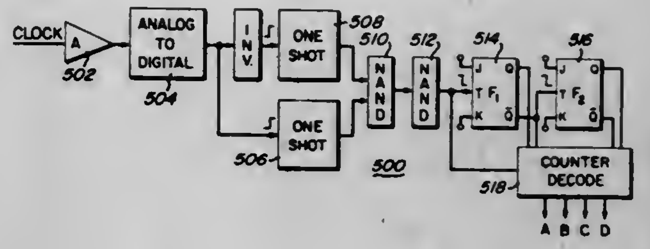
3,891,829
CODED RECORDS, METHOD OF MAKING SAME AND METHOD AND AN APPARATUS FOR READING CODED RECORDS

Bruce W. Dobras, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Aug. 29, 1973, Ser. No. 392,413

Int. Cl. G06k *7/10, 19/08;* **G08c** *9/06*

U.S. Cl. 235—61.11 E **19 Claims**



1. A machine readable record which may be scanned by means of a manually held scanning instrument, said record comprising:

a base material;

a first set of uniformly spaced and parallel bars printed upon said base material and containing a material which, when stimulated by electromagnetic radiation, strongly emits or reflects electromagnetic radiation within a first frequency range; and

a second set of bars printed upon said base material on top of and parallel to said first set of bars having a minimum width which is at least twice the width of said first set of bars and which, when stimulated by electromagnetic radiation, strongly emits or reflects electromagnetic radiation within a second frequency range, the spacing and/or width of said second set of bars being varied in such a manner as to convey information.

8. A method of transmitting coded data using a printed record member and an optical scanning device comprising the steps of:

pre-printing a plurality of evenly-spaced invisible timing marks having a first optical characteristic which optically distinguishes the marks from the record member upon the record members;

printing groups of plural data marks having a different optical characteristic than said timing marks which optically distinguishes the data marks from the record member and spaced from one another to represent coded information upon the record member superimposed over and parallel to said timing marks;

optically scanning the record to generate a composite optical signal;

separating first and second optical signals from said composite optical signal corresponding respectively to emissions or reflections from said timing marks and said data marks; and

sampling the state of said second optical signal corresponding to said data marks at times when said first optical signal corresponding to said timing marks fluctuates to recover from said second optical signal data corresponding to the information carried by the record.

3,891,830

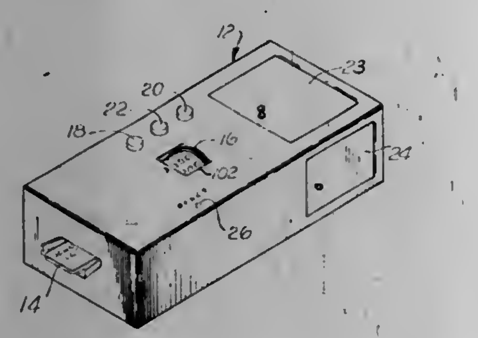
CREDIT VERIFICATION SYSTEM

Robert N. Goldman, Pacific Palisades, Calif., assignor to Telecredit, Inc., Los Angeles, Calif.

Continuation of Ser. No. 150,601, June 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 558,127, June, 1966, Pat. No. 3,610,889. This application Oct. 12, 1973, Ser. No. 406,063The portion of the term of this patent subsequent to Oct. 5, 1988, has been disclaimed.

Int. Cl. G06k *7/08;* **G11b** *1/06;* **G07f** *1/06;* **B67d** *5/10;* **H01h** *43/08*

U.S. Cl. 235—61.7 B **17 Claims**



12. In a system for controlling the aggregate use of a credit card or the like which bears a recording medium, whereby the card is to have a use limit during any of a series of specific time periods and wherein said system includes sensing means for sensing signals from said recording medium, and means for recording signals on said recording medium, the improvement which comprises:

time means for indicating a current one of said time periods;
means coupled to said sensing means for providing use-related signals and time-related signals indicative of a prior aggregate use of said card during a specified period of prior use of said card;
means coupled to said time means, for processing said use-related signals and said time-related signals to provide approval signals upon a detection that the use of said card during said current one of said time periods is within said limited use; and
means coupled to said means for recording, controlled by said means for processing, for providing signals to indicate a selected combination of said use limit with representations of the use of said card during said current one of said time intervals.

3,891,831

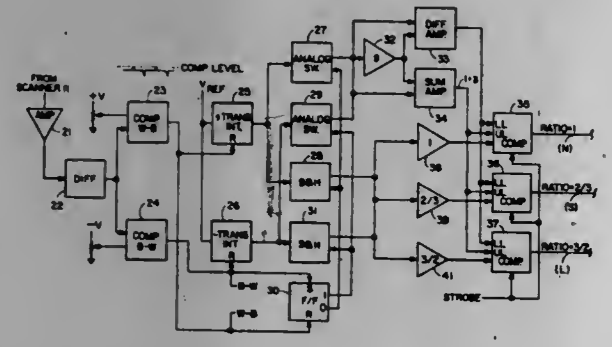
CODE RECOGNITION APPARATUS

Herbert George Coles, Jr., West Upton, Mass., assignor to Data General Corporation, Southboro, Mass.

Filed Dec. 5, 1973, Ser. No. 421,885

Int. Cl. G06k *7/10, 19/06*

U.S. Cl. 235—61.11 E **14 Claims**



1. Apparatus for reading on a record medium a two level code representing at least one character of a set of characters, the code for each character defined by a plurality of consecutive transitional occurrences between the two levels of the code comprising:

means for scanning the record medium to derive a time based electrical signal;
means for converting said signal into a series of pulses denoting said transitional occurrences to define at least four periods between alternate ones of said pulses;
means for measuring said periods and generating a signal level representative of each period duration;
means for comparing the signal levels measured for each one of two overlapping periods to generate three ratios, each ratio representing not more than one of three possible values, and;
means for decoding the values arrived at for said three ratios to define a character.

3,891,832

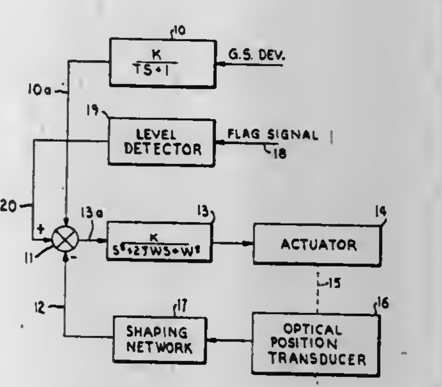
AVIONICS DISPLAY CIRCUIT HAVING OPTICAL FEEDBACK AND A ROTARY SOLENOID ACTUATOR THEREIN

Daniel L. Rodgers, and Thomas F. Cater, both of Olathe, Kans., assignors to King Radio Corporation, Olathe, Kans.

Filed Mar. 23, 1973, Ser. No. 344,234

Int. Cl. G06g *7/78, 7/70*

U.S. Cl. 235—150.2 **10 Claims**



1. An avionics indicator device having an indicator pointer operable to visually indicate aircraft deviation from a preselected condition, said device comprising

a deviation signal input,
means for producing an electrical signal corresponding to the position of said pointer,
means for summing said pointer position signal with said deviation signal input, said summing means having an output signal corresponding to the difference in said deviation signal input and said pointer position signal,
means for positioning said pointer in accordance with the output signal emanating from said summing means, said pointer positioning means including a rotary solenoid, said solenoid having a rotary magnet that is positionable in accordance with said summing means output signal, said indicator pointer being mechanically linked to said rotary magnet and operable to indicate said aircraft deviation, and
wherein said rotary solenoid includes at least one retract pole located adjacent said rotary magnet, said retract pole operable to automatically remove said pointer from view during a flag condition.

3,891,833

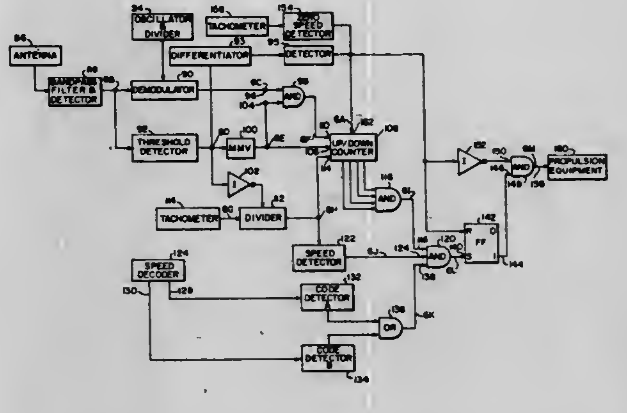
VEHICLE COAST CONTROL SYSTEM

Richard S. Rhoton, Monroeville, and Michael P. McDonald, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 5, 1974, Ser. No. 458,381

Int. Cl. B60l *15/40;* **G06f** *15/48*

U.S. Cl. 235—150.2 **7 Claims**



1. In a vehicle coast control system, the combination comprising:

means for providing a first signal coded to indicate the distance said vehicle should travel under tractive effort from a reference position to a coast position at which tractive effort is interrupted;
means for providing a second signal indicative of how far said vehicle has traveled at a given instant of time;
means for comparing the distances represented by said first and second signals on a time dependent basis; and
means for interrupting tractive effort on said vehicle for causing said vehicle to coast at the time said means for comparing senses that the distances represented by said first and second signals are equal.

3,891,834

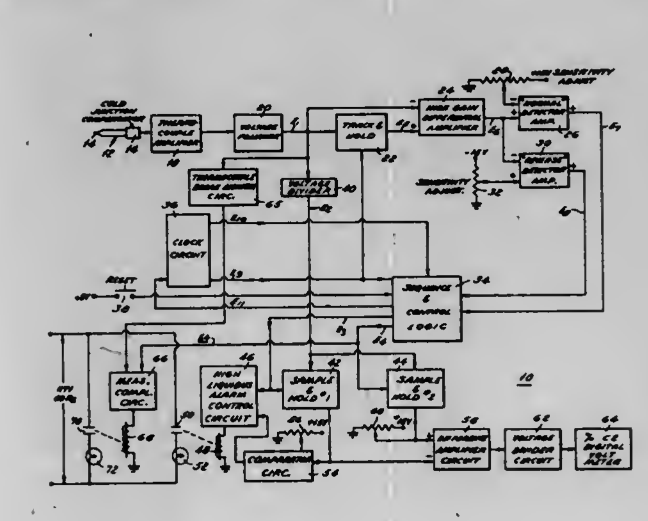
COOLING CURVE COMPUTER

Robert Warsinski, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 22, 1974, Ser. No. 472,395

Int. Cl.² G06F *15/20;* **G01N** *25/02*

U.S. Cl. 235—151.3 **11 Claims**



1. A cooling curve computer for detecting first and second temperatures at which changes occur in the slope characteristic of the cooling curve of a metal alloy sample, said cooling curve computer comprising:

means for generating a first electrical signal proportional to the temperature of said sample;
first circuit means, supplied with said first electrical signal, for detecting said first temperature and said second temperature of said sample, said first electrical signal at said first temperature being characterized by a decrease in the magnitude of the slope of said cooling curve and by the absence of a reversal in the slope thereof and said first electrical signal at said second temperature being characterized by a change in the magnitude of the slope of the said cooling curve with or without a reversal in said slope; second circuit means for storing signals representative of the magnitudes of said first electrical signal at the times of occurrence of said first and second temperatures; and third circuit means for generating a second electrical signal having a magnitude mathematically related to the magnitude of said first electrical signal as represented by said signals stored by said second circuit means, said third circuit means utilized said stored signals in the generation of said second electrical signal.

3,891,835

CONTROL SYSTEM FOR A BALANCE CORRECTING MACHINE

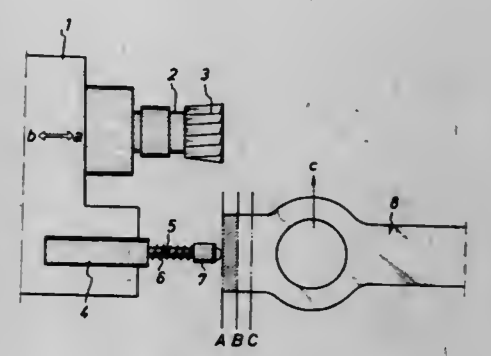
Hiroshi Shoda, and Mikio Araki, both of Kaga, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 26, 1972, Ser. No. 257,373

Claims priority, application Japan, May 26, 1971, 46-35513

Int. Cl. B23c *3/00*

U.S. Cl. 235—151.11 **5 Claims**



1. A control system for a balance correcting machine having a laterally advanceable cutter slide with a cutter mounted on a cutter spindle for machining a workpiece, comprising first means associated with the cutter slide for producing a first analog output signal when coming into contact with the to-be-machined surface of the workpiece as the cutter slide advances, said first analog output signal being indicative of the position of the cutter slide relative to said surface, second means for providing a second analog output signal indicative of the predetermined value of the unbalance of the workpiece prior to machining, third means for comparing the first analog output signal with the second analog output signal to produce a control signal, said third means including an amplifier for amplifying said first analog signal, an output voltage regulator for regulating the voltage of the amplified first analog signal, a firs A–D converter for converting the amplified first analog signal into a first digital signal, a first gate for selectively passing the first digital signal therethrough, a digital counter for presetting the first digital signal passed through said first gate, a second A–D converter for converting the second analog signal into a second digital signal, and a comparator for comparing said first digital signal of said first means preset in said digital counter with said second digital signal of said second means to produce a control signal and fourth means for controlling the cutter slide in accordance with the control signal to determine the proper correcting position of the cutter for machining said workpiece to the desired balance.

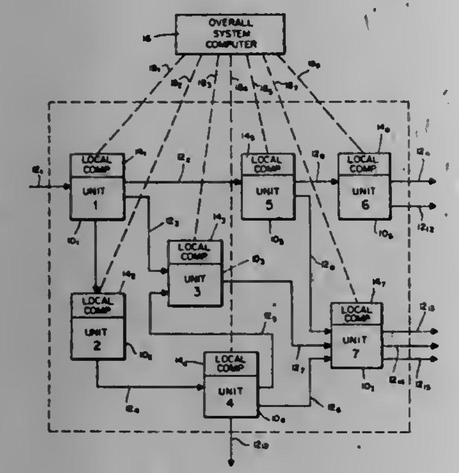
3,891,836
APPARATUS FOR OPTIMIZING MULTIUNIT PROCESSING SYSTEMS

Wooyoung Lee, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 246,445, April 21, 1972, abandoned. This application Mar. 25, 1974, Ser. No. 454,620

Int. Cl. G06f *15/46;* **G06g** *7/58*

U.S. Cl. 235—151.12 **18 Claims**



1. Apparatus for controlling the operation of a processing system including a plurality of individual processing units supplied by a plurality of feed streams of materials being transformed by the units into a plurality of product streams flowing from the units, the product yield and the product cost or profit for each unit being dependent upon the operating conditions of the unit, said apparatus comprising:

- feed stream computer means for generating initial feed stream signals representing the initial feed stream flow rates for a given yield and cost at each of the units under a given set of operating conditions so as to maximize the profitability of the overall system;
- feed stream control means coupled to said feed stream computer means for controlling the feed stream flow rates in response to said initial feed stream signals;
- unit yield and cost computer means for repeatedly and continuously generating new yield and cost signals representing new yields and costs at one of the units corresponding to an increase in the profitability of the overall system;
- unit control means coupled to said unit yield and cost computer means for controlling the operating conditions at said one of said units in response to said new yield and cost signals; and
- another feed stream computer means coupled to said unit yield and cost computer means for repeatedly and continuously generating new feed stream signals representing new feed stream flow rates in response to said new yield and cost signals;
- said other feed stream computer means being coupled to said feed stream control means for controlling the feed stream flow rates in response to said new feed stream signals.

3,891,837
DIGITAL LINEARITY AND BIAS ERROR COMPENSATING BY ADDING AN EXTRA BIT

Drew E. Sunstein, 19 Parkhurst Dr., Nashua, N.H. 03060

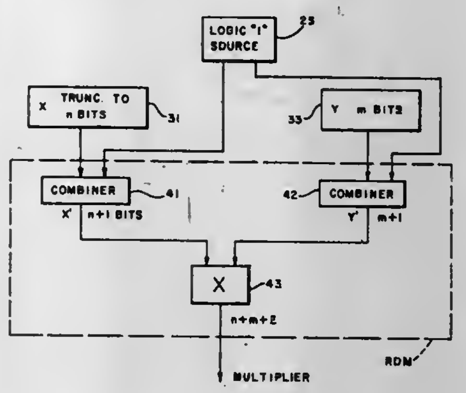
Filed July 3, 1972, Ser. No. 268,589

Int. Cl. G06f *7/38*

U.S. Cl. 235—152 **8 Claims**

1. Apparatus for bias error reduction in quantized number signals represented by first and second binary digits comprising,

- a source of a first digital signal having N bits representing a quantity and having bias error,
- a source of at least another digital signal,
- means for representing said first digital signal as having N+1 bits with the least significant bit thereof always corresponding to the nonzero one of said two binary digits,
- whereby this representation introduces an offset to reduce said bias error,
- and means for combining the first digital signal represented as having N+1 bits by said means for representing with at least said another digital signal to produce a result signal with reduced bias error.



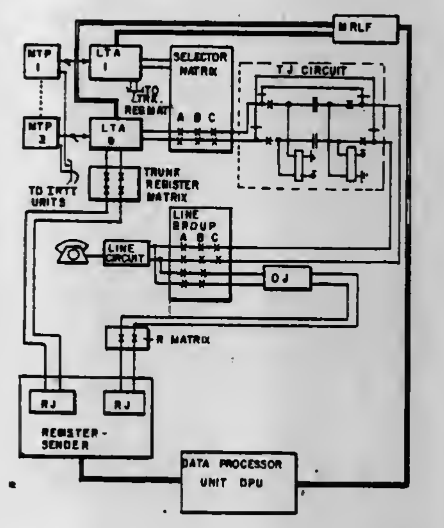
3,891,838
SYSTEM OF TESTING LINES OF A COMMUNICATION SWITCHING SYSTEM

Kurt F. Herr, Woodridge; Dennis A. Heck, Franklin Park; Lucian J. Lesny, Addison, and Ronald L. Ward, Palatine, all of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed June 15, 1973, Ser. No. 370,576

Int. Cl. H04m *3/26*

U.S. Cl. 235—153 AK **5 Claims**



1. In a communication switching system having switching network means for establishing connections between calling and called lines, register apparatus for receiving call processing information from a calling line via said switching network means, a pool of register junctors coupling said switching network means and the register apparatus for serving as inlets therefor through which are conveyed said information, a data processor means coupled to said register apparatus for performing testing operations on the system, a line testing arrangement comprising:

- manual testing means for initiating tests of a selected line to be tested;
- line testing adapting means coupled between said manual testing means and said switching network means and

  responsive to an initiation signal from said manual testing means for causing the establishment of a first connection to an idle one of the register junctors so that call processing information indicative of the selected line can be supplied from said testing means to the register apparatus for establishing a second connection to the selected line from said manual testing means which can then test said selected line; and
- logic means responsive to an in-test signal from said manual testing means for generating an interrupt signal and for supplying it to said processor means to request it to cause said switching network means to establish a third connection between said selected line to another one of said register junctors while maintaining said second connection between said adapting means and said selected line so that said manual testing means can perform in-testing operations.

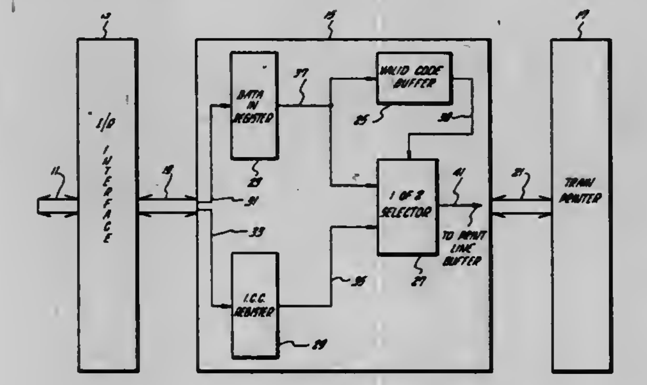
3,891,839
METHOD AND APPARATUS FOR IDENTIFYING AN INVALID CHARACTER CODE

Randall G. Ehlers, San Jose, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed July 22, 1974, Ser. No. 490,563

Int. Cl.² G06K *5/02;* **B41B** *25/24*

U.S. Cl. 235—153 AS **3 Claims**



2. A method for verifying that a received character code to be read into a print line buffer identifies a character within a previously defined character set, the method comprising:

- clearing all storage locations in a read/write memory to a first predetermined logical signal representation;
- writing a second predetermined logical signal representation into each storage location in a read/write memory having an address corresponding to a character code of the defined character set;
- storing a character code that represents an invalid character in the defined character set;
- addressing the read/write memory with each received character code that is intended to be read into said print line buffer; and
- selecting either the received character code or the invalid character code to be read into said print line buffer, depending on the logic level read out of the read/write memory.

3,891,840
LOW LEAKAGE CURRENT INTEGRATOR

Robert L. Cloke, Santa Clara, Calif., assignor to Information Storage Systems, Inc., Cupertino, Calif.

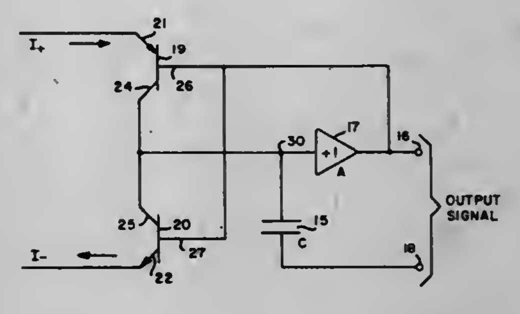
Filed Dec. 14, 1973, Ser. No. 424,841

Int. Cl. G06g *7/18*

U.S. Cl. 235—183 **1 Claim**

1. A current integrator capable of performing the function 1/*c* I dt, said integrator comprising:

- first and second integrator input terminals and first and second integrator output terminals;
- a capacitor having first and second terminals;
- first and second transistors with the collectors thereof interconnected with the first terminal of the capacitor;
- an isolation amplifier having a gain of unity and having input and output terminals;
- circuit means connecting the first terminal of the capacitor to the amplifier input terminal;
- circuit means connecting the bases of the first and second transistors, the output of the amplifier and the first integrator output terminal;



- circuit means connecting the capacitor second terminal with the second integrator output terminal;
- circuit means connecting the first and second integrator input terminals to the first and second transistor collectors respectively whereby electric current transmitted to the integrator input terminals will result in a voltage signal at the integrator output terminals which is the integral of the differences in the current received at the integrator input terminals.

3,891,841
DEVICE FOR CONTINUOUSLY REGULATING THE INTENSITY OF THE LUMINOUS FLOW PROJECTED TOWARDS THE RADIANT ENERGY CARRIERS

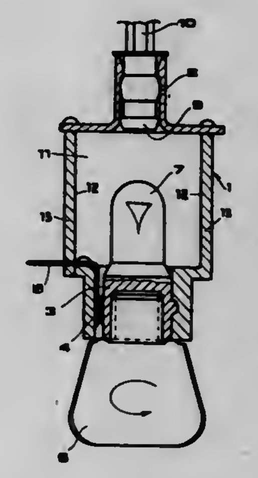
Giuseppe Codrino, Via Stazione, 15028 Quattordio (Alessandria), Italy

Filed Feb. 6, 1974, Ser. No. 440,041

Claims priority, application Italy, Mar. 1, 1973, 210/73

Int. Cl. F21

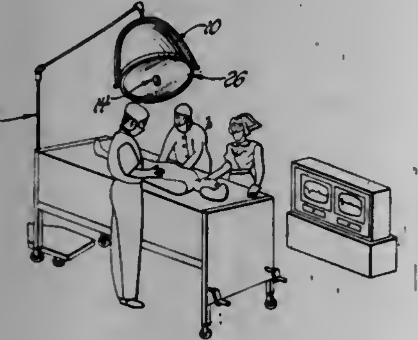
U.S. Cl. 240—1 LP **10 Claims**



1. An apparatus for continuously regulating luminous intensity, particularly for use in variable lighting of the instrument panels of motor vehicles or the like, comprising a first element formed with a recess bounded by an inner peripheral wall surface and having two open ends and a longitudinally spaced wall portion, said first element including securing means and abutment means; a second element receivable with clearance in said recess through one of said open ends and overlying a portion of said inner peripheral wall surface; a radiant energy source accommodated in said second element and projecting said radiant energy onto said inner peripheral wall surface when said second element is received in said recess; a bundle

of radiant energy carriers receiving said radiant energy and conducting said radiant energy away from said first element; a third element receivable with clearance in said recess through the other of said open ends of said first element and being fixedly mounted therein so as to fixedly mount said bundle of radiant energy carriers in said other open end; and movement means for continuously varying the axial position of said radiant energy source with respect to the fixed position of said bundle of radiant energy carriers, said movement means being limited by said abutment means so as to limit said axial movement of said radiant energy source towards said fixed position of said bundle of radiant energy carriers to a predetermined distance when said second element is received in said recess.

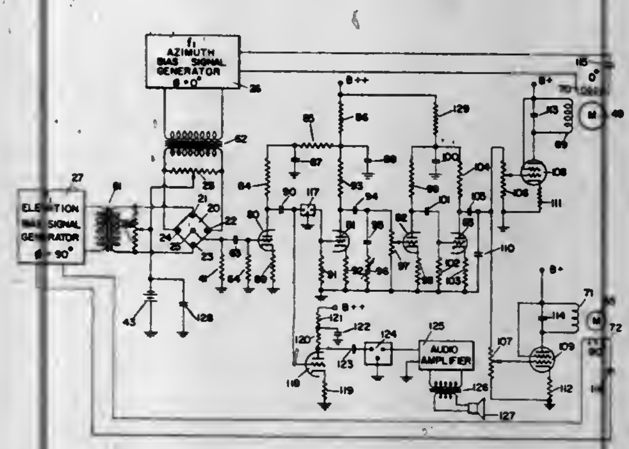
3,891,842
OPTICAL DEVICE
Mary R. Strusinski, 5132 31st St., Detroit, Mich. 48210
Filed May 10, 1974, Ser. No. 468,918
Int. Cl. H04n *7/18*
U.S. Cl. 240—1.4 **5 Claims**



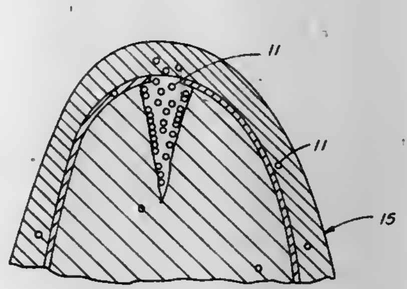
1. In apparatus for illuminating and simultaneously optically reproducing a surgical subject in a surgically sterile field, the improvements comprising:
- a lamp operable to illuminate surfaces at a relatively high light intensity;
- means supporting said lamp;
- means gimballing said lamp on said supporting means whereby said lamp is operable to pivot and rotate with respect to said supporting means through a substantial displacement on a spherical surface corresponding to said gimballing means;
- a directing member;
- means rigidly securing said directing member to said lamp in a manner such that the upper aft portion of said member is proximate the focal axis and optical center of the outer surface of the outermost lens of said lamp at a point forward and below said center;
- and a camera rigidly mounted on said member in such a manner that the focal axis of the outermost lens of said camera is substantially co-linear with the focal axis of the outermost lens of said lamp.

3,891,843
PHOTOSENSITIVE TRACKER INCLUDING MEANS FOR PRODUCING AN OUTPUT IN ACCORDANCE WITH A PLURALITY OF RADIATION CHARACTERISTICS
William J. Parkin, Natick, Mass., assignor to Sanders Associates, Inc., South Nashua, N.H.
Filed Apr. 5, 1963, Ser. No. 272,181
Int. Cl. G01j *1/20*
U.S. Cl. 250—203 R **26 Claims**

16. Sensing apparatus, comprising:
- radiation responsive, variable impedance detector means having an element adapted to vary in impedance in response to said radiation for continuously producing a position signal indicative of the position of said radiation relative to said element and in accordance with the variation of an internal element impedance with respect to another internal element impedance;
- load impedance means coupled to said detector means for continuously developing an intensity signal, independently of said position signal, in accordance with the variation of the total impedance of said element with respect to said load impedance and indicative of the intensity of said radiation; and
- output means coupled to said detector and load means for providing an output signal in accordance with selected characteristics of said radiation.


f1 AZIMUTH BIAS SIGNAL GENERATOR θ=0°
ELEVATION BIAS SIGNAL GENERATOR θ=90°
AUDIO AMPLIFIER
B++
B+
M

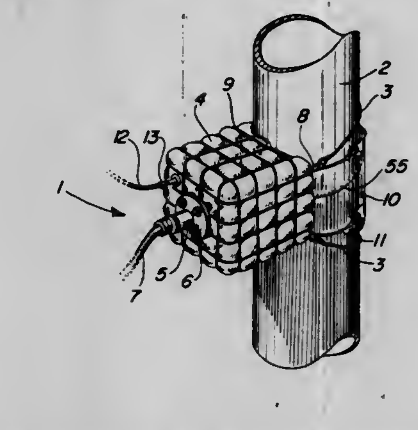
3,891,844
PROCESS FOR NONDESTRUCTIVELY TESTING WITH RADIOACTIVE GAS USING A CHILL SET SEALANT
Carl B. Gibbons, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 9, 1974, Ser. No. 432,019
Int. Cl. G21h *5/02*
U.S. Cl. 250—303 **10 Claims**



1. In a method of nondestructively testing an article surface for substantially invisible voids comprising
- a. adsorbing a radioactive gas on the surface of the article by bringing it into contact with the gas,
- b. disproportionately retaining the adsorbed radioactive gas on those surfaces presented by the substantially invisible voids as compared to the remaining surfaces of the article contacted by the radioactive gas, and
- c. utilizing radiation released by the radio-active gas remaining adsorbed to identify the substantially invisible voids,

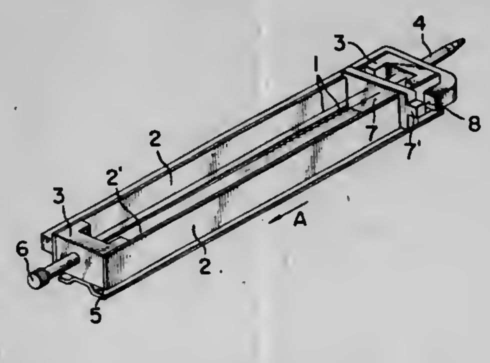
the improvement comprising
1. providing a sealant composition capable of being chill set,
2. relating the temperatures of the article surface to be tested and the sealant composition so that the article surface to be tested is at a temperature below the chill set temperature of the sealant composition and the sealant composition is at a temperature above its chill set temperature, and
3. coating the article portion to be tested with sealant composition to form a chill set coating thereon of substantially uniform thickness.

3,891,845
WET ENVIRONMENT RADIOGRAPHY APPARATUS
Paul Nelson English, 2741 Iowa St., Baton Rouge, La. 70802
Filed Dec. 18, 1972, Ser. No. 315,914
Int. Cl. G03b *41/16*
U.S. Cl. 250—321 **5 Claims**



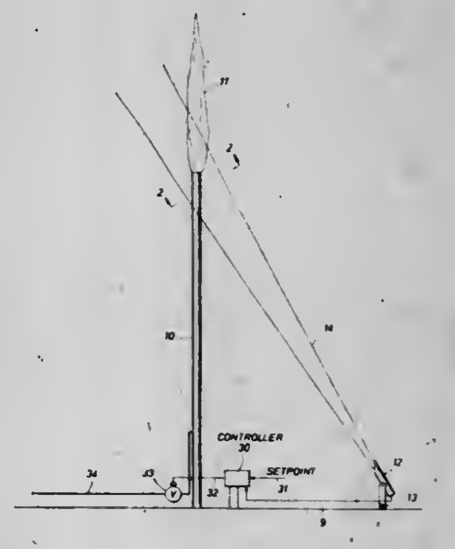
1. In an apparatus for making a radiograph of an object submerged in a liquid, the improvement therein which comprises the combination of:
- a. means for providing a beam of penetrating radiation;
- b. means for supporting the radiation-providing means;
- c. means for securely positioning the means for supporting the radiation-providing means in proximity to, but spaced from the object to be radiographed, so the radiation will impinge upon a chosen section of a surface of the object;
- d. means for displacing the liquid from the intervening space between the radiation-providing means and said chosen section so that significant attenuation and scattering of the beam of radiation impinging upon said chosen section will not result, the radiation-providing means and support means being otherwise surrounded by the liquid;
- e. imaging means positioned on a surface of the object so that said chosen section is between the radiation-providing means and the imaging means; and
- f. means for securing the imaging means to the object.

3,891,846
CORONA DISCHARGER CLEANING APPARATUS
Yoshio Ito, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 322,228, Jan. 9, 1973, abandoned. This application May 30, 1974, Ser. No. 474,789
Claims priority, application Japan, Jan. 18, 1972, 47-7024
Int. Cl. H01j *37/26*
U.S. Cl. 250—324 **16 Claims**



1. A corona discharger comprising:
- corona discharge electrodes;
- a shield member surrounding said corona discharge electrodes and at least having a discharging slit;
- support members provided at the opposite ends of said shield member;
- a member for connecting said corona discharge electrodes with a source of high voltage;
- a cleaning member movable in frictional contact at least with said corona discharge electrodes to thereby clean the same;
- means for holding said cleaning member at one end of said corona discharger during non-cleaning; and
- means for reciprocating said cleaning member between the opposite ends of and along said corona discharge electrodes responsive to movement of a detachable element for a copying device.

3,891,847
METHOD AND APPARATUS FOR CONTROLLING THE ADDITION OF A COMBUSTION ASSISTING FLUID TO A FLARE
Thomas R. Schmidt, Houston, and Gary B. Schinman, Deer Park, both of Tex., assignors to Shell Oil Company, Houston, Tex.
Filed Feb. 13, 1974, Ser. No. 442,030
Int. Cl. G01j *5/00*
U.S. Cl. 250—342 **10 Claims**



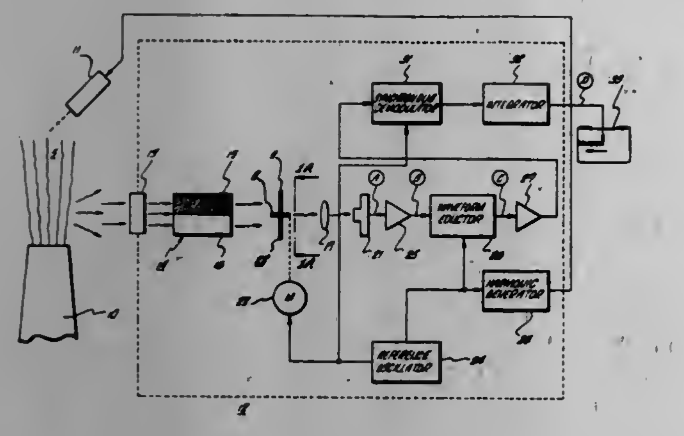
1. A method for controlling steam flow to a flare stack for improving combustion comprising:
- detecting the radiation existing at the base of the flare while substantially discriminating against reflected light;
- producing a signal proportional to said detected radiation; and
- controlling the steam flow in response to said signal.

3,891,848
FLUORESCENCE DETECTOR FOR MONITORING ATMOSPHERIC POLLUTANTS
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Robert R. Menzies, Pasadena, Calif.
Filed Dec. 27, 1973, Ser. No. 428,993
Int. Cl. G01t *1/16*
U.S. Cl. 250—345 **12 Claims**

1. A remote measuring device for monitoring pollutant gases in an atmospheric area including the subject pollutant gases, which area is located at a site remote from the measuring device, said measuring device comprising:
- an infrared coherent radiation source adapted to excite fluorescence radiation in said pollutant gases at said atmospheric area;
- filter means at said measuring device for blocking infrared radiation from said coherent radiation source and passing said fluorescence radiation from the excited pollutant gases;
- a gas cell means in the path of said fluorescence radiation passed by said filter means, said gas cell means containing a standard sample of a known pollutant gas to be moni-

tored for absorbing the fluorescence associated with said known gas and passing the remaining fluorescence;

a neutral cell means in the path of said fluorescence radiation passed by said filter means for passing all of said fluorescence including the fluorescence of the type absorbed by said gas cell means;



photodetector means, in response to fluorescence received from said gas cell means and said neutral cell means, for emitting an electrical difference signal indicative of the magnitude of the particular pollutant gas being monitored; and

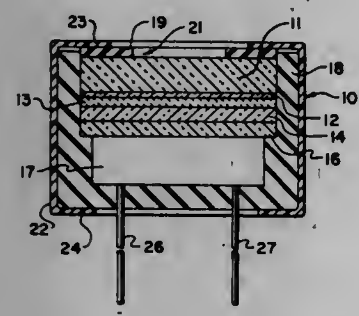
signal detecting means in circuit with said photodetector for detecting the electrical difference signal.

3,891,849
MEANS FOR INTEGRATING ERYTHEMAL SPECTRAL RADIATION

Patrick E. Felice, Jeannette, and Robert R. Ferber, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 30, 1974, Ser. No. 438,060
Int. Cl. G01j ***1/02***

U.S. Cl. 250—372 **14 Claims**



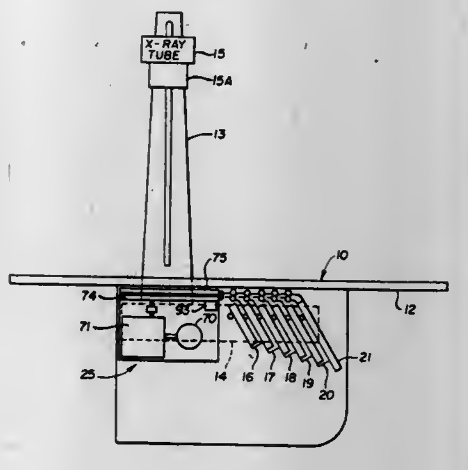
1. An erythemal radiation sensing means comprising an interference filter consisting essentially of a thin film having a vacuum deposition on one side adapted to transmit ultraviolet radiation of from 2800 to 3200 A, a magnesium tungstate phosphor coating on said other side of said interference filter thin film, a photocell having an active surface positioned substantially against said phosphor coating, and an elastomeric member for encapsulating said filter and photocell and including a window at one end to expose said thin film filter.

3,891,850
X-RAY TABLE

Cecil K. Bridgeman, Islington, Canada, assignor to Picker X-Ray Mfg. Limited, Bramalea, Canada

Continuation of Ser. No. 93,268, Nov. 27, 1970, abandoned, which is a continuation-in-part of Ser. No. 777,943, Oct. 4, 1968, abandoned, which is a continuation-in-part of Ser. No. 657,121, July 31, 1967, abandoned. This application Jan. 2, 1973, Ser. No. 320,142
Int. Cl. G01n ***23/02***

U.S. Cl. 250—444 **44 Claims**



1. In a film handling system for a medical X-ray examination mechanism including an X-ray tube and a patient engaging surface connected to a body, the combination of:

a. the body defining an unexposed film magazine, an exposed film receiving means, an exposure station, and film transport means for conveying film from said unexposed film magazine to said exposure station for exposure and thereafter to said exposed film receiving means;

b. said unexposed film magazine comprising a plurality of drawer members having film receiving volumes and closure members supported by respective drawer members for movement between an opened position and a closed position and wherein said respective drawer member is closed in a light tight fashion;

c. actuator means including actuator members associated with respective closure members to move said closure members between said open and closed positions;

d. said body defining at least an access opening and drawer supporting means enabling movement of said drawer members into and out of said body through said access opening;

e. an access door supported by said body for movement between a closed position wherein said access opening is closed against entrance of light into said body and an open position wherein drawer members of said magazine are removable;

f. door locking means preventing movement of said access door to said position when said closure members are away from said closed positions whereby film in said magazine cannot be inadvertently exposed by opening said access door when the closure members are in their open positions; and,

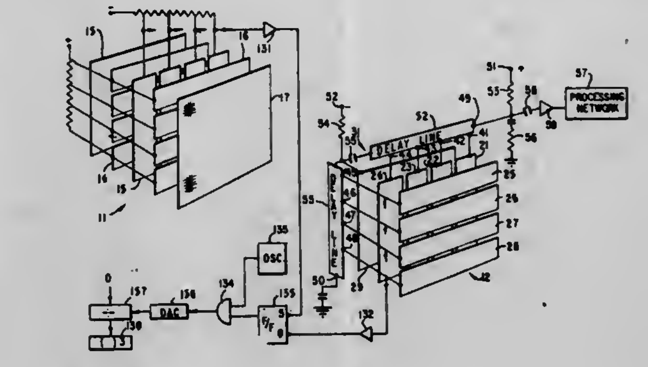
g. said body including structure shielding unexposed film in said magazine from radiation when said tube is energized.

3,891,851
IMPACT POSITION DETECTOR FOR OUTER SPACE PARTICLES

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Siegfried O. Auer, Lanham, Md.

Filed Aug. 30, 1974, Ser. No. 502,136
Int. Cl. G01t ***1/00***

U.S. Cl. 250—385 **13 Claims**



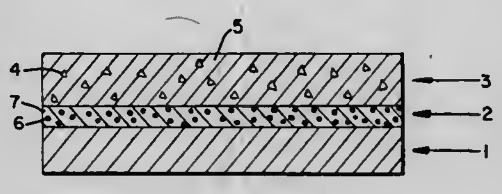
1. In an apparatus for determining the impact position of cosmic dust or other similar outer space particles on a detector, an array of electrically conducting, mutually insulated metal strips each having a different impact area for the particles, each of said strips including means for generating a different electric pulse in response to a particle having a line of flight in the impact area thereof, the strips of said array being arranged so that each strip uniquely indicates the spatial location of an impact, at least some of said strips having parallel longitudinal axes and defining an impact area having the same length in a direction at right angles to the longitudinal axes, a delay line having a multiplicity of taps, each of which is connected to one of said strips, the delay time of the delay line between adjacent taps being proportional to the spatial separation between adjacent electrodes, whereby a first pulse is induced in the delay line at the tap connected to the strip in which a line of flight exists and propagates down the delay line to a first end thereof, means for substantially preventing reflection of pulses from the first end of the line, and an amplifier having an input terminal connected to be responsive to pulses arriving at the first end of the line.

3,891,852
NEUTRON DETECTION AND RADIOGRAPHY

Romain Henri Bollen, Hove, and Robert Florent Van Esch, Mechelen, both of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Nov. 3, 1972, Ser. No. 303,387
Int. Cl. G01t ***3/00***

U.S. Cl. 250—391 **29 Claims**



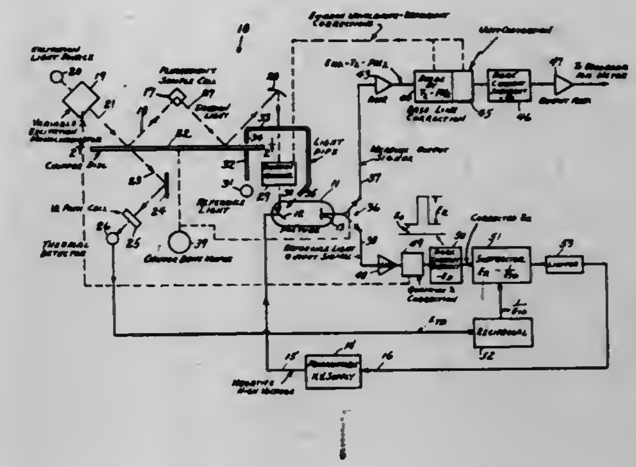
1. A method of recording neutron images which method comprises the steps of (1) information-wise irradiating with neutrons an intensifying screen incorporating a phosphor compound in which gadolinium is the host metal and at least one other rare earth metal is present as a fluorescence activating metal; and (2) subjecting the fluorescent light pattern resulting from the impact of the neutrons on the screen onto a photographic material.

3,891,853
ENERGY COMPENSATED SPECTROFLUOROMETER

Jerome C. Kremen, Takoma Park, and Isaac Landa, Wheaton, both of Md., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed Mar. 20, 1974, Ser. No. 452,980
Int. Cl. G01n ***21/52***

U.S. Cl. 250—458 **14 Claims**



1. In a spectrofluorometer, a source of radiant energy, a transparent sample holder, a photosensitive detector having variable gain, a moving chopper element, means including said moving chopper element defining an excitation optical channel directed to said holder and a second optical channel, means defining an emission optical channel between said sample holder and said photosensitive detector, a measure signal channel and a reference signal channel, switch means synchronized with the chopper element to alternately connect the output of the photosensitive detector to the measure signal channel and the reference signal channel, a reference radiant energy source, means including said moving chopper element defining an optical path between said reference source and said photosensitive detector time-shared with said emission optical channel, and means controlling the gain of said photosensitive detector in accordance with the signal generated in said photosensitive detector by said reference radiant energy source and the energy content of said second optical channel.

3,891,854
METHOD AND APPARATUS FOR UNLOADING CASSETTES

Michael Hura, Wickliffe, Ohio, assignor to Picker Corporation, Cleveland, Ohio

Filed Dec. 4, 1969, Ser. No. 882,084
Int. Cl. G01n ***23/04***

U.S. Cl. 250—468 **16 Claims**

1. A daylight cassette unloader comprising:

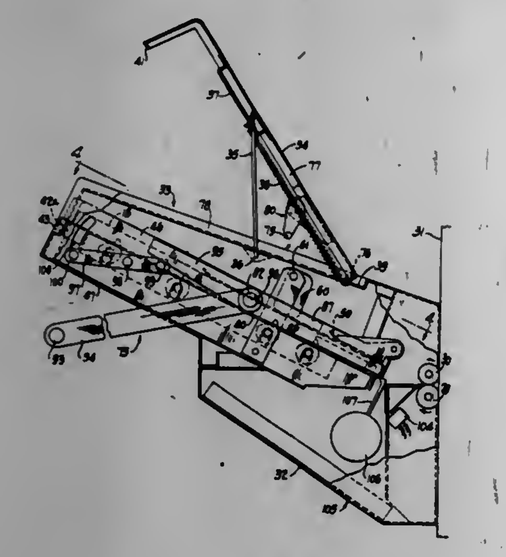
a. a housing including a load opening and means to render the load opening light tight;

b. said housing defining a light-tight enclosure at times when cassettes are opened therein;

c. cassette retainer release means within the housing and adapted to release cassette retainers upon insertion of a cassette into the housing and thereafter to maintain the cassette in a closed condition.

d. cassette opening means at least partially within the housing and adapted to open a cassette and release a film retained therein after operation of the retainer release means and subsequent to the load opening being rendered light tight by the rendering means; and,

e. said opening means being adapted to permit a back plate of the cassette to swing open and the lead edge of a sheet of film to drop while a portion near the trailing edge is pinched to retain it in the cassette and thereafter to release the pinch on the trailing portion.



3,891,855

HIGH ENERGY ELECTRON IRRADIATION OF FLOWABLE MATERIALS

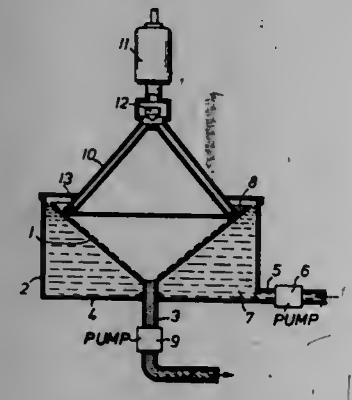
Bernd Peter Offermann, Hamburg, Germany, assignor to Licentia-Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed Nov. 28, 1973, Ser. No. 419,543

Claims priority, application Germany, Nov. 29, 1972, 2258393

Int. Cl. H01j *37/06*

U.S. Cl. 250—492 **2 Claims**



1. Apparatus for irradiating a flowable material with high energy electrons, comprising, in combination: a container for holding a quantity of such material; a funnel-shaped hollow body disposed in said container with the small diameter opening of said body directed downwardly and the upper extremity of said body at a lower elevation than the top of said container; outlet conduit means connected to the small diameter opening of said body for receiving material from the region enclosed by said body, said conduit passing through the bottom of said container in a liquid-tight manner; inlet conduit means connecting the interior of said container with a source of material to be irradiated; material delivery means connected in said inlet conduit means for delivering such material to the interior of said container at a predetermined rate selected for causing material filling said container to overflow the upper extremity of said body and to flow down the inner wall surface of said body as a continuous, uniform stream; and irradiation means disposed for irradiating such material with high energy electrons as the material flows down said inner wall surface of said body.

3,891,856

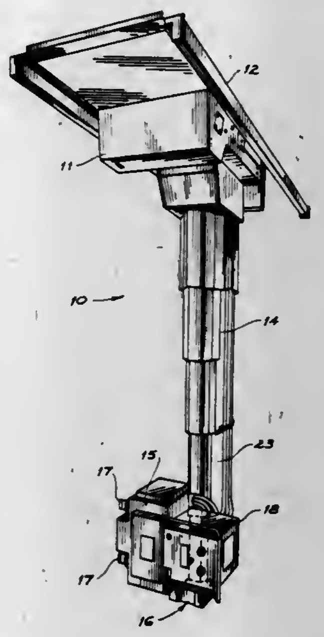
MOUNT FOR CEILING SUPPORTED X-RAY TUBE

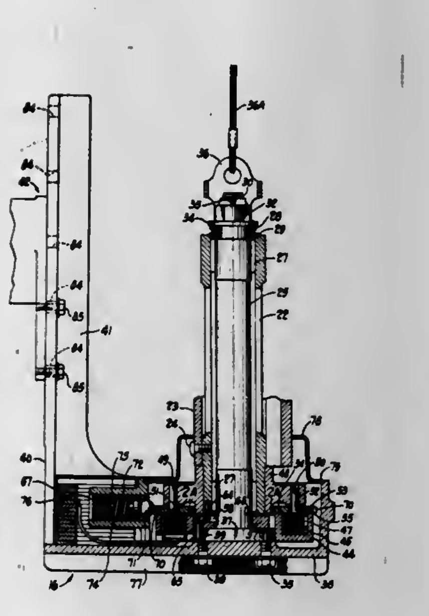
William H. Amor, Jr., Auburn Township, and Robert E. Stancliff, Mentor, both of Ohio, assignors to Picker Corporation, Cleveland, Ohio

Filed Nov. 21, 1973, Ser. No. 418,057

Int. Cl. H05g *1/02*

U.S. Cl. 250—523 **21 Claims**





1. X-ray apparatus comprising:
a. supporting and supported members;
b. bearing mechanism interposed between the members to permit relative rotation of the members;
c. an X-ray tube carried by one of the members;
d. tube supporting structure connected to the other of the members for supporting the members and the tube;
e. a rotation control element rotatably positioned between the members and coactable with the members to provide relative rotation of a predetermined maximum amount;
f. a selected one of the element and the supporting member having a first recess formed therein and defined in part by a pair of arcuately spaced stop surfaces, said surfaces being coactable with a projection extending from the other of the element and the supporting member;
g. a selected one of the element and the supported member having a second recess formed therein and defined in part by another pair of arcuately spaced stop surfaces, said other surfaces being coactable with another projection extending from the other of the element and the support member; and,
h. the members being at one limit of relative rotation when said projections are respectively in engagement with a first one of each pair of stop surfaces and being at the other limit of relative rotation when the projections respectively engage the second stop surfaces of each pair.

3,891,857

DEVICE FOR THE NON-CONTACT LENGTH MEASUREMENT OF OBJECTS

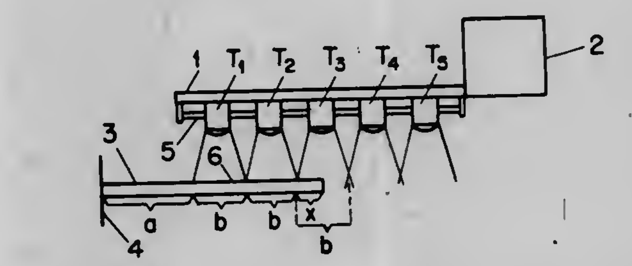
Klas Rudolf Wiklund, Taby, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Feb. 22, 1974, Ser. No. 444,712

Claims priority, application Sweden, Mar. 9, 1973, 7303302

Int. Cl.² G01N *21/30*

U.S. Cl. 250—560 **5 Claims**



1. A device for measuring the length of an object including: a plurality of radiation sensors mounted to divide the length which is to be measured into a corresponding number of length increments, each of said sensors providing a first signal level when no radiation is incident thereon and a second signal level when more than a predetermined amount of radiation is incident thereon and a signal between said first and second signals level for radiation below said predetermined level; and means for combining signals from said plurality of sensors to provide a measurement of the length of said object; the device being characterized in that the area from which each of the sensors receives radiation is arranged so that by means of an optical element inserted in each sensor, the ray path is restricted to a substantially rectangular shape; said device being further characterized in that the said optical elements consist of a cylindrical lens whose generatrices of the cylinder surface are parallel with the length being measured.

3,891,858

OPTICAL-ELECTRONIC SEMICONDUCTOR COUPLING ELEMENT

Werner Schoberl, Heilbronn, Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

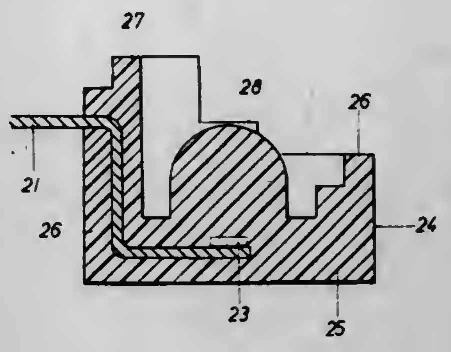
Filed Nov. 1, 1973, Ser. No. 411,732

Claims priority, application Germany, Nov. 2, 1972, 2253699

Int. Cl. G02f *1/28*

U.S. Cl. 250—551 **7 Claims**

1. An optical-electronic semiconductor coupling element, comprising:
a. a light-emitting semiconductor component;
b. a light-sensitive semiconductor component;
c. first light-permeable housing means, made of plastic, within which said light-emitting component is embedded, said first housing means having a lens-shaped part through which light emittered by said light-emitting component may exit;
d. second light-permeable housing means, made of plastic, within which said light-sensitive component is embedded, said second housing means having a lens-shaped part through which light that is to impinge on said light-sensitive component may enter; and
e. third, outer housing means, made of plastic, surrounding at least part of said first and second housing means, said third housing means comprising a tubular body and said first and second housing means being arranged at opposite ends of said tubular body, respectively, the lens-shaped parts of said first and second housing means being generally in the center of said tubular body and being positioned with their respective lens-shaped parts directed toward each other, said lens-shaped parts having front faces which form between themselves a gap of approximately 0.1 mm.



3,891,859

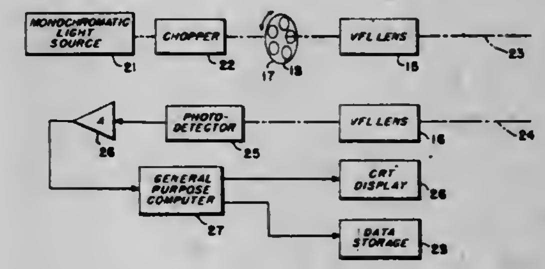
PULSED, VARIABLE BEAM PATTERN OPTICAL MEASURING DEVICE

Clarence J. Funk, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 21, 1974, Ser. No. 481,589

Int. Cl.² G01N *21/28*

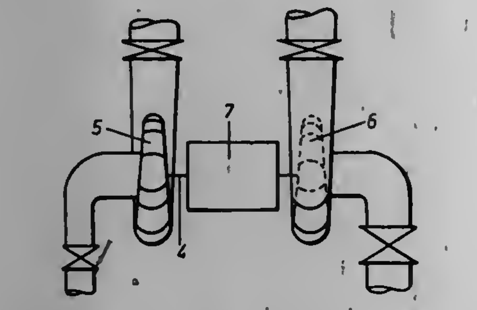
U.S. Cl. 250—564 **21 Claims**



12. A method of measuring optical properties of a body of fluid comprising in sequence the steps of:
generating a beam of quasi-monochromatic light energy;
directing said beam of quasi-monochromatic energy into said body of fluid in a predetermined angular divergence; pulsing said beam of quasi-monochromatic light into a plurality of time separated pulses;
receiving the pulsed light returned from said body of fluid; converting said received pulsed light into electrical analogs thereof;
sensing the electrical analogs of the pulsed light analog signals at predetermined time intervals between pulses;
repeating said previous five steps for other predetermined angular divergences;
measuring the exponential decay rate of the power of the returned pulses; converting the measured data to the basic optical properties of said body of fluid; and
storing said calculated data for further analysis.

3,891,860
PUMPED STORAGE POWER PLANT

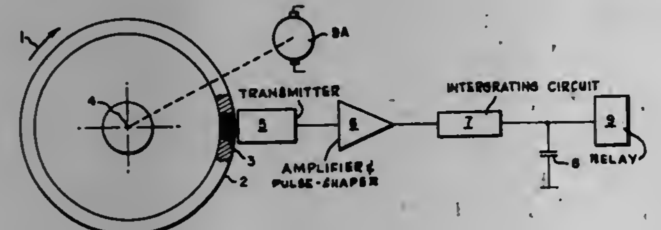
Georg Hutarew, Stuttgart-Schoenberg, Germany, assignor to J. M. Voith GmbH, Heidenheim (Brenz), Germany
Filed Mar. 11, 1974, Ser. No. 450,222
Claims priority, application Germany, Mar. 16, 1973, 2313095
Int. Cl. F03b *3/10*
U.S. Cl. 290—52 X **7 Claims**



1. Pumped-storage plant comprising a pump turbine, an electric motor-generator coupled with said pump turbine, an additional pump also coupled with said motor-generator, and means for admitting operating medium separately to said pump turbine and said additional pump, said additional pump having a construction for pumping only in an upper delivery head subrange ranging upwardly to maximum delivery head, and said pump turbine having a construction so that, when operating as a pump, it pumps only in a lower delivery head subrange ranging downwardly to minimum delivery head, both of said subranges being at least mutually adjacent, said pump turbine being further constructed so that, when operating as a turbine, it operates within the entire fall head range.

3,891,861
DEVICE FOR MONITORING THE TEMPERATURE OF ROTATING MACHINE PARTS

Karl-Heinz Weber, Witten-Heven, and Anton Dinkelbach, Gelsenkirchen, both of Germany, assignors to Gebr. Eickhoff, Maschinenfabrik und Eisengiesseri m.b.H., Bochum, Germany
Filed Jan. 23, 1974, Ser. No. 435,878
Claims priority, application Germany, Feb. 3, 1973, 2305388
Int. Cl. H01h *36/00*
U.S. Cl. 307—117 **6 Claims**



1. Apparatus for monitoring the temperature of a rotatable element during rotation without contact therewith, said apparatus comprising:

magnetic flow means including a ferromagnetic insert carried by said rotatable element for rotary movement therewith, said ferromagnetic insert having a Curie point temperature at which said insert becomes paramagnetic;

an inductive pulse transmitter forming an air gap with said ferromagnetic insert for producing electrical pulses in response to the passing movement of said insert relative to said transmitter;

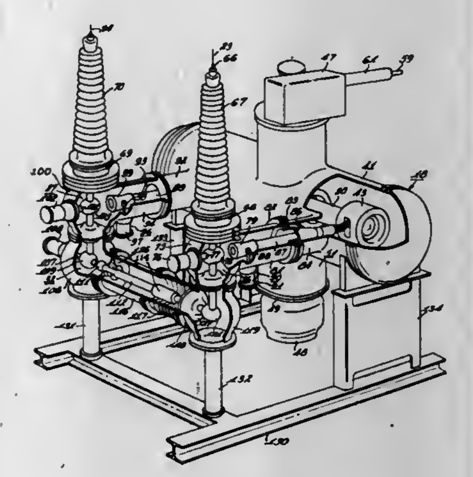
means for shaping and amplifying the successive pulses produced by said transmitter;

means including an integrating circuit receiving the shaped and amplified pulses for producing a continuous control signal to indicate that the temperature of said insert lies below the Curie point temperature of the insert; and

means responsive to said control signal for controlling rotation of said rotatable element in a dependent relation upon said ferromagnetic insert attaining a temperature which is not in excess of the Curie point temperature of said ferromagnetic insert.

3,891,862
COMPACT UNIT BREAKER

Thomas F. Clark, Canton, Mass., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed June 26, 1973, Ser. No. 373,789
Int. Cl.² H01H *47/00*
U.S. Cl. 307—125 **5 Claims**



1. In a compact single phase power circuit breaker assembly comprising a plurality of operative gas sealed units including; a portable supporting base;

an upstanding U-shaped enclosure mounted on said base for movement with said base, said U-shaped enclosure including an assembly of gas sealed housings in which electrical operating components are disposed;

a gas sealed interrupter tank supported on said base for movement with the base and extending parallel to said U-shaped enclosure, said tank operatively supporting at least one circuit interrupter therein;

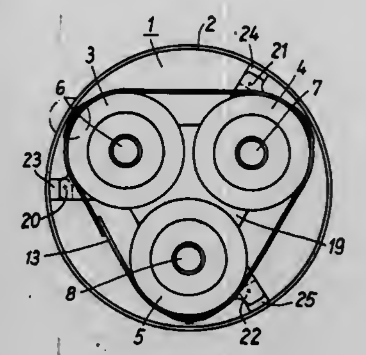
a horizontal gas sealed housing interconnecting a gas sealed housing of each upstanding leg of said U-shaped enclosure with an adjacent end of said interrupter tank, the horizontal gas sealed housings being disposed in parallel spaced apart relationship in the same horizontal plane;

an electrical circuit interrupter disconnect switch in a gas sealed housing of each leg of said U-shaped enclosure to which said interrupter tank interconnecting housings are connected, the disconnect switch of each leg being operable to interrupt the circuit through the horizontal parallel interconnecting housing for isolating each side of the circuit interrupter; and,

a bypass disconnect switch in a gas sealed housing of at least one of said legs of said U-shaped enclosure and operable to establish a bypass circuit from the circuit interrupter disconnect switch of the associated leg of the U-shaped enclosure through the base of the U-shaped enclosure and through the circuit interrupter disconnect switch in the sealed housing of the other leg of said U-shaped enclosure.

3,891,863
VOLTAGE TRANSFORMER FOR A FLUID INSULATED HIGH-VOLTAGE MULTI-CONDUCTOR SWITCHING APPARATUS

Gerhard Kleen, and Albert Herrmann, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed May 17, 1974, Ser. No. 470,906
Claims priority, application Germany, May 17, 1973, 2325446
Int. Cl. H01f *40/08, 40/10;* **H01b** *9/06*
U.S. Cl. 307—147 **15 Claims**



1. An improved voltage transformer for a fluid insulated high-voltage multi-conductor switching apparatus, which includes a metal casing, comprising:

a plurality of electrical insulation members disposed about the conductors and each having an electrode disposed on the surface thereof;

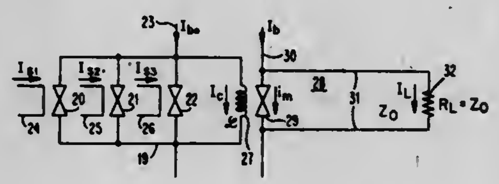
a centering member, disposed between said insulation members and in engagement therewith, for positioning said members in a predetermined position relative to the conductors;

means, disposed about said electrical insulation members and said centering member, for securing said members in said predetermined position relative to said conductors; and

means for fastening said electrical insulation members secured in said predetermined position to said metal casing.

3,891,864
JOSEPHSON JUNCTION LOGIC ELEMENT

Pierre Leopold Gueret, Thalwil, Switzerland, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 2, 1973, Ser. No. 412,084
Claims priority, application Switzerland, Nov. 17, 1972, 16755/72
Int. Cl. H03k *19/02, 3/38*
U.S. Cl. 307—212 **5 Claims**



1. A Josephson junction logic circuit comprising an output circuit having at least a single resettable Josephson device connected to a transmission line which is terminated with its characteristic impedance and having an input circuit coupled to said device, said output circuit having parameters which meet the following criteria:

$$\frac{I_{min}}{i_{mo}} \simeq \frac{G}{G_o}\,\frac{i_m/i_{mo}}{\beta_c} + \frac{(\pi/4)^2}{2\beta_c}\,\frac{i_m{}^2}{i_{mo}}$$

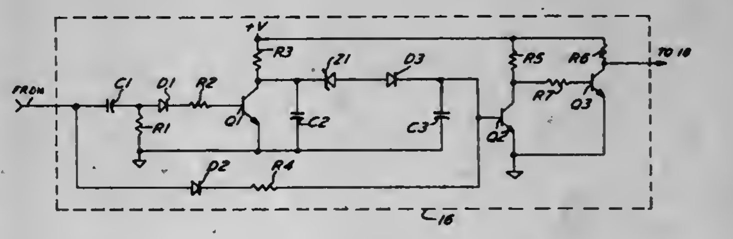
$$\frac{4}{\pi}\,\frac{V_{min}}{V_g} \simeq \frac{i_m/i_{mo}{}^{1/2}}{\beta_c}$$

$$\frac{I_b}{i_{mo}} < \frac{(\pi/4)^2}{2\beta_c} + \frac{1+GR_L}{G_oR_L}\,\frac{1}{\sqrt{\beta_c}}$$

wherein I_{min} and V_{min} are, respectively, the minimum junction current and voltage beyond which said junction reverts to its voltage state, I_{mo} and i_m are, respectively, the maximum Josephson currents for $I_c = 0$ and I_c 0, G is the actual conductance at $V_j = V_{min}$, G_o is the normal conductance for $V_j > V_g$, V_g is the gap voltage, V_j is the voltage drop across said Josephson device, I_b is the bias current supplied to said junction, β_c the junction admittance ratio, R_L is the output resistance and I_c is the control current applied to said input circuit, said input circuit including at least a single reversible Josephson device therein and at least a single signal means electrically coupled to said at least a single reversible Josephson device and at least an inductance electrically connected to said at least a single reversible Josephson device, said inductance having a value that, at least in the fundamental mode, where $N = 0$, only less than one flux quantum can be trapped by said inductance and wherein $I_{bo}/i_{mo} < \pi/\lambda$ where I_{bo} is the bias current supplied to said reversible device, λ is proportional to the inductance L and, N is the maximum number of flux quanta, ϕ_o, which can be trapped in the inductance.

3,891,865
INTRUSION DETECTOR

Salvatore R. Picard, Hatboro, and Robert F. Starry, Horsham, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Nov. 14, 1973, Ser. No. 415,900
Int. Cl. H03k *5/18*
U.S. Cl. 307—232 **3 Claims**



1. A low current counting device for indicating the receipt of at least two pulses within a predetermined period of time, comprising, in combination:

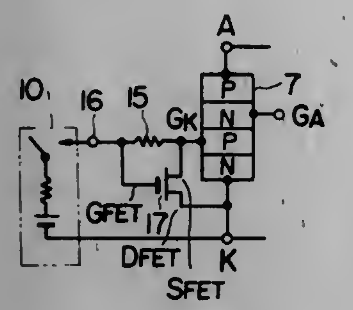
first switching means including a first transistor having a base operatively connected to receive individual ones of said pulses, an emitter connected to ground, and a collector, and timing means having one terminal of a resistor, the cathode of a zener diode and one terminal of a first capactitor commonly connected to said collector, one terminal of a second capacitor operatively connected to the anode of said zener diode for providing an output signal for said predetermined period of time whereby said output signal is indicative of the end of the first one of said pulses, the other resistor terminal being connected to a voltage supply and the other first and second capacitor terminals being connected to ground;

second switching means having an input commonly connected to receive said first switching means output signal and said pulses for switching to a nonconductive state in response to the second one of said pulses within said first switching means predetermined period of time, and an output for providing a signal indicative thereof; and third switching means having an input connected to receive said second switching means output signal for switching to a conductive state in response to said second switching means output signal, and an output for providing said counting device output signal.

3,891,866

HIGHLY SENSITIVE GATE-CONTROLLED PNPN SWITCHING CIRCUIT

Shinzi Okuhara, Fujisawa; Masaaki Kusano, and Mitsuru Kawanami, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan
Filed June 28, 1974, Ser. No. 484,238
Claims priority, application Japan, July 2, 1973, 48-73725
Int. Cl. H03k *17/16, 17/72*
U.S. Cl. 307—252 A **8 Claims**

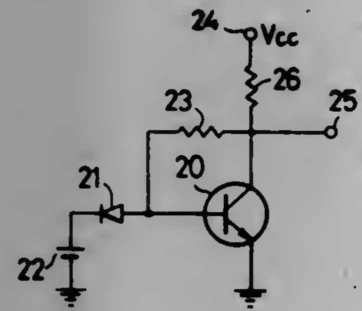


1. A highly sensitive gate-controlled PNPN switching circuit comprising a PNPN switch having a structure equivalent to a four-layer one consisting of P, N, P and N conductivity type layers; a field effect transistor and a voltage drop element, wherein electrodes are provided on the first (P) layer, the third (P) layer and the fourth (N) layer, the source and the drain of said field effect transistor are connected respectively with said third (P) and said fourth (N) layers of said PNPN switch, one end of said voltage drop element is connected with said third (P) layer of said PNPN switch, and the other end of said voltage drop element is connected with the gate of said field effect transistor, the junction point of said other end of said voltage drop element and said gate of said field effect transistor serving as the control gate terminal of said PNPN switching circuit.

3,891,867

VARIABLE IMPEDANCE CIRCUIT

Yasuaki Watanabe, Kasugabe, Japan, assignor to Victor Company of Japan, Limited, Kanagawa-ken, Japan
Filed Oct. 25, 1973, Ser. No. 409,443
Claims priority, application Japan, Oct. 31, 1972, 47-109352; Oct. 31, 1972, 47-109353; Dec. 28, 1972, 48-3461
Int. Cl. H03k *1/14;* **H03g** *3/00*
U.S. Cl. 307—264 **6 Claims**

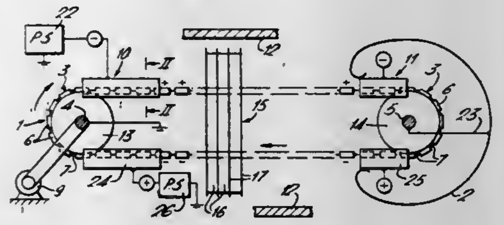


1. A variable impedance circuit comprising: a transistor having a grounded emitter, and a collector connected to a power source through a load resistor; a first resistor connected between the collector and the base of said transistor; a diode connected to said base of the transistor with a polarity opposite that of an equivalent diode between said base and emitter of the transistor, the semi-conductor material of said diode being the same as that of said transistor; and a variable voltage source for control connected serially through said diode to said base of said transistor and operating to vary voltage, the impedance between the collector of the transistor and ground being varied linearly according to the value of the voltage of said variable voltage source.

3,891,868

ELECTRICALLY-CONDUCTING MATERIALS

Norman George Joyce, Reading, England, assignor to Science Research Council, London, England
Filed May 3, 1974, Ser. No. 466,846
Int. Cl. H02n *1/00*
U.S. Cl. 310—5 **9 Claims**

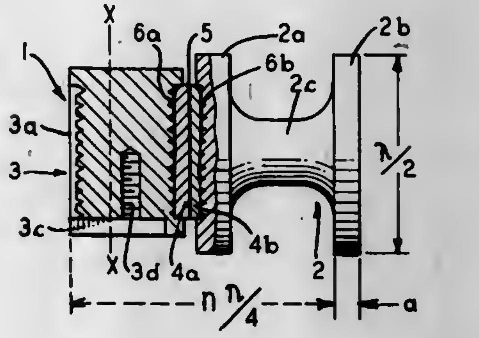


1. For use in an electrostatic generator of the kind in which an electrode is charged to a high electrical potential by the transfer of electrical charges there to by an endless charge conveyor, an electrically conductive pulley for the charge conveyor, the pulley comprising a metal hub portion and a rim portion, the rim portion having a conveyor-engaging surface at least in part formed by the edges of laminations of sheets of electrically conductive fibres integrated into a coherent body by a cured impregnant.

3,891,869

PIEZOELECTRICALLY DRIVEN ULTRASONIC GENERATOR

Thomas J. Scarpa, Edison, N.J., assignor to Scarpa Laboratories, Inc., Metuchen, N.J.
Filed Sept. 4, 1973, Ser. No. 394,407
Int. Cl. H04r *17/00*
U.S. Cl. 310—8.2 **8 Claims**



1. A transducer assembly comprising in combination:

an ultrasonic generator which includes a pair of piezoelectric ceramic wafers having substantially parallel opposite major surfaces comprising electrode means interposed between the internal major surfaces of said wafers and on the two external surfaces thereof, said generator designed to vibrate in the direction of the longitudinal axis of said transducer assembly in a principal resonant-thickness mode of vibration.

a cylindrical backing element having a pair of substantially flat end surfaces,

means interposed between one said end surface of said cylindrical backing element and one of the opposite surfaces of said generator for bonding said backing element to said one face,

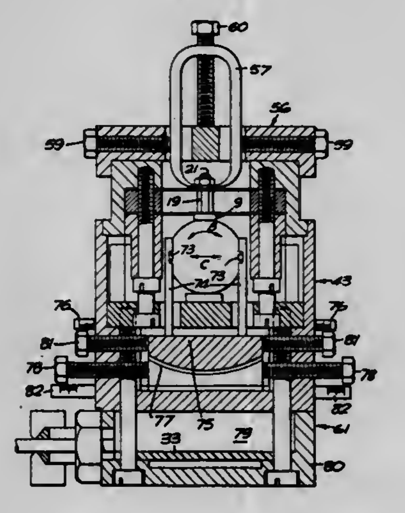
a solid transforming member formed to include at its opposite ends a pair of substantially circular parallel disks coaxial with said ultrasonic generator each having a diameter slightly exceeding the diameter of said generator, said disks spaced apart along the axis thereof by a connecting portion symmetrical about the said axis and declining therebetween to a minimum diameter not exceeding about one-third the diameter of said disks,

one of said disks being bonded in acoustical transfer relation to the other face of said generator, and the other said disk being free to function as an ultrasonic radiator.

3,891,870

ROTATING PIEZOELECTRIC TRANSDUCER MOUNTING

James Patrick Corbett, Old Manor House, 27 Station Rd., Thames Ditton, England
Continuation of Ser. No. 302,098, Oct. 30, 1972. This application Mar. 15, 1974, Ser. No. 451,457
Claims priority, application United Kingdom, Nov. 23, 1971, 54410/71
Int. Cl. H04r *17/00*
U.S. Cl. 310—8.7 **17 Claims**



1. A force transducer comprising:

an enclosure including a frame and a base;

a plate-like piezo electric crystal mounted in said enclosure upright with respect to said base;

means for mounting said crystal in position and for permitting rotation of said crystal in its own plane, said means for mounting comprising a seat on said base, and a spigot for transmitting a force to be measured to said crystal, said base and said spigot engaging opposite edge portions of said crystal, said spigot being disposed in the plane of said crystal and aligned substantially with the center of the active area thereof;

first support means including a flexible diaphragm which is fixed to said frame and extends across it so as to complete said enclosure, said diaphragm laterally surrounding said spigot and engaging same;

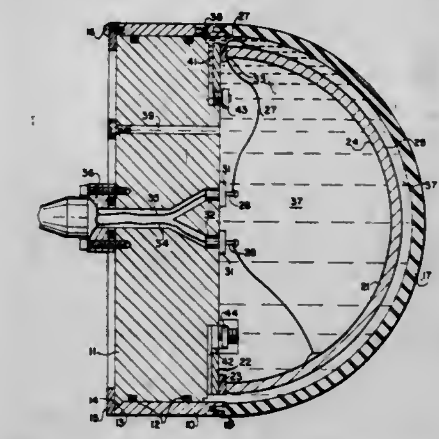
second support means which are laterally rigid and which are attached to said frame and to said spigot, said first and second support means each being arranged to restrain said spigot resiliently in a longitudinal direction and rigidly in a lateral direction and to clamp said crystal between said spigot and said base; and

electrical connections to said crystal, said connections extending outside said enclosure.

3,891,871

PRESSURE RELEASE HEMISPHERICAL PIEZOELECTRIC TYPE TRANSDUCER

Theodore A. Henriquez, and Allan C. Tims, both of Orlando, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed May 24, 1974, Ser. No. 473,050
Int. Cl.^{2} H01L *41/04*
U.S. Cl. 310—9.1 **4 Claims**



1. A piezoelectric transducer; which comprises,

a solid cylindrical backing mass,

a hemispherical piezoelectric ceramic active element secured at the major diameter thereof to one end face of said backing mass,

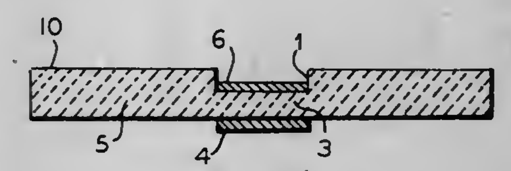
a ring of insulating material insulating said active element from said backing mass, and

a layer of fiberglass bonded between said backing mass and said insulating ring.

3,891,872

THICKNESS-EXTENSIONAL MODE PIEZOELECTRIC RESONATOR WITH POISSON'S RATIO LESS THAN ONE-THIRD

Takashi Nagata, Ikeda, Japan, and Raymond David Mindlin, New York, N.Y., assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Continuation of Ser. No. 304,417, Nov. 7, 1972, abandoned. This application June 20, 1974, Ser. No. 481,451
Claims priority, application Japan, Nov. 12, 1971, 46-90816; Nov. 12, 1971, 46-90817
Int. Cl. H01v *7/00*
U.S. Cl. 310—9.5 **9 Claims**



1. A piezoelectric resonator comprising a thin plate of piezoelectric material having a Poisson's ratio less than one-third, said plate having two flat spaced major surfaces on opposite sides thereof and a flat bottomed recess in at least one of said two major surfaces, and a pair of electrodes, one on the bottom of said recess and the other on the major surface at least in the area opposite the position of said recess, said recessed part of said plate vibrating in the fundamental thickness-extensional mode at a pre-selected frequency when an electrical signal is applied thereto, the thickness t of said plate at said recess and the thickness t' of said plate at said flat part being in the relationship $(N_{TA}/2N_S) < (t/t') < (N_{TS}/N_{TA})$ where N_S, N_{TS} and N_{TA} are frequency constants for the thickness-shear vibration, the thickness-extensional vibration and the anti-resonant thickness-extensional vibration, respectively, whereby the resonant frequency of said fundamental

thickness-extension vibration of said plate at said recessed part is higher than the resonant frequency of said plate at said flat part.

3,891,873
PIEZOELECTRIC RESONATOR WITH MULTI LAYER ELECTRODES

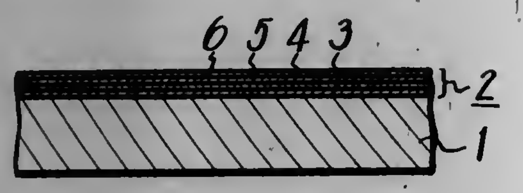
Yuzuru Yanagisawa, Fujisawa, and Hidemasa Tamura, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 30, 1973, Ser. No. 420,465

Claims priority, application Japan, Dec. 9, 1972, 47-123653; Oct. 6, 1973, 48-112726

Int. Cl. H04r *17/00*

U.S. Cl. 310—9.7 **6 Claims**



1. A resonator comprising a plate of piezoelectric material containing lithium, electrodes formed on opposite sides of said plate and each electrode comprising a first layer of chromium adjacent said piezoelectric plate, a second layer of copper formed over said first layer, a third layer of chromium formed over said second layer, and a fourth outer layer of a noble metal formed over said third layer.

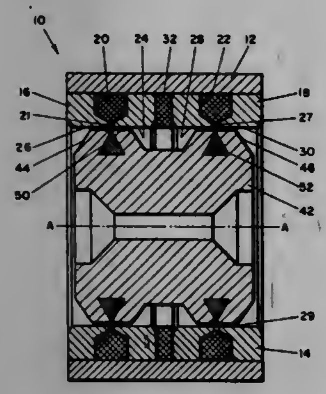
3,891,874
COMPENSATED RECIPROCATING ELECTRODYNAMIC MACHINE

Herbert C. Roters, deceased, late of Nogales, Ariz., by Mary D. Roters, executrix, Nogales, A iz., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Filed May 31, 1973, Ser. No. 365,584

Int. Cl. H02k *33/00*

U.S. Cl. 310—14 **26 Claims**



1. An electrodynamic machine comprising: a magnetic circuit having an axially polarized constant flux source and axially spaced wound stator poles with slots and tooth tips which simultaneously confront the axially spaced poles of an axially movable flux conducting armature through an air gap; and means establishing low resistance current paths in each of said armature poles operative to cancel alternating flux in said armature poles.

3,891,875
SUPERCONDUCTING ROTOR

Evangelos T. Laskaris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 16, 1973, Ser. No. 406,881

Int. Cl. H02k , *9/00*

U.S. Cl. 310—40 **20 Claims**

1. A superconducting rotor for a dynamoelectric machine, the superconducting rotor being of the type having a field winding and an amortisseur winding and including:

a. means for maintaining said field winding in a superconducting state;

b. means for maintaining said amortisseur winding in a normally conducting state;

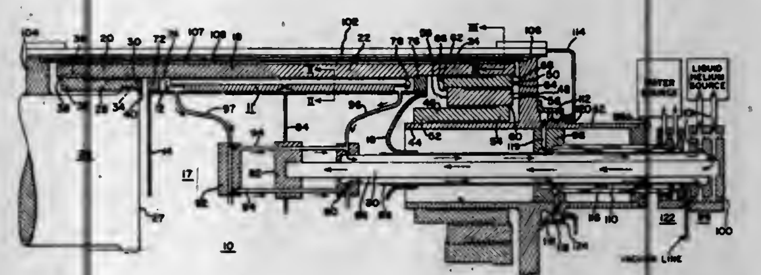
c. a support cylinder having a first end portion, a middle portion, and a second end portion, said field winding being disposed interiorly of and coaxially with said middle portion of said support cylinder in fixed relation thereto;

d. a drive shaft having a first end disposed interiorly of said first end portion of said support cylinder;

e. a carrier cylinder having a first end disposed interiorly of said second end portion of said support cylinder, said amortisseur winding fixedly securing said drive shaft to said carrier cylinder;

f. first insulating ring means for securing said support cylinder to said drive shaft, said first insulating ring means providing a circuitous heat conducting path between said first end of said drive shaft and said first end portion of said support cylinder; and,

g. second insulating ring means for mounting said support cylinder on said carrier cylinder to allow axial movement therebetween, said second insulating ring means providing a circuitous heat conducting path between said first end of said carrier cylinder and said second end portion of said support cylinder.



3,891,876
PERMANENT MAGNET ELECTRIC MOTOR HAVING A NON-FERROUS SOLID ARMATURE

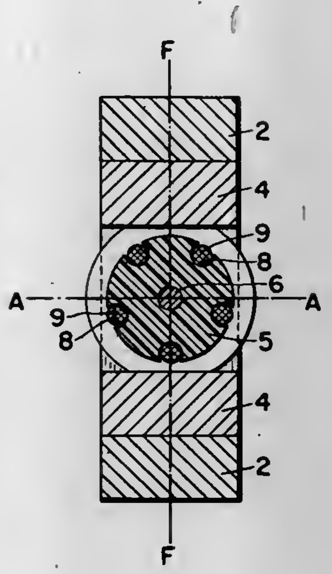
John A. Herr, Garwood, and Wolfgang Jaffe, Roselle Park, both of N.J., assignors to The Singer Company, New York, N.Y.

Continuation-in-part of Ser. No. 427,178, Dec. 21, 1973, abandoned.

This application Aug. 2, 1974, Ser. No. 494,265

Int. Cl.^{2} H02K *1/04*

U.S. Cl. 310—43 **5 Claims**



1. In an electric motor, a single solid non-magnetic cylindrical armature having commutated windings thereon, means for rotationally mounting said armature about the cylindrical axis thereof radially within a single air gap formed by peripheral permanent magnets having oppositely polarized pole faces facing the axis of said armature.

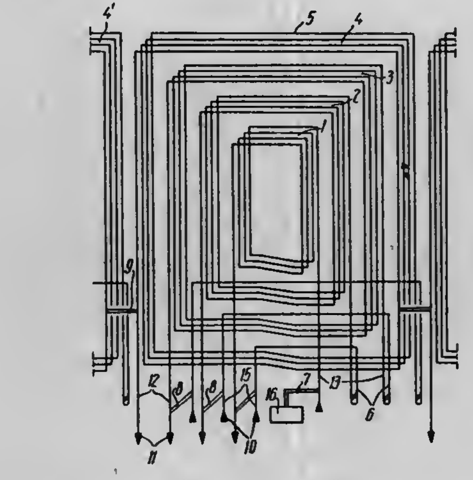
3,891,877
DIRECTLY LIQUID COOLED ROTOR WINDING FOR A NON-SALIENT POLE SYNCHRONOUS ELECTRIC MACHINE

Aron Beniaminovich Shapiro, Basseinaya ulitsa 53, kv. 70; Vladimir Pavlovich Chernyavsky, Pulkovskaya ulitsa 17, kv. 185; Ibragim Akhmedovich Kadi-Ogly, ulitsa Chaikovskoga 15, kv. 24, and Jury Grigorievich Tjurin, V.O. 8 Linia 55, kv. 1, all of Leningrad, U.S.S.R.

Filed Apr. 16, 1973, Ser. No. 351,766

Int. Cl. H02k *1/32*

U.S. Cl. 310—61 **3 Claims**



1. A directly liquid cooled rotor winding for a synchronous electric machine having non-salient poles, comprising: windings of said poles of said rotor; concentrically arranged and wound in a similar direction coils included in said winding of each one of said poles; leads of said coils, positioned to one side of said rotor and projecting beyond the coil end portion of said rotor; directly liquid cooled auxiliary U-shaped conductors arranged concentrically to each other under said face end portion of said rotor, said auxiliary conductors electrically connecting said coils in serial relationship; ends of said auxiliary connectors extending axially beyond said coil end portion in the respective sectors of the upper and of the lower ones of said leads of said coils, said auxiliary conductors being electrically connected with the respective ones of said leads either directly or through jumpers of solid cross-section, inter-pole electric connections being effected in the area of the axial portion of said coil end portion of said rotor, on the side thereof where said coil leads are positioned, with the help of at least two jumpers of solid cross-section, each one of said jumpers connecting the upper conductor adjoining the lead of the biggest coil of the respective one of said poles to the adjacent upper conductor of the biggest coil of the other one of said poles.

3,891,878
DYNAMOELECTRIC MACHINE HAVING IMPROVED LUBRICATION SYSTEM

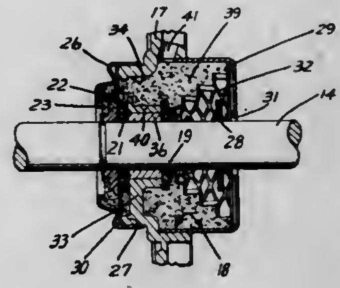
Richard W. Dochterman, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Feb. 14, 1973, Ser. No. 332,265

Int. Cl. F16c *1/24*, *33/66*, *13/02*

U.S. Cl. 310—90 **13 Claims**

1. In a dynamoelectric machine comprising a stator assembly and a rotor assembly having a shaft, said stator assembly including an end frame, a bearing supported in said end frame and a lubrication system of the type wherein lubricant flows from a lubricant reservoir to an oilwicking material in contact with the shaft for feeding lubricant to a bearing and then recirculates to the lubricant reservoir, the lubrication system comprising a lubricant reservoir, an extrudable lubricant retaining base material within at least a portion of the reservoir for storing lubricant therein and for supplying lubricant to the bearing, the improvement wherein: the lubrication system comprises means for retaining the base material within a predetermined locale in the reservoir and for promoting the recirculating movement of lubricant from the vicinity of the bearing to the base material in the predetermined locale; said means for retaining at least in part defining the predetermined locale and said means for retaining comprising a mesh basket member having a plurality of openings through which circulating lubricant may pass in one direction and through which the free passage of an extrudable lubricant retaining base material in a direction opposite to the one direction is inhibited, said basket member extending axially relative to the shaft and defining a cavity about at least a portion of the shaft.



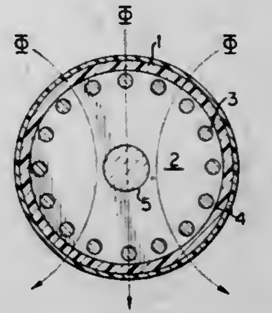
3,891,879
ROTOR FOR A HYSTERESIS MOTOR

Keiko Yamada; Kimiyuki Kamino, and Toshiro Kubota, all of Tokyo, Japan, assignors to Mitsubishi Seiko Kabushiki Kaishi, Tokyo and Kyoei Denshi Kogyo Kabushiki Kaisha, Honjyo, both of, Japan

Filed June 25, 1974, Ser. No. 483,003

Int. Cl. H02k *19/08*, *21/46*

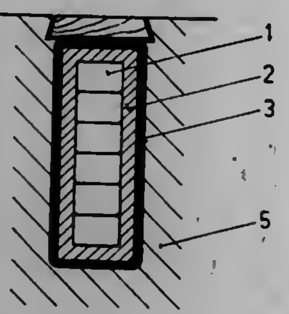
U.S. Cl. 310—163 **2 Claims**



1. A rotor for a hysteresis motor comprising a cylindrical laminated core of silicon steel plates having a cage winding, a sheet-like flexible plastic magnetic material secured to the outer periphery of said core without being magnetized and a coating of a filler adhesive fixedly secured to the outer periphery of said sheet-like flexible plastic magnetic material, said sheet-like flexible plastic magnetic material being anisotropic in the thickness direction of the sheet and having such magnetic properties as not less than 2.2 KG residual magnetic flux density Br, not less than 1.2 KOe coercive force $_{B}H_{C}$ and not less than 1.1 MGOe maximum magnetic energy product (BH)max and not greater than 4 KOe minimum intensity of magnetic field necessary for saturation Hs, said sheet-like flexible plastic magnetic material further having a knee point in its hysteresis loop located in the second quadrant of the B-H diagram, said coating of a filler adhesive comprising the powders of materials having high magnetic permeability such as iron, and synthetic resins.

3,891,880
HIGH VOLTAGE WINDING WITH PROTECTION AGAINST GLOW DISCHARGE

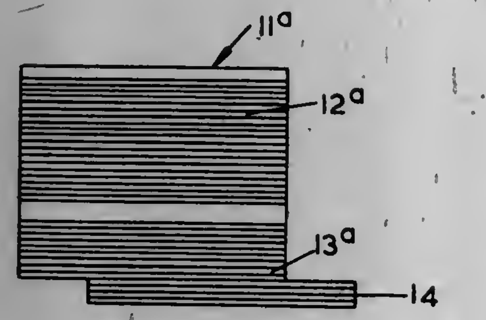
Helmut Britsch, Gebenstorf, Switzerland, assignor to BBC Brown Boveri & Company, Baden, Switzerland
Filed May 18, 1973, Ser. No. 361,648
Claims priority, application Switzerland, June 16, 1972, 8938/72
Int. Cl. H02k *3/40*
U.S. Cl. 310—196 **13 Claims**



1. An insulated high-voltage winding installed in the slots of the stator component of an electrical machine and wherein external glow-protection means are provided between the insulation on said winding and the slotted portion of said stator, said external glow-protection means being constituted by a wound-on impregnatable woven tape of an electrically semi-conductive material covering the entire surface of said winding insulation, the warp threads of said woven tape consisting of a pre-stretched non-heat set and heat contractible filamentary material having an organic polymeric structure and the weft threads thereof consisting of dimensionally stable filaments.

3,891,881
MAGNETIC POLES

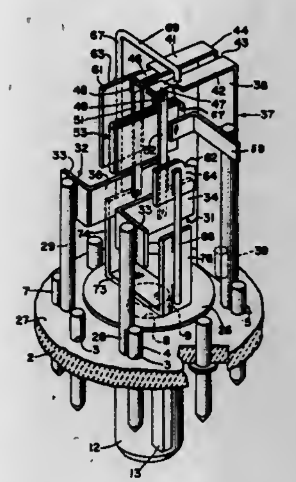
John Derek Harris, and Francis Roy Wood, both of Solihull, England, assignors to The Lucas Electrical Company Ltd., Birmingham, England
Continuation of Ser. No. 356,058, April 30, 1973, abandoned. This application Oct. 31, 1974, Ser. No. 519,543
Claims priority, application United Kingdom, May 3, 1972, 20679/72
Int. Cl. H02k *1/14*
U.S. Cl. 310—218 **4 Claims**



1. A magnetic pole assembly comprising:
a pair of magnetic poles;
a magnetic yoke assembly interconnecting said poles;
an electromagnet winding through which an electric current is passed to generate a flow of magnetic flux in the magnetic pole assembly;
each of said poles being constructed of a single strip of magnetic material bent back and forth upon itself so that successive convolutions are interconnected to each other at opposite ends to define a stack of convolutions in face to face contact;
each of said poles being attached to said yoke assembly in such a manner that flux traveling from the yoke through the poles or vice versa travels substantially perpendicular to the plane of the convolutions of said poles.

3,891,882
IONIZATION GAUGE

Anthony J. Barraco, 5499 Blossom Tree Ln., San Jose, Calif. 95124
Filed Jan. 3, 1974, Ser. No. 430,598
Int. Cl. H01j *7/16*
U.S. Cl. 313—7 **15 Claims**

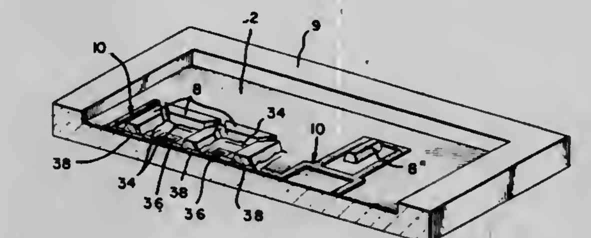


13. In a thermionic ionization gauge for measuring vacuum pressures in the order of 10^{-6} Torr, the combination comprising:
a. at least one elongated filament mounted so that any thermal elongation thereof is accomodated so as to prevent lateral displacement of any part of the filament;
b. an electron collector mounted in spaced relationship with said elongated filament whereby thermal expansion of the electron collector occurs in a direction which does not alter the spaced relationship thereof with the associated filament;
c. at least one ion collector mounted in spaced relationship with said elongated filament on the side thereof opposite said electron collector, the width of said ion collector being orders of magnitude greater than the width of said filament, and the length of said ion collector being almost as long as said filament; and
d. means physically joining and electrically isolating said filament, electron collector and ion collector so that separate electrical potentials may be selectively applied thereto.

3,891,883
DISCHARGE DISPLAY PANEL INCLUDING A SUBSTRATE SUPPORTING PLURAL CATHODES AND RECESSED ANODES

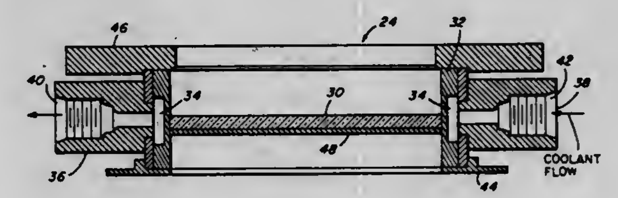
Abbas Mesbahuddin Ahmed, Beauford Manor, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Continuation-in-part of Ser. No. 300,631, Oct. 25, 1972, Pat. No. 3,818,556. This application May 9, 1974, Ser. No. 468,356
Int. Cl.² H01J *17/32, 61/12*
U.S. Cl. 313—54 **4 Claims**

1. A glow discharge readout device, comprising: a fusible ceramic substrate, portions of the substrate forming elevated platforms, the platforms receiving cathodes therein arranged in a desired pattern, contact pins imbedded in said substrate and in contact with corresponding cathodes, anodes affixed to the substrate and generally recessed with respect to said cathodes, additional contact pins imbedded in said substrate and in contact with corresponding anodes, said anodes and cathodes being encapsulated in a transparent sealed envelope filled with an illuminating gas, and upon impressing an electrical potential between said anodes and selected cathodes, electrons will be caused to flow from said selected cathodes in a direction focused toward said relatively recessed anodes and toward the surface of the substrate and away from said transparent sealed envelope, thereby preventing discoloration of said transparent envelope by electron collision therewith, portions of said anodes being encircled by selected cathodes, said encircled portions of said anodes being interconnected by bridging anode portions imbedded in and extending beneath said elevated platforms on which said selected cathodes are located.



3,891,884
ELECTRON DISCHARGE DEVICE HAVING ELECTRON MULTIPACTOR SUPPRESSION COATING ON WINDOW BODY

Lawrence H. Tisdale, Wakefield, Mass., assignor to Raytheon Company, Lexington, Mass.
Division of Ser. No. 266,020, June 26, 1972, abandoned. This application Dec. 17, 1973, Ser. No. 425,435
Int. Cl. H01j *43/28;* **H01p** *1/08*
U.S. Cl. 313—107 **2 Claims**

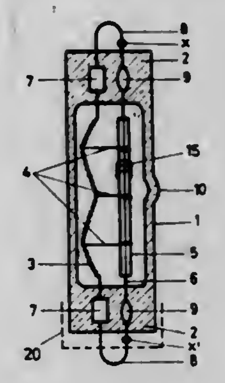


1. An electron discharge device comprising:
an evacuated envelope having an access opening for propagating electromagnetic energy;
a body of a dielectric material sealing said access opening;
a coating of a semiconducting oxide material of a transition metal having a thickness averaging about 1,000 Angstrom units on the surface of said dielectric body exposed to the vacuum to suppress electron multipactoring.

3,891,885
HALOGEN INCANDESCENT LAMP

Ewald Wurster, Grunwald, Germany, assignor to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH, Munich, Germany
Filed Jan. 16, 1974, Ser. No. 433,726
Claims priority, application Germany, Feb. 7, 1973, 2305960
Int. Cl.² H01R *1/24, 1/54*
U.S. Cl. 313—178 **11 Claims**

1. In a halogen incandescent lamp comprising a tubular envelope (1) closed at each end by a press stem (2) with foil seals (7), each, a double-coiled tungsten filament (3), a gettering substance (15) inside the envelope and means (5, 11) supporting the filament inside the envelope,
wherein the filament extends transversely across the tubular envelope, from one end of the press stem (2) to the other; the filament support means comprises a support tube (5, 11) of fused silica secured to at least one of the press stems (2) and located inside the envelope, and a plurality of support wires (4) secured in torsion-resistant manner to the silica tube, the support wires being spaced from each other along the length of the tube and having, alternatingly, different lengths, the support wires supporting the filament extending between said press stems in zig-zag position in the lamp envelope.



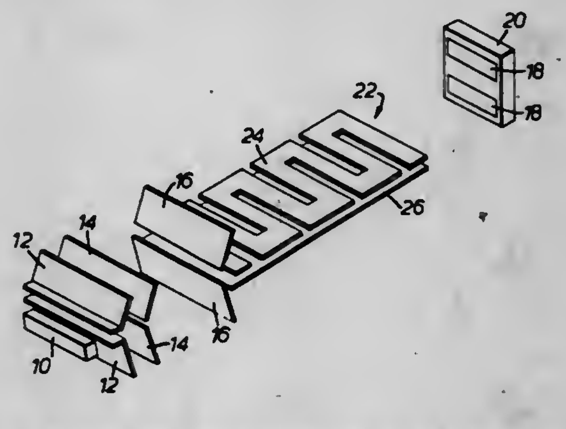
3,891,886
CATHODE RAY TUBE HAVING A LUMINESCENT SCREEN INCLUDING A TWO COMPONENT WHITE-EMITTING PHOSPHORIC MIXTURE

Leo Woontner, Marion, Ind., assignor to RCA Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 811,532, March 28, 1969. This application Mar. 10, 1971, Ser. No. 122,720
Int. Cl. H01j *29/20;* **C09k** *1/04*
U.S. Cl. 313—467 **5 Claims**

1. A cathode-ray tube comprising an evacuated envelope, a luminescent screen within said envelope and electron-producing means for exciting said screen to luminescence within said envelope, said luminescent screen including at least one white-emitting area consisting essentially of a mixture of:
a. 54 to 58 weight percent of a blue-emitting silver-activated zinc sulfide phosphor containing between 0.010 and 0.030 weight percent silver and
b. 46 to 42 weight percent of a yellow-emitting copper-and-aluminum-activated zinc cadmium sulfide phosphor having the composition $m\text{ZnS}.n\text{CdS:Cu}(o),\text{Al}(p)$ wherein: m is between 0.83 and 0.88 parts by weight, n is between 0.12 and 0.17 parts by weight, m plus n equals 1.0, o is between 0.001 and 0.009 weight percent and p is not less than o.

3,891,887
SEMICONDUCTOR DEVICES

David Edward Barry, Braintree, and Peter Edward Steigmann, Heybridge, both of England, assignors to English Electric Valve Company Limited, Chelmsford, England
Filed Oct. 3, 1973, Ser. No. 403,043
Int. Cl. H01j *23/16, 27/96*
U.S. Cl. 315—3 **3 Claims**



1. In a vacuum tube such as an electron beam semiconductor amplifier including a semiconductor crystal having a p-n junction target area adapted to be bombarded with electrons, an electron beam source spaced from said target area and adapted to generate a beam of electrons of sufficient intensity

as to give off x-rays incidental to bombardment of the target area with such beam of electrons, and a deflection system between said source and said target area to deflect said electron beam to bombard said target area, and an oxide insulation layer on the crystal, the interface between the semiconductor material of the crystal and the oxide insulation layer being sensitive to x-rays, the improvement wherein said crystal includes a planar surface, the oxide insulation layer being formed on said planar surface to define a planar x-ray sensitive interface and said p-n junction being formed at said planar surface to define a planar target area spaced from said x-ray sensitive interface, and a barrier of x-ray absorbent material is provided in a direct line between the interface defining said target area and the x-ray sensitive interface.

3,891,888
ROAD VEHICLE LIGHTING SYSTEMS

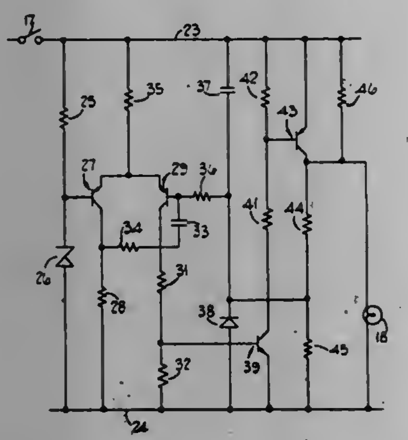
John Peter Southgate, Sutton Coldfield, England, assignor to The Lucas Electrical Company Ltd., Birmingham, England

Filed Mar. 25, 1974, Ser. No. 454,380

Claims priority, application United Kingdom, May 19, 1973, 23963/73

Int. Cl. H01j *29/00*

U.S. Cl. 315—82 **6 Claims**



1. A road vehicle lighting system including at least one tungsten-halogen lamp having a rated operating voltage range and a regulator connected with the lamp for maintaining the voltage across the lamp within said operating voltage range of the lamp, said regulator including a transistor in series with the lamp, said transistor including a base, collector and emitter, and means for switching the transistor on and off to regulate the voltage across the lamp, and a resistor connected across the collector-emitter of the transistor.

3,891,889
COLOR CONVERGENCE APPARATUS FOR A COLOR TELEVISION TUBE

James Anthony Fazio, Liverpool, N.Y., assignor to The Singer Company, New York, N.Y.

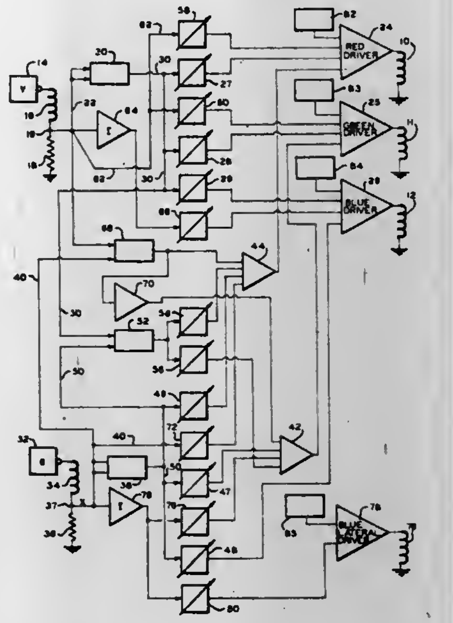
Continuation of Ser. No. 287,523, Sept. 8, 1972, which is a continuation-in-part of Ser. No. 138,492, April 29, 1971, abandoned. This application Feb. 6, 1974, Ser. No. 440,111

Int. Cl. H01j *29/70*

U.S. Cl. 315—368 **7 Claims**

1. Apparatus for providing convergence of the three beams from three electron guns, respectively, in a tri-color TV tube of the shadow mask type, the guns being disposed along a circle radially from an axis extending between the center of the screen and the base of the tube, deflection of the three beams on the screen of the tube being responsive to both periodic currents and non-periodic currents provided to the horizontal and vertical coils of a deflection yoke around the neck of the tube, said tube also having a convergence yoke comprised of at least three convergence coils respectively corresponding to said guns, for providing additional deflection to each of said respective guns in response to convergence currents provided to each convergence coil comprising:

- first and second sensing means connected to the horizontal and vertical deflection coils respectively for providing horizontal and vertical signals proportional to the horizontal and vertical deflection currents, including providing said horizontal and vertical signals when said deflection currents are periodic and when said deflection currents are non-periodic;
- first and second multiplying means connected to said first and second sensing means respectively, said first multiplying means being responsive to said horizontal signal and providing a first output signal proportional to the square of said horizontal signal, including providing said first signal when said horizontal signal is representative of a periodic signal and when said horizontal signal is representative of a non-periodic signal, said second multiplying means being responsive to said vertical signal and providing a second output signal proportional to the square of said vertical signal, including providing said second signal when said vertical signal is representative of a periodic signal and when said vertical signal is representative of a non-periodic signal;
- signal attenuating means connected to said horizontal, vertical, first and second signals for providing a plurality of selectively attenuated signals, including at least one attenuated signal for each of said horizontal, vertical, first and second signals; and
- first, second and third combining means, each responsive to selected ones of said attenuated signals and each providing a convergence current representative of a combination of said attenuated signals to one of the convergence coils for providing convergence to the beams of the three electron guns when said beams are deflected in response to periodic currents and when said beams are deflected in response to non-periodic currents.



3,891,890
LIGHT PEN POSITION DETECTOR FOR COLOR DISPLAY DEVICE

Isao Yasuda, and Akira Osawa, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

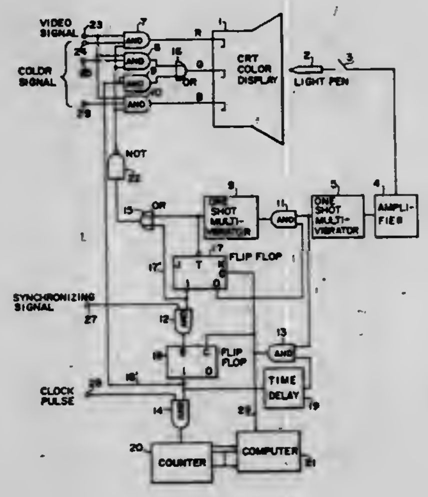
Filed Aug. 3, 1973, Ser. No. 385,335

Claims priority, application Japan, Aug. 7, 1972, 47-78381

Int. Cl. G06k *15/20*

U.S. Cl. 315—365 **11 Claims**

7. In a color display device for displaying in color a desired pattern on the screen of a cathode-ray tube, an apparatus for detecting a given position on said screen of said cathode-ray tube indicated by a light pen comprising means for stopping the display on said screen of said cathode-ray tube in response to a light detection signal from said light pen indicating a given position on said screen of said cathode-ray tube, means for detecting the lapse of time *t* following the stoppage of the display on said screen of said cathode-ray tube, means for starting a monochromatic scanning following the lapse of time *t*, and counter means to start its counting operation simultaneously with the starting of the monochromatic scanning, the counting operation being stopped by a light detection signal from said light pen.



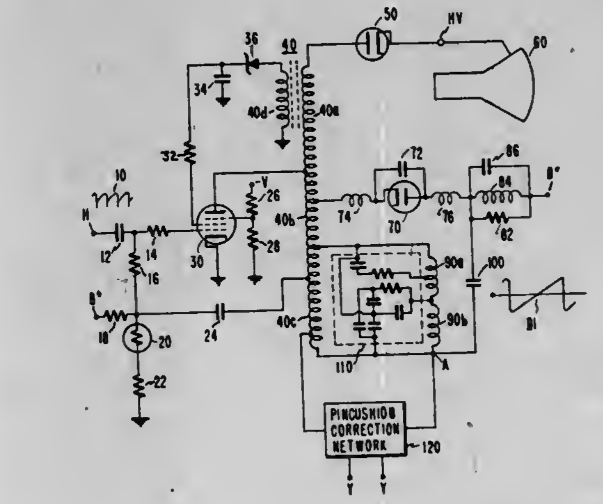
3,891,891
HIGH VOLTAGE PROTECTION CIRCUIT

John Stark, Jr., Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 31, 1974, Ser. No. 438,324

Int. Cl. H01j *29/70*

U.S. Cl. 315—379 **10 Claims**



1. A high voltage protection system for controlling a generated high voltage supplied to a kinescope, comprising:

- means for producing a viewable display on said kinescope including a controlled current conducting device having at least a first control electrode;
- means coupled to said means for producing a viewable display for having alternating current voltage variations excited therein in response to the conduction of said controlled current conducting device, said voltage variations determining said generated high voltage; and
- means, including a rectifying and regulating device and filtering and storage means, coupled to said means for having voltage variations excited therein and to said first control electrode of said controlled current conducting device, for rectifying an alternating current voltage derived from said means for having voltage variations excited therein when said rectifying and regulating device is forward biased and for filtering and storing said rectified voltage for providing direct current voltage to said first control electrode which provides for conduction of said controlled current conducting device, said rectifying and regulating device conducting in a reverse direction when the difference between said stored voltage and said alternating current voltage exceeds a predetermined value for regulating said direct current voltage supplied to said control electrode of said controlled current conducting device for controlling said generated high voltage.

3,891,892
START-UP CONTROL CIRCUIT FOR SCR DEFLECTION

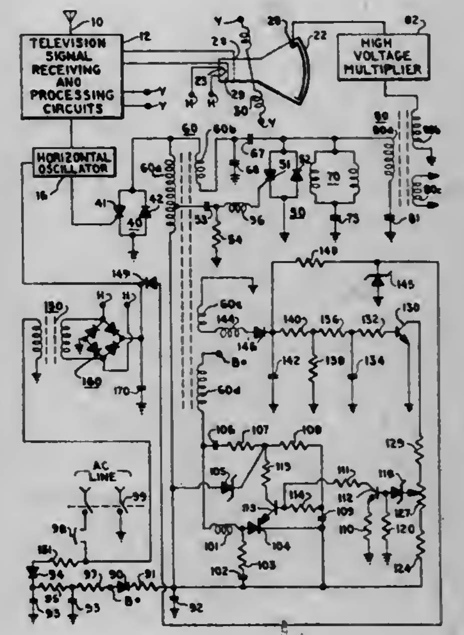
Walter Bohringer, Schlieren, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Dec. 4, 1973, Ser. No. 421,704

Claims priority, application Switzerland, Sept. 12, 1973, 42812/73

Int. Cl. H01j *29/70*

U.S. Cl. 315—411 **9 Claims**



1. A boost voltage delay system for switching loss protection in a deflection system comprising:

- a deflection winding;
- a source of direct current voltage;
- inductive means coupled to said direct current voltage source;
- first and second deflection switching means coupled to each other and to said inductive means and said deflection winding, said first switching means operative from a first to a second state for providing a current path through said inductive means for a portion of each deflection cycle;
- controllable voltage generating and rectifying means coupled to said direct current voltage supply and to said inductive means for generating, rectifying and adding boost voltage to said direct current voltage is response to said flow of current through said inductive means; and
- boost voltage delaying means including rectifying means coupled to said inductive means and to said controllable voltage generating and rectifying means for generating signals in response to said flow of current through said inductive means and for rectifying said signals in said rectifying means for supplying a delayed control voltage for said controllable voltage generating and rectifying means for delaying the supply of said rectified boost voltage to said first switching means.

3,891,893
HIGH-VOLTAGE POWER SWITCH

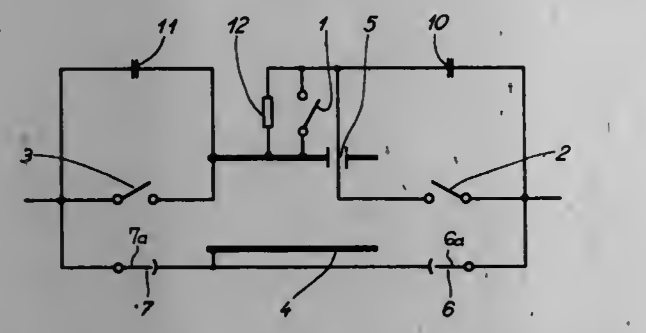
Richard Thaler, Uterentfelden, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland

Filed May 24, 1974, Ser. No. 473,323

Claims priority, application Switzerland, May 28, 1973, 7625/73

Int. Cl. H02h *7/22*

U.S. Cl. 317—11 A **5 Claims**



5. A high-voltage power switch arrangement composed of at least two power switching locations comprising at least one oil-poor switch and at least one gas-blast switch, said oil-poor switch having an arc extinguishing compartment, a pressure-stroke transducer cooperating with said arc extinguishing compartment, said pressure-stroke transducer including a component which carries out the stroke movement, a pump device provided for the gas-blast switch, said component of the pressure-stroke transducer being operatively connected with said pump device of the gas-blast switch in order to be able to use, during the cut-off operation, the current-dependent pressure energy which prevails in the arc extinguishing compartment of the oil-poor switch for the actuation of the gas-blast switch.

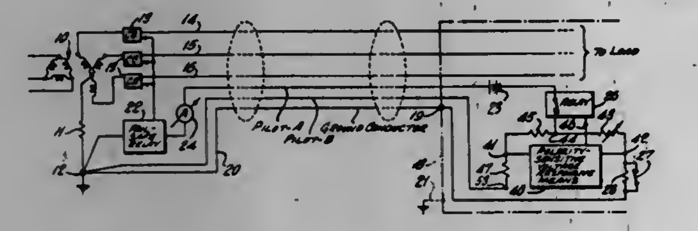
3,891,894
MEANS FOR MONITORING THE SAFETY OF A REMOTE ELECTRICAL GROUND CONNECTION

Leopoldo Scarpino, Indianapolis, Ind., assignor to Amax Inc., New York, N.Y.

Continuation-in-part of Ser. No. 358,468, May 9, 1973. This application July 16, 1973, Ser. No. 379,243

Int. Cl. H02h *3/16*

U.S. Cl. 317—18 C **30 Claims**



1. Elongate transmission-line means having a source-connection end and a remote load-connection end and comprising power-conductor means, a ground conductor and at least two pilot conductors; a d-c conducting connection of said two pilot conductors at the source-connection end; a d-c conducting connection of said two pilot conductors at the load-connection end; thereby establishing separate d-c conducting paths through the respective pilot conductors; means for impressing a d-c potential across the full length of said ground conductor, said last-mentioned means including a d-c source in one of said paths and a circuit connection of said one path and said ground conductor at the load-connection ends thereof; and d-c responsive resistance-monitoring means at the load-connection end and including a reference connection to the source-connection end of said ground conductor via the other of said paths, said resistance-monitoring means being also connected to the load-connection end of said ground conductor and thus tracking the instantaneous effective resistance between the source-connection and load-connection ends thereof.

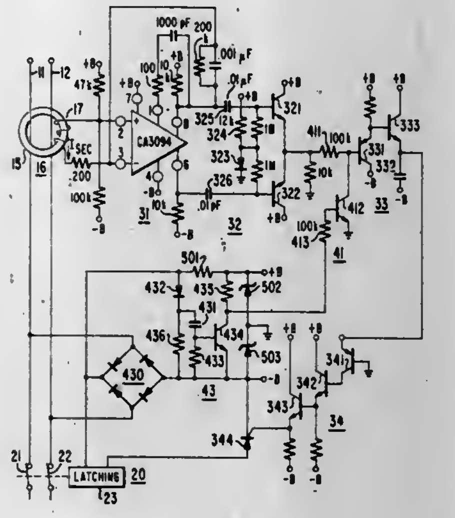
3,891,895
GROUND FAULT DETECTION

Harold Allen Wittlinger, Pennington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 15, 1974, Ser. No. 461,226

Int. Cl. H02h *3/28*

U.S. Cl. 317—18 D **16 Claims**



1. Ground-fault detection apparatus for use with a plurality of a-c power line conductors comprising:

a differential transformer having a plurality of primary windings and a secondary winding, each of said primary windings being arranged for inclusion in one of said a-c power line conductors so that in the absence of a ground fault in any of said power line conductors substantially no a-c signal current will be induced in said secondary winding and during the occurrence of such ground fault a relatively substantial a-c signal current will be induced in said secondary winding;

a detector responsive to peaks of the potential between a pair of said primary windings to produce a set of control pulses;

a rectifier;

a transmission gate having a controlled transmission path responsive to said control pulses which control pulses render the otherwise relatively non-conductive said transmission path relatively conductive; and

an amplitude detector, having an input circuit intermittently coupled to said secondary winding by means of a cascade connection of said rectifier and said transmission gate, and having an output circuit from which indications of resistive ground faults are supplied.

3,891,896
VACUUM CIRCUIT INTERRUPTER

Jan Christiaan Clason, Hengelo, Netherlands, assignor to Hazemeijer B.V., Hengelo, Netherlands

Filed Jan. 29, 1974, Ser. No. 437,646

Claims priority, application Netherlands, Jan. 30, 1973, 7301313

Int. Cl. H02h *7/22*

U.S. Cl. 317—58 **3 Claims**

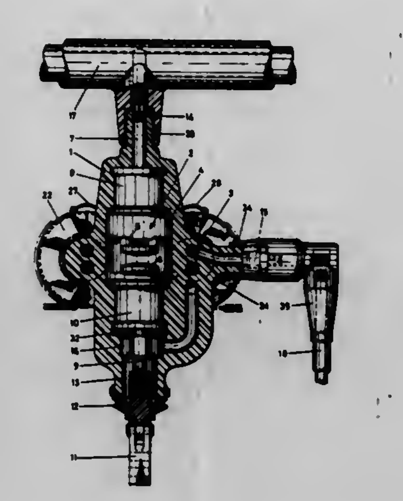
1. Vacuum circuit interrupter and current transformer switching apparatus comprising:

a hermetically sealed evacuated housing including two contact members;

a first contact rod mounted immovably along the longitudinal axis of said housing and extending in sealing relationship to the exterior of said housing;

a second contact rod mounted to be movable along the longitudinal axis of said housing and extending to the exterior of said housing through a sealing electric insulator and bellows;

a first contact member supported by said first contact rod; a second contact member movably supported by said second contact rod; and



a coil wound around said first and second contact members coaxially with respect to said first and second contact rods, one end of said coil being electrically connected in series to one of said contact rods and the other end of said coil being connected to a plug terminal within said housing, whereby the current flow through said coil generates a magnetic field at said two contact members along the longitudinal axis of said housing, said coil being embedded in an insulating material and forming a primary winding of at least one current transformer.

3,891,897
VOLTAGE OVERLOAD ARRESTER FOR HIGH-VOLTAGE SWITCHING SYSTEMS

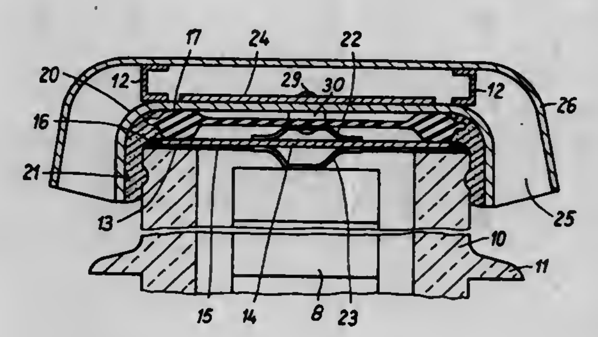
Werner Jakszt, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 17, 1973, Ser. No. 397,921

Claims priority, application Germany, Sept. 27, 1972, 2247997

Int. Cl. H02h *3/22*

U.S. Cl. 317—62 **3 Claims**



1. In a high-voltage switching system voltage overload arrester, of the type including a metallic arrester housing containing a gaseous insulating medium, spark gaps and voltage dependent current discharge resistors coupled in series thereto, and an electrically nonconductive housing, containing another gaseous insulating medium, disposed within the arrester housing, in which the spark gaps and resistors are disposed, the improvement comprising a diaphragm comprising a layer of electrically conductive metallic material, electrically coupled to said arrester housing and discharge resistors, and disposed over at least one end of said nonconductive housing and fastened thereto about the periphery of said diaphragm by a metallic gas-impermeable solder joint, said solder joint comprising a layer of metallic material fastened to an end face of said nonconductive housing and solder material joining said diaphragm to said layer of metallic material; a rubber seal engaging said diaphragm; and a metallic cap, disposed over the endface of said nonconductive housing and secured thereto by a cement joint, and spaced apart from said diaphragm by said rubber seal.

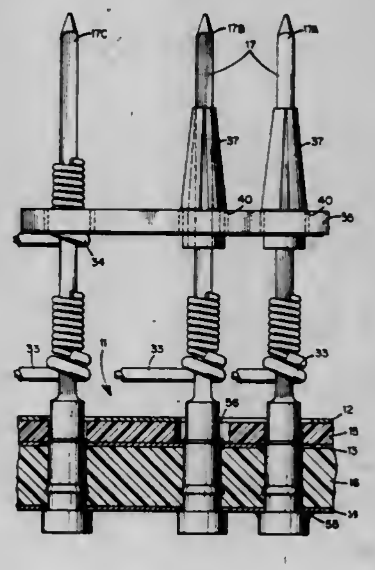
3,891,898
PANEL BOARD MOUNTING AND INTERCONNECTION SYSTEM FOR ELECTRONIC LOGIC CIRCUITRY

Neil F. Damon, Cumberland, R.I., assignor to Augat, Inc., Attleboro, Mass.

Filed Oct. 11, 1973, Ser. No. 405,500

Int. Cl. H05k *1/04*

U.S. Cl. 317—101 CC **8 Claims**



1. A mounting and interconnection system for electronic logic circuitry, said system comprising:

a dielectric panel board;

a first conductive layer on a first side of said panel board; a second conductive layer on the second side of said panel board;

a plurality of arrays of elongated pins mounted in said panel board and projecting substantially perpendicularly from said first side of said board, said elongated pins being wire wrapping pins, some of which have at least one interconnecting wire wrapped around it at the first wire wrapping level adjacent said board, some of said elongated pins having two interconnecting wires wrapped therearound, the second wrapping being located at the second wire wrapping level adjacent the first wire wrapping and spaced from the distal end of said pins;

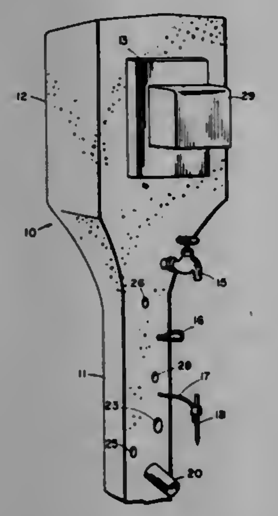
an electronic interconnection element comprising printed circuitry mounted to dielectric material and having a plurality of holes therethrough to receive all the pins of one of said arrays, said printed circuitry being formed to selectively interconnect said holes, said electronic interconnection element comprising a flat dielectric substrate having a configuration substantially similar to the outline shape of one of said arrays, said holes in said substrate being of sufficient size to accomodate one of said pins and the coil of wire wrapped around it; and

a plurality of contact members mounted in selected ones of said holes in said substrate, said contact members being configured to engage said pins, said selected holes in said substrate having contact members mounted therein corresponding to ones of said pins having less than two interconnecting wires wrapped therearound, the remaining holes in said substrate corresponding to said elongated pins having at least two interconnecting wires wrapped therearound;

wherein said substrate is mounted to said array of pins in a position substantially parallel to said panel board, said pins projecting through said substrate and said contact members.

3,891,899
CONCRETE UTILITY POST WITH METER, GAS LINE AND WATER LINE

Donald F. Sparling, P.O. Box 2294, Delray Beach, Fla. 33444
Division of Ser. No. 163,919, July 19, 1971, abandoned. This application June 26, 1973, Ser. No. 373,641
Int. Cl. H02b *9/00*
U.S. Cl. 317—105 **4 Claims**

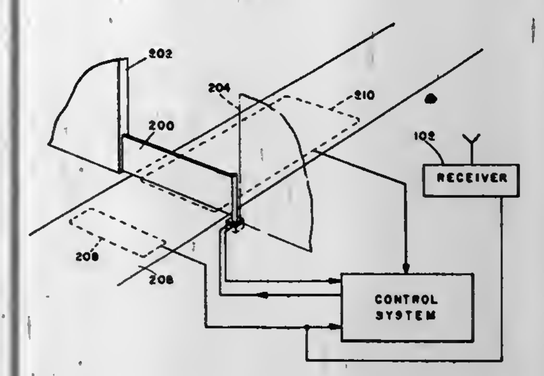


1. A precast concrete utilities post apparatus having a reinforced elongated concrete post with two end portions, one said end portion being larger than the other said end portion, a meter box and a power box found in said large portion of said concrete post, said meter box having an opening from one side of said post and said power box having an opening from a second side of said post and having conduit connected to said meter box passing through a portion of said post, said meter box and said power box being operatively connected to each other; a water line located in said elongated concrete post, said water line having a tapped output from said elongated post; and an electrical ground wire electrically connecting said meter and power boxes from said elongated concrete post for insertion into the earth for grounding said meter and power boxes.

3,891,900
CONTROL SYSTEM FOR VEHICLE GATES

Terry B. Gallant, San Diego, Calif., assignor to Automation General, San Diego, Calif.
Filed Dec. 7, 1973, Ser. No. 422,853
Int. Cl. H01h *47/14*
U.S. Cl. 317—139 **11 Claims**

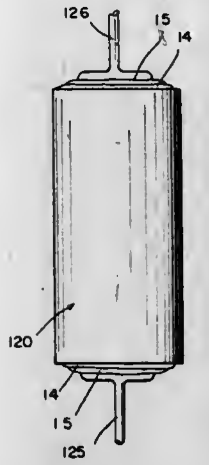
1. A control system for motor driven gates comprising:
- a gate close timer,
- a gate open relay,
- a gate close relay,
- a single signal control input means for selectively closing and latching said gate open relay, and charging said gate close timer,
- open limit switch responsive means for unlatching said gate open relay and for starting the cycle of said timer,



- timer responsive means for closing and latching said gate close relay.

3,891,901
CAPACITORS WITH SPRAYED ELECTRODE TERMINALS

James M. Booe, and Lawrence A. Landry, both of Indianapolis, Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.
Continuation of Ser. No. 13,688, Feb. 24, 1970, abandoned, which is a continuation-in-part of Ser. No. 732,928, May 29, 1968, abandoned. This application Aug. 5, 1971, Ser. No. 169,554
Int. Cl. H01g *1/14*
U.S. Cl. 317—258 **24 Claims**

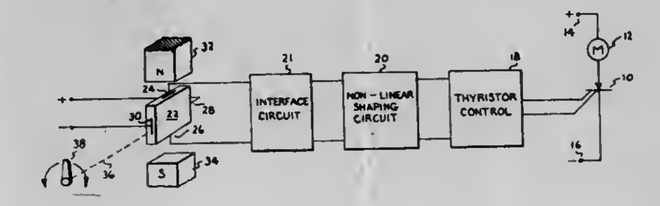


1. A capacitor comprising:
- at least two adjacent, spaced apart, first and second metal electrodes;
- at least one separating dielectric layer in contact with at least a portion of said electrodes;
- said layer having a first extension beyond a first edge of said first electrode to define, at the edge of said first extension, a first separator surface;
- said second electrode extending to said first separator surface, but having essentially no protrusion beyond said first separator surface, thereby defining a first electrode surface;
- a dielectric material covering said first edge of said first electrode and filling any void space between the first edge of said first electrode and said first separator;
- said separator layer having a second extension beyond a first edge of said second electrode to define at the edge of said second extension, a second separator surface;
- said first electrode extending to said second separator surface but having essentially no protrusion beyond said second separator surface, thereby defining a second electrode surface;
- a dielectric material covering said first edge of said second electrode and filling any void space between the first edge of said second electrode and said second separator surface;

- a first deposit of nickel-aluminum material consisting essentially of about 50 to 98 weight percent nickel, weld-bonded to said first electrode surface to provide a terminal; and
- a second deposit of nickel-aluminum material consisting essentially of about 50 to 98 weight percent nickel, weld-bonded to said second electrode surface to provide a terminal; the terminal to electrode bond strength being at least about 300 psi.

3,891,902
SPEED CONTROL UNIT FOR ELECTRIC VEHICLES

Charles Edward Konrad, Roanoke, Va., assignor to General Electric Company, Salem, Va.
Filed Dec. 3, 1973, Ser. No. 420,889
Int. Cl.² H02P *5/16*
U.S. Cl. 318—139 **5 Claims**

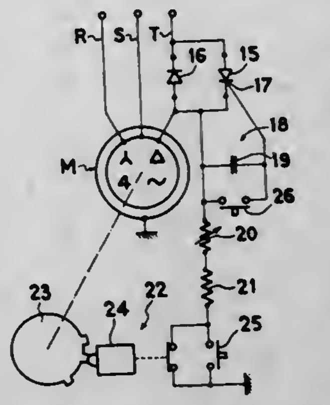


1. Speed controlling means for a vehicle powered by an electric traction motor coupled to a source of d.c. potential comprising:
- magnetic means for producing a magnetic field in a predetermined location;
- Hall effect means disposed in the field produced by said magnetic means;
- a first pair of electrodes coupled to the Hall effect means for providing a current path to a source of d.c. potential;
- a second pair of electrodes coupled to said Hall effect means for receiving an output voltage which varies as a function of position of said Hall effect means;
- manually operable means for rotating said Hall effect means with respect to said magnetic means;
- a thyristor for coupling the d.c. traction motor to the d.c. source;
- thyristor control means for varying the mark-space ratio of the thyristor as a function of an applied control voltage; and
- a shaping circuit for producing an output voltage whose rate of change increases with an increasing input voltage for coupling said second pair of electrodes to said thyristor control means.

3,891,903
DEVICE FOR AUTOMATICALLY STARTING AND STOPPING AN ASYNCHRONOUS MOTOR

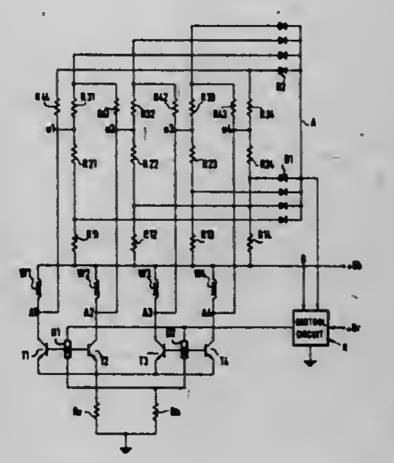
Gabriel Selam, 161 Boulevard Edouard Vaillant, 93 Aubervilliers, France
Filed Oct. 10, 1973, Ser. No. 405,109
Claims priority, application France, Oct. 10, 1972, 72.35817
Int. Cl. H02p *3/20*
U.S. Cl. 318—212 **10 Claims**

1. A device for automatically starting and stopping an asynchronous motor having supply phases, said device comprising a variable impedance connected in series in at least one of the supply phases of the motor and means associated with said impedance and responsive to the speed of said motor for automatically decreasing the value thereof as the speed of said motor increases during its starting period and for automatically increasing the value of said impedance as the speed of said motor decreases during its stopping period so as to produce a disequilibrium in the supply of the motor by varying the voltage applied to said at least one phase.



3,891,904
METHODS AND CIRCUIT ARRANGEMENTS FOR SMOOTHING PULSATING VOLTAGES

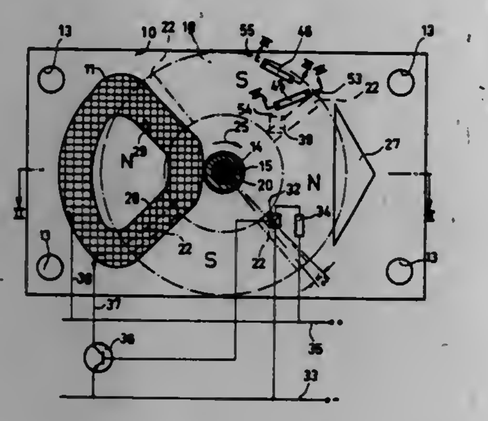
Werner Pollmeier, Verl, Germany, assignor to Nixdorf Computer AG, Paderborn, Germany
Filed Nov. 23, 1973, Ser. No. 418,237
Claims priority, application Germany, Nov. 24, 1972, 2257713
Int. Cl. H02k *29/00*
U.S. Cl. 318—254 **13 Claims**



6. An apparatus for smoothing pulsating voltages, comprising:
- means defining a source of more than two independent and phase shifted alternating voltage components having generally equal peak-to-peak values and having a difference in phase less than 180° between adjacent phase components;
- means for limiting the peak value of each of said independent alternating voltage components and producing limited values of said independent alternating voltage components;
- means for combining the phase adjacent components of said independent alternating voltage components in pairs and producing alternating summation values; and
- means for rectifying and summing said limited values of said phase adjacent independent alternating voltage components and said alternating summation values, whereby twice as many alternating voltage components are summed at said summing means as come from said source means so that the amount of ripple in a total rectified voltage component from said summing means is minimized.

3,891,905
BRUSHLESS D-C MOTOR

Rolf Müller, St. Georgen, Germany, assignor to Papst-Motoren KG, St. Georgen, Germany
Filed Nov. 27, 1973, Ser. No. 419,416
Claims priority, application Germany, Dec. 8, 1972, 2260069
Int. Cl. Ho2p *5/06*
U.S. Cl. 318—254 **36 Claims**



1. Brushless d-c motor having a stator, an essentially cylindrical permanent magnet rotor (26), a substantially cylindrical air gap between the stator and the rotor, a winding (126; 215, 216) on the stator, transducer means (127; 202) located in fixed relation to the stator, and responsive to the angular position of the rotor and providing an output signal if the rotor has a predetermined relative position with respect to the transducer means, and semiconductor switching means (36; 245, 246) connected to and controlled by said transducer means and controlling intermittent current flow through the stator winding to provide a pulsed drive torque (M_{el}; M_{215}, M_{216}) to the rotor

wherein the improvement comprises

the substantially cylindrical air gap (133, 134; 230, 231) between the stator and the rotor having nonuniform radial dimension at different circumferential locations to generate an alternating reluctance torque upon rotation of the permanent magnet rotor;

permanent magnet means (137, 138; 226, 227) located on the stator comprising at least one permanent magnet located on a stator pole face, facing the air gap;

said permanent magnet means and said air gap of nonuniform radial dimension being located, shaped, and dimensioned with respect to each other as well as with respect to the magnetic field generated by said winding to provide, upon interaction with the permanent magnet rotor, a torque component (79; FIG. 18-d) which is added to the pulsed drive torque generated by the winding to provide an overall torque (M_{ges}) to the rotor which is essentially uniform during the entire revolution of the rotor.

3,891,906
VOLTAGE AMPLITUDE CONTROLLED REVERSING D.C. POWER CIRCUIT

Elester M. Crist, 3924 Anastasia St., San Diego, Calif. 92111
Filed Apr. 22, 1974, Ser. No. 462,664
Int. Cl.^{2} H02P *7/06;* **H02P** *7/68*
U.S. Cl. 318—257 **10 Claims**

1. Voltage amplitude controlled reversing D.C. power circuit comprising:

a source of electrical power having a regularly pulsating voltage amplitude,

regulation means connected to said source of electrical power for passing D.C. power exceeding a predetermined voltage amplitude,

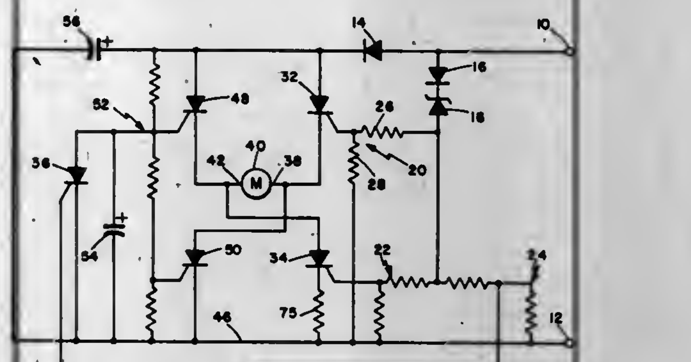
a polarity sensitive D.C. power utilization device having first and second input-output terminals,

first electronic switch means for connecting said first input-output terminal to said source of electrical power,

second electronic switch means for connecting said second input-output terminal to said source of electrical power,

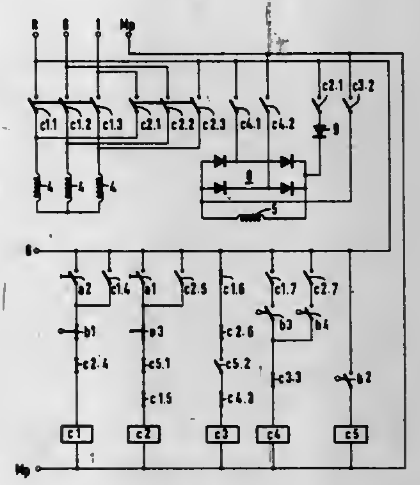
first switch operator means connected to said regulation means for turning on said first electronic switch means and turning off and holding off said second electronic switch means in response to said regulation means passing electrical power above a predetermined voltage level,

second switch operator means connected to said source of electrical power for turning on said second electronic switch means in response to voltage levels below said predetermined voltage amplitude.



3,891,907
ACTUATING MECHANISM FOR SLIDING DOORS

Dieter Lenzkes, Erlangen, and Karl-Heinz Seiler, Salz, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed Nov. 8, 1973, Ser. No. 413,956
Claims priority, application Germany, Nov. 14, 1972, 2255780
Int. Cl. H02p *3/00*
U.S. Cl. 318—369 **8 Claims**



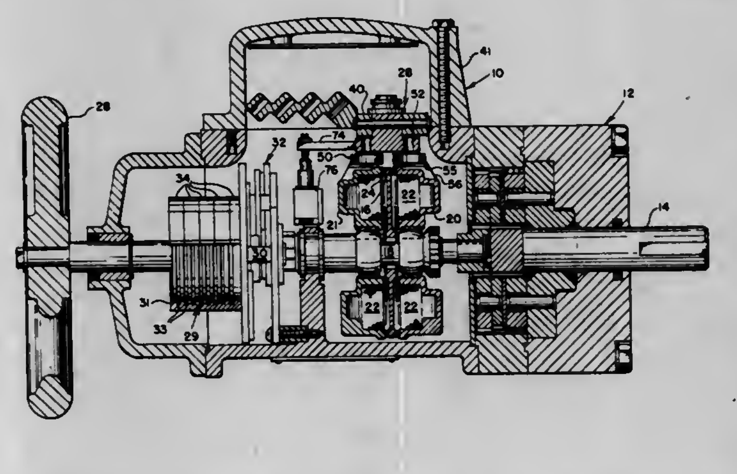
1. In an actuating mechanism for a sliding door, a linear motor including a slidable bar coupled to the door for moving the door into closed and open positions, a dual stator having the stacks thereof disposed on each side of the bar, ac and dc field windings disposed in the stator, for generating a traveling field for moving the bar and a braking field for reducing the velocity of movement thereof, respectively, and means coupled to the field windings, for energizing the windings and generating said fields, the improvement comprising:

first sequential switching means, coupled to said field winding energizing means and responsive to the movement and position of said slidable bar, including a first pair of contact switches disposed adjacent said door and each other for engaging said door, energizing said dc field winding and generating said braking field as said door is moved from one of said positions to the other by said traveling field; and

second sequential switching means, coupled to said field winding energizing means, and responsive to movement of said slidable bar, including a second pair of contact switches disposed adjacent said door and adjacent said first pair of contact switches, said first pair of switches being disposed between said second pair of switches, for engaging said door, deenergizing both said ac and dc field windings and terminating said braking and traveling fields when said door is moved by said bar into its closed and open positions.

3,891,908
TORQUE SENSING DEVICE

Ruben J. Porras, 13215 S.E. 30th, Kirkland, Wash. 98004
Filed Oct. 10, 1973, Ser. No. 405,099
Int. Cl. G05d *17/02*
U.S. Cl. 318—434 **8 Claims**

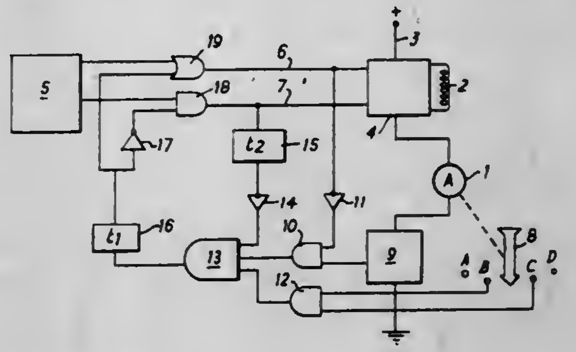


1. In a motor having an output shaft, a rotor secured to the output shaft, at least one stator mounted concentric with the rotary axis of said output shaft, means for restricting rotation of said stator, and means for coupling the rotor and stator for rotating the rotor and thus driving the output shaft, a torque sensing device comprising means coupled to said stator rotation restricting means for sensing a reaction torque in said stator over a predetermined amount and first and second switch means coupled to said sensing means for performing a control function, said means for restricting rotation of said stator including a stationary member, a movable member pivotally secured to said stationary member, and first and second switch actuating members on said movable member and operable upon pivoting of said movable member in opposite directions due to oppositely directed increases in reaction torque to actuate said first and second switch means, respectively.

3,891,909
DOOR OPERATING CONTROLS

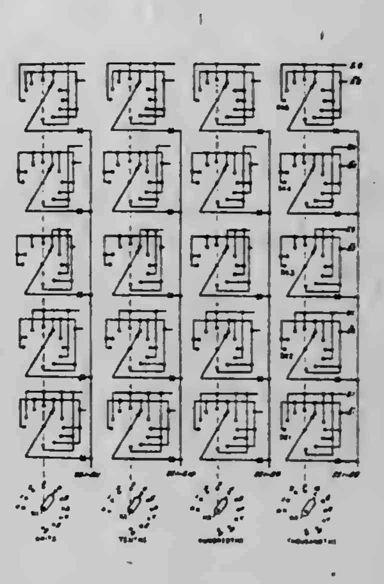
John Chase Newson, London, England, assignor to Westinghouse Brake & Signal Co. Ltd., London, England
Filed May 29, 1973, Ser. No. 364,414
Claims priority, application United Kingdom, June 5, 1972, 26218/72
Int. Cl. G05d *3/08*
U.S. Cl. 318—469 **16 Claims**

1. A vehicle door operating apparatus comprising an electrical power source, an electric motor, an electrical threshold sensor connected in the circuit of said motor for sensing the occurrence of an abnormal magnitude of an electrical quantity corresponding to a loading of the motor in excess of a normal moving door loading and for producing an output signal in accordance therewith, an open and closed door control means, operable to cause the motor to drive the vehicle door in an opening mode towards an open position and, alternatively, in a closing mode towards a closed position, for, responsive to said output signal from said threshold sensor, changing the mode of operation of the apparatus, door position sensors located at points along the path of the door movement near to each end thereof, and a logic unit connected to the output of said threshold sensor and to said door position sensors.



3,891,910
MACHINE TOOL MOTOR CONTROL WITH POSITION OFFSET

Tom T. Kumagai, Gardena; William C. Leone, Palos Verdes Estates; Michael May, Santa Monica; Harold L. Shoemaker, Manhattan Beach, and Roy A. Howard, Los Angeles, all of Calif., assignors to Houdaille Industries, Inc., Buffalo, N.Y.
Continuation of Ser. No. 598,525, Jan. 12, 1966, Pat. No. 3,609,497, which is a division of Ser. No. 827,981, March 10, 1959, Pat. No. 3,245,144. This application Sept. 16, 1971, Ser. No. 181,168. The portion of the term of this patent subsequent to Sept. 28, 1988, has been disclaimed.
Int. Cl. G05b *19/24*
U.S. Cl. 318—572 **3 Claims**



1. In a control system for positioning a controllable member to position a tool relative to a workpiece: an input signal system producing a group of discrete electrical signals in accordance with a fixed signal program based on a given assumed tool dimension; a discrete electrical signal producing system for producing discrete electrical signals each of which is indicative of a predetermined increment of displacement of said member; electrical comparator means receiving electrical signals from both said input signal system and said discrete electrical signal producing system and producing an electrical output when the signals of each system are different; electrically operated drive means receiving said electrical output and controlling said member; a manually adjustable discrete signal producing device selectively manually adjustable for registering a manually selected discrete tool offset value in accordance with the difference between the given assumed tool dimension on which the fixed signal program is based and an actual tool dimension; and means combining the discrete

signals of said adjustable device with the discrete signals of said input signal system to change the positioning of the member from that represented by the fixed signal program in accordance with the manually selected discrete tool offset value registered by said manually adjustable discrete signal producing device.

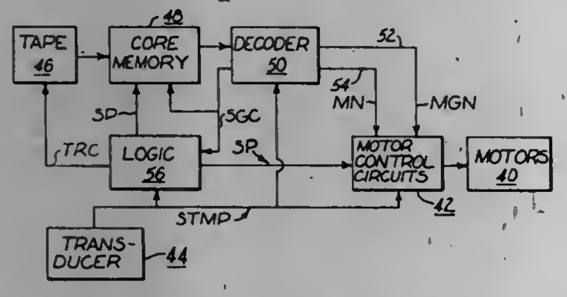
3,891,911
CONTROL SYSTEM FOR A CYCLICALLY-OPERATED MACHINE

Zane Frentress, Greenville, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 185,689, Oct. 1, 1971. This application Jan. 29, 1973, Ser. No. 327,511

Int. Cl. G05b *19/40*

U.S. Cl. 318—696 **17 Claims**



1. A control system for a cyclically operated machine having a large number of outputs which are driven by a controlled number of incremental steps during each cycle comprising, in combination:

a. means for storing information in records which are made up of blocks of information, a record being provided for each cycle of information and each of the blocks of a record corresponding to a different step, said information within each block identifying those outputs which are to be controlled in the step with which the block is associated, and said information being arranged to identify the outputs by group and number within the group;

b. means for sequentially distributing the information blocks in synchronism with said steps; and

c. means responsive to each of said distributed blocks for identifying at a much higher rate than said steps and for controlling, simultaneously, those outputs identified in said block before the next step of the outputs, said controlling means being responsive to the identification of the outputs by group and number.

3,891,912
AUTOMATIC PULSE PHASE SHIFTER FOR A.C.-D.C. OR D.C.-A.C. CONVERTER

Atsumi Watanabe, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 21, 1973, Ser. No. 427,150

Claims priority, application Japan, Dec. 25, 1972, 47-129412

Int. Cl. H02m *1/08*

U.S. Cl. 321—16 **5 Claims**

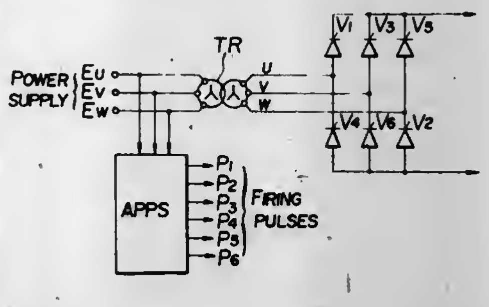
1. An automatic pulse phase shifter comprising:

an oscillator for producing an oscillation frequency in accordance with an input voltage applied thereto;

first means for dividing the oscillation frequency of said oscillator by a prescribed value and producing an output representative thereof;

second means, coupled to receive an A.C. voltage and the output of said first means, for producing an output representative of the phase difference between said A.C. voltage and the output of said first means;

third means for converting the output of said third means into a voltage to be applied to said oscillator in accordance with a signal applied thereto for maintaining a prescribed phase difference between the output of said oscillator and said A.C. voltage; and



fourth means for producing firing pulses in accordance with the output of said first means and a control signal for regulating the phase at which said firing pulses are required to be produced.

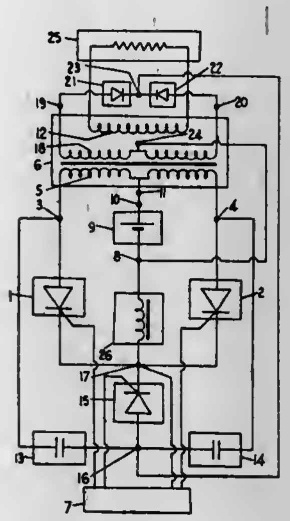
3,891,913
INVERTER

Hattangady Vasanth Rao, and Ravindra Nath Doss, both of c/o Telecommunication Research Centre, Posts and Telegraphs Khurshid Lal Bhavan, Janpath, New Delhi-1, India

Filed Apr. 5, 1973, Ser. No. 348,354

Int. Cl. H02m *7/52*

U.S. Cl. 321—45 R **1 Claim**



1. A parallel inverter comprising:

a transformer having primary, auxiliary and secondary windings closely coupled to each other, said secondary winding serving as AC output means, said primary winding divided into two equal portions, said two portions joined at a common centre point, said auxiliary winding divided into two equal portions, said two portions joined at a common centre point,

a D.C. source having a live terminal and a return terminal, the live terminal connected to the centre point of the said primary winding,

a pair of series connected first and second thyristors having their like terminals, such as cathodes or anodes, connected together and their remaining terminals, such as anodes or cathodes, connected across the said primary winding, an inductor connected between the junction of the said first and second thyristors and the return terminal of the D.C. source,

a pair of series connected first and second commutating capacitors connected across the said primary winding,

a third thyristor connected between the junction of the said commutating capacitors and the junction of the said first and second thyristors, all three thyristors having their like terminals together,

a pair of series connected diodes having their like terminals, such as cathodes or anodes connected together and their remaining terminals, such as anodes or cathodes, connected across the said auxiliary winding, with common centre point of the said auxiliary winding and the junction of the said diodes electrically bridged across the said third thyristor and said inductor in series, the conducting directions of the said diodes and the said third thyristor being same around the loop so formed, and

a control circuit to which the gates and cathodes of the said first, second and third thyristors are connected.

3,891,914
POWER AND SIGNAL TRANSMITTING MEANS

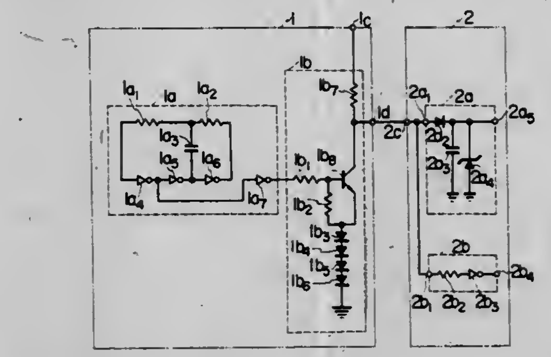
Sigeyuki Akita, Kariya, Japan, assignor to Nippon Soken, Inc., Nishio-shi, Japan

Filed Apr. 19, 1973, Ser. No. 352,615

Claims priority, application Japan, Apr. 21, 1972, 47-40792

Int. Cl. H02m *7/00*

U.S. Cl. 321—47 **9 Claims**



1. A power and signal transmitting means including a first circuit for sending out a transmitted signal of a given repetition frequency over a transmission line and a second circuit means connected to said first circuit through said transmission line for receiving the signal transmitted over said transmission line for reproducing said transmitted signal, said second circuit comprising a D.C. power voltage conversion circuit for rectifying said transmitted signal to produce a D.C. power voltage and a signal wave pickup circuit for receiving said transmitted signal to reproduce said transmitting signal.

3,891,915
DIGITAL COMPUTER CONTROL SYSTEM AND METHOD FOR MONITORING AND CONTROLLING OPERATION OF INDUSTRIAL GAS TURBINE APPARATUS TO DRIVE SIMULTANEOUSLY AN ELECTRIC POWER PLANT GENERATOR AND PROVIDE EXHAUST GASES TO AN INDUSTRIAL PROCESS

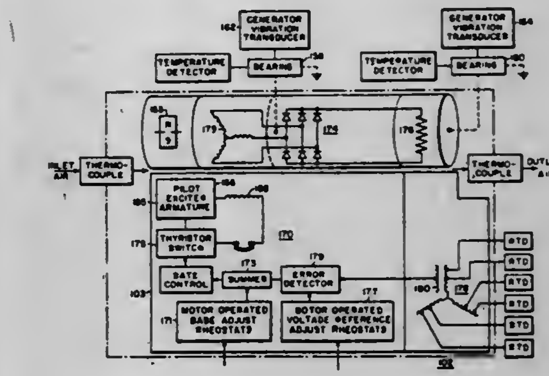
Robert A. Yannone, Aldan, and Roy W. Kiscaden, Springfield, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 189,632, Oct. 15, 1971, abandoned. This application Jan. 15, 1973, Ser. No. 323,593

Int. Cl. F02c *7/26*

U.S. Cl. 322—15 **23 Claims**

1. A gas turbine electric power plant comprising a gas turbine having compressor, combustion and turbine elements, a generator having a field winding and being coupled to said gas turbine for drive power, a fuel system for supplying fuel for said gas turbine combustion elements, means for exciting said generator field winding, a control system including a digital computer and an input/output system therefor, a plurality of sensors disposed to monitor selected turbine parameters and to provide control system inputs representative thereof, means for operating said fuel system to energize said turbine and for controlling said exciting means, means continuously responsive to a control system output for modulating air flow into said compressor, and means for operating said computer to make control action determinations for implementation by said fuel system operating means, said exciting means and said air flow modulating means, said modulating means control actions being determined in response to time varying combinations of said sensor inputs.



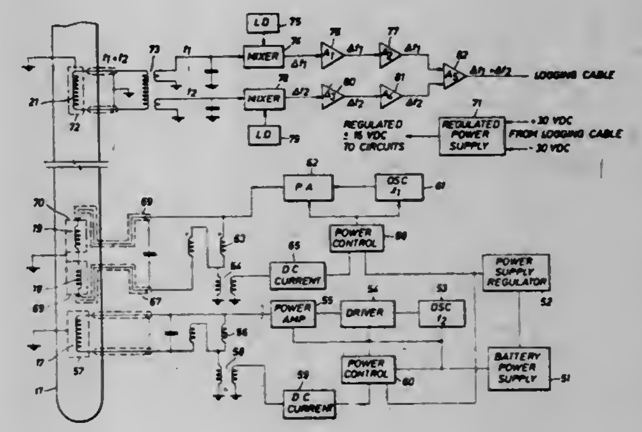
3,891,916
DUAL RADIO FREQUENCY MEASUREMENT OF DIELECTRIC CONSTANT AND RESISTIVITY OF BOREHOLE MEDIA

Richard A. Meador, Houston; Richard H. Arnold, Sugarland, and Hans J. Paap, Houston, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Aug. 27, 1973, Ser. No. 391,900

Int. Cl. G01v *3/10, 3/18*

U.S. Cl. 324—6 **23 Claims**



1. A method for determining the electromagnetic characteristics of materials in the vicinity of a well borehole, comprising the steps of:

generating, in a well borehole, a first, lower frequency, alternating electromagnetic field at a radio frequency in the range of approximately 10 to 20 megahertz;

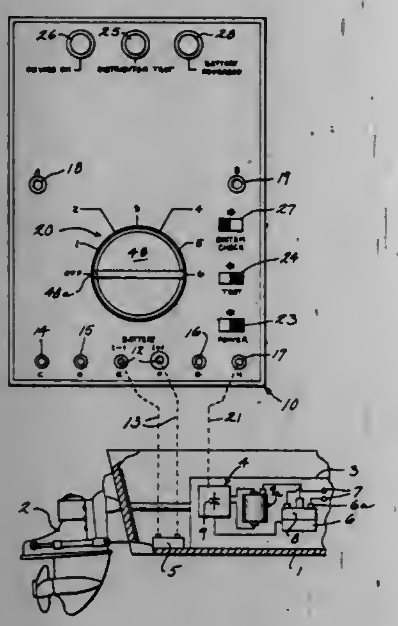
generating, in a well borehole, a second, higher frequency alternating electromagnetic field at a radio frequency in the range of approximately 20 to 40 megahertz said second frequency being a non-integer multiple of said first frequency;

detecting, in a well borehole, at a longitudinally spaced distance from the locations where said first and second alternating electromagnetic fields are generated, the voltage amplitudes of the total electromagnetic field at said first and second frequencies and generating signals representative of said total field voltage amplitudes; and recording said first field amplitude signals as a function of borehole depth.

3,891,917
CAPACITOR DISCHARGE IGNITION TESTING APPARATUS

Mark Harris, Brownsville, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Mar. 29, 1973, Ser. No. 346,158
Int. Cl. G01r *13/42, 23/00*
U.S. Cl. 324—16 R **36 Claims**



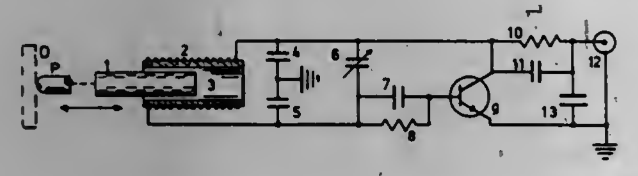
1. An ignition analyzing apparatus for analyzing the functioning of capacitor discharge ignition systems comprising an electronic pulse source means adapted to establish a plurality of time spaced pulses,

a selection means having a releasable connecting means for selectively connecting the output of said electronic pulse source means to an ignition system to provide timed trigger of said ignition system, and a portable spark gap means constructed to create a load corresponding to the load driven from the ignition system and adapted to be connected to said capacitor discharge ignition system and driven from the output of said capacitor discharge ignition system to produce a visual display of the operation, said pulse source means includes a first electronic oscillating circuit establishing a plurality of output pulses, and a switching means is connected to said oscillating circuit and controlled thereby to establish a time delayed signal for a predetermined portion of each cycle.

3,891,918
LINEAR DISPLACEMENT TRANSDUCER UTILIZING AN OSCILLATOR WHOSE AVERAGE PERIOD VARIES AS A LINEAR FUNCTION OF THE DISPLACEMENT

James F. Ellis, R.R. No. 2, Box 248, Powell, Tenn. 37849

Continuation-in-part of Ser. No. 127,319, March 23, 1971, abandoned. This application July 16, 1973, Ser. No. 379,567
Int. Cl. G01r *33/00*
U.S. Cl. 324—34 D **18 Claims**



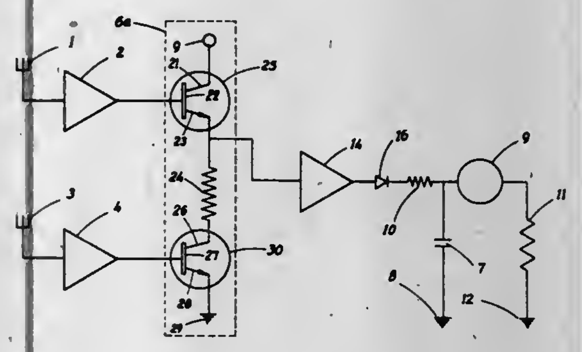
1. In an apparatus for measuring a dimensional quantity, in combination

- a variable inductor comprising
  - an inductive coil,
  - means interfacing with a portion of the length of said coil, said means axially movable in a direction parallel to the axis of said coil, and varying the inductance of said coil as a square function of the relative axial displacement of said coil and said means interfacing, and
  - means mechanically coupling to the measured dimensional quantity and effecting said relative axial displacement;
- a variable oscillator comprising in part
  - said variable inductor and controlled at least in part thereby, and producing a periodic output time-varying in proportion to said relative axial displacement; and
- means receiving said periodic output and measuring the period thereof relative to a suitable reference, and yielding therefrom a measure of said dimensional quantity.

3,891,919
STORM-LIGHTNING DETECTOR

William Penninger, 1731 Cloverbrook Dr., Louisville, Ky. 40215

Filed Mar. 4, 1974, Ser. No. 447,888
Int. Cl. G01r *31/02*
U.S. Cl. 324—72 **7 Claims**



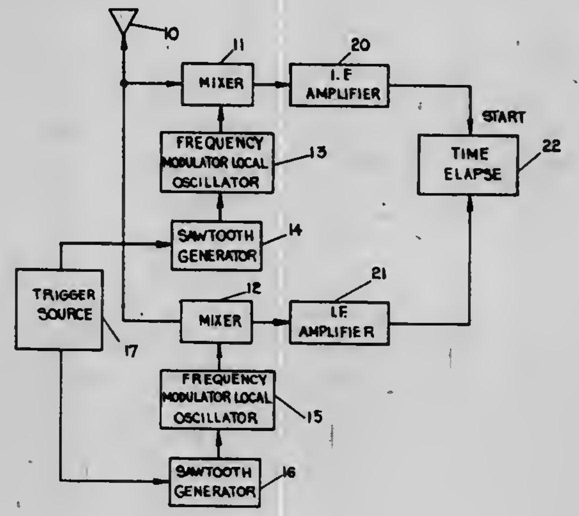
1. A storm and lightning detecting device comprising radio receiver means to receive radio signals at at least two different frequencies including first radio frequency receiver means having tuning means to receive radio signals of first selected frequency and output means to provide first output signal in response to reception of radio signals at said first selected frequency and at least one second radio frequency receiver means having tuning means to receive radio signals of second selected frequency and output means to provide second output signal in response to reception of radio signal at said second selected frequency; at least one first switch means connected to said output means of said first radio frequency receiver means and actuated by receipt of output signal from said first radio frequency receiver; and second switch means connected to said output of said second radio frequency receiver and actuated by receipt of output signal from said second radio frequency receiver; and indication means responsive to simultaneous actuation of said first and second switch means to indicate reception by said radio receiver means of radio frequency signals at said first and second selected frequencies.

3,891,920
SCANNING MIXED BASE RECEIVER

Richard E. Williams, Fairfax, Va., assignor to Melphor Inc., Falls Church, Va.

Filed June 26, 1957, Ser. No. 668,255
Int. Cl. G01r *23/14*
U.S. Cl. 324—77 B **12 Claims**

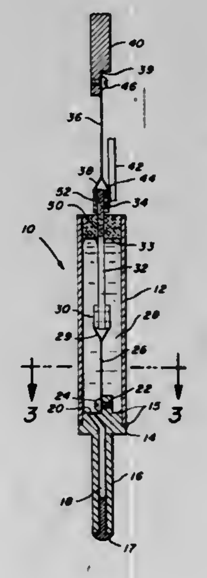
1. A system of frequency measuring comprising a first frequency scanning system for capturing a predetermined frequency at a time within a first time interval wherein said time is a function of said frequency, and a second predetermined frequency scanning system for capturing said predetermined frequency at a time within a second time interval which is a function of said predetermined frequency, and means for indicating the value of said predetermined frequency as a function of the difference of said times.



3,891,921
LIQUID DAMPED GALVANOMETER

Irvin L. Patterson, Tulsa, Okla., assignor to Telex Computer Products, Inc., Tulsa, Okla.

Filed Jan. 31, 1974, Ser. No. 438,478
Int. Cl. G01r *1/14, 13/38*
U.S. Cl. 324—125 **9 Claims**



1. In a liquid damped galvanometer having:

a. a lower ribbon torsion spring fastened in a lower support rod;

b. a coil supported between two spools, the lower ribbon torsion spring fastened to the lower spool;

c. an upper ribbon torsion spring fastened at its lower end to the upper spool of said coil, and at its upper end to an upper support rod;

d. mirror means mounted to said upper spool; the improvement comprising;

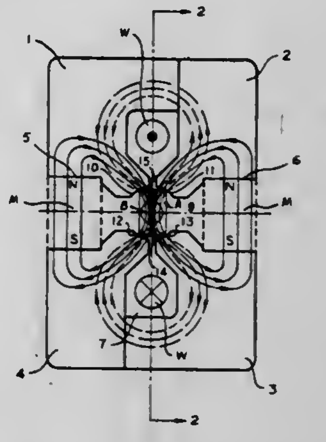
e. damping liquid tubular means surrounding said lower torsion spring and said coil, and damping liquid in said tubular means; and

f. means to mount said mirror to said upper spool comprising; an epoxy cement including an inert, non-hygroscopic filler material.

3,891,922
PIVOTED ARMATURE INSTRUMENT FOR AN ELECTROMAGNETIC RECORDING SYSTEM

Wolfgang Atzinger, Munich, Germany, assignor to Fritz Schwarzer GmbH, Munich, Germany

Filed Feb. 14, 1974, Ser. No. 442,528
Claims priority, application Germany, Apr. 6, 1973, 231749
Int. Cl. G01r *1/16, 5/18*
U.S. Cl. 324—151 R **7 Claims**

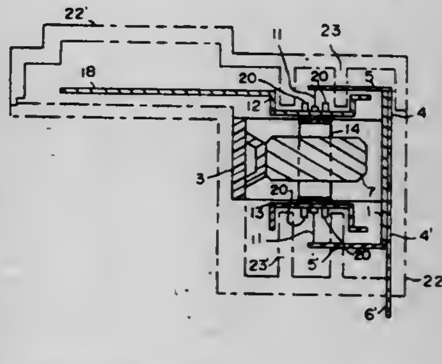


1. An electromagnetic rotational positioning device comprising a magnetically permeable support structure including a tubularly-shaped aperture, an unmagnetized but magnetically permeable armature rotatably mounted within said aperture, electrical conductor means disposed within said structure adjacent opposite boundaries of said aperture and substantially parallel to the axis of rotation of said armature, means for applying an electrical current to said electrical conductor means, said electrical conductor means being arranged to generate responsive to said current a control magnetic field permeating said armature in substantially the same directions at opposite sides of said rotatable mount and in directions orthogonal to said axis of rotation of said armature, and permanent magnet means disposed within said structure adjacent other opposite boundaries of said aperture for generating at least two permanent magnetic fields permeating said armature in substantially the same direction and in a direction orthogonal to said axis of rotation of said armature, said armature being arranged to rotate in response to inter-action of said control magnetic field with said permanent magnetic fields.

3,891,923
UNIT FOR ASSEMBLING ELEMENTS OF TAUT BAND SUSPENSION TYPE INDICATING INSTRUMENT

Takehiko Sakaguchi, Sakaki-machi, Japan, assignor to Hioki Electric Works Co., Ltd., Nagano, Japan

Filed Jan. 16, 1974, Ser. No. 434,761
Claims priority, application Japan, Feb. 2, 1973, 48-13480
Int. Cl. G01r *1/04*
U.S. Cl. 324—154 R **6 Claims**



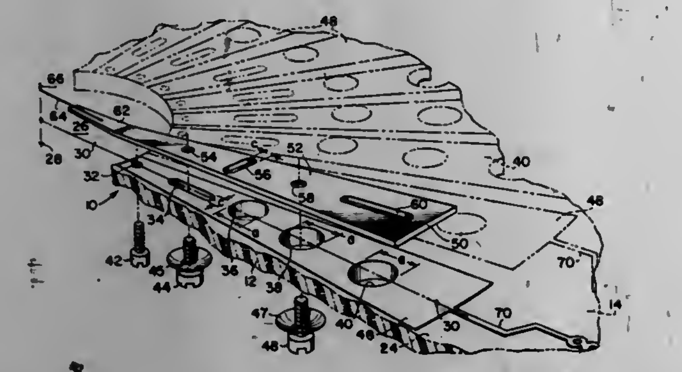
1. A meter element assembling plate for taut band suspension type electrical indicating instruments comprising:

- an insulating plate having apertures therein for coupling with other elements of the instrument;
- a pair of metal plates fastened to said insulating plate in a spaced relation to one another;
- a taut band suspending leaf spring connected to each of said metal plates; and
- a terminal plate connected to each of said metal plates and extending outwardly therefrom.

3,891,924
ADJUSTABLE MULTI-POINT PROBE HEAD ASSEMBLY

Frank J. Ardezzone, Santa Clara, and Thomas A. Englert, San Jose, both of Calif., assignors to Probe Rite, Inc., Santa Clara, Calif.

Filed Sept. 10, 1973, Ser. No. 395,964
Int. Cl. G01r *31/02, 1/06*
U.S. Cl. 324—158 P **5 Claims**



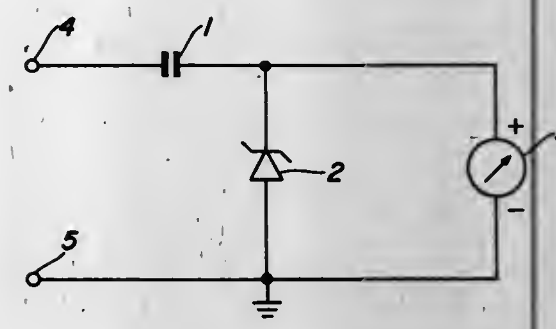
1. A multi-point electrical test probe head assembly for interface contact with miniature electronic devices to be tested, the assembly comprising, in combination:

- a platform carrying an interconnect plug means for electrical interconnection with electronic test instruments;
- a planar probe support member integrally coupled to the platform, said support member defining a central opening therein, a plurality of rows of individual openings within said support member, each row of openings being in a fixed pattern along a radial path line projecting from said central opening, at least one opening of each row of openings of the support member being oblong with the longitudinal axis in alignment with the central opening;
- a plurality of elongated electrically conductive probe arms having a planar main part and an extension arm extending from one end of the main part, each probe arm being positioned with the planar main part thereof in overlapping engagment with the support member, the planar main part of each of the probe arms carrying a plurality of openings arranged in a row along the longitudinal axis of the probe arm and radial to the central opening, each row of openings including a first oblong slot, a second oblong slot and a pin engagement bore intermediate the first and second slots, the longitudinal dimension of the two oblong slots being at right angles relative to one another and the width of the slots being substantially less than the diameter of the mated openings of the board, each opening of the probe arm being in alignment with an opening of an associated row of openings of the board to establish related pairs of openings between each probe arm and the support member, a tip contact engaged to and extending from the terminal end of each of the extension arms, each of said tip contacts projecting to within said central opening, said tip contacts being positioned for making interface contact with electronic devices positioned adjacent said central opening;
- fastening means for securing the planar main part of each of said probe arms in place and in abutment to said support member with each arm being secured about a row of openings along one of said radial paths, the fastening means including fastener pin means engaged through at least one pair of openings between the board and each probe arm including the pin engagement bore to secure the arm in place to the support member, said fastening means being free to move within the opening of the board laterally and radially relative to the central opening;
- positional adjustment means coupled to the planar part of each of said probe arms and said platform of adjusting the lateral and radial position of said probe arms relative to said central openings of said probe support; and
- electrical coupling means for coupling the probe arms with said interconnect plug means.

3,891,925
TACHOMETER CIRCUIT

John Dimeff, San Jose, Calif., assignor to National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Dec. 3, 1973, Ser. No. 420,812
Int. Cl. G01p *3/12*
U.S. Cl. 324—169 **5 Claims**



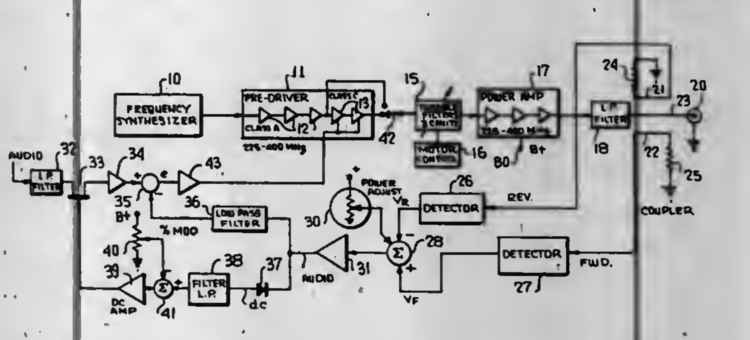
1. A tachometer circuit adapted for connection to a source of pulses, the frequency of said pulses being a direct function of the angular speed to be measured, consisting of:

- first and second input terminals for receiving said pulses;
- an unpolarized capacitor;
- a zener diode, said zener diode and said capacitor being connected in series, said capacitor and said zener diode being connected between said first and second input terminals;
- a d-c ammeter connected in shunt with said zener diode;
- a fixed charge being transferred to said capacitor for each of said pulses, said charge being a function of the zener voltage of said zener diode and the capacitance of said capacitor;
- said current flowing through said ammeter being dependent on only one variable, said pulse frequency, and thus said current being directly proportional to said speed.

3,891,926
FILTER MODULE

Neal H. Ishman, Springfield; Richard W. Lenert, Annandale, both of Va., and Jeffrey B. Goldman, Rockville, Md., assignors to American Standard, Inc., McLean, Va.

Filed Dec. 18, 1972, Ser. No. 315,818
Int. Cl. H04b *1/04*
U.S. Cl. 325—159 **12 Claims**

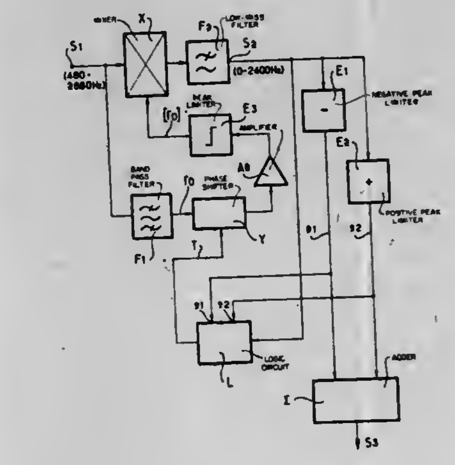


1. A multi-channel radio transmitter, comprising a source of radio frequency signal tunable over a band including plural megacycles, a predriver amplifier having a substantially equal response over the entirety of said band, a band pass filter tunable over said band and having a narrow band width connected in cascade with said pre-driver amplifier, a broad band power amplifier connected in cascade with said filter, said broad band power amplifier having a substantially equal response over said band of frequencies, and an antenna coupled to said broad band amplifier, wherein said pre-driver amplifier and said broad band amplifier are transistor amplifiers, wherein said filter is a cavity resonator filter having plural resonant helix cavities coupled in cascade, and wherein is included means for automatically tuning said filter to the frequency of said source of radio frequency for any frequency in said band, said filter having three adjacent output settings for which phase difference between input and output terminals of said filter equals 0° in response to a single input frequency to said filter, and said means for automatically tuning includes means for setting said tuning to equal only the central one of said adjacent settings to the exclusion of remaining ones of said three adjacent settings.

3,891,927
PHASE CORRECTION DEVICE FOR DEMODULATION OF BIPOLAR SIGNALS

Rene Filaferro, Suresnes, and Francois Hebert, Villebon sur Yvette, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed July 19, 1973, Ser. No. 380,557
Claims priority, application France, July 19, 1972, 72.26068; Sept. 14, 1972, 72.32621
Int. Cl. H03d *1/02;* **H04b** *1/16*
U.S. Cl. 325—421 **12 Claims**



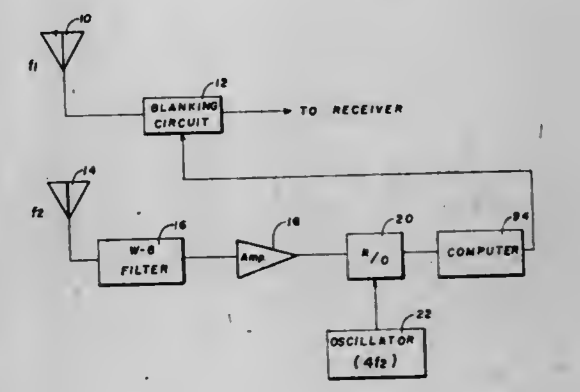
1. Apparatus for obtaining synchronous demodulation of a wave amplitude modulated by a rhythmic bipolar signal, by applying phase correction to a carrier frequency wave, said apparatus comprising:

- means for supplying said carrier frequency wave;
- demodulating means responsive to said modulated wave and to said carrier frequency wave for supplying a baseband bipolar signal;
- first means responsive to the amplitude of said base-band bipolar signal for generating a first signal representative of the length of time between the instant that the amplitude of said base-band bipolar signal departs from a first peak-limiting level having a first polarity until said amplitude returns thereto;
- second means responsive to the amplitude of said base-band bipolar signal for generating a second signal representative of the length of time between the instant that the amplitude of said base-band bipolar signal departs from a second peak-limiting level having a second polarity until said amplitude returns thereto; and
- a logic circuit comprising input circuit means for receiving said base-band bipolar signal, integrating means responsive to said input circuit means for integrating a signal applied thereto, and control means responsive to said first signal and to said second signal for controlling said input circuit means so as to allow the integration of said baseband bipolar signal during a time interval between a first intant when the amplitude of said base-band bipolar signal departs from said first peak-limiting level and a second instant when said amplitude arrives at said second peak-limiting level, and to exclude the integration of that portion of said base-band bipolar signal which departs from one of said peak-limiting levels and rearrives thereat without having reached the other peak-limiting level, the output signal of said integrating means being applied to said carrier frequency wave supplying means for controlling the phase of said carrier frequency wave.

3,891,928
VLF PHASE TRACKER WITH PHASE DISCRETION

Eric R. Swanson, 640 Silvergate Ave., San Diego, Calif. 92106

Filed Mar. 25, 1974, Ser. No. 454,183
Int. Cl.² H04B *1/10*
U.S. Cl. 325—474 **5 Claims**



5. VLF phase tracker apparatus comprising first means for receiving incoming VLF signals at f_1, second means for receiving incoming VLF signals at f_2 simultaneously with said signals at f and including phase lock means, means for comparing the phase of individual cycles of said signals at F_2 with a reference track phase and for providing an output signal in response to a selectively predetermined phase difference, and blanking circuit means being responsive to said output signal to block said signals at f_1 from said first means for receiving signals at f_1.

3,891,929
ACOUSTIC SURFACE WAVE FREQUENCY SYNTHESIZER

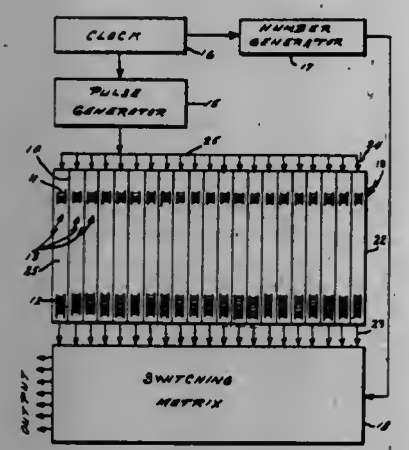
Paul H. Carr, Bedford, and Alan J. Budreau, Arlington, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 14, 1974, Ser. No. 433,180
Int. Cl. H03b *19/00;* **H03h** *7/10*
U.S. Cl. 328—14 **7 Claims**

1. An acoustic surface wave frequency synthesizer comprising

- a multiplicity of acoustic surface wave filters, each filter having an electromagnetic wave to acoustic surface wave input transducer and an acoustic surface wave to electromagnetic wave output transducer,
- a pulsed source of electromagnetic wave energy connected to supply, simultaneously, electromagnetic wave pulses to each filter input transducer,
- a system clock connected to said source of electromagnetic wave energy,

- a switching matrix having an output and multiple inputs, each filter output transducer being connected to a separate switch matrix input, and



- a switching matrix control means, said control means being connected to said switching matrix and to said system clock.

3,891,930
METHOD AND DEVICE FOR DETERMINING THE EXISTENCE AND THE TIME POSITION OF MAIN PEAKS APPEARING IN AN ELECTRONIC SIGNAL

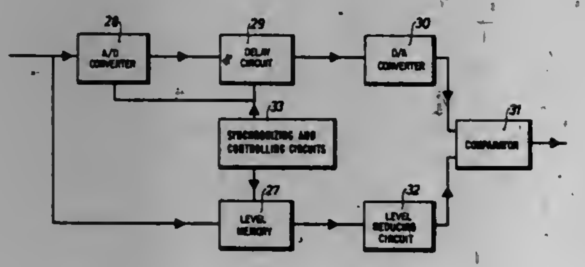
Erling Olav Valdemar Petrusson, Sollentuna, Sweden, assignor to AB Teleplan, Solna, Sweden

Filed Sept. 13, 1973, Ser. No. 396,724

Claims priority, application Sweden, Sept. 15, 1972, 11988/72

Int. Cl. H03k *5/18, 5/20*

U.S. Cl. 328—117 **7 Claims**



1. In a method of determining the existence and the time position of main peaks appearing in an electrical signal by comparing the amplitude of said signal with a variable reference level, called the cut-off level, an improved method for processing such signal, comprising:

- dividing the signal to be examined into consecutive time intervals;
- allocating a cut-off level to each of said time intervals, the amplitude of said cut-off level being based upon an analysis of measurements performed on the amplitude of the signal in the corresponding interval and in a number of adjacent intervals;
- generating allocated cut-off levels during each consecutive time interval thereby providing a variable cut-off level function for the electrical signal;
- delaying said electrical signal for a time equal to the time required to generate said cut-off level function; and
- comparing the amplitude of the delayed signals with the cut-off level function to detect the presence, in the signal, of a main peak whose time position can then be determined.

3,891,931
CONTROL SYSTEM FOR SWITCHING ELEMENT

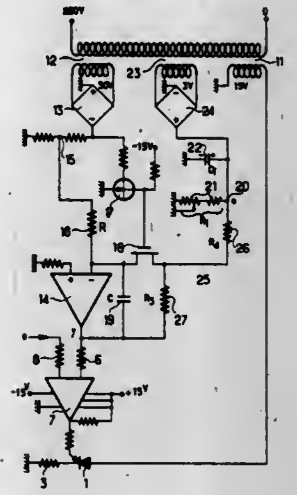
Marcel Nougaret, Seyssinet, and Jean-Claude Belmonte, Echirolles, both of France, assignors to Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM), France

Filed Sept. 29, 1972, Ser. No. 293,509

Claims priority, application France, Sept. 29, 1971, 71.35146

Int. Cl. G06g *7/18*

U.S. Cl. 328—127 **7 Claims**



1. Device for controlling by impulses, responsive to a control signal, a switching element operating by an on-off process and connected to a current supply having a periodic voltage, comprising rectifier means for rectifying said supply voltage, an integrator connected to receive said rectified supply voltage for providing the instantaneous value of the integral of a function of that supply voltage, a comparator connected to receive at one input said instantaneous value from the output of said integrator and at the other input said control signal, and applies to said switching element, according to the comparison of those two magnitudes, a switching order for opening or closing the switching element, and means for resetting said integrator, at each pass through zero of the periodic supply voltage, to an original value, other than zero, provided for compensating variations in the periodic voltage supply, the original value of said integrator being supplied by a second integrator which receives, at its input, said control signal, and further means for resetting said second integrator to zero at each pass through zero of the said function.

3,891,932
METHOD AND APPARATUS FOR SENSING AND CONTROLLING MOTION OF A MOVABLE MEMBER

Charles C. Conner, and William R. Price, both of Portland, Oreg., assignors to William R. Price, Portland, Oreg.

Filed July 19, 1973, Ser. No. 380,679

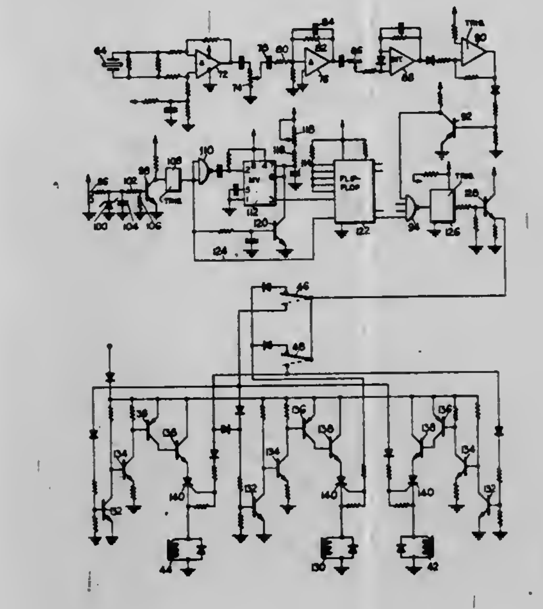
Int. Cl. H03k *5/20*

U.S. Cl. 328—147 **8 Claims**

1. The method of sensing a predetermined motion of a movable member, comprising:

- a. engaging the movable member with a transducer capable of converting noise signals to electric alternating current signals,
- b. utilizing the electric alternating current signals to produce direct current motion signals proportional to the magnitude of motion of the movable member,
- c. producing direct current control signals representing a predetermine condition of the movable member,

- d. comparing the motion signals and control signals, and
- e. utilizing said compared signals to produce a constant output electric sensing signal when said compared signals are matched, the magnitude of the output electric sensing signal being independent of the difference between the motion and control signals.



3,891,933
AMPLIFIER WITH SIGNAL CLIPPING INDICATOR AND/OR PROTECTIVE CIRCUIT

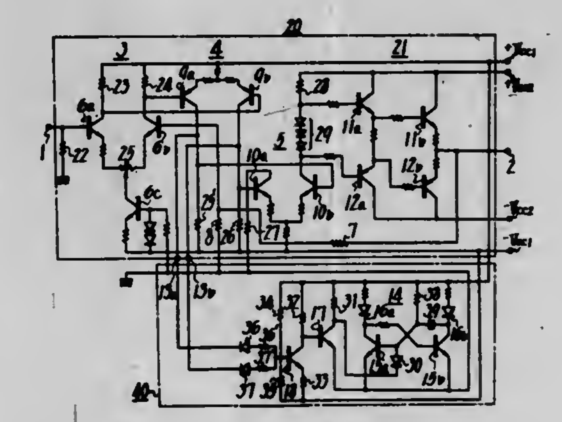
Tadao Suzuki, and Hirohito Kawada, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 4, 1974, Ser. No. 439,008

Claims priority, application Japan, Feb. 9, 1973, 48-17436

Int. Cl. G01r *21/00;* **H01f** *21/00*

U.S. Cl. 330—2 **9 Claims**



8. An amplifier with a signal clipping indication and/or a protective circuit comprising:

- a. a voltage source;
- b. a first differential amplifier having first and second transistors each having base, emitter and collector, the emitters of said first and second transistors being connected together and connected to one terminal of said voltage source through a common emitter impedance, the base of said first transistor being supplied with an input signal to be amplified;
- c. first and second resistors each connected between the other terminal of said voltage source and each collector of said first and second transistors;
- d. signal output means connected to at least one of said first and second resistors;
- e. feedback means connected between said signal output means and the base of said second transistor so as to supply a feedback signal having the same phase and amplitude as said input signal supplied to the base of said first transistor; and
- f. means for detecting an abrupt voltage change at one of said collectors of said first and second transistors and for producing a control signal when an unbalance exists between said input signal and said feedback signal whereby said control signal is indicative of a clipping state produced in said signal output means.

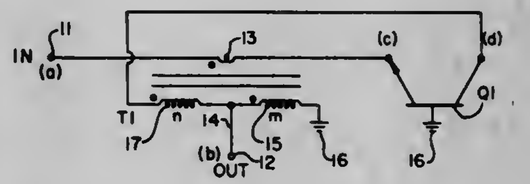
3,891,934
TRANSISTOR AMPLIFIER WITH IMPEDANCE MATCHING TRANSFORMER

David E. Norton, Framingham, Mass., and Allen F. Podell, Los Altos, Calif., assignors to Adams-Russell Co., Inc., Waltham, Mass.

Filed May 22, 1974, Ser. No. 472,281

Int. Cl. H03f *3/04*

U.S. Cl. 330—21 **8 Claims**



1. Amplifying apparatus comprising,

- amplifying means having at least control, input and output electrodes,
- a common terminal,
- transformer means having at least a primary and a secondary winding,
- said secondary winding having a tap intermediate to first and second portions thereof,
- an input terminal,
- an output terminal,
- means for coupling said output terminal to said tap,
- means for coupling said primary winding between said input terminal and said input electrode,
- said first portion being coupled between said tap and said common terminal,
- said second portion being coupled between said tap and said output electrode,
- and means for coupling said control electrode to said common terminal.

3,891,935
TRANSISTOR BIASING ARRANGEMENT

Allen Leroy Limberg, Lambertville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 21, 1973, Ser. No. 399,486

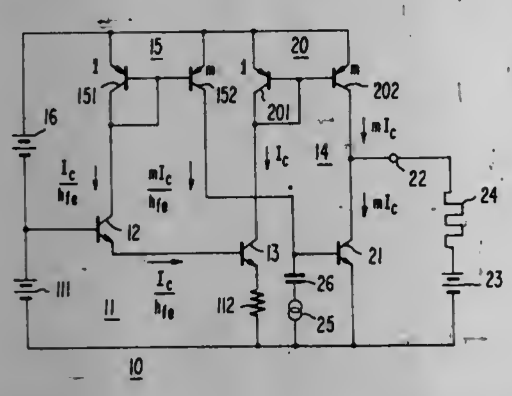
Int. Cl. H03f

U.S. Cl. 330—22 **25 Claims**

1. In combination:

- first and second transistors of the same conductivity type, each having a base and an emitter electrode with a base-emitter junction therebetween, each having a collector electrode;
- means for direct current conductively coupling said first transistor emitter electrode to said second transistor base electrode so a fixed portion of said second transistor base current will flow as said first transistor emitter current;
- means for providing forward bias to the base-emitter junctions of said first and said second transistors, said means being connected between said first transistor base electrode and said second transistor emitter electrode;

a first current amplifier having an input circuit connected to said first transistor collector electrode, having an output circuit, and having an inverting current transfer charac-



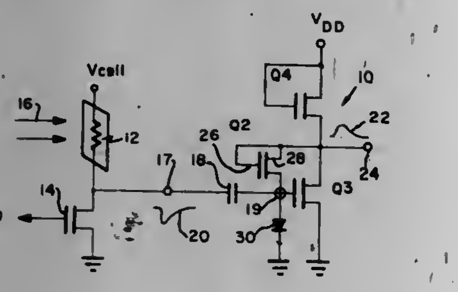
teristic between its said input and said output circuits; and utilization means connected to said second transistor collector electrode and connected to said first current amplifier output circuit.

3,891,936
LOW FREQUENCY FIELD EFFECT AMPLIFIER
Donald E. Romeo, Torrance, and Archie J. MacMillan, Long Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 266,155, June 26, 1972, abandoned. This application Aug. 5, 1974, Ser. No. 494,588

Int. Cl. H03f *3/16*

U.S. Cl. 330—28 **12 Claims**



1. A field effect circuit comprising:
a silicon substrate;
a first MOS field effect device formed on said substrate and having a channel, with drain and source electrodes connected to said channel and a control gate associated with said channel;
load means connected in the drain-source external circuit of said device for developing output signals in response to gate voltage induced variations in the conductivity of said channel;
an integrated circuit capacitor formed as a metallized layer on a portion of said substrate, having one terminal connected to the control gate of said first MOS device and having the other terminal connected to a source of input signals to be amplified; and
dynamic feedback means coupled between the drain and the gate of said first MOS device for providing signal frequency negative feedback and biasing and stabilizing the operating point of said first MOS device;
said feedback means comprising a gate-to-drain connected second MOSFET device constructed and arranged to operate near the threshold current level and to thereby exhibit a dynamic resistance, for small signals, of the order of 10^9 to 10^{13} ohms;
whereby the frequency response characteristic of said circuit is characterized by a low frequency corner of the order of about 20 Hertz or less.

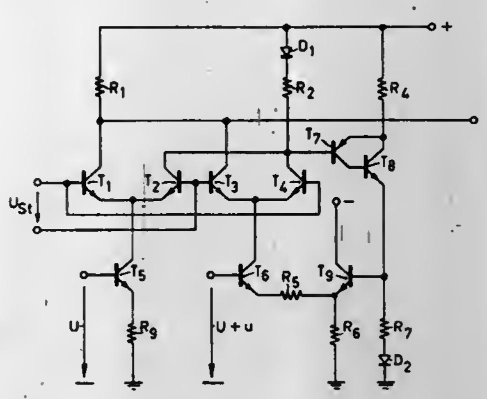
3,891,937
CIRCUIT ARRANGEMENT FOR ELECTRONIC GAIN/CONTROL, IN PARTICULAR ELECTRONIC VOLUME CONTROL CIRCUIT
Paul Bockelmann, Halstenbek, and Wilfried Aschermann, Hamburg, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 29, 1973, Ser. No. 420,268

Claims priority, application Germany, Dec. 21, 1972, 2262580

Int. Cl. H03q *3/30;* **H03f** *3/68*

U.S. Cl. 330—29 **6 Claims**



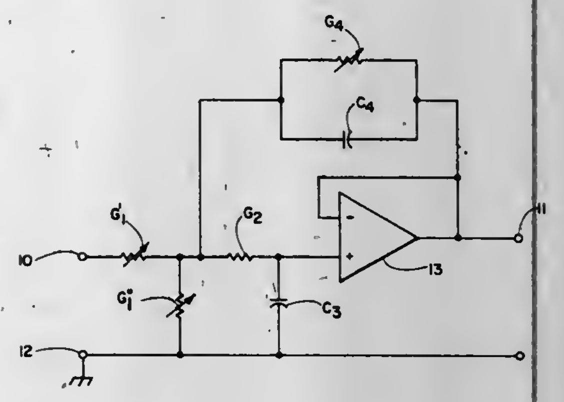
1. A gain control circuit comprising at least a first differential amplifier including first and second coupled transistors each having emitter, base, and collector electrodes; a signal transistor means coupled to said emitters for carrying direct and signal currents; means coupled to said bases for applying a gain control voltage thereto; means coupled to one of said collectors for deriving an output signal therefrom; and means for negatively feeding back at least said signal from the remaining collector to said signal transistor.

3,891,938
FUNCTIONALLY TUNABLE ACTIVE LOW-PASS FILTER
Wasfy Boushra Mikhael, Ottawa, and Lloyd Kenneth Keys, Carp, both of Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed July 19, 1974, Ser. No. 490,108

Int. Cl.² H03F *1/36*

U.S. Cl. 330—107 **2 Claims**



1. A functionally tunable active low-pass filter comprising: input, output and common terminals;
a non-inverting essentially unity gain amplifier having its output connected to said output terminal;
first and second resistors serially connected between said input terminal and the input of said amplifier;
a first capacitor connected between the input of said amplifier and said common terminal;
a second capacitor and a third resistor connected in shunt between the output of said amplifier and the junction of said first and second resistors;

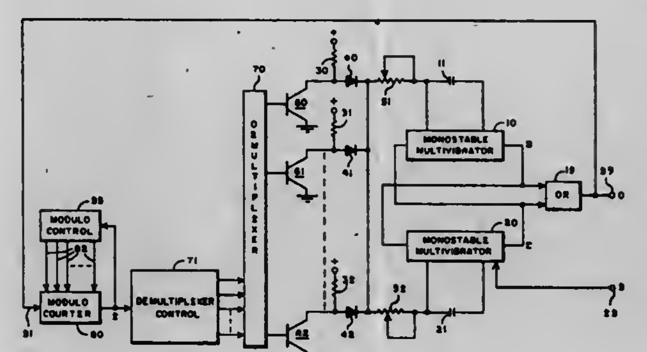
the amplifier, resistors and capacitors coacting such that variations in resistance of the second resistor connected to the input of the amplifier affects only the pole resonant frequency ω_p and the pole quality factor Q_p, and variations in resistance of the third resistor affects only the pole quality factor Q_p, thereby enabling a unidirectional sequence of functional tuning of said filter.

3,891,939
VARIABLE FREQUENCY PULSE TRAIN GENERATOR
David B. Bennett, Minneapolis, and Charles P. Harman, Roseville, both of Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Feb. 4, 1974, Ser. No. 439,200

Int. Cl. H03b *3/04*

U.S. Cl. 331—1 A **6 Claims**



1. A variable frequency pulse train generator comprising:
an astable free-running multivibrator including first and second monostable multivibrators, each adapted to provide an output pulse of predetermined width in response to application of a pulse at its respective inputs, said predetermined pulse width being a function of the parameters of the timing network associated with the monostable multivibrators;
a plurality of resistors, each of different value, each of said resistors having a first end connected to a source of potential and a second end connected through a diode to the timing networks of the two monostable multivibrators;
a plurality of switching means equal in number to the plurality of said resistors, each said switching means adapted to connect the second end of one of said resistors to a point of reference potential and each said switching means being operable through a control terminal to disconnect said second end of said resistor from said point of reference potential; and
control means having an input and a plurality of outputs, one of said outputs being connected to the control terminal of each of said switching means to connect one of said resistors into the timing networks of the two monostable multivibrators upon application of a signal to the input of said control means.

3,891,940
TWO-TONE GENERATOR USING TRANSISTORS FOR SWITCHING LC RESONANT CIRCUITS
Kouichi Sekiguchi, Asaka, Japan, assignor to Iwasaki Tsushinki Kabushiki Kaisha, Japan

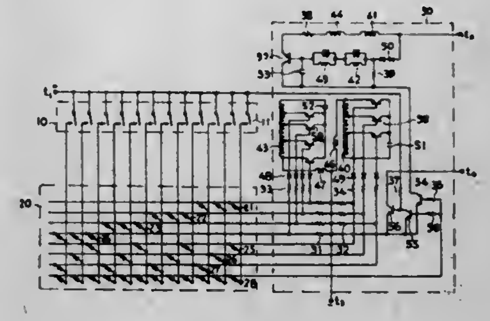
Filed Feb. 6, 1974, Ser. No. 439,985

Claims priority, application Japan, Feb. 10, 1973, 48-16119; Sept. 21, 1973, 48-105951

Int. Cl. H03b *5/12;* **H04m** *1/50*

U.S. Cl. 331—48 **3 Claims**

1. A two-tone generator for producing a dial tone in the form of two-tone signal, comprising:
a two-tone oscillator having two LC resonance circuits each composed of a primary coil and a secondary coil and a capacitor in parallel with said secondary coil;
a plurality of switching transistors having the collector-emitter paths thereof coupled between corresponding taps along respective ones of said secondary coils and said capacitors to switch the values of the inductances of the secondary coils in response to turning-ON of ones of said switching transistors;
a plurality of switches individually controllable and each having a contact operable to an open and a closed condition;



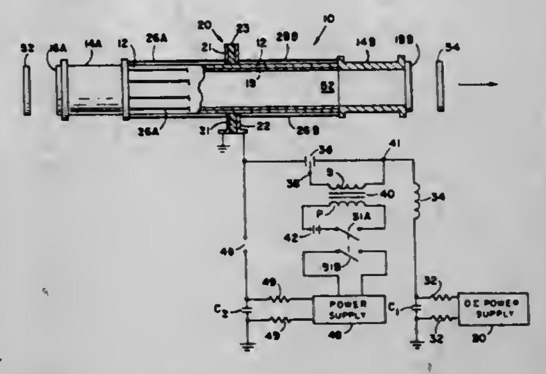
a matrix connected to the contacts of the switches for providing outputs corresponding to closed contacts of the switches; and
biasing means electrically coupled to said matrix and said switching transistors for biasing the bases of respective selected ones of said switching transistors of the two LC resonance circuits with base currents sufficient to turn-ON said selected ones of said switching transistors in response to said outputs of the matrix.

3,891,941
IMPLODING CYLINDER METAL VAPOR LASER
Thomas G. Roberts; Thomas A. Barr, Jr., and Charles M. Rust, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 25, 1974, Ser. No. 436,580

Int. Cl. H01s *3/22, 3/09*

U.S. Cl. 331—94.5 G **7 Claims**



1. A metal vapor laser comprising: a glass tube, a metal coating around the inner surface of said tube, first and second cylindrical electrodes at respective ends of said tube, said electrodes being disposed coaxial with said tube and in contact with the ends of said metal coating for conducting electrical current through the metal coating therebetween, first and second optical windows covering respective ends of said electrodes, pumping means coupled to said electrodes for coupling electrical energy thereto and through said metal coating for vaporizing said metal, and for producing a population in said vapor, and means for stimulating the emission of a laser beam therefrom.

3,891,942

METHOD OF PUMPING FOR A LASER AND DEVICE FOR CARRYING OUT SAID METHOD

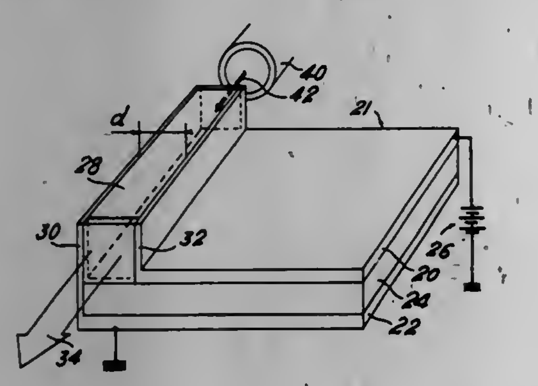
Michel Clerc, Limours, and Paul Goujon, Chennevieres-sur-Marne,, France, assignors to Commissariata l'Energie Atomique, Paris, France

Filed Sept. 11, 1973, Ser. No. 396,177

Claims priority, application France, Sept. 24, 1972, 72.33492

Int. Cl. H015 *3/09*

U.S. Cl. 331—94.5 G **8 Claims**



1. A method of pumping for a gas laser which consists in exciting a gas contained in a passage and discharging a structure for storage and propagation of electrical energy in such a manner as to ensure that the excitation wave is progressive and travels along the axis of said passage in a direction parallel to the stimulated radiation and at a velocity in the vicinity of the velocity of said radiation, wherein said discharge is initiated by injecting an electron beam into said passage in a direction parallel to its axis at a velocity in the vicinity of the velocity of said radiation in said gas.

3,891,943

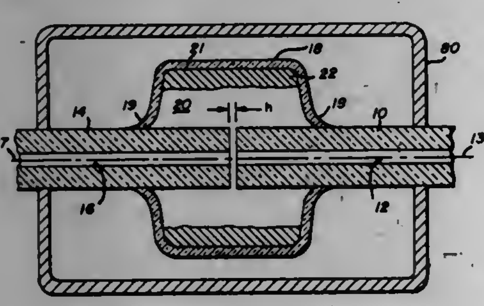
LONG LIFE HELIUM METAL VAPOR LASER

Mark W. Dowley, Palo Alto, and William A. Shull, Portola Valley, both of Calif., assignors to Liconix, Mountain View, Calif.

Filed Aug. 6, 1974, Ser. No. 495,222

Int. Cl. H01s *3/22, 3/09*

U.S. Cl. 331—94.5 G **13 Claims**



1. A helium metal vapor laser comprising:

a first tube defining a first bore;

a second tube disposed along an axis common to said first tube and defining a second bore, adjacent ends of said first and second tubes being closely spaced relative to one another so as to form a narrow opening therebetween;

a third tube coaxial with said first and second tubes and having end walls which are joined to said first and second tubes such that the internal surface of said third tube and the outer surfaces of the enclosed portions of said first and second tubes form a reservoir, the inner diameter of said third tube being greater than the outer diameter of said first and second tubes near said adjacent ends;

a mass of metal disposed within said reservoir, said metal forming a coating on said internal surface away from said bores and said narrow opening;

a cathode structure coupled to the end of said first tube opposite said narrow opening and including a cathode;

an anode structure coupled to the end of said second tube opposite said narrow opening and including an anode, said cathode structure, said anode structure, and said first, second and third tubes forming a sealed envelope; and

helium gas filling said envelope for substaining a discharge through said first and second tubes between said anode and said cathode, said narrow opening serving to effectively confine said discharge within said bores so as to inhibit its direct contact with said metal, said end walls and said third tube serving to conduct discharge produced heat to said metal, and said first and second tubes serving to radiate and convect discharge produced heat to said metal, thereby indirectly heating said metal in a manner such that a substantially uniform rate of the metal vaporizes and diffuses through said narrow opening into said first and second bores.

3,891,944

GAS LASER GENERATOR WITH DISCHARGE CONTAINER GAS FLOW CIRCULATION

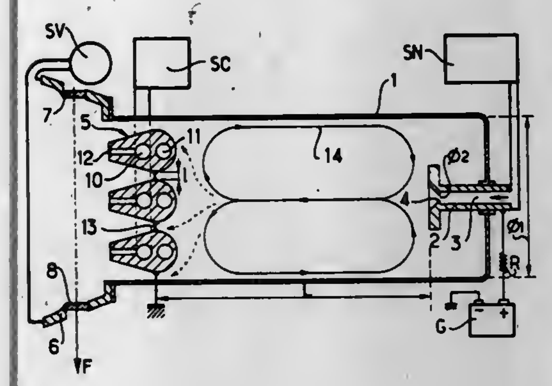
Bernard Lavarini, Paris; Jean-Pierre Crancon, Arpajon, and Jean-Yves Thomas, Paris, all of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed Apr. 20, 1973, Ser. No. 353,174

Claims priority, application France, Apr. 20, 1972, 72.14049; May 18, 1972, 72.17856

Int. Cl. H01s *3/22, 3/09*

U.S. Cl. 331—94.5 G **3 Claims**



1. A gas laser generator comprising:

an extended container,

a plurality of equally, laterally spaced, transversely aligned aerodynamically profiled gas injectors positioned within said container adjacent a first end thereof and forming with said container transfer openings at said first end,

an injection pipe opening into said container close to its second end for supplying said container with at least one jet of a first gas capable of being excited by an electric discharge,

longitudinally spaced electrodes disposed in the container at respective ends for producing an electrical discharge in the first gas,

an extended expansion chamber connected to the first end of the container and increasing in diameter progressively from the first end of the chamber adjacent the container to its second end,

evacuation means for maintaining the second end of the expansion chamber at low pressure and for circulating the first gas from the injection pipe through said extended container and into the expansion chamber by way of the transfer openings,

said profiled gas injectors including gas discharge nozzles facing into the expansion chamber and supplied with at least one second gas capable of being excited by molecular interaction with the first gas in its excited state and being downstream of said electrical discharge, so as to cause the first and second gases to mix,

a cavity capable of amplifying a laser emission in the presence of the second gas in its excited state; said cavity being arranged in the expansion chamber in such a manner as to be traversed by the gaseous mixture downstream of said nozzles, said generator being characterized in that the dimensions of the container, the diameter and position of the injection pipe, the injection rate of the first gas and the dimensions of the transfer openings are such as to produce a whirling flow movement of the first gas longitduinally throughout said container, upstream of said nozzles with a first, inner flow portion extending longitudinally from the second end to the first end, between said electrodes, and at least one second flow portion radially outwards of the first flow portion reversed thereto near the sidewalls of said container.

3,891,945

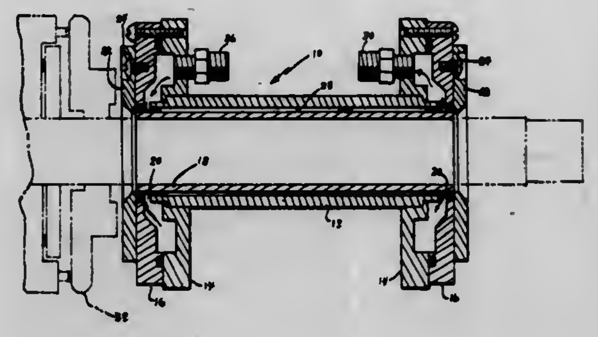
CONFIGURATION FOR EFFICIENT COOLING AND EXCITATION OF HIGH AVERAGE POWER SOLID STATE LASERS

Howard Schlossberg, Lexington, and David Milam, Burlington, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 20, 1973, Ser. No. 399,012

Int. Cl. H01s *3/09*

U.S. Cl. 331—94.5 P **7 Claims**



1. A system for cooling and exciting high average power solid state lasers comprising: a hollow thin walled cylindrically shaped, solid state lasing medium; a coolant; a coolant containing means surrounding the exterior wall of the lasing medium and sealed thereto; a housing mounted in a sealed relationship to the interior wall of the lasing medium and at one end thereof; a housing extension mounted in a sealed relationship to the interior wall of the lasing medium and at the end remote from the said housing; removably attachable means in the housing and the housing extension for exciting the lasing medium, and means in the housing and housing extension for directing the flow of a coolant around the exciting means and lasing medium.

3,891,946

VARIABLE FREQUENCY OSCILLATOR INCLUDING ACTIVE BAND-PASS FILTER WITH POSITIVE FEEDBACK

John L. Aker, Chanute, Kans., assignor to Kustom Electronics, Inc., Chanute, Kans.

Division of Ser. No. 222,524, Feb. 1, 1972, Pat. No. 3,812,278. This application Mar. 20, 1974, Ser. No. 452,709

Int. Cl. H03b *5/20*

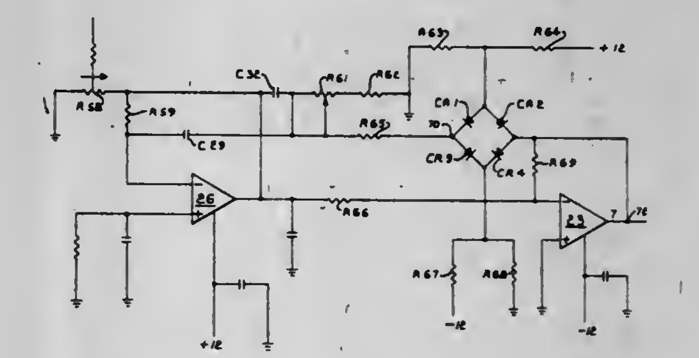
U.S. Cl. 331—108 D **2 Claims**

1. A low distortion sinusoidal oscillator circuit comprising: an active inverting band pass filter having an input and an output,

inverter means for generating a positive feedback signal, said inverter means having an output and an input interconnected with said inverting band-pass filter output,

a feedback loop having an input and an output, the feedback loop input interconnected with said inverter means output and said feedback loop output interconnected with said active band-pass filter input, said feedback loop having a means for limiting the amplitude of said positive feedback signal, the limiting means comprising a clipping circuit interconnected between said inverter means output and said filter means input, and

a means for adjusting the center frequency of said active band-pass filter, the adjusting means consisting of a single resistive element.



3,891,947

CIRCUIT ARRANGEMENT FOR ADAPTING A LOAD NETWORK TO A TRANSCEIVER

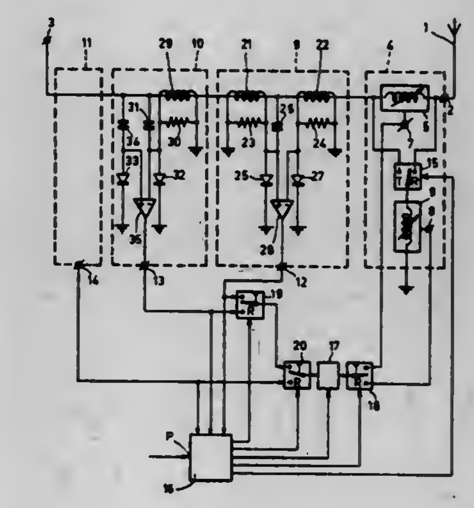
Jean-Pierre Debost, Versailles, and Jacques Mezan de Malartic, Antony, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 23, 1973, Ser. No. 408,403

Claims priority, application France, Oct. 31, 1972, 72.38590

Int. Cl. H03h *7/40*

U.S. Cl. 333—17 **6 Claims**



1. An arrangement for adapting a load network to a transceiver, comprising a load adaptor having a first and a second adjustable reactive element, switching means and at least a first and a second control means in which in the presence of a first information indicating at least the fact that the resistance of the load network is higher than that of the transceiver, the switching elements connect the first reactive element in series with the load network which is connected in parallel with the second reactive element and permit the second control means to vary the susceptance of the second reactive element during a first control phase until the real part of the impedance at the input terminal of the arrangement is substantially equal to the resistance of the transceiver, while during a second control phase a control means other than that used during the first control phase ensures the adjustment of the first reactive element, whereas in the presence of a second information indicating at least the fact that the conductance

of the load network is higher than that of the transceiver the switching elements connect the second reactive element in parallel with the combination of the first reactive element which is in series with the load network and permit the first control means to vary the reactance of said first reactive element during the first control phase until the real part of the admittance at the input terminals of the arrangement is substantially equal to the conductance of the transceiver while during the second control phase a control means other than that used during the first phase ensures the adjustment of the second reactive element.

3,891,948
MICROWAVE FILTER USING HYBRID CIRCUIT AND RESONATORS

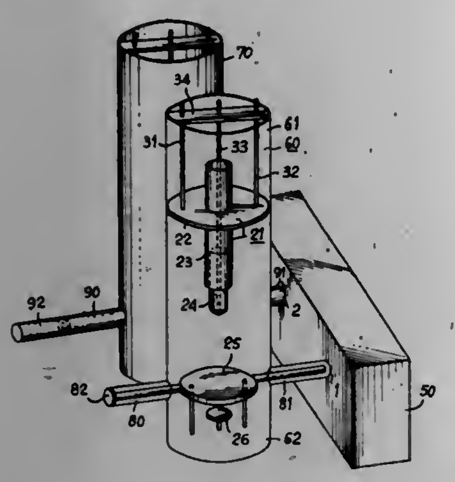
Michel Destrade, and Jean-Luc Vassort, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed June 25, 1974, Ser. No. 482,984

Claims priority, application France, June 29, 1973, 73.24002

Int. Cl. H01p *1/20*

U.S. Cl. 333—73 W **4 Claims**



1. A branching filter comprising: a hybrid circuit having two pairs of conjugate ports; two line sections having respective first ends connected respectively to the ports of one and the same pair of conjugate ports and respective second ends one of which is open and the other short-circuited; and two resonators tuned to the same frequency F_o and respectively coupled in parallel to said two line sections at the same distance from said second ends.

3,891,949
SLIT LINE-TYPE MICROWAVE CIRCUIT CONSTRUCTION

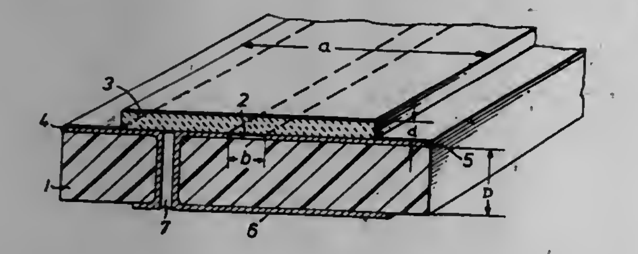
Jurgen Marquardt, Backnang, and Erich Pivit, Allmersbach Im Tal, both of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed Nov. 27, 1973, Ser. No. 419,294

Claims priority, application Germany, Nov. 30, 1972, 2258594; Nov. 30, 1972, 438665[U]

Int. Cl. H01p *3/02, 3/08*

U.S. Cl. 333—84 R **7 Claims**



1. In a circuit device including a dielectric carrier substrate having a relatively low dielectric constant ϵ_{r1} and a first metal layer on one surface side for forming a symmetrical microwave line, the improvement wherein said line is in the form of a slit line, said device comprises

a. a dielectric plate bonded to said first metal layer and covering the side of said line which faces away from said substrate; the dielectric constant ϵ_{r2} of said dielectric plate being relatively high and having a value of at least 8;

b. a second metal layer disposed on the side of said substrate facing away from said slit line, said second metal layer defining an asymmetrical strip line;

c. means defining a bore extending through said substrate between its side carrying said slit line and its side carrying said strip line; and

d. a third metal layer disposed on the walls of said bore and coupling said lines together.

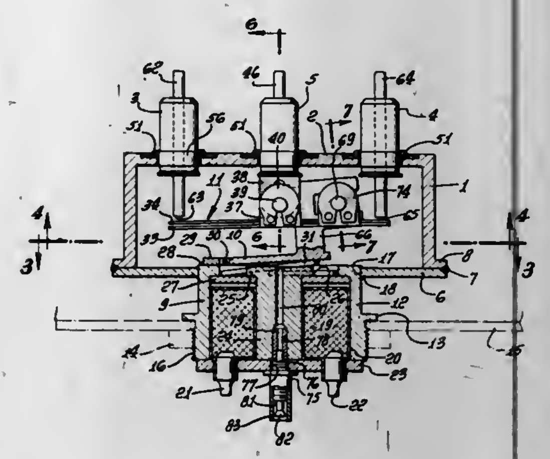
3,891,950
PRESSURIZED RELAY ASSEMBLY

Victor E. De Lucia, 927 Euclid Ave., Santa Monica, Calif. 90403

Filed Aug. 5, 1974, Ser. No. 494,825

Int. Cl.² H01H *1/66*

U.S. Cl. 335—151 **16 Claims**



1. A high voltage double pole, double throw relay assembly comprising: a metal housing, normally open contact means and normally closed contact means in said housing including terminals projecting from said housing, electromagnetic operating means for closing and opening said contact means upon energization and deenergization of said electromagnetic operating means, means forming a seal between said terminals and said housing, and means for admitting a pressurized dielectric gas into said housing, said means forming a seal including insulators on said terminals, first sealing members sealingly affixed to said insulators, and other sealing members sealingly affixed to said housing and to said first sealing members and said terminals.

3,891,951
DEVICE FOR THE DISPLAY OF COLOUR TELEVISION IMAGES

Tjitte Talsma, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 25, 1974, Ser. No. 445,909

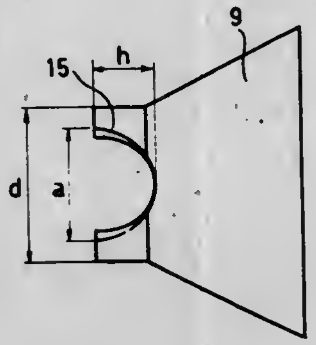
Claims priority, application Netherlands, Mar. 19, 1973, 7303773

Int. Cl. H01t *7/00*

U.S. Cl. 335—210 **8 Claims**

1. A device for the display of colour television images, comprising a cathode-ray tube of the shadow mask type having a rearmost cylindrical part in which a plurality of electron guns are arranged for generating a plurality of electron beams which are situated substantially in one plane, and a foremost flared part, the said device furthermore comprising a deflection system which is coaxially arranged about the tube near the transition between the two parts of the tube and which essentially comprises an annular ferromagnetic core having a

cylindrical rear section, a first deflection coil system for deflecting the electron beams in a first deflection direction perpendicular to the tube axis and in the said plane, and a second deflection coil system for deflecting the electron beams in a second deflection direction perpendicular to the tube axis and to the said plane, the said deflection system being adapted such that the second deflection coil system generates a magnetic field which has a cushion-like shape near the rear of the deflection system and a barrel-like shape near the front, characterized in that the rear of the ring core has recesses in two diametrically situated locations, the connecting line between the recesses being substantially situated in the plane of the electron beams, said recesses having a depth at least equal to half the length of the rear section.



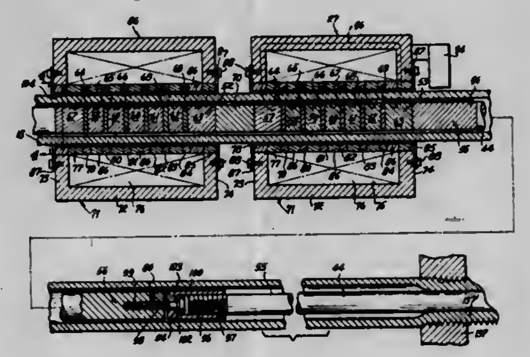
3,891,952
ELECTROMAGNETIC ASSEMBLY RESISTING AXIAL ARMATURE MOVEMENT FOR WORKING OR FINNING TUBING

Richard M. Winter, Mentor, and William F. Aylard, Northfield, both of Ohio, assignors to Non-Ferrous International Corporation, New York, N.Y.

Division of Ser. No. 141,249, May 7, 1971. This application Aug. 21, 1973, Ser. No. 390,240

Int. Cl. H01f *7/08*

U.S. Cl. 335—258 **7 Claims**



1. Magnetic apparatus for resisting axial movement of an armature within a non-magnetic tube extending through the magnet comprising, in combination:

- an annular magnet assembly having a generally centrally located opening extending through the assembly;
- the tube extending through the opening and beyond ends of the magnet assembly;
- an armature of a diameter smaller than and within the tube; flux producing means to create magnetic flux in said magnet; and
- cooperating pole piece means on said magnet assembly and magnetic material means on said armature for causing magnetic flux to enter and leave said armature at multiple locations along the armature, so that axial displacement of the armature with respect to the magnet assembly is effectively resisted.

3,891,953
HIGH HOLDING STRENGTH AND LOW RESPONSE TIME ELECTRO-MAGNET STRUCTURE

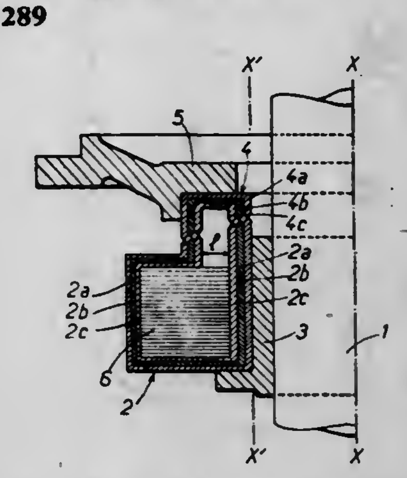
Georges Thomin, Ramonville, France, assignor to Centre National d'Etudes Spatiales, Paris, France

Filed Apr. 2, 1974, Ser. No. 457,212

Claims priority, application France, Apr. 3, 1973, 73.11920; Jan. 4, 1974, 74.00306

Int. Cl. H01f *7/20*

U.S. Cl. 335—289 **9 Claims**



1. An electro-magnet apparatus for attracting a load comprising:

- a shaft;
- an armature adapted to support a load and formed of a plurality of electrically insulated magnetic plates arranged concentrically of said shaft and fitted one into another, the armature plates being made of a high saturation induction material;
- a core formed of a plurality of electrically insulated magnetic plates arranged concentrically of said shaft and fitted one into another, the core plates being made of a high saturation induction material, said core disposed in axially spaced relation to said armature; and
- an energizing coil means disposed in coöperating relation to said core for generating a magnetic flux therein, whereby when said coil means is excited by an electrical current a large attraction force having a short response time will be generated.

3,891,954
TRANSFORMER

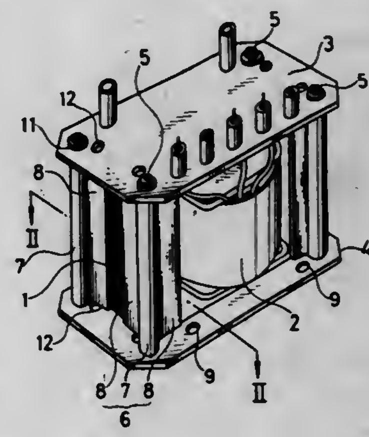
Iseo Konishi, Niichi Seisakusho 4-49-Chome, Osaka, Japan

Filed Jan. 2, 1974, Ser. No. 429,766

Claims priority, application Japan, Dec. 29, 1972, 47-482171

Int. Cl. H01f *27/26*

U.S. Cl. 336—61 **12 Claims**



1. A transformer device comprising:

a. a core on which a coil is wound;

b. a plurality of setting plate means each setting plate means approximately equal in length to the height of the core, each said setting plate means including two setting surface means forming a substantially right angle, wherein each said setting plate means engaging only one corner of said core with said setting surface means pressing against the respective core edges, and thereby firmly holding said core in place; and,

c. two end plate means respectively arranged on the top and bottom of said core, for securely setting the top and bottom ends of said plurality of setting plate means, said end plate means having means for independently adjusting the position of each of said setting plate means for accommodating different size cores.

3,891,955

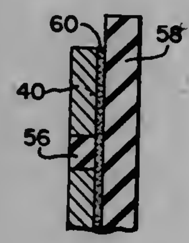
ELECTRICAL INDUCTIVE APPARATUS

William E. Horton, III, Bogart, Ga., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 7, 1974, Ser. No. 467,756

Int. Cl. H01f *27/30*

U.S. Cl. 336—205 1 Claim



1. A transformer comprising:

a magnetic core;

a primary winding disposed in inductive relationship with said magnetic core;

a secondary winding having a plurality of conducting layers disposed in inductive relationship with the magnetic core, with each of said conducting layers comprising at least two metallic foil conductors which are bonded to a common layer of insulating material; and,

an insulating member positioned between the foil conductors, with said insulating member having substantially the same radial thickness as the foil conductors.

3,891,956

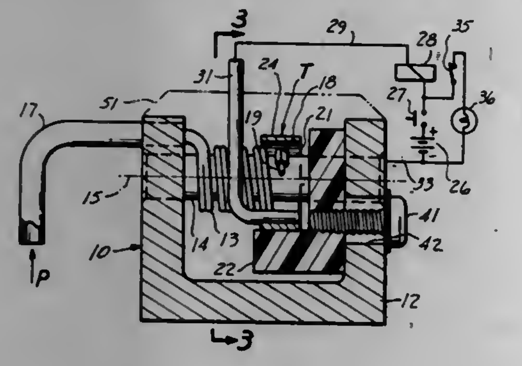
APPARATUS FOR MEASURING VARIABLES

James G. Allemann, Santa Ana, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed Nov. 19, 1973, Ser. No. 417,338

Int. Cl. H01b *37/10*

U.S. Cl. 337—1 17 Claims



1. In apparatus for determining the state of a fluid by measuring two variable characteristics thereof, the improvement comprising, in combination:

first means for expressing one of said variables in terms of a first change of position;

second means for expressing the other of said variables in terms of a second change of position;

third means operatively associated with said first and second means for deriving from said first and second changes of position an indication of the relative displacement of said first and second changes of position with respect to each other; and

fourth means connected to said first means for combining a third change of position with said first change of position to modify the operation of said measurement deriving means.

3,891,957

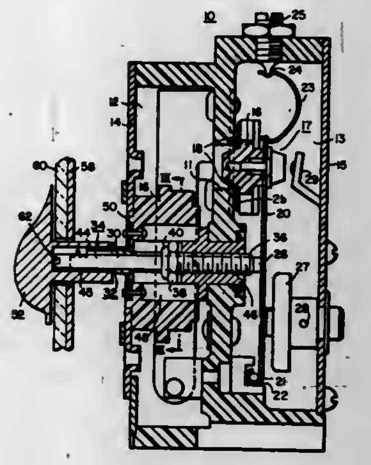
REFERENCE CORRECTABLE TEMPERATURE CONTROL

Calvin J. Holtkamp, Mansfield, Ohio, assignor to White-Westinghouse Corporation, Cleveland, Ohio

Filed May 10, 1974, Ser. No. 468,708

Int. Cl. H01h *37/14*

U.S. Cl. 337—347 6 Claims



1. In a control of the type having a casing with a snap-acting, overcenter mechanism therein for operating cycling switch contact means, and in which positioning of a fulcrum controls the operating point of said overcenter mechanism;

a rotatable hollow outer shaft, having an inner end and a headed outer end, threadably carried in said casing and axially movable in accordance with rotation of the outer shaft;

a rotatable rod threadably carried in said outer shaft and having an inner end projecting beyond said inner end of said outer shaft to serve as said fulcrum of said overcenter mechanism, said rod extending outwardly well beyond said headed outer end of said outer shaft;

circuit switching cam means including a recess receiving said headed outer end of said outer shaft in rotationally coupled relation, said cam means also including an outwardly projecting sleeve through which said rod extends and projects beyond the outer end of said sleeve;

a removable, user operated rotatable temperature setting dial in indexed relation on said sleeve and covering the outer ends of said sleeve and said rod; and

means on the outer end of said rod for engagement by a tool with said dial removed for rotating said rod to shift said rod axially relative to said outer shaft and to thereby recalibrate said control by changing said fulcrum position relative to the rotative position of said dial and sleeve.

3,891,958

HUMIDITY SENSOR

Takashi Wakabayashi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 2, 1973, Ser. No. 384,936

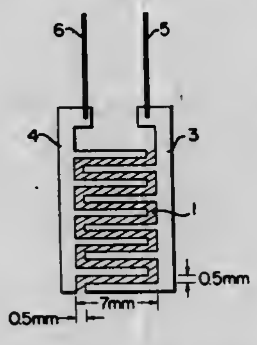
Claims priority, application Japan, Sept. 20, 1972, 47-94737

Int. Cl. H01c *13/00*

U.S. Cl. 338—35 6 Claims

1. A humidity sensor comprising (1) a humidity sensitive film which consists essentially of a reaction product obtained by heating (a) a chlorine containing polymer selected from the group consisting of a chlorinated natural rubber, polyvinyl

chloride, polyvinylidene chloride, chlorinated polyethylene and chlorinated polypropylene and (b) a polyamide resin, the reactive proportion of said chlorine containing polymer and



said polyamide resin being 45 to 90 weight % of polyamide resin and 10 to 55 weight % of chlorine containing polymer, and (2) two electrodes applied to said humidity sensitive film.

3,891,959

CODING SYSTEM FOR DIFFERENTIAL PHASE MODULATION

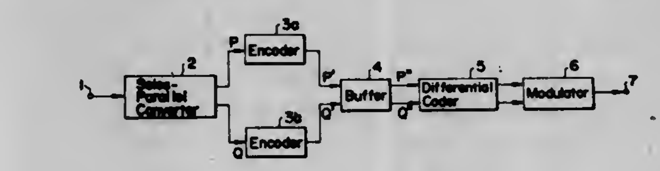
Yoshikazu Tsuji, and Yukio Sohma, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 28, 1973, Ser. No. 429,156

Claims priority, application Japan, Dec. 29, 1972, 48-1508

Int. Cl.² G06F *11/12*

U.S. Cl. 340—146.1 AQ 19 Claims



1. A coding system for a differential phase modulation system for coding an input, serial bit signal into a signal including an error correcting code, and wherein each successive, predetermined number of bits of the thus coded signal defines a respectively corresponding symbol, and the phase of a carrier is shifted in accordance with each successive symbol, said coding system comprising:

series-to-parallel converter means for receiving and converting an input, serial bit signal into parallel, serial bit signals,

encoder means for receiving the parallel signals from said converter means and encoding each of the parallel signals with respectively corresponding error correcting codes, and producing corresponding, parallel coded signal outputs,

buffer means for receiving the parallel, coded signals from said encoder means and selecting a predetermined number of bits in alternate succession from each thereof, each said predetermined number of bits defining a corresponding symbol, and said buffer means providing the thus defined symbols in serial succession as an output.

3,891,960

DOPPLER SONAR SYSTEM

Maurice W. Widener, Austin, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 24, 1970, Ser. No. 15,322

Int. Cl. G01s *9/66*

U.S. Cl. 340—3 R 8 Claims

1. A system for acoustic echo ranging capable of measuring bearing range and velocity of moving targets; comprising:

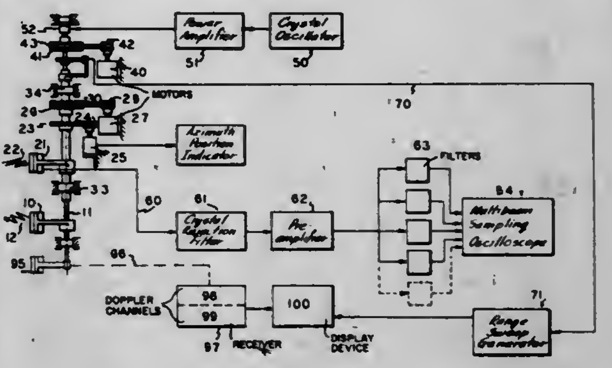
a. a first sound transducer rotatably mounted;

b. a second transducer rotatably mounted, said first and second transducers forming a rotating directional acoustic array;

c. a signal source for generating a first substantially pure sine wave signal coupled to said first sound transducer;

d. a means for receiving and amplifying signal echoes of a given frequency above or below said first signal received from a moving target coupled to said second sound transducer;

e. means for comparing the frequencies of the transmitted signal and the echo signal and converting the difference



to target velocity, said means coupled to said signal source and said receiving means;

f. means of measuring range on the said received signal by measuring the delay of the signal related to the rotation speed and position of said first rotating sound transducer; and

g. means for producing a signal capable of both frequency resolution and time resolution using as a reference the rotating directional acoustic array.

3,891,961

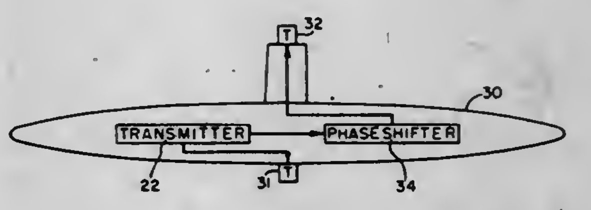
SONAR COUNTERMEASURE

Rudolph M. Haisfield, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 27, 1961, Ser. No. 92,101

Int. Cl.² H04B *11/00*

U.S. Cl. 340—5 R 11 Claims



1. A sonar countermeasure comprising, a first and second sonar transducer, a broadband source of signals coupled to each of said transducers, said transducers being rigidly interconnected and separated by a plurality of wavelengths at the lowest frequency within the band of said source, and continuously variable phasing means to adjust the frequency of the signal supplied to each of said transducers to a different value differing by less than 1 cycle per second.

3,891,962

ELECTRONIC INSECT CONTROLLER

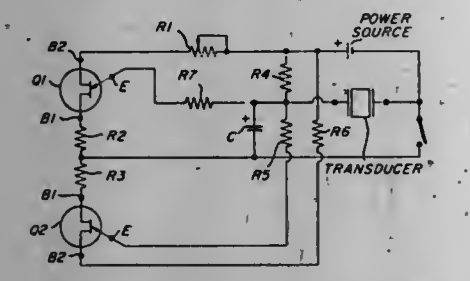
Herbert Montgomery White, Carleton Place, Canada, assignor to Tritronics (1971) Ltd., Weston, Canada

Filed Oct. 10, 1972, Ser. No. 296,049

Claims priority, application Canada, Oct. 7, 1971, 124720

Int. Cl. H04b *11/00*

U.S. Cl. 340—15 **9 Claims**



1. A device for repelling insects comprising electrical circuit means having input conductor means and output conductor means, power supply means connected to said input conductor means for supplying electrical power to said circuit means, said circuit means including unijunction transistor means electrically connected to said input conductor means and to said output conductor means, said circuit means being adapted to generate a continuous oscillating electrical signal having substantially a saw tooth wave form of continuously varying frequency at said output conductor means and transducer means connected to said output conductor means adapted to convert said electrical signal into a continuous sonic signal.

3,891,963

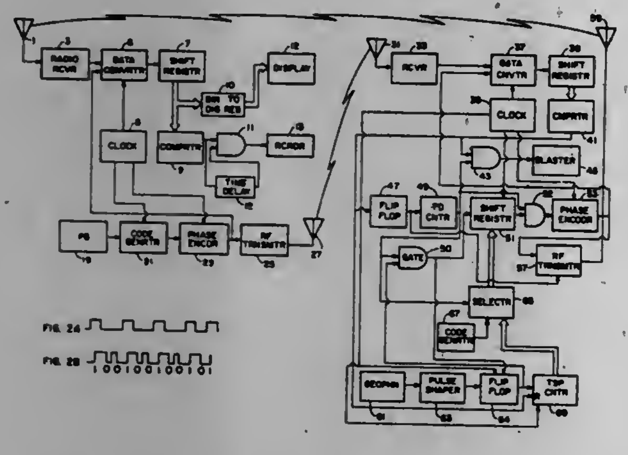
CODED RADIO SHOOTING UNIT

Curtis B. Herbert, Jr., Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Oct. 23, 1973, Ser. No. 408,695

Int. Cl. G01v *1/14*

U.S. Cl. 340—15.5 TS **11 Claims**



1. Apparatus for controlling the activation of a seismic energy generator through a communications link between a control location and a generator location, comprising:

first means for transmitting a first coded signal from the control location to the generator through the communications link;

second means responsive to the first coded signal for transmitting a second coded signal through the communications link from the generator location to the control location;

third means for activating the seismic energy generator response to the second coded signal, for measuring the time interval from activation of the seismic energy generator to the arrival of resulting seismic energy from the level of the seismic generator in the earth to the earth's surface and for sending a signal indicative of said time interval through the communications link to said control location; and

fourth means for generating a time zero signal at the control location responsive to the second coded signal.

3,891,964

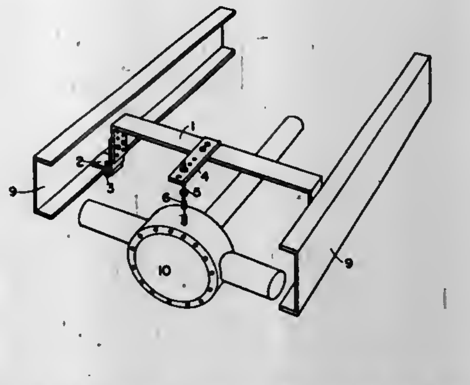
TRUCK OR TRAILER AXLE OVERLOAD INDICATOR

Leo Franklin Geiger, 6803 Cherbourg Ave. North, Jacksonville, Fla. 32205

Filed July 15, 1974, Ser. No. 488,310

Int. Cl. G08b *21/00*

U.S. Cl. 340—52 R **7 Claims**



1. An improvement in axle overload indicators for motor trucks and trailers, said improvement consisting of an adjustable height horizontal beam with ends bent at substantially right angles, attached by nuts and bolts at each end through one of a plurality of pairs of holes in each member, to a pair of frame brackets, each of said frame brackets attached by nuts and bolts to a truck or trailer frame clamp plate, an indicator support bar rigidly attached to and extending frontwardly or rearwardly from the center of said horizontal beam, an indicator holder and adjustment bolt passing through and affixed to one of a plurality of holes in said indicator support bar, a flexible pendent indicator attached to and suspended from said indicator holder and adjustment bolt, the lower end of said pendent indicator being positioned directly over and in close proximity to the center of the truck or trailer axle or differential housing.

3,891,965

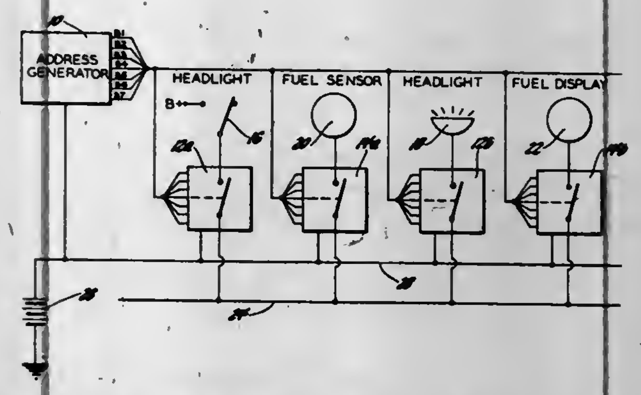
TIME DIVISION MULTIPLEX SYSTEM FOR A MOTOR VEHICLE

Thaddeus Schroeder, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 16, 1974, Ser. No. 506,224

Int. Cl. G08c *15/12*

U.S. Cl. 340—52 F **4 Claims**



1. In a motor vehicle having a source of direct current, a plurality of information input means and associated load means, a time division multiplex system for controlling the application of current to said load means comprising:

a sender-receiver set for each input means and associated load means;

address generator means for successively generating a plurality of multibit binary words;

conductor cable means including a power conductor for supplying current from said source to said address generator means and each of said sender-receiver sets, said cable means including an information conductor interconnecting each sender-receiver set, said cable means further including a plurality of address conductors interconnecting said address generator means with said sender-receiver sets, the number of address conductors corresponding to the number of bits in each of said plurality of multibit binary words;

each of said sender-receiver sets including address decoder means responsive to different binary words whereby information may be communicated between respective sender-receiver sets during the time the respective sender-receiver sets are being addressed;

the receiver in each sender-receiver set controlling the application of current to the associated load means in response to the information received from the associated sender.

3,891,966

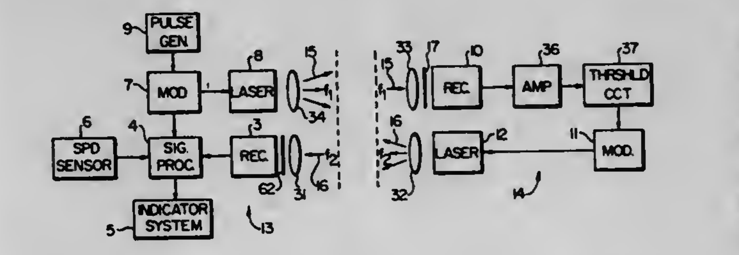
AUTOMOBILE COLLISON AVOIDANCE LASER SYSTEM

Zoltan G. Sztankay, 4450 S. Park Ave., No. 802, Chevy Chase, Md. 20015

Filed Aug. 8, 1974, Ser. No. 495,746

Int. Cl. B60t *7/12*

U.S. Cl. 340—53 **5 Claims**



1. An automobile collision avoidance system comprising:

a. means located on the rear end of an automobile for receiving radiant energy at the frequency f_1;

b. means located on the rear end of an automobile for transmitting radiant energy at the frequency f_2;

c. means located on the front end of an automobile for transmitting radiant energy of a frequency f_1;

d. means located on the front end of an automobile for receiving radiant energy at the frequency f_2;

e. means responsive to the receipt of radiant energy at the frequency f_2 for determining the proper distance between a leading automobile and a trailing automobile; and

f. means responsive to said last-named means for providing an indication to the driver that the distance is less than a predetermined minimum.

3,891,967

ANTITHEFT ALARM SYSTEM FOR AUTOMOBILES

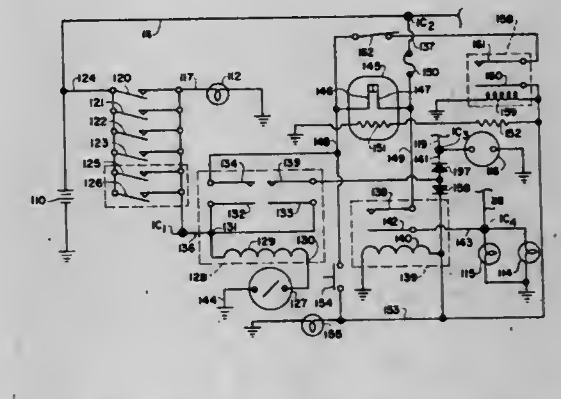
Clifton R. Betts, 190 Jennifer Dr., San Pablo, Calif.

Continuation of Ser. No. 135,545, April 20, 1971. This application Oct. 15, 1973, Ser. No. 406,147

Int. Cl. B60g *1/04;* **B60r** *25/10*

U.S. Cl. 340—63 **10 Claims**

1. An alarm system for automotive vehicles and the like having an electrical system, also having at least one electrically operated device usable when energized to attract attention to such vehicle to protect the same against unauthorized entry into a compartment thereof, futher having a closure member for an access opening into such compartment, and still further having a compartment switch arranged with the closure member so as to be actuated by opening thereof, comprising: a circuit having a pluality of conductors connectable with such electrical system, device, and compartment switch; a master switch connected in said circuit and movable between open and closed positions for selectively conditioning said alarm system for operation; an alarm-actuating mechanism connected in said circuit so as to maintain the same normally in an inoperative condition and such device de-energized and to effect operation of said circuit and energization of such device whenever said master switch has conditioned said alarm system for operation and such compartment switch is actuated; said alarm-actuating mechanism and said circuit being provided with operation-maintenance means effective to maintain said circuit in an operative condition and such device energized following deactivation of such compartment switch; whereby such device and compartment switch are usuable in an ordinary manner but when said master switch is closed, opening such closure member will actuate the compartment switch to energize said alarm-actuating mechanism and such device and to maintain the energized state of the latter even after deactuation of the compartment switch; condition-sampling means arranged in said circuit in operative connection with said alarm-actuating mechanism and operation-maintenance means thereof to test the condition of said circuit as determined by the condition of such compartment switch so as to return said circuit to an inoperative condition and de-energize such device after a predetermined time interval if such compartment switch is deactuated and set said alarm system for a subsequent cycle of operation or to permit said circuit to remain in the operative condition thereof with such device energized if such compartment switch remains actuated; and light switch means connectable with the exterior lights of such vehicle so as to energize the same and connected in circuit with said condition-sampling means, said light switch means being manually operable so as to energize such vehicle lights when desired and being returned to an inoperative state automatically by said condition-sampling means following expiration of a predetermined time interval.



3,891,968

COHERENT OPTICAL PROCESSOR APPARATUS WITH IMPROVED FOURIER TRANSFORM PLANE SPATIAL FILTER

Donald H. McMahon, Carlisle, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 4, 1974, Ser. No. 457,750

Int. Cl. G06k *9/13*

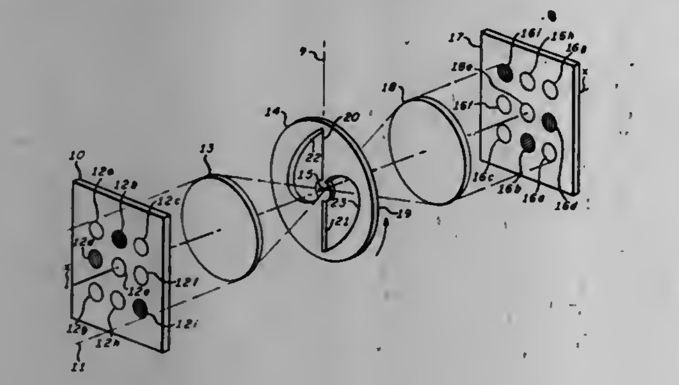
U.S. Cl. 340—146.3 E **14 Claims**

1. An optical processor fingerprint inspection apparatus comprising:

optical means for generating a diffraction pattern of the fingerprint to be identified in the Fourier transform plane of said inspection apparatus,

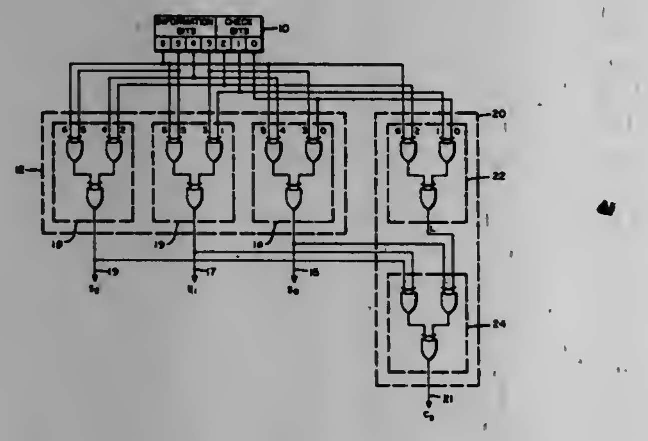
opaque mask means having at least one internal asymmetric transparent portion disposed fully within said mask means in said Fourier transform plane,

said internal asymmetric transparent portion having a radially disposed internal boundary edge cooperating with a curvate internal boundary edge for the cyclic control of the passage of light therethrough, means for cyclically rotating said internal asymmetric transparent portion about the major axis of said optical means through said diffraction pattern,



means responsive to radiant energy transmitted cyclically through said transparent portion between said radial and curvate internal boundary edges during passage thereof through said diffraction pattern for sensing the amplitude of ridge line separation of said fingerprint.

3,891,969
SYNDROME LOGIC CHECKER FOR AN ERROR CORRECTING CODE DECODER
Bruce A. Christensen, Minneapolis, Minn., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Sept. 3, 1974, Ser. No. 503,011
Int. Cl. G06f *11/10*
U.S. Cl. 340—146.1 AL **2 Claims**



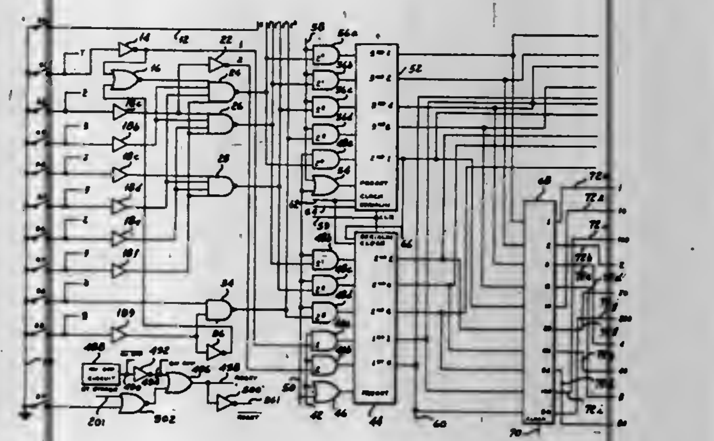
1. In combination with a syndrome generator network that generates syndrome bits from a vinary word that includes information bits and check bits, a syndrome checker for detecting errors in the generation of said syndrome bits from said binary word, said syndrome checker comprising:

a parity predict network for generating a parity predict bit;
 a parity check network for generating a syndrome check bit;

first means for coupling the bits of said binary word as inputs to said syndrome generator network and to said parity predict network in accordance with the following conditions:
 1. each bit of the binary word appears in the syndrome generator network logic equations and the parity predict network logic equations an even number of times;
 2. the output of each gate within the syndrome generator network and the parity predict network has an odd fan-out;

second means coupling said syndrome bits and said parity predict bit as inputs to said parity check network for generating as an output therefrom alternative signals for indicating that said syndrome bits are either correct or not correct.

3,891,970
TEN BUTTON SELECTION SYSTEM FOR AUTOMATIC PHONOGRAPH
William C. Brotz, Wyoming, Mich., assignor to Rowe International, Inc., Whippany, N.Y.
Filed Apr. 26, 1974, Ser. No. 464,575
Int. Cl. G11b *19/08*
U.S. Cl. 340—162 **36 Claims**



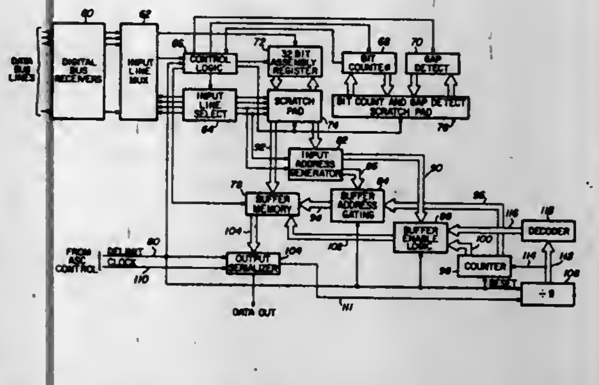
1. In an automatic phonograph adapted to play a multiplicity of selections identified by respective multi-digit numbers and having credit registering means which produces a credit signal indicating the existence of a credit equalling at least the price of a play, apparatus for visibly displaying the number of a selection including,

a number of digital display devices corresponding to the number of digits in a selection identification number, each of said display devices comprising a plurality of segments adapted to be selectively illuminated to represent various digits,

a plurality of manually operable switches corresponding respectively to the digits adapted to make up a selection indentification number,

and means responsive to said credit signal and to operation of a number of said switches corresponding to the number of digits in an identification number for selectively illuminating the segments of said devices to cause said devices respectively to visibly display the digits making up a selected number.

3,891,971
SERIAL DATA MULTIPLEXING APPARATUS
Robert J. Hirvela, Cedar Rapids, and Robert A. Bolin, Marion, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.
Continuation-in-part of Ser. No. 197,905, Nov. 11, 1971, abandoned. This application July 27, 1973, Ser. No. 383,237
Int. Cl. G06f *3/04*
U.S. Cl. 340—172.5 **3 Claims**



1. Apparatus for sampling digital data bits on a plurality of lines wherein the data bits are supplied at at least two different rates comprising, in combination:

a plurality of digital data source means some of which supply data at different rates; means for supplying a clock signal in conjunction with each data bit;

multiplexing means connected to each of said aforenamed means for receiving data and clock signals therefrom, said multiplexing means completing a cycle of sampling all of said data sources in a predetermined order in no greater time than the bit period of the highest rate data source means;

resettable data indication means for providing an indication of receipt of a clock signal in conjunction with a data bit;
 scratch pad memory means for supplying and receiving data words in different locations in accordance with said predetermined order;

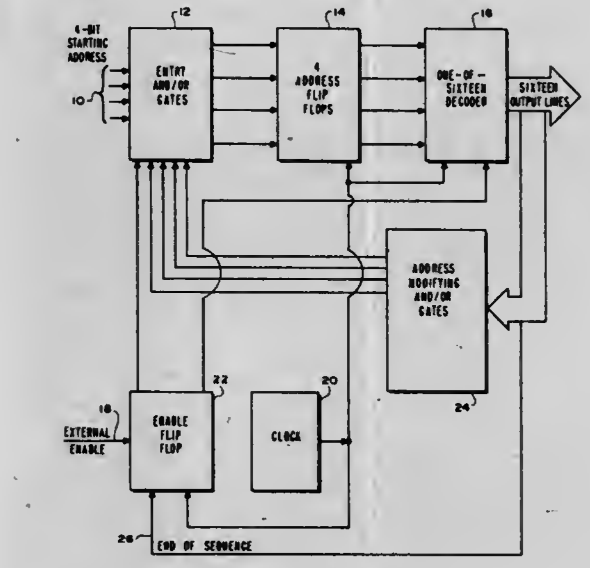
word assembly means, connected to said multiplexing means, said data indication means and said scratch pad means, for retrieving data words as assembled to date from said scratch pad memory means in said predetermined order;

means, forming a part of said word assembly means, for updating the retrieved word with a further data bit when same is received concurrently with an indication of receipt of a clock signal by the apparatus;

means, forming a part of said word assembly means, for resetting said data indication means to a clock signal not received condition and for returning the updated word to the location in said scratch pad memory from which it was retrieved; and

output means connected for receiving said data word after it is completely assembled in said word assembly means.

3,891,972
SYNCHRONOUS SEQUENTIAL CONTROLLER FOR LOGIC OUTPUTS
Gary L. Egan, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed June 9, 1972, Ser. No. 263,741
Int. Cl. G06f *9/20*
U.S. Cl. 340—172.5 **2 Claims**



1. A synchronous sequential controller for issuing a predetermined sequence of instructions, said controller comprising: gating means for sequentially gating starting and other addresses, each of which is associated with a separate instruction;

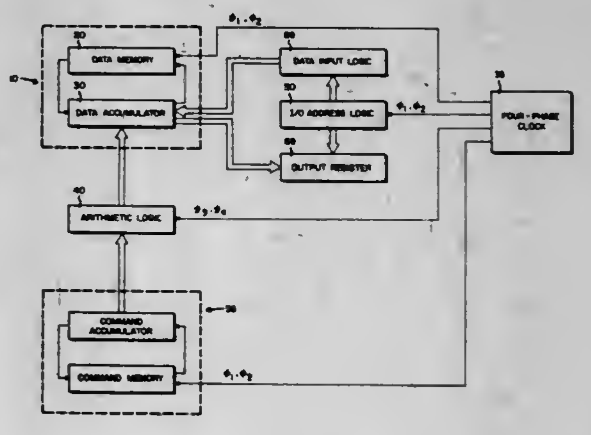
addressing means connected to said gating means for sequentially storing each of said addresses gated by said gating means;

decoding means connected to said addressing means for decoding the one of said addresses currently stored in said addressing means and for issuing the instruction associated with that address on a corresponding one of a plurality of separate output lines of said decoding means; address modification means connected to the output lines of said decoding means and to said gating means for directly translating each instruction issued on any of the output lines of said decoding means into the one of said addresses associated with the next instruction in said predetermined sequence to be issued and for transmitting that address to said gating means;

clock means connected to said addressing means and to said decoding means for determining the point in time at which each of said instructions is to be issued; and

enabling means connected to said gating means and to said decoding means and responsive to said clock means for simultaneously enabling said decoding means and disabling said gating means.

3,891,973
MULTI-FUNCTION DIGITAL COUNTER/TIMER
Jerome Eugene Maxwell, Colorado Springs, Colo., assignor to TRW Inc., Redondo Beach, Calif.
Filed Aug. 16, 1973, Ser. No. 389,047
Int. Cl. G06f *7/38*
U.S. Cl. 340—172.5 **15 Claims**



1. A multi-function numerical processor comprising:

a. electronic storage means to store a plurality of independent numerical words, each of said words being logically represented within said storage means as an ordered series of digits, each of said digits being in a selected arithmetic modulus and logically represented as an ordered series of binary bits, the totality of said words being logically represented within said storage means as an ordered cyclic series of binary bits, said storage means comprising an accumulator adapted to store one of said digits and a memory adapted to store all portions of said word series not stored in said accumulator;

b. shifting means to serially cause each of the binary bits comprising each of the digits stored within said storage means to exit said memory and enter said accumulator;

c. logic means to act on any specific digit instantaneously stored within said accumulator to perform thereon an arithmetic operation in the arithmetic modulus of said specific digit, said operation comprising changing the modular magnitude of said specific digit unitarily in a selected algebraic sign if and only if the elapsed time since the last change in said digit exceeds a selected period, said electronic logic means comprising:
 1. first electronic means to generate an electrical output signal indicative of the condition wherein an entire digit is instantaneously stored within said accumulator;
 2. second electronic means to generate an electrical output signal representative of the identity of the specific digit;
 3. third electronic means, responsive to the output from

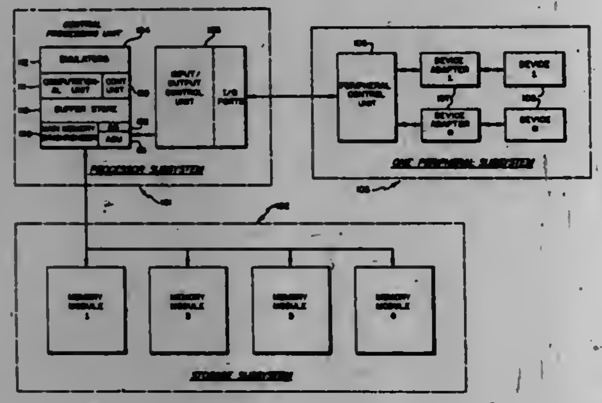
said second electronic means, to generate and electrical output signal representative of said algebraic sign;
4. chronometer means to generate an output signal indicating elapsed time; and
5. fourth electronic means, responsive to the output signals from said first electronic means, said third electronic means and said chronometer means, to perform said operation;

d. means to cause the binary bits comprising each digit stored within said accumulator to serially return, subsequent to the activity of said electronic logic means, to said memory into the assigned logical position of that particular digit within said word series; and
e. output means operable on said storage means to extract the instantaneous values of all digits constituting any selected one of said numerical words.

3,891,974
DATA PROCESSING SYSTEM HAVING EMULATION CAPABILITY FOR PROVIDING WAIT STATE SIMULATION FUNCTION

Brent W. Coulter, Bellingham, Mass., and Laurence F. Migdalek, Bethesda, Md., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 17, 1973, Ser. No. 425,661
Int. Cl.² G06F *9/18*
U.S. Cl. 340—172.5 **17 Claims**

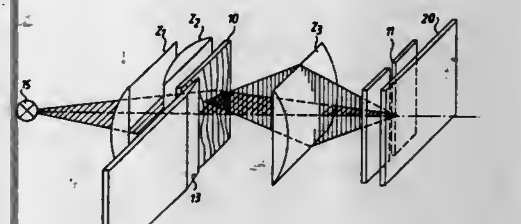


1. A data processing system comprising:
A. a central processing unit for executing instructions in a native mode;
B. an emulation unit, coupled with said central processing unit, for executing instructions in a non-native mode, in order to emulate the operation of another central processing unit;
C. first means for indicating whether said central processing unit emulated by means of said emulation unit is in a wait state wherein no further emulation unit processing may continue;
D. second means for indicating whether there is a pending interrupt;
E. third means for indicating whether said pending interrupt is allowable;
F. means for enabling further processing in said native mode of said central processing unit while said emulated processing unit is in the wait state, and
G. means responsive to said second and third means for indicating for again continuing execution in said non-native mode if said interrupt is pending and allowable.

3,891,975
METHOD AND ARRANGEMENT FOR RECORDING THE PHASE DISTRIBUTION OF AN OBJECT WAVE STORED IN A HOLOGRAM

Reinhold Deml, Munich; Ulrich Greis, Weyarn; Friedrich Bestenreiner, Grunwald, and Josef Helmberger, Munich, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 14, 1973, Ser. No. 370,098
Claims priority, application Germany, June 16, 1972, 2229381
Int. Cl. G02b *27/38;* **G11c** *13/04*
U.S. Cl. 340—173 LM **44 Claims**

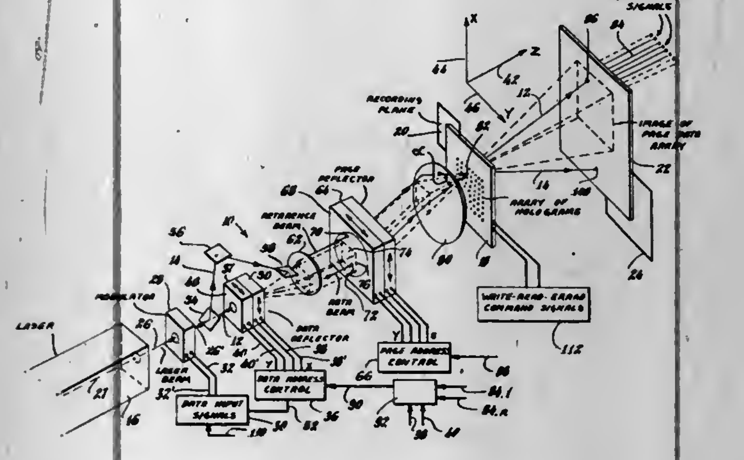


1. Method for recording the phase distribution of an object wave stored in a hologram, said hologram having a density distribution having a plurality of maxima, comprising, in combination, the steps of furnishing a pulse grating having a pulse for each of said maxima and summing the so-furnished pulses thereby creating a phase signal; and recording said phase signal.

3,891,976
HOLOGRAM MEMORY WITH SEQUENTIAL DATA STORAGE AND BEAM ANGULAR RELATIONSHIP

W. John Carlsen, Natick, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 14, 1974, Ser. No. 432,912
Int. Cl.² G11C *13/04;* **G02B** *27/38*
U.S. Cl. 340—173 LM **14 Claims**



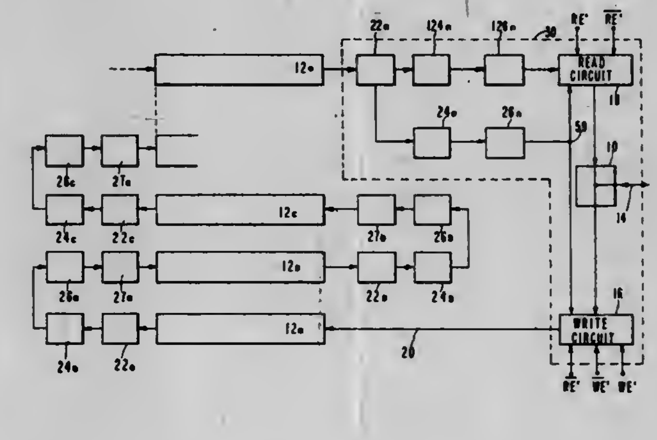
1. A method for holographically processing digital data comprising the steps of
producing a beam of coherent energy,
modulating the beam with a bit of digital data,
dividing the modulated beam into a reference beam and a data beam,
deflecting the data beam by a first preselected angle selected from a first matrix array of angles maintaining the reference beam at a second preselected angle to establish a unique spatial relationship between the data beam and the reference beam,

deflecting both the data beam and the reference beam by a third preselected angle selected from a second matrix array of angles, and
focussing the data beam and the reference beam onto a recording medium so that the beams interfere and form a hologram of the bit of digital data in the recording medium, the third preselected angle determining the position of the hologram in the recording medium and the first and second preselected angles determining the angle of intersection of the data beam and the reference beam at the recording medium whereby the hologram of the bit of digital data has a unique address within the recording medium and may be stored in a sequential manner.

3,891,977
CHARGE COUPLED MEMORY DEVICE

Gilbert F. Amelio, Saratoga; Jack A. Livezey, San Jose, and Phillip J. Salsbury, Sunnyvale, all of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed July 15, 1974, Ser. No. 488,387
Int. Cl. G11c *11/40*
U.S. Cl. 340—173 R **11 Claims**

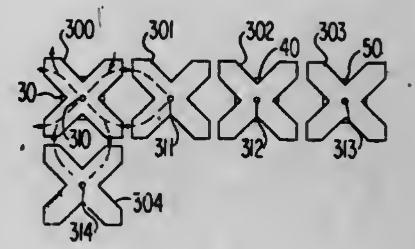


1. A charge coupled memory device having input/output means, said device comprising:
a. N CCD shift registers (wherein N is an integer from 1 to N), each having register input terminal means for receiving serial bits of data, and register output means for supplying serial bits of data from said shift registers, and each of said shift registers being capable of storing M bits of data (wherein M is an integer from 1 to M), whereby said memory device is capable of storing M×N bits of data;
b. write terminal means, coupled between said input/output means and the register input means of a first one of said shift registers for writing data into said memory device;
c. read terminal means, coupled to said input/output means for reading data from said memory device; and,
d. N charge comparison circuits (wherein N is an integer from 1 to N), wherein each of N-1 of said circuits is uniquely coupled between the register output means of a corresponding one of said shift registers and the register input means of the next adjacent one of said shift registers, the Nth comparison circuit having an input terminal coupled to the output terminal means of the Nth shift register and having two output terminals for providing complementary output signals representative of the bits of data, wherein the first one of said two output terminals is coupled to said read terminal means of said memory device, and the second one of said two output terminals is coupled to both said write terminal means and said read terminal means so as to recirculate the serial bits of data through the shift registers, whereby the serial bits of data are recirculated through said N CCD shift registers at the same time the data is read from the memory device.

3,891,978
MAGNETIC DOMAIN PROPAGATING CIRCUIT

Haruki Kohara, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Dec. 28, 1973, Ser. No. 429,340
Claims priority, application Japan, Dec. 29, 1972, 47-1855
Int. Cl. G11c *11/14, 19/00*
U.S. Cl. 340—174 TF **9 Claims**



1. A magnetic domain propagating circuit comprising: a sheet of magnetic material capable of retaining domains; means for applying a biasing magnetic field normal to said sheet; means for generating in-plane magnetic fields parallel with the surface of the sheet; and at least two ferromagnetic pieces disposed adjacent said sheet; said ferromagnetic pieces being responsive to said in-plane magnetic fields for creating a magnetic pole at a position thereon dependent upon the direction of said in-plane magnetic field, whereby a domain can be held at said position, said two ferromagnetic pieces being adjacent one another thereby forming a plurality of propagation paths for domains in both directions between said two ferromagnetic pieces, each of said two pieces having a geometric center and being symmetrical about an axis drawn through said center and further comprising at least four legs extending outwardly from said center, whereby a domain is held at said center in the absence of an in-plane magnetic field above a minimum value, and whereby a domain at said center of either of said two ferromagnetic pieces may be shifted to the center of the other of said ferromagnetic pieces by the generation of in-plane magnetic field pulses.

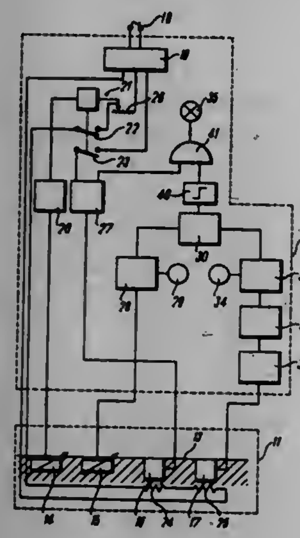
3,891,979
ROAD CONDITION MONITORING DEVICES

Otto Paul Braun, Freiberg, and Horst Oehler, Waiblingen, both of Germany, assignors to Otto P. Braun, Germany

Filed Oct. 23, 1973, Ser. No. 408,377
Claims priority, application Germany, Nov. 7, 1972, 2254351
Int. Cl. G08b *21/00*
U.S. Cl. 340—234 **18 Claims**

1. A device for detecting the danger of ice or snow on roads, comprising an electrical ground temperature sensor, an electrical salt content sensor, said sensors being adapted to be applied to the road surface, means connected to said sensors

for comparing the ground temperature with the freezing point of the particular salt soluton present, and means for producing a warning signal when the ground temperature approaches the freezing point of the solution on the road surface.



3,891,980
SECURITY SYSTEMS

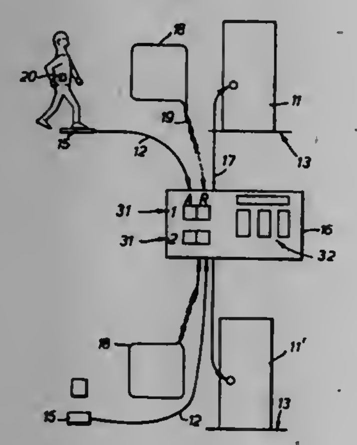
John Lewis, London, and William Dudley Gilmour, Glastonbury, both of England, assignors to Lewis Security Systems, Ltd., London, England

Filed Nov. 7, 1972, Ser. No. 304,560

Claims priority, application United Kingdom, Nov. 8, 1971, 51724/71; May 16, 1972, 22898/72

Int. Cl. G08b *13/18*

U.S. Cl. 340—258 D **22 Claims**



1. A security system including at least one portable token embodying a generator and transmitter of oscillations at a predetermined frequency, a pickup at a certain location and means in the pickup for responding to the oscillations transmitted from the token when the token is carried in any atatitude by a user who comes to the location, a sensor responsive to arrival of a person at the location, and a control unit rendered operative by response of the sensor and having means for providing a local reference signal, means responsive to the pick-up response and the local reference signal for forming an output signal, and means receiving the output signal for detecting whether the pickup is responding to oscillations at the predetermined frequency, and to deliver a control signal to dependence upon such detection.

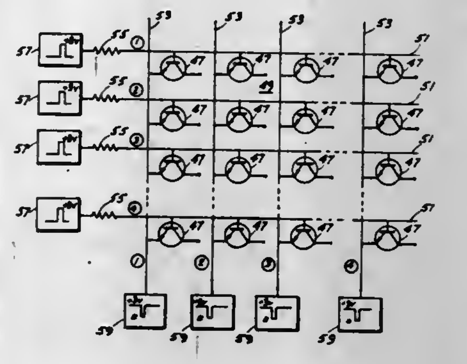
3,891,981
DRIVE CIRCUIT FOR A LIQUID CRYSTAL DISPLAY

Vincenzo N. Torresi, Tenafly, N.J., assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Feb. 20, 1973, Ser. No. 334,177

Int. Cl. G09f *9/32;* **G02f** *1/18*

U.S. Cl. 340—324 M **16 Claims**



1. In a display including a plurality of display cells, each of the type actuatable by a potential applied across display material between a pair of electrodes and wherein said cells are arranged in M groups of N cells, a driving circuit for multiplexing the cells comprising:

a source of chopped DC actuating potential;

capacitive means for each of said cells;

a transistor for each of said cells, each of said transistors having a base terminal, an emitter terminal and a collector terminal, said collector terminal connected in series with said capacitive means and said source of chopped DC potential, wherein the collector terminal of each transistor is connected to its associated capacitive means and wherein each transistor enables current flow in one direction between the emitter and collector thereof in response to simultaneous pulses applied to said base and emitter thereof;

a set of M selectively actuatable driving circuits each connected to the base of the transistor of each cell of the corresponding group for applying base-emitter junction saturating pulses to the transistors of the cell of at least one of the M groups; and

a set of N sequentially actuatable driving circuits each connected to the emitter of one transistor in each of the M groups for sequentially applying base-emitter junction enabling pulses to the successive sets of transistors connected thereto for enabling the selective actuation of said set of M driving circuits to saturate said base emitter junction of said successive groups of transistors and for preventing the saturation by said M driving circuits of the base-emitter junction of the transistors of the others of said groups.

3,891,982
COMPUTER DISPLAY TERMINAL

Thomas B. Cheek, Lexington; Daniel E. Thornhill, Brookline, and Ronald B. Stewart, Arlington, all of Mass., assignors to Adage, Inc., Boston, Mass.

Filed May 23, 1973, Ser. No. 362,952

Int. Cl. G08b *5/36*

U.S. Cl. 340—324 AD **10 Claims**

1. Apparatus for repetitively generating a video signal for driving a raster scan display from data encoded in data words representing respective vector segments, the raster scan being divisible into an angular array of rows and columns of cells, each vector segment, as encoded, lying within a single cell with more than one image component being permissible per cell, each word being encoded in a form defining starting

point, slope and length in one dimension; said apparatus comprising:

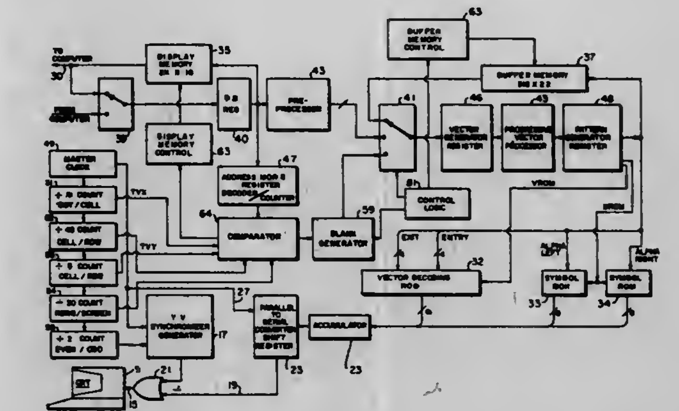
a serial, circulatory memory for holding, in cell order, data words defining an image to be displayed;

means for selectively advancing the contents of said memory to read out all data words pertaining to a given cell; means for modifying each data word during the initial scan line traversing the vector segment to generate entry and exit values defining the picture element positions in that line affected by the vector segment, the exit value replacing the starting point values in the data word during subsequent circulations, and for progressively modifying each data word during successive scans to generate, from the previous exit value and the slope, new entry and exit values defining the picture element positions affected by the vector segment on each respective scan line;

decoding means for generating, from the entry and exit values obtained from each data word successively read out, signals defining the corresponding image element positions affected by the respective vector segment;

an accumulator register for accumulating data representing the contributions made by a succession of data words pertaining to a given cell; and

means for serially reading out data accumulated in said register as a video signal to said display.



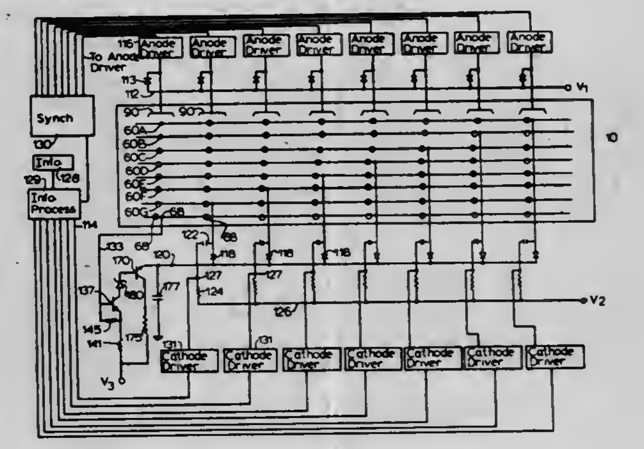
3,891,983
MULTI-POSITION CHARACTER DISPLAY PANEL HAVING DISPLAY CATHODES AND AUXILIARY CATHODES AND CIRCUITS FOR OPERATING THE SAME

James Y. Lee, New Brunswick, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed June 20, 1974, Ser. No. 481,172

Int. Cl. G08b *5/36*

U.S. Cl. 340—336 **10 Claims**



1. A display panel and system for operating the same comprising

a gas-filled envelope including a base plate and a face plate having a viewing window,

a plurality of groups of display cathode electrodes supported on said base plate and adapted to be operated in different combinations to display different characters,

corresponding cathodes in all of the groups being interconnected by a single common conductor, there thus being a single common conductor for each corresponding cathode electrode in each of said groups,

an auxiliary cathode electrode associated with each said group of display cathodes,

an auxiliary common conductor connected to all of said auxiliary cathodes,

an anode electrode associated with each said group of cathodes,

means coupled to said anodes and said common conductors for sequentially energizing each of said anode electrodes and simultaneously applying information signals to selected ones of said common conductors and their associated display cathodes, and

a circuit loop connected between said auxiliary common conductor and all of said single common conductors including means for generating a bias voltage in response to current flow through an auxiliary electrode and applying said bias voltage to all of said display cathodes.

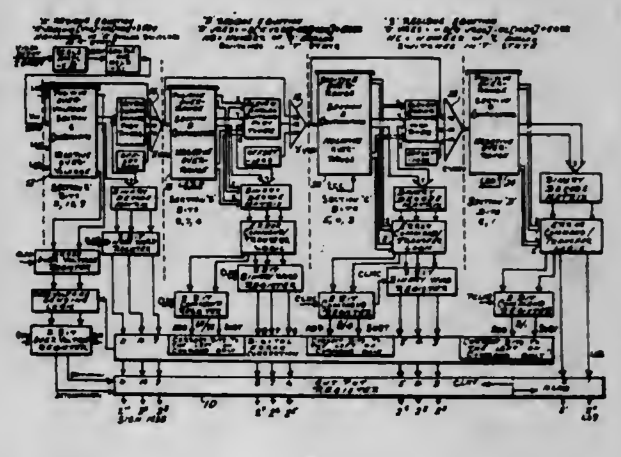
3,891,984
ANALOG TO DIGITAL CONVERSION BY SUBRANGING WITH MULTIPLE LEVEL REDUNDANT ERROR CORRECTION

Robert D. Kerwin, Orange, and Darwin B. Sulzle, Placentia, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 7, 1973, Ser. No. 338,727

Int. Cl. H03k *13/02*

U.S. Cl. 340—347 CC **2 Claims**



1. An analog to digital converter apparatus with digital error correction comprising in combination:

an analog to digital converter having four stages to generate an 11 bit word, said analog to digital converter receiving an input voltage signal, said first state generating a 3 bit word, said second and third stages each generating a 3 bit word, said fourth stage generating a 2 bit word, said analog to digital converter providing an output binary count, said second, third and fourth stages including a plurality of redundancy comparators, (said plurality of redundancy comparators respectively checking the output of the previous stages) said plurality of redundancy comparators respectively generating a correction command for the affected stage upon sensing an error therein.

a plurality of decode logic units respectively connected to said four stages of said analog to digital converter to receive the respective word bit, said plurality of decode logic units respectively decoding said output binary count, said plurality of decode logic units providing a binary word output, said plurality of decode logic units respectively including error command logic units connected respectively to said plurality of redundancy comparators of said second, third and fourth stages of said analog to digital converter, said error command logic units respectively providing an error correction signal upon receipt of said correct command from one of said plurality of redundancy comparators,

an interim holding register connected to said plurality of decode logic units to store said binary word output,

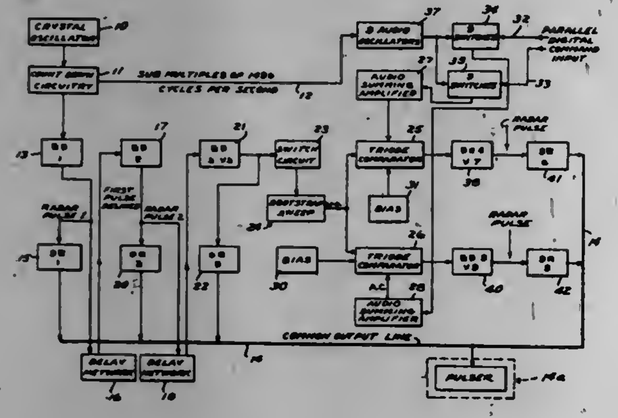
a digital error correction unit connected to said interim holding register to receive said binary word output, said digital error correction unit receiving error correction signals from said plurality of decode logic units, said error correction signals being utilized by said digital error correction unit to correct said binary word output, and

an output register connected to said digital error correction unit to receive said binary word output, said output register aligning said binary word output in time, said output register providing a final 11 bit output word.

3,891,985
DRONE CONTROL SYSTEM WITH PULSE POSITION ENCODING

Tarald H. Olgarden, Cold Spring Harbor; Erwin S. Teltscher, Forest Hills, and Robert D. Gross, New York, all of N.Y., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 21, 1961, Ser. No. 90,886
Int. Cl. G08c *19/22, 19/28*
U.S. Cl. 340—353 **6 Claims**



1. A pulse encoder comprising a set of series connected pulse producers, a multiple frequency source, said source being connected to the input of one of said producers the latter being controlled thereby, delay networks disposed in the series connections of said producers, a second set of pulse producers connected in parallel lines and driven by the output of the first mentioned set of producers, means for pulse position modulating the pulses generated by said second set of pulse producers, said means being controlled by said source and another of said producers, a common output line, each of said pulse producers in the two sets of producers being individually connected to said common output line, and a pulser connected to said output line.

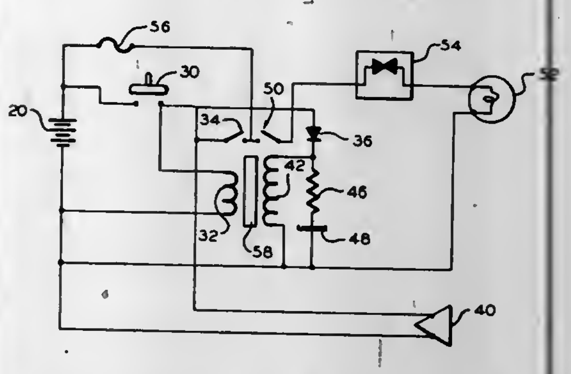
3,891,986
AUDIO-VISUAL/WARNING SYSTEM

Gordon C. Lipe, Box 114, Teton Village, Wyo. 83025, and William S. Abbott, 20 Lakeview Cir., Skaneateles, N.Y. 13152

Continuation-in-part of Ser. No. 204,125, Dec. 12, 1971, Pat. No. 3,786,498. This application Jan. 14, 1974, Ser. No. 433,116
Int. Cl. G08b *7/00*
U.S. Cl. 340—371 **15 Claims**

1. A combined audible-visual warning system for use with a vehicle, or the like, comprising:

- a. an electrical power source;
- b. an electrically operated audible warning element;
- c. an electrically operated visual warning element;
- d. a single, manually operable switch selectively closable to effect connection of both said audible and visual warning elements to said power source; and
- e. timing means effective to insure that electrical power is provided to said visual warning element for at least a predetermined minimum time after closure of said switch irrespective of whether said switch is retained in the closed position for such minimum time, said timing means comprising a relay having:
  - i. a first coil energized by closure of said switch;

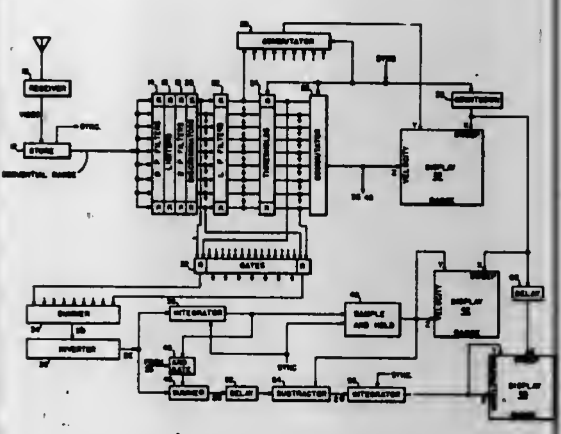


  - ii. first contacts closed by energization of said first coil to connect said audible warning element to said power source;
  - iii. second contacts closed by energization of said first coil to connect said visual warning element to said power source;
  - iv. a second coil energized by closure of at least one of said switch and said first contacts; and
  - an RC timing network connected in parallel with said second coil to maintain the latter in an energized condition for a predetermined time after said first coil is deenergized by opening of said switch, the force exerted by said relay when said first coil is deenergized and said second coil is energized being effective to maintain only said second contacts closed.

3,891,987
ONE-OPERATION SIGNAL PROCESSOR

Garold K. Jensen, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 18, 1969, Ser. No. 862,632
Int. Cl.² G01s *7/06, 9/02*
U.S. Cl. 343—5 R **6 Claims**



6. In a data processing and display system for radar wherein the receiver video doppler signal is stored in range order and, upon readout, is further separated by frequency into a plurality of channels, each of which includes a discriminator and a threshold device that produces an output only when energized by a discriminator output signal in excess of a certain strength, such as is caused by a target of constant velocity or by jamming, display apparatus comprising:

first cathode ray tube (CRT) means synchronized with said readout and connected to said plurality of channels to display a plot of constant velocity target or jamming information against range;

second CRT means synchronized with said readout and functioning to display a plot of non-constant velocity target information against range;

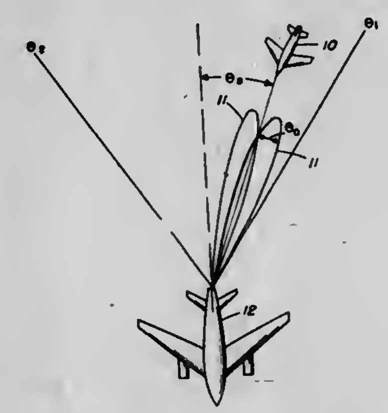
third CRT means synchronized with said readout and functioning to display a plot of target acceleration information against range and

circuit means connected between the discriminators and threshold devices in said plurality of channels and said second and third CRT means and functioning to produce signals which control the intensity and one directional position of the traces which produce the plots displayed by said second and third CRT means.

3,891,988
SEARCH-WHILE-TRACK SYSTEM

Charles C. Ryan, Glen Burnie; Melvin D. Siedband, Baltimore, both of Md., and Abraham M. Fuchs, Rydal, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 31,498, May 24, 1960, abandoned. This application Jan. 16, 1964, Ser. No. 338,271
Int. Cl.² G01S *9/22, 7/28*
U.S. Cl. 343—16 LS **3 Claims**



1. In a search-while-track radar system for determining the angular position of a target without stopping the antenna,

saturated amplifier means adapted to receive video return signal pulses from said target,

said saturated amplifying means having a storage means for storing the bias developed by said saturated amplifier means and allowing said bias to decay at a rate proportional to the change in amplitude of the video returns from pulse to pulse, and

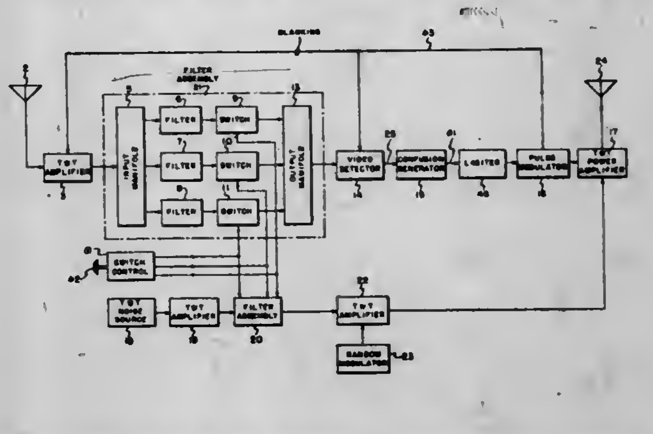
comparator circuit means connected to said saturated amplifier means for comparing the output of said amplifier with pulses which identify the lobe in which the video signals are received.

3,891,989
RADAR CONFUSION COUNTERMEASURE SYSTEM

Kay H. Barney, Roslyn Heights, and John M. Lester, Garden City, both of N.Y., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 27, 1959, Ser. No. 789,444
Int. Cl.² H04K *3/00*
U.S. Cl. 343—18 E **6 Claims**

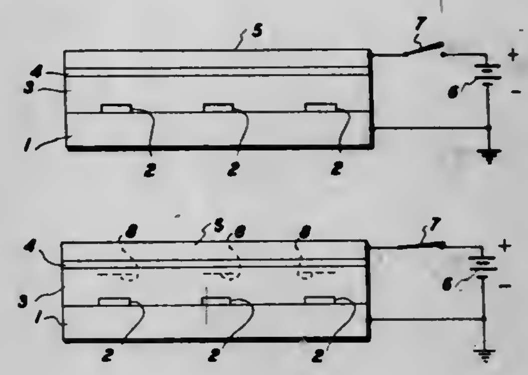
1. Apparatus comprising wide band pulsed microwave signal receiving means, first filter means connected to said receiving means for directing the pulsed signal output therefrom into respective microwave frequency channels according to frequency content, first signal combining means, each said frequency channel including a switch for selectively connecting its respective channel to said first signal combining means, a detector connected to the output of said first signal combining means, a plurality of pulse delay means, each said delay means introducing a unique delay in the pulse respectively applied thereto, a plurality of gating circuits equaling in number the number of said plurality of pulse delay means, each of said gating circuits when actuated applying the output pulse from said detector to a respective one of said plurality of pulse delay means, means for substantially randomly actuating said gating circuits, second signal combining means for combining the outputs of said plurality of delay means, a source of local signals commensurate in frequency extent with that of said wide band receiving means, second filter means connected to said local signal source for directing the outputs therefrom into respective local signal channels according to frequency content, third signal combining means, each said local signal channel including a switch for selective connection to said third signal combining means, means for selectively actuating the switches of said microwave and local signal channels in corresponding frequency pairs, gated amplifying means connected to the outputs of said second and third signal combining means, said gated amplifying means being actuated by the output of said second signal combining means for amplifying the output of said third signal combining means, and antenna means for radiating the output of said gated amplifying means.



3,891,990
IMAGING PROCESS USING DONOR MATERIAL

John B. Wells, Brighton, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 27, 1973, Ser. No. 374,215
Int. Cl. G01d *15/06*
U.S. Cl. 346—74 E **11 Claims**



1. A method for forming charge patterns which comprises the steps of:

- a. providing in imagewise configuration a layer of an injecting material on a conductive substrate to form an injecting master, said injecting material being capable of generating and injecting charge carriers in response to electrical field alone;

b. providing a layer of an insulating liquid on said injecting master;

c. contacting the free surface of said layer of insulating liquid with an insulating member; and,

d. applying an electrical potential difference across said injecting material and said insulating liquid layer of sufficient magnitude to cause said injecting material to form a charge pattern on said insulating member as a result of charge carrier injection from said injection material.

3,891,991

RECORDING APPARATUS WITH IMPROVED COUNTERELECTRODE

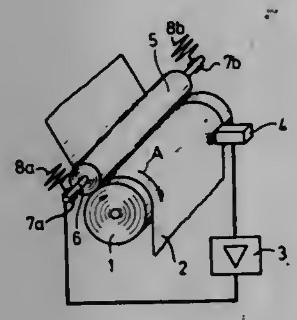
Kurt Hurst, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

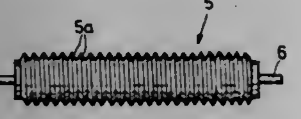
Filed Sept. 24, 1973, Ser. No. 400,319

Claims priority, application Germany, Oct. 2, 1972, 2248318

Int. Cl. G01d *15/06*

U.S. Cl. 346—74 E **11 Claims**





1. In an apparatus for recording intelligence on an electrosensitive web, a combination comprising transporting means arranged to advance a web lengthwise along a predetermined path and including an advancing member engaging one side of the web in said path; at least one writing electrode contacting the other side of the web in said path; and a counterelectrode adjacent to said other side of the web opposite said advancing member, said counterelectrode having a plurality of web-engaging projections forming part of an external thread on said counterelectrode.

3,891,992

SINGLE LENS REFLEX CAMERA

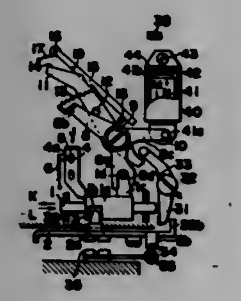
Hiroshi Ueda, Nara, and Yoshio Kuramoto, Toyonaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed Feb. 8, 1974, Ser. No. 440,859

Claims priority, application Japan, Feb. 9, 1973, 48-16257

Int. Cl. G03b *19/12*

U.S. Cl. 354—152 **7 Claims**



1. A single lens reflex camera comprising:

a reflecting mirror movable between a viewing position and a picture taking position and urged to assume said viewing position;

a reflecting mirror operating member for shifting said mirror, said operating member being movable between a first position and a second position in which said mirror assumes said viewing and picture taking positions respectively;

an interchangeable lens removably mounted on said camera and having a diaphragm;

a diaphragm operating member engaging said diaphragm and movable between a first position in which said diaphragm is brought to its open position, against a tendency thereof to close, and a second position in which said diaphragm is allowed to close to a minimum aperture;

means urging said diaphragm from its open position to its closing position;

means urging said diaphragm operating member to said first position;

an actuating member movable between a cocked position and a rest position, to urge said reflecting mirror operating member and said diaphragm operating member from said first position to said second position respectively;

means for locking said actuating member in the cocked position and unlocking the same in association with a shutter release operation; and

an air damper for decelerating the movement of said actuating member, said air damper including a cylinder supported by the camera body and a piston slidable within said cylinder and interconnected with said actuating member.

3,891,993

SEMICONDUCTOR ARRANGEMENT FOR THE DETECTION OF LIGHT BEAMS OR OTHER SUITABLE ELECTRO-MAGNETIC RADIATION

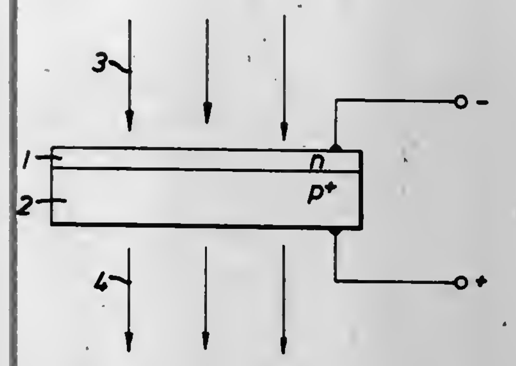
Heinz Beneking, Aachen, Germany, assignor to Licentia-Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Sept. 20, 1973, Ser. No. 399,042

Claims priority, application Germany, Sept. 29, 1972, 2247966

Int. Cl. H01l *15/00*

U.S. Cl. 357—19 **18 Claims**



1. A semiconductor arrangement for the detection of light beams comprising in combination:

a semiconductor body having a first region of a first conductivity type, constituting a light sensitive photo-resistance, for producing charge carriers as a result of light irradiation and a second region of semiconductor material of a larger band spacing than said first region and of the opposite conductivity type abutting said first region and forming a pn hetero-junction luminescent diode therewith, said second region recombining said charge carriers to emit light radiation; and means for applying a voltage across said first and second region to polarize said pn hetero-junction in the forward direction.

3,891,994

COLOUR TELEVISION

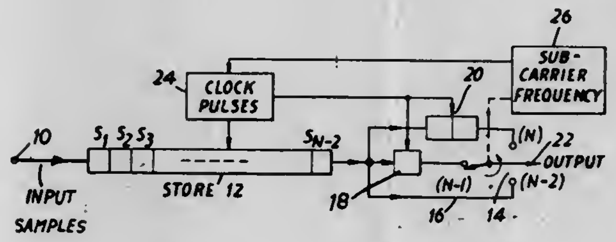
Geoffrey John Phillips, London, and John Philip Chambers, Crawley, both of England, assignors to The Marconi Company Limited and Standard Telephones & Cables Limited, both of London, England, part interest to each

Filed Sept. 12, 1973, Ser. No. 396,412

Claims priority, application United Kingdom, Oct. 9, 1972, 46500/72

Int. Cl. H04n *9/38*

U.S. Cl. 358—11 **10 Claims**



7. A method of sampling a PAL colour television signal, said method comprising the steps of:

sampling a PAL colour television signal at a sampling rate which bears a ratio of small integers to the frequency of the colour subcarrier; and

simultaneously maintaining sampling instants at points symmetrically disposed in time about the maxima and minima of the U-component of the signal sampled.

9. A method of converting a PAL colour television signal to an N.T.S.C. signal, comprising sampling said PAL signal at a sampling rate which bears a ratio of small integers to the colour subcarrier frequency, the sampling instants being symmetrically disposed about the phase of the B-Y component of the PAL signal, and re-ordering the samples with a subcarrier phase sequence such as to provide a signal of N.T.S.C. form.

3,891,995

MAGNETIC HEAD

Masanobu Hanazono; Osamu Asai, and Kanji Kawakami, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 4, 1973, Ser. No. 394,257

Claims priority, application Japan, Sept. 14, 1972, 47-91708

Int. Cl. G11b *5/20*

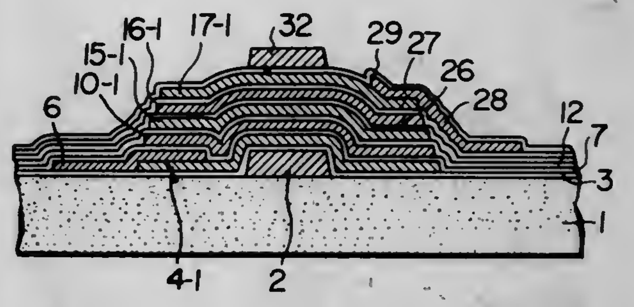
U.S. Cl. 360—123 **10 Claims**

1. A magnetic head comprising:

a first magnetic film and a second magnetic film disposed on a substrate, said first and second magnetic films forming a magnetic gap therebetween at one of the respective ends thereof, said gap lying substantially in a plane including an end surface of said substrate, said first and second magnetic films being magnetically coupled with each other at the other respective ends thereof;

a plurality of electrically conductive films laid one upon another substantially on a given area on said substrate when seen in plan view, the lamination of said plurality of electrically conductive films traversing an area between said first and second magnetic films, said plurality of electrically conductive films being electrically insulated from one another and from said first and second magnetic films;

a plurality of coil forming electrically conductive members including first, second, third and fourth portions, said first and second portions respectively extending from respective ends of respective ones of said plurality of electrically conductive films in a direction opposite to said end surface of said substrate, said third and fourth portions respectively extending toward each other from the respective extended ends of said first and second portions, said first and second portions being respectively laid one upon another substantially on respective given areas on said substrate, the respective extended ends of said third and fourth portions being electrically connected with each other outside of said area between said first and second magnetic films so that said plurality of electric conductive films are connected in series through said plurality of coil forming electrically conductive members to thereby form a continuous coil, the respective connections between said third and fourth portions being disposed; when seen in plan view and in the longitudinal direction of said lamination of said plurality of electrically conductive films, within a length which is obtained by moving in parallel the length of said lamination of said plurality of electrically conductive films and outside of said area between said first and second magnetic films; and

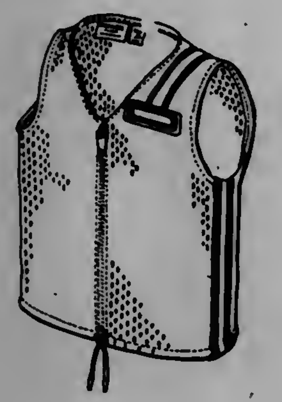


a pair of lead-out electrically conductive members respectively connected to the two free ends of said continuous coil formed by said plurality of electrically conductive films and said plurality of coil forming electrically conductive members.

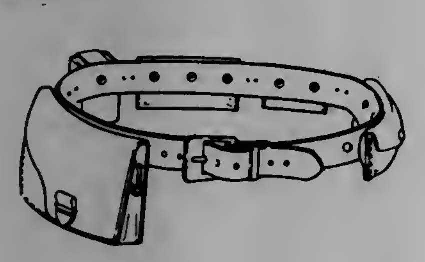
DESIGNS

JUNE 24, 1975

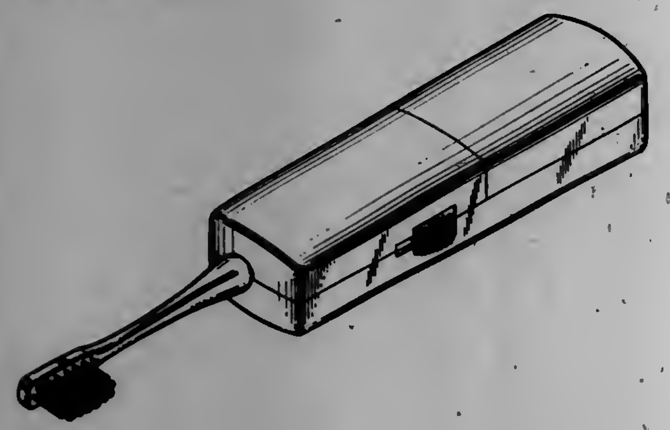
235,489
REFLECTIVE SAFETY VEST
Louis Spitz, Los Angeles, Calif.
(463 S. Almont Drive, Beverly Hills, Calif. 90212)
Filed Apr. 29, 1974, Ser. No. 465,261
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—27



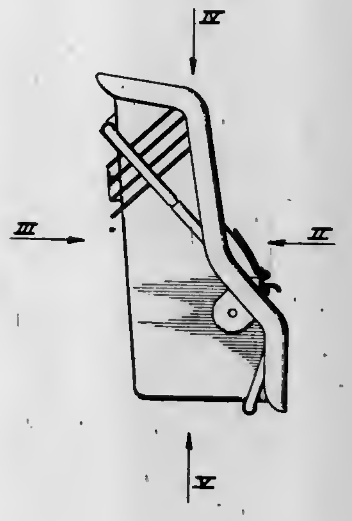
235,490
COMBINED BELT AND DETACHABLE COMPARTMENTS
James D. Lewis, 3716 Indiana St.,
San Diego, Calif. 92103
Filed Dec. 26, 1973, Ser. No. 428,119
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—381



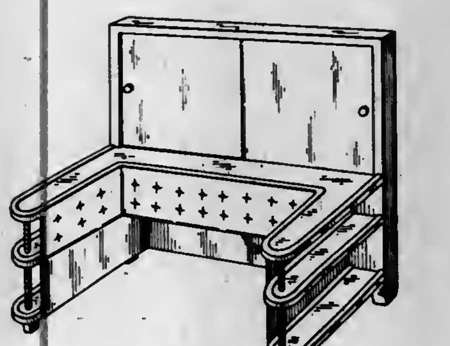
235,491
ELECTRIC TOOTHBRUSH
Norman Spiegel, New York, N.Y., assignor to Nasta Industries, Inc., New York, N.Y.
Filed Oct. 17, 1973, Ser. No. 407,060
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—15



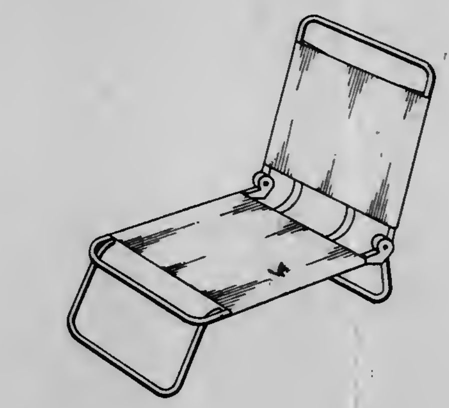
235,492
CHILD SAFETY SEAT FOR USE IN VEHICLES
Daniel A. Armstrong, Utica, and Thomas B. Bartholomew, Orchard Lake, Mich., assignors to American Safety Equipment Corporation, Encino, Calif.
Filed Oct. 1, 1973, Ser. No. 402,333
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—7



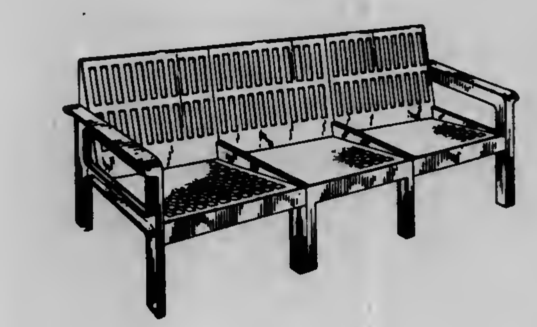
235,493
HEADBOARD
Linda Louise Bingley, East Star Rte., Box 10, Nowata, Okla. 74048
Filed Feb. 12, 1973, Ser. No. 331,527
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—80



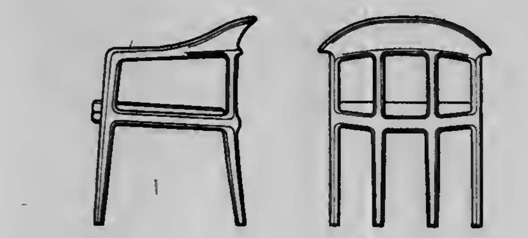
235,494
ADJUSTABLE BEACH CHAIR
Siegfried Von Juergensonn, Saddle River, N.J., assignor to Kettler of America, Inc., Mahwah, N.J.
Filed June 28, 1973, Ser. No. 374,300
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—38



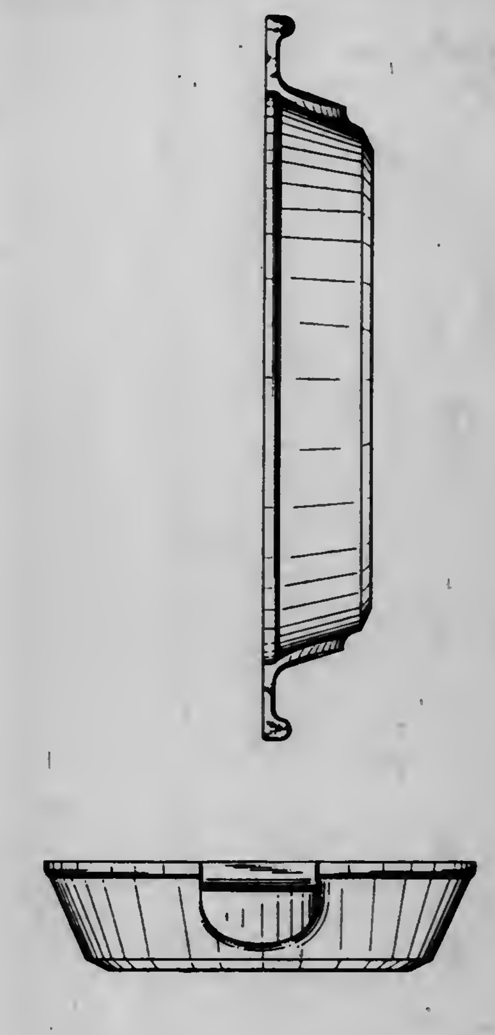
235,495
SECTIONAL SOFA
Harry Laylon, Syracuse, N.Y., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Mar. 2, 1973, Ser. No. 337,709
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



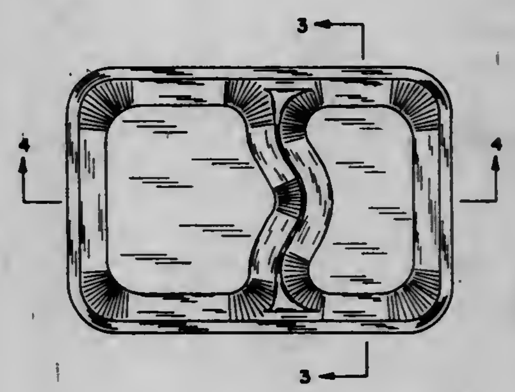
235,496
CHAIR
Akihiko Noda, Tokyo, and Satoshi Tada, Uenohara-machi, Japan, assignors to France Bed Co., Ltd., Tokyo, Japan
Filed Feb. 28, 1973, Ser. No. 336,486
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—70



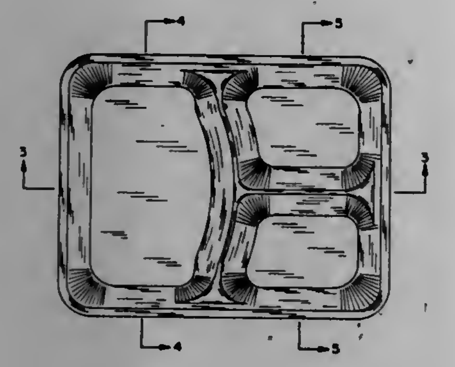
235,497
BAKING DISH
Gunnar Cyren, Gavle, Sweden, assignor to Dansk International Designs Ltd., Mount Kisco, N.Y.
Filed Feb. 19, 1974, Ser. No. 443,929
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—21



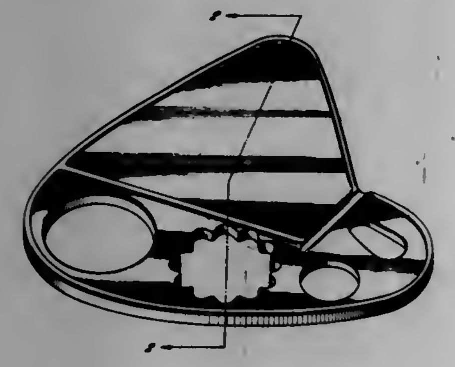
235,498
COMPARTMENTED SERVING TRAY
William Henry Day, Brantford, Ontario, Canada, assignor to W. R. Grace & Co., Duncan, S.C.
Filed Sept. 20, 1973, Ser. No. 399,202
Term of patent 14 years
Int Cl. D7—*99*
U.S. Cl. D7—38



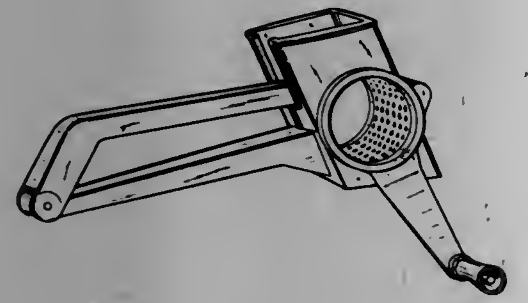
235,499
COMPARTMENTED SERVING TRAY
William Henry Day, Brantford, Ontario, Canada, assignor
to W. R. Grace & Co., Duncan, S.C.
Filed Sept. 20, 1973, Ser. No. 399,219
Term of patent 14 years
Int Cl. D7—*99*
U.S. Cl. D7—38



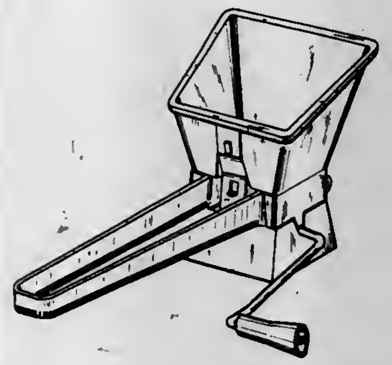
235,500
THUMB-ORIENTED FOOD TRAY
Merton J. Alexander, 173 Highland Place,
Monrovia, Calif. 91016
Filed Oct. 3, 1973, Ser. No. 402,976
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—38



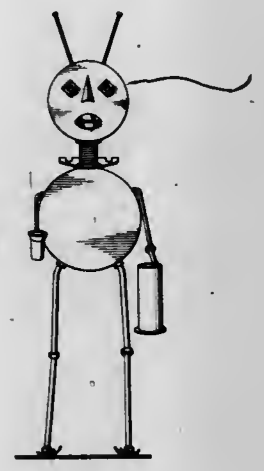
235,501
DOMESTIC FOOD GRATER
Jean Mantelet, Paris, France, assignor to Moulinex,
Societe Anonyme, Bagnolet, France
Filed Nov. 12, 1973, Ser. No. 415,229
Claims priority, application France June 5, 1973
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—47



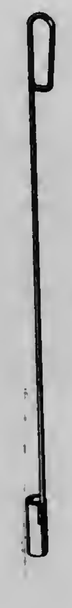
235,502
DOMESTIC FOOD CHOPPER
Jean Mantelet, Paris, France, assignor to Moulinex,
Societe Anonyme, Bagnolet, France
Filed Nov. 12, 1973, Ser. No. 415,230
Claims priority, application France June 5, 1973
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—155



235,503
FIREPLACE EQUIPMENT CADDY
Raymond H. Fry, 1017 W. D St.,
Ontario, Calif. 91762
Filed May 7, 1973, Ser. No. 358,044
Term of patent 14 years
Int. Cl. D6—*04;* D7—*08;* D11—*02;* D21—*01*
U.S. Cl. D7—206

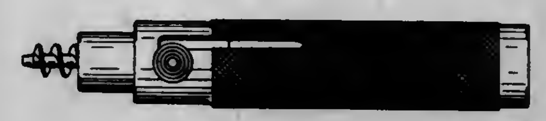


235,504
EARTH PLUG REMOVER
Marshall J. Kramer, Creve Coeur, Mo.
(11301 Trieste, St. Louis, Mo. 63141)
Filed Jan. 21, 1974, Ser. No. 435,122
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—7

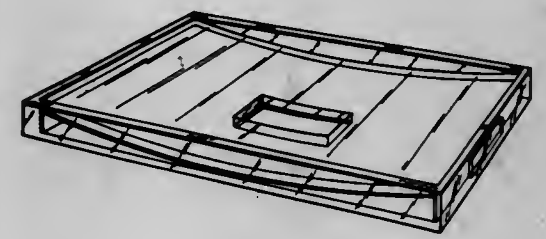


235,505
BAR FOR TURNING OVER A SHUT-DOWN MACHINE
Albert C. Phelps, 3219 W. Lisbon Ave.,
Milwaukee, Wis. 53208
Filed Apr. 23, 1973, Ser. No. 353,521
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—88

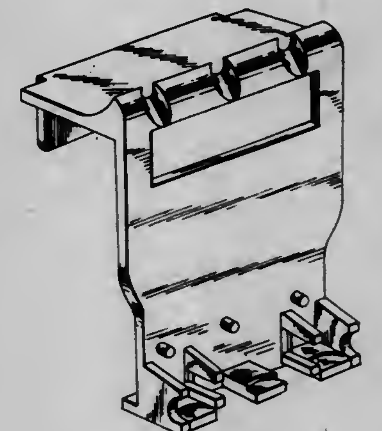
235,506
CABLE CORING TOOL
James J. Matthews, East Haddam, Conn., assignor to
Utility Tool Corp., East Haddam, Conn.
Filed Apr. 4, 1973, Ser. No. 347,862
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—98



235,507
SNAP-ON WALL PLATE FOR ELECTRICAL SWITCHES
Dean R. Straka, 2319 Lincoln Ave.,
Evansville, Ind. 47714
Filed Apr. 16, 1973, Ser. No. 351,171
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D8—181

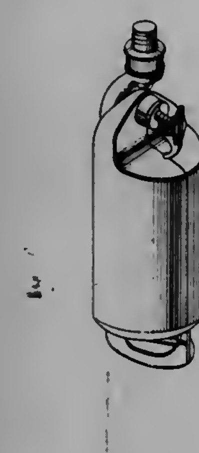


235,508
VALVE BRACKET
Tetsumi Yamasaki, 12–8 Sakae-Honmachi, Ikeda,
Osaka, Japan
Filed May 2, 1974, Ser. No. 466,515
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—233



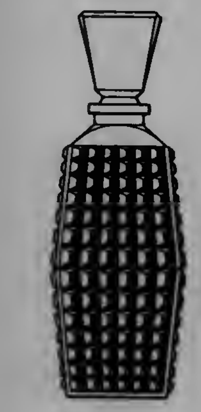
235,509
BOTTLE

Edward van Amerongen, Wilmette, Ill., assignor to Respiratory Care, Inc., Arlington Heights, Ill.
Filed Nov. 17, 1972, Ser. No. 307,343
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—83



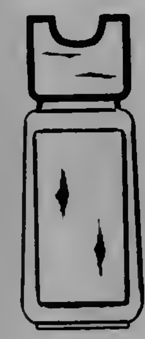
235,510
BOTTLE

Humberto Pilató Blat, Actor Mora 14, Valencia, Spain
Filed Nov. 6, 1973, Ser. No. 413,205
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—130



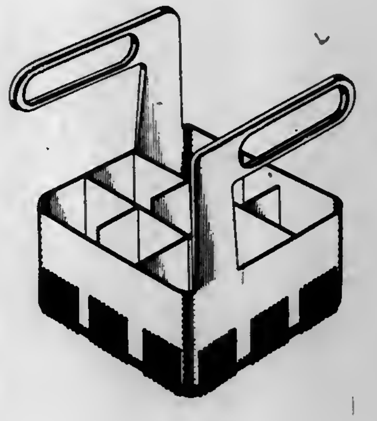
235,511
BOTTLE

Jean Boy, Luzarches, France, assignor to Compagnie Francaise des Parfums D'Orsay, Puteaux, Hauts-de-Seine, France
Filed July 26, 1973, Ser. No. 382,792
Claims priority, application France Apr. 18, 1973
Term of patent 7 years
Int. Cl. D9—*01*
U.S. Cl. D9—149



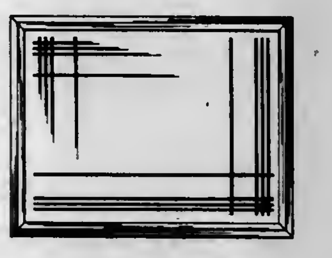
235,512
BOTTLE CARRYING CASE

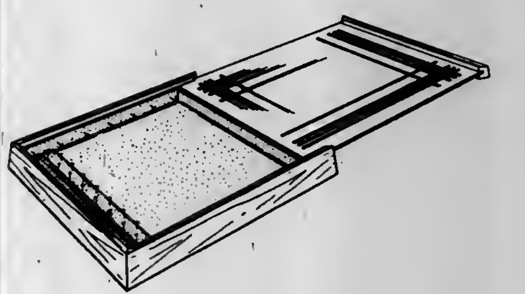
Rodney D. Marchetti, 1114 W. Lancaster, Bluffton, Ind. 46714
Filed Jan. 10, 1972, Ser. No. 216,903
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—179



235,513
JEWELRY BOX

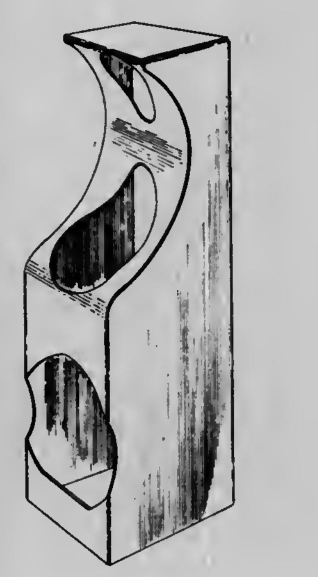
Glen A. Greer, 7416 NW. 7th 73127, and Robert W. Boutz, 5530 Woodbrier 73122, both of Oklahoma City, Okla.
Filed Apr. 11, 1973, Ser. No. 350,076
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—223





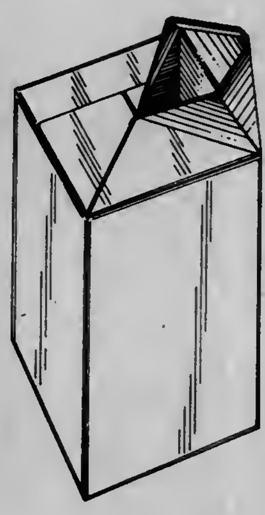
235,514
CARTON

Robert A. Hackenberg, East Lyme, Conn. (% Robertson Paper Box Co., Inc., Montville, Conn. 06353)
Filed Aug. 28, 1972, Ser. No. 284,368
Term of patent 7 years
Int. Cl. D9—*03*
U.S. Cl. D9—224



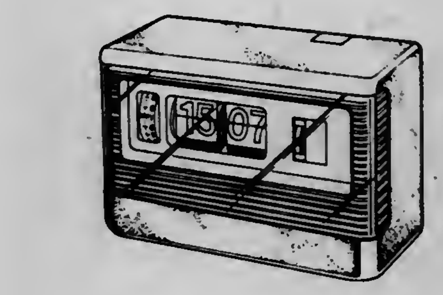
235,515
DISPENSING CONTAINER OR SIMILAR ARTICLE

Harry B. Egleston, Livonia, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.
Filed Mar. 10, 1972, Ser. No. 233,851
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—240



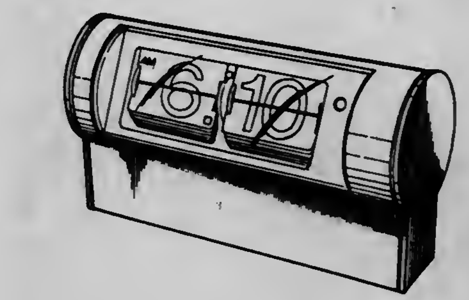
235,516
DIGITAL ALARM CLOCK

Hideaki Nagata, Tokyo-to, Japan, assignor to Kabushiki Kaisha Koparu, Tokyo-to, Japan
Filed June 25, 1973, Ser. No. 373,309
Claims priority, application Japan Dec. 27, 1972
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



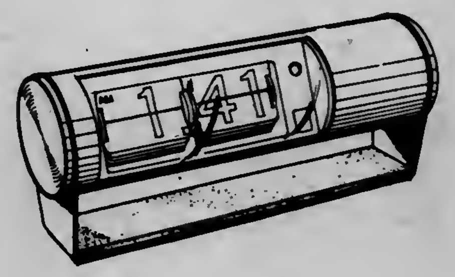
235,517
DIGITAL CLOCK

Riki Watanabe, Tokyo-to, Japan, assignor to Kabushiki Kaisha Koparu, Tokyo-to, Japan
Filed June 25, 1973, Ser. No. 373,310
Claims priority, application Japan Dec. 27, 1972
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15

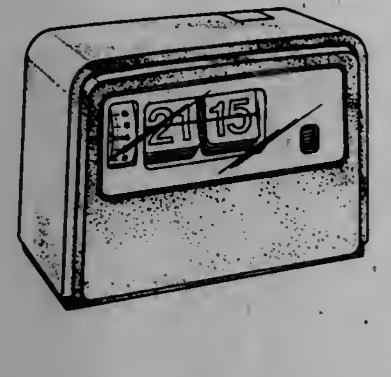


235,518
DIGITAL CLOCK

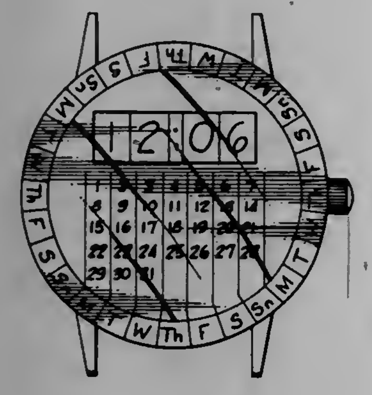
Riki Watanabe, Tokyo-to, Japan, assignor to Kabushiki Kaisha Koparu, Tokyo-to, Japan
Filed June 25, 1973, Ser. No. 373,311
Claims priority, application Japan Dec. 27, 1972
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



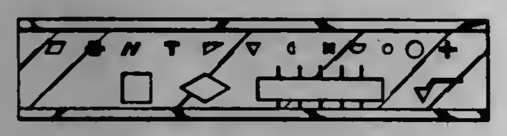
235,519
DIGITAL ALARM CLOCK
Hideaki Nagata, Tokyo-to, Japan, assignor to Kabushiki Kaisha Koparu, Tokyo-to, Japan
Filed June 25, 1973, Ser. No. 373,312
Claims priority, application Japan Dec. 27, 1972
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



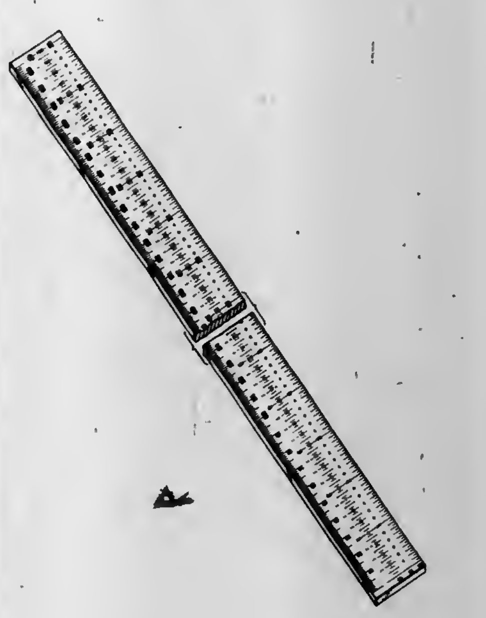
235,520
DIGITAL CALENDAR WATCH
Young D. Kwon, 531 Whitten Way, Placentia, Calif. 92670
Filed May 2, 1973, Ser. No. 356,582
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39



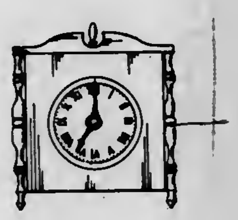
235,521
TEMPLATE
Jack Miles Donnelly, Chesterfield Village, near Lichfield, England, assignor to Girling Limited, Birmingham, England
Filed June 25, 1973, Ser. No. 372,936
Claims priority, application Great Britain Jan. 27, 1973
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D10—64



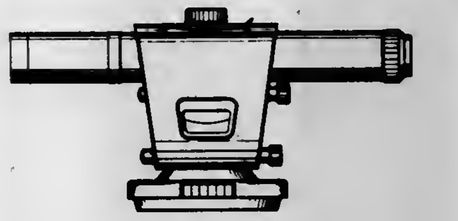
235,522
COMBINED MEASURING AND CALCULATING SCALE
Elmer Harold Cunningham, P.O. Box 552, Bowie, Tex. 76230
Filed Feb. 1, 1973, Ser. No. 329,203
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—71



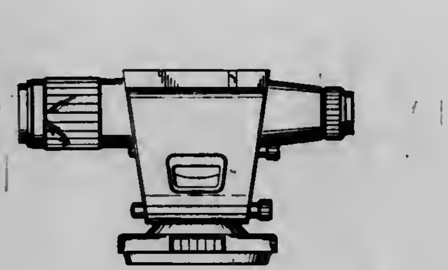
235,523
COMBINED CLOCK AND CABINET
Murray Miller, 24 Shorewood Drive, Port Washington, N.Y. 11050, and Andrew Kunkel, 49 Roosevelt Court, Westbury, N.Y. 11590
Filed Feb. 19, 1974, Ser. No. 443,727
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—2



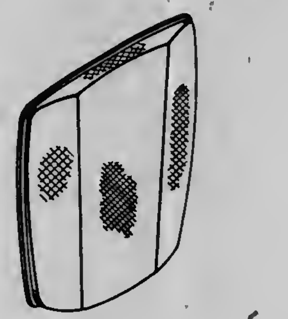
235,524
LEVEL TRANSIT OR THE LIKE
J. Peter E. Kooi, Succasunna, and Allister L. Baker, Denville, N.J., assignors to Keuffel & Esser Company, Morristown, N.J.
Filed Aug. 16, 1973, Ser. No. 389,062
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—66



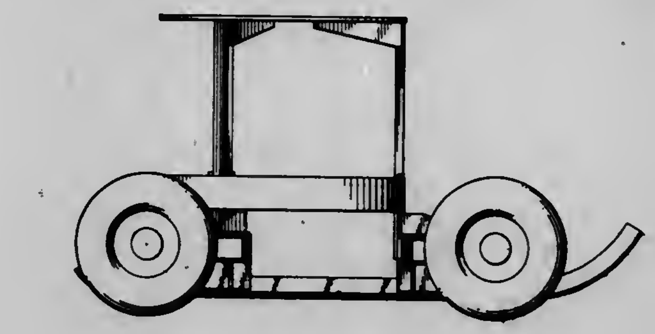
235,525
AUTOMATIC LEVEL TRANSIT OR THE LIKE
J. Peter E. Kooi, Succasunna, and Allister L. Baker, Denville, N.J., assignors to Keuffel & Esser Company, Morristown, N.J.
Filed Aug. 22, 1973, Ser. No. 390,458
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—66



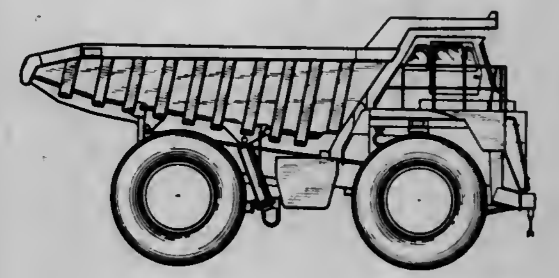
235,526
BICYCLE REFLECTOR
Nicholas A. Amoroso, Hillsdale, N.J., assignor to Bright Star Industries, Inc., Clifton, N.J.
Filed Mar. 27, 1974, Ser. No. 455,133
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111



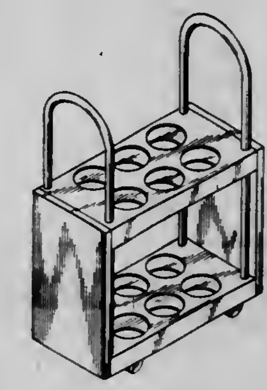
235,527
SLED FOR TRANSPORTING A SEISMIC ENERGY GENERATOR
Clifford D. Dransfield, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.
Filed Jan. 3, 1974, Ser. No. 430,545
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—1



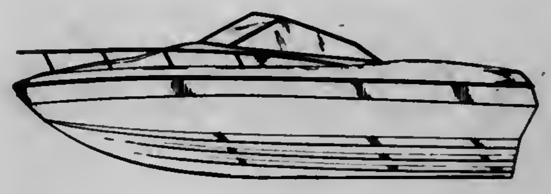
235,528
DUMP TRUCK
Jacob W. Ahola, Decatur, Bernard E. Erlacher, Washington, and Richard E. Guhl, Samuel L. Kershaw, and Alfred W. Sieving, Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Jan. 30, 1974, Ser. No. 437,988
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—15



235,529
CART FOR OXYGEN CYLINDERS
John P. Salsgiver, 29 Ethan Allen Drive, Acton, Mass. 01720
Filed June 22, 1973, Ser. No. 372,831
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—29



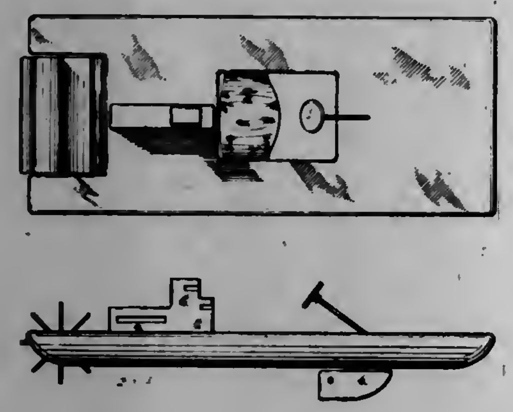
235,530
BOAT
David T. Livingston, Seattle, Wash., assignor to Reinell Boats, Inc., Marysville, Wash.
Filed Aug. 24, 1973, Ser. No. 391,226
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



235,531
CHILD'S BOAT SHAPED LIKE A STERNWHEELER

Rodolphe J. Bernard, 16330 Sandalwood,
Fountain Valley, Calif. 92708
Filed June 6, 1974, Ser. No. 477,005
Term of patent 14 years
Int. Cl. D12—*06*

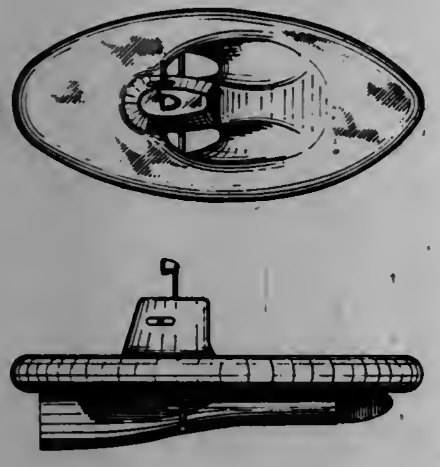
U.S. Cl. D12—68



235,532
CHILD'S BOAT SHAPED LIKE A SUBMARINE

Rodolphe J. Bernard, 16330 Sandalwood,
Fountain Valley, Calif. 92708
Filed June 6, 1974, Ser. No. 477,006
Term of patent 14 years
Int. Cl. D12—*06*

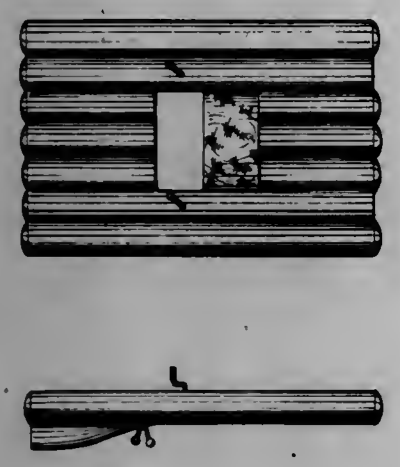
U.S. Cl. D12—68



235,533
CHILD'S BOAT SHAPED LIKE A LOG RAFT

Rodolphe J. Bernard, 16330 Sandalwood,
Fountain Valley, Calif. 92708
Filed June 6, 1974, Ser. No. 477,008
Term of patent 14 years
Int. Cl. D12—*06*

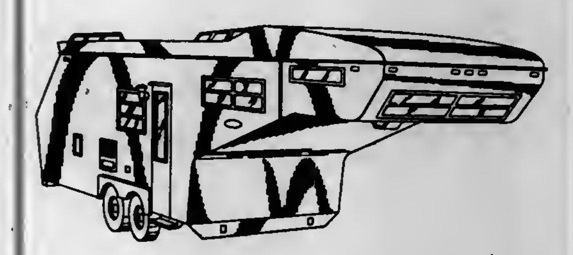
U.S. Cl. D12—68



235,534
MOBILE HOME

John May, Rte. 2, Concordia, Mo. 64020
Filed Oct. 5, 1972, Ser. No. 295,221
Term of patent 14 years
Int. Cl. D12—*10*

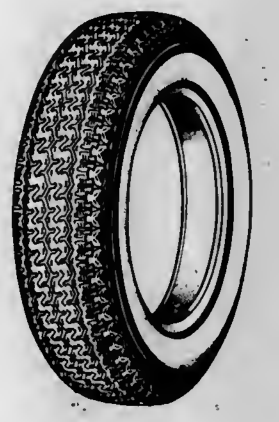
U.S. Cl. D12—103



235,535
TIRE FOR A VEHICLE WHEEL

Brian Howard Holmes, Birmingham, and Clive Flint, Sutton Coldfield, England, assignors to Dunlop Limited
Filed June 29, 1973, Ser. No. 375,179
Claims priority, application Great Britain Jan. 19, 1973
Term of patent 14 years
Int. Cl. D12—*15*

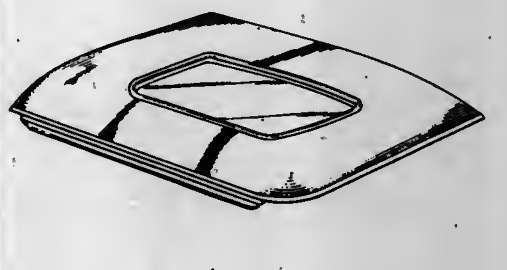
U.S. Cl. D12—142



235,536
DETACHABLE SUNROOF FOR A PASSENGER VEHICLE

Andrew W. Boston, Jr., 4618 Rodeo 90016, and Lance M. Porter, 1116 W. 96th St. 90044, both of Los Angeles, Calif.
Filed June 11, 1973, Ser. No. 368,765
Term of patent 14 years
Int. Cl. D12—*16*

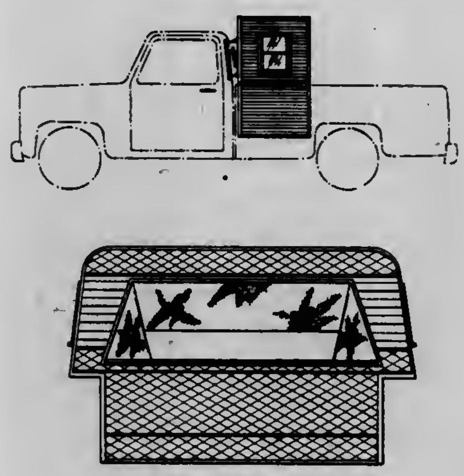
U.S. Cl. D12—156



235,537
AUXILIARY HOUSING FOR USE WITH PICKUP TRUCKS

Thomas E. Haynes, 3701 NW. 42nd,
Oklahoma City, Okla. 73112
Filed July 30, 1973, Ser. No. 383,686
Term of patent 14 years
Int. Cl. D12—*16*

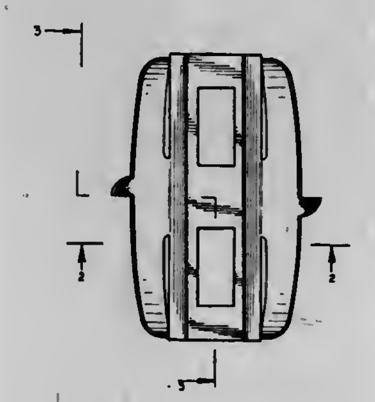
U.S. Cl. D12—156



235,538
PAD ANTI-RATTLE SPRING FOR A DISC BRAKE

Hermann Brix, Koblenz, Germany, assignor to Girling Limited, Birmingham, England
Filed Jan. 15, 1973, Ser. No. 323,418
Claims priority, application Great Britain July 13, 1972
Term of patent 14 years
Int. Cl. D12—*16*

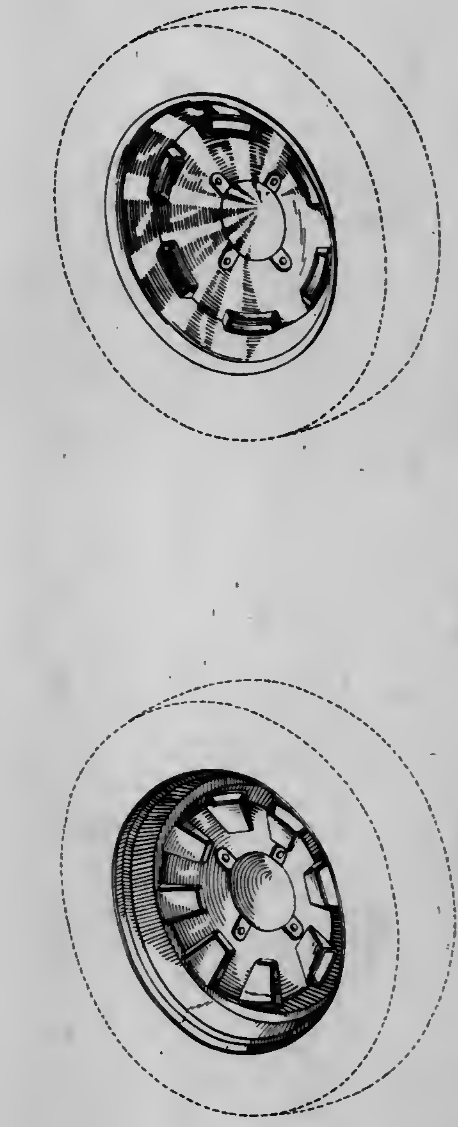
U.S. Cl. D12—180



235,539
WHEEL COVER

Sture Lennart Asberg, Partille, Sweden, assignor to SKF Nova AB, Goteborg, Sweden
Filed June 20, 1973, Ser. No. 371,580
Claims priority, application Sweden Dec. 18, 1972
Term of patent 14 years
Int. Cl. D12—*16*

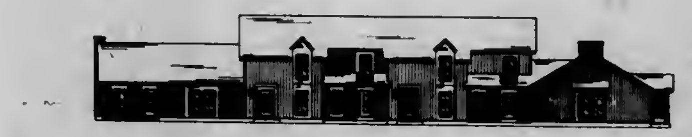
U.S. Cl. D12—206



235,540
BUILDING OR THE LIKE

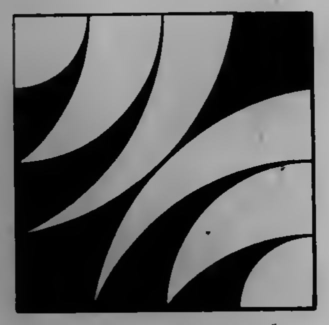
Floyd P. Jenkins, Jr., Fayetteville, N.C., assignor to American Classic Industries, Fayetteville, N.C.
Filed May 30, 1973, Ser. No. 365,272
Term of patent 14 years
Int. Cl. D25—*03*

U.S. Cl. D13—1 A



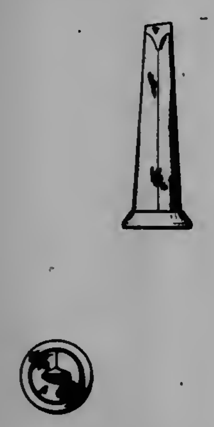
235,541
TILE

Stephan Eusemann, Nurnberg, Germany, assignor to Dynamit Nobel Aktiengesellschaft
Filed June 13, 1972, Ser. No. 262,180
Claims priority, application Germany Dec. 13, 1971
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2 B



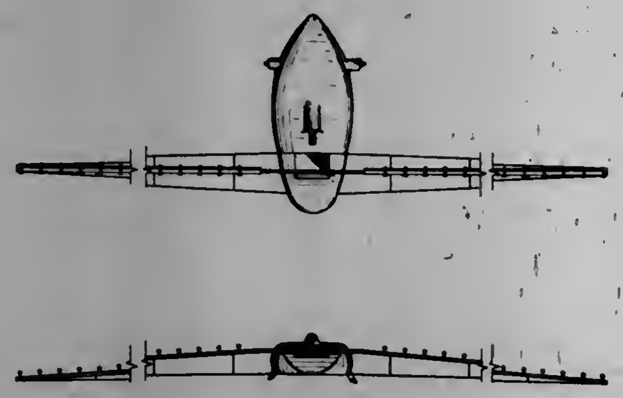
235,542
FILTER

William C. Blocker, 1406 N. Butler Ave., Indianapolis, Ind. 46219
Filed Oct. 25, 1972, Ser. No. 300,472
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4



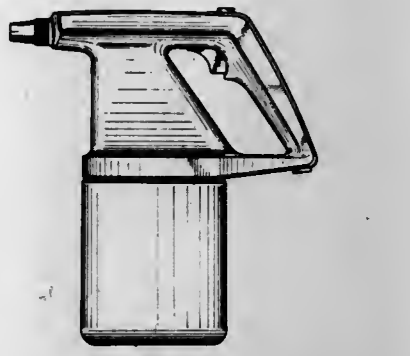
235,543
AIRCRAFT-BORNE SPRAY UNIT

Richard Werling, Fort Atkinson, and James P. Lindsey, Janesville, Wis., assignors to Omniflight Helicopters, Inc., Janesville, Wis.
Filed May 17, 1973, Ser. No. 361,263
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18



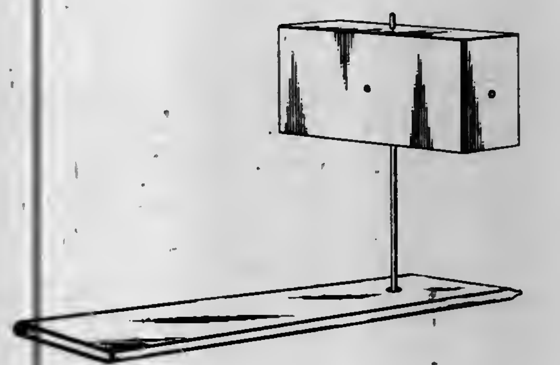
235,544
GARDEN SPRAYER

Jacob R. Bippus, Pittsburgh, and Raymond Kazusky, Jr., Jeannette, Pa., and Edward D. Levy, Spring Valley, N.Y., assignors to Rockwell International Corporation, Pittsburgh, Pa.
Filed Nov. 28, 1973, Ser. No. 419,699
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18



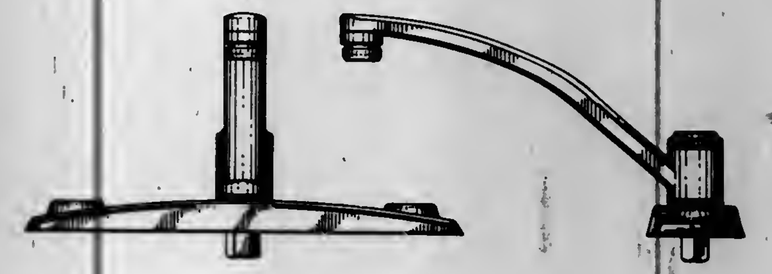
235,545
FLOAT VALVE

Quentin T. Cox, 1216 W. 226th St., Torrance, Calif. 90502
Filed Apr. 16, 1973, Ser. No. 351,777
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



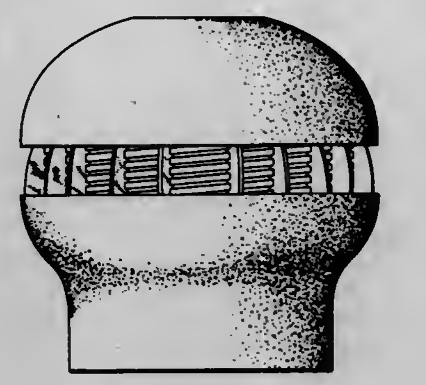
235,546
FAUCET FIXTURE BODY

Harper Landell, Fort Washington, Pa., assignor to Speakman Company
Filed Aug. 3, 1972, Ser. No. 277,663
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—32



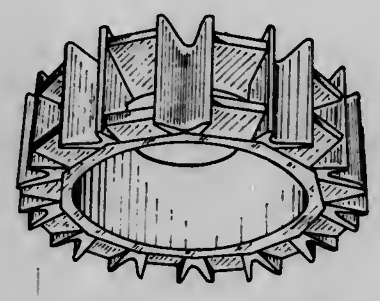
235,547
AIR PURIFIER

Georg Schimanski, Rummenohl, Germany, assignor to Globol-Werk GmbH, Neuburg (Danube), Germany
Filed Sept. 17, 1973, Ser. No. 398,058
Claims priority, application Germany July 13, 1973
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—149



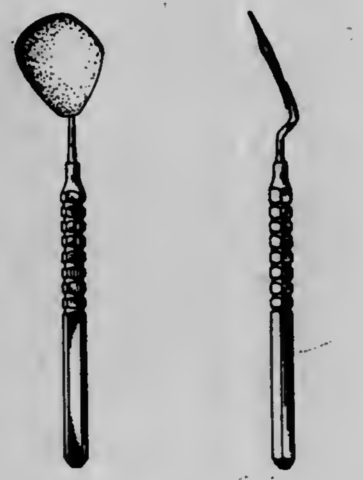
235,548
INJECTION NOZZLE RIM FOR VENTILATING APPARATUS

Jorgen Holt, Naestved, Denmark, assignor to Nordisk Ventilator Co. Aktieselskab, Naestved, Denmark
Filed July 27, 1973, Ser. No. 383,326
Claims priority, application Denmark Feb. 1, 1973
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—163



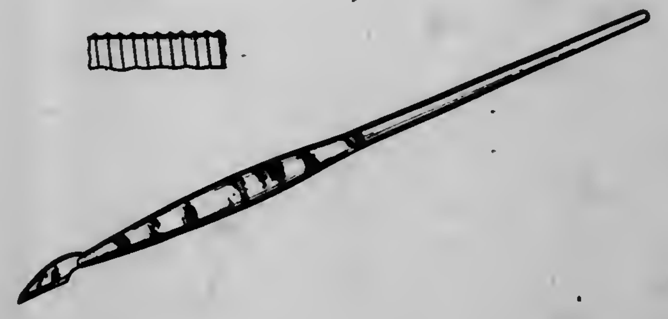
235,549
DENTAL TONGUE RETRACTOR

Ervin M. Funderburk, 1648 Providence Road, Charlotte, N.C. 28806
Filed Apr. 12, 1974, Ser. No. 460,293
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—1 D



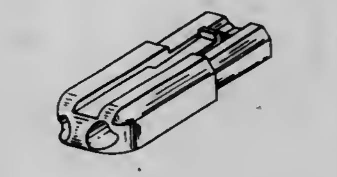
235,550
DENTAL BLADE PROBE TOOL

Robert Philip Berger, 17110 Clemons Drive, Encino, Calif. 91316
Filed Dec. 29, 1969, Ser. No. 20,651
Term of patent 14 years
The term of this patent subsequent to Feb. 24, 1986, has been disclaimed
Int. Cl. D24—*02*
U.S. Cl. D24—1 D



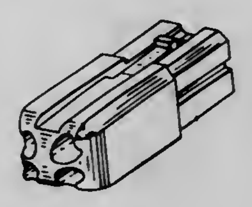
235,551
ELECTRICAL CONNECTOR

Paul "B" Derr, Middletown, Gilbert Douglas Ferdon, Hummelstown, and Robert George Harwood, Mechanicsburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Sept. 29, 1972, Ser. No. 293,625
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A



235,552
ELECTRICAL CONNECTOR

Paul "B" Derr, Middletown, Gilbert Douglas Ferdon, Hummelstown, and Robert George Harwood, Mechanicsburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Sept. 29, 1972, Ser. No. 293,639
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A

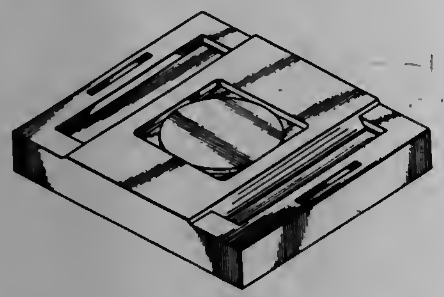


235,553

CONNECTOR PACKAGE

James Raymond Kunkle, Enola, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 20, 1973, Ser. No. 333,580
Term of patent 14 years
Int. Cl. D13—*03*

U.S. Cl. D26—1 A

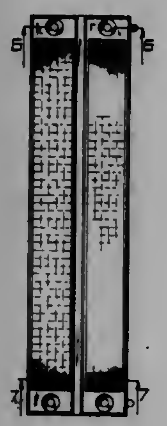


235,554

ELECTRICAL SOCKET

Ronald J. Portugal, North Haven, Conn., assignor to Continental Specialties Corporation, New Haven, Conn.
Filed Nov. 8, 1973, Ser. No. 413,919
Term of patent 14 years
Int. Cl. D13—*03*

U.S. Cl. D26—1 B

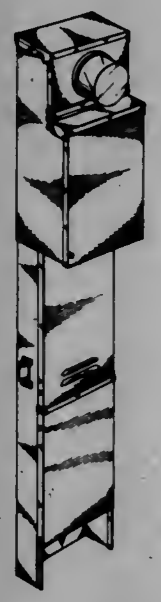


235,555

POWER OUTLET PEDESTAL BOX

Merle A. Plummer, North Hollywood, Calif., assignor to Myers Electric Products, Inc., Montebello, Calif.
Filed Aug. 4, 1972, Ser. No. 278,088
Term of patent 14 years
Int. Cl. D13—*03*

U.S. Cl. D26—5 R

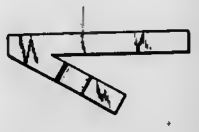


235,556

REED FOR A REED SWITCH

Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed July 9, 1974, Ser. No. 486,883
Term of patent 14 years
Int. Cl. D13—*03*

U.S. Cl. D26—13 R

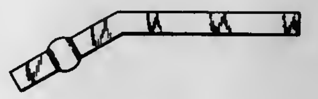


235,557

REED FOR A REED SWITCH

Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed July 9, 1974, Ser. No. 486,886
Term of patent 14 years
Int. Cl. D13—*03*

U.S. Cl. D26—13 R

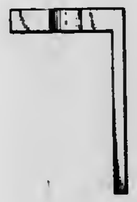


235,558

REED FOR A REED SWITCH

Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed July 9, 1974, Ser. No. 486,889
Term of patent 14 years
Int. Cl. D13—*03*

U.S. Cl. D26—13 R

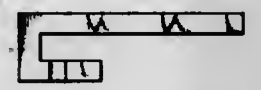


235,559

REED FOR A REED SWITCH

Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed July 9, 1974, Ser. No. 486,891
Term of patent 14 years
Int. Cl. D13—*03*

U.S. Cl. D26—13 R

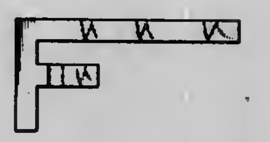


235,560

REED FOR A REED SWITCH

Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed July 9, 1974, Ser. No. 486,892
Term of patent 14 years
Int. Cl. D13—*03*

U.S. Cl. D26—13 R

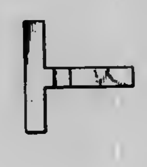


235,561

REED FOR A REED SWITCH

Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed July 9, 1974, Ser. No. 486,893
Term of patent 14 years
Int. Cl. D13—*03*

U.S. Cl. D26—13

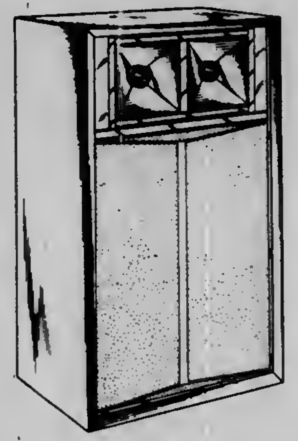


235,562

HORN SPEAKER

Arthur Robson, Jericho, N.Y., assignor to Morse Electro Products Corp., Brooklyn, N.Y.
Filed Aug. 13, 1973, Ser. No. 388,331
Term of patent 14 years
Int. Cl. D14—*03*

U.S. Cl. D26—14 G

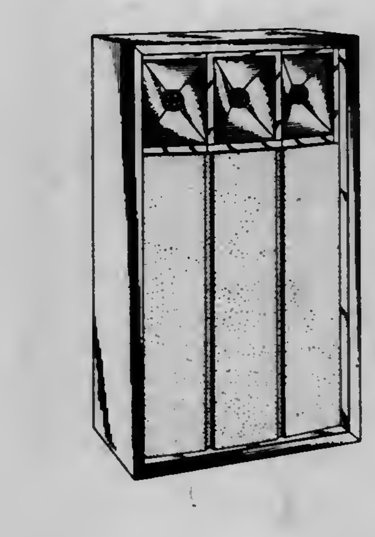


235,563

HORN SPEAKER

Arthur Robson, Jericho, N.Y., assignor to Morse Electro Products Corp., Brooklyn, N.Y.
Filed Aug. 13, 1973, Ser. No. 388,332
Term of patent 14 years
Int. Cl. D14—*03*

U.S. Cl. D26—14 G

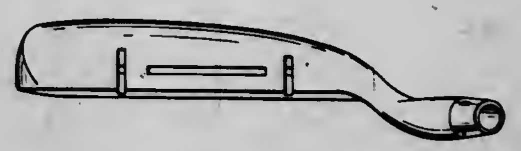


235,564

GOLF PUTTER HEAD

Raymon W. Cook, San Antonio, Tex., assignor to Ray Cook Golf Putters, Inc., San Antonio, Tex.
Filed Sept. 29, 1972, Ser. No. 293,526
Term of patent 14 years
Int. Cl. D21—*02*

U.S. Cl. D34—5 GH

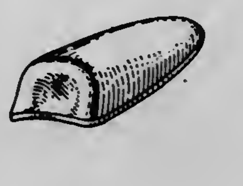


235,565

PUTTING AID ATTACHMENT FOR A GOLF CLUB SHAFT

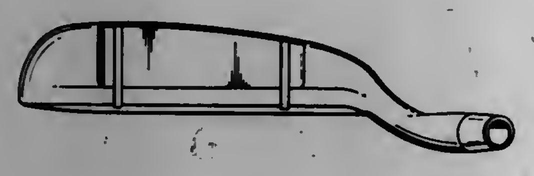
Anthony J. Prisco, Sr., Woodcliff Lake, N.J. (102 Beech St., Westwood, N.J. 07675)
Filed Aug. 27, 1973, Ser. No. 391,739
Term of patent 14 years
Int. Cl. D21—*02*

U.S. Cl. D34—5 CB



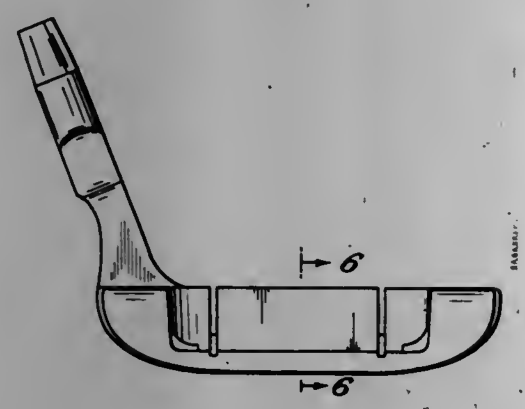
235,566
GOLF PUTTER HEAD

Raymon W. Cook, San Antonio, Tex., assignor to Ray Cook Golf Putters, Inc., San Antonio, Tex.
Continuation of abandoned design applications Ser. No. 293,526, Sept. 29, 1972, and Ser. No. 343,387, Mar. 21, 1973. This application June 14, 1974, Ser. No. 479,452
Term of patent 14 years
Int Cl. D21—*02*
U.S. Cl. D34—5 GH



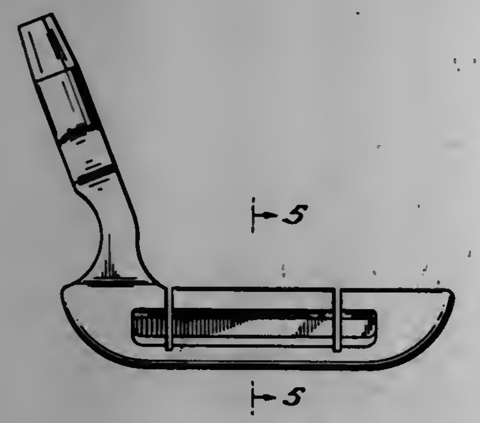
235,567
GOLF PUTTER HEAD

Raymon W. Cook, San Antonio, Tex., assignor to Ray Cook Golf Putters, Inc., San Antonio, Tex.
Continuation of abandoned design applications Ser. No. 293,523 and Ser. No. 293,528, both Sept. 29, 1972. This application June 14, 1974, Ser. No. 479,457
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



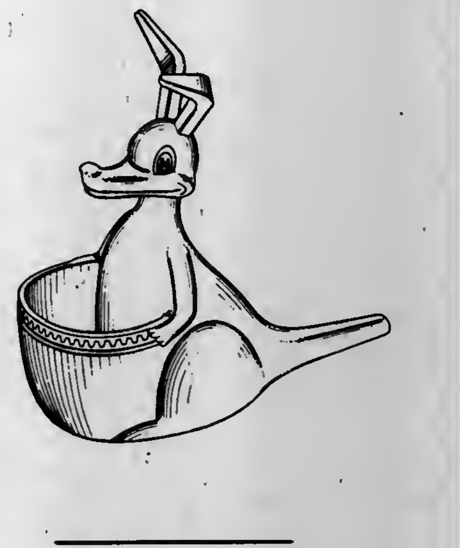
235,568
GOLF PUTTER HEAD

Raymon W. Cook, San Antonio, Tex., assignor to Ray Cook Golf Putters, Inc., San Antonio, Tex.
Continuation of abandoned design applications Ser. No. 293,531, Sept. 29, 1972, and Ser. No. 343,389, Mar. 21, 1973. This application June 14, 1974, Ser. No. 479,459
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



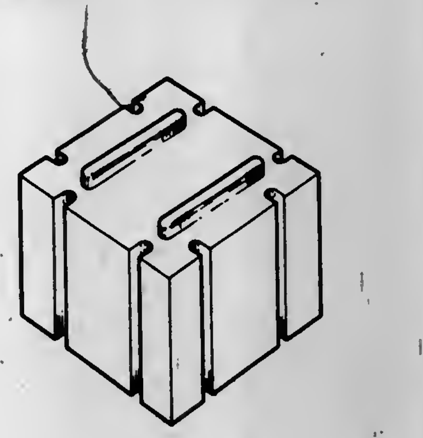
235,569
TOY BANK

Angelo L. De Fina, 2882 86th St., Brooklyn, N.Y. 11223
Filed Sept. 20, 1973, Ser. No. 399,105
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D34—11 R



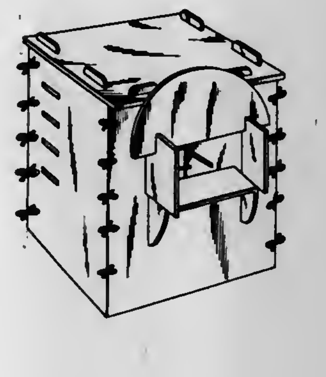
235,570
TOY CONSTRUCTION PIECE

Stanley Ernest Barton, McKinnon, Victoria, Australia, assignor to Rosenhain and Lipmann Pty. Limited, Richmond, Victoria, Australia
Filed Apr. 3, 1973, Ser. No. 347,511
Claims priority, application Australia Nov. 22, 1972
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 GG



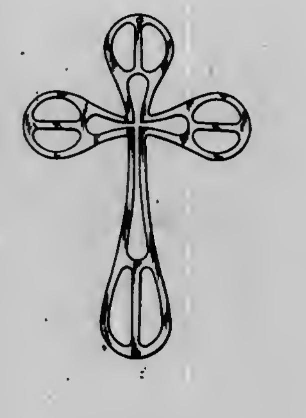
235,571
TOY HOUSE

Gertrude Klara Maria Jaros, Forlandegatan 5, S-415 06 Goteborg, Sweden
Filed May 22, 1973, Ser. No. 362,876
Claims priority, application Sweden Nov. 22, 1972
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL



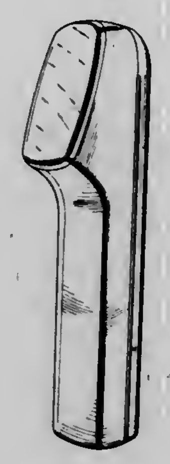
235,572
CROSS PENDANT OR THE LIKE

Karl Edward Guetzlaff, 1173 Dixon Drive, Waterloo, Iowa 50701
Filed Oct. 10, 1973, Ser. No. 404,985
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—16 B



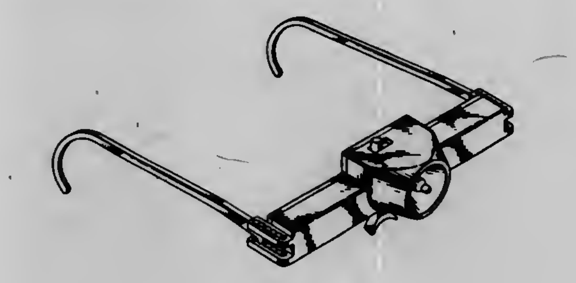
235,573
LAMP

Alfred Brych, Chasneuil, France, assignor to Saft-Societe des Accumulateurs Fixes et de Traction
Filed June 3, 1974, Ser. No. 475,993
Claims priority, application France Dec. 3, 1973
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A



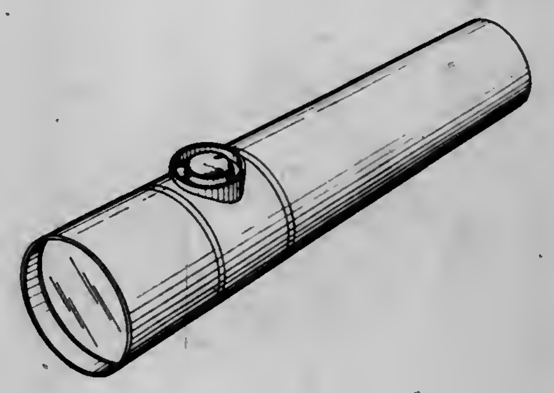
235,574
HEAD SUPPORTED FLASHLIGHT

Donald E. Willis, 621 W. State St., Rockford, Ill. 61101, and Robert P. Hohm, Rockford, Ill.; said Hohm assignor to said Willis
Filed Sept. 4, 1973, Ser. No. 393,949
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A



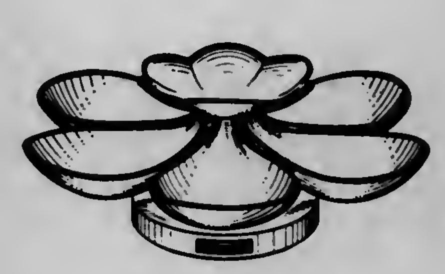
235,575
FLASHLIGHT

Robert E. Brindley, New York, N.Y., assignor to Union Carbide Corporation, New York, N.Y.
Filed Mar. 22, 1973, Ser. No. 343,707
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A



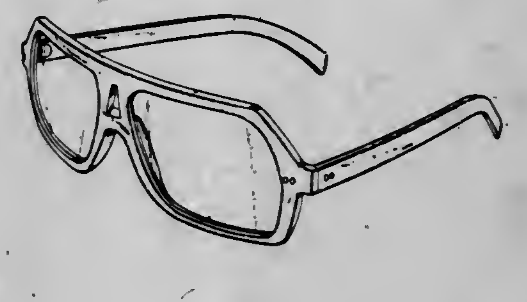
235,576
COMBINED RADIO AND FOOD SERVICE DISH

Morris Fink, Great Neck, N.Y.
Filed July 11, 1973, Ser. No. 378,345
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



235,577
PAIR OF SPECTACLES

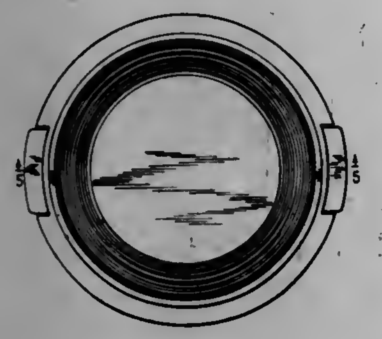
Larry G. Loughner, North Andover, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Oct. 19, 1972, Ser. No. 298,894
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 F



235,578

LENS CAP OR SIMILAR ARTICLE

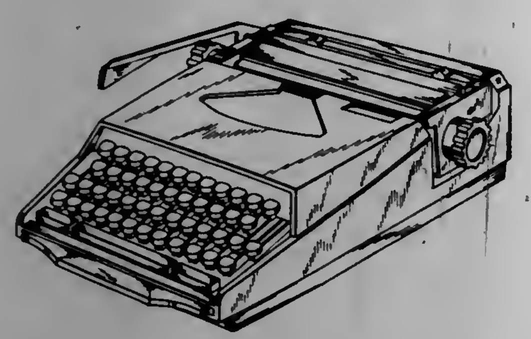
Kenichi Miyake, Osaka, and Masakazu Nakanishi, Hashimoto, Japan, assignors to Minolta Camera Kabushiki Kaisha, Higashi-ku, Osaka, Japan
Filed Dec. 20, 1973, Ser. No. 426,731
Claims priority, application Japan June 22, 1973
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 E



235,579

TYPEWRITER

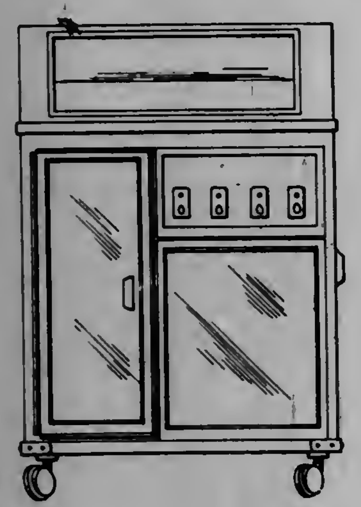
Alejandro De Tomaso and Thom Tjaarda, Turin, Italy, assignors to SCM Corporation, New York, N.Y.
Filed Oct. 25, 1972, Ser. No. 300,534
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A



235,580

PORTABLE HOSPITAL EMERGENCY LIFE SUPPORT SYSTEM

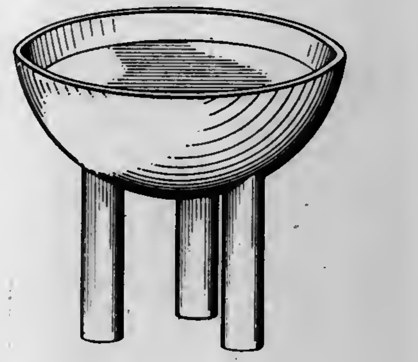
Robert D. Miller, Berkeley, Calif., assignor to Hospital Systems, Inc., Oakland, Calif.
Filed June 22, 1973, Ser. No. 372,662
Term of patent 14 years
Int. Cl. D24—*01, 99*
U.S. Cl. D83—1 F



235,581

SUNBATHING PLATFORM

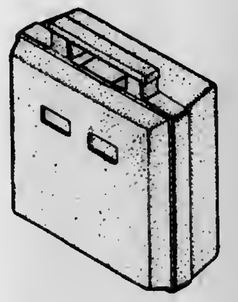
Charles W. Gage, 545 Manchester Drive,
South Bend, Ind. 46615
Filed Jan. 24, 1973, Ser. No. 326,494
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1 C



235,582

CASE FOR REFRIGERATION TEST INSTRUMENTS OR THE LIKE

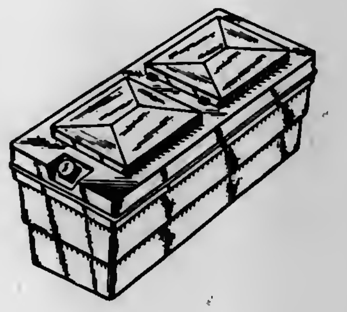
Raymond M. Beck, Los Angeles, Calif., assignor to Mechanical Refrigeration Enterprises, North Hollywood, Calif.
Filed June 1, 1973, Ser. No. 366,172
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



235,583

COMBINED VEHICLE AUXILIARY FUEL TANK AND UTILITY COMPARTMENT

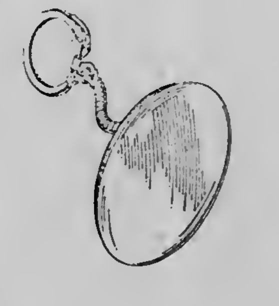
Alan C. Parry, Des Moines, Iowa, assignor to Mid-America Body & Equipment Co., Inc.
Filed May 7, 1973, Ser. No. 358,006
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



235,584

KEY HOLDER

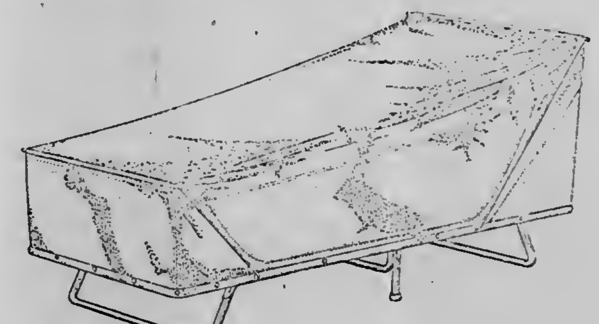
Edward M. Hall, 2053 W. Cocopah,
Phoenix, Ariz. 85009
Filed Nov. 7, 1973, Ser. No. 413,585
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—8



235,585

COT-TENT

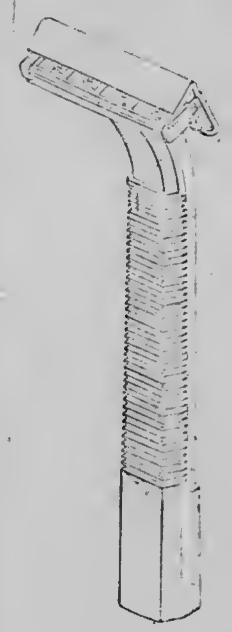
Dale W. Stevens, 3998 Oliver Drive,
Salt Lake City, Utah 84117
Filed Sept. 14, 1973, Ser. No. 397,254
Term of patent 14 years
Int. Cl. D21—*04*
U.S. Cl. D88—3 B



235,586

RAZOR

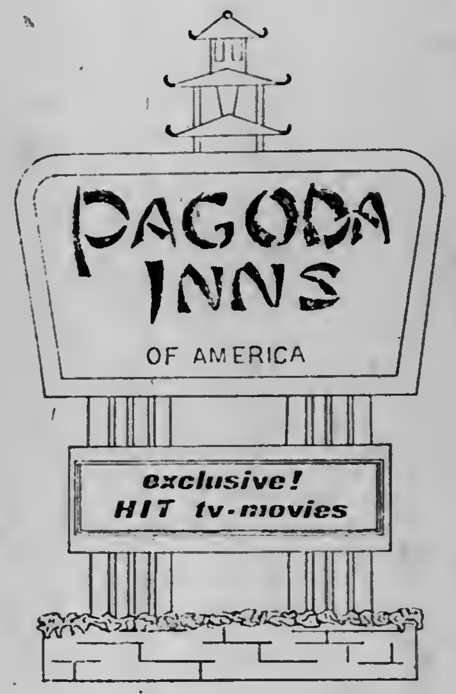
Norman D. Poisson, Andover, Mass., assignor to The Gillette Company, Boston, Mass.
Filed June 4, 1973, Ser. No. 366,664
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A



235,587

SIGNBOARD

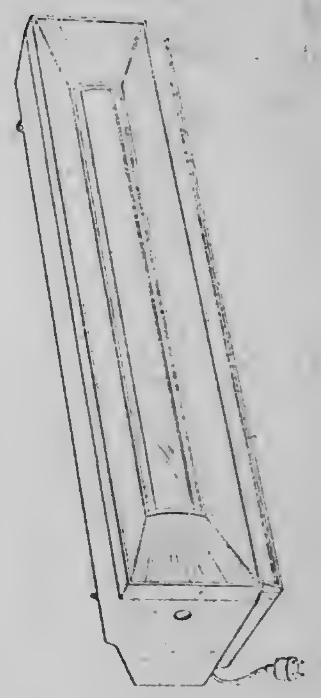
Jefferson D. Muse, 156 Forsythe St. SW.,
Atlanta, Ga. 30306
Filed Jan. 14, 1974, Ser. No. 433,349
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12



235,588

ELECTRICAL LIGHTING APPARATUS FOR DISPLAYING ADVERTISING MESSAGES ON A ROTARY DRUM

Jakob Asam, Merano, Italy, assignor to Informa S.R.L., Merano, Bolzano, Italy
Filed Dec. 20, 1972, Ser. No. 316,767
Claims priority, application Italy June 21, 1972
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 R



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF JUNE, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. Duda & Sons, Inc.: *See—*
  - Boots, Vernie A., 3,890,909.
- A.G. fur industrielle Elektronik AGIE: *See—*
  - Ullmann, Werner; Schumacher, Bernd; Sieg, Arno; Mattei, Silvano; Fenner, Hans-Ueli; Wettstein, Gottlieb; and Ruh, Herbert, 3,891,819.
- A. H. Robins Company, Incorporated: *See—*
  - Lunsford, Carl Dalton; and Cale, Albert Duncan, Jr., 3,891,646.
- A-Lok Corporation: *See—*
  - Ditcher, John, 3,891,224.
- AB Bofors: *See—*
  - Aldrin, Henry Wilhelm, 3,890,731.
- AB Teleplan: *See—*
  - Petrusson, Erling Olav Valdemar, 3,891,930.
- Abbott Laboratories: *See—*
  - Mehta, Shashi Pal, 3,891,755.
  - Standley, Wendell Evert; and Beall, Glenn Lee, 3,890,972.
  - Swett, Leo Ralph, 3,891,630.
- Abbott, William S.: *See—*
  - Lipe, Gordon C.; and Abbott, William S., 3,891,986.
- Abdallah, Abdulmuniem H.: *See—*
  - Shea, Philip J.; and Abdallah, Abdulmuniem H., 3,891,769.
- Abe, Michiharu: *See—*
  - Yasumori, Akiyoshi; Ohta, Katsuichi; Kunikane, Makoto; and Abe, Michiharu, 3,891,513.
- Abe, Toshizo; Sakamoto, Seiho; Go, Shigeo; Maekuma, Koichi; Yamada, Yoshitaka; and Hirashima, Yasumasa, to Mitsubishi Chemical Industries Ltd. Process for polymerizing olefins. 3,891,611, Cl. 260-88.20B.
- Abeta, Sadaharu, to American Cyanamid Company. Basic dye-bath and method for dyeing acrylic fibers therewith. 3,891,390, Cl. 8-173.000.
- Abrashev, Georgi Ivanov: *See—*
  - Yordanov, Yordan Todorov; Abrashev, Georgi Ivanov; Georgiev, Georgi Tenev; Zhekov, Velyo Dimitroy; Yanev, Yancho Hristov; Rossenov, Ivan Georgiev; Prodanov, Velcho Angelov; and Roussey, Yordan Todev, 3,891,428.
- Ackroyd, John Morton; and Hart, Graham Arthur Nigel, to Firestone Burleigh Marine Pneumatic Fendering Company Limited. Marine fenders. 3,890,917, Cl. 114-220.000.
- Adachi, Kazuma; Tokunaga, Masayoshi; and Takeshita, Shigeru, to Kabushiki Kaisha Daikin Seisakusho. Impeller wheel for torque converter or fluid coupling and manufacturing method thereof. 3,891,350, Cl. 416-180.000.
- Adage, Inc.: *See—*
  - Cheek, Thomas B.; Thornhill, Daniel E.; and Stewart, Ronald B., 3,891,982.
- Adams-Russell Co., Inc.: *See—*
  - Norton, David E.; and Podell, Allen F., 3,891,934.
- Addressograph-Multigraph Corporation: *See—*
  - Brugge, Walter James; and Takacs, Edward Francis, 3,890,899.
  - Kolibas, James Andrew, 3,891,315.
- Advance Value Installations Inc.: *See—*
  - Blazek, George A., 3,891,146.
- Aerojet-General Corporation: *See—*
  - Allemann, James G., 3,891,956.
  - Lista, Edwin L.; and Williams, Kenneth S., 3,890,877.
- Aeschmann, Marc, to Ebauches S.A. Watch stem intermediate setting position with functions determined by whether intermediate position was achieved by pushing stem in or pulling stem out. 3,890,778, Cl. 58-57.500.
- AG International: *See—*
  - Hoff, John K.; and Goss, John B., 3,891,150.
- AGA Aktiebolag: *See—*
  - Mogensen, Palne; and Kaij, Mats J., 3,891,562.
  - Wiklund, Klas Rudolf, 3,891,857.
- Agence National de Valorization de la Researche (ANVAR): *See—*
  - Fradin, Maurice, 3,890,674.
- Agency of Industrial Science & Technology: *See—*
  - Kobayashi, Kazuo; Watari, Shinjiro; Kato, Tsutomu; Shiraishi, Minoru; and Kawana, Yoshio, 3,891,574.
  - Sunahara, Hiroshi; and Kimura, Yoshio, 3,891,205.
- Agfa-Gavaert Aktiengesellschaft: *See—*
  - Van Paesschen, August Jean; and Herbots, Joseph Antoine, 3,891,444.
- Agfa-Gevaert Aktiengesellschaft: *See—*
  - Deml, Reinhold; Greis, Ulrich; Bestenreiner, Friedrich; and Helmberger, Josef, 3,891,975.
- Agfa-Gevaert, N.V.: *See—*
  - Bollen, Romain Henri; and Van Esch, Robert Florent, 3,891,852.
- Ahmed, Abbas Mesbahuddin, to AMP Incorporated. Discharge display panel including a substrate supporting plural cathodes and recessed anodes. 3,891,883, Cl. 313-54.000.
- Air Preheater Company, Inc., The: *See—*
  - Mahoney, Robert E., 3,891,029.
- Aisin Seiki Kabushiki Kaisha: *See—*
  - Kawai, Taneichi; and Nishida, Koji, 3,890,734.
- Aizawa, Hiroshi; Ito, Tadashi; Itoh, Fumio; Takahashi, Kiyoshi; and Isobe, Yasuo, to Canon Kabushiki Kaisha. Electrical driving device for film mechanism. 3,891,312, Cl. 352-180.000.
- Aker, John L., to Kustom Electronics, Inc. Variable frequency oscillator including active band-pass filter with positive feedback. 3,891,946, Cl. 331-108.00D.
- Akita, Sigeyuki, to Nippon Soken, Inc. Power and signal transmitting means. 3,891,914, Cl. 321-47.000.
- Aktiebolaget Atomenergi: *See—*
  - Margen, Peter Heinrich Erwin, 3,890,787.
- Aktiebolaget Hassle: *See—*
  - Carlsson, Per Arvid Emil; and Corrodi, Hans Rudolf, 3,891,768.
- Aktiengesellschaft Brown, Boveri & Cie.: *See—*
  - Sahm, Peter; and Sebalj-Novosel, Renata, 3,891,431.
- Aktiengesellschaft Gebruder Loepfe: *See—*
  - Domig, Rene, 3,890,810.
- Alacchi, Georges. Walking-props for mining galleries. 3,890,792, Cl. 61-45.00D.
- Albert & Rowland S.A.: *See—*
  - Valette, Raymond, 3,891,654.
- Alcanzare, Eduardo V. Detachable trash box and trailer. 3,891,106, Cl. 214-318.000.
- Aldred, Peter: *See—*
  - Allen, Robert E.; Bartos, Jon L.; and Aldred, Peter, 3,890,816.
- Aldrin, Henry Wilhelm, to AB Bofors. Method of and device for extracting cartridge cases. 3,890,731, Cl. 42-25.000.
- Alewitz, Sam, to Perfection Corporation. Anode-fitting assembly. 3,891,530, Cl. 204-197.000.
- Allaben, Charles M., Jr.: *See—*
  - Zimmer, George A; Allaben, Charles M., Jr.; and Weidman, William K., 3,891,286.
- Allardyce, Gordon E.; Amedee, Roy; and Belleau, Claude, to Chrysler Corporation. Method of preparing oxidation resistant brazed joints. 3,891,784, Cl. 427-295.000.
- Allemann, James G., to Aerojet-General Corporation. Apparatus for measuring variables. 3,891,956, Cl. 337-1.000.
- Allen, Bill. Trailer hitch. 3,891,237, Cl. 280-477.000.
- Allen, Robert E.; Bartos, Jon L.; and Aldred, Peter, to General Electric Company. Elimination of carbide segregation to prior particle boundaries. 3,890,816, Cl. 75-0.5BA.
- Allen, Robert P.; and Hagemeyer, Hugh J., Jr., to Eastman Kodak Company. Production of 2,2-disubstituted propiolactones. 3,891,679, Cl. 260-343.900.
- Allen, Thomas E.; and Smith, Don W., to CMI Corporation. Dual pressure control assembly. 3,890,783, Cl. 60-420.000.
- Allied Chemical Corporation: *See—*
  - Damon, William H., 3,891,233.
  - Sundie, Richard D.; and Pennie, Walter L., 3,891,590.
- Allis-Chalmers Corporation: *See—*
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  - Jenness, Raymond C., 3,891,281.
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- Amedee, Roy: *See—*
  - Allardyce, Gordon E.; Amedee, Roy; and Belleau, Claude, 3,891,784.
- Amelio, Gilbert F.; Livezey, Jack A.; and Salsbury, Phillip J., to Fairchild Camera and Instrument Corporation. Charge coupled memory device. 3,891,977, Cl. 340-173.00R.
- American Air Filter Company, Inc.: *See—*
  - Kannapell, David H.; Schupp, Philipp P.; and Amrein, David, 3,891,248.
  - Revell, Alan E., 3,891,253.
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  - Genta, Guido R., 3,891,691.
- American Can Company: *See—*
  - Schane, Alvin Mansfield, 3,891,116.
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  - Breuer, Charles Benedict, 3,891,507.
- American Flange & Manufacturing Co., Inc.: *See—*
  - Laurizio, Jeremiah J., 3,891,118.
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  - Sellstedt, John H.; and Wolf, Milton, 3,891,643.
  - Teller, Daniel M.; Guinosso, Charles J.; Bell, Stanley C.; and Douglas, George H., 3,891,665
- American Standard, Inc.: *See—*
  - Ishman, Neal H.; Lenert, Richard W.; and Goldman, Jeffrey B., 3,891,926.

- Ameron, Inc.: *See—*
  - Bordner, Dalton W.; and Kline, Harlan H., 3,891,489.
- Ames Rubber Corporation: *See—*
  - Lawson, Richard, 3,891,739.
- Amor, William H., Jr.; and Stancliff, Robert E., to Picker Corporation. Mount for ceiling supported X-ray tube. 3,891,856, Cl. 250-523.000.
- AMP Incorporated: *See—*
  - Ahmed, Abbas Mesbahuddin, 3,891,883.
  - Bakermans, Johannes Cornelis Wilhelmus, 3,891,012.
  - Folk, Kenneth Foster; Ross, Milton Dean; and Shatto, Walter Clifton, Jr., 3,891,013.
  - House, William James, 3,891,075.
  - Lawson, Gustaf Rudolph; and Stuart, John H., 3,890,858.
  - Swengel, Robert Charles, Sr.; and Crumley, J. A., 3,891,789.
- Amrein, David: *See—*
  - Kannapell, David H.; Schupp, Philipp P.; and Amrein, David, 3,891,248.
- Anderson, Bruce W., to Bendix Corporation, The. Keyway drive for multiple disc brake. 3,891,066, Cl. 188-73.200.
- Anderson Company, The: *See—*
  - Mason, John A., 3,890,667.
- Anderson, Matthew E.; and Redmond, Stephen L., to United States of America, Navy. Digital electronic safety and arming system. 3,890,901, Cl. 102-70.20R.
- Anderson, Paul L., to Sandoz, Inc. Terephenylyl-butadienols. 3,891,716, Cl. 260-618.00R.
- Anderson, William J. Closet rod. 3,891,091, Cl. 211-105.300.
- Ando, Noriaki: *See—*
  - Yaeda, Yasuyuki; Chikatsu, Yoshishige; Ando, Noriaki; and Sakata, Ryuichi, 3,891,724.
- Ando, Noriyoshi: *See—*
  - Oishi, Kazuo; Ando, Noriyoshi; and Yoshida, Hiroshi, 3,890,938.
- Anglada, Norberto Puig. Knitting machines. 3,890,804, Cl. 66-50.00R.
- Angruner, Herbert, to Bunzl and Biach Aktiengesellschaft. Method of laying webs of composite material containing plant seed. 3,890,910, Cl. 111-1.000.
- Angus, John H., to Westinghouse Electric Corporation. Overhead traveling crane with a telescopic hoist drive. 3,891,094, Cl. 212-20.000.
- Anthony, David W.: *See—*
  - Caputo, Arnold P.; Anthony, David W.; and Pickett, William H., 3,890,751.
- Apparatebau Rothemuhle Brandt & Kritzler: *See—*
  - Schluter, Siegfried Hans-Dietmar; and Kraft, Erich, 3,891,030.
- Arai, Atsuaki; and Oishi, Yasushi, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive materials. 3,891,445, Cl. 96-100.000.
- Araki, Mikio: *See—*
  - Shoda, Hiroshi; and Araki, Mikio, 3,891,835.
- Ardezzone, Frank J.; and Englert, Thomas A., to Probe Rite, Inc. Adjustable multi-point probe head assembly. 3,891,924, Cl. 324-158.00P.
- Areschka, Alex: *See—*
  - Descamps, Marcell; and Areschka, Alex, 3,891,648.
- Argenio, Domenic. Water dilutable transfer ink compositions. 3,891,581, Cl. 260-16.000.
- Aries, Robert. Stabilized slow release DDUP composition. 3,891,759, Cl. 424-219.000.
- Armco Steel Corporation: *See—*
  - Burwick, Edward R., 3,891,518.
  - Christ, Frederick C., 3,891,356.
- Arnold, Raymond Mills; and Stubbings, Alec Walter George. Transfer materials. 3,891,242, Cl. 283-6.000.
- Arnold, Richard H.: *See—*
  - Meador, Richard A.; Arnold, Richard H.; and Paap, Hans J., 3,891,916.
- Arthur, Jett C., Jr.; and Bains, Malkait S., to United States of America, Agriculture. Carbohydrate-boron alkoxide compounds. 3,891,621, Cl. 260-210.00R.
- Artisan Industries Inc.: *See—*
  - Baird, James L., 3,891,495.
- Asahi Broadcasting Corporation: *See—*
  - Kimura, Hisao, 3,891,792.
- Asai, Osamu: *See—*
  - Hanazono, Masanobu; Asai, Osamu; and Kawakami, Kanji, 3,891,995.
- Aschermann, Wilfried: *See—*
  - Bockelmann, Paul; and Aschermann, Wilfried, 3,891,937.
- Ashworth, Denis Henry, to Simon Engineering Dudley Limited. Hydraulically elevatable platforms. 3,891,056, Cl. 182-148.000.
- Aspelin, Gary Bertil; Caffrey, Richard Francis; and Lauer, William, to Johnson & Johnson. Anti-fog surgical face mask with slits. 3,890,966, Cl. 128-146.200.
- Athenes, Claude: *See—*
  - Charransol, Pierre; Hauri, Jacques; and Athenes, Claude, 3,891,807.
- Athlone Industries, Inc.: *See—*
  - Simon, Jack, 3,890,679.
- Atkinson, James L., to Rockwell International Corporation. Electrostatic bearing sensing and control circuitry. 3,891,285, Cl. 308-10.000.
- Atlantic Richfield Company: *See—*
  - Rosenthal, Rudolph; and Kieras, Joseph A., 3,891,748.
- Atlas Copco Aktiebolag: *See—*
  - Lagerstrom, Gunnar, 3,891,039.
- Atwal, Manmohan Singh: *See—*
  - Diassi; Patrick Andrew; and Atwal, Manmohan Singh, 3,891,629.
- Atzinger, Wolfgang, to Fritz Schwarzer GmbH. Pivoted armature instrument for an electromagnetic recording system. 3,891,922, Cl. 324-151.00R.
- Auborn, James J., to GTE Laboratories Incorporated. Electrochemical cell. 3,891,457, Cl. 136-6.0LN.
- Auer, Robert Thomas; Campbell, Laurie Jay; Lohr, Raymond J.; and Smith, James, to Marx Toys Division of The Quaker Oats Company. Toy vehicle for transporting at least the vehicle operator. 3,891,234, Cl. 280-211.000.
- Auer, Siegfried O.: *See—*
  - United States of America, National Aeronautics and Space Administration; and Auer, Siegfried O., 3,891,851.
- Augat, Inc.: *See—*
  - Damon, Neil F., 3,891,898.
- August Bilstein, Firma: *See—*
  - Willich, Jean Herbert; and Pfeil, Christian, 3,891,199.
- Auker, Byron H.: *See—*
  - United States of America, National Aeronautics and Space Administration; Levin, Herman; Auker, Byron H.; and Gardos, Michael N., 3,891,452.
- Auriat, Edouard; and Gaudard, Yves, to Rhone-Poulenc-Textile. Reinforced dike. 3,890,802, Cl. 61-30.000.
- Austral-Erwin Engineering Co.: *See—*
  - Erwin, Ransome W., 3,891,496.
- Automation General: *See—*
  - Gallant, Terry B., 3,891,900.
- Automobiles Peugeot: *See—*
  - Haurat, Edouard; and Bouclet, Roland, 3,890,723.
  - Pruvot, Francois C., 3,891,283.
- Automotive Products Co., Ltd.: *See—*
  - Bainbridge, Wilfred Nicholas; and Parsons, David, 3,891,241.
- Auxier, Thomas A., to General Electric Company. Turbine blade with increased film cooling. 3,891,348, Cl. 416-97.000.
- Avalon Industries, Inc.: *See—*
  - Berman, Morton, 3,891,179.
- Avery, Carl Frederick, to Marion Health & Safety, Inc. Unit for dispensing liquid from a frangible ampoule. 3,891,331, Cl. 401-132.000.
- Axelsson, Lars Bengt, to Svenska Aktiebolaget Bromsregulator. Clearance-sensing slack adjuster for a vehicle brake-actuating pneumatic cylinder-piston unit. 3,891,067, Cl. 188-196.00D.
- Aylard, William F.: *See—*
  - Winter, Richard M.; and Aylard, William F., 3,891,952.
- Ayres, Waldemar A., to Becton, Dickinson and Company. Centrifuge. 3,891,140, Cl. 233-26.000.
- Ayres, Waldemar A., to Becton, Dickinson and Company. Serum and plasma separator — constrictionless type. 3,891,553,. Cl. 210-136.000.
- Babson, Edward S.; Brennan, John W.; Gorini, Robert F.; and Mason, Ronald C., to USM Corporation. Automatic hemming machine. 3,890,911, Cl. 112-121.120.
- Bachor, Jurgen: *See—*
  - Sewing, Gerhard; and Bachor, Jurgen, 3,890,670.
- Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
  - Danneil, Axel; Flickinger, Erich; Graefje, Heinz; Plass, Reinhold; and Schnur, Rudolf, 3,891,511.
- Bain, Brian MacDonald: *See—*
  - Phillipps, Gordon Hanley; Bain, Brian MacDonald; and Durrant, Graham, 3,891,631.
- Bainbridge, Wilfred Nicholas; and Parsons, David, to Automotive Products Co., Ltd. Vehicle suspension systems. 3,891,241, Cl. 280-124.00F.
- Bains, Malkait S.: *See—*
  - Arthur, Jett C., Jr.; and Bains, Malkait S., 3,891,621.
- Baird, James L., to Artisan Industries Inc. Method and apparatus for recovering powders from liquids. 3,891,495, Cl. 159-6.0WH.
- Baker, Richard J.; Miller, Timothy A.; Erlinger, Gary K.; Loepiktie, Stephanus F.; and Hanselman, Larry R., to Ralston Purina Company. Soft textured dry protein product and method for forming same. 3,891,774, Cl. 426-104.000.
- Bakermans, Johannes Cornelis Wilhelmus, to AMP Incorporated. Apparatus for applying ties to bundles. 3,891,012, Cl. 140-93.00A.
- Ballast-Nedam Group N.V.: *See—*
  - De Koning, Jan; and Van Der Veen, Romke, 3,890,791.
- Balm Paints Limited: *See—*
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- Balzer, Russell R.: *See—*
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- Banbury Buildings Holdings Limited: *See—*
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- Bar-On, Ari, to Xerox Corporation. Sheet stripping apparatus. 3,891,206, Cl. 271-174.000.
- Bar Productions (Bromsgrove) Limited: *See—*
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- Barco International Corporation of Texas: *See—*
  - Paranto, Archie V., 3,891,122.
- Barenyi, Bela, to Daimler-Benz Aktiengesellschaft. Bumper for motor vehicles. 3,891,258, Cl. 293-98.000.
- Barenyi, Bela: *See—*
  - Wilfert, Karl; Barenyi, Bela; and Renner, Hermann, 3,891,266.
- Barker, June N.: *See—*
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- Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
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- Barnas, Eugene F.: *See—*
  - Richter, Sidney B.; and Barnas, Eugene F., 3,891,687.
- Barnes, Derek Leonard. Tables for playing games. 3,891,074, Cl. 194-1.00R.
- Barnett, Richard E.: *See—*
  - Woodrum, Guy Thomas; and Barnett, Richard E., 3,891,708.
- Barney, Kay H.; and Lester, John M., to Sperry Rand Corporation. Radar confusion countermeasure system. 3,891,989, Cl. 343-18.00E.
- Barozzi, Gian Piero; and Horeschi, Giancarlo, to Citizen Watch Company Limited. Device for calculating machines wherein the platen is tapped against the types, to allow for an uniform impression thereof. 3,891,142, Cl. 235-58.00P.
- Barquero, Joaquin Gomez. Combined system of optical devices for photography and stereoscopic vision. 3,891,303, Cl. 350-132.000.
- Barr, Thomas A., Jr.: *See—*
  - Roberts, Thomas G.; Barr, Thomas A., Jr.; and Rust, Charles M., 3,891,941.
- Barraclough, Ronald: *See—*
  - Langley, Robert; and Barraclough, Ronald, 3,891,455.
- Barraco, Anthony J. Ionization gauge. 3,891,882, Cl. 313-7.000.
- Barron, Morton A.: *See—*
  - Ryan, Maurice A.; and Barron, Morton A., 3,891,323.
- Barry, David Edward; and Steigmann, Peter Edward, to English Electric Valve Company Limited. Semiconductor devices. 3,891,887, Cl. 315-3.000.
- Bartelink, Everhard H. B., to Northeast Electronics Corporation. Apparatus and method for augmenting a telephone network. 3,891,802, Cl. 179-2.00A.
- Bartholomaus, Reiner; Bernd, Hubert; and Liedhegener, Friedel, to G. L. Rexroth GmbH. Hydraulic tracking valve for templates in machine tools or the like. 3,891,145, Cl. 137-625.600.
- Bartos, Jon L.: *See—*
  - Allen, Robert E.; Bartos, Jon L.; and Aldred, Peter, 3,890,816.
- BASF Aktiengesellschaft: *See—*
  - Heil, Eduard; Kuchner, Karl; Sliwka, Wolfgang; and Smits, Harald, 3,891,603.
  - Petersen, Harro; Erhard, Paulus; Queins, Hubertus; and Schoeppl, Hubert, 3,891,608.
- BASF Wyandotte Corporation: *See—*
  - Cenker, Moses; and Narayan, Thirumurti L., 3,891,579.
  - Kan, Peter T.; and Cenker, Moses, 3,891,578.
- Bassani, Giancarlo, to Decio Maraglio. Set of interconnectable pressure elements for making construction models. 3,890,738, Cl. 46-16.000.
- Battaerd, Hendrik Adrian Jacobus; Bolto, Brian Alfred; and Shah, Pir Ghulam Samadani, to ICI Australia Limited; and Commonwealth Scientific and Industrial Research Organization. Process. 3,891,576, Cl. 260-2.10R.
- Battelle Development Corporation: *See—*
  - Russell, James T., 3,891,794.
- Bauer, Friedrich, to Metabowerke KG Closs, Rauch, & Schnitzler. Compass saw. 3,890,708, Cl. 30-393.000.
- Bauer, Kurt; Findeiss, Helmut; and Krempel, Alfred, to Haarmann & Reimer GmbH. Process for the extraction of hops. 3,891,781, Cl. 426-429.000.
- Baum, John W., to Zoecon Corporation. Phenoxy containing branched chain alkyl sulfides. 3,891,714, Cl. 260-609.00F.
- Baxter Laboratories, Inc.: *See—*
  - Fischel, Halbert, 3,890,969.
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  - Leonard, Ronald J.; and Takagishi, Jonathan Wayne, 3,891,416.
- Bayer Aktiengesellschaft: *See—*
  - Kuhn, Rainer; and Schon, Nikolaus, 3,891,607.
  - Lorenz, Walter; and Hammann, Ingeborg, 3,891,642.
  - Neeff, Rutger, 3,891,388.
  - Rudolph, Hans; Heine, Hans-Georg; Fuhr, Karl; and Schnell, Hermann, 3,891,524.
  - Runte, Helmut; and Schwartz, Peter, 3,890,685.
  - Schirmer, Hermann; Peilstocker, Gunter; and Schuster, Herbert, 3,891,719.
  - Sommer, Richard; Wiesel, Manfred; Otten, Hans-Gunter; and Siegel, Edgar, 3,891,619.
  - Wolf, Gerhard Dieter; Bentz, Francis; and Nischk, Gunther, 3,891,718.
- Bazell, Seymour; Ostensen, Ralph G.; and Goldberg, Edward M., to Medical Products Corporation. Catheter tip assembly. 3,890,976, Cl. 128-351.000.
- BBC Brown Boveri & Company: *See—*
  - Britsch, Helmut, 3,891,880.
- Beal, Robert Eugene. Protective device for use by player of a hardball game, particularly baseball. 3,890,648, Cl. 2-20.000.
- Beall, Glenn Lee: *See—*
  - Standley, Wendell Evert; and Beall, Glenn Lee, 3,890,972.
- Bearden, Richard D., Jr. Portable rescue device. 3,891,187, Cl. 254-93.00R.
- Beatrice Foods Company: *See—*
  - Dian, Walter, 3,890,847.
- Beavers, Dorothy Johnson, to Eastman Kodak Company. Lithographic materials containing metal complexes. 3,891,442, Cl. 96-76.00R.
- Bebinger, Jack E., to White-Westinghouse Corporation. Low pressure liquid dispensing valve. 3,891,180, Cl. 251-120.000.
- Becker, Alan M.; Epstein, Joseph A.; Lupin, Michael S.; and Zolotov, Shaul, to Dead Sea Works Ltd. Process for the separate recovery of potassium chloride and sodium chloride from a solid mixture thereof. 3,891,544, Cl. 209-166.000.
- Beckmann, Georg; and Gilli, Paul Viktor, to Waagner-Biro Aktiengesellschaft. Thermal power plants. 3,890,789, Cl. 60-659.000.
- Becton, Dickinson and Company: *See—*
  - Ayres, Waldemar A., 3,891,140.
  - Ayres, Waldemar A., 3,891,553.
- Beesch, Otto, to Robert Bosch G.m.b.H. Electrochemical oxygen sensor, especially for motor exhaust gas analysis. 3,891,529, Cl. 204-195.00S.
- Beeston, John Wilmot; Bryant, Greyham Frank; and Spooner, Peter David, to Gec-Elliott Automation Limited. Methods of rolling strip materials, and strip materials rolled thereby. 3,890,817, Cl. 72-6.000.
- Bell & Howell Company: *See—*
  - Hideo, Hirokawa; and Yoshiaki, Mizuki, 3,891,310.
- Bell, Stanley C.: *See—*
  - Teller, Daniel M.; Guinosso, Charles J.; Bell, Stanley C.; and Douglas, George H., 3,891,665.
- Bell Telephone Laboratories, Incorporated: *See—*
  - Hachenburg, Victor, 3,891,804.
  - Melhose, Alfred E., 3,891,799.
- Bellan, Alfred; and Deneke, Klaus, to Dynamit Nobel AG. Process for producing basic aluminum chlorides. 3,891,745, Cl. 423-462.000.
- Bellanger, Maurice Georges: *See—*
  - Daguet, Jacques Lucien; Bellanger, Maurice Georges; and Lepagnol, Guy Pierre, 3,891,803.
- Belleau, Claude: *See—*
  - Allardyce, Gordon E.; Amedee, Roy; and Belleau, Claude, 3,891,784.
- Bellin, Jack L. S.: *See—*
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- Belling & Lee Limited: *See—*
  - Blight, Dennis Jack; Miller, David Frederick; and Morgan, John Trevor, 3,891,292.
- Belmonte, Jean-Claude: *See—*
  - Nougaret, Marcel; and Belmonte, Jean-Claude, 3,891,931.
- Belmuth, Harold; and Leto, Alfred R. Apparatus for molding a brassiere cup shape. 3,891,378, Cl. 425-398.000.
- Beloit Corporation: *See—*
  - Daane, Robert A.; and Han, Shu Tang, 3,891,497.
  - Justus, Edgar J., 3,891,157.
- Bender, Hans: *See—*
  - Wolz, Werner; Bender, Hans; and Schmitt, Manfred, 3,890,992.
- Bendix Corporation, The: *See—*
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- Benedict, Lee: *See—*
  - Leo, Jack D.; and Benedict, Lee, 3,891,239.
- Beneking, Heinz, to Licentia-Patent-Verwaltungs-G.m.b.H. Semiconductor arrangement for the detection of light beams or other suitable electro-magnetic radiation. 3,891,993, Cl. 357-19.000.
- Bennett, David B.; and Harman, Charles P., to Honeywell, Inc. Variable frequency pulse train generator. 3,891,939, Cl. 331-1.00A.
- Bennett, John P.; Bliss, George D.; and New, Michael, to Syntex (U.S.A.) Inc. Aquarium filter with replaceable cartridge. 3,891,555, Cl. 210-169.000.
- Benninger, Siegfried; and Rebsdat, Siegfried, to Hoechst Aktiengesellschaft. Tertiary perfluoro-amino ethers. 3,891,625, Cl. 260-239.00A.
- Bentz, Francis: *See—*
  - Wolf, Gerhard Dieter; Bentz, Francis; and Nischk, Gunther, 3,891,718.
- Berkhout, Frans: *See—*
  - Boonstra, Douwe Johannes; and Berkhout, Frans, 3,891,624.
- Berlin, Alfred Anisimovich; Liogonky, Boris Izrailevich; and Zapadinsky, Boris Isaakovich. Method of producing dianhydrides of aromatic tetracarboxylic acids. 3,891,633, Cl. 260-240.00G.
- Berman, Herbert M.; and Hooper, Ira, to Composite Construction Systems, Inc. Construction system. 3,890,750, Cl. 52-127.000.
- Berman, Morton, to Avalon Industries, Inc. Hobby casting mold. 3,891,179, Cl. 249-134.000.
- Bernd, Hubert: *See—*
  - Bartholomaus, Reiner; Bernd, Hubert; and Liedhegener, Friedel, 3,891,145.
- Bernt, Erich: *See—*
  - Stary, Emil; Roeschlau, Peter; and Bernt, Erich, 3,891,573.
- Berry, Ronald: *See—*
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- Berthagen, Nils Ture Lennart. Frictionally adjustable hinge assembly with nonrotatable hinge pin bedring sleeve. 3,890,672, Cl. 16-141.000.
- Besel, Roland Leroy: *See—*
  - Shearon, Michael Hillas; and Besel, Roland Leroy, 3,891,158.
- Bestenreiner, Friedrich: *See—*
  - Deml, Reinhold; Greis, Ulrich; Bestenreiner, Friedrich; and Helmberger, Josef, 3,891,975.
- Betts, Clifton R. Antitheft alarm system for automobiles. 3,891,967, Cl. 340-63.000.
- Betts, Peter Alan; and Stephenson, Kenneth. Method of maintaining a column of liquid within an open-ended tube, and a tube device for carrying out the method. 3,891,392, Cl. 23-230.00R.
- Betzler, Mark H.: *See—*
  - Mills, Justin W., Jr.; and Betzler, Mark H., 3,891,195.

Bible, Kenneth G. Furniture upholstery spring securing bracket. 3,891,198, Cl. 267-110.000.
Bichsel, Heinz F.; Furrer, Peter; and Maier, Jorg, to Swiss Aluminium Ltd. Induction-type reaction rails for high speed trains. 3,891,433, Cl. 75-147.000.
Birchall, James Derek, to Imperial Chemical Industries Limited. Friction material. 3,891,595, Cl. 260-38.000.
Bird, Paul G.: *See—*
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Bison-werke Bahre and Greten GmbH and Co. KG: *See—*
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Black, James Whyte; and Durant, Graham John, to SmithKline & French Laboratories Ltd. Method of inhibiting histamine activity with amidine derivatives. 3,891,764, Cl. 424-273,000.
Blackburn, Donald. Automatic fluid dispensing system. 3,891,123, Cl. 222-64.000.
Blackburn, Jack. Methods of producing grass carpets. 3,890,739, Cl. 47-56.000.
Blackburn, James R. Fairing for attachment to the handlebars of a bicycle. 3,891,265, Cl. 296-78.100.
Blaise, Rolland Robert, to Societe Anonyme pour l'Industrie Chimique. Compounds derived from tetrahydro-isoquinoline and gamma-benzopyrone. 3,891,651, Cl. 260-287.00R.
Blankenship, Ernest Bayne, to Research Products/Incinolet Corporation. Incinerator toilet having a vertically movable incinerator chamber lid. 3,890,653, Cl. 4-131.000.
Blankenship, Ernest Bayne, to Research Products/Incinolet Corporation. Incinerator toilet vented by air ejector. 3,890,654, Cl. 4-131.000.
Blau K. G. Fabrik Fuer Kraftfahrzeugteile: *See—*
Gerdes, Theo, 3,891,114.
Blazek, George A., to Advance Value Installations Inc. Pipeline apparatus. 3,891,146, Cl. 138-94.300.
Blight, Dennis Jack; Miller, David Frederick; and Morgan, John Trevor, to Belling & Lee Limited. Electrical component. 3,891,292, Cl. 339-36.000.
Bliss, George D.: *See—*
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Block, Michael J.; and Young, Donald C., to Union Oil Company of California. Free-flowing sulfur product. 3,891,743, Cl. 423-267.000.
Bloom Engineering Company, Inc.: *See—*
Hovis, James E.; Johns, James E.; and Finke, Harry P., 3,891,384.
Blount, Bobby J. Vehicle loading and storage system for wheeled containers. 3,891,102, Cl. 214-75.00T.
Bloxwich Lock and Stamping Company Limited, The: *See—*
Lycett, Peter; and Kempson, Kenneth William, 3,891,112.
Bobier, Wilfred S. Fluid device having plastic housing and means for mounting a cylinder barrel. 3,890,882, Cl. 91-487.000.
Bochumer Eisenhutte Heintzmann & Co.: *See—*
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Bock, Ronald E.: *See—*
Farfaglia, Silvio T.; Coburn, Leslie O.; Halpin, Robert G.; and Bock, Ronald E., 3,890,765.
Bockelmann, Paul; and Aschermann, Wilfried, to U.S. Philips Corporation. Circuit arrangement for electronic gain/control, in particular electronic volume control circuit. 3,891,937, Cl. 330-29.000.
Bodor, Nicolae S.; and Kaminski, James J., to INTERx Research Corporation. 1,4-Dichloro-2,2,5,5-tetrasubstituted-3,6-piperazinediones. 3,891,649, Cl. 260-268.0DK.
Bodor, Nicolae S.; Sloan, Kenneth B.; and Hussain, Anwar A., to Interx Research Corporation. Novel, transient pro-drug forms of l-dopa. 3,891,696, Cl. 260-479.00R.
Boehm, Edward. Haying feeder. 3,890,933, Cl. 119-60.000.
Boehringer Mannheim GmbH: *See—*
Stary, Emil; Roeschlau, Peter; and Bernt, Erich, 3,891,573.
Boger, Leon H. Toothbrush. 3,891,085, Cl. 206-229.000.
Bohringer, Walter, to RCA Corporation. Start-up control circuit for SCR deflection. 3,891,892, Cl. 315-411.000.
Bolin, Robert A.: *See—*
Hirvela, Robert J.; and Bolin, Robert A., 3,891,971.
Bolkow Gesellschaft mit beschrankter Haftung: *See—*
Hermann, Joachim, 3,891,161.
Bollen, Romain Henri; and Van Esch, Robert Florent, to Agfa-Gevaert, N.V. Neutron detection and radiography. 3,891,852, Cl. 250-391.000.
Bolli, Hans. Paving stone unit having integral connecting webs. 3,891,340, Cl. 404-38.000.
Bollig, Georg; Grothe, Horst; Knell, Bernhard; Thalmann, Armin; and Zeller, Josef, to Schloemann-Siemag Aktiengesellschaft; and Concast AG. Apparatus for withdrawing a casting and feeding a dummy bar in a continuous casting machine for steel. 3,891,025, Cl. 164-154.000.
Bolto, Brian Alfred: *See—*
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Bolton, Frank Edmund, to Banbury Buildings Holdings Limited. Securing glazing rails together. 3,890,752, Cl. 52-495.000.
Bonne, Ulrich, to Honeywell, Inc. Reflective alterable state material display. 3,891,309, Cl. 350-160.00R.
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Bontempi, Ignatius; and Giemisch, Peter, to De Francisci Machine Corporation. Pre-mixer for alimentary paste. 3,891,192, Cl. 259-110.000.
Booe, James M.; and Landry, Lawrence A., to P. R. Mallory & Co. Inc. Capacitors with sprayed electrode terminals. 3,891,901, Cl. 317-258.000.
Boone, George R. Fluid flow measuring system using improved temperature compensation apparatus and method. 3,891,391, Cl. 73-204.000.
Boonstra, Douwe Johannes; and Berkhout, Frans, to Scholten-Honig Research N.V. Preparation of redispersible hydrophobic starch derivatives. 3,891,624, Cl. 260-233.30R.
Boots, Vernie A., to A. Duda & Sons, Inc. Device for aligning, cutting and covering seed cane. 3,890,909, Cl. 111-1.000.
Borden, Inc.: *See—*
Snow, Harold F., 3,890,676.
Bordner, Dalton W.; and Kline, Harlan H., to Ameron, Inc. Pressure cure method of making resin pipe. 3,891,489, Cl. 156-171.000.
Borg-Warner Corporation: *See—*
Silberschlag, Russell E., 3,890,884.
Tuzson, John J., 3,891,071.
Zimmer, George A; Allaben, Charles M., Jr.; and Weidman, William K., 3,891,286.
Borsotti, Giampietro: *See—*
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Boscacci, William L.: *See—*
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Bosch, Paul, to Robert Bosch G.m.b.H. Regulating system for pumps. 3,891,354, Cl. 417-216.000.
Bosch, Paul: *See—*
Rometsch, Werner; Robeller, Walter; Lutz, Gerhard; Reichel, Eckehart; Bosch, Paul; and Vohringer, Gerd, 3,890,883.
Botnick, Irlin H. Shutoff valve with cleanout filter. 3,891,001, Cl. 137-549.000.
Bouchard, Michel. Anchoring device for securing and positioning equipment. 3,890,758, Cl. 52-713.000.
Bouclet, Roland: *See—*
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Bourgeois, Norbert Paul, to Etudes et Bonneterie S.A. Needle selection device for a circular knitting machine. 3,890,805, Cl. 66-50.00R.
Bouy, Pierre; Masure, Daniel; Collon, Paul; Pigeaud, Jean-Marie; and Sartre, Bernard, to Rhone-Progil. Electrolytic diaphragm cells including current connection means between the cell base and anode. 3,891,531, Cl. 204-263.000.
Bowser, George C.; Moser, James R., deceased; and Moser, Patricia Karen, administratrix, to Catalyst Research Corporation. Thermal battery and molten metal anode therefore. 3,891,460, Cl. 136-83.00T.
Boyer, Robert Allan, to Ralston Purina Company. Method of making protein food products resembling cheese. 3,891,777, Cl. 426-573.000.
Boyer, Robert Allan, to Ralston Purina Company. Method of making protein food products resembling cheese. 3,891,778, Cl. 426-573.000.
Bozhko, Viktor Vasilievich: *See—*
Kononenko, Vadim Grigorievich; Strizhenko, Vitaly Evgenievich; Maznichenko, Stanislav Anisimovich; Sarancha, Vladimir Nikolaevich; Stelmakh, Viktor Alexeevich; Komnatny, Igor Pavlovich; Schekochikhin, Serafim Vasilievich; Bozhko, Viktor Vasilievich; Ponomarenko, Nikolai Borisovich; Danilenko, Valeria Mikhailovna; and Yatsenko, Sergei Vasilievich, 3,891,880.
BP Chemicals (U.K.) Limited: *See—*
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Brady, Robert T.: *See—*
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Brady, Stephen F.: *See—*
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Braga, Albert T.; Brenner, Robert A.; and Odle, Ralph S., Jr., to Whirlpool Corporation. Broken belt power-disconnect system for dryers. 3,890,719, Cl. 34-55.000.
Braga, Alfred M.: *See—*
Surrette, Richard H.; and Braga, Alfred M., 3,891,092.
Brandenstein, Manfred: *See—*
Ernst, Horst; Brandenstein, Manfred; and Olschewski, Armin, 3,891,284.
Brandt, Hans-Werner: *See—*
Glaser, Hans-Joachim; and Brandt, Hans-Werner, 3,891,536.
Braun, Gerald W. Control arrangement for a hydraulically powered vehicle. 3,891,042, Cl. 180-6.480.
Braun, Otto P.: *See—*
Braun, Otto Paul; and Oehler, Horst, 3,891,979.
Braun, Otto Paul; and Oehler, Horst, to Braun, Otto P. Road condition monitoring devices. 3,891,979, Cl. 340-234.000.
Brautigam, Hans; Weidenbach, Gunter; and Koepernik, Karl Hermann, to Kali-Chemie Aktiengesellschaft. Catalyst for purifying exhaust gases. 3,891,575, Cl. 252-455.00R.
Braxton, Henry G., Jr.; and Lehikoinen, U. Albert, to Ethyl Corporation. Modified phosphazene flame retardant. 3,891,448, Cl. 106-15.0FP.
Braxton, Henry G., Jr.; Griffing, Margaret E.; and Jolly, James G., to Ethyl Corporation. Modified phosphazene fire retardants. 3,891,449, Cl. 106-15.0FP.
Braytenbah, Andrew S., to Westinghouse Electric Corporation. Steam turbine system with digital computer position control having improved automatic-manual interaction. 3,891,344, Cl. 415-1.000.
Brennan, Edward N. Golf tee carrying and dispensing device. 3,891,130, Cl. 224-5.00C.

Brennan, John W.: *See—*
Babson, Edward S.; Brennan, John W.; Gorini, Robert F.; and Mason, Ronald C., 3,890,911.
Brenner, Robert A.: *See—*
Braga, Albert T.; Brenner, Robert A.; and Odle, Ralph S., Jr., 3,890,719.
Breuer, Charles Benedict, to American Cyanamid Company. Organ function test cards. 3,891,507, Cl. 195-103.50R.
Bricker, Francis G.; Isaacs, Jack L.; and Nobbs, Douglas C., to General Electric Company. Shipping skid. 3,891,170, Cl. 248-119.000.
Bridgeman, Cecil K., to Picker X-Ray Mfg. Limited. X-ray table. 3,891,850, Cl. 250-444.000.
Bridgeport Metal Goods Manufacturing Company, The: *See—*
Vasas, Martin M., 3,891,330.
Bries Engineering Ltd.: *See—*
Cadle, Terence M., 3,891,399.
Bristol-Myers Company: *See—*
Monkovic, Ivo; Saucier, Michel; and Montzka, Thomas Alfred, 3,891,657.
British Gas Corporation: *See—*
Templeman, John Joseph, 3,891,353.
Britsch, Helmut, to BBC Brown Boveri & Company. High voltage winding with protection against glow discharge. 3,891,880, Cl. 310-196.000.
Brixy, Heinz, to Kernforschungsanlage Julich GmbH. Thermal noise measurement system. 3,890,841, Cl. 73-359.000.
Broad, Michael John: *See—*
Moss, Norman; Martin, Barrie James; and Broad, Michael John, 3,890,935.
Broaddus, Charles David; and Robbins, Medford Dwight, to Procter & Gamble Company. Process for preparing r-sultones. 3,891,672, Cl. 260-327.00S.
Broadfoot, John T. Method of replacing piling. 3,890,794, Cl. 61-54.000.
Brodie, Alexander O.: *See—*
Richardson, John L.; Brodie, Alexander O.; and Lewis, Clarke H., 3,891,556.
Broken Hill Proprietary Company Limited, The: *See—*
Roper, Howard Frank, 3,891,079.
Brokke, Mervin E., to Stauffer Chemical Company. N-(3,4,4-trifluorobutene-3)thiazalodine dione. 3,891,662, Cl. 260-306.70R.
Brooking, Ivor Harold: *See—*
Keenan, John Gregory; Chilman, John Alfred; and Brooking, Ivor Harold, 3,891,346.
Brooks, Joseph J.: *See—*
Sievers, Robert E.; and Brooks, Joseph J., 3,891,413.
Brotz, William C., to Rowe International, Inc. Ten button selection system for automatic phonograph. 3,891,970, Cl. 340-162.000.
Brown, Alvin E.: *See—*
Cusick, John H.; Brown, Alvin E.; Hamamoto, Al S.; and Bellin, Jack L. S., 3,890,831.
Brown, Harold. Hydronic heating system. 3,891,817, Cl. 219-10.55R.
Brown, Melancthon S., deceased; and by Kohn, Gustave K., special administrator, to Chevron Research Company. Herbicidal 1-carbonamidothio-3-aryl ureas. 3,891,424, Cl. 71-98.000.
Brown, Robert S.; and Muzzy, Raymond J., to United States of America, Army. Propellant instability modifier. 3,891,482, Cl. 149-7.000.
Brown, Samuel L.: *See—*
Travor, Bruce W.; and Brown, Samuel L., 3,890,902.
Brown, Ted R. Air conditioning process. 3,890,797, Cl. 62-91.000.
Bruel, Alain. Grape-gathering machine. 3,890,774, Cl. 56-330.000.
Bruel, Alain. Beating device for a grape-gathering machine. 3,890,775, Cl. 56-330.000.
Bruget, Bernard C. Pipe smokers' folding combination tool. 3,890,982, Cl. 131-243.000.
Brugge, Walter James; and Takacs, Edward Francis, to Addressograph-Multigraph Corporation. Card gage for data recorder. 3,890,899, Cl. 101-269.000.
Brunel, John R. Folding carrier rack for pick-up trucks. 3,891,262, Cl. 296-3.000.
Brunswick Corporation: *See—*
Harris, Mark, 3,891,917.
Minks, Floyd M., 3,890,948.
Bryant, Greyham Frank: *See—*
Beeston, John Wilmot; Bryant, Greyham Frank; and Spooner, Peter David, 3,890,817.
Buckler, Benjamin: *See—*
Samuelian, Maurice P.; and Buckler, Benjamin, 3,891,171.
Budreau, Alan J.: *See—*
Carr, Paul H.; and Budreau, Alan J., 3,891,929.
Buehler Ltd.: *See—*
Keith, Marvin W., Jr., 3,891,409.
Buelk, Eggert, to Rockwell International Corporation. Controls for aquatic towing craft. 3,890,920, Cl. 115-6.100.
Buildex Incorporated: *See—*
Loikitz, Frank, 3,891,334.
Bunzl and Biach Aktiengesellschaft: *See—*
Angruner, Herbert, 3,890,910.
Burckhardt, Manfred H., to Daimler-Benz Aktiengesellschaft. Installation for filling several pressure reservoirs, especially in motor vehicles. 3,890,996, Cl. 137-119.000.
Burdick, Robert E., to Rolair Systems, Inc. Air bearing transporter having multidirectional drive unit. 3,891,048, Cl. 180-119.000.
Burger, Hans; and Riester, Hans, to Georg Fischer Aktiengesellschaft. Gas filter. 3,891,418, Cl. 55-302.000.
Burgess, Glen W., to Clark Equipment Company. Straddle carrier lifting means. 3,891,107, Cl. 214-392.000.
Burlington Industries, Inc.: *See—*
Reid, James P., Jr.; and McConnell, Bobby L., 3,891,386.
Burmah Oil Trading Limited: *See—*
Field, Peter G. S.; and Lock, David A., 3,891,711.
Burns, William F. Adjustable dental impression tray. 3,890,711, Cl. 32-17.000.
Burris Industries, Incorporated: *See—*
Taylor, William P., 3,891,267.
Burroughs Corporation: *See—*
Ehlers, Randall G., 3,891,839.
Lee, James Y., 3,891,983.
Burton, Henry A. Dog ladder for boats. 3,891,053, Cl. 182-97.000.
Burwick, Edward R., to Armco Steel Corporation. Method of electroplating utilizing zinc dross anodes. 3,891,518, Cl. 204-35.00R.
Buske, Earl R. Tow truck boom and method of constructing same. 3,890,696, Cl. 228-173.000.
Busse, Louis W.: *See—*
Warren, Don R.; and Busse, Louis W., 3,891,509.
Buynak, Robert G.: *See—*
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Byron Jackson Inc.: *See—*
Scott, Lyle B., 3,891,033.
Bysouth, Raymond: *See—*
Robertson, Peter Struan; and Bysouth, Raymond, 3,891,783.
C.G.E.E.-Alsthom: *See—*
Debaigt, Jean, 3,891,295.
C. J. Doris: *See—*
Lamy, Jacques Edouard, 3,890,790.
C. L. Frost & Son, Inc.: *See—*
Frost, Charles C., 3,890,773.
Cadle, Terence M., to Bries Engineering Ltd. Sintered glass containing ferrous material. 3,891,399, Cl. 29-182.500.
Caffrey, Richard Francis: *See—*
Aspelin, Gary Bertil; Caffrey, Richard Francis; and Lauer, William, 3,890,966.
Cahn, Jean: *See—*
Coirre, Paul; Coirre, Bertrand; Denis, Jean-Claude; Rambaud, Jerome; and Cahn, Jean, 3,891,765.
Plat, Michel Marie Rene; Plat, Monique, nee Berry; Cahn, Jean; and Tisseyre, Pierre Georges Christian, 3,891,640.
Calcagno, Kenneth H., to Olin Corporation. Constant depth cutter assembly. 3,891,015, Cl. 144-136.00J.
Calderon, Nissim: *See—*
Scott, Kenneth W.; and Calderon, Nissim, 3,891,816.
Cale, Albert Duncan, Jr.: *See—*
Lunsford, Carl Dalton; and Cale, Albert Duncan, Jr., 3,891,646.
Calgon Corporation: *See—*
Woodrum, Guy Thomas; and Barnett, Richard E., 3,891,708.
Califano, Frank L.; Stepien, George, Jr.; and Russell, Thomas E., to Flintkote Company, The. Product and method for reducing water ions through soil bv seepage. 3,891,586, Cl. 260-28.5AS.
California Institute of Technology: *See—*
Chang, Daniel P. Y.; Friedlander, Sheldon K.; and California Institute of Technology, 3,891,547.
Camco, Incorporated: *See—*
Tausch, Gilbert H.; and Pringle, Ronald E., 3,891,032.
Cameron, Donald Dean: *See—*
Wolfe, Paul Dillon; Saxton, Ronald Luther; and Cameron, Donald Dean, 3,891,609.
Camion, Jean; Campot, Etienne; Conneau, Jean; Contival, Serge; Dejoux, Andre; Detton, Jean; Gournelle, Maurice; and Traimond, Antoine. Implosion jack. 3,890,824, Cl. 72-453.000.
Campbell, Laurie Jay: *See—*
Auer, Robert Thomas; Campbell, Laurie Jay; Lohr, Raymond J.; and Smith, James, 3,891,234.
Camph, Sven Erik. Automatic slack adjuster. 3,891,068, Cl. 188-196.0BA.
Campot, Etienne: *See—*
Camion, Jean; Campot, Etienne; Conneau, Jean; Contival, Serge; Dejoux, Andre; Detton, Jean; Gournelle, Maurice; and Traimond, Antoine, 3,890,824.
Canadian Patents & Development Limited: *See—*
Gregerson, Leslie F.; and Symonds, Gordon R., 3,890,718.
Shen, Kuo-Cheng, 3,891,738.
Cannon, Clifford D.: *See—*
Nadsady, Clarence A.; and Cannon, Clifford D., 3,891,291.
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Ladany, Ivan; and Cannuli, Vincent Michael, 3,891,478.
Canon Kabushiki Kaisha: *See—*
Aizawa, Hiroshi; Ito, Tadashi; Itoh, Fumio; Takahashi, Kiyoshi; and Isobe, Yasuo, 3,891,312.
Ito, Yoshio, 3,891,846.
Katayama, Hajime; Miyamoto, Koichi; and Ohashi, Shoji, 3,890,721.
Capt, Edmond; and Gander, Gerald, to Valjoux S.A. Chronograph watch. 3,890,779, Cl. 58-76.000.
Caputo, Arnold P.; Anthony, David W.; and Pickett, William H., to Plasticrete Corporation. Post hole block. 3,890,751, Cl. 52-166.000.
Carley, Don A.; and Crookshank, Fred T., to Texaco Inc. Process for preparing mixed lithium-calcium soap thickened greases. 3,891,564, Cl. 252-40.000.
Carlin, William W., to PPG Industries, Inc. Opening of molybdenite ores and the electrowinning of rhenium. 3,891,521, Cl. 204-105.00R.

Carlin, William W.; Darlington, William B.; and Dubois, Donald W., to PPG Industries, Inc. Recovery of fission products from acidic waste solutions thereof. 3,891,741, Cl. 423-2.000.

Carlsen, W. John, to GTE Laboratories Incorporated. Hologram memory with sequential data storage and beam angular relationship. 3,891,976, Cl. 340-173.0LM.

Carlson, Richard D.: *See—*
Marciniak, Harry W.; Carlson, Richard D.; and Dever, James L., 3,891,599.
Maul, James J.; and Carlson, Richard D., 3,891,600.

Carlsson, Per Arvid Emil; and Corrodi, Hans Rudolf, to Aktiebolaget Hassle. Treatment of Parkinson's disease. 3,891,768, Cl. 424-309.000.

Carmel, Amichai Meir; and Lundh, Bengt Olov, to Rederiaktiebolaget Nordstjernan. Method and an apparatus for dewatering a suspension. 3,891,549, Cl. 210-66.000.

Carpenter, Roland Paul; Cowie, William Pirie; Heyes, Alan; and Sutton, Anthony Hubert, to Lever Brothers Company. Protein product. 3,891,776, Cl. 426-573.000.

Carr, Paul H.; and Budreau, Alan J., to United States of America, Air Force. Acoustic surface wave frequency synthesizer. 3,891,929, Cl. 328-14.000.

Carrigan, James David, to Vance Industries, Inc. Flame hardener. 3,891,194, Cl. 266-4.00A.

Caspers, Hubert H.: *See—*
Rast, Howard E.; and Caspers, Hubert H., 3,891,559.

Castanedo, Edwin W. Tongue cleaning and massage instrument. 3,890,964, Cl. 128-62.00R.

Castro, Rodolfo: *See—*
Tarbox, John W.; Hinds, Walter E.; and Castro, Rodolfo, 3,890,865.

Catalyst Research Corporation: *See—*
Bowser, George C.; Moser, James R., deceased; and Moser, Patricia Karen, administratrix, 3,891,460.

Cater, Thomas F.: *See—*
Rodgers, Daniel L.; and Cater, Thomas F., 3,891,832.

Caterpillar Tractor Company: *See—*
Girard, William T.; Hamilton, Thomas R.; and Waddell, Bennett N., 3,890,726.
Habiger, Cyril W., 3,890,788.

Catt, John D.; and Matier, William L., to Mead Johnson & Company. Sulfamide process. 3,891,703, Cl. 260-556.00N.

Caubet, Jacques-Jean, to Centre Stephanois de Recherches Mecaniques Hydromecanique et Frottement. Surface coating for ferrous alloy parts. 3,890,686, Cl. 29-196.100.

Cawrse, Richard S. Apparatus for applying lids to containers. 3,890,767, Cl. 53-296.000.

Cefilac: *See—*
de Charsonville, Jacques, 3,890,818.

Celto, John E.: *See—*
Schimitschek, Erhard J.; Trias, John A.; and Celto, John E., 3,891,569.

Cenker, Moses; and Narayan, Thirumurti L., to BASF Wyandotte Corporation. Process for the preparation of isocyanurate foams employing halogenated aliphatic alkanol accelerators. 3,891,579, Cl. 260-2.5AW.

Cenker, Moses: *See—*
Kan, Peter T.; and Cenker, Moses, 3,891,578.

Centre National d'Etudes Spatiales: *See—*
Thomin, Georges, 3,891,953.

Centre Stephanois de Recherches Mecaniques Hydromecanique et Frottement: *See—*
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Centre Stephanois de Recherches Mechaniques Hydromecanique et Frottement: *See—*
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Centro Sperimentale Metallurgico S.p.A.: *See—*
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DeLuca, Bruno, 3,890,819.

Century Industries, Inc.: *See—*
Perry, L. F., Jr., 3,891,193.

Cerroni, Manlio. System for recovering and treating useful elements from waste materials. 3,891,105, Cl. 214-305.000.

Ceskoslovenska akademie Ved No. 3 Narodni: *See—*
Vodnansky, Jiri; and Stoy, Artur, 3,890,683.

Chambers, John Philip: *See—*
Phillips, Geoffrey John; and Chambers, John Philip, 3,891,994.

Chancellor Chair Company: *See—*
Griffin, Vernon Dale, 3,891,259.

Chandler, Roy L., to Red Ant Products, Inc. Apparatus for transporting a bicycle on a vehicle. 3,891,132, Cl. 224-42.03B.

Chang, Daniel P. Y.; Friedlander, Sheldon K.; and California Institute of Technology. Permeable hollow fiber filter. 3,891,547, Cl. 210-23.000.

Chang, David Chi-kung; and McDowell, Maurice James, to du Pont de Nemours, E. I., and Company. Coating compositions. 3,891,591, Cl. 260-29.6WB.

Chao, Kwei C.: *See—*
Ridgway, John A., Jr.; and Chao, Kwei C., 3,891,772.

Charbonnages de France: *See—*
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Charransol, Pierre; Hauri, Jacques; and Athenes, Claude, to International Standard Electric Corporation. Electronic switching module. 3,891,807, Cl. 179-15.0BS.

Chatelon, Andre Edouard Joseph; and Coudray, Andre Lucien, to International Standard Electric Corporation. System for preventing intelligible crosstalk in TDM switching systems. 3,891,806, Cl. 179-15.0AN.

Chauvel, Bernard; and Daniel, Jean-Claude, to Rhone-Progil. Process for producing rubber polymer latices with large particles. 3,891,592, Cl. 260-29.70E.

Chauvin, Raymond, to Charbonnages de France; and Houilleres du Bassin du Nord et du Pasde-Calais. Process for the manufacture of light granulates. 3,891,734, Cl. 264-43.000.

Cheek, Thomas B.; Thornhill, Daniel E.; and Stewart, Ronald B., to Adage, Inc. Computer display terminal. 3,891,982, Cl. 340-324.0AD.

Chemische Fabrik Kalk GmbH: *See—*
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Chernyavsky, Vladimir Pavlovich: *See—*
Shapiro, Aron Beniaminovich; Chernyavsky, Vladimir Pavlovich; Kadi-Ogly, Ibragim Akhmedovich; and Tjurin, Jury Grigorievich, 3,891,877.

Chester, Arthur N., to Hughes Aircraft Company. Large screen color display. 3,891,560, Cl. 250-461.000.

Chevron Research Company: *See—*
Brown, Melancthon S., deceased; and Kohn, Gustave K., special administrator, 3,891,424.
Katsumoto, Kiyoshi; and Lind, Wilton H., 3,891,680.
Walkey, John E., 3,891,538.

Chiba, Akio: *See—*
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Chikatsu, Yoshishige: *See—*
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Chilman, John Alfred: *See—*
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Chollet, Pierre: *See—*
Gervais, Edouard; Levert, Henri; and Chollet, Pierre, 3,891,024.

Choules, Marcel Henry; and Hare, Alan William, to Russell Finex Limited. Vibratory apparatus. 3,891,191, Cl. 259-1.00R.

Christ, Frederick C., to Armco Steel Corporation. Fluid guide plunger system. 3,891,356, Cl. 417-437.000.

Christensen, Bruce A., to Sperry Rand Corporation. Syndrome logic checker for an error correcting code decoder. 3,891,969, Cl. 340-146.1AL.

Christoff, Chris A., to Stevens Corporation. Offset rotary printing press with cable actuated form rollers. 3,890,897, Cl. 101-148.000.

Chrysler Corporation: *See—*
Allardyce, Gordon E.; Amedee, Roy; and Belleau, Claude, 3,891,784.
Latva, Henry F., 3,891,473.
May, Robert F., 3,891,166.

Chu, Simon L., to Polychrome Corporation. Process of electrolyically anodizing a mechanically grained aluminum base and article made thereby. 3,891,516, Cl. 204-33.000.

Ciba-Geigy AG: *See—*
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Ciba-Geigy Corporation: *See—*
Drabek, Jozef; and Varsanyi, Denis, 3,891,728.
Hari, Stefan; and Ronco, Karl, 3,891,685.
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Citizen Watch Company Limited: *See—*
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Urushida, Yoshihisa, 3,890,776.

Civarella, Alfredo: *See—*
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Clark Equipment Company: *See—*
Burgess, Glen W., 3,891,107.
Duttarer, Ralph M.; and Hushower, Richard R., 3,891,003.

Clark, James O., to Westinghouse Electric Corporation. Elevator system. 3,891,064, Cl. 187-29.00R.

Clark, Lowell E., to Motorola, Inc. Field shaping layer for high voltage semiconductors. 3,890,698, Cl. 29-577.000.

Clark, Michael A. Animal commode. 3,890,930, Cl. 119-1.000.

Clark, Thomas F., to Allis-Chalmers Corporation. Compact unit breaker. 3,891,862, Cl. 307-125.000.

Clason, Jan Christiaan, to Hazemeijer B.V. Vacuum circuit interrupter. 3,891,896, Cl. 317-58.000.

Clavin, Edward A., to CRC-Crose International, Inc. Apparatus for driving a device within a pipe. 3,890,905, Cl. 104-138.00G.

Clerc, Michel; and Goujon, Paul, to Commissariata l'Energie Atomique. Method of pumping for a laser and device for carrying out said method. 3,891,942, Cl. 331-94.50G.

Clinical Convenience Products, Inc.: *See—*
Warren, Don R.; and Busse, Louis W., 3,891,509.

Cloke, Robert L., to Information Storage Systems, Inc. Low leakage current integrator. 3,891,840, Cl. 235-183.000.

Clontz, James G. Control assembly for rear view mirror. 3,890,848, Cl. 74-501.00M.

Clugage, Robert G. Compression hold-down elements. 3,891,201, Cl. 269-136.000.

CMI Corporation: *See—*
Allen, Thomas E.; and Smith, Don W., 3,890,783.

Coats & Clark, Inc.: *See—*
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Coats Company, Inc., The: *See—*
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Coburn, Leslie O.: *See—*
Farfaglia, Silvio T.; Coburn, Leslie O.; Halpin, Robert G.; and Bock, Ronald E., 3,890,765.

Codrino, Giuseppe. Device for continuously regulating the intensity of the luminous flow projected towards the radiant energy carriers. 3,891,841, Cl. 240-1.0LP.

Coirre, Bertrand: *See—*
Coirre, Paul; Coirre, Bertrand; Denis, Jean-Claude; Rambaud, Jerome; and Cahn, Jean, 3,891,765.

Coirre, Paul; Coirre, Bertrand; Denis, Jean-Claude; Rambaud, Jerome; and Cahn, Jean, to Franco Chimie S.a.r.l. Anti-inflammatory and analgesic L-hydroxyproline derivatives. 3,891,765, Cl. 424-274.000.

Cola, Giorgio, to Centro Sperimentale Metallurgico S.p.A. Process for manufacturing cores and moulds. 3,891,022, Cl. 164-41.000.

Cole, Ernest R., Jr.; Dressel, Waldemar M.; and Smith, Lawrence L., to United States of America, Interior. Recovery of lead. 3,891,430, Cl. 75-77.000.

Coleman, Bestor P.; and McConnell, Kennedy, to Interlake, Inc. Conveyor stop. 3,891,073, Cl. 193-35.00A.

Coles, Herbert George, Jr., to Data General Corporation. Code recognition apparatus. 3,891,831, Cl. 235-61.11E.

Colgate-Palmolive Company: *See—*
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Collon, Paul: *See—*
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Colorado School of Mines Research Institute: *See—*
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Colpoys, Patrick J., to Union Carbide Corporation. Gravel packing fluid. 3,891,565, Cl. 252-8.55R.

Cominco Ltd.: *See—*
McKay, Donald R.; and Swinkels, Godefridus M., 3,891,522.

Commercial Solvents Corporation: *See—*
Hodge, Edward B.; and Riddick, John A., 3,891,615.

Commissariata l'Energie Atomique: *See—*
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Commonwealth Scientific and Industrial Research Organization: *See—*
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Compactor Company, Inc.: *See—*
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Compagnie Francaise des Petroles: *See—*
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Compagnie Generale d'Automatisme: *See—*
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Compagnie Generale d'Electricite: *See—*
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Compagnie Honeywell Bull (Societe Anonyme): *See—*
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Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
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Filaferro, Rene; and Hebert, Francois, 3,891,927.

Composite Construction Systems, Inc.: *See—*
Berman, Herbert M.; and Hooper, Ira, 3,890,750.

Con-Stan Industries, Inc.: *See—*
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Concast AG: *See—*
Bollig, Georg; Grothe, Horst; Knell, Bernhard; Thalmann, Armin; and Zeller, Josef, 3,891,025.

Condit, Paul, Jr. Oil and debris removal unit. 3,891,558, Cl. 210-526.000.

Conklin, Christine, to Herculite Protective Fabrics Corporation. Electrically conductive sheeting. 3,891,786, Cl. 428-136.000.

Conneau, Jean: *See—*
Camion, Jean; Campot, Etienne; Conneau, Jean; Contival, Serge; Dejoux, Andre; Detton, Jean; Gournelle, Maurice; and Traimond, Antoine, 3,890,824.

Conner, Charles C.; and Price, William R., to Price, William R. Method and apparatus for sensing and controlling motion of a movable member. 3,891,932, Cl. 328-147.000.

Connors, John D.: *See—*
Moore, William C.; Connors, John D.; and Newman, Richard W., 3,890,961.

Consolidated Devices, Inc.: *See—*
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Continental Display Corporation: *See—*
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Cook, William J.; and Ellens, Gordon A., to U.S. Industries, Inc. Housing for combination lap and shoulder belts. 3,891,274, Cl. 297-389.000.

Cooper, Carlos M.; and Gladson, Francis M., Jr. Self container toilet and sewage treatment unit. 3,891,554, Cl. 210-152.000.

Cooper, Julius; and Reinertsen, Tormod K., to Ideal Toy Corporation. Skee-ball apparatus including ball ejection targets. 3,891,213, Cl. 273-95.00D.

Copas, Donald D. Holding frame for cable splicing tools and method for splicing cables. 3,890,689, Cl. 29-203.00C.

Cope, Geoffrey Wilton, to Dresser Industries, Inc. Hand brake automatic release assembly. 3,891,277, Cl. 303-2.000.

Corbett, James Patrick. Rotating piezoelectric transducer mounting. 3,891,870, Cl. 310-8.700.

Corderac'k, Maurice Louis Paul Jean. Mounting assembly for bicycle saddle or the like. 3,891,333, Cl. 403-84.000.

Cordone, Leonard G.; Donakowski, William A.; Morgan, John R.; and Roemming, Karl, to Ford Motor Company. Electroplating system for improving plating distribution of elnisil coatings. 3,891,534, Cl. 204-272.000.

Cordone, Leonard G.; Donakowski, William A.; Morgan, John R.; and Roemming, Karl, to Ford Motor Company. Method for insuring high silicon carbide content in elnisil coatings. 3,891,542, Cl. 204-16.000.

Corrodi, Hans Rudolf: *See—*
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Cothron, Lawson B., to Labann Corporation. Combination latch & dead bolt lock assembly. 3,890,813, Cl. 70-92.000.

Coudray, Andre Lucien: *See—*
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Coulter, Brent W.; and Migdalek, Laurence F., to Honeywell Information Systems Inc. Data processing system having emulation capability for providing wait state simulation function. 3,891,974, Cl. 340-172.500.

Cowie, William Pirie: *See—*
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Cox, Gordon L.; and Williams, Olin E., to Koppers Company, Inc. Method for selective decarburization of alloy steels. 3,891,429, Cl. 75-60.000.

Crancon, Jean-Pierre: *See—*
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CRC-Crose International, Inc.: *See—*
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Cremonese, Henry V. Kitchen knife. 3,890,707, Cl. 30-340.000.

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Crist, Elester M. Voltage amplitude controlled reversing D.C. power circuit. 3,891,906, Cl. 318-257.000.

Crook, James D.: *See—*
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Crook, Monty Frederick: *See—*
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Crookshank, Fred T.: *See—*
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Crossman, Philip Edgar; and Resch, Richard Jerome, to Krueger Metal Products, Inc. Pneumatic stool with foot rest connected to seat base. 3,891,270, Cl. 297-347.000.

Crowe, Curtis W., to Dow Chemical Company, The. Fluid loss additive. 3,891,566, Cl. 252-8.55R.

Crown Recreation, Inc.: *See—*
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Crown Zellerbach Corporation: *See—*
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Crumley, J. A.: *See—*
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Cumberland Corporation: *See—*
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Cunningham, Willis C.; George, Charles R.; and Shryock, Stanley H., to Halliburton Company. Composition and method for cementing wells in low temperature formations. 3,891,454, Cl. 106-89.000.

Curtiss-Wright Corporation: *See—*
Davis, Robert C.; and Pratt, Winthrop B., 3,891,357.
Jones, Charles, 3,891,059.

Cushman, Donald R.; and Schick, John W., to Mobil Oil Corporation. Modified natural gums. 3,891,620, Cl. 260-209.600.

Cusick, John H.; Brown, Alvin E.; Hamamoto, Al S.; and Bellin, Jack L. S., to United States of America, Navy. Ultrasonic bond monitor. 3,890,831, Cl. 73-88.00B.

Cylpik, Incorporated: *See—*
Van Schoyck, Quentin H., 3,890,827.

Daane, Robert A.; and Han, Shu Tang, to Beloit Corporation. Nonaqueous defiberizing process of waste paper in the presence of steam and a liquid nonmiscible in water, e.g., tetrachlorethylene. 3,891,497, Cl. 162-6.000.

Dabby, Franklin Winston; and Kestenbaum, Ami, to Western Electric Company, Inc. Method of filtering modes in optical waveguides. 3,891,302, Cl. 350-96.0WG.

Daguet, Jacques Lucien; Bellanger, Maurice Georges; and Lepagnol, Guy Pierre, to Telecommunications Radioelectriques T.R.T. Single sideband system for digitally processing a given number of channel signals. 3,891,803, Cl. 179-15.0FS.

Dahl, Norman C. Two-part, two-material fastening element. 3,890,876, Cl. 85-62.000.

- Dai-Nippon Suban Manufacturing Co. Ltd.: *See—*
  - Matubayashi, Tadao; Shiono, Taiichi; Hukuda, Yositugu; and Kimura, Toshio, 3,891,503.
- Daicel, Ltd.: *See—*
  - Higuchi, Masaru; and Ohnaka, Kouichi, 3,891,709.
  - Sawada, Hideo; and Kawamoto, Junji, 3,890,983.
- Daimler-Benz Aktiengesellschaft: *See—*
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  - Burckhardt, Manfred H., 3,890,996.
  - Flemming, Helmut, 3,891,232.
  - Lehmann, Adolf, 3,891,252.
  - Vogt, Ulrich, 3,891,287.
  - Wilfert, Karl; Barenyi, Bela; and Renner, Hermann, 3,891,266.
- Dainippon Ink & Chemicals Inc.: *See—*
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  - Matubayashi, Tadao; Shiono, Taiichi; Hukuda, Yositugu; and Kimura, Toshio, 3,891,503.
- Damon, Neil F., to Augat, Inc. Panel board mounting and interconnection system for electronic logic circuitry. 3,891,898, Cl. 317-101.0CC.
- Damon, William H., to Allied Chemical Corporation. Inflator seal. 3,891,233, Cl. 280-150.0AB.
- Dana Corporation: *See—*
  - Sink, William Howard; and Flotow, Richard Allen, 3,891,072.
- Daniel, Jean-Claude: *See—*
  - Chauvel, Bernard; and Daniel, Jean-Claude, 3,891,592.
- Danilenko, Valeria Mikhailovna: *See—*
  - Kononenko, Vadim Grigorievich; Strizhenko, Vitaly Evgenievich; Maznichenko, Stanislav Anisimovich; Sarancha, Vladimir Nikolaevich; Stelmakh, Viktor Alexeevich; Komnatny, Igor Pavlovich; Schekochikhin, Serafim Vasilievich; Bozhko, Viktor Vasilievich; Ponomarenko, Nikolai Borisovich; Danilenko, Valeria Mikhailovna; and Yatsenko, Sergei Vasilievich, 3,891,380.
- Danneil, Axel; Flickinger, Erich; Graefje, Heinz; Plass, Reinhold; and Schnur, Rudolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of very pure butanediol. 3,891,511, Cl. 203-81.000.
- Darlington, William B.: *See—*
  - Carlin, William W.; Darlington, William B.; and Dubois, Donald W., 3,891,741.
- Data General Corporation: *See—*
  - Coles, Herbert George, Jr., 3,891,831.
- Date, Tasuku; and Yagi, Shizuo, to Honda Giken Kogyo Kabushiki Kaisha. Reduction of NO_x, HC, and CO in the exhaust gases of internal combustion engines. 3,890,942, Cl. 123-75.00B.
- Dave, Shashi Bhaishanker, to Johns-Manville Corporation. Trimethylolpropane use of macroreticular polymers of trimethacrylate for making chromatographic separations. 3,891,412, Cl. 55-67.000.
- Davenport, Larry C.: *See—*
  - Ellison, Donald E.; and Davenport, Larry C., 3,891,137.
- Davidson, Morris J.: *See—*
  - Nick, Charles F.; and Davidson, Morris J., 3,890,832.
- Davies, John R., to Oliver Machinery Company. Method and apparatus for inspecting position of labels on product surfaces. 3,891,324, Cl. 356-156.000.
- Davis, Alwyn K.; and St. John, Ward A. Sanitary diaper. 3,890,973, Cl. 128-286.000.
- Davis, Bryan Terence: *See—*
  - Elliott, John Scotchford; Davis, Bryan Terence; and Crook, Monty Frederick, 3,891,726.
- Davis, Dalton M., to E-T Industries, Inc. Spider machining apparatus. 3,891,343, Cl. 408-42.000.
- Davis, Kenneth E., to Hobart Corporation. Analysis of comminuted meat products. 3,890,825, Cl. 73-15.00B.
- Davis, Robert C.; and Pratt, Winthrop B., to Curtiss-Wright Corporation. Rotary mechanism of the type having a planetating rotor. 3,891,357, Cl. 418-61.00A.
- Day, Douglas B.; and Stahl, Welfred A., to United States of America, Air Force. Retrieval assembly. 3,891,165, Cl. 244-137.00R.
- Day, Ian: *See—*
  - Hoggan, Donald; Wright, Ernest Walter; and Day, Ian, 3,890,820.
- Day Star Corporation: *See—*
  - Ernst, G. Fred; and Faulkner, William P.; 3,890,762.
- Dayco Corporation: *See—*
  - Gordon, Daniel J., 3,890,860.
  - Huber, Walter E., 3,891,405.
  - Kleykamp, Donald L., 3,891,007.
- De Francisci Machine Corporation: *See—*
  - Bontempi, Ignatius; and Giemisch, Peter, 3,891,192.
- Dead Sea Works Ltd.: *See—*
  - Becker, Alan M.; Epstein, Joseph A.; Lupin, Michael S.; and Zolotov, Shaul, 3,891,544.
- Dean Foods Company: *See—*
  - Green, Dan E.; and Hanover, L. Mark, 3,891,771.
- Debaigt, Jean, to C.G.E.E.-Alsthom. Fixing device for a support means. 3,891,295, Cl. 339-198.0GA.
- Debost, Jean-Pierre; and de Malartic, Jacques Mezan, to U.S. Philips Corporation. Circuit arrangement for adapting a load network to a transceiver. 3,891,947, Cl. 333-17.000.
- Debray, Werner, to Siemens Aktiengesellschaft. Weld-plating of steel. 3,891,820, Cl. 219-76.000.
- de Charsonville, Jacques, to Cefilac. Process for hot extruding metals. 3,890,818, Cl. 72-42.000.
- Decio Maraglio: *See—*
  - Bassani, Giancarlo, 3,890,738.
- Decker, Hanns; Hurtmanns, Heinz; and Stockmann, Helmut, to Klockner-Humboldt-Deutz, AG. Lubricant feed means for gyratory crushers. 3,891,153, Cl. 241-214.000.
- De Cordova, James: *See—*
  - Shelly, Jacques, 3,891,235.
- De Corso, Serafino M., to Westinghouse Electric Corporation. Graphite-lined inert gas arc heater. 3,891,828, Cl. 219-383.000.
- Dederra, Carl-Helmut: *See—*
  - Schmidt, Gunther; Theiss, Armin; Dederra, Carl-Helmut; and Kaiser, Leonhard, 3,890,781.
- Deere & Company: *See—*
  - Miller, Wayne Russel; and Lucke, Robert James, Jr., 3,890,995.
- Deering Milliken Research Corporation: *See—*
  - Frentress, Zane, 3,891,911.
- Dejoux, Andre: *See—*
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- De Koning, Jan; and Van Der Veen, Romke, to Ballast-Nedam Group N.V. Method of building a tunnel and tunnel built according to said method. 3,890,791, Cl. 61-43.000.
- Delestrade, Andre; and Marce, Roger, to Compagnie Francaise des Petroles; and Compagnie Generale d'Automatisme. Device for measuring the position and speed of a boring tool. 3,891,038, Cl. 175-7.000.
- Delker, Thomas C.: *See—*
  - Snoberger, Robert C.; Delker, Thomas C.; and Reschly, Richard L., 3,891,231.
- De Loye, Martin, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Binary coding device. 3,891,793, Cl. 178-6.000.
- DeLuca, Bruno, to Centro Sperimentale Metallurgico S.p.A. Apparatus for deforming sheet metal blanks by fluid pressure. 3,890,819, Cl. 72-57.000.
- De Lucia, Victor E. Pressurized relay assembly. 3,891,950, Cl. 335-151.000.
- de Malartic, Jacques Mezan: *See—*
  - Debost, Jean-Pierre; and de Malartic, Jacques Mezan, 3,891,947.
- Deml, Reinhold; Greis, Ulrich; Bestenreiner, Friedrich; and Helmberger, Josef, to Agfa-Gevaert Aktiengesellschaft. Method and arrangement for recording the phase distribution of an object wave stored in a hologram. 3,891,975, Cl. 340-173.0LM.
- Demmel, Edward J.; Nace, Donald M.; Owen, Hartley; and Rosinski, Edward J., to Mobil Oil Corporation. Combination operation to maximize fuel oil product of low pour. 3,891,540, Cl. 208-77.000.
- De Montmollin, Rene; and Riat, Henri, to Ciba-Geigy AG. Azodyestuffs containing α,β-dichloropropionylamino or α,β-dibromopropionylamino groups. 3,891,618, Cl. 260-163.000.
- Den-Tal-Ez Mfg. Co.: *See—*
  - Gerlich, Irvin V., 3,890,986.
- Deneke, Klaus: *See—*
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- Denis, Jean-Claude: *See—*
  - Coirre, Paul; Coirre, Bertrand; Denis, Jean-Claude; Rambaud, Jerome; and Cahn, Jean, 3,891,765.
- D'Entremont, Donald J., to W. R. Grace & Co. Multi-layer thermoplastic film and method of making same. 3,891,008, Cl. 138-146.000.
- Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Derivatives of 1H-imidazo(4,5-c)pyridine-7-carboxylic acids and esters. 3,891,660, Cl. 260-295.50B.
- Depew, Chester: *See—*
  - Gaines, Clarence; and Depew, Chester, 3,890,768.
- Deproux, Jacques Roland, to Compagnie Honeywell Bull (Societe Anonyme). Endless type-carrying tape for printing machine. 3,890,895, Cl. 101-111.000.
- Derible, Pierre Henri; and Lavaux, Jean-Paul, to Roussel Uclaf. 10-(Piperidino-alkyl) -phenothiazines. 3,891,636, Cl. 260-243.00A.
- Descamps, Marcell; and Areschka, Alex, to Labaz. 2-[(1,4-Benzodioxan)-2-yl]-acetamidines. 3,891,648, Cl. 260-268.0BC.
- Deseret Pharmaceutical Co., Inc.: *See—*
  - Moorehead, Harvey Robert, 3,890,956.
- Desmarais, Armand J., to Hercules Incorporated. Joint cement compositions utilizing water-insoluble carboxymethylated cellulose derivatives as asbestos substitutes. 3,891,582, Cl. 260-17.00R.
- DeSoto, Inc.: *See—*
  - Sekmakas, Kazys, 3,891,527.
- Destrade, Michel; and Vassort, Jean-Luc, to Thomson-CSF. Microwave filter using hybrid circuit and resonators. 3,891,948, Cl. 333-73.00W.
- Detton, Jean: *See—*
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- Deumens, Johannes J. M.: *See—*
  - Verheijen, Egidius J. M.; Thoma, Jozef A.; and Deumens, Johannes J. M., 3,891,678.
- Deutsche Babcock & Wilcox Aktiengesellschaft: *See—*
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- Dever, James L.: *See—*
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- DeVita, William R., to Structural Foam Products, Inc. Apparatus for molding foamed thermoplastic articles. 3,891,362, Cl. 425-4.00R.
- Di/An Controls, Inc.: *See—*
  - Kodis, Robert D., 3,890,893.
- Diamond, Julius, to William H. Rorer, Inc. Pseudothiuronium compounds. 3,891,704, Cl. 260-564.00E.

- Diamond, Julius; and Douglas, George H., to William H. Rorer, Inc. S-triazines. 3,891,705, Cl. 260-565.000.
- Dian, Walter, to Beatrice Foods Company. Front derailler for bicycles. 3,890,847, Cl. 74-217.00B.
- Diana, Guy D.; and Hinshaw, William B., Jr., to Sterling Drug Inc. Esters of aryl-aliphatic alcohols. 3,891,674, Cl. 260-340.500.
- Diassi, Patrick Andrew; and Atwal, Manmohan Singh, to E. R. Squibb & Sons, Inc. Process for the preparation of 6-(d-2-amino-2(1,4-cyclo-hexadienyl)acetamido) penicillanic acid. 3,891,629, Cl. 260-239.100.
- Diefenbach, Peter C. Tennis racket with interchangable string frame. 3,891,211, Cl. 273-73.00L.
- Diepers, Heinrich; Musebeck, Horst; and Wirkner, Eduard, to Siemens Aktiengesellschaft. Method for the manufacture of a composite wire with an aluminum core and niobium cladding. 3,890,700, Cl. 29-599.000.
- Diepers, Heinrich, to Siemens Aktiengesellschaft. Process for the production of a composite wire having an aluminum core and a niobium cover. 3,890,701, Cl. 29-599.000.
- Diesel, William J.: *See—*
  - Loose, Guenter H.; Diesel, William J.; and Graczyk, Thadeus S., 3,890,892.
- Dietiker, Ernst, to Maschinenfabrik Schweiter AG. Lubricated yarn guide for yarn spooling machine. 3,891,154, Cl. 242-43.000.
- Diggins, Dennis R., to Ramirez, Daniel M. Safety glove for football players. 3,890,649, Cl. 2-161.00A.
- Digmor Equipment & Engineering: *See—*
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- Dimeff, John, to United States of America, General Counsel-Code GP. Tachometer circuit. 3,891,925, Cl. 324-169.000.
- Dinkelbach, Anton: *See—*
  - Weber, Karl-Heinz; and Dinkelbach, Anton, 3,891,861.
- Ditcher, John, to A-Lok Corporation. Joint assembly for vertically aligned sectionalized manhole structures incorporating D-shaped gaskets. 3,891,224, Cl. 277-207.000.
- Dobras, Bruce W., to Monarch Marking Systems, Inc. Coded records, method of making same and method and an apparatus for reading coded records. 3,891,829, Cl. 235-61.11E.
- Dochterman, Richard W., to General Electric Company. Dynamoelectric machine having improved lubrication system. 3,891,878, Cl. 310-90.000.
- Doehling, Theodore W.: *See—*
  - Kratsch, Henry W.; and Doehling, Theodore W., 3,891,134.
- Doldouras, George A.: *See—*
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- Domenico, Penelope B., to Dow Chemical Company, The. Halopyridyl thioalkylthiocyanates. 3,891,659, Cl. 260-294.80F.
- Domig, Rene, to Aktiengesellschaft Gebruder Loepfe. Apparatus for monitoring a thread or the like. 3,890,810, Cl. 66-161.000.
- Donakowski, William A.: *See—*
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  - Cordone, Leonard G.; Donakowski, William A.; Morgan, John R.; and Roemming, Karl, 3,891,542.
- Doolin, John H., to Worthington Pump International, Inc. Supporting foot means for a separately coupled centrifugal pump. 3,891,345, Cl. 415-121.00R.
- Doran, Ronald W.: *See—*
  - Weeks, Lorne E.; and Doran, Ronald W., 3,891,393.
- Doss, Ravindra Nath: *See—*
  - Rao, Hattangady Vasanth; and Doss, Ravindra Nath, 3,891,913.
- Dotzer, Richard; and Plundrich, Winfried, to Siemens Aktiengesellschaft. Chemical recording of flow patterns. 3,890,835, Cl. 73-147.000.
- Douglas, George H.: *See—*
  - Diamond, Julius; and Douglas, George H., 3,891,705.
  - Teller, Daniel M.; Guinosso, Charles J.; Bell, Stanley C.; and Douglas, George H., 3,891,665.
- Dow Chemical Company, The: *See—*
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  - Domenico, Penelope B., 3,891,659.
  - Kenaga, Eugene E., 3,891,767.
  - Larsen, Eric R.; and Ecker, Ernest L., 3,891,605.
  - Layne, Gilbert S.; and Huml, James O., 3,891,690.
  - Marzolf, Richard T., 3,891,598.
  - O'Melia, Frances C., 3,891,760.
  - Shea, Philip J.; and Abdallah, Abdulmuniem H., 3,891,769.
- Dowley, Mark W.; and Shull, William A., to Liconix. Long life helium metal vapor laser. 3,891,943, Cl. 331-94.50G.
- Downing, Todd R.; and Nolen, Robert K., to Maremont Corporation. Hanger for suspending exhaust pipes from a horizontal support. 3,891,176, Cl. 248-340.000.
- Dowty Rotol Limited: *See—*
  - Keenan, John Gregory; Chilman, John Alfred; and Brooking, Ivor Harold, 3,891,346.
- Drabek, Jozef; and Varsanyi, Denis, to Ciba-Geigy Corporation. O-alkyl-S-alkyl-O-substituted phenyl-thiophosphoric acid esters. 3,891,728, Cl. 260-955.000.
- Draf Tool Co., Inc.: *See—*
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- Dragerwerk Aktiengesellschaft: *See—*
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- Dragomier, John D.; and Zysset, Edgar H., to Van Dorn Company. Easy-opening can end construction. 3,891,117, Cl. 220-270.000.
- Dreibelbis, Richard C., to Emerson Electric Co. Means for storing and dispensing heated liquid with expansion chamber module and system therefor. 3,891,124, Cl. 222-66.000.
- Dreikorn, Barry A., to Eli Lilly and Company. Substituted 4-5 dehydrotetrazolo(1,5-a)quinolenes. 3,891,653, Cl. 260-288.0CF.
- Dresler, Helmut, to Linde Aktiengesellschaft. Automatic pressure-control valve, especially for a pressurized-gas supply installation. 3,890,997, Cl. 137-271.000.
- Dressel, Waldemar M.: *See—*
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- Dresser Industries, Inc.: *See—*
  - Cope, Geoffrey Wilton, 3,891,277.
  - Nick, Charles F.; and Davidson, Morris J., 3,890,832.
- Drew, Marie. Hydrotherapy apparatus. 3,890,965, Cl. 128-66.000.
- Drews, Ulrich: *See—*
  - Werner, Peter; and Drews, Ulrich, 3,890,944.
- Drexel, Richard Jacob, Jr.: *See—*
  - Morris, Horton Harold; Drexel, Richard Jacob, Jr.; and Turner, Kenneth Lamar, 3,891,580.
- Drisko, Richard W.; and Crilly, Joseph B., to United States of America, Navy. Quick setting adhesive for application underwater. 3,891,583, Cl. 260-18.0EP.
- Driver, Anna P. Combined card and poker chip holder. 3,891,220, Cl. 273-150.000.
- Drostholm, Frede Hilmar; Petersen, Kaj Ditlev Frederik; and Raabo, Ulf, to Frede Hilmar Drostholm. Integrated apparatus for distilling batches of contaminated solvents. 3,891,510, Cl. 202-206.000.
- Dubois, Donald W.: *See—*
  - Carlin, William W.; Darlington, William B.; and Dubois, Donald W., 3,891,741.
- Du Corday, Gerard M. Book cover. 3,891,240, Cl. 281-29.000.
- Dulude, Donald O.; and Winbigler, Paul H., to Kuhlman Corporation. Methods for the manufacture of spring assemblies. 3,891,823, Cl. 219-85.000.
- Dumoulin, Bernard. Enrobing apparatus. 3,890,923, Cl. 118-19.000.
- Dunn, George L.; and Hoover, John R. E., to SmithKline Corporation. P-Hydroxymethylphenylacetamidocephalosporins. 3,891,634, Cl. 260-243.00C.
- Dunton, Roy P.: *See—*
  - Seifert, Lester H.; Powers, Raymond P.; Schmidt, William M.; Thorwaldsen, Stanley E.; Smith, Frederick; McElroy, David C.; and Dunton, Roy P., 3,890,772.
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  - Chang, David Chi-kung; and McDowell, Maurice James, 3,891,591.
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  - Ramsey, Harold Eugene, 3,890,761.
  - Shearon, Michael Hillas; and Besel, Roland Leroy, 3,891,158.
  - Wolfe, James Richard, Jr., 3,891,604.
  - Wolfe, Paul Dillon; Saxton, Ronald Luther; and Cameron, Donald Dean, 3,891,609.
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- Duttarer, Ralph M.; and Hushower, Richard R., to Clark Equipment Company. Hydraulic manifold. 3,891,003, Cl. 137-561.00A.
- Dworak, Wilhelm; Jons, Claus; and Vlemmings, Jan, to Robert Bosch G.m.b.H. Gear machine with axially movable end wall seal. 3,891,360, Cl. 418-132.000.
- Dyck, Gerhard J. Grain moisture tester. 3,890,830, Cl. 73-73.000.
- Dynamit Nobel AG: *See—*
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- E. B. Wiggins, Inc.: *See—*
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- E. R. Squibb & Sons, Inc.: *See—*
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  - Diassi, Patrick Andrew; and Atwal, Manmohan Singh, 3,891,629.
  - Hauck, Frederic Peter; and Sundeen, Joseph E., 3,891,652.
  - Ondetti, Miguel Angel, 3,891,616.
- E-T Industries, Inc.: *See—*
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- Eagleton, Harold N.; Lormand, Jerome D.; and Herring, Joe S. Method for controlled pressurization of a pipeline during construction thereof. 3,890,693, Cl. 29-429.000.
- Eastman Kodak Company: *See—*
  - Allen, Robert P.; and Hagemeyer, Hugh J., Jr., 3,891,679.
  - Beavers, Dorothy Johnson, 3,891,442.
  - Gibbons, Carl B., 3,891,844.
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- Ebner, Heinrich; and Enenkel, Anton, to Heinrich Frings, Firma. Device for aerating liquids. 3,891,729, Cl. 261-87.000.
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- Eckhardt, Wilhelm; and Kuster, Klaus, to Kuster & Co. GmbH. Vehicle window lifter. 3,890,743, Cl. 49-352.000.
- Eckstein, George R., to Remington Arms Company, Inc. Shaping and turning machine. 3,890,682, Cl. 29-1.300.
- Edgerton, Philip, to FMC Corporation. Peripheral feed clarification tank. 3,891,557, Cl. 210-519.000.
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  - Pracilio, Francis Paul, 3,891,369.
- Edwards, Lawrence K. Railway system. 3,890,904, Cl. 104-121.000.
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- Egan, Gary L., to Hewlett-Packard Company. Synchronous sequential controller for logic outputs. 3,891,972, Cl. 340-172.500.
- Ehlers, Randall G., to Burroughs Corporation. Method and apparatus for identifying an invalid character code. 3,891,839, Cl. 235-153.0AS.
- Ehlert, Elmer R. Trailer hitch. 3,891,238, Cl. 280-446.00R.
- Ehrlick, Robert; and Young, Archie R., II, to Thiokol Corporation. Preparation of aluminum hydride trialkylaminates. 3,891,686, Cl. 260-448.00R.
- Einhorn, Ruediger, to Coats & Clark, Inc. Support member having a locking cam. 3,891,172, Cl. 248-223.000.
- Eisenberg, Morris, to Electrochimica Corporation. Electric current producing galvanic cell. 3,891,458, Cl. 136-6.0LN.
- Ejima, Mizuo: *See—*
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- Elco Industries, Inc.: *See—*
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- Elizondo-Garcia, Javier. Basket for the carrying of all types of bottles. 3,891,084, Cl. 206-143.000.
- Elkamet-Werk Lohn-Kunststoff: *See—*
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- Elliott, Angelika: *See—*
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- Elliott, John, to Elliott, Angelika. Vacuum indicator. 3,890,955, Cl. 128-2.00F.
- Elliott, John Scotchford; Davis, Bryan Terence; and Crook, Monty Frederick, to Edwin Cooper & Company Limited. Heterocyclic phosphorus compounds. 3,891,726, Cl. 260-927.00R.
- Ellis, James F. Linear displacement transducer utilizing an oscillator whose average period varies as a linear function of the displacement. 3,891,918, Cl. 324-34.00D.
- Ellis, James P.; and Ridgeway, William G. Light support for boats. 3,891,173, Cl. 248-226.00A.
- Ellison, Donald E.; and Davenport, Larry C., to Inland Container Corporation. Corrugated container having access door. 3,891,137, Cl. 229-44.00R.
- Elsas, Tibor, to Norland Gazelle Travel Goods Limited. Luggage trolleys. 3,891,245, Cl. 280-47.13R.
- Elsbett, Gunter: *See—*
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- Elsbett, Ludwig; and Elsbett, Gunter. Twist turbulence forming passage, especially in the intake system of reciprocable internal combustion engines. 3,890,949, Cl. 123-188.00M.
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- Elsters, Inc.: *See—*
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- English, Paul Nelson. Wet environment radiography apparatus. 3,891,845, Cl. 250-321.000.
- Ensmann, Burt; Ieda, Michael; and, Joshi, Madhusdan, to Ideal Toy Corporation. Gunfight game. 3,891,216, Cl. 273-119.00R.
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  - Petersen, Harro; Erhard, Paulus; Queins, Hubertus; and Schoeppl, Hubert, 3,891,608.
- Erickson, Porter W.; and Hellfritzsch, Alvin G., to United States of America, Navy. Attachment device. 3,891,466, Cl. 136-200.000.
- Erikson, J. Alden: *See—*
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- Ernst, G. Fred; and Faulkner, William P., to Day Star Corporation. Produce shipping container and packing method. 3,890,762, Cl. 53-25.000.
- Ernst, Horst; Brandenstein, Manfred; and Olschewski, Armin, to SKF Industrial Trading and Development Company, B.V. Longitudinally moving shaft bearing. 3,891,284, Cl. 308-6.00C.
- Ernst Leitz GmbH: *See—*
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  - Hock, Fromund, 3,891,322.
- Ernst, Robert; and Miller, Eugene J., to Textilana Corporation. Acylamidoethoxyethyl sulfosuccinate salts, methods of producing the same and froth-forming compositions containing the same. 3,891,682, Cl. 260-401.000.
- Erwin, Ransome W., to Austral-Erwin Engineering Co. Method of heat exchange and evaporation. 3,891,496, Cl. 159-47.00R.
- ESB Incorporated: *See—*
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- Escher Wyss Limited: *See—*
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- Essers, Wilhelmus Gerardus; and Jelmorini, Gerardus, to U.S. Philips Corporation. Method of plasma-MIG-welding. 3,891,824, Cl. 219-121.00P.
- Ethicon, Inc.: *See—*
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  - Braxton, Henry G., Jr.; Griffing, Margaret E.; and Jolly, James G., 3,891,449.
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- Evertz, Egon. Method for repairing iron molds used in steel making, casting plates in iron molds and other objects made of cast iron. 3,891,821, Cl. 219-76.000.
- Exxon Production Research Company: *See—*
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- Fader, Lester. Apparatus for simulating a three-dimensional image by use of plural image producing surfaces. 3,891,305, Cl. 350-144.000.
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- Fall, Janet E. Inflatable wig tote. 3,891,082, Cl. 206-8.000.
- Fantoni, Marco, to McClure Furniture Industries, Inc. Recessed hinges for articles of furniture. 3,890,671, Cl. 16-137.000.
- Fantoni, Marco, to McClure Furniture Industries, Inc. Pushbutton lockset mechanism. 3,890,814, Cl. 70-106.000.
- Far-Mar-Co., Inc.: *See—*
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- Farfaglia, Silvio T.; Coburn, Leslie O.; Halpin, Robert G.; and Bock, Ronald E., to Phillips Petroleum Company. Carton forming machine. 3,890,765, Cl. 53-183.000.
- Farona, Michael F.; and White, James F., to University of Akron, The. Method for producing aromatic sulfones. 3,891,713, Cl. 260-607.00A.
- Fassett, Donald G.; and Thompson, Ralph F. Welding hood. 3,890,646, Cl. 2-8.000.
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- Fazio, James Anthony, to Singer Company, The. Color convergence apparatus for a color television tube. 3,891,889, Cl. 315-368.000.
- Feil, Fred W., to Continental Display Corporation. Retaining clip. 3,891,335, Cl. 403-173.000.

- Feiring, Monroe J., to Gulf & Western Manufacturing Company. Sealing and seat assembly for ball valve construction. 3,891,183, Cl. 251-315.000.
- Fekete, Eugene Zoltan; and Grady, Raymond J., to Huyck Corporation. Apparatus for needling textiles. 3,890,681, Cl. 28-4.00R.
- Felice, Patrick E.; and Ferber, Robert R., to Westinghouse Electric Corporation. Means for integrating erythemal spectral radiation. 3,891,849, Cl. 250-372.000.
- Feltz, Albert John, to Singer Company, The. Gear mechanism for producing periodic rotation. 3,890,853, Cl. 74-435.000.
- Fencl, Miroslav. Structure of coordinated modular building construction. 3,890,748, Cl. 52-79.000.
- Fenner, Hans-Ueli: *See—*
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- Fernandez, Alberto; and Quintero, Eduardo. Material applying dispenser having screw actuated feed. 3,891,127, Cl. 222-387.000.
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- Ferraro, Frank A., to Warner-Lambert Co. Razor blade cartridge. 3,890,704, Cl. 30-47.000.
- Fessler, Andreas; and Fessler, Ewald, to Hochland, Reich, Summer & Co. Apparatus for interleaving sheets of paper between individual slices of cheese for packages of sliced cheese. 3,890,886, Cl. 93-93.00D.
- Fessler, Ewald: *See—*
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- Fiedelman, Howard W., to Morton-Norwich Products, Inc. Crystallization of sodium chloride of reduced calcium sulfate content in presence of about 5 to about 500 ppm. 3,891,397, Cl. 23-300.000.
- Field, Peter G. S.; and Lock, David A., to Burmah Oil Trading Limited. Production of ketones. 3,891,711, Cl. 260-597.00R.
- Fields, Ellis K., to Standard Oil Company. Arylation process. 3,891,656, Cl. 260-290.00R.
- Fields, Meredith. Multi-purpose lift device. 3,891,184, Cl. 254-4.00R.
- Fieni, Walter, to Societe Anonyme Francaise du Ferodo. Safety belt system. 3,891,271, Cl. 297-386.000.
- Fierst, Jeannette I. Reinforced foundation construction. 3,890,979, Cl. 128-555.000.
- Filaferro, Rene; and Hebert, Francois, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Phase correction device for demodulation of bipolar signals. 3,891,927, Cl. 325-421.000.
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- Finnell, Joseph C., to McDonnell Douglas Corporation. Plating area measuring system. 3,891,797, Cl. 178-6.800.
- Finneman, Erwin F. Catwalk for vehicle boxes. 3,891,261, Cl. 296-1.00R.
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- Fischel, Halbert, to Baxter Laboratories, Inc. Cardiopulmonary bypass system. 3,890,969, Cl. 128-214.00R.
- Fischer, Charles F., to Colgate-Palmolive Company. Apparatus for making a striated soap bar. 3,891,365, Cl. 425-131.100.
- Fischer, Hermann, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Directionally reversible rotary offset printing machine and wetting system therefor. 3,890,898, Cl. 101-148.000.
- Fishburne, Francis B. Material compacting and disposal apparatus. 3,890,889, Cl. 100-48.000.
- Fister, Louis P.; and Paine, Robert, to Moog Automotive, Inc. Physiological diagnostic apparatus. 3,890,958, Cl. 128-2.00S.
- Flachenecker, Gerhard: *See—*
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- Flanagan, James Loton; and Jayant, Nuggehally Sampath. Digital signal detection in telephonic communication systems. 3,891,805, Cl. 179-15.0BF.
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- Fleck, Fritz; and Schmid, Hans Rudolf, to Sandoz Ltd. Triazolylstyryl compounds. 3,891,632, Cl. 260-240.00D.
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- Fleissner, Hans, to Vepa AG. Padder-type apparatus for the continuous application of liquids to permeable materials. 3,890,811, Cl. 68-200.000.
- Flemming, Helmut, to Daimler-Benz Aktiengesellschaft. Independent wheel suspension for motor vehicles. 3,891,232, Cl. 280-124.00A.
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- Flotow, Richard Allen: *See—*
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  - Knight, Houston W., 3,891,004.
- Foerst, Reiner. Game board with color distinguishable play pins and bores. 3,891,219, Cl. 273-136.00F.
- Folk, Kenneth Foster; Ross, Milton Dean; and Shatto, Walter Clifton, Jr., to AMP Incorporated. Apparatus for positioning leading portions of individual wires of a plurality of wires in spaced apart relationships with respect to each other. 3,891,013, Cl. 140-147.000.
- Ford Motor Company: *See—*
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  - Cordone, Leonard G.; Donakowski, William A.; Morgan, John R.; and Roemming, Karl, 3,891,542.
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- Forster, Eckehard; Richter, Helmut; Spetzler, Edgar; Wendorff, Jochen; Klapdar, Wilhelm; and Rommerswinkel, Heinrich-Wilhelm, to Thyssen Niederrhein AG Hutten- und Walzwerke. Apparatus for treating a melt. 3,891,196, Cl. 266-34.00T.
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- Fowells, Robert W., to Crown Zellerbach Corporation. Polyolefin fibers and process of formation during polymerization. 3,891,610, Cl. 260-88.20R.
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- Franco Chimie S.a.r.l.: *See—*
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- Frank, Pierre: *See—*
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- Frank, Robert G., to PPG Industries, Inc. Shaping heat softened glass sheets by roll forming. 3,891,420, Cl. 65-106.000.
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- Freeman, James A., to FSW Associates. Biological feedback systems. 3,890,957, Cl. 128-2.10B.
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- Frentress, Zane, to Deering Milliken Research Corporation. Control system for a cyclically-operated machine. 3,891,911, Cl. 318-696.000.
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- Fried, John H.; and Harrison, Ian T., to Syntex Corporation. D 2-(6-Substituted-2-naphthyl)-propanals. 3,891,712, Cl. 260-599.000.
- Fried, John H.: *See—*
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- Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
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- Frisoli, David M. Projectile or cartridge injector for automatic weapons employing magazines. 3,890,729, Cl. 42-7.000.
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- Fritz Schwarzer GmbH: *See—*
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- Frizzell, Joseph G.; and Hulme, Jack R., to Halliburton Company. Electronic signal multiplier for flowmeters. 3,890,837, Cl. 73-194.00E.
- Froberg, Magnus L.; and Jackson, Robert F., to Owens-Corning Fiberglas Corporation. Electrically-heated melting furnace with melt cooling means. 3,891,422, Cl. 65-137.000.

- Frost, Charles C., to C. L. Frost & Son, Inc. Mower blade support assembly. 3,890,773, Cl. 56-255.000.
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- Fujimoto, Ryoichi; Takasugi, Kazuo; Inose, Fumiyuki; Maio, Kenji; and Yokozawa, Norio, to Hitachi, Ltd. Refrigerator control apparatus. 3,890,798, Cl. 62-155.000.
- Fujita, Jihei: *See—*
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- Fukushima, Mitsuru; Inaba, Yoshihito; Kobari, Sadami; and Morishita, Masataka, to Toyo Jozo Co., Ltd.; and Fuji Photo Film Co., Ltd. Process for preparing microcapsules. 3,891,570, Cl. 252-316.000.
- Fulkerson, David E., to Honeywell, Inc. Bipolar semiconductor device construction. 3,891,480, Cl. 148-187.000.
- Fuller Company: *See—*
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- Fulton, Howard A., to Mansfield Sanitary, Inc. Flush water valve assembly. 3,890,652, Cl. 4-58.000.
- Funk, Clarence J., to United States of America, Navy. Pulsed, variable beam pattern optical measuring device. 3,891,859, Cl. 250-564.000.
- Furrer, Peter: *See—*
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- G. L. Rexroth GmbH: *See—*
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- Gaastra B.V.: *See—*
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- Gaastra, Douwe, to Gaastra B.V. Method of inserting a grummet or thimble in sail cloth or the like. 3,890,695, Cl. 29-458.000.
- Gach, Peter P., to Sunbeam Plastics Corporation. Child-resistant closure for a container having a threaded neck. 3,891,110, Cl. 215-216.000.
- Gad-Jets, Inc.: *See—*
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- Gale, William F. Periphyton sampler and method for sampling. 3,890,844, Cl. 73-421.00R.
- Galecki, Glenn E.; and Oberson, Sonia R., to Olin Corporation. Chlorate removal from alkali metal chloride solutions. 3,891,747, Cl. 423-499.000.
- Galis, Martin A., to Giambalvo, George. Patio door operator. 3,890,744, Cl. 49-360.000.
- Gallant, Terry B., to Automation General. Control system for vehicle gates. 3,891,900, Cl. 317-139.000.
- Gallaro, Anthony V.; and Hedler, Robert A., to GTE Sylvania Incorporated. Process for fabricating a color cathode ray tube screen structure incorporating optical filter means therein. 3,891,440, Cl. 96-36.100.
- Gander, Gerald: *See—*
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- Gardner, Paul C., to United States of America, Navy. Torpedo control system. 3,890,914, Cl. 114-23.000.
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- Geldmacher, Erwin Helmut. Method for preventing the escape of tobacco crumbs or detritus at the ends of cigarettes in transparent packages. 3,890,980, Cl. 131-121.000.
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- Giehler, Herbert, to Elkamet-Werk Lohn-Kunststoff. Apparatus for making hollow bodies from thermoplastic materials by rotation-melting. 3,891,370, Cl. 425-144.000.
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- Grandy, Andrew J. Ammunition and weapon systems. 3,890,732, Cl. 42-39.500.
- Grandy, Andrew J. Ammunition and weapon systems. 3,890,878, Cl. 89-1.700.
- Grandy, Andrew J. Ammunition and weapon systems. 3,890,880, Cl. 89-1.705.
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Hagemeister, Klaus; and Wiesbock, Josef, to Motoren-und Turbinen-Union Munich GmbH. Bearing support for thermal power engines. 3,890,780, Cl. 60-39.080.
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Hanke, Edward F. Lockable electrical outlet. 3,891,289, Cl. 339-14.00P.
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Hannah, John; Rogers, Edward F.; and Graham, Donald W., to Merck & Co., Inc. Fungicial and anthelmintic 1-phosphorylated benzimidazoles. 3,891,758, Cl. 424-200.000.
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Harris, James E.; and Regan, Patrick E. Heavy equipment handler. 3,891,103, Cl. 214-75.00H.
Harris, John Derek; and Wood, Francis Roy, to Lucas Electrical Company Ltd., The. Magnetic poles. 3,891,881, Cl. 310-218.000.
Harris, Mark, to Brunswick Corporation. Capacitor discharge ignition testing apparatus. 3,891,917, Cl. 324-16.00R.
Harrison, Ian T.: *See—*
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  Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,891,766.
Harrison, Robert L. Ligature. 3,890,873, Cl. 84-383.000.
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Hart, Milburn L. System for controlling the deposition of a coating material onto a pipe or the like. 3,891,368, Cl. 425-114.000.
Hartman, Carl C. Semi-automatic packing of packages. 3,890,764, Cl. 53-61.000.
Harvey, Louis A. Carrier-attached expansible container holder. 3,891,174, Cl. 248-313.000.
Hasegawa, Eiichi: *See—*
  Tsuji, Nobuo; and Hasegawa, Eiichi, 3,891,441.
Hatch, Donald. Vernier indicator. 3,890,716, Cl. 33-1.00D.
Hatta, Akihiro, to Tenchi Kikai Kabushiki Kaisha. Packing and aligning devices for pieces of candy. 3,890,766, Cl. 53-234.000.
Hauck, Frederic Peter; and Sundeen, Joseph E., to E. R. Squibb & Sons, Inc. Antianginal aryldecahydropyrrolo[3,4-f]quinolines. 3,891,652, Cl. 260-288.00R.
Haun, Russell W. Device for setting grading lines. 3,890,717, Cl. 33-86.000.
Haurat, Edouard; and Bouclet, Roland, to Automobiles Peugeot; and Regie Nationale des Usines Renault. Dummy, in particular for vehicle or vehicle accessory tests. 3,890,723, Cl. 35-17.000.
Hauri, Jacques: *See—*
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Hauser, Hans; and McGuire, Robert D., to J. B. Foote Foundry Co., The. Transmission with draw-key type shift. 3,890,850, Cl. 74-372.000.
Hauser, Raimund: *See—*
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Hawkins, Edwin George Edward, to BP Chemicals (U.K.) Limited. Peroxy compounds and processes for their preparation. 3,891,663, Cl. 260-307.00F.
Hawkins, Joseph D., to Liconix. Acoustooptic modulator. 3,891,308, Cl. 350-161.000.
Hawley, William L.; and Lewis, Terence E., to GTE International Incorporated. Traffic signal hanger. 3,891,175, Cl. 248-317.000.
Hayashi, Naotake. Headphone. 3,891,810, Cl. 179-156.00R.
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Hecht, Gert; Schoning, Rudolf; and Pieper, Wolfgang, to Siemens Aktiengesellschaft. Cooling arrangement for a motor driven compressor. 3,891,355, Cl. 417-371.000.
Heck, Dennis A.: *See—*
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Henniger, Peter Wolfgang; and Smid, Peter Max, to Koninklijke Nederlandsche Gist-en Spiritusfabrieken N.V. 7-[3-(Phenyl)-isoxazol-5-yl]acetamido-cephalosporanic acids. 3,891,635, Cl. 260-243.00C.
Henriquez, Theodore A.; and Tims, Allan C., to United States of America, Navy. Pressure release hemispherical piezoelectric type transducer. 3,891,871, Cl. 310-9.100.
Henze, Michael, to Allmanna Svenska Elektriska Aktiebolaget. Force or tension measuring means. 3,890,834, Cl. 73-144.000.
Herbenar, Edward J., to TRW Inc. Ball joint and method of manufacture thereof. 3,891,336, Cl. 403-320.000.
Herbert, Curtis B., Jr., to Exxon Production Research Company. Coded radio shooting unit. 3,891,963, Cl. 340-15.5TS.
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  Gersbeck, Rolf; Greten, Berndt; and Steininger, Hans-Peter, 3,891,376.
Hermann, Joachim, to Bolkow Gesellschaft mit beschrankter Haftung. Optical position determining device for controlling a spin stabilized flying body. 3,891,161, Cl. 244-3.120.
Herr, john A.; and Jaffe, Wolfgang, to Singer Company, The. Permanent magnet electric motor having a non-ferrous solid armature. 3,891,876, Cl. 310-43.000.
Herr, Kurt F.; Heck, Dennis A.; Lesny, Lucian J.; and Ward, Ronald L., to GTE Automatic Electric Laboratories Incorporated. System of testing lines of a communication switching system. 3,891,838, Cl. 235-153.0AK.
Herreshoff, L. Francis, deceased; and by Vaughn, Muriel D., executrix, to Stinnes, Margarete L. Anchor. 3,890,915, Cl. 114-207.000.
Herring, Joe S.: *See—*
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Hertz, Walter; Mentel, Jurgen; and Stroh, Jan, to Siemens Aktiengesellschaft. Apparatus for arc quenching. 3,891,814, Cl. 200-148.00R.
Hesener, Walter. Question and answer educational game with an answer control device. 3,890,724, Cl. 35-48.00R.
Hess, Hans-Jurgen E.; and Nelson, Roger P., to Pfizer Inc. 11-Deoxoglycyrrhetinic acid amides useful as antiulcer agents. 3,891,750, Cl. 424-80.000.
Hester, Jackson B., Jr., to Upjohn Company, The. 6-Phenyl-s-triazolo[4,3-a]]1,3,4]-benzotriazepines and their preparation. 3,891,666, Cl. 260-308.00B.
Hettich, Alfred: *See—*
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Hicks, William Robert, to General Electric Company. Appliance accessory attachment means. 3,890,985, Cl. 132-9.000.
Hideo, Hirokawa; and Yoshiaki, Mizuki, to Bell & Howell Company. Macro focusing device for variable focal-length lens. 3,891,310, Cl. 350-187.000.
Hiele, Adrianus Leonardus, to U.S. Philips Corporation. Printed circuit board for a switching network. 3,891,815, Cl. 200-175.000.
Higuchi, Masaru; and Ohnaka, Kouichi, to Daicel, Ltd. Polyoxyalkylene amines. 3,891,709, Cl. 260-584.00B.
Higuchi, Takeru, to Alza Corporation. Anaesthetic topical and percutaneous administration with selected promoters. 3,891,757, Cl. 424-310.000.
Hilgartner, Carol H.; and Hilgartner, Stephen H. Decoding crossword-type game. 3,891,218, Cl. 273-130.00E.
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Hirvela, Robert J.; and Bolin, Robert A., to Rockwell International Corporation. Serial data multiplexing apparatus. 3,891,971, Cl. 340-172.500.
Hisamatsu, Hiroyoshi; Takahashi, Katutoshi; and Takase, Masanori, to Dainippon Ink & Chemicals Inc. Photopolymerizable, isocyanate-containing prepolymers. 3,891,523, Cl. 204-159.150.
Hitachi, Ltd.: *See—*
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  Hanazono, Masanobu; Asai, Osamu; and Kawakami, Kanji, 3,891,995.
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  Maki, Naoki, 3,890,906.
  Mitomo, Isamu; Kaji, Tetsunori; and Fukushima, Masakazu, 3,891,306.
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  Tamaki, Mituo; Ninomiya, Yasumasa; Koyama, Tatsuo; and Ishige, Ryouhei, 3,891,100.
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Hock, Fromund, to Ernst Leitz GmbH. Method of locating the plane of sharp focussing of an image and apparatus therefore. 3,891,322, Cl. 356-126.000.
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Hoey, Charles E., to Rohm and Haas Company. Decorative laminate. 3,891,487, Cl. 156-78.000.
Hoff, John K.; and Goss, John B., to AG International. Drip irrigation device. 3,891,150, Cl. 239-272.000.
Hoffmann-La Roche Inc.: *See—*
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Hoggan, Donald; Wright, Ernest Walter; and Day, Ian, to Industrial Engineering Limited. Plate bending machines. 3,890,820, Cl. 72-169.000.
Hohman, Alvin E.; and Lively, Gerald W., to United States of America, Air Force. Surface treatment of titanium and titanium alloys. 3,891,456, Cl. 134-3.000.
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- Honeywell, Inc.: *See—*
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- Horioka, Masaki, to Nippon Kokan Kabushiki Kaisha. Method of fixing members with bolts. 3,890,697, Cl. 29-526.000.
- Horodecka, Maria Teresa: *See—*
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- Horstmann, Aloys, to Hamel G.m.b.H, Zwirnmaschinen. Apparatus for waxing a thread. 3,890,924, Cl. 118-78.000.
- Horton, William E., III, to Westinghouse Electric Corporation. Electrical inductive apparatus. 3,891,955, Cl. 336-205.000.
- Houdaille Industries, Inc.: *See—*
  - Kumagai, Tom T.; Leone, William C.; May, Michael; Shoemaker, Harold L.; and Howard, Roy A., 3,891,910.
- Houilleres du Bassin du Nord et du Pasde-Calais: *See—*
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- House, William James, to AMP Incorporated. Solid state control circuit for vending devices. 3,891,075, Cl. 194-9.00R.
- Hovercraft Development Limited: *See—*
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- Hovis, James E.; Johns, James E.; and Finke, Harry P., to Bloom Engineering Company, Inc. Stove burner. 3,891,384, Cl. 432-217.000.
- Howard, Jack E., to International Fabric Molders, Inc. Apparatus for fabric molding. 3,891,377, Cl. 425-383.000.
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- Huebner, Karl Heinz. Display card for knives and the like. 3,891,088, Cl. 206-349.000.
- Hughes Aircraft Company: *See—*
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  - Tarbox, John W.; Hinds, Walter E.; and Castro, Rodolfo, 3,890,865.
- Hughes, James W., to Texaco Inc. Epoxy scale-resistant coating. 3,891,602, Cl. 260-47.0EN.
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- Humphreys, Ira B. Helical chute concentrator and method of concentrating. 3,891,546, Cl. 209-211.000.
- Humphries, William H., to Raychem Corporation. Welded polymeric articles and process. 3,891,490, Cl. 156-295.000.
- Hunt, Stacy R., Jr.: *See—*
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- Hunter, Charles A., II; Pech, David J.; and Morrow, James G., Sr., to Manitowoc Company, Inc., The. Selectively positionable operator's cab. 3,891,264, Cl. 296-28.00C.
- Hunter, Edward E., to Goodyear Tire & Rubber Company, The. Apparatus for treating tire cord fabric. 3,890,927, Cl. 118-419.000.
- Hunter, Edward E., to Goodyear Tire & Rubber Company, The. Mechanism for detecting trapped cords on a creel. 3,891,156, Cl. 242-54.00R.
- Hunter, Edward E., to Goodyear Tire & Rubber Company, The. Pricker roll. 3,891,494, Cl. 156-437.000.
- Hunter, Edward W., to Emco Limited. Manhole cover lock. 3,891,119, Cl. 220-324.000.
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- Hunziker, Fritz: *See—*
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- Hura, Michael, to Picker Corporation. Method and apparatus for unloading cassettes. 3,891,854, Cl. 250-468.000.
- Hurlemann, Ernst; and Zellweger, Jurg, to Werkzeugmaschinenfabrik Oerlikon Buhrle & Co. Automatic firing weapon. 3,890,881, Cl. 89-176.000.
- Hurst, John, to W. R. Grace & Company. Method of sealing shuttering against a deformable section of an external waterstop for use in forming joints in concrete. 3,891,732, Cl. 264-34.000.
- Hurst, John F.: *See—*
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- Hurst, Kurt, to Robert Bosch G.m.b.H. Recording apparatus with improved counterelectrode. 3,891,991, Cl. 346-74.00E.
- Hurtmanns, Heinz: *See—*
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- Hutchison, Arthur H.: *See—*
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- Huyck Corporation: *See—*
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- Hyggen, Egil, to Elkem-Spigerverket A/S. Gripping shoes for vehicle wheels. 3,891,018, Cl. 152-225.000.
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- ICI Australia Limited: *See—*
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- Iijima, Katsuhiko; and Yoshida, Katsuhiko, to Mitsubishi Jukogyo Kabushiki Kaisha. Movable frame fixing device. 3,891,065, Cl. 188-41.000.
- Ikegai Tekko Kabushiki Kaisha: *See—*
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- Imperial Chemical Industries Limited: *See—*
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  - Moody, Anthony Gifford; and Osmond, Desmond Wilfrid John, 3,891,572.
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  - Voaden, Arthur Trevor, 3,891,736.
  - Waddan, Dhafir Yusuf, 3,891,707.
- Inaba, Shigeho; Yamamoto, Michihiro; Ishizumi, Kikuo; Mori, Kazuo; Koshiba, Masao; and Yamamoto, Hisao, to Sumitomo Chemical Co., Ltd. Fused quinazolinones. 3,891,638, Cl. 260-244.00R.
- Inaba, Yoshihito: *See—*
  - Fukushima, Mitsuru; Inaba, Yoshihito; Kobari, Sadami; and Morishita, Masataka, 3,891,570.
- Inagaki, Takeo: *See—*
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- Industrial Engineering Limited: *See—*
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- Information Storage Systems, Inc.: *See—*
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- Inland Container Corporation: *See—*
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- Inose, Fumiyuki: *See—*
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- Inoue, Kazuhiko: *See—*
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- Institut Merieux: *See—*
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- Institute of Gas Technology: *See—*
  - Weil, Sanford A.; Tarman, Paul B.; and Punwani, Dharamvir, 3,891,403.
  - Weil, Sanford A.; Tarman, Paul B.; and Punwani, Dharamvir, 3,891,404.
- Instituttet for Produktudvikling: *See—*
  - Trostmann, Erik; and Fensvig, Jens Andreas Toft, 3,890,839.

- Instytut Przemyslu Farmaceutycznego: *See—*
  - Kotiuszko, Danuta Maria; Wituch, Krystyna Maria; Siejko, Danuta Janina; Morawska, Halina; Porowska, Natalia; Horodecka, Maria Teresa; Wolkowicz, Maria Waclawa; Nowacka, Marzena; Makarowska-Plociennik, Zofia Eliza; and Halski, Leszek, 3,891,505.
- Intel Corporation: *See—*
  - Vadasz, Leslie L., 3,891,190.
- Intellectual Property Development Corporation: *See—*
  - Saltzman, William H., 3,891,681.
- Interlake, Inc.: *See—*
  - Coleman, Bestor P.; and McConnell, Kennedy, 3,891,073.
- Intermountain Research and Development Corporation: *See—*
  - Weeks, Lorne E.; and Doran, Ronald W., 3,891,393.
- International Business Machines Corporation: *See—*
  - Gueret, Pierre Leopold, 3,891,864.
- International Fabric Molders, Inc.: *See—*
  - Howard, Jack E., 3,891,377.
- International Flavors & Fragrances Inc.: *See—*
  - Evers, William J.; Heinsohn, Howard H., Jr.; and Mayers, Bernard J., 3,891,710.
  - Vinals, Joaquin Francisco; Quinn, Alton Dewitt; and Pittet, Alan Owen, 3,890,981.
- International Standard Electric Corporation: *See—*
  - Charransol, Pierre; Hauri, Jacques; and Athenes, Claude, 3,891,807.
  - Chatelon, Andre Edouard Joseph; and Coudray, Andre Lucien, 3,891,806.
  - Van Brussell, Marcel A.; and Julia-Polle, Raymond Louis, 3,891,808.
- INTERx Research Corporation: *See—*
  - Bodor, Nicolae S.; and Kaminski, James J., 3,891,649.
  - Bodor, Nicolae S.; Sloan, Kenneth B.; and Hussain, Anwar A., 3,891,696.
- Intreprinderea Mecanica de Utilaje Medcidia: *See—*
  - Radu, Stefan I., 3,890,823.
- Investments and Innovative Concepts, Inc.: *See—*
  - Petersilie, Frank W., 3,890,658.
- Ipos Gesellschaft fur Integrierte Prothesenentwicklung und Orthopadietechnischen Service m.b.H. & Co. K.G.: *See—*
  - Prahl, Jan, 3,890,650.
- Irwin, James; and Erikson, J. Alden, to PPG Industries, Inc. Method of electro-depositing compositions containing hydrolyzed polyepoxides. 3,891,525, Cl. 204-181.000.
- Irwin, Malcolm F., to Pro-Tech Inc. Liquid sampling. 3,890,843, Cl. 73-421.00B.
- Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhiro; and Nagayama, Masuzo, to Lion Fat & Oil Co., Ltd. Process for manufacturing polyol esters of carboxylic acids. 3,891,683, Cl. 260-410.600.
- Isaac, Eirlys R.; and Kirby, Peter, to Shell Oil Company. Dioxolanyl carbonyl ureas and thioureas. 3,891,675, Cl. 260-340.900.
- Isaacs, Jack L., to General Electric Company. Composite package. 3,891,086, Cl. 206-320.000.
- Isaacs, Jack L.: *See—*
  - Bricker, Francis G.; Isaacs, Jack L.; and Nobbs, Douglas C., 3,891,170.
- Ishida, Kengo: *See—*
  - Sato, Takaaki; and Ishida, Kengo, 3,891,770.
- Ishige, Ryouhei: *See—*
  - Tamaki, Mituo; Ninomiya, Yasumasa; Koyama, Tatsuo; and Ishige, Ryouhei, 3,891,100.
- Ishiguro, Toshihiro: *See—*
  - Morimoto, Shiro; Nomura, Hiroaki; Fugono, Takeshi; Maeda, Kihachiro; and Ishiguro, Toshihiro, 3,891,763.
- Ishikawa, Norikatsu: *See—*
  - Goto, Kenji; and Ishikawa, Norikatsu, 3,890,945.
- Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
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- Ishikawajima-Harima Jukogyo Kubushiki: *See—*
  - Takenouchi, Senji; Yanai, Tautomu; Matsumoto, Takamasa; and Ohtani, Hiroyoshi, 3,891,051.
- Ishizumi, Kikuo: *See—*
  - Inaba, Shigeho; Yamamoto, Michihiro; Ishizumi, Kikuo; Mori, Kazuo; Koshiba, Masao; and Yamamoto, Hisao, 3,891,638.
- Ishman, Neal H.; Lenert, Richard W.; and Goldman, Jeffrey B., to American Standard, Inc. Filter module. 3,891,926, Cl. 325-159.000.
- Iskra, Marian. Combination screw and screwdriver with axial guide spigot. 3,891,017, Cl. 145-50.00A.
- Isobe, Yasuo: *See—*
  - Aizawa, Hiroshi; Ito, Tadashi; Itoh, Fumio; Takahashi, Kiyoshi; and Isobe, Yasuo, 3,891,312.
- Itaya, Toshihisa: *See—*
  - Suzuki, Yasushi; Itaya, Toshihisa; Minami, Nobuyoshi; Tarutani, Masaaki; Miki, Tokutaro; and Miyasaka, Katsuhiko, 3,891,664.
- Ito, Hisakatu: *See—*
  - Munakata, Katsura; Oda, Takeshi; Mori, Toshito; and Ito, Hisakatu, 3,891,506.
- Ito, Katsuhiko; and Tsuchimoto, Takashi, to Hitachi, Ltd. Method of manufacturing semiconductor device. 3,891,468, Cl. 148-1.500.
- Ito, Tadashi: *See—*
  - Aizawa, Hiroshi; Ito, Tadashi; Itoh, Fumio; Takahashi, Kiyoshi; and Isobe, Yasuo, 3,891,312.
- Ito, Yoshio, to Canon Kabushiki Kaisha. Corona discharger cleaning apparatus. 3,891,846, Cl. 250-324.000.
- Itoh, Fumio: *See—*
  - Aizawa, Hiroshi; Ito, Tadashi; Itoh, Fumio; Takahashi, Kiyoshi; and Isobe, Yasuo, 3,891,312.
- ITT Industries, Inc.: *See—*
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- Iwasaki Tsushinki Kabushiki Kaisha: *See—*
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- Izumiya, Nobuo: *See—*
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- J. B. Foote Foundry Co., The: *See—*
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- J. I. Case Company: *See—*
  - Lamer, Gerald P.; and Holmes, Terry M., 3,890,757.
  - Symmank, William D., 3,891,095.
- J. M. Voith GmbH: *See—*
  - Hutarew, Georg, 3,891,860.
- J. P. Stevens and Co., Inc.: *See—*
  - Latta, Bruce M.; and Willard, John J., Jr., 3,891,387.
- Jackson, Paul L., to Ford Motor Company. Determination of oxygen in molten steel. 3,891,512, Cl. 204-1.00T.
- Jackson, Robert F.: *See—*
  - Froberg, Magnus L.; and Jackson, Robert F., 3,891,422.
- Jacobs, Marcellus L.; and Jacobs, Paul R. Clutch-controlled, wind-operated, power producing propeller. 3,891,347, Cl. 416-32.000.
- Jacobs, Paul R.: *See—*
  - Jacobs, Marcellus L.; and Jacobs, Paul R., 3,891,347.
- Jaeger, Charles G. Dental dowel pin positioning and aligning apparatus. 3,890,710, Cl. 32-11.000.
- Jaffe, Wolfgang: *See—*
  - Herr, john A.; and Jaffe, Wolfgang, 3,891,876.
- Jakszt, Werner, to Siemens Aktiengesellschaft. Voltage overload arrester for high-voltage switching systems. 3,891,897, Cl. 317-62.000.
- Jandura, John J., Jr. Process and apparatus for the removal of arrows. 3,890,692, Cl. 29-427.000.
- Janssen, Peter Johannes Hubertus; van Hattum, Johannes Simon Albert; and Korver, Jan Abraham Cornelis, to U.S. Philips Corporation. Line time base in a television receiver. 3,891,800, Cl. 178-69.5TV.
- Janusonis, Gaile A., to Eastman Kodak Company. Sensitizing solid silver halide emulsion layer with hot hydrogen. 3,891,446, Cl. 96-107.000.
- Japan Storage Battery Co., Ltd.: *See—*
  - Muto, Eiji; Kawarabayashi, Tsuneo; Matsumura, Koichi; and Tamura, Hitoshi, 3,891,465.
- Japan Synthetic Rubber Co., Limited: *See—*
  - Yaeda, Yasuyuki; Chikatsu, Yoshishige; Ando, Noriaki; and Sakata, Ryuichi, 3,891,724.
- Japanese National Railways: *See—*
  - Tamaki, Mituo; Ninomiya, Yasumasa; Koyama, Tatsuo; and Ishige, Ryouhei, 3,891,100.
- Jayant, Nuggehally Sampath: *See—*
  - Flanagan, James Loton; and Jayant, Nuggehally Sampath, 3,891,805.
- Jeanmaire, Peter; and Heinzer, Paul, to Wifo Wissenschaftliches Forschungs-Institut A.G. Magnetic brush for use in developing electrophotographic images. 3,890,928, Cl. 118-637.000.
- Jeffers, Carl H. Push broom handle clamp. 3,891,339, Cl. 403-192.000.
- Jefferson Chemical Company, Inc.: *See—*
  - Yeakey, Ernest Leon; and Moss, Philip Hotchkiss, 3,891,742.
- Jelmorini, Gerardus: *See—*
  - Essers, Wilhelmus Gerardus; and Jelmorini, Gerardus, 3,891,824.
- Jenkner, Herbert, to Chemische Fabrik Kalk GmbH. Process for the purification of crude terephthalic. 3,891,700, Cl. 260-525.000.
- Jenko, Dragutin: *See—*
  - Scharfen, Hans; Schmitz, Karl Heinz; Strerath, Theo; and Jenko, Dragutin, 3,891,058.
- Jenness, Raymond C., to Allis-Chalmers Corporation. Pivoted pad bearing apparatus and method for bidirectional rotation. 3,891,281, Cl. 308-1.00R.
- Jennings Compound Bow, Inc.: *See—*
  - Jennings, Thomas Paul; Williamson, John Monroe; and Sumida, Carl, 3,890,951.
- Jennings, Thomas Paul; Williamson, John Monroe; and Sumida, Carl, to Jennings Compound Bow, Inc. Adjustable arrow rest. 3,890,951, Cl. 124-41.000.
- Jensen, Garold K., to United States of America, Navy. One-operation signal processor. 3,891,987, Cl. 343-5.00R.
- Jensen, Gerald A.; and Parsonage, Harry N., to Mead Corporation, The. Electrolytic chemical reaction apparatus. 3,891,532, Cl. 204-260.000.
- Jerrel, Raymond M. Support means for wheeled vehicles. 3,891,177, Cl. 248-352.000.
- Joerns Furniture Company: *See—*
  - Peterson, Warren J., 3,890,907.
- Johansen, Jorgen Skoubo. Ceiling or wall covering. 3,890,753, Cl. 52-500.000.
- John Wyeth and Brother (Ltd.): *See—*
  - White, Alan Chapman, 3,891,644.
- Johns, James E.: *See—*
  - Hovis, James E.; Johns, James E.; and Finke, Harry P., 3,891,384.
- Johns-Manville Corporation: *See—*
  - Dave, Shashi Bhaishanker, 3,891,412.
  - Sadler, Thomas Harry, 3,891,498.
  - Terry, Rupert Douglas, 3,891,493.

Johnson, Jay. Roving cutter for fiber reinforced synthetic resin sprayers. 3,890,706, Cl. 30-180.000.

Johnson & Johnson: *See—*
Aspelin, Gary Bertil; Caffrey, Richard Francis; and Lauer, William, 3,890,966.

Johnson, Morris E.; and Princ, Josef, to Nichols-Homeshield, Inc. Self-retaining latch with insert strengthener. 3,891,256, Cl. 292-202.000.

Johnson, Quentin S.; and Pignone, Edward H. Automatic day-night television surveillance system. 3,891,795, Cl. 178-7.200.

Johnson, Robert F. Surfboard rudder-fin combination. 3,890,661, Cl. 9-310.00B.

Johnson, Waldo O.; and Buynak, Robert G., to Louisiana-Pacific Corporation. Double hung pivotal window. 3,890,741, Cl. 49-162.000.

Jolly, James G.: *See—*
Braxton, Henry G., Jr.; Griffing, Margaret E.; and Jolly, James G., 3,891,449.

Jones, Allan F., to ITT Industries, Inc. Flat cable terminating. 3,891,293, Cl. 339-97.00C.

Jones, Boyd C. Fish hook receptacle. 3,890,737, Cl. 43-57.50R.

Jones, Charles, to Curtiss-Wright Corporation. Air-cooled oil sump with fins for receiving oil in a heat exchange relationship. 3,891,059, Cl. 184-104.00B.

Jones, Henry M.: *See—*
Lance, James W.; and Jones, Henry M., 3,891,477.

Jones, Paul H., to National Rolling Mills Co. Main beam joint for suspended ceilings. 3,890,760, Cl. 52-758.00A.

Jones, Robert E.: *See—*
Gilbert, Eugene C.; Jones, Robert E.; and Sherman, Edward, 3,891,717.

Jons, Claus: *See—*
Dworak, Wilhelm; Jons, Claus; and Vlemmings, Jan, 3,891,360.

Joshi, Madhusdan: *See—*
Ensmann, Burt; Ieda, Michael; and Joshi, Madhusdan, 3,891,216.

Joullie, Maurice L.; Maillard, Gabriel; Lakah, Lucien; and Muller, Pierre, to Recherche Pharmaceutiques et Scientifiques. Digestive pharmaceutical composition comprising S-carboxymethyl cysteine for reducing viscosity of respiratory tract secretions, and method of treating therewith. 3,891,749, Cl. 424-311.000.

Joyce, Norman George, to Science Research Council. Electrically-conducting materials. 3,891,868, Cl. 310-5.000.

Julia-Polle, Raymond Louis: *See—*
Van Brussell, Marcel A.; and Julia-Polle, Raymond Louis, 3,891,808.

Jung, Friedrich, to Triumph Werke Nurnberg A.G. Ribbon shifting arrangement. 3,891,078, Cl. 197-156.000.

Jung, Herbert A., to Exxon Research and Engineering Company. Preparation of organometallic complexes. 3,891,684, Cl. 260-429.00R.

Justus, Edgar J., to Beloit Corporation. Slitting mechanism for winder. 3,891,157, Cl. 242-56.200.

Kabushiki Kaisha Daikin Seisakusho: *See—*
Adachi, Kazuma; Tokunaga, Masayoshi; and Takeshita, Shigeru, 3,891,350.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
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Kadi-Ogly, Ibragim Akhmedovich: *See—*
Shapiro, Aron Beniaminovich; Chernyavsky, Vladimir Pavlovich; Kadi-Ogly, Ibragim Akhmedovich; and Tjurin, Jury Grigorievich, 3,891,877.

Kaij, Mats J.: *See—*
Mogensen, Palne; and Kaij, Mats J., 3,891,562.

Kaiser Aluminum & Chemical Corporation: *See—*
Robinson, Ivan B., 3,891,400.

Kaiser, Bernhard: *See—*
Wokock, Ortwin; and Kaiser, Bernhard, 3,891,076.

Kaiser, Leonhard: *See—*
Schmidt, Gunther; Theiss, Armin; Dederra, Carl-Helmut; and Kaiser, Leonhard, 3,890,781.

Kaiser, Reinhold, to Telefunken Patentverwertungsgesellschaft mbH. Method of producing a semiconductor device. 3,891,481, Cl. 148-188.000.

Kaji, Tetsunori: *See—*
Mitomo, Isamu; Kaji, Tetsunori; and Fukushima, Masakazu, 3,891,306.

Kali-Chemie AG.: *See—*
Musall, Reimar; and Wolsing, Wilhelm, 3,891,396.

Kali-Chemie Aktiengesellschaft: *See—*
Brautigam, Hans; Weidenbach, Gunter; and Koepernik, Karl Hermann, 3,891,575.

Kalopissis, Gregoire; Viout, Andre; and Vanlerberghe, Guy, to Societe Anonyne dite: L'Oreal. Hair softening dye compositions containing surface-active asparagine derivatives. 3,891,385, Cl. 8-10.100.

Kalter, Jan: *See—*
Smid, Peter Max; and Kalter, Jan, 3,891,628.

Kamino, Kimiyuki: *See—*
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Kaminski, James J.: *See—*
Bodor, Nicolae S.; and Kaminski, James J., 3,891,649.

Kan, Peter T.; and Cenker, Moses, to BASF Wyandotte Corporation. Carbodiimide-isocyanurate foams containing urethane linkages. 3,891,578, Cl. 260-2.5AC.

Kanaoka, Yuichi; and Machida, Minoru, to Yuichi Kanaoka. Thiol-group detecting fluorescence reagents. 3,891,669, Cl. 260-326.340.

Kanaoka, Yuichi; Machida, Mikiko; and Machida, Minoru, to Kanaoka, Yuichi. N-(1-anilino naphthyl-4) malemide thiol-group detecting reagent. 3,891,670, Cl. 260-326.5FM.

Kankaanpaa, Matti, to Valmet O. Y. Paper machine having a long transport wire for making tissue paper. 3,891,500, Cl. 162-274.000.

Kannapell, David H.; Schupp, Philipp P.; and Amrein, David, to American Air Filter Company, Inc. Expansion joint. 3,891,248, Cl. 285-156.000.

Kao Soap Co., Ltd.: *See—*
Matsuda, Kazuo; Tanaka, Yoshiaki; and Sakai, Takeyo, 3,891,715.

Kaplan, Arthur R. Device for measuring advertising space. 3,890,715, Cl. 33-1.00B.

Karl M. Reich Maschinenfabrik GmbH: *See—*
Gebhardt, Fritz, 3,890,861.

Karobath, Ernst; and Rippel, Leopold, to Telephon-und Telegraphen-Fabriks Aktiengesellschaft Kapsch & Sohne In Wien. Leak-proof galvanic cell. 3,891,463, Cl. 136-134.00R.

Karszes, William M., to General Electric Company. Ethylene-vinyl chloride emulsion coated plastic laminate. 3,891,788, Cl. 428-511.000.

Kasbo, Loyd G.: *See—*
Stanley, Leonard A.; and Kasbo, Loyd G., 3,891,423.

Kasugai, Hiroshi; Motojima, Shozo; and Inoue, Kazuhiko, to Mitsubishi Chemical Industries Ltd. Agricultural pesticide composition. 3,891,756, Cl. 424-177.000.

Katayama, Hajime; Miyamoto, Koichi; and Ohashi, Shoji, to Canon Kabushiki Kaisha. Developing liquid recovery device in a copying machine. 3,890,721, Cl. 34-73.000.

Kato, Kazue, to Platinum Pen Co., Ltd. Writing implement. 3,891,329, Cl. 401-65.000.

Kato, Teiji; and Okamoto, Katsumi, to Crown Zellerbach International, Inc. Synthetic papermaking pulp and process of manufacture. 3,891,499, Cl. 162-157.00R.

Kato, Tsutomu: *See—*
Kobayashi, Kazuo; Watari, Shinjiro; Kato, Tsutomu; Shiraishi, Minoru; and Kawana, Yoshio, 3,891,574.

Katsumoto, Kiyoshi; and Lind, Wilton H., to Chevron Research Company. Maleic anhydride recovery using nonaqueous medium. 3,891,680, Cl. 260-346.80M.

Katz, Leon; and Golda, Eugene, to Polychrome Corporation. Aqueous developing composition for lithographic diazo printing plates. 3,891,438, Cl. 96-49.000.

Katz, Leon; Rowe, William; and Golda, Eugene, to Polychrome Corporation. Aqueous developing composition for lithographic diazo printing plates. 3,891,439, Cl. 96-49.000.

Kaufman, Arnold S.; and Sweet, Albert, to Elsters, Inc. Exhaust hood. 3,890,887, Cl. 98-115.00K.

Kawada, Hirohito: *See—*
Suzuki, Tadao; and Kawada, Hirohito, 3,891,933.

Kawai, Masanori: *See—*
Kimura, Yoshiaki; Kawai, Masanori; Yajima, Tatsuo; and Morishita, Taneji, 3,891,320.

Kawai, Taneichi; and Nishida, Koji, to Aisin Seiki Kabushiki Kaisha. Automatic fishing apparatus. 3,890,734, Cl. 43-4.000.

Kawakami, Kanji: *See—*
Hanazono, Masanobu; Asai, Osamu; and Kawakami, Kanji, 3,891,995.

Kawamoto, Junji: *See—*
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Kawana, Yoshio: *See—*
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Kawanami, Mitsuru: *See—*
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Kawarabayashi, Tsuneo: *See—*
Muto, Eiji; Kawarabayashi, Tsuneo; Matsumura, Koichi; and Tamura, Hitoshi, 3,891,465.

Keenan, John Gregory; Chilman, John Alfred; and Brooking, Ivor Harold, to Dowty Rotol Limited. Fans. 3,891,346, Cl. 415-129.000.

Keith, Marvin W., Jr., to Buehler Ltd. Polishing apparatus. 3,891,409, Cl. 51-361.000.

Kelpin, Thomas G. Aquatic harvester with improved flotation system. 3,890,771, Cl. 56-9.000.

Kelsey-Hayes Company: *See—*
Frait, John S., 3,891,279.

Kelsey, Paul S. Precast panels with corner-divider projections. 3,891,178, Cl. 249-91.000.

Kempelmann, Reinhold: *See—*
Knappe, Heinrich; Notle, Karl Heinz; and Kempelmann, Reinhold, 3,891,129.

Kempson, Kenneth William: *See—*
Lycett, Peter; and Kempson, Kenneth William, 3,891,112.

Kenaga, Eugene E., to Dow Chemical Company, The. Certain triaryl tin compounds as chemosterilants. 3,891,767, Cl. 424-288.000.

Kendall Co., The: *See—*
Stanley, Leonard A.; and Kasbo, Loyd G., 3,891,423.

Kernforschungsanlage Julich GmbH: *See—*
Brixy, Heinz, 3,890,841.

Kershaw, Robert William; Lubbock, Frederick John; and Polgar, Livia, to Balm Paints Limited. Process of preparing vesiculated polymers. 3,891,577, Cl. 260-2.50R.

Kerwin, Robert D.; and Sulzle, Darwin B., to United States of America, Air Force. Analog to digital conversion by subranging with multiple level redundant error correction. 3,891,984, Cl. 340-347.0CC.

Kestenbaum, Ami: *See—*
Dabby, Franklin Winston; and Kestenbaum, Ami, 3,891,302.

Kewley, James W.: *See—*
Prior, William C.; and Kewley, James W., 3,891,552.

Keys, Lloyd Kenneth: *See—*
Mikhael, Wasfy Boushra; and Keys, Lloyd Kenneth, 3,891,938.

Kienzle Apparate GmbH: *See—*
Wokock, Ortwin; and Kaiser, Bernhard, 3,891,076.

Kieras, Joseph A.: *See—*
Rosenthal, Rudolph; and Kieras, Joseph A., 3,891,748.

Kierstead, William L., to Electronized Chemicals Corporation. Splicing and repairing insulated electrical wire. 3,891,790, Cl. 174-93.000.

Kim, Chang-Kyo: *See—*
Opdahl, Everett W.; and Kim, Chang-Kyo, 3,890,919.

Kimura, Hisao, to Asahi Broadcasting Corporation. Television character crawl display method and apparatus. 3,891,792, Cl. 178-5.80R.

Kimura, Toshio: *See—*
Matubayashi, Tadao; Shiono, Taiichi; Hukuda, Yositugu; and Kimura, Toshio, 3,891,503.

Kimura, Yoshiaki; Kawai, Masanori; Yajima, Tatsuo; and Morishita, Taneji, to Konishiroku Photo Industry Co., Ltd. Light interference gauge and flatness tester. 3,891,320, Cl. 356-109.000.

Kimura, Yoshio: *See—*
Sunahara, Hiroshi; and Kimura, Yoshio, 3,891,205.

King Engineering Corporation: *See—*
Wade, William D., 3,891,417.

King, Olin B.: *See—*
Pierce, Oscar L.; Hutchison, Arthur H.; King, Olin B.; and McMillian, Lonnie S., 3,890,968.

King Radio Corporation: *See—*
Rodgers, Daniel L.; and Cater, Thomas F., 3,891,832.

Kinnerud, Verner Elof Johannes; and Svensson, Bernt Oskar Gerhard, to Svenska Ackumulator Aktiebolaget Jungner. Electric accumulator with chiefly plane plates. 3,891,464, Cl. 136-145.000.

Kirby, Peter: *See—*
Isaac, Eirlys R.; and Kirby, Peter, 3,891,675.

Kircher, Melvin D. Collating machine. 3,891,202, Cl. 270-58.000.

Kirkpatrick, Burnard M.; and Moore, James C., to Teledyne Industries, Inc. Bore hole instrument package self-leveler. 3,891,050, Cl. 181-102.000.

Kiscaden, Roy W.: *See—*
Yannone, Robert A.; and Kiscaden, Roy W., 3,891,915.

Kiyonaga, Yasuhiro: *See—*
Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhiro; and Nagayama, Masuzo, 3,891,683.

Klapdar, Wilhelm: *See—*
Forster, Eckehard; Richter, Helmut; Spetzler, Edgar; Wendorff, Jochen; Klapdar, Wilhelm; and Rommerswinkel, Heinrich-Wilhelm, 3,891,196.

Kleen, Gerhard; and Herrmann, Albert, to Siemens Aktiengesellschaft. Voltage transformer for a fluid insulated high-voltage multi-conductor switching apparatus. 3,891,863, Cl. 307-147.000.

Klein, Laszlo: *See—*
Lea, Darrell Bernard; and Klein, Laszlo, 3,890,725.

Kleine, Jean Jacques, to S.T. Dupont. Process for storing a liquid for its distribution in the gaseous state. 3,891,147, Cl. 239-6.000.

Kleinewefers Industrie Companie GmbH: *See—*
Sonnen, Rudolf, 3,891,223.

Kleis, Derk, to U.S. Philips Corporation. Magnet system for an acoustic transducer. 3,891,809, Cl. 179-119.00R.

Klemm, Martin, to Fritz Buser AG. Maschinenfabrik. Method to prepare matrices to manufacture lattice or grid metal layers structures by electrolytic deposition. 3,891,514, Cl. 204-15.000.

Klever, Harold Howard, to du Pont de Nemours, E. I., and Company. Vulcanizable chlorinated elastomer composition. 3,891,725, Cl. 260-889.000.

Kleykamp, Donald L., to Dayco Corporation. Exteriorly corrugated hose of composite materials. 3,891,007, Cl. 138-121.000.

Kline, Harlan H.: *See—*
Bordner, Dalton W.; and Kline, Harlan H., 3,891,489.

Kline, Leo; and Sugihara, Takashi F., to United States of America, Agriculture. Culture of sour dough bacteria. 3,891,773, Cl. 426-61.000.

Klocker-Humboldt-Deutz, AG: *See—*
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Knappe, Heinrich; Notle, Karl Heinz; and Kempelmann, Reinhold, to Herbert Kannegiesser Kommanditgesellschaft. Process for folding shirts or similar articles of clothing. 3,891,129, Cl. 223-37.000.

Knell, Bernhard: *See—*
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Knight, Houston W., to FMC Corporation. Bottom cross-over loading arm. 3,891,004, Cl. 137-615.000.

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Kobayashi, Kazuo; Watari, Shinjiro; Kato, Tsutomu; Shiraishi, Minoru; and Kawana, Yoshio, to Agency of Industrial Science & Technology. Hollow spheres of activated carbon and method for manufacture thereof. 3,891,574, Cl. 252-421.000.

Kobayashi, Toshihiro, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Rotary kiln apparatus with suspension preheater having burner for calcining. 3,891,383, Cl. 432-80.000.

Kobayashi, Tsuyoshi: *See—*
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Kobayashi, Yasunobu; and Ogawa, Hikaru, to Kobe Steel, Ltd. Meshes cutting machine. 3,890,864, Cl. 83-162.000.

Kobe Steel, Ltd.: *See—*
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Koch, Andrew T. Apparatus for inverting containers. 3,891,098, Cl. 214-8.50H.

Kodis, Robert D., to Di/An Controls, Inc. Multiple sheet ticket printer. 3,890,893, Cl. 101-69.000.

Koepernik, Karl Hermann: *See—*
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Kogon, Irving Charles, to du Pont de Nemours, E. I., and Company. Curing with complexes of selected diamines and alkali metal salts. 3,891,606, Cl. 260-77.5AM.

Kohara, Haruki, to Nippon Electric Company, Limited. Magnetic domain propagating circuit. 3,891,978, Cl. 340-174.0TF.

Kohn, Gustave K., special administrator: *See—*
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Kohno, Hideki: *See—*
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Koivunen, Erkki A., to General Motors Corporation. Distributor drive arrangement for a rotary combustion. 3,890,937, Cl. 123-8.450.

Kolibas, James Andrew, to Addressograph-Multigraph Corporation. Electrophotographic reproduction apparatus. 3,891,315, Cl. 355-8.000.

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Kombinat Za Zvetni Metali "Dimiter Blagoev": *See—*
Yordanov, Yordan Todorov; Abrashev, Georgi Ivanov; Georgiev, Georgi Tenev; Zhekov, Velyo Dimitroy; Yanev, Yancho Hristov; Rossenov, Ivan Georgiev; Prodanov, Velcho Angelov; and Roussey, Yordan Todev, 3,891,428.

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Konishi, Iseo. Transformer. 3,891,954, Cl. 336-61.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
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Konrad, Charles Edward, to General Electric Company. Speed control unit for electric vehicles. 3,891,902, Cl. 318-139.000.

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Koppers, Manfred; and Kuhnapfel, Friedhelm, to Rheinstahl AG. Support advancing apparatus for mines. 3,890,793, Cl. 61-45.00D.

Korpel, Adrianus; and Whitman, Robert L., to Zenith Radio Corporation. Method and apparatus for acoustical imaging. 3,890,829, Cl. 73-67.50H.

Korver, Jan Abraham Cornelis: *See—*
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Kotone, Akira; Hoda, Masahiro; and Hori, Takeshi, to Sakai Chemical Industry Company, Ltd. Ferrous metals treated with imidazole compounds for corrosion resistance. 3,891,470, Cl. 148-6.140.

Kotthaus, Erich, to Werkzeugmaschinenfabrik Oerlikon Buhrle & Co. Method for grinding bevel- or hyperboloid-shaped gears. 3,891,407, Cl. 51-287.000.

Kowa Company, Ltd.: *See—*
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- Kraft, Erich: *See—*
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- Kratsch, Henry W.; and Doehling, Theodore W., to Medslist Industries, Inc. Furniture piece fabricating machine. 3,891,134, Cl. 227-14.000.
- Kraus, Peter, to Messerschmitt-Boelkow-Blohm GmbH. Apparatus for safeguarding the spacing between successive bodies, especially vehicles on a track. 3,891,168, Cl. 246-167.00R.
- Kraus, Werner; and Viehbach, Hans-Dieter, to Kraus, Werner. Electrical apparatus generating a low frequency, alternating magnetic field for promoting the growth of bone and other body tissues. 3,890,953, Cl. 128-1.500.
- Kremen, Jerome C.; and Landa, Isaac, to Baxter Laboratories, Inc. Energy compensated spectrofluorometer. 3,891,853, Cl. 250-458.000.
- Krempel, Alfred: *See—*
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- Kritzberg, Nathan I., to Psychotherapeutic Devices, Inc. Psychological testing and therapeutic game device. 3,891,209, Cl. 273-1.00R.
- Krueger Metal Products, Inc.: *See—*
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- Kruger, Jean J.; and Rositto, Vincent E., to said Vincent E. Rossitto, by said Jean J. Kruger. Method for removing liquid contaminants from a submerged tank. 3,890,796, Cl. 61-69.000.
- Kruka, Vitold R.: *See—*
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- Kubik, Paul P. Holder for revolver loader. 3,890,733, Cl. 42-89.000.
- Kubota, Toshiro: *See—*
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- Kuchner, Karl: *See—*
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- Kuhlman Corporation: *See—*
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- Kuhn, Hans, to F. B. Hatebur A.G. Tongs for use in a multi-stage forging press. 3,891,260, Cl. 294-90.000.
- Kuhn, Rainer; and Schon, Nikolaus, to Bayer Aktiengesellschaft. Process for the production of thermoreversible coacervates. 3,891,607, Cl. 260-80.30N.
- Kuhnapfel, Friedhelm: *See—*
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- Kumagai, Tom T.; Leone, William C.; May, Michael; Shoemaker, Harold L.; and Howard, Roy A., to Houdaille Industries, Inc. Machine tool motor control with position offset. 3,891,910, Cl. 318-572.000.
- Kunikane, Makoto: *See—*
  - Yasumori, Akiyoshi; Ohta, Katsuichi; Kunikane, Makoto; and Abe, Michiharu, 3,891,513.
- Kunzle, Franz Martin: *See—*
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- Kuo, Chan-Hwa; Taub, David; and Wendler, Norman L., to Merck & Co., Inc. 2-Alpha-carboxy-3-alpha(hydroxyethyl)-5-oxocyclopentane derivatives. 3,891,676, Cl. 260-340.900.
- Kupper, Walter E.: *See—*
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- Kuramoto, Yoshio: *See—*
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- Kurek, Thaddeus P.: *See—*
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- Kurz, Gunter: *See—*
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- Kusano, Masaaki: *See—*
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- Kuster & Co. GmbH: *See—*
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- Kuster, Klaus: *See—*
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- Kuwano, Nobuyori; and Tajima, Yasutomo, to Showa Manufacturing Co., Inc. Shock absorber for bicycles. 3,891,236, Cl. 280-283.000.
- Kuxhouse, Benjamin; and Balzer, Russell R. Canopy supporting frame and canopy. 3,890,989, Cl. 135-7.10R.
- Kyoei Denshi Kogyo Kabushiki Kaisha: *See—*
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- Kyowa Hakko Kogyo Co., Ltd.: *See—*
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- Labann Corporation: *See—*
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- Ladany, Ivan; and Cannuli, Vincent Michael, to RCA Corporation. Deposition of epitaxial layer from the liquid phase. 3,891,478, Cl. 148-171.000.
- Ladd, Floyd N.; and Stacy, Donald G., to Ford Motor Company. Window regulator mechanism. 3,890,742, Cl. 49-350.000.
- Ladusaw, William T., to General Electric Company. Suction valve for rotary compressor. 3,891,358, Cl. 418-63.000.
- Laffitte, Royce D., to Eastman Kodak Company. Process for preparing alpha-trichloride particles. 3,891,746, Cl. 423-492.000.
- Lagerstrom, Gunnar, to Atlas Copco Aktiebolag. Method and device for drilling to a predetermined surface. 3,891,039, Cl. 175-40.000.
- Lakah, Lucien: *See—*
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- Lakin, Charles T.; and Leighty, William J., to Martin Marietta Corporation. Reference insertion device. 3,891,314, Cl. 353-101.000.
- Lamberet, Paul. Equipment for manufacturing stratified isothermal panels. 3,891,484, Cl. 156-60.000.
- Lambou, Madeline G.; Spadaro, James J.; and Rusch, Eunice M., to United States of America, Agriculture. Foam producing composition containing whey solids. 3,891,571, Cl. 252-354.000.
- Lamer, Gerald P.; and Holmes, Terry M., to J. I. Case Company. Boom members having stiffener elements for crane boom constructions. 3,890,757, Cl. 52-695.000.
- Lamy, Jacques Edouard, to C. J. Doris. Anti-heave protective system. 3,890,790, Cl. 61-3.000.
- Lance, James W.; and Jones, Henry M., to Mangrove Enterprise, Incorporated, The. Material treatment by cryogenic cooling. 3,891,477, Cl. 148-125.000.
- Landa, Isaac: *See—*
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- Landry, Lawrence A.: *See—*
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- Landstorfer, Friedrich: *See—*
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- Lane, Charles E., III, to Honeywell, Inc. Method of making thermal recording print head. 3,890,702, Cl. 29-611.000.
- Lanes, Nathan. Container-cap applying machine. 3,890,851, Cl. 74-400.000.
- Langkau, John Frank, to Union Carbide Corporation. Galvanic cell structure. 3,891,462, Cl. 136-111.000.
- Langley, Robert; and Barraclough, Ronald, to Ciba-Geigy Corporation. Phythlocyanine pigments. 3,891,455, Cl. 106-288.00Q.
- Larsen, Eric R.; and Ecker, Ernest L., to Dow Chemical Company, The. Brominated pentaerythritolic polyesters and process therefor. 3,891,605, Cl. 260-75.00H.
- Larson, Clayton E., to White Metal Rolling & Stamping Corporation. Ladder stabilizers. 3,891,054, Cl. 182-107.000.
- Laskaris, Evangelos T., to General Electric Company. Superconducting rotor. 3,891,875, Cl. 310-40.000.
- Latta, Bruce M.; and Willard, John J., Jr., to J. P. Stevens and Co., Inc. Method for checking the yarn pattern in a fabric. 3,891,387, Cl. 8-18.000.
- Latva, Henry F., to Chrysler Corporation. Heat treating atmospheres. 3,891,473, Cl. 148-16.700.
- Laub, Joseph L.; and Hurst, John F., to Unitek Corporation. Pulse heated thermocompression bonding apparatus. 3,891,822, Cl. 219-85.000.
- Lauer, William: *See—*
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- Laurizio, Jeremiah J., to American Flange & Manufacturing Co., Inc. Plastic bonded closure. 3,891,118, Cl. 220-288.000.
- Lavarini, Bernard; Crancon, Jean-Pierre; and Thomas, Jean-Yves, to Compagnie Generale d'Electricite. Gas laser generator with discharge container gas flow circulation. 3,891,944, Cl. 331-94.50G.
- Lavaux, Jean-Paul: *See—*
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- Lawall, Thomas R.; and Porter, Edward S., to Fuller Company. Apparatus for calcining raw material. 3,891,382, Cl. 432-58.000.
- Lawrence, Raymond Keith, to Girling Limited. Brake shoes. 3,891,069, Cl. 188-250.00G.
- Lawson, Gustaf Rudolph; and Stuart, John H., to AMP Incorporated. Wire stripper. 3,890,858, Cl. 81-9.50R.
- Lawson, Richard, to Ames Rubber Corporation. Method of forming precisely dimensioned apertures. 3,891,739, Cl. 264-155.000.
- Layne, Gilbert S.; and Huml, James O., to Dow Chemical Company, The. Process for the preparation of metal and metal fluoride products. 3,891,690, Cl. 423-465.000.
- Lea, Darrel Bernard: *See—*
  - Lea, Darrell Bernard; and Klein, Laszlo, 3,890,725.
- Lea, Darrell Bernard; and Klein, Laszlo, to Lea, Darrel Bernard; Marcus, Robert Phillips; and Gilman, Howard lee. Shoe construction. 3,890,725, Cl. 36-11.500.
- Leaman, Harold E.: *See—*
  - Roberson, Cletis L.; Russell, Robert G.; Stream, Ralph M.; and Leaman, Harold E., 3,890,925.
- Lebryk, Matthew J. Method of forming a cotter key hole in a bolt. 3,890,663, Cl. 10-27.00R.
- Lectromelt Corporation: *See—*
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- Lee, Edward, to Solv-X Inc. Cleaning assembly for automotive parts and the like. 3,890,988, Cl. 134-111.000.
- Lee, Harvey H. Anchor and insulation arrangement for conduit. 3,891,006, Cl. 138-106.000.
- Lee, Herschel D., Jr.: *See—*
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- Lee, Herschel D., Sr.; and Lee, Herschel D., Jr. Adjustable porch and steps. 3,891,052, Cl. 182-88.000.
- Lee, James Y., to Burroughs Corporation. Multi-position character display panel having display cathodes and auxiliary cathodes and circuits for operating the same. 3,891,983, Cl. 340-336.000.

- Lee, Lieng Huang, to Xerox Corporation. Heterophase adhesive compositions containing chlorosulfonated polyethylene for metal-selenium composites. 3,891,435, Cl. 96-1.500.
- Lee, Wooyoung, to Mobil Oil Corporation. Apparatus for optimizing multiunit processing systems. 3,891,836, Cl. 235-151.120.
- Leeson, Thomas A.; and Hamilton, Mark Scott. Safety syringe. 3,890,971, Cl. 128-218.00R.
- Lehikoinen, U. Albert: *See—*
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- Lehmann, Adolf, to Daimler-Benz Aktiengesellschaft. Lock mechanism. 3,891,252, Cl. 292-6.000.
- Leighty, William J.: *See—*
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- Lenert, Richard W.: *See—*
  - Ishman, Neal H.; Lenert, Richard W.; and Goldman, Jeffrey B., 3,891,926.
- Lenk, Erich, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Spinning head with an exchangeable, self-sealing nozzle assembly. 3,891,379, Cl. 425-464.000.
- Lenzkes, Dieter; and Seiler, Karl-Heinz, to Siemens Aktiengesellschaft. Actuating mechanism for sliding doors. 3,891,907, Cl. 318-369.000.
- Leo, Jack D.; and Benedict, Lee. Hydraulically operated hitch for towing and positioning mobile homes. 3,891,239, Cl. 280-479.00R.
- Leonard, Ronald J.; and Takagishi, Jonathan Wayne, to Baxter Laboratories, Inc. Cardiotomy reservoir. 3,891,416, Cl. 55-178.000.
- Leonard, Sidney H., Jr., to Leonard, Sidney H., Sr., a part interest. Tie button. 3,890,678, Cl. 24-49.00C.
- Leonard, Sidney H., Sr.: *See—*
  - Leonard, Sidney H., Jr., 3,890,678.
- Leonard, Verna M. Octave locator for keyboard and note reading. 3,890,875, Cl. 84-471.000.
- Leone, William C.: *See—*
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- Lepagnol, Guy Pierre: *See—*
  - Daguet, Jacques Lucien; Bellanger, Maurice Georges; and Lepagnol, Guy Pierre, 3,891,803.
- Lerner, Martin L., to Zenith Radio Corporation. Apparatus for re-etching a color cathode ray tube shadow mask. 3,891,491, Cl. 156-345.000.
- Lesetar, Alexander C. Hair dryer with rotary brush. 3,890,984, Cl. 132-9.000.
- Lesny, Lucian J.: *See—*
  - Herr, Kurt F.; Heck, Dennis A.; Lesny, Lucian J.; and Ward, Ronald L., 3,891,838.
- Lester, John M.: *See—*
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- Leto, Alfred R.: *See—*
  - Belmuth, Harold; and Leto, Alfred R., 3,891,378.
- Lett, Laurence W. Brake shoe hold down spring tool. 3,891,185, Cl. 254-10.500.
- Leutwyler, Robert: *See—*
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- Lever Brothers Company: *See—*
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  - Pryce, Alan, 3,891,689.
- Levert, Henri: *See—*
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- Levin, Herman: *See—*
  - United States of America, National Aeronautics and Space Administration; Levin, Herman; Auker, Byron H.; and Gardos, Michael N., 3,891,452.
- Levin, Robert E., to GTE Sylvania Incorporated. Method of making a controlled-diffusion stippled reflector by sag molding. 3,891,421, Cl. 65-107.000.
- Leviton Manufacturing Co., Inc.: *See—*
  - Poliak, John M.; and Lopez, Juan M., 3,891,297.
- Lewis, Clarke H.: *See—*
  - Richardson, John L.; Brodie, Alexander O.; and Lewis, Clarke H., 3,891,556.
- Lewis, John; and Gilmour, William Dudley, to Lewis Security Systems, Ltd. Security systems. 3,891,980, Cl. 340-258.00D.
- Lewis Security Systems, Ltd.: *See—*
  - Lewis, John; and Gilmour, William Dudley, 3,891,980.
- Lewis, Terence E.: *See—*
  - Hawley, William L.; and Lewis, Terence E., 3,891,175.
- Lhenry, Bernard, to Creusot-Loire. Apparatus for shearing the edges of a sheet of metal. 3,890,862, Cl. 83-71.000.
- Li, Chou H. Method of making reinforced metal matrix composites having improved load transfer characteristics and reduced mismatch stresses. 3,890,690, Cl. 29-404.000.
- Licentia-Patent-Verwaltungs-G.m.b.H.: *See—*
  - Beneking, Heinz, 3,891,993.
  - Messerschmidt, Jurgen; and Schimmer, Rigobert, 3,891,483.
- Licentia Patent-Verwaltungs-GmbH: *See—*
  - Marquardt, Jurgen; and Pivit, Erich, 3,891,949.
  - Offermann, Bernd Peter, 3,891,855.
  - Schoberl, Werner, 3,891,858.
- Liconix: *See—*
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  - Hawkins, Joseph D., 3,891,308.
- Lieberman, Gilbert: *See—*
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- Liedhegener, Friedel: *See—*
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- Lif-O-Gen, Inc.: *See—*
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- Lile, Pleasant M. Wire gate latch. 3,891,254, Cl. 292-113.000.
- Limberg, Allen Leroy, to RCA Corporation. Transistor biasing arrangement. 3,891,935, Cl. 330-22.000.
- Lin, Din-Min. Method of embossing with manually adjustable patterns or designs. 3,891,485, Cl. 156-63.000.
- Linck, Drew W.: *See—*
  - Wilkerson, Joseph B.; and Linck, Drew W., 3,891,163.
- Lind, Wilton H.: *See—*
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  - Meinke, Hans Heinrich; Flachenecker, Gerhard; Landstorfer, Friedrich; Lindenmeier, Heinz; and Fastenmeier, Karl, 3,891,319.
- Lintzenich, Vincent C., to Shell Oil Company. Phosphoramidate derivatives. 3,891,667, Cl. 260-308.00R.
- Liogonky, Boris Izrailevich: *See—*
  - Berlin, Alfred Anisimovich; Liogonky, Boris Izrailevich; and Zapadinsky, Boris Isaakovich, 3,891,633.
- Lion Fat & Oil Co., Ltd.: *See—*
  - Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhiro; and Nagayama, Masuzo, 3,891,683.
- Lipe, Gordon C.; and Abbott, William S. Audio-visual warning system. 3,891,986, Cl. 340-371.000.
- List, Hans. Internal combustion engine with indirect fuel injection. 3,890,940, Cl. 123-32.00C.
- Lista, Edwin L.; and Williams, Kenneth S., to Aerojet-General Corporation. Staple orienting apparatus. 3,890,877, Cl. 86-1.000.
- Litton Systems, Inc.: *See—*
  - Tuffias, Robert H., 3,891,282.
- Lively, Gerald W.: *See—*
  - Hohman, Alvin E.; and Lively, Gerald W., 3,891,456.
- Livezey, Jack A.: *See—*
  - Amelio, Gilbert F.; Livezey, Jack A.; and Salsbury, Phillip J., 3,891,977.
- Lloyd, E. J.: *See—*
  - Shackelford, Albert D.; Holladay, John H.; and Lloyd, E. J., 3,891,097.
- Lock, David A.: *See—*
  - Field, Peter G. S.; and Lock, David A., 3,891,711.
- Loepiktie, Stephanus F.: *See—*
  - Baker, Richard J.; Miller, Timothy A.; Erlinger, Gary K.; Loepiktie, Stephanus F.; and Hanselman, Larry R., 3,891,774.
- Loesch, Claude E.: *See—*
  - Loesch, Leo J.; and Loesch, Claude E., 3,891,120.
- Loesch, Leo J.; and Loesch, Claude E. Operation monitor for air pressure type seed planter. 3,891,120, Cl. 221-2.000.
- Lohr, Raymond J.: *See—*
  - Auer, Robert Thomas; Campbell, Laurie Jay; Lohr, Raymond J.; and Smith, James, 3,891,234.
- Loikitz, Frank, to Buildex Incorporated. Cross brace interlock. 3,891,334, Cl. 403-234.000.
- Lombardino, Joseph G., to Pfizer Inc. Process for the production of carboxamides of oxo-1,2-benzothiazine-1,1-dioxides. 3,891,637, Cl. 260-243.00R.
- Londontown Manufacturing Co., The: *See—*
  - Mager, Julian, 3,891,204.
- Lonza Ltd.: *See—*
  - Nicolet, Rene; and Gutmann, Walter, 3,891,723.
- Looger, Lonnie L.; and Vickers, Wiley B., to United States of America, Army. Anti-tank launcher. 3,890,879, Cl. 89-1.816.
- Loose, Guenter H.; Diesel, William J.; and Graczyk, Thadeus S., to Eastman Kodak Company. Ultrasonic marking. 3,890,892, Cl. 101-32.000.
- Lopez, Juan M.: *See—*
  - Poliak, John M.; and Lopez, Juan M., 3,891,297.
- Lopez, Oscar. Saliva ejector. 3,890,712, Cl. 32-33.000.
- Lorenz, Walter; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. O-alkyl-O-6-[p-halophenyl]-pyridazinyl-[3]-thiono-phosphoric (phosphonic) acid esters. 3,891,642, Cl. 260-250.0AP.
- Lormand, Jerome D.: *See—*
  - Eagleton, Harold N.; Lormand, Jerome D.; and Herring, Joe S., 3,890,693.
- Louisiana-Pacific Corporation: *See—*
  - Johnson, Waldo O.; and Buynak, Robert G., 3,890,741.
- Love Oil Company, Inc.: *See—*
  - Smith, Owen; and Holder, James F., 3,891,394.
- Lowther, Frank E., to Purification Sciences Inc. Corona generator apparatus. 3,891,561, Cl. 250-541.000.
- Lubbock, Frederick John: *See—*
  - Kershaw, Robert William; Lubbock, Frederick John; and Polgar, Livia, 3,891,577.
- Lucas Aerospace Limited: *See—*
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- Lucas Electrical Company Ltd., The: *See—*
  - Harris, John Derek; and Wood, Francis Roy, 3,891,881.
  - Southgate, John Peter, 3,891,888.

Lucasey, Joseph A.; and Boscacci, William L., to Lucasey Manufacturing Corporation. Portable elevator apparatus. 3,891,063, Cl. 187-11.000.

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Lunsford, Carl Dalton; and Cale, Albert Duncan, Jr., to A. H. Robins Company, Incorporated. 5-(2-Aminoethyl)-2,3-dioxopiperazines. 3,891,646, Cl. 260-268.0DK.

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Lutz, Gerhard: *See—*
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Lycett, Peter; and Kempson, Kenneth William, to Bloxwich Lock and Stamping Company Limited, The. Doors for containers and the like. 3,891,112, Cl. 220-1.500.

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MacNeilage, George C. Earthquake actuated fluid flow obstructing device. 3,890,993, Cl. 137-45.000.

Maconachie, Ian Christy, to Reinforced Shuttlecocks Limited. Shuttlecocks. 3,891,215, Cl. 273-106.00A.

Madag Maschinen- und Apparatebau Dietikon AG: *See—*
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Maier, Jorg: *See—*
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Maki, Naoki, to Hitachi, Ltd. Linear synchronous motor for magnetically levitated vehicle. 3,890,906, Cl. 104-148.0SS.

Malloy, Richard J., to United States of America, Navy. Laser controlled fathometer. 3,890,840, Cl. 73-290.00V.

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Manitowoc Company, Inc., The: *See—*
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Marciniak, Harry W.; Carlson, Richard D.; and Dever, James L., to Hooker Chemicals & Plastics Corporation. Fire retardant polymer compositions. 3,891,599, Cl. 260-45.70R.

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Marcus, Robert Phillips: *See—*
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Marcus, Thomas J., to Rockwell International Corporation. Tracker unit. 3,891,798, Cl. 178-6.800.

Marcussen, Henry; and Marcade, Rogue D., to Whirlpool Corporation. Washing apparatus with auxiliary distributor. 3,890,987, Cl. 134-57.00D.

Marcussen, Henry, to Whirlpool Corporation. Manual screen filter for automatic washer and method. 3,891,548, Cl. 210-65.000.

Mardiguian, Jean; and Fournier, Pierre, to Societe anonyme dite: MAR-PHA, Societe d'Etude et d'Exploitation de Marques. Heparin esters. 3,891,622, Cl. 260-211.00R.

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Marforio, Nerino, to Virginio Rimoldi & C. S.p.A. Detector device of thread breakage on a sewing machine. 3,891,812, Cl. 200-61.180.

Margen, Peter Heinrich Erwin, to Aktiebolaget Atomenergi. Method and means for heating buildings in a district heating system with waste heat from a thermal power plant. 3,890,787, Cl. 60-648.000.

Marion Health & Safety, Inc.: *See—*
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Maroschak, Ernest J. Method of making corrugated plastic pipe with integral coupler collars. 3,891,733, Cl. 264-40.000.

Marquardt, Jurgen; and Pivit, Erich, to Licentia Patent-Verwaltungs-GmbH. Slit line-type microwave circuit construction. 3,891,949, Cl. 333-84.00R.

Marquette, John L. Plug-in equipment shipping container and rack system. 3,891,288, Cl. 312-338.000.

Marsh, Alexander J.; and Sargent, Henry O., to Reynolds Metals Company. Method of making a heat shrinkable film of polyethylene copolymers thereof and article produced therefrom. 3,891,737, Cl. 264-95.000.

Marshall, Tommy G., to McDonnell Douglas Corporation. Washer for electrically connecting the tubes of a fluid line. 3,891,290, Cl. 339-15.000.

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Mason, John A., to Anderson Company, The. Wiping element of a wiper blade. 3,890,667, Cl. 15-250.420.

Mason, Ronald C.: *See—*
Babson, Edward S.; Brennan, John W.; Gorini, Robert F.; and Mason, Ronald C., 3,890,911.

Masuda, Shigeo; and Tanaka, Toshihiko, to Sumitomo Electric Industries, Ltd. Method of electrocoating electric wire. 3,891,526, Cl. 204-181.000.

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Masyc AG: *See—*
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Mata, Justo Martinez; and Stapley, Edward O., to Merck & Co., Inc. Antibiotic prenomycin and process of producing the same. 3,891,753, Cl. 424-118.000.

Mata, Justo Martinez: *See—*
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Mathis, Cleo L. Whirlpool jet for bathtubs. 3,890,656, Cl. 4-178.000.

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Matsumura, Koichi: *See—*
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Matuszak, Michael L.: *See—*
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Maurer, John R., to Plummer, Walter A. Kit of components and a method of protecting steel piling from corrosion. 3,890,795, Cl. 61-54.000.

Maxwell, Jerome Eugene, to TRW Inc. Multi-function digital counter/-timer. 3,891,973, Cl. 340-172.500.

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McCartney, Charles P., Jr.; and Willmann, Norman L., to General Motors Corporation. Negative lead-acid battery plates with expanded lead sheet grids. 3,891,459, Cl. 136-26.000.

McCarty, Michael, to Special Metals Corporation. Desulfurization of transition metal alloys. 3,891,425, Cl. 75-10.00V.

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McCoy, Archibald Henry Richard. Method and means for adjusting the elevation of manhole covers. 3,891,337, Cl. 404-26.000.

McDonald, Charles H. Elastomeric pavement repair composition for pavement failure and a method of making the same. 3,891,585, Cl. 260-28.5AS.

McDonald, Michael P.: *See—*
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McFarlan, Edward Russell, to McFarlan, Alden I. Air conditioning system and method utilizing humidification of the air. 3,891,027, Cl. 165-2.000.

McFarland, James W., to Pfizer Inc. ω-(3-Hydroxyphenyl)substituted amidines and derivatives thereof as anthelmintic agents. 3,891,698, Cl. 260-501.140.

McGregor, Walter, to Ethicon, Inc. Controlled release suture. 3,890,975, Cl. 128-339.000.

McGuire, Robert D.: *See—*
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McInerney, Michael J.; Brady, Robert T.; and Phillips, Alvia E., to Vapor Corporation. Hot water generator for shock testing fabricated piping components. 3,890,936, Cl. 122-248.000.

McIntosh, Alex A. Rotary engine with improved seal and timing mechanism providing linear acceleration between pistons during the power stroke. 3,890,939, Cl. 123-8.470.

McKay, Donald R.; and Swinkels, Godefridus M., to Cominco Ltd. Hydrometallurgical process for treating copper-iron sulphides. 3,891,522, Cl. 204-108.000.

McKenzie, James M.; and Sachs, Jeffrey L., to Draf Tool Co., Inc. Automatic temperature control system analyzer. 3,890,836, Cl. 73-168.000.

McKenzie, Thomas J. Surface texture modification device for carpets. 3,890,666, Cl. 15-142.000.

McMahon, Donald H., to Sperry Rand Corporation. Coherent optical processor apparatus with improved fourier transform plane spatial filter. 3,891,968, Cl. 340-146.30E.

McMillian, Lonnie S.: *See—*
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Mechanical Technology Incorporated: *See—*
Roters, Herbert C., deceased; and Roters, Mary D., executrix, 3,891,874.

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Mehta, Shashi Pal, to Abbott Laboratories. Dosage formulation for erythromycin cetyl sulfate. 3,891,755, Cl. 424-157.000.

Meinke, Hans Heinrich; Flachenecker, Gerhard; Landstorfer, Friedrich; Lindenmeier, Heinz; and Fastenmeier, Karl, to Eltro GmbH Gesellschaft Fuer Strahlung Stechnik. Receiver for impulse-shaped light signals. 3,891,319, Cl. 356-5.000.

Melhose, Alfred E., to Bell Telephone Laboratories, Incorporated. Coding device with light responsive key generator. 3,891,799, Cl. 178-22.000.

Melnick, Irving. Impregnated magnetic flap valve. 3,891,000, Cl. 137-525.300.

Melphor Inc.: *See—*
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Mennuto, Anthony R. Door assembly including insert storing means. 3,891,020, Cl. 160-37.000.

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Merck Sharp & Dohme (I.A.) Corporation: *See—*
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Merrick, Joseph M. Method of rapid identification of gram-negative bacteria. 3,891,508, Cl. 195-103.500.

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Messerschmidt, Jurgen; and Schimmer, Rigobert, to Licentia-Patent-Verwaltungs G.m.b.H. Method for etching semiconductor surfaces. 3,891,483, Cl. 156-3.000.

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Meyer, Georg Michael, to Deutsche Babcock & Wilcox Aktiengesellschaft. Method and apparatus for the production of nitrogen for use as an inert gas. 3,891,411, Cl. 55-26.000.
Meyerhoff, Walter: *See—*
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Michel, Phlippoteau, to Scal (Societe de Conditionnement en Aluminum). Punch for manufacturing flexible conical tubes. 3,890,822, Cl. 72-273.000.
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Mihailovski, Alexander, to Stauffer Chemical Company. Thioureido Sulfonanilide compositions. 3,891,688, Cl. 260-455.00A.
Mikhael, Wasfy Boushra; and Keys, Lloyd Kenneth, to Northern Electric Company Limited. Functionally tunable active low-pass filter. 3,891,938, Cl. 330-107.000.
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Miller, Arthur O., to Hewlett-Packard Company. Wire pair identification system. 3,891,811, Cl. 179-175.30A.
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Miller, Eugene J.: *See—*
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Miller, Laurence B.; and Crook, James D., to Digmor Equipment & Engineering. Scarifier and scraper attachment for a tractor. 3,891,035, Cl. 172-197.000.
Miller, Timothy A.: *See—*
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Miller, Wayne Russel; and Lucke, Robert James, Jr., to Deere & Company. Flow-sensing switch for backup steering system. 3,890,995, Cl. 137-113.000.
Millett, James A. Door lock assembly. 3,891,255, Cl. 292-169.130.
Millett, James A.: *See—*
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Milliken, Paul E., to Goodyear Tire & Rubber Company, The. Hay conditioner roll. 3,890,770, Cl. 56-1.000.
Mills, Justin W., Jr.; and Betzler, Mark H., to Lif-O-Gen, Inc. Cutting-welding torch. 3,891,195, Cl. 266-23.00P.
Mills, Robert H.; and Raube, Richard R., to Monsanto Company. Plasticizer purification. 3,891,694, Cl. 260-475.00B.
Miloscia, William J.; Weisz, John J.; and Planz, Paul E., to Standard Oil. Company. Process for manufacture of impact-resistant polymerizates of olefinic nitriles and diene rubbers. 3,891,722, Cl. 260-879.000.
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Mogensen, Palne; and Kaij, Mats J., to AGA Aktiebolag. Arrangement in a reactor for plasma-chemical processes. 3,891,562, Cl. 250-547.000.
Molyneux Engineering Company Limited: *See—*
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Montague, Donald J. Safety resilient slip coupling for pierced earrings. 3,890,800, Cl. 63-13.000.
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Moorehead, Harvey Robert, to Deseret Pharmaceutical Co., Inc. Blood-gas sampler. 3,890,956, Cl. 128-2.00F.
Morane, Bruno; and Gueret, Jean Louis, to Societe Anonyne dite: L'Oreal. Device for storing two products separately and subsequently mixing them. 3,891,125, Cl. 222-129.000.
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Moss, Norman; Martin, Barrie James; and Broad, Michael John, to Plessey Handel und Investments A.G. Heat exchange apparatus with gas chamber below heat exchange bed. 3,890,935, Cl. 122-4.00D.
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Munakata, Katsura; Oda, Takeshi; Mori, Toshito; and Ito, Hisakatu, to Kowa Company, Ltd. Antibiotic substance and process for its preparation. 3,891,506, Cl. 195-80.00R.
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Nagata, Takashi; and Mindlin, Raymond David, to Matsushita Electric Industrial Co., Ltd. Thickness-extensional mode piezoelectric resonator with poisson's ratio less than one-third. 3,891,872, Cl. 310-9.500.
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Needham, Donald G.; and Hill, George R., to Phillips Petroleum Company. Rotational molding of crosslinkable polymers. 3,891,597, Cl. 260-42.210.
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Neises, Reuben J., to Stertz, Leroy F., a part interest. Bottle receiving apparatus. 3,891,080, Cl. 198-43.000.
Nelson, Gerald Verdell; and Wray, Glenn Cooper, to Texaco Inc. Hydrocracking process for converting heavy hydrocarbon into low sulfur gasoline. 3,891,539, Cl. 208-59.000.
Nelson, Norman E., to Minnesota Mining and Manufacturing Company. Guide roller biasing shim liner. 3,891,159, Cl. 242-199.000.
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Nihira, Shohachi, to Citizen Watch Company Limited. Electromagnetically-operated printer. 3,890,894, Cl. 101-93.180.
Nilberg, Reinhold Hermann. Apparatus for centering irregular peeler logs. 3,891,016, Cl. 144-209.00A.
Ninomiya, Tomokazu; and Hirata, Nobuhiro, to Mitsui Petrochemical Industry Ltd. Apparatus for imparting an oblique orientation to tubular film. 3,891,374, Cl. 425-326.00R.
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Nishio, Kazuo; and Bird, Paul G., to Wright Chemical Corporation. Method and composition for control of corrosion and scale formation in water systems. 3,891,568, Cl. 252-181.000.
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Nordenholt, George F. Sealant applying apparatus. 3,890,922, Cl. 118-7.000.
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Novak, Leo J.; and Myers, William A., III. Crustacean waste water product recovery process. 3,891,780, Cl. 426-657.000.
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Ohtsuka, Tetsuro: *See—*
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Oicles, Jeffrey A., to TRW Inc. Digital speed control. 3,891,046, Cl. 180-105.00E.
Oigarden, Tarald H.; Teltscher, Erwin S.; and Gross, Robert D., to Sperry Rand Corporation. Drone control system with pulse position encoding. 3,891,985, Cl. 340-353.000.
Oil States Rubber Co.: *See—*
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Oishi, Kazuo; Ando, Noriyoshi; and Yoshida, Hiroshi, to Nippondenso Co., Ltd. Electrical fuel injection control system for internal combustion engines. 3,890,938, Cl. 123-32.0EA.
Oishi, Yasushi: *See—*
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Oka, Teruhiko; and Fujii, Masamichi, to Mitsubishi Jukogyo Kabushiki Kaisha. Multilayer paper making machine. 3,891,501, Cl. 162-290.000.
Okada, Yoshiyuki: *See—*
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Okamoto, Tadashi; Kobayashi, Tsuyoshi; and Yamamoto, Hisao, to Sumitomo Chemical Co., Ltd. 1-Substituted benzo(b) azocine derivatives and their acid addition salts. 3,891,626, Cl. 260-239.0BB.
Okazaki, Hiroyuki; Yuji, Isao; and Yui, Masayuki, to Sumitomo Chemical Co., Ltd. Thermoplastic traffic paint. 3,891,451, Cl. 106-30.000.
Okuhara, Shinzi; Kusano, Masaaki; and Kawanami, Mitsuru, to Hitachi, Ltd. Highly sensitive gate-controlled pnpn switching circuit. 3,891,866, Cl. 307-252.00A.
Oleck, Stephen M.; Stein, Thomas R.; Sherry, Howard S.; and Milstein, Donald, to Mobil Oil Corporation. Process for demetalizing and desulfurizing residual oil with hydrogen and alumina-supported catalyst. 3,891,541, Cl. 208-89.000.
Olin Corporation: *See—*
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Olsen, Charles R. Normally open valve construction having a deformable bladder. 3,890,994, Cl. 137-67.000.
Olson, Carroll G. Wagon with elongate conveyor housing as unloader and drayage hitch. 3,891,109, Cl. 214-519.000.
O'Melia, Frances C., to Dow Chemical Company, The. Nematicidal compositions comprising 2-chloro-6-methoxy-4-(trichloromethyl)-pyridine and 2,2-dimethyl-2,3-dihydrobenzofuranyl-7-N-methyl carbamate. 3,891,760, Cl. 424-263.000.
Ondetti, Miguel Angel, to E. R. Squibb & Sons, Inc. Hypotensive β-homoaminoacid nonapeptides. 3,891,616, Cl. 260-112.500.
O'Neal, Cothburn M.; and Mayo, Alfred M., to Riverside Press, Inc. Method of severing corners and punching cards. 3,891,141, Cl. 234-1.000.
O'Neil, James D.: *See—*
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Ono, Taiichi. Waste paper container. 3,891,115, Cl. 220-260.000.
Oonishi, Masayoshi: *See—*
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Opdahl, Everett W.; and Kim, Chang-Kyo, to United States of America, Navy. External launcher for underwater weapon. 3,890,919, Cl. 114-239.000.
Orsulak, Joseph. Safety shield and compartmentizer. 3,891,263, Cl. 296-24.00R.
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Pancella, Vincent A. Hydraulic transmission motor vehicle. 3,891,045, Cl. 180-66.00R.
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Paranto, Archie V., to Barco International Corporation of Texas. Automatic fluid dispersing apparatus. 3,891,122, Cl. 222-17.000.
Parkin, Bernard A., Jr.; and Schuller, Walter H., to United States of America, Agriculture. Polymerized rosin product and process for the production of same. 3,891,612, Cl. 260-99.500.
Parkin, William J., to Sanders Associates, Inc. Photosensitive tracker including means for producing an output in accordance with a plurality of radiation characteristics. 3,891,843, Cl. 250-203.00R.
Parsonage, Harry N.: *See—*
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Penninger, William. Storm-lightning detector. 3,891,919, Cl. 324-72.000.

Penny, Robert Noel. Regenerative heat exchanger. 3,891,028, Cl. 165-6.000.
Perfection Corporation: *See—*
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Perry, L. F., Jr., to Century Industries, Inc. Mobile apparatus to mix and deliver concrete compositions or the like. 3,891,193, Cl. 259-165.000.
Perry, Robert H., to Westinghouse Electric Corporation. Vehicle presence detection in a vehicle control system. 3,891,167, Cl. 246-34.00R.
Persson, Gert Artur: *See—*
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Petersen, Harro; Erhard, Paulus; Queins, Hubertus; and Schoeppl, Hubert, to BASF Aktiengesellschaft. Rubber mixtures showing improved surface tack. 3,891,608, Cl. 260-80.780.
Petersen, Kaj Ditlev Frederik: *See—*
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Petersilie, Frank W., to Investments and Innovative Concepts, Inc. Fold-open convertible occupant-receiving unit of furniture. 3,890,658, Cl. 5-2.00B.
Peterson, Marvin A.; Good, Adrian J.; and Kurek, Thaddeus P., to Valspar Inc.; and General Electric Company. Process for producing water soluble polyamide resins. 3,891,601, Cl. 260-47.0CP.
Peterson, Warren J., to Joerns Furniture Company. Vertically adjustable overbed table. 3,890,907, Cl. 108-136.000.
Peterson, William H., to Pullman Incorporated. Hopper car door closure improvement. 3,891,101, Cl. 214-63.000.
Petrie, Gordon D. Clamping device. 3,891,093, Cl. 211-46.000.
Petrovich, Vojislav. Iminophenols as froth flotation reagents for metallic ores. 3,891,545, Cl. 209-166.000.
Petrusson, Erling Olav Valdemar, to AB Teleplan. Method and device for determining the existence and the time position of main peaks appearing in an electronic signal. 3,891,930, Cl. 328-117.000.
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  McFarland, James W., 3,891,698.
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Phillipps, Gordon Hanley; Bain, Brian MacDonald; and Durrant, Graham, to Glaxo Laboratories Limited. Process for preparing 17α-monoesters of 17α, 21-dihydroxy-20-oxo steroids. 3,891,631, Cl. 260-239.55R.
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Picker Corporation: *See—*
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Pilet, Charles; and Bonneau, Marc, to Institut Merieux. Vaccines and processes for their preparation. 3,891,751, Cl. 424-87.000.
Pilewski, John J.; Plotz, Lawrence F.; and Pruisman, Richard A., to Vector Corporation. Tablet press. 3,891,375, Cl. 425-344.000.

- Pillsbury Company, The: *See—*
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- Pitner, Alfred, to Nadella, a part interest. Rolling bearing assembly, in particular for a steering shaft of an automobile vehicle. 3,890,854, Cl. 74-492.000.
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- Plat, Michel Marie Rene; Plat, Monique, nee Berry; Cahn, Jean; and Tisseyre, Pierre Georges Christian, to Synthelabo. Apovincaminic acid amines and acid addition salts thereof. 3,891,640, Cl. 260-247.5FP.
- Plat, Monique, nee Berry: *See—*
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- Poliak, John M.; and Lopez, Juan M., to Leviton Manufacturing Co., Inc. Electrical connector for attachment to multi-conductor cable. 3,891,297, Cl. 339-270.00R.
- Pollmeier, Werner, to Nixdorf Computer AG. Methods and circuit arrangements for smoothing pulsating voltages. 3,891,904, Cl. 318-254.000.
- Polychrome Corporation: *See—*
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- Pracilio, Francis Paul, to Educational Machinery Corporation. Apparatus for teaching vacuum forming and pressure forming. 3,891,369, Cl. 425-174.000.
- Prahl, Jan, to Ipos Gesellschaft fur Integrierte Prothesenentwicklung und Orthopadietechnischen Service m.b.H. & Co. K.G. Artificial foot for leg prostheses. 3,890,650, Cl. 3-7.000.
- Pratt, Winthrop B.: *See—*
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- Prudence, Robert T., to Goodyear Tire & Rubber Company, The. Block polymers of styrene-butadiene-2-vinylpyridine. 3,891,721, Cl. 260-879.000.
- Pruisman, Richard A.: *See—*
  - Pilewski, John J.; Plotz, Lawrence F.; and Pruisman, Richard A., 3,891,375.
- Pruvot, Francois C., to Regie Nationale des Usines Renault; and Automobiles Peugeot. Self-feeding hydrostatic. 3,891,283, Cl. 308-5.00R.
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  - Weil, Sanford A.; Tarman, Paul B.; and Punwani, Dharamvir, 3,891,404.
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- Radu, Stefan I., to Intreprinderea Mecanica de Utilaje Medcidia. Method and a device for reducing the pipe diameter. 3,890,823, Cl. 72-402.000.
- Ralston Purina Company: *See—*
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- Ramsey, Harold Eugene, to du Pont de Nemours, E. I., and Company. Vacuum skin packaging method. 3,890,761, Cl. 53-22.00A.

- Ramsey, Maynard, III, to Ramtech, Inc. Disposable manometer. 3,890,842, Cl. 73-420.000.
- Ramsey, Maynard, III, to Ramtech, Inc. Disposable manometer. 3,890,962, Cl. 128-2.05D.
- Ramtech, Inc.: *See—*
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  - Ramsey, Maynard, III, 3,890,962.
- Rao, Ganta V.; and Gerrish, Oliver B., Sr., to Far-Mar-Co., Inc. Process for separation of whole wheat kernel components to isolate the gluten employing water. 3,891,613, Cl. 260-112.00G.
- Rao, Hattangady Vasanth; and Doss, Ravindra Nath. Inverter. 3,891,913, Cl. 321-45.00R.
- Rapson, John Edward, to Hovercraft Development Limited. Skirts of gas cushion vehicles. 3,891,047, Cl. 180-117.000.
- Rast, Howard E.; and Caspers, Hubert H., to United States of America, Navy. Dye laser transmitter-resonant fluorescent detector system for optical communications. 3,891,559, Cl. 250-199.000.
- Raube, Richard R.: *See—*
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- Ray-Chaudhuri, Dilip K.; Schoenberg, Jules E.; and Flanagan, Thomas P., to National Starch and Chemical Corporation. Water-dispersible hot melt adhesives and products using same. 3,891,584, Cl. 260-27.00R.
- Ray-Chaudhuri, Dilip K., to National Starch and Chemical Corporation. Process for preparing stable high solids aqueous solution of cationic thermosetting resins. 3,891,589, Cl. 260-29.2EP.
- Ray-Chaudhuri, Dilip K.; Georgoudis, Paul C.; and Stockmann, Hans H., to National Starch and Chemical Corporation. Bromine-containing esters. 3,891,695, Cl. 260-475.00N.
- Raychem Corporation: *See—*
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- Raymond, James W.; and Millett, James A. Lock assembly. 3,890,815, Cl. 70-363.000.
- Raytheon Company: *See—*
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  - Limberg, Allen Leroy, 3,891,935.
  - Stark, John, Jr., 3,891,891.
  - Wittlinger, Harold Allen, 3,891,895.
  - Woontner, Leo, 3,891,886.
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- Redling, Anthony E. Mailbox apparatus. 3,891,139, Cl. 232-35.000.
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- Reenskoug, Hans Ivar. Fully automatic torque responsive planetary gearbox with plural countershafts. 3,890,855, Cl. 74-730.000.
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- Reid, James P., Jr.; and McConnell, Bobby L., to Burlington Industries, Inc. Process for continuously treating spunlaced nonwoven polyester textiles on a tenter frame. 3,891,386, Cl. 8-18.000.
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- Reihle, Markus; and Harsch, Erich, to Maschinenfabrik Weingarten AG. Stamping machine for slotting core plates. 3,890,863, Cl. 83-71.000.
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- Reinhards, Gunter, to Firm Tente-Rollen Gesellschaft mit beschrankter Haftung Companie. Lockable castor, in particular swivel castor. 3,890,669, Cl. 16-35.000.
- Reinhards, Gunter: *See—*
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  - Blankenship, Ernest Bayne, 3,890,654.
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- Richardson, John L.; Brodie, Alexander O.; and Lewis, Clarke H., to Oxy Metal Industries (Intra) Inc. Multi-layer braided tubular membrane reinforcement. 3,891,556, Cl. 210-490.000.
- Richardson, Murl R., to Oil States Rubber Co. Pipeline cleaning ball and valve structure. 3,890,665, Cl. 15-104.06R.
- Richter, Albert P., Jr., to Texaco Inc. Swaged-tube coupling. 3,891,251, Cl. 285-338.000.
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- Richter, Sidney B.; and Barnas, Eugene F., to Velsicol Chemical Corporation. 2-Alkoxy 3,5-dihalo-benzaldoximes. 3,891,687, Cl. 260-453.00R.
- Richter, Sidney B.; and Barnas, Eugene, to Velsicol Chemical Corporation. Compositions of matter. 3,891,701, Cl. 260-545.00R.
- Ricoh Co., Ltd.: *See—*
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- Ritter, Karl Hermann; and Ritter, Johannes Andreas. Notepad. 3,891,244, Cl. 283-56.000.
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- Roberson, Cletis L.; Russell, Robert G.; Stream, Ralph M.; and Leaman, Harold E., to Owens-Corning Fiberglas Corporation. Strand doctoring means. 3,890,925, Cl. 118-104.000.

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Roberts, Thomas G.; Barr, Thomas A., Jr.; and Rust, Charles M., to United States of America, Army. Imploding cylinder metal vapor laser. 3,891,941, Cl. 331-94.50G.
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Sahm, Peter; and Sebalj-Novosel, Renata, to Aktiengesellschaft Brown, Boveri & Cie. Methods of, and apparatus for, controlling the crystalline structure of alloys, and alloys so produced. 3,891,431, Cl. 75-122.000.
Sailer, Andre Louis; and Frank, Pierre, to Pechiney Ugine Kuhlmann. Metallized and non-metallized diphenol methane containing azo dyestuffs. 3,891,617, Cl. 260-148.000.
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Sauerbrunn, Wolfgang, to Robert Bosch G.m.b.H. High-speed printer. 3,891,077, Cl. 197-1.00R.
Saver, Helene. Sanitary pet box. 3,890,931, Cl. 119-1.000.
Sawada, Hideo; and Kawamoto, Junji, to Daicel, Ltd. Method for preparing cigarette filter. 3,890,983, Cl. 131-267.000.
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Scarpino, Leopoldo, to Amax Inc. Means for monitoring the safety of a remote electrical ground connection. 3,891,894, Cl. 317-18.00C.
Schafer, Josef, to Telesco Brophey Limited. Umbrella frame. 3,890,990, Cl. 135-20.00R.
Schaffner, Carl P.: *See—*
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Scharfen, Hans; Schmitz, Karl Heinz; Strerath, Theo; and Jenko, Dragutin, to Paul Forkardt Kommanditgesellshcaft. Device for oiling and de-oiling compressed air. 3,891,058, Cl. 184-55.00A.
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Tanabe, Masato, 3,891,677.
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Schiff, Joseph. Office machine including flat article feeder. 3,891,203, Cl. 271-4.000.
Schimitschek, Erhard J.; Trias, John A.; and Celto, John E., to United States of America, Navy. Lasing dyes. 3,891,569, Cl. 252-301.20R.
Schimmer, Rigobert: *See—*
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Schinman, Gary B.: *See—*
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Schirmer, Hermann; Peilstocker, Gunter; and Schuster, Herbert, to Bayer Aktiengesellschaft. Thermoplastic moulding compositions of a polycarbonate and a graft copolymer of styrene and acrylonitrile on an acrylic acid ester polymer. 3,891,719, Cl. 260-873.000.
Schloemann-Siemag Aktiengesellschaft: *See—*
Bollig, Georg; Grothe, Horst; Knell, Bernhard; Thalmann, Armin; and Zeller, Josef, 3,891,025.
Schlossberg, Howard; and Milam, David, to United States of America, Air Force. Configuration for efficient cooling and excitation of high average power solid state lasers. 3,891,945, Cl. 331-94.50P.
Schluter, Siegfried Hans-Dietmar; and Kraft, Erich, to Apparatebau Rothemuhle Brandt & Kritzler. Cylindrical heating-surface support structure for regenerative air preheaters. 3,891,030, Cl. 165-10.000.
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Schmidt, Gunther; Theiss, Armin; Dederra, Carl-Helmut; and Kaiser, Leonhard. Fluid cooled combustion chamber construction. 3,890,781, Cl. 60-267.000.
Schmidt, Paul, to Tracto Technik Paul Schmidt. Control arrangement for the forward and backward movement of percussive boring rams. 3,891,036, Cl. 173-91.000.
Schmidt, Thomas R.; and Schinman, Gary B., to Shell Oil Company. Method and apparatus for controlling the addition of a combustion assisting fluid to a flare. 3,891,847, Cl. 250-342.000.
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Schroder, Walter. Drive for converters, rotating drums, plate conveyors or the like. 3,890,852, Cl. 74-410.000.
Schroeder, Thaddeus, to General Motors Corporation. Time division multiplex system for a motor vehicle. 3,891,965, Cl. 340-52.00F.
Schubert, Wilfried, to National Advertising Company. Display character module for changeable copyboards. 3,890,728, Cl. 40-140.000.
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Schwarz, Wilhelm, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Buffer structure. 3,891,200, Cl. 267-140.000.
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SCI Systems, Inc.: *See—*
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Scott, Kenneth W.; and Calderon, Nissim, to Goodyear Tire & Rubber Company, The. Preparation of graft, block and crosslinked unsaturated polymers and copolymers by olefin metathesis. 3,891,816, Cl. 260-889.000.
Scott, Lyle B., to Byron Jackson Inc. Annulus pressure controlled testing apparatus. 3,891,033, Cl. 166-133.000.
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Seifert, Lester H.; Powers, Raymond P.; Schmidt, William M.; Thorwaldsen, Stanley E.; Smith, Frederick; McElroy, David C.; and Dunton, Roy P. Self-propelled lawn mower. 3,890,772, Cl. 56-202.000.
Seiler, Karl-Heinz: *See—*
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Sekiguchi, Kouichi, to Iwasaki Tsushinki Kabushiki Kaisha. Two-tone generator using transistors for switching LC resonant circuits. 3,891,940, Cl. 331-48.000.
Sekmakas, Kazys, to DeSoto, Inc. Water-dispersible cationic polyurethane resins. 3,891,527, Cl. 204-181.000.
Selam, Gabriel. Device for automatically starting and stopping an asynchronous motor. 3,891,903, Cl. 318-212.000.
Selden, Robert W.; and Schein, Edward W., to Weyerhaeuser Company. Connector. 3,890,759, Cl. 52-753.00C.
Sell, James F. Ski bar. 3,890,918, Cl. 114-235.0WS.
Sellstedt, John H.; and Wolf, Milton, to American Home Products Corporation. pyrrolo[1,2,3-de]quinoxalin-2-(3H)-ones and related compounds. 3,891,643, Cl. 260-250.00Q.
Serrill, Dehart M. Mechanism for fishing lure. 3,890,735, Cl. 43-36.000.
Sessa, Raymond V. Wheeled ski skate. 3,891,225, Cl. 280-11.190.
Seuthe, Eberhard, deceased; and by Seuthe, Ellen, executrix. Electrically heated smoke or steam generator. 3,891,826, Cl. 219-273.000.
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Severini, Febo; Valvassori, Alberto; and Pagliari, Alberto, to Montecatini Edison S.p.A. Graft polymers of vinyl chloride on unsaturated olefinic elastomers and process for the preparation thereof. 3,891,720, Cl. 260-878.00R.
Severinsson, Lars Mattis; and Persson, Gert Artur, to Svenska Aktiebolaget Bromsregulator. Device responsive to vehicle loading with signal generating means for brake actuation. 3,891,280, Cl. 303-22.00R.
Sewing, Gerhard; and Bachor, Jurgen, to Paul Hettisch & Co. Adjustable furniture hinge. 3,890,670, Cl. 16-129.000.
Shackelford, Albert D.; Holladay, John H.; and Lloyd, E. J., to United States of America, Agriculture. Chicken coop unstacking machine. 3,891,097, Cl. 214-8.50H.
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Shea, Philip J.; and Abdallah, Abdulmuniem H., to Dow Chemical Company, The. Psychotherapeutic methods employing thioureas. 3,891,769, Cl. 424-322.000.
Shearon, Michael Hillas; and Besel, Roland Leroy, to du Pont de Nemours, E. I., and Company. Method and apparatus for splicing a standby web to a running web. 3,891,158, Cl. 242-58.100.
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  Smitherman, Chester L., Jr.; Overcashier, Robert H.; and Kruka, Vitold R., 3,891,593.
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Shen, Kuo-Cheng, to Canadian Patents & Development Limited. Method and apparatus for pressing particleboard. 3,891,738, Cl. 264-101.000.
Shen, Tsung-Ying: *See—*
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Sherlock, Margaret H., to Schering Corporation. N-Methyl-d-glucamine salt of 2(2-methyl-3′-trifluoro-methylanilino) nicotinic acid in the treatment of pain. 3,891,761, Cl. 424-266.000.
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Shimazawa, Eiichirou: *See—*
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Shoda, Hiroshi; and Araki, Mikio, to Kabushiki Kaisha Komatsu Seisakusho. Control system for a balance correcting machine. 3,891,835, Cl. 235-151.110.
Shoemaker, Harold L.: *See—*
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Showalter, Merle Robert. Pilot injection fuel injection pump. 3,891,151, Cl. 239-533.000.
Showell, Richard G. D., to Bar Productions (Bromsgrove) Limited. Storage assemblies. 3,890,903, Cl. 104-1.00R.
Shryock, Stanley H.: *See—*
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  Kleen, Gerhard; and Herrmann, Albert, 3,891,863.
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Sievers, Robert E.; and Brooks, Joseph J. Separation of compounds differing in isotopic composition. 3,891,413, Cl. 55-67.000.
Sievers, Willi; and Van Steenput, Andre, to Continental Gummi-Werke Aktiengesellschaft. Mold segment for vulcanizing molds. 3,891,363, Cl. 425-28.00R.
Signora, Maurizio, to Ing. C. Olivetti & C., S.p.A. Apparatus for moulding helical gears by compression of powders. 3,891,367, Cl. 425-78.000.
Silberschlag, Russell E., to Borg-Warner Corporation. Hydraulic actuator. 3,890,884, Cl. 92-84.000.
Simington, Jack F. Automatic chain sharpener. 3,890,857, Cl. 76-25.00A.
Simmons, George A., to Owens-Illinois, Inc. Glass-ceramic and process therefor. 3,891,419, Cl. 65-30.000.
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Simon Engineering Dudley Limited: *See—*
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  Feltz, Albert John, 3,890,853.
  Herr, john A.; and Jaffe, Wolfgang, 3,891,876.
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Sisk, George William, Jr., to Whirlpool Corporation. Bimetal thermostat defrost and air temperature control. 3,890,799, Cl. 62-215.000.
Sjostrand, Gunnar O.; and Sjostrand, Staffan G., to Musikindustriell Forskning MIFO AB. Device for stringing and tuning of strings in pianos, grand pianos, harpsichords, zithers and the like. 3,890,872, Cl. 84-207.000.
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Smid, Peter Max: *See—*
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Smith, Fred T.; Munyon, Julian M.; and Gebhardt, James J., Jr., to Barber-Greene Company. Convergent link system for connecting a screed to the traction unit of a paving machine. 3,891,338, Cl. 404-84.000.
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Smith, Lynn Elwyn. Plastic one-piece saddle for plastic pipe. 3,891,247, Cl. 285-110.000.
Smith, Owen; and Holder, James F., to Love Oil Company, Inc. Crystal generator to inhibit scale formation and corrosion in fluid handling systems. 3,891,394, Cl. 23-273.00R.
Smith, Trevor James, to Imperial Chemical Industries Limited. Pyrimidyl-anthraquinone dyes. 3,891,645, Cl. 260-256.50R.
Smitherman, Chester L., Jr.; Overcashier, Robert H.; and Kruka, Vitold R., to Shell Oil Company. Method and apparatus for dissolution of polymer in solvent. 3,891,593, Cl. 260-34.200.
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Snader, Earle Stuart, to Koppers Company, Inc. Drag scraper assembly for electrostatic precipitator. 3,891,414, Cl. 55-108.000.
Snazuk, Vladimir R. Spring biased prop for a pivoted member. 3,891,111, Cl. 217-60.00F.
Snoberger, Robert C.; Delker, Thomas C.; and Reschly, Richard L., to Travel Equipment Corporation. Travel trailer frame and suspension. 3,891,231, Cl. 280-106.50R.
Snow, Harold F., to Borden, Inc. Method for eviscerating clams. 3,890,676, Cl. 17-45.000.
Socha, Johannes; and Groth, Wolfgang, to W. Schlafhorst & Co., Maschinenfabrik. Driving mechanism for knitting needle displacement in warp knitting machines, such as raschel machines, particularly. 3,890,807, Cl. 66-86.00R.
Societe anonyme dite: MAR-PHA, Societe d'Etude et d'Exploitation de Marques: *See—*
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Societe Anonyme pour l'Industrie Chimique: *See—*
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Sommer, Richard; Wiesel, Manfred; Otten, Hans-Gunter; and Siegel, Edgar, to Bayer Aktiengesellschaft. Phenyl-azo-indole compounds. 3,891,619, Cl. 260-165.000.
Sonnen, Rudolf, to Kleinewefers Industrie Companie GmbH. Seal for treatment containers, especially for width of textile goods. 3,891,223, Cl. 277-32.000.
Sonobe, Eitetsu: *See—*
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Spademan, Richard G. Releasable ski binding. 3,891,227, Cl. 280-11.35R.
Sparling, Donald F. Concrete utility post with meter, gas line and water line. 3,891,899, Cl. 317-105.000.
Specht, Dieter, to Masyc AG. Construction set. 3,890,755, Cl. 52-645.000.
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Spies, Kalus, to Bochumer Eisenhutte Heintzmann & Co. Mobile mine roof support with mining apparatus. 3,891,275, Cl. 299-32.000.
Spisak, Edward G., to S & S Product Engineering Service, Inc. Wheel and wheel trim assembly. 3,891,276, Cl. 301-37.00R.
Spooner, Peter David: *See—*
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Spurdle, Graham David. Corner bend in fibrous sheet material. 3,890,754, Cl. 52-631.000.
Stacy, Donald G.: *See—*
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Standley, Wendell Evert; and Beall, Glenn Lee, to Abbott Laboratories. Syringe injector with pop-top cap. 3,890,972, Cl. 128-220.000.
Stanish, Robert B., to Poster Products, Inc. Display device. 3,890,777, Cl. 58-50.00R.
Stanley, Leonard A.; and Kasbo, Loyd G., to Kendall Co., The. Substrate having a slightly water soluble binder and a herbicide for retarding weed growth over a long period of time. 3,891,423, Cl. 71-86.000.
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  Mihailovski, Alexander, 3,891,688.
  Weil, Edward D., 3,891,727.
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Stroh, Jan: *See—*
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  Okazaki, Hiroyuki; Yuji, Isao; and Yui, Masayuki, 3,891,451.
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Sunday, William V. Plastic washboard. 3,890,812, Cl. 68-224.000.
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Sunstein, Drew E. Digital linearity and bias error compensating by adding an extra bit. 3,891,837, Cl. 235-152.000.
Surrette, Richard H.; and Braga, Alfred M., to Foster Grant Co., Inc. Sunglass display stand. 3,891,092, Cl. 211-13.000.
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Suverkropp, Geertrudes H.; and Reichrath, Werner, to Stamicarbon, N.V. 1-Ureido-5-aminocapronamide. 3,891,702, Cl. 260-553.00R.
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Swett, Leo Ralph, to Abbott Laboratories. Substituted pyrazolo[3,4-e][1,4]thiazepines and isoxazolo[5,4-e][1,4]thiazepines. 3,891,630, Cl. 260-239.30B.
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Szczepanski, Harry. Rotatively indexed spray-painting machine. 3,890,921, Cl. 118-4.000.
Szekeres, Edward S., to United States Steel Corporation. Controlled flux addition for minimizing surface defects on continuously cast steel. 3,891,023, Cl. 164-55.000.
Sztankay, Zoltan G. Automobile collison avoidance laser system. 3,891,966, Cl. 340-53.000.
Tabata, Kazuo. Diver's harness for compressed air tank. 3,891,131, Cl. 224-25.00A.
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Takada, Takezo, to Takata Kojyo Co., Ltd. Motor vehicle safety devices. 3,891,272, Cl. 297-386.000.
Takada, Takezo, to Takata Kojyo Co., Ltd. Automatic withdrawal control mechanism for vehicle safety. 3,891,273, Cl. 297-388.000.
Takagishi, Jonathan Wayne: *See—*
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Tallman, Erven. Method of making a hydraulic jack. 3,890,684, Cl. 29-156.40R.
Talsma, Tjitte, to U.S. Philips Corporation. Device for the display of colour television images. 3,891,951, Cl. 335-210.000.
Tamaki, Mituo; Ninomiya, Yasumasa; Koyama, Tatsuo; and Ishige, Ryouhei, to Hitachi, Ltd.; and Japanese National Railways. Storage with automatic handling means for storing articles. 3,891,100, Cl. 214-38.0CA.
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Tanabe, Masato, to Schering Corporation. 17α,20,20,21-Bismethylenedioxy-4,5-seco-3-pregnyne-5-ones. 3,891,677, Cl. 260-340.900.
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Tausch, Harry W., to Goodyear Tire & Rubber Company, The. Non-settling rubber chemical composition and method of preparing said composition. 3,891,588, Cl. 260-29.70R.
Taylor, A. Hadley. Ramp attachment for wheel chair. 3,891,268, Cl. 297-217.000.
Taylor, Lynn J. Direct synthesis of composite materials. 3,891,594, Cl. 260-37.00N.
Taylor, William P., to Burris Industries, Incorporated. Reclining chair assembly. 3,891,267, Cl. 297-68.000.
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Teed, Richard K., to Riegel Textile Corporation. Apparatus for intermittently applying deposits of adhesive onto a moving web of material. 3,890,926, Cl. 118-325.000.
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Tenconi, Riccardo. Circular knitting machine with pneumatic thread feeding devices. 3,890,809, Cl. 66-132.00R.
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  - Rose, Lloyd E., 3,890,727.
- Thaler, Richard, to Sprecher & Schuh AG. High-voltage power switch. 3,891,893, Cl. 317-11.00A.
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- Theiss, Armin: *See—*
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  - Lavarini, Bernard; Crancon, Jean-Pierre; and Thomas, Jean-Yves, 3,891,944.
- Thomin, Georges, to Centre National d'Etudes Spatiales. High holding strength and low response time electro-magnet structure. 3,891,953, Cl. 335-289.000.
- Thominet, Michel Leon, to Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France. N-(2-pyrrolidyl or piperidyl alkyl)-4-hydroxy benzamides. 3,891,671, Cl. 260-326.470.
- Thompson, Ralph F.: *See—*
  - Fassett, Donald G.; and Thompson, Ralph F., 3,890,646.
- Thomson-CSF: *See—*
  - Destrade, Michel; and Vassort, Jean-Luc, 3,891,948.
- Thornhill, Daniel E.: *See—*
  - Cheek, Thomas B.; Thornhill, Daniel E.; and Stewart, Ronald B., 3,891,982.
- Thorsell, Sven Torgny, to Linden-Alimak AB. Device for inserting drains into the ground. 3,891,186, Cl. 254-29.00R.
- Thorwaldsen, Stanley E.: *See—*
  - Seifert, Lester H.; Powers, Raymond P.; Schmidt, William M.; Thorwaldsen, Stanley E.; Smith, Frederick; McElroy, David C.; and Dunton, Roy P., 3,890,772.
- Thyssen Niederrhein AG Hutten- und Walzwerke: *See—*
  - Forster, Eckehard; Richter, Helmut; Spetzler, Edgar; Wendorff, Jochen; Klapdar, Wilhelm; and Rommerswinkel, Heinrich-Wilhelm, 3,891,196.
- Tiede, Clair L. Bicycle propelling means. 3,891,044, Cl. 180-31.000.
- Tiedemann, Wolfgang Otto, to Sibtec, AB. Method of cleaning a liquid filter, and filter for performing the method. 3,891,551, Cl. 210-82.000.
- Tietjens, Eduard Willem, to U.S. Philips Corporation. Coupling pin for an electric dry-shaver. 3,890,705, Cl. 30-43.600.
- Tietjens, Eduard Willem, to U.S. Philips Corporation. Rotatable cutter head for an electric dry shaver. 3,890,709, Cl. 30-43.600.
- Tilg, Robert: *See—*
  - Maier, Elmar; Tilg, Robert; and Walser, Karl, 3,891,133.
- Tims, Allan C.: *See—*
  - Henriquez, Theodore A.; and Tims, Allan C., 3,891,871.
- Tisdale, Lawrence H., to Raytheon Company. Electron discharge device having electron multipactor suppression coating on window body. 3,891,884, Cl. 313-107.000.
- Tisdale, Robby R.; Rollison, Leon C.; and Hall, Ben F., to Southern Weaving Company. Filling detecting device for narrow fabric loom. 3,891,011, Cl. 139-372.000.
- Tisseyre, Pierre Georges Christian: *See—*
  - Plat, Michel Marie Rene; Plat, Monique, nee Berry; Cahn, Jean; and Tisseyre, Pierre Georges Christian, 3,891,640.
- Tjurin, Jury Grigorievich: *See—*
  - Shapiro, Aron Beniaminovich; Chernyavsky, Vladimir Pavlovich; Kadi-Ogly, Ibragim Akhmedovich; and Tjurin, Jury Grigorievich, 3,891,877.
- Tobacman, Leo: *See—*
  - Hertrick, Thomas P.; Mitiska, James L.; and Tobacman, Leo, 3,891,164.
- Todt, Hans-Gunther; and Voss, Gunter, to Schering AG. Acid, galvanic zinc bath. 3,891,520, Cl. 204-55.00R.
- Tokumoto, Toshiyuki. Electrostatic separating apparatus. 3,891,537, Cl. 204-308.000.
- Tokunaga, Masayoshi: *See—*
  - Adachi, Kazuma; Tokunaga, Masayoshi; and Takeshita, Shigeru, 3,891,350.
- Tomita, Sadami; Chiba, Akio; and Miyajima, Goh, to Hitachi, Ltd. Pole piece for producing a uniform magnetic field. 3,891,475, Cl. 148-31.550.
- Torresi, Vincenzo N., to Ing. C. Olivetti & C., S.p.A. Drive circuit for a liquid crystal display. 3,891,981, Cl. 340-324.00M.
- Torsten, Bo Goran, to Kommanditbolaget United Stirling AB & Co. Stirling cycle engine with common heat exchanger housing. 3,890,785, Cl. 60-525.000.
- Toshiba Kikai Kabushiki Kaisha: *See—*
  - Segawa, Kazuyoshi, 3,891,126.
- Touchette, Albert F., to Scott Paper Company. Method and apparatus for registering, feeding and separating original and copy sheets in a duplicator. 3,891,318, Cl. 355-100.000.
- Toyo Jozo Co., Ltd.: *See—*
  - Fukushima, Mitsuru; Inaba, Yoshihito; Kobari, Sadami; and Morishita, Masataka, 3,891,570.
- Toyo Kogoyo Co., Ltd.: *See—*
  - Shibagaki, Masao; and Oonishi, Masayoshi, 3,890,947.
- Toyo Kogyo Co., Ltd.: *See—*
  - Yoshino, Tsutomu, 3,891,406.
- Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
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  - Miyake, Joji; and Nakakobara, Takeshi, 3,891,361.
  - Noda, Fumiyoshi; and Takeuchi, Yukihisa, 3,891,009.
- Track Pack Corporation: *See—*
  - Roe, Harry James, 3,891,342.
- Tracto Technik Paul Schmidt: *See—*
  - Schmidt, Paul, 3,891,036.
- Traficant, Charles. High lift mechanism. 3,891,108, Cl. 214-512.000.
- Traimond, Antoine: *See—*
  - Camion, Jean; Campot, Etienne; Conneau, Jean; Contival, Serge; Dejoux, Andre; Detton, Jean; Gournelle, Maurice; and Traimond; Antoine, 3,890,824.
- Trainor, Maurice J.; and Riddle, Charles F., to Rexnord Inc. Wear balanced cleat for compaction wheel. 3,891,341, Cl. 404-121.000.
- Travel Equipment Corporation: *See—*
  - Snoberger, Robert C.; Delker, Thomas C.; and Reschly, Richard L., 3,891,231.
- Travor, Bruce W.; and Brown, Samuel L., to United States of America, Army. Projectile. 3,890,902, Cl. 102-93.000.
- Trease, Ralph E., to Owens-Illinois, Inc. Solvents and vehicles for micro-circuitry pastes and pastes made therefrom. 3,891,450, Cl. 106-26.000.
- Tremarco, Emelio. Model airplane adjustable motor mount. 3,891,169, Cl. 248-5.000.
- Trias, John A.: *See—*
  - Schimitschek, Erhard J.; Trias, John A.; and Celto, John E., 3,891,569.
- Tritronics (1971) Ltd.: *See—*
  - White, Herbert Montgomery, 3,891,962.
- Triumph Werke Nurnberg A.G.: *See—*
  - Jung, Friedrich, 3,891,078.
- Trostmann, Erik; and Fensvig, Jens Andreas Toft, to Instituttet for Produktudvikling. Apparatus for measuring a fluid flow rate. 3,890,839, Cl. 73-199.000.
- TRW Inc.: *See—*
  - Herbenar, Edward J., 3,891,336.
  - Maxwell, Jerome Eugene, 3,891,973.
  - Oicles, Jeffrey A., 3,891,046.
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  - Ito, Katsuhiko; and Tsuchimoto, Takashi, 3,891,468.
- Tsuji, Nobuo; and Hasegawa, Eiichi, to Fuji Photo Film Co., Ltd. Light-sensitive stencil printing material with porous support and cover sheets. 3,891,441, Cl. 96-68.000.
- Tsuji, Yoshikazu; and Sohma, Yukio, to Fujitsu Limited. Coding system for differential phase modulation. 3,891,959, Cl. 340-146.1AQ.
- Tsukamoto, Junya, to Mitsubishi Kinzoku Kabushiki Kaisha. Liquid-piston type slurry pumping system. 3,891,352, Cl. 417-101.000.
- Tsukamoto, Masahide; and Ohtsuka, Tetsuro, to Matsushita Electric Industrial Co., Ltd. Phase control of the voltages applied to opposite electrodes for a cholesteric to nematic phase transition display. 3,891,307, Cl. 350-160.0LC.
- Tsukiyasu, Tadashi: *See—*
  - Yanagida, Kiyomi; Hirokane, Tadashi; Tsukiyasu, Tadashi; and Sato, Tomoari, 3,891,517.
- Tsunoda, Yoshito, to Hitachi, Ltd. Apparatus for making hologram. 3,891,300, Cl. 350-3.500.
- Tubeue, Jean Andre Georges, to Societe Europeenne de Propulsion. Thermohydraulic engines. 3,890,784, Cl. 60-516.000.
- Tuffias, Robert H., to Litton Systems, Inc. Lubricated assemblies. 3,891,282, Cl. 308-9.000.
- Tummers, Josef; and Pisarik, Walter, to Mannesmannrohren-Werke Aktiengesellschaft. Fender for mooring posts or the like. 3,890,916, Cl. 114-219.000.
- Turner, Kenneth Lamar: *See—*
  - Morris, Horton Harold; Drexel, Richard Jacob, Jr.; and Turner, Kenneth Lamar, 3,891,580.
- Tuzson, John J., to Borg-Warner Corporation. Transient brake application upon acceleration release. 3,891,071, Cl. 192-3.0TR.
- Tyler, Hugh J., to Robertshaw Controls Company. Thermocouple with a diffused chromium casing. 3,891,467, Cl. 136-233.000.
- Udelhofen, John Henry: *See—*
  - Watson, Roger William; Udelhofen, John Henry; and Strukl, Joseph Stephan, 3,891,401.
- Ueda, Hiroshi; and Kuramoto, Yoshio, to Minolta Camera Kabushiki Kaisha. Single lens reflex camera. 3,891,992, Cl. 354-152.000.
- Ueyama, Seizi, to General Company Ltd. Electrostatic recording member. 3,891,787, Cl. 428-409.000.
- Ullman, John E., to Huntington Industries Incorporated. Packaging Machine and method. 3,890,763, Cl. 53-39.000.
- Ullmann, Werner; Schumacher, Bernd; Sieg, Arno; Mattei, Silvano; Fenner, Hans-Ueli; Wettstein, Gottlieb; and Ruh, Herbert, to A.G. fur industrielle Elektronik AGIE. Automatic set-up electroerosion machining method. 3,891,819, Cl. 219-69.00M.
- Under Sea Industries, Inc.: *See—*
  - Roberts, Robert E., 3,890,662.
- Union Carbide Corporation: *See—*
  - Colpoys, Patrick J., 3,891,565.
  - Kozak, Theodore F., 3,890,974.
  - Langkau, John Frank, 3,891,462.
  - Nausedas, Joseph A., 3,890,675.
- Union Oil Company of California: *See—*
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- United Kingdom Atomic Energy Authority: *See—*
  - North, John Malcolm; and Wilks, Ronald Spencer, 3,891,735.

- United States Gypsum Company: *See—*
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- U.S. Industries, Inc.: *See—*
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- U.S. Medical Research & Development, Inc.: *See—*
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- United States of America
  - Agriculture: *See—*
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    - Kline, Leo; and Sugihara, Takashi F., 3,891,773.
    - Lambou, Madeline G.; Spadaro, James J.; and Rusch, Eunice M., 3,891,571.
    - Parkin, Bernard A., Jr.; and Schuller, Walter H., 3,891,612.
    - Shackelford, Albert D.; Holladay, John H.; and Lloyd, E. J., 3,891,097.
    - Verburg, Gerald B.; Frick, John G., Jr.; and Reid, John D., 3,891,389.
  - Air Force: *See—*
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    - Day, Douglas B.; and Stahl, Welfred A., 3,891,165.
    - Harada, Yoshiro; and Hed, A. Z., 3,891,461.
    - Hohman, Alvin E.; and Lively, Gerald W., 3,891,456.
    - Kerwin, Robert D.; and Sulzle, Darwin B., 3,891,984.
    - Schlossberg, Howard; and Milam, David, 3,891,945.
  - Army: *See—*
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    - Gould, William I., Jr., 3,890,900.
    - Looger, Lonnie L.; and Vickers, Wiley B., 3,890,879.
    - Roberts, Thomas G.; Barr, Thomas A., Jr.; and Rust, Charles M., 3,891,941.
    - Ryan, Maurice A.; and Barron, Morton A., 3,891,323.
    - Travor, Bruce W.; and Brown, Samuel L., 3,890,902.
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    - Wolterman, William G., 3,891,162.
  - General Counsel-Code GP: *See—*
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  - Interior: *See—*
    - Cole, Ernest R., Jr.; Dressel, Waldemar M.; and Smith, Lawrence L., 3,891,430.
  - National Aeronautics and Space Administration; administrator; with respect to an invention of:
    - Auer, Siegfried O. Impact position detector for outer space particles. 3,891,851, Cl. 250-385.000.
    - Levin, Herman; Auker, Byron H.; and Gardos, Michael N. Refractory porcelain enamel passive control coating for high temperature alloys. 3,891,452, Cl. 106-48.000.
    - Menzies, Robert T. Fluorescence detector for monitoring atmospheric pollutants. 3,891,848, Cl. 250-345.000.
    - Putnam, David F.; and Vaughan, Richard L. Electrolytic cell structure. 3,891,533, Cl. 204-267.000.
  - National Aeronautics and Space Administration; deputy administrator; with respect to an invention of:
    - Hunt, Stacy R., Jr.; Homkes, Robert J.; Poteate, Wilmer B.; and Sturgis, Andrew C. Multiparameter vision testing apparatus. 3,891,311, Cl. 351-38.000.
  - Navy: *See—*
    - Anderson, Matthew E.; and Redmond, Stephen L., 3,890,901.
    - Cusic[illegible] John H.; Brown, Alvin E.; Hamamoto, Al S.; and Bellin, Ja[illegible] L. S., 3,890,831.
    - [illegible], Richard W.; and Crilly, Joseph B., 3,891,583.
    - [illegible]son, Herman E.; and Lieberman, Gilbert, 3,890,913.
    - E[illegible]ckson, Porter W.; and Hellfritzsch, Alvin G., 3,891,466.
    - Funk, Clarence J., 3,891,859.
    - Gardner, Paul C., 3,890,914.
    - Haisfield, Rudolph M., 3,891,961.
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    - Jensen, Garold K., 3,891,987.
    - Malloy, Richard J., 3,890,840.
    - Opdahl, Everett W.; and Kim, Chang-Kyo, 3,890,919.
    - Picard, Salvatore R.; and Starry, Robert F., 3,891,865.
    - Rast, Howard E.; and Caspers, Hubert H., 3,891,559.
    - Ryan, Charles C.; Siedband, Melvin D.; and Fuchs, Abraham M., 3,891,988.
    - Schimitschek, Erhard J.; Trias, John A.; and Celto, John E., 3,891,569.
    - Stevens, Orlando J., 3,891,057.
    - Widener, Maurice W., 3,891,960.
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  - Debost, Jean-Pierre; and de Malartic, Jacques Mezan, 3,891,947.
  - Essers, Wilhelmus Gerardus; and Jelmorini, Gerardus, 3,891,824.
  - Hiele, Adrianus Leonardus, 3,891,815.
  - Janssen, Peter Johannes Hubertus; van Hattum, Johannes Simon Albert; and Korver, Jan Abraham Cornelis, 3,891,800.
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  - Naastepad, Pieter Aart, 3,891,476.
  - Talsma, Tjitte, 3,891,951.
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  - Tietjens, Eduard Willem, 3,890,709.
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- Upjohn Company, The: *See—*
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- Urushida, Yoshihisa, to Citizen Watch Company Limited. Watch with solar cell unit. 3,890,776, Cl. 58-23.00C.
- Usines Decoufle: *See—*
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- USM Corporation: *See—*
  - Babson, Edward S.; Brennan, John W.; Gorini, Robert F.; and Mason, Ronald C., 3,890,911.
  - Hanson, Raymond, 3,890,664.
  - Zemlin, John C., 3,891,785.
- Vadasz, Leslie L., to Intel Corporation. Integrated circuit structure and method for making integrated circuit structure. 3,891,190, Cl. 357-41.000.
- Vaidettaro, Alarico A., to Sarkes Tarzian, Inc. UHF tuner composite dial mounting arrangement. 3,890,846, Cl. 74-10.410.
- Valdex, George L. Self-propelled earth moving device. 3,891,043, Cl. 180-13.000.
- Valette, Raymond, to Albert & Rowland S.A. 6,7 Substituted 3-hydroxymethyl- 1 phenyl, benzyl or phenylethyl substituted isoquinolines. 3,891,654, Cl. 260-289.00C.
- Valjoux S.A.: *See—*
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- Valmet O. Y.: *See—*
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- Valspar Inc.: *See—*
  - Peterson, Marvin A.; Good, Adrian J.; and Kurek, Thaddeus P., 3,891,601.
- Valtersson, Bo Valtersson, to Husqvarna Vapenfabriks AB. A filtering device for restrictively propagating incoming high-frequency waves. 3,891,818, Cl. 219-10.55F.
- Valvassori, Alberto: *See—*
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- Van Dorn Company: *See—*
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  - Van Cleave, Eugene, 3,890,870.
- Van Brussell, Marcel A.; and Julia-Polle, Raymond Louis, to International Standard Electric Corporation. Dial pulse receiver. 3,891,808, Cl. 179-16.0EA.
- Vance Industries, Inc.: *See—*
  - Carrigan, James David, 3,891,194.
- Van Cleave, Eugene, to Van Mark Products Corporation. Louver cutter. 3,890,869, Cl. 83-559.000.
- Van Cleave, Eugene, to Van Mark Products Corporation. Free travel handle for louver punch or the like. 3,890,870, Cl. 83-616.000.
- Van Der Lely, Cornelis. Apparatus for the construction and or assembly of prefabricated building sections or room units. 3,890,688, Cl. 29-200.00R.
- Van Der Lely, Cornelis. Prefabricated, space-bounding building sections and a building made from said sections. 3,890,747, Cl. 52-64.000.
- van der Lely, Cornelis. Hay making machines. 3,890,769, Cl. 56-1.000.
- Van Der Veen, Romke: *See—*
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- Van Esch, Robert Florent: *See—*
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  - Janssen, Peter Johannes Hubertus; van Hattum, Johannes Simon Albert; and Korver, Jan Abraham Cornelis, 3,891,800.
- Van Horne, William J. Deflector ball game apparatus. 3,891,210, Cl. 273-30.000.
- Vanlerberghe, Guy: *See—*
  - Kalopissis, Gregoire; Viout, Andre; and Vanlerberghe, Guy, 3,891,385.
- Vannan, Frederick F., Jr., to Goodyear Tire & Rubber Company, The. Method for forming an injection molded tire using molded reinforcing plies. 3,891,740, Cl. 264-263.000.
- Van Paesschen, August Jean; and Herbots, Joseph Antoine, to Agfa-Gavaert Aktiengesellschaft. Motion picture film materials containing magnetic recording stripes. 3,891,444, Cl. 96-84.00R.
- Van Schoyck, Quentin H., to Cylpik, Incorporated. Method and apparatus for monitoring grease buildup within an exhaust system. 3,890,827, Cl. 73-28.000.
- Van Steenput, Andre: *See—*
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- Vapor Corporation: *See—*
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- Varsanyi, Denis: *See—*
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- Vasas, Martin M., to Bridgeport Metal Goods Manufacturing Company, The. Sealing gland for product container. 3,891,330, Cl. 401-122.000.
- Vassort, Jean-Luc: *See—*
  - Destrade, Michel; and Vassort, Jean-Luc, 3,891,948.
- Vaughan, Richard L.: *See—*
  - United States of America, National Aeronautics and Space Administration; Putnam, David F.; and Vaughan, Richard L., 3,891,533.

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Richter, Sidney B.; and Barnas, Eugene, 3,891,701.
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Verberne, Petrus, to W. A. Scholten's Chemische Fabrieken B.V. of W. A. Method and apparatus for the recovery of non-diluted or little diluted juice and of starch from root crops. 3,890,888, Cl. 99-483.000.
Verburg, Gerald B.; Frick, John G., Jr.; and Reid, John D., to United States of America, Agriculture. Shrinkage-control treatment for knitted fabrics. 3,891,389, Cl. 8-149.200.
Vereinigte Deutsche Metallwerke AG: *See—*
Stawicky, Wolfgang; and Ossig, Horst, 3,891,426.
Verheijen, Egidius J. M.; Thoma, Jozef A.; and Deumens, Johannes J. M., to Stamicarbon, B.V. Preparation of alkylated or non-alkylated dihydrocoumarin together with the corresponding alkylated, or non-alkylated, coumarin. 3,891,678, Cl. 260-343.20R.
Verjux, Jean, to Usines Decoufle. Device for cutting a continuous strip of paper. 3,890,866, Cl. 83-346.000.
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Vilms, Juri, to United States of America, Army. Method of making an ohmic contact to a semiconductor material. 3,890,699, Cl. 29-590.000.
Vinals, Joaquin Francisco; Quinn, Alton Dewitt; and Pittet, Alan Owen, to International Flavors & Fragrances Inc. Novel process for altering the organoleptic properties of tobacco using one or more alpha-pyrones and process. 3,890,981, Cl. 131-144.000.
Viout, Andre: *See—*
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Voaden, Arthur Trevor, to Imperial Chemical Industries Limited. Process for shaping polytetrafluoroethylene sheet. 3,891,736, Cl. 264-92.000.
Vockenhuber, Karl: *See—*
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Vodnansky, Jiri; and Stoy, Artur, to Ceskoslovenska akademie Ved No. 3 Narodni. Roller with an elastic hydrogel layer for dye application or printing on glass and other materials. 3,890,683, Cl. 29-132.000.
Vogt, Ulrich, to Daimler-Benz Aktiengesellschaft. Sliding bearing. 3,891,287, Cl. 308-237.00A.
Vohringer, Gerd: *See—*
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Volz, Frederic E. Multi-channel sun photometer. 3,891,326, Cl. 356-222.000.
von Klenck, Jurgen; Michel, Erich; and Gerstenacker, Klaus-Dieter, to Mannesmann-AG. Method and apparatus for pyrolytically reducing waste. 3,890,908, Cl. 110-8.00R.
Vorbruggen, Helmut; and Niedballa, Ulrich, to Schering Aktiengesellschaft. Process for preparing cytidines. 3,891,623, Cl. 260-211.50R.
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Vuceta, Ivan N.: *See—*
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Wagner, Edmund. Concrete reinforcement. 3,890,756, Cl. 52-648.000.
Wahl, Josef, to Robert Bosch G.m.b.H. Method and system to reduce noxious components in the exhaust emission from internal combustion engines with carburetor supply. 3,890,946, Cl. 123-119.00R.
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Wakae, Osamu; Yakushiji, Kunito; and Okada, Yoshiyuki, to Takeda Chemical Industries, Ltd. Method for combatting bacterial plant diseases using 2-amino-1,3,4-thiadiozoles. 3,891,762, Cl. 424-270.000.
Walcott, Frank R. Water collection and storage dispersion apparatus. 3,890,934, Cl. 119-78.000.
Walker, Richard A., to Kollmorgen Corporation. Photometric device for printer light source and the like. 3,891,317, Cl. 355-68.000.
Walkey, John E., to Chevron Research Company. Integrated hydrocarbon conversion process. 3,891,538, Cl. 208-50.000.
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Warsinski, Robert, to Ford Motor Company. Cooling curve computer. 3,891,834, Cl. 235-151.300.
Wasson, Burton Kendall, to Merck Sharp & Dohme (I.A.) Corporation. 4-[3-Amino-2-acyloxypropoxy]-1,2,5-thiadiazole compounds. 3,891,639, Cl. 260-247.10H.
Watanabe, Atsumi, to Hitachi, Ltd. Automatic pulse phase shifter for A.C.-D.C. or D.C.-A.C. converter. 3,891,912, Cl. 321-16.000.
Watanabe, Tamotsu, to Nippon Kogei Kogyo Company, Limited. Electrostatic dust collector for exhaust gases containing fine particles. 3,891,415, Cl. 55-122.000.
Watanabe, Yasuaki, to Victor Company of Japan, Limited. Variable impedance circuit. 3,891,867, Cl. 307-264.000.
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Watts, William A., to Goodyear Tire & Rubber Company, The. Synergistic antiblock systems for an ethylene/vinyl acetate copolymer. 3,891,587, Cl. 260-28.5AV.
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Weil, Sanford A.; Tarman, Paul B.; and Punwani, Dharamvir, to Institute of Gas Technology. Oil shale hydrogasification process. 3,891,403, Cl. 48-197.00R.
Weil, Sanford A.; Tarman, Paul B.; and Punwani, Dharamvir, to Institute of Gas Technology. Heavy oil hydrogasification process. 3,891,404, Cl. 48-213.000.
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Well, Dale E.; and Marley, Kenneth C. Remotely operated seafloor coring and drilling method and system. 3,891,037, Cl. 175-6.000.
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White, Charles S. Structural bearing element having a low friction surface and method. 3,891,488, Cl. 156-170.000.
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Wikey, Arnold. Aquarium water treatment apparatus. 3,891,535, Cl. 204-275.000.
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Wilcox, Merrill. 2-Amino-2,6-dinitrophenylhydrazines. 3,891,706, Cl. 260-569.000.
Wilfert, Karl; Barenyi, Bela; and Renner, Hermann, to Daimler-Benz Aktiengesellschaft. Roof for motor vehicles. 3,891,266, Cl. 296-137.00R.
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Wolf, Gerhard Dieter; Bentz, Francis; and Nischk, Gunther, to Bayer Aktiengesellschaft. Shaped articles made of acrylonitrile polymers containing antistatic additives. 3,891,718, Cl. 260-859.00R.
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Woontner, Leo, to RCA Corporation. Cathode ray tube having a luminescent screen including a two component white-emitting phosphoric mixture. 3,891,886, Cl. 313-467.000.
Worden, R. B. Action-shaft fish lure mount. 3,890,736, Cl. 43-42.110.
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Wurster, Ewald, to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH. Halogen incandescent lamp. 3,891,885, Cl. 313-178.000.
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Yasuda, Isao; and Osawa, Akira, to Hitachi, Ltd. Light pen position detector for color display device. 3,891,890, Cl. 315-365.000.
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  Berlin, Alfred Anisimovich; Liogonky, Boris Izrailevich; and Zapadinsky, Boris Isaakovich, 3,891,633.
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  Bollig, Georg; Grothe, Horst; Knell, Bernhard; Thalmann, Armin; and Zeller, Josef, 3,891,025.
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  Hurlemann, Ernst; and Zellweger, Jurg, 3,890,881.
Zemlin, John C., to USM Corporation. Process for forming a flexible polyurethane coating. 3,891,785, Cl. 427-359.000.
Zenith Radio Corporation: *See—*
  Korpel, Adrianus; and Whitman, Robert L., 3,890,829.
  Lerner, Martin L., 3,891,491.
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Zimmer, George A; Allaben, Charles M., Jr.; and Weidman, William K., to Borg-Warner Corporation. Roller bearing assembly. 3,891,286, Cl. 308-207.000.
Zimmer, Peter. Textile-printing machine. 3,890,896, Cl. 101-119.000.
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Zullig, Heinz; and Leutwyler, Robert, to Madag Maschinen- und Apparatebau Dietikon AG. Device on a flat knitting machine for inserting a design. 3,890,808, Cl. 66-127.000.
Zwernemann, Ross, to Motorola, Inc. Method of making a high current Schottky barrier device. 3,891,479, Cl. 148-175.000.
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Ecke, Paul, Jr., to Paul Ecke Ranch. Poinsettia plant. 3,735, 6–24–75, Cl. 86.
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Kendall, Harold E. Avocado tree. 3,734, 6–24–75. Cl. 44.

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  Kunkle, James R. 235,553.
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Alexander, Merton J. Thumb-oriented food tray. 235,500, 6–24–75, Cl. D7—38.
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American Safety Equipment Corp.: *See—*
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Amoroso, Nicholas A., to Bright Star Industries, Inc. Bicycle reflector. 235,526, 6–24–75, Cl. D10—111.
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Asam, Jakob, to Informa S.r.l. Electrical lighting apparatus for displaying advertising messages on a rotary drum. 235,588, 6–24–75, Cl. D96—12.
Asberg, Sture L., to SKF Nova AB. Wheel cover. 235,539, 6–24–75, Cl. D12—206.
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Barton, Stanley E., to Rosenhain and Lipmann Pty. Ltd. Toy construction piece. 235,570, 6–24–75, Cl. D34—15.
Beck, Raymond M., to Mechanical Refrigeration Enterprises. Case for refrigeration test instruments or the like. 235,582, 6–24–75, Cl. D87—1.
Berger, Robert P. Dental blade probe tool. 235,550, 6–24–75, Cl. D24—1.
Bernard, Rodolphe J. Child's boat shaped like a sternwheeler. 235,531, 6–24–75, Cl. D12—68.
Bernard, Rodolphe J. Child's boat shaped like a submarine. 235,532, 6–24–75. Cl. D12—68.
Bernard, Rodolphe J. Child's boat shaped like a log raft. 235,533, 6–24–75, Cl. D12—68.
Bingley, Linda L. Headboard for a bed or similar article. 235,493, 6–24–75, Cl. D6—80.
Bippus, Jacob R., R. Kazusky, Jr., and E. D. Levy, to Rockwell International Corp. Garden sprayer. 235,544, 6–24–75, Cl. D23—18.
Blocker, William C. Filter. 235,542, 6–24–75, Cl. D23—4.
Boston, Andrew W., Jr., and L. M. Porter. Detachable sunroof for a passenger vehicle. 235,536, 6–24–75, Cl. D12—156.
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Brindley, Robert E., to Union Carbide Corp. Portable flashlight. 235,575, 6–24–75, Cl. D48—24.
Brix, Hermann, to Girling Ltd. Pad anti-rattle spring for a disc brake. 235,538, 6–24–75, Cl. D12—180.
Brych, Alfred, to Saft-Societe des Accumulateurs Fixes et de Traction. Lamp. 235,573, 6–24–75, Cl. D48—24.
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Cook, Raymon W., to Ray Cook Golf Putters, Inc. Golf putter head. 235,568, 6–24–75, Cl. D34—5.
Cox, Quentin T. Float valve. 235,545, 6–24–75, Cl. D23—19.
Cunningham, Harold. Combined measuring and calculating scale. 235,522, 6–24–75, Cl. D10—71.
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Defina, Angelo L. Toy bank. 235,569, 6–24–75, Cl. D34—11.
Derr, Paul B., G. D. Ferdon, and R. G. Harwood, to AMP Inc. Electrical connector. 235,551, 6–24–75, Cl. D26—1.
Derr, Paul B., G. D. Ferdon, and R. G. Harwood, to AMP Inc. Electrical connector. 235,552, 6–24–75, Cl. D26—1.
De Tomaso, Alejandro, and T. Tjaarda, to SCM Corp. Typewriter. 235,579, 6–24–75, Cl. D64—11.
Donnelly, Jack M., to Girling Ltd. Template. 235,521, 6–24–75, Cl. D10—64.
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  Eusemann, Stephen. 235,541.
Egleston, Harry B., to Ex-Cell-O Corp. Dispensing container or similar article. 235,515, 6–24–75, Cl. D9—240.
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  Day, William H. 235,499.
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- Hackenberg, Robert A. Carton. 235,514, 6–24–75, Cl. D9—224.
- Hall, Edward M. Key holder. 235,584, 6–24–75, Cl. D87—8.
- Harwood, Robert G.: *See—*
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- Haynes, Thomas E. Auxiliary housing for use with pickup trucks. 235,537, 6–24–75, Cl. D12—156.
- Hohm, Robert P.: *See—*
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- Holmes, Brian H., and C. Flint, to Dunlop Ltd. Tire for a vehicle wheel. 235,535, 6–24–75, Cl. D12—142.
- Holt, Jorgen, to Nordisk Ventilator Co. Aktieselskab. Injection nozzle rim for ventilating apparatus. 235,548, 6–24–75, Cl. D23—163.
- Hospital Systems, Inc.: *See—*
  - Miller, Robert D. 235,580.
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- Kramer, Marshall J. Earth plug remover. 235,504, 6–24–75, Cl. D8—7.
- Kunkle, James R. to AMP Inc. Connector package. 235,553, 6–24–75, Cl. D26—1.
- Kwon, Young D. Digital calendar watch. 235,520, 6–24–75, Cl. D10—39.
- Landell, Harper, to Speakman Co. Faucet fixture body. 235,546, 6–24–75, Cl. D23—32.
- Laylon, Harry, to Dart Industries Inc. Sectional sofa. 235,495, 6–24–75, Cl. D6—63.
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- Lewis, James D. Combined belt and detachable compartments. 235,490, 6–24–75, Cl. D2—381.
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- Livingston, David T., to Reinell Boats, Inc. Boat. 235,530, 6–24–75, Cl. D12—62.
- Loughner, Larry G., to American Optical Corp. Pair of spectacles. 235,577, 6–24–75, Cl. D57—1.
- Mantelet, Jean, to Moulinex, Societe Anonyme. Domestic food grater. 235,501, 6–24–75, Cl. D7—47.
- Mantelet, Jean, to Moulinex, Societe Anonyme. Domestic food chopper. 235,502, 6–24–75, Cl. D7—155.
- Marchetti, Rodney D. Bottle carrying case. 235,512, 6–24–75, Cl. D9—179.
- Matthews, James J., to Utility Tool Corp. Cable coring tool. 235,506, 6–24–75, Cl. D8—98.
- May, John, Mobile home. 235,534, 6–24–75, Cl. D12—103.
- Mechanical Refrigeration Enterprises: *See—*
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- Miller, Murray, and A. Knukel. Combined clock and cabinet. 235,523, 6–24–75, Cl. D10—2.
- Miller, Robert D., to Hospital Systems, Inc. Portable hospital emergency life support system. 235,580, 6–24–75, Cl. D83—1.
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- Myers Electric Products, Inc.: *See—*
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- Parry, Alan C., to Mid-America Body & Equipment Co., Inc. Combined vehicle auxiliary fuel tank and utility compartment. 235,583, 6–24–75, Cl. D87—1.
- Phelps, Albert C. Bar for turning over a shut-down machine. 235,505, 6–24–75, Cl. D8—88.
- Pilato Blat, H. Bottle. 235,510, 6–24–75. Cl. D9—130.
- Plummer, Merle A., to Myers Electric Products, Inc. Power outlet/pedestal box. 235,555, 6–24–75, Cl. D26—5.
- Poisson, Norman D., to The Gillette Co. Razor. 235,586, 6–24–75, Cl. D95—3.
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- Shlesinger, Bernard E. Jr., Reed for reed switch. 235,558, 6–24–75, Cl. D26—13.
- Shlesinger, Bernard E. Jr., Reed for reed switch. 235,559, 6–24–75, Cl. D26—13.
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- Stevens, Dale W. Cot-tent. 235.585, 6–24–75, Cl. D88—3.
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- Watanabe, Riki, to Kabushiki Kaisha Koparu. Digital clock. 235,517, 6–24–75, Cl. D10—15.
- Watanabe, Riki, to Kabushiki Kaisha Koparu. Digital clock. 235,517, 6–24–75. Cl. D10—15.
- Werling, Richard, and J. P. Lindsey, to Omniflight Helicopters, Inc. Spray unit. 235,543, 6–24–75, Cl. D23—18.
- Willis, Donald E., and R. P. Hohm; said Hohm assignor to said Willis. Head supported flashlight. 235,574, 6–24–75, Cl. D48—24.
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25	3,890,731
39.5	3,890,732
89	3,890,733
CLASS 43	
4	3,890,734
36	3,890,735
42.11	3,890,736
57.5R	3,890,737
CLASS 44	
68	3,891,401
CLASS 46	
16	3,890,738
CLASS 47	
56	3,890,739
58	3,890,740
CLASS 48	
197R	3,891,402
	3,891,403
213	3,891,404
CLASS 49	
162	3,890,741
350	3,890,742
352	3,890,743
360	3,890,744
CLASS 51	
71	3,890,745
105R	3,891,405
	3,891,406
287	3,891,407
295	3,891,408
334	3,890,746
361	3,891,409
CLASS 52	
64	3,890,747
79	3,890,748
84	3,890,749
127	3,890,750
166	3,890,751
495	3,890,752
500	3,890,753
631	3,890,754
645	3,890,755
648	3,890,756
695	3,890,757
713	3,890,758
753C	3,890,759
758A	3,890,760
CLASS 53	
22A	3,890,761
25	3,890,762
39	3,890,763
61	3,890,764
183	3,890,765
234	3,890,766
296	3,890,767
CLASS 54	
39	3,890,768
CLASS 55	
20	3,891,410
26	3,891,411
67	3,891,412
	3,891,413
108	3,891,414
122	3,891,415
178	3,891,416
274	3,891,417
302	3,891,418
CLASS 56	
1	3,890,769
	3,890,770
9	3,890,771
202	3,890,772
255	3,890,773
330	3,890,774
	3,890,775
CLASS 58	
23C	3,890,776
50R	3,890,777
57.5	3,890,778
76	3,890,779
CLASS 60	
39.08	3,890,780
267	3,890,781
327	3,890,782
420	3,890,783
468	3,890,788
516	3,890,784
525	3,890,785
547	3,890,786
648	3,890,787
659	3,890,789
CLASS 61	
3	3,890,790
30	3,890,802
43	3,890,791
45D	3,890,792
	3,890,793
54	3,890,794
	3,890,795
69	3,890,796
CLASS 62	
91	3,890,797
155	3,890,798
215	3,890,799
CLASS 63	
13	3,890,800
15.65	3,890,801
CLASS 64	
27B	3,890,803
CLASS 65	
30	3,891,419
106	3,891,420
107	3,891,421
137	3,891,422
CLASS 66	
50R	3,890,804
	3,890,805
	3,890,806
86R	3,890,807
127	3,890,808
132R	3,890,809
161	3,890,810
CLASS 68	
200	3,890,811
224	3,890,812
CLASS 70	
92	3,890,813
106	3,890,814
363	3,890,815
CLASS 71	
86	3,891,423
98	3,891,424
CLASS 72	
6	3,890,817
42	3,890,818
57	3,890,819
169	3,890,820
208	3,890,821
273	3,890,822
402	3,890,823
453	3,890,824
CLASS 73	
15B	3,890,825
27R	3,890,826
28	3,890,827
29	3,890,828
67.5H	3,890,829
73	3,890,830
88B	3,890,831
116	3,890,832
141A	3,890,833
144	3,890,834
147	3,890,835
168	3,890,836
194B	3,890,838
194E	3,890,837
199	3,890,839
204	3,891,391
290V	3,890,840
359	3,890,841
420	3,890,842
421B	3,890,843
421R	3,890,844
462	3,890,845
CLASS 74	
10.2	3,890,849
10.41	3,890,846
217B	3,890,847
372	3,890,850
400	3,890,851
410	3,890,852
435	3,890,853
492	3,890,854
501M	3,890,848
730	3,890,855
869	3,890,856
CLASS 75	
.5BA	3,890,816
10R	3,891,426
10V	3,891,425
12	3,891,427
24	3,891,428
60	3,891,429
77	3,891,430
122	3,891,431
130R	3,891,432
147	3,891,433
CLASS 76	
25A	3,890,857
CLASS 81	
9.5R	3,890,858
52.4R	3,890,859
CLASS 82	
38A	3,890,860
CLASS 83	
23	3,890,861
71	3,890,862
	3,890,863
162	3,890,864
198	3,890,865
346	3,890,866
404	3,890,867
408	3,890,868
559	3,890,869
616	3,890,870
CLASS 84	
1.01	3,890,871
207	3,890,872
383	3,890,873
384	3,890,874
471	3,890,875
CLASS 85	
62	3,890,876
CLASS 86	
1	3,890,877
CLASS 89	
1.7	3,890,878
1.75	3,890,880
1.816	3,890,879
176	3,890,881
CLASS 91	
487	3,890,882
499	3,890,883
CLASS 92	
84	3,890,884
125	3,890,885
CLASS 93	
93D	3,890,886
CLASS 96	
1LY	3,891,434
1.5	3,891,435
27H	3,891,436
36.1	3,891,440
36.3	3,891,437
49	3,891,438
	3,891,439
68	3,891,441
76R	3,891,442
79	3,891,443
84R	3,891,444
100	3,891,445
107	3,891,446
CLASS 98	
115K	3,890,887
CLASS 99	
483	3,890,888
CLASS 100	
48	3,890,889
	3,890,890
102	3,890,891
CLASS 101	
32	3,890,892
69	3,890,893
93.18	3,890,894
111	3,890,895
119	3,890,896
148	3,890,897
	3,890,898
269	3,890,899
CLASS 102	
70.2R	3,890,900
	3,890,901
93	3,890,902
CLASS 104	
1R	3,890,903
121	3,890,904
138G	3,890,905
148SS	3,890,906
CLASS 106	
1	3,891,447
15FP	3,891,448
	3,891,449
26	3,891,450
30	3,891,451
48	3,891,452
85	3,891,453
89	3,891,454
288Q	3,891,455
CLASS 108	
136	3,890,907
CLASS 110	
8R	3,890,908
CLASS 111	
1	3,890,909
	3,890,910
CLASS 112	
121.12	3,890,911
CLASS 113	
1K	3,890,912
CLASS 114	
20R	3,890,913
23	3,890,914
207	3,890,915
219	3,890,916
220	3,890,917
235WS	3,890,918
239	3,890,919
CLASS 115	
6.1	3,890,920
CLASS 118	
4	3,890,921
7	3,890,922
19	3,890,923
78	3,890,924
104	3,890,925
325	3,890,926
419	3,890,927
637	3,890,928
	3,890,929
CLASS 119	
1	3,890,930
	3,890,931
19	3,890,932
60	3,890,933
78	3,890,934
CLASS 122	
4D	3,890,935
248	3,890,936
CLASS 123	
8.45	3,890,937
8.47	3,890,939
32EA	3,890,938
32C	3,890,940
44R	3,890,941
75B	3,890,942
90.3	3,890,943
117R	3,890,944
119A	3,890,945
119R	3,890,946
148DS	3,890,947
148E	3,890,948
188M	3,890,949
193P	3,890,950
CLASS 124	
41	3,890,951
CLASS 126	
45	3,890,952
CLASS 128	
1.5	3,890,953
2F	3,890,955
	3,890,956
2S	3,890,958
2W	3,890,954
2.05D	3,890,962
2.05F	3,890,959
2.1B	3,890,957
16	3,890,960
17	3,890,961
24.1	3,890,963
62R	3,890,964
66	3,890,965
146.2	3,890,966
202	3,890,967
214E	3,890,968
214R	3,890,969
215	3,890,970
218R	3,890,971
220	3,890,972
286	3,890,973
287	3,890,974
339	3,890,975
351	3,890,976
418	3,890,977
485	3,890,978
555	3,890,979
CLASS 131	
121	3,890,980
144	3,890,981
243	3,890,982
267	3,890,983
CLASS 132	
9	3,890,984
	3,890,985
84A	3,890,986
CLASS 134	
3	3,891,456
57D	3,890,987
111	3,890,988
CLASS 135	
7.1R	3,890,989
20R	3,890,990

CLASS 136	
6LN	3,891,457
	3,891,458
26	3,891,459
83T	3,891,460
86E	3,891,461
111	3,891,462
134R	3,891,463
145	3,891,464
182	3,891,465
200	3,891,466
233	3,891,467
CLASS 137	
1	3,890,991
14	3,890,992
45	3,890,993
67	3,890,994
113	3,890,995
119	3,890,996
271	3,890,997
436	3,890,998
505.25	3,890,999
525.3	3,891,000
549	3,891,001
557	3,891,002
561A	3,891,003
615	3,891,004
625.4	3,891,005
625.6	3,891,145
CLASS 138	
94.3	3,891,146
106	3,891,006
121	3,891,007
146	3,891,008
149	3,891,009
CLASS 139	
313	3,891,010
372	3,891,011
CLASS 140	
93A	3,891,012
147	3,891,013
CLASS 144	
32	3,891,014
136J	3,891,015
209A	3,891,016
CLASS 145	
50A	3,891,017
CLASS 148	
1.5	3,891,468
	3,891,469
6.14	3,891,470
6.16	3,891,471
11.5R	3,891,472
16.5	3,891,474
16.7	3,891,473
31.55	3,891,475
103	3,891,476
125	3,891,477
171	3,891,478
175	3,891,479
187	3,891,480
188	3,891,481
CLASS 149	
7	3,891,482
CLASS 152	
225	3,891,018
CLASS 156	
3	3,891,483
60	3,891,484
63	3,891,485
71	3,891,486
78	3,891,487
170	3,891,488
171	3,891,489
295	3,891,490
345	3,891,491
351	3,891,492
437	3,891,494
455	3,891,493
CLASS 157	
1.24	3,891,019
CLASS 159	
6WH	3,891,495
47R	3,891,496
CLASS 160	
37	3,891,020
235	3,891,021
CLASS 162	
6	3,891,497
154	3,891,498
157R	3,891,499
274	3,891,500
290	3,891,501
CLASS 164	
41	3,891,022
55	3,891,023
89	3,891,024
154	3,891,025
282	3,891,026
CLASS 165	
2	3,891,027
6	3,891,028
8	3,891,029
10	3,891,030
CLASS 166	
68.5	3,891,031
117.5	3,891,032
133	3,891,033
285	3,891,034
CLASS 172	
197	3,891,035
CLASS 173	
91	3,891,036
CLASS 174	
68.5	3,891,789
93	3,891,790
107	3,891,791
CLASS 175	
6	3,891,037
7	3,891,038
40	3,891,039
CLASS 176	
71	3,891,502
CLASS 177	
230	3,891,040
255	3,891,041
CLASS 178	
5.8R	3,891,792
6	3,891,793
6.6DD	3,891,796
6.7R	3,891,794
6.8	3,891,797
	3,891,798
7.2	3,891,795
22	3,891,799
69.5TV	3,891,800
CLASS 179	
1CN	3,891,801
2A	3,891,802
15AL	3,891,804
15AN	3,891,806
15BF	3,891,805
15BS	3,891,807
15FS	3,891,803
16EA	3,891,808
119R	3,891,809
156R	3,891,810
175.3A	3,891,811
CLASS 180	
6.48	3,891,042
13	3,891,043
31	3,891,044
66R	3,891,045
105E	3,891,046
117	3,891,047
119	3,891,048
CLASS 181	
36A	3,891,049
102	3,891,050
CLASS 182	
63	3,891,051
88	3,891,052
97	3,891,053
107	3,891,054
141	3,891,055
148	3,891,056
CLASS 184	
7D	3,891,057
55A	3,891,058
104B	3,891,059
CLASS 186	
1R	3,891,060
14	3,891,061
CLASS 187	
10	3,891,062
11	3,891,063
29R	3,891,064
CLASS 188	
41	3,891,065
73.2	3,891,066
196BA	3,891,068
196D	3,891,067
250G	3,891,069
CLASS 190	
41R	3,891,070
CLASS 192	
3TR	3,891,071
99A	3,891,072
CLASS 193	
35A	3,891,073
CLASS 194	
1R	3,891,074
9R	3,891,075
102	3,891,076
CLASS 195	
28R	3,891,503
	3,891,504
80R	3,891,505
	3,891,506
103.5R	3,891,507
103.5	3,891,508
109	3,891,509
CLASS 197	
1R	3,891,077
156	3,891,078
CLASS 198	
36	3,891,079
43	3,891,080
218	3,891,081
CLASS 200	
61.18	3,891,812
144AP	3,891,813
148R	3,891,814
175	3,891,815
CLASS 202	
206	3,891,510
CLASS 203	
81	3,891,511
CLASS 204	
1T	3,891,512
2	3,891,513
15	3,891,514
16	3,891,542
26	3,891,515
33	3,891,516
35N	3,891,517
35R	3,891,518
37R	3,891,519
55R	3,891,520
105R	3,891,521
108	3,891,522
159.15	3,891,523
	3,891,524
181	3,891,525
	3,891,526
	3,891,527
186	3,891,528
195S	3,891,529
197	3,891,530
260	3,891,532
263	3,891,531
267	3,891,533
272	3,891,534
275	3,891,535
298	3,891,536
308	3,891,537
CLASS 206	
8	3,891,082
98	3,891,083
143	3,891,084
229	3,891,085
320	3,891,086
346	3,891,087
349	3,891,088
439	3,891,089
478	3,891,090
CLASS 208	
50	3,891,538
59	3,891,539
77	3,891,540
89	3,891,541
CLASS 209	
144	3,891,543
166	3,891,544
	3,891,545
211	3,891,546
CLASS 210	
23	3,891,547
65	3,891,548
66	3,891,549
67	3,891,550
82	3,891,551
88	3,891,552
136	3,891,553
152	3,891,554
169	3,891,555
490	3,891,556
519	3,891,557
526	3,891,558
CLASS 211	
13	3,891,092
46	3,891,093
105.3	3,891,091
CLASS 212	
20	3,891,094
48	3,891,095
CLASS 214	
1BB	3,891,096
8.5H	3,891,097
	3,891,098
17DA	3,891,099
38CA	3,891,100
63	3,891,101
75H	3,891,103
75T	3,891,102
132	3,891,104
305	3,891,105
318	3,891,106
392	3,891,107
512	3,891,108
519	3,891,109
CLASS 215	
216	3,891,110
CLASS 217	
60F	3,891,111
CLASS 219	
10.55F	3,891,818
10.55R	3,891,817
69M	3,891,819
76	3,891,820
	3,891,821
85	3,891,822
	3,891,823
121P	3,891,824
243	3,891,825
273	3,891,826
302	3,891,827
383	3,891,828
CLASS 220	
1.5	3,891,112
3.6	3,891,113
209	3,891,114
260	3,891,115
270	3,891,116
	3,891,117
288	3,891,118
324	3,891,119
CLASS 221	
2	3,891,120
CLASS 222	
1	3,891,121
17	3,891,122
64	3,891,123
66	3,891,124
129	3,891,125
334	3,891,126
387	3,891,127
402.17	3,891,128
CLASS 223	
37	3,891,129
CLASS 224	
5C	3,891,130
25A	3,891,131
42.03B	3,891,132
CLASS 227	
10	3,891,133
14	3,891,134
CLASS 228	
173	3,890,696
CLASS 229	
4.5	3,891,135
22	3,891,136
44R	3,891,137
56	3,891,138
CLASS 232	
35	3,891,139
CLASS 233	
26	3,891,140
CLASS 234	
1	3,891,141
CLASS 235	
58P	3,891,142
61.11E	3,891,829
	3,891,831
61.7B	3,891,830
61.7R	3,891,143
150.2	3,891,832
	3,891,833
151.11	3,891,835
151.12	3,891,836
151.3	3,891,834
152	3,891,837
153AK	3,891,838
153AS	3,891,839
183	3,891,840
CLASS 236	
46	3,891,144
CLASS 239	
6	3,891,147
68	3,891,148
70	3,891,149
272	3,891,150
533	3,891,151
CLASS 240	
1LP	3,891,841
1.4	3,891,842
CLASS 241	
88.4	3,891,152
214	3,891,153
CLASS 242	
43	3,891,154
45	3,891,155
54R	3,891,156
56.2	3,891,157
58.1	3,891,158
199	3,891,159
CLASS 244	
1SS	3,891,160
3.12	3,891,161
3.22	3,891,166
3.25	3,891,162
42CD	3,891,163
134A	3,891,164
137R	3,891,165
CLASS 246	
34R	3,891,167
167R	3,891,168
CLASS 248	
5	3,891,169
119	3,891,170
131	3,891,171
223	3,891,172
226A	3,891,173
313	3,891,174
317	3,891,175
340	3,891,176
352	3,891,177
CLASS 249	
91	3,891,178
134	3,891,179
CLASS 250	
199	3,891,559
203R	3,891,843
303	3,891,844
321	3,891,845
324	3,891,846
342	3,891,847
345	3,891,848
372	3,891,849
385	3,891,851
391	3,891,852
444	3,891,850
458	3,891,853
461	3,891,560
468	3,891,854
492	3,891,855
523	3,891,856
541	3,891,561
547	3,891,562
551	3,891,858
560	3,891,857
564	3,891,859
CLASS 251	
120	3,891,180
128	3,891,181
297	3,891,182
315	3,891,183
CLASS 252	
8.55D	3,891,567
8.55R	3,891,565
	3,891,566
8.8	3,891,563
40	3,891,564
181	3,891,568
301.2R	3,891,569
316	3,891,570
	3,891,572
354	3,891,571
408	3,891,573
421	3,891,574
455R	3,891,575
CLASS 254	
4R	3,891,184
10.5	3,891,185
29R	3,891,186
93R	3,891,187
134.3R	3,891,188
CLASS 256	
1	3,891,189
CLASS 259	
1R	3,891,191
110	3,891,192
165	3,891,193
CLASS 260	
2.1R	3,891,576
2.5AC	3,891,578
2.5AW	3,891,579
2.5R	3,891,577
8	3,891,580
16	3,891,581
17R	3,891,582
18EP	3,891,583
27R	3,891,584
28.5AS	3,891,585
	3,891,586
28.5AV	3,891,587
29.2EP	3,891,589
29.4R	3,891,590
29.6WB	3,891,591
29.7E	3,891,592
29.7R	3,891,588
34.2	3,891,593
37N	3,891,594
38	3,891,595
40R	3,891,596
42.21	3,891,597
42.56	3,891,598
45.7R	3,891,599
45.75R	3,891,600
47CP	3,891,601
47EN	3,891,602
63R	3,891,603
75H	3,891,605
75R	3,891,604
77.5AM	3,891,606
80.3N	3,891,607
80.78	3,891,608
85.5HC	3,891,609
88.2B	3,891,611
88.2R	3,891,610
99.5	3,891,612
112G	3,891,613
112.5	3,891,614
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148	3,891,617
163	3,891,618
165	3,891,619
209.6	3,891,620
210R	3,891,621
211R	3,891,622
211.5R	3,891,623
233.3R	3,891,624
239BB	3,891,626
239A	3,891,625
239.1	3,891,627
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239.3B	3,891,630
239.55R	3,891,631
240D	3,891,632
240G	3,891,633
243A	3,891,636
243C	3,891,634
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244R	3,891,638
247.1H	3,891,639
247.5FP	3,891,640
250AP	3,891,642
250A	3,891,641
250Q	3,891,643
251A	3,891,644
256.5R	3,891,645
268BC	3,891,648
268DK	3,891,646
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268TR	3,891,647
287R	3,891,651
288CF	3,891,653
288R	3,891,652
289C	3,891,654
289R	3,891,655
290R	3,891,656
293.54	3,891,657
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294.8F	3,891,659
295.5B	3,891,660
297R	3,891,661
306.7R	3,891,662
307D	3,891,664
307F	3,891,663
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308B	3,891,666
308R	3,891,667
309	3,891,668
326.34	3,891,669
326.47	3,891,671
326.5FM	3,891,670
327S	3,891,672
327T	3,891,673
340.5	3,891,674
340.9	3,891,675
	3,891,676
	3,891,677
343.2R	3,891,678
343.9	3,891,679
346.8M	3,891,680
376	3,891,650
397.1	3,891,681
401	3,891,682
410.6	3,891,683
429R	3,891,684
438.1	3,891,685
448R	3,891,686
453R	3,891,687
455A	3,891,688
458	3,891,689
465D	3,891,691
468G	3,891,697
471C	3,891,692
471R	3,891,693
475B	3,891,694
475N	3,891,695
479R	3,891,696
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525	3,891,700
545R	3,891,701
553R	3,891,702
556N	3,891,703
564E	3,891,704
565	3,891,705
569	3,891,706
583K	3,891,707
583N	3,891,708
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878R	3,891,720
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884	3,891,723
889	3,891,724
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927R	3,891,726
928	3,891,727
955	3,891,728
CLASS 261	
87	3,891,729
CLASS 264	
11	3,891,730
33	3,891,731
34	3,891,732
40	3,891,733
43	3,891,734
59	3,891,735
92	3,891,736
95	3,891,737
101	3,891,738
155	3,891,739
263	3,891,740
CLASS 266	
4A	3,891,194
23P	3,891,195
34T	3,891,196
CLASS 267	
47	3,891,197
110	3,891,198
139	3,891,199
140	3,891,200
CLASS 269	
136	3,891,201
CLASS 270	
58	3,891,202
CLASS 271	
4	3,891,203
85	3,891,204
98	3,891,205
174	3,891,206
CLASS 272	
58	3,891,207
65	3,891,208
CLASS 273	
1R	3,891,209
30	3,891,210
73L	3,891,211
80.1	3,891,212
95D	3,891,213
102B	3,891,214
106A	3,891,215
119R	3,891,216
130E	3,891,218
130R	3,891,217
136F	3,891,219
150	3,891,220
177R	3,891,221
CLASS 274	
1R	3,891,222
CLASS 277	
32	3,891,223
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CLASS 280	
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11.35R	3,891,227
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150AB	3,891,233
211	3,891,234
252	3,891,235
283	3,891,236
446R	3,891,238
477	3,891,237
479R	3,891,239
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29	3,891,240
CLASS 283	
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35	3,891,243
56	3,891,244
CLASS 285	
110	3,891,246
	3,891,247
156	3,891,248
189	3,891,249
242	3,891,250
338	3,891,251
CLASS 290	
52	3,891,860
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6	3,891,252
59	3,891,253
113	3,891,254
169.13	3,891,255
202	3,891,256
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98	3,891,258
CLASS 294	
33	3,891,259
90	3,891,260
CLASS 296	
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24R	3,891,263
28C	3,891,264
78.1	3,891,265
137R	3,891,266
CLASS 297	
68	3,891,267
217	3,891,268
252	3,891,269
347	3,891,270
386	3,891,271
	3,891,272
388	3,891,273
389	3,891,274
CLASS 299	
32	3,891,275
CLASS 301	
37R	3,891,276
CLASS 303	
2	3,891,277
21AF	3,891,279
21F	3,891,278
22R	3,891,280
CLASS 307	
117	3,891,861
125	3,891,862
147	3,891,863
212	3,891,864
232	3,891,865
252A	3,891,866
264	3,891,867
CLASS 308	
1R	3,891,281
5R	3,891,283
6C	3,891,284
9	3,891,282
10	3,891,285
207	3,891,286
237A	3,891,287
CLASS 310	
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8.7	3,891,870
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9.5	3,891,872
9.7	3,891,873
14	3,891,874
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43	3,891,876
61	3,891,877
90	3,891,878
163	3,891,879
196	3,891,880
218	3,891,881
CLASS 312	
338	3,891,288
CLASS 313	
7	3,891,882
54	3,891,883
107	3,891,884
178	3,891,885
467	3,891,886
CLASS 315	
3	3,891,887
82	3,891,888
365	3,891,890
368	3,891,889
379	3,891,891
411	3,891,892
CLASS 317	
11A	3,891,893
18C	3,891,894
18D	3,891,895
58	3,891,896
62	3,891,897
101CC	3,891,898
105	3,891,899
139	3,891,900
258	3,891,901
CLASS 318	
139	3,891,902
212	3,891,903
254	3,891,904
	3,891,905
257	3,891,906
369	3,891,907
434	3,891,908
469	3,891,909
572	3,891,910
696	3,891,911
CLASS 321	
16	3,891,912
45R	3,891,913
47	3,891,914
CLASS 322	
15	3,891,915
CLASS 324	
6	3,891,916
16R	3,891,917
34D	3,891,918
72	3,891,919
77B	3,891,920
125	3,891,921
151R	3,891,922
154R	3,891,923
158P	3,891,924
169	3,891,925
CLASS 325	
159	3,891,926
421	3,891,927
474	3,891,928
CLASS 328	
14	3,891,929
117	3,891,930
127	3,891,931
147	3,891,932
CLASS 330	
2	3,891,933
21	3,891,934
22	3,891,935
28	3,891,936
29	3,891,937
107	3,891,938
CLASS 331	
1A	3,891,939
48	3,891,940
94.5G	3,891,941
	3,891,942
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94.5P	3,891,945
108D	3,891,946
CLASS 333	
17	3,891,947
73W	3,891,948
84R	3,891,949
CLASS 335	
151	3,891,950
210	3,891,951
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289	3,891,953
CLASS 336	
61	3,891,954
205	3,891,955
CLASS 337	
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347	3,891,957
CLASS 338	
35	3,891,958
CLASS 339	
14P	3,891,289
15	3,891,290
	3,891,291
36	3,891,292
97C	3,891,293
103R	3,891,294
198GA	3,891,295
246	3,891,296
270R	3,891,297
272R	3,891,298
CLASS 340	
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52R	3,891,964
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162	3,891,970
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234	3,891,979
258D	3,891,980
324AD	3,891,982
324M	3,891,981
336	3,891,983
347CC	3,891,984
353	3,891,985
371	3,891,986
CLASS 343	
5R	3,891,987
16LS	3,891,988
18E	3,891,989
CLASS 346	
74E	3,891,990
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CLASS 350	
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85	3,891,301
96WG	3,891,302
132	3,891,303
144	3,891,305
160LC	3,891,306
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160R	3,891,309
161	3,891,308
184	3,891,304
187	3,891,310
CLASS 351	
38	3,891,311
CLASS 352	
180	3,891,312
CLASS 353	
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101	3,891,314
CLASS 354	
152	3,891,992
CLASS 355	
8	3,891,315
14	3,891,316
68	3,891,317
100	3,891,318
CLASS 356	
5	3,891,319
109	3,891,320
111	3,891,321
126	3,891,322
154	3,891,323
156	3,891,324
205	3,891,325
222	3,891,326
244	3,891,327
249	3,891,328
CLASS 357	
19	3,891,993
41	3,891,190
CLASS 358	
11	3,891,994
CLASS 360	
123	3,891,995
CLASS 401	
65	3,891,329
122	3,891,330
132	3,891,331
CLASS 403	
13	3,891,332
84	3,891,333
173	3,891,335
192	3,891,339
234	3,891,334
320	3,891,336
CLASS 404	
26	3,891,337
38	3,891,340
84	3,891,338
121	3,891,341
128	3,891,342
CLASS 408	
42	3,891,343
CLASS 415	
1	3,891,344
121R	3,891,345
129	3,891,346
CLASS 416	
32	3,891,347
97	3,891,348
132	3,891,349
180	3,891,350
219	3,891,351
CLASS 417	
101	3,891,352
183	3,891,353
216	3,891,354
371	3,891,355
437	3,891,356
CLASS 418	
61A	3,891,357
63	3,891,358
104	3,891,359
132	3,891,360
142	3,891,361
CLASS 423	
2	3,891,741
229	3,891,742
267	3,891,743
415	3,891,744
462	3,891,745
465	3,891,690
492	3,891,746
499	3,891,747
587	3,891,748
CLASS 424	
80	3,891,750
87	3,891,751
117	3,891,752
118	3,891,753
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157	3,891,755
177	3,891,756
200	3,891,758
219	3,891,759
263	3,891,760
266	3,891,761
270	3,891,762
271	3,891,763
273	3,891,764
274	3,891,765
283	3,891,766
288	3,891,767
309	3,891,768
310	3,891,757
311	3,891,749
322	3,891,769
CLASS 425	
4R	3,891,362
28B	3,891,364
28R	3,891,363
78	3,891,367
114	3,891,368
131.1	3,891,365
140	3,891,366
144	3,891,370
174	3,891,369
233	3,891,371
244	3,891,372
301	3,891,373
326R	3,891,374
344	3,891,375
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398	3,891,378
464	3,891,379
CLASS 426	
32	3,891,770
52	3,891,771
60	3,891,772
61	3,891,773
104	3,891,774
107	3,891,775
399	3,891,779
429	3,891,781
455	3,891,782
478	3,891,783
573	3,891,776
	3,891,777
	3,891,778
657	3,891,780
CLASS 427	
295	3,891,784
359	3,891,785
CLASS 428	
136	3,891,786
409	3,891,787
511	3,891,788
CLASS 431	
1	3,891,380
255	3,891,381
CLASS 432	
58	3,891,382
80	3,891,383
217	3,891,384

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D2—	27	235,489		98	235,506		66	235,524	D13—	1A	235,540			235,557	D48—	24A	235,573
	381	235,490		181	235,507			235,525	D18—	2B	235,541			235,558			235,574
D4—	15	235,491		233	235,508		71	235,522	D23—	4	235,542			235,559			235,575
D6—	7	235,492	D9—	83	235,509		111	235,526		18	235,543			235,560	D56—	4B	235,576
	38	235,494		130	235,510	D12—	1	235,527			235,544			235,561	D57—	1F	235,577
	63	235,495		149	235,511		15	235,528		19	235,545		14G	235,562	D61—	E	235,578
	70	235,496		179	235,512		29	235,529		32	235,546			235,563	D64—	11A	235,579
	80	235,493		223	235,513		62	235,530		149	235,547	D34—	5CB	235,565	D83—	1C	235,581
D7—	21	235,497		224	235,514		68	235,531		163	235,548		GH	235,564		F	235,580
	38	235,498		240	235,515			235,532	D24—	1D	235,549			235,566	D87—	R	235,582
		235,499	D10—	2	235,523			235,533			235,550			235,567			235,583
		235,500		15	235,516		103	235,534	D26—	A	235,551			235,568		8	235,584
	47	235,501			235,517		142	235,535			235,552		11R	235,569	D88—	3B	235,585
	155	235,502			235,518		156	235,536			235,553		15GG	235,570	D95—	A	235,586
	206	235,503			235,519			235,537		B	235,554		LL	235,571	D96—	12R	235,588
D8—	7	235,504		39	235,520		180	235,538		5R	235,555	D45—	16B	235,572			235,587
	88	235,505		64	235,521		206	235,539		13	235,556						

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3	:	3,890,731
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DESIGN PATENTS

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PLANT PATENTS

6 :	3,733
	3,735
12 :	3,734

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